Best Management Practices (BMPs) for Linear Transportation Projects

Perimeter Control Devices
Runoff Conveyance Measures
Velocity Control Treatments
Drain Inlet/Catch Basin Controls
Sediment Containment Systems

Perimeter Control Devices
**Safety Fence**
- Polyethylene or polypropylene orange fencing
- Installed along the outside riparian buffer, wetland, or water boundary located within the construction corridor
- Installed prior to ANY land disturbance
- Conform to the ground contours
- Wood or steel posts

**Gravel Construction Entrance**
- 2-5” stone placed on filter fabric
- Approximately 50’ long and 12’ wide
- Allow adequate turning radius for trucks
- Minimizes tracking of soil onto pavement
- Supplement stone

**Temporary Silt Fence**
- Reduces water flow and retains sediment on-site
- Overlap splice joints 18 inches
- Optional outlet using Special Sediment Control Fence (Max width=6 ft)
Special Sediment Control Fence

- Reduces water flow and retains sediment
- Used where flows and sediment loads will be too great for silt fence

Fold in 4 ft. wire mesh
(24 gauge, 1/4-in. opening)

Not to be placed in areas determined to be wetlands without proper permits
**Special Sediment Control Fence**

**Temporary Silt Ditch**
- Small ditch or channel that directs runoff from project perimeter into a basin, or rock filter dam
- 2:1 side slopes
- 1 ft deep

**Temporary Silt Ditch**

Stabilized 1 ft. deep
Temporary Silt Ditch

- Problems
  - Ditch too deep
  - Walls too steep
  - Runoff bypasses ditch

Temporary Diversion

- Excavated channel that directs runoff into a sediment control structure
- 2:1 side slopes
- Minimum depth 1ft 6in

Temporary Diversion

- Stabilized
Temporary Diversion

Problems

- Channel walls too steep
- Channel too deep
- Channel too steep
Runoff Conveyance Measures

Temporary Slope Drain with Earthen Berm
- Carries concentrated runoff down a cut or fill slope without causing erosion
- 12 in diameter flexible pipe
- Sediment storage must be provided at top of slope near inlet or at outlet if slope drain discharges directly offsite w/o basin or trap

Temporary Slope Drain w/ Earthen Berm

Inlet Protection Option #1
Erosion & Sediment Control Workshop

Temporary Slope Drain with Earthen Berm
- Anchor stakes placed on 10’ max. spacing

Erosion & Sediment Control Workshop

Temporary Slope Drain
- Proper Installation—Inlet Protection

Erosion & Sediment Control Workshop

Temporary Slope Drain
- Proper Installation—Outlet Protection
**Velocity Control Treatments**

**ODOT Rock Filter Dam**
- Small dam with center weir
- Constructed with Class B rip-rap
- Reduces runoff velocity
- Minimizes erosion of drainage ditch
Ideal spacing - base of the upstream dam is not higher than the top of the downstream dam.
Temporary Rock Silt Check - Type B

• Maintenance
  ~ Remove sediment when ½ the dam height is reached

• Problems
  ~ Center of the dam should be lower than the edges
  ~ Properly key in dam to channel banks
  ~ Lacking weir section in center of structure
**Temporary Rock Silt Check-Type A**
- Small dam with weir outlet
- Constructed of Class B Rip-rap and Sediment Control Stone
- Usage
  - Outlet of slope drain
  - In ditches and channels
  - Can lead off-site
- Naturally formed storage area traps sediment

**Wattles/ Fiber Check Dams**
- Substitute for Type B Rock Silt Check
- Usage adjacent to Trout Waters and other Environmentally Sensitive Areas (ESAs)
- Involve application of Polymer to aid in turbidity reduction of project runoff
Wattles/Fiber Check Dams

Drain Inlet/Catch Basin Controls

Rock Pipe Inlet Sediment Trap - Type A & B
- Prevents sediment from entering pipe structure
- Receives water from more than one direction
Rock Pipe Inlet Sediment Trap - Type B

- Stone dam built around a drop inlet
- Slows flow creating a pool for settling of sediment

Class A

Rock Inlet Sediment Trap - Type A & B

Class B Stone
Rock Inlet Sediment Trap - Type C

- Small protective structure around an inlet that receives light to moderate flow
- Slows flow creating a pool for settling of sediment
- Can be located within 30 ft of travel lane

Problems
- Improper installation
- Use of silt fence in place of stone
- Lack of stone around structure
Rock Inlet Sediment Trap - Type C

• Problems

Summary - Rock Inlet Sediment Traps

<table>
<thead>
<tr>
<th>Structure Material</th>
<th>Type A</th>
<th>Type B</th>
<th>Type C</th>
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<tbody>
<tr>
<td>Class B</td>
<td>1632.01</td>
<td>1632.02</td>
<td>1632.03</td>
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<tr>
<td>Class A</td>
<td></td>
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<tr>
<td>Sediment control stone</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Dist. from travel lane</td>
<td>&gt;30 ft.</td>
<td>&lt;30 ft.</td>
<td>&lt;30 ft.</td>
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<tr>
<td>Min. volume</td>
<td>3600 ft³/ac</td>
<td>3600 ft³/ac</td>
<td>3600 ft³/ac</td>
</tr>
</tbody>
</table>

BMPs must be
1. installed correctly
2. inspected often
3. maintained as needed to work effectively.

BMP’s should be inspected before and after rainfall events.
Sediment Containment Systems

ODOT Sed Basin Detail

Temporary Silt Basin - Type B
- Collects sediment flowing through a drainage way
- Used with rock silt checks to slow flow
Temporary Silt Basin – Type B

- Small dam with weir outlet and built-in sediment basin
- Traps sediment prior to runoff leaving the site
- Must meet minimum dimensions listed on plans for L x W x D and weir Length
- Built above grade
Riser Basin

- Captures runoff before leaving site
- Perforated riser pipe drains the basin
- Overflow spillway for runoff exceeding riser capacity
Riser Basin

- Serves large drainage areas with concentrated flows where other BMPs are inadequate
- Storage area of 1800 cu ft/disturbed ac

Common Problems
- Outlet pipe not protected
- Lack of maintenance
- Steep inlet channels generating sediment
- Drainage bypasses basin

Flashboard Riser Outlet

- Adjustable standing pool
- Can empty for sediment removal
Example of a Flashboard Riser Installation

COIR FIBER BAFFLE

Porous Baffle Spacing

- Baffles in Silt Basins at drainage turnouts and all other temporary rock sediment dams—Type-A and -B:
  - If basin length ≤ 10 feet; 1 baffle. (State Forces Projects)
  - If basin length > 20 feet; 3 baffles.
  - If basin length between 10 -20 feet; 2 baffles.
How many porous baffles are needed and what is their spacing if the basin is:

A.) 8 ft long?
B.) 18 ft long?
C.) 48 ft long?

Surface Outlet (Skimmer)
- Skimmer is a dewatering device
- Primary dewatering during a storm event occurs over the emergency spillway.
- Opening in ‘C’ points towards the dam
Emergency Spillway

- Line with Type 2 filter fabric for drainage
- Overlap seams 18 inches
- Secure edges in 5” deep trench and compact
- Secure fabric with 6” metal staples; 3 ft spacing
- Size weir length (width) per plan
- Significant rain should activate emergency spillway

Skimmer Basin with Baffle
Skimmer Basin with Baffle

- Minimum barrel diameter = 4 inches
- Ensure orifice is sized per plan
  - Example: 4-inch skimmer with 3.6-inch orifice
  - Contractor must insert “knock out plug” with 3.6 inch hole drilled in it into the 4 inch orifice
Maintenance
- Clean out sediment at $\frac{1}{4}$ design capacity

Questions?