

Section B – SEDIMENT BARRIERS

4.0 STANDARDS AND SPECIFICATIONS

FOR

STRAW BALE DIKE

Definition

Straw bale dikes are temporary barriers of straw or similar material used to intercept and direct surface runoff.

Purpose

The straw bale dike intercepts sediment laden runoff so that deposition of transported sediment can occur.

1. The use of straw bale dikes is not recommended as a primary sediment control device. Straw bale dikes clog and deteriorate rapidly and require frequent maintenance.
2. Straw bale dikes can be used to intercept sheet flow only. They cannot be used as velocity checks in swales, or placed where they will intercept concentrated flow.
3. Straw bale dikes can be used only on projects that will be completed within three months.
4. Straw bale dikes shall not be used on slopes exceeding 5:1.
5. The length of straw bale dikes must conform to the following limitations:

Table 1 Straw Bale Design Criteria

<u>Slope</u>	<u>Slope Steepness</u>	<u>Slope Length</u>	<u>Dike Length</u>
0% to <2%	Flatter than 50:1	300 feet	500 feet
2% to <10%	50:1 to <10:1	125 feet	500 feet
10% to <20%	10:1 to <5:1	100 feet	500 feet

Construction Specifications

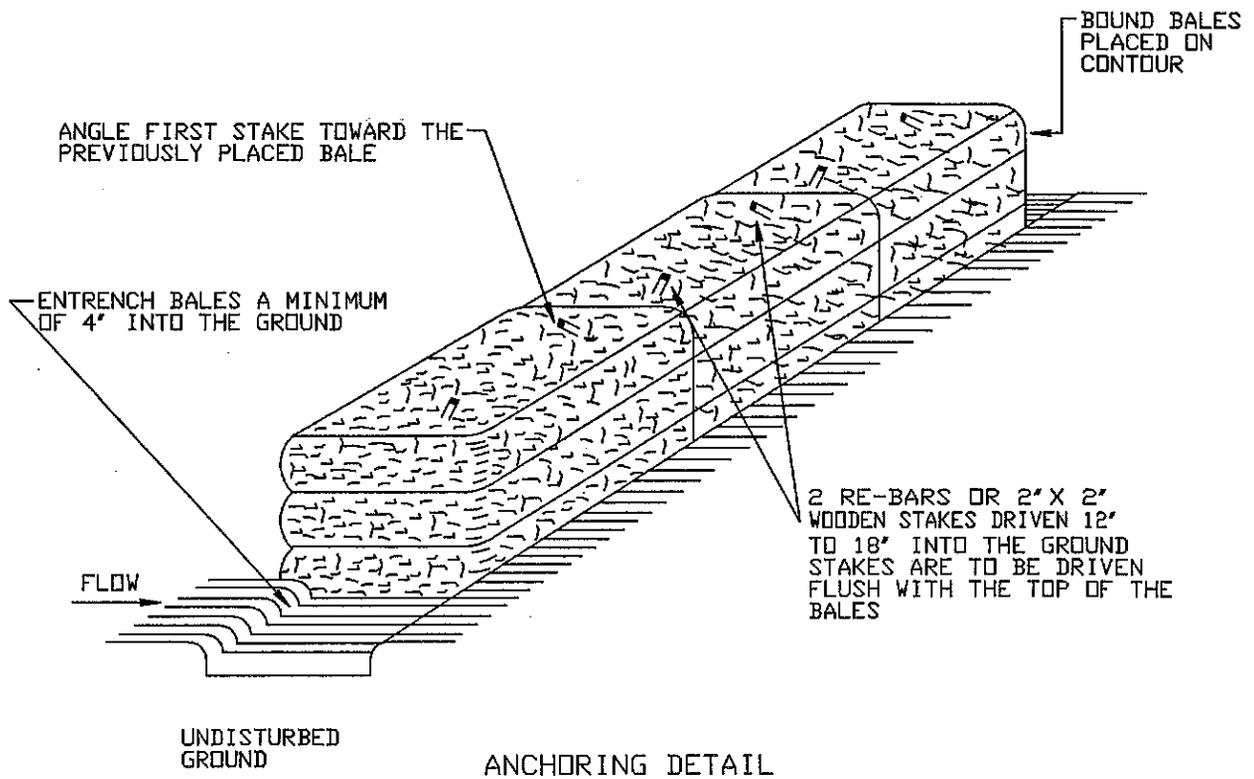
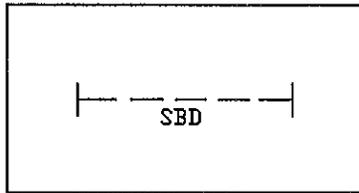
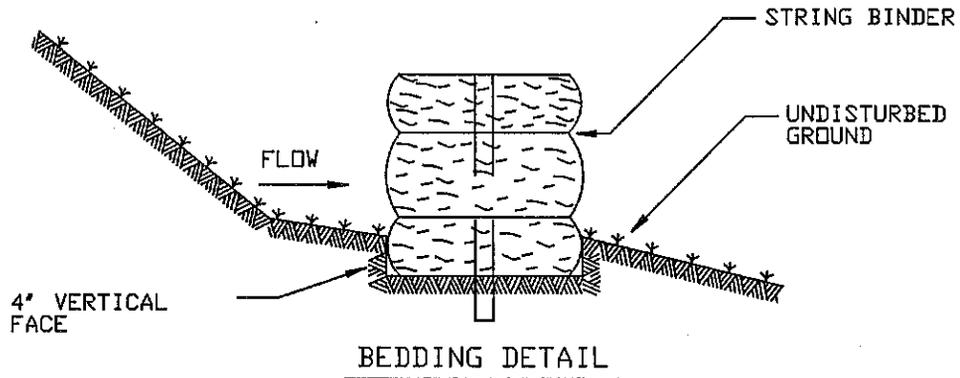
1. Bales shall be placed in a row on the contour with the ends of each bale tightly abutting the adjacent bales.
2. Each bale shall be entrenched 4" min. in the soil and placed so the bindings are horizontal.

3. Bales shall be securely anchored in place by either two stakes or re-bars driven through the bale 12" to 18" into the ground. The first stake in each bale shall be driven toward the previously laid bale at an angle to force the bales together. Stakes shall be driven flush with the top of the bale.
4. All bales shall be removed when the site has been stabilized. The trench where the bales were located shall be graded flush and stabilized.

Maintenance

1. Straw bale barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall events. The anchoring stakes must be re-driven if they become exposed
2. Close attention shall be paid to the repair of damaged bales, end runs and undercutting beneath bales.
3. Necessary repairs to barriers or replacement of bales shall be accomplished promptly.
4. Sediment deposits should be removed after each rainfall. They must be removed when the level of deposition reaches approximately one-half the height of the barrier.
5. Any sediment deposits remaining in place after the straw bale barrier is no longer required shall be dressed to conform to the existing grade, prepared and seeded.

DETAIL 3 - STRAW BALE DIKE



STRAW BALE DIKE

Construction Specifications

1. Bales shall be placed at the toe of a slope, on the contour, and in a row with the ends of each bale tightly abutting the adjacent bales.
2. Each bale shall be entrenched in the soil a minimum of 4' and placed so the bindings are horizontal.
3. Bales shall be securely anchored in place by either two 2' X 2' wooden stakes or re-bars driven through the bale 12' to 18' into the ground. The first stake in each bale shall be driven toward the previously laid bale at an angle to force the bales together. Stakes shall be driven flush with the top of the bale.
4. Straw bale dikes shall be inspected frequently and after each rain event and maintenance performed as necessary.
5. All bales shall be removed when the site has been stabilized. The trench where the bales were located shall be graded flush and stabilized.

5.0 STANDARDS AND SPECIFICATIONS

FOR

SILT FENCE

Definition

Temporary barriers of woven geotextile fabric used to intercept, reduce velocity and filter surface runoff from disturbed areas.

Purpose

Silt fences intercept sediment laden sheet flow runoff so that deposition of the transported sediment can occur. Silt fences can be used to intercept sheet flow only. Silt fence shall not be used as velocity checks in ditches or swales, or placed where it will intercept concentrated flow.

Conditions Where Practice Applies

Silt fence is limited to intercepting sheet flow runoff from limited distances according to slope. Silt fence provides filtering and velocity dissipation to promote gravity settling of sediments.

