4714.1702 NONPOTABLE RAINWATER CATCHMENT SYSTEMS.

Subpart 1. **Section 1702.1.** UPC section 1702.1 is amended to read as follows:

1702.1 General. The installation, construction, alteration, and repair of rainwater catchment systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower makeup, and similar uses shall be approved by the commissioner.

Subp. 2. **Section 1702.2.** UPC section 1702.2 is amended to read as follows:

1702.2 Plumbing Plan Submission. No permit for a rainwater catchment system shall be issued until complete plumbing plans have been submitted and approved by the commissioner in accordance with Minnesota Rules, part 1300.0215, subpart 6.

Subp. 3. **Section 1702.4.** UPC section 1702.4 is amended to read as follows:

1702.4 Connections to Potable or Reclaimed (Recycled) Water Systems. Rainwater catchment systems shall have no direct connection to a potable water supply or alternate water source system. Potable or reclaimed (recycled) water is permitted to be used as makeup water for a rainwater catchment system provided the potable or reclaimed (recycled) water supply connection is protected by an air gap or reduced-pressure principle backflow preventer in accordance with this code. An automatic means to supply the rainwater catchment system with makeup water shall be installed when there is insufficient rainwater to meet the required demand or due to system failure.

Subp. 4. **Section 1702.5.** UPC section 1702.5 is amended to read as follows:

1702.5 Initial Cross-Connection Test. Where a portion of a rainwater catchment system is installed within a building, a cross-connection test is required in accordance with section 1702.11.2, as amended. Before the building is occupied or the system is activated, the plumbing contractor shall perform the initial cross-connection test in the presence of the Authority Having Jurisdiction. The test shall be ruled successful before final approval is granted.

Subp. 5. **Section 1702.7.** UPC section 1702.7 is amended to read as follows:

1702.7 Rainwater Catchment System Materials. Rainwater catchment system materials shall comply with sections 1702.7.1 through 1702.7.4.

1702.7.1 Water Supply and Distribution Materials. Rainwater catchment water supply and distribution materials shall comply with Chapter 6, as amended in this code, and the requirements of this code for potable water supply and distribution systems, unless otherwise provided for in this section.

1702.7.2 Rainwater Catchment System Drainage Materials. Materials used in rainwater catchment drainage systems, including gutters, downspouts, conductors,

and leaders shall be in accordance with Chapter 11, as amended in this code, and the requirements of this code for storm drainage.

1702.7.3 Storage Tanks. Rainwater storage tanks shall comply with section 1702.9.5, as amended in this code.

1702.7.4 Collection Surfaces. The collection surface shall be constructed of a hard, impervious material.

Subp. 6. **Section 1702.9.** UPC section 1702.9.3 is amended to read as follows:

1702.9.3 Collection Surfaces. Rainwater catchment systems shall collect rainwater only from roof surfaces. Rainwater catchment systems shall not collect rainwater from:

(1) vehicular parking surfaces;

(2) surface water runoff;

(3) bodies of standing water; or

(4) similar nonroof surfaces.

1702.9.3.1 Prohibited Discharges. Overflows and bleed-off pipes from roof-mounted equipment and appliances, condensate, and other waste disposal shall not discharge onto roof surfaces that collect rainwater for rainwater catchment systems.

Subp. 7. **Section 1702.9.** UPC section 1702.9.4 is amended to read as follows:

1702.9.4 Minimum Water Quality. The minimum water quality for rainwater catchment systems shall meet the applicable water quality recommendations in Table 1702.9.4.

Subp. 8. **Section 1702.9.4.** UPC section 1702.9.4 is amended by adding the following table:

TABLE 1702.9.4

Measure	**Limit**
Turbidity (NTU)	<1
E. coli (MPN/100 mL)	2.2
Odor	Non-offensive
Temperature (degrees Celsius)	MR
Color	MR
pH	MR

MR = measured and recorded only

Treatment:

5 micron or smaller absolute filter

Minimum .5-log inactivation of viruses

Subp. 9. **Section 1702.9.5.** UPC subsection 1702.9.5.1 is amended to read as follows:

1702.9.5.1 Construction. Rainwater storage shall be constructed of solid, durable materials not subject to excessive corrosion or decay, watertight, and suitable for rainwater storage.

Subp. 10. **Section 1702.9.5.** UPC section 1702.9.5.6 (A) is amended to read as follows:

1702.9.5.6 (A) Animals and Insects. Rainwater tank openings shall be protected to prevent the entrance of insects, birds, or rodents into the tank and piping system. Screen installed on vent pipes, inlets, and overflow pipes shall be corrosion-resistant and have an aperture of not greater than 1/16 inch (1.6 mm) and shall be close-fitting.

Subp. 11. **Section 1702.9.5.** UPC section 1702.9.5 is amended by adding a new subsection as follows:

1702.9.5.8 Storage Tank Venting. A vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate a minimum of 12 inches above grade, shall be a minimum of 1-1/2 inches in diameter, and shall be turned downward.

