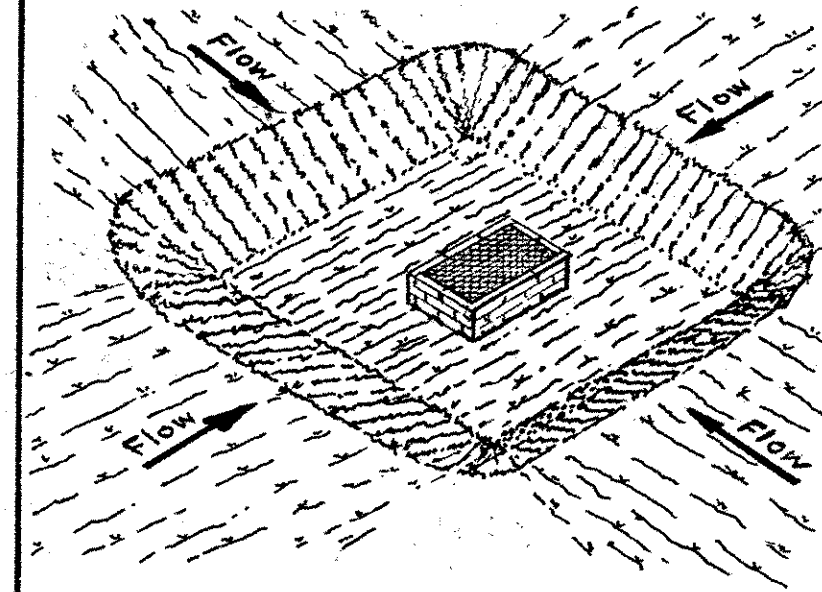
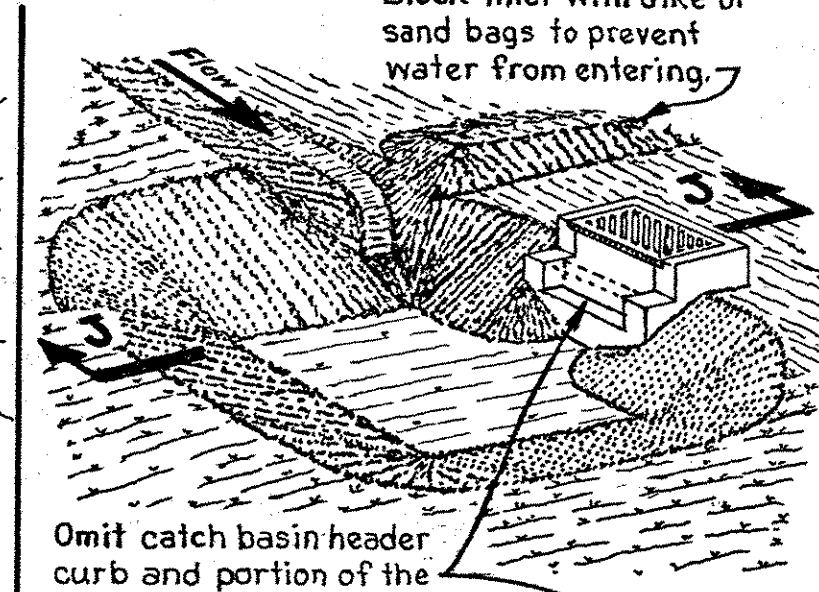


STORM INLET SEDIMENT TRAPS (DRAINAGE AREA: 5 ACRES OR LESS)

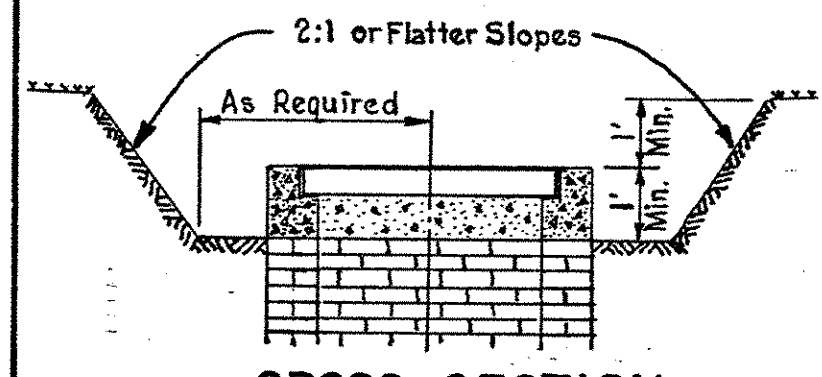
A storm inlet sediment trap consists of a basin formed by excavation or by natural ground that discharges through an opening in a storm drain inlet structure. This opening can either be the inlet opening or a temporary opening made by omitting bricks or blocks in the inlet wall. An inlet located in a median swale or a side ditch of the roadway might use the inlet opening as an outlet. A pavement inlet in a curbed section would require a temporary opening. The trap should be out of the roadway so as not to interfere with construction. Placing the trap back of the curb and diverting water from the roadway to the trap is one means of doing this.



