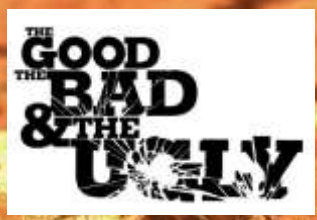
Installation and Maintenance of Erosion Control BMPs

Or…



- Common BMPs
- Applications
- Specifications
- Installation
- Problems
- Maintenance

Utility

- Design Professionals
  - Clarifications, proactive problem solving
- Contractors
  - Installation , maintenance and function
- Inspectors
  - Common deficiencies, documentation
- Owners
  - Specifications required by approved plan…


You ever had a whitehead on your eyeball, Mary? Hmm?


Woogie just wants a few things…
• Sediment Fence
• Fence Outlets
• Construction Entrances
• RECP
• Slope Drains
• Baffles
• Grade Control
• Skimmers
• Basins
• Extras??
E&SC Planning and Design Manual


Silt Fence (6.62.1)

Sediment Fence Specs

- Metal Posts (1.33 lb/ft; minimum 5' length)
  - 8' on center w/wire (14 ga., 6" spacing)
- 12" buried (8" down, 4" flap)*
- Less than 2% slope
- No concentrated flows
- Treats ¼ acre per 100 feet (refer to Table 6.62a)
- Additional requirements for high-hazard

Recommendations

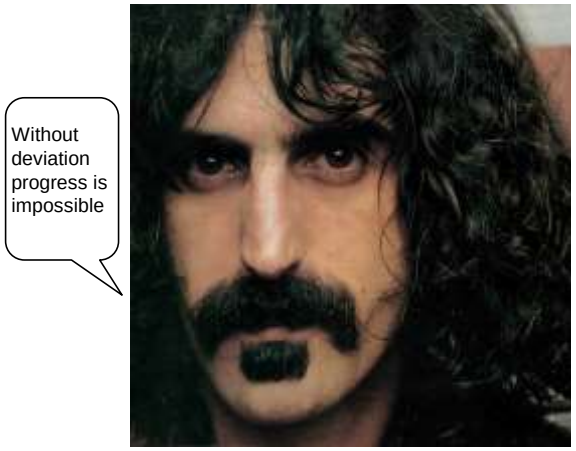
- Place along contours and tie to grade
- Do not use as stand-alone measure beneath denuded slopes higher than 10 feet
- Mechanical compaction for anchoring
- Place 12" #5 stone along toe when using fence to divert flows to treatment areas
- J-hook to treat perimeter slopes


Maintenance
• Inspect weekly and after rain
• Restore storage area when sediment accumulation reaches 9”
• Replace worn or damaged sections
• Stabilize/repair drainage areas


Sediment Fence Outlet
• Known to NCDOT as Special Sediment Control Fence


Applications
• Treat small disturbed areas where sediment fence in insufficient to function as a stand-alone device
• Short-term


Design Specs
• No State Spec?


Without deviation progress is impossible

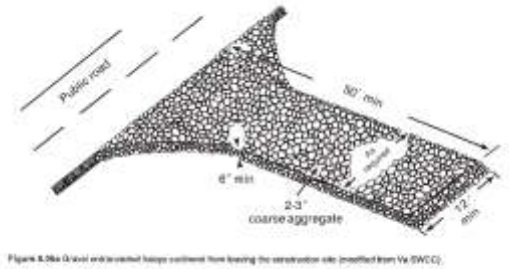
Installation

- Offset from low point
- Appropriately spaced
- Hardware cloth and washed stone
- Additional reinforcement

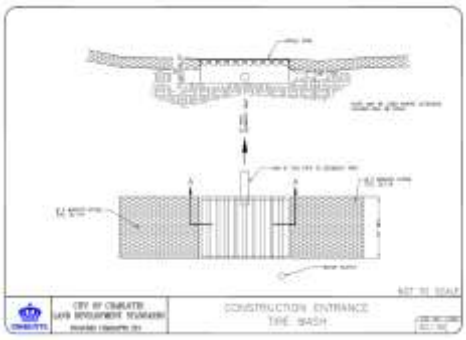
Maintenance

- Inspect weekly and after rain
- Restore storage area when sediment accumulation reaches ½ the storage area or no greater than 1 foot
- Replace worn or damaged sections
- Stabilize/repair drainage areas

