Cisterns and rain barrels

Mission Trails Regional Park

Background

Cisterns and rain barrels are storage containers that collect rooftop runoff from a downspout and store it for later use. Typically, the collected water is seen as a resource to be reused or released into the landscape for irrigation needs. Though cisterns and rain barrels do not remove pollutants by themselves, they do help control runoff volume and reduce the amount of water that can enter the storm water conveyance system.

Cisterns are effective in:

- Runoff volume
- Peak flow reduction
- Non-potable beneficial use

Site Assessment

Cisterns and rain barrels can be used at both commercial and residential building sites and should be sized according to the rooftop drainage area and its potential flow volume. Single or multiple downspouts may be directed to a single barrel or cistern. Screens or first-flush diverters should be used to filter out debris and large particles that could clog the inlet. In addition, cisterns and rain barrels must incorporate an overflow system to ensure that excess flow is properly directed away from adjacent structures. As cisterns hold a much larger capacity of water than rain barrels, a geotechnical evaluation should be completed to determine the structural capacity of the soils.

Drainage area	Soil infiltration rate	Water table separation	Depth to bedrock	Facility slope	Inflow rate
Rooftop area	Dependent upon downstrream area	Below-grade tanks must be above the water table and bedrock		< 5%	Capacity of rain gutters

Pollutant Removal	Not a primary method for removing pollutants; Controls runoff.	Runoff volume reduction	Groundwater recharge
		Medium	Dependent upon downstrream BMP

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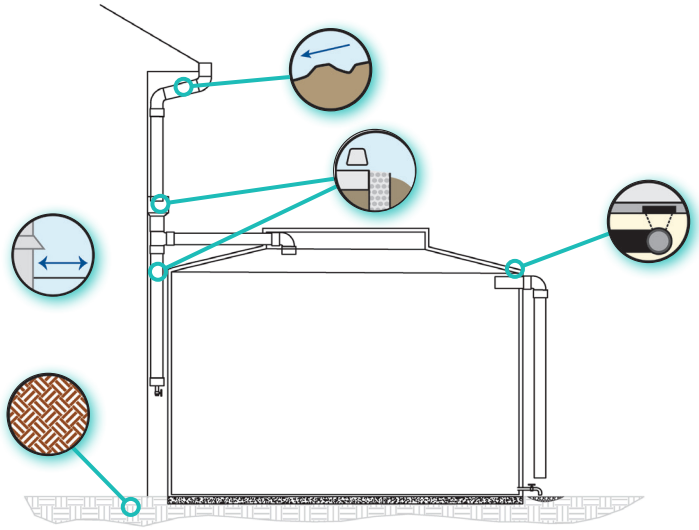

Existing Buildings: Ideally, cistern overflows should be set away from building foundations at least 5 feet.

Soil Type: Ensure that the cistern is securely mounted on stable soils to avoid erosion around the base or significant soil compaction with the weight of a full cistern. If structural capacity of the site is in question, complete a geotechnical report to determine the structural capacity of soils.

Flow regulation: Inflow is determined by the capacity of the rain gutters. First flush diverters can be used to prevent small particles from entering the system. The outflow volume of the cistern/rain barrel should be allowed to slowly release, preferably into an inline infiltration BMP.

Pretreatment: Inlet filters should be installed to remove debris and large particles. First flush diverters should be installed after the inlet filter to divert the initial volume of water away from the cistern.

Overflow system: All cisterns should have an overflow for runoff volumes that exceed the capacity of the cistern. During high volume storm events, the overflow system conveys overflow to traditional conveyance or, preferably, storm water BMPs such as a bioretention cell or other pervious surfaces that enhance infiltration.

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