



## DRY WELL (DW)

Effective October 6, 2012

The Dry Well methods described in the following section are based on the Dry Well design found in Chapter 5 of the Maryland Storm Water Design Manual and the ESD Process & Computations Supplement dated July 2010. Where deemed appropriate, the design specifications have been modified by the Montgomery County Department of Permitting Services (DPS).

### A. Facility Description

A Dry Well is an excavated pit, often filled with gravel or stone that provides temporary storage of rooftop runoff within the void space in the stone media. Proprietary chamber systems are also available. Rooftop runoff is directed to the storage area via downspout piping and is allowed to infiltrate into the surrounding soil. Dry Wells are not acceptable for runoff from non rooftop sources, such as driveways. Dry Wells may not be fed via trench drains.

### B. System Design Considerations

#### 1. Applicability

Dry Wells may be used on any development where groundwater recharge is desired and there are appropriate soil conditions to allow it. This practice should not be located in areas that may result in damage to mature trees, or where existing slopes exceed 15 percent. A minimum of 1 foot and a maximum of three feet of earth cover may be placed above the Dry Well, and a minimum of 50% of the Dry Well storage volume must be located within undisturbed soils.

#### 2. Soils

Provide soils information to support the use of Dry Wells. Acceptable methods include soil typing and infiltration testing. For existing single family lots that are not going through the subdivision process, soil typing is acceptable. For all other project types, sufficient infiltration testing must be performed on the subject property to demonstrate the Dry Wells will likely function acceptably. If the measured infiltration rate is less than 0.52 in/hr, the design must demonstrate that the facility will dewater in 48 hours or less. In no case may a rate of greater than 0.52 in/hr be used to compute facility depth. See "Soil Testing Guidelines for Stormwater Management Practices".

#### 3. Setbacks

Dry Wells shall set back at least 20 feet from building foundations. If the structure is slab on grade the set back may be reduced to 10 feet. Refer to the Dry Well standard details for other set back requirements. While it is preferable to locate dry wells down gradient from building foundations, it is not a requirement in all cases.

### C. Specifications and Details

#### 1. Sizing

A Dry Well shall be sized to capture and store 100% of the calculated target treatment volume for the area draining to it. The maximum allowable drainage area to a Dry Well is 1,000 square feet.

The maximum allowable storage depth within a Dry Well practice is a function of the desired drawdown time, average infiltration rate for the soil type in which the facility is proposed, and the void

ratio of the storage area within the facility. The desired drawdown time is 48 hours. Storage depth includes the stone and the sand layer.

For design purposes we will use 0.5 inches per hour as the standard rate for acceptable soils. At 100% void ratio, this means the entire water column in the well must infiltrate into the soil within 48 hours with an assumed infiltration rate of 0.5 inches per hour. Therefore, maximum Dry Well storage depth at 100% void ratio is:

$$0.5 \text{ inches per hour} \times 48 \text{ hours} = 24 \text{ inches or } 2 \text{ feet}$$

For a stone filled facility, use a void ratio of 40%. Therefore:

$$2 \text{ feet} / 0.4 = 5 \text{ feet maximum storage depth}$$

For proprietary facilities with larger void ratios, a shallower storage depth is allowed. For example, a structure providing a 95% void ratio would be:

$$2 \text{ feet} / 0.95 = 2.10 \text{ feet maximum storage depth}$$

These maximum storage depths may not be exceeded.

## **2. Inflow Design Criteria**

Runoff shall enter the Dry Well via minimum 4 inch diameter schedule 40 PVC downspout piping. Pipe must be perforated per the Montgomery County Standard Dry Well Detail. Dry Wells require pretreatment filtering measures, such as downspout gutter filters or some other acceptable filter method. The proposed pretreatment method must be specified and shown on the detailed construction plans.

## **3. Overflow Design Criteria**

In order to prevent backup of water in the downspout, an overflow downspout surcharge pipe must be provided as shown on the Dry Well detail. Discharge from the downspout surcharge pipe must be directed to an above ground splash block and conveyed in a non-erosive manner to a stable outfall. In some cases it may be desirable to add an additional overflow pipe or pop up emitter directly out of the dry well. This shall be in addition to the required splash block overflow. The flow from the additional overflow pipe or emitter must be directed to a safe location that is unlikely to contribute to nuisance drainage problems such as a wet lawn areas or seepage across sidewalks.

## **4. Stone**

Dry Wells shall be filled with clean 1.5-3.0 inch diameter stone meeting ASTM D448, Size No. 1. Filter fabric shall be placed on the top and sides of the facility as shown on the Dry Well detail. No geotextile or filter fabric is allowed to be placed on the bottom of the facility or in any other location not called for specifically on the detail.

## **5. Sand Bed**

A 12-inch layer of fine aggregate sand shall be provided at the bottom of the excavation. Clean ASTM C33 or AASHTO M6 Fine Aggregate Concrete Sand is required per Montgomery County sand specifications.

## **6. Observation Well**

The Dry Well must incorporate an observation well in accordance with the standard detail.

