



***Cross-Connection Control  
Regulations and  
Working Memos***



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## Part II. Operation Regulations for Waterworks

### Article 4. Cross Connection Control and Backflow Prevention in Waterworks [Repealed]

#### 12VAC5-590-580. General requirements for cross-connection control and backflow prevention.

A. Every owner shall establish and enforce a cross-connection control program (CCCP) in accordance with 12VAC5-590-360. The goal of the CCCP is to prevent the intrusion of contamination into the distribution system via cross-connections and backflow. The owner shall document the CCCP activities in a cross-connection control plan and submit the written document to the department for review and approval.

B. No owner shall install, maintain, or allow a service connection to any premises where cross-connections to a waterworks or a consumer's water system exist, unless the owner and department ensure the cross-connections are adequately safeguarded.

C. No owner shall install, maintain, or allow any connection whereby water from an auxiliary water system may enter a waterworks or consumer's water system, unless the owner and department approve the auxiliary water system, the method of connection, and use of such system ].

D. The owner, in accordance with 12VAC5-590-510 C, shall maintain acceptable working pressures in the distribution system to reduce the potential for backflow to occur.

#### **Statutory Authority**

§§32.1-12 and 32.1-170 of the Code of Virginia.

#### **Historical Notes**

Derived from VR355-18-006.01 § 2.25, eff. August 1, 1991; amended, Virginia Register Volume 9, Issue 17, eff. June 23, 1993; Volume 37, Issue 20, eff. June 23, 2021.

## Part II. Operation Regulations for Waterworks

### Article 4. Cross Connection Control and Backflow Prevention in Waterworks [Repealed]

#### 12VAC5-590-600. Cross-connection control program responsibilities.

A. The owner shall establish and implement a CCCP consistent with the extent of the distribution system and the consumers served by the waterworks. The owner shall review the CCCP and written cross-connection control plan not less than every five years and update it as necessary to satisfy the requirements of this chapter. The owner shall submit updates to the department to obtain approval. The department may review the plan upon request. This program shall include at least one designated individual assigned by the owner. Requirements for this position shall include training and experience in cross-connection control programs.

B. The CCCP shall not be in conflict with the USBC and applicable building code regulations, including 13VAC5-63 or subsequent regulations promulgated by the Board of Housing and Community Development.

C. The CCCP shall ensure complete assessments of every consumer's water system and shall determine both the degree of hazard and the appropriateness of existing safeguards to prevent contamination from cross-connections and backflow.

D. The CCCP shall ensure testing, maintenance, and repairs of all backflow prevention assemblies, backflow elimination methods, and backflow prevention devices required and installed pursuant to 12VAC5-590-610.

E. 13VAC5-63-530, which incorporates the International Property Maintenance Code into the USBC, requires testing of RPZ assemblies, double check valve assemblies, double check detector backflow assemblies, and pressure vacuum breaker assemblies after initial installation, immediately after repairs or relocation, and annually thereafter. The CCCP shall establish procedures for completing and monitoring operational tests, or other evaluation procedures as appropriate, at least annually, and after installation, relocation, or repairs, for testable backflow prevention assemblies, devices, and methods that provide containment. The CCCP may include a public education program to:

1. Prompt consumer self-assessments, increase the awareness of cross-connections, and inform the consumer of the public health hazards of backflow.
2. The public education program, if provided as part of the CCCP, shall include, at a minimum, the following:

- a. Causes of backflow;
- b. Hazards and health effects of cross-connections and backflow;
- c. Resources available to identify actual or potential cross-connections;
- d. Safeguards to use to eliminate or control the hazards at the point of use; and
- e. Sources for additional information.

F. The CCCP shall provide a method to discontinue or refuse water service to the consumer to ensure that the waterworks is adequately protected from cross-connections and backflow if any of the following conditions occur:

1. The consumer does not install, test and maintain a required backflow prevention assembly or backflow elimination method in accordance with the applicable sections of this chapter;
2. The consumer allows a required backflow prevention assembly or backflow elimination method to become inoperable or the consumer removes or bypasses it; or
3. The owner knows an unprotected or inadequately protected cross-connection exists on the premises and determines that there is inadequate backflow prevention at the service connection.

G. In the event of backflow of contaminants into the waterworks, the owner shall promptly take or cause corrective action to confine and eliminate the contamination. The owner shall report the event to the department within one business day in the most expeditious manner. The owner shall submit a written report by the 10th day of the month following the month during which backflow occurred addressing the incident, its causes and effects, and safeguards required or other action taken.

