

**PROPOSED REGULATION OF THE
STATE ENVIRONMENTAL COMMISSION**

LCB File No. R104-22

August 13, 2022

EXPLANATION – Matter in *italics* is new; matter in brackets ~~omitted material~~ is material to be omitted.

AUTHORITY: §§ 1-14, NRS 445A.860.

A REGULATION relating to public water systems; revising references to certain standards and publications adopted by reference; revising certain requirements relating to pumps and pumping facilities; revising certain requirements relating to cross-connections; revising certain requirements relating to fire sprinkler systems; and providing other matters properly relating thereto.

Legislative Counsel’s Digest:

Existing law authorizes the State Environmental Commission to adopt regulations for the construction, operation and maintenance of public water systems if those activities affect the quality of water. (NRS 445A.860)

Existing regulations adopt by reference certain standards and publications relating to the design, construction, operation and maintenance of public water systems. (NAC 445A.6663) **Section 1** of this regulation updates information on certain publications adopted by reference and how to obtain a copy of such standards and publications. **Sections 2, 9 and 10** make conforming changes to update such information.

Existing regulations require a supplier of water to certify that the work on a water project was performed in compliance with certain requirements. (NAC 445A.66715) **Section 3** of this regulation requires the supplier of water to also supply to the Division of Environmental Protection of the State Department of Conservation and Natural Resources or the appropriate board of health drawings of the water project as it was built.

Existing regulations require the construction of submersible pumps in a water well to comply with *American Water Works Association Standard E101*. (NAC 445A.66915) **Section 4** of this regulation instead requires compliance with *American Water Works Association Standard E102*.

Existing regulations require a supplier of water to ensure that each pump used by a public water system: (1) is suitable for its intended purpose; (2) has an adequate capacity; and (3) is installed in accordance with the directions of the manufacturer. (NAC 445A.66995) **Section 5** of this regulation additionally requires that each pump is determined to be compatible with drinking water and replaces a reference to the Division of Public and Behavioral Health of the Department of Health and Human Services with the Division of Environmental Protection.

Existing regulations require, with certain exceptions, that a supplier of water ensures that, with regard to the suction piping of the public water system: (1) the velocity of the water does not exceed 3 feet per second; (2) the diameter of the piping is a certain size; (3) if there is a valve on the suction line, a gauge is installed; (4) if elbows are required, the elbows are of a certain radius; and (5) if a pump is connected to a header used for suction, the pump is located a certain distance away from the header. (NAC 445A.67025) **Section 6** of this regulation requires instead that: (1) the velocity of the water is in compliance with the specifications and recommendations of the manufacturer of the pump; (2) the diameter of the piping is in compliance with the specifications and recommendations of the manufacturer of the pump; (3) if there is a valve on the suction line, a permanent pressure gauge is installed; (4) if elbows are required, the elbows are designed in compliance with the specifications and recommendations of the manufacturer of the pump; and (5) if a pump is connected to a header used for suction, the distance between the pump and the header is in compliance with the specifications and recommendations of the manufacturer of the pump. **Section 6** also provides that in lieu of a permanent pressure gauge, a connection for a temporary pressure gauge and a pressure transducer may be installed.

Existing regulations require, subject to certain exceptions, that a supplier of water ensure that, with regard to the discharge piping of the public water system: (1) a concentric reducer or eccentric reducer is installed at the pump and the diameter of the discharge pipe is a certain size; and (2) a gauge with a pet cock or ball valve is installed on the discharge pipe. (NAC 445A.6703) **Section 7** of this regulation requires instead that: (1) the diameter of the discharge pipe is in compliance with the specifications and recommendations of the manufacturer of the pump and allows the installation of a concentric or eccentric reducer; and (2) a permanent pressure gauge with a pet cock or ball valve be installed. **Section 7** also provides that in lieu of a permanent pressure gauge, a connection for a temporary pressure gauge and a pressure transducer may be installed.

Existing regulations require each pump at a pumping facility to have, with certain exceptions: (1) a standard pressure gauge on its discharge line; (2) a standard pressure gauge on its suction line if the pump is in suction head; and (3) a compound pressure gauge on its suction line if the pump is in suction lift. Existing regulations also require each pumping station to have a device for measuring the rate of flow of discharge and total flow. (NAC 445A.67035) **Section 8** of this regulation provides all such gauges must be permanent pressure gauges but that, in lieu of a permanent pressure gauge, a connection for a temporary pressure gauge and a pressure transducer may be installed.

Existing regulations require, with certain exceptions, that the minimum type of protection from cross-connection required for a service connection to certain buildings, consists of a reduced pressure principle assembly. (NAC 445A.67195) **Section 11** of this regulation requires that, with certain exceptions, the minimum type of protection from cross-connection for a dwelling unit consists of a reduced pressure principle assembly, if the service connection serves more than one dwelling unit.

