

2024 UPC Chapter 16

and Appendix K

*2024 UPC Rainwater Catchment
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Montana EduCode*

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This class..... our approach

Relevant portions of other UPC chapters:

- Chapter 16 – Nonpotable Rainwater Catchment Systems
- Appendix K – Potable Rainwater Catchment Systems

or Water Efficiency and Sanitation Standard for the Built Environment (WESand)

Chapter 2 Definitions

203.0

Accepted Engineering Practice

That which conforms to technical or scientific-based principles, tests, or standards that are acceptable by the engineering profession.

Alternate Water Source

Nonpotable source of water that includes but not limited to gray water, on-site treated nonpotable water, rainwater, and reclaimed (recycled) water.

205.0

Construction Documents

Plans, specifications, written, graphic, and pictorial documents prepared or assembled for describing the design, location, and physical characteristics of the elements of a project necessary for obtaining a permit.

Cross-Connection

A connection or arrangement, physical or otherwise, between a potable water supply system and a plumbing fixture or tank, receptor, equipment, or device, through which it may be possible for nonpotable, used, unclean, polluted, and contaminated water, or other substances to enter into a part of such potable water system under any condition.

206.0

Debris Excluder

A device installed on the rainwater catchment conveyance system to prevent the accumulation of leaves, needles, or other debris in the system.

Diverter Valve, Rainwater

A component in commercial rainwater catchment systems to control high inflow and overflow volumes in rainwater storage tanks.

218.0

Potable Water

Water that is satisfactory for drinking, culinary, and domestic purposes and that meets the requirements of the **Health** Authority Having Jurisdiction.



220.0

Rainwater

Natural precipitation that has not been contaminated by use.

Rainwater Catchment System

A system that utilizes the principal of collection, storing, and using rainwater from a rooftop or other manmade, aboveground collection surface. Also, known as a rainwater harvesting system.

Rainwater Storage Tank

The central component of the rainwater catchment system. Also, known as a cistern or rain barrel.

Registered Design Professional

An individual who is registered or licensed by the laws of the state to perform such design work in the jurisdiction.

Roof Washer

A device or method for removal of sediment and debris from a collection surface by diverting initial rainfall from entry into the cistern(s). Also, known as a first flush device.

225.0

Water-Conditioning or Treating Device

A device that conditions or treats a water supply to change its chemical content or remove suspended solids by filtration.

Chapter 3 General Regulations

301.3 Alternate Materials and Methods of Construction Equivalency. Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code. Technical documentation shall be submitted to the AHJ to demonstrate equivalency prior to installation. The AHJ shall have the authority to approve or disapprove the system, method, or device for the intended purpose.

Workmanship

309.1 Engineering Practices. Design, construction, and workmanship shall be in accordance with accepted engineering practices and shall be of such character as to secure the results sought to be obtained by this code.



Installation practices

309.4 Installation Practices. Plumbing systems shall be installed in a workmanlike manner which is in accordance with this code, applicable standards, and the manufacturer's installation instructions. All materials shall be installed so as not to adversely affect the systems and equipment or the structure of the building, and in compliance with all laws and other provisions of this code. All plumbing systems shall be in accordance with construction documents approved by the AHJ.

Freeze protection

312.6 Freezing Protection. No water, soil, or waste pipe shall be installed or permitted outside of a building, in attics or crawl spaces, or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing.

Excavation

314.1 Trenches. Trenches deeper than the footing of a building or structure, and paralleling the same, shall be located not less than 45 degrees (0.79 rad) from the bottom exterior edge of the footing, or as approved in accordance with Section 301.0.

Chapter 6 Water Supply and Distribution

601.2 Water Supply and Flushing

Each plumbing fixture shall be provided with an adequate supply of **potable** running water pipe thereto in an approved manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross-connection.

Exceptions:

Listed fixtures that do not require water for their operation and are not connected to the water supply.

Where not deemed necessary for safety and sanitation by the AHJ.

