

**CROSS-CONNECTION CONTROL
ORDINANCE FOR
MOORE COUNTY PUBLIC UTILITIES &
EAST MOORE WATER DISTRICT**

STANDARDS & SPECIFICATION MANUAL



**MOORE COUNTY PUBLIC WORKS
DEPARTMENT**

Revised and Adopted on December 4, 2023

A. Objective.

1. To protect the public water supply of potable water to Moore County Public Utilities and East Moore Water District water distribution systems (hereinafter “County Water Systems”) from the possibility of contamination or pollution from the user’s water system such contaminants, waterborne health hazards and other significant pollutants which could backflow into the public water system.
2. To eliminate or control existing cross-connections, actual or potential, direct or indirect, between the user’s potable water system(s) and non-potable water system(s), plumbing fixtures and industrial piping systems.
3. To provide a continuing monitoring program of cross-connection control which will systematically and effectively prevent contamination or pollution of the public water system.

B. Administration and applicability.

1. Moore County Public Utilities and East Moore Water District are the water purveyors responsible for the elimination of all cross-connections within its public potable water supply.
2. Moore County Public Utilities and East Moore Water District have established and will maintain a program to control potential sources of contamination of drinking water from cross connections. The program shall, at a minimum, comply with the Federal Safe Drinking Water Act, the North Carolina Drinking Water Act, and the NCDEQ regulations and North Carolina State Building Code, and regulations issued thereunder. The requirements of those laws and implementing regulations are incorporated into this ordinance as minimum requirements.
3. The cross-connection control program requires containment of potential contamination resulting from cross connections. Isolation of specific contamination which may be present at the customer’s facility is addressed by the NC Plumbing Code. The program shall be administered by the Moore County Department of Public Works. The system shall have a Cross Connection Control Operator in Responsible Charge as required by the NCDEQ who, along with the Public Works Director, is authorized to interpret this ordinance and the standards, and enforce the program. This Ordinance shall apply to all users connected to Moore County Public Utilities and East Moore Water District’s public potable water supply.

C. Definitions. For purposes of this ordinance, the following terms shall have the meanings set forth below, unless the context clearly indicates otherwise.

1. *Air gap* means an unobstructed physical separation enough to prevent backflow between the free-flowing end of a drinking water supply system and any other system. Physically, an approved air gap is defined as a distance that is at least twice the diameter of the supply pipe measured vertically to the overflow rim of

the receiving vessel, but never less than one inch (25 mm) above the receiving vessel rim.

2. *Approved* means meeting the standards for cross connections or certified in writing as acceptable by the Cross-connection Control Specialist, provided that such certifications cannot contradict the standards.
3. *Auxiliary intake* means a piping connection or device whereby water may be secured from a source other than the County Water Supply Systems (e.g., well).
4. *Backflow* means the undesirable reversal of flow of a liquid, gas, or other substance in the County Water Supply Systems distribution piping system as a result of a cross-connection. See also terms *Backpressure* and *Back siphonage*.
5. *Backflow prevention assembly* means an assembly used to prevent backflow or back siphonage into a consumer or public potable water system. Backflow prevention assemblies to be connected to County Water Supply Systems are limited to those assemblies approved by the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California, American Society of Sanitary Engineers (ASSE) and FM Approvals (for fire line installations).
6. *Backpressure* means a condition in which the pressure in the user's drinking water supply system is greater than the County Water Supply Systems' pressure which can cause a reversal of the normal direction of flow.
7. *Back siphonage* means the flowing back of used or contaminated water from a plumbing fixture or vessel into the pipe which feeds it, caused by reduced pressure in the pipe.
8. *Certified tester* means a person who meets applicable state requirements for inspecting, testing, and repairing backflow preventers and, in addition, meets County requirements, which include successful completion of a training program approved by the Director, and performance of work that meets standards.
9. *Commercial service* is defined to include service to each separate business enterprise, occupation, or institution occupying for its exclusive use any unit or units of space as an entire building, entire floor, suite of rooms or a single room, and using water for such incidental use as the schedule of rates applicable to the particular installation may permit. "Commercial service" shall apply to all stores, offices, hotels, wholesale houses, garages, display windows, signs, theaters, barber and beauty shops, churches, opera houses, auditoriums, lodge halls, schoolhouses, banks, bakeries, and any other space occupied for commercial purposes. Any rooming house, lodging house, resort, inn or tavern renting more than four rooms to strangers or transients, without any previous agreement for accommodation or as to the duration of stay, shall be classed as a hotel and as such it comes under the "commercial" classification.
10. *Containment* means preventing the impairment of the public potable water supply by installing an approved backflow preventer directly downstream of the water meter or other point of water service connection before any branching occurs within the user's drinking water supply system.

