



# DINWIDDIE COUNTY

PLANNING, ZONING, CODE COMPLIANCE AND ENVIRONMENTAL

## FILTERING PRACTICES

Plan Name: \_\_\_\_\_ Date Submitted: \_\_\_\_\_

The following checklist only identifies the information and details that must be included in the SWM plan

Level 1

Level 2

### **LEVEL 1 MINMUM DESIGN CRITERIA:**

	SELECT
The treatment volume of the swale was calculated using the following equation: $(1.0)(Rv)(A)]/12$ – the volume reduced by an upstream BMP.	

### **LEVEL 2 MINMUM DESIGN CRITERIA:**

	SELECT
The treatment volume of the swale was calculated using the following equation: $(1.25)(Rv)(A)]/12$ – the volume reduced by an upstream BMP.	
The swale slope must be < 1%.	
The design must incorporate at least two-cells.	
The sand media must be topped with an organic layer.	

### **ADDITIONAL DESIGN CRITERIA:**

	SELECT
Non-structural sand filters must be designed in accordance with the following criteria:	
- The CDA must be less than 2 acres in size,	

**ADDITIONAL DESIGN CRITERIA:**

	SELECT
- The design must meet the Bioretention Practice standards with the following exceptions:	
<ul style="list-style-type: none"> <li>a) The bottom is lined with an impermeable filter fabric and always contains an underdrain;</li> <li>b) The surface cover is sand, turf, or pea gravel;</li> <li>c) The filter media is 100% sand;</li> <li>d) The filter has two cells with a wet or dry sedimentation chamber preceding the sand filter bed.</li> </ul>	
Surface sand filters and organic media filters must be designed in accordance with the following criteria:	
- The filter bed and sediment chamber must be located at ground level;	
- Constructed of pre-cast or cast-in-place concrete;	
- Designed off-line so that only the treatment volume is directed to the filter;	
- Sand is replaced with an organic filtering medium for organic media filters.	
Underground sand filters must be designed in accordance with the following criteria:	
- The sand filtration chamber must contain an 18-inch layer of sand over a 6-inch layer of stone;	
- Filter fabric must be placed between the sand and stone layers;	
- If the filter length exceeds 20 feet, 4-inch diameter underdrains must be placed in the stone layer with 2 inches of stone cover and the underdrains are wrapped in filter fabric and spaced 2 feet on center;	
- An internal weir, sized to pass the 10-year post-development flow, must be provided between the sedimentation chamber and the clear well;	
- The bottom of the sand filter must be sloped towards the clear well at 1%;	
- If the filter is subjected to traffic loads or significant earth loads, the concrete vault must be designed accordingly;	
- Reinforcement specifications must be shown on the plans;	
- A layer of filter fabric and a layer of 2 inch deep rock must be placed on top of the sand;	
- Weirs located in the wall between the sedimentation chamber and the sand filtration chamber must be 3 – 4 inches in diameter and spread one foot on center;	
- Trash racks must be installed over the curb openings into the sand filter;	
- Observation wells must be provided in the sand filter chamber and are located at the access manhole on the upper end of the structure.	
Perimeter filters must be designed in accordance with the following criteria:	

**ADDITIONAL DESIGN CRITERIA:**

	SELECT
- Flow enters through grates (usually at the edge of a parking lot) before the sediment chamber and filter bed;	
- Must be designed on-line where larger flows bypass and enter an overflow chamber;	
- 2 feet of hydraulic head is required.	
Proprietary filters must be designed in accordance with the following criteria:	
- The design criteria provided by the manufacturer must be followed.	
- Conveyance and overflow must be considered.	
- Filter practices have an impermeable liner.	

**PLAN REQUIREMENTS:**

	SELECT
Provide a site map identifying pertinent information regarding the Filtering Practice.	
- The contributing drainage area (CDA) boundaries, acreage, and land cover;	
- Topography of the site area including the Filtering Practice;	
- Provide soil boring location(s) taken at the low point within the footprint of the proposed Filtering Practice;	
- Identify areas of the site compensated for in water quality calculations;	
- Provide a delineation of the FEMA 100-year floodplain.	
The following are shown on and/or specified on the plan view of the Filtering Practice.	
-The layout and dimensions of the filtering practice;	
- Proper orientation to avoid short-circuiting;	
- Adequate maintenance access to the facility;	
-The observation well location.	
Provide profiles, section views, and details of the Filtering Practice.	
- There must be a minimum of two feet separation distance between the seasonally high groundwater table and/or bedrock and the bottom of the invert of the Filtering Practice.	

**COMPUTATIONS:**

	SELECT
Provide appropriate hydraulic calculations.	
- Verify sufficient hydraulic head is provided for proper function of the filtering systems.	
- The facility must completely dewater within 40 hours of a storm event.	
- The storage volume must be at least 75% of the treatment volume.	
- State all assumptions and coefficients used.	
- Provide a stage-storage table and curve.	
- Provide storm drainage and hydraulic grade line calculations.	
- Account for a large storm overflow or bypass.	

**LANDSCAPING:**

	SELECT
Provide a landscape plan that specifies the following:	
- The landscaping plan must indicate the methods to be used to establish and promote long term vegetative cover in the SWM facility and its buffer area.	
- SWM facilities that are visible from the right-of-way must be effectively screened from the public right-of-way or less intense uses of adjacent properties. Examples of acceptable screening include fencing, landscaping, or a combination of these features.	

**MAINTENANCE:**

	SELECT
Provide a summary of the long term maintenance requirements for the SWM facility on the SWM plan.	
Inspections required by the Maintenance Agreement must be conducted by 1) a person who is licensed as a professional engineer, architect, landscape architect, or land surveyor pursuant to Sec. 54.1-400 et seq. of the Code of Virginia; 2) a person who works under the direction and oversight of a licensed professional engineer, architect, landscape architect, or land surveyor; or 3) a person who holds a Stormwater Inspector or Stormwater Combined Administrator certificate of competence from the State Water Control Board.	

**CONSTRUCTION:**

	SELECT
The sequence of construction must address the SWM facility installation and appropriate inspections, including: initial site preparation, excavation/grading, and installation of the embankment, principal outlet structure, and emergency spillway. We recommend the County staff be involved in these inspections..	
The sequence of construction must clearly state that a construction record drawing and certification that the stormwater management facility has been constructed in accordance with the approved plan must be submitted to the County and approved prior to Environmental Compliance Bond (ECB) release.	

Engineer Signature: \_\_\_\_\_ Date: \_\_\_\_\_