

**STANDARD SPECIFICATIONS WATER MAINS AND APPURTENANCES**

**DEVELOPER PROCEDURES**

All Developer procedures as established by Erie County Commissioners, Erie County Engineer, Erie County Regional Planning Commission and local political subdivisions shall be followed, which includes: entering into a Developer's Agreement, following standards and basis of design, inspection, permits, record drawings (as-builts) on mylar media, warranty and financial assurances. One (1) electronic copy in pdf format and one (1) set of paper detail drawings, (including plan and profiles, proposed and existing topography and all buried utilities) and specifications of all proposed water line drawings on 24" x 36" sheets shall be submitted for review and approval to: Erie County Sanitary Engineer, c/o D.O.E.S., 554 River Road, P.O. Box 469, Huron, Ohio, 44839. Upon the Sanitary Engineers approval of the drawings and specifications for construction, the Developer will have one (1) year from approval date to complete the construction of the water and sanitary sewer lines or will have to resubmit for approval and at a minimum be subject to any new D.O.E.S. requirements.

The cost to record any and all easements and/or plats for Developer's projects for sanitary sewer lines, water lines, or pumpstations to be dedicated to Erie County for ownership, operation and maintenance shall be at the cost of the Developer. The County shall invoice the Developer for these costs. The Developer shall pay said invoice within thirty (30) days of the invoice date.

**O.R.C. 307.73 AGREEMENTS**

Erie County may agree to an ORC 307.73 Agreement to allow a Developer install a water line, dedicate it to the County as a public owned and maintained line in an easement and the County will collect and return connection fees from non-participating property owners as allowed under the law under the following terms:

1. Agreement Term: not-to-exceed 10 years.
2. Pro-rated front footage fees shall not exceed the County's current equalization fee as described in Water Rule 3. Section 1.C. at the date of the agreement.
3. No successor and/or assignment of the agreement will be allowed for the Developer.
4. Developer will pay for all costs involved in acquiring easements including the cost of recording said easements.

**WATER DISTRIBUTION SYSTEM IMPROVEMENTS**

**BASIS OF DESIGN**

The Sanitary Engineer and local Fire Department Official shall determine whether or not the County has available adequate water capacity and pressure to allow for a development to proceed. Generally, in single family residential subdivision, the County will attempt to maintain a fire flow of 500 g.p.m. or more, preferably 1,000 g.p.m. in more dense residential areas and in dense commercial and industrial development, a minimum of 1,200 g.p.m. with a preferred 2,000 g.p.m. fire flow. No public water lines shall be installed smaller than eight inch (8") diameter for Water District "A" with fire hydrants, six inch (6") diameter for Water District "B" where fire hydrants may be added, and four inch (4") for Water District "B" where no fire hydrants are planned. Along major routes, water lines will consist of a minimum size of twelve inch (12") diameter. The Sanitary Engineer shall require all water lines and appurtenances to be sized for ultimate development of the entire service area.

Fire hydrants shall be spaced at the maximum 500 feet apart so that no more than 250 feet of fire hose along the frontage plus setback length is needed to reach each structure and in more dense development closer spacing shall be required as determined by the Sanitary Engineer and the local fire department. Fire hydrants along rural roads shall be located at all high spots in line for air release. Locate fire hydrants in curb lawn area in most subdivisions at least seven feet (7') behind curb to a maximum of fifteen feet (15') as required by Sanitary Engineer. Local fire departments shall also review and approve fire hydrant spacing.

Line valves shall be installed at all intersections on each branch near the intersection and at least every 2,000 feet elsewhere.

All twelve inch (12") diameter and larger water lines shall contain restrained joints at the fittings, before and after, as recommended by the Ductile Iron Pipe Research Association. All dead end water lines eight inch (8") in diameter and larger shall utilize restrained joints consisting of EBAA Iron restrained devices for PVC pipe, Series 1600 or approved equal at all joints within sixty feet (60') of the end of the line and shall include a line valve and fire hydrant at the end.

The Developer and/or Engineer shall not allow other utilities to be installed within five feet (5') horizontally of an installed water main or in the same trench as the water main except at crossings. Should this occur, the Developer will be responsible for maintaining the water mains and the Sanitary Engineer will not permit taps to said line until the other utility lines are relocated five feet (5') away from the water main.

Water lines shall be located within the public road right-of-way, along with other County utilities, such as sanitary sewers, storm sewers and drainage swales. All other utilities shall be located in Easements, outside the public right-of-way.

Pursuant to EPA requirements, water mains shall be installed with at least a ten foot (10') horizontal and eighteen inch (18") vertical separation from any sanitary sewers. The County also requires a five foot (5') horizontal and eighteen inch (18") vertical separation from any storm sewers, measured from out-to-out.