11. *Contamination* means an impairment of the quality of the water which creates a potential or actual hazard to the public health through the introduction of hazardous or toxic substances or waterborne health hazards in the form of physical or chemical contaminants or biological organisms and pathogens.
12. *County Water Supply Systems* means the water systems which are owned by Moore County Public Utilities and East Moore Water District and operated by Moore County Public Works.
13. *Cross-connection* or *cross connection* means:
 - i. any physical connection between a potable water supply system and any other piping system, sewer fixture, container, or device, whereby water or other liquids, mixtures, or substances may flow into or enter the potable water supply system; or
 - ii. any potable water supply outlet that is submerged or is designed or intended to be submerged in non-potable water or in any source of contamination; or
 - iii. an air gap that does not meet the requirements set forth in Subparagraph 2 of this section.
14. *Cross-connection Control Specialist, or Specialist*, means the official in the Department designated by the Director to perform certain functions with regard to administration of the County's program for controlling cross connections and installing backflow preventers.
15. *Department* means the Moore County Public Works Department.
16. *Director* means the Director of the Moore County Public Works Department. The Director may delegate any functions under this ordinance to one or more designees.
17. *Double check detector assembly* (DCDA) means an assembly consisting of two approved double check valve assemblies installed as one unit. One of those assemblies is smaller than the other and is installed as a protected bypass around the main backflow preventer. The bypass branches out of the body of the larger assembly immediately after the inlet shut-off valve, and it terminates in the body of the larger backflow preventer immediately before its outlet shut-off valve. The bypass contains a specific water meter (reading in cubic feet) that detects small flows. The maximum pressure loss through the assembly cannot exceed ten pounds per square inch under normal flow conditions.
18. *Double check valve assembly* or *double check valve assembly preventer* (each may be referred to as a DCVA) means an assembly containing two single, spring-loaded, independently operating check valves with tightly closing shut-off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve.
19. *Drinking water supply system* means the piping that distributes water meeting potable water standards and supplied by the County Water Supply Systems. If the

system is on the street side of a water meter, the system is the "county drinking water supply system" and if it is on the user's side of the water meter it is the "user's drinking water supply system."

20. *Fire line* means a system of pipes and equipment for a fire system. A system of pipes and equipment used to supply water in an emergency for extinguishing fire.
21. *Hazard.*
 - i. *High Hazard*- the risk of contamination causing an impairment of the quality of the potable water that creates an actual hazard to the public health through poisoning or the spread of disease.
 - ii. *Low Hazard*- the risk of an impairment of the quality of the potable water to a degree that does not create a hazard to public health but that does adversely and unreasonable affect the aesthetic qualities of such potable water for domestic use
22. *In-Ground* means below ground or below finished grade; including but not limited to below concrete, sod, mulch, or sand. An in-ground piping system is any in-ground piping, sprinklers, drip tubing, valve, control wiring of 30 volts or less, and associated components, thereby making the in-ground piping not readily accessible (defined below).
23. *Irrigation.* See irrigation system.
24. *Irrigation contractor* means any person who, for compensation or other consideration, constructs, installs, expands, services, or repairs irrigation systems. An irrigation contractor, who is not a licensed plumber, may only perform work downstream of a backflow preventer.
25. *Irrigation system* means all piping, fittings, sprinklers, drip tubing, valves, control wiring of 30 volts or less, and associated components installed for the delivery and application of water for the purpose of irrigation.
26. *Isolation* means isolating a localized hazard at the point of use from the drinking water system so that it does not affect the remainder of the internal drinking water system.
27. *Non-potable water supply* means waters not approved for drinking or other household use.
28. *Potable water supply* means water approved for drinking and other household uses.
29. *Plumbing permit* shall have the same meaning as it has in the North Carolina State Building Code.
30. *Private fire line* means an individual fire line with fire hydrant with no service connection outside the building.
31. *Readily accessible (ready access)* means that which enables piping, fittings, sprinklers, drip tubing, valves, control wiring of 30 volts or less, and associated components to be directly reached without requiring the removal or movement of

any panel, door, dirt, concrete, sod, mulch, sand or other obstruction similar to those included in this list.

