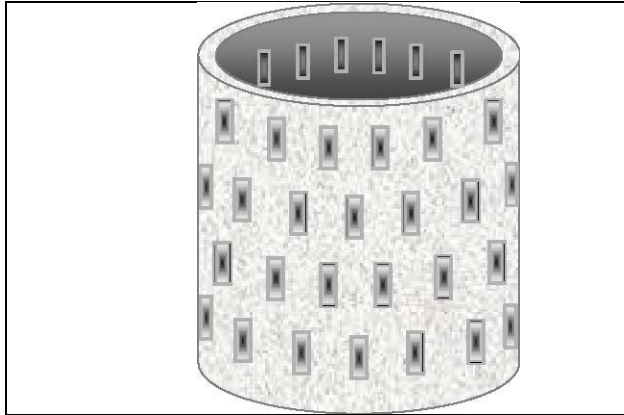


2.2.18 Downspout Drywell



Description: Drywells are essentially perforated manholes, but they can be manufactured in various sizes. Located underground, they allow stormwater infiltration even in highly urbanized areas. They should be used in conjunction with some type of pretreatment devices where there are minimal risks of groundwater contamination

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Intended for space-limited applications
- Like other infiltration devices, drywells should not be used for stormwater containing high sediment loads to minimize clogging

ADVANTAGES / BENEFITS:

- Filtration provides pollutant removal capability in adjacent soil
- Decreases peak flow rates

DISADVANTAGES / LIMITATIONS:

- Subsurface structure considered an injection well and may require special permit

POLLUTANT REMOVAL

- 80% **Total Suspended Solids**
- 60/60% **Nutrients** – Total Phosphorous / Total Nitrogen Removal
- 90% **Metals** – Cadmium, Copper, Lead, and Zinc Removal
- 90% **Pathogens** – Coliform, Streptococci, E. Coli Removal

STORMWATER MANAGEMENT SUITABILITY

- P** Water Quality Protection
- Streambank Protection
- On-Site Flood Control
- Downstream Flood Control

IMPLEMENTATION CONSIDERATIONS

- L** Land Requirement
- L** Capital Cost
- M** Maintenance Burden

Residential Subdivision Use: Yes
 Hi Density/Ultra-Urban: Yes
 Drainage Area: No restrictions
 Soils: Pervious soils required (0.5 in/hr or greater)

L = Low M = Moderate H = High

2.2.18.1 General Description

Drywells are infiltration devices that have historically been used to dispose of excess runoff without extensive infrastructure. Its minimal land requirements allow it to be used in highly urbanized areas. Drywells used for stormwater disposal are considered Class V injection devices by the EPA and fall under the Texas UIC program. Concerns about contaminating aquifers limit their application to “clean” runoff, such as roofdrains, and require pretreatment devices to remove sediments and other pollutants.

Drywells should not be used in areas near drinking water wells, with industrial land use, with high groundwater tables, a substrate of fractured rock, or slow-draining soils. Drywell design should be overseen by a licensed engineer.

2.2.18.2 Pollutant Removal Capabilities

Pollutant removal is similar to infiltration trenches (see Section 2.2.17), but care should be taken to avoid clogging with sediments.

- **Total Suspended Solids – 80%**
- **Total Phosphorus – 60%**
- **Total Nitrogen – 60%**
- **Fecal Coliform – 90%**
- **Heavy Metals – 90%**

2.2.18.3 Design Criteria and Specifications

- The drywell should be located at least 5 feet from the nearest property line and 10 feet away from an occupied building.
- Drywells shall be located at least 200 feet from the tops of slopes more than 10 feet high and steeper than 2h:1v.
- The drywell shall be excavated in native soil, uncompacted by heavy equipment.
- A qualified professional shall conduct infiltration testing. The surrounding soil should have a minimum infiltration rate of 0.5 inches per hour.
- The drywell shall be surrounded by a 12 inch thick layer of ¾” to 2 ½” round rock.
- There should be at least four feet between the bottom of the drywell and the seasonal high ground water table or bedrock.
- A pretreatment device should be installed upstream of the drywell to remove sediments and other pollutants.
- The drywell shall be sized in accordance with the simplified sizing criteria.
- The drywell should not be located next to trees, since roots may penetrate drywell and clog it.
- Access should be provided for drywell maintenance via a secured manhole or cleanout.

2.2.18.4 Inspection and Maintenance Requirements

The inspection and maintenance requirements for drywells are designed to maintain an adequate drainage rate through the drywell, while avoiding groundwater contamination.