Construction Entrance (6.06.1)



Tire Wash (CLDS)

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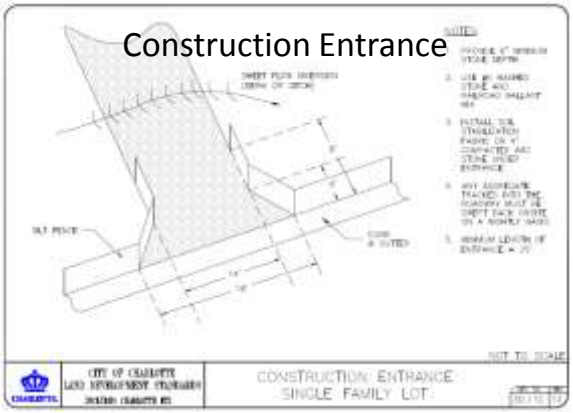
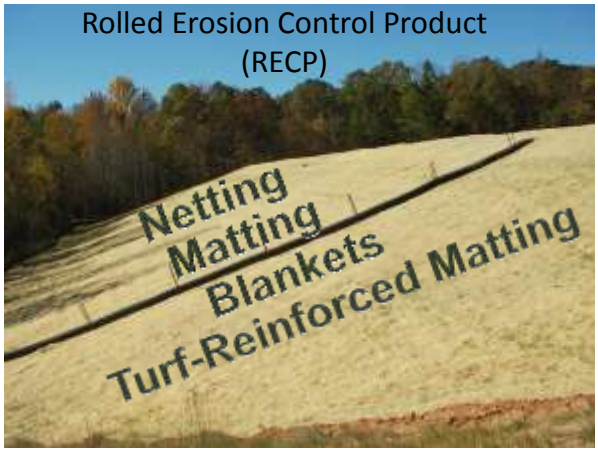
Construction Entrance



Maintenance

- Replace/refresh WHEN NECESSARY
- Require subcontractors/site workers to sweep/shovel at curb and street daily
- Ensure cut-off swale integrity (if needed)
- Consider conditions
- Enlarge if necessary
- Add entrances if necessary

Rolled Erosion Control Product (RECP)



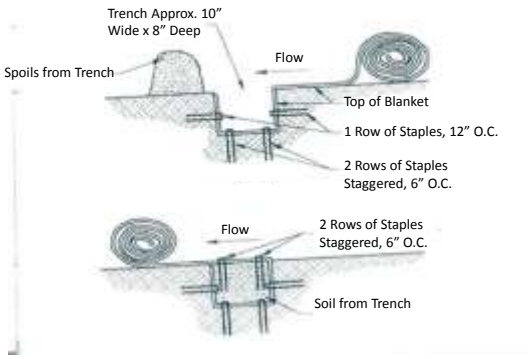
Applications

- Long or steep slopes
- When mulch cannot be adequately tacked
- Where immediate ground cover is needed
- Vegetated channels (check shear stress)

Specifications

- Design specifications (use the right RECP… correctly)
- Ground contact
- Seed bed preparation
- Manufacturer-specific directions

Installation



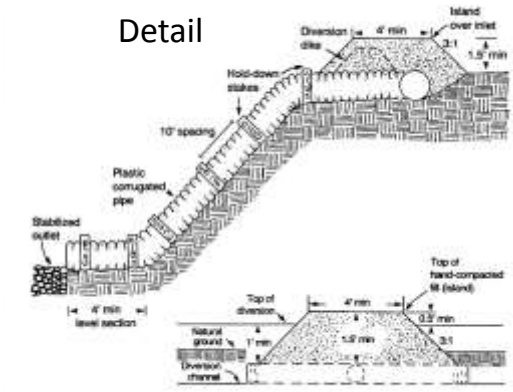
Maintenance

- Inspect weekly and after rains for signs of undermining or washout
- Correct deficiencies and repair damaged areas immediately

