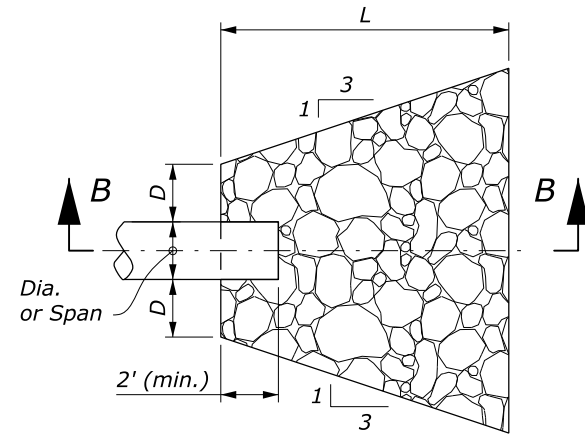


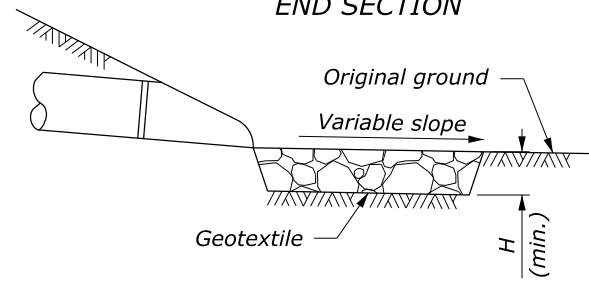
PLAN VIEW

CULVERT WITH STANDARD END SECTION

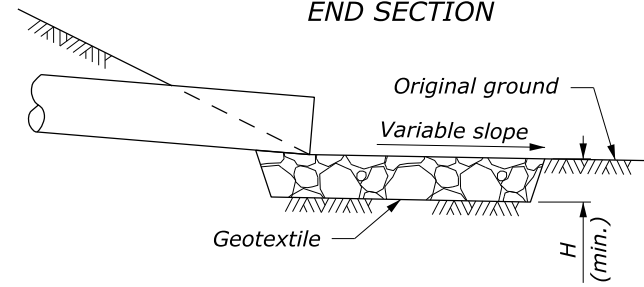


PLAN VIEW

CULVERT WITHOUT STANDARD END SECTION

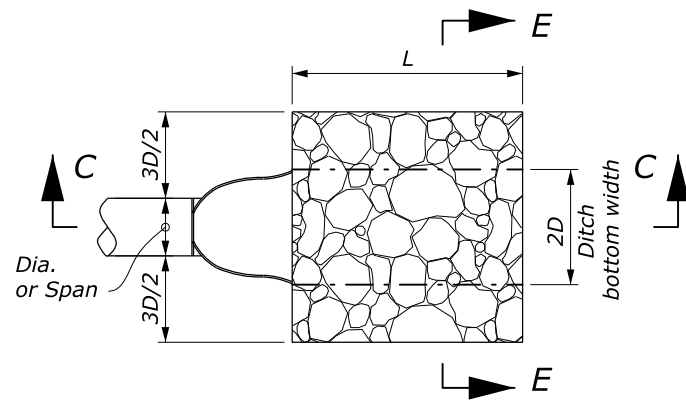


SECTION A-A



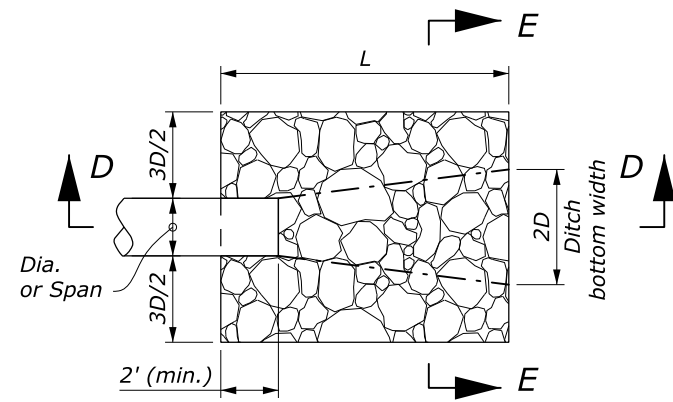
SECTION B-B

**PROTECTIVE APRON AT CULVERT OUTLET WITHOUT DITCH**



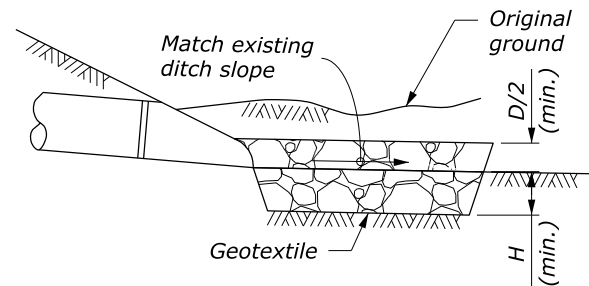
PLAN VIEW

CULVERT WITH STANDARD END SECTION

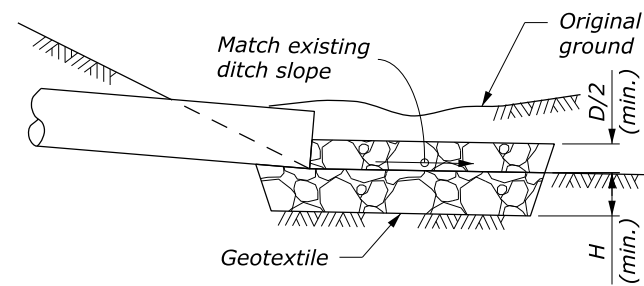


PLAN VIEW

CULVERT WITHOUT STANDARD END SECTION



SECTION C-C



SECTION D-D

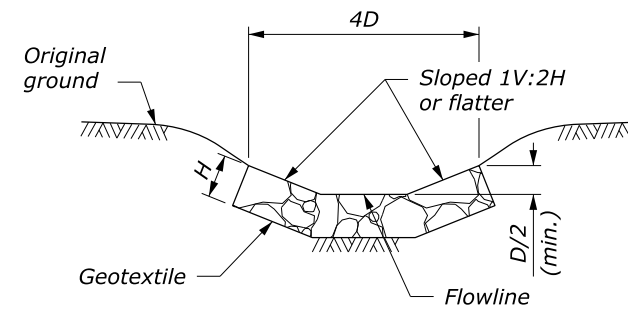
**PROTECTIVE APRON AT CULVERT OUTLET WITH DITCH**

**OUTLET WITHOUT DITCH  
PROTECTIVE APRON DIMENSIONS AND QUANTITIES  
FOR INFORMATION ONLY**

	CULVERT SIZE D (INCHES)	RIPAP CLASS	APRON LENGTH L (FEET)	APRON DEPTH H (INCHES)	ESTIMATED RIPRAP QUANTITY (CUYD)	ESTIMATED GEOTEXTILE QUANTITY (SQYD)
WITH END SECTION	12	2	4	18	1.0	5
	18	2	6	18	2.2	9
	24	2	8	18	3.9	13
	30	3	12.5	24	10.8	27
	36	3	15	24	15.6	37
	42	4	21	30	34.0	63
WITHOUT END SECTION	12	2	6	18	1.7	7