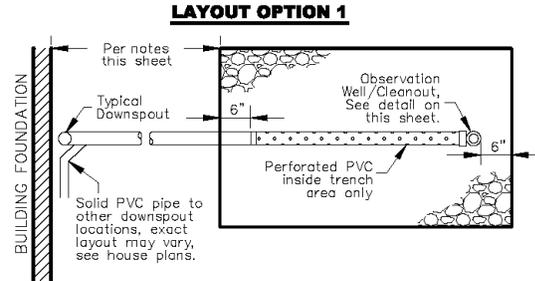


**NOTES:**

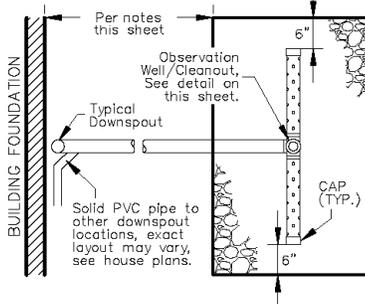
- Manufactured sand is not acceptable in drywells.
- All perforated pipes must be Schedule 40 PVC or higher quality, 4 inch diameter minimum.
- Drywells must be located:
  - 5 ft min. from property lines
  - 10 ft min. from slab on-grade buildings
  - 20 ft min. from building foundation
  - 20 ft min. from another drywell
  - 30 ft min. from septic trench or tank
  - 50 ft min. from alternate well location
  - 100 ft min. from primary well location
  - so as to minimize any basement seepage
- All dimensions are to be specified by design engineer.
- Drywell locations may be field-adjusted based upon site conditions, with inspector's approval.
- Drywells may not be combined or eliminated without MCDPS approval.

**PLAN VIEW**

NOT TO SCALE  
 SEE PLAN FOR ALL DIMENSIONS

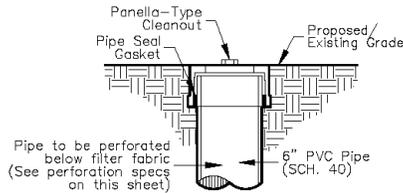


**LAYOUT OPTION 2**



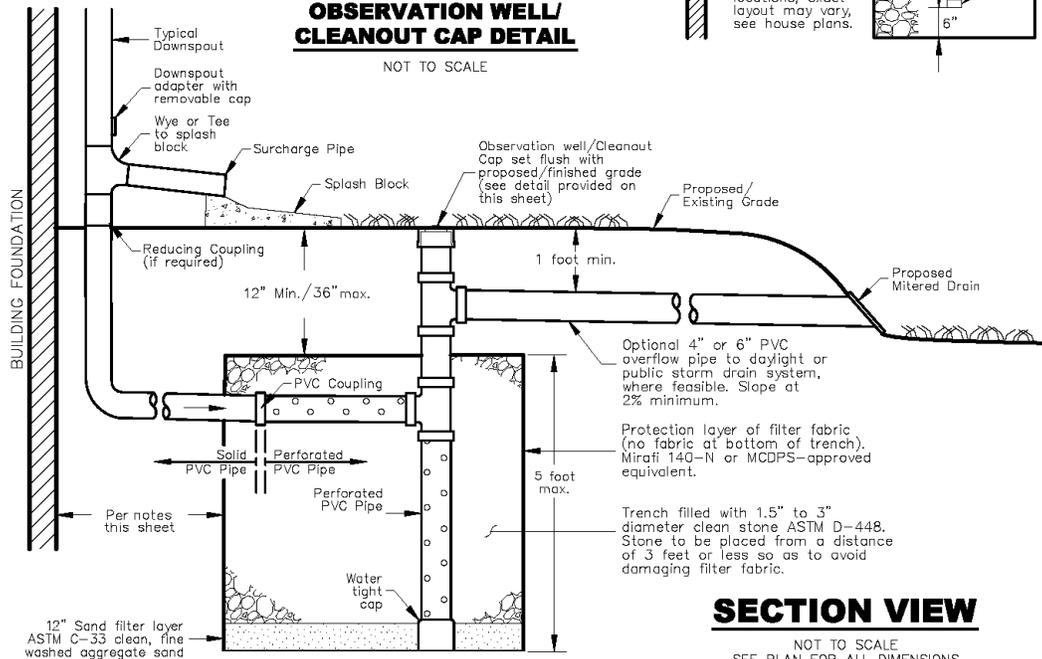
**PERFORATED PIPE:**

- Schedule 40 PVC
- 3/8 Inch Holes
- 4 Inch on center
- 90° around pipe



**OBSERVATION WELL/ CLEANOUT CAP DETAIL**

NOT TO SCALE



**SECTION VIEW**

NOT TO SCALE  
 SEE PLAN FOR ALL DIMENSIONS



**MONTGOMERY COUNTY  
 DEPARTMENT OF  
 PERMITTING SERVICES  
 WATER RESOURCES SECTION**

**DRYWELL  
 FOR  
 ROOF DRAIN**

**DATE:**  
 August 2012

**SCALE:**  
 NONE