Water lines shall be installed with a minimum cover of fifty-four inches (54") and to a maximum of seventy-two inches (72") over top of pipe.

**WATER LINE MATERIAL**

**MINIMUM REQUIRED SPECIFICATIONS AND INSTALLATION STANDARDS**

IN THE CASE OF CONFLICTS BETWEEN WRITTEN SPECIFICATIONS AND DRAWINGS, THE WRITTEN SPECIFICATION SHALL APPLY.

**Shop Drawing Requirements**

Two (2) copies of shop drawings containing manufacturers information concerning meeting the minimum required specifications shall be submitted to the Sanitary Engineer for approval by the Contractor prior to installation for the following items: pipe, valves, fittings, fire hydrants, meter vaults, detector checks, reduced pressure backflow preventers, casing pipe, casing spacers, casing end seals, pipe stanchions and appurtenances. All drawings shall be stamped and initialed as reviewed by the Contractor before submitting these documents to the Sanitary Engineer for acceptance. U.S.A. manufactured materials are preferred by Erie County vendors.

**Water Line Construction Staking**

Water lines shall be staked prior to the installation of new pipe. Staking shall be for both line and grade every 100' plus at all fittings and off-set at 10' 0". A professional surveyor will be required where the Contractor does not have competent surveyors.

**Water Line Pipe Material**

Shall be PVC AWWA C-900 (4"-12") DR18 with integral bell and spigot joints, PVCO AWWA C-909/CJOD (4"-12") Class 200 psi or high density polyethylene pipe (HDPE), DR11 with butt fused joints. Under special conditions, waterline pipe material may be Class 52 Ductile Iron Pipe with push-on type joints, cement lined (AWWA C-104) and shall meet the requirements of AWWA C-150 and AWWA C-151 where approved by the Sanitary Engineer. Two No. 8 stranded wires shall be buried with all PVC and HDPE water mains located at the 10:00 and 2:00 positions and terminated in valve boxes, along with 4" wide tape noting "WATER LINE BURIED BELOW" buried over pipe 12" below finish grade.

**Fittings**

For three inch through twenty-four inch (3"-24") mechanical joint ductile iron, fittings shall meet the requirements of ANSI/AWWA C-153/A21.53 and ANSI/AWWA C111/A21.11. Fittings shall be cement-lined and seal-coated in accordance with ANSI/AWWA C104/A21.4. All HDPE fittings shall be installed with proper expansion devices (flex washers) and stiffeners made for HDPE pipe and approved by Erie County Water Division Superintendent. Mechanical fittings, when required, will use thrust block and Meg-a-lugs, Model Ebba Series 1100 or approved equal through shop drawings submittal. All fittings shall utilize 316 stainless steel bolts and specially designed sacrificial anodes will be required.

**Water Line Joints**

PVC AWWA C-900 and C909 joints shall incorporate rubber gaskets and meet ASTM F-477 and ASTM D-3139. HDPE pipe joints shall be butt fused. All eight inch (8") diameter and larger pipe joints shall include restrained joints at the fittings and before and after fittings as recommended by the Ductile Iron Pipe Research Association. Restrained joints shall be Meg-a-Lugs, Model Ebba Series 1100 or approved equal through shop drawing submittal. Pipe installed within casing pipe shall be restrained joints regardless of pipe diameter. D.I.P. joints shall incorporate rubber gaskets and meet requirements or AWWA C-111. All restrained joint bolts and nuts shall be 316 stainless steel.

**Water Line Valves**

Water line valves three inch through twelve inch (3"-12") shall be Resilient Wedge Gate Valve (RWGV) and meet the requirements of AWWA C509 latest edition, line valves shall be of full body design. Resilient Seat Compact-Type or Thin-Body Type valves are NOT ACCEPTABLE. The RWGV shall have a 250 PSIG working pressure and a 500 PSIG hydrostatic test pressure. The RWGV shall open "right" or "clockwise" and shall be supplied with a two inch (2") square-red wrench nut. The RWGV shall have Type 316 stainless steel bolts and nuts for the stuffing box and bonnet and specially designed sacrificial anodes shall be used. Resilient Wedge Gate Valves shall be American AVK Series 25 or Mueller A-2360-E30 open right and side tap valves T-2360-16E302 open right or approved equal.

Water line valves fourteen inch through twenty-four inch (14"-24") shall be Resilient Wedge Gate Valve (RWGV) and meet the requirements of AWWA C515 latest edition. The RWGV shall have a 250 PSIG working pressure. The RWGV shall open "right" or "clockwise" and shall be supplied with an enclosed bevel gear and a two inch (2") square-red wrench nut. The RWGV shall have Type 316 stainless steel bolts and nuts for the stuffing box and bonnet or specially designed sacrificial anodes may be used. Resilient Wedge Gate Valves and side tap valves shall be Mueller A2361-E302 open right or approved equal.

