

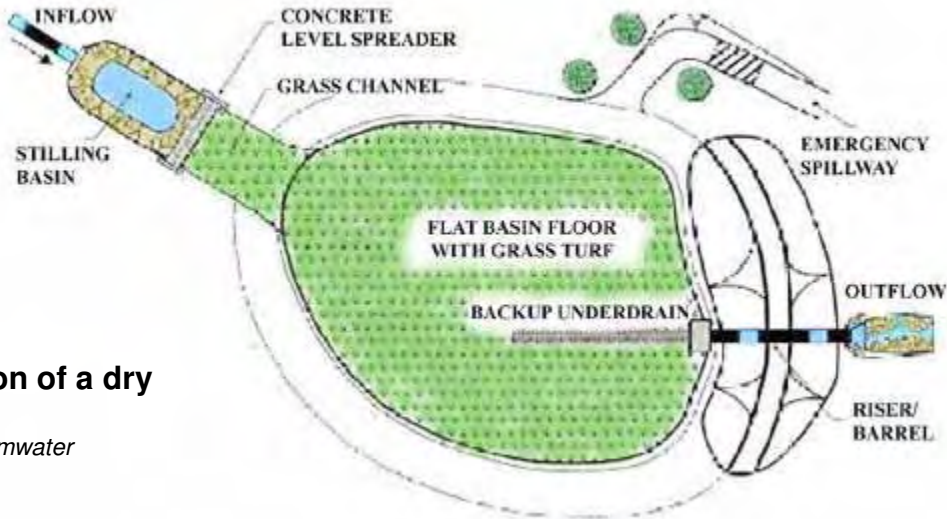
3.3 Dry Detention Basin



Dry Detention Basin at NW 12th St & Keating Drive,

<p>Description</p>	<p>Dry detention basins, also called dry ponds, are stormwater basins that are designed to intercept a volume of stormwater runoff and temporarily impound the water for gradual release to the receiving stream or stormwater system. Dry detention basins are typically on-line, end-of-pipe BMPs. Dry detention basins are designed to completely empty out between runoff events, typically within 48 hours, and therefore provide mainly runoff control as opposed to water quality control. They can provide limited settling of particulate matter, but a large portion of this material can be resuspended by subsequent runoff events.</p> <p>Detention basins can limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of stormwater discharges. As a general rule, dry detention basins should be designed for drainage of areas greater than 10 acres. In many areas, the detention basins, when dry, can be used for other recreational purposes.</p>
<p>Effectiveness</p>	<p>Detention basins may remove from 10 to 90 percent of suspended solids depending on the volume of stormwater held in the basin, and how long it resides there. Removal of pollutants is less efficient, and generally contingent on holding period of stormwater, which is typically substantially greater than the holding period required for reducing the peak period of storm periods.</p>
<p>Advantages</p>	<ul style="list-style-type: none"> • Reduces peak flow rate and energy of stormwater discharges, therefore limiting downstream erosion and scouring. • Good potential for removal of sediments. • Can be used for recreation when dry. • Can serve as green space, supporting wet prairie functions and wildlife habitat. • Using native plants reduces mowing costs.

<p>Disadvantages</p>	<ul style="list-style-type: none"> • Generally not prescribed for drainages less than 10 acres. • Potential for clogging of outlets. • Can be considered unattractive by residents if not designed or maintained correctly. • Limited ability to remove pollutants. • Depending on size and volume of stormwater capture, basin designs may require approval of dam safety authorities.
<p>Implementation Considerations</p>	<ul style="list-style-type: none"> • The required volume of the dry detention basin, called the “flood storage volume,” is dependent on the City’s policies as provided in the City’s Drainage Criteria Manual. Typically, storm volumes ranging from the 2- to the 100-year events are required. • A detention time of 48 hours or less should be targeted. Water should not remain more than 48 hours after a runoff event. • Smaller drainage areas can be considered if the dry detention is part of a stormwater treatment train. • Maximum depth of water, when full, should be 6 to 10 feet.
<p>Cost</p>	<p>Costs may range from less than \$1.00 to more than \$1.50 per cubic foot of detention, depending on the size of the basin. Costs will also vary depending on the existing condition, vegetation, and amount of excavation and construction to be completed.</p>
<p>Main Design Components</p>	<ul style="list-style-type: none"> • The outlet area should be a deeper micropool to provide final settling and prevent resuspension of sediments. The outlet pipe should be located in the pond embankment wherever possible for ease of maintenance. • In some cases, emergency spillways should be included in the basin design. • The basin should include a low-flow drain to assist in maintenance of the detention area. • Proper design and maintenance of the embankments will prolong the integrity of the basin structure. The embankments should have minimum side slopes of 3:1 and a top width of at least 4 feet, and should be well vegetated. • A low flow vegetated channel may need to be installed in the basin to ensure that the basin dries out completely between storm events. • Scour control is important to maintain the function of the dry detention basin and reduce erosion. • All federal, state, and local permit requirements must be established prior to construction of the dry detention basin.



Typical configuration of a dry detention basin

Source: Pennsylvania Stormwater Management Manual