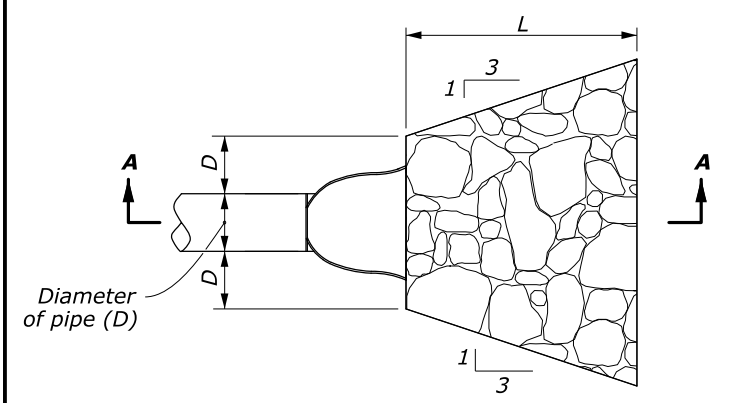
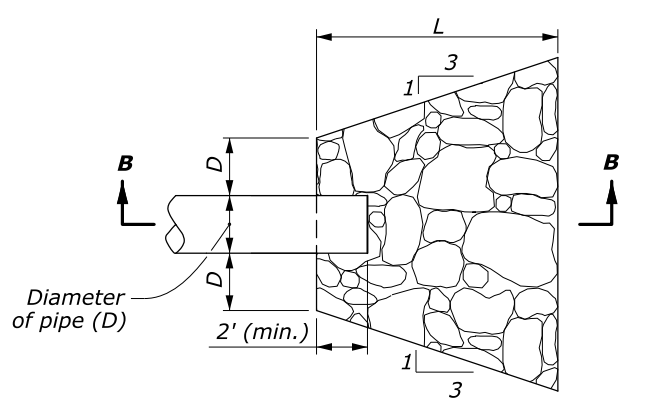


NOTES:

