

HSC-4: Residential Rain Barrels

Rain barrels are above ground storage vessels that capture runoff from roof downspouts during rain events and detain that runoff for later reuse for irrigating landscaped areas. The temporary storage of roof runoff reduces the runoff volume from a property and may reduce the peak runoff velocity for small, frequently occurring storms. In addition, by reducing the amount of storm water runoff that flows overland into a storm water conveyance system (storm drain inlets and drain pipes), less pollutants are transported through the conveyance system into local creeks and ocean. The reuse of the detained water for irrigation purposes leads to the conservation of potable water and the recharge of groundwater.

Feasibility Screening Considerations

- Rain barrels not actively managed that overflow to infiltration areas shall be screened as Infiltration BMPs for feasibility screening.

Opportunity Criteria

- Rooftops with downspouts or other suitable conveyances (e.g. rain chains) present in the drainage area.
- If detained water will be used for irrigation, sufficient vegetated areas and other impervious surfaces must be present in drainage area.
- Storage capacity and sufficient area for overflow dispersion must be accounted for.

OC-Specific Design Criteria and Considerations

- Screens on gutters and downspouts should be used to remove sediment and particles as the water enters the barrel or cistern. Removable child-resistant covers and mosquito screening should be used to prevent unwanted access.
- Above-ground barrels should be secured in place.
- Above-ground barrels should not be located on uneven or sloped surfaces; if installed on a sloped surface, the base where the cistern will be installed should be leveled prior to installation.
- Overflow dispersion should occur greater than 8 feet from building foundations.
- Dispersion should not cause geotechnical hazards related to slope stability.
- Dispersion should be only allowed to stable vegetated areas where erosion or suspension of sediment is minimized.
- Effective energy dissipation and uniform flow spreading methods should be employed to prevent erosion and facilitate dispersion.
- Aesthetics should be considered for placement of barrels and incorporation into surroundings. Placement should allow easy access for regular maintenance.

Also known as:

➤ *Small cistern*

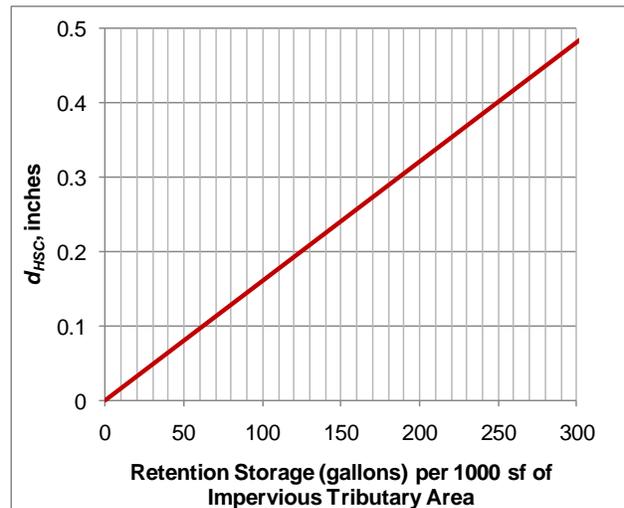


Rain Barrel
Source:
<http://www.auburn.edu/projects/sustainability/website/newsletter/0910.php>

- To draw down a 55 gallon rain barrel within 2 days with plant watering, at least 1,600 square feet of conservation landscape or 800 square feet of active turf area is needed.

Calculating HSC Retention Volume

- At least 1,600 sq-ft of conservation landscape or 800 sq-ft of active turf landscape shall be provided for each rain barrel to claim an HSC credit volume
- The effective volume provided by rain barrels that are not actively managed can be computed as 50% of the total storage volume (e.g., 27.5 gallons for each 55 gallon barrel).
- If the rain barrel is actively managed then it should be treated as a cistern as described in **Appendix XIV.4**.
- Estimate the average retention volume per 1000 square feet impervious tributary area provided by rain barrels. Example:
 - 500 square feet of roof draining to a 55 gallon rain barrel
 - Retention volume = $(55/2) = 27.5$ gallons
 - Retention volume per 1000 sq feet = $27.5 \text{ gallons} / 0.5 = 55 \text{ gallons per } 1000 \text{ sq-ft}$
 - Based on the retention storage estimated, look up the storm retention depth, d_{HSC} from the chart to the right = 0.07 inches
 - The max d_{HSC} is equal to the design storm depth for the project site.



Configuration for Use in a Treatment Train

- Rain barrels can be combined into a treatment train to provide enhanced water quality treatment and reductions in the runoff volume and rate. For example, if a green roof is placed upgradient of a rain barrel, the rate and volume of water flowing to the barrel can be reduced and the water quality enhanced.
- Rain barrels can be incorporated into the landscape design of a site and can be aesthetically pleasing as well as functional for irrigation purposes.

Additional References for Design Guidance

- Santa Barbara BMP Guidance Manual, Chapter 6:
http://www.santabarbaraca.gov/NR/rdonlyres/91D1FA75-C185-491E-A882-49EE17789DF8/0/Manual_071008_Final.pdf
- County of Los Angeles Low Impact Development Standards Manual:
http://dpw.lacounty.gov/wmd/LA_County_LID_Manual.pdf
- SMC LID Manual (pp 114):
http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf
- San Diego County LID Handbook Appendix 4 (Factsheet 26):
<http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf>