

Section 3.4 Dry Well (DW)



A dry well is a subsurface storage facility that temporarily stores stormwater runoff until it can seep into the surrounding soil. Runoff is stored in a reservoir of gravel, an open-bottomed chamber, or both.

A. Purpose

- This practice is intended to treat concentrated flow or piped runoff from small impervious areas such as individual rooftops and driveways.

B. Site Criteria

- Practice should be located within 40 feet of downspout or impervious surface. Runoff must be piped into the underground gravel reservoir.
- The drainage area for a dry well shall be less than 2,500 square feet of impervious cover. Drainage area should be primarily impervious (more than 90% by volume).
- Overland sheet flow can be treated by a dry well if the appropriate pretreatment measure is installed to prevent clogging.
- If contributing drainage area is greater than 2,500 square feet should, consider using Infiltration (Practice 3.9) instead.
- The site must have soils capable of infiltrating stormwater runoff (>0.5 inches/hour). An infiltration test must be performed.
- If infiltration rate is < 0.5 inches/hour, consider bioretention with underdrain (Section 3.8).
- Depth to water table and bedrock shall be 2 feet or greater from bottom of the practice. If the seasonal high water table is identified as a potential concern based on field or desktop analysis, it should be verified by a professional soil scientist (Contact Extension, NRCS, or Society of Professional Soil Scientists for local providers).
- Cannot be placed on wetland soils.
- Cannot be placed within the areas designated as the FEMA 100-year flood plain, 1% annual chance flood plain, or by the locality as within the 100-year flood plain, whichever is most stringent.
- Shall not be placed in a ditch or conveyance channel.
- Shall not be appropriate where high pollutant or sediment loading is anticipated due to potential clogging of the dry well and contamination of the groundwater.

- Shall be located at least 10 feet from building foundations (includes basement and crawl space walls, slabs on grade), greater if upgradient. May not be appropriate near buildings where there is significant risk for basement seepage. A Form 5-Release Agreement may be required.
- Impact on septic drain fields should be evaluated prior to application submission. Consult local setback requirements.

C. Design Criteria

- Dry wells shall be sized to capture the 1-inch volume of runoff. This shall be based on the contributing drainage area, corresponding runoff value, and storage depth. (See Appendix A.1 for Calculations).
- Practice should drain within 48 hours.
- Depth is typically 3 to 5 feet with 6 to 12 inches of cover (permeable topsoil and turf, pea gravel, or similar).
- The top and sides of the gravel reservoir shall be wrapped in non-woven geotextile meeting NRCS specification Va-795. The bottom of the reservoir shall be left open.
- Leaf screens or debris sumps shall be used as pretreatment to prevent clogging. See Appendix B for other pretreatment options.
- A stabilized stormwater overflow or bypass route must be provided. Pop-up emitters are the preferred overflow device.
- Sodding or other establishment measures must occur immediately after construction. Temporary stabilization measures may be necessary.
- Dry Wells can include observation wells for monitoring practice function.

D. Design Plan Components

- A design plan for the site must be submitted by the applicant and approved by the Steering Committee before construction is initiated. The district must be notified of any proposed changes to the approved design. Changes to the approved design may jeopardize cost share reimbursement. The Steering Committee has discretion to approve or deny cost share reimbursement in the event of design changes. Information required in the planting/design plan includes (see VCAP Submission Checklist for a comprehensive list):
 - Soil map and/or a soil assessment indicating water table and bedrock depths and other limiting factors.
 - Infiltration test results.
 - Sizing calculations.
 - Design plant showing cross-section, aerial footprint, and outflow. May include location of filter fabric, plantings/soil and reseeding, and maintenance ports if applicable.
 - A statement regarding compliance with any permitting requirements or local codes.
 - Other information as requested by the local District.
- It is the VCAP participant's responsibility to ensure any contractors meet all applicable local codes and requirements.

E. Operation and Maintenance

- Maintenance will include:
 - Inspection of pretreatment devices and debris removal.
 - If installed, inspection of observation ports for signs of prolonged standing water.
 - Routine maintenance of cover (sod, pea gravel, etc.) and filter fabric to assure appropriate pre-treatment and drainage into practice.
- Practice should drain in less than 48 hours after a storm event.

F. Cost-Share Rates/Incentives

- See District Guide to VCAP for practice cost-share rates and caps.
- Eligible costs may include: soil testing, design services, excavation, grading/reseeding, stone, storage reservoir, piping, geotextile fabric, pre-treatment and overflow components, delivery of materials, seed/sod/plants.

G. Technical References

- Virginia Stormwater Management Handbook, Version 1.0. 2024. Virginia Department of Environmental Quality.
- [Natural Resources Conservation Service. Construction Specification VA-795 Geotextile.](#)
- [Virginia Department of Conservation and Recreation. Virginia Flood Risk Information System.](#)