Slope Drains

- Convey flows at denuded slopes while permanent vegetation is established
- Convey flows at denuded slopes while permanent drainage is addressed
- Convey diversion ditches to basin forebays

Detail



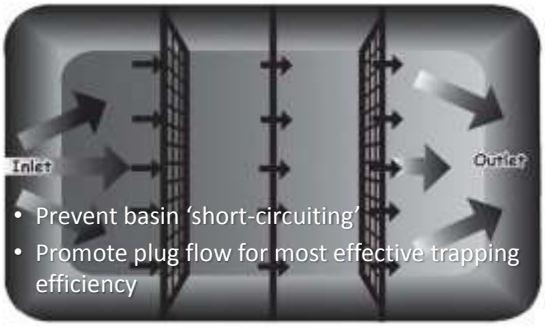
Installation

- Earthen diversion with storage area and energy dissipation
- Berm 1’ above top of pipe at all locations
- Hand compaction around inlet pipe
- Ensure connections are watertight

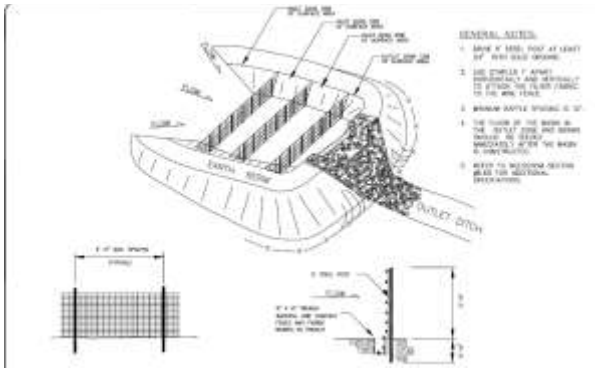
Drain Area	Pipe Diameter
0.50 acres	12”
0.75 acres	15”
1.00 acres	18”

Maintenance

- Inspect inlet area
- Repair washouts
- Remove accumulated sediment at inlet
- Inspect discharge area
- Inspect berm/slope



Installation



Installation

- Install perpendicular to the direction of flow
- Ensure baffle elevation = spillway elevation
- Coir fabric (700g/m2) or equivalent
- 9 ga. suspension wire
- Tie to basin sides

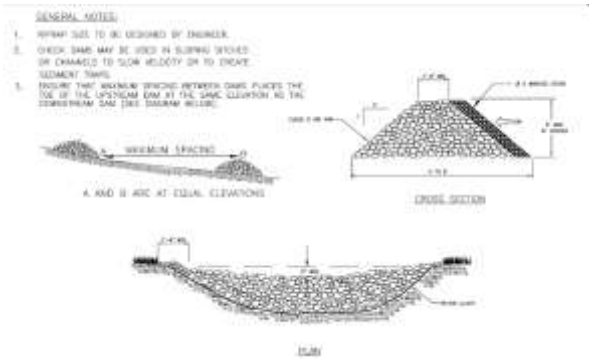
Maintenance

- Inspect baffles weekly and after every rain
- Maintain access for repairs
- Replace when torn, collapsed, decomposed or ineffective
- Remove sediment when half full
- Design life of 6-12 months

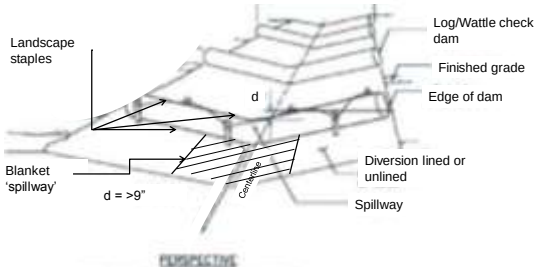
Check Dams / Grade Control

- Reduce velocity
- Reduce rill/gully erosion
- Reduce basin maintenance
- Can provide dosing method for PAM
- Do not use in jurisdictional waters

Rock Check Dam Installation



Wattle/Log Check Dam Installation



Note: ensure secure contact with the ground. Use scrap erosion control blanket to plug gaps.