Identification

601.3 Identification of a Potable and Nonpotable Water System. In buildings where potable water and nonpotable water systems are installed, each system shall be clearly identified in accordance with Section 601.3.1 through Section 601.3.5.

601.3.1 Potable Water. Green background with white lettering.

601.3.2 Color and Information. Each system shall be identified with a colored pipe or band and coded with paints, wraps, and materials compatible with the piping. Except as required by Section 601.3.3, nonpotable water systems shall have a yellow background with black uppercase lettering, with the words "CAUTION: NONPOTABLE WATER, DO NOT DRINK." Each nonpotable system shall be identified to designate the liquid being conveyed, and the direction of normal flow shall be clearly shown. The minimum size of the letters and length of the color field shall comply with Table 601.3.2. The background color and



required information shall be indicated every 20 feet (6096 mm) but not less than once per room, and shall be visible from the floor level.

601.3.3 Alternate Water Sources. Alternate water source systems shall have a purple (Pantone color No. 512, 522C, or equivalent) background with uppercase lettering and shall be field or factory marked as follows:

- (1) Gray water systems shall be marked in accordance with this section with the words "CAUTION: NONPOTABLE GRAY WATER, DO NOT DRINK" in black letters.
- (2) Reclaimed (recycled) water systems shall be marked in accordance with this section with the words: "CAUTION: NONPOTABLE RECLAIMED (RECYCLED) WATER, DO NOT DRINK" in black letters.
- (3) On-site treated water systems shall be marked in accordance with this section with the words: "CAUTION: ON-SITE TREATED NONPOTABLE WATER, DO NOT DRINK" in black letters.
- (4) Rainwater catchment systems shall be marked in accordance with this section with the words: "CAUTION: NONPOTABLE RAINWATER, DO NOT DRINK" in black letters.

601.3.5 Outlets. Each outlet on the nonpotable water line that is used for special purposes shall be posted with black uppercase lettering as follows: "CAUTION: NONPOTABLE WATER, DO NOT DRINK."

602.2 Cross-Contamination. No person shall make a connection or allow one to exist between pipes or conduits carrying domestic water supplied by a public or private building supply system, and pipes, conduits, or fixtures containing or carrying water from any other source or containing or carrying water that has been used for any purpose whatsoever, or piping carrying chemicals, liquids, gases, or substances whatsoever, unless there is provided a backflow prevention device approved for the potential hazard and maintained in accordance with this code. Each point of use shall be separately protected where potential cross-contamination of individual units exists.

602.4 Approval by Authority. No water piping supplied by a private water supply system shall be connected to any other source of supply without the approval of the AHJ, Health Department, or other department having jurisdiction.

604.2 Lead Content. The maximum allowable lead content in pipes, pipe fittings, plumbing fittings, and fixtures intended to convey or dispense water for human consumption shall be not more than a weighted average of 0.25 percent with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. For solder and flux, the lead content shall be not more than 0.2 percent where used in piping systems that convey or dispense water for human consumption.



607.2 Potable Water Tanks. Potable water supply tanks, interior tank coatings, or tank liners intended to supply drinking water shall comply with NSF 61.

607.3 Venting. Tanks used for potable water shall be tightly covered and vented in accordance with the manufacturer's installation instructions. Such vent shall be screened with a corrosion-resistant material of not less than number 24 mesh.

607.4 Overflow. Tanks shall have not less than a 16 square inch (0.01 m²) overflow that is screened with a corrosion resistant material of not less than number 24 mesh.

606.8 Check Valve Required

All systems that circulate water by means of a pump or other mechanical device or method shall have a check valve(s) or equal device(s) installed so as to ensure the direction of flow.

609.8 Pumps

Pumps shall be installed in accordance with the manufacturer's installation instructions

609.8.1 Access

Pumps shall be accessible for repairs.

609.8.2 Potable Water Pumps

Pumps intended to supply drinking water shall be in accordance with NSF 61.