Subp. 12. **Section 1702.9.6.** UPC section 1702.9.6 is amended to read as follows:

1702.9.6 Pumps. Pumps serving rainwater catchment systems shall be listed. Pumps supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) (103 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in the rainwater supply system within the building exceeds 80 psi (552 kPa), a listed pressure-reducing valve reducing the pressure to 80 psi (552 kPa) or less to water outlets in the building shall be installed in accordance with this code.

Subp. 13. **Section 1702.9.7.** UPC section 1702.9.7 is amended to read as follows:

1702.9.7 Roof Drains. Primary and secondary roof drain systems shall be designed and installed in accordance with Chapter 11, as amended in this code. Secondary roof drains shall be equipped with a working alarm.

Subp. 14. **Section 1702.9.8.** UPC section 1702.9.8 is amended to read as follows:

1702.9.8 Water Quality Devices and Equipment. The rainwater catchment system shall include filtration and disinfection to maintain the minimum water quality

requirements in Table 1702.9.4. At a minimum, a 5-micron absolute filter shall be provided along with disinfection to provide a 0.5-log inactivation of viruses. Devices and equipment used to treat rainwater shall be suitable for rainwater catchment system applications, properly designed, sized, and documented for the specific project by a Minnesota registered professional engineer.

Subp. 15. **Sections 1702.9.11 and 1702.9.12.** UPC sections 1702.9.11 and 1702.9.12 are deleted in their entirety.

Subp. 16. **Section 1702.10.** UPC section 1702.10.1 is amended to read as follows:

1702.10.1 Commercial, Industrial, and Institutional Restroom Signs. A sign shall be installed in restrooms in commercial, industrial, and institutional occupancies using nonpotable rainwater for water closets, urinals, or both. Each sign shall contain 1/2-inch (12.7 mm) letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to users. Each sign shall contain one of the following texts as determined by the application:

1702.10.1 (A) TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS.

1702.10.1 (B) TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS.

1702.10.1 (C) TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH URINALS.

1702.10.1 (D) TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO *_____*

_____ shall indicate the rainwater usage.

Subp. 17. **Section 1702.11.** UPC section 1702.11.2 is amended to read as follows:

1702.11.2 Cross-Connection Inspection and Testing. The potable and rainwater catchment water systems shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with sections 1702.11.2.1 through 1702.11.2.4.

1702.11.2.1 Visual System Inspection. Prior to commencing the cross-connection testing and annually thereafter, a dual system inspection shall be conducted as follows:

Pumps, equipment, equipment room signs, and exposed piping in an equipment room shall be inspected for visible cross-connections, proper operation, and damage.

1702.11.2.2 Cross-Connection Test. The following procedure shall be followed by the plumbing contractor in the presence of the Authority Having Jurisdiction to determine whether a cross-connection has occurred:

(1) The potable water system shall be activated and pressurized. The rainwater catchment water system shall be shut down and completely drained.

(2) The potable water system shall remain pressurized while the rainwater catchment water system is completely drained. The minimum period the rainwater catchment water system is to remain completely drained shall be determined based on the size and complexity of the potable water system and rainwater catchment water distribution system, but in no case shall that period be less than one hour.

(3) Fixtures, potable water, and rainwater, shall be tested and inspected for flow. Flow from a rainwater catchment water system outlet indicates a cross-connection. No flow from a potable water outlet indicates that it is connected to the rainwater catchment water system.

(4) The drain on the rainwater catchment water system shall be checked for flow during the test and at the end of the testing period.

(5) The potable water system shall then be completely drained.

(6) The rainwater catchment water system shall then be activated and pressurized.

(7) The rainwater catchment water system shall remain pressurized for a minimum time specified by the Authority Having Jurisdiction while the potable water system is completely drained. The minimum period the potable water system is to remain completely drained shall be based on the size and complexity of the potable water system and rainwater catchment water distribution system but in no case shall that period be less than one hour.

(8) Fixtures, potable and rainwater catchment, shall be tested and inspected for flow. Flow from a potable water system outlet indicates a cross-connection. No flow from a rainwater catchment water outlet indicates that it is connected to the potable water system.

(9) The drain on the potable water system shall be checked for flow during the test and at the end of the testing period.

(10) Where there is no flow detected in the fixtures that would indicate a cross-connection, the potable water system shall be repressurized.

1702.11.2.3 Discovery of Cross-Connection. In the event that a cross-connection is discovered, the following procedure, in the presence of the Authority Having Jurisdiction, shall be activated immediately:

(1) Rainwater catchment water piping to the building shall be shut down at the meter and the rainwater water riser shall be drained.

(2) Potable water piping to the building shall be shut down at the meter.

(3) The cross-connection shall be uncovered and disconnected.

(4) The building shall be retested following procedures listed in sections 1702.11.2.1 and 1702.11.2.2.