Existing regulations require: (1) a supplier of water to ensure that an assembly for the prevention of backflow is installed at each service connection between the public water system and a fire sprinkler system; and (2) any reduced pressure principle assembly or reduced pressure detector assembly to not have holes drilled in the check valve clappers. (NAC 445A.67215) **Section 12** of this regulation requires that: (1) an assembly for the prevention of backflow also be easily accessible; and (2) any reduced pressure principle assembly or reduced pressure detector assembly be located above ground. **Section 12** further provides that if an assembly for

the prevention of backflow is not installed and the supplier of water determines that the absence of a backflow prevention device presents a potential threat, a supplier of water must submit a report to the property owner that includes certain information.

Existing regulations require the designer of a fire sprinkler system to ensure that, based on the placement of certain assemblies: (1) an antifreeze loop or the total line of the fire sprinkler system is able to accommodate the thermal expansion of antifreeze; or (2) if necessary, an expansion tank is provided. (NAC 445A.6722) **Section 13** of this regulation requires that the designed pressure and rate of flow of water required to operate the fire sprinkler system be based on the minimum pressure, as determined by the fire authority, after taking into account certain information.

Existing regulations require a supplier of water to: (1) perform a certain analysis if any backflow involving a fire sprinkler system threatens a public water system; and (2) modify of certain devices that are necessary to ensure adequate fire flow. (NAC 445A.67225) **Section 14** of this regulation requires the supplier of water to: (1) perform the analysis such that the pressure and rate of flow of water required to operate the fire sprinkler system, as determined by the fire authority, are included; and (2) notify the operator of the facility if certain modifications are necessary to ensure adequate pressure and fire flow.

Section 1. NAC 445A.6663 is hereby amended to read as follows:

445A.6663 The following provisions and publications are hereby adopted by reference:

1. The *American Water Works Association Standards*, as those standards existed on July 1, ~~2014.~~ **2022**. A copy of those standards is available by mail from the American Water Works Association, 6666 West Quincy Avenue, Denver, Colorado 80235, by toll-free telephone at (800) 926-7337, or at the Internet address <http://www.awwa.org/store.aspx>, at a price of ~~3,774~~ **4,250** for members and ~~5,990~~ **6,400** for nonmembers.

2. Standards 14, 42, 44, 53, 55, 58, 60, 61 and 372 of the American National Standards Institute and NSF International, as those standards existed on July 1, ~~2014.~~ **2022**. Those standards are available by mail from Techstreet, 3025 Boardwalk Drive, Suite 220, Ann Arbor, Michigan 48108, by toll-free telephone at ~~(800) 699-9277.~~ **(855) 999-9870**, or at the Internet address <http://www.techstreet.com/nsf/>, at a price of ~~220~~ **165** for Standard 14, 42, 44, 53, 55 or 58, ~~380~~ **325** for Standard 60 ~~325 for Standard~~ **or** 61 and ~~110~~ **55** for Standard 372.

3. Standards D3212 and D3139 of ASTM International as those standards existed on ~~May~~ **July** 1, ~~2018.~~ **2022**. Those standards are available by mail from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania 19428, by toll-free telephone at (877) 909-2786, or at the Internet address <http://www.astm.org>, at a price of ~~(\$41.)~~ **\$48**.

4. The *Manual of Cross-Connection Control*, tenth edition, as developed by the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California. This publication is available by mail from the University of Southern California, Research Annex 219, Los Angeles, California 90089-7700, by toll-free telephone at (866) 545-6340, or at the Internet address www.uscfoundationstore.com at a price of ~~(\$90)~~ **\$100** for members and ~~(\$125)~~ **\$140** for nonmembers.

5. *Manual of Water Supply Practices M14* ~~Recommended Practice for~~ *Backflow Prevention and Cross-Connection Control*, ~~third~~ **Recommended Practices, fourth** edition, as published by the American Water Works Association. This publication is available by mail from the American Water Works Association, 6666 West Quincy Avenue, Denver, Colorado 80235, by toll-free telephone at (800) 926-7337, or at the Internet address <http://www.awwa.org/store.aspx>, at a price of ~~(\$76)~~ **\$97** for members and ~~(\$122)~~ **\$152** for nonmembers.

6. *Recommended Standards for Water Works*, ~~2012~~ **2018** edition, as developed and approved by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers. This publication is available at ~~no cost at~~ the Internet address ~~<http://10statesstandards.com>~~ **<https://www.mngovpublications.com>**, at a price of **\$13.95**.

7. *Standard Methods for the Examination of Water and Wastewater*, ~~22nd~~ **23rd** edition, as published by the American Water Works Association. This publication is available by mail from the American Water Works Association, 6666 West Quincy Avenue, Denver, Colorado 80235, by toll-free telephone at (800) 926-7337, or at the Internet address <http://www.awwa.org/store.aspx>, at a price of ~~(\$225)~~ **\$275** for members and \$395 for nonmembers.