Size of Potable Water Piping

610.1 Size. The size of each water meter and each potable water supply pipe from the meter or other source of supply to the fixture supply branches, risers, fixtures, connections, outlets, or other uses shall be based on the total demand and shall be determined according to the methods and procedures outlined in this section. Water piping systems shall be designed to ensure that the maximum velocities allowed by the code and the applicable standard are not exceeded.

610.13 Exceptions. The provisions of this section relative to the size of water piping shall not apply to the following:

(1) Water supply piping systems designed in accordance with recognized engineering procedures acceptable to the AHJ.

Other acceptable methods include:

Appendices A, L and M

Engineered systems



Chapter 16 Nonpotable Rainwater Catchment Systems

1601.1 Applicability. The provisions of this chapter shall apply to the installation, construction, alteration, and repair of nonpotable rainwater catchment systems.

1601.1.1 Allowable Use of Alternate Water. Where approved or required by the AHJ, rainwater shall be permitted to be used instead of potable water for the applications identified in this chapter.

1601.2 System Design. Rainwater catchment systems shall be designed in accordance with this chapter by a licensed plumbing contractor or registered design professional. Components, piping, and fittings used in a rainwater catchment system shall be listed.

Exceptions:

(1) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems used for irrigation with a maximum storage capacity of 360 gallons (1363 L).

(2) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems for single family dwellings where outlets, piping, and system components are located on the exterior of the building.

1601.3 Permit. It shall be unlawful for a person to construct, install, alter, or cause to be constructed, installed, or altered a rainwater catchment system in a building or on a premise without first obtaining a permit to do such work from the AHJ.

Exceptions:

(1) A permit is not required for exterior rainwater catchment systems used for outdoor drip and subsurface irrigation with a maximum storage capacity of 360 gallons (1363 L).

(2) A plumbing permit is not required for rainwater catchment systems for single family dwellings where outlets, piping, and system components are located on the exterior of the building. This does not exempt the need for permits where required for electrical connections, tank supports, or enclosures.

1601.5 Maintenance and Inspection. Rainwater catchment systems and components shall be inspected and maintained in accordance with Section 1601.5.1 through Section

1601.5.1 Frequency. Rainwater catchment systems and components shall be inspected and maintained in accordance with **Table 1601.5** unless more frequent inspection and maintenance are required by the manufacturer.



1601.6 Operation and Maintenance Manual. An operation and maintenance manual for rainwater catchment systems required to have a permit in accordance with Section 1601.3, 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 for operating and maintaining the system.
- (3) Details on maintaining the required water quality as determined by the Authority Having Jurisdiction.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection, and maintenance frequencies in accordance with Table 1601.5.
- (6) A method of contacting the manufacturer(s).

1601.7 Minimum Water Quality Requirements. The minimum water quality for rainwater catchment systems shall comply with the applicable water quality requirements for the intended application as determined by the AHJ. Water quality for nonpotable rainwater catchment systems shall comply with Section 1603.5.

Exceptions:

- (1) Water treatment is not required for rainwater catchment systems used for aboveground irrigation with a maximum storage capacity of 360 gallons (1363 L).
- (2) Water treatment is not required for rainwater catchment systems used for subsurface or drip irrigation.

1601.10 Separation Requirements. Underground rainwater catchment service piping shall be separated from the building sewer 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 where both pipe materials are approved for use within a building. Where minimum separation shall be increased to 60 inches. The potable water piping shall be installed at an elevation above the treated nonpotable water piping.

1601.11 Abandonment. Rainwater catchment systems that are no longer in use, or fail to be maintained in accordance with Section 1601.5, shall be abandoned. Abandonment shall comply with Section 1601.11.1 and Section 1601.11.2.

- Piping drained & capped
- Tank drained & filled

1601.12 Sizing. Unless otherwise provided for in this chapter, rainwater catchment piping shall be sized in accordance with Chapter 6 for sizing potable water piping.



