

# OVERVIEW OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND STORMWATER INSPECTIONS

**SWCA**<sup>®</sup>  
ENVIRONMENTAL CONSULTANTS  
Sound Science. Creative Solutions.

# OVERVIEW

- FEDERAL/STATE GENERAL STORMWATER DISCHARGE PERMITS UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIRE PREPARATION AND IMPLEMENTATION OF A STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
- GENERAL STORMWATER DISCHARGE PERMITS
  - General Permit for Stormwater Discharges Associated with Construction Activity (NDR11-0000)
  - General Permit for Stormwater Discharges Associated with Industrial Activity (NDR05-0000)
  - General Permit for Stormwater Discharges Associated with Mining, Extraction, or Paving Material (NDR32-0000)
  - Municipal Separate Storm Sewer System (MS4) for stormwater discharges from municipal storm sewer systems

# SWPPP PURPOSE

- Establishes methods and procedures to ensure compliance with the conditions of the General Permit for Stormwater Discharges Associated with Construction Activity
- Serves as a guidance/reference document to select, implement and maintain stormwater best management practices (BMPs)
- Is a living document that can be modified, as needed, to address erosion and sediment control issues
- Records and documents BMP implementation, inspections, and corrective actions

# SWPPP COMPONENTS

## SWPPP ADMINISTRATION

- Regulatory overview
- Owner/operator information
- Implementation team
- Spill notification contact information

## PROJECT DESCRIPTION

- Site location, land disturbance area, physiographic information
- Construction narrative and planned timeframe
- Nearby surface water drainages
- Nearby Section 303(d) impaired water bodies
- Construction dewatering

# SWPPP COMPONENTS

## POTENTIAL POLLUTION SOURCES AND MATERIALS INVENTORY

- Structural controls to reduce stormwater pollution
- Materials handling, loading, and storage areas
- Description of significant spills, leaks, releases
- Potential pollution sources

## STORMWATER MANAGEMENT CONTROLS

- Erosion and sediment control requirements
- Selection of structural controls
- Operational controls
- Stabilization requirements
- Chemical treatment
- Final stabilization
- Local requirements
- Spill response plans

# SWPPP COMPONENTS

## INSPECTION AND MAINTENANCE PROCEDURES

- Stormwater inspection procedures
  - Areas to inspect
  - Frequency
  - Specific items to look for
  - Inspection report and recommendations
- Maintenance & corrective action procedures
  - Personnel
  - Scheduling
  - Maintenance & corrective action requirements

## RECORDKEEPING PROCEDURES

## NON-STORMWATER DISCHARGES

## CERTIFICATION (owner/permittee & contractor/subcontractor)

## APPENDICES

- Permit documentation, BMP construction specifications, drainage log, training log, & inspection form)

# INSPECTION REQUIREMENTS

## ACTIVE CONSTRUCTION PERIOD

- 14-day inspection frequency (alternative schedule available)
- BMP installation/maintenance as required
- Within 24 hours after >0.25-inch rainfall event
- BMP corrective actions - within 24 hours of discovery or as conditions allow

## POST-CONSTRUCTION PERIOD

- 30-day inspection frequency
- BMP maintenance as required

## PERMIT DURATION

- Remains in effect until final stabilization achieved
- Notice of Termination submitted to the NDDH

# AREAS TO INSPECT

- Ingress/egress points
- Materials handling, loading, and storage areas
- Vehicle, maintenance, and fuel storage areas
- Waste facilities (trash bins & chemical toilettes)
- Concrete wash-out pits
- Active construction areas
- Run-on and runoff areas
- Stormwater outfalls

# Best Management Practices (BMPs)

## TYPES OF BMPs

- Structural (physical)
- Non-Structural (administrative)

## STRUCTURAL BMPs

- Physical barriers/actions
  - Erosion Control - reduce soil particle displacement and runoff by either wind or water
  - Sediment Control - prevent sediment from entering waterways or traveling off-site

# BEST MANAGEMENT PRACTICES

## NON-STRUCTURAL

- SWPPP administration & implementation
- Education/training
- Construction sequencing
- Planning to minimize disturbance area & weather impacts
- Preserve existing vegetation to the extent possible to serve as a natural buffer
- Operations and Preventative Maintenance Programs
  - Good housekeeping (dust control, trash collection, etc.)
  - Proper materials storage and handling:
    - Protect dry products
    - Petroleum products, fuel storage tanks
    - Secure chemical toilets
  - Spill Prevention, Release, and Response Actions

# SPILL PREVENTION, RELEASE & RESPONSE ACTIONS

## PREVENTION

- Operation and maintenance procedures
  - Inspection program, repair/maintenance follow-up
  - Good housekeeping (daily)
  - Identify potential pollution sources & conduct materials inventory
- Petroleum products & materials storage - locations & requirements
- Personnel training & regular reviews (weekly)

## RELEASE

- Early detection
- Daily inspections

## RESPONSE

- Have established response procedure
- Notification call-down list
- On site spill kits

# FINAL STABILIZATION CRITERIA

## 1. ALL SOIL DISTURBING ACTIVITIES HAVE BEEN COMPLETED, AND:

- All soils have been stabilized by:
  - A uniform 70% perennial vegetative\* cover over the entire pervious surface area; or
  - Other equivalent means necessary to prevent soil failure under erosive conditions.
- And:
  - i. All ditches that drain water from the site have been stabilized;
  - ii. All temporary synthetic structural erosion/sediment controls (e.g., silt fence) have been removed; and,
  - iii. Sediment has been removed from conveyances and temporary sediment basins used for permanent water quality management, and the sediment has been stabilized.
- **Re-vegetation with native grasses, not noxious weeds**

# FINAL STABILIZATION CRITERIA

## 2. FOR AREAS WITH < 20 INCHES ANNUAL RAINFALL:

- All soil disturbing activities are complete;
- Temporary erosion control measures have been selected, designed & installed;
- Appropriate seed base was applied to provide erosion control for 3 years; and,
- The applied seed mixture will achieve 70% vegetative cover within 3 years, without active maintenance.

## 3. SOIL DISTURBING ACTIVITIES ON AGRICULTURAL LAND

- The land is returned to its pre-disturbance agricultural use; and,
- Areas not used for agricultural activities (e.g., buffer strips adjacent to state waters) and areas not returned to pre-disturbance agricultural use must meet the criteria in #1 or #2.

# PERMIT TERMINATION CRITERIA

1. FINAL STABILIZATION HAS BEEN ACHIEVED
2. TRANSFERRED PERMIT TO ANOTHER PERMITTEE
  - New permittee agrees to/accepts all permit conditions
  - Includes all areas that have not achieved final stabilization
3. FOR RESIDENTIAL CONSTRUCTION - N/A

# STRUCTURAL BMP Examples

## EARTHEN BERMS

- Run-off/Run-on control
- Spill Containment
- Advantages
  - Use existing excavated soil
  - Primary cost is labor
  - Very effective when constructed correctly (must be compacted)
- Disadvantages
  - If not constructed/compacted correctly failure can increase sedimentation

# EARTHEN BERMS



# STRUCTURAL BMP EXAMPLES

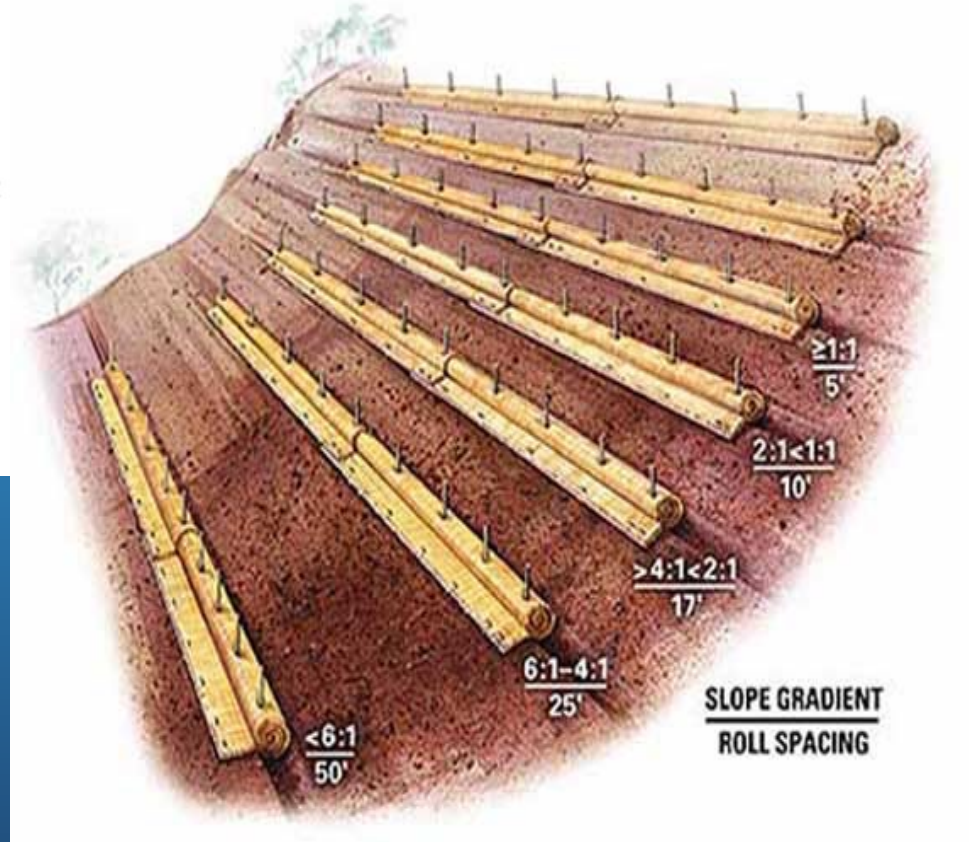
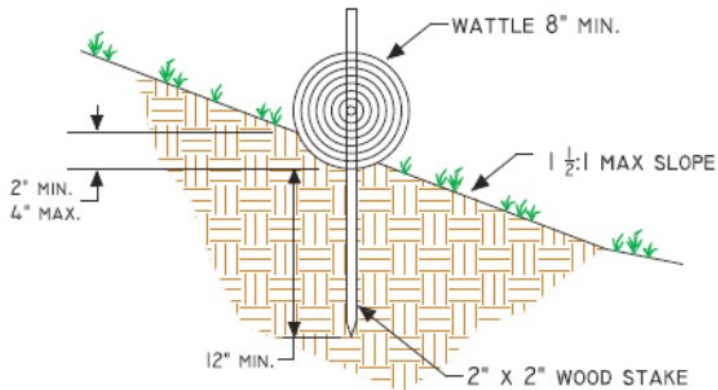
## STRAW WATTLES/FIBER ROLLS/SEDIMENT CONTROL LOGS

- Used for run-off control and sediment drop-out
- Advantages
  - Excellent for long linear applications
  - Can be stacked to improve effectiveness
  - Biodegradable
  - Can be left in place after final stabilization achieved
- Disadvantages
  - Easily damaged (once damaged not effective)
  - If not staked/trenched properly, easily undercut/washed away
  - Livestock/wildlife
  - Labor & materials installation costs

# STRAW WATTLES/FIBER ROLLS



# STRAW WATTLES/FIBER ROLLS

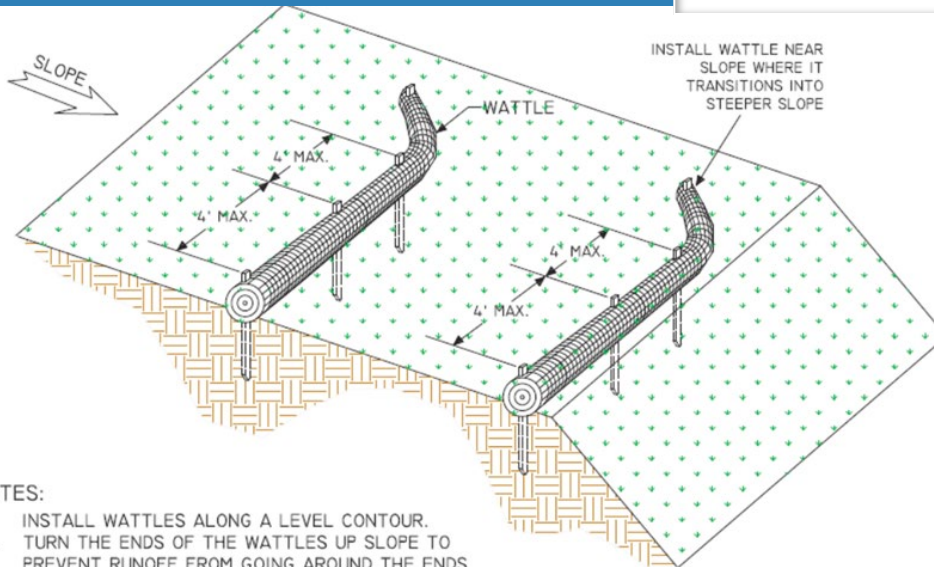
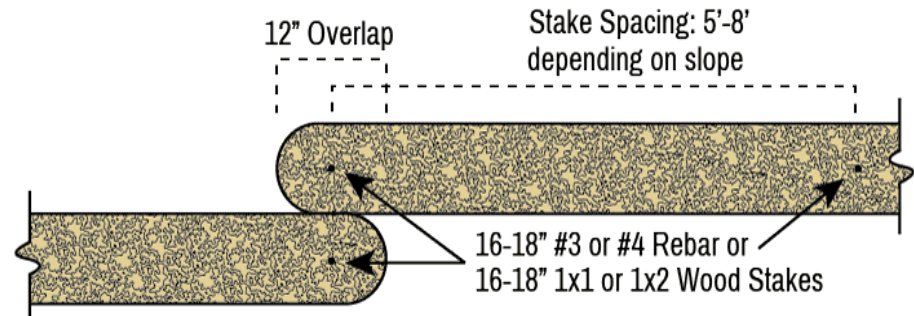


## STRAW WATTLE SPACING

SLOPE		SPACING
(H:V)	(%)	(FT)
> 1:1	> 100	5
1:1 -- 2:1	50	10
2:1 -- 4:1	25	17
4:1 -- 6:1	17	25
< 6:1	< 17	50

# STRAW WATTLE INSTALLATION

## STRAW WATTLE INSTALLATION - PLAN VIEW



### NOTES:

1. INSTALL WATTLES ALONG A LEVEL CONTOUR.
2. TURN THE ENDS OF THE WATTLES UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE ENDS.
3. STAKE WATTLES INTO A 2 TO 4 INCH DEEP TRENCH.
4. IF MORE THAN ONE WATTLE IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED, NOT ABUTTED.

# STRAW WATTLES IN USE



# STRAW WATTLES - IMPROPER INSTALLATION



## COMMON MISTAKES:

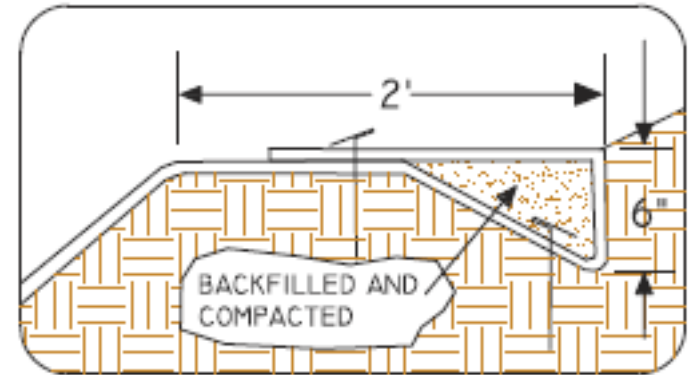
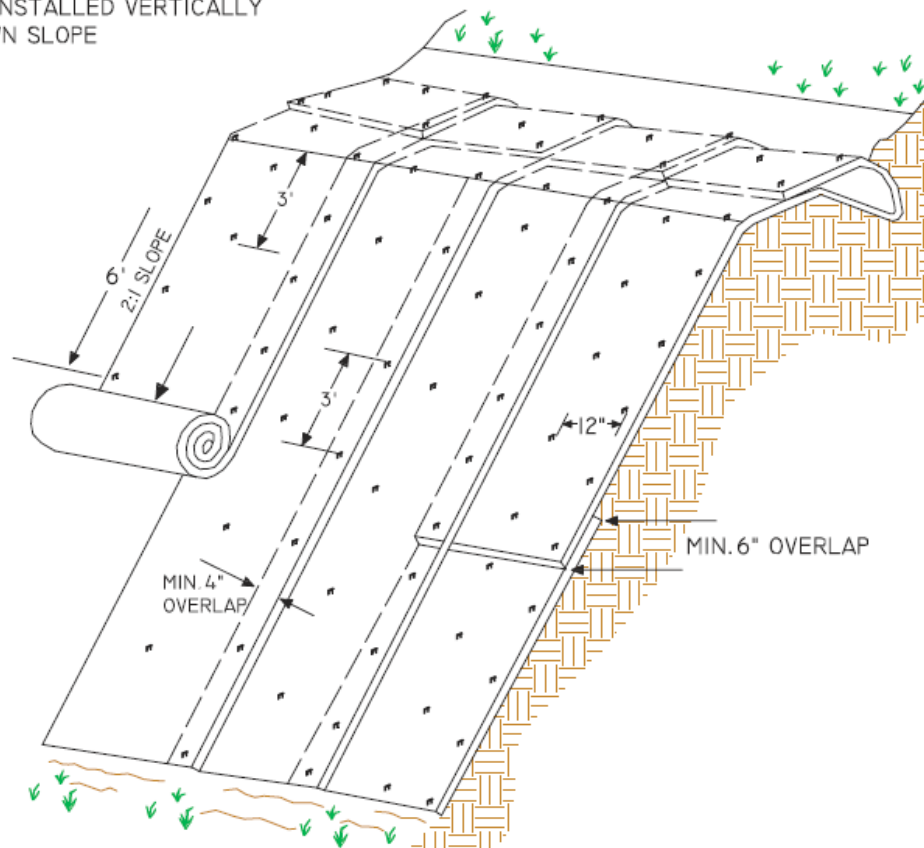
- Not trenched
- Stake spacing >4 feet
- Inadequate stake size (l x w)
- Wattle spacing too great for slope
- Improper/no overlap

# EROSION CONTROL BLANKET (ECB)



# ECB INSTALLATION

MATS/BANKETS SHOULD  
BE INSTALLED VERTICALLY  
DOWN SLOPE



# ECB - PROPER INSTALLATION



# ECB - INCORRECT INSTALLATION



# ECB - CORECT/INCORRECT INSTALL

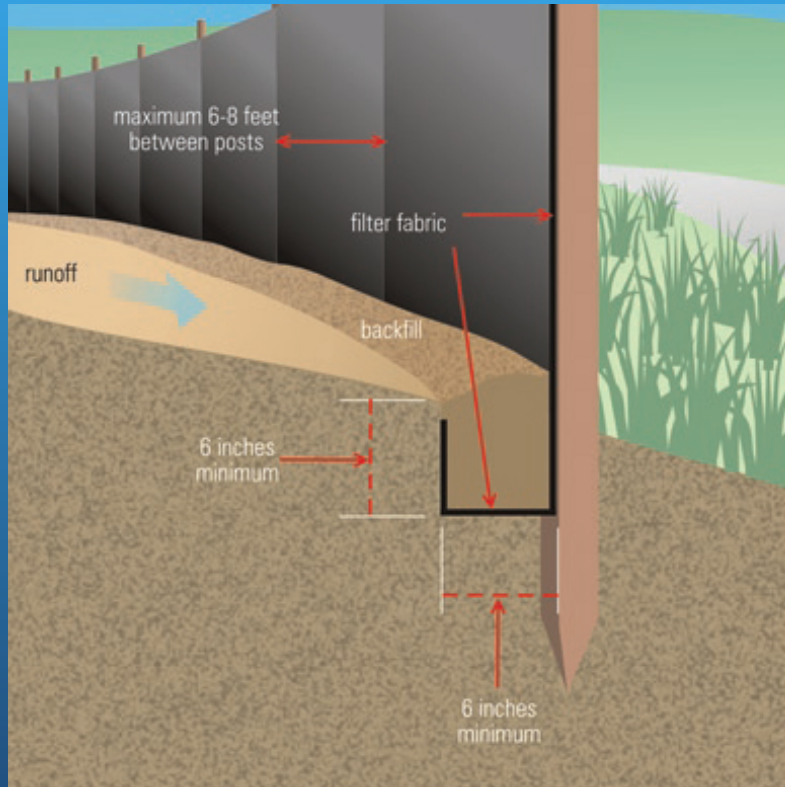


# STRUCTURAL BMPs

## SILT FENCE

- Used to prevent offsite transport of sediment
- Advantages
  - Excellent for long linear applications
  - Can be used for onsite applications (e.g., soil stockpiles)
  - A lot of footage can be transported easily to the site
  - Labor & materials installation costs
- Disadvantages
  - Not biodegradable
  - Must be removed once final stabilization is achieved
  - If not installed correctly (i.e., staked & trenched), easily undercut or is ineffective

# SILT FENCE



# SILT FENCE IN USE



# SILT FENCE IN USE



# SILT FENCE - INSTALLATION AND MAINTENANCE ISSUES

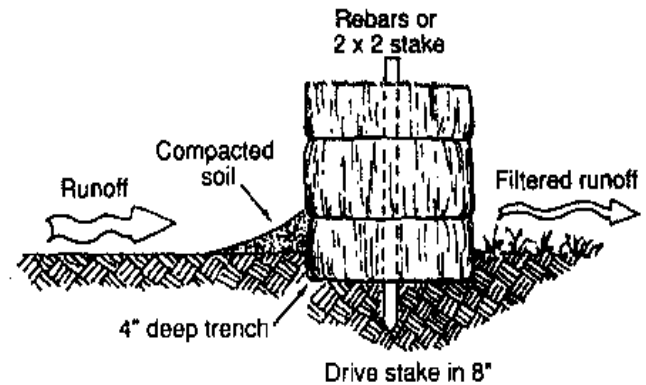
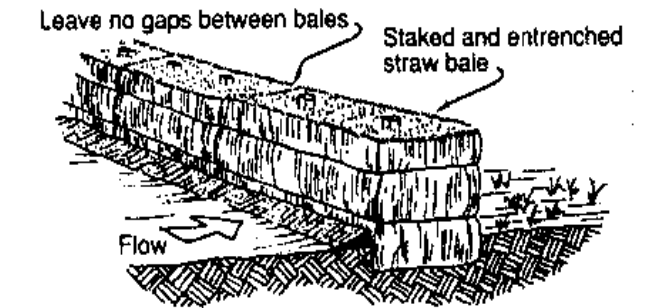
- MOST COMMON INSTALLATION MISTAKES
  - Not trenched
  - Installed so that stakes are on the upgradient side
  - Spacing between stakes in too great
    - Non-reinforced = 8 feet
    - Wire mesh reinforced = 10 feet
  - Insufficient overlap when joining fence rolls
- MOST COMMON MAINTENANCE ISSUES
  - Sediment buildup > 1/2 height of fence
  - Fabric detached from stakes
  - Broken support stakes
  - Torn fabric

# STRUCTURAL BMPs

## STRAW BALE BARRIERS

- Run off control/sediment drop-out
- Advantages
  - Cost
  - Biodegradable
  - Can be left in place after final stabilization achieved
- Disadvantages
  - Livestock/wildlife
  - Clogs easily
  - Maintenance - repair is replacement

# STRAW BALE BARRIERS



# STRUCTURAL BMPs

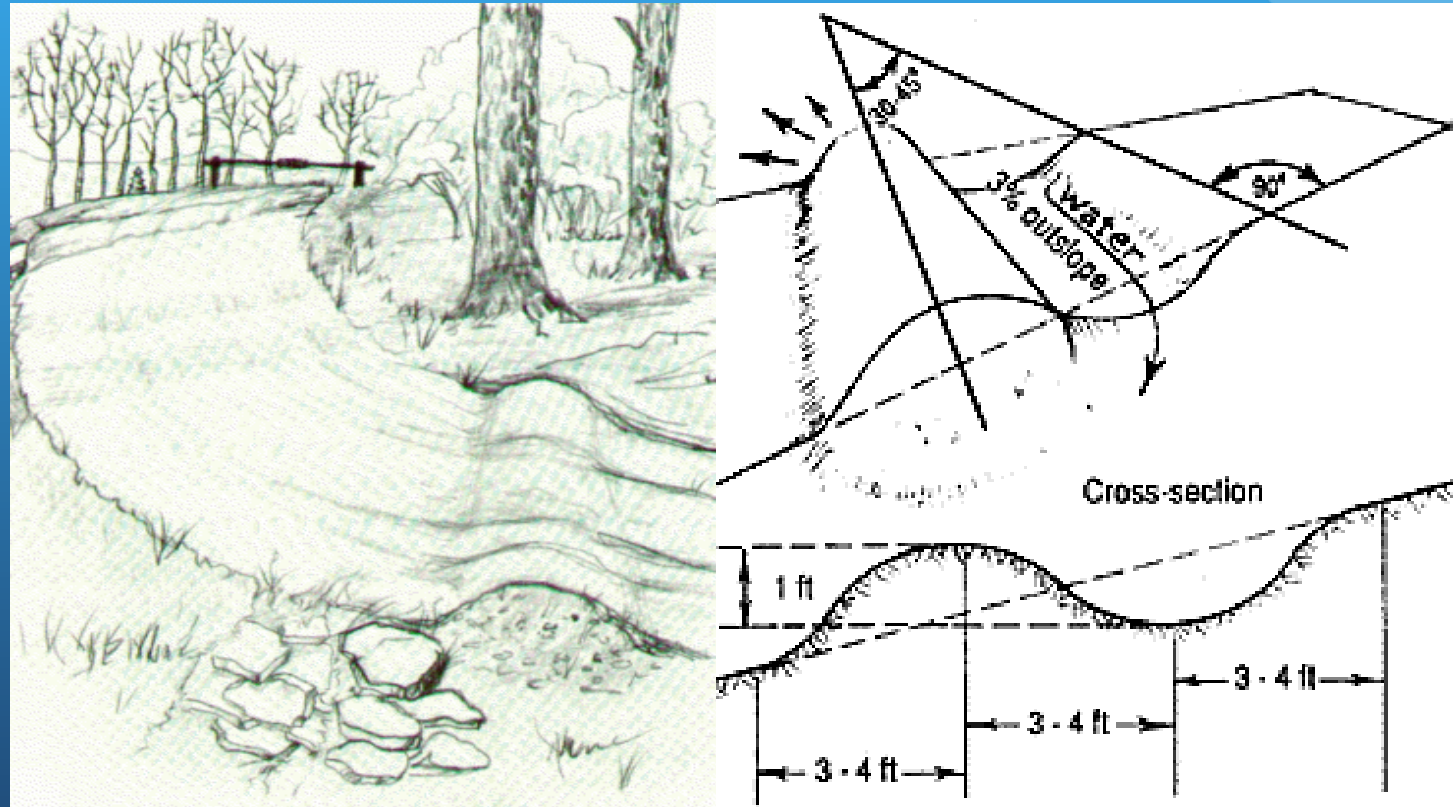
## WATER BARS

- Conveyance and velocity dissipation
- Advantages
  - Formed from excavation of an uphill conveyance ditch
  - Breaks up long slopes
  - Channels water off slopes
- Disadvantage
  - Easily damaged by traffic

## TURNOUTS

- Conveyance and velocity dissipation
- Advantages
  - Easily excavated conveyance ditch
  - Channels water off slopes
- Disadvantages
  - Must be protected to prevent erosion in ditch
  - Must be protected to prevent sedimentation at discharge end

# STRUCTURAL BMPs



# TURNOUT



# STRUCTURAL BMPs

- **SILT FENCE**
  - Used to prevent offsite transport of sediment
  - Advantages
    - Very effective using existing soil
    - Helps establish vegetation
    - Easy to install with tracked equipment
  - Disadvantages
    - Primarily for use with gentle or shallow depth rains
    - Easily washed away in heavy rains
    - Effectiveness partly dependent on soil characteristics
    - Easy to install incorrectly

# CULVERTS AND OUTLET PROTECTION



# STRUCTURAL BMPs

## SURFACE ROUGHENING

- Velocity dissipation in preparation for final stabilization
- Advantages
  - Very effective using existing soil
  - Helps establish vegetation
  - Easy to install with tracked equipment
- Disadvantages
  - Primarily for use with gentle or shallow depth rains
  - Easily washed away in heavy rains
  - Effectiveness partly dependent on soil characteristics
  - Easy to install incorrectly

# SURFACE ROUGHENING



# SURFACE ROUGHENING -- INCORRECT



# BMP PROBLEMS



# SEDIMENT DISCHARGE



# EROSION



# STORMWATER VIOLATION





# LACK OF BMP UNDERSTANDING