Water line valves for larger than twenty-four inch (24") diameter pipe shall be Butterfly valves, except for side tapping valves, and meet with requirements of AWWA C-504 Class/150B latest edition. Butterfly valves shall have a working pressure of 150 PSI and hydrostatic pressure of 300 PSI and shall open "right" or "clockwise" and supplied with a two inch (2") wrench nut with type 316 stainless steel fasteners on actuators and stem or specially designed sacrificial anodes may be used. Butterfly valves shall be Mueller B3211 or approved equal.

- Side tapping valves shall be as manufactured by Mueller, Model No. T-2360-16 E302 open right or approved equal by the Sanitary Engineer through a shop drawing submittal.
- Air relief valves shall be as manufactured by Val-Matic, Model No. 38 or approved equal and shall be located in a standard meter crotch setting.
- Valve manholes when required by the Sanitary Engineer shall be four foot (4') diameter precast concrete and designed for an H-20 loading.
- Valve boxes shall be Tyler, Model C, three piece cast iron with bell that will cover valve bonnet with sufficient vertical adjustment to finish grade.

**Fire Hydrants**

Shall be American AVK 2780 or Mueller Super Centurion A-423-250 or specified herein. Fire hydrants shall comply with AWWA C502 latest edition, Dry-Barrel Fire Hydrants. Hydrants shall be of the compression-type with a five and one-quarter inch (5 1/4") valve opening, open left. The hydrant shoe shall be six inches (6") M.J. with all accessories. The complete interior of the shoe shall be coated with a H.P. epoxy. The main valve assembly shall consist of two (2) all bronze drain outlets, a bronze seat ring, a bronze drain ring, and a bronze top main valve plate or upper valve plate. The hydrant stem shall be made of steel rod, one and one-quarter inch (1-1/4") minimum diameter, except for machined surfaces. All hydrants shall be furnished with one (1) five-inch (5") Red Head Storz nozzle, with 5-36 and two (2) two and one-half inch (2-1/2") N.S.T. hose nozzles. All hydrants shall be drainable, unless specified differently by Erie County. All hydrants shall have Type 316 stainless steel bolts and nuts above and below the bury line or specially designed sacrificial anodes shall be used, except the M.J. shoe connection T-bolts shall be Cor-Ten steel. Unless otherwise specified, hydrants shall be buried a minimum of five feet (5') deep. Locate fire hydrants in curb lawn area (behind sidewalk and curb) in most subdivisions at least three feet (3') behind curb, along areas without sidewalks at least seven feet (7') behind pavement edge to a maximum of fifteen feet (15') as required by Sanitary Engineer.

All hydrants shall be painted red with white bonnet using Rustoleum Red for metal and white epoxy paint on bonnet, or equal. Paint shall be provided, upon request, by the Erie County Water Division.

All hydrant leads shall consist of anchoring pipe with appropriate concrete thrust blocks. As a minimum anchoring pipe shall include a two foot (2') or longer section of anchoring pipe between the valve and the hydrant. Any spacer pipe required between the tee and the valve shall consist of anchoring pipe or restrained joint pipe. Hydrant piping shall include swivel fittings or hydrant extension kit for height adjustment.

Watch valves shall meet requirements of AWWA C509 and shall open "right" or "clockwise." Watch valve boxes shall meet the requirements of line valve boxes as previously described.

**Cathodic Protection**

All buried ductile iron water pipe materials such as valves, hydrant assemblies, and fittings shall be installed with sacrificial prepackaged anodes for corrosion protection. The following minimum size and type anodes are required: Fire Hydrant Assemblies - a 32# magnesium anode between watch valve and hydrant shoe and a 32# magnesium anode between the main and watch valve. Line Valves - a 32# magnesium anode. Fittings - a 32# magnesium anode. Water Meter yokes in pits - a 5# zinc anode.

Wire connections to buried ductile iron will be made with Cadweld Type "HA" soldered connections. The soldered connection will be insulated with electrical potting compound. The anode lead wires shall be ten feet (10') length and made of #12 copper wire with Type TW insulation, black in color. Each sacrificial anode will be installed with a test station wired to ground surface installed flush with the ground surface.

**Disinfection**

Disinfection of the lines shall take place after the lines have been properly flushed. Erie County shall provide the water necessary for the first flush (1-1/2 times the volume of the line being flushed) at no cost, but will charge for any water required beyond this volume. Disinfection shall be in accordance with AWWA C651 and is the responsibility of the Contractor.

**Testing**

Shall be performed after the main has been disinfected and flushed out, and shall be subject to a pressure and leakage test in accordance with AWWA C600 consisting of 150 psi/30 minutes. Testing will be performed by the Contractor under the supervision of the Erie County Department of Environmental Services Inspector or Water Division personnel.

