

Section E - FILTERING PRACTICES

15.0 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 filter sediment from runoff so that deposition of transported sediment can occur. Silt fences can be used to intercept sheet flow only. They cannot be used as velocity checks in ditches or swales, or placed where they 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 on or parallel to contours.
3. The length of silt fences must conform to the following:

Table 17 Silt Fence Design Constraints

<u>Slope Steepness</u>	<u>(Maximum) Slope Length</u>	<u>(Maximum) 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.

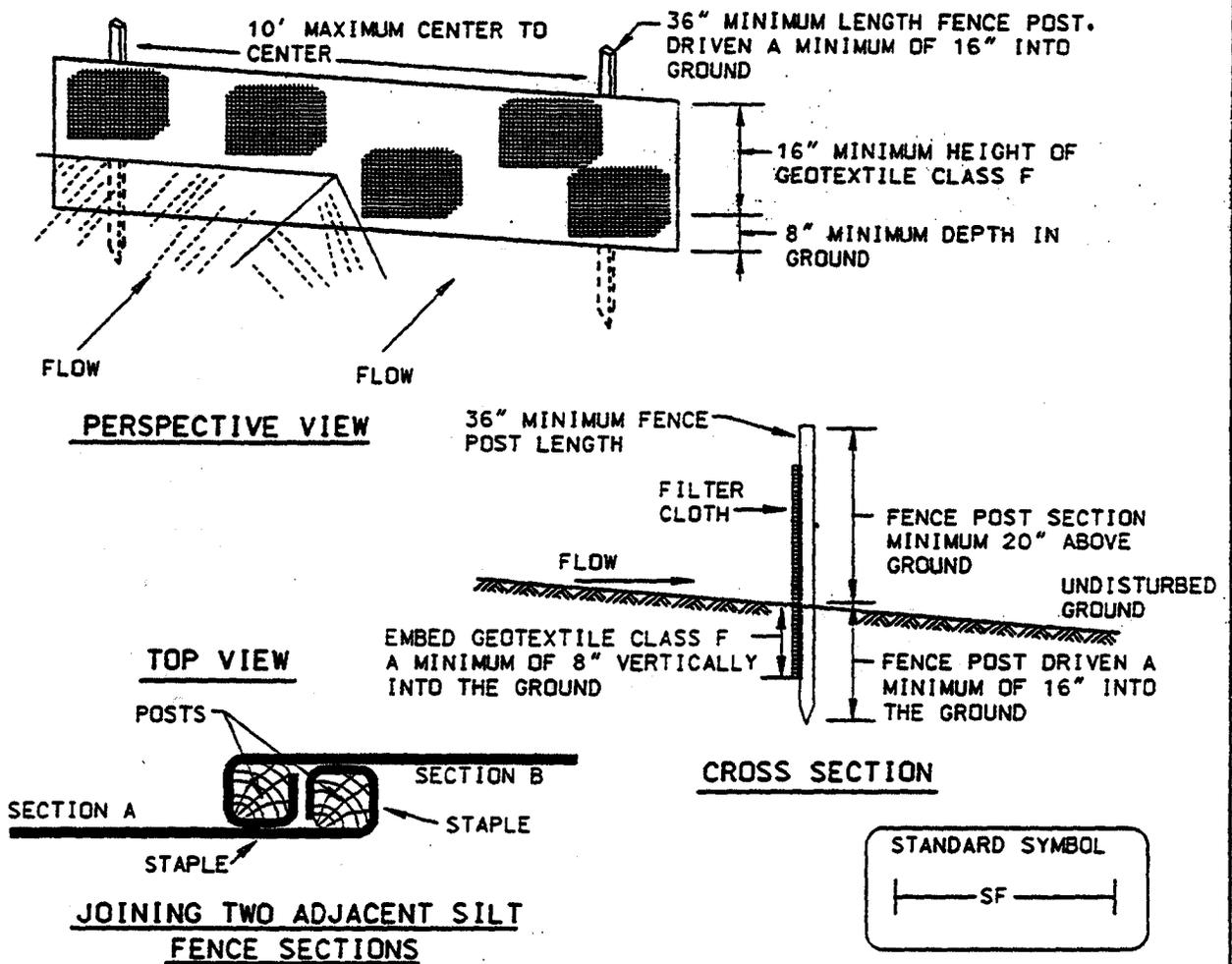
2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate.	3 gal/ft ² /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

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 50% of the fabric height.

