Note: Only revisions in underline or strikethrough are available for comment at this time.

ARCSA/ASPE 63:
Rainwater Catchment Systems

Third Public Review Draft

ARCSA/ASPE 63: Rainwater Catchment Systems (Normative)

3.0 DEFINITIONS

The following terms are defined in the manner in which they are intended to be used in the Standard. Additional definitions of terms relevant to the scope of the Standard that are not used in the body of the Standard are provided in Appendix C for informational purposes.

~~3.23 Sanitize: Destruction of most microorganisms (whether or not pathogenic) through the use of chemicals or heat.~~

4.0 DESIGN AND INSTALLATION REQUIREMENTS

4.4 Cisterns / Storage

4.4.3 Installation

a. Cisterns may be installed either above- or below-grade.

b. Cisterns shall comply with the administrative authority having jurisdiction, local building codes and ordinances, and/or as certified by a structural engineer.

c. Above-grade plastic tanks used as cisterns shall be listed for the applicable use for the intended application.

d. Above-grade cisterns shall be protected from direct sunlight or shall:

(1) Be constructed using opaque, UV-resistant materials (i.e., heavily tinted flexible or rigid plastic, metal tank with lining, concrete, etc.), or

(2) Have specially constructed sun barriers (e.g., installed in garages, crawlspaces, sheds, etc.) to minimize heat gain of the stored water.

e. Below-grade cisterns, located outside a building, shall be provided with manhole risers a minimum of 10.2 cm (4 in.) above surrounding grade and/or installed in such a way as to prevent surface- or groundwater from entering ~~through the top of any fittings~~ the cistern.

(1) Manholes shall be designed in accordance with OSHA Regulations for Confined Space Entry, 29 CFR 1910.

(2) Cisterns installed beneath a building structure likewise will installed in such a way as to prevent surface or groundwater from entering through the top of any fittings.

4.9 Potable Water Applications

4.9.6 Water Disinfection

4.9.6.1 To conform to the minimum water quality standards for potable water specified in Table 4.1, one of the following disinfection methods shall be used:

a. Chlorination may be used with an automated demand feed system and, if used, shall enable adequate contact time and residual according to local health authorities.

b. Ozone may be used with an approved ozone system ensuring adequate contact time with the ozone. Provision must be made to off-gas ozone to a safe environment.

c. Ultraviolet disinfection may be used and shall be provided between final filtration (5 micron maximum) and final point of use. UV systems shall be listed for the applicable use per the requirements of NSF 55 Class A devices.

~~d. Ultrafiltration to .02 micron~~

Note: The user of this standard is advised to check with the local authority having jurisdiction prior to implementing a design project intended to deliver potable water. Additional requirements may exist and the potable water system may fall under the responsibility of a state, federal, or tribal agency having responsibility over public water systems.

Table 4.1 Stored Rainwater Minimum Quality Standards

Parameter	Intended End-Use Quality Level	
	Non-potable	Potable [a]
Escherichia coli (E. coli)	< 100 CFU / 100 ml	None Detected
~~Protozoan Cysts~~	~~< 10 cysts/100 ml~~	~~None Detected~~
~~Viruses~~	~~—~~	~~None Detected~~
Heterotrophic Plate Count (HPC)	—	Less than 500 CFU/ml [b]
Turbidity	< 10 NTU [c]	< 0.3 NTU

[a] Potable water standards meet the U.S. Environmental Protection Agency's drinking water standard for pathogens.
[b] US EPA recommended limit
[c] Nephelometric Turbidity Unit (NTU),
Note: Monitoring requirements vary greatly from state to state. Consult state and local guidelines for monitoring requirements.

4.10 Operation and Water Quality Maintenance

4.10.1 Prior to Use: Prior to system operation, all debris will be removed from the collection surface and piping system. The cistern and distribution piping shall be cleaned with a sanitizing solution.

a. After several cycles of rainwater harvesting, an initial sample of the resultant accumulated water shall be tested for compliance according to the procedures listed in the latest edition of Standard Methods for the Examination of Water and Wastewater. Systems that cannot meet the minimum quality standards as listed in Table 4.1 shall be re-cleaned and then tested again, after several additional rain events, for compliance with the applicable

standards. Should the water quality still not be achievable, the system shall be provided with an appropriate filtration/disinfection device noted in Sections 4.9.4 and 4.9.5.

b. For private water systems, prior to placing the water system into service, water quality testing, at a minimum, shall be performed for E. coli, total coliform, and heterotrophic bacteria using the minimum quality standards provided in Table 4.1.

Note: The user of this standard is advised to check with the local authority having jurisdiction prior to implementing a design project intended to deliver potable water. Additional requirements may exist and the potable water system may fall under the responsibility of a state, federal, or tribal agency having responsibility over public water systems.

c. Public System

(1) In addition 4.10.1a and b, water shall be tested for Cryptosporidium. and Legionella bacterium.

(2) Subsequent annual tests shall be made for total coliform, E. coli, heterotrophic bacteria, and any chemicals of concern.

(3) Records of test results shall be maintained for at least two years.

4.10.2 Water Quality Maintenance

a. The quality of the water for the intended application shall be verified at the point of use in accordance with the minimum requirements of Table 4.1 complying with the testing procedures set forth in the Standard Methods for the Examination of Water and Wastewater.

b. Non-potable water shall be tested every 12 months. Potable water shall be tested every three months. If Legionella pneumophila is detectable in amounts greater than 10 CFU/ml at the point of use, appropriate disinfection will be required.

c. Maintenance: Non – Potable

(1) Non-potable water shall not be applied above ground in a spray application (irrigation, powerwash, etc.) without appropriate disinfection for airborne bacteria.

d. ~~c.~~Maintenance: Potable

(1) For a potable public water system, one sample shall be analyzed for applications serving up to 1,000 persons. When the treated water shall serve 1,001–2,500 persons, two samples shall be analyzed, and for 2,501 persons and up, three samples shall be analyzed. Samples must come from the following locations when additional taps for sampling are available:

(a~~1~~) One sample from the same location as the positive sample;

(b~~2~~) One sample within five service connections upstream;

(c~~3~~) One sample within five service connections downstream; and

(d~~4~~) For systems serving 25–1,000 persons, a fourth sample from any other sampling site.

(2) If refill of the cistern is required, replacement water shall be provided in a conveyance, and with procedures, as approved by the local health authority.

e~~d~~. If the quality of the tested water cannot consistently be maintained at the minimum levels specified in Table 4.1, the system shall be equipped with an appropriate treatment device meeting the applicable NSF standard referenced in Section 2.

Note: The user of this standard is advised to check with the local authority having jurisdiction prior to implementing a design project intended to deliver potable water. Additional

requirements may exist and the potable water system may fall under the responsibility of a state, federal, or tribal agency having responsibility over public water system.

END OF NORMATIVE STANDARD

APPENDIX A ADDITIONAL RELEVANT STANDARDS/DOCUMENTS (INFORMATIVE)

2. International Association of Plumbing and Mechanical Officials (IAPMO)

Uniform Plumbing Code

Green Plumbing and Mechanical Code Supplement

Water Efficiency and Sanitation Standard (WeStand)

APPENDIX C REFERENCE DEFINITIONS (INFORMATIVE)

~~DISINFECTION: The process of rendering microbial contaminates non-infectious.~~

