

NCDOT Skimmer Devices



Barney Blackburn, PE, CPESC, CPSWQ
NCDOT – Roadside Environmental Unit
Soil & Water Engineering Section Supervisor

NCDOT Skimmer Devices

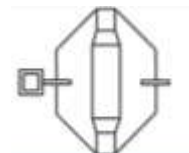
- Skimmer Basin

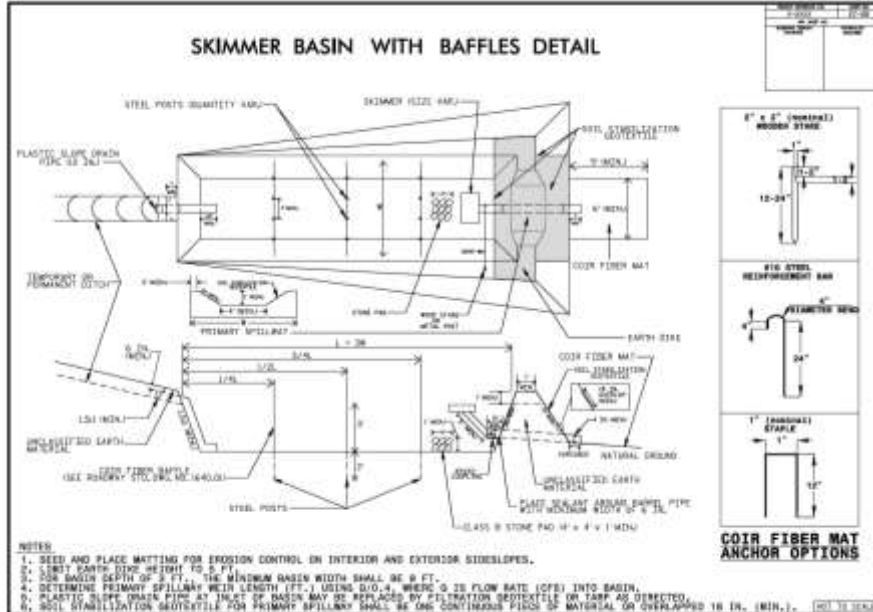


- Tiered Skimmer Basin



- Earthen Dam with Skimmer



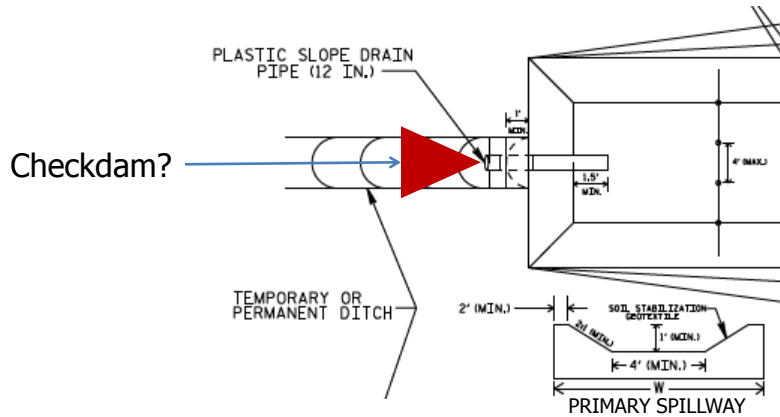


Inlet to Skimmer Basin

- 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



Permanent Pipe Inlet



Stone Inlet Protection