32. *Reduced pressure principle detector assembly (RPDA)* means an assembly consisting of two approved reduced pressure backflow prevention assemblies installed as one unit. One of those assemblies is smaller than the other and is installed as a protected bypass around the main backflow preventer. The bypass branches out of the body of the main assembly immediately after the inlet shut-off valve, and it terminates in the body of the main backflow preventer before its outlet shut-off valve. The bypass contains a specific water meter (reading in cubic feet) that detects small flows. The type of backflow preventer in the bypass assembly is the same type as the main backflow preventer, thus providing the same level of protection in both branches. The RPDA is often used on a fire sprinkler system or an extended fire hydrant line. The entire assembly shall meet the design and performance specifications as determined by the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California, ASSE, and FM Approvals (if on a fire line).
33. *Reduced pressure principle backflow prevention assembly (RP)* means an assembly containing two spring-loaded independently operating check valves, with an automatically operating pressure differential relief valve located between the two check valves, plus tightly closing shut off valves on each side of the check valves, and properly located test cocks for testing the check valves. The entire assembly shall meet the design and performance specifications as determined by the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California, ASSE, and FM Approvals (if on a fire line).
34. *Residential service* is defined as service to a householder or tenant living in a separate house or a separate apartment in an apartment building.
 - i. Should the owner of a multiple apartment building undertake to furnish water to his tenants as a part of their monthly rent, then such service shall be classed as commercial.
 - ii. A close member of a householder's family, living with that householder and using the same water facilities, shall not be classified as an additional service or as commercial.
 - iii. In cases where a householder or tenant devotes some portion of the occupied building to commercial use and uses the remainder as a residence, then the predominant use of water shall constitute the basis for classification as either residential or commercial.
35. *Service connection* means a piped connection from a water main for the purpose of conveying water to a building or onto premises for human use. A service connection begins:
 - i. At the point downstream of a service meter; or
 - ii. For unmetered service, at the point of connection to the potable water supply system.

36. *Standards* mean those written requirements issued and maintained by the Department that meet, at a minimum, the requirements of law and promote the containment and isolation of potential contamination caused by cross connections. The standards shall be considered requirements of this ordinance and are incorporated herein. Among other things, the standards shall set forth the types of backflow preventers, and manufacturers and models that are approved for control of backflow from different types of cross connections. The standards may also address all other activities necessary for operation of the County Water Supply Systems program, including installation, maintenance, testing, repair, and permitting of backflow preventers; permitting of other activities; and qualifications of certified testers. The standards shall be maintained in a document available in paper and online which bears the title “Cross Connection Control Standards & Specifications Manual”, available on the Moore County website or hard copy available at the Public Works office.

37. *User* means any person that occupies or owns property that receives water from the County Water Supply Systems.

38. *Water purveyor* means the operator of a public potable water system providing an approved water supply to the public.

D. **Unlawful connections; regulation of contamination and cross connections; installation of backflow preventers.**

1. It shall be unlawful for any person to construct, maintain, or operate a physical arrangement whereby a public water system has a cross-connection without the use of proper backflow protection.
2. It shall be unlawful for any person to allow contamination of the drinking water system.
3. It shall be unlawful for any person to allow the creation or use of a cross connection that is prohibited under this ordinance. Users shall eliminate all unprotected cross connections that are prohibited under this ordinance.
4. Users shall install one or more approved backflow preventers for those cross connections requiring such backflow preventers under this ordinance or within the time frames established under the standards.
5. Users shall bear all responsibility and cost for the installation, testing, maintenance, repair, inspection, permitting, and replacement of backflow preventers required under this ordinance and for all associated plumbing work.

