

## Fabric Drop Inlet Protection (FIP)



### Practice Description

Fabric drop inlet protection is a structurally supported geotextile barrier placed around or over a drop inlet to prevent sediment from entering storm drains during construction. This practice applies where early use of the storm drain system is necessary prior to stabilization of the disturbed drainage area. This practice is suitable for inlets with a drainage area of less than 1 acre and a gentle approach slope generally of 1% or less.

### Planning Considerations

Storm sewers that are made operational before their drainage area is stabilized can convey large amounts of sediment to natural drainage ways. In case of extreme sediment loading, the storm sewer itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets that discharge directly to waters of the state.

The best way to prevent sediment from entering the storm sewer system is to stabilize the site as quickly as possible, preventing erosion and stopping sediment at its source. Sediment is best treated by preventing erosion. Leave as much of the site undisturbed as possible in the total site plan. Clear and disturb the site in small increments, if possible.

Numerous products have been developed to facilitate the capture of suspended soil particles at inlets. The design criteria for performance should be considered when evaluating alternative products. Products that will likely not meet performance goals or that usually fail under storm conditions should not be selected.

## Design Criteria and Installation

Prior to start of construction, fabric drop inlet protection structures should be designed by a qualified professional. Plans and specifications should be available to field personnel. (*Note: Premanufactured fabric drop inlet protective structures should be installed and maintained according to the manufacturer's requirements.*)



### Drainage Area

Drainage area should be less than 1 acre per inlet.

### Sediment Storage

The basin created at the inlet should provide 67 cubic yards per disturbed acre of sediment storage.

### Site Preparation

The soil around the drop inlet should be well compacted. The area around the drop inlet should be shaped, if necessary, to store the runoff on an almost level area. If runoff could bypass the protected inlet, a temporary dike should be planned and force the runoff to be trapped by the protective device.

### Approach

The approach to the inlet protection practice should generally be less than 1% slope.

### Height

The height of the structurally supported geotextile should be at least 1 foot but no more than 2.5 feet. The base of the fabric should be buried with compacted earth fill at least 12 inches into the soil or extend horizontally and be adequately secured with ballast material according to the manufacturer's recommendations. Ensure that the height of the structure when fully ponded does not cause unintentional damage or hazards to adjacent areas.

### Structural Frame Installation

The frame (premanufactured or constructed) should provide the internal support necessary to prevent the structure from buckling, the fabric from sagging, or the fabric from being undermined. Frames should be positioned so that water that overtops the device goes directly into the inlet and does not cause erosion between the frame and inlet. Premanufactured frames should be installed according to manufacturer's recommendations.

### Fabric Installation

Generally, fabric is installed by one of two methods:

Fabric can be buried vertically in a trench. The trench is excavated at least 12 inches into compacted soil adjacent to the inlet. Support posts are installed securely against the exterior of the drop inlet. Fabric along with wire fence is secured in the bottom of the trench and against the exterior surface of the inlet with stakes no more than 2 feet apart

and driven at least 6 inches into the soil. The trench is backfilled with hand-compacted soil to the density equivalent to the surrounding soil. Fence and fabric are secured to the posts and the structure internally supported to meet the structural requirements of the device.

Fabric for pre-manufactured drop inlet protective devices is generally secured with ballast pockets on well-compacted soil around the inlet. Install these according to manufacturer's recommendations

### **Performance**

Either the system of protection for the project or the drop inlet protection that discharges directly to the outfall of the project must be designed to meet the NTU requirements for discharge.

### **Stabilization**

Stabilize all bare areas that drain to the inlet with temporary seeding and mulching unless construction will disturb it within 13 days.

### **Safety**

Protection should be provided to prevent children from entering open-top structures.

### **Construction Verification**

Check finished grades and dimensions of fabric drop inlet protection structures.

### **Common Problems**

*Consult with a qualified design professional if any of the following occurs:*

Variations in site conditions indicate that the practice will not function as intended; change in plan may be needed.

Sediment not removed from pool resulting in inadequate storage volume for the next storm.

Top of fabric set too high, resulting in flow bypassing the inlet.

Fabric is not adjacent to the inlet exterior surface, resulting in erosion and undercutting of inlet.

### **Maintenance**

Inspect fabric barrier after each rainfall event and make needed repairs immediately.