DETAIL 22 - SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1½" x 1½" square (minimum) cut, or 1¾" 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: 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

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 50% of the fabric height.

SILT FENCE

Silt Fence Design Criteria

<u>Slope Steepness</u>	(Maximum) <u>Slope Length</u>	(Maximum) <u>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.

16.0 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.

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 less than 1/4 acre for curb or standard inlet protections and 1 acre for elevated or yard inlets. 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 23A. 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 E²³ 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 1/2"²⁴ stone, 4 - 6" thick on the grate to secure the fabric and provide additional filtration.

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.

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²³ Refer to Table 27

²⁴ Refer to Table 28

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.

D. Median Inlet Protection (MIP)

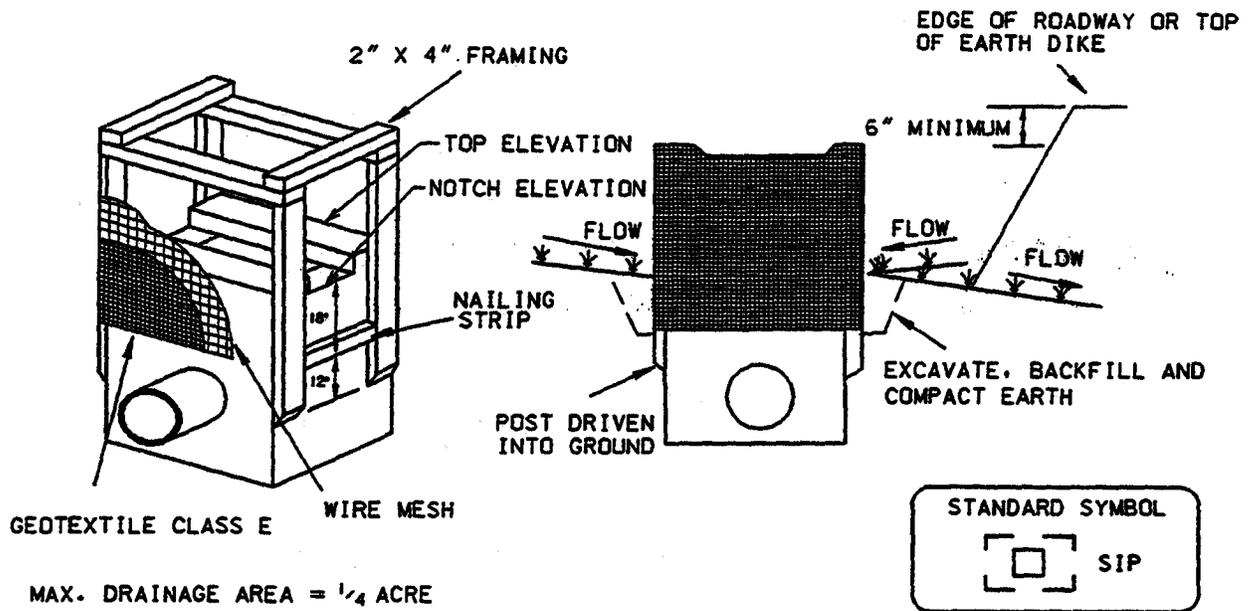
1. Construct standard Slope Silt Fence having 5' post spacing 1' - 6" away from the existing inlet only on the sides of the inlet receiving sheet flow and in the location of the "wings".
2. In the location of concentrated flow, construct a stone check dam using 4" - 7" stone for the base faced on the upstream side with 3/4" - 1 1/2" aggregate, 1' thick. The 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.

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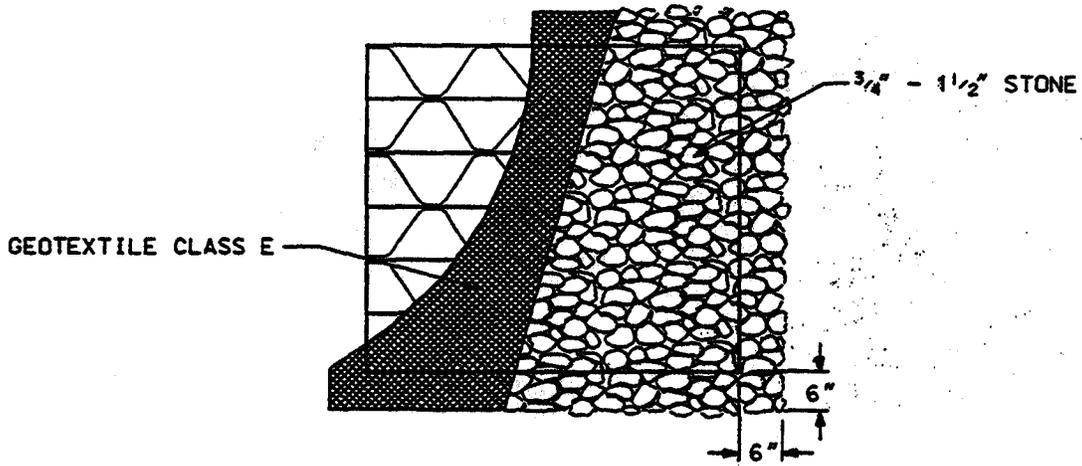
DETAIL 23A - STANDARD INLET PROTECTION