Design Criteria

1. Silt fence should be used with caution in areas of rocky soils that may prevent trenching.
2. Silt fence should be placed parallel to contours.
3. The length of silt fences must conform to the following:

Table 2 Silt Fence Design Constraints

<u>Slope Steepness</u>	(Maximum) <u>Slope Length</u>	(Maximum) <u>Silt Fence Length</u>
Flatter than 50:1 (2 %)	unlimited	unlimited
>50:1 to 10:1 (2- 10%)	125 feet	1,000 feet
>10:1 to 5:1(10-20%)	100 feet	750 feet
>5:1 to 3:1 (20- 33%)	60 feet	500 feet
>3:1 to 2:1 (33- 50%)	40 feet	250 feet
> 2:1 (> 50%)	20 feet	125 feet

4. In areas of less than 2% slope and sandy soils (USDA general classification system, soil class A) maximum slope length and silt fence length will be unlimited. In these areas, a silt fence may be the only perimeter control required.
5. Downslope from the silt fence should be undisturbed ground.

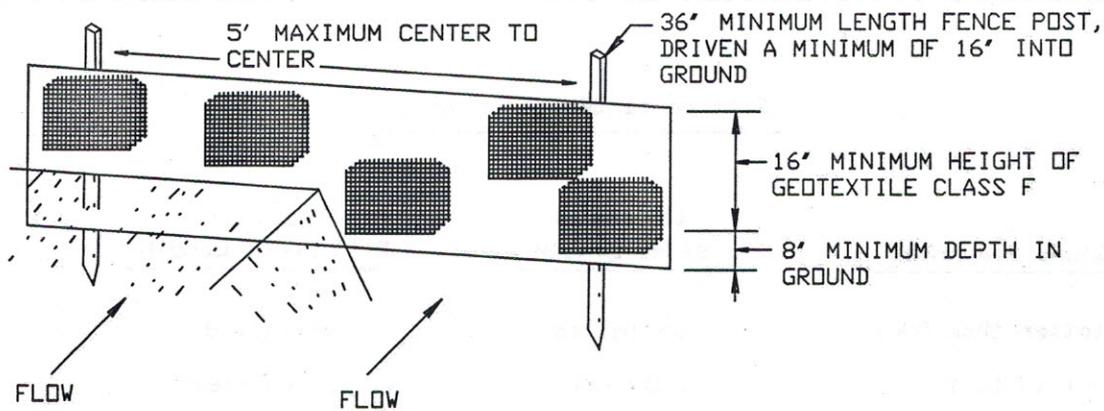
Construction Specifications

1. Fence posts shall be a minimum of 36 inches long driven 16" minimum into ground. Wood posts shall be 1 1/2" X 1 1/2" (minimum) square cut, or 1 3/4" (minimum) diameter round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pound per linear foot.
2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

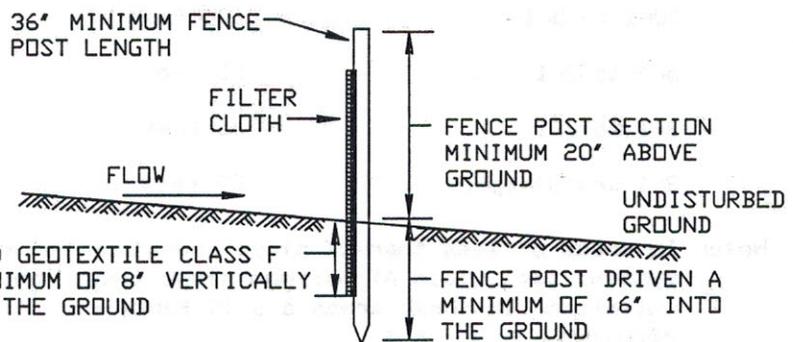
Tension Strength	50 lb/in (min.)	Test: ASTM D-4595
Tensile Modulus	20 lb/in (min.)	Test: ASTM D-4595
Flow Rate	0.3 gal/ft ² /minute (max.)	Test: ASTM D-5141
Filtering Efficiency	75% (min.)	Test: ASTM D-5141

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 30% of the fabric height.

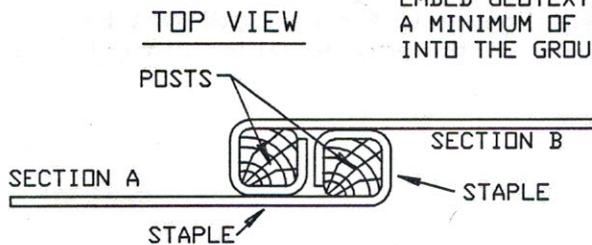
DETAIL 4 - SILT FENCE



PERSPECTIVE VIEW

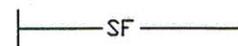


CROSS SECTION



JOINING TWO ADJACENT SILT FENCE SECTIONS

STANDARD SYMBOL



Construction Specifications

1. Fence posts shall be a minimum of 36' long driven 16' minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pound per linear foot.

2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: ASTM D-4595
Tensile Modulus	20 lbs/in (min.)	Test: ASTM D-4595
Flow Rate	0.3 gal/ft ² /minute (max.)	Test: ASTM D-5141
Filtering Efficiency	75% (min.)	Test: ASTM D-5141

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 30% of the fabric height.

SILT FENCE

Silt Fence Design Criteria

<u>Slope Steepness</u>	<u>(Maximum) Slope Length</u>	<u>(Maximum) Silt Fence Length</u>
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

6.0 STANDARDS AND SPECIFICATIONS

FOR

SUPER SILT FENCE

Definition

A temporary barrier of Geotextile Class F over chain link fence used to intercept sediment laden sheet flow runoff from drainage areas.

Purpose

To reduce runoff velocity and allow the deposition of transported sediment to occur. Limits imposed by ultraviolet light stability of the fabric will dictate the maximum period that the silt fence may be used.

1. Super silt fence provides a barrier that can collect and hold debris and soil, preventing the material from entering critical areas, streams, streets, etc.
2. Super silt fence should be placed as close to the contour as possible. No section of silt fence should exceed a grade of 5% for a distance of more than 50 feet.
3. Super silt fence shall not be used as velocity checks in ditches or swales or placed where it will intercept concentrated flow.

Table 3 Design Criteria

Length of the flow contributing to Super Silt Fence shall conform to the following limitations:

<u>Slope</u>	<u>Slope Steepness</u>	<u>Slope Length (maximum)</u>	<u>Silt Fence Length (maximum)</u>
0 - 10%	0 - 10:1	Unlimited	Unlimited
>10 - 20%	>10:1- 5:1	200 feet	1,500 feet
>20- 33%	>5:1- 3:1	100 feet	1,000 feet
>33 - 50%	>3:1 - 2:1	100 feet	500 feet
>50% +	>2:1 +	50 feet	250 feet

Where ends of the geotextile fabric come together, the ends shall be overlapped, folded, and stapled to prevent sediment bypass.

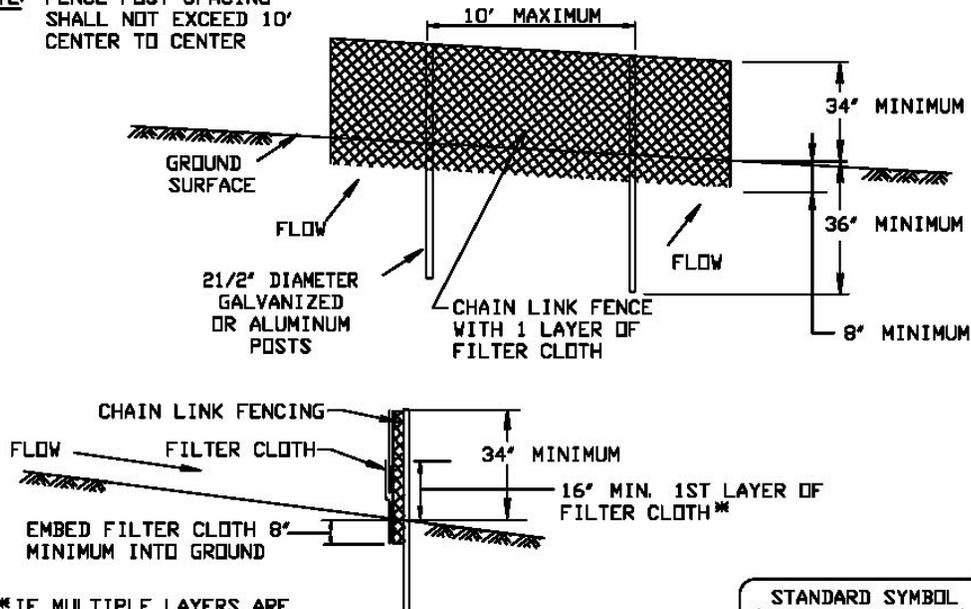
Construction Specifications

1. Fencing shall be 42 inches in height and constructed in accordance with the latest DDOT Details for Chain Link Fencing. The DDOT specification for a 6 foot fence shall be used, substituting 42 inch fabric and 6 foot length posts. (Posts do not need to be set in concrete.)
2. Chain link fence shall be fastened securely to the fence posts with wire ties or staples. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.
3. Filter Cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of geotextile fabric adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 30% of the fence height.
7. Filter cloth shall meet the following requirements for Geotextile Class A:

Tension Strength	50 lb/in (min.)	Test: ASTM D-4595
Tensile Modulus	20 lb/in (min.)	Test: ASTM D-4595
Flow Rate	0.3 gal/ft ² /minute (max.)	Test: ASTM D-5141
Filtering Efficiency	75% (min.)	Test: ASTM D-5141

DETAIL 5 - SUPER SILT FENCE

NOTE: FENCE POST SPACING SHALL NOT EXCEED 10' CENTER TO CENTER



* IF MULTIPLE LAYERS ARE REQUIRED TO ATTAIN 42'

Construction Specifications

1. Fencing shall be 42' in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42' fabric and 6' length posts.
2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.
3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24' at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8' into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6' and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height
7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft ² /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

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WATERSHED PROTECTION DIVISION
DISTRICT OF COLUMBIA DEPARTMENT OF HEALTH

SUPER SILT FENCE

Design Criteria
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<u>Slope</u>	<u>Slope Steepness</u>	<u>Slope Length (maximum)</u>	<u>Silt Fence Length (maximum)</u>
0 - 10%	0 - 10: 1	Unlimited	Unlimited
10 - 20%	10: 1 - 5: 1	200 feet	1,500 feet
20 - 33%	5: 1 - 3: 1	100 feet	1,000 feet
33 - 50%	3: 1 - 2: 1	100 feet	500 feet
50% +	2: 1 +	50 feet	250 feet

7.0 STANDARDS AND SPECIFICATIONS

FOR

STORM DRAIN INLET PROTECTION

Definition

A filter constructed around a storm drain inlet.

Purpose

Storm Drain Inlet Protection is used to filter sediment laden runoff before it enters the storm drain system.

Conditions Where Practices Applies

Storm drain inlet protection is a secondary sediment control device and is not to be used in place of a sediment trapping device unless approved by the appropriate approval authority.

Storm drain inlet protection should not be used on major arterial roadways and residential collector streets and higher.

Design Criteria

Storm drain inlet protection shall be used when the drainage area to an inlet is disturbed and the following conditions prevail:

1. It is not possible to temporarily divert the storm drain outfall into a sediment trapping device;
2. Watertight blocking of inlets is not advisable; and
3. Drainage area is at grade 1/4 acre (max.) for curb or standard inlet protections and 1 acre (max.) for median or at grade. For yard inlets, the total for inlets in series must be 1 acre or less and the contributing drainage area must have slopes flatter than 5%.

Maintenance

Maintenance requirements for storm drain inlet protection are intense, due to the susceptibility to clogging. When the structure does not drain completely within 48 hours after a storm event, it is clogged. When this occurs, accumulated sediment must be removed and the geotextile fabric and stone must be cleaned or replaced.

Construction Specifications

A. Standard Inlet Protection (Elevated or Yard Inlet)

1. Excavate completely around the inlet to a depth of 18" below the notch elevation.
2. Drive 2" X 4" construction grade lumber posts 1' into the ground at each corner of the inlet. Place nail strips between the posts on the ends of the inlet. Assemble the top portion of the 2" X 4" frame using the overlap joint shown on Detail 6A. The top of the frame (weir) must be 6" below adjacent roadways where flooding and safety issues may arise.
3. Stretch 1/2" X 1/2" wire mesh tightly around the frame and fasten securely. The ends must meet and overlap at a post.
4. Stretch the Geotextile Class E⁶ tightly over the wire mesh with the geotextile extending from the top of the frame to 18" below the inlet notch elevation. Fasten the geotextile firmly to the frame. The ends of the geotextile must meet at a post, be overlapped and folded, then fastened down.
5. Backfill around the inlet in compacted 6" layers until the layer of earth is level with the notch elevation on the ends and top elevation on the sides.
6. If the inlet is not in a sump, construct a compacted earth dike across the ditch line directly below it. The top of the earth dike should be at least 6" higher than the top of the frame.
7. The structure must be inspected periodically and after each rain and the geotextile replaced when it becomes clogged.

B. At Grade Inlet

1. Lift grate and wrap with Geotextile Class E to completely cover all openings, then set grate back in place.
2. Place 3/4 to 1-1/2⁷ stone, 4 - 6" thick on the grate to secure the fabric.
3. If there are any signs of street flooding or water ponding, this structure must be cleaned or replaced or redesigned with a viable alternative.

⁶ Refer to Table 44 (located on page L-53-1)

⁷ Refer to Table 45 (located on page L-53-2)

C. Curb Inlet Protection (COG or COS Inlets)

1. Attach a continuous piece of 1/2" X 1/2" wire mesh (30" minimum width by throat length, plus 4') to the 2" x 4" weir (measuring throat length plus 2') as shown on the standard drawing.
2. Place a continuous piece of approved Geotextile Class E of the same dimensions as the wire mesh over the wire mesh and securely attach it to the 2" x 4" weir.
3. Securely nail the 2" X 4" weir to a 9" long vertical spacer to be located between the weir and the inlet face (max. 4' apart).
4. Place the assembly against the inlet throat and nail (minimum 2' lengths of 2" x 4" to the top of the weir at spacer locations). These 2" x 4" anchors shall extend across the inlet top and be held in place by sandbags or alternate weight.
5. The assembly shall be placed so that the end spacers are 1' beyond both ends of the throat opening.
6. Form the 1/2" x 1/2" wire mesh and the geotextile fabric to the concrete gutter and against the face of the curb on both sides of the inlet. Place clean 3/4" to 1 1/2" stone over the wire mesh and geotextile in such a manner as to prevent water from entering the inlet under or around the geotextile.
7. This type of protection must be inspected frequently and the geotextile fabric and stone replaced when clogged with sediment.
8. Assure that storm flow does not bypass the inlet by installing a temporary earth or asphalt dike to direct the flow to the inlet.
9. If there are any signs of street flooding or water ponding, this structure must be cleaned or replaced or redesigned with a viable alternative.

D. Median Inlet Protection (MIP)

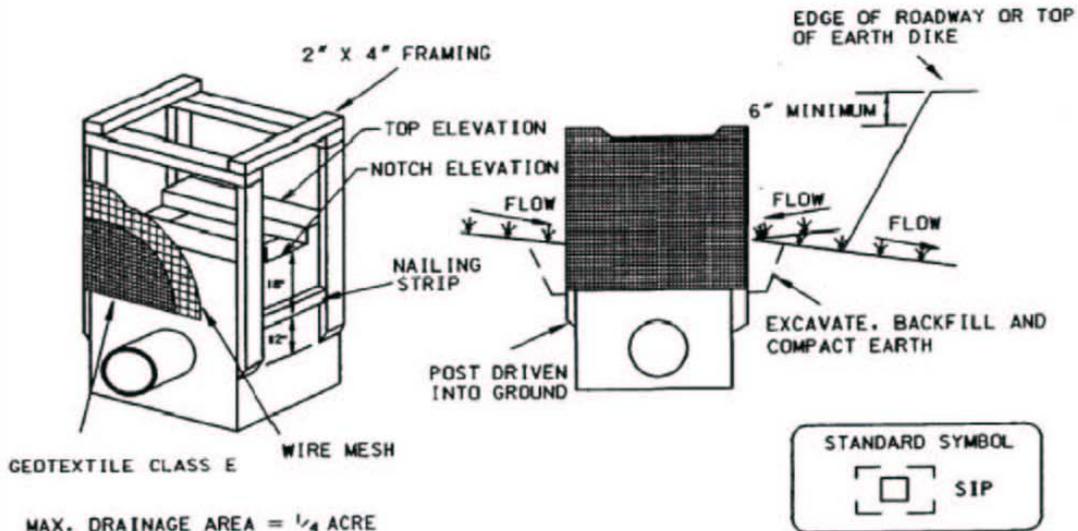
1. Construct standard Slope Silt Fence having 5' post spacing 1' - 6" away from the existing inlet only on the sides of the inlet receiving sheet flow and in the location of the "wings".
2. In the location of concentrated flow, construct a stone check dam using 4" - 7" stone for the base faced on the upstream side with 3/4" - 1-1/2" aggregate, 1' thick. The stone check dam shall be 16" high with the weir 10" above the invert of the ditch or valley gutter and shall be the same width as the ditch or gutter bottom or 2' (min.). Where the end of the "wings" meet the ground shall be at or above the weir elevation.