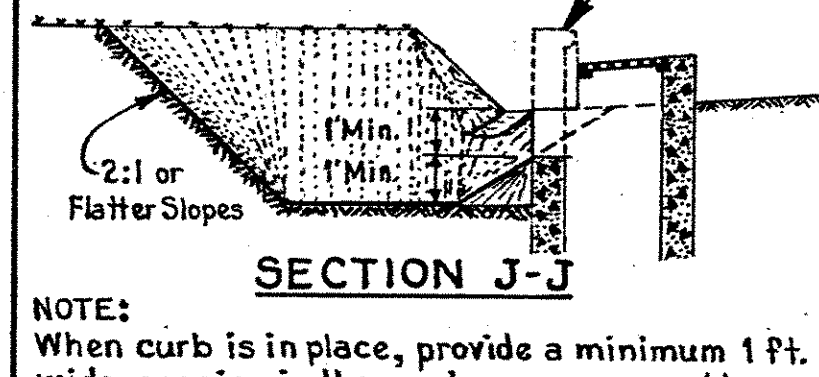
PERSPECTIVE



PERSPECTIVE



CROSS SECTION



SECTION J-J

NOTE: When curb is in place, provide a minimum 1 ft. wide opening in the curb or use a sand bag dam to force water over the curb to the trap.