(5) The potable water system shall be chlorinated with 50 ppm chlorine for 24 hours.

(6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. Where test results are acceptable, the potable water system shall be permitted to be recharged.

1702.11.2.4 Inspection. An annual inspection of the rainwater catchment water system, following the procedures in Section 1702.11.2.1, shall be required. Cross-connection testing, following the procedures listed in section 1702.11.2.2, shall be required every five years.

Alternate testing requirements shall be permitted by the Authority Having Jurisdiction.

Subp. 18. **Section 1702.** UPC section 1702 is amended by adding the following section:

1702.12 Maintenance and Inspection. Rainwater catchment water systems and components shall be inspected and maintained in accordance with sections 1702.12.1 through 1702.12.3.

1702.12.1 Frequency. Rainwater catchment systems and components shall be inspected and maintained in accordance with Table 1702.12 unless more frequent inspection and maintenance is required by the manufacturer.

1702.12.2 Maintenance Log. A maintenance log for rainwater catchment systems is required. The property owner or designated appointee shall ensure that a record of testing, inspection, and maintenance in accordance with Table 1702.12 is maintained in the log. The log shall indicate the frequency of inspection and maintenance for each system.

1702.12.3 Maintenance Responsibility. The required operation, maintenance, monitoring, testing, and inspection of rainwater catchment systems shall be the responsibility of the property owner.

Subp. 19. **Section 1702.12.** UPC section 1702.12 is amended by adding the following table:

TABLE 1702.12

Minimum Alternate Water Source Testing, Inspection, and Maintenance Frequency

Description	Minimum Frequency
Inspect and clean filters and screens, and replace.	Every three months.
Inspect and verify that required disinfection, filters, and water quality treatment devices and systems are operational and maintaining minimum water quality requirements in Table 1702.9.4.	After initial installation and monthly thereafter. Exception: Every 12 months thereafter when electronically monitored.
Inspect and clear debris from rainwater gutters, downspouts, and roof washers.	At the beginning of seasonal usage and monthly during seasonal usage.
Inspect and clear debris from roof or other aboveground rainwater collection surfaces.	At the beginning of seasonal usage and monthly during seasonal usage.
Remove tree branches and vegetation overhanging roof or other aboveground rainwater collection surfaces.	As needed.
Inspect pumps and verify operation.	After initial installation and every 12 months thereafter.
Inspect valves and verify operation.	After initial installation and every 12 months thereafter.
Inspect pressure tanks and verify operation.	After initial installation and every 12 months thereafter.
Clear debris from and inspect storage tanks and locking devices and verify operation.	After initial installation and every 12 months thereafter.
Inspect caution labels and marking.	After initial installation and every 12 months thereafter.
Cross-connection inspection and test.*	After initial installation and thereafter in accordance with Section 1702.11.2.4.

*The cross-connection inspection and test shall be performed in accordance with this chapter by a plumber licensed under Minnesota Statutes, section 326B.46, and certified to ASSE Standard 5120.

Subp. 20. **Section 1702.** UPC section 1702 is amended by adding a section as follows:

1702.13 Operation and Maintenance Manual. An operation and maintenance manual for rainwater catchment systems shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

(1) Detailed diagram of the entire system and the location of system components.

(2) Instructions on operating and maintaining the system.

(3) Details on maintaining the required water quality in Table 1702.9.4.

(4) Details on deactivating the system for maintenance, repair, or other purposes.

(5) Applicable testing, inspection, and maintenance frequencies in accordance with Table 1702.12.

(6) A method of contacting the manufacturer(s).

Subp. 21. **Section 1702.** UPC section 1702 is amended by adding the following section:

1702.14 Separation Requirements. All underground rainwater service piping shall be separated from the building sewer piping in accordance with section 609.2. Treated, nonpotable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12-inch minimum vertical and horizontal separation when both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement, the minimum separation shall be increased to 60 inches. The potable water piping shall be installed at an elevation above the treated-nonpotable water piping.

Subp. 22. **Section 1702.** UPC section 1702 is amended by adding the following section:

1702.15 Abandonment. All rainwater catchment systems that are no longer in use and fail to be maintained in accordance with section 1702.12 shall be considered abandoned. Abandoned rainwater catchment systems are subject to sections 1702.15.1 and 1702.15.2.

1702.15.1 General. Every abandoned rainwater catchment system or part thereof covered under the scope of this chapter, as amended in this code, shall be disconnected from any remaining systems, drained, plugged, and capped per the requirements of this code. Abandoned systems must comply with chapter 11, Storm Drainage, as amended.

1702.15.2 Underground Tank. Every underground water storage tank that has been abandoned or otherwise discontinued from use in a rainwater catchment system covered under the scope of this chapter, as amended in this code, shall be completely drained and filled with earth, sand, gravel, or concrete or removed in a manner approved by the administrative authority.

Statutory Authority: *MS s 326B.43; 326B.435*

History: *40 SR 71*

Published Electronically: *October 31, 2016*