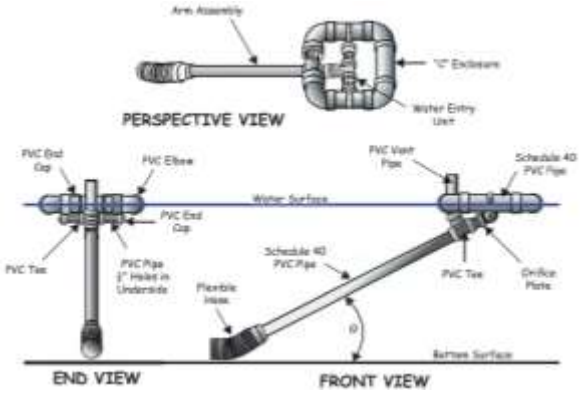
Maintenance

- Inspect weekly and after rain
- Expect damage from high flows washing around edges of the dam; repair immediately
- Remove accumulated sediment as necessary to prevent damage to channel vegetation
- Adjust elevations as necessary
- Do not use in jurisdictional waters

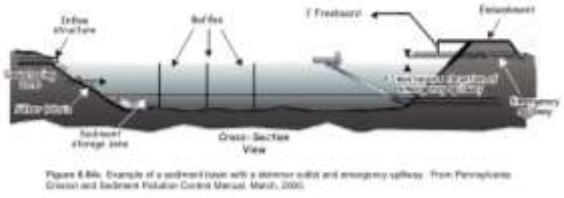
Skimmers

- Dewater from the top of the water surface
- Provide most efficient removal for gravity-treatment basins
- Dewatering rate controlled by orifice plate (drawdown in 2-5 days)
- Can be re-used
- Require more frequent maintenance

Skimmer Schematic



Common Problems

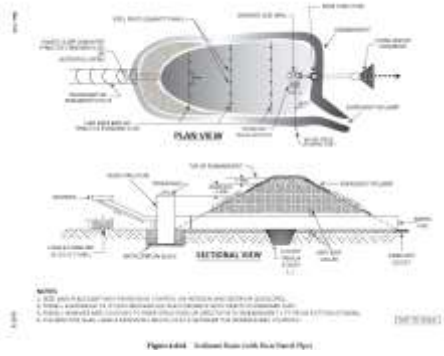


- L/W ratio
- Failure at outlet pipe
- Inflow armoring
- Orifice size
- Orifice size
- Orifice fouling
- Spillway damage

Maintenance

- Inspect weekly and after rain
- Check orifice plate for blockage
- Ensure skimmer floats freely
- Use rope to 'bob' skimmer to remove debris from screen
- Inspect inlets
- Inspect skimmer assembly for any damage
- Check spillway and outfall

Basin Construction



Installation

- PHASE 1 EROSION CONTROL!
- Ensure basin floor is flat
- Ensure basin floor is one foot below skimmer invert
- Ensure that a permanent outlet structure doesn't change storage capacity or surface area
- Locate inlets opposite of outlet
- Armor inlet zones
- Provide "landing pad" for skimmer, account for sway
- Check seals at first rainfall

Installation

- Cut-off trench (2' deep, max 1:1 sideslope)
- Embankment top width:
  - Height less than 10 feet, top width $\geq$ 8 feet
  - Height 10 to 15 feet, top width $\geq$ 10 feet
- Freeboard 1 foot from ***settled*** embankment
- Allowance for settlement (build 10% above design)
- Basin slopes 2.5:1 or flatter
- Stabilize embankments (except bottom half)
- Non-erosive discharge

Maintenance

- Check inlets for scour/stability
- Vegetation
- Discharge clarity/turbidity impacts
- Offsite impacts?