MEDIAN DRAIN

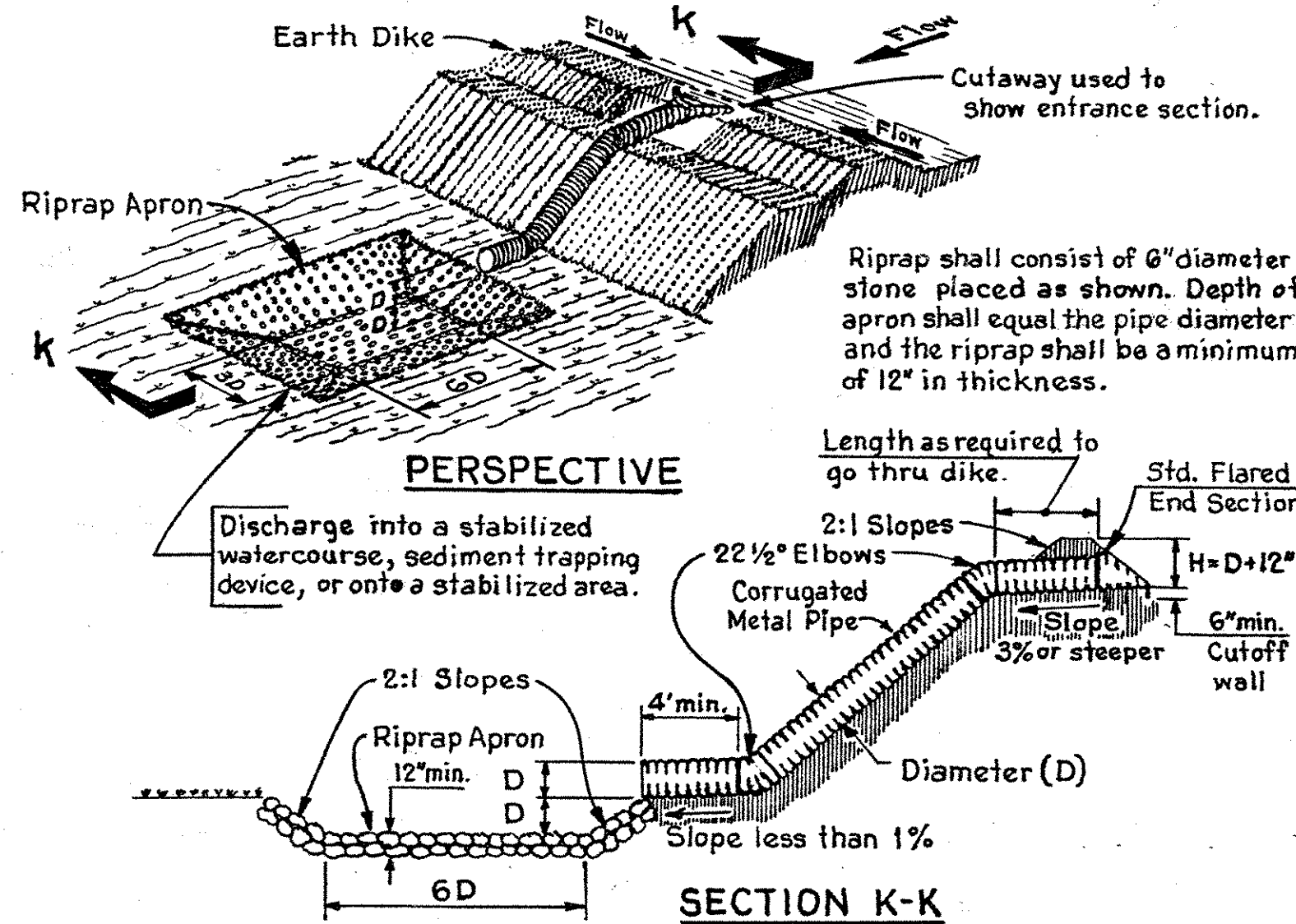
CURB DRAIN

NOTES:

- The area under embankments shall be cleared, grubbed and stripped of all vegetation and root mat. The pool area shall be cleared.
- The fill material for embankments shall be free of roots or other woody vegetation, as well as oversized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being placed.
- The outlet crest shall be at least 1 foot below the top of any embankment or in the case of excavation, at least 1 foot below the ground adjacent to the trap.
- The capacity of the outlet shall be based on the size of the catch basin outlet pipe. Select the allowable drainage area from the table in Note 5 under Pipe Outlet Sediment Traps on Standard Sheet Number EC-3.
- All cut and fill slopes used in the construction of sediment traps shall be 2:1 or flatter. The minimum top width of embankments used to form sediment traps shall be 4 feet.
- The structure shall be inspected after each rain and repairs shall be made when required.
- Sediment shall be removed and the trap restored to its original dimensions, when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be disposed of in a suitable area, as approved by the Engineer, and in such a manner that it will not erode.
- Construction operations shall be carried out in such a manner that erosion and water pollution are minimized.
- The sediment trap shall be removed and the area shall be stabilized after the drainage area above the trap has been properly stabilized.
- See also the General Notes for Sediment Traps on Standard Sheet EC-3.

GRADE STABILIZATION STRUCTURE RIGID PIPE SLOPE DRAINS (DRAINAGE AREA: 5 ACRES OR LESS)

A rigid pipe with a prefabricated flared entrance section, temporarily placed to extend from the top to the bottom of a slope, used to convey surface runoff safely down the slope without causing erosion. Pipe slope drains are to be used whenever concentrated flows of surface runoff are to be conveyed down a cut or fill slope in order to prevent erosion.



