



DURHAM COUNTY
Engineering Department
Stormwater Division

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Wet Detention Pond Design Summary

Stormwater Management Construction Plan Review:

A complete stormwater management construction plan submittal includes a design summary for each stormwater BMP, design calculations, plans and specifications showing BMP, inlet and outlet structure details.

I. PROJECT INFORMATION

Project Name: _____ Phase _____

PIN: _____ Case #: _____

Design Contact Person: _____ Phone #: (____) ____-_____

Legal Name of Owner: _____

Owner Contact: _____ Phone #: (____) ____-_____

Owner Address: _____

Deed Book _____ Page # _____ or Plat Book _____ Page# _____ for BMP Property

For projects with multiple basins, specify which pond this worksheet applies to: _____

Does the proposed pond also incorporate stormwater detention? Yes No

Detention provided for: _____ 1-year _____ 2-year _____ 10-year _____ other _____

Dam Height: _____ (feet) Dam Classification: _____

Elevations

Pond bottom elevation	_____	ft. (floor of the pond)
Permanent pool elevation	_____	ft. (invert elevation of the orifice)
Temporary pool elevation	_____	ft. (elevation of the structure overflow)
1-year storm orifice/weir elevation	_____	ft. (invert elevation)
1-year storm water surface elevation	_____	ft.
2-year storm orifice/weir elevation	_____	ft. (invert elevation)
2-year storm water surface elevation	_____	ft.
10-year storm orifice/weir elevation	_____	ft. (invert elevation)
10-year storm water surface elev.	_____	ft.
Emergency spillway elevation	_____	ft. (invert of emergency spillway)
Top of embankment/dam	_____	ft. (elevation)
Maximum water surface elevation	_____	ft. (max. storm pond can safely pass)

Areas

Permanent pool area provided	_____	ft ² (water surface area at orifice invert elevation)
Minimum required permanent pool area	_____	ft ² (calculated surface area required)
Design storm surface area	_____	ft ² (Specify frequency event: _____ year)
Drainage area (10-acres min)	_____	ac. (total drainage to the pond)

Discharges (Specify only applicable frequency events)

At BMP

	1-year	2-year	10-year	____-year
Inflow	_____ cfs	_____ cfs	_____ cfs	_____ cfs
Routed outflow	_____ cfs	_____ cfs	_____ cfs	_____ cfs

At Analysis Point(s) that BMP Contributes to

	1-year	2-year	10-year	____-year
Pre-development	_____ cfs	_____ cfs	_____ cfs	_____ cfs
Post-development w/o detention	_____ cfs	_____ cfs	_____ cfs	_____ cfs
With detention	_____ cfs	_____ cfs	_____ cfs	_____ cfs

Volumes

Permanent pool volume	_____	ft ³ (volume of main pond and forebay)
Water quality pool storage volume	_____	ft ³ (volume above permanent pool)
Design storm storage volume	_____	ft ³ (volume above permanent pool)
Total Storage volume provided at design storm	_____	ft ³
Total Storage volume provided at top of dam	_____	ft ³
Forebay volume	_____	ft ³ (~ 20% of permanent pool volume)

Hydraulic Depths

Volume of normal pool divided by surface area of normal pool	_____	ft.
Volumes at temporary pool plus normal pool divided by surface area of temporary pool	_____	ft.

Other Parameters

SA/DA ¹	_____	(from DWQ table)
Diameter of orifice	_____ in.	(must provide draw down over 2 to 5 day period)
Draw-down time	_____ hrs	

¹ When using the SA/DA tables from the Stormwater Best Management Practices Manual, linear interpolation may be used for values between table entries.

Riser/Principal and Emergency Spillway Information

1-year storm orifice/weir	diameter_____ in.	length _____ft.
2-year storm orifice/weir	diameter_____ in.	length _____ft.
10-year storm orifice/weir	diameter_____ in.	length _____ft.
____- year storm orifice/weir	diameter_____ in.	length _____ft.
Principal spillway	diameter_____ in.	
Emergency spillway	width_____ ft.	side slopes ____:1 slope_____%

II. REQUIRED ITEMS CHECKLIST

The following checklist outlines design requirements. Initial in the space provided to indicate the following design requirements have been met and supporting documentation is attached.

Applicant's initials

- _____ a. The permanent pool depth is between 3- and 6-feet (required minimum hydraulic depth of 3-feet).
- _____ b. The forebay volume is approximately equal to 20% of the pond volume.
- _____ c. The temporary pool controls runoff for water quality design storm.
- _____ d. The temporary pool draws down in 2- to 5-days.
- _____ e. The drainage area to the facility is at least 10-acres.
- _____ f. Riprap outlet protection, if provided, reduces flow to non-erosive velocities (provide calculations).
- _____ g. The pond length to width ratio is greater than or equal to 3:1.
- _____ h. The pond side slopes above the permanent pool area are no steeper than 3:1.
- _____ i. A submerged and vegetated shelf with a slope no greater than 6:1 is provided around the perimeter of the pond (show on plan and profile and provide a vegetation plan).
- _____ j. Vegetative cover above the permanent pool elevation is specified. No woody vegetation is permitted on the embankment.
- _____ k. A surface baffle, trash rack or similar device is provided for both the overflow and orifice. Flat top trash racks are not acceptable. Access hatch has been provided.
- _____ l. A recorded drainage easement is provided for each pond including access to the nearest right-of-way and is graded per Section 8.3, Stormwater Control Facilities (BMPs).
- _____ m. If the basin is used for sediment and erosion control during construction, a note requiring clean out and vegetative cover being established prior to use as a wet detention basin shall be provided on the construction plan.
- _____ n. A mechanism is specified which will drain the pond for maintenance and emergencies. Valves used shall be plug valves.
- _____ o. Anti-floatation calculations are provided for riser structure.
- _____ p. A plan view of the pond with grading shown is provided.
- _____ q. A profile through the forebay, main pond and spillway is provided. Water surface elevations are shown on the profile.
- _____ r. Riser structure details are provided.
- _____ s. Dam designed to account for a 5.00% settlement factor.
- _____ t. Compaction specifications for the embankment are shown on the plan.
- _____ u. The minimum top of dam width has been provided for the pond embankment top width per Section 8.3, Stormwater Control Facilities (BMPs).

Note: Executed Stormwater Facility Operation and Maintenance Permit Agreement and payment of surety are required prior to Stormwater Permit issuance.