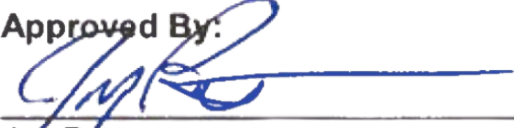



<p>Subject: Pre- Approved Alternate Methods of Compliance (AMoC) for Cross Connection Test (CCT)</p> <p>Prepared By: Charles Deatherage Water Protection Program Manager</p>	<p>Effective Date:</p> <p>Approved By:  Jay Porter Environmental-Conservation Division Manager  Charles Deatherage Water Protection Program Manager</p>
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PURPOSE

Define acceptable Alternate Methods of Compliance (AMoCs) for performing Cross Connection Tests (CCTs) on alternate water sites.

The Chapter 15-1 prescribed method was moved from the Uniform Plumbing Code at the request of the Development Services Department. This method involves independently shutting down and draining the alternate and potable water systems. On large scale and multistory building sites this is not feasible and in fact could be detrimental to the quality of the potable water system. Sites could be rendered unoccupiable during the test, as large scale or multistory projects could take long periods of time to perform the test and bring the systems back online. The alternate methods proposed would be as effective as the ordinance prescribed method without the problems associated with draining down a building.

DEFFINITIONS

Alternate water system (Chapter 15-1) means a water supply from a source other than the City's potable water supply, such as, but not limited to: well water, rainwater, reclaimed water, on site reuse water, or lake/river water. Also referred to as Alternative Water and Auxiliary Water.

Cross connection in this context means an interconnection between the potable distribution system and an alternate water system.

Tester means a person licensed by the Texas Commission on Environmental Quality as a Customer Service Inspector (CSI) or a plumber licensed by the Texas State Board of Plumbing Examiners with a Water Supply Protection Specialist (WSPS) endorsement on their license. The tester must be registered with the Water Protection Program and demonstrate the knowledge needed to perform the CCT.

APPLICABLE CODE SECTIONS

City of Austin Ordinance Chapter 15-1 Cross Connection Regulations

CHAPTER 15-1 ORDINANCE METHOD

The ordinance prescribed procedure for performing the CCT is found in 15-1-19 (E) Visual System Inspection and 15-1-19 (F) Cross Connection Test.

PRE-APPROVED ALTERNATE METHODS

The following methods are pre-approved for the initial and reoccurring CCTs on sites with a valid reason that the procedure in 15-1-19 (F) is not feasible. Each alternate method will require a visual system inspection per 15-1-19 (E) before beginning the CCT.

1.5 METHOD

This procedure is an option for existing and new multiple building sites where the code prescribed CCT would not be feasible, and site conditions would not support a one-sided test. The 1.5 Test shall only be used to test the potable water against alternate water irrigation systems that do not enter the building(s). To use this procedure, a functioning potable water isolation valve must be provided at each building either immediately outside or inside the building. A valid hardship must be provided to consider this option for approval. The 1.5 CCT procedure for determining cross connections shall be followed by the applicant in the presence of the Director or their designees to determine whether a cross connection has occurred as follows:

- 1) The potable water system shall be activated and pressurized. The alternate water system shall be shut down and completely drained. All zone valves and the master control valve shall be open. The test begins when the system is completely drained, and no water is draining from any zone valves.
- 2) The potable water system shall remain pressurized for a minimum period specified by the Authority Having Jurisdiction while the alternate water system is emptied. The minimum period the alternate water system is to remain depressurized shall be determined on a case-by-case basis, considering the size and complexity of the potable and nonpotable water distribution systems, but in no case shall that period be less than one (1) hour.
- 3) Fixtures, potable and nonpotable, shall be tested and inspected for flow. Flow from an alternate water system outlet or zone valve shall indicate a cross connection. Lack of flow from a potable water outlet shall indicate that it is connected to the nonpotable water system. The drain on the alternate water system shall be checked for flow during the test and at the end of the test. If flow is detected from the alternate water system or if there is a lack of flow at any potable outlet, then the test shall be deemed unsuccessful.