EROSION PLAN SYMBOL

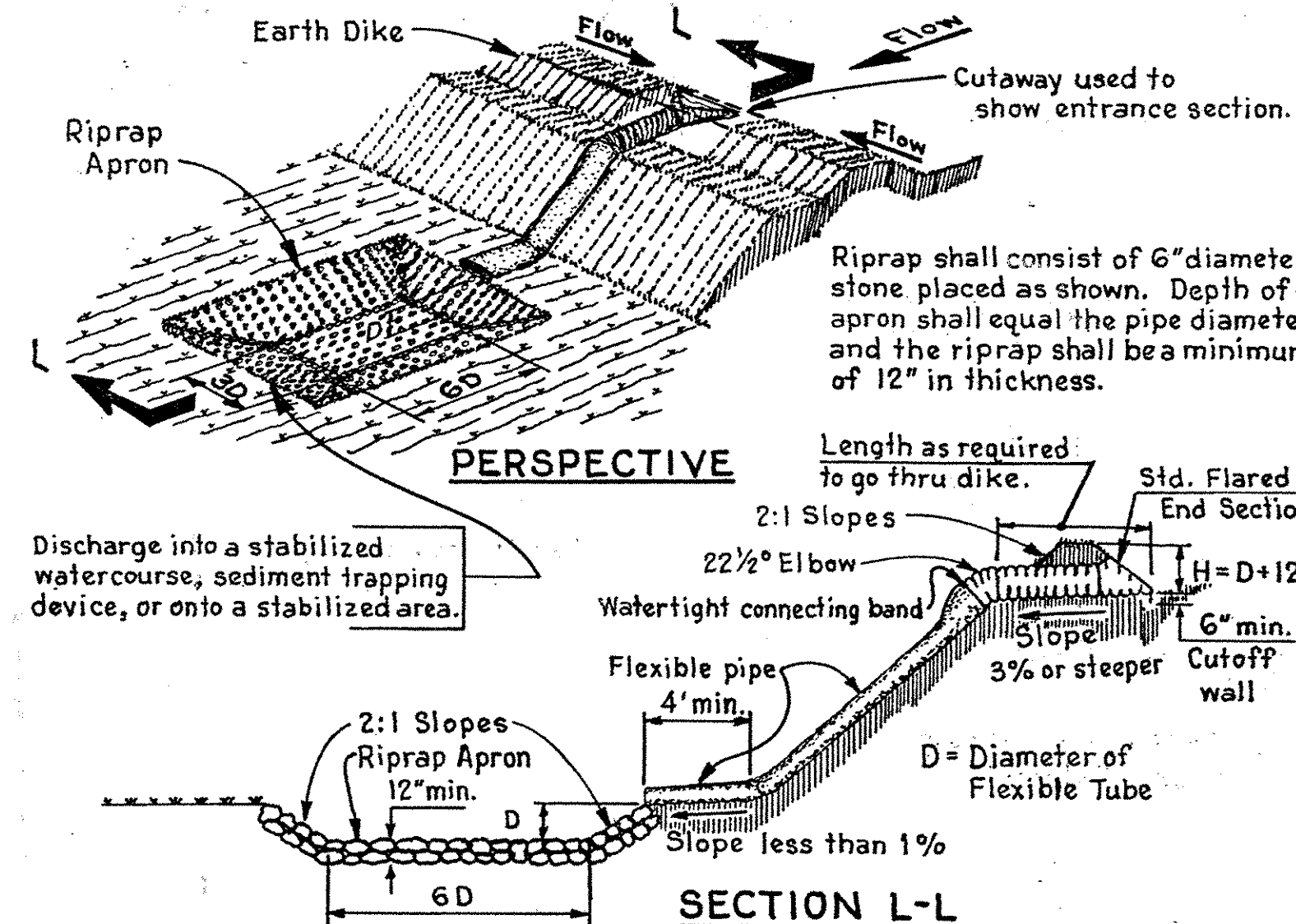
RPSD-Diameter Example: RPSD-12 = Rigid Pipe Slope Drain with 12" C.M. Pipe.

NOTES:

- The entrance section and the inlet pipe shall have a slope of 3% or steeper.
 - The top of the earth dike over the inlet pipe and of all dikes carrying water to the slope drain shall be at least 1 foot higher at all points than the top of the inlet pipe.
 - The pipe shall be corrugated metal pipe with water tight connecting bands at all joints.
 - A riprap apron shall be provided at the outlet. The stone shall have a minimum dimension of 6" and shall be placed in a layer at least 12" in thickness, to the lines and grades shown by the drawing above.
 - The soil around and under the inlet pipe and entrance section shall be hand tamped in 4" lifts to the top of the earth dike.
 - Pipe slope drains are to be sized in accordance with the following table:
- | Maximum Drainage Area (acres) | 0.5 | 1.5 | 2.5 | 3.5 | 5.0 |
|--------------------------------|-----|-----|-----|-----|-----|
| Minimum Pipe Diameter (inches) | 12 | 18 | 21 | 24 | 30 |
- Follow-up inspection and any needed maintenance shall be performed after each storm.

