

**Town of Cicero/Cicero Area  
Hamilton County, Indiana  
Utility & Street Standards**

**Section 3: Domestic Water Distribution System**

Part 1: General Rules and Design Standards

Part 2: Materials

Part 3: Installation

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Part 1: GENERAL RULES AND DESIGN STANDARDS

1.01 General

1.02 General Design Standards

## PART 1: General Rules and Design Standards

### 1.01 GENERAL

All Domestic Watermains installed within existing or proposed right-of-ways shall conform to all applicable American Waterworks Association (AWWA) Standards. Any requirements of the Indiana Department of Environmental Management (IDEM) will be the responsibility of the developer. Acquisition of all necessary permits will also be the developer's responsibility. No construction will be allowed until the developer has delivered copies of all permits to the Town for review.

### 1.01 GENERAL DESIGN STANDARDS

Design of all domestic water systems to be owned and operated by the Town of Cicero will be in accordance with all applicable standards. Private mains that may eventually be dedicated to the Town are not allowed. The Town of Cicero, with its Engineer, will dictate the size of the mains as necessary to provide adequate fire protection and to allow for future growth.

Water systems shall be designed and installed with fire hydrants at all intersections and at intervals no greater than 400 feet. Closer hydrant spacing may be required by the Town depending upon the nature of the development.

Systems shall be designed and installed with adequate isolation valves to isolate areas of the system for routine maintenance and for repair. Isolation valves will be required at all intersections and at intervals no greater than 600 feet. The Town reserves the right to require smaller valve intervals if it believes that the nature of the development necessitates such.

All domestic watermains shall be design and installed at depths no less than five feet.

Easement requirements for water systems shall be as indicated in Section 2-Part 3 of these Standards. Easement widths for both sanitary sewer and water systems may be reduced by the Town, if in the Town's opinion, adequate space is provided for future maintenance.

Requirements for record drawings, separation and protection of water supplies, existing utility structures and facilities and utility coordination shall be as indicated in Section 2 - Part 3 of these Standards.

End of Part 1

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**Section 3: Domestic Water Distribution System**

Part 2: MATERIALS

- 2.01 Gate Valves
- 2.02 Hydrants
- 2.03 Ductile Iron Watermain
- 2.04 Alternate Watermain Materials
- 2.05 Tracing Wire
- 2.06 Service Lines

## PART 2: MATERIALS

### 2.01 GATE VALVES

Gate Valves shall comply with AWWA C-509 and shall be cast iron body with a urethane rubber-coated cast-iron wedge in accordance with ASTM D429. The valve shall have a non-rising stem and be coated with fusion bonded epoxy both interior and exterior.

The valves shall be designed and constructed to withstand a working pressure of 200 psi shall be hydrostatic tested, without leakage or distortion, under a water pressure of not less than 400 psi. They shall be as manufactured by Clow Corporation, DeZurik, or approved equal.

Valve boxes shall be Clow F-2545 screw type two piece or F-2450 three piece cast iron with removable cast iron lid marked "water" or approved equal. Valve boxes shall be provided for all gate valves located in the distribution system and in other locations where required or necessary for the operation of the valves. One (1) valve operating wrench shall be provided to Owner/Developer.

Valves shall be spaced per Part 1 of this Section. Installation shall be in accordance with the typical valve and box installation detail included in these Standards.

### 2.02 HYDRANTS

All hydrants shall be 6", three-way Super Centurion 250 as manufactured by Mueller Co., or approved equal. Hydrants shall be rated for a 200 psig working and 400 psig test pressure, respectively. Hydrants shall conform to AWWA C502.

Hydrants shall be spaced per Part 1 of this Section. Installation shall be in accordance with the hydrant installation detail of these Standards.

### 2.03 DUCTILE IRON WATERMAIN

All pipe shall be within the following specifications unless approved otherwise by the Town of Cicero. Each length of pipe and fittings shall be plainly stamped or indelibly marked or color coded to an acceptable standards specification as to the weight, class, and type thereof, and the manufacturer's trademark or name. Prior to ordering pipe materials, approval of the manufacturer will be obtained from the Town of Cicero.

Pipe shall be designed in accordance with AWWA Specification C-151 (ANSI A21.50), latest revision. Pipe shall be designed for a minimum of 150 psi water working pressure plus 100 psi surge and a safety factor of 2.

Pipe shall be manufactured in accordance with AWWA Specification C-151 (ANSI A21.51), latest revision.

Pipe shall be standard cement lined and seal coated with an approved bituminous seal coat in accordance with AWWA Specification C-104 (ANSI A21.4), latest revision.

Joints shall be push-on or restrained push-on conforming to AWWA Specification C-111 (ANSI A21.11), latest revision, designed for 250 psi water working pressure.

The pipe class for both pipe and bell and the pipe thickness shall be as determined in accordance with AWWA Specification C150 A21.50.

Fittings shall be cast iron or ductile iron and furnished in accordance with AWWA Specification C-110 (ANSI A21.10) or AWWA C-153 (ANSI A21.53), latest revision. Joints shall be mechanical joint as shown on drawings. A cement mortar lining shall be furnished as detailed above for pipe. Fittings shall be rated for a 250 psi working pressure.

Steel Casing pipe shall be used where crossing State Highways, railroads, or where shown elsewhere on plans. The casing pipe shall be welded steel pipe, new and unused material in accordance with current ASTM Specifications A-139 Grade B for "Electric Fusion of Welded Steel Pipe" with a minimum yield of 35,000 psi. The diameter of the casing shall be 24" unless otherwise noted with a wall thickness of 0.407.

Ductile iron pipe systems shall be wrapped with pipe manufacturer's polyethylene wrap where required by the Town.

## 2.04 ALTERNATE WATERMAIN MATERIALS

High Density Polyethylene Pipe (HDPE) may be used as an alternate to ductile iron for watermains if prior approval is granted on a case by case basis by the Town Representatives.

### A. HIGH DENSITY POLYETHYLENE PIPE

Polyethylene pipe shall conform to the latest edition of ANSI/AWWA C901 and C906, as appropriate. Material used in the manufacture of HDPE pipe shall conform to the PE Standard Code, PE 3408. All HDPE pipe shall have the same outside diameter as Ductile Iron Pipe Size (DIPS), with the exception of 3-inch pipe or smaller, where iron pipe size shall be used. In no case shall HDPE pipe be

provided with an interior diameter smaller than the proposed pipe that it is connected to. HDPE pipe shall be DR-9, rated for 200 psi, unless indicated otherwise approved by the Town.

Where fittings are required, Ductile Iron fittings shall be used (Refer to the above section for “Ductile Iron Watermain”).

Minimum pipe wall thickness shall be DR 9 (200 psi) minimum.

Joining of HDPE pipe to mechanical joints fittings shall be accomplished by restraining the HDPE pipe to the mechanical joint fittings to prevent pipe pull out. This connection shall be made by means of mechanical rings and bolts using a molded coupling or HDPE MJ (Harvey) adapter fused to the pipe.

Mechanical joint anchor fittings (HDPE MJ “Harvey” Adapter) shall be used to transition from HDPE pipe to ductile iron pipe. The fittings shall be stronger than the pipe in that when it is subjected to tensile stress the pipe will pull apart before the fitting will pull out and the pipe will blow before the fitting will rupture under pressure.

The HDPE MJ “Harvey” Adapter shall have a pre-installed stainless steel stiffener, in accordance with the Plastic Pipe Institute (PPI) recommendations, to neutralize point-loading, ACQ, creep and loss of gasket seal due to diameter contraction. The stiffener shall be engineered sufficiently thick to avoid radial buckling due to gasket pressure.

The HDPE MJ “Harvey” Adapter requires longer bolts and shall be sold with the modified longer bolt kit to avoid construction crew delays or improper installation with too short bolts.

The following are acceptable manufacturers: Performance Pipe, North American Pipe Company, and CSR Poly Pipe Industries.