1602.0 Nonpotable Rainwater Catchment Systems

1602.1 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, irrigation, industrial processes, water features, cooling tower makeup and other uses shall be approved by the AHJ. Rainwater catchment systems for collecting precipitation from rooftops shall comply with ARCSA/ASPE 63.

1602.4 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.

1602.5 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 1605.3. Before the building is occupied or the system is activated, the installer shall perform the initial cross-connection test in the presence of the AHJ and other authorities having jurisdiction. The test shall be ruled successful by the AHJ before final approval is granted.

1602.6 Sizing. The design and size of rainwater drains, gutters, conductors, and leaders shall comply with Chapter 11 of this code.

1602.7.1 Water Supply and Distribution Materials. Rainwater catchment water supply and distribution materials shall comply with the requirements of this code for potable water supply and distribution systems unless otherwise provided for in this section.

1602.7.2 Rainwater Catchment System Drainage Materials. Materials used in rainwater catchment drainage systems, including gutters, downspouts, conductors, and leaders shall be in accordance with the requirements of this code for storm drainage.

1602.7.3 Storage Tanks. Rainwater storage tanks shall comply with Section 1603.6.

1602.7.4 Collections Surfaces. The collection surface shall be constructed of a hard, impervious material.

1602.8 Rainwater Catchment System Color and Marking Information. Rainwater catchment systems shall have a colored background in accordance with Section 601.3. Rainwater catchment systems shall be marked, in lettering in accordance with Section 601.3.3, with the words: "CAUTION: NONPOTABLE RAINWATER, DO NOT DRINK."

1603.0 Design and Installation

1603.1 Rainwater Catchment Systems.

The design and installation of nonpotable rainwater catchment systems shall be in accordance with Section 1603.2 through Section 1603.20.

1603.2 Hose Bibbs

Outside hose bibbs shall be allowed on rainwater piping systems. Hose bibbs supplying rainwater shall be marked with the words: "CAUTION: NONPOTABLE RAINWATER, DO NOT DRINK" and in Figure 1603.2.



FIGURE 1603.2

Design & Installation

1603.3 Construction. Rainwater storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight.

1603.4 Rainwater Catchment Collection Surfaces. Rainwater shall be collected from roof surfaces or other manmade, aboveground collection surfaces.

1603.4.1 Other Surfaces. Natural precipitation collected from surface water runoff, vehicular parking surfaces, or manmade surfaces at or below grade shall be in accordance with the stormwater requirements for on-site treated nonpotable water systems in Section 1506.0.

1603.4.2 Prohibited Discharges. Overflows and bleed-off pipes from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater without prior approval from the AHJ.

1603.5.1 Treatment

If the quality of the tested water cannot consistently be maintained at the minimum levels specified in Table 1603.5, then the system shall be equipped with an appropriate treatment device meeting applicable NSF standards referenced in Chapter 17.

Storage Tanks

1603.7 Location. Rainwater storage tanks shall be permitted to be installed above or below grade.

1603.8 Above Grade. Above grade, storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight or shall be shielded from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate loads in accordance with the building code.



1603.9 Below Grade

Rainwater storage tanks installed below grade shall be structurally designed to withstand anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft²) where the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall be not less than 20 inches in diameter and located not less than 4 inches above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground where empty. The combined weight of the tank and hold down system shall meet or exceed the buoyancy force of the tank.

1603.10 Drainage and Overflow. Rainwater storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge in accordance with this code for storm drainage systems. Where discharging to the storm drainage system, the overflow drain shall be protected from backflow of the storm drainage system by a backwater valve or other approved method.

1603.11 Opening and Access Protection. Rainwater tank openings shall be protected to prevent the entrance of insects, birds, or rodents into the tank. Rainwater tank access openings exceeding 12 inches (305 mm) in diameter shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

1603.12 Marking. Rainwater tanks shall be permanently marked with the capacity and the language: "NONPOTABLE RAINWATER." Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following language: "DANGER-CONFINED SPACE."

1603.14 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 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.