GRADE STABILIZATION STRUCTURE FLEXIBLE PIPE SLOPE DRAINS (DRAINAGE AREA: 5 ACRES OR LESS)

A flexible tubing with a rigid pipe and prefabricated flared entrance section, temporarily placed to extend from the top to the bottom of a slope, used to convey surface runoff safely down the slope without causing erosion. Pipe slope drains are to be used whenever concentrated flows of surface runoff are to be conveyed down a cut or fill slope in order to prevent erosion.



EROSION PLAN SYMBOL

FPSD-Diameter Example: FPSD-18 = Flexible Pipe Slope Drain with 18" C.M. Pipe inlet section and 18" dia. flexible tubing.

NOTES:

- The entrance section and the inlet pipe shall have a slope of 3% or steeper.
 - The top of the earth dike over the inlet pipe and of all dikes carrying water to the slope drain shall be at least 1 foot higher at all points than the top of the inlet pipe.
 - The inlet pipe shall be corrugated metal pipe with water tight connecting bands at all joints.
 - The flexible tubing shall be the same diameter as the inlet pipe and shall be constructed of a durable material with hold-down grommets spaced 10' on centers.
 - The flexible tubing shall be securely fastened to the corrugated metal pipe with metal strapping or water tight connecting collars.
 - The flexible tubing shall be securely anchored to the slope by staking at the grommets provided.
 - A riprap apron shall be provided at the outlet. The stone shall have a minimum dimension of 6" and shall be placed in a layer at least 12" in thickness, to the lines and grades shown by the drawing above.
 - The soil around and under the inlet pipe and entrance section shall be hand tamped in 4" lifts to the top of the earth dike.
 - Pipe slope drains are to be sized in accordance with the following table:
- | Maximum Drainage Area (acres) | 0.5 | 1.5 | 2.5 | 3.5 | 5.0 |
|--------------------------------|-----|-----|-----|-----|-----|
| Minimum Pipe Diameter (inches) | 12 | 18 | 21 | 24 | 30 |
- Follow-up inspection and any needed maintenance shall be performed after each storm.

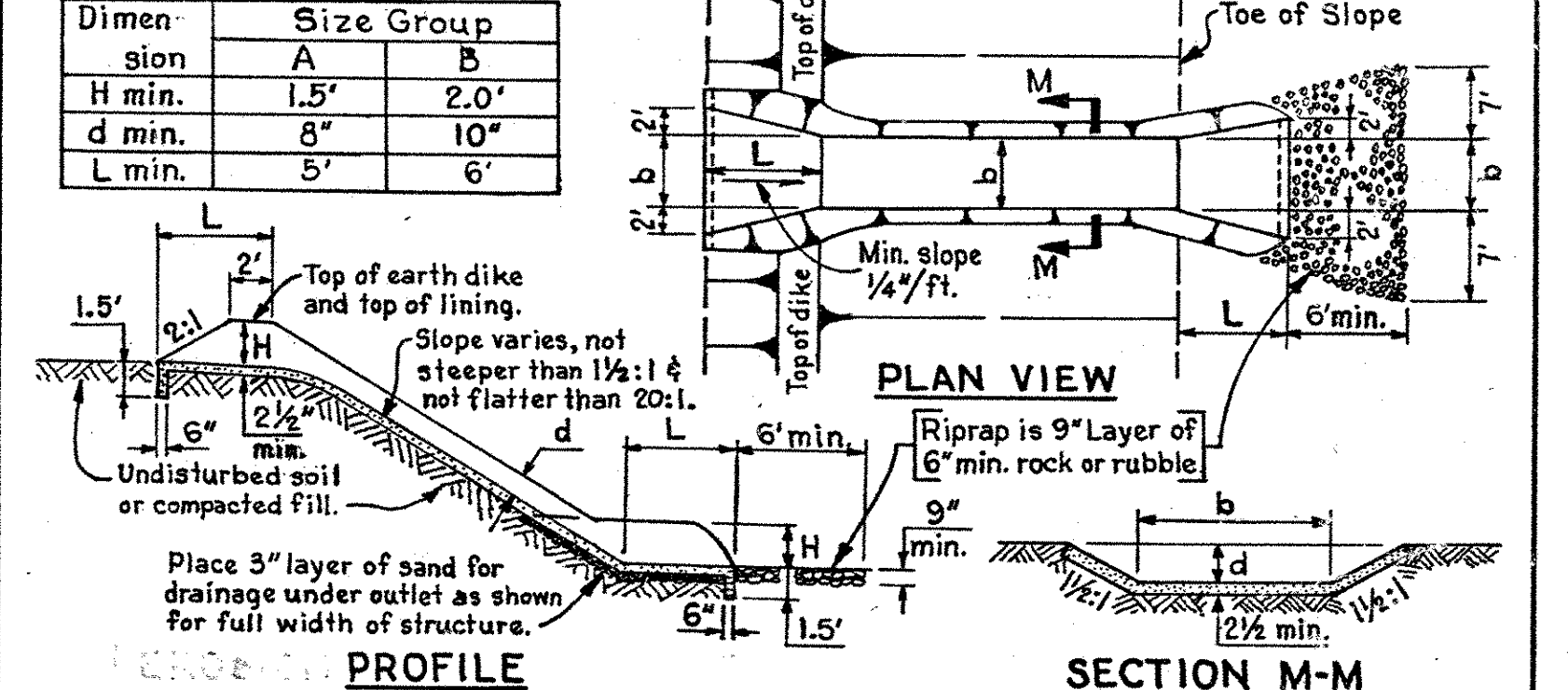
APPROVED: DATE:	STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION
DIRECTOR OF HIGHWAYS	STANDARD SHEET NUMBER EC-4 EROSION CONTROL DETAILS SEDIMENT TRAPS AND GRADE STABILIZATION STRUCTURES
RECOMMENDED: DATE:	PREL. TRACING WRJ DESIGN WRJ CHKD. REVISIONS
DEPUTY DIRECTOR OF HIGHWAYS	