Stone Pad Inlet

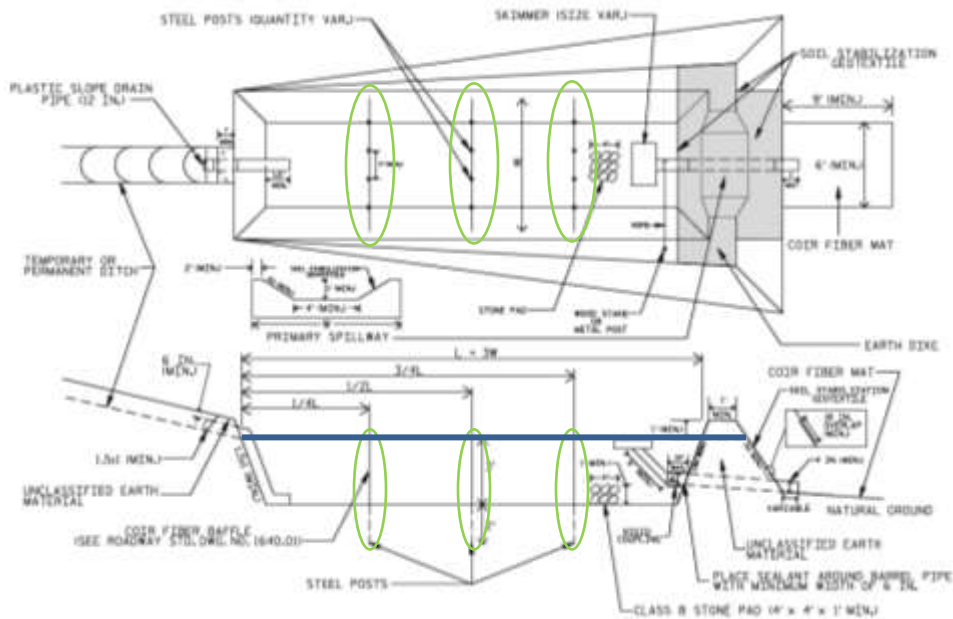


Geotextile Inlet



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



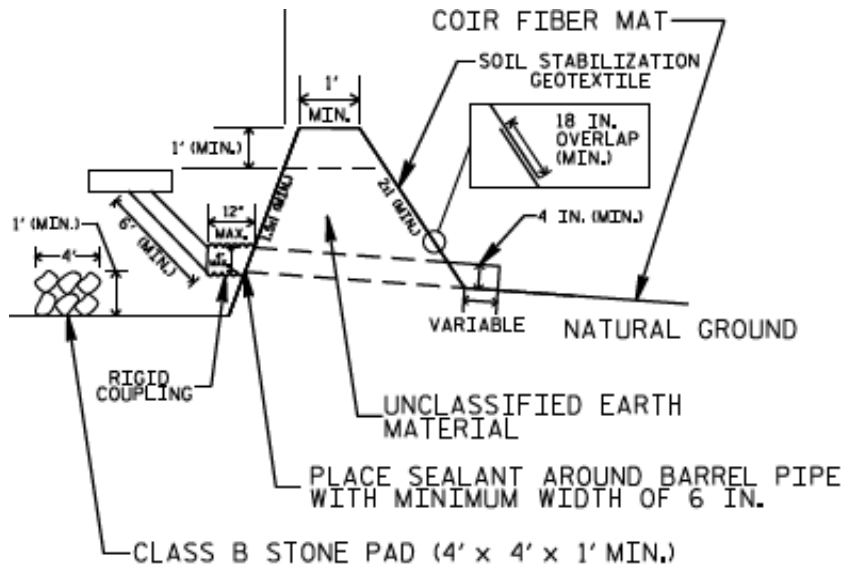
Skimmer Accommodations

- 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



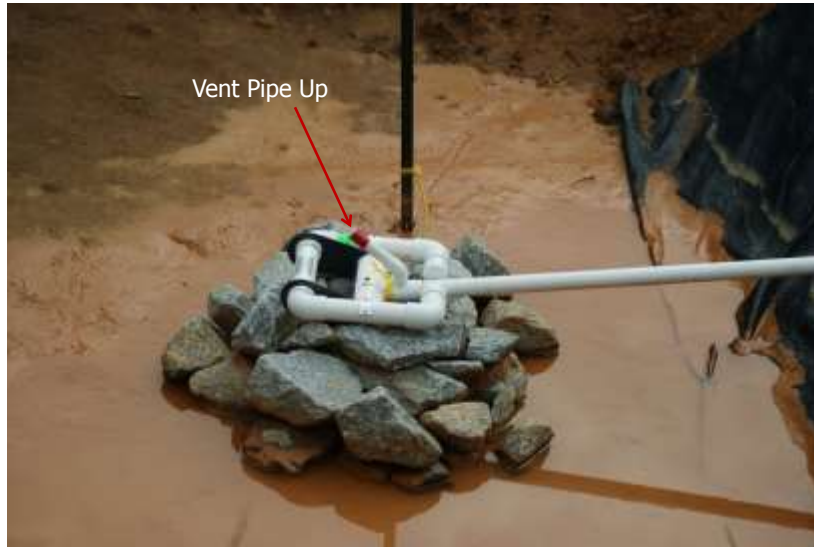
Sealant around Barrel Pipe



Skimmer with Rope & Pad



Post and Rope Arrangement



Skimmer on Mud Pile



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

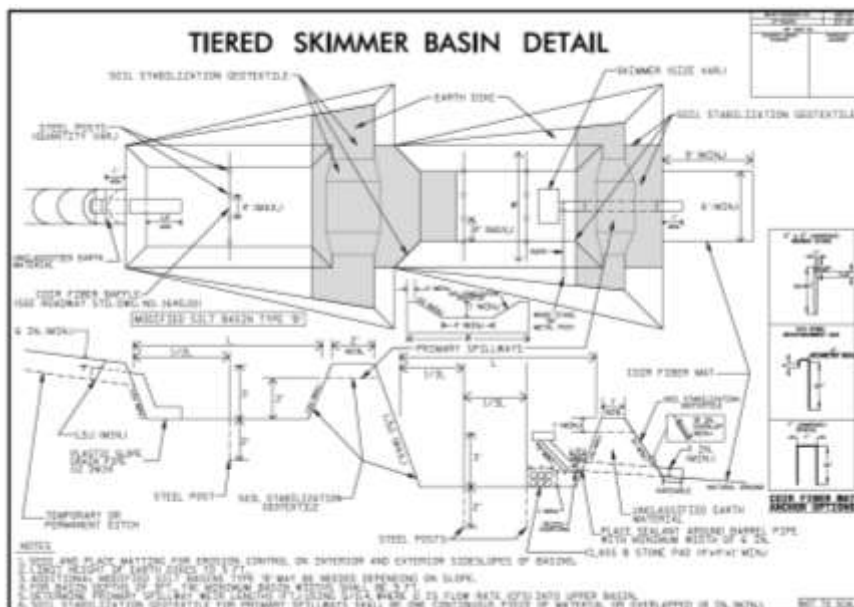