1603.18 Debris Removal. The rainwater catchment conveyance system shall be equipped with a debris excluder or other approved means to prevent the accumulation of leaves, needles, other debris and sediment from entering the storage tank. Devices or methods used to remove debris or sediment shall be accessible and sized and installed in accordance with manufacturer's installation instructions.



1603.19 Required Filters. A filter permitting the passage of particulates not larger than 100 microns (100 µm) shall be provided for rainwater supplied to water closets, urinals, trap primers, and drip irrigation system.

1604.2 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 of an 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. The number and location of the signs shall be approved by the AHJ and shall contain the following text: TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS.

1604.3 Equipment Room Signs. Each equipment room containing nonpotable rainwater equipment shall have a sign posted with the following wording in 1 inch (25.4 mm) letters: CAUTION NONPOTABLE RAINWATER, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM. NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM. This sign shall be posted in a location that is visible to anyone working on or near rainwater equipment.

1605.2 Supply System Inspection and Test. Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of this code for testing of potable water and storm drainage systems. Storage tanks shall be filled with water to the overflow opening for a period of 24 hours, and during the inspection, or by other means as approved by the AHJ. Seams and joints shall be exposed during the inspection and checked for watertightness.

1605.3 Annual Cross-Connection Inspection and Testing. An initial and subsequent annual inspection and test in accordance with Section 1602.5 shall be performed on both the potable and rainwater catchment water systems. 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 Section

1605.3.3 Discovery of Cross-Connection

In the event that a cross-connection is discovered, the following procedure, in the presence of the AHJ, shall be activated immediately:

- (1) RW drain down
- (2) Potable water shut down
- (3) Find & correct cross-connection
- (4) Chlorination
- (5) Flushing



1605.3.4 Annual Inspection. An annual inspection of the rainwater catchment water system, following the procedures listed in Section 1605.3.1 shall be required. Annual cross-connection testing, following the procedures listed in Section 1605.3.2 shall be required by the AHJ, unless site conditions do not require it. In no event shall the test occur less than once in 4 years. Alternate testing requirements shall be permitted by the AHJ.

Appendix K Potable Rainwater Catchment Systems

K 101.2 System Design. Potable rainwater catchment systems in accordance with this appendix shall be designed by a registered design professional or person deemed competent by the AHJ to perform potable rainwater catchment system design work.

RDP

Stamp & Signature

Approved plans indicate how the system was designed and how it is to be installed.

K 101.4.1 Plumbing Materials and Systems. Pipe, pipe fittings, traps, fixtures, material, and devices used in a potable rainwater system shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and shall be in accordance with approved applicable recognized standards referenced within this code, and shall be free from defects. Unless otherwise provided for in this appendix, materials, fixtures, or devices used or entering into the construction of plumbing systems, or parts thereof shall be submitted to the AHJ for approval.

K 101.5.2 Maintenance Log. A maintenance log for potable rainwater catchment systems shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection, and maintenance in accordance with Table K 101.5.1 is maintained in the log. The log will indicate the frequency of inspection, and maintenance of each system. A record of the required water quality tests shall be retained for not less than 2 years.

K 101.6 Operation and Maintenance Manual. An operation and maintenance manual for potable 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 for operating and maintaining the system.
- (3) Details on maintaining the required water quality as determined by the AHJ.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection, and maintenance frequencies in accordance with Table K 101.5.1.
- (6) A method of contacting the manufacturer(s).



K 101.7 Minimum Water Quality Requirements. The minimum water quality for potable rainwater catchment systems shall comply with the applicable water quality requirements as determined by the AHJ. In the absence of water quality requirements, the guidelines EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies develop, revise, or expand alternate water source water quality standards.

K 101.8 Material Compatibility. In addition to the requirements of this appendix, potable rainwater catchment systems shall be constructed of materials that are compatible with the type of pipe and fitting materials and water conditions in the system.

K 101.9 System Controls. Controls for pumps, valves, and other devices that contain mercury that come in contact with the water supply shall not be permitted.

