



What is Rainwater Harvesting?

Rainwater harvesting involves the capture and storage of rainwater, the practice of which has been ongoing for thousands of years. Captured rainwater has many uses. In the Pacific Northwest, people use it for eco-friendly purposes such as supplementing yard irrigation or use with some plumbing fixtures. Rainwater harvesting can be as simple as collecting roof water stored in rain barrels to complex systems using underground tanks, filters, valves and pumps.

Are there government regulations involved in rainwater harvesting?

In the State of Washington, the Department of Ecology (DOE) regulates water resources by law. RCW 43.27A.020 broadly defines water resources as “*all water above, upon or beneath the surface of the earth located within the state*”. A recent policy (POL 1017) published by Department of Ecology establishes that the law may be reasonably interpreted to not require a water right for onsite storage and use of rooftop collected rainwater. It goes on to say that when the DOE determines that rooftop rainwater harvesting systems are likely to negatively affect instream values or existing water rights, local restriction may be set in place to govern subsequent new systems.

As a general rule, local governments **do not** allow rainwater systems or any other unapproved water source to be connected to plumbing systems or public water supply. Plumbing systems are strictly regulated through the state amended Uniform Plumbing Code (UPC) which is adopted by local jurisdictions. Plumbing systems include all potable water, distribution pipes, plumbing fixtures, traps, vent pipes, drains, sewers, joints connections, devices, receptors and appurtenances within the property.

Building departments that are members of the e-Gov Alliance and MyBuildingPermit.com have created this document which provides for an exemption and alternate method addressing these regulations. These are identified below.

Are there any permit exemptions allowed for installing simple rainwater harvesting systems?

Simple systems that collect roof rainwater through downspouts then directly deposit that water into approximate 55 gallon rain barrels are exempt from the requirements of a local permit. Water barrels may be inter-connected and the collected water may only be used for outdoor irrigation purposes. There shall be no electrical power, pumps, pressurization, controls or potable water connection to any part of the system. It is important that you first check with you local Planning Department for other requirements such as setbacks and distances to environmentally sensitive areas.

Are there alternative methods allowed to connect rainwater systems to building plumbing systems?

The state amended version of the Uniform Plumbing Code regulates any and all work connected with plumbing. The code generally allows for an alternate method of design when strict compliance of the code is not possible and where it can be shown that the intent of the code is met and or exceeded.

Approved Alternative Method allowing for harvested rainwater connection to approved plumbing fixtures

Proposed harvested rainwater systems that are connected to a structure's plumbing system may be approved when all applicable design conditions noted below are complied with. Please check with your local jurisdiction for their requirements in processing of Alternate Methods requests.

General Requirements:

- Rainwater harvesting systems shall normally be designed by a WA State licensed engineer experienced in designing harvested rain water systems. The designs shall be site specific. Some jurisdictions may allow designs by other approved professionals.
- Rainwater harvesting systems shall be subject to plan review and applicable fees.
- Rainwater shall only be collected from roofs, gutters and downspout systems not containing copper, zinc, lead or preservative treatment such as fungicides or herbicides.
- Provide isometric drawings showing the extent of supply up to and including specific fixtures. Clearly identify how potable water isolation is maintained. Include irrigation details if also used for irrigation. Show all detail of how rain water is collected along with down spouts that will be used to divert rainwater to the collection system.
- Provide calculations to demonstrate appropriate water pressure delivery to plumbing fixtures as required by the plumbing code.
- Premise Isolation: Whenever public water is provided on any site that also contains non-potable water source, then premise isolation shall be required just following the water meter. The backflow device shall be a State of Washington-approved reduced pressure backflow assembly which shall be inspected annually by a state certified backflow inspector. Clearly identify this on the drawings.
- An automatic factory listed "first flush" system shall be installed to divert the first 0.02 inch of rainfall per 24 hour period per square foot of roof area. Other standards such as the first 10 gallons per 1,000 sf of roof area may also be considered. All water entering roof washer shall be screened to prevent debris from entering the system. Water shall be disposed of away from a building so as not to cause damage to property or cause erosion. Note: a first flush or roof washer is not required for systems used exclusively for irrigation purposes.
- Potable water shall be introduced to the storage tank by providing an approved air gap that is twice the diameter of the inlet piping, with a minimum gap of 2".
- If potable water is to be connected to any portion of the harvested water system other than what is noted above for providing water to the storage tank, then a State of Washington approved reduced pressure backflow assembly which shall be inspected annually by a state certified backflow inspector shall be required at the point of connection in addition to premise isolation noted above.
- Provide approved equipment isolation valves to allow removal of equipment without affecting remaining system.
- All piping used for harvested rainwater shall be appropriately identified and labeled. Identification shall note "Non potable water – DO NOT DRINK" or other wording approved by the building official. The piping shall be light purple in color with black colored label markings visible on two sides of the pipe and visible in every stud or joist bay. Where piping is not concealed the label shall be visible every four feet. All piping shall conform to UPC standards for water use.
- Installation of materials shall conform to UPC requirements
- All other products used in the construction of a rainwater harvesting system shall be listed as required by code for the purpose intended and suitable for use in a potable water system.
- All storage containers must have secure covers
- All toilets, urinals, clothes washers, hose bibs or irrigation outlets that are connected to rainwater harvesting systems shall be individually and identified with a permanent sign stating "Non potable water – DO NOT DRINK" along with the international non potable water symbol.
- In commercial occupancies, all rooms using non-potable water for water closets, urinals or connection to other approved water fixture appliances approved by the local jurisdiction, a permanent sign posted with the following wording in contrasting 1 inch letters:

**TO CONSERVE WATER,
THIS BUILDING USES RAINWATER TO SERVICE
TOILETS, URINALS AND OR CLOTHES WASHERS**

- Each equipment room containing harvested rainwater shall have a permanent sign posted with the following wording in 1 inch contrasting letters:

**CAUTION: HARVESTED RAINWATER
DO NOT DRINK
DO NOT CONNECT TO DRINKING WATER SYSTEM**

**NOTICE
CONTACT BUILDING MANAGEMENT BEFORE PERFORMING
ANY WORK ON THIS WATER SYSTEM**

The sign shall be posted in a location that is visible to anyone working on or near the system.

Tank/Water Storage Requirements:

- Approved storage tanks listed for potable water use requires seismic anchoring if installed above grade. Tanks must also meet minimum height to width ratio of 1:1 if installed above ground unless a specific engineered design and foundation is submitted.
- Tanks shall be protected from sunlight to inhibit algae growth and ensure the life expectancy of the tank.
- Tanks shall be vented and protected from freezing.
- Tanks shall be accessible for inspections and cleaning. Minimum access opening (if enclosed) shall be 18" x 24". Provide a light, light switch and power source within equipment rooms and similar enclosures including crawlspaces.
- Tanks shall be supported on a foundation designed to carry the tank at full water capacity. Provide engineering calculations for the foundation design.
- Soils reports may be required for above grade or below grade tanks. Check with your local building department for specific requirements.
- If the tank is installed below grade, provide a manhole riser that extends a minimum of 8" above the adjacent grade. The cover to the manhole must be secure and locked. Provide signage at the opening stating "Danger Confined Space".
- Tanks shall have a designated overflow (minimum of 4 inches) and capable of diverting the volume of all water devices supplying the tank. The overflow shall be protected by a screen having openings no greater than 0.25 inches. Overflow water shall be disposed at an approved location away from a building so as not to cause damage to property or cause erosion.
- Storage tanks if pressurized or connected to pumps listed and approved for use with potable water and shall provide UPC required pressure to fixtures.
- Water shall be drawn at least 4" above the bottom of the tank.
- Harvested rainwater requires filtering both at the gutter or downspouts and within the tank collection. Tank filtering shall not exceed 50 microns. Access must be provided to maintain filters.

Fixture Connections:

- Only landscape irrigation, exterior decorative water features, toilets, urinals and or clothes washers may be connected to a harvested rainwater system.
- Piping carrying Harvested Rainwater shall not be located in the same trench as potable water unless separated by 12 inches vertically and horizontally.
- All fixtures connected to a harvested rainwater system shall be affixed with a universal symbol for non potable water.

Other Requirements:

- Operational and maintenance manuals: provide a document that includes all operations and maintenance necessary to ensure proper function for the life of the rainwater harvesting system.

Information should include timing on the replacement or cleaning of filters, removing of sediment, backflow inspections, valve inspections and operations and seasonal startup/shutdown.

- All work shall comply with this publication, building codes and manufacturer installation instructions.
- A flow test shall be performed through the system to the point of water distribution and disposal. In addition, the water distribution system shall be tested and proved tight at the operating pressure. Where the manufacturer permits, a 50 psi air test may substitute for the test above. All lines shall be water tight.
- The local jurisdiction shall require a plumbing inspection of all work installed when permits are required.

System Abandonment:

- If the owner of a rainwater harvesting system elects to cease use of, or fails to properly maintain such systems, they shall abandon the system by completely removing the system in its entirety. The harvested rainwater piping shall be replaced with a permitted and approved potable water supply system connected to approved plumbing fixtures.

What permits are required to install a harvested rainwater system?

Check with your local building department. Permits may include:

- Building permits for storage tank support, footings and foundations
- Plumbing permit
- Land use review for setback and critical areas
- Grading permits if tank is to be installed underground
- Electrical permits for lighting, power, pumps and controls
- DOE permits for systems using more than “negligible” amounts of water. (see section on Government Regulations above)

Resources

Information provided in this publication uses resources from:

- Washington State Department of Ecology
- Chapter 51-56 Washington Administrative Code (WAC)
- King County Department of Public Health
- City of Seattle