H. The owner shall maintain an inventory and records of testing, repairs, and maintenance of all backflow prevention assemblies, backflow elimination methods, and backflow prevention devices required and installed under 12VAC5-590-610 C. In the case of single-family residences subject to 12VAC5-590-610 C 5, the owner may determine whether or not to maintain an inventory or records. The department recommends the owner follow best practices identified in the AWWA Manual of Water Supply Practices M14 and the EPA Cross-Connection Control Manual.

I. The owner shall maintain an inventory and records of testing, repairs, and maintenance of all backflow prevention assemblies, backflow elimination methods, and backflow prevention devices required and installed under 12VAC5-590-610 E.

J. The owner shall maintain records related to the CCCP implementation, and any other records the department requires in accordance with 12VAC5-590-550.

**Statutory Authority**

§§32.1-12 and 32.1-170 of the Code of Virginia.

**Historical Notes**

Derived from VR355-18-006.03 § 2.27, eff. August 1, 1991; amended, Virginia Register Volume 9, Issue 17, eff. June 23, 1993; Volume 37, Issue 20, eff. June 23, 2021.

## Part II. Operation Regulations for Waterworks

### Article 4. Cross Connection Control and Backflow Prevention in Waterworks [Repealed]

#### 12VAC5-590-610. Containment of backflow.

A. The owner shall ensure installation of backflow prevention assemblies or backflow elimination methods (i) at the service connection or (ii) downstream of the service connection but before any unprotected takeoffs.

B. Where the consumer's water system is not intricate or complex and where actual or potential cross-connection hazards can be eliminated or controlled, instead of containment, the owner may allow consumers to use point-of-use isolation protection by application of appropriate backflow prevention assemblies, backflow prevention devices, or backflow elimination methods complying with the USBC.

C. A backflow prevention assembly or backflow elimination method shall be installed where the following conditions exist:

1. A substance is handled in such a manner as to create an actual or potential hazard to a waterworks (this shall include premises having sources or systems containing process fluids or waters originating from a waterworks which are no longer under the control of the owner);
2. There exists internal cross-connections that, in the judgment of the owner or the department, may not be easily correctable or have intricate or complex plumbing arrangements that make it impracticable to determine whether or not cross-connections exist;
3. There are security requirements or other prohibitions or restrictions that prevent the assessment of all potential cross-connections that may impair the quality of the water delivered;
4. There is a repeated history of cross-connections being established or reestablished;
5. There are fire protection systems, lawn sprinkler systems, or irrigation systems;
6. The owner or department can show that a potential cross-connection hazard exists.

D. The owner shall ensure that consumers equip premises having booster pumps or fire pumps connected to the waterworks with control devices to prevent a reduction of pump suction line pressure to less than 20 psig.

E. A backflow prevention assembly or backflow elimination method shall be installed at consumer water systems serving the following types of facilities, including:

1. Hospitals, mortuaries, clinics, veterinary establishments, nursing homes, and medical buildings;
2. Laboratories;
3. Piers, docks, and waterfront facilities;
4. Sewage treatment plants, sewage pumping stations, or storm water pumping stations;
5. Food and beverage processing plants;
6. Chemical plants, dyeing plants, and pharmaceutical plants;
7. Metal plating industries;
8. Petroleum or natural-gas processing or storage plants;
9. Radioactive materials processing plants or nuclear reactors;
10. Car washes and laundries;
11. Buildings with commercial, industrial, or institutional occupants served through a master meter;
12. Water loading facilities;
13. Slaughter houses and poultry processing plants;
14. Farms where the water is used for other than household purposes;
15. Commercial greenhouses and nurseries;
16. Health clubs with swimming pools, therapeutic baths, hot tubs, or saunas;
17. Paper and paper-product plants and printing plants;
18. Pesticide or exterminating companies and their vehicles with storage or mixing tanks;
19. Facilities that blend, store, package, transport, or treat chemicals, and their related vehicles;
20. Schools or colleges with laboratory facilities;
21. Highrise buildings (four or more stories);
22. Multiuse commercial, office or warehouse facilities; and
23. Others specified by the owner or the department when reasonable cause can be shown for a potential backflow or cross-connection hazard.

F. All temporary or emergency service connections shall be protected where reasonable cause can be shown for a potential backflow or cross-connection hazard. Backflow prevention assemblies or backflow elimination methods used shall be appropriately certified or approved to match the requirements of this section.