If the alternate water system shut down and drain portion of the test is deemed successful, then the following alternate method to the complete potable water shut down and drain portion shall be performed:

- 1) Pressurize the alternate water system and activate each zone to inspect for flow.
- 2) Shut off the building supply shut off valves to each building to isolate the underground potable water distribution system from the building/s potable water distribution system.
- 3) Shut down the potable water supply system at the customer shut off valve.
- 4) Relieve the pressure on the underground potable water supply system by draining the system to the highest outlet on the underground water supply system. This could be the

number four test port at the containment RP, or elevation differences may require that a hose bib or other outlet be installed at the highest point of the underground distribution system. The purpose being to eliminate the need to drain any of the potable water distribution system, thus preventing problems associated with draining down a large potable water distribution system.

- 5) Observe the highest outlet on the potable water system for flow for a minimum period specified by the Authority Having Jurisdiction, but in no case shall that period be less than one (1) hour. This outlet shall be checked during the test period and at the end of the test.
- 6) The alternate water system shall remain pressurized for a minimum period specified by the Authority Having Jurisdiction while the underground potable water system is depressurized. The minimum period the alternate water system shall be pressurized shall be determined on a case-by-case basis, but in no case shall that period be less than one (1) hour.
- 7) Outlets (irrigation zone valves) on the alternate water system shall be tested and inspected for flow. No flow from an alternate water system outlet shall indicate that it is connected to the potable water system.
- 8) If there is no flow detected at the highest point of the underground Potable Water System (flow at this outlet would indicate a cross connection) the underground potable water system shall be re-pressurized, and the building supply shut off valves shall be opened.

If a cross connection is discovered, then the procedure in 15-1-19 (G) shall be followed.

These are the basic procedures for the 1.5 CCT. Individual sites may require some procedural modifications to suit the site. The tester will discuss any pertinent details with AW Water Protection staff during the test pre-approval process.

HIGH PRESSURE TEST

This test can only be used to test an alternate water irrigation system against the potable water system.

The test consists of performing the first portion of the ordinance prescribed CCT per COA 15-1-19 (F) (1)(2)(3). If that portion of the test passes, then the alternate water system shall be repressurized and tested using a hydrostatic pump to increase the pressure to 50 PSI above the potable water source pressure. The test shall hold for a period of not less than one (1) hour. If it does so, then the test is considered successful.

If it does not hold 50 PSI above potable pressure for one (1) hour, then that would indicate a cross connection. However, it could be that a component of the alternate irrigation system has failed. If that is the case, then the failed component shall be discovered and repaired. The second part of the test shall be performed a second time. If the test still doesn't hold the required 50 PSI above potable pressure, then it would be advisable to perform a different alternate method. Submittal of a second AMoC form will be required for the second method chosen.

As with all CCTs, if a cross connection is discovered, then the procedure in 15-1-19 (G) shall be followed.

VISUAL CROSS CONNECTION TEST

The visual test is used when the entire alternate water system is visible, except wall and floor penetrations. It is acceptable to remove ceiling panels or open access doors to view the entire system. If any section of the system piping is not visible to the tester, then the test fails, and the concealed piping shall be uncovered. During the initial test, photo documentation shall be made proving there are no branches between the source and the outlet(s).

ONE-SIDED CROSS CONNECTION TEST

To use this method the potable service line from the meter to the building (underground portions) must be encased in flowable fill or concrete per the detail in the following link. This encasement must be witnessed by a tester and photo documented.

[Standard Detail for Encasement of Pipe 62325](#)

With documentation proving there are no branches on the potable water distribution system between the meter and the building the One-Sided CCT procedures are:

- 1) The potable water system shall be activated and pressurized, and the alternate water system shall be shut down, depressurized, and drained.
- 2) The potable water system shall remain pressurized for a minimum period specified by the Authority Having Jurisdiction while the alternate water system is empty. The minimum period the alternate water system is to remain depressurized shall be determined on a case-by-case basis, considering the size and complexity of the potable and nonpotable water distribution systems, but in no case shall that period be less than one (1) hour from the time the alternate system is drained down completely.
- 3) Fixtures, potable and nonpotable, shall be tested and inspected for flow. Flow from an alternate water system outlet or zone valve shall indicate a cross connection. Lack of flow from a potable water outlet shall indicate that it is connected to the nonpotable water system.
- 4) The drain on the alternate water system shall be checked for flow during the test and at the end of the test. If flow is detected, then the test shall be deemed unsuccessful.

