City of Lancaster

Division of Water

Department of Engineering

800 Series

CONSTRUCTION AND MATERIAL SPECIFICATIONS

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801 - WATER SUPPLY – GENERAL

801.01 Description. This specification covers material specifications, installation, and maintenance of water mains, main line fittings, fire hydrants, backfill material, service line connections, service line fittings, water meters, meter pits, curb boxes, roadway boxes, and backflow preventers, and the inspection of the same is published by the City of Lancaster, Division of Water for three purposes: (1) to insure all materials meet AWWA, EPA, and City of Lancaster standards as set forth by the above mentioned entities; (2) to insure inspection of all materials and installation of the same; and (3) for the protection of customers of the City of Lancaster.

The intent of this document is to cover provisions associated with installation of water mains, services, etc.; however, these provisions are not intended to be all inclusive. Local laws, ordinances, other governmental regulations, and construction drawings approved by the Division of Water must be complied with when they are more stringent than the requirements contained herein. Where accepted engineering design procedures require that material specifications and installation procedures exceed standards in this document, those higher standards must be used.

WHEN IN DOUBT AS TO THE PROPER PROCEDURE, CONSULT THE CITY OF LANCASTER, DIVISION OF WATER BEFORE PROCEEDING WITH THE WORK. The Division of Water will not assume responsibility for any imperfect material or defective or faulty workmanship in the installation or repair of the customer's service line, meter pit, curb box, or backflow preventer.

801.02 Definitions

(a) City's Service Line. The City's service line is the K-type copper that extends from the City's main line to the curb stop. The City's service line ends at the curb stop. (See Drawing W-2.)

(b) Customer Service Line. The customer service line starts at the downstream side of the curb stop and goes to water meter/backflow preventer.

(c) Meter Assembly/Meter Pit. The meter assembly is the customer's piping, fittings, water valve, and backflow preventer, including the water meter that is installed to connect to the customer's house, building, or facility water lines. Meter pit is the pit in which the above mentioned is installed if the meter set assembly cannot be installed inside owner's facility.

(d) Backflow Preventer. A backflow preventer is a device to prevent back siphonage of non-potable water into the potable water supply.

(e) Backflow Prevention devices.

1. Dual check - A double check valve assembly consists of two independently acting check valves in one single unit.
2. Double check - A double check valve assembly consists of two single, independently acting check valves in one single unit (with test cocks).
3. Reduced pressure principle device (R.P. Device) - A R.P. Device consists of two spring-loaded check valves operating in series, and a spring-loaded/ diaphragm-activated differential pressure relief valve located in the zone between the check valves. These devices will indicate leakage through one or both valves or the relief valve by the discharge of water from the relief valve port.
4. Air gap - An air gap separation provides a complete physical separation between the potable water and a non-potable system.

(f) Thermal Expansion Tank. Thermal expansion tank is designed to prevent a hot water tank pressure relief valve from spilling by providing control of maximum pressures at a level below the relief valve setting. Thermal expansion tanks may also be utilized with certain types of hot water or steam heating systems for similar purposes.

(g) Division of Water. The City of Lancaster, Division of Water is herein also referred to as the Water Department and Water Company.

(h) Customer. The customer is the person, firm, or corporation for whom water service is established and delivered.

(i) Approved. Approved, when referring to material items, signifies that these materials have been qualified through testing and/or experience by the Division of Water and/or by the AWWA and have been found to be acceptable for use in the water piping systems covered by this manual.

(j) AWWA. The American Water Works Association - A research foundation.

(k) Ohio EPA. The Ohio Environmental Protection Agency.

(l) M.J. Fittings. A mechanical joint fitting.

(m) ODOT CMS. State of Ohio Department of Transportation Construction and Material Specifications, 2005 edition.

(n) NSF. National Sanitary Foundation - A research and testing foundation.

801.03 Policy and Requirements

(a) Service Charge Policy. The Lancaster Division of Water may, on certain occasions, charge service fees in order that the Lancaster Division of Water can recover some of the cost of unwarranted service calls. Customers and customers' representatives may be billed for the following calls:

1. Damage to fire hydrant, main line, service lines, meters, meter pits, etc.
2. Multiple calls backs as described within.
3. Service calls not originating with the Division of Water (e.g. to borrow city tools, to buy fittings, water shut off by someone other than the Division of Water, etc.).
4. The Division of Water will continue to offer its customers most services on a no-cost basis.

(b) Application for Water Tap. All prospective water customers must make application to the Division of Water to be considered for a water tap. The application procedure to be followed shall be based on the classification and location of the proposed water tap as follows:

1. Residential. Application for a residential water tap should be made by the customer or customer's representative as soon as the structure is planned. Application shall be made by completing the City of Lancaster Division of Water Tap Application. Water Tap Applications are available at the City of Lancaster Division of Engineering, 121 E. Chestnut Street, Lancaster, Ohio. Once complete, the application shall be submitted to the City of Lancaster Division of Engineering.

2. Industrial, Commercial, or Housing Projects. Submit 4 sets of drawings detailing the preliminary plans for installation to the Division of Engineering for approval. Following receipt of approval of the preliminary plans from the Division of Water, make application by completing the City of Lancaster Division of Water Tap Application. Once complete, the application shall be submitted to the Division of Engineering with an approved copy of the preliminary plans.

3. Water Taps Outside of City Limits. For new water taps outside of the City limits where water lines exist, the customer or customer's representative must apply for water service at the City Engineering Department as noted above for the type of tap proposed. Upon submission, the application must be reviewed for approval by the Utility Service Committee per Chapter 137 of the Codified Ordinances of Lancaster, Ohio. Upon approval, further coordination for the installation shall be as detailed for installations within the City. In cases where the property is located on a state highway, a permit must be applied for by the Division of Water to the Ohio Department of Transportation for approval of excavation near, in, or under the highway.

4. Where coordination of other City department facilities are involved in the project (such as sanitary sewers, natural gas lines, storm sewers, etc.), preliminary plans must also be submitted to the City Engineering Department.

5. Information Required from Customers
   a. Name
   b. Exact address and description of the location at which tap is required.
   c. Type of occupancy, such as residential (single or multiple), commercial, church, school, industrial, municipal, or other public use.
   d. Size of tap required by customer.
   e. Estimated date water service will be required.

6. Arrangements for Water Service and Inspections. Prior to approval for water service, the Division of Water will first determine if water is available to the customer in the area of the water tap request. If water is available and the tap

application is approved and paid in full, the customer or customer's representative will then be responsible for making the arrangements for the installation and inspection of the customer's water service line in accordance with the standards and information set forth in this manual.

7. The following steps for obtaining water service, in order suggested, are:
   a. Apply at City Engineering Department for a water tap.
   b. Pay for water tap, meter, and backflow preventer, upon approval.
   c. Stake location of water tap on property.
   d. Arrange for installation of customer's side service line by a qualified plumber or the property owner. Installation of the service line must be inspected by the Division of Water before backfilling ditch.
   e. Contact the Division of Water (Meter Shop) to determine the location of water meter and backflow preventer.
   f. Contact the Division of Water (Meter Shop) 24 hours (2 working days) prior to commencement of construction to schedule inspections. Inspections of all water service lines are required.
   g. Contact the Division of Water (Meter Shop) at (740) 687-6635 to have water service turned on when all standards are in accordance with information set forth in this specification.

(c) General Requirements Governing Customer Service Lines.

1. For single family dwellings and for doubles, duplexes, and apartments having a common basement to all tenants, or one single unit (building), only one service line is required. For separate units (buildings), two or more taps will be required.

2. For single dwellings and for doubles, duplexes and apartments, meaning one unit (building) requesting two or more water meters, they will be required to have lock valves.

3. A customer service (as defined in Section 801.02(b)) shall not penetrate and then exit a building wall structure with intent to supply water to a separate unit (building) such as garage, apartments, etc. Unless otherwise approved, ONLY one meter will be permitted at any one dwelling.

ITEM 802 - FURNISHING AND LAYING PIPE AND FITTINGS

802.01 Description. This work shall consist of all work for the furnishing and laying of the various sizes of water lines. This work comprises excavating the trench, furnishing and laying pipe in the trench and joining it, placement of concrete thrust blocks, backfilling the trench, repairing or replacing head walls, drains, sewer, gas, electric, and water connections, and any other structures or facilities that may be disturbed or damaged by the Contractor's operations; disposing of surplus excavation; testing; and all other work required for the furnishing and laying of the pipe lines and connections complete and ready for service as shown on the plans and covered in the specifications. Included is the furnishing and installation of all required fittings including bends, reducers, blow-offs, tees, sleeves, small diameter branch connections; connections at the ends of mains to other lines or fittings, and special castings required for the installation of the valves, all as called for on the drawings.

802.02 Design Criteria. All pipe shall be designed to meet the following:

(a) External Loads

1. Live Loads: AASHTO HS-20 truck. AREMA E-80 loads for railroad crossings. Use 1.5 Impact Factor

2. Dead Loads: 8 feet of cover or 2.5 feet of cover whichever produces greatest load in conjunction with live load.
3. Soil Unit Weight: minimum 120 pcf

(b) Internal Pressure.
1. 150 psi normal operating pressure
2. 100 psi surge allowance (water hammer)
3. 150 psi test pressure

(c) Laying Condition.
1. Flat-Bottom trench with bell holes
2. Tamped backfill

802.03 Ductile Iron Pipe. Pipe shall be manufactured in accordance with AWWA C151 except as herein modified:

Wall Thickness and Class as follows:

All water pipe 4-inch or larger shall be Ductile Iron Special Thickness Class 52 manufactured in accordance with AWWA C151. All Ductile Iron pipe shall be push-on joint pipe internally lined with cement-mortar lining in accordance with AWWA C104.

All ductile iron water pipe shall have brass wedges installed at each slip seal bell joint for continuity to allow surface tracing by pipe locator. The number of wedges required for each joint shall be determined by using the following formula: Nominal pipe size divided by 2. (For example, a 4-inch pipe would require 2 brass wedges per push-on bell joint).

802.04 Fittings For Use With Ductile Iron Pipe. Fittings shall be Class 250, manufactured in accordance with AWWA C110. All fittings shall be manufactured of ductile iron. Fittings 48 inches and smaller in diameter may be "compact fittings" manufactured according to AWWA C153. Fittings 4-inches through 24-inches in diameter shall have a minimum working pressure rating of 350 psi. Fittings 30-inches through 48-inches shall have a minimum working pressure of 250 psi. All fittings shall be provided with ends manufactured in accordance with AWWA C111. All fittings shall be coated inside and outside with an asphaltic coating in compliance with AWWA C110.

All fittings shall be shall retained with approved retainer glands per CMSL Item 802.04.

(a) Tees: 4-inch or larger shall be MJ. (UTILIZE SELF ANCHORING TEES, WHERE POSSIBLE).
(b) Offsets: 4-inch or larger shall be MJ (SELF ANCHOR STYLE ACCEPTED).
(c) Push-On Plugs: 4-inch or larger shall be Bell Tite push-on plugs, Clow, or equal.
(d) Bends:
1. 4-inch or larger MJ x MJ bends (1/32) 11 1/4 degree Clow or equal.
2. 4-inch or larger MJ x MJ bends (1/16) 22 1/2 degree Clow or equal.
3. 4-inch or larger MJ x MJ bends (1/8) 45 degree Clow or equal.

4. 4-inch or larger MJ x MJ bends (1/4) 90 degree Clow or equal.

(e) Retainer Gland: 4-inch or larger MJ retainer glands Uni-flange Series 1400 - Wedge action manufactured by Megalug, Ford, or Sigma ONLY.

(f) Underground Clamp: Underground clamps, strap iron type for ductile iron pipe (1/2-inch x 2-inch flat bar stock) with 2 washers/clamp (Steller Corp Cat. No. 31-79, Figs. 380 and 380X) or equal.

(g) Split Repair Clamp: 4-inch or larger shall be split repair clamps (American A-600) or equal.

(h) All Stainless Steel Wrap Around Repair Clamps: 4-inch or larger shall be full circle, wrap around, wide range, stainless steel with S.S. nuts and bolts, Clow or equal.

(i) Extra Mechanical Joint Accessories:
   1. Duc lugs for mechanical or restrained joints (Stellar Corp. Cat. No. 31-79, Fig. S-14).
   2. 3/4-inch all thread rod.
   3. Rod coupling nuts (connectors): long hex shaped 3/4-inch nuts to connect all thread rods together (Stellar Corp. Cat. No. 31-79, Fig. 80).
   4. 3/4-inch heavy duty nuts for MJ tee head bolts, 1-3/16-inch flat to flat Clow, or equal.

(j) Bell Joint Leak Clamp:
   1. Four-inch or larger full range clamp for all classes of cast iron pipe (Smith-Blair 274), or equal.

802.05 Water Line Appurtenances. The Contractor shall furnish and install, prior to testing, all fittings, blow offs, air vents, and water service taps in the number and sizes shown on the drawings, or at locations selected by the Engineer. The connection outlets are designed for attaching valves and other appurtenances as shown on the plans where appurtenances are to be furnished and installed by the Contractor under other items.

The Contractor in conjunction with the laying of the water main shall furnish and install all valves as shown or as directed by the Engineer. The cost of furnishing and installing valves will be paid for under other items. Such valves will be provided with mechanical joint ends, unless otherwise shown or approved by the Engineer, and the Contractor shall furnish and lay, under this item, any special casting necessary to make the valve installation as shown on the drawings. The Contractor shall furnish and lay all closure pieces, special bends, and fittings necessary for the constructing of the pipe line, along the route as shown on the drawings.

802.06 Excavation. The Contractor shall excavate all material of whatever nature encountered, including rock in place, unless a separate item is provided for rock excavation necessary for the construction of work as shown on the plans and as specified. All excavation, except as otherwise required, permitted or ordered in writing by the Engineer shall be in open trench.

802.07 Limit as to Width of Trench. The width of trench below the elevation of the outside top of the barrel of the water line shall not exceed the specified width when shown on the construction drawings unless permitted or ordered in writing by the Engineer. Sufficient sheeting, bracing, timbering, etc., shall be provided, installed and used by the Contractor to maintain the sides of the trench in a substantially vertical position in such a manner so as to protect and preserve life, property or the use of such property and no separate payment will be made for such sheeting, bracing, timbering, etc., necessitated by the Contractor's operations to accomplish and carry out this responsibility.

Where a water line is to be placed within an embankment or the top of the water line is above existing ground, the embankment, compacted to Section ODOT CMS 203 requirements, shall be constructed at least to 30 inches above the outside top of the water line before trenching. The trench shall then be excavated to the minimum width necessary for the proper placing and backfilling of the water line as described in CMSL Item 802.15 and 802.17.

802.08 Unauthorized Excavation. All excavation outside or below the limiting lines for excavation as shown on the standard drawings shall be classed as unauthorized and shall be filled by the Contractor at his own cost and expense in a manner and with material approved by the Engineer.

802.09 Subgrade. It is expected that satisfactory material will be found at the subgrade of the trench if adequate water removal facilities are provided. If soft, spongy, unsuitable, or similarly unacceptable material is encountered at the subgrade upon which the bedding material is to be placed, this unsuitable material shall be removed or dewatered as directed by the Engineer in writing. The following will govern the prosecution of the work involved.

a. If the unsuitable material is removed by written order of the Engineer, it shall be replaced by stone foundation as specified in CMSL Item 906 and paid for as indicated therein.
b. If the dewatering of the subgrade materials, by whatever means is used by the Contractor, produces a subgrade acceptable to the Engineer for placing the bedding material, no additional payment will be made for the work and the payment for this work will be included in this item.

802.10 Excavation Material. All excavated material in excess of that required for backfilling shall be disposed of by the Contractor. Public or private property shall not be used for this purpose without the written permission of the owner. Excavated material required for backfill, except as hereinafter provided for under Surface Soil as per CMSL Item 802.20, may be stored on the bank of the trench immediately adjacent to the work under construction where space is available in the right-of-way acquired for the work, provided, however, that such storage shall not interfere with access to and maintenance of traffic, drainage, and utilities as herein specified.

Ingress and egress to all properties along the line of the work shall be maintained, except as permitted, in writing, by the Engineer.

Broken concrete, rubble fill, and other excess material shall be removed from the site and wasted.

All waste disposal areas and all areas used for the storage of materials or the temporary deposit of excavated earth shall be leveled off, cleaned up, and returned to condition that existed prior to construction.

All surplus material, tools, and equipment shall be removed, and the premises shall be left free of everything of the kind.

802.11 Removal of Water. The Contractor shall at all times during construction, provide proper and satisfactory means and devices for the removal of all water entering the excavations and shall not interfere with the prosecution of the work or the proper placing of masonry or other work.

802.12 Removal of Obstructions. The removal of any obstructions, including abandoned water line, which may be encountered or is necessary for the construction of the work, shall be done by the Contractor at his own expense under the direction of the Engineer. All trees encountered within the excavation limits shall be considered obstructions, and the Contractor is responsible for removal of those trees.

802.13 Maintaining Drainage. The flow of all sewers, drains, streets, gutters, field tiles, and water courses encountered shall be provided for by and at the Contractor's own expense and wherever such water courses and drains are disturbed or destroyed during the prosecution of the work, they shall be restored by and at the Contractor's own cost and expense to a condition satisfactory to the Engineer.

802.14 Maintenance of Service in Existing Structures. All existing overhead, surface, or subsurface structures, together with all appurtenances and service connections, except those otherwise provided for herein, encountered or affected in any way during the construction of any of the work under this contract, shall be maintained in service by the Contractor at all times unless other arrangements, satisfactory to the authority responsible for their operation, are made with such authority.

The cost of this work shall be included in the prices bid for all the various items of this contract.

802.15 Pipe Laying. The pipe shall be laid according to the proposed horizontal and vertical locations as shown on the drawings. Connections to the existing pipe lines shall be made at the locations shown on the drawings. If, during the course of the work, unforeseen conditions arise, the horizontal or vertical alignment of the pipe line or location of the connection to the existing pipe may be changed as directed by the Engineer. If the water line grade is not shown on the plans, the water line shall be installed with a minimum of 4 feet of cover from the existing ground, or the top of the

existing or proposed curb grade to the top of the water line, whichever is deeper. If it is necessary to change the grade of the water line, it shall be lowered unless specific approval to raise the grade is given by the Engineer.

The cutting and removal of pavement, curbs, and sidewalk is to be included in the bid item for their replacement. The excavation and preparation of the trench and the laying of the pipe shall be done to conform to the applicable parts of the Standard Specifications for Installing Ductile Iron Pipe (AWWA C600), except as herein modified.

All pipe shall be laid as per the manufacturer's specifications.

All underground water main piping, except where noted or specified, shall be laid in accordance with Recommended Standards for Water Works 2012 Edition or most current edition.

All underground water main piping shall maintain a minimum 10-foot horizontal separation and a minimum 18-inch vertical separation from any existing or proposed gravity sanitary or storm sewer, septic tank, or subsoil treatment system. The distance shall be measured edge to edge. When it is impossible to maintain the minimum specified separation distances, the reviewing authority, the Director of the Ohio EPA, must specifically approve any variance from the requirement. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the gravity sewer.

At crossings, water mains crossing sewers shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer with preference to the water main located above the sewer. One full length of water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required.

No other underground utilities shall run parallel within 3 feet of the buried water line.

All underground ductile iron piping shall be installed with a polyethylene encasement. Encasement and installation shall conform to AWWA Specification C105. Polyethylene encasement shall have a minimum thickness of 8-mil.

Concrete blocking and supports shall be provided at all tees, bends, and valves and at any other locations shown on the drawings or directed by the Engineer.

These concrete items shall be constructed to the lines, grades, and dimensions shown on the Standard Detail Drawings or as ordered by the Engineer, and constructed with Class "C" concrete as per ODOT CMS 499. The cost of temporary timber backers and the cost of excavating to line and grade shown for the supports shall be included in the unit price bid per foot for furnishing and laying the various sizes of pipe and valves.

During any construction where the outside temperature is below 40 degrees F rubber gaskets and lubricants shall be kept in a heated area at least 40 degrees F until needed. No gasket or lubricant shall be out of the heated area more than 5 minutes before being placed in the bell or on the spigot of the pipe. The Contractor shall lubricate all joints according to the manufacturer's recommendations.

All valves connecting existing water lines to newly installed water lines shall remain closed until the newly installed lines have been disinfected and accepted by the Division of Water. ONLY Division of Water employees shall operate said valves.

802.16 Restrained Joints.

Ductile iron push-on joint pipe shall be restrained by Flex-Ring or Lok-Ring Joint by American Ductile Iron Pipe, TRFLEX by U.S. Pipe, or equal.

Contractor shall restrain joints in accordance with Table 802.16-1.

TABLE 802.16-1
MINIMUM LENGTH (IN FEET) RESTRAINED PIPE
FROM BENDS OR FITTINGS

	Test Pressure, psi	
Pipe Size, Inches	100	150
3-12		
14-18	36	54
20-24	54	72
30	54	90
36	72	108
42	72	
48	90	
	108	

802.18 Bedding. All underground pipe, except copper and polyethylene pipe, shall be bedded in compacted granular material. Bedding shall consist of not less than 6 inches of level, washed concrete fill sand per ODOT CMS 703.02A.

Copper and polyethylene pipe piping shall be bedded in compacted sand.

Contractor shall perform all necessary excavation and shall furnish all required materials to provide bedding material. Bedding material shall conform to the gradation requirements of ASTM C-33.

Concrete sand shall be used for ductile iron piping bedding.

Immediately prior to placing the pipe, bedding shall be shaped by hand to fit the entire bottom quadrant of the pipe between bell holes.

Bell holes shall be large enough to permit proper making of the joint but not larger than necessary to make the joint.

All adjustments to line and grade must be done by scraping away or filling in bedding under the body of the pipe. Bedding must be tamped into place.

802.19 Cover Material. Material which is to be placed from the bedding material around and to 1-foot above the top of all pipe shall be termed cover material.

Cover material shall consist of material in compliance with ODOT CMS 703.02A (washed concrete fill sand).

Native materials may be used for cover material if they conform to the above specifications.

Cover material shall be deposited in the trench for its full width on each side of the pipe, fittings, and appurtenances simultaneously.

Cover material must be tamped.

Compaction shall be performed in accordance with ODOT CMS 638.08 except that material shall be compacted in maximum 6-inch lifts.

802.20 Surface Soil and Restoration of Surface. Except where otherwise specifically exempted or provided, the Contractor shall, before starting trench excavation, remove the surface soil to a depth of not less than that of the topsoil material to a maximum of 12 inches below the original surface of the ground within the limits to be excavated and then segregate and store it separately from the remaining stored excavated material. In cultivated areas, the entire work area, including storage for backfill, shall be stripped up to 12 inches deep and stored for reuse. If necessary, he shall acquire additional area to provide for such separate storage of surface soil.

After completion of water line construction and basic trench backfill, the Contractor shall replace and redistribute surface soil in the affected areas to a depth of up to 12 inches and shall make due allowance where embankment is required and shall re-execute the basic trench backfill where necessary to allow for the surface soil fill. When directed by the Engineer, the Contractor shall perform restoration of all surfaces as the work progresses and will be directed to cease excavation and pipe laying until such restoration work is accomplished. Where surface soil is replaced, any settlement below the original ground surface occurring within the guarantee period shall be refilled with surface soil equivalent to the original material. The cost of all work and other expenses connected with the surface soil operation shall be included in the price bid for the various water line items and no extra payment will be made therefore.

All surfaces, including grass or lawn, pavement, sidewalk, curbing or other surfaces disturbed or destroyed during and as a result of the construction work, shall be replaced

by the Contractor as hereinafter specified under the respective items therefore, providing such items as herein included.

The Contractor will be required under this provision to sod all lawn areas and seed all other areas disturbed. The seeding and sodding operations shall be done in conformity with the requirements set forth under ODOT CMS 659 and 660 and shall be performed within 30 days, weather permitting.

Suitable surface soil shall be obtained and applied over excavated area to a depth not less than that of the original topsoil up to 12 inches to allow for proper leveling and for preparation of adequate bed to support growth.

All fences damaged or removed in connection with the construction of the water line shall be repaired or replaced by the Contractor to the satisfaction of the Engineer. If necessary, temporary fencing shall be provided by the Contractor.

Within ODOT right-of-way, any item that is damaged or removed including, but not limited to, pavement/shoulder repairs, guardrail, underdrain outlets, signs, sign supports, fence, pipes, and paved gutters shall be re-erected or replaced in accordance with the applicable ODOT Standard Drawings, or approved by the ODOT Engineer. Guardrail, pipes, and paved gutters will be replaced within 10 days; fence and underdrain outlets within 30 days; signs and supports within 8 hours. Rock channel protection that is removed shall be replaced in kind and approved by the ODOT Engineer.

The Contractor shall include in the prices bid for the water line items, the cost of all such restoration in all areas involved above and adjacent to the work and no separate or additional payment shall be made therefore unless specifically provided for under other items.

802.21 Trees. All branches or growth from trees that are to be saved and which are interfering with the free construction of the water line may be removed by the use of pruning tools. All pruning tools used and methods employed shall meet with the approval of the Engineer. The branches shall be removed with a good clean cut made flush with the parent trunk or if having a good healthy lateral branch, the cut shall be a good clean slanting cut close to and beyond the healthy branch. All pruning cuts shall be painted with an accepted pruning preservative. All branches removed shall be at the direction of the Engineer. The cost of all work and expenses connected with the removal of branches shall be included in the price bid for the various water line items and no extra payment shall be made therefore.

802.22 Backfilling. Backfill, cleanup, and maintenance of surfaces shall be done in accordance with the provisions of Section 4.3.5 of AWWA Specification C600, except as otherwise provided herein.

All trenches and excavations shall, in general, be backfilled from 12 inches above the top of the pipe, as hereinafter specified, as soon after the water line or other

appurtenances built therein are completed and as the particular type of construction and the circumstances will, in the opinion of the Engineer, permit.

For pipe sizes 2 inches to and including 18 inches in diameter, a carefully selected and placed backfill, using finely divided job excavated earth that is free from debris, organic or frozen material, and stone larger than 2 inches in their greater dimension, shall be placed from the top of the granular bedding or concrete backing, as shown on the standard drawing, to a level not lower than 12 inches above the outside top of the pipe. The 12 inches of selected backfill shall be placed in two 6 inch thick lifts, each carefully tamped, in order to produce a cushion over the pipe to prevent its breakage during that placing of the remaining trench backfill material. The selected backfill layer may be composed entirely of granular bedding material if the Contractor so elects, but without extra compensation therefore. When compacted granular backfill is specified in the plans, the material for the selected backfill layer shall be per CMSL Item 815.02.

Earth backfilling of open trench excavations shall be done with the best of excavated earth, which shall be free from rubbish or excessive frozen material, provided, however, that occasional boulders or stones not larger than one cubic foot may be deposited at least 2 feet above the top of the water line and subject to the approval of the Engineer.