Contractor shall install a one inch (1") diameter service at the end of all lines to a meter crotch with a compression fitting shut off valve in the crotch to be used for bacteria testing sampling. The meter crotch and valve shall be provided by the D.O.E.S. Water Division. Bacteria sampling will be done by an Erie County D.O.E.S. Water Division employee. There shall be two (2) consecutive safe samples on a line before it will be turned on. Any additional samples beyond this will be subject to additional charges, which will include the cost of the sample and Water Division employee's time to collect and transport the sample.

**Service Lines**

From main to meter pit all service lines, two-inch (2") diameter and smaller, shall be CTS pipe and constructed of HDPE pipe with compression fittings rated for 200psi or K-copper with welded fittings. All service lines (two-inch (2") diameter and smaller) from the meter pit to the customers building foundation shall be polyethylene CTS pipe and shall be constructed of pipe material and joints designed for a minimum pressure rating of 200 psi. Larger services shall meet the requirements of Water Line Pipe Material. All services shall be buried with a minimum ground cover of forty-eight inches (48") measured from finish grade.

The Developer shall be responsible for installing continuous conduit carrier pipes under pavement for service line installations to each lot, building, condominium, etc. to be served which are located across the street from the water main. Continuous conduit carrier pipes shall be two inches (2") in diameter schedule 40 rigid PVC conduit, sunlight resistant gray, and provided by the D.O.E.S. Water Division. The carrier pipe shall be installed from within two feet zero inches (2' 0") of the water main to the edge of right-of-way beyond any utilities, such as storm sewers or tile on the opposite side. Erie County Water Division is responsible for tapping the main and installing the service lateral in public right-of-way or in utility easement, plus install the water meter pit, where one inch (1") diameter service lines are installed. Larger than one inch (1") diameter, the Contractor shall install the meter vaults as needed.

Water services for commercial, industrial and institutional installations may be required to have backflow prevention device(s) installed and tested by a certified plumber registered with Erie County D.O.E.S. and as required by the State of Ohio. Water services for irrigation are required to have a backflow prevention device. Annual testing and reporting of test results to Erie County will be required for all backflow prevention devices.

**Thrust Blocks**

Thrust blocks shall be provided at fittings, valves or changes in direction of pipe or as determined by the Sanitary Engineer. Thrust blocks shall consist of concrete with a minimum 28-day compressive strength of 4,000 psi and shall be installed using the dimensions shown in the standard drawings. The Contractor shall use forms to ensure all pipe fitting joints and bolts are free of concrete.

**Connection to Existing Water Mains**

New mains to connect to existing Erie County water mains shall generally be with tapping valves and sleeves, unless approval is obtained from the Sanitary Engineer to shut off the existing main. The Contractor shall perform all excavation and provide and install all materials, except the Erie County Water Division shall install the tap. Tapping valves shall meet all requirements of water line valves.

**Road and Railroad Crossings**

**Ohio Turnpike and Railroad Crossings:**

D.I.P. water mains shall be installed in welded steel encasement pipe with minimum wall thickness of 0.375 inches, with a minimum I.D. of eight inches (8") larger than the O.D. of the D.I.P. measured at the bell, installed with use of a bore machine. The annular space shall be filled with sand or approved grout mixture. All PVC lines installed in casing pipes shall have restrained joints and shall contain at least three (3) stainless steel or plastic casing spacers (restrained) per pipe length as well as casing end seals as manufactured by Advance Products and Systems, Inc., (318 233- 6116), or approved equal. All D.I.P. lines installed in casing pipes shall have restrained joints and shall contain at least two (2) spacers per pipe length; and all HDPE pipe installed in casing pipe shall contain one (1) spacer for every 10'-00" of pipe.

**State, County, Township, Village and City Roads :**

These roads may be directional drilled or opened cut upon applicable political subdivision approval, backfilled and road repaired to the local jurisdiction's specifications.

**Warranty**

All new public water lines, sanitary sewer lines and appurtenances installed shall have a one (1) year warranty against any manufacturer defects, installation defects, workmanship or failures of the system. Trench backfill and pavement installed as part of a public water or sewer project shall have a two (2) year warranty against settlement, cracking, raveling, deterioration or shrinking of joint seal products, etc. Term of the warranties shall commence upon County written acceptance of the public lines, and appurtenances.

**REVISION DATE:**

06/15/1999  
01/14/2000  
12/01/2000  
06/11/2001  
07/01/2002  
07/01/2003  
07/01/2004  
07/01/2005  
07/01/2006  
07/01/2007  
07/01/2008  
07/01/2011

**Last revision date:**

07/01/2013

ERIE COUNTY, OHIO  
DEPARTMENT OF ENVIRONMENTAL SERVICES

Standard Specifications  
Water Mains and Appurtenances