E. **New residential and nonresidential water connections.**

1. Users that construct any residential or nonresidential building of any type shall include an approved backflow preventer of the type specified in the standards near the point of connection to the County Water Supply Systems, as set forth under the standards.
2. Building plans for residential and nonresidential buildings that show the locations of plumbing connections, cross connections, and uses within each building shall

be submitted to the Cross Connection Control Specialist and approved backflow preventers shall be installed as required under these standards.

3. The County Water Supply Systems may refuse water service and/or issuance of a certificate of compliance in the absence of compliance with these requirements, in addition to other remedies.

F. Other cross connections.

1. County Water Supply Systems require containment of the potential backflow hazard at the point of water service or metering. Cross connections not occurring at the point of water service or metering, and cross connections internal to the user's drinking water supply system require backflow preventers as prescribed by the North Carolina Plumbing Code.

G. Inspections; interference.

1. The Cross Connection Control Specialist and/or other Department employees designated as inspectors shall inspect properties served by the County Water Supply Systems on a schedule as set by the Specialist.
2. As a condition of continuing provision of water service, the inspectors shall have the right to enter at any reasonable time any property connected to the County Water Supply Systems for the purpose of performing the duties of this ordinance. Refusal of entry may result in termination of water service. No person shall interfere with an inspector in the performance of the activities authorized by this ordinance.

H. Installation; permits.

1. Installation of backflow preventers shall be installed in accordance with the standards furnished by the County Water Supply Systems and/or the latest edition of the North Carolina State Building Code, whichever is most restrictive.
2. The Department may require permits for the installation, initial testing, and re-testing of backflow preventers required under this ordinance.
3. Backflow prevention assemblies shall be installed in such a manner that inspections, periodic testing and necessary repairs can be conveniently performed.

I. Hazardous connections and uses.

1. Any connection or use identified in the standards as requiring a backflow preventer is deemed hazardous.
2. Any person that installs, repairs, or inspects any plumbing line that serves a hazardous connection or that serves a facility that is not equipped with required backflow preventers, shall immediately notify the Cross Connection Control Specialist of such connections and uses.
3. Any user that occupies or owns property in which there is a plumbing line that serves a hazardous connection, or that serves a facility that is not equipped with

required backflow preventers, shall immediately notify the Cross Connection Control Specialist of such connections and uses.

4. Users shall comply with the requirements of this ordinance regardless of whether the connection or facility pre-existed the requirements of this ordinance, except as noted herein.
5. Double check valves that were on lawn irrigation systems before September 17, 2013, that remain testable can remain in service as long as they are testable. Replacement with RP Assembly is required for devices that fail testing.

J. Approved backflow prevention assemblies.

1. The following are approved backflow prevention assemblies:
 - i. Reduced pressure principle backflow prevention assembly
 - ii. Reduced pressure principle detector assembly
 - iii. Pressure Vacuum Breaker (for non-pumped applications only)
 - iv. Double check valve assembly - **APPLIES TO EXISTING INSTALLATIONS ONLY**
 - v. Double check valve detector assembly - **APPLIES TO EXISTING INSTALLATIONS & PRIVATE FIRE LINES WITH NO SERVICE TAPS ONLY**
2. All assemblies and installations shall be subject to inspection and approval by the Department.
3. All assemblies installed prior to September 17, 2013, and which are not reduced pressure principle and reduced pressure principal detector type are permitted to remain in service until the Department determines their replacement to be necessary, as long as they are testable and pass the test.

K. Certification and qualification of testers.

1. *Certification; other qualifications.* Testing of backflow preventers shall be approved by the Department only if performed by a certified tester. The standards shall establish qualifications for certified testers, which shall include successful completion of a training program recognized by the Department, as well as meeting performance standards relating to compliance with this ordinance.
2. *Disqualification of certified tester.* The Department may disqualify a certified tester for failure to meet the qualifications established by the Department. The Department shall provide written notice to the certified tester, mailed to the address the certified tester has provided to the Department, setting forth the reasons for disqualification. Disqualification shall be effective three days after such mailing. The Department shall also give either fax or email notice to the certified tester if the tester has provided a fax or email address. The Department

shall provide an opportunity for a certified tester who has been disqualified to obtain reconsideration by the Director upon written request received no later than ten days following the effective date of disqualification.