Where concrete cradle or backing, or both, are required, at least 2 hours shall elapse before granular backing, pipe protection, or backfill is placed. The method employed in depositing the backfill shall be as to prevent damage to the water line or other appurtenances. Concrete structures built in place shall not be backfilled until permitted by the Engineer.

Except when other requirements as noted on the plans, or provided for in the specifications, or are ordered by the Engineer, all open trench backfill above the elevation of the bedding material of the water line shall be done with materials that, subject to other provisions of the specifications for compaction or special fill, have the same as or better soil characteristics than the adjacent undisturbed soil or materials and shall be performed in a manner satisfactory to the Engineer. All backfilling operations and placement of the backfill material shall be conducted by such means as to eliminate damage to the water line and its appurtenances.

All trenches that cross existing or proposed pavements or where the front face of trenches, paralleling the pavement, is within 48 inches of the face of the curb or edge of pavement within public right-of-way shall be backfilled with compacted granular material as per CMSL Item 815. The material shall extend 48 inches beyond that face of the curb or edge of pavement. Other areas outside above requirement but inside right-of-way shall be compacted per CMSL Item 814.

The above backfill requirements within public rights-of-way shall be considered minimum requirements. City standard drawings promulgating more stringent requirements will prevail where applicable.

Any settlement in the open trench backfill taking place within the guarantee period shall be refilled with satisfactory materials and the affected surface properly repaired to the satisfaction of the Engineer by the Contractor all at the Contractor's own cost and expense and no extra pavement will be made therefore.

The backfill under pavement and/or within the influence line shall be compacted the full width of the trench by means of approved mechanical devices to meet the requirements of CMSL Item 815. The compacted backfill shall extend from the bottom of the trench to the top of the pavement subgrade for trenches within traveled areas, and to within 6 inches of the existing ground in all other areas.

The backfill for a water main parallel to the centerline and within proposed or dedicated rights-of-way, but outside the influence line for support of pavement or berms, shall be compacted to a minimum 90 percent maximum dry density.

The remaining depth of trench within traveled areas shall be backfilled with material specified for pavement replacement. The base and pavement materials shall be placed and compacted as specified in City of Lancaster Standard Construction Drawing P-1. The pavement base shall be struck off at the proper depth to accommodate the specified thickness of temporary or permanent pavement.

The remaining depth of trench outside traveled areas shall be backfilled as specified under CMSL Item 802.19 Surface Soil and Restoration of Surface.

The Contractor will be required to uniformly wet or dry the backfill as may be necessary to obtain the specified density. No sod, debris, frozen earth, foreign objects, or large rocks or stones will be permitted in the backfill. No extra payment will be made for hauling away and disposing of the excavated material, as such payment shall be included in the unit price bid for furnishing and installing the various sizes of valves and water mains, and constructing the structures.

No trenches shall be backfilled until the line has been observed by the Division of Water representative.

Backfill shall comply with the applicable permit authorizing the installation of the line at that location.

In all cases where CDF is to be used as an alternate backfill material, it shall meet the requirement of CMSL Item 636 and first be approved by the Division of Water.

Where the proposed water line is located within the street, or within the influence area of the street, the backfill material shall conform to City of Lancaster Standard Drawing P-1. The influence area of a street shall be defined as the area within the zone defined by the outward horizontal projection of a line at a 45 degree angle from the edge of the pavement surface.

802.23 Water Main Cleaning and Flushing. Before a hydrostatic test is applied to any newly constructed water main, the main shall be flushed or cleaned and flushed as herein prescribed. During the construction operations, workers shall use care to assure that the interior surfaces of all pipe and fittings are maintained in a sanitary condition. Every effort shall be made to keep loose foreign material out of all pipe and fittings. Exposed open ends of pipe must be temporarily plugged or capped during construction. Particular care shall be taken to protect the main whenever work is temporarily interrupted.

All main shall be flushed through available fire hydrants as directed and witnessed by a designated Division of Water representative. Valving operations may be required to assure that all sections of the main are thoroughly cleaned. Flow rates for adequate flushing velocities shall be 1,000 gallons per minute for 6-inch mains and 1,600 gallons per minute for 8-inch mains or the maximum available flow from the system. Sections of main which cannot be flushed by valving and hydrant operations shall be cleaned as directed by the Division of Water.

The control valve installed by the City of Lancaster Division of Water will be operated by **DIVISION OF WATER EMPLOYEES ONLY! ANY UNAUTHORIZED PERSONNEL FOUND TO BE OPERATING SAID VALVE/VALVES WILL BE PROSECUTED.**

The City of Lancaster Division of Water will pressurize the new water main line/fire line upon request by the developer/contractor upon 24 hours (one working day) notice providing all installation requirements are met and a representative of the developer/contractor is present.

Flushing of the new water main line/fire line from fire hydrants or hose bibs will be permitted only after the following requirements are met.

(a) Not more than a 1.5-inch inside diameter hose has been provided for flushing and has been installed by the contractor.

(b) The flushing of the water line will be for the purpose of obtaining water samples.

802.24 Hydrostatic Tests. A hydrostatic test as outlined in AWWA Specification C600 Section 5 shall be applied to the water main and fire hydrant leads. Each valved section of water main shall be tested independently of one another unless otherwise approved by the Engineer. The pressure test shall be conducted with all watch valves open and hydrant foot valves closed. The pressure during the test shall be maintained at 150 psi. The duration of each pressure test shall be at least two hours. The Contractor will furnish gauges for the test as well as furnish all materials, make all taps required and furnish a pump, piping, other equipment, and all necessary assistance for conducting the tests.

If there are indications of leaks under this pressure test, the Contractor shall locate them at his cost and expense. Any cracked or defective pipes, fittings, valves, joints, or other appurtenances discovered as a consequence of this pressure test shall be removed and

replaced by the Contractor with approved material, at his cost and expense, and the test shall be repeated until satisfactory to the Engineer.

A test shall be made to determine the quantity of water lost by leakage under the specified test pressure as provided in AWWA C600 Section 5 Specification above. No pipe installation will be accepted until or unless this leakage is less than specified per AWWA Specifications.

Before applying the specified pressure, all air shall be expelled from the pipe. To accomplish this, air release outlets shall be installed by the Contractor or as required by the Engineer. Cost for air release outlets shall be paid for under CMSL Item 811.

Should any test of combined sections of pipe laid disclose leakage greater than that specified, or if individual sections show leakage greater than the specified limit, the Contractor shall, at his own expense, locate and repair the leaks until the leakage is within the specified allowance.

Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi of the specified test pressure after the air in the pipe line has been expelled and the pipe has been filled with water.

Any testing performed against existing valves shall be at the Contractor's risk and in strict compliance with the requirements of the Engineer. If unable to achieve the required test, the Contractor shall disconnect from the existing valve, plug, and re-test until satisfactory results are obtained. Any damage caused to existing facilities shall be repaired at the Contractor's expense.

802.25 Disinfection. After satisfactory hydrostatic testing, the completed pipe will be chlorinated by the Contractor in accordance with AWWA C651. Contractor shall furnish the chlorine and all equipment necessary to introduce the chlorine into the water line. All labor, material, and equipment including chlorination tablets will be furnished and paid for by the Contractor.

The Contractor shall hand swab all pipes and fittings that are not otherwise disinfected. The amount of chlorine to be used during hand swabbing operations will be determined by the Division of Water.

Upon completion of flushing, hydrostatic testing, and disinfection of the line, the Contractor shall be responsible for collecting water samples and having the samples tested at a laboratory certified by Ohio EPA and approved by the Division of Water, the cost of which shall be borne by the Contractor. All testing shall be done in accordance with the Ohio Environmental Protection Agency rules and regulations. The laboratory shall submit certified copies of the test results to the Superintendent of the Division of Water.

Testing may be performed through the City of Lancaster Division of Water and MASI Labs. Two consecutive safe samples are required.

Upon 48 hours (two working days) notice, the City of Lancaster Division of Water will open the main water line valve for the purpose of flushing the new water line for water samples to be collected by the developer's or contractor's representative upon request by the developer/contractor, providing all flushing requirements are met.

If the developer/contractor chooses to utilize the City of Lancaster Division of Water to perform the testing, they must take the samples on Tuesday afternoon at 2:00 P.M. to 3:00 P.M., and again on Wednesday morning at 8:30 A.M. to 9:00 A.M. A check payable to the City of Lancaster Division of Water in the amount of $100.00 must be given to the Division of Water employee upon taking the first sample.

Any flushing for the purpose of pressure testing, flow testing, etc. required by the City of Lancaster Fire Department will not be permitted until after the City of Lancaster Division of Water has received documentation of **two consecutive, acceptable bacteriological tests on the water line**.

802.26 Certification. The Contractor shall furnish a sworn statement from the material manufacturer certifying that all the required tests have been made and that the pipe and fittings comply with the requirements specified.

The Division of Water will refuse to accept any water line not conforming to current City of Lancaster Construction and Material Specifications or Division of Water standards. The Contractor shall notify the Division of Water at least 48 hours (work days only) prior to commencement of construction to schedule inspections. No line shall be installed, tested, or disinfected without the inspection and approval of the Division of Water.

ITEM 803 - VALVES AND APPURTENANCES

803.01 Description. The Contractor shall provide all work necessary for furnishing and installing valves of the type, sizes, and locations shown on the plans and as herein specified.

803.02 Gate Valves. All gate valves shall be Resilient Seated Wedge with non-rising stem and have standard mechanical joint ends. They shall conform to the requirements of AWWA C515 and shall be designed for a minimum 200 pounds working pressure. All valves shall be approved pattern and make. If required, complete shop drawings of valves or sample valves shall be furnished.

All valves shall have full-size waterway when open.

All gate valves shall have bronze trim consisting of inside stem and stem nut. Both the body and resilient seated wedge shall have smooth and true faces, and make a perfectly water-tight joint.

All gate valves shall open by turning to the right, or clockwise.

The wrench nut shall be 2-inch square.

Mechanical joint valves shall be furnished with gaskets, standard glands, and bolts.

Gate valve extension stem (if needed) shall have a 2-inch square coupling; Mueller Style A-26441, or equal.

803.03 Butterfly Valves. Butterfly valves shall be Resilient Seated MJ x MJ with glands, non-rising stem, and open to the right with a 2-inch operating nut. They shall conform to requirements of AWWA C504.

803.04 Cutting-In Valves. The Contractor shall furnish all labor, tools, material, and equipment to insert valves into existing water lines at locations shown on plans or as ordered by the Distribution Supervisor, Division of Water.

All cutting-in valves shall be right hand open (clockwise). Gate valves approved for use within the City of Lancaster distribution system may also be utilized as cutting-in valves if they are installed utilizing the "Line-Stop" method or a similar installation technique approved by the Division of Water.

803.05 Valves 2-Inch and Smaller. Wherever a valve 2-inch or smaller is required on a water line, it shall be a curb stop type conforming to requirements of CMSL Section 806.04.

803.06 Certification. Prior to manufacture, the manufacturer shall submit for approval by the Engineer, 3 sets of drawings, certified as to the accuracy of the information contained thereon, showing the principal dimensions, general construction features, and materials proposed for use for all parts of the valve and operator. Drawings shall be in sufficient detail to enable the Engineer to verify conformance to the requirements of the specifications. The drawings shall include data on the number of turns to fully open or close the valve and for butterfly valves, the input and output torque rating of the operator. The valves shall be manufactured in accordance with these certified drawings after they have been approved by the Engineer.

The Contractor shall furnish a sworn and notarized statement from the manufacturer certifying the valves comply with all requirements of these specifications.

803.07 Roadway Valve Boxes. Valve boxes shall be in 2 sections, slip-type adjustable. Boxes shall have a minimum shaft inside diameter of 5 and 1/4-inches. The bell for the lower section shall be sufficiently larger to fit over the stuffing box of 8-inch gate valve.

The valve box lid shall be of drop cover type provided with slots for easy removal and shall have the word "Water" cast on top.

Boxes shall be capable of being adjusted between the approximate limits of 57-inch and 67-inch length of box. All valve boxes shall be of close-grained, tough, gray iron free from all defects and shall be uniform in shape and dimension; Bigham & Taylor 5664-S.

All boxes shall be installed flush with finished grade.

Where 2-inch and smaller curb stops are installed in the water line and outside traveled areas, they shall be furnished with a Buffalo Type box per CMSL Section 806.04, or equal.

All valve boxes shall be installed such that they are centered vertically over the valve operating nut and such that the box provides maximum cover of the operating housing. No separate payment for those valve boxes shall be made as their cost is to be included in the unit price bid for the various valve types and sizes.

803.08 Valve Supports. Concrete supports of the size shown on the Standard Construction Drawing W-13 shall be provided under all valves. No separate payment for

these supports shall be made as their cost is to be included in the unit price bid for the various valve types and sizes.

803.09 Operation. All valves which affect the flow of water through water lines in service are to be operated by the Division of Water personnel only.

ITEM 804 - TAPPING SLEEVES AND VALVES

804.01 Description. The following specification includes procedures and material specifications for the tapping of cast and ductile iron water mains.

The City of Lancaster Division of Water will make all taps to the City water lines. The City will install the tee, nipple, and valve. This work shall be scheduled with City of Lancaster Division of Water. The Contractor shall incur all costs of tapping water line. This cost shall include all material, equipment, and labor required to complete tapping operation.

804.02 Valves and Sleeves for Cast and Ductile Iron Mains. Unless approved by the Distribution Supervisor, Division of Water, tapping sleeves 4-inch or larger shall be mechanical joint type or stainless steel two piece tapping sleeves designed for use on the class of pipe being tapped. Mechanical joint sleeves shall be Clow F-5205, JCM Industries, Inc. 432 Series stainless tapping sleeves, or approved equal.

Tapping valves shall conform in all respects to the requirements of CMSL Item 803. All tapping valves 4-inch or larger shall be mechanical joint type, open right design for use on the class of pipe being tapped. Tapping valves shall be Clow resilient wedge, or approved equal.

804.03 Installation. After the sleeves and valves are installed at the designated locations, but before any cut is made or any concrete supports or backers installed, the sleeves and valves shall be tested under 150 pounds per square inch air or water pressure, for a minimum of 15 minutes, to check for leaks. When the valves and sleeves show no leaks, the Contractor shall make the cut through the wall of the pipe to be tapped under pressure. Valves shall be adequately supported prior to cutting. Excavation and backfill shall be as specified under CMSL Item 802.

804.04 Valve Boxes. All tapping valves shall be provided with a valve box as provided under CMSL Item 803, unless otherwise specified.

804.05 Concrete Supports. Concrete backers and supports of the sizes shown on the Standard Construction Drawings or designated by the Division of Water shall be provided. Concrete for thrust backer and valve support is to be included for payment under this item. The cost of excavating to line and grade shown for the supports shall be included in the unit prices bid under this item.

ITEM 805 - IRON CASTINGS

805.01 Description. The Contractor shall furnish and place manhole frames and covers, frames around openings, wall pipes, valve boxes and other iron castings shown or which may be found necessary to complete the work, as shown or ordered. No payment under this item will be made for cast iron pipe, fittings, valves, or valve box castings. Iron castings not paid for under CMSL Item 806 will be paid for by weight under this item.

805.02 Quality. All castings shall conform to the Standard Specifications for Gray Iron Castings, ASTM A48, except as modified herein. The castings shall be smooth, clean and free from blow holes, shrinkage cracks, cold shuts, scales, lumps, blisters, and other defects. Defective castings which have been plugged or filled will be rejected. Before leaving the shop and before rusting begins, all castings shall be thoroughly cleaned and shop coated with approved asphalt paint.

805.03 Workmanship. All castings shall be made accurately to the dimensions shown, and where marked or otherwise necessary to secure flat and true surfaces, they shall be planed, but allowance shall be made in the patterns so that the finished casting shall have the specified thickness. The meeting surfaces of manhole frames and covers shall be ground true and shall seat at all points. All drilling and tapping shall be carefully done.

805.04 Installation. All castings shall be installed to accurate grade and alignment and shall be carefully supported to prevent movement while concrete or backfill is being placed around them. After the castings have been placed in a satisfactory manner, all foreign adhering substances shall be removed and the castings shall be repainted as necessary.

805.05 Method of Measurement. The weight of iron castings to be paid for shall be the actual weight, weighed after shop painting of the iron castings installed in the work. No casting will be accepted, the weight of which is less than its standard weight by more than 5 percent, and no allowance for payment will be made for an excess of more than 2 percent over the total standard weight of the casting. Where the weights of castings are to be determined by computation, the dimensions shown shall be used and one cubic inch of metal shall be assumed to weigh 0.260 pounds.

805.06 Basis of Payment. The price bid per pound for iron castings shall include the furnishing, placing, and coating, complete as specified.

Payment will be made at the contract price for:

Item	Unit	Description
805	Pound	Iron Castings

ITEM 806 - WATER SERVICE TAPS

806.01 Description. This section consists of the rules, regulations, installation requirements, and technical specifications for the installation of water service taps in the City of Lancaster.

For new water main installations, the Contractor is to provide all work necessary to furnish and install or transfer water service taps complete and ready for use where shown on the drawings or otherwise required in accordance with these specifications. Water "tap" and "customer service line" shall be defined as stated in CMSL Item 801 of this specification.

A new water service tap shall consist of all pipe, valves, fittings, and appurtenances required from the water main connection to the curb stop and box, inclusive. Prior to constructing any new water service tap, a tap permit shall be obtained from the Division of Water.

806.02 Water Main Connection. The Division of Water shall install service taps, corporation stops, curb stops, and curb boxes on all existing water mains. Curb stops and curb boxes will be located adjacent to the lot line at a location marked by a stake set by the applicant for water service. The Division of Water shall make the final determination of the curb stop location. Upon installation of the curb stop and box, the property owner shall be responsible for any damage to the curb stop and box. Any and all repairs that must be made to the curb stop and box after installation shall be performed by the Division of Water. All costs related to these repairs shall be the responsibility of the property owner and will be charged on a time and material basis.

For water service taps ¾ & 1 inch and made to new water mains, the connection shall be made using a corporation stop as specified in Item 806.04, or equal. Corporation stops shall not be installed in the top 1/4 of the water main and shall be located no closer than 24 inches to any other corporation stop, valve, bend, tee, or joint.

For water service taps 1 1/2 and or 2inches made to new water mains may require a full wrap stainless steel tapping band with an 1 ½ or 2 inch cc outlet installed on the water main; or a tee and 4 inch gate valve as specified in Item CMSL 803 of this specification to be installed and reduced to 1 ½ or 2 inch out of the valve.

For water service taps 4 inches and larger made to new water mains, the connection shall consist of a tee and gate valve. Valves shall be secured to the water main by

anchoring tees, anchoring pipe of minimum length, or by other means approved by the Division of Water.

806.03 Pipe and Fittings. For water service taps 2-inch and smaller, all pipe from the water main connection to the backflow preventer, unless specifically called for on the drawings, shall be either Type K, soft temper copper tubing conforming in all respects to ASTM B88 or Federal Specification WW-T-799. Ultra high molecular weight polyethylene tubing (PE pipe) conforming in all respects to ASTM D2737, PE 3408, D-1238, SDR-9 may be used for 2 inch services.

Fittings shall be high quality copper brass with approved flare or compression "pack joint" or "grip joint" fittings. Only on a case-by-case basis and with approval of the Division of Water, will the installation of sweat joint fittings be permitted before the meter/backflow preventer.

Pipe for water service taps 4-inch and larger shall be ductile iron up to the meter inlet and valve on the meter bypass line. Ductile iron pipe and fittings shall conform to requirements of Item CMSL 802. In general, there will be no fittings permitted between the water main connection and the control valve.

806.04 Corporation Stops. Corporation stops for 2-inch and smaller water service taps shall be bronze with AWWA taper inlet and CTS outlet. Outlet may be flare or compression type. Insert stiffeners shall be installed in all connections to polyethylene pipe. Corporation stops shall be the make and type shown in Table 806.04-1.

806.05 Curb Stops and Boxes. Curb stops for 2-inch and smaller water service taps shall be bronze, ball valve type with solid tee head. Tee head shall rotate a full 360 degrees. Curbs stops shall be of the make and type shown in Table 806.04-1. Insert stiffeners shall be installed in all connections to polyethylene pipe.

Curb boxes shall be 3-inch combination cast iron/plastic slide-type top, Bingham and Taylor No. 303 or Valvco No. 323 ONLY. The lid shall have the word "WATER" cast neatly and legibly on it.

Curb stops and valve boxes for 4-inch and larger water service taps shall conform to the requirements of CMSL Item 803.

806.06 Installation. Four-inch and larger taps shall be installed in accordance with CMSL Items 802, 803, and 804. Water services 2-inch and smaller may be installed by piercing tool or open cut methods, unless specifically called for on the drawings. If the pipe is installed by piercing tool, the procedure used shall be such as not to bend or kink the service pipe, nor strain the pipe joints. The pipe from the water main connection to the curb box shall be installed to the grade and elevations shown on the drawings, but in no case shall less than 42-inches of cover be provided. Bends in taps are to be minimized and must be approved by the Division of Water prior to installation. (See Drawing W-2)

All service lines shall be encased in plastic at locations where service penetrates a structure through the wall or floor.

All service lines from the curb stop to the backflow preventers, including the meter sets, must be inspected by a representative of the Division of Water. No new underground lines or repairs of an existing water line shall be backfilled or placed in service prior to inspection and approval of the Division of Water. In all cases, the service shall be turned on for the first time by the Division of Water personnel.

Prior to backfilling, all water service taps shall be pressure tested from the water main connection to the curb stop and all leaks shall be repaired. Water service taps shall be tested as outlined in CMSL Item 802.

After a successful pressure test has been performed, all excavations shall be backfilled in accordance with the requirements of CMSL Item 802.

Pavement replacement shall be in accordance with the requirements of the appropriate bid item for pavement replacement.

In situations where a Contractor is installing curb stops on a private, unmetered main, the installation shall be subject to the same inspection practices and procedures as outlined above. Curb stops shall be installed with the key parallel to the structure when the key is in the OFF position.

806.07 Meters. All new 5/8, ¾ and 1 inch meters shall be installed by a Division of Water Representative. 1 1/2 meters and larger shall be installed by the Owner and inspected by the Division of Water. Meters will not be installed until authorization from the City of Lancaster Utilities Collection Office has been received.

All meters shall be installed within a residence or structure. Access to meter locations shall be granted at all times to the Division of Water. All meters shall be equipped with a touch read remote-type unit installed outside of the residence or structure. All meters and touch read remote-type units shall be accessible at all times to the Division of Water and Utilities Collection Department. In locations where it is impossible or impractical to install the meter within a residence or structure, a meter pit shall be required.

In locations where the distance between the curb stop and the inside of the building is in excess of 300 feet, the meter shall be installed in a meter pit as defined in CMSL Item 808.
All customer service lines shall be equipped with an accessible hand valve. Hand valves shall be installed on the customer service line at the point of entry of all residences and structures. Customer service lines shall not be concealed between the point of entry and the meter.

All new water taps shall have a Division of Water approved backflow preventer installed. Backflow preventer shall be installed immediately downstream of the water meter and prior to any plumbing fixture, device, and or other equipment.

All customer service lines shall have a thermal expansion tank installed on the cold water side of the hot water tank. The expansion tank shall be located within 5 feet of the hot water tank. In locations where it is impossible or impractical to install the expansion tank within the required distance of the hot water tank; the expansion tank shall be located at the direction of the Division of Water.

(FOR REFERENCE)

Figure 806.06-1

Customer's Water Line Inspection Form:

Michael Nixon - Supt. of Water — James Graf - Cross Connection Control

Customer's Water Line Inspection Form and Checklist

Owner's Name: _____

Address: _____

_____

Customer's Service Line....New_____ Old_____ Replaced_____ Repaired_____
Type of Material (Service Line)... Copper_____ Galvanized_____ P.E._____ Other_____
Depth of Service Line at House.....Feet _____ Inches _____
Depth of Service Line at Stop Box.....Feet _____ Inches _____
Size of Service..... _____ Inch

If any corrections are necessary to comply with the rules and regulations of the City of Lancaster Division of Water, explain below.

The undersigned below hereby certify that on this day of _____, 20_____ that the above inspection as described is true to the best of your knowledge. Also, a duplicate of this form will be furnished to the owner or his representative.

_____ _____
Owner or Owner's Representative — City of Lancaster Division of Water Representative

Building Diagram

_____

_____

_____

_____ Street

Curb Box-

N__
S__
E__
W__

Structure

N__
S__
E__
W__

Table 806.04-1
Acceptable Manufacturers and Models

Type of Fitting		Copper Tubing				
Corporation Stop*		3/4"	1"	1-1/2"	2"	
(w/ Compression Fittings)	Mueller	B-25008				
	Ford	FB-1000-3	FB-1000-4	FB-1000-6	FB-1000-7	
	A.Y. McDonald	4701B-22				
Corporation Stop		3/4"	1"	1-1/2"	2"	
(w/ Flare Fittings)	Mueller	B-25000				
	Ford	FB-600-3	FB-600-4	FB-600-6	FB-600-7	
	A.Y. McDonald	4701B				
Curb Stop*		3/4"	1"	1-1/2"	2"	
(w/ Compression Fittings)	Mueller	B-25209-3				
	Ford	B-44-333RQ	B-44-444RQ	B-44-666Q	B-44-777Q	
	A.Y. McDonald	6110T				
Curb Stop		3/4"	1"	1-1/2"	2"	
(w/ Flare Fittings)	Mueller	B-25204-3				
	Ford	B-22-333RQ	B-22-444RQ	B-22-666Q	B-22-777Q	
	A.Y. McDonald	6110				

* Insert stiffeners shall be installed in all connections to polyethylene pipe (PE).

ITEM 807 - CASING PIPE

807.01 Description. The Contractor shall furnish and install casing pipe where shown on the plans and as herein specified.

807.02 Requirements. The furnishing and laying of the casing pipe shall conform to the requirements and regulations of the appropriate agency, utility, and the City of Lancaster. The City of Lancaster will secure the necessary permit and easement. The Contractor shall prepare necessary shop drawings, working schedule, description of type of materials, and methods of construction.

The Contractor shall, before commencing work on the encasement, present evidence to prove to the satisfaction of the Division of Water that it has had previous experience in tunneling through ground similar to that found on the project, or shall employ a superintendent able to furnish such evidence and shall keep such a supervisor continuously on site while the work is being performed until the tunnel work is completed.

The Contractor shall notify the appropriate agency or utility at least two working days in advance of commencing any construction work on the encasement.

The Contractor shall be responsible for costs which may result due to the agency or utility requirements relative to the furnishing of watchmen, inspectors, and supervision by their forces.