8. *Standard Specifications for Public Works Construction*, also known as the “Orange Book,” ~~2012~~ **2016** edition, as sponsored and distributed by the Regional Transportation Commission of Washoe County, Washoe County, **Churchill County**, the City of Sparks, the City of Reno, Carson City and the City of Yerington. This publication may be obtained by mail from the Regional Transportation Commission of Washoe County, 1105 Terminal Way, Suite 108, Reno, Nevada 89502, or by telephone at (775) 348-0171, at a price of \$40, or at no cost at the Internet address <https://www.rtcwashoe.com/engineering-resource/orange-book>.

9. *Uniform Design and Construction Standards for Potable Water ~~Distribution~~ Systems*, third edition, as developed and adopted by Boulder City, Henderson, North Las Vegas, the Big Bend Water District and the Las Vegas Valley Water District, or a subsequent edition adopted by the respective governing body of such local governments and approved by the Division. This publication is available by mail from the Las Vegas Valley Water District, Engineering Services Division, 1001 South Valley View Boulevard, Las Vegas, Nevada 89153, or by telephone at (702) 822-8518 at a price of ~~(\$12)~~ **approximately \$19**, or at no cost at the Internet address <https://www.lvvd.com/engineering-resources/design/index.html>.

10. The *Uniform Plumbing Code*, ~~2012~~ **2021** edition, as adopted by the International Association of Plumbing and Mechanical Officials. This publication is available by mail from

the International Association of Plumbing and Mechanical Officials, 4755 E. Philadelphia Street, Ontario, California 91761, by telephone at (909) ~~472-4208,~~ **472-4100**, or at the Internet address **http://iapmmembership.org**, at a price of ~~88.80~~ **109.60** for members and ~~111~~ **137** for nonmembers for a softcover copy, ~~107.20~~ **131.20** for members and ~~134~~ **164** for ~~members~~ **nonmembers** for a looseleaf copy, and ~~80.80~~ **101.60** for members and ~~101~~ **127** for nonmembers for a CD-ROM or electronic copy.

Sec. 2. NAC 445A.66685 is hereby amended to read as follows:

445A.66685 1. Except as otherwise provided in subsection 2, the design and construction of a public water system must comply with the provisions of:

(a) NAC 445A.65505 to 445A.6731, inclusive.

(b) The *American Water Works Association Standards*, as adopted by reference in NAC 445A.6663.

(c) Standards 14, 42, 44, 53, 55, 58, 60, 61 and 372 of the American National Standards Institute and NSF International, as adopted by reference in NAC 445A.6663.

(d) *Manual of Water Supply Practices M14* ~~Recommended Practice for~~ *Backflow Prevention and Cross-Connection Control*, *Recommended Practices*, as adopted by reference in NAC 445A.6663.

(e) *Recommended Standards for Water Works*, as adopted by reference in NAC 445A.6663.

(f) For public water systems in Carson City, Fallon, Reno, Sparks, Yerington, Douglas County, Lander County, Lyon County, Nye County or Washoe County, *Standard Specifications for Public Works Construction*, also known as the “Orange Book,” as adopted by reference in NAC 445A.6663.

(g) For public water systems in Boulder City, Henderson, North Las Vegas, the Big Bend Water District or the Las Vegas Valley Water District, *Uniform Design and Construction Standards for Potable Water ~~Distribution~~ Systems*, as adopted by reference in NAC 445A.6663.

(h) *The Uniform Plumbing Code*, as adopted by reference in NAC 445A.6663.

(i) Any other engineering standards approved by the Division.

2. If there is any conflict between any of the provisions described in subsection 1, the most stringent of those provisions prevails unless a special exception has been granted pursuant to NAC 445A.6665.

Sec. 3. NAC 445A.66715 is hereby amended to read as follows:

445A.66715 1. Work on a water project must be:

(a) Performed in substantial compliance with the plans and specifications approved for the water project by the Division or the appropriate district board of health. Approval of the Division or the appropriate district board of health is required before carrying out any proposed changes in materials, equipment, quantities, configurations or processes, and before any additions or deletions of infrastructure, which would affect the quality or quantity of water.

(b) Inspected by qualified representatives of the supplier of water.

2. Within 30 days after the completion of a water project, the supplier of water shall certify to the Division or the appropriate district board of health that the water project was completed in substantial compliance with the plans and specifications approved for the water project by the Division or the appropriate district board of health.

3. Not later than 90 days after the completion of a water project, the supplier of water shall supply to the Division or the appropriate district board of health one set of drawings of the water project as it was built.

Sec. 4. NAC 445A.66915 is hereby amended to read as follows:

445A.66915 1. A water well with an above-ground discharge must be protected by a concrete slab and, if the well is equipped with a lineshaft turbine pump, with a concrete pedestal, both of which are constructed of continuously poured concrete. The pedestal must be of a sufficient diameter to extend at least 3 inches beyond the outer periphery of the sanitary seal. The slab must:

- (a) Be placed above the finished grade;
- (b) Have a minimum thickness of 6 inches;
- (c) Slope away from the pedestal at a minimum slope of 2 percent;
- (d) Extend a minimum of 4 feet from the casing of the well in all directions; and
- (e) Be free from cracks and other defects likely to detract from its capability to remain watertight.

