

Utility Line Construction

Designing Sedimentation and Erosion Control for Utility Lines

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Utility Lines

- Water
- Gravity Sewer
- Sewer Force Main
- Natural Gas
- Petroleum
- Buried Electric
- Overhead Electric

Locations of Utility Lines

- Parallel to Roads
 - Under the pavement
 - On the road shoulder
 - In the ditchline
- Parallel to Streams
 - Stream buffers
 - Crossing meandering streams
- Cross-Country
 - Crossing everything

Planning Considerations

- Steep Terrain
 - Steep side-slope may require benching
 - Stormwater must be diverted off disturbed area
- Stream Buffers
 - Statutory Riparian Buffers in some river basins
 - Zone of undisturbed vegetation

Planning Considerations

- Stream Crossings
 - Minimized extent and duration of disturbance
 - Meet General 401 Certification requirements
 - 75 to 105 degree angle for crossing
- Blasting
 - Use earthen berms, not silt fence
 - Use blast mats to prevent fly rock

Planning Considerations

- Highway Traffic
 - Sediment controls must be safe for cars
 - Mulch must be tacked or netted
- Limited Space
 - Use small measures at frequent intervals
 - Sediment fence
 - Provide ground cover quickly

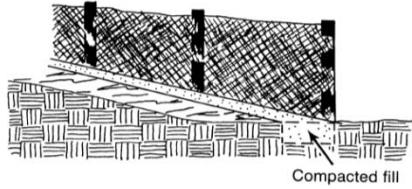
Practices and Standards

- Sediment Fence
- Temporary Diversion Berms
- Stone Outlets
- Temporary Sediment Traps
- Temporary Silt Basins

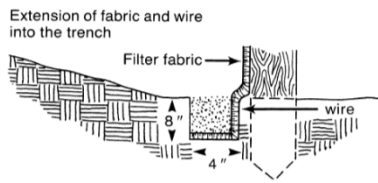
Practices and Standards

- Rock Check Dams
- Right-of-Way Diversions
- Temporary Equipment Crossings
- Stream Flow Diversions
- Pipe Inlet Protection
- Drop Inlet Protection

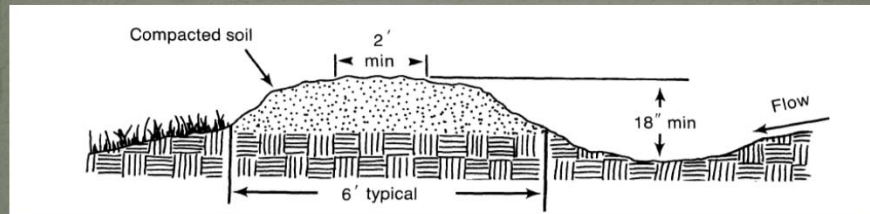
Sediment Fence



- Steel Posts
- Posts 6-8 feet apart
- Fabric anchored in trench
- Controls sheet flow



Temporary Diversions



- Place on lower side of right-of-way
- Compact the berm with tracked equipment
- Provide ground cover on diversion
- Direct runoff to sediment control measure



Stone Outlets



- Can be constructed from hardware cloth and gravel or Class B Riprap and #57 Washed Stone

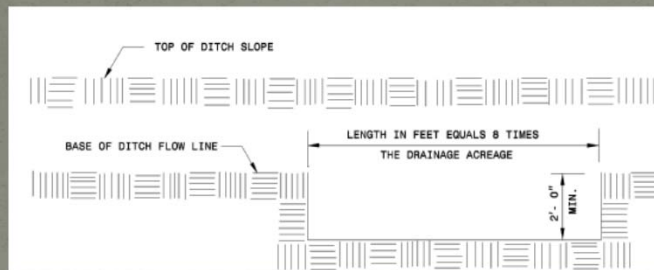
Temporary Sediment Traps



- Use on either side of stream crossings
- Use at low points in right-of-way profile
- Do not use in streams



Temporary Silt Basins



- Provides sediment storage in ditch or diversion
- Locate in bottom of ditch
- Use just above small check dam



Rock Check Dams



- Recommend NC DOT Temporary Rock Silt Check Standard
- Keep the center lower than the sides
- Use washed stone on upstream face