## 2.05 TRACING WIRE

Contractor shall install tracing wire along with all pipe installations.

In open trench installations, all non-metallic pipe shall be provided with a #12 gauge solid tracer wire with High Molecular Weight Polyethylene (HMWPE) insulation. The #12 gauge solid tracer wire with HMWPE insulation shall have a minimum thickness of 0.045”. The insulation thickness at any point shall not be less than 90% of the specified average thickness in compliance with UL 83. The tracing wire shall be UL rated for 600-volt service and shall be rated for direct-bury applications. The tracing wire insulation shall be blue in color for the watermain project. No buried splices shall be allowed in the locator wire. The wire shall be as manufactured by Kris-Tech Wire Co., Inc. in Rome,

NY (315-339-5268) or approved equal.

The solid tracing wire must be laid directly on top of the watermain. The wire shall be attached to the pipe at a maximum of 25' intervals to ensure it stays in place during backfill.

In directional bore installations a minimum of two (2) #6 gauge HMWPE insulated tracing wires that are rated for direct-bury applications must be attached to the main at maximum of 25' intervals. The Contractor shall ensure that the tracing wire attached to the main is functional by performing a continuity test after the bore is completed. The Contractor shall over-ream the bore as necessary to insure that the locator wire is installed successfully with the bore.

At hydrants, the tracing wire shall be connected to the loop below the 4-1/2" nozzle. The tracing wire shall be taped to the hydrant barrel as it is brought to ground level. At valves, the tracing wire shall be brought to one (1) foot below grade on the outside of the riser. A 1/2" diameter hole shall be cut in the side of the riser and the tracing wire looped and knotted on the inside of the riser to keep the tracing wire at this elevation. A minimum 12" loop of tracing wire must be left inside of the valve box riser. The tracing wire should continue down the valve box in a continuous run to the pipe on the opposite side of the valve.

The tracing wire shall be installed without buried connections or splices.

Additionally, watermain locator signal stations shall be installed, so that, there is a maximum distance of 1,000 feet between locations in which a signal generator can be used to determine watermain location. The watermain locator signal stations shall be required at each side of all bore locations. Watermain locator signal stations do not need to be placed within 1,000 feet of a valve box in which the tracing wire has been installed as described in this section, unless required due to bore proximity, where installed within the right-of-way. Watermain locator signal stations shall be installed within 2 feet horizontally of the right-of-way or easement line to avoid future damage.

## 2.06 SERVICE LINES

Residential service lines shall be constructed using 3/4 inch or larger type k soft copper or HDPE. Larger service lines may be necessary for larger water consumers. The copper service shall extend a minimum of five feet beyond the meter pit prior to transition to any other Owner/Developer selected and maintained material.

All meter pits shall be adjustable fiberglass or plastic type with minimum diameter of 18" with lid indicating water service. Pits shall be set at the property line. Pits shall be at finish grade to allow easy access for Utility personnel. No. 8 stone bedding or concrete brick shall be utilized below pits to minimize settling.



Yokes will be installed 14 inches below finish grade.

End of Part 2

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**Section 3: Domestic Water Distribution System**

Part 3: INSTALLATION

- 3.01 Pipe Laying
- 3.02 Pipe Bedding and Haunching
- 3.03 Service Line Installation
- 3.04 Testing and Disinfection

## PART 3: INSTALLATION

### 3.01 PIPE LAYING

The Contractor shall provide proper implements, tools, and facilities for the safe and expeditious prosecution of the work. Plan details shall govern if any discrepancies exist. The Contractor shall meet the minimum requirements of IOSHA regulations 29 CFR 1926, Subpart P for trench safety systems.

Every pipe, fitting, and valve shall be cleaned of all debris, dirt, and other foreign material before being laid and shall be kept clean until accepted in the completed work.

The Contractor shall lay and maintain pipe to the lines shown on the approved drawings, except as specified in this Article. Lay and maintain pipe to the grade shown on the drawings or to the minimum depth specified in this Article. Install fittings, valves, and hydrants in the locations shown on the approved drawings.