↪ The casing of the well must extend to a height of at least 12 inches above the slab and at least 18 inches above the level of the final ground surface or 100-year floodplain, whichever is greater.

2. If a water well is equipped with a lineshaft turbine pump:

- (a) The top of the casing must be sealed into the base of the pump or the casing must be inserted into a recess extending at least 1 inch into the base of the pump.

(b) The foundation and base of the pump must be designed in such a manner as to prevent water from coming into contact with joints between the base of the pump and the casing, and from entering the well.

3. Any submersible pumps installed in a water well must be constructed in accordance with *American Water Works Association Standard ~~E101.~~ E102, as adopted by reference in NAC 445A.6663.*

Sec. 5. NAC 445A.66995 is hereby amended to read as follows:

445A.66995 A supplier of water shall ensure that, with regard to the pumps used by the public water system:

1. Each pump is suitable for its intended purpose, has an adequate capacity for its intended purpose, *is determined to be compatible with drinking water* and is installed in accordance with the directions of the manufacturer.

2. When the pressure in a distribution system is dependent exclusively on a pumping station, at least two pumping units are used unless the required quantity and pressure of water can be supplied by other facilities in the public water system during any period that can reasonably be expected necessary to complete the repair of one pump.

3. Power to drive a pump at maximum horsepower is provided by a suitably sized prime mover.

4. Spare parts and tools are readily accessible.

5. Control equipment is provided with proper heaters or fuses for protection from overloads.

6. If a lineshaft turbine pump has oil-lubricated bearings, the grade and designation of the oil is approved by the Division of ~~Public and Behavioral Health.~~ *Environmental Protection.*

7. If a pump is used to pressurize a small system that may experience periods of zero flow, the pump has a small relief bypass to prevent the overheating of water in the pump.

Sec. 6. NAC 445A.67025 is hereby amended to read as follows:

445A.67025 **1.** Except as otherwise justified by an engineer and approved by the Division or the appropriate district board of health, a supplier of water shall ensure that, with regard to the suction piping of the public water system:

~~1.1~~ **(a)** The velocity of water in the piping ~~does not exceed 3 feet per second.~~ *is in compliance with the specifications and recommendations of the manufacturer of the pump.*

~~1.2~~ **(b)** The diameter of the piping is ~~at least 2 inches greater than that of the inlet for~~ *sized in compliance with the specifications and recommendations of the manufacturer of* the pump.

~~1.3~~ **(c)** The reducer between the piping and the pump is an eccentric reducer and not a concentric reducer.

~~1.4~~ **(d)** A fitting is installed between the inlet valve and pump which will allow easy removal of the pump. For pumps in suction lift, unions must not be used, and valves, except for foot valves, must not be installed on suction lines.

~~1.5~~ **(e)** There is a continuous slope up from the surface of the water to the pump. The suction line must be as straight as possible, and the restriction of suction must be minimized.

~~1.6~~ **(f)** If there is a valve on the suction line, *except as otherwise provided in subsection 2,* there is installed between the valve and the pump, preferably on a spool, a *permanent pressure* gauge that:

~~(a)~~ **(1)** Operates within the appropriate range of pressure; and

~~(b)~~ **(2)** Is equipped with a pet cock or ball valve. Except when the gauge is being read, the pet cock and ball valve must remain closed.

~~{7.}~~ (g) If elbows are required in the suction line, the elbows are ~~{of a sufficiently long radius to minimize head loss.}~~ *designed in compliance with the specifications and recommendations of the manufacturer of the pump.*

~~{8.}~~ (h) Each inlet of a suction pipe in a suction well or clear well is:

~~{(a)}~~ (1) Bell-shaped in such a manner as to reduce head loss at the entrance. Square-cut inlets are prohibited.

~~{(b)}~~ (2) Adequately submerged, in accordance with the specifications of the manufacturer, at a depth of at least six times the diameter of the pipe.

~~{(c)}~~ (3) Located away from:

~~{(1)}~~ (I) The floor of the suction well or clear well at a distance specified by the manufacturer of the pump or, in the absence of such a specification, at a distance of not less than four nor more than five times the diameter of the pipe.

~~{(2)}~~ (II) The sidewall of the suction well or clear well at a distance specified by the manufacturer of the pump or, in the absence of such a specification, at a distance of not less than one-half the diameter of the pipe nor more than the diameter of the pipe.

~~{9.}~~ (i) If an inlet screen is installed:

~~{(a)}~~ (1) The inlet screen is designed in such a manner that an adequate flow can enter the pump when half of the screen is plugged.

~~{(b)}~~ (2) The diameter of the screen inlet is at least three times the diameter of the suction pipe inlet.

