

CITY UTILITIES DESIGN STANDARDS MANUAL

**Book 4
Water (W)
W7 Appurtenances**

September 2017

W7.01 Purpose

This Chapter focuses on the appurtenances necessary for the proper design of potable water distribution systems. This Chapter establishes the minimum standards and technical design criteria for water main appurtenances for all City of Fort Wayne water distribution systems. All variances from these design standards shall be approved prior to commencement of design in compliance with [Chapter GR3 - Variances](#). Refer to [Chapter MA7 - Water Materials and Testing Requirements](#) for material requirements.

This Chapter covers the following items:

- Valves
- Fire Hydrants
- Fittings
- Air Release Valves
- Blow-off Assemblies
- Temporary Test Risers
- Tracing Wire
- Polyethylene Wrap

W7.02 Valves

Valves are to be provided on water mains for isolation of the water distribution system as necessary for inspection and repair.

1. Valve Location

- Valves shall be located at three (3) branches of a cross intersection.
- Valves shall be located at two (2) branches of a tee intersection.
- Valves shall be located as required to maintain the Maximum Allowable Valve Spacing per Figure W7.1 below.
- Refer to the Typical Valve Placement Standard Drawings, [W-1](#) and [W-2](#), for schematic layouts for valve location requirements.
- Line valves along long runs shall be bolted to the hydrant tee.

2. Valve Requirements

- Valves shall meet the requirements as defined in [Chapter MA7 - Water Materials and Testing Requirements](#).
- A valve box and lid shall accompany each valve.
- Refer to the Standard Drawing [STR-43](#) Valve Box for requirements for installation.
- Valves 24-inches or greater shall be butterfly valves. Valves less than 24-inches shall be resilient seat wedge valves.

Figure W7.1

Maximum Allowable Valve Spacing Intervals	
6" and 8"	900'
12"	1,600'
16"	2,200'
24" and greater	Consult City Utilities

W7.03 Fire Hydrants

Fire Hydrants shall be installed along all water mains that are at least six-inches in diameter and that have been designed to carry fire flow. Hydrants shall be designed per the following guidelines:

1. Hydrant Requirements
 - A. All fire hydrants shall meet the requirements as defined in [Chapter MA7 - Water Materials and Testing Requirements](#).
 - B. All fire hydrants shall be equipped with an auxiliary valve.
 - C. All fire hydrants shall be restrained the for the entire length from the hydrant to the tee fitting.
2. Assembly Configurations
 - A. There are six (6) fire hydrant assembly configurations are acceptable for use in the distribution system. These configurations are depicted in Standard Drawings [W-10](#), [W-12](#), [W-13](#), [W-14](#), [W-15](#) and [W-16](#).
3. Drainage
 - A. Hydrants shall be placed within a drainage pit. The drainage pit area shall consist of aggregate material consisting of INDOT No. 8, INDOT No. 53 or INDOT No. 73. Refer to the Standard Drawing [W-17](#) Standard Hydrant Setting for installation requirements.
 - B. No hydrant drainage pit shall be connected to a sewer.
4. Location
 - A. Fire hydrants shall be located in a manner to provide complete accessibility, and in such manner that the possibility of damage from vehicles or injury to pedestrians is minimized.
 - B. Fire hydrants should be located at every major intersection and shall not exceed average spacing intervals of 500-feet in residential areas, 400-feet in commercial areas, and 350-feet in industrial or other higher risk areas.
 - C. When hydrants are required at intermediate points between intersections they shall be placed near property lines, in locations that avoid driveways and in locations where they will not be damaged.
 - D. When set in the lawn space between the curb and the sidewalk, or between the sidewalk and the right-of-way, no portion of the hydrant or nozzle caps shall be within 6-inches of the sidewalk.
 - E. When placed behind curb, the hydrant barrel shall be set so that no portion of the pumper or hose nozzle caps will be less than 12-inches or more than 42-inches from the back of the curb. Refer to the General Location of Fire Hydrant Standard Drawings [W-18](#) and [W-19](#).

