Add New Section: SECTION P2914 POTABLE RAINWATER COLLECTION AND DISTRIBUTION SYSTEMS

P2914.1 General.

The provisions of this section shall govern the construction, installation, *alteration*, and repair of rainwater collection and conveyance systems for the collection, storage, treatment and distribution of rainwater for potable applications, as permitted by Coconino County.

P2914.2 Collection surface.

Rainwater shall be collected only from above-ground impervious roofing surfaces constructed from *approved* materials. Collection of water from vehicular parking or pedestrian walkway surfaces shall be prohibited except where the water is used exclusively for landscape irrigation. Overflow and bleed-off pipes from roof-mounted *appliances* including, but not limited to, evaporative coolers, water heaters and solar water heaters shall not discharge onto rainwater collection surfaces. Where asphalt shingles or galvanized metal roofing are used as part of the collection surface, the water shall be tested for potability by a laboratory licensed by the Arizona Department of Health Services. Laboratory results shall be provided to the Coconino County Building Division before the water can be used for potable purposes.

P2914.3 Debris excluders.

Downspouts and leaders shall be connected to a roofwasher and shall be equipped with a debris excluder or equivalent device to prevent the contamination of collected rainwater with leaves, sticks, pine needles and similar material. Debris excluders and equivalent devices shall be self-cleaning. Exhibit 1. Example of a Debris Excluder.

P2914.4 Roofwasher.

An amount of rainwater shall be diverted at the beginning of each rain event, and not allowed to enter the storage tank, to wash accumulated debris from the collection surface. The amount of rainfall to be diverted shall be field adjustable as necessary to minimize storage tank water contamination. The roofwasher shall not rely on manually operated valves or devices and shall operate automatically. Diverted rainwater shall not be drained to the roof surface and shall be discharged in a manner consistent with the storm water runoff requirements of the *County*. Roofwashers shall be accessible for maintenance, service and drainage. Exhibit 2. Example of a RoofWasher

P2914.5 Roof gutters and downspouts.

Gutters and downspouts shall be constructed of materials that are compatible with the collection surface and the rainwater quality for the desired end use. Joints shall be water tight.

P2914.5.1 Slope.

Roof gutters, leaders and rainwater collection piping shall slope continuously toward collection inlets and shall be free of leaks. Gutters and downspouts shall have a slope of not less than $^1/_8$ inch per foot (10.4 mm/m) along their entire length. Gutters and downspouts shall be installed so that water does not pool at any point.

P2914.5.2 Cleanouts.

Cleanouts shall be provided in the water conveyance system to allow access to filters, flushes, pipes and downspouts.

P2914.6 Collection pipe.

Rainwater collection and conveyance systems shall utilize drainage piping *approved* for use within plumbing drainage systems to collect and convey captured rainwater. Vent piping *approved* for use within plumbing venting systems shall be utilized for vents within the rainwater system. Collection and vent piping materials shall comply with Section P3002.

P2914.6.1 Installation.

Collection piping conveying captured rainwater shall be installed in accordance with Section P3005.3.

P2914.6.2 Joints.

Collection piping conveying captured rainwater shall utilize joints *approved* for use with the distribution piping and appropriate for the intended applications as specified in Section P3003.

P2914.6.3 Size.

Collection piping conveying captured rainwater shall be sized in accordance with drainage-sizing requirements specified in Section P3005.4.

P2914.7 Filtration.

Collected rainwater shall be filtered as required for the intended end use. Filters shall be accessible for inspection and maintenance. Filters shall utilize a pressure gauge or other *approved* method to provide indication when a filter requires servicing or replacement. Filters shall be installed with shutoff valves installed immediately upstream and downstream to allow for isolation during maintenance. Exhibit 3. Example of a Filtration and Disinfection system.

P2914.8 Disinfection.

Where the intended application for rainwater requires disinfection or other treatment or both, it shall be disinfected as needed to ensure that the required water quality is delivered at the point of use. Exhibit 3. Shows a representative Filtration and Disinfection system.

P2914.9 Storage tanks.

Storage tanks utilized in potable rainwater collection and conveyance systems shall comply with Section P2915.

P2914.9.1 Location.

Storage tanks shall be located with a minimum horizontal distance between various elements as indicated in Table P2914.9.1.