Size of casing pipe shall be as follows:

Carrier Pipe	Casing Pipe
6-inch	12-inch
8-inch	18-inch
12-inch	22-inch
16-inch	24-inch
20-inch	30-inch
24-inch	36-inch

807.03 Steel Casing Pipe. The steel casing pipe shall be steel pipe meeting ASTM Specifications 35,000 PSI yield strength and 60,000 PSI tensile strength, or approved equal, to serve as a casing for the water main and shall be installed within the limits and at the location shown on the plans. The casing pipe shall be galvanized with a

minimum of 2 ounces per square foot and conform to ASTM A-120. Steel casing pipe shall have a minimum wall thickness of 0.38 inches unless otherwise approved by the Engineer. Steel casing pipe shall be joined utilizing a full circumferential weld.

807.04 Casing Spacers and Seals. Casing spacers shall be utilized in all locations where the water main carrier pipe is to be installed within casing.

Spacers shall be metallic PVC coated casing isolators with glass reinforced plastic runner, Model C8G-2 as manufactured by Pipeline Seal and Insulator, Inc., Model SS1 as manufactured by Search Technologies, or equal.

Sufficient spacers shall be supplied for each installation so that spacing complies with the manufacturer's recommendations. (See Drawing W-14)

807.05 Shop Drawings. The shop drawings referred to above shall be prepared by the Contractor and three copies shall be sent to the Engineer for review, checking, and approval. If the shop drawings, methods of construction, and work schedule meet with the approval of the Engineer, he will forward all three copies to the appropriate agency or utility for its approval. Upon receipt of approval, one set of prints shall be returned to the Contractor while the other sets will be retained by the Engineer and the appropriate agency or utility.

807.06 Placing of Casing Pipe. The placing of the casing pipe shall be accomplished by approved driving or tunneling methods.

The granular fill to be used in connection with the laying of the water line in the casing pipe will be furnished and placed to the depth shown on the drawings and paid for under this item.

The masonry header walls shown on the drawings are included under this item for payment of materials and labor required.

807.07 Pressure Grouting. Where designated on the drawings, any space existing outside the casing pipe shall be grouted at low pressure through grout holes provided in a sufficient quantity in the casing pipe. These holes shall be installed in suitable locations so that grouting can be done effectively. The pressure grouting shall preferably begin at the lowest middle hole of each grout section, grout holes above being open, and proceed upward progressively and simultaneously on both sides of the tunnel. Grouting shall be done as near the end of the lined tunnel as practicable and, if deemed necessary by the Engineer, grout stops shall be placed behind the sections at or near the end of the erected lining to permit grouting to or near the end.

ITEM 808 - METER PITS

808.01 Description. This specification includes the general requirements for materials, equipment, and construction of meter pits within the City of Lancaster.

Where applicable, meter pits may be approved by the City of Lancaster Division of Water.

Meter and meter pits for irrigation lines must be approved by the Distribution Supervisor, Division of Water and shall be equipped with approved backflow prevention device.

All meters located outside of a residence or structure shall be installed in an approved meter pit. All meters shall comply with all applicable standards as set forth in Item 806 of this specification.

All water meters used for City billing purposes may be purchased through the Division of Water or purchased privately. Privately purchased water meters shall be approved and certified by the Division of Water prior to being installed.

808.02 Location. Meter pits shall be conveniently located in an area readily accessible for meter reading and maintenance activities. This location shall be as close to the property line as practical. Where meter pits are located in or near parking areas, the area shall be deemed No Parking to prevent parking over structure. The City of Lancaster Division of Water shall determine the practicality of all proposed meter pit locations.

808.03 Structure. Meter pit structure may be constructed of reinforced cast-in-place concrete, concrete or brick masonry, polyvinylchloride (PVC), or precast reinforced concrete. Meter pit structure shall be a frost-proof and waterproof pit or box of approved type (see Standard Construction Drawings).

Above ground heated, insulated, aluminum enclosure manufactured by Hot Box® may be installed in lieu of a meter pit or meter house when approved by the Division of Water.

Meter pits shall be constructed with a stone/gravel base or concrete floor. Stone/gravel base shall be 2-feet thick and cover an area at least as large as the bottom of the meter pit. This base shall provide for drainage. In applications where a concrete floor or bottom is required by the Division of Water, a drain pipe or sump pump connecting to an existing storm sewer or approved ditch shall be required. The size of drain required

shall be determined by the size of the meter pit or box and the size of the service line contained in the meter pit or box.

808.04 Meter Pit. All meter pits for water lines 4-inch and larger shall be constructed in accordance with these specifications and Standard Construction Drawing W-26. Meter pits constructed of reinforced cast-in-place concrete, concrete or brick masonry or precast reinforced concrete shall be constructed in accordance with ODOT CMS Item 604, except as herein modified.

Meter pits top section shall be reinforced concrete designed for HS-20 loadings. Opening in slabs shall be offset unless otherwise required or shown. Opening locations should be placed in locations that facilitate maintenance of the equipment located in the meter pit. Manhole frames and covers shall be provided for the openings and indicated on the Standard Construction Drawings. Gasket materials shall conform to ASTM C443.

Except as otherwise specified, entry of pipes into meter pits shall incorporate a flexible, watertight connection.

All pipe and equipment shall be properly supported with cast-in-place concrete pipe supports. Concrete pipe supports shall be made of 4,000 psi concrete, appropriately sized to support equipment per manufacturer recommendations. Equipment shall not be supported only by flanges or allowed to hang from pipe. Concrete pipe supports shall have a 3/4-inch chamfer on all corners.

Excavation for meter pits shall provide a firm base of undisturbed soil. If unsuitable soils are encountered, they are to be removed and replaced at the direction of the Engineer. All meter pits shall be placed or constructed on a 6-inch layer of crushed No. 57 stone meeting ODOT CMS Item 703.02 requirements. Stone shall be placed on a layer of geotextile fabric, Mirafli 140N, or equal.

Meter pits shall be backfilled with crushed No. 57 stone. Stone shall extend from the bottom of the footing to a depth of 6-inches from finished grade. Geotextile fabric, Mirafli 140N, or equal shall be placed between stone and fill. Stone backfill shall extend out from the meter pit for a minimum distance of 1 foot.

Meter pits for water lines 2-inch and smaller shall be equipped with enclosure covers as follows:

(a) 5/8-, 3/4-, and 1-inch meters shall be Ford Type A or C, 11 and 1/2-inch diameter opening.

(b) 1 and 1/2- and 2-inch meters shall be Ford Type A or C, 15-inch diameter opening.

All enclosure covers for the purpose of meter reading shall be an inset lid with a worm-type lock and standard pentagon bolt 27/32-inch in diameter. All covers must be easily removed by one person.

Meter pits for water line 2-inch and smaller shall be equipped with meter risers (resetters). Meter resetters shall be manufactured by Ford of all brass or copper construction, VHH type, or equal. All risers/resetters shall have ball-type shut-off valves. No rubber or fiber washer shall be used; only brass washers will be permitted.

All meters shall be equipped with a remote-type read system. System shall meet the City of Lancaster requirements. Meter pits shall have remote-type lid-mounted modules installed in the enclosure cover or door.

808.05 Backflow Prevention Devices. Backflow prevention devices as specified in CMSL Item 812 shall be installed on customer's side of the meter.

All meter risers/resetters shall be equipped with double-check backflow preventers, Ford Type VHH, or equal (see Standard Construction Drawings). Under no circumstances will reduce pressure backflow prevention devices be permitted in pits. Reduce pressure devices shall be installed in above-ground, weatherproof housings (see Standard Construction Drawings).

ITEM 809 - FIRE LINES AND SPRINKLER LINES

809.01 Description. This specification includes the general requirements for materials, equipment, and construction of fire lines and sprinkler lines within the City of Lancaster.

809.02 Materials. All piping and materials used for the installation of fire lines and sprinkler lines shall be in accordance with CMSL Items 802 and 806.

809.03 Installation. Installation of all fire and sprinkler lines shall be performed by a State licensed sprinkler fitter. Proof of State licensure shall be made available upon request.

Installation of all pipe and fittings shall be in accordance with Standard Construction Drawings W-24 and W-25 and CMSL Items 802 and 806. All fire and sprinkler lines shall be equipped with backflow prevention devices in accordance with CMSL Item 812. Devices shall be installed at the closest possible location to the entry point of the structure. Responsibility of property owner begins at downstream side of Division of Water installed shut-off valve.

809.04 Hydrostatic Testing. Hydrostatic testing shall be completed at the direction of the City of Lancaster Department of Fire Prevention. For information on hydrostatic testing and additional inspections, contact the Department of Fire Prevention.

809.05 Disinfection. Disinfection shall be performed in accordance with CMSL Items 802.25 and 802.26.

809.06 Inspection. Inspection of all materials and their installation must be made by the Division of Water and the Department of Fire Prevention prior to any backfilling. An inspection sheet bearing the signature of a State licensed plumber shall be required. Inspections shall be coordinated with the Division of Water and the Department of Fire Prevention. Upon completion of inspection, owner will be furnished with a copy of the *Customer's Fire Line Inspection Sheet,* Figure 809.06-1.

FIGURE 809.06-1

Customer's Fire Line Inspection Sheet

Mike Nixon, Superintendent of Water

Customer's Fire Line Installation and Inspection Form and Checklist

Owner's Name _____

Address _____

Customer's Fire Line: ☐ New ☐ Old ☐ Replaced ☐ Repaired

Type of Material: Ductile Iron _____

Depth of Fire Line: _____ Feet _____ Inches

Depth of Fire Line at Valve Box: _____ Feet _____ Inches

Size of Fire Line: _____Inch

If any corrections are necessary to comply with the rules and regulations of the Lancaster Water Department, explain below.

_____

_____

The undersigned below hereby certify that on this day of _____, _____ the above inspection as described is true to the best of your knowledge. Also, a duplicate of this form will be furnished to the owner or his or her representative.

_____ _____

Owner or Owner's Representative Lancaster Water Dept. Representative

Notes _____

_____

_____

_____

ITEM 810 - FIRE HYDRANTS

810.01 Scope of Work. The Contractor shall furnish all labor, tools, material, and equipment necessary to furnish and install new fire hydrants at the locations shown on the plans or as ordered and specified.

The item shall include all excavation, furnishing, and installing the new fire hydrant complete with proper jointing, blocking, backfilling, and all other incidental work necessary to complete this item of work. Hydrant watch valves and 6-inch (152 mm) ductile iron hydrant leads are to be installed and paid under CMSL Items 802 and 803.

The Contractor shall notify the Division of Fire prior to taking any fire hydrant out of service.

810.02 Description of Fire Hydrants. All fire hydrants shall be post type made of cast iron and shall conform in all respects to the American Water Works Association Standard for Fire Hydrants for Ordinary Water Works Service, AWWA C502, except as hereinafter specified.

(a) **Type of Hydrant.** The hydrant main valve assembly shall be of the compression type with the valve opening or closing with or against the line pressure. The valve end of the stem or valve rod shall be so constructed as to eliminate contact of dissimilar metals in the presence of moisture; this construction to extend above the moisture line at valve.

The stem or valve rod shall be made of 1.25-inch (31.25 mm) minimum diameter steel stock except for machined surfaces.

Unless approved by the Division of Water, the only fire hydrants approved for use in the City of Lancaster are Mueller "Super Centurion 250" or American Darling "B-84-B".

(b) **Design.** Hydrants shall be of dry top design. All threads and metal bearing surfaces shall be sealed away from water at all times. The size of valve openings shall be at least 5 and 1/4-inch. The design must allow all internal parts, including the seat ring, to be removed from above ground without excavation. The design shall be such that the stresses generated by a smashing blow will be localized and concentrated at a predetermined point in the couplings, straining the metal at this point beyond its ultimate tensile strength before a similar condition develops in the adjacent sections of the standpipe and stem. This design must assure that the upper and lower sections of the hydrant will break apart cleanly without bending the stem and without damage to the

working parts of the hydrant, or the abutting parts of the standpipe sections; also, that there will be no leaking or flooding.

The upper section of the standpipe which carries the nozzle shall be secured to the lower section in such a manner that the upper section may be rotated from 1 degree to 360 degrees without disassembly of the device below the ground line.

The hydrant shall be so designed that, if broken at the joint, repairs may be made by the use of simple tools and the minimum number of parts, and without the necessity of excavating or shutting off the water supply to the hydrant.

(c) **Materials.** All materials used in the construction of this hydrant shall be of the best commercial quality in their respective classes.

(d) **Workmanship.** All castings shall be clean and perfect; no plugging or patching allowed. The machine work on all parts must be true to gauge so that all parts shall be interchangeable from one hydrant to another of the same make and size.

All hydrants delivered not conforming to specifications shall be rejected and returned to the Contractor at Contractor's expense.

(e) **Testing.** Each hydrant shall be properly assembled and tested before leaving the factory.

(f) **Certification.** The hydrant manufacturer shall certify that the type of hydrant furnished has been manufactured and tested in accordance with these specifications; same to show facts and figures of the test.

(g) **Paint.** The hydrant manufacturer shall ensure that each hydrant be given two good coats of blue hydrant enamel, except the bonnet of the hydrant from operating nut down which shall be painted red. Hose nozzle caps shall be painted white.

(h) **Detailed Specifications, Size, Etc.**

Size and type of connection to main:	6 inches (152 mm) mechanical joint
Depth of trench or bury:	5 feet (1.5 m) unless otherwise specified or shown on the drawings
Inside diameter of hose couplings:	5.000 inches
Outside diameter of finished threads:	6.052 inches
Diameter of root threads (male):	5.699 inches
Blank end of male part:	.250 inches
Total length of thread:	1.500 inches
Number of threads per inch:	4.000 inches
Style of thread:	.023 inches

(i) **Hydrants to Open to the Right (Clockwise).** Opening direction shall be cast on top of hydrant. Size and shape of nozzle caps and operating nuts - 7/8-inch (22

(i) **Hydrants to Open to the Right (Clockwise).** Opening direction shall be cast on top of hydrant. Size and shape of nozzle caps and operating nuts - 7/8-inch (22 mm) square at top, tapered to 1-inch (25 mm) at bottom, by 1 and 1/4-inch (32 mm) high.

(j) **Draining Devices.** The drain valve assembly shall consist of at least 1 drain valve that provides for automatic flushing of the drains under line pressure each time the hydrant is cycled open or closed. The valve plate shall be bronze. Drain holes shall be tapped and plugs shall be furnished.

(k) **Nozzles.** All hydrants shall be furnished with 2 hose nozzles and 1 steamer nozzle. The size and shape of threads shall be the same as those in service in the system described in Item 810.02 (detailed specifications, size, etc.) above. The hose nozzles shall be 2 and 1/2-inch NST. Hose nozzle caps are not required to be secured to the hydrant barrel by means of holding chains.

(l) **The Breaking Connection.** The breaking connection of this hydrant shall be made by means of a two-part safety flange, threaded collar, or four-part segmental coupling.

Exclusive of the main valve opening, the cross-sectional area available for water flow at any point in the waterway of the barrel or foot-piece of the smallest part shall not be less than 120 percent of that of the net opening of the main valve.

(m) **Hydrant Extensions.** Fire hydrant extensions, if necessary, will not be less than 6-inches or more than 24-inches.

(n) **Shop Drawings.** Before any hydrant is installed under the jurisdiction of this specification, drawings of the proposed hydrant shall be approved. The drawings shall be in sufficient detail to enable checking design and material. Should any error or omission be discovered, it shall be corrected and the hydrant supplied in accordance with the specifications.

810.03 Installation. Hydrants shall be furnished and installed at the locations shown on the drawings. Unless otherwise shown on the drawings or directed by the Engineer, fire hydrants shall be located 2.5 feet (0.76 m) behind the back of the curb line or 6 feet (1.8 m) from the edge of paved area on non-curbed roadways. They shall be of the proper length to suit the depth of cover over the water lines at the locations shown on the drawings and the necessary extensions shall be furnished to obtain the proper depth. Fire hydrants shall be located to clear all driveway openings by a minimum of 6 feet (1.8 m). Fire hydrants shall not be placed within the radius of street intersections.

The pit or trench for the fire hydrant shall be excavated to a depth of 6-inches below the intended base depth so that when the hydrant is installed, the base shall rest on hardwood or concrete backing. The hydrant shall be set plumb with nozzle outlet approximately 18-inches (0.5 m) from ground line. Steamer nozzle shall face road

unless otherwise specified. Hydrants shall be set in accordance with grade line which is approximately 2-inches (51 mm) below bottom of break connection on the hydrant standpipe.

All fire hydrants shall be installed with hardwood backing against undisturbed earth or Class "C" concrete backing conforming to ODOT Item 499 poured against undisturbed earth, as approved by the Engineer.

810.04 Backfilling. Backfill shall consist of No. 57 granular material conforming to ODOT CMS Item 703. This granular backfill shall be placed around hydrant drain and shall extend from the bottom of the pit or trench to 2-feet (0.6 m) below the existing or proposed surface of the surrounding area. The cost of furnishing and placing this backfill shall be included in the price bid per fire hydrant.

810.05 Hydrant Relocation. Relocation of fire hydrant shall be accomplished by removing existing hydrant, installing new 6-inch (152 mm) ductile iron pipe and cast iron fittings as required to set hydrant at location and elevation shown on the drawings, resetting hydrant, blocking, and backfilling to complete the work.

810.06 Hydrant Abandoned. Where shown on the drawings or directed by the Engineer, the abandonment of a fire hydrant shall be accomplished by closing the watch valve, removing the hydrant, and capping or plugging the water line at the watch valve. The capping or plugging shall be in accordance with City of Lancaster requirements. All abandoned hydrants shall be delivered to the Division of Water, 225 North Memorial Drive, Lancaster, Ohio, unless otherwise directed by the Engineer. No additional payment will be made for this delivery.

ITEM 811 - AIR RELEASE OUTLETS

811.01 Description. Under this item, the Contractor shall furnish all labor, materials and equipment necessary to furnish and install the air release outlets, of the size and, at the locations shown on the drawings or as directed by the Engineer. See Standard Construction Drawing W-6.

811.02 Materials. The corporation stops shall be bronze with AWWA taper inlet and a copper service outlet, and shall be Mueller B-25008, Ford FB1000-3RQ (3/4-inch), Ford FB1000-4RQ (1-inch), or McDonald ONLY, and shall be installed in the top quarter section of the water main.

The curb stops shall be designed for use with copper tubing and shall be Mueller B-25209-3, Ford B44-333RQ (3/4-inch), Ford B44-444RQ (1-inch), or McDonald, without drain, or equal.

The curb boxes shall be 3-inch slide type, combination cast iron/plastic boxes. They shall be adjustable in height from 37 inches to 64 inches and shall have the word "WATER" cast neatly and legibly on the lid. Acceptable manufacturers shall be Bingham and Taylor No. 303 or Valvco No. 323 ONLY.

ITEM 812 - CROSS-CONNECTION CONTROL

812.01 Description. These rules and regulations include the general policy, requirements, and procedures for cross-connection control used in the City of Lancaster. These requirements are a guideline for cross-connection control and should be used in conjunction with the requirements of the Ohio Environmental Protection Agency *Drinking Water Rules and Regulations*, current revisions.

The purpose of these rules and regulations are:

(a) To protect the public potable water supply from contamination or pollution by isolating within the consumer's water system, contaminants or pollutants which could backflow through the service connection into the public potable water system.

(b) To promote the elimination or control of existing cross-connections, actual or potential, between the public or consumer's potable water system and non-potable water systems, plumbing fixtures, and sources or systems containing process fluids.

(c) To provide for the maintenance of a continuing program of cross-connection control which will systematically and effectively prevent the contamination or pollution of the public and consumer's potable water system.

812.02 Application. These rules and regulations shall apply to all premises served by the public potable water system of the City of Lancaster.

812.03 Policy. The Superintendent of Water shall be responsible for the protection of the public potable water system from contamination due to backflow of contaminants through the water service connection. If, in the judgment of the Superintendent of Water or his authorized representative, an approved backflow prevention device is necessary at the water service connection to any consumer's premises for the safety of the water system, the Superintendent of Water or his authorized representative shall give notice to the consumer to install such approved backflow prevention device at each service connection to his premises. A thermal

expansion tank must also be installed on the cold water side of the hot water tank or other hot water system.

(a) The consumer of any commercial/industrial business shall, at a reasonable time determined by the Superintendent of Water, install such approved device or devices at his own expense and failure, refusal, or inability on the part of the consumer to install such device or devices immediately shall constitute grounds for discontinuing water service to the premises until such device or devices have been installed.

(b) The consumer of any new dwelling shall install such approved device or devices at his own expense at the time that the water line is inspected and the meter is set. Failure, refusal, or inability on the part of the consumer to install such device or devices shall constitute grounds for discontinuing water service to the premises until such device or devices have been installed.

(c) The consumer of any new sprinkler system line shall install an approved device at his own expense and failure, refusal, or inability on the part of the consumer to install such device shall constitute grounds for discontinuing water service to the premises until such device has been installed. The Water Department shall determine which device is to be installed by the degree of hazard.

(d) The consumer of any existing water service that has a service line repaired or replaced will have to install such approved device or devices at his own expense before line is inspected. Failure, refusal, or inability on the part of the consumer to install such device or devices shall constitute grounds for discontinuing water service to the premises until such device or devices have been installed.

812.04 Definitions. (3745-95-01)

As used in this chapter:

(a) "Air gap separation" means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood level rim of the receptacle.

(b) "Approved" means that a backflow prevention device or method has been accepted by the supplier of water and the director as suitable for the proposed use.

(c) "Auxiliary water system" means any water system on or available to the premises other than the public water system. These auxiliary water systems shall include used water or water from a source other than the public water system, such as wells, cisterns, or open reservoirs that are equipped with pumps or other prime movers, including gravity.

(d) "Backflow" means the flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable water supply from any source other than the intended source of the potable water supply.

(e) "Backflow prevention device" means any device, method, or type of construction intended to prevent backflow into a potable water system.

(f) "Booster pump" means any device which is intended to increase the in-line water pressure.

(g) "Consumer" means the owner or person in control of any premises supplied by or in any manner connected to a public water system.

(h) "Consumer's water system" means any water system, located on the consumer's premises, supplied by or in any manner connected to a public water system. A household plumbing system is considered to be a consumer's water system.

(i) "Cross-connection" means any arrangement whereby backflow can occur.

(j) "Degree of hazard" is a term derived from an evaluation of the potential risk to health and welfare.

(k) "Director" means the director of environmental protection or his duly authorized representative.

(l) "Double check valve assembly" means an assembly composed of two single, independently acting, check valves including tightly closing shutoff valves located at each end of the assembly and suitable connections for testing the water tightness of each check valve.

(m) "Double check-detector check valve assembly" means a specially designed assembly composed of a line-size approved double check valve assembly with a specific bypass water meter and a meter-sized approved double check valve assembly. The meter shall register accurately for only very low rates of flow and shall show a registration for all rates of flow.

(n) "Health hazard" means any condition, device, or practice in a water system or its operation that creates, or may create, a danger to the health of users.

(o) "Human consumption" means the ingestion or absorption of water or water vapor as the result of drinking, cooking, dishwashing, hand washing, bathing, showering, or oral hygiene.

(p) "Interchangeable connection" means an arrangement or device that will allow alternate but not simultaneous use of two sources of water and includes an approved reduced pressure principle backflow prevention assembly or an approved

reduced pressure principle-detector assembly on the public water system side of the connection.

(q) "Person" means the state, any political subdivision, public or private corporation, individual, partnership, or other legal entity.

(r) "Pollutional hazard" means a condition through which an aesthetically objectionable or degrading material, which is not dangerous to the public water system or health of users, may enter the public water system or portion of a consumer's water system.

(s) "Potable water" means water intended for human consumption.

(t) "Premises" means any building, structure, dwelling, or area containing plumbing or piping supplied from a public water system.

(u) "Process fluids" means any fluid or solution which may be chemically, biologically, or otherwise contaminated or polluted in a form or concentration such as would constitute a pollutional, system, health, or severe health hazard if introduced into the public water system or portion of a consumer's water system. This includes, but is not limited to:

(1) Polluted or contaminated waters;
(2) Process waters 3745-95-01 3;
(3) Used waters originating from a public water system which may have deteriorated in sanitary quality;
(4) Cooling waters;
(5) Contaminated natural waters taken from wells, lakes, streams, or irrigation systems;
(6) Chemicals in solution or suspension;
(7) Oils, gases, acids, alkalis, and other liquid and gaseous fluids used in industrial or other processes, or for fire fighting purposes.

(v) "Public water system" has the same meaning as in rule 3745-81-01 of the Administrative Code.

(w) "Reduced pressure principle backflow prevention assembly" means a device containing a minimum of two independently acting check valves together with an automatically operated pressure differential relief valve located between the two check valves. During normal flow and at the cessation of normal flow, the pressure between these two checks shall be less than the supply pressure. In case of leakage of either check valve, the differential relief valve, by discharging to the atmosphere, shall operate to maintain the pressure between the check valves at less than the supply pressure. The unit must include tightly closing shutoff valves located at each end of the device, and each device shall be fitted with properly located test cocks.

(x) "Reduced pressure principle-detector assembly" means a specially designed assembly composed of a line-size approved reduced pressure principle backflow prevention assembly with a specific bypass water meter and a meter sized, approved reduced pressure principle backflow prevention assembly. The meter shall register accurately for only very low rates of flow and shall show a registration for all rates of flows.

(y) "Service connection" means the terminal end of a service line from the public water system. If a meter is installed at the end of the service, then the service connection means the downstream end of the meter.

(z) "Severe health hazard" means a health hazard to users that could reasonably be expected to result in significant morbidity or death.

(aa) "Supplier of water" means the owner or operator of a public water system.

(bb) "System hazard" means a condition posing an actual or potential threat of damage to the physical properties of the public water system or a consumer's water system. 3745-95-01 4

(cc) "Used water" means any water supplied by a supplier of water from a public water system to a consumer's water system after it has passed through the service connection and is no longer under the control of the supplier.

(dd) "Water system" means a system for the provision of piped water or process fluids, and includes any collection, treatment, storage, or distribution facilities used primarily in connection with such system.

(ee) "Weep holes" means a series of small diameter holes located in the wall of the supply pipe for a yard hydrant that allow for drainage of accumulated water from the delivery piping. These holes are usually part of a plunger and valve system that seals off the holes during water usage and opens the holes during shutdown. These openings are located below ground level and below the frost line in areas where the threat of freezing exists.

(ff) "Yard hydrant" means a device that is located outside of a building, equipped with a valved mechanism that controls the delivery of potable water, and is not designed to supply a fire department pumper.
Effective: 10/01/2006

812.05 Cross-Connections. (3745-95-02)

(a) No person shall install or maintain a water service connection to any premises where actual or potential cross-connections to a public water system or a consumer's water system may exist unless such actual or potential cross-connections are abated or controlled to the satisfaction of the supplier of water.