	18	2	8	18	3.2	12
	24	2	10	18	5.2	17
	30	3	14.5	24	13.2	32
	36	3	17	24	18.5	42
	42	4	23	30	38.7	70
48	4	26	30	49.8	86	

**OUTLET WITH DITCH  
PROTECTIVE APRON DIMENSIONS AND QUANTITIES  
FOR INFORMATION ONLY**

	CULVERT SIZE D (INCHES)	RIPAP CLASS	APRON LENGTH L (FEET)	APRON DEPTH H (INCHES)	ESTIMATED RIPRAP QUANTITY (CUYD)	ESTIMATED GEOTEXTILE QUANTITY (SQYD)
WITH END SECTION	12	2	4	18	0.9	4
	18	2	6	18	2.0	8
	24	2	8	18	3.6	12
	30	3	12.5	24	9.3	24
	36	3	15	24	13.3	32
	42	4	21	30	27.2	52
WITHOUT END SECTION	12	2	6	18	1.3	6
	18	2	8	18	2.7	10
	24	2	10	18	4.4	15
	30	3	14.5	24	10.7	27
	36	3	17	24	15.1	36
	42	4	23	30	29.8	56
48	4	26	30	38.5	70	



SECTION E-E

**NOTE:**

1. Use for aprons serving culverts with slopes less than 10%.
2. Furnish separation and stabilization geotextile.
3. Do not measure riprap placement excavation for payment.

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
WESTERN FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY DETAIL

**PLACED RIPRAP AT  
CULVERT OUTLETS**

DETAIL APPROVED FOR USE --/----

REVISID: 8/2016

DETAIL  
W251-1