Orifice Plate on Barrel Pipe



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

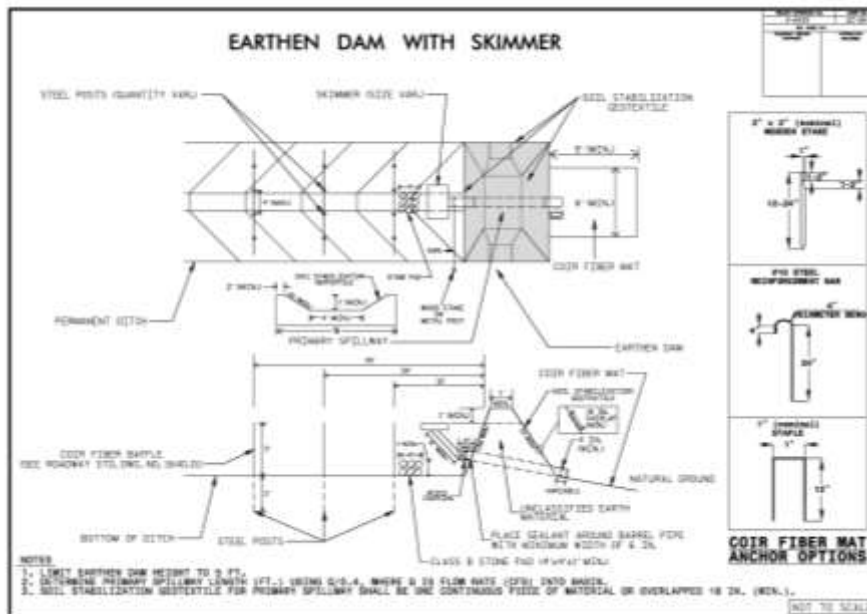


Tiered Skimmer Basin in Rock



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

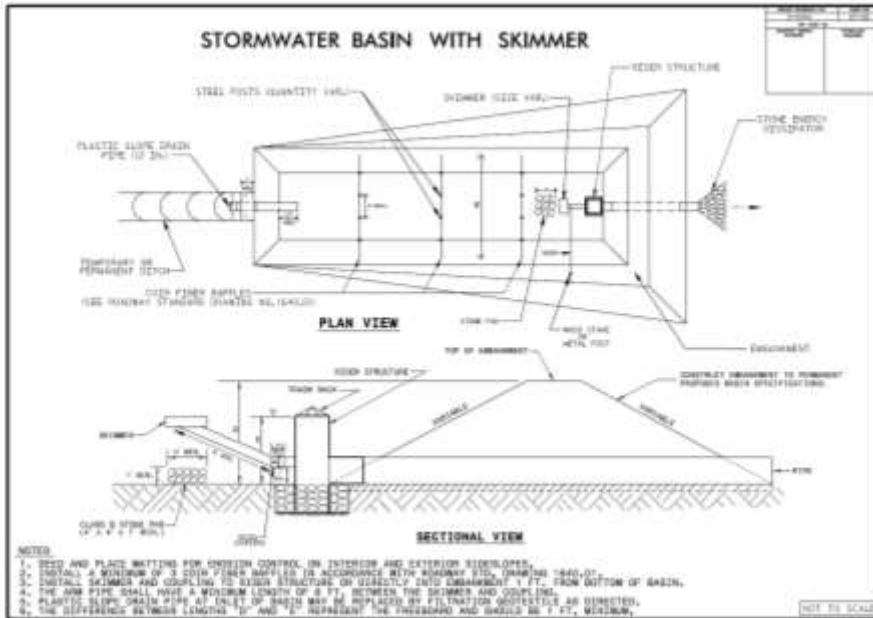


Earthen Dam with Skimmer Retrofit



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

http://www.ncdot.org/doh/operations/dp_chief_eng/roadside/soil_water/erosion_control/downloads.html

- 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?