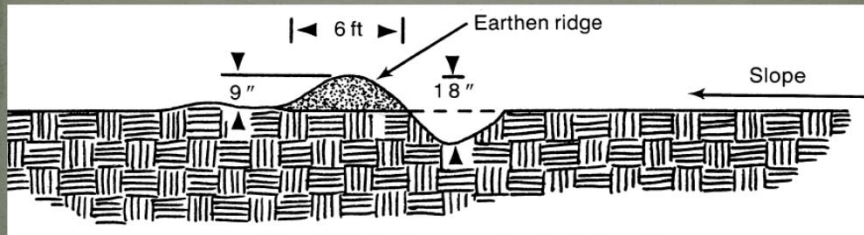




Right-of-Way Diversions



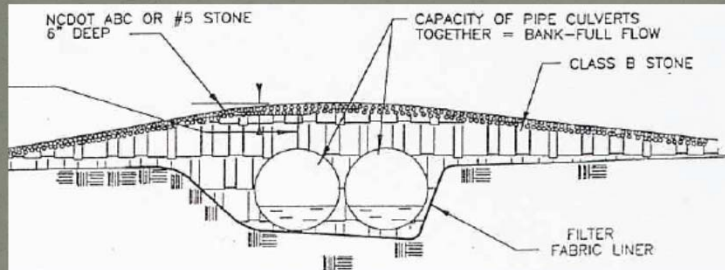
Right-of-Way Diversions



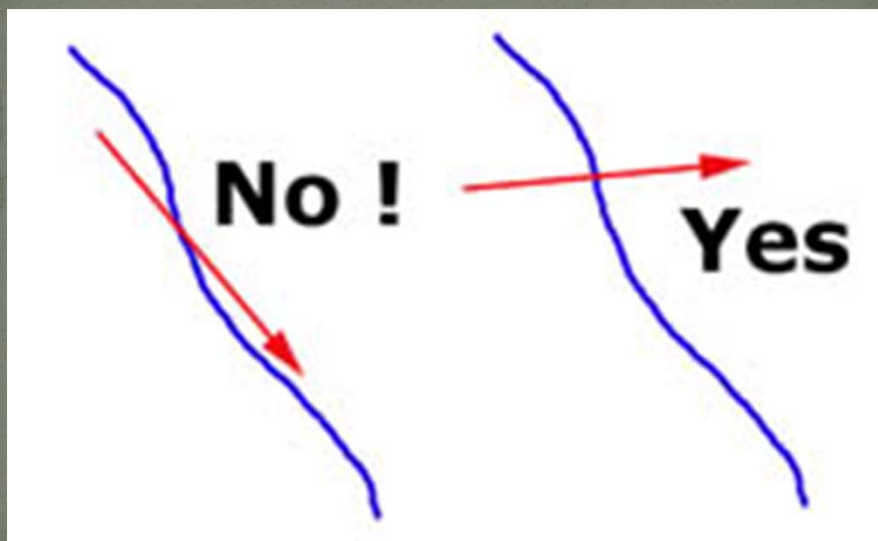
- Use as temporary and permanent measure
- Divert runoff from disturbed area
- Keep diversion slope to 2 % or less

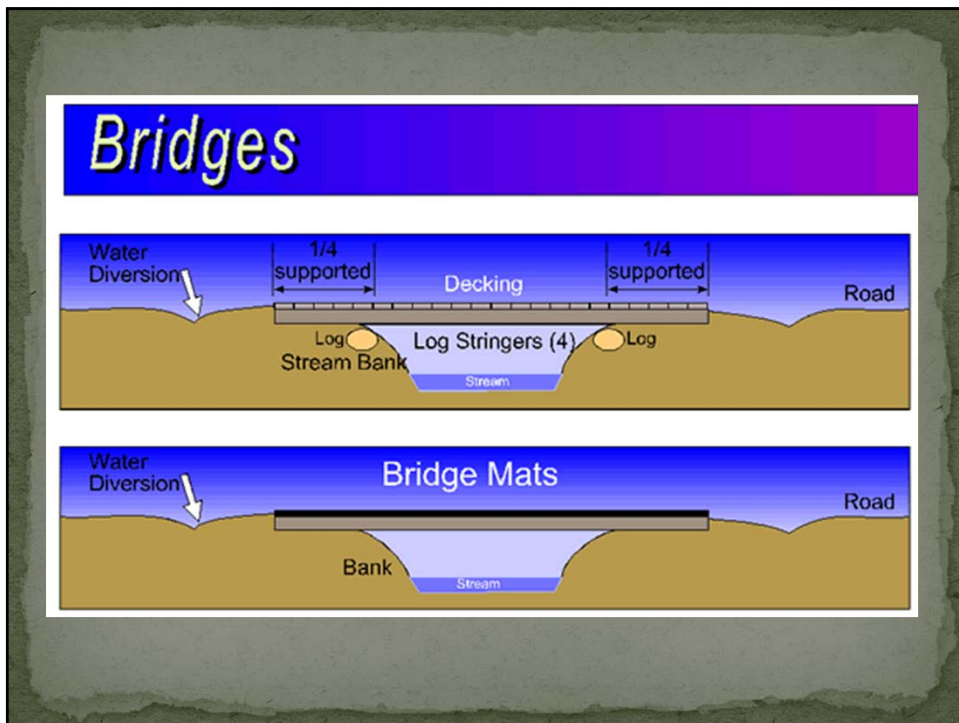


Temporary Equipment Crossings



- Ford may be acceptable for one-time crossing
- Use pipe for repeated crossings
- Backfill pipe with Class B Stone, NOT soil
- Size for Bank-full flow







