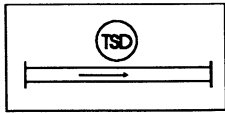


STD & SPEC 3.15



TEMPORARY SLOPE DRAIN

Definition

A flexible tubing or conduit extending from the top to the bottom of a cut or fill slope.

Purpose

To temporarily conduct concentrated stormwater runoff safely down the face of a cut or fill slope without causing erosion on or below the slope.

Conditions Where Practice Applies

On cut or fill slopes where there is a potential for upslope flows to move over the face of the slope causing erosion and preventing adequate stabilization.



Planning Considerations

There is often a significant lag between the time a cut or fill slope is completed and the time a permanent drainage system can be installed. During this period, the slope is usually not stabilized and is particularly vulnerable to erosion. This situation also occurs on slope construction which is temporarily delayed before final grade is reached. Temporary slope drains can provide valuable protection of exposed slopes until permanent drainage structures can be installed or vegetation can be established.

Temporary slope drains can be used in conjunction with diversion dikes to convey runoff from the entire drainage area above a slope to the base of the slope without erosion. It is very important that these temporary structures be installed properly, since their failure will often result in severe gully erosion on the site and sedimentation below the slope. The entrance section must be securely entrenched, all connections must be watertight, and the conduit must be staked securely.

Design Criteria

Drainage Area

The maximum allowable drainage area per slope drain is 5 acres.

Flexible Conduit

The slope drain shall consist of heavy-duty, flexible material designed for this purpose. The diameter of the slope drain shall be equal over its entire length. Reinforced hold-down grommets shall be spaced at 10-foot (or less) intervals. Slope drains shall be sized as listed in Table 3.15-A.

Entrance Sections

The entrance to the slope drain shall consist of a standard VDOT flared end-section for metal pipe culverts (see Plates 3.15-2 and 3.15-3) with appropriate inlet protection as set forth in CULVERT INLET PROTECTION, Std. & Spec. 3.08. If ponding will cause a problem at the entrance and make such protection impractical, appropriate sediment-removing measures shall be taken at the outlet of the pipe. Extension collars shall consist of 12-inch long corrugated metal pipe. Watertight fittings shall be provided (see Plate 3.15-1).

Note: End-sections made of heavy-duty, flexible material may be utilized if determined by the Plan-Approving Authority to provide a stable inlet or outlet section.

<u>Maximum Drainage Area (acres)</u>	<u>Pipe Diameter (inches)</u>
0.5	12
1.5	18
2.5	21
3.5	24
5.0	30

Source: Va. DSWC

Dike Design

An earthen dike shall be used to direct stormwater runoff into the temporary slope drain and shall be constructed as set forth in DIVERSION, Std. & Spec. 3.12. See Plate 3.15-1 for placement of dike in relation to the slope drain.

The height of the dike at the centerline of the inlet shall be equal to the diameter of the pipe plus 6 inches. Where the dike height is greater than 18 inches at the inlet, it shall be sloped at the rate of 3:1 or flatter to connect with the remainder of the dike (see Plate 3.15-1).

Outlet Protection

The outlet of the slope drain must be protected from erosion as set forth in OUTLET PROTECTION, Std. & Spec. 3.18.

Construction Specifications

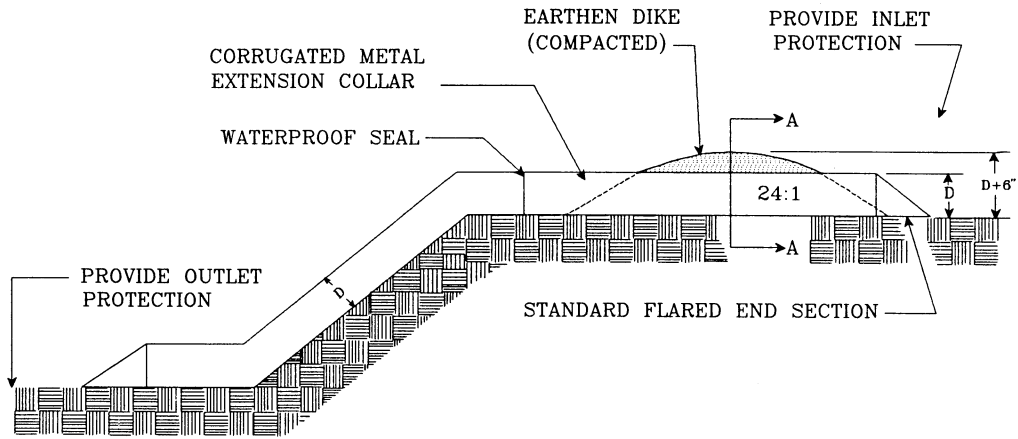
1. The measure shall be placed on undisturbed soil or well-compacted fill.
2. The entrance section shall slope toward the slope drain at the minimum rate of 1/2-inch per foot.
3. The soil around and under the entrance section shall be hand-tamped in 8-inch lifts to the top of the dike to prevent piping failure around the inlet.

