



*City of Durham*  
**Public Works Department**  
**Stormwater Services Divisions**

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

#### *Areas*

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

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 <sup>3</sup> (volume of main pond and forebay)
Water quality pool storage volume	_____	ft <sup>3</sup> (volume above permanent pool)
Design storm storage volume	_____	ft <sup>3</sup> (volume above permanent pool)
Total Storage volume provided at design storm	_____	ft <sup>3</sup>
Total Storage volume provided at top of dam	_____	ft <sup>3</sup>
Forebay volume	_____	ft <sup>3</sup> (~ 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 <sup>1</sup>	_____	(from DWQ table)
Diameter of orifice	_____ in.	(must provide draw down over 2 to 5 day period)
Draw-down time	_____ hrs	

<sup>1</sup> 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, payment of permit fee per facility and payment of surety are required prior to construction drawing approval.**