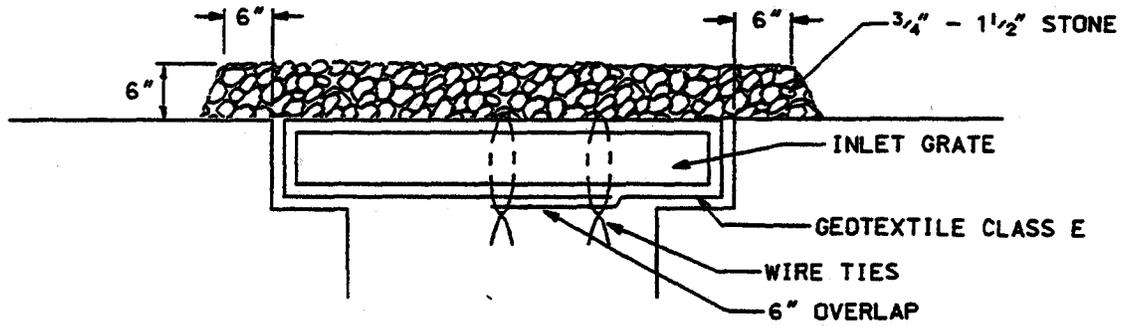
Construction Specifications

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.

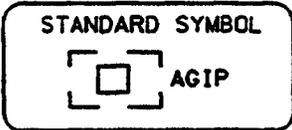
DETAIL 23B - AT GRADE INLET PROTECTION



PLAN/CUT AWAY VIEW



CROSS SECTION

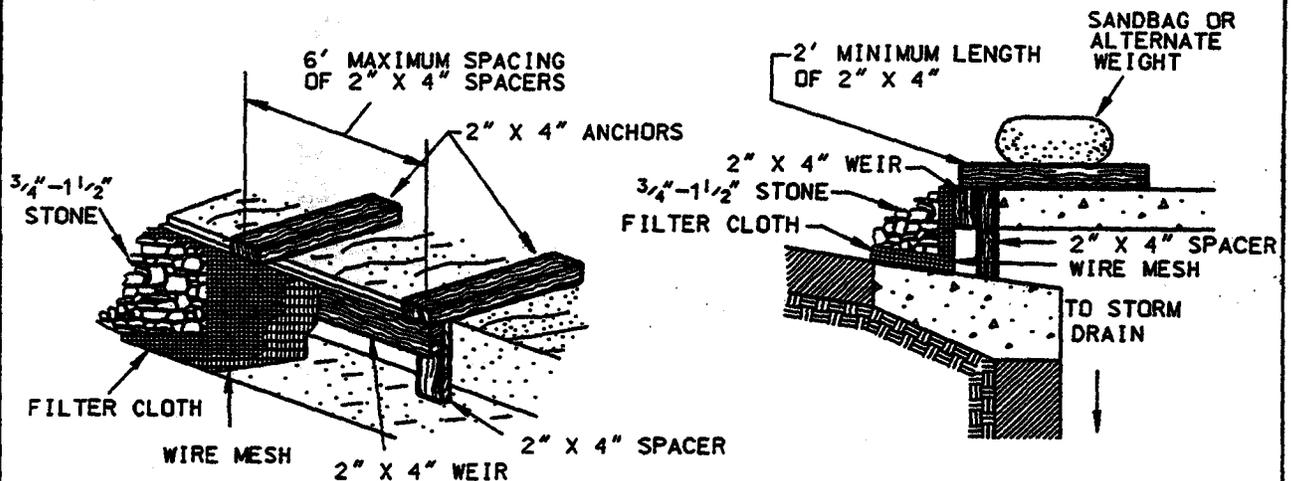


MAX. DRAINAGE AREA = 1/4 ACRE

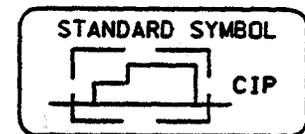
Construction Specifications

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 23C - CURB INLET PROTECTION (COG OR COS INLETS)