Where the piping is to be constructed parallel to and close to existing buried utilities, the exact location of which is unknown, adjust the alignment of the piping to least interfere with these utilities.

Potable water piping shall be laid at least ten feet horizontally from any existing sanitary sewer or sewage force main. The distance shall be measured form edge of pipe to edge of pipe. Portable water piping crossing sanitary sewers or sewage force mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the portable water piping and the outside of the sewer force main. The 18-inch separation shall apply whether the portable water piping is over or under the sewer or force main. Lay potable water piping at crossings of sewers and force mains so a full length of pipe is centered on the sewer pass through or come in contact with any part of a sanitary sewer manhole.

Piping shall be installed so that not less than 5'-0" of cover is provided over pipe, unless approved otherwise in writing by the Town of Cicero. Cover shall be measured as the vertical distance from the top of the pipe to the finish grade elevation.

Piping shall not be laid in water or when the trench or weather conditions are unsuitable for proper installation.

Pipe, fittings, and valves shall be lowered into the trench by hand, by means of hoists or ropes, or by other suitable tools or equipment which will not damage products, coatings, or linings.

Thrust restraint shall be provided at horizontal and vertical deflection fittings and at tees, plugs, tapping sleeves, and tapping saddles. Mechanical restraints shall be installed on all joints within the distance given in the details. General thrust blocking details are given in

Water System Details of these specifications.

Pipe shall be laid in accordance with the requirements of ANSI/AWWA C600-99, unless otherwise specified in this section.

All piping shall be installed using metallic tracer wire for future locating purposes.

Open excavation shall be satisfactorily protected at all times. At the end of each day's work, the open ends of all pipes shall be protected against the entrance of animals, children, earth, or debris by bulkheads or stoppers. The bulkheads or stoppers shall be perforated to allow passage of water into the installed pipe line to prevent flotation of the pipe line. Any earth or other material that may find entrance into the main sewer or into any lateral sewer through any such open end of unplugged branch must be removed at the Contractor's expense. The cost of all such plugs, and the labor connected therewith, must be included in the regular bid for the sewers.

### 3.02 PIPE BEDDING AND HAUNCHING

Each pipe section shall be laid in a firm foundation of bedding material and haunched and backfilled with care.

Prior to pipe installation, bedding material shall be carefully brought to grade along the entire length of pipe to be installed. The following bedding procedures are recommended to provide adequate, uniform support for the piping.

Uniformly compacted clean sand bedding shall be installed below all watermain. Excavate the bedding material or place it to a point above the pipe bottom, determining such point by the depth of loose material resulting in the preparation of the bedding and the amount of compaction that will be required to bring the material to grade. Use hand or mechanical tamping to compact the bedding material to a minimum 95% Standard Proctor Density.

Slightly damp material will generally result in a maximum compaction with a minimum of effort. If water is added to improve compaction or if water exists in the trench, take care to avoid saturation of bedding material, which could result in the loss of stability. Check grade of bedding after compaction.

In yielding subsoils, the trench bottom shall be undercut to the depth necessary and backfilled with graded, crushed stone to form a firm foundation.

Where excavation occurs in rock or hard shale, the trench bottom shall be undercut and a minimum of 6 inches crushed stone bedding placed prior to pipe typical bedding installation.

Bell holes shall be excavated in advance of pipe laying so the entire barrel will bear

uniformly. Backfill and bedding shall be in accordance with Water System Details of these Standards unless approved in writing by the Town of Cicero.

### 3.03 SERVICE LINE INSTALLATION

All Service lines within the public right-of-way shall be installed in accordance with these Standards and Town policies. Portions of service lines installed on private property shall be installed in accordance with the latest addition of the *One and Two Family Dwelling Code* and the *Uniform Plumbing Code*.

### 3.04 TESTING AND DISINFECTION

All domestic watermains connected to the Cicero Water System shall be flushed, tested and disinfected in accordance with Section 1 of these Standards.

End of Part 3