- F. When hydrants are placed in sidewalks, block-outs should be utilized per the Block-Outs in Sidewalks for Fire Hydrants Standard Drawing [W-20](#).
 - G. Fire hydrants shall be separated from potential sources of contamination by at least ten feet (10') horizontally measured from the outside edge of the hydrant to the outside edge of the potential contamination source. Refer to [Chapter W5 – Water Main Design](#) for distance requirements from potential contamination sources.
 - H. When feasible, align hydrant barrels with property corner lines.
 - I. Hydrants shall have a minimum clear zone of 3-feet from utility poles and have a minimum of 5-feet of separation between a utility pole and any hose nozzle.
5. Protection
- A. When structural protection of the hydrant is directed from the developer, engineer, or City Utilities, protective guard bollards should be placed. Posts shall be per the Standard Drawing W-21 Fire Hydrant Bollards.
6. End Points of Water Mains
- A. Flushing devices consisting of fire hydrants or blow-off assemblies shall be placed at permanent or temporary end points of water mains.
 - B. Type V fire hydrants are the preferred method of ending a main. Fire hydrants shall be placed at water main end points greater than 8-inches in diameter.
 - C. Blow-off Assemblies shall be placed at water main end points for water mains 8-inches in diameter and less. Refer to section W7.06 Blow-Off Assemblies of this Chapter.

W7.04 Fittings

All water main fittings shall meet the requirements as defined in [Chapter MA7 - Water Materials and Testing Requirements](#).

1. Water Main Crossing Connection

Water main replacement or proposed water main installation with a proposed connection into the crossing water main shall be completed with a tee fitting and elbow and shall not connect with a cross fitting. Refer to the Standard Drawing W-41 Round Way Connection for an example.

2. Water Main Deflection

When space allows the preferred method for vertical and horizontal deflections shall be to use 45 degree, 22 ½ degree and 11 ¼ degree bends in lieu of a 90 degree bend.

W7.05 Air Release Valves

Air release valves or other air release devices shall be installed at any intermediate apex points in the water main where air may accumulate in the water main. In typical circumstances, either water services or fire hydrants act as air release structures. A specific project design may require the installation of an air release valve. The installation of an air release valve shall be considered primarily for water transmission mains 16-inches and greater. City Utilities shall be consulted and a request for a variance shall be submitted for approval to install an air release valve.

W7.06 Blow-Off Assemblies

Flushing devices consisting of fire hydrants or blow-off assemblies shall be placed at all permanent or temporary end points of all water mains. Fire hydrants are the preferred method of ending a main. Blow-off assemblies may be used to end water mains 8-inches in diameter or less only where a fire hydrant has not already been required due to an intersection or spacing requirements.

The Standard Drawing [STR-42](#) Blow-Off Assembly provides temporary and permanent blow-off assembly configurations.

W7.07 Temporary Test Risers

Temporary test risers will be required during construction of the distribution system extension for use in pressure testing and disinfection. DVS or CUE shall be consulted to determine the riser locations. In general, the temporary risers shall be installed as required for pressure and disinfection and as specified in the materials and construction sections and shall be removed at the end of construction. Risers shall be located at least once for every 1,000-feet of main.

Refer to the Standard Drawings [W-23](#), [W-24](#), and [W-25](#) for configuration details and requirements for test risers.

W7.08 Tracing Wire

Tracing wire shall be used for identifying buried water infrastructure. Tracing wire shall be installed on all water main lines, services and hydrants. The tracing wire shall be brought to ground level at each valve and hydrant.

1. Tracing wire shall meet the requirements as defined in [Chapter MA7 - Water Materials and Testing Requirements](#).
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W7.09 Polyethylene Wrap (Polywrap)

Polywrap shall be placed on all ductile iron pipe 24-inches in diameter and larger where the soil survey indicates the presence of corrosive soils. The soils shall be considered corrosive when a soil survey has not been performed.