3. If there are any signs of street flooding or water ponding, this structure must be cleaned or replaced or redesigned with a viable alternative.

E. At Grade Inlet Guard

1. Position guard sections to cover inlet with at least 2 inches of overlap on each end of inlet.
2. Overlap guards at least 2 inches at their intersections.
3. Position the desired filter cloth around guard so that it can be tucked in at the bottom.
4. Position the cloth so that the horizontal metal strip can hold the cloth in place.
5. Do not cover the 2 inch overflow holes with cloth.
6. Attach horizontal strip with sheet metal screws.
7. Place end clips into position so that the triangular end gap is covered and bend covers the face.
8. Place 2 inch attaching clips at the ends and intersections of the guards.
9. Insert the attaching bolt, nail or screw as shown in detail 6E.
- 10. Make a watertight connection along the sides and bottom of the inlet guard with the street and curb.**
11. If there are any signs of street flooding or water ponding, this structure must be cleaned or replaced or redesigned with a viable alternative.

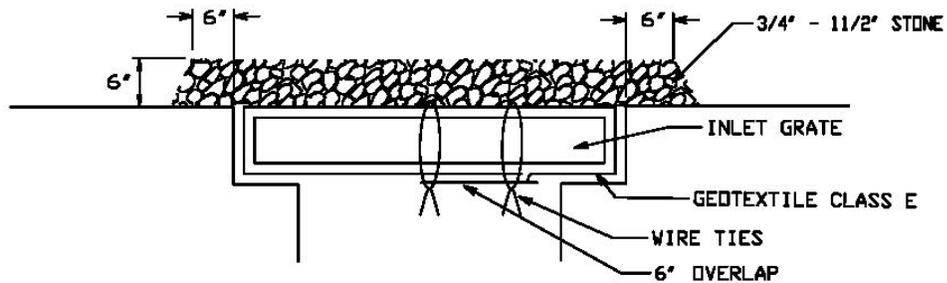
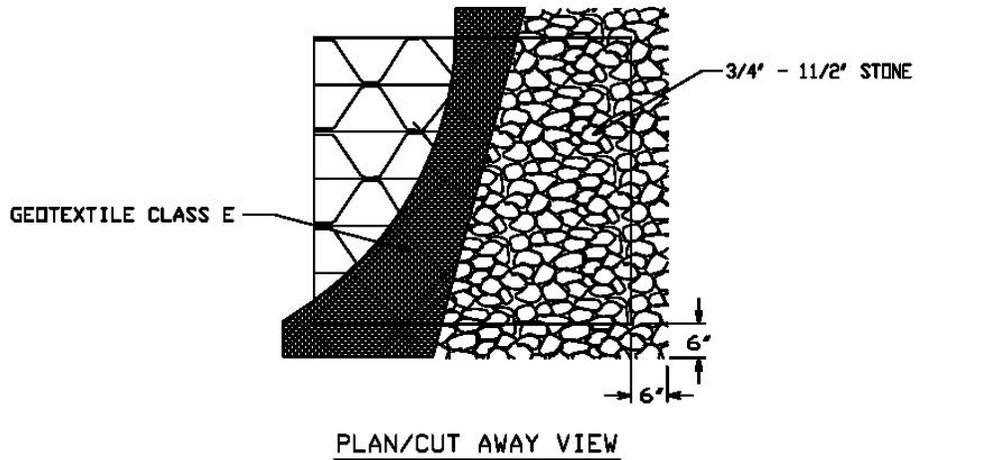
DETAIL 7A - STANDARD INLET PROTECTION



Construction Specifications

1. Excavate completely around the inlet to a depth of 18" below the notch elevation.
2. Drive the 2" x 4" construction grade lumber posts 1' into the ground at each corner of the inlet. Place nail strips between the posts on the ends of the inlet. Assemble the top portion of the 2" x 4" frame using the overlap joint shown on Detail 23A. The top of the frame (weir) must be 6" below adjacent roadways where flooding and safety issues may arise.
3. Stretch the 1/2" x 1/2" wire mesh tightly around the frame and fasten securely. The ends must meet and overlap at a post.
4. Stretch the Geotextile Class E tightly over the wire mesh with the geotextile extending from the top of the frame to 18" below the inlet notch elevation. Fasten the geotextile firmly to the frame. The ends of the geotextile must meet at a post, be overlapped and folded, then fastened down.
5. Backfill around the inlet in compacted 6" layers until the layer of earth is level with the notch elevation on the ends and top elevation on the sides.
6. If the inlet is not in a sump, construct a compacted earth dike across the ditch line directly below it. The top of the earth dike should be at least 6" higher than the top of the frame.
7. The structure must be inspected periodically and after each rain and the geotextile replaced when it becomes clogged.

DETAIL 7B - AT GRADE INLET PROTECTION



STANDARD SYMBOL



AGIP

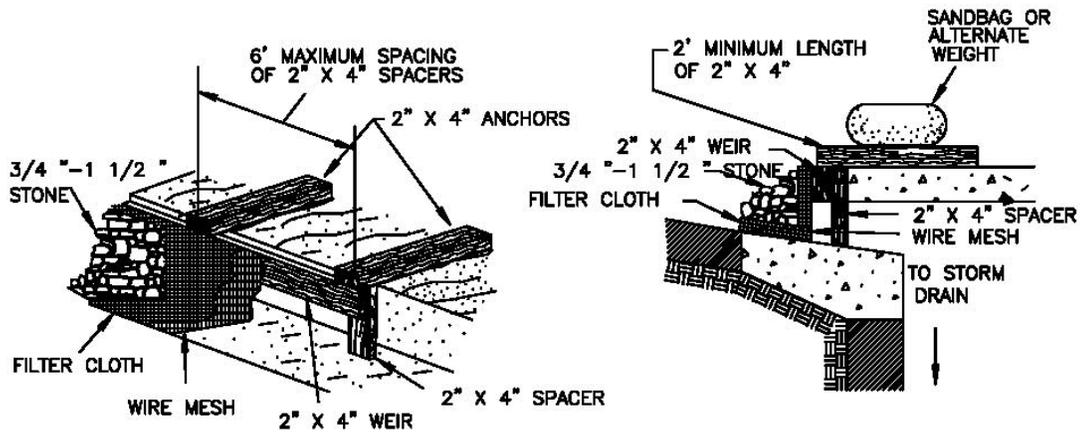
CROSS SECTION

MAX. DRAINAGE AREA = 1/4 ACRE

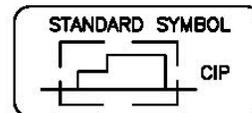
Construction Specifications

1. Lift grate and wrap with Geotextile Class E to completely cover all openings, then set grate back in place.
2. Place 3/4" to 1 1/2" stone, 4"-6" thick on the grate to secure the fabric and provide additional filtration.