(b) No person shall install or maintain a connection between a public water system or consumer's water system and an auxiliary water system unless the auxiliary water system, the method of connection, and the use of such system have been approved by the supplier of water and by the director as required by section 6109.13 of the Revised Code.
Effective: 05/01/2003

812.06 Surveys and investigations. (3745-95-03)

(a) The supplier of water shall conduct or cause to be conducted periodic surveys and investigations, of frequency acceptable to the director, of water use practices within a consumer's premises to determine whether there are actual or potential cross-connections to the consumer's water system through which contaminants or pollutants could backflow into the public water system.

(b) The supplier of water, or his authorized representative, shall have the right to enter premises served by the public water system at all reasonable times for the purpose of making surveys and investigations of water use practices within the premises.

(c) On request by the supplier of water, or his authorized representative, the consumer shall furnish the supplier, or his authorized representative, information on water use practices within the consumer's premises.

(d) Paragraph (a) of this rule does not relieve the consumer of the responsibility for conducting, or causing to be conducted, periodic surveys of water use practices on his premises to determine whether there are actual or potential cross-connections in the consumer's water system through which contaminants or pollutants could backflow into a public water system or a potable consumer's water system.
Effective: November 26, 1980

812.07 Where Protection is Required. (3745-95-04)

(a) An approved backflow prevention device shall be installed on each service line to a consumer's water system serving premises, where in the judgment of the supplier of water or the director, a pollutional, system, health, or severe health hazard to the public water system exists.

(b) An approved backflow prevention device shall be installed on each service line to a consumer's water system serving premises where any of the following conditions exist:

(1) Premises having an auxiliary water system on the premises, unless such auxiliary system is accepted as an additional source by the supplier of water and the source is approved by the director;

(2) Premises on which any substance is handled in such a fashion as to create an actual or potential hazard to a public water system. This shall include premises having sources or systems containing process fluids;

(3) Premises having internal cross-connections that, in the judgment of the supplier of water, are not correctable or intricate plumbing arrangements which make it impracticable to determine whether or not cross-connections exist;

(4) Premises where, because of security requirements or other prohibitions or restrictions, it is impossible or impractical to make a complete cross-connection survey;

(5) Premises having a repeated history of cross-connections being established or re-established; or

(6) Others specified by the director.

(c) The following requirements apply to premises that have an auxiliary water system on the real property that is owned or under control of the consumer and adjacent to the premises.

(1) A physical separation shall be maintained between the public water system or a consumer's water system and the auxiliary water system as required by paragraph (B) of rule 3745-95-02 of the Administrative Code; and

(2) An approved backflow prevention device shall be installed on each service connection serving the consumer's water system, unless the supplier of water does all of the following:

a. Determines, on a case-by-case basis, that the installation of an 3745-95-04 2 approved backflow prevention device on a service connection is not required in consideration of factors, including but not limited to, the past history of cross connections being established or re-established on the premises, the ease or difficulty of connecting the auxiliary water system with the public water system on the premises, the presence or absence of contaminants on the property or other risk factors;

b. Requires the consumer to sign an agreement which specifies the penalties, including those set forth in rule 3745-95-08 of the Administrative Code, for creating a connection between the public water system and the auxiliary water system;

c. Conducts or causes to be conducted an inspection at least every 12 months to certify that no connection or means of connection has been created between the public water system and the auxiliary water system;

d. Maintains an inventory of each consumer's premises where an auxiliary water system is on or available to the premises, or on the real property adjacent to the premises; and

e. Develops and implements an education program to inform all consumers served by the public water system about the dangers of cross-connections and how to eliminate cross-connections.

(d) An approved backflow prevention device shall be installed on each service line to a consumer's water system serving, but not necessarily limited to, the following types of facilities unless the director determines that no severe health, health, system, or pollutional hazard to the public water system exists:

(1) Hospitals, mortuaries, clinics, nursing homes;
(2) Laboratories;
(3) Piers, docks, waterfront facilities;
(4) Sewage treatment plants, sewage pumping stations, or storm water pumping stations;
(5) Food or beverage processing plants;
(6) Chemical plants;
(7) Metal plating industries;
3745-95-04 3
(8) Petroleum processing or storage plants;
(9) Radioactive material processing plants or nuclear reactors;
(10) Car washes; Laundromats; and
(11) Others specified by the director.

(e) An approved backflow prevention device shall be installed at any point of connection that is approved in accordance with paragraph (b) of rule 3745-95-02 of the Administrative Code between a public water system or a consumer's water system and an auxiliary water system, unless such auxiliary system is accepted as an additional source by the supplier of water and the source is approved by the director.
Effective: 05/01/2003

812.08 Type of Protection Required. (3745-95-05)

(a) The type of protection required under paragraphs (a), (b), (c) and (d) of rule 3745-95-04 of the Administrative Code shall depend on the degree of hazard which exists as follows:

(1) An approved air gap separation shall be installed where a public water system may be contaminated with substances that could cause a severe health hazard;
(2) An approved air gap separation, an approved reduced pressure principle backflow prevention assembly, or an approved reduced pressure detector check assembly shall be installed where a public water system may be contaminated with any substance that could cause a system or health hazard;
(3) An approved air gap separation, an approved reduced pressure principle backflow prevention assembly, an approved reduced pressure principle detector check assembly, an approved double check valve

assembly, or an approved double check-detector check valve assembly shall be installed where a public water system may be contaminated with any substance that could cause a pollutional hazard.

(b) The type of protection required under paragraph (e) of rule 3745-95-04 of the Administrative Code shall be an approved air gap separation or an approved interchangeable connection.

(c) Where an auxiliary water system is used as a secondary source of water for a fire protection system, the provisions of paragraph (b) of this rule for an approved air gap separation or an approved interchangeable connection may be waived by the director, provided:

(1) At premises where the auxiliary water system may be contaminated with substances that could cause a system, health, or severe health hazard, a public water system or a consumer's water system shall be protected against backflow by installation of an approved reduced pressure principle backflow prevention assembly or an approved reduced pressure principle-detector check assembly;
(2) At all other premises, a public water system or a consumer's water system shall be protected against backflow by installation of an approved reduced pressure principle backflow prevention assembly, an approved reduced pressure principle-detector check assembly, an approved double check valve assembly, or an approved double check-detector check valve assembly;
(3) A public water system or a consumer's water system shall be the primary 3745-95-05 2 source of water for the fire protection system;
(4) The fire protection system shall be normally filled with water from a public water system or a consumer's water system; and
(5) The water in the fire protection system shall be used for fire protection only, with no other use of water from the fire protection system downstream from the approved backflow prevention device.
Effective: 05/01/2003

812.09 Backflow Prevention Devices. (3745-95-06)

(a) Any backflow prevention device required by rules 3745-95-04 and 3745-95-05 of the Administrative Code shall be of a model or construction approved by the supplier of water and conform to at least one of the following standards:

(1) For air gap separations: American National Standards Institute standard A112.1.2 - 1991;
(2) For reduced pressure principle backflow prevention assemblies: American National Standards Institute/American Water Works Association standard C511-97 (1997), or American Society of Sanitary Engineering standard 1013-99 (1999), or Canadian Standards Association standard B64.4-01 (2001), or Foundation for Cross Connection Control and

Hydraulic Research, University of Southern California Specifications of Backflow Assemblies for Reduced Pressure Principle Assemblies - ninth edition (1993);

(3) For double check valve assemblies: American National Standards Institute/American Water Works Association standard C510-97 (1997), or American Society of Sanitary Engineering standard 1015-99, or Canadian Standards Association standard B64.5-01 (2001), or Foundation for Cross Connection Control and Hydraulic Research, University of Southern California Specifications of Backflow Assemblies for Double Check Valve Assemblies - ninth edition (1993);

(4) For reduced pressure principle-detector assemblies: American National Standards Institute/American Society of Sanitary Engineering standard 1047-99 (1999), or Canadian Standards Association standard B64.4.1-01 (2001), or Foundation for Cross Connection Control and Hydraulic Research, University of Southern California Specifications of Backflow Assemblies for Reduced Pressure Principle-Detector Assemblies - ninth edition (1993); or (5) For double check-detector check valve assemblies: American National Standards Institute/American Society of Sanitary Engineering standard 1048-99 (1999), or Canadian Standards Association standard B64.5.1-01 (2001), or Foundation for Cross Connection Control and Hydraulic Research, University of Southern California Specifications of Backflow Assemblies for Double Check-Detector Assemblies - ninth edition (1993).

(b) Any backflow prevention device required by rules 3745-95-04 and 3745-95-05 of the Administrative Code shall be installed at a location and in a manner approved by the supplier of water and shall be installed at the expense of the water consumer.

In addition, any backflow prevention device required by paragraphs (b) and (c) of rule 3745-95-05 of the Administrative Code shall be installed at a location and in a manner approved by the director as required by section 6109.13 of the Revised Code.
3745-95-06 2

(c) It shall be the duty of the water consumer to maintain any backflow prevention device required by rules 3745-95-04 and 3745-95-05 of the Administrative Code in proper working order and in continuous operation.

(1) The supplier of water shall retain authority over any backflow prevention device required by rules 3745-95-04 and 3745-95-05 of the Administrative Code.

(2) It shall be the duty of the supplier of water to see that the tests and inspections required under this paragraph are made.

(3) The consumer shall, on any premises on which backflow prevention devices required by rules 3745-95-04 and 3745-95-05 of the Administrative Code are installed, have thorough inspections and operational tests made of the devices at the time of installation or repair,

and as may be reasonably required by the supplier of water or the director, but in all cases at least once every 12 months. These inspections and tests shall be at the expense of the water consumer and shall be performed by the supplier of water or a person approved by the supplier as qualified to inspect and test backflow prevention device.

(4) These devices shall be repaired, overhauled, or replaced at the expense of the consumer whenever they are found to be defective.

(5) Records of such inspections, tests, repairs, and overhaul shall be kept by the consumer and made available to the supplier of water.

(6) A copy of the inspection report shall be sent to the City of Lancaster Division of Water at 225 North Memorial Drive, Lancaster, OH 43130 within 10 working days of the inspection date.

(d) The supplier of water shall inspect or cause to be inspected all installations where an approved connection exists between an auxiliary water system and the public water system or a consumer's water system at least once every 12 months and shall maintain an inventory of all such installations and inspection records. Such inventories and inspection records shall be made available during sanitary surveys and at other reasonable times.

(e) Backflow prevention devices approved by the supplier of water and conforming to prior or subsequent editions of the standards cited in paragraph (a) of this rule, and which are properly maintained in accordance with paragraph (c) of this rule shall be excluded from the requirements of paragraphs (a) and (b) of this rule if the supplier of water and the director are assured that the devices will satisfactorily protect the public water system.

[Comment: This rule incorporates the following standard by reference: American National Standards Institute standard A112.1.2 - 1991, Air Gaps in Plumbing Systems R(1991). At the effective date of this rule, a copy may be obtained from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112, phone: 303-397-7956 or 800-854-7179, world-wide web address: http://global.ihs.com/. This document is available for review at Ohio EPA, Lazarus 3745-95-06 3 Government Center, 122 South Front Street, Columbus, OH, 43215-3425.]

[Comment: This rule incorporates the following standards by reference: American National Standards Institute/American Water Works Association standard C510-97 and American National Standards Institute/American Water Works Association standard C511-97. At the effective date of this rule, a copy of these documents may be obtained from AWWA, 6666 W . Quincy Ave., Denver, CO, 80235, phone: 800-926-7337, world-wide web address: http://www.awwa.org/ or from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112, phone: 303-397-7956 or 800-854-7179, world-wide web address: http://global.ihs.com/. These documents are available for review at Ohio EPA, Lazarus Government Center, 122 South Front Street, Columbus, OH, 43215-3425]

[Comment: This rule incorporates the following standards by reference: American Society of Sanitary Engineering standard 1013-99, American Society of Sanitary Engineering standard 1015-99, American National Standards Institute/American Society of Sanitary Engineering standard 1047-99, and American National Standards Institute/American Society of Sanitary Engineering standard 1048-99. At the effective date of this rule, a copy these documents may be obtained from American Society of Sanitary Engineering, 901 Canterbury Road, Suite A, Westlake, OH, 44145-1480, phone: 440-835-3040, world-wide web address: http://www.asse-plumbing.org/ or from Global Engineering Documents, 15 Inverness Way East, Englewood, CO, 80112, phone: 303-397-7956 or 800-854-7179, world-wide web address: http://global.ihs.com/. These documents are available for review at Ohio EPA, Lazarus Government Center, 122 South Front Street, Columbus, OH, 43215-3425]

[Comment: This rule incorporates the following standards by reference: Canadian Standards Association standard B64.4-01, Canadian Standards Association standard B64.5-01, Canadian Standards Association standard B64.4.1-01 and Canadian Standards Association standard B64.5.1-01. At the effective date of this rule, a copy of these documents may be obtained as "B64 Series-01: Backflow Preventers and Vacuum Breakers" from Canadian Standards Association, 5060 Spectrum W ay, Suite 100, Mississauga, Ontario, L4W 5N6, Canada, world-wide web address: http://www.csa.ca/default.asp?language=english. These documents are available for review at Ohio EPA, Lazarus Government Center, 122 South Front Street, Columbus, OH, 43215-3425]

[Comment: This rule incorporates portions of the following manual by reference: The Manual of Cross-Connection Control, Ninth Edition, published by The Foundation for Cross Connections Control and Hydraulic Research, University of Southern California. At the effective date of this rule, a copy of this document may be obtained from The Foundation for Cross Connection Control and Hydraulic Research, University of Southern California, Kaprielian Hall 200, Los Angeles, CA 90089-2531, phone: 213-740-2032, world-wide web address: http://www.usc.edu/dept/fccchr/. This document is available for review at Ohio EPA, Lazarus Government Center, 122 South Front Street, Columbus, OH 43215-3425]
Effective: 05/01/2003

812.10 Installation.

(a) Backflow prevention devices required by these rules and regulations shall be installed at a location and in a manner approved by and at the expense of the water consumer. In addition, any backflow prevention device required by Section 813.08(b) and 813.08(c) of these regulations shall be installed at a location and in a manner approved by the Director of the Ohio Environmental Protection Agency as required by Section 6109.13 of the Ohio Revised Code.

(b) Backflow prevention devices installed on the service line to a consumer's water system shall be located on the consumer's side of the water meter, as close to the meter as is reasonably practical, and prior to any other connection. (See Drawings

No. W-17, W-18, W-19, W-20, W-21, W-22, W-23, W-24, W-25, W-26, W-27A AND W-27B.

812.11 Violations. (3745-95-08)

(a) The supplier of water shall deny or discontinue, after reasonable notice to the occupant thereof, the water service to any premises wherein any backflow prevention device required by this chapter is not installed, tested, and maintained in a manner acceptable to the supplier of water, or if it is found that the backflow prevention device has been removed or by-passed, or if an unprotected cross-connection exists on the premises or if a low pressure cut-off required by rule 3745-95-07 of the Administrative Code is not installed and maintained in working order, or if the supplier of water or the director, or the authorized representative of either, is denied entry to determine compliance with this chapter of the Administrative Code.

(b) Water service to such premises shall not be restored until the consumer has corrected or eliminated such conditions or defects in conformance with this chapter of the Administrative Code, and to the satisfaction of the supplier of water.
Effective: November 26, 1980

812.12 List of Approved Devices.

(a) In accordance with 3745-95-06(a), any backflow prevention device required by Rules 3745-95-04 and 3745-95-05 shall be of a model or construction approved by the supplier of water and the Director of the Ohio Environmental Protection Agency.

(b) Device Approval List. The list of State approved devices is subject to change as new units are designed, tested, and approved; therefore, a list of approved units is not included in these regulations but may be obtained by a request in writing to the City of Lancaster Division of Water, 225 North Memorial Drive, Lancaster, OH 43130.

812.13 Requirements for Yard Hydrants. (3745-95-09)

(a) Yard hydrants with weep holes are prohibited.

(b) Sanitary yard hydrants that do not have weep holes, such as those that meet the requirements of the *American Society of Sanitary Engineers (ASSE) standard 1057, Performance Requirements for Freeze Resistant Yard Hydrants with Backflow Protection (2001)*, are not prohibited provided:

(1) The device is acceptable to the public water system to which it will be connected; and
(2) All of the backflow and cross-connection requirements of this chapter of the Administrative Code are met.
Replaces: Former 3745-99-01 Effective: 10/01/2006

Figure 812.09-1

Annual Test & Maintenance Report for Backflow Prevention Assemblies

Facility Name: _____ **Address:** _____

Contact Person: _____ **Phone No.** _____

Assembly Information		Installation Information	
Make:		Containment	Isolation
Model:		Meter Pit	Basement
Size:		Mechanical Room	Boiler Room
Serial Number:			

Double Check Assembly

Initial Test Date	Outlet Valve		Pass Fail
	1st Check Valve	____ psig	Pass Fail
	2nd Check Valve	____ psig	Pass Fail

Reduced Pressure Assembly

1st Check Valve	____psig	Pass Fail
Relief Valve Opening Point	____psig	Pass Fail
2nd Check Valve		Pass Fail
Outlet Valve	Pass	Fail

Pressure Vacuum Breaker

Air Inlet Valve	____psig	Pass Fail
Check Valve	____psig	Pass Fail

Repairs & Materials Used	

Double Check Assembly

After Repairs Date	Outlet Valve		Pass Fail
	1st Check Valve	____ psig	Pass Fail
	2nd Check Valve	____ psig	Pass Fail

Reduced Pressure Assembly

1st Check Valve	____psig	Pass Fail
Relief Valve Opening Point	____psig	Pass Fail
2nd Check Valve		Pass Fail
Outlet Valve	Pass	Fail

Pressure Vacuum Breaker

Air Inlet Valve	____psig	Pass Fail
Check Valve	____psig	Pass Fail

TESTER CERTIFICATION: *I certify that the above data is correct and that the backflow prevention device is in proper working condition.*

Tester Name (Printed) _____ Signature: _____

Phone No. _____ Company Name _____

Cert. No. _____ Contractor No. _____ Date _____

Facility Certification: *I hereby certify that the above backflow prevention device has been in constant use at this location during the entire prescribed interval between test periods and during that period this device was not bypassed, made inoperative or removed without proper authorization. I further certify that I have the authority and responsibility to ensure the above.*

Owner / Officer (Printed) _____ Signature _____

Title: _____ Date: _____ Phone No. _____

MAIL OR FAX TO:

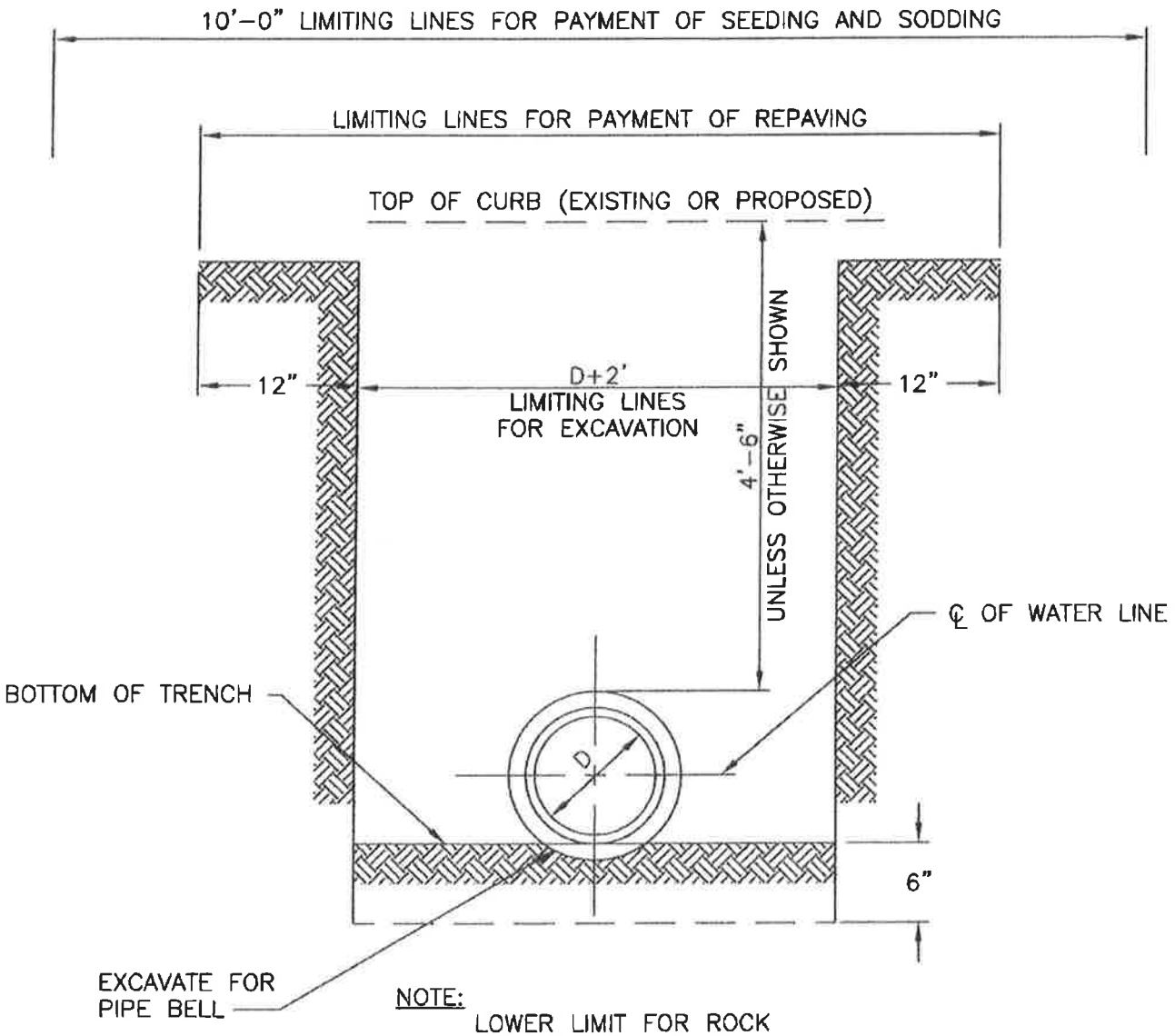
CITY OF LANCASTER
DIVISION OF WATER
225 NORTH MEMORIAL DR.
LANCASTER, OHIO 43130
(740) 687-6631
FAX (740) 687-6638

City of Lancaster
Division of Water

Standard Construction Drawings

225 North Memorial Drive
Lancaster, Ohio 43130
(740) 687-6631
www.ci.lancaster.oh.us

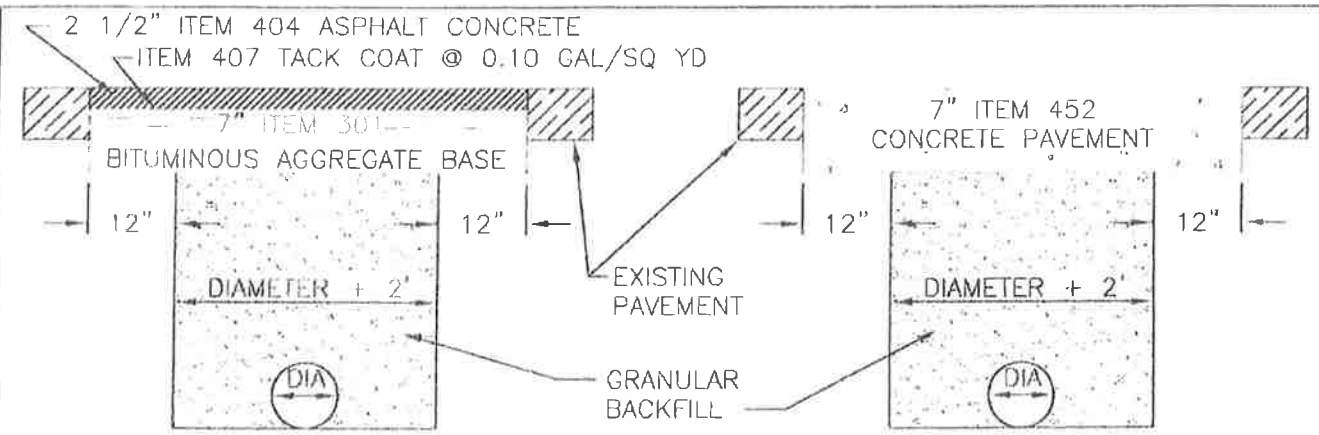
Revised August 2013



NOTE:

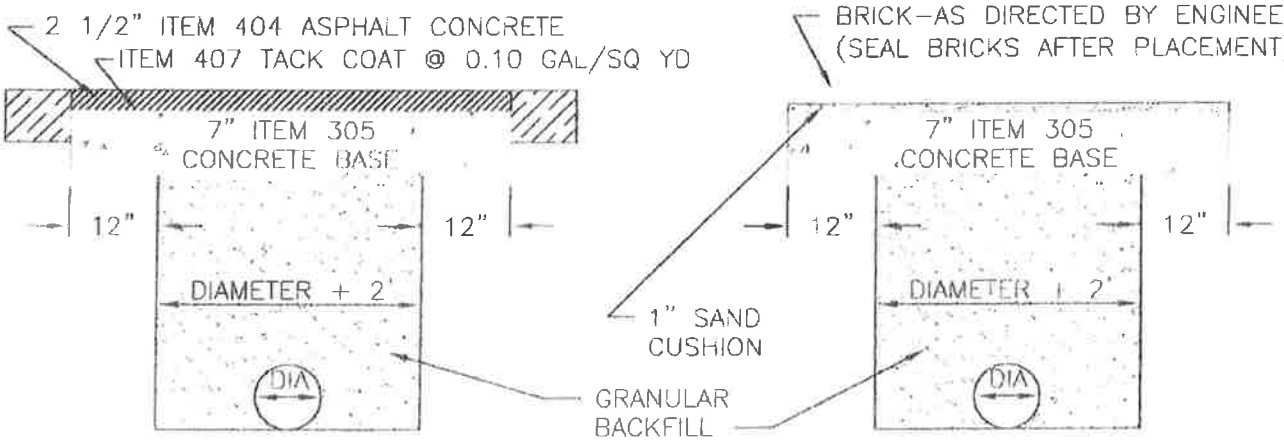
LOWER LIMIT FOR ROCK EXCAVATION REPLACE WITH NO. 57 GRANULAR MATERIAL PER 703 ODOT CMS.

APPROVED 9-18-14 Brad Fogrell CITY ENGINEER REVISED: 3/2/07	TYPICAL TRENCH FOR WATER LINES	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W–1



TYPE–A
FLEXIBLE STREETS

TYPE–B
CONCRETE STREETS



TYPE–C
BITUMINOUS AND BRICK STREETS

TYPE–D
BRICK STREETS

NOTES:

PERMANENT PAVEMENT REPLACEMENT SHALL NOT BE PERFORMED UNTIL SO ORDERED BY THE ENGINEER.