Activity	Schedule
• Ensure that inflow is unimpeded. Clean out accumulated sediment/debris and dispose of properly.	Quarterly and within 48 hours of major storms
• Inspect pretreatment device and clean if necessary. Cleaning shall be done without the used of detergents or solvents.	As needed, based on minimum annual inspection
• Inspect area surrounding the drywell for waterlogged soils at surface, indicating drywell failure. Clogged drywells must be replaced.	Inspect between 24 - 48 hours after major storms
• Pest control measures shall be taken if rodents or mosquitoes are found to be present. Holes in the ground around the drywell shall be filled and a low toxicity mosquito larvacide, such as Bacillus thuringiensis (Bti), Bacillus Sphearicus (Bsph) or Methoprene (insect growth regulator) applied by a licensed individual, if necessary.	As needed

2.2.18.5 Example Schematic

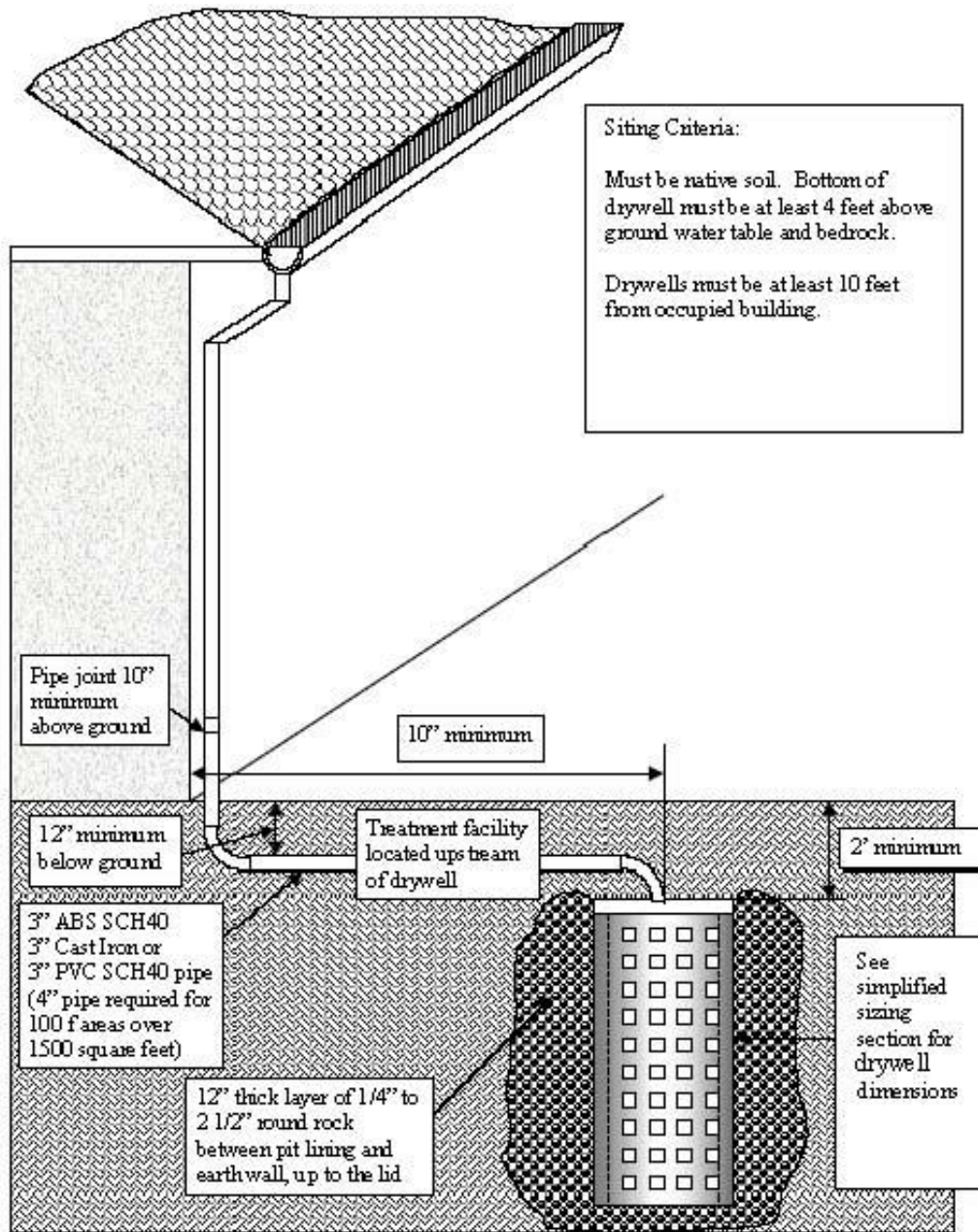


Figure 2.2.18-1 Schematic of Drywell System

(Source: City of Portland, Oregon)

Downspout Drywell – end