DETAIL 7C - CURB INLET PROTECTION (COG OR COS INLETS)



MAX. DRAINAGE AREA = 1/4 ACRE



Construction Specifications

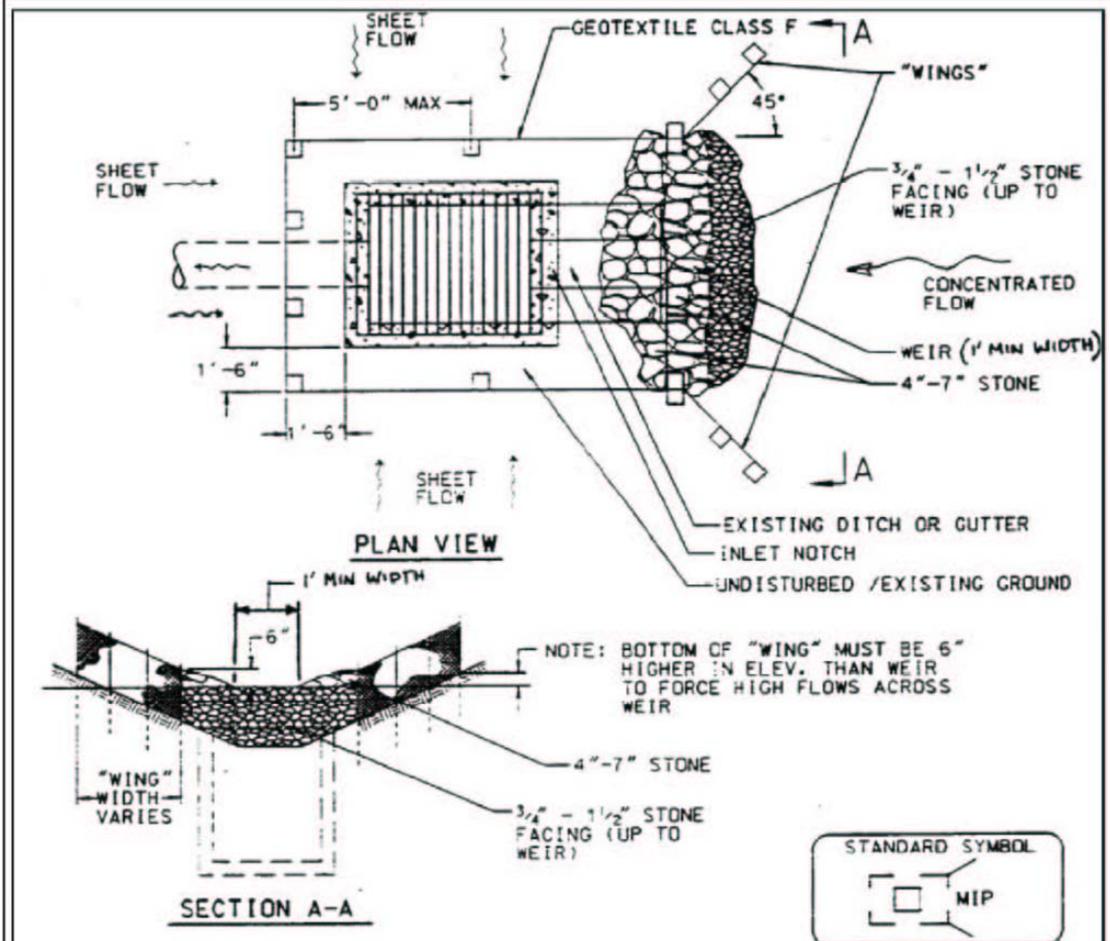
1. Attach a continuous piece of wire mesh (30" minimum width by throat length plus 4') to the 2" x 4" weir (measuring throat length plus 2') as shown on the standard drawing.
2. Place a continuous piece of Geotextile Class E the same dimensions as the wire mesh over the wire mesh and securely attach it to the 2" x 4" weir.
3. Securely nail the 2" x 4" weir to a 9" long vertical spacer to be located between the weir and the inlet face (max. 4' apart).
4. Place the assembly against the inlet throat and nail (minimum 2' lengths of 2" x 4" to the top of the weir at spacer locations). These 2" x 4" anchors shall extend across the inlet top and be held in place by sandbags or alternate weight.
5. The assembly shall be placed so that the end spacers are a minimum 1' beyond both ends of the throat opening.
6. Form the 1/2" x 1/2" wire mesh and the geotextile fabric to the concrete gutter and against the face of the curb on both sides of the inlet. Place clean 3/4" x 1 1/2" stone over the wire mesh and geotextile in such a manner to prevent water from entering the inlet under or around the geotextile.
7. This type of protection must be inspected frequently and the filter cloth and stone replaced when clogged with sediment.
8. Assure that storm flow does not bypass the inlet by installing a temporary earth or asphalt dike to direct the flow to the inlet.

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WATERSHED PROTECTION DIVISION
DISTRICT OF COLUMBIA DEPARTMENT OF HEALTH

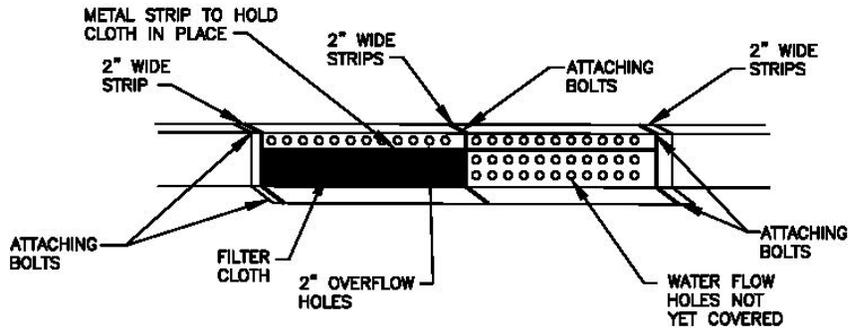
DETAIL 7D - MEDIAN INLET PROTECTION



Construction Specifications

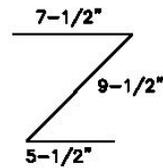
1. Fence posts shall be 36" (min.) long, driven 16" into the ground and spaced 5' (max.) apart. Wood posts shall be 1 1/2" x 1 1/2" (min.) square cut or 1 3/4" (min.) diameter round and shall be of sound quality hardwood. Steel posts shall be standard T or U section weighing not less than 1.0 #/linear foot.
2. Geotextile Class F shall be fastened securely to each post with wire ties or staples at top and mid-section.
3. Where ends of geotextile fabric come together they shall be overlapped, folded and stapled.
4. Median Inlet Protection shall be inspected after each rain and maintained when bulges occur in the fabric or when the stone gets clogged.
5. Stone used to construct the weir shall be 4" - 7" with a 1' thick layer of 3/4" - 1 1/2" stone on the upstream face.

DETAIL 6E - AT GRADE INLET GUARD



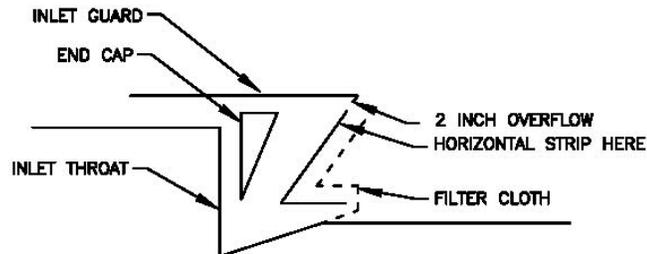
* AT EACH INTERSECTION OF INLET PROTECTOR OVERLAP A MINIMUM OF 2"

STANDARD INLET GUARD ATTACHMENT METHOD



- THE TOP MEASUREMENT OF 7-1/2" IS SET TO PROVIDE A 2" EXTENSION FOR OVERFLOW WHILE AVOIDING BLOCKAGE OF THE MANHOLE COVER.
- MAKE A WATERTIGHT CONNECTION ALONG THE SIDES AND BOTTOM OF THE INLET GUARD WITH THE STREET AND CURB.

STANDARD INLET GUARD DIMENSIONS



STANDARD INLET GUARD CROSS SECTION

8.0 STANDARDS AND SPECIFICATIONS

FOR

INLET FILTER BAGS

Storm sewer inlets should be protected from sediment pollution wherever the sewer system does not discharge into a functioning sediment basin. (NOTE: Since detention ponds do not effectively remove sediment prior to discharging, storm sewers discharging to detention ponds should be protected from sediment pollution.) Inlet protection may also be desirable in cases where it would be difficult or expensive to clean accumulated sediment from sewer lines, or where a temporary riser may have to be removed from a permanent basin prior to completion of all earthmoving. Inlet protection should be maintained until all earthwork within the tributary drainage area has been completed and stabilized.