Stream Diversions

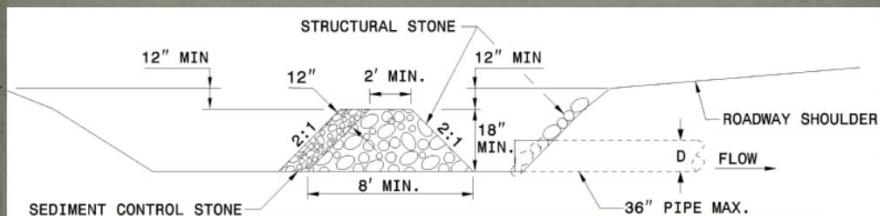


- Divert stream flow with flume pipe or pump
- Use coffer dam of sand bags, stone and fabric, concrete barrier or sheet piles

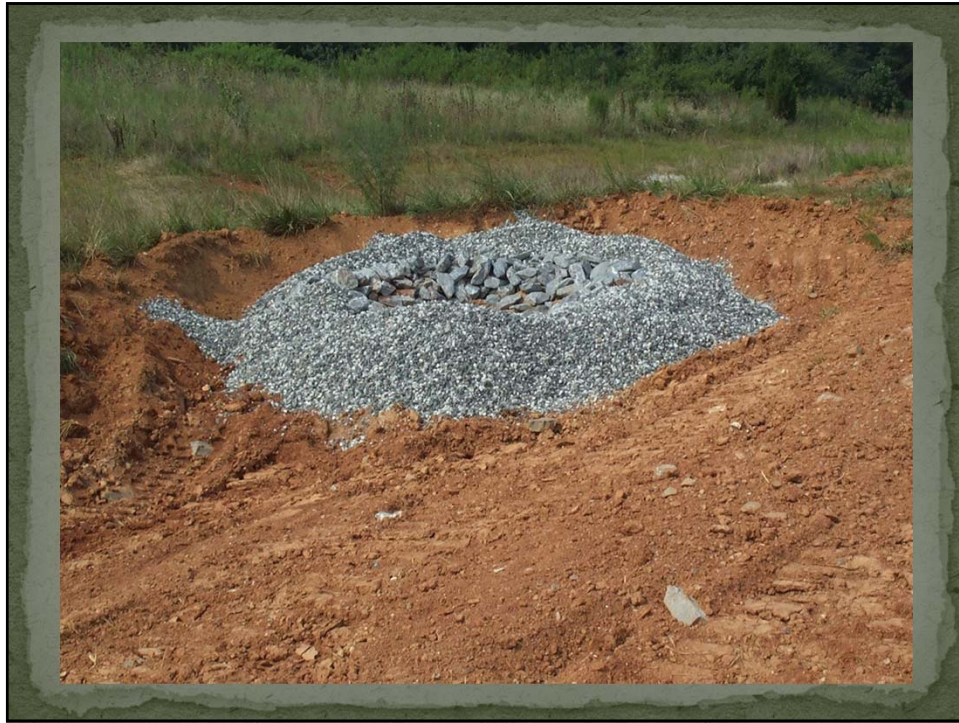




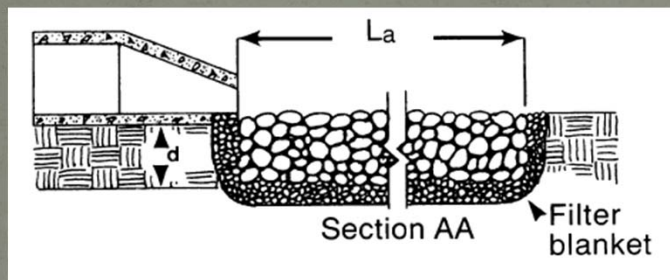
Inlet protection



- Use stone horseshoe at inlets of cross-culverts
- Use check dams above driveway culverts
- Use block and gravel for curb inlets



Outlet Protection



- Provide riprap apron at outlet of cross culverts
- Place rock check dam in ditch on both sides of culvert outlet

Putting It All Together

- Provide stream buffers
- Minimize the number of stream crossings
- Select appropriate measures
- Use combinations of measures

Utilities in the Road

- Spread rock dust or sand on pavement before stockpiling soil in road
- Backfill the trench daily and cap with crushed stone



Utilities on the Road Shoulder

- Protect drop inlets and pipe inlets
- Provide sediment fence on lower side of disturbance
- Provide ground cover and RECP daily if no room for sediment controls