TABLE P2914.9.1
LOCATION OF RAINWATER STORAGE TANKS

ELEMENT	MINIMUM HORIZONTAL DISTANCE FROM STORAGE TANK (feet)
Critical root zone (CRZ) of protected trees	2
Lot line adjoining private lots	5
Seepage pits	5
Septic tanks	5

For SI: 1 foot = 304.8 mm

P2914.9.2 Inlets.

Storage tank inlets shall be designed to introduce collected rainwater into the tank with minimum turbulence and shall be located and designed to avoid agitating the contents of the storage tank.

P2914.9.3 Outlets.

Outlets shall be located not less than 2 inches (51 mm) above the bottom of the storage tank and shall not skim water from the surface.

P2914.10 Influent diversion.

A means shall be provided to divert storage tank influent to allow for maintenance and repair of the storage tank system.

P2914.10.1 Backwater valve.

Backwater valves or air gaps shall be installed on each overflow and tank drain pipe. Backwater valves shall be in accordance with Section P3008.

P2914.11 Pumping and control system.

Mechanical equipment including pumps, valves and filters shall be easily accessible and removable in order to perform repair, maintenance and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall be appropriate for the application and in accordance with Section P2903.

P2914.12 Water pressure-reducing valve or regulator.

Where the water pressure supplied by the pumping system exceeds 80 psi (552 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the rainwater distribution

system piping to 80 psi (552 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with Section P2903.3.1.

P2914.13. Materials, joints and connections.

Distribution piping shall conform to the standards and requirements specified in Section P2906 for potable water.

P2914.13.1 Design.

Distribution piping systems shall be designed and sized in accordance with the Section P2903 for the intended application.

P2914.14 Roof gutter inspection and test.

Roof gutters shall be inspected to verify that the installation and slope is in accordance with Section P2914.5.1. Gutters shall be tested by pouring not less than 1 gallon of water (3.8 L) into the end of the gutter opposite the collection point. The gutter being tested shall not leak and shall not retain standing water.

P2914.14.1 Roofwasher test.

Roofwashers shall be tested by introducing water into the gutters. Proper diversion of the first quantity of water in accordance with the requirements of Section P2914.4 shall be verified.

P2914.14.2 Collection pipe and vent test.

Drain, waste and vent piping used for rainwater collection and conveyance systems shall be tested in accordance with Section P2503.

P2914.14.3 Storage tank test.

Storage tanks shall be tested in accordance with the Section P2915.7

P2914.14.4 Water supply system test.

The testing of makeup water supply piping and distribution piping shall be conducted in accordance with Section P2503.7.

P2914.14.5 Inspection and testing of backflow prevention assemblies.

The testing of backflow preventers and backwater valves shall be conducted in accordance with Section P2503.8.

P2914.14.6 Inspection of vermin and insect protection.

Inlets and vents to the system shall be inspected to verify that each is protected to prevent the entrance of insects and vermin into the storage tank and piping systems in accordance with Section P2915.2

P2914.14.7 Water quality test.

The quality of the water for the intended application shall be verified at the point of use in accordance with the requirements of the *jurisdiction*. If testing is required, the water shall be tested for potability by a laboratory licensed by the Arizona Department of Health Services. Approved roofing material such as tile, metal, slate, concrete, fiberglass, or other approved material shall not be subject to testing. Water shall be tested if collected off asphalt shingles or galvanized metal roofing.

Add New Section: SECTION P2915 POTABLE WATER STORAGE TANKS

P2915.1 Approved components and materials.

Piping, plumbing components and materials used in collection and conveyance systems shall be manufactured of material *approved* for the intended application and compatible with any disinfection and treatment systems used.

P2915.2 Insect and vermin control.

The system shall be protected to prevent the entrance of insects and vermin into storage tanks and piping systems. Screen materials shall be compatible with contacting system components and shall not accelerate the corrosion of system components.

P2915.3 Freeze protection.

Where sustained freezing temperatures occur, provisions shall be made to keep storage tanks and the related piping from freezing.

P2915.4 Sizing.

The holding capacity of the storage tank shall be sized in accordance with the anticipated demand.

P2915.5 Location.

Storage tanks shall be installed above or below grade. Above-grade storage tanks shall be protected from direct sunlight and shall be constructed using opaque, UV-resistant materials such as, but not limited to, heavily tinted plastic, lined metal, concrete and wood; or painted to prevent algae growth; or shall have specially constructed sun barriers including, but not limited to, installation in garages, crawl spaces or sheds. Storage tanks and their manholes shall not be located directly under any soil piping, waste piping or any source of contamination.