4. The slope drain shall be securely staked to the slope at the grommets provided.
5. The slope drain sections shall be securely fastened together and have watertight fittings.
6. Install CULVERT INLET PROTECTION and OUTLET PROTECTION as per Std. & Spec.'s 3.08 and 3.18, respectively.

Maintenance

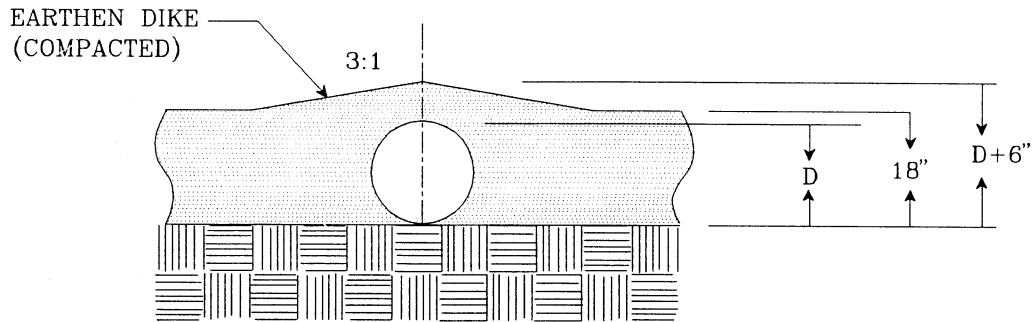
The slope drain structure shall be inspected weekly and after every storm, and repairs made if necessary. The contractor should avoid the placement of any material on and prevent construction traffic across the slope drain.