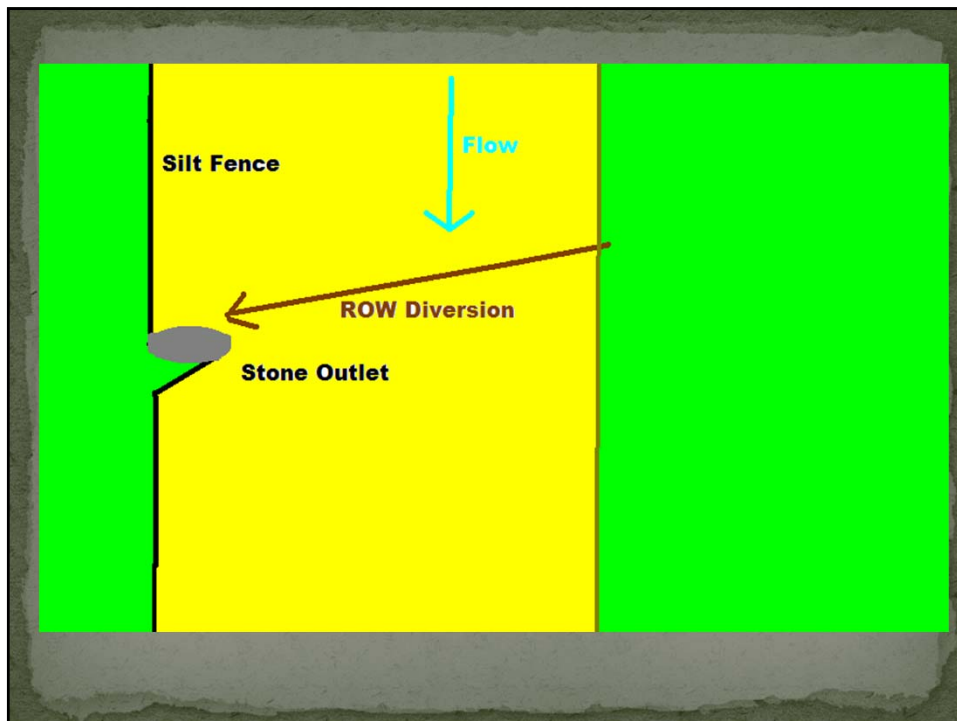


Utilities in the Roadside Ditch

- Use rock check dams and silt basins
- Use sediment trap at ditch turnouts
- Provide ground cover and RECP
 - 2 % Rule of Thumb
 - Use RECP if straw will blow off
 - Use RECP if germination will be delayed

Cross-Country Utilities

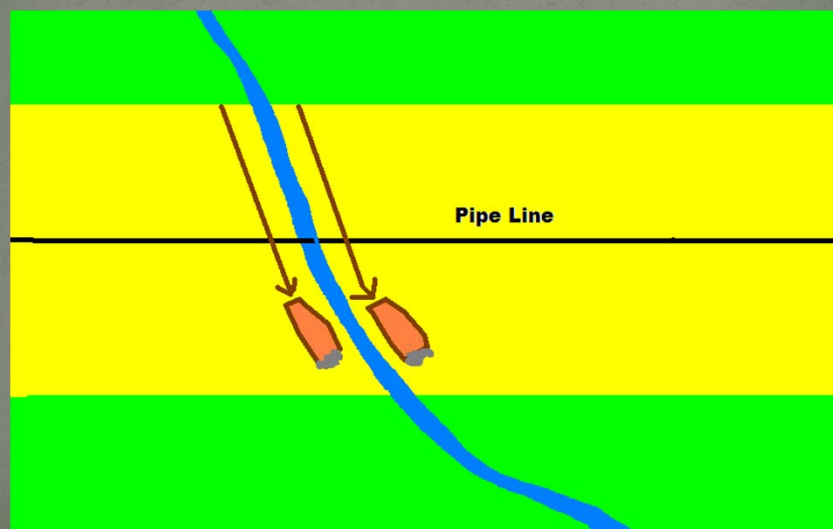
- Slope across right-of-way
 - Diversion berm or sediment fence with stone outlets
- Slope up and down the right-of-way
 - Right-of-way diversions
 - Place silt basin at end of each diversion
 - Silt fence parallel to right-of-way ineffective



Crossing Streams

- Require timber mats or temporary equipment crossing for clearing crew
- Do not grub stream banks when clearing
- Divert flow around work area while laying pipe
- Install pipe and stabilize stream banks the same day

Provide diversions to temporary sediment traps at stream crossings



Ground Cover

- Provide ground cover as soon as possible
- Stream crossings must have ground cover immediately
- Slopes must have ground cover in 21 days, (7 and 14 days per NCGo1)
- Some areas (stream buffers) may need ground cover at the end of each work day
- Roadside work should be stabilized every 1000 feet

Ground Cover





Monitor and Maintain

- Monitor for establishment of ground cover
- Repair seed as necessary
- Maintain sediment controls until permanent ground cover established

That's All Folks!