

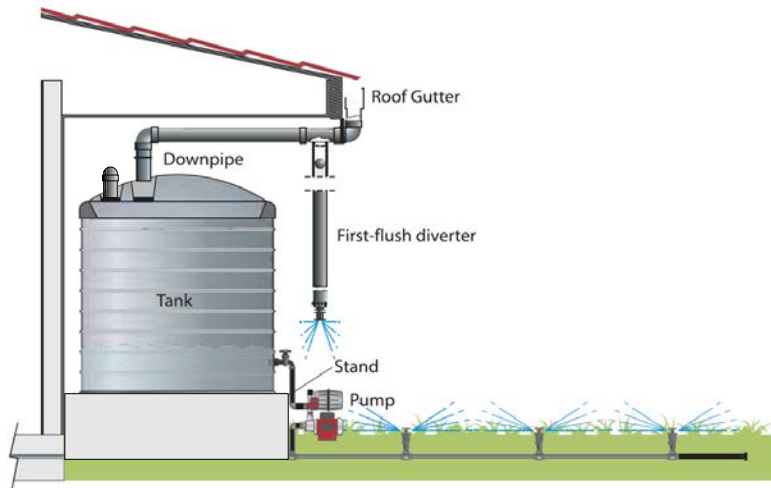


### Rainwater Catchment Systems

Handout No: 36  
Revised: 1/27/2020

#### Rainwater Catchment

Rainwater catchment is the capture, retainage storage and diversion of rainwater flowing off of an impervious surface for subsequent use for landscaping irrigation and other onsite use. Collection



of rainwater is usually from rooftops, which is then stored in rainwater storage tanks. Stored water can be used for non-potable purposes such as irrigating landscaping, washing cars or possibly even flushing toilets. Rainwater catchment systems can range from a simple barrel at the bottom of a downspout to multiple large underground tanks with pumps and controls.

#### Rainwater Catchment System Limitations


Most rainwater catchment systems are used exclusively for landscaping irrigation purposes. A building permit is usually required for the installation of large storage tanks, distribution systems, and/or pumps and backflow prevention devices associated with a rainwater catchment system. A building permit is always required if the rainwater storage and distribution system is proposed for use inside of a building. Currently, the State of California has not adopted rainwater catchment standards for use within buildings. Section 601.2 of the California Plumbing Code requires that plumbing fixtures including toilets, urinals washing machines and floor drains, be connected to an “adequate supply of potable running water” unless the City Building Official determines that it is not necessary for safety or sanitation reasons. Given that there are cities within the United States and other countries that have safely allowed the use of rainwater for fixtures such as toilets, urinals, washing machines and trap primers in floor drains, City Building Department staff will review and determine the acceptability of such requests on a case-by-case basis when designed by a licensed California Mechanical Engineer that specializes in plumbing or rainwater catchment systems. The installation of a rainwater system within a building requires separately isolated and identifiable piping systems for both the non-potable rainwater system and the potable City water system to prevent contamination between them.



# Requirements for Nonpotable Rainwater Catchment Systems

Zoning. Rainwater storage barrels are containers with a volume of 80 gallons or less. Larger storage tanks are considered structures for the purposes of determining City zoning and setback requirements. The following enumerates some of the City’s zoning requirements:

## Setbacks for Residential Uses

- A  rainwater storage barrel with a volume of 80 gallons or less may be placed below downspouts around a building without considering front, side or rear yard building setback requirements. *[Planning Department Interpretation]*
  - Rainwater storage tanks that do not exceed 8 feet in height above finished grade and do not exceed 120 square feet in area may be placed immediately adjacent to a side or rear property line. *[Sonoma Municipal Code Section 19.50.080.C.2.b.]*
  - Rainwater storage tanks not exceeding 9 feet in height above grade that are separated from other buildings on the property by a 6-foot-wide or more open yard may be placed as close as 5 feet to a side or rear property line. *[Sonoma Municipal Code Section 19.50.080.C.5. and 19.50.080.C.2.a.]*
  - Above-ground storage tanks are prohibited in required front and street-side setbacks, and in designated creek setback areas. *[Sonoma Municipal Code Section 19.50.080.C.3.]*
  - Above-ground rainwater storage tanks not meeting the above requirements must comply with the building setback requirements set forth in the Article III of the City’s Development Code for the zoning district in which it is located. *[Sonoma Municipal Code Section 19.40.110.A.1]*

## Setback and Design Review Requirements for Nonresidential Uses

- A rainwater storage barrel with a volume of 80 gallons or less may be placed below downspouts around a building without considering front, side or rear yard building setback requirements. *[Planning Department Interpretation]*
- Rainwater storage tanks not meeting the above requirements must comply with the building setback requirements set forth in the Article III of the City’s Development Code for the zoning district in which it is located. *[Sonoma Municipal Code Section 19.40.110.A.1]*
- Above-ground rainwater storage tanks for nonresidential uses are prohibited in required front and street-side setbacks, and in designated creek setback areas. *[Sonoma Municipal Code Section 19.40.110.A.3, 19.40.110.E. and 19.40.020.D.2 ]*
- Design Review Approval is required for above-ground rainwater storage tanks for which a building permit is required. *[Sonoma Municipal Code Section 19.54.080.B.2]*
- Design Review Approval is required for rainwater storage tanks located in public view. *[Sonoma Municipal Code Section 19.54.080.B.2]* **EXCEPTION:** Design Review Approval will not be required for single rainwater storage barrels with a volume of 80 gallons or less and placed below downspouts around a building. *[Planning Department Interpretation]*