L. Inspection and testing of backflow devices.

1. *Testing.* A user or permit-holder shall have all permitted backflow preventers inspected and tested on such schedule as may be required by the standards. The test shall be conducted by a certified tester. The certified tester, or the user if the certified tester fails to do so, shall report the results of the test to the Cross Connection Control Specialist within 15 days of testing. Testing must be performed with equipment approved by the Department. The user or permit holder shall cause such maintenance, repairs, or replacements to be made, rendering the assembly fully operational. Failure of the user or permit holder to perform required testing and maintenance shall be cause for the premises to be deemed an immediate public health hazard.
2. *Testing of Opt-in Residential Lawn Irrigation Customers by Moore County.* All residential customers with lawn irrigation systems require a backflow preventer which must be tested. Moore County staff will test the devices with certified testers. **if the customer signs the required document(s) to opt-in. Please note, the County is not responsible for backflow preventers that freeze and are not winterized properly.**
3. *Testing by Residential Lawn Irrigation Customers that do not Opt-In.* Customers may elect to not Opt-in to the testing program performed by Moore County. They may elect to have their certified tester test the backflow preventer at the customer's sole expense. In that event they will need to submit the completed test result to the County's electronic reporting system employed for that purpose.
4. *Other testing.* Inspection and testing shall be conducted after installation or repair of any backflow preventer. Any person that installs, removes, relocates, or repairs a backflow preventer shall report such action to the Cross Connection Control Specialist within 15 days of the action and the Cross Connection Control Specialist shall inform that person if additional inspection, permits, or testing is required. If the person who conducted the work fails to make such report within 20 days of the inspection or testing, the user shall report this information to the Specialist.
5. Any certified tester who performs an operational test on any assembly connected to the County Water Supply Systems shall file a report regarding the results of that operational test using the County Water Supply Systems' designated electronic reporting system managed by the currently contracted vendor. Certified testers shall supply all testing information required by the County Water Supply Systems and the designated electronic reporting system to include but not limited to test values for assembly, size, make, model, serial number and location of assembly, name and address of owner as recorded on notice, by-pass reading meter number for fire services, and meter number for domestic and irrigation services. The fee for any report filed using the electronic reporting system shall be

as set by the County Water Supply Systems' contracted vendor and paid by the certified tester. In addition, certified testers shall comply with all requirements set by the standards. Failure to comply may result in revocation of certified tester status pursuant to the standards.

6. Failed tests. In the event of a failed test of the backflow preventer, it is the customer's responsibility to have the device repaired or replaced. Notification to the Moore County Cross Connection Control Specialist is required within 15 days of receiving the failed test.

M. Notice to user of need for action or violation.

1. Upon identification of the potential for contamination or a hazard to the County Water Supply System, or a failure to comply with any requirement of this ordinance, the Cross Connection Control Specialist shall notify, by first-class mail, the owner of record of the property at which the potential contamination or hazard exists, of the location and nature of the potential contamination or hazard, the number of the applicable section of this ordinance, and the order of the Cross Connection Control Specialist regarding actions to be taken. Notice shall be deemed received three days after mailing.
2. The Cross Connection Control Specialist shall, among other things, determine if an imminent danger to the drinking water supply or to public health exists, which determination shall impact deadlines for compliance as described in Section L. The Specialist may issue any follow-up orders he/she deems necessary, including orders for testing and other actions related to compliance.

N. User responsibilities.

1. *Compliance deadlines.* A user that has received notice as described above shall comply with the order of the Cross Connection Control Specialist. If the order is to install an approved backflow preventer or remove a cross connection, and an imminent danger to the drinking water supply or to public health does not exist, the user shall take such action within 90 days from the date notification is deemed received. If the Cross Connection Control Specialist has determined that an imminent danger to the drinking water supply or to public health exists the Specialist may order a shorter time for action. In cases that do not present an imminent danger or danger to public health, the Specialist may extend the time for compliance up to an additional 90 days if compliance efforts are underway and continuing, and the existence of a hardship or special circumstances can be demonstrated. The extension shall only be valid if in writing and signed by the Specialist or Director.
2. *Failure to comply.* A user that fails to comply with an order issued by the Cross Connection Control Specialist, or with the deadlines described in subsection (1) above, shall be in violation of this ordinance.