Design Criteria

Wherever filter bags are used they should be installed according to the manufacturer's specifications. Typical installation details should be provided on the drawings. NOTE: Filter bags designed to fit over the inlet grate are not recommended for most storm sewer inlets. Use of such filter bags could result in a severe reduction of the inlet capacity resulting in flooding or runoff bypassing the inlet. Wherever such bags are used, they should be located at topographic low points and limited to 1/2 acre maximum drainage areas. Inlet filter bags are not generally recommended as the primary BMP to remove sediment from site runoff water.

Filter bags should trap all particles larger than 150 Microns.

Inlet filter bags shall be inspected on a weekly basis or after each rainfall event, whichever is less.

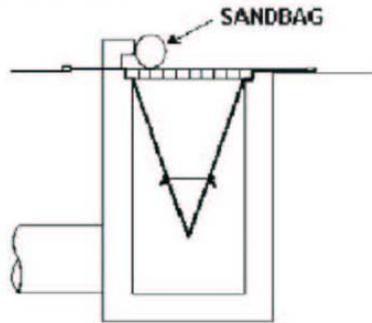
Filter bags should be cleaned and/or replaced when the bag is 1/2 full.

Damaged filter bags shall be replaced immediately.

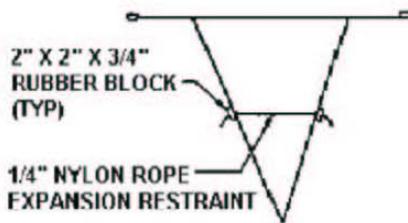
Needed repairs should be initiated immediately after the inspection.

Do not use on major paved roadways where ponding may cause traffic hazards.

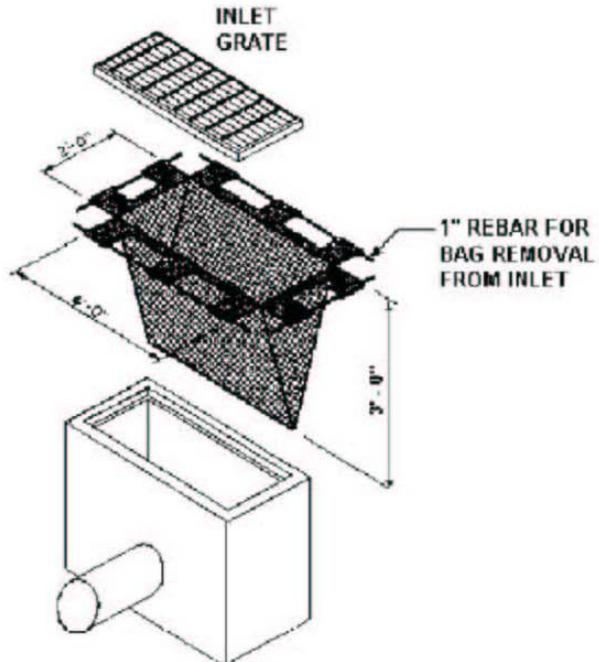
DETAIL 8A - FILTER BAG INLET PROTECTION CURBED ROADWAY



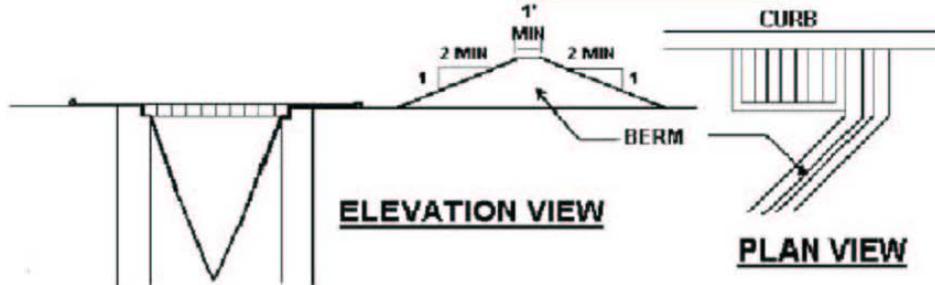
INSTALLATION DETAIL



BAG DETAIL



ISOMETRIC VIEW



ELEVATION VIEW

PLAN VIEW

Maximum Drainage Area = 1/2 acre.

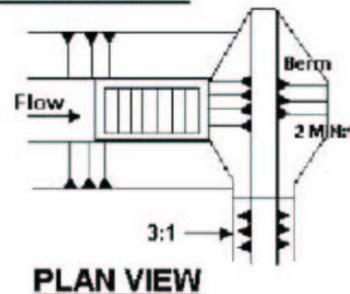
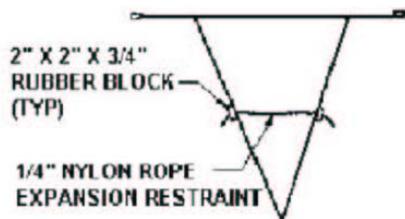
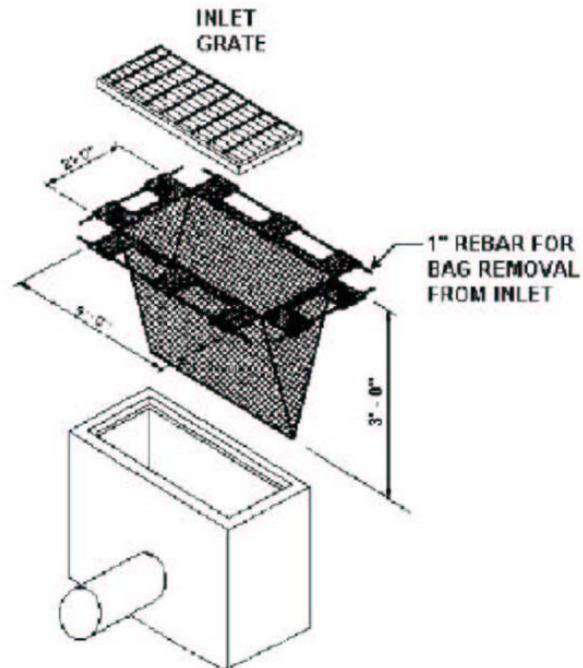
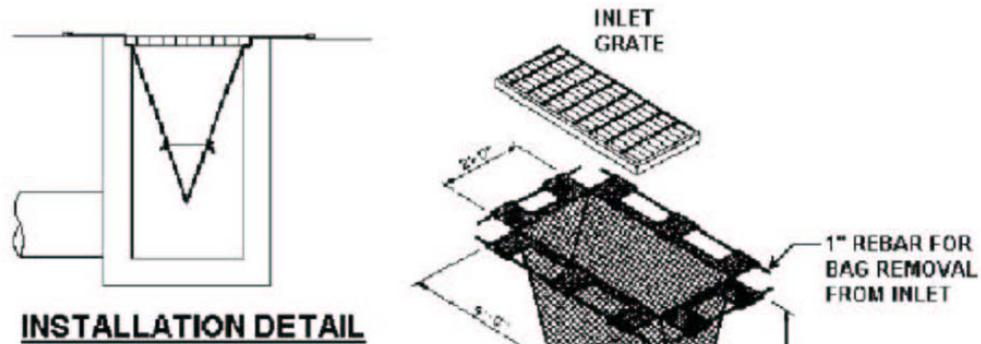
Inlet protection is not required for inlet tributary to sediment basin or trap. Berms required for all installations.

Earthen berm shall be maintained until roadway is stoned. Road subbase berm shall be maintained until roadway is paved.

Six inch minimum height asphalt berm shall be maintained until roadway surface receives final coat.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS

**DETAIL 8B - FILTER BAG INLET PROTECTION
CHANNEL OR ROADSIDE SWALE**



Maximum Drainage Area = 1/2 acre.

Inlet protection is not required for inlet tributary to sediment basin or trap. Berms required for all installations.

Earthen berm in roadway shall be maintained until roadway is stoned. Road subbase berm on roadway shall be maintained until roadway is paved. Earthen berm in channel shall be maintained until permanent stabilization is completed or to remain permanently.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS

9.0 STANDARDS AND SPECIFICATIONS

FOR

CULVERT INLET PROTECTION

Definition

A sediment filter located at the inlet to storm sewer culverts.

Purposes

1. To prevent sediment from entering, accumulating in and being transferred by a culvert and associated drainage system prior to permanent stabilization of a disturbed project area.
2. To provide erosion control at culvert inlets during the phase of a project where elevation and drainage patterns change, causing original control measures to be ineffective or in need of removal.