Table K 101.5.1

These systems put responsibility on owner...
Inspection and maintenance frequency

TABLE K 101.5.1
MINIMUM POTABLE RAINWATER CATCHMENT SYSTEM TESTING, INSPECTION, AND MAINTENANCE FREQUENCY

DESCRIPTION	MINIMUM FREQUENCY
Inspect and clean filters and screens, and replace (where necessary).	Every 3 months
Inspect and verify that disinfection, filters and water quality treatment devices and systems are operational. Perform water quality tests in accordance with the Authority Having Jurisdiction.	In accordance with the manufacturer's instructions, and the Authority Having Jurisdiction.
Perform applicable water quality tests to verify compliance with Section K 104.3.	Every 3 months
Perform a water quality test for E. Coli, Total Coliform, and Heterotrophic bacteria. For a system where 25 different people consume water from the system over a 60 day period, a water quality test for cryptosporidium shall be performed.	After initial installation and every 12 months thereafter, or as directed by the Authority Having Jurisdiction.
Inspect and clear debris from rainwater gutters, downspouts, and roof washers.	Every 6 months
Inspect and clear debris from the roof or other aboveground rainwater collection surface.	Every 6 months
Remove tree branches and vegetation overhanging roof or other aboveground rainwater collection surface.	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 and inspect storage tanks, 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



K 102.2 Connections to Public or Private Potable Water Systems. Potable rainwater catchment systems shall have no direct connection to a public or private potable water supply or alternate water source system. Potable water from a public or private potable water system is permitted to be used as makeup water to the rainwater storage tank provided the public, or private potable water supply connection is protected by an air gap or reduced-pressure principle backflow preventer in accordance with this code.

K 103.1 Collections Surfaces. The collection surface for potable applications shall be constructed of a hard, impervious material and shall be approved for potable water use. Roof coatings, paints, and liners shall comply with NSF Protocol P151.

K 103.1.1 Prohibited. Roof paints and coatings with lead, chromium, or zinc shall not be permitted. Wood roofing material and lead flashing shall not be permitted.

K 103.4 Water Supply and Distribution Materials. Potable rainwater supply and distribution materials shall comply with the requirements of this code for potable water supply and distribution systems.

Collection Surfaces

Rainwater shall be collected from a roof or other cleanable above-ground surfaces specifically designed for rainwater catchment. A rainwater catchment system shall not collect rainwater from:

- (1) Vehicular parking surfaces
- (2) Surface water runoff
- (3) Bodies of standing water

K 104.2 Prohibited Discharges. Overflows, condensate, and bleed-off pipes from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater.

K 104.3 Minimum Water Quality. Upon initial system startup, the quality of the water for the intended application shall be verified at the point(s) of use as determined by the AHJ in accordance with Section K 104.3.1 and Section K 104.3.2. Water quality maintenance shall be in accordance with Section K 104.3.3.

K 104.3.1 Private Potable Water System. In the absence of water quality requirements determined by the AHJ, the minimum water quality for a private potable water system at the point of use shall comply with Table K 104.3.1.

K 104.3 & 104.3.1

Public use

K 104.3.2 Public Use Occupancies. The minimum water quality for a potable water system for public use occupancies at the point of use and testing procedures shall comply with the Environmental Protection Agency (EPA) Safe Drinking Water Act for a public water system.



104.3.3 Maintenance. Normal system maintenance shall require system testing for *Escherichia coli* (fecal coliform) and turbidity every 3 months in accordance with Table K 104.3.3. Upon failure of the fecal coliform test, the system shall be re-commissioned involving cleaning, and retesting in accordance with Section K 104.3. Testing for viruses and cysts shall occur once after 3 months of initial operation and once every 12 months thereafter.

Exception: Upon failure of the virus or cyst test, the tests will be repeated every 3 months until the tests results are negative for two consecutive tests.

K 104.4 Water Quality Devices and Equipment. Devices and equipment used to treat rainwater to maintain the minimum water quality requirements determined by the AHJ shall be listed or labeled (third party certified) by a listing agency (accredited conformity assessment body) and approved for the intended application.