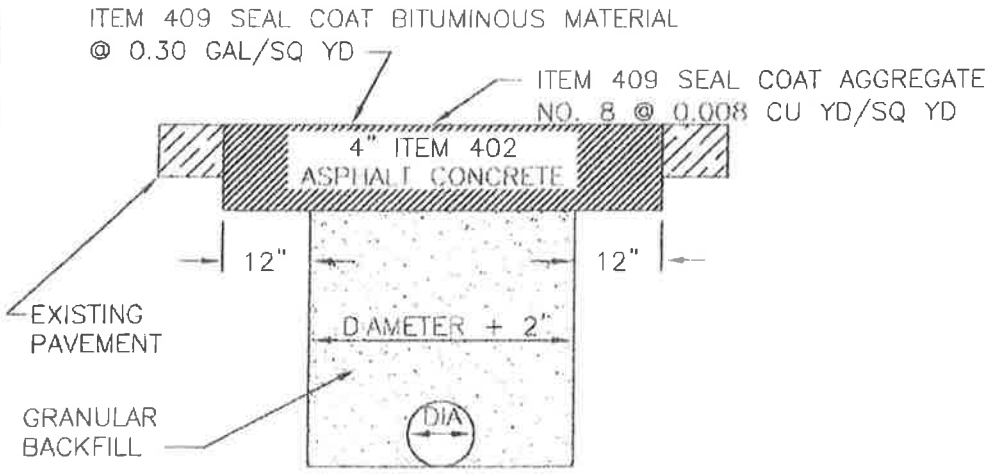
EDGES OF THE EXISTING PAVEMENT SHALL BE CUT VERTICAL AND TRIMMED TO PROVIDE A STRAIGHT LINE JUNCTURE BETWEEN EXISTING AND NEW PAVEMENT. NO RAGGED EDGES SHALL BE PERMITTED.

GRANULAR BACKFILL SHALL BE COMPACTED PER 912. IT SHALL BE SHAPED AND COMPACTED AS DIRECTED BY THE ENGINEER.

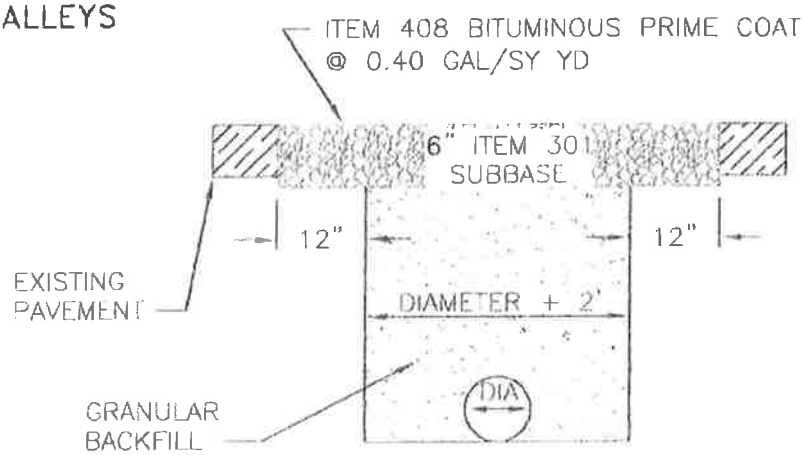
VERTICAL FACES OF EXISTING ASPHALT PAVEMENT AND THE SUBBASE SHALL BE CLEANED AND COATED WITH BITUMINOUS MATERIAL IN ACCORDANCE WITH 401.12.

SURFACE JOINTS SHALL BE SEALED BY AN APPLICATION OF 409.02 BITUMINOUS MATERIAL FOLLOWED BY AN APPLICATION OF 407.02 COVER AGGREGATE.

APPROVED 9-18-14 Brad Fagrell CITY ENGINEER REVISED: 3/5/07	TYPICAL PAVEMENT REPLACEMENT FOR TRENCHES	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: FILE NUMBER W–1B



TYPE–E
TAR AND CHIP ALLEYS



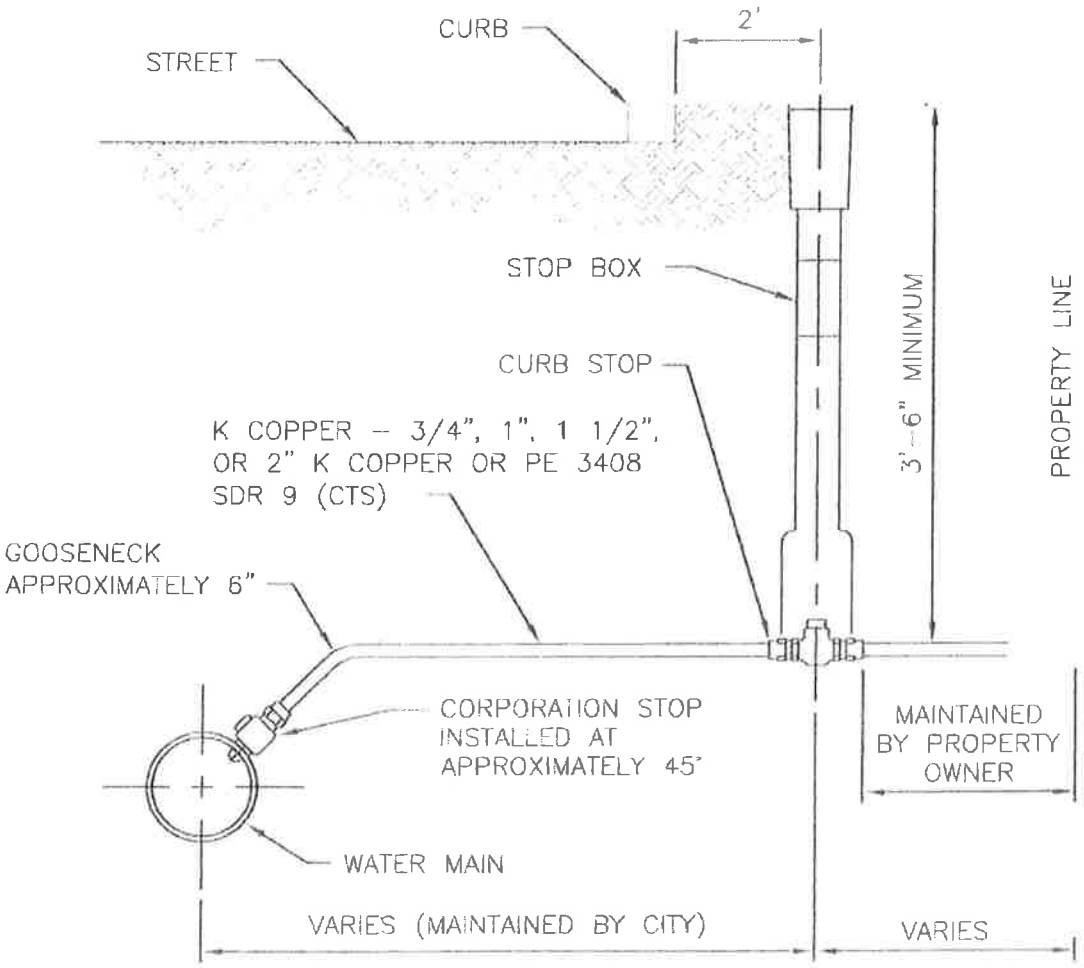
TYPE–F
TAR AND CHIP ALLEYS

NOTES:

PERMANENT PAVEMENT REPLACEMENT SHALL NOT BE PERFORMED UNTIL SO ORDERED BY THE ENGINEER.

THE EDGE SHALL BE CUT VERTICLE AND TRIMMED TO PROVIDE A STRAIGHT LINE.

APPROVED 9-18-19 Brad Fogrell CITY ENGINEER REVISED: 3/5/07	TYPICAL PAVEMENT REPLACEMENT FOR TRENCHES	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W–1C



NOTES:

1 1/2", 1", & 3/4" SERVICE LINES SHALL BE TYPE K COPPER.

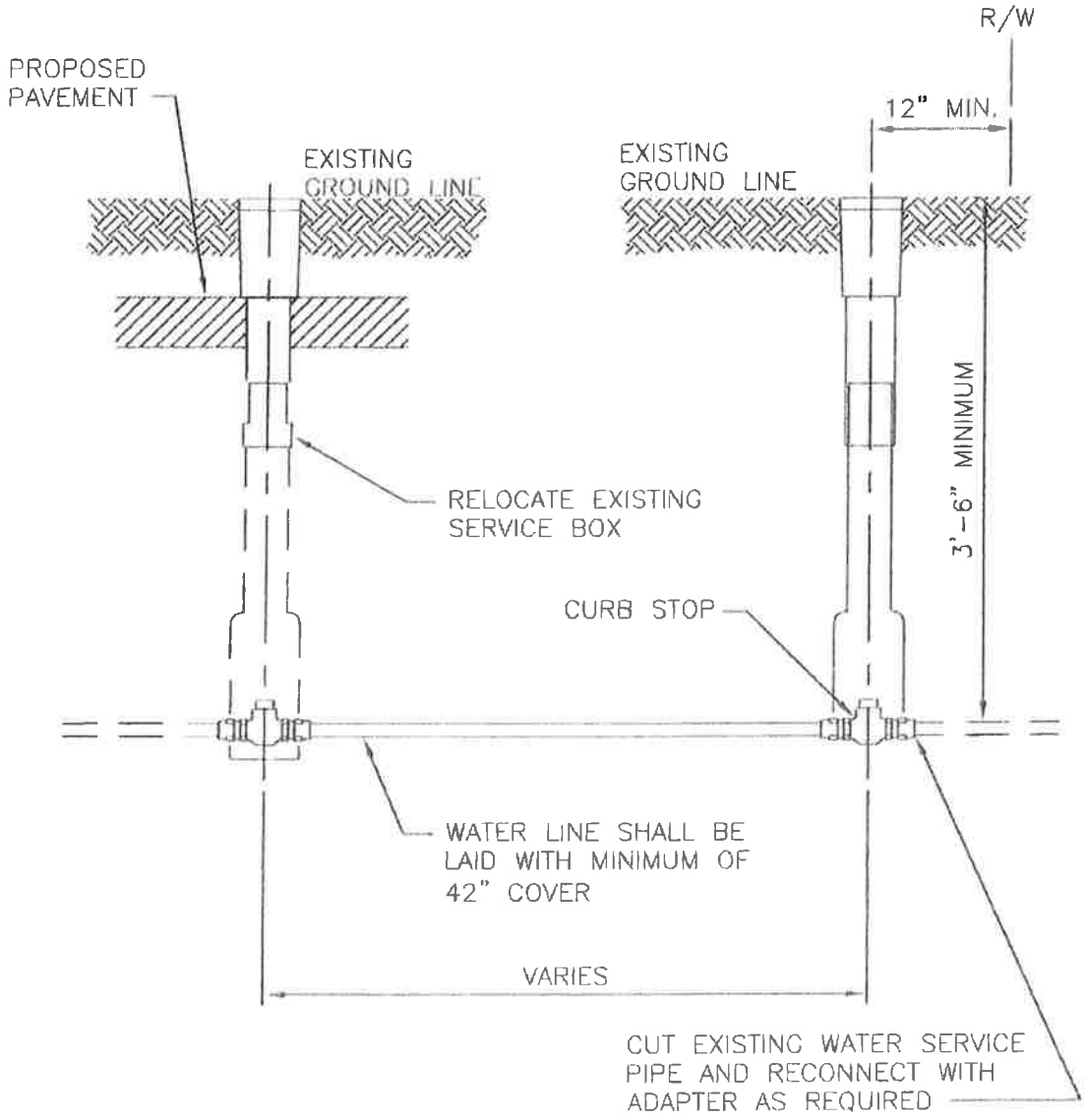
2" SERVICE LINES SHALL BE K COPPER OR P.E. 3408 SDR 9 (CTS).

3/4", 1", 1 1/2", & 2" FITTINGS SHALL BE FLARE TYPE OR COMPRESSION PACK JOINT FITTINGS (NO SOLDER FITTINGS)

TAPPING INTO MAIN LINE WILL BE TAPERED THREAD TO FLARED CORPORATION MUELLER TYPE H-1500 TAP MADE BY MUELLER B-100, B-101, OR A-3 PRESSURE TAPPING MACHINE OR EQUAL.

CORPORATIONS TAPPED INTO WATER MAIN MUST HAVE A MINIMUM OF 24" SEPARATION BETWEEN CORPORATION STOPS.

APPROVED 9-18-14 Brad Fagnell CITY ENGINEER REVISED: 1/2/09	STANDARD WATER SERVICE	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W-2



APPROVED 9-18-14

Brad Fagnell
CITY ENGINEER

REVISED: 3/5/07

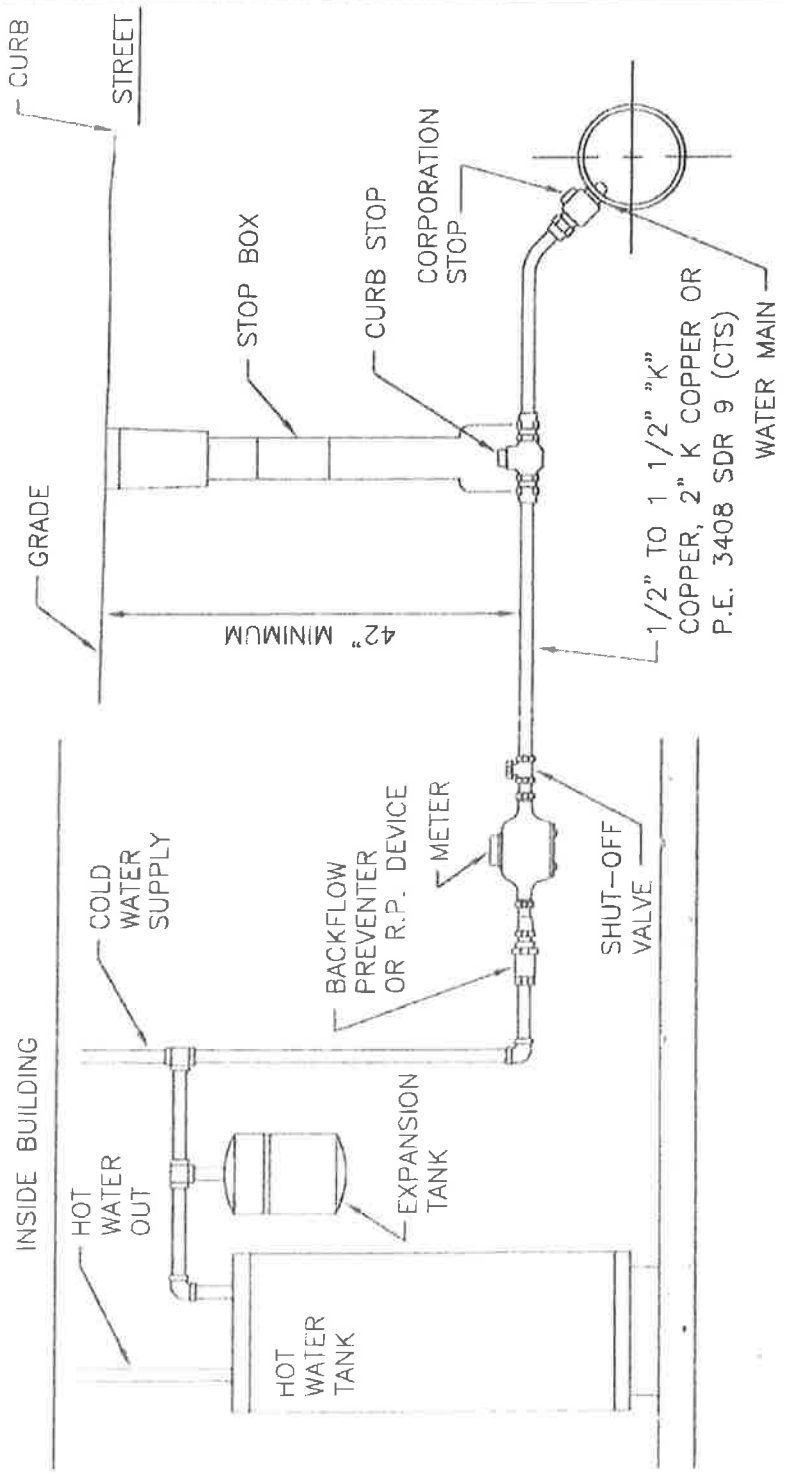
WATER SERVICE EXTENSION AND CURB BOX RELOCATION

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY: .....

FILE NUMBER
W-3



APPROVED 9-18-14

Brad Fogall
CITY ENGINEER

REVISED: 8/15/13

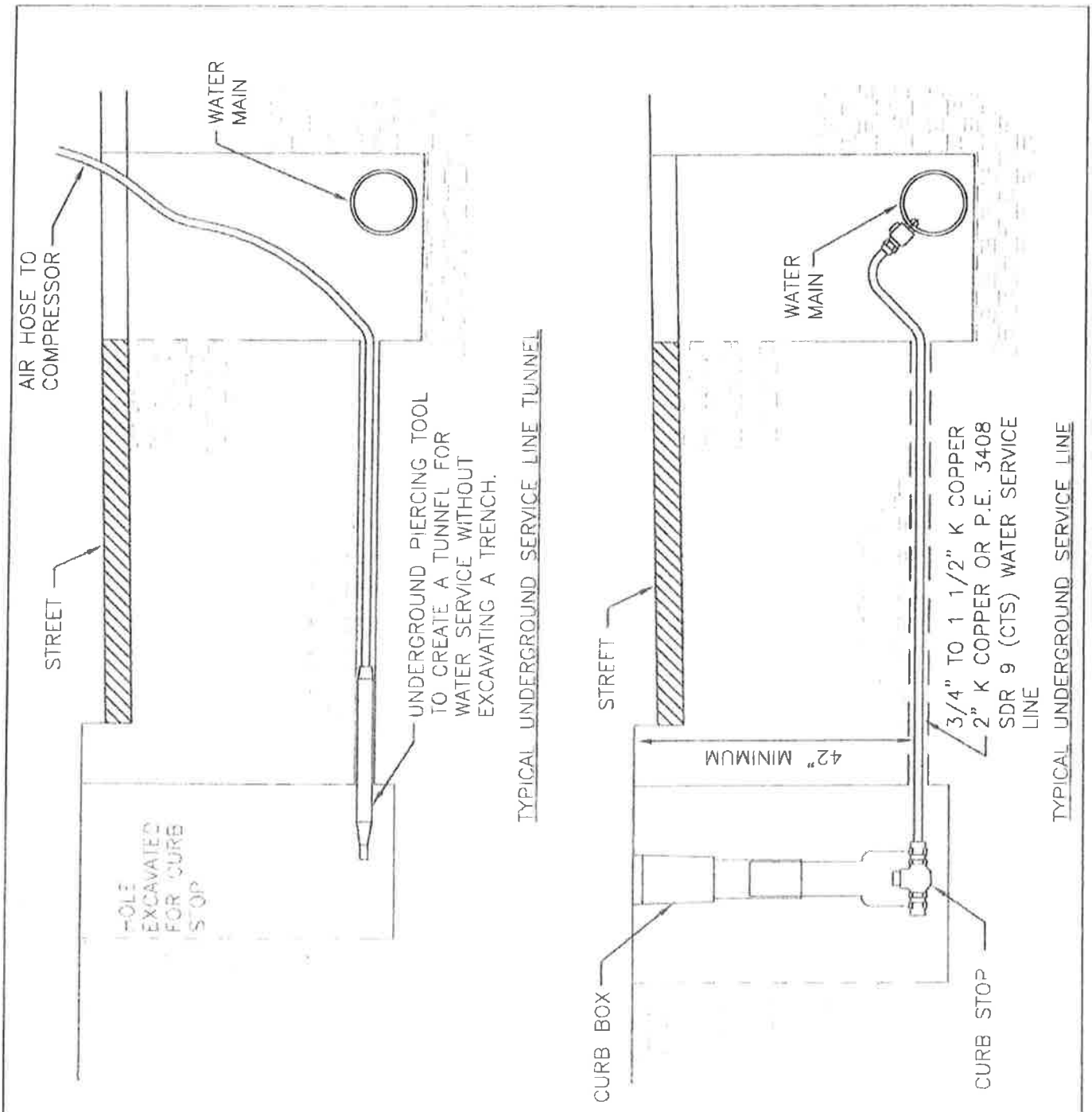
TYPICAL WATER SERVICE
1/2" TO 2"

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD
CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY: .....

FILE NUMBER
W-4



APPROVED 9-18-14

Brad Fagrell
CITY ENGINEER

REVISED: 8/15/13

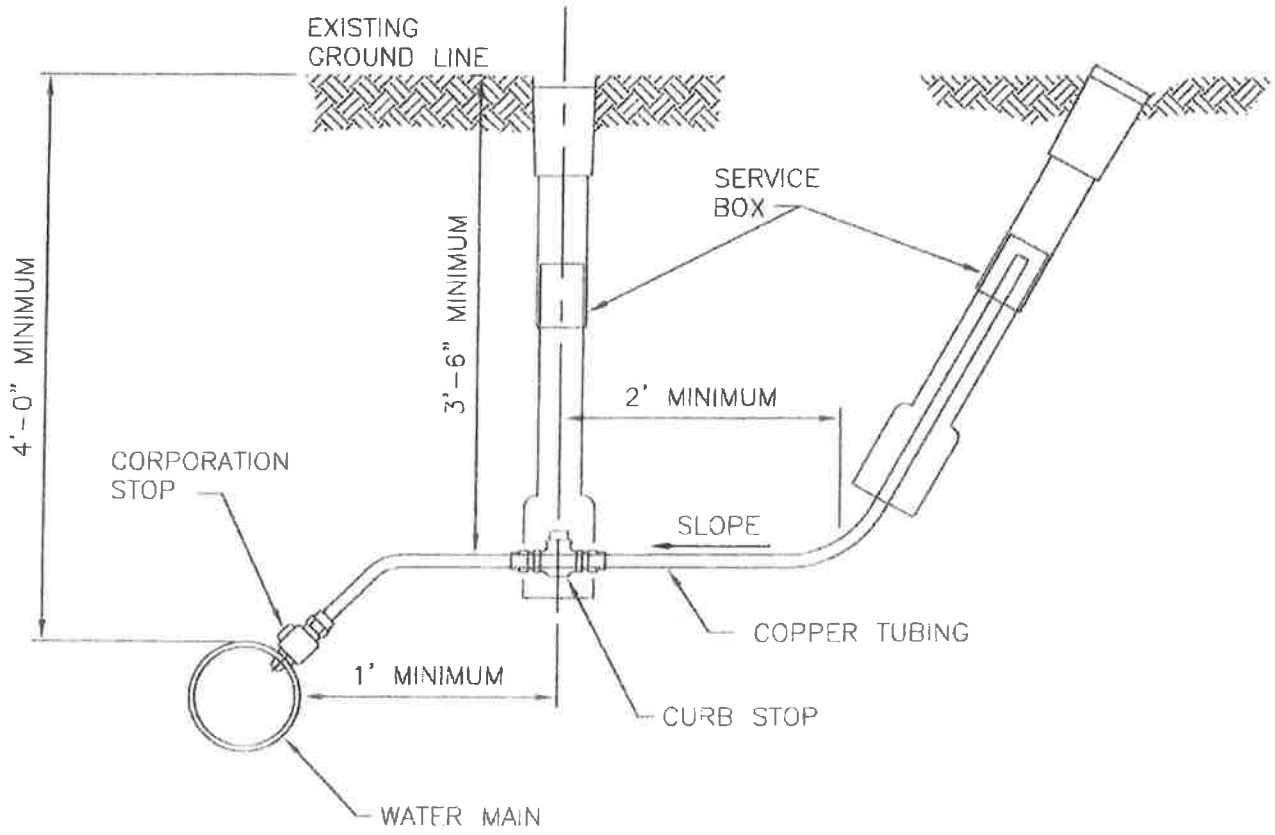
TYPICAL UNDERGROUND SERVICE LINE TUNNEL AND TYPICAL UNDERGROUND SERVICE LINE

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

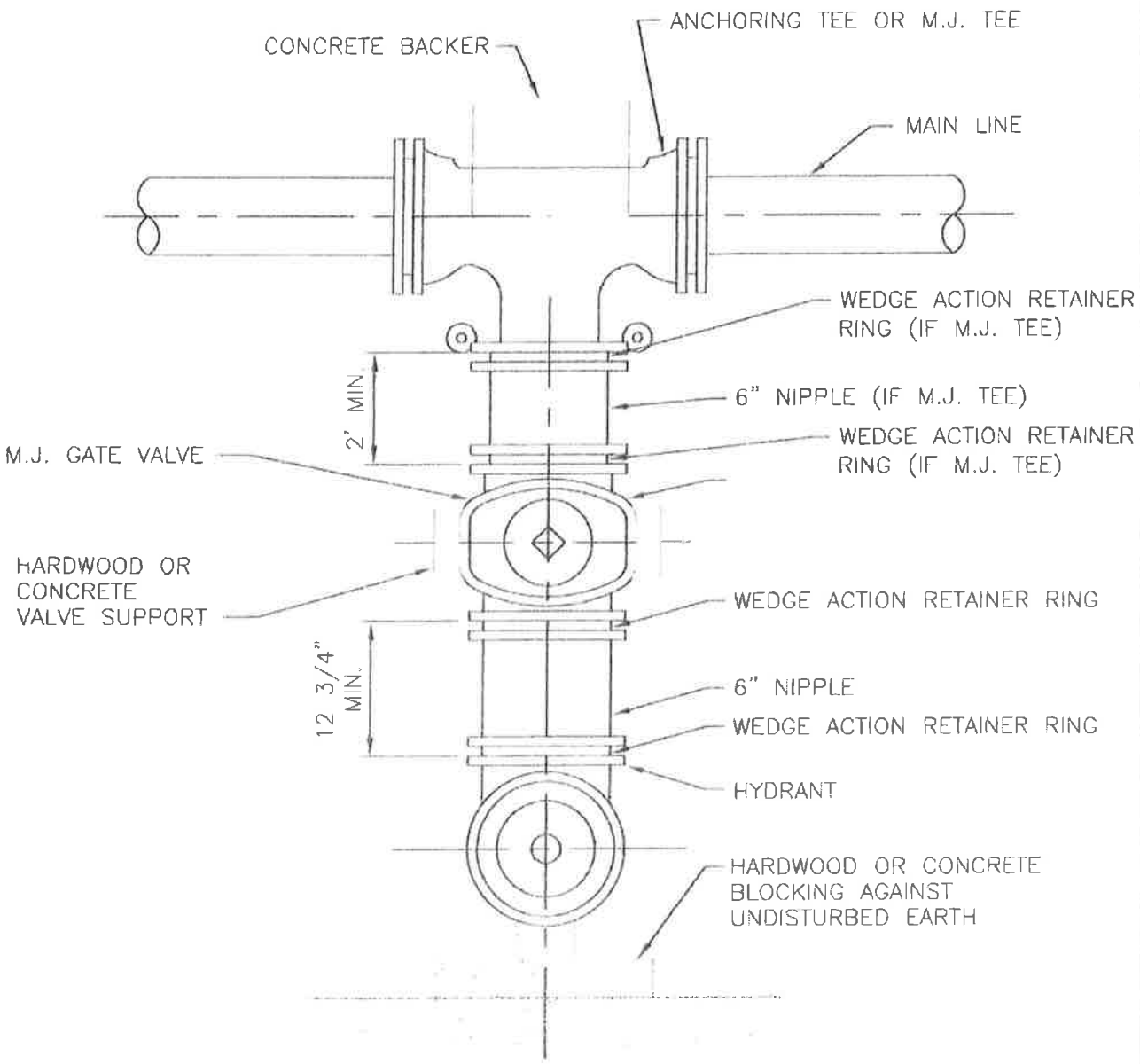
DWG. BY: MAC
CHK'D BY: .....