Remove sediment from the pool area when sediment has reached ½ the fabric height. Take care not to damage or undercut the fabric during the sediment removal.

When the contributing drainage area has been adequately stabilized, remove all materials and unstable sediment and dispose of properly. Fill the disturbed area to the grade of the drop inlet. Stabilize disturbed areas in accordance with the plans.

## References

### BMPs from Volume 1

#### Chapter 4

Sediment Barrier (SB) 4-284

Sediment Basin (SBN) 4-298

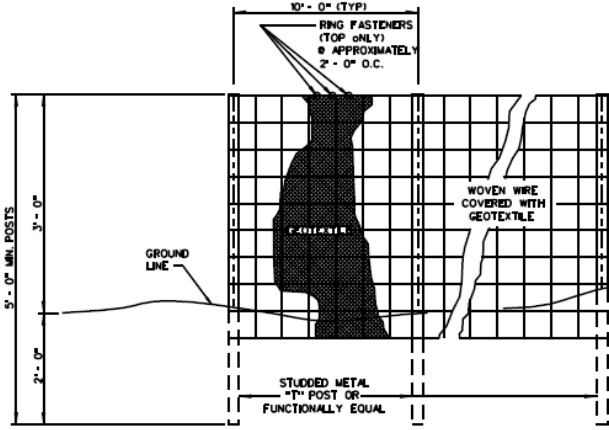
#### MDOT Drawing ECD-3

Details of Silt Fence Installation 4-247

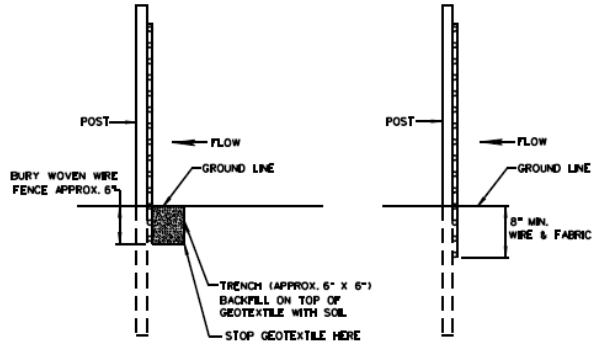
#### MDOT Drawing ECD-13

Inlet Protection Details of Manufactured Inlet Protection 4-248

STATE	PROJECT NO.
MSS.	



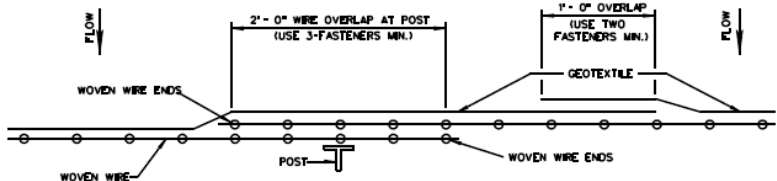
ELEVATION VIEW



METHOD I  
METHOD II  
MECHANICAL INSTALLATION

SIDE VIEW

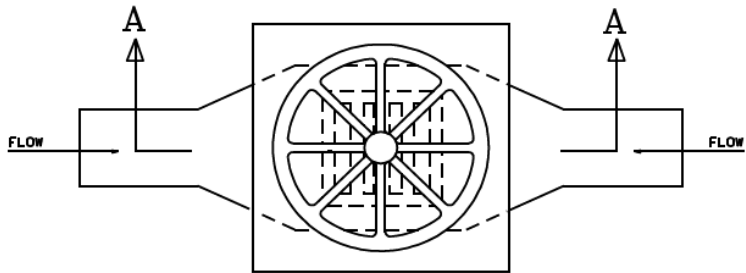
- NOTES:
1. SILT FENCES SHALL BE USED IN AREAS WHERE FLOW IS NOT SEVERE.
  2. SILT FENCES ARE TEMPORARY SEDIMENT CONTROL ITEMS THAT SHALL BE ERRECTED OPPOSITE ERODIBLE AREAS SUCH AS NEWLY GRADED FILL SLOPES AND ADJACENT TO STREAMS AND CHANNELS.
  3. SILT FENCE SHOULD BE PLACED WELL INSIDE RIGHT-OF-WAY AND ALONG EDGE OF CLEARING LIMITS. THIS WILL ALLOW ROOM FOR A BACK-UP FENCE IF FIRST FENCE BECOMES FULL.
  4. WHEREVER POSSIBLE SILT FENCE SHALL BE CONSTRUCTED ACROSS A LEVEL AREA IN THE SHAPE OF A SABLE. THIS ADS IN PONDING OF RUNOFF AND FACILITATES SEDIMENTATION.
  5. THE CONTRACTOR MAY ELECT TO USE EITHER METHOD I OR METHOD II. COST TO BE LINEAR FEET OF SILT FENCE.
  6. METHOD II INSTALLATION SHALL BE ACCOMPLISHED USING AN IMPLEMENT THAT IS MANUFACTURED FOR THE APPLICATION AND PROVIDES A CONFIGURATION MEETING THE REQUIREMENTS OF THE DETAIL.
  7. WIRE SHALL BE MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
  8. GEOTEXTILE FABRIC MEETING THE TYPE I MATERIAL REQUIREMENTS AND INSTALLED ACCORDING TO SPECIFICATION MAY BE USED WITHOUT WIRE FENCE.