**Statutory Authority**

§§32.1-12 and 32.1-170 of the Code of Virginia.

**Historical Notes**

Derived from VR355-18-006.04 § 2.28, eff. August 1, 1991; amended, Virginia Register Volume 9, Issue 17, eff. June 23, 1993; Volume 37, Issue 20, eff. June 23, 2021.

## Part II. Operation Regulations for Waterworks

### Article 4. Cross Connection Control and Backflow Prevention in Waterworks [Repealed]

#### 12VAC5-590-630. Backflow prevention assemblies, devices, and backflow elimination methods for containment.

A. Any backflow prevention assembly or backflow elimination method or backflow prevention device shall be of the approved type and shall comply with the USBC.

#### B. General safeguards

1. The backflow prevention assembly or backflow elimination method or backflow elimination device used shall depend on the degree of hazard that exists or may exist. The safeguard shall ensure maintenance of the distribution system water quality and its usefulness.

2. The degree of hazard, either high or low, is based on (i) the nature of the contaminant; (ii) the potential of the health hazard; (iii) the potential method of backflow (either by backpressure or by backsiphonage); and (iv) the potential effect on waterworks structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of potable water. Table 630.1 shall be used as a guide to determine the degree of hazard for any situation.

Table 630.1  
Determination of Degree of Hazard

Cross-connections that meet or may meet the following conditions shall be rated at the corresponding degree of hazard.

High Hazard	Low Hazard
The contaminant would be toxic, poisonous, noxious, unhealthy, or of unknown quality.	The contaminant would only degrade the quality of the water aesthetically or impair the usefulness of the water.
A health hazard would exist.	A health hazard would not exist.
The contaminant would disrupt the service of piped water for human consumption.	The contaminant would not disrupt service of piped water for human consumption.
Backflow would be by either backpressure or backsiphonage.	Backflow would occur by backsiphonage.
Examples: lawn irrigation systems, fire sprinkler systems with chemical additives or antifreeze, sewage, used water, nonpotable water, auxiliary water systems, and mixtures of water and other liquids, gases, or other	Examples: food residuals, coffee machines, non-carbonated beverage dispensers, and residential fire sprinkler systems constructed of materials designed for potable water flow.

chemicals.

3. The USBC and the manufacturer's specifications shall be used to determine the appropriateness of the backflow prevention assembly or backflow prevention device application for containment.

C. Owners shall not allow the installation of backflow prevention devices or backflow prevention assemblies with openings, outlets, or vents that are designed to operate or open during backflow prevention:

1. In areas subject to flooding or in pits;
2. In areas with atmospheric conditions that represent a contamination threat to the potable water supply; and
3. In such a manner as to be able to be bypassed.

D. Starting January 1, 2023, persons testing and repairing backflow prevention assemblies and backflow prevention devices shall be certified by a Commonwealth of Virginia tradesman certification program (identified by DPOR as backflow prevention device workers). Until January 1, 2023, persons testing and repairing backflow prevention assemblies and backflow prevention devices shall be qualified to perform such work as demonstrated by possessing a certification or license from a local or state agency having legal authority or shall possess a certificate of completion of applicable vocational training acceptable to the owner.

**Statutory Authority**

§§32.1-12 and 32.1-170 of the Code of Virginia.


**Historical Notes**

Derived from VR355-18-006.06 § 2.30, eff. August 1, 1991; amended, Virginia Register Volume 9, Issue 17, eff. June 23, 1993; Volume 31, Issue 1, eff. October 10, 2014; Volume 37, Issue 20, eff. June 23, 2021.



**DATE:** August 29, 1980, **Revised** November 15, 2002, **February 4, 2014**

**TO:** ODW Field Office and Technical Services Staff

**FROM:** John J Aulbach II, PE, Director  
Office of Drinking Water 

**SUBJECT:** ADMINISTRATION - CONTACTS OUTSIDE ODW –  
Interaction with the Board of Housing and Community Development

Project Leader: Susan Douglas 

A revised Memorandum of Understanding (MOU), attached, has been signed between the State Health Commissioner and the Director of the Department of Housing and Community Development (DHCD). The purpose of the MOU is to coordinate the implementation of the VDH's *Waterworks Regulations* and the BHCD's *Uniform Statewide Building Code*. The revised versions are substantially similar to the initial agreement, albeit with updated language and clarifications.

In the late 1980's the Virginia Department of Health (VDH) entered into an agreement with the Board of Housing and Community Development (BHCD) to clarify our respective agency jurisdictions in regard to potable water and premise plumbing. The agreement was revised in June 2002, and has been revised again, at the instigation of the Department of Housing and Community Development, in conjunction with their 2012 regulatory cycle.