FILE NUMBER
W-5



NOTE:
TYPICAL AIR RELEASE WILL BE 3/4" OR 1" TYPE K COPPER

APPROVED 9-18-14 Brad Fagrell CITY ENGINEER REVISED: 8/15/13	TYPICAL AIR RELEASE 3/4" OR 1"	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W-6



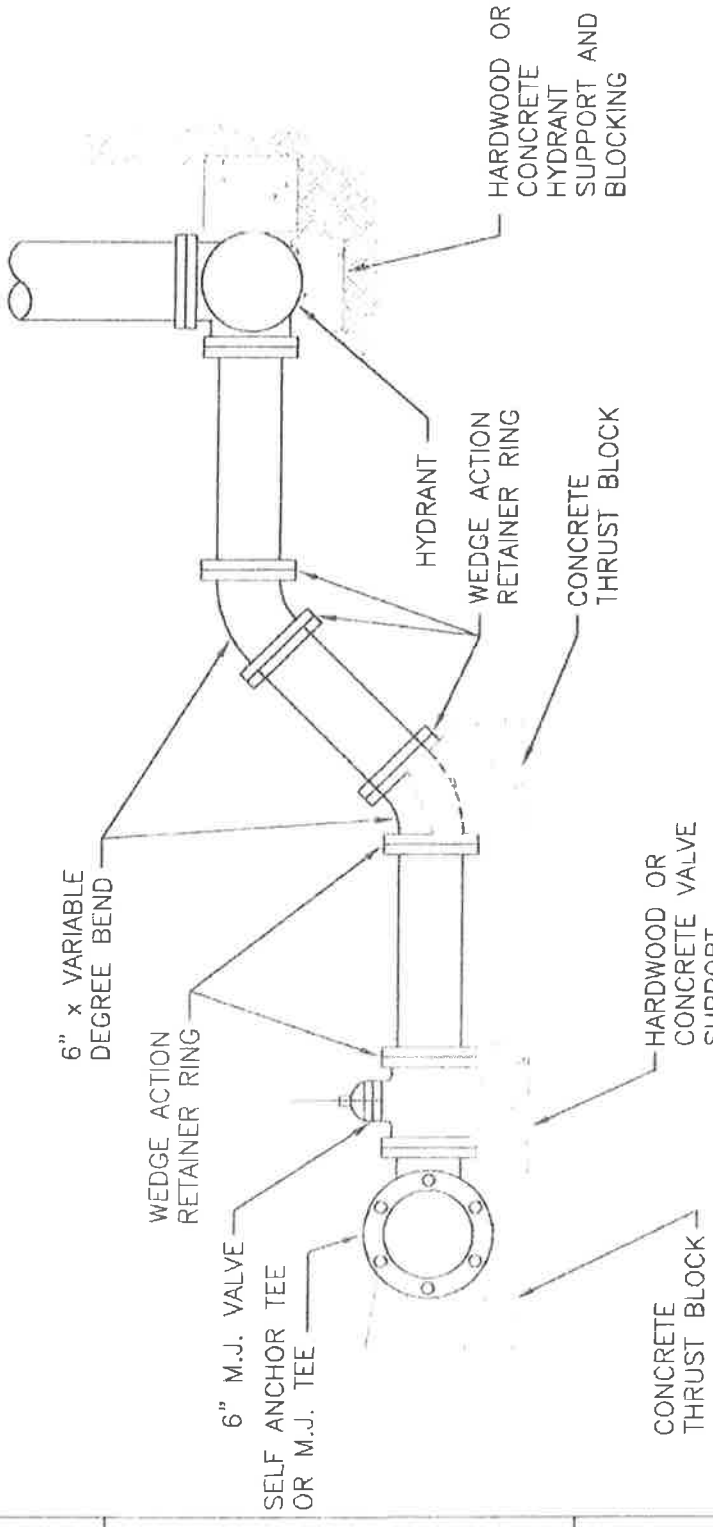
NOTES:

DRAIN ROCK AROUND AND ABOVE HYDRANT DRAIN SHALL BE NO. 57 WASHED STONE OR GRAVEL. PLACE MIRAFI 140N OR EQUAL BETWEEN DRAIN ROCK AND FILL.

FIRE HYDRANTS TO BE SET 2'-6" BACK OF CURB AND 6' FROM EDGE OF ROAD.

STEAMER NOZZLE SHALL FACE THE STREET UNLESS OTHERWISE SPECIFIED.

APPROVED 9-18-14 Brad Fagrell CITY ENGINEER REVISED: 8/15/13	TYPICAL HYDRANT SETTING TYPE "A"	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: FILE NUMBER W-7



NOTES:

HARDWOOD OR CONCRETE THRUST BLOCK AGAINST UNDISTURBED EARTH AS APPROVED BY INSPECTOR.

APPROVED 9-18-14

Brad Fagnell
CITY ENGINEER

REVISED: 8/15/13

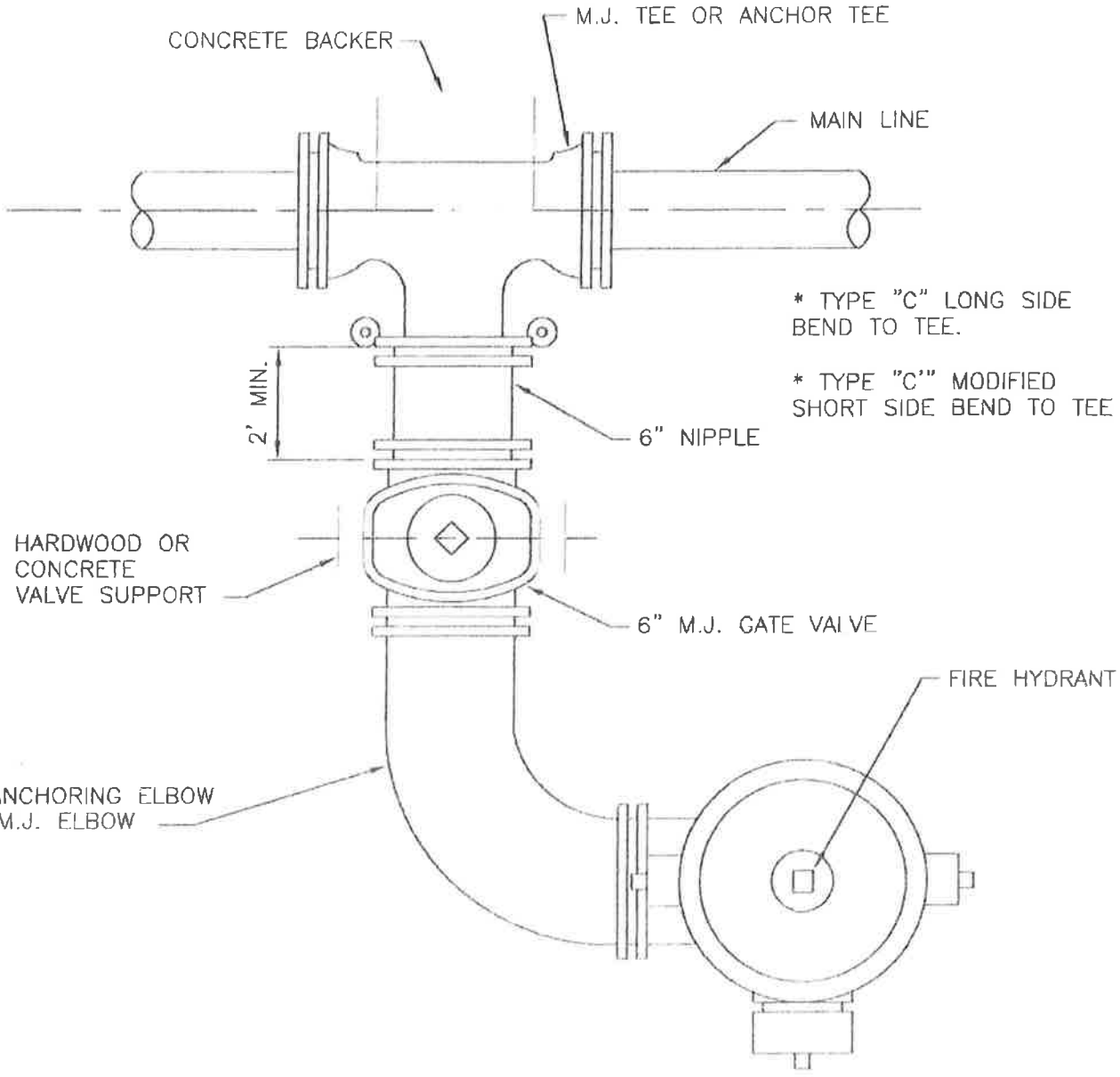
TYPICAL HYDRANT SETTING TYPE "A" MODIFIED

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY:

FILE NUMBER
W-8



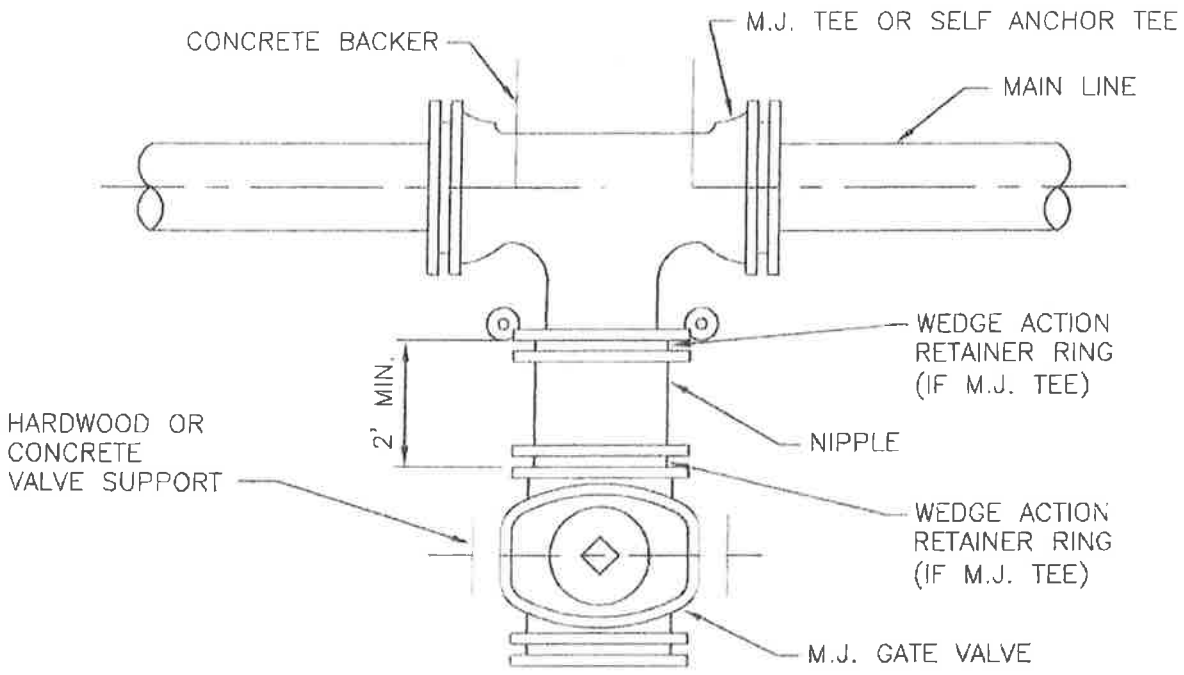
NOTES:

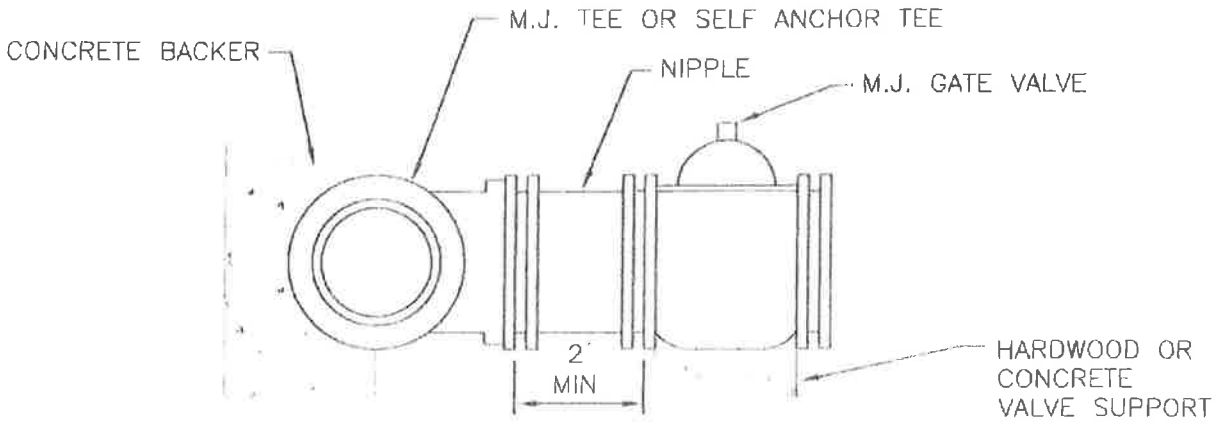
DRAIN ROCK AROUND AND ABOVE HYDRANT DRAIN SHALL BE NO. 57 WASHED STONE OR GRAVEL. PLACE MIRAFI 140N OR EQUAL BETWEEN DRAIN ROCK AND FILL.

STEAMER NOZZLE SHALL FACE THE STREET UNLESS OTHERWISE SPECIFIED

* TO BE USED ONLY IF TYPE "A" IS NOT APPLICABLE.

APPROVED 9-18-14 Brad Fagrell CITY ENGINEER REVISED: 8/15/13	TYPICAL HYDRANT SETTING TYPE "C" AND TYPE "C" MODIFIED	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: FILE NUMBER W-9





NOTES:

BACKING DESIGNED FOR 3000 PSF SOIL BEARING.

CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH.

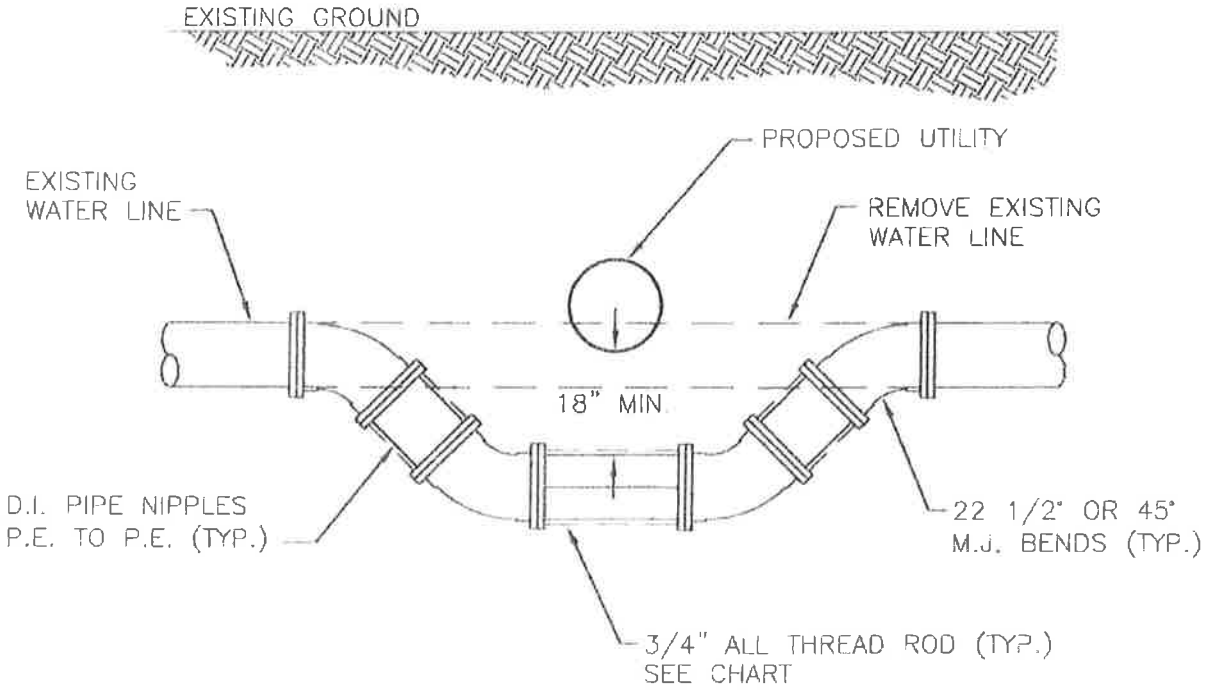
PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.

4" VALVES OR LARGER WILL BE APPROXIMATELY 2' OFF MAIN LINE.

TEES WILL BE VALVED.

ANY CHANGES IN THIS VALVE SETTING MUST BE APPROVED BY THE LANCASTER DIVISION OF WATER DEPARTMENT.

APPROVED 9-18-14 Brad Fogrell CITY ENGINEER REVISED: 8/15/13	TYPICAL 4" OR LARGER TEE AND VALVE SETTING AND BACKING FOR TEES	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W-10



PIPE DIAMETER	NO. OF RODS
4" & 6"	2
8"	3
10" & UP	4

NOTES:

TIME AND DURATION OF SHUTDOWN SHALL BE DETERMINED BY THE LANCASTER DIVISION OF WATER DISTRIBUTION MANAGER.

THE CONTRACTOR SHALL NOTIFY ALL WATER CUSTOMERS AFFECTED BY THE PROPOSED WORK AT LEAST 24 HOURS IN ADVANCE OF SHUTDOWN.

ALL BENDS SHALL BE SECURED BY WEDGE ACTION RETAINER RINGS, RODDING OR OTHER METHODS AS APPROVED BY THE INSPECTOR TO RESTORE THE MAIN TO SERVICE AS SOON AS POSSIBLE.

THE RELOCATED LINES SHALL BE LAID TO THE NEW LINE AND GRADE, TESTED, AND DISINFECTED PRIOR TO SHUTDOWN OF EXISTING MAIN AND CONNECTION OF THE RELOCATED LINES TO THE EXISTING MAIN.

ALL WATER LINES SHALL BE DISINFECTED BY SWABBING WITH A 5 PERCENT HYPOCHLORITE SOLUTION IN ACCORDANCE WITH APPLICABLE SECTIONS OF A.W.W.A. C-601.

APPROVED 9-18-14

Brad Fogwell
CITY ENGINEER

REVISED 8/15/13

TYPICAL WATER LINE LOWERING

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

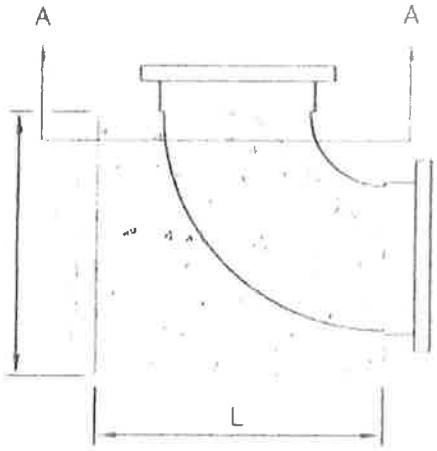
STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY: .....

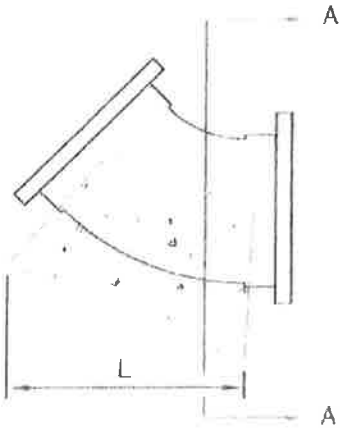
FILE NUMBER
W-11

SIZE OF PIPE	DEGREE OF BEND											
	11 1/4°			22 1/2°			45°			90°		
	L"	D"	Vcf	L"	D"	Vcf	L"	D"	Vcf	L"	D"	Vcf
3"	4	3	0.1	6	4	0.2	10	4	0.3	10	4	0.3
4"	5	4	0.2	9	5	0.4	14	5	0.6	14	5	0.6
6"	8	6	0.5	12	7	0.7	20	8	1.4	18	9	1.7
8"	9	8	0.7	16	9	1.4	24	12	2.7	25	11	4.0
12"	14	12	1.8	24	14	3.6	36	18	6.8	32	18	10.7
16"	18	16	3.4	32	18	6.7	36	32	13.4	41	26	25.4
20"	25	20	6.4	30	30	11.5	49	36	20.5	50	32	46.5
24"	27	24	9.0	39	34	18.4	60	42	35.0	58	40	77.7

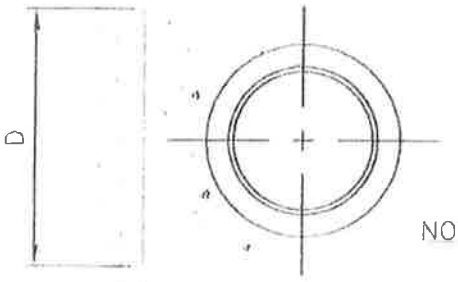
STEEL WILL BE USED AS REQUIRED BY ENGINEER



90° BENDS



BENDS LESS THAN 90°



SECTION A-A

NOTES:

BACKING DESIGNED FOR 3000 PSF SOIL BEARING.

CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH

APPROVED 9-18-14

Brad Fogwell
CITY ENGINEER

REVISED: 8/15/13

BACKING FOR BENDS

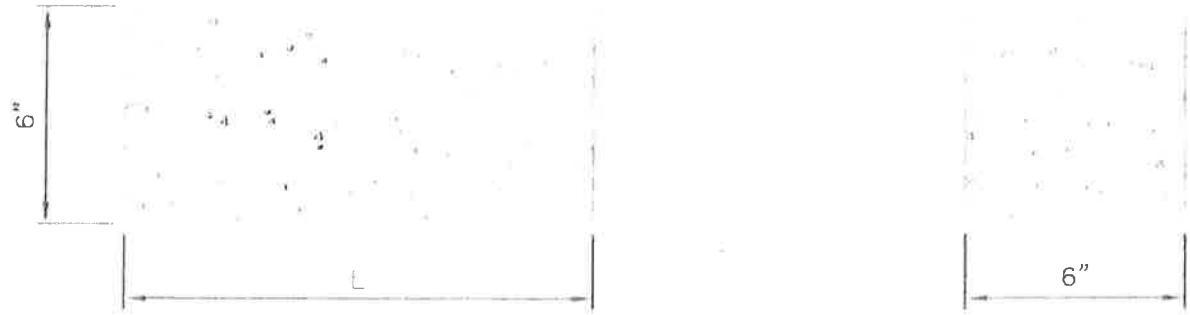
CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD
CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY: .....

FILE NUMBER
W-12

	SIZE OF VALVE	SIZE OF VALVE	VOLUME CU-FT
VALVES	3"	15"	0.31
	4"	16"	0.33
	6"	17"	0.36
	8"	20"	0.42
	12"	24"	0.50
	16"	30"	0.63
BUTTERFLY VALVES	20"	36"	0.75
	24"	42"	0.88
	30"	48"	1.00



APPROVED 9-18-14

Brad Fogwell
CITY ENGINEER

REVISED: 8/15/13

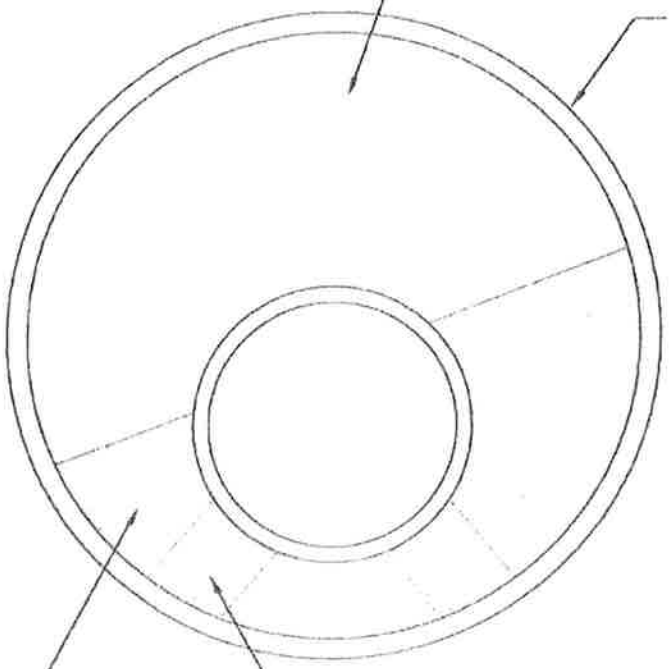
CONCRETE VALVE SUPPORT

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

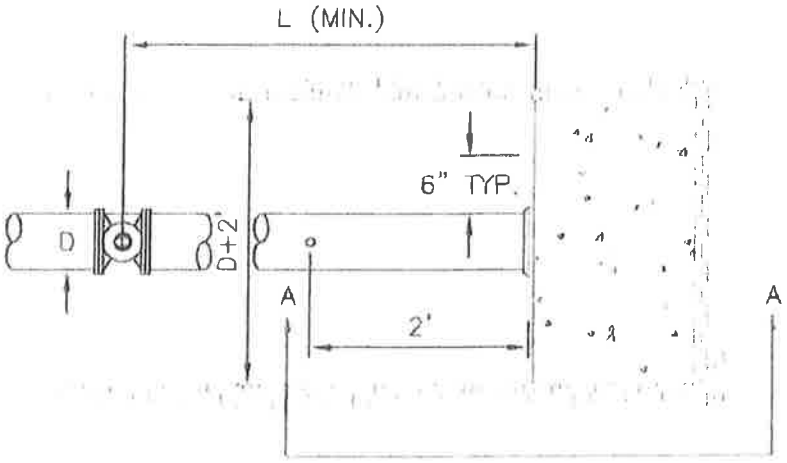
STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY:

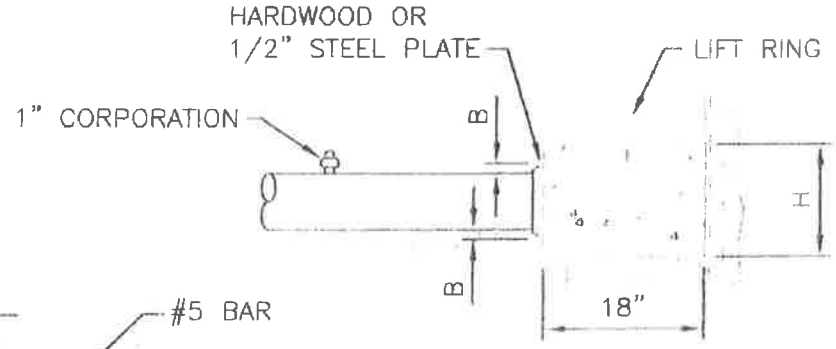
FILE NUMBER
W-13



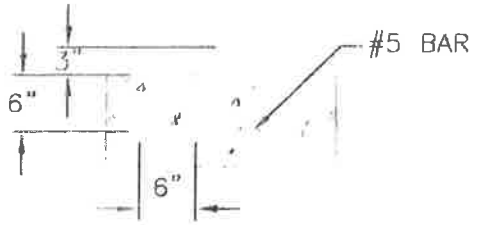
APPROVED 9-18-14 Brad Fogrell CITY ENGINEER REVISED: 8/15/13	CASING PIPE PLUGGING	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W-14



PLAN VIEW



SECTION A–A



LIFT RING DETAIL

PIPE DIA.	H	B	L
6"	8"	1"	10'
8"	10"	1"	10'
12"	18"	3"	18'

NOTES:

BACKING DESIGNED FOR 4000 PSF SOIL BEARING

END OF PIPE CAPPED OR PLUGGED.

