

Dry Wells

Dry wells are similar to infiltration trenches, a dry well is a small, excavated pit, backfilled with clean stone aggregate that receives and temporarily stores roof runoff.

Limitations

- Restricted in Natural Resource Conservation Service Hydrologic Soil Group (HSG) C & D soils as well as Karst topography
- Not appropriate for roofs where high pollutant or sediment loading is anticipated.
- High risk areas where stormwater runoff is exposed to hazardous or toxic materials / substances / products.

Supporting Practice Considerations:

- Flow splitter to address overflows / high-flow storm events
- Vegetation for final stabilization
- Subsurface drain

Recommended V_Q Credit

Total storage volume, taking into account void space of aggregate, calculated by design professional.

Sizing Considerations

1. Compute the Water Quality Treatment Volume (V_Q) for the given rooftop.

$$V_Q = \text{Drainage Area in Square Feet} \times 0.083 \text{ (1 inch rain)}$$

2. Size dry well

$$\frac{CF}{0.4^*} = \text{dry well volume}$$

(*varies – 40% void ration is rule of thumb for rock backfill)

Dry well volume = Depth (D) x Width (W) x Length (L)

Depth = well depth is typically limited to 3.5 feet;

Recommended Guidelines

1. Design Considerations

- 1.1. For buildings with basement or crawl space the practice should be located a minimum of ten feet from building foundation to avoid seepage problems.
- 1.2. Should be performed after all other areas of the site are stabilized to avoid clogging.
- 1.3. During construction, compaction of the sub-grade soil should be avoided, and construction should be performed with only light machinery.

2. Slopes

- 2.1. Not applicable

3. Design flow

- 3.1. Dry wells should be designed to accept 1 inch of runoff over the contributing roof area; generally installed at each drainpipe.

4. Groundwater

- 4.1. Four (4) feet clearance from seasonal high water table is recommended, minimum 1 foot.

5. Pretreatment

- 5.1. Not applicable

6. Detention time

- 6.1. A dry well must fully drain runoff volume within 72 hours.

7. Observation well

- 7.1. Dry wells should include an observation well constructed of a perforated 4" diameter PVC pipe secured in position by placing a section of rebar through a perforation in the bottom of the pipe, prior to filling the well with stone aggregate.

8. Construction Considerations

8.1. Post-construction soil

- 8.1.1. The minimum design permeability rate of the surrounding soil is 0.5 inches per hour. The permeability rate must be determined by field or laboratory testing.

8.2. Aggregate material

- 8.2.1. Clean-washed aggregate 1.5 to 3-inch diameter.
- 8.2.2. Aggregate should be placed within 6 to 12 inches of the finished surface elevation, leaving sufficient depth for topsoil replacement.

8.3. Filter fabric

- 8.3.1. Only non-woven filter fabrics shall be used.

8.3.2. Fabric installation shall provide sufficient length to cover the bottom, sides and top of the aggregate. Filter fabric shall be wrapped over the top of the aggregate such that it becomes completely enclosed and tied with wire or nylon twine or otherwise tightly secured around the horizontal inflow pipe where the pipe protrudes through the fabric.

8.3.3. Fabric shall be overlapped six inches in “shingle” fashion when more than one section is required to enclose aggregate.

8.4. Inlet control

8.4.1. Downspout serves as the inlet control

8.5. Outlet control

8.5.1. Not applicable

8.6. Overflow

8.6.1. All dry wells must be able to safely convey system overflows which can be done by installing an overflow pipe on the downspout.

8.7. Final stabilization

8.7.1. 6” – 12” of topsoil can be placed over the dry well and vegetated to blend into the rest of the landscape

9. *Maintenance Considerations*

9.1. Periodically

9.1.1. Dry well should be inspected at least four times annually as well as after large storm events during the first year; annually thereafter.

9.1.2. All inlets and outlets should be inspected semi-annually for clogging debris (i.e., leaf litter).

9.2. Repairs

9.2.1. If water is standing in a pipe more than 3 days after a storm event, clogging has most likely occurred and the dry well requires repair or replacement.

Dry Well Resources:

New Jersey Stormwater Best Management Practices Manual, chapter 9.3: Standard for Dry Wells Final Draft December 2003

Rhode Island Stormwater Manual, 4.3.4.5: Dry Wells