PLAN VIEW  
REQUIRED LAPPING

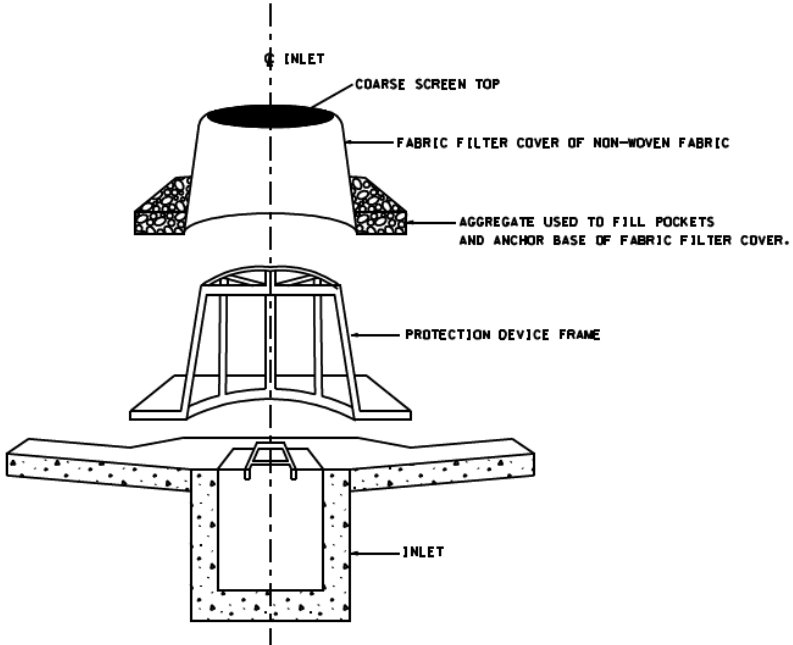
DESIGN		BY		DATE		REVISION		NO.		DATE	
MISSISSIPPI DEPARTMENT OF TRANSPORTATION											
DETAILS OF SILT FENCE INSTALLATION											
FILENAME: EROSION_CONTROL\ECD-3.DGN										WORKING NUMBER ECD-3	
DESIGN TEAM										SHEET NUMBER	

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PLAN

- NOTES:
1. FRAMES WITH EITHER SQUARE OR CIRCULAR BASES MAY BE USED. SELECTED FRAME BASE SHOULD PROVIDE BEST SEAL AROUND INLET AS DIRECTED BY THE ENGINEER.
  2. FILL POCKETS AROUND BASE OF FILTER COVER WITH #57 STONE OR SOIL. STONE IS REQUIRED WHEN ANCHORING THE MANUFACTURED INLET PROTECTION DEVICE OVER PAVED DITCH OR FLUME.
  3. USE ONLY DURING STAGE 3 OR STAGE 4 INLET CONSTRUCTION.
  4. FOR MEDIAN INLET PROTECTION, THE ELEVATION OF THE COARSE SCREEN TOP SHOULD BE A MINIMUM OF 6" BELOW THE ELEVATION OF THE OUTSIDE EDGE OF THE INSIDE SHOULDER.



SECTION "A-A"

BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION
DATE	
DESIGN	
CHECKED	
DATE	
FILENAME:	EROSION CONTROL/ECD-13.DGN
DESIGN TEAM	
ORDER	
DATE	
WORKING NUMBER	ECD-13
SHEET NUMBER	