GREASE STEEL PLATE WHERE IN CONTACT WITH CONCRETE BACKER.

PLACE CONCRETE AGAINST UNDISTURBED SOIL.

THOROUGHLY COMPACT BACKFILL BETWEEN VALVE AND END OF PIPE.

APPROVED 9-18-14

Brad Fogrell
CITY ENGINEER

REVISED: 3/7/07

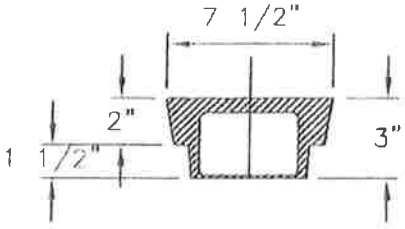
END OF PIPE THRUST BLOCK DETAIL

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

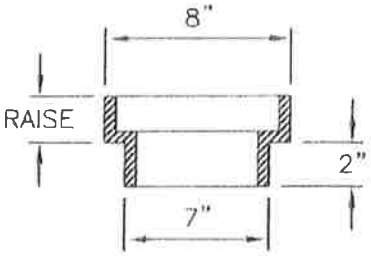
STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY:

FILE NUMBER
W-15



VALVE BOX LID

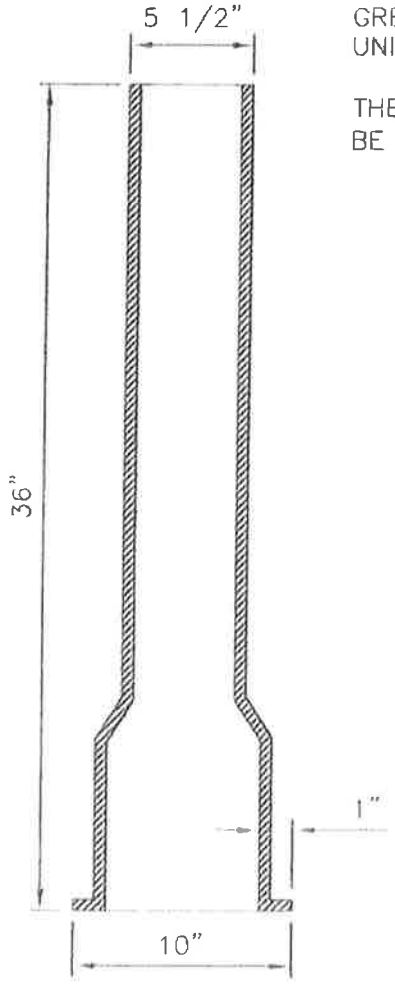


VALVE BOX RISER

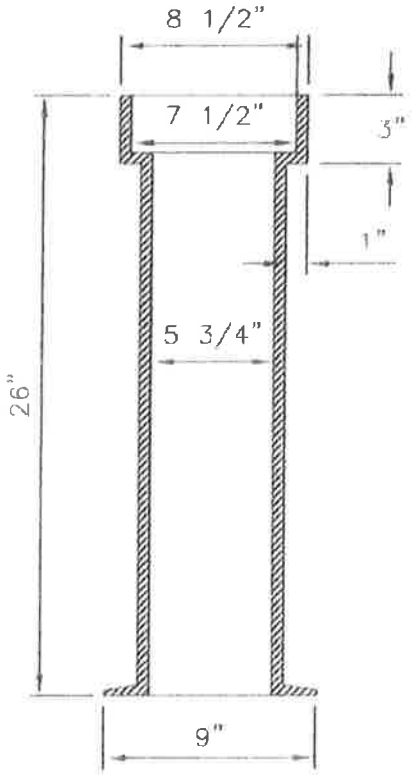
NOTES:

ALL VALVE BOXES SHALL BE CLOSE GRAINED, TOUGH GREY IRON FREE FROM ALL DEFECTS AND SHALL BE UNIFORM IN SHAPE AND DIMENSION.

THE "RAISE" DIMENSION FOR VALVE BOX RISERS SHALL BE 1", 2", 3", OR 4" SIZES.

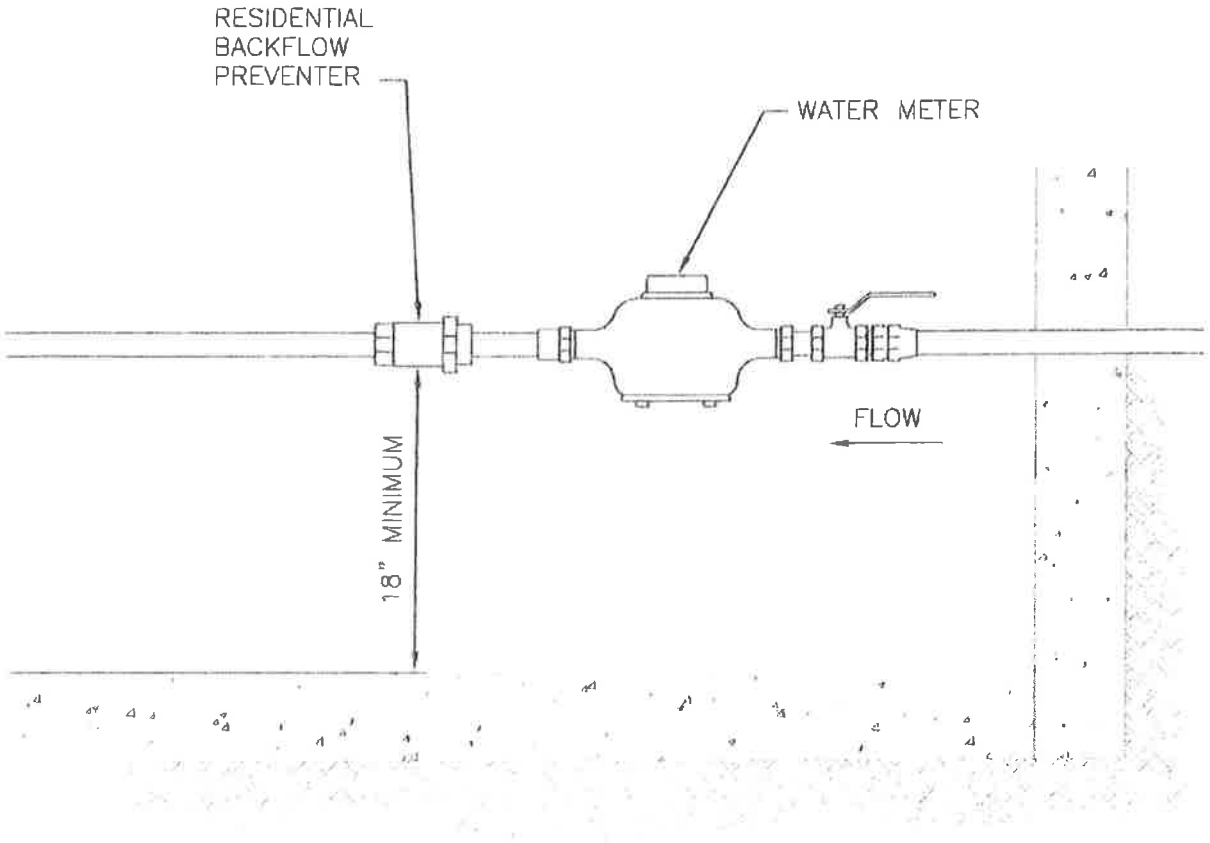


VALVE BOTTOM BOX



VALVE BOX TOP

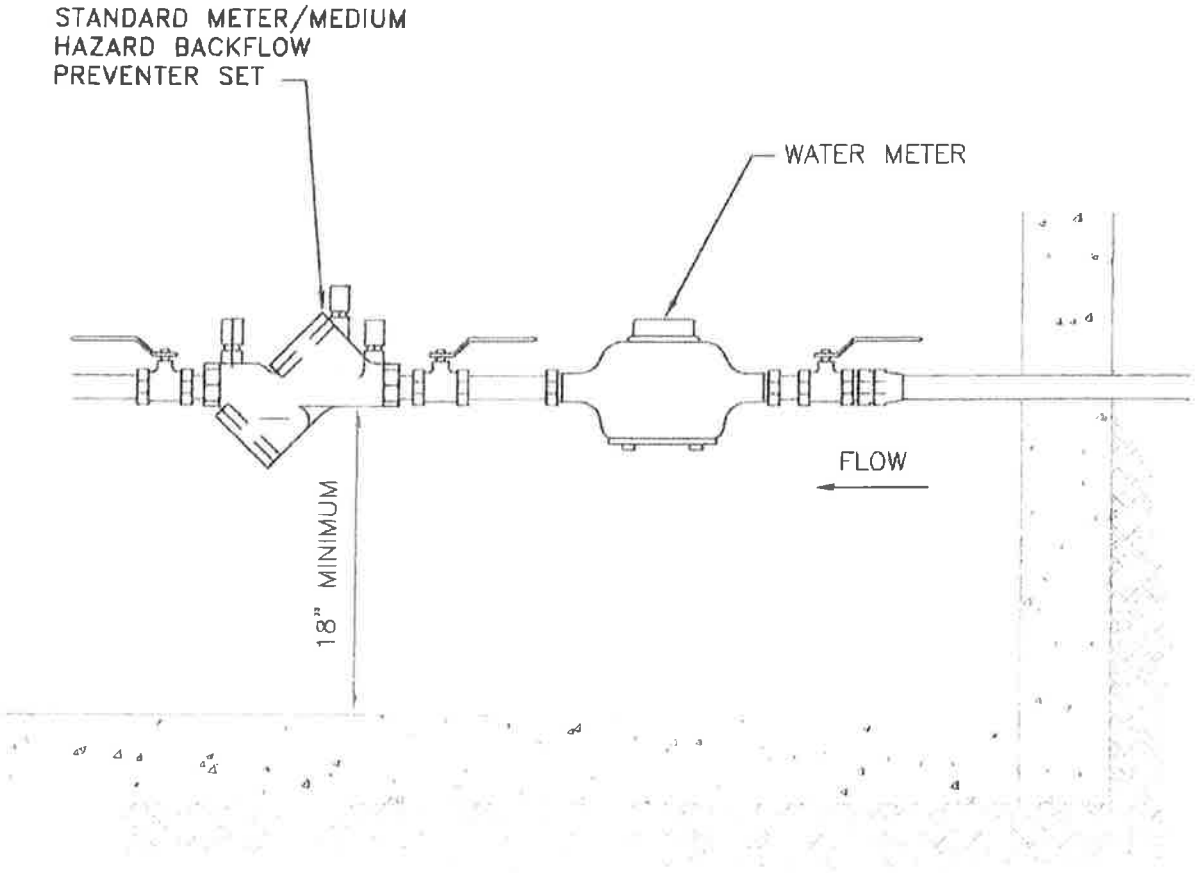
APPROVED 9-18-14 Brad Fagnell CITY ENGINEER REVISED: 8/15/13	STANDARD SLIDE TYPE WATER VALVE BOX	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W-16



NOTE:

IF ANY QUESTIONS CONTACT C.C. CONTROL METER REPRESENTATIVE OR WATER DISTRIBUTION MANAGER AT LANCASTER DIVISION OF WATER.

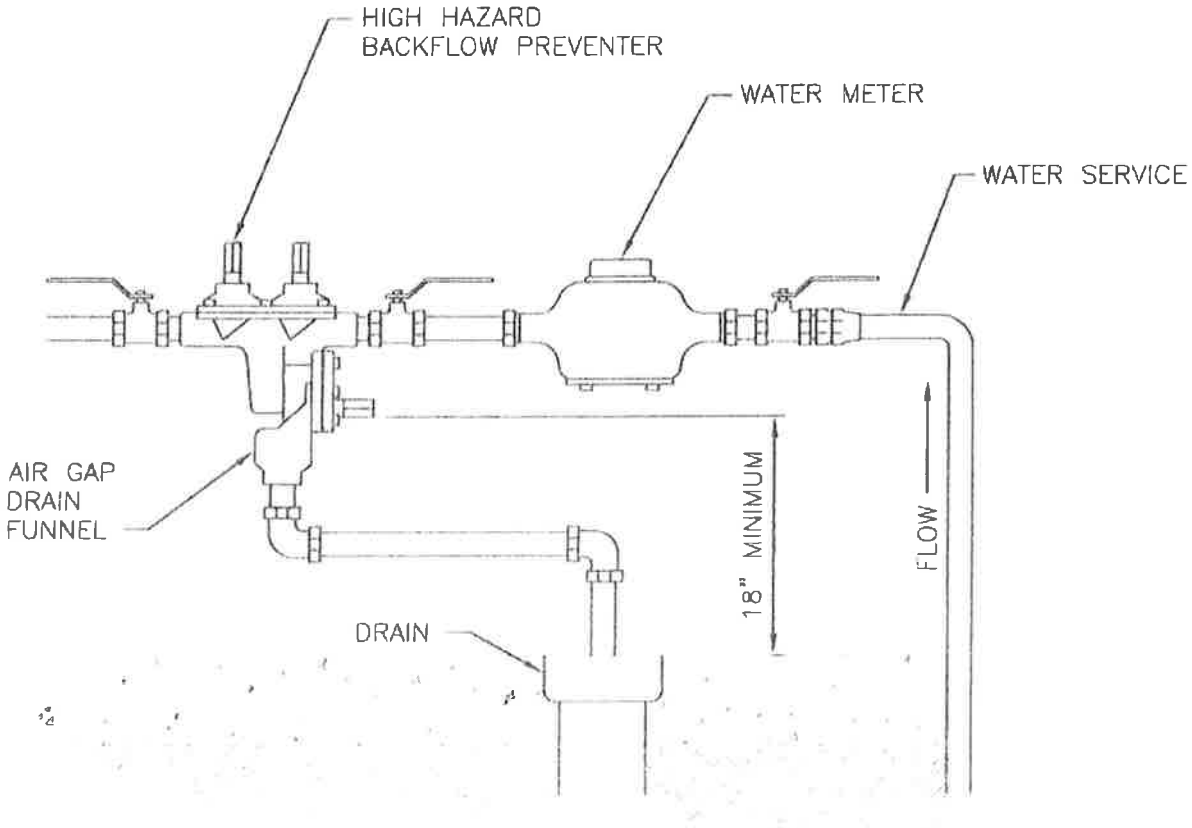
APPROVED 9-18-14 Brad Fagrell CITY ENGINEER REVISED: 8/15/13	STANDARD RESIDENTIAL METER SET & BACKFLOW PREVENTER	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W-17



NOTE:

IF ANY QUESTIONS CONTACT C.C. CONTROL METER REPRESENTATIVE OR WATER DISTRIBUTION MANAGER AT LANCASTER DIVISION OF WATER.

APPROVED 9-18-14 Brad Fagnell CITY ENGINEER REVISED: 8/15/13	STANDARD METER/MEDIUM HAZARD BACKFLOW PREVENTER SET	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W-18



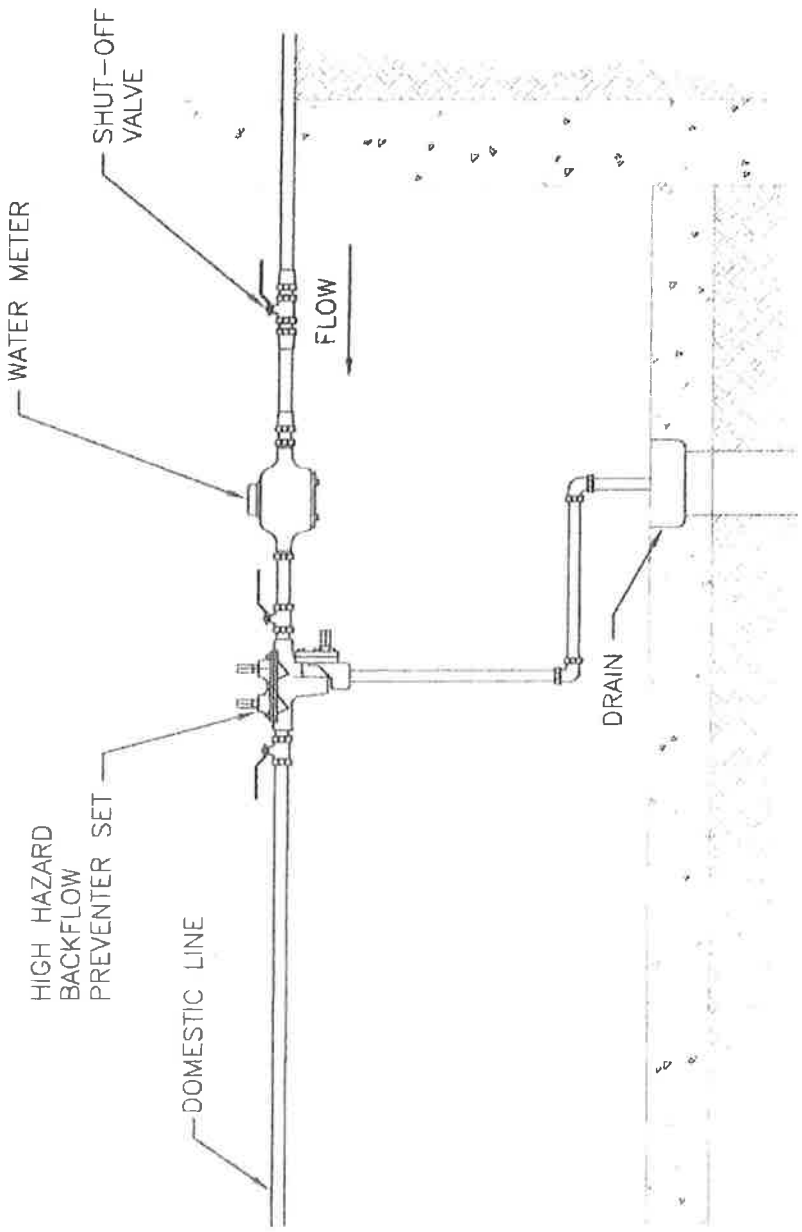
NOTES:

WHERE IT IS ESSENTIAL TO PROVIDE UNINTERRUPTED WATER SERVICE, INSTALLATION OF TWO FRP DEVICES IN A BATTERY (PARALLEL) SETTING IS RECOMMENDED.

IF OPTIONAL AIR GAP DRAIN FUNNEL IS NOT INSTALLED, AN AIR GAP MUST BE PROVIDED BETWEEN THE OUTLET OF THE RELIEF VALVE AND ANY PIPING TO A DRAIN.

IF ANY QUESTIONS CONTACT C.C. CONTROL METER REPRESENTATIVE OR WATER DISTRIBUTION MANAGER AT LANCASTER DIVISION OF WATER.

APPROVED 9-18-14 Brad Fagnell CITY ENGINEER REVISED: 8/15/13	COLD WEATHER INDOOR/ABOVE GROUND INSTALLATION OF HIGH HAZARD BACKFLOW PREVENTER AND METER SET	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: FILE NUMBER W-19



NOTE:
IF ANY QUESTIONS CONTACT C.C. CONTROL METER REPRESENTATIVE OR WATER DISTRIBUTION MANAGER AT LANCASTER DIVISION OF WATER.

APPROVED 9-18-14

Brad Fagrell
CITY ENGINEER

REVISED: 8/15/13

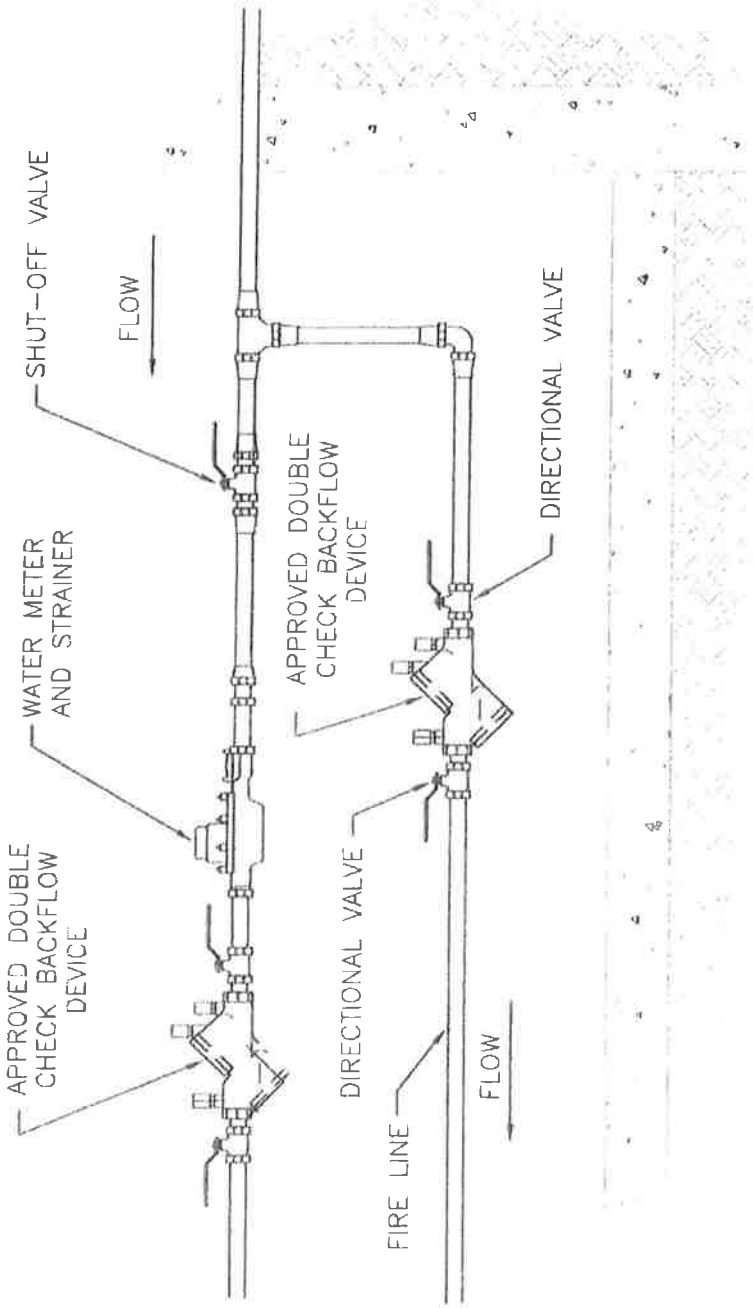
TYPICAL DOMESTIC WATER SERVICE WITH HIGH HAZARD BACKFLOW PREVENTER SET FOR IRRIGATION LINE

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY:

FILE NUMBER
W-20



NOTES:

IF ANY QUESTIONS CONTACT C.C. CONTROL METER REPRESENTATIVE OR WATER DISTRIBUTION MANAGER AT LANCASTER DIVISION OF WATER.

DIRECTIONAL VALVE HANDLES SHALL BE REMOVED OR CHAINED AND LOCKED.

APPROVED 9-18-14

Brad Fogrell
CITY ENGINEER

REVISED: 8/15/13

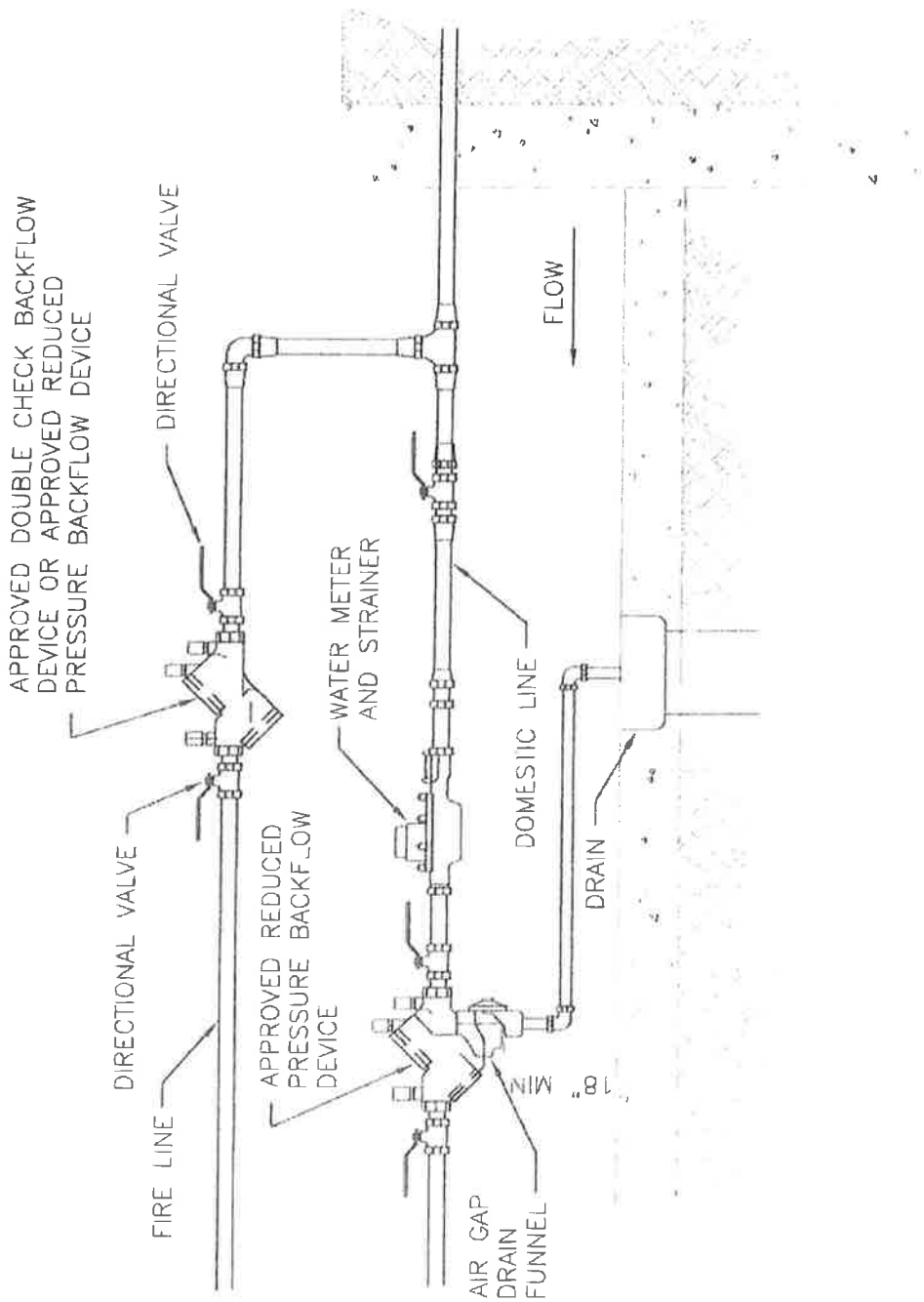
STANDARD MEDIUM HAZARD "Y" STRAINER/ METER/BACKFLOW PREVENTER SET WITH FIRE LINE

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY: .....

