NCDOT Skimmer Devices

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NCDOT Skimmer Devices

- Skimmer Basin

- Tiered Skimmer Basin

- Earthen Dam with Skimmer
Inlet to Skimmer Basin

• Provide Stabilized Inlet to Basin with:
  - Permanent Drainage System Pipe
  - Plastic Slope Drain Pipe
  - Stone
  - Geotextile

• Avoids Scouring of Side Slope at Basin Inlet
Slope Drain Pipe Inlet to Basin

Slope Drain Pipe Inlet

T-Posts
Permanent Pipe Inlet

Stone Inlet Protection
Stone Pad Inlet

Geotextile Inlet
Baffles in Skimmer Basins

- Minimum of 3 at Equal Spacing in Basin
- Porous Material (Excelsior or Coir Fiber Mat)
- Anchor Baffles into Basin Floor & Side Slopes
- Configure Baffles Perpendicular to flow to Skimmer
- Install per NCDOT Std. Drawing No. 1640.01
Coir Fiber Baffles

Non-Typical Baffle Orientation
Side Slopes of Basin

• Interior Side Slopes 1.5:1

• Exterior Side Slopes 2:1

• Seed and Mat (Excelsior, TRM) all Slopes

• Provide Low Permeability Geotextile at Spillway

Stabilized Slopes
Stable Runoff Diversion

Skimmer Accommodations

- Construct Pad for Skimmer to Rest On
  - Stone
  - Wood Pallets
  - H-beam section
- Install Skimmer and Pad away from Baffles
- Attach Rope to Skimmer for Maintenance
Skimmer Installation

• Place Sealant around Barrel Pipe at Dam (interior)

• Install 6’ Arm Pipe between Skimmer and Coupling

• Ensure Coupling:
  • Is not buoyant! (4” maximum diameter)
  • Less than 2 ft. in length (12” limit on NCDOT details)
  • Rigid

• Provide Minimum 4” Barrel Pipe

• Extend Barrel Pipe as needed!

Outlet End of Skimmer Basin

PLACE SEALANT AROUND BARREL PIPE WITH MINIMUM WIDTH OF 6 IN.

CLASS B STONE PAD (4’ X 4’ X 1’ MIN.)
Sealant around Barrel Pipe

Skimmer with Rope & Pad
Post and Rope Arrangement

Skimmer on Mud Pile

NOT RECOMMENDED!
Desired Skimmer Features

• Orifice Close to Surface of Basin Water

• Trash Rack for Orifice

• Adjustable Orifice for Variable Dewatering
  -Data Available to Show Dewatering Rates

NCDOT Approved Skimmers

• J.W. Faircloth & Son

• Erosion Supply Company

• Innovative Applied Solutions (IAS)

• Marlee Float Skimmer
Faircloth Skimmer

Erosion Supply Skimmer
IAS Skimmer

Anti-Ice Treatment
Marlee Float Skimmer

Marlee Float Skimmer Orifice
Primary Spillway

- Construct with Cohesive Clay Material
- Compact or Use Stone with 1 ft. layer of Soil Material
- Install Low Permeability Geotextile (entire basin width!)
- Adequate Spillway Cross Section Depth and Weir Length
  - Minimum Depth of 1 ft.
  - Minimum Length of 4 ft.

Geotextile Primary Spillway
Outlet Pipe

- Provide Matting or Stone Outlet Energy Dissipater
- Pipe Should not be Perched!
- Make Sure Barrel Pipe will Drain
- Extend Pipe as needed (No minimum length!)
- May need Orifice Plate if Skimmer Dewatering Fast!

Coir Fiber Mat Outlet
Perched Barrel Pipe

Orifice Plate on Barrel Pipe
Tiered Skimmer Basin

- Utilized for > 6 ft. Elevation Changes between Inflow and Outflow of Basin
- Same Construction Specs for ALL Spillways
- Upper Basins can be Different Dimensions
Tiered Skimmer Basin

Tiered Skimmer Basin in Rock
Earthen Dam with Skimmer

- Need Large Cross Section and Ditch Grade of 2% or less

- Easier to install and remove than Skimmer Basin

- Cheaper to construct than traditional Skimmer Basin
Earthen Dam with Skimmer Retrofit

Stormwater Basin with Skimmer

• Attach Skimmer to Riser 1 ft. from Bottom

• Install 3 Baffles with Equal Spacing

• Permanently Seed and Mat Slopes
Riser Basin with Skimmer
Hazardous Spill Basin with Skimmer

Things to Watch for New Skimmers:

• Dewater Too Quickly

• Dewater Too Far Below Surface

• Flotation Device Not Water Tight

• No Data or Test Info for Dewatering Rate
Submerged Skimmer!

Skimmer in Sediment
Soil & Water Engineering Web Site

- Basin Design & Quantity Spreadsheets

- Details
  http://www.ncdot.org/doh/operations/dp_chief_eng/roadside/soil_water/Details/

- Special Provisions
  http://www.ncdot.org/doh/operations/dp_chief_eng/roadside/soil_water/special_provisions/

Questions?