



*City of Durham*

*Public Works Department*

*Stormwater Services Divisions*

101 City Hall Plaza, Durham, North Carolina, 27701  
 Telephone (919) 560-4326 FAX (919) 560-4316

**Sand Filter 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: \_\_\_\_\_

Drainage area \_\_\_\_\_ ac. *(total drainage area to the sand filter)*

Impervious area \_\_\_\_\_ ac. *(total impervious area to the sand filter)*

Design runoff \_\_\_\_\_ in.

Design treatment volume (540 ft<sup>3</sup>/Ac) \_\_\_\_\_ ft<sup>3</sup>

*Sediment chamber design*

Bottom elevation \_\_\_\_\_ ft. *(floor of the sediment chamber)*

Weir elevation \_\_\_\_\_ ft. *(invert elevation of overflow to sand bed)*

Volume \_\_\_\_\_ ft<sup>3</sup> *(volume of sediment chamber to weir elevation)*

Surface area \_\_\_\_\_ ft<sup>2</sup> *(surface area of sediment chamber at bottom)*

Design treatment volume provided \_\_\_\_\_ ft<sup>3</sup>

*Sand filter bed design*

Bottom elevation \_\_\_\_\_ ft. *(elevation of bottom of sand bed)*

Top of sand \_\_\_\_\_ ft. *(elevation of top of sand)*

Sand volume \_\_\_\_\_ ft<sup>3</sup> *(volume of sand in bed)*

Sand surface area \_\_\_\_\_ ft<sup>2</sup> *(surface area of sand bed at bottom of bed)*

Design treatment volume provided \_\_\_\_\_ ft<sup>3</sup>

Perforated pipe length \_\_\_\_\_ ft. *(length of perforated pipe provided under sand bed)*

Diameter of perforated pipe \_\_\_\_\_ in. *(pipe diameter of perforated pipe)*

## 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. Runoff from landscaped areas and other non-impervious areas has been directed away from the sand filter to the maximum extent practical.
- \_\_\_\_\_ b. Drainage area for sand filter is less than 5-acres.
- \_\_\_\_\_ c. Maximum water quality head over the sand filter is 12" or less.
- \_\_\_\_\_ d. Plan specifies how all slopes draining to the sand filter will be stabilized.
- \_\_\_\_\_ e. No side slopes draining to sand filter greater than 3:1.
- \_\_\_\_\_ f. Design drawings provide note: "All slopes draining to sand filter shall be stabilized per the North Carolina State Erosion and Sediment Control Planning and Design Manual before sand is placed in sand bed."
- \_\_\_\_\_ g. Riprap outlet protection, if provided, reduces flow to non-erosive velocities (provide calculations).
- \_\_\_\_\_ h. A recorded drainage easement is provided for each sand filter including access to the nearest right-of-way and is graded per Section 8.3, Stormwater Control Facilities (BMPs).
- \_\_\_\_\_ i. Anti-floatation calculations are provided for riser structure.
- \_\_\_\_\_ j. 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.
- \_\_\_\_\_ k. A plan view of the sand filter with grading shown is provided.
- \_\_\_\_\_ l. A profile through the settling chamber, sand bed and spillway is provided. Water surface elevations are shown on the profile.
- \_\_\_\_\_ m. Riser structure details are provided.
- \_\_\_\_\_ n. Compaction specifications for the embankment are provided on the plan.
- \_\_\_\_\_ o. Runoff from storms larger than the 1-year storm are routed around the sand bed.
- \_\_\_\_\_ p. Sand size, type and gradation specified. The sand shall be a clean ASTM C-33 medium aggregate sand with a size range of 0.02-inch to 0.04-inch.

**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.**