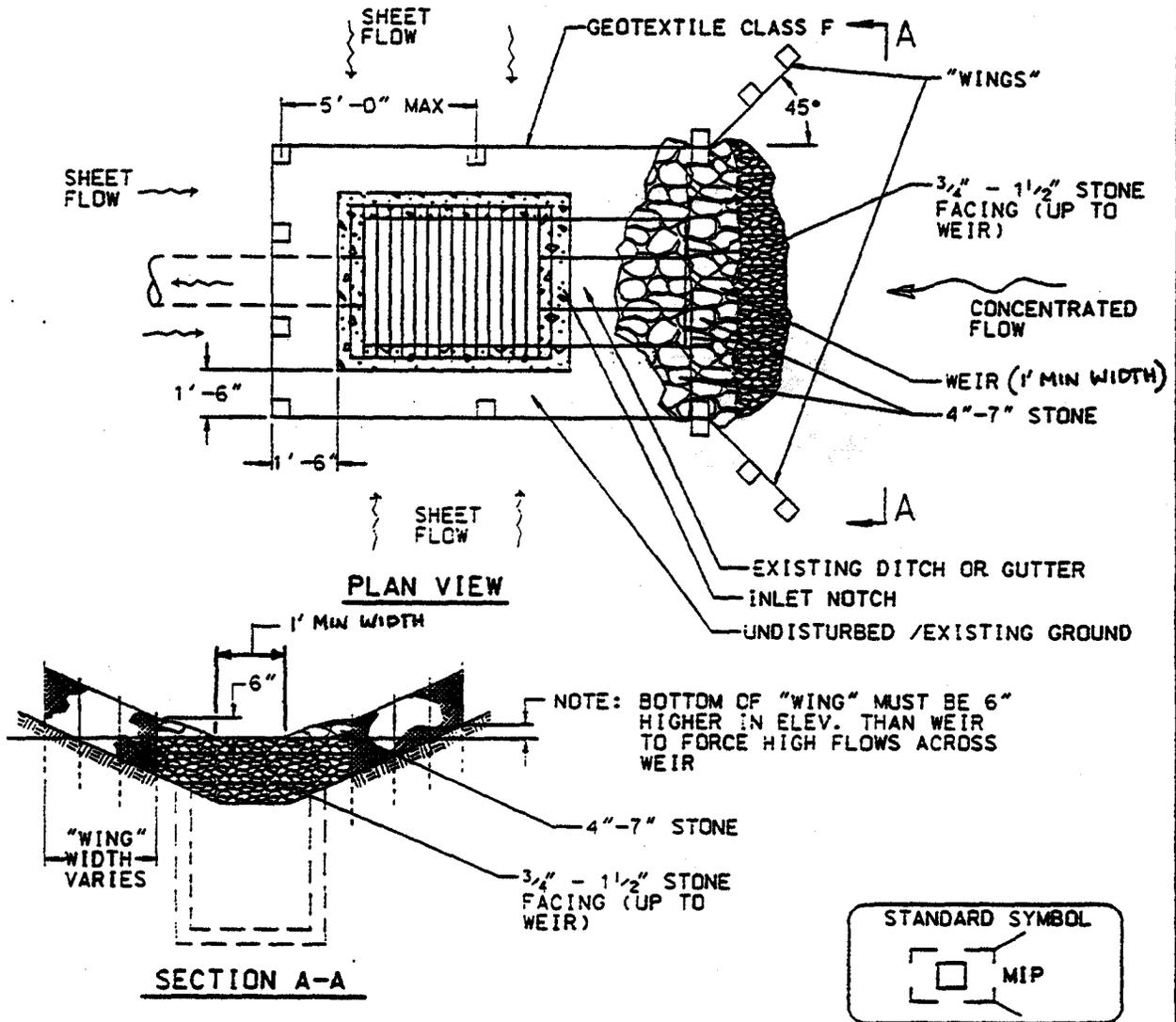
MAX. DRAINAGE AREA = $\frac{1}{4}$ ACRE



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 $\frac{1}{2}$ " x $\frac{1}{2}$ " 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 $\frac{3}{4}$ " x $1\frac{1}{2}$ " 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.

DETAIL 23D - 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.