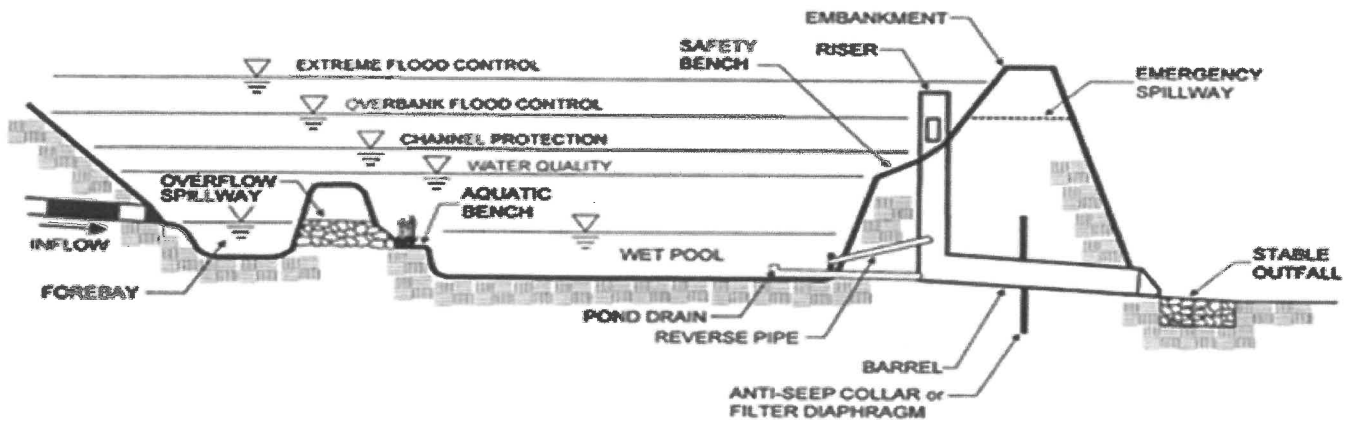


PLAN VIEW



PROFILE

## Summary of permit requirements

Permit requirements are included throughout this page. A summary of these requirements is provided below.

- Stormwater ponds must not be located in, nor drain water from, wetlands unless mitigated for
- Stormwater ponds must not be located within surface water bodies or any buffer zones required under [Section 23.11 of the CSW permit](#)
- The *Required* minimum permanent pool volume, or dead storage ( $V_{pp}$  below the outlet elevation), is 1800 cubic feet of storage below the outlet pipe for each acre that drains to the pond
- The *Required* minimum water quality volume, or live storage ( $V_{wq}$ ), is 1.0 inch of runoff from the net increase in impervious surfaces created by the project. This should be calculated as an instantaneous volume
- The [CGP](#) requires that the  $V_{wq}$  is discharged at no more than 5.66 cubic feet per second per acre of surface area of the pond. The surface area of the pond is calculated at the elevation that results from the  $V_{wq}$  being dropped into the pond instantaneously
- Permanent pool depths must be a minimum of 3 feet and maximum of 10 feet at the deepest points
- Basin outlets must have energy dissipation
- Adequate maintenance access, typically with a minimum width of 8 feet, must be provided. Where a forebay is installed, direct vehicle/equipment access should be provided to the forebay for sediment removal and other maintenance activities. The maintenance access should extend to the forebay, access bench, riser, and outlet, and allow vehicles to turn around
- An emergency spillway must be provided to pass storms in excess of the pond hydraulic design. The spillway must be stabilized to prevent erosion and designed in accordance with applicable dam safety requirements ([NRCS Pond Standard 378](#) and [Mn/DNR dam safety guidelines](#)). The emergency spillway must be located so that downstream structures will not be impacted by spillway discharges. If the spillway crosses the maintenance access, materials meeting the appropriate load requirements must be selected
- The riser must be located so that short-circuiting between inflow points and the riser does not occur
- Basin outlets must be designed to prevent discharge of floating debris
- Permittees must design basins using an impermeable liner if located within active [karst](#) terrain
- Inlet areas should be stabilized to ensure that non-erosive conditions exist during high-flow events
- All pond designs should incorporate an access bench
- (Minnesota Department of Health Rule 4725.4350) states that a minimum horizontal distance between a water-supply well and the ordinary high water level of a storm water retention pond is 35 feet
- Public safety must be considered in every aspect of pond design

## Design inlets

- It is *Highly Recommended* that inlet pipe inverts be located at the permanent pool elevation. Submerging the inlet pipe can result in freezing and upstream damage.
- To prevent freezing and blockage of inflow, it is *Highly Recommended* that inlet pipes not be fully submerged and that they be buried below the frost line. [The Minnesota Department of Transportation](#) has developed frost and thaw depths for several Minnesota sites.
- It is also *Highly Recommended* to design the inlet to reduce or prevent scour, by including riprap or flow diffusion devices such as plunge pools or berms.