GRADE STABILIZATION STRUCTURE PAVED CHUTE OR FLUME (DRAINAGE AREA: 36 ACRES OR LESS)

A temporary channel lined with bituminous concrete, Portland cement concrete, or comparable non-erodible material, placed to extend from the top of a slope to the bottom of a slope, that is used to convey concentrated flow of surface runoff down the slope in a manner that will not cause erosion.

TABLE of BASIC DIMENSIONS

Dimension	Size Group A	Size Group B
H min.	1.5'	2.0'
d min.	8"	10"
L min.	5'	6'



EROSION PLAN SYMBOL

PCF-Size Group, Bottom Width Example: PCF-A2 = Paved chute or flume, Size Group A with a 2 ft. bottom width (b). The selected size shall be shown on the erosion plan.

NOTES:

- The structure shall be placed on undisturbed soil or on well compacted fill.
- The cut or fill slope shall not be steeper than 1 1/2:1 and shall not be flatter than 20:1.
- The top of the earth dike at the entrance and of all dikes carrying water to the entrance shall not be lower at any point than the top of the lining at the entrance to the structure.
- The lining at the entrance to the structure shall extend the distance H above the lining crest as shown in the drawing above.
- The lining shall be placed beginning at the lower end and proceeding up the slope to the upper end. The lining shall be well compacted and free of voids and have a reasonably smooth surface finish.
- The entrance floor at the upper end of the structure shall be sloped toward the outlet at a rate of 1/4 to 1/2 inch per foot.
- The cutoff walls at the entrance and discharge aprons shall be continuous with the lining.
- The lining shall consist of Portland cement concrete, bituminous concrete, or comparable non-erodible material.
- An energy dissipator of adequate design shall be used at the outlet to prevent erosion.
- Chutes or flumes are divided into two size groups, which have basic dimensions as shown by the tabulation in the drawing above. Each size group has various bottom widths and allowable drainage areas as shown below:

Size	Bottom Width b, feet	Max. D.A. acres	Size	Bottom Width b, feet	Max. D.A. acres
A-2	2	5	B-4	4	14
A-4	4	8	B-6	6	20
A-6	6	11	B-8	8	25
A-8	8	14	B-10	10	31
A-10	10	18	B-12	12	36

If a minimum of 75% of the drainage area will have a good grass or woodland cover throughout the life of the structure, the drainage areas listed above may be increased by 50%. If a minimum of 75% of the drainage area will have a good mulch cover throughout the life of the structure, the drainage areas listed above may be increased by 25%. Structures of size group B shall have their outfall velocity checked for erosion potential downstream.