



TYPE OF OUTLET PROTECTION MATERIAL	MAXIMUM OUTLET VELOCITY (FOR DESIGN STORM)	MINIMUM "T"
CLASS 1	EC-3 TYPE B	6 fps
CLASS 2	CLASS A1 DRY RIPRAP	8 fps
CLASS 3	CLASS I DRY RIPRAP	14 fps
CLASS 4	CLASS II DRY RIPRAP	19 fps

NOTES:

- FOR MULTIPLE LINE INSTALLATIONS, DIMENSION S IS TO GOVERN THE PROTECTION OUTSIDE THE CHANNEL WIDTH (W).
  - ON ANY INSTALLATION REQUIRING CULVERT OUTLET PROTECTION WHERE NO ENDWALL OR ENDSECTION IS SPECIFIED ON THE PLANS, CONSTRUCTION IS TO BE IN ACCORDANCE WITH DETAIL 2 SHOWN ABOVE.
  - GEOTEXTILE FABRIC TO BE INSTALLED UNDER CLASS 2, 3, AND 4 MATERIALS IN ACCORDANCE WITH THE SPECIFICATIONS.
  - S = DIAMETER OF CIRCULAR CULVERT OR SPAN FOR BOX, ELLIPTICAL OR ARCH CULVERT. H = DIAMETER OF CIRCULAR CULVERT OR RISE/HEIGHT FOR BOX, ELLIPTICAL OR ARCH CULVERT.
  - PLAN AND SECTION DETAILS DEPICT CLASS 2, 3, AND 4 MATERIALS. FOR CLASS 1 INSTALLATION DETAILS SEE EC-3 TYPE B STANDARD DRAWING.
- \* USE TYPICAL SECTION SHOWN ON PLANS FOR SIDE SLOPE, BOTTOM WIDTH AND DEPTH OF CHANNEL OR MATCH EXISTING DITCH OR NATURAL GROUND.

OUTLET PROTECTION MINIMUM LENGTH (L)	
TYPE A INSTALLATION	3H
TYPE B INSTALLATION	5H

SPECIFICATION REFERENCE
204
245
303
414

CULVERT OUTLET PROTECTION

VIRGINIA DEPARTMENT OF TRANSPORTATION