~~{10.}~~ (j) If a foot valve is used, the diameter of the foot valve is at least 2 inches greater than that of the inlet piping.

~~{11.}~~ (k) If a pump is connected to a header used for suction:

~~1(a)~~ (1) The connection is at an angle relative to the header of not less than 30 degrees nor more than 45 degrees; or

~~1(b)~~ (2) If it is necessary to connect the pump to the header at an angle of 90 degrees, the pump is located away from the header at a distance ~~{of at least eight times the diameter of the suction pipe.}~~ *in compliance with the specifications and recommendations of the manufacturer of the pump.*

~~12.~~ (l) If a pump is in suction head, a valve is installed in the suction line to facilitate the removal of the pump for maintenance. The valve must not be used to throttle the pump.

2. In lieu of installing a permanent pressure gauge as required by paragraph (f) of subsection 1, a supplier of water may install a connection for a temporary pressure gauge and a pressure transducer with a local or remote indicator. A temporary pressure gauge installed pursuant to this subsection must be maintained on site.

Sec. 7. NAC 445A.6703 is hereby amended to read as follows:

445A.6703 Except as otherwise justified by an engineer and approved by the Division or the appropriate district board of health, a supplier of water shall ensure that, with regard to the discharge piping of the public water system:

1. ~~{A concentric reducer or eccentric reducer is installed at the pump, such that the}~~ *The diameter of the discharge pipe is {at least 2 inches greater than that of the discharge} sized in accordance with the specifications and recommendations of the manufacturer of the pump. A concentric reducer or eccentric reducer may be installed on the discharge pipe.*

2. A fitting, which may consist of a spool or union, is installed on a discharge pipe to facilitate the removal of the pump. ~~{A}~~ *Except as otherwise provided in this subsection, a permanent pressure gauge with a pet cock or ball valve must also be installed on the discharge*

pipe. *In lieu of a permanent pressure gauge, a connection for a temporary pressure gauge and a pressure transducer may be installed. A temporary pressure gauge installed pursuant to this subsection must be maintained on-site.*

3. A check valve or other suitable type of valve is installed just beyond the fitting required by subsection 2, to prevent the reversal of flow through the pump. On pumping installations of:

(a) Low pressure, a swing check valve may be used.

(b) High pressure, a silent check valve or automatic check valve, or another suitable valve, must be used. The engineer who designs such an installation shall seek to minimize the potential for water hammer.

4. Another valve is installed just beyond the check valve required pursuant to subsection 3, to isolate the discharge and to provide for a positive shutdown of the system when repair is required.

5. Isolation valves are not used for the control of flow or pressure and remain only in a fully open or a fully closed position. If the control of flow or pressure is desired, other valves must be installed.

6. The piping is arranged in such a manner as to avoid high spots. An air and vacuum valve, which is piped to a drain, must be provided.

7. The piping is rigidly supported and restrained in such a manner as to prevent movement.

Sec. 8. NAC 445A.67035 is hereby amended to read as follows:

445A.67035 1. ~~Each~~ *Except as otherwise provided in subsection 4, each* pump must:

(a) Have a *permanent* standard pressure gauge on its discharge line located upstream from any check valve.

(b) Except for a vertical turbine pump, have a:

(1) ~~Standard~~ *Permanent standard* pressure gauge on its suction line if the pump is in suction head; or

(2) A *permanent* compound pressure gauge on its suction line if the pump is in suction lift.

2. Each pumping station must have a device for measuring the rate of flow of discharge and the total flow.

3. A meter or flow sensor must have straight pipes installed both upstream and downstream. The length of the pipes must:

(a) Comply with the specifications of the manufacturer of the meter or flow sensor; or

(b) In the absence of those specifications, be at least five times the diameter of the pipes.

4. In lieu of a permanent standard or compound pressure gauge required by subsection 1, a pump may have a connection for a temporary pressure gauge and a pressure transducer with a local or remote indicator. A temporary pressure gauge installed pursuant to this subsection must be maintained on-site.

Sec. 9. NAC 445A.67145 is hereby amended to read as follows:

445A.67145 1. Except as otherwise provided in this section, a water main must be installed:

(a) For public water systems in Carson City, Fallon, Reno, Sparks, Yerington, Douglas County, Lander County, Lyon County, Nye County or Washoe County, in compliance with *Standard Specifications for Public Works Construction*, also known as the “Orange Book,” and the *American Water Works Association Standards*, as adopted by reference in NAC 445A.6663.

(b) For public water systems in Boulder City, Henderson, North Las Vegas, the Big Bend Water District or the Las Vegas Valley Water District, in compliance with *Uniform Design and*

Construction Standards for Potable Water ~~{Distribution}~~ Systems and the American Water Works Association Standards, as adopted by reference in NAC 445A.6663.

(c) For public water systems in other areas of the State, in compliance with the *American Water Works Association Standards*, as adopted by reference in NAC 445A.6663.