FILE NUMBER
W-21



NOTES:

IF ANY QUESTIONS CONTACT C.C. CONTROL METER REPRESENTATIVE OR WATER DISTRIBUTION MANAGER AT LANCASTER DIVISION OF WATER.

DIRECTIONAL VALVE HANDLES SHALL BE REMOVED OR CHAINED AND LOCKED.

APPROVED 9-18-14

Brad Fagnell
CITY ENGINEER

REVISED: 8/15/13

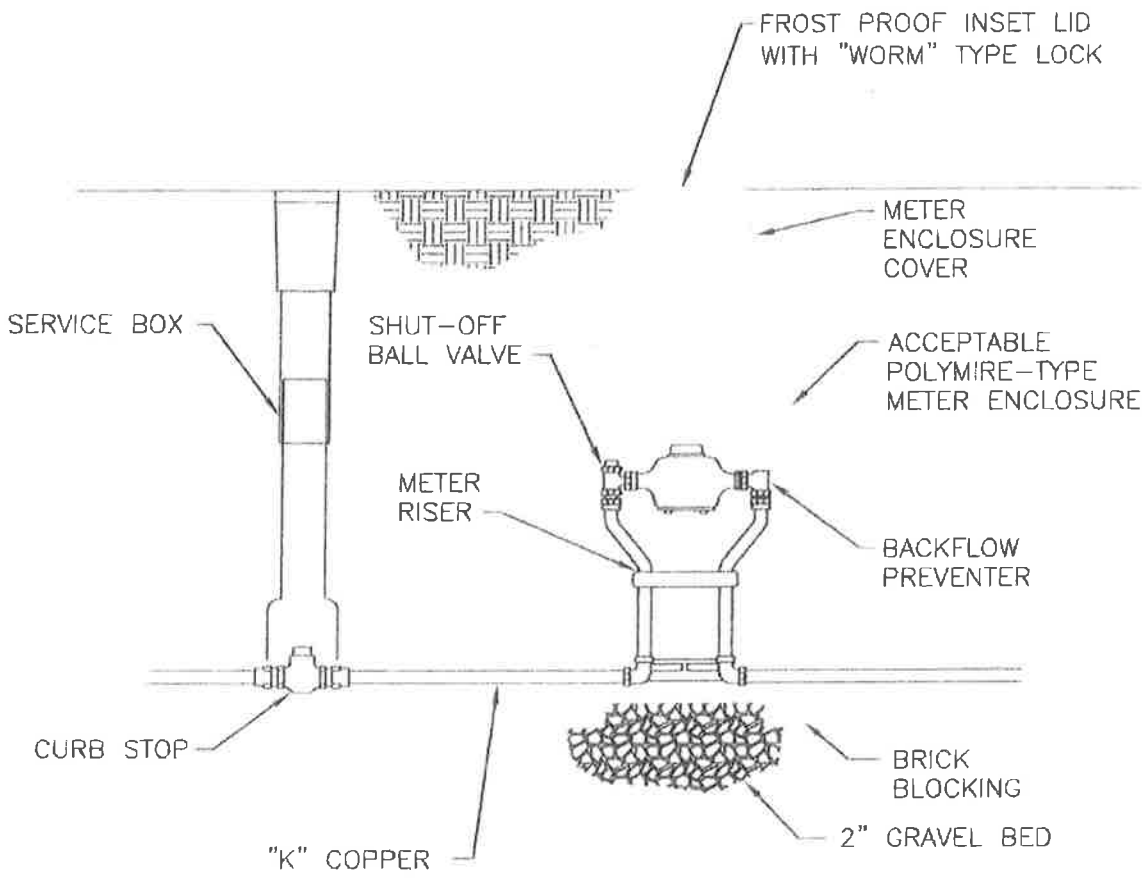
STANDARD HIGH HAZARD "Y" STRAINER/ METER/BACKFLOW PREVENTER SET WITH FIRE LINE

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY: .....

FILE NUMBER
W-22



NOTES

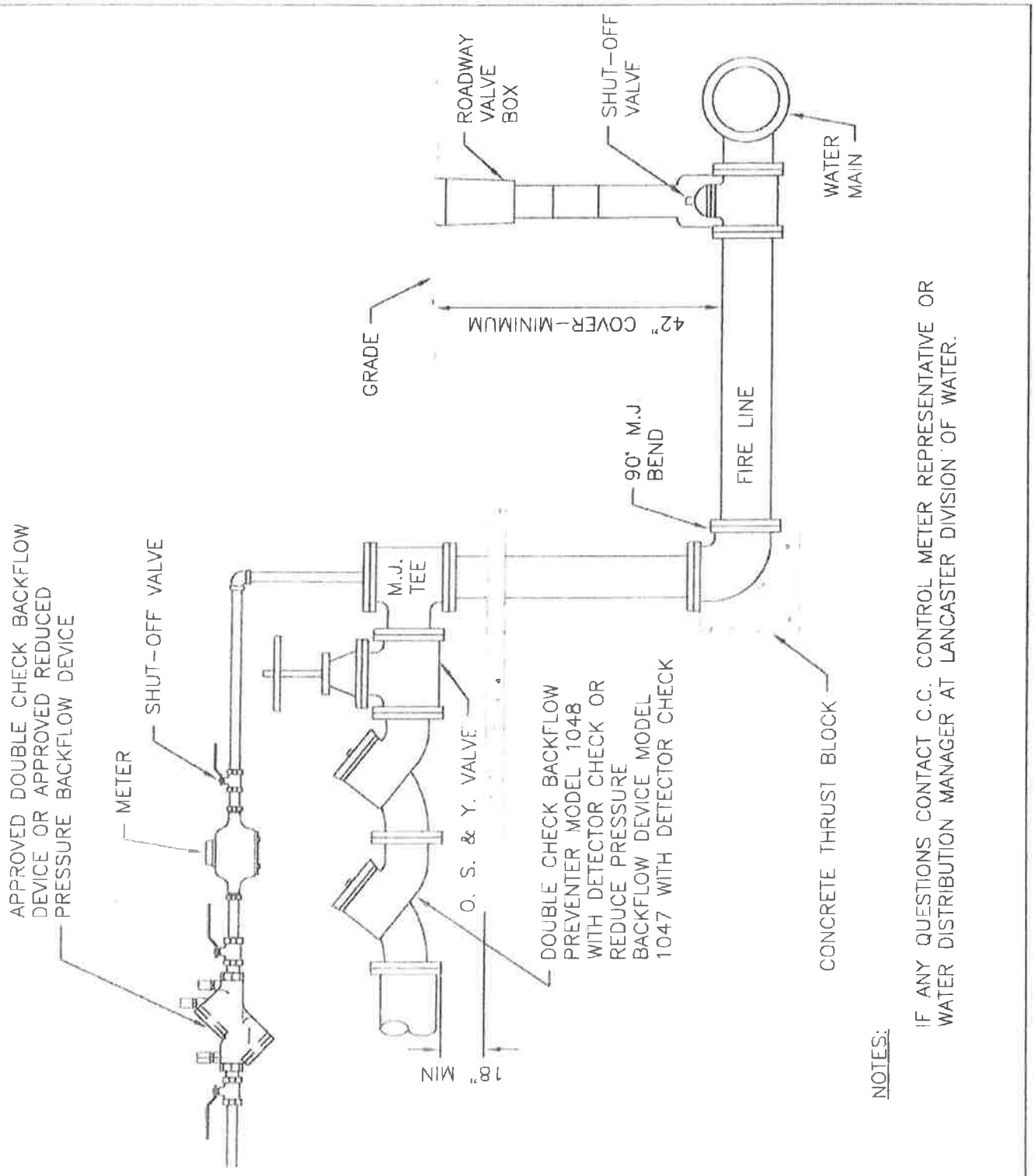
CURB STOP AND METER SET TO BE INSTALLED WITHIN A MINIMAL DISTANCE TO PROPERTY LINE AS APPROVED BY LANCASTER DIVISION OF WATER.

METER TO BE SET AT RIGHT ANGLES TO RIGHT-OF -WAY AND MUST BE LEVEL AND CENTERED WITH YOLK VALVES UPRIGHT.

METER ENCLOSURE DIAMETER SHALL BE 18" FOR 5/8", 3/4", AND 1" METERS

METER ENCLOSURE COVER TO BE FORD METER BOX CO. NUMBER W-3 OR AN APPROVED EQUAL WITH AN 11 1/2" OPENING.

APPROVED 9-18-14 Brad Fagnell CITY ENGINEER REVISED: 8/15/13	STANDARD OUTSIDE METER SET FOR 5/8", 3/4", AND 1" METERS/BACKFLOW PREVENTERS	CITY OF LANCASTER, OHIO DEPARTMENT OF ENGINEERING STANDARD CONSTRUCTION DRAWING DWG. BY: MAC CHK'D BY: ..... FILE NUMBER W-23



NOTES:

IF ANY QUESTIONS CONTACT C.C. CONTROL METER REPRESENTATIVE OR WATER DISTRIBUTION MANAGER AT LANCASTER DIVISION OF WATER.

APPROVED 9-18-14

Brad Fogwell
CITY ENGINEER

REVISED: 8/15/13

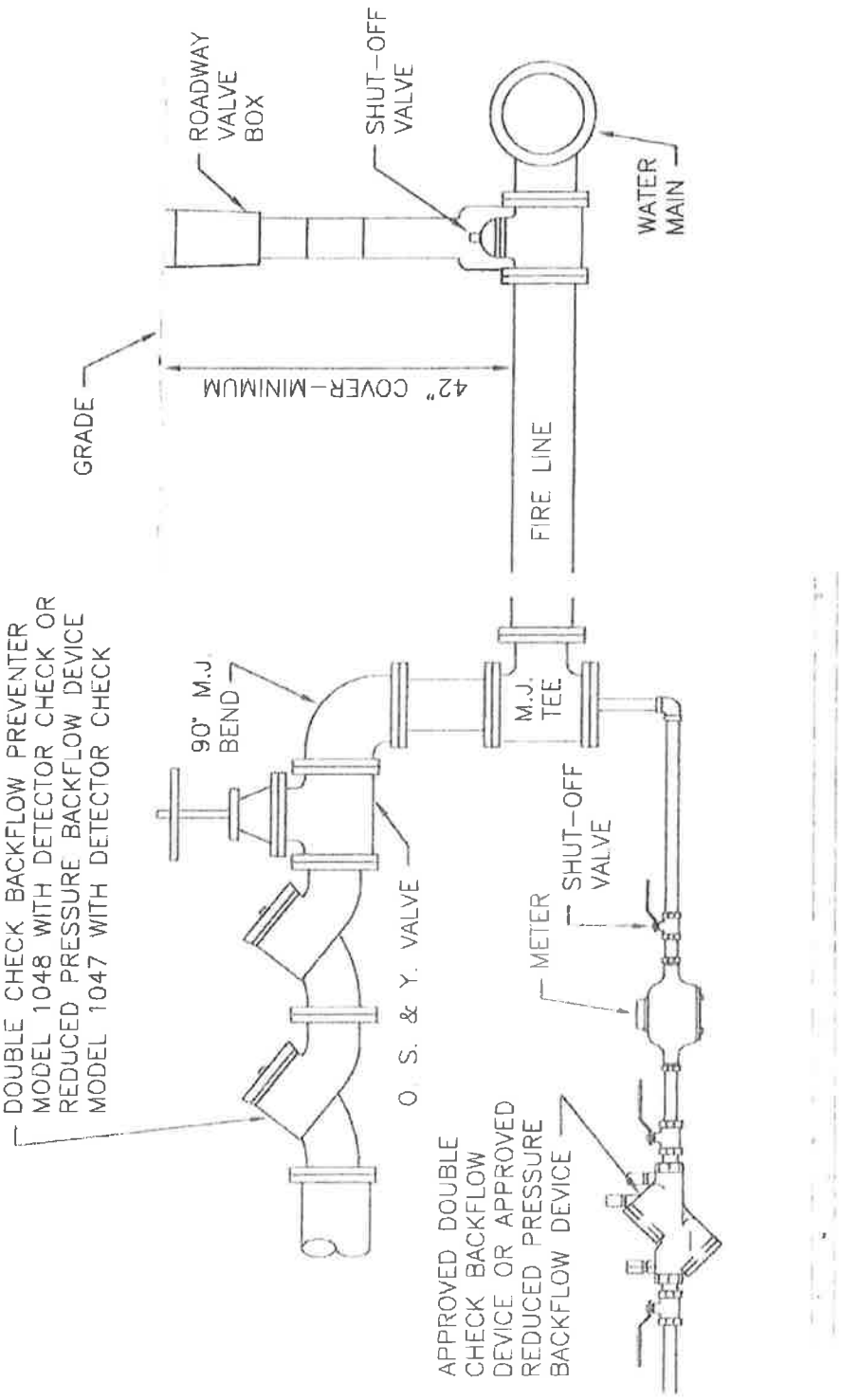
TYPICAL 4" TO 16" FIRE LINE CONNECTION TYPE "A"

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY: .....

FILE NUMBER
W-24



NOTES:

IF ANY QUESTIONS CONTACT C.C. CONTROL METER REPRESENTATIVE OR WATER DISTRIBUTION MANAGER AT LANCASTER DIVISION OF WATER.

APPROVED 9-18-14

Brad Fagnell
CITY ENGINEER

REVISED: 8/15/13

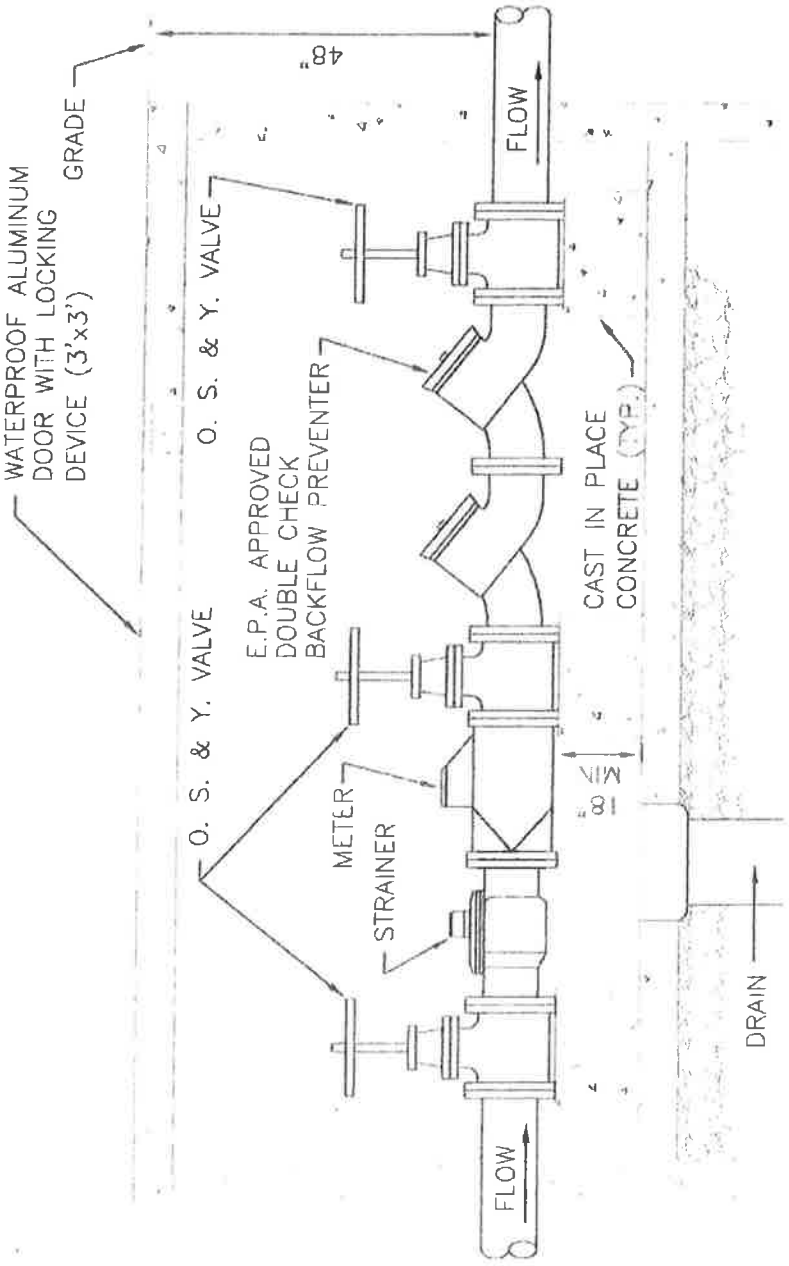
TYPICAL 4" TO 16" FIRE LINE CONNECTION TYPE "B"

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY:

FILE NUMBER
W-25



NOTES:

IF ANY QUESTIONS CONTACT C.C. CONTROL METER REPRESENTATIVE OR WATER DISTRIBUTION MANAGER AT LANCASTER DIVISION OF WATER.

APPROVED 9-18-14

Brad Fagrell
CITY ENGINEER

REVISED: 8/15/13

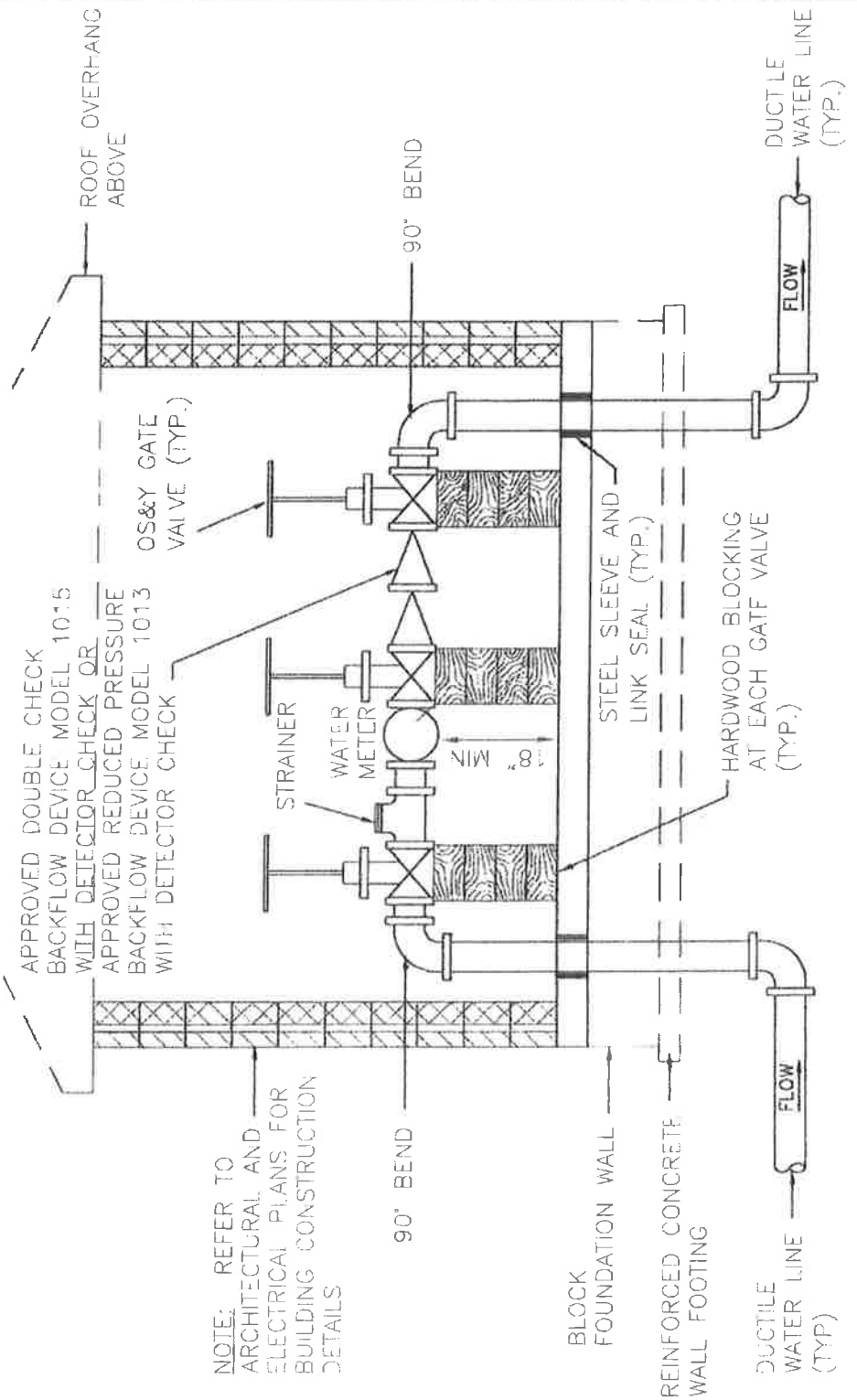
4", 6", 8", & 12" RESIDENTIAL/COMMERCIAL WATER METER/BACKFLOW PREVENTER VAULT

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY: .....

FILE NUMBER
W-26



APPROVED 9-18-14

Brad Fogrell
CITY ENGINEER

REVISED: 8/15/13

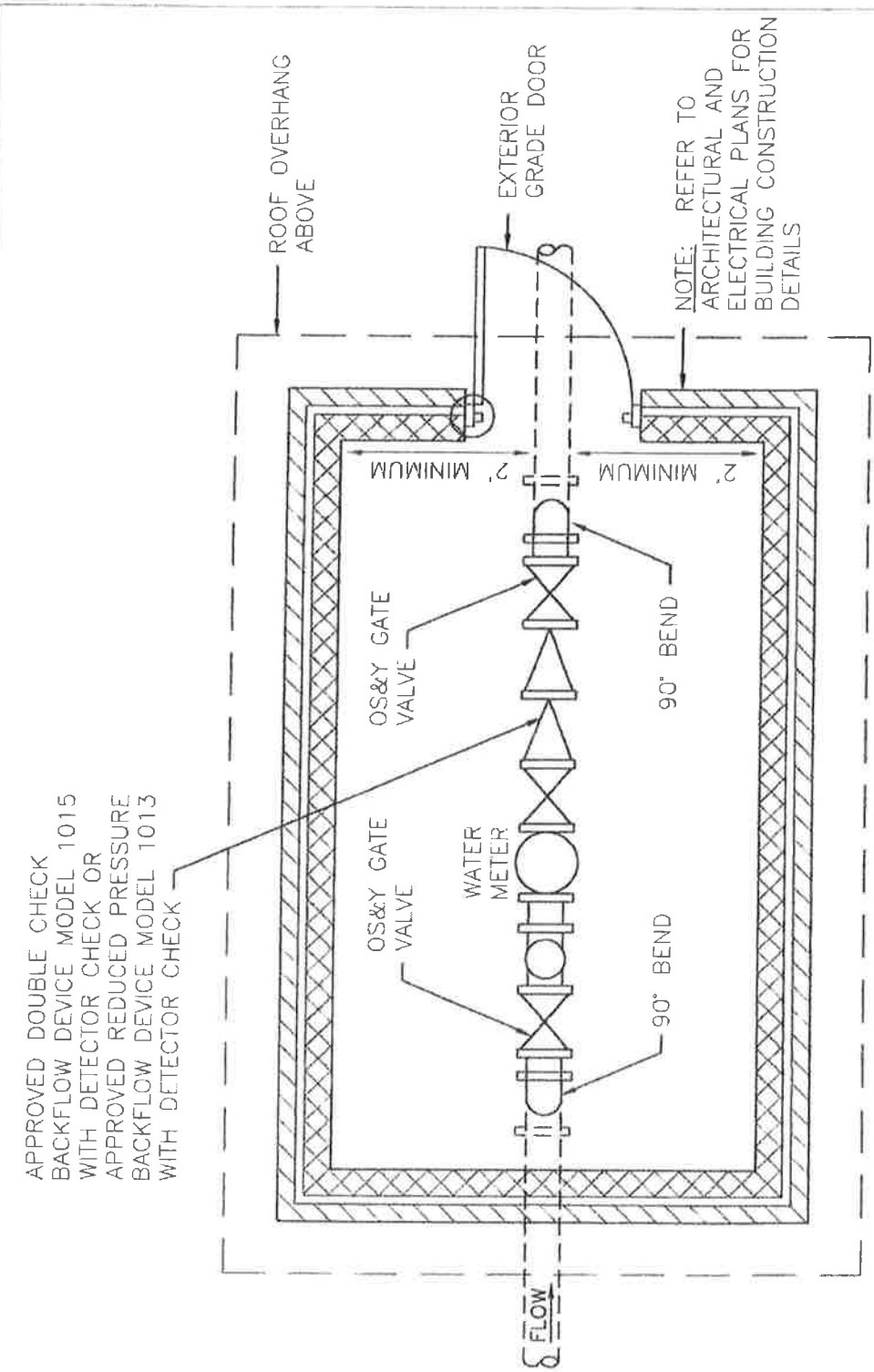
4", 6", 8" & 12" RESIDENTIAL/COMMERCIAL WATER METER/BACKFLOW PREVENTER ENCLOSURE

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY:

FILE NUMBER
W-27A



APPROVED 9-18-14

Brad Fagnell
CITY ENGINEER

REVISED: 8/15/13

4", 6", 8" & 12" RESIDENTIAL/COMMERCIAL WATER METER/BACKFLOW PREVENTER ENCLOSURE

CITY OF LANCASTER, OHIO
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DRAWING

DWG. BY: MAC
CHK'D BY: .....

FILE NUMBER
W-27B