K 104.4.1 Filtration Devices. Potable water filters shall comply with NSF 53 and shall be installed in accordance with the manufacturer's installation instructions.

104.4.2 Disinfection Devices. Chlorination, ozone, ultraviolet, or other disinfection methods approved by the AHJ, or the product is listed and certified according to a microbiological reduction performance standard for drinking water, shall be used to treat harvested rainwater to meet the required water quality permitted. The disinfection devices and systems shall be installed in accordance with the manufacturer's installation instructions and the conditions of listing. Disinfection devices and systems shall be located downstream of the storage tank.

K 104.4.3 Filtration and Disinfection Systems. Filtration and disinfection systems shall be located after the water storage tank. Where a chlorination system is installed, it shall be installed upstream of filtration systems. Where an ultraviolet disinfection system is installed, a filter not more than 5 microns (5 μm) shall be installed upstream of the disinfection system.

K 104.5 Overhanging Tree Branches and Vegetation. Tree branches and vegetation shall not be located over the roof or other aboveground rainwater collection surface. Where existing tree branch and vegetation growth extends over the rainwater collection surface, it shall be removed in accordance with Section K 101.5.

K 105.2 Construction. Rainwater storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Storage tanks shall be approved by the AHJ for potable water applications, provided such tanks are in accordance with approved applicable standards.



K 105.3.1 Above Grade. Above grade, storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight, or shall be shielded from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate loads in accordance with the building code.

K 105.3.2 Below Grade. Rainwater storage tanks installed below grade shall be structurally designed to withstand anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft²) (1465 kg/m²) where the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall be not less than 20 inches (508 mm) in diameter and located not less than 4 inches (102 mm) above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground where empty. The combined weight of the tank and hold down system shall meet or exceed the buoyancy force of the tank.

K 105.4 Drainage and Overflow. Rainwater storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge in accordance with this code for storm drainage systems. Where discharging to the storm drainage system, the overflow drain shall be protected from backflow of the storm drainage system by a backwater valve or other approved method.

K 105.5 Animals and Insects. Rainwater tank openings to the atmosphere shall be protected to prevent the entrance of insects, birds, or rodents into the tank.

K 105.6 Human Access. Rainwater tank access openings exceeding 12 inches (305 mm) in diameter shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

K 105.7 Exposure to Sunlight. Rainwater tank openings shall not be exposed to direct sunlight.

K 105.8 Inlets. A device or arrangement of fittings shall be installed at the inlet of the tank to prevent rainwater from disturbing sediment as it enters the tank.

K 105.9 Primary Tank Outlets. The primary tank outlet shall be located not less than 4 inches (102 mm) above the bottom of the tank, or shall be provided with a floating inlet to draw water from the cistern just below the water surface.



K 106.2 Roof Washer or Pre-Filtration System. Collected rainwater shall pass through a roof washer or pre-filtration system before the water enters the rainwater storage tank. Roof washer systems shall comply with Section K 106.2.1 through Section K 106.2.4.

K 106.2.1 Size. The roof washer shall be sized to direct rainwater containing debris that has accumulated on the collection surface away from the storage tank. ARCSA/ASPE 63 contains additional guidance on acceptable methods of sizing roof washers.

K 106.2.3 Drain Discharge. Water drained from the roof washer, or pre-filter shall be diverted away from the storage tank and discharged to a disposal area that does not cause property damage or erosion. Roof washer drainage shall not drain over a public way.

K 106.2.4 Automatic Drain. Roof washing systems shall be provided with an automatic means of self-draining between rain events.

K 108.0 Supply System Inspection & Test

K 108.1 General. Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of this code for testing of potable water and storm drainage systems. Storage tanks shall be filled with water to the overflow opening for 24 hours, and during the inspection, or by other means as approved by the AHJ. Seams and joints shall be exposed during the inspection and checked for water tightness.

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