(d) Except as otherwise provided in paragraphs (a), (b) and (c), in compliance with the procedures for installation recommended by the manufacturer of the water main.

2. Except as otherwise provided in this subsection, water mains must be installed in areas that are dedicated for public use as streets or highways or are otherwise sufficiently open to the public to facilitate access for maintenance and emergency repairs. Water mains may be constructed on private property, under structures or in or under bodies of water only if approved by the Division or the appropriate district board of health.

3. Piping for a distribution system must be designed and constructed in such a manner that appropriate measures, as determined by frost depth, type of backfill and surface loads, are taken for trenching, bedding and refilling. Water mains must be:

(a) Properly bedded and covered with a sufficient amount of earth or other insulation to prevent freezing.

(b) Installed with at least 36 inches of cover over the piping or at least 12 inches below frost depth, whichever is deeper.

4. The design and construction of a distribution system must provide for the avoidance of pressure surges and water hammer through the use of reaction blocking and similar methods. Where appropriate, water mains, tees, bends, plugs and hydrants must have thrust blocks, thrust anchors or joints designed to prevent movement. Water mains located on a slope must be restrained in such a manner as determined appropriate by an engineer.

5. Locator tape, magnetic tape or conductive wire and tape must be installed in the trench above a water main.

6. A water main must not be placed into service after its initial construction until:

(a) The water main has been disinfected in accordance with *American Water Works Association Standard C651*, as adopted by reference in NAC 445A.6663. The disposal of any spent chlorine solutions must be coordinated with the Division.

(b) An analysis of the water main which indicates that it meets primary standards for coliform bacteria has been obtained and reported to the Division or the appropriate district board of health.

7. The piping installed in a distribution system must, if the piping consists of:

(a) Ductile iron, be pressure tested in accordance with *American Water Works Association Standard C600*, as adopted by reference in NAC 445A.6663;

(b) PVC, be pressure tested in accordance with *American Water Works Association Standard C605*, as adopted by reference in NAC 445A.6663; or

(c) Another material, be pressure tested in accordance with:

(1) For public water systems in Carson City, Fallon, Reno, Sparks, Yerington, Douglas County, Lander County, Lyon County, Nye County or Washoe County, *Standard Specifications for Public Works Construction*, also known as the “Orange Book,” as adopted by reference in NAC 445A.6663;

(2) For public water systems in Boulder City, Henderson, North Las Vegas, the Big Bend Water District or the Las Vegas Valley Water District, *Uniform Design and Construction Standards for Potable Water ~~fDistribution~~ Systems*, as adopted by reference in NAC 445A.6663; or

(3) For public water systems in other areas of the State, the requirements of the Division or the appropriate district board of health,

↳ before the piping is flushed, disinfected or sampled for an analysis of water quality.

8. During the construction of a distribution system, any openings in unfinished piping or appurtenances must be sealed at the end of each working day in such a manner as to prevent the entry of birds and other animals, dirt, trench water and other sources of pollution or contamination.

Sec. 10. NAC 445A.67185 is hereby amended to read as follows:

445A.67185 A supplier of water shall:

1. Ensure that there are no unprotected connections between the supplies of water, systems for the pumping, storage and treatment of water, and distribution system of the public water system and any source of pollution or contamination pursuant to which any unsafe water or other degrading material can be discharged or drawn into the public water system as a result of backsiphonage or backpressure.

2. Develop and carry out a program for the control of cross-connections that is approved by the Division or the appropriate district board of health. Except for a program that has been approved by the Division of Public and Behavioral Health or the appropriate district board of health before February 20, 1997, a program for the control of cross-connections must:

(a) Be submitted to the Division or the appropriate district board of health for its approval not later than:

(1) January 1, 1999; or

(2) Eighteen months after the public water system begins operation,

↳ whichever is later.

(b) Include:

(1) A schedule for implementation.

(2) A plan for inspecting the properties served by the public water system to determine the potential risk of cross-connection and backflow.

(3) A plan for testing and tracking all primary assemblies for the prevention of backflow which are intended to protect the public water system upstream from a service connection. The plan must provide for the annual testing of those assemblies and for the retention of records from that testing.

(4) A list of the particular assemblies for the prevention of backflow which may be used in the public water system or on service connections to the public water system.

(5) A list of the measures the supplier of water will take to enforce the program if any customers of the system fail to comply with the program.

(c) Ensure compliance with NAC 445A.67185 to 445A.67255, inclusive.

(d) Except as otherwise provided in NAC 445A.67185 to 445A.67255, inclusive, comply with the provisions of:

(1) The *Uniform Plumbing Code*, as adopted by reference in NAC 445A.6663;

(2) *Manual of Water Supply Practices M14 ~~Recommended Practice for~~ Backflow Prevention and Cross-Connection Control, Recommended Practices*, as adopted by reference in NAC 445A.6663; and

(3) The *Manual of Cross-Connection Control*, as adopted by reference in NAC 445A.6663.

