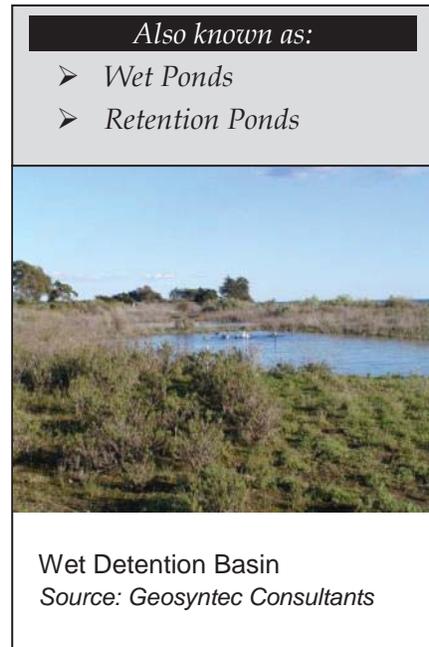


BIO-4: Wet Detention Basin

Wet detention basins are constructed, naturalistic ponds with a permanent or seasonal pool of water (also called a “wet pool” or “dead storage”). Aquascape facilities, such as artificial lakes, are a special form of wet pool facility that can incorporate innovative design elements to allow them to function as a stormwater treatment facility in addition to an aesthetic water feature. Wet ponds require base flows to exceed or match losses through evaporation and/or infiltration, and they must be designed with the outlet positioned and/or operated in such a way as to maintain a permanent pool. Wet ponds can be designed to provide extended detention of incoming flows using the volume above the permanent pool surface.



Feasibility Screening Considerations

- Feasibility screening is not applicable to wet ponds; however the potential risk of groundwater contamination should be considered in selection and design.

Opportunity Criteria

- Can provide aesthetic/recreational value for a project.
- Requires relatively large open space area at outlet of drainage area.
- Generally most applicable for drainage areas larger than 10 acres; however may be applied to smaller drainage areas.
- Applicable in drainage areas with source of base flow to maintain water level.

OC-Specific Design Criteria and Considerations

- Minimum set-backs from foundations and slopes should be observed.
- Retention of permanent pool volume should not cause geotechnical concerns related to slope stability. Proposed basins in areas with slopes greater than 15 percent or within 200 feet from the top of a hazardous slope or landslide area require geotechnical investigation.
- Design should include a sediment forebay to remove coarse solids.
- Flow path length to width ratio is 2:1 (minimum) and 3:1 or greater (preferred).
- Maximum side slope (H:V) should be 4:1 interior and 3:1 exterior, unless protected from public access by fencing and approved for stability by a geotechnical professional.
- Wetland vegetation must not occupy more than 25% of surface area.
- A buffer zone with a minimum width of 25 feet should be provided around the top perimeter of the wet detention basin.

- Inlets and outlets should be positioned to maximize flowpaths through the facility. All inlets should enter the first cell of the wet detention basin.
- The inlet to wet detention basin should be submerged to dissipate the energy of incoming flow. Energy dissipation should also be used at the outlet of the basin.
- Minimum freeboard should be 1 foot (2 feet preferred) above the maximum water surface elevation for on-line basins and 1 foot maximum for off-line basins.
- Maximum basin residence time for dry weather flows is 7 days.

Computing Sizing Criteria for Wet Detention Basins

- This document does not provide specific sizing guidance for wet detention basins. Wet basins should be designed by a team of specialists that understand wetland ecology and biology and are familiar with methods to avoid stagnation, odors, and vector issues associated with maintaining a permanent pool. The BMP designer(s) must demonstrate that the facility is sized to capture and treat the volume of runoff not being addressed by upstream BMPs such that 80 percent of average annual stormwater runoff volume from the site is retained or biotreated.
- The retention volume within a wet detention basin is the equal to the permanent pool volume. The drawdown time criteria, or the rate at which the retention volume becomes available, does not apply to wet detention basins. All runoff in excess of the retention volume that flows through the basin is considered biotreated.
- The permanent pool volume should be at least 50 percent of the volume of active (extended detention) storage.

Configuration for Use in a Treatment Train

- Wet detention basins would generally be designed to serve as the final BMP before discharging runoff off-site.
- Wet detention basins may be preceded in a treatment train by HSCs and LID BMPs in the drainage area, which would reduce the pollutant load and volume of runoff entering the basin, thereby reducing the sizing requirements of the wet detention basin.
- Wet detention basins can be designed to precede other LID or treatment control BMPs, providing equalization and pretreatment.

Additional References for Design Guidance

- CASQA BMP Handbook for New and Redevelopment:
<http://www.cabmphandbooks.com/Documents/Development/TC-20.pdf>
- Los Angeles County Stormwater BMP Design and Maintenance Manual:
http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf
- LA County LID Manual, Chapter 5: http://dpw.lacounty.gov/wmd/LA_County_LID_Manual.pdf
- Portland Stormwater Management Manual:
<http://www.portlandonline.com/bes/index.cfm?c=47953&>
- Western Washington Stormwater Management Manual, Volume V, Chapter 10:
<http://www.ecy.wa.gov/pubs/0510033.pdf>