P2915.6 Materials.

Where collected on site, water shall be collected in an *approved* tank constructed of durable, nonabsorbent and corrosion-resistant materials. The storage tank shall be constructed of materials compatible with any disinfection systems used to treat water upstream of the tank and with any systems used to maintain water quality within the tank. Wooden storage tanks that are not equipped with a makeup water source shall be provided with a flexible liner.

P2915.6.1 Foundation and supports.

Storage tanks shall be supported on a firm base capable of withstanding the weight of the storage tank when filled to capacity. Storage tanks shall be supported in accordance with this code.

P2915.6.2 Ballast.

Where the soil can become saturated, an underground storage tank shall be ballasted or otherwise secured to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold-down ballast shall meet or exceed the buoyancy force of the tank. Where the installation requires a foundation, the foundation shall be flat and shall be designed to support the storage tank weight when full, consistent with the bearing capability of adjacent soil.

P2915.6.3 Structural support.

Where installed below grade, storage tank installations shall be designed to withstand earth and surface structural loads without damage and with minimal deformation when empty or filled with water.

P2915.6.4 Overflow.

The storage tank shall be equipped with an overflow pipe having a diameter not less than the inlet pipe. The overflow outlet shall discharge at a point not less than 6 inches (152 mm) above the roof or roof drain; floor or floor drain; or over an open water-supplied fixture. The overflow outlet shall be covered with a corrosion-resistant screen of not less than 16 by 20 mesh per inch (630 by 787 mesh per m) and by $^1/_4$-inch (6.4 mm) hardware cloth or shall terminate in a horizontal angle seat check valve. Drainage from overflow pipes shall be directed to prevent freezing on roof walks. The overflow drain shall not be equipped with a shutoff valve. Not less than one cleanout shall be provided on each overflow pipe in accordance with Section P3005.2.

P2915.6.5 Access.

Not less than one access opening shall be provided to allow inspection and cleaning of the tank interior. Access openings shall have an *approved* locking device or other *approved* method of securing access. Below-grade storage tanks, located outside of the building, shall be provided with a manhole either not less than 24 inches (610 mm) square or with an inside diameter not less than 24 inches (610 mm). Manholes shall extend not less than 4 inches (102 mm) above ground or shall be designed to prevent water infiltration. Finished grade shall be sloped away from the manhole to divert surface water. Manhole covers shall be secured to prevent unauthorized access. Service ports in manhole covers shall be not less than 8 inches (203 mm) in diameter and shall be not less than 4 inches (102 mm) above the finished grade level. The service port shall be secured to prevent unauthorized access.

Exception: Storage tanks under 800 gallons (3028 L) in volume installed below grade shall not be required to be equipped with a manhole but shall have a service port not less than 8 inches (203 mm) in diameter.

P2915.6.6 Venting.

Storage tanks shall be provided with a vent sized in accordance with Chapter 31 and based on the aggregate diameter of all tank influent pipes. The reservoir vent shall not be connected to sanitary drainage system vents. Vents shall be protected from contamination by means of an *approved* cap or a U-bend installed with the opening directed downward. Vent outlets shall extend not less than 4 inches (102 mm) above grade, or as necessary to prevent surface water from entering the storage tank. Vent openings shall be protected against the entrance of vermin and insects in accordance with the requirements of Section P2915.2.

P2915.6.7 Drain.

A drain shall be located at the lowest point of the storage tank. The tank drain pipe shall discharge as required for overflow pipes. Not less than one cleanout shall be provided on each drain pipe in accordance with Section P3005.2.

P2915.7 Storage tank tests.
Storage tanks shall be tested in accordance with the following:

1. Storage tanks shall be filled with water to the overflow line prior to and during inspection. Seams and joints shall be left exposed and the tank shall remain water tight without leakage for a period of 24 hours.

2. After 24 hours, supplemental water shall be introduced for a period of 15 minutes to verify proper drainage of the overflow system and leaks do not exist.

3. Following a successful test of the overflow, the water level in the tank shall be reduced to a level that is 2 inches (51 mm) below the makeup water trigger point by using the tank drain. The tank drain shall be observed for proper operation. The makeup water system shall be observed for proper operation, and successful automatic shutoff of the system at the refill threshold shall be verified. Water shall not be drained from the overflow at any time during the refill test.