➔ If there is any conflict between any of the provisions described in this paragraph, the most stringent of those provisions prevails.

Sec. 11. NAC 445A.67195 is hereby amended to read as follows:

445A.67195 Except as otherwise provided in NAC 445A.67185 to 445A.67255, inclusive, or authorized by the Division or the appropriate district board of health, the minimum type of protection from cross-connection required for a service connection to:

1. A public building or any building:

- (a) That contains a hotel, motel ~~{}~~ or casino ; ~~{; condominium or town house, or any apartments;}~~
- (b) Used for commercial purposes where a specific business activity has not been identified;
or
- (c) In which one or more sewage pumps or sewage ejectors have been installed,
↳ consists of a reduced pressure principle assembly.

2. *A dwelling unit consists of a reduced pressure principle assembly, if the service connection serves more than one dwelling unit. As used in this subsection, “dwelling unit” includes, without limitation, a condominium, apartment or townhouse.*

3. A building that:

- (a) Has multiple stories and booster pumps or elevated tanks to distribute potable water; or
- (b) Exceeds 40 feet in height, as measured from the service connection to the highest water outlet,
↳ consists of a double check valve assembly.

~~{3;}~~ 4. A class 1, class 2 or class 3 fire sprinkler system consists of a double check valve assembly.

~~{4;}~~ 5. A class 4, class 5 or class 6 fire sprinkler system consists of a reduced pressure principle assembly.

~~15.1~~ 6. A hydronic heating system that contains any chemical additives consists of a reduced pressure principle assembly.

~~16.1~~ 7. A baptismal font of a church consists of a reduced pressure principle assembly.

~~17.1~~ 8. A facility for bottling beverages consists of a reduced pressure principle assembly.

~~18.1~~ 9. A brewery consists of a reduced pressure principle assembly.

~~19.1~~ 10. A cannery, facility for the processing of food, packing house or rendering facility consists of a reduced pressure principle assembly.

~~110.1~~ 11. A facility for cold storage consists of a reduced pressure principle assembly.

~~111.1~~ 12. A dairy processing facility consists of a reduced pressure principle assembly.

~~112.1~~ 13. A restaurant or other facility in which food is served consists of a reduced pressure principle assembly.

~~113.1~~ 14. A dental clinic consists of a reduced pressure principle assembly.

~~114.1~~ 15. A hospital, medical building or clinic consists of a reduced pressure principle assembly.

~~115.1~~ 16. A convalescent home or nursing home consists of a reduced pressure principle assembly.

~~116.1~~ 17. A sanitarium consists of a reduced pressure principle assembly.

~~117.1~~ 18. A morgue, mortuary or facility for conducting autopsies consists of a reduced pressure principle assembly.

~~118.1~~ 19. A laboratory, including, without limitation, a laboratory of a teaching institution or another biological or analytical facility, consists of a reduced pressure principle assembly.

~~119.1~~ 20. A facility of a school, college or university consists of a reduced pressure principle assembly.

~~{20.}~~ 21. A facility for the production of motion pictures consists of a reduced pressure principle assembly.

~~{21.}~~ 22. A facility for the publishing or printing of a newspaper consists of a reduced pressure principle assembly.

~~{22.}~~ 23. A veterinary clinic, pet shop or facility for grooming pets consists of a reduced pressure principle assembly.

~~{23.}~~ 24. A laundry or dry cleaning facility consists of a reduced pressure principle assembly.

~~{24.}~~ 25. A dyeing facility consists of a reduced pressure principle assembly.

~~{25.}~~ 26. A facility for mechanical, chemical or electrochemical plating consists of a reduced pressure principle assembly.

~~{26.}~~ 27. Any portable spraying or cleaning equipment consists of an air gap.

~~{27.}~~ 28. A pool or spa consists of a reduced pressure principle assembly.

~~{28.}~~ 29. A park for mobile homes or recreational vehicles consists of a reduced pressure principle assembly.

~~{29.}~~ 30. A facility located on a waterfront, including, without limitation, a fishery, fish hatchery, dock or marina, consists of a reduced pressure principle assembly.

~~{30.}~~ 31. A facility for the production of power consists of a reduced pressure principle assembly.

~~{31.}~~ 32. A facility for the production, storage or transmission of oil or gas consists of a reduced pressure principle assembly.

~~{32.}~~ 33. A facility that handles, processes or stores radioactive materials or substances consists of a reduced pressure principle assembly.

~~33.~~ 34. A facility for processing sand or gravel consists of a reduced pressure principle assembly.

~~34.~~ 35. A system for storm drainage, the collection of sewage or the distribution of reclaimed wastewater consists of an air gap.

~~35.~~ 36. A facility in which:

(a) Water is used to manufacture, store, compound or process chemicals for industrial purposes;

(b) Chemicals are added to water used in the compounding or processing of products;

(c) Chemicals are added to the supply of water; or

(d) The supply of water is used for the transmission or distribution of chemicals,

↪ consists of a reduced pressure principle assembly.

