City of Durham

Public Works Department

Stormwater Services Divisions

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Level Spreader** 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 facilities, specify which facility this worksheet applies to: _____

*Water Quality Treatment: ___ % TSS ☐ Nitrogen ☐ Phosphorous ☐ other

*Pollutant removal credits are achieved ONLY when the Vegetated Filter Strip (VFS) is an engineered filter strip

Is there a BMP Upstream of the proposed Level Spreader? Yes / No

If yes, *Type of BMP _____ Drawdown Flow from the BMP _____ cfs

* Per the buffer rules, a level spreader is NOT needed down slope of a stormwater wetland, bioretetention area or any other BMP that removes a minimum of 30% TN and 30% TP.

If No, Please provide below drainage area information:

Drainage area	_____	ft^2
Impervious area	_____	ft^2
Percent Impervious	_____	%
Peak flow	_____	cfs (flow from 1-inch per hour storm)
Peak flow	_____	cfs (flow from 10-year storm)

***When it appears that the **location of a level spreader may be infeasible or inappropriate**, coordination with the Stormwater Services Division to **discuss alternative solutions** (i.e., the provision of alternative water quality BMPs, etc.) **shall be** required.*

**Please see Section 8.3 for information on Level Spreader design. Note that Preformed Scour holes are NO longer allowed in lieu of LS.*Where does the Level Spreader Discharge i.e. the type of Vegetated Filter Strip (VFS)*

☐ Engineered Filter Strip[1] ☐ Riparian Buffer [2] *Where does the Level Spreader Discharge i.e. the type of Vegetated Filter Strip*

Slope within the VFS __ %

[1]*Max Average Slope cannot exceed 8% ; a minimum level spreader length of at least 10 linear feet shall be provided for each 1 cfs of design flow; the design flow entering the level spreader cannot exceed 10 cfs; and*

[2] *Max Average Slope cannot exceed 5%; the design flow entering the level spreader (typically, the 1-inch per hour event) cannot exceed 2 cfs;a minimum level spreader length of at least 50 linear feet shall be provided for each 1 cfs of design flow.*

Are there any naturally occurring channels downstream of the level spreader present? ☐ Yes ☐ No

If yes, explain how sheet flow condition is sustained _____
_____
_____

Level Spreader design

Forebay Surface area	_____ ft^2
Design flow entering level spreader	_____ cfs
Length of level Lip	_____ ft
Bypass channel length	_____ ft
Invert elevation of 1-inch per hour (flow splitter)	_____ ft
Invert elevation of 1–inch per hour bypass	_____ ft
Peak velocity in the bypass channel	_____ ft/sec (10-year event)
Reinforcement for bypass channel	_____ (provide calculations)

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. A description of the VFS characteristics downstream of the proposed level spreader location has been provided.

_____ b. Sizing of the level spreader (e.g., proposed length) based on design flow has been provided.

_____ c. Level Spreader shall be concrete

_____ d. A blind swale is required immediately upslope of the lip for stromwater distribution. Blind swales shall be designed as 10-ft wide linear wetlands and shall be planted as such.

_____ e. Forebay has been provided with a surface area of 0.2% of the contributing drainage area's impervious surface

_____ f.

_____ g. Evaluation (i.e., discharge rates, erosive potential, etc.) of the high-flow bypass channel has been provided.

_____ h. When an engineered filter strip is to be used, this strip shall be placed in an easement and this filter strip area shall be maintained as a dense grass in perpetuity. The design drawings should reflect this as well.

_____ i. A construction sequence that shows how the level spreaders will be protected from sediment until the entire drainage area is stabilized is provided.

_____ j. Riprap outlet protection, if provided, reduces flow to non-erosive velocities.

_____ k. A recorded drainage easement is provided for each level spreader including access to the nearest right-of-way and is graded per Section 8.3, Stormwater Control Facilities (BMPs).

_____ l. An annual operation and maintenance plan is provided.

_____ m. A plan view of the level spreader system is provided.

_____ n. Details for the flow bypass structure are provided. Invert elevations are shown.

_____ o. A #57 stone is specified downstream of the level spreader.

_____ p. Runoff from storms larger than the 1-inch per hour storm is routed around the level spreader,

Note: Executed Stormwater Facility Operation and Maintenance Permit Agreement, payment of $700 permit fee per facility are required prior to construction drawing approval.