TEMPORARY SLOPE DRAIN



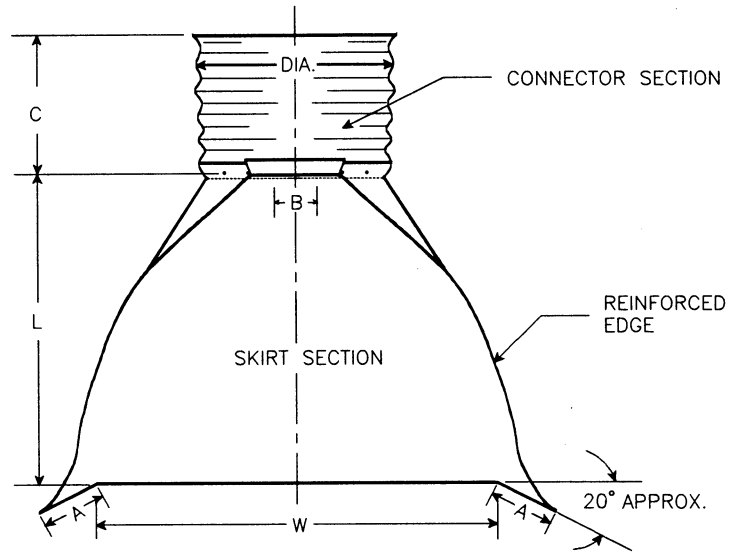
SECTION VIEW

NOTE: SEDIMENT MAY BE CONTROLLED AT OUTLET IF UPLAND PONDING WILL CREATE PROBLEMS



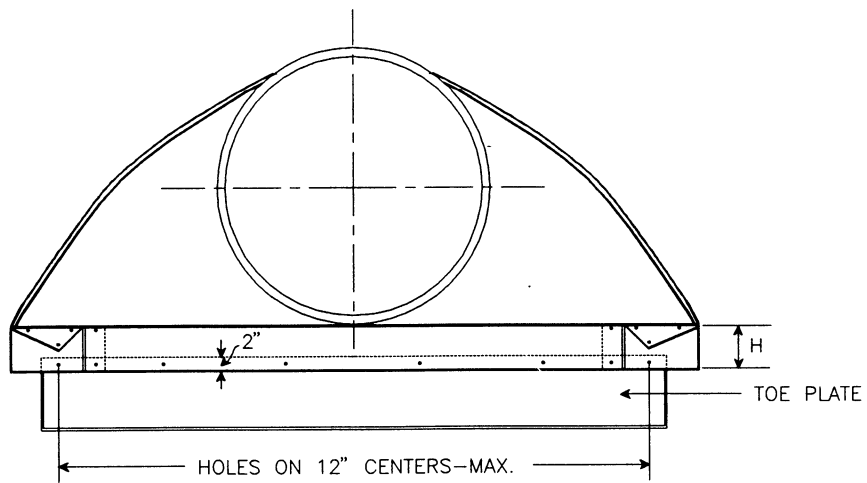
SECTION A - A

FLARED END-SECTION



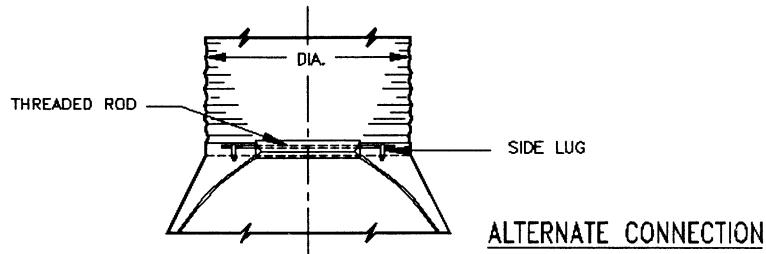
PLAN

WHERE FLARED END-SECTIONS ARE TO BE USED WITH BITUMINOUS COATED AND PAVED METAL PIPE, THEY ARE TO BE GALVANIZED ONLY.



ELEVATION

FLARED END-SECTION (CONTINUED)



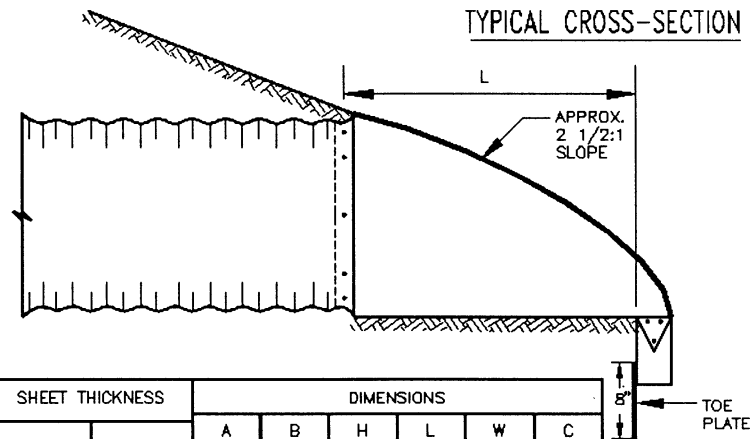
TOE PLATE, WHERE NEEDED, TO BE PUNCHED TO MATCH IN SKIRT LIP. 3/8" GALV. BOLTS TO BE FURNISHED. LENGTH OF TOE PLATE IS W + 10" FOR 12" TO 30" DIA. PIPE AND W + 22" FOR 36" TO 60" DIA. PIPE.

SKIRT SECTION FOR 12" TO 30" DIA. PIPE TO BE MADE IN ONE PIECE.

SKIRT SECTION FOR 36" TO 54" DIA. PIPE MAY BE MADE FROM TWO SHEETS JOINED BY RIVETING OR BOLTING ON CENTER LINE, 60" MAY BE CONSTRUCTED IN 3 PIECES.

CONNECTOR SECTION, CORNER PLATE AND TOE PLATE TO BE SAME SHEET THICKNESS AS SKIRT.

END-SECTIONS AND FITTINGS ARE TO BE GALVANIZED STEEL OR ALUMINUM ALLOY FOR USE WITH LIKE PIPE.



PIPE DIA.	SHEET THICKNESS		DIMENSIONS						
	STEEL	ALUMINUM	A 1" TOL.	B MAX.	H 1" TOL.	L 1 1/2" TOL.	W 2" TOL.	C	
12"	.064"	.060"	6"	6"	6"	21"	24"	24"	
15"	.064"	.060"	7"	8"	6"	26"	30"	24"	
18"	.064"	.060"	8"	10"	6"	31"	36"	24"	
21"	.064"	.060"	10"	12"	6"	36"	42"	24"	
24"	.064"	.060"	10"	13"	6"	41"	48"	24"	
27"/30"	.064"	.075"	12"	16"	8"	51"	60"	24"	
36"	.064"	.075"	14"	19"	9"	60"	72"	36"	
42"	.064"	.105"	16"	22"	11"	69"	84"	36"	
48"	.064"	.105"	18"	27"	12"	78"	90"	24"	
54"	.064"/.079"	.105"	18"	30"	12"	84"	102"	36"	
60"	.064"/.109"	.105"/.135"	18"	33"	12"	87"	114"	36"	