~~36.~~ 37. A facility for the manufacture of aircraft or missiles consists of a reduced pressure principle assembly.

~~37.~~ 38. A facility for the manufacture, repair or washing of motor vehicles consists of a reduced pressure principle assembly.

~~38.~~ 39. A facility for the manufacturing or processing of film consists of a reduced pressure principle assembly.

~~39.~~ 40. A facility for the manufacturing of ice consists of a reduced pressure principle assembly.

~~40.~~ 41. A facility for the manufacturing, processing or cleaning of metal consists of a reduced pressure principle assembly.

~~41.~~ 42. A facility for the manufacturing of natural or synthetic rubber consists of a reduced pressure principle assembly.

~~{42.}~~ 43. A facility for the manufacturing of paper or paper products consists of a reduced pressure principle assembly.

~~{43.}~~ 44. Any other facility for manufacturing, processing or fabricating consists of a reduced pressure principle assembly.

Sec. 12. NAC 445A.67215 is hereby amended to read as follows:

445A.67215 1. A supplier of water shall ensure that:

(a) An appropriate assembly for the prevention of backflow is installed at each service connection between the public water system and a fire sprinkler system; and

(b) The assembly is:

(1) *Easily accessible;*

(2) Tested upon installation; and

~~{2.}~~ (3) Maintained and tested, and the results of those tests logged, annually.

↪ The testing required by this subsection must be conducted by a certified backflow prevention assembly tester.

2. An assembly for the prevention of backflow installed on a service connection between a public water system and a fire sprinkler system must:

(a) Be of such a type and installed in such a manner that the assembly:

(1) Protects the public water system; and

(2) Does not interfere with the capability of the fire sprinkler system, as engineered, to protect the safety of persons in the public or private facility in which the fire sprinkler system is located; and

(b) Prevent any pollution or contamination of drinking water, by any nonpotable water contained in the fire sprinkler system, which may be caused by any backpressure or

backsiphonage that may occur during normal or abnormal operation of the fire sprinkler system or the public water system.

3. The supplier of water shall determine the type of assembly required on a particular service connection between the public water system and a fire sprinkler system based upon the degree of risk posed by the fire sprinkler system to the supply of potable water, considering the chemical and biological contents of the fire sprinkler system, the materials used to construct the fire sprinkler system and the possibility that backflow will occur.

4. Any reduced pressure principle assembly or reduced pressure detector assembly used on a service connection between a public water system and a fire sprinkler system must *be located above ground and* not have any holes drilled in the check valve clappers.

5. If an assembly for the prevention of backflow is not installed on a service connection between a public water system and a fire sprinkler and the supplier of water determines that the absence of a backflow prevention device presents a potential threat to the water system, the supplier of water must submit a report to the property owner setting forth the estimated available pressure and rate of flow delivered to the service connection both before and after an assembly for the prevention of backflow is installed. The report must include, without limitation, a recommendation that the property owner contact a fire design professional to determine if any modification to the fire sprinkler system is necessary given the estimated available pressure and rate of flow delivered to the service connection if the assembly for the prevention of backflow is installed.

Sec. 13. NAC 445A.6722 is hereby amended to read as follows:

445A.6722 **1.** The designer of a fire sprinkler system shall ensure that, based upon the placement of any reduced pressure principle assembly or reduced pressure detector assembly:

~~1.1~~ (a) An antifreeze loop or the total line of the fire sprinkler system is able to accommodate the thermal expansion of any antifreeze; or

~~1.2~~ (b) If necessary, an expansion tank is provided to accommodate the thermal expansion of any antifreeze.

2. The designed pressure and rate of flow of water required to operate a fire sprinkler system must be based on the minimum pressure, as determined by the fire authority, that accounts for:

(a) The loss in pressure associated with the meter, if applicable; and

(b) The assembly for the prevention of backflow.

Sec. 14. NAC 445A.67225 is hereby amended to read as follows:

445A.67225 *1.* If any backflow involving a fire sprinkler system threatens a public water system, the supplier of water shall require, as a condition to the provision of service to the fire sprinkler system:

~~1.1~~ (a) The installation of an assembly for the prevention of backflow in accordance with the requirements of NAC 445A.67215.

~~1.2~~ (b) An analysis to determine how the assembly will affect the pressure and rate of flow of water available to the fire sprinkler system.

~~1.3. The modification of~~ *The analysis must include the pressure and rate of flow of water required to operate the fire sprinkler system, as determined by the fire authority.*

2. If the pressure and rate of flow listed in an analysis required by paragraph (b) of subsection 1 is not adequate to operate the fire sprinkler system, the supplier of water shall notify the operator of the facility in which the fire sprinkler system is located that modifications are necessary to ensure the fire sprinkler system, and the riser and water service

lateral for the fire sprinkler system, *operate* in such a manner as necessary to ensure adequate *pressure and* fire flow.