The main objectives of this MOU are:

1. Suspend issuance of building permits in locations where the waterworks has reached its maximum capacity and/or is unable to reliably meet safe drinking water standards;
2. Coordinate the requirements for cross-connection control and backflow prevention included in BHCD *Codes* and the *Waterworks Regulations*;
3. Recognize situations where a waterworks' facilities may be housed within a building served by the waterworks.

The third objective will provide a foundation for VDH to consistently address non-community waterworks that may have been overlooked or misidentified, particularly those using point-of-use or point-of-entry treatment systems.

The VDH Office of Drinking Water (ODW) routinely communicates with the DHCD local building officials on waterworks status, and field personnel are encouraged to contact building officials directly when situations arise. Please be aware that the local building officials are local and are only advised (not controlled) by state building officials. Any disputes with a local official's decision must be settled through local and state review boards.

END OF MEMO

Attachment

**MEMORANDUM OF UNDERSTANDING  
BETWEEN THE  
VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT  
AND THE  
VIRGINIA DEPARTMENT OF HEALTH**

December 2013

In accordance with § 36-97 *et seq.* and § 32.1-167 *et. seq.* of the *Code of Virginia*, the Virginia Department of Health (hereafter referred to as the "VDH") and the Virginia Department of Housing and Community Development (hereafter referred to as the "DHCD") agree to coordinate the Uniform Statewide Building Code (hereafter referred to as the "USBC") and the Virginia *Waterworks Regulations* (hereafter referred to as the "*Regulations*"). The USBC shall not supersede the *Regulations* as stated in § 36-98 of the *Code of Virginia*. The parties agree to the following.

1. Adoption and promulgation of the USBC is the responsibility of the DHCD; enforcement of the USBC is the responsibility of the local building department; and adoption, promulgation, and enforcement of the *Regulations* is the responsibility of the VDH.
2. The jurisdiction of the USBC includes all buildings, structures, and equipment (as defined in § 36-97 of the *Code of Virginia*) up to the point of connection to the water meter; and that the jurisdiction of the *Regulations* includes the meter, all waterworks' mains, treatment facilities, and raw water collection and transmission facilities. Where no meter is installed, the point of demarcation between the jurisdiction of the USBC and of the *Regulations* is the point of connection to the waterworks main; or, in the case of an owner of both waterworks and the building served, the point of demarcation is the point of entry into the building.


Exception: Whenever a building or structure is utilized to house portions of a waterworks, as determined by the VDH, the *Regulations* shall apply to all such water treatment, storage, and pumping facilities and the USBC shall apply to the building, structure, and equipment as defined in § 36-97 of the *Code of Virginia*.

3. Both the USBC and the *Regulations* will include a clear reference to jurisdiction of the other document.
4. The *Regulations* will require each waterworks owner to have a cross-connection control and backflow prevention program consistent with the *Regulations*. The *Regulations* will require, as a minimum, an approved containment device at each service connection consistent with any existing or potential health, pollution, or system hazard to the waterworks. In lieu of such containment devices, point-of-use isolation protection devices shall be permitted to be installed; shall comply with the provisions of the USBC; and, shall be deemed to be in compliance with the *Regulations*.

5. The building official is required by the USBC to be assured that the water supply to a building is safe and of adequate capacity before issuing a building permit. Building permits involving a new water connection or extension of an existing connection to a waterworks main shall not be issued when the VDH has notified the building official in writing that the waterworks is unsafe or at or above its permitted capacity.
6. Appropriate amendments, additions, or deletions will be made to the *Regulations* and to the USBC to insure that there is no jurisdictional conflict between the two documents.
7. It is the intention of both the DHCD and the VDH to cooperate with each other in resolving any technical conflicts between the *Regulations* and the USBC, and in developing and implementing operational procedures to ensure and promote a constructive working relationship between building and health officials.
8. Except in matters of imminent danger to public health or safety, whenever conflicts or disagreements arise between the two agencies or their staffs, all appropriate regulatory procedures will be exhausted before any judicial action.
9. This Understanding may be amended or terminated by mutual consent of the parties.

The undersigned agree to the conditions of this Understanding.

  
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William C. Shelton, Director  
Virginia Department of Housing and  
Community Development

  
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Cynthia Romero, MD, FAAFP  
State Health Commissioner  
Virginia Department of Health