If a cross connection is discovered, then the procedure in 15-1-19 (G) shall be followed.

DYE INJECTION METHOD

This alternate method is for sites with alternate water toilet and urinal flushing systems that would not be feasible to drain down either the potable water distribution system, or the alternate toilet

flushing system. This method will not require a shutdown of either potable or alternate water systems to conduct the test.

Appurtenances to inject the dye into the alternate water system and ensure that it has circulated throughout the system must be installed during the construction phase. Design of this system is the responsibility of the customer's design professionals. The procedures are:

- 1) Dye must be distributed throughout the alternate water distribution system at a level visible to the naked eye in all toilets and urinals. The dye shall remain in the system for 24 hours before the third-party tester begins the test. This may require continuous injection. The tester shall flush each toilet and urinal and observe for visible dye presence in the flushing water. Lack of dye presence in the flushing water shall indicate a cross connection, so it is important that there is enough dye in the system to ensure each toilet/urinal has a visual dye presence and prevent false negatives.
- 2) Each potable outlet, hot and cold, shall be tested for the presence of dye, by running water into a white Styrofoam cup and illuminating with a UV flashlight.
- 3) Potable outlets such as icemakers, coffee makers etc. protected by backflow protection assemblies (BPA) shall run water from the number 1 test port for the test.

If the alternate water outlets show presence of dye and all potable outlets do not, then the test passes. If any potable outlet shows dye, or alternate outlet does not, then the test fails and the procedures in 15-1-19 (G) shall be followed.

OTHER CROSS CONNECTION TESTS

Other CCTs proposed by the owner or their representatives will be considered on a case-by-case basis.

GENERAL PROCEDURES

Before beginning the alternate water sourced irrigation system shutdown portion of the CCT, the tester shall cycle the irrigation system to ensure there is flow at all zones.

After 8/18/2025 an AMoC form is required to be submitted and approved before construction to use any of the pre-approved alternate CCT methods. The 1.5 CCT may be used on existing multiple building sites in existence before that date.

Some sites may use alternate water to flush toilets and urinals and for irrigation. On these sites it will be necessary to use a combination of tests. A separate AMoC form will be required for each method.

The alternate water systems and the potable water system shall be provided with the necessary appurtenances to conduct any alternate CCT.

For the initial alternate method CCT, except the dye injection method, all potable water outlets will be checked for flow during the alternate shut down portion of the test.

During subsequent alternate method tests, except the dye injection method, all potable outlets outside the building shall be checked for flow as well as a random sampling of potable outlets inside the building(s). The tester will discuss with AW Water Protection staff which potable outlets shall be checked for flow, during the test pre-approval process. If there is a lack of flow at any potable outlet, then the test shall be deemed unsuccessful.

To use an alternate CCT method on a site that uses alternate water for irrigation inside the building in locations such as interior courtyards or roof decks, then a tester must inspect and photo document the interior irrigation system for connections with the potable water system before it is covered or concealed.

If a cross connection is discovered during any CCT, then the procedure in 15-1-19 (G) shall be followed.

All piping shall be labeled per 15-1-13. The tester shall check for labeling of all exposed piping. Signage per Chapter 15-1, the local plumbing code, TCEQ and any other city ordinances shall be in place. A lack of required labeling will not fail the CCT but should be noted on the form and brought to the attention of the Water Protection Program.

A tester must request approval to conduct an AMoC for cross connection testing before conducting the test. Details and site-specific information will be discussed with the Water Protection Department before approval is granted.

Once a CCT is successfully performed, the tester should enter the results into AWs Water Protection electronic database, and then the contractor should call for a 625-inspection release.