Conditions Where Practice Applies

Where culvert and associated drainage system is to be made operational prior to permanent stabilization of the disturbed drainage area. Different types of structures are applicable to different conditions (see Details 8A and 8B).

Planning Considerations

When construction on a project reaches a stage where culverts and other storm sewer appurtenances are installed and many areas are brought to a desired grade, the erosion control measures used in the early stages normally need to be modified or may need to be removed altogether. At that time, there is a need to provide protection at the points where runoff will leave the area via culverts and drop or curb inlets.

Similar to drop and curb inlets, culverts which are made operational prior to stabilization of the associated drainage areas can convey large amounts of sediment to natural drainageways. In case of extreme sediment loading, the pipe or pipe system itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the culvert by using one of the methods noted in this section.

General Guidelines (All Types)

1. The inlet protection device shall be constructed in a manner that will facilitate cleanout and disposal of trapped sediment and minimize interference with flow paths and construction activities.
2. The inlet protection devices shall be constructed in such a manner that any resultant ponding of storm water will not cause damage or nuisance to adjacent areas or structures.
3. Design criteria more specific to each particular inlet protection device will be found in Details 8A and 8B.

Design Criteria

1. Silt Fence Culvert Inlet Protection
 - a. No formal design is required.
 - b. Silt fence culvert inlet protection has an expected maximum usable life of three months.**
 - c. The maximum area draining to this practice shall not exceed one acre.
2. Culvert Inlet Sediment Trap
 - a. Runoff storage requirements shall be in accordance with information outlined under 14.0 Sediment Traps.
 - b. Sediment storage area
 - b. Culvert inlet sediment traps have a maximum expected useful life of 18 months unless otherwise directed by inspection.
 - c. The maximum area draining to this practice shall not exceed 3 acres.

Construction Specifications

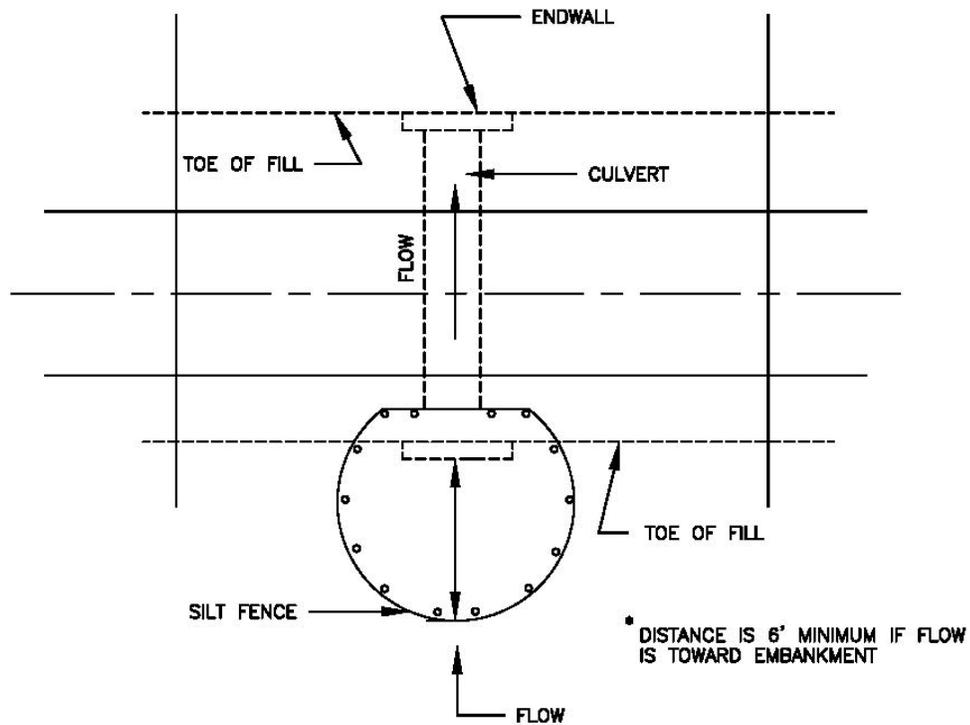
1. Silt Fence Culvert Inlet Protection
 - a. The height of the silt fence (in front of the culvert opening) shall be a minimum of 16 inches and shall not exceed 34 inches.

- b. **Extra strength filter fabric with a maximum spacing of stakes of 3 feet shall be used to construct the measure.**
- c. The placement of silt fence should be approximately 6 feet from the culvert in the direction of incoming flow, creating a "horseshoe" shape as shown in Detail 8A.
- d. If silt fence cannot be installed properly or the flow and/ or velocity of flow to the culvert protection is excessive and may breach the structure, the stone combination noted in Detail 8A should be utilized.

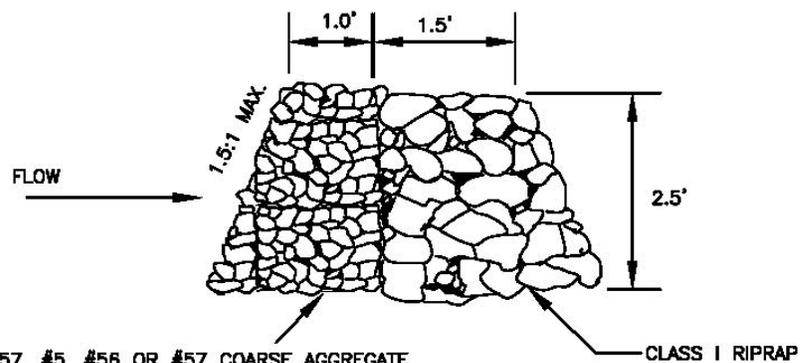
2. Culvert Inlet Sediment Trap

- a. Geometry of the design will be a "horseshoe" shape around the culvert inlet (see Detail 8B).
- b. The toe of riprap (composing the sediment filter dam) shall be no closer than 24" from the culvert opening in order to provide an acceptable emergency outlet for flows from larger storm events.
- c. All other "Construction Specifications" found within 14.0 Sediment Traps, also apply to this practice.
- e. The proper installation of the culvert inlet sediment trap is a viable substitute for the installation of the TEMPORARY SEDIMENT TRAP.

DETAIL 9A - SILT FENCE CULVERT INLET PROTECTION



* *OPTIONAL STONE COMBINATION*



* VDOT #3, #357, #5, #56 OR #57 COARSE AGGREGATE TO REPLACE SILT FENCE IN "HORSESHOE" WHEN HIGH VELOCITY OF FLOW IS EXPECTED

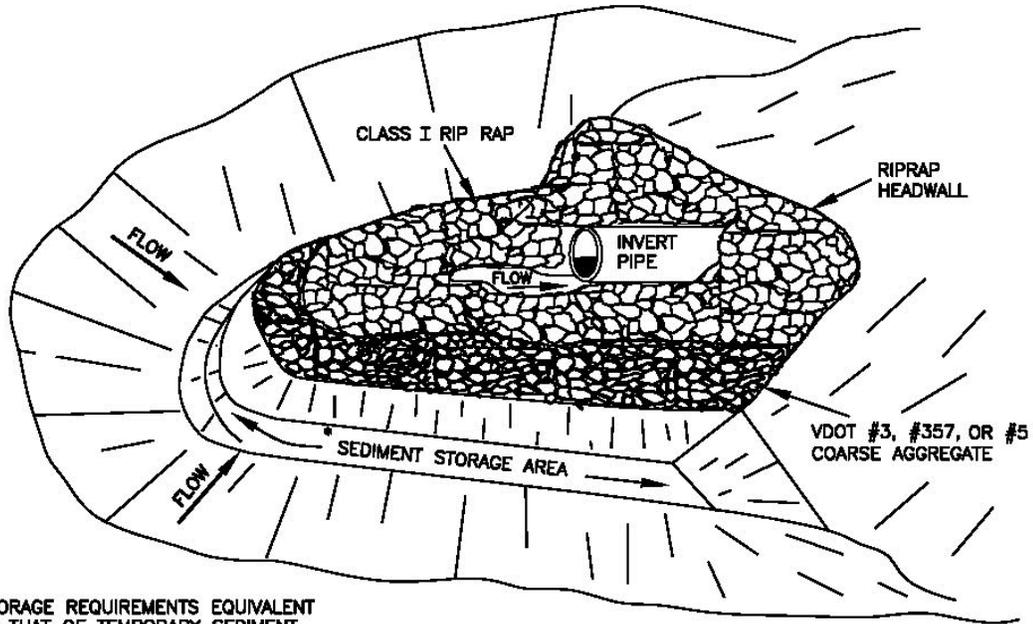
SOURCE: ADAPTED from VDOT Standard Sheets and Va. DSWC

