1 General

1.1 This guideline provides the design criteria, minimum quality and materials for the selection, fabrication and installation of potable water valves.

1.2 Materials and installations shall be in accordance with the following industry and association standards.

- ASME B16.1 Gray Iron Pipe Flanges and Flanged Fittings
- ASME B16.21 Nonmetallic Flat Gaskets for Pipe Flanges
- ASME B31.1 Power Piping Code
- ASTM Materials
- AWWA C509 Resilient Seated Gate Valves for Water Supply Service
- AWWA C515 Reduced Wall, Resilient Seated Gate Valves for Water Supply Service
- AWWA C550 Protective Interior Coatings for Valves and Hydrants
- AWWA C800 Underground Service Line Valves and Fittings
- AWS Welding

1.3 All valves shall open counterclockwise.

1.4 All pipe, fittings, and pipe joining materials used for potable water systems shall be lead-, copper-, arsenic-, zinc-, synthetic organic compound-, and volatile organic compound-free. All pipe, fittings, and pipe joining materials for potable water systems shall comply with the EPA requirements enacted into law on January 4th, 2011 in the Reduction of Lead in Drinking Water Act, which established an effective date of January 4th, 2014. This Act amends the Safe Drinking Water Act (SDWA).

1.5 Bleach ports shall only be installed when directed by Utilities Engineering. Typically, temporary blind flange bleach ports are preferred.

1.6 Consult Utilities Engineering if an application is believed to be outside of these conditions.

2 Materials & Equipment

2.1 Valve Boxes

2.1.1 Furnish and install adjustable 5-1/4” valve boxes on all new valves buried in the ground.

2.1.2 The boxes shall be cast iron of proper length and with a base suitable for valve size.

2.1.3 The boxes shall have covers marked “WATER”.

2.1.4 The boxes shall have a 12” concrete ring or square poured around the valve box at grade. The concrete shall be a minimum of 6” thick.

2.1.5 The boxes shall be sealed at the valve bonnet using a resilient valve box adapter. The adapter shall prevent settling and shifting, center the operating nut and protect the epoxy coating of the valve.

2.2 Valves on Pipe 2” and Less:

2.2.1 This section only applies to corporate stops.

2.2.2 Valves shall be the same size as the pipe.

2.2.3 Valves shall be threaded brass, quarter-turn ball valves, or ball-type corporate stops.

2.2.4 Valves shall have male iron pipe thread on both ends and tee head for slotted key operation.

2.2.5 Valves shall have a minimum of 12” of schedule 80 brass pipe or ductile iron pipe on either side of valve through the valve box.

2.3 Bleach Ports

2.3.1 Bleach ports shall consist of 6” brass nipple and 2” brass ball valve with brass plug. All items shall have threaded fittings.

2.4 Valves on Pipe Greater than 2”:

2.4.1 Valves greater than 2” shall be resilient-wedge-type with non-rising stem to meet or exceed the requirements of the AWWA C509 and C515 Standards.

2.4.2 The valve body, bonnet and wedge shall be constructed of ASTM A536 Ductile Iron.

2.4.3 The exterior of the ductile iron wedge shall be encapsulated with EPDM rubber.

2.4.4 All internal and external ferrous surfaces of the valve body and bonnet shall have a fusion-bonded epoxy coating free of visible holidays, complying with the AWWA C550 Standard. This coating shall be applied electrostatically prior to assembly and cover bolt holes and flange-to-body surfaces.

2.4.5 The wedge shall be symmetrical and seal with flow in either direction. There shall be no exposed metal seams, edges or fasteners within the water way. The gate, when fully open,
shall result in the full diameter of the waterway to be unobstructed and equal to the nominal size of valve. There shall be no recesses to trap debris or obstruct flow when fully open. The valve shall not be used for flow rate control.

2.4.6 The stem and its nut shall be high strength ASTM B763 Manganese Bronze in compliance with the AWWA C509 and C515 Standards.

2.4.7 The operating nut shall be constructed of ductile iron. The nut shall have four flats at the stem connection and shall evenly distribute input operating torque to the valve stem. The nut shall be 2” square AWWA size nut.

2.4.8 Valves must have thrust washers located above and below the thrust collar.

2.4.9 All body–to–bonnet and bonnet–to–cover seals shall be pressure-energized O-rings. Flat gaskets shall not be allowed. The valve shall have triple O-ring stem seals. Two O-rings shall be located above and one O-ring located below the thrust collar. The lower two O-rings shall provide a permanently sealed lubrication chamber.

2.4.10 Fasteners shall be hexagonal shaped Type-304 stainless steel bolts and nuts. End connections shall be mechanical joints.

3 Installation Guidelines

3.1 All valve operators shall be no more than 5 feet below grade.

3.2 All valves shall be fully closed and fully opened twice by hand before installation. Any valve that is not operable by hand shall not be accepted and not installed.

3.3 After installation all valves shall be left in the open position unless otherwise instructed by Utilities Engineering.

3.4 Operation of the potable water distribution system shall be by an Authorized Purdue University Water Works Employee.