O. Violation of ordinance.

1. *Violation.* A person who fails to comply with this ordinance, or with any order, certificate, or permit issued hereunder, or who installs or alters a plumbing system

in nonconformance with approved specifications or plans that address cross connections or backflow preventers regulated under this ordinance, shall be in violation of this ordinance.

2. *Inspection and testing by the Department.* The Department may inspect and test any backflow preventer where an approved inspection or testing has not been performed as required under this ordinance, written notice has been given to the user, and the user has not provided the approved inspection or testing within the deadline provided in the notice. The fee for inspection and testing, plus an administrative fee set by the Moore County Board of Commissioners, may be added to the user's utility bill.
3. *Civil penalty.*
 - i. *Maximum.* A person in violation of this ordinance is subject to a civil penalty which may be recovered by the County Water Supply System in a civil action in the nature of debt if the violator does not pay the penalty within 30 days after the assessment has become final by exhaustion of the appeal process established by this section, or by failure to appeal the assessment.
 1. The civil penalty for a non-willful violation shall not exceed \$250.00 per day for each day of violation, or a cumulative penalty of \$5,000.00.
 2. The civil penalty for a willful violation shall not exceed \$500.00 per day for each day of a violation, or a cumulative penalty of \$10,000.00.
 - ii. *Factors in setting penalty.* Any civil penalty shall be assessed by the Director and, at a minimum, shall take into account whether the violation was willful or non-willful. The Director is authorized to reduce civil penalties previously assessed if compliance has been achieved and reduction appears justified as determined in the discretion of the Director.
 - iii. *Notice to violator.* The Director shall send a violator written notice of the civil penalty and the basis of the amount assessed by certified mail, return receipt requested, and by first class mail. Such notice shall be deemed received three days from the time it is mailed.
 - iv. *Appeal.* A violator may appeal a violation by mailing a written appeal to the County Manager, including all arguments that support reducing or eliminating the penalty. The appeal must be received within 30 days of the date notice of the penalty is deemed received pursuant to subsection (iii) above. An appeal mailed by first-class mail shall be deemed received three days from the time it is mailed. The County Manager or his/her designee shall review the written appeal and penalty and make a final determination and notify the appellant in writing within 60 days of receipt of the notice of appeal pursuant to which shall be sent to the violator in accordance with subsection (3) above.

- v. *Penalties added to utility bill.* A civil penalty that has become final pursuant to subsection (1) may be added to a user's water bill, and water service may be terminated for nonpayment.

P. Discontinuance of service for violations.

1. *Procedure.* The Department may discontinue water service to any structure or parcel for a violation of this ordinance. Prior to discontinuing water service, the Director will give written notice to the customer as shown on the revenue billing roll and to the owner, occupant, or other person in apparent control of the structure or parcel. The Director will attempt, but is not required, to provide written notice prior to discontinuing irrigation water service.
 - i. *Public Health Threat.* If a cross connection is discovered which poses an imminent threat to public health, the water service will be immediately disconnected, and notification given to the owner as soon as possible under the circumstances.
2. *Service restoration.* When service is discontinued as described in subsection (a), it shall not be reinstated until the Cross Connection Control Specialist determines that appropriate steps have been taken to comply with this ordinance and alleviate any risk to the drinking water system. Prior to restoration, all fees required by the Department for restoration of water service shall be paid, in addition to any final civil penalties assessed.
3. *No liability.* The County Water Supply Systems shall bear no liability for damage resulting from the discontinuance of service pursuant to this section.

Q. No County Water Supply System Liability.

1. The provisions of this ordinance shall not create any liability in the County Water Supply Systems for failure to detect any cross connection, malfunctioning backflow preventer, hazard, or contamination of the drinking water supply.

R. Fees.

1. Fees for the activities authorized under this ordinance, including fees for manuals, permits, County Water Supply Systems inspections, County Water Supply Systems re-inspections, County Water Supply Systems testing, electronic reporting, training classes, and certifications of testers will be established by the County Water Supply Systems.