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WATERSHED PROTECTION DIVISION
DISTRICT OF COLUMBIA DEPARTMENT OF HEALTH

DETAIL 9B - CULVERT INLET SEDIMENT TRAP

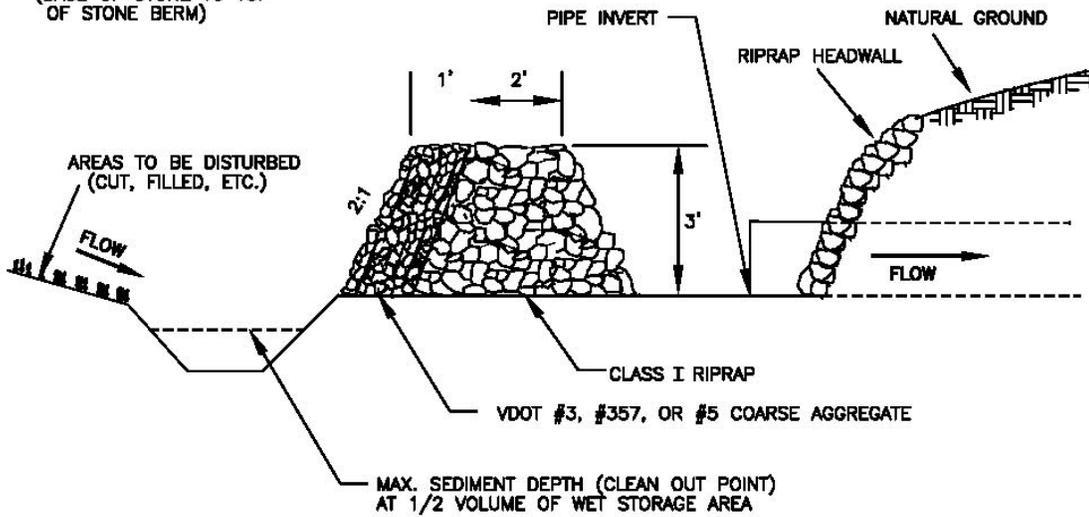


*STORAGE REQUIREMENTS EQUIVALENT TO THAT OF TEMPORARY SEDIMENT TRAP, STD. & SPEC. 3.13

67 C.Y./ACRE WET STORAGE (BELOW BASE OF STONE)

67 C.Y./ACRE DRY STORAGE (BASE OF STONE TO TOP OF STONE BERM)

PERSPECTIVE VIEW



ELEVATION

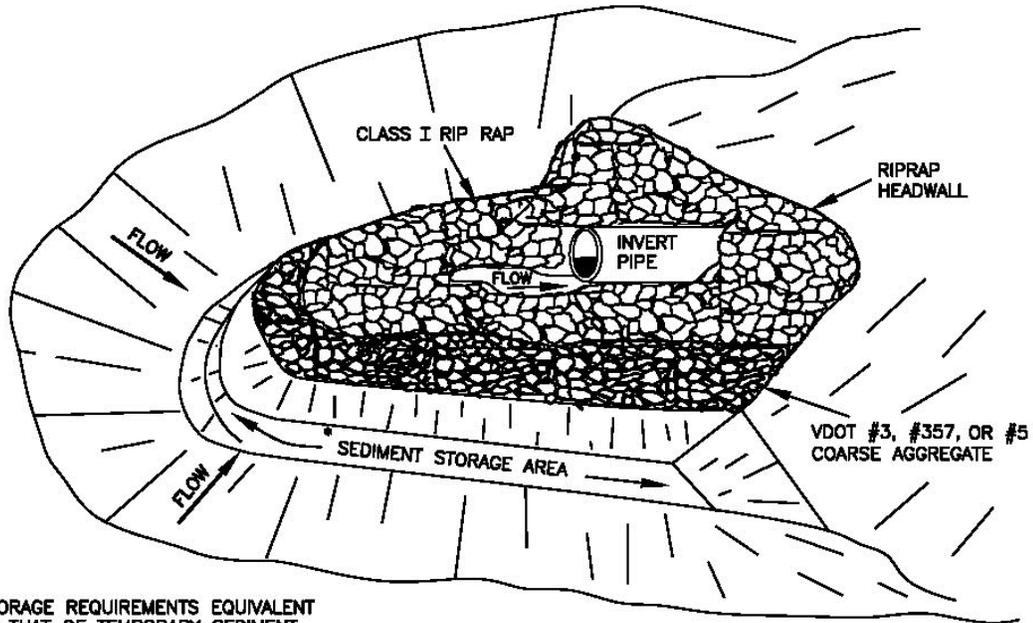
SOURCE: NORTH CAROLINA SEDIMENT CONTROL COMMISSION

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WATERSHED PROTECTION DIVISION
DISTRICT OF COLUMBIA DEPARTMENT OF HEALTH

DETAIL 9B - CULVERT INLET SEDIMENT TRAP

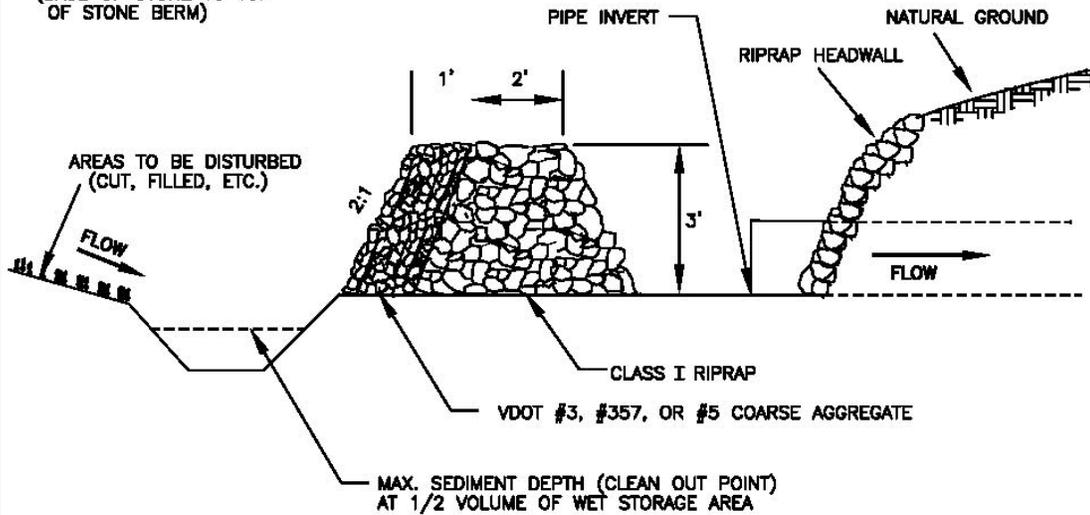


*STORAGE REQUIREMENTS EQUIVALENT TO THAT OF TEMPORARY SEDIMENT TRAP, STD. & SPEC. 3.13

67 C.Y./ACRE WET STORAGE (BELOW BASE OF STONE)

67 C.Y./ACRE DRY STORAGE (BASE OF STONE TO TOP OF STONE BERM)

PERSPECTIVE VIEW



ELEVATION

SOURCE: NORTH CAROLINA SEDIMENT CONTROL COMMISSION

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WATERSHED PROTECTION DIVISION
DISTRICT OF COLUMBIA DEPARTMENT OF HEALTH

Maintenance

1. The structure shall be inspected after each rain and repairs made as needed.
2. Aggregate shall be replaced or cleaned when inspection reveals that clogged voids are causing ponding problems which interfere with on-site construction.
3. Sediment shall be removed and the impoundment restored to its original dimensions when sediment has accumulated to $\frac{1}{2}$ the volume of the Wet Storage Zone. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode and cause sedimentation problems.
4. Temporary structures shall be removed when they have served their useful purpose and the area should be stabilized, but not before the up slope area has been permanently stabilized.