Permits. Nonpotable rainwater catchment systems must comply with the requirements of Chapter 16 of the 2019 California Plumbing Code. A City building permit is required for rainwater catchment and storage systems except as follows:

- A permit is not required for exterior rainwater catchment systems used for non-spray irrigation with a maximum storage capacity of 5000 gallons where all of the following conditions are met:
  - the storage tank is supported directly by the ground or concrete slab; and
  - the ratio of height to width of the storage tank does not exceed 2:1; and
  - the system does not require electrical power; and
  - the system does not require a makeup water supply connection; and
  - the property is not served by the City’s municipal water system.

*[See CPC 1601.3 exception (1). Installation and inspection of a cross-connection control device near the City water meter is required in accordance with Sonoma Municipal Code Section 13.20.030 and City Standard Plan #213.]*

- A permit is not required for exterior rainwater catchment systems used for spray irrigation with a maximum storage capacity of 360 gallons provided that the property is not served by the City’s municipal water system. *[See CPC 1601.3 exception (2). Installation and inspection of a cross-connection control device near the City water meter is required in accordance with Sonoma Municipal Code Section 13.20.030 and City Standard Plan #213.]*



### Other Considerations for Rainwater Catchment Systems.

- Most requirements for rainwater catchment systems can be found in Chapter 16 of the California Plumbing Code. The code addresses specific design and safety considerations related to the proposed system including, but not limited to the following:
  - Plan Submission
  - Connections to Potable or Reclaimed (Recycled)
  - Cross-Connection
  - Water Systems
  - System and Pipe Sizing
  - Water Supply, Distribution and Drainage Materials

- Catchment System Components Color and Marking
- Minimum Water Quality
- Requirements for Rainwater Storage Tanks
- Requirements for Pumps, Roof Drains, Water Quality Devices, Filters,
- Signs
- Inspection and Testing.

- Untreated rainwater may contain contaminants and is considered non-potable water. Non-potable water piping must be exposed to view and must be marked every 20 feet with a yellow identification band and labeled “CAUTION: NON-POTABLE RAINWATER, DO NOT DRINK.” Discharge outlets must be exposed to view and must be labeled with the international symbol for non-potable water and the words “CAUTION: NON-POTABLE RAIN WATER, DO NOT DRINK.” [2019 California Plumbing Code sections 601.3, 1602.8]



- Rainwater catchment systems may not be directly connected to other potable water sources, such as the City-supplied domestic water system or a well serving the home or business. [2019 California Plumbing Code - 1602.4]
- For above-ground water storage tanks exceeding 5,000 gallons or if the ratio of height to width of a tank exceeds 2:1, an engineered pad base and adequate anchorage system must be provided. [2019 California Building Code Chapter 16 and CPC Section 1603.4]
- Rainwater storage tanks installed below grade must be adequately tied down and anchored to prevent lifting caused by groundwater. [CPC Section 1603.5]
- Rainwater that is part of a rainwater catchment system must be filtered and treated to meet the minimum filtering and water quality requirements set forth in Table 1602.9.6 of the California Plumbing Code. [CPC 1602.9.6; See exception 1602.9.6 for rainwater catchment system used for non-spray irrigation with above-ground water storage tanks less than 5,000 gallons and the ratio of height to width of the tank is less than 2:1]
- Rainwater storage tanks must be provided with pressure relief mechanisms (vents) and tank overflows to prevent tank pressure buildup and to provide an overflow route should the tanks fill to capacity. Rainwater tanks shall be permanently marked with the capacity and the language: "NONPOTABLE RAINWATER." [2019 California Plumbing Code – 1603.8 & 1603.9]
- The rainwater catchment system should be designed as an integrated solution incorporating collection, contaminant removal, pumping, control and distribution. Rainwater tanks should be well sealed, maintainable and be provided with first-flush devices and filters to keep out leaves and other contaminants. Inlet and overflow screens should be provided to prevent access of mosquitoes and other insects and vermin. Provisions should be made for periodically draining and cleaning the rainwater storage tanks of siltation and other contaminants.



- It is important that a rainwater catchment system be designed to prevent growth of algae and other organisms in the system. Good aeration and circulation of water, no sunlight on water and keeping leaves and organic matter in the water to a minimum will help to reduce the growth of algae.
- The rainwater catchment system should be properly sized. Variables such as available capture area, storage availability, spring-time average rainfall and usage requirements must be considered to properly design a system.
- For automated irrigation and distribution systems, consideration should be given to providing makeup water to the tank from sources other than rainwater (i.e. City or well water).

## Rainwater Catchment Resources

- [2019 California Plumbing Code](#)
- American Rainwater Catchment Systems Association:  
<http://www.arcsa.org/>

For further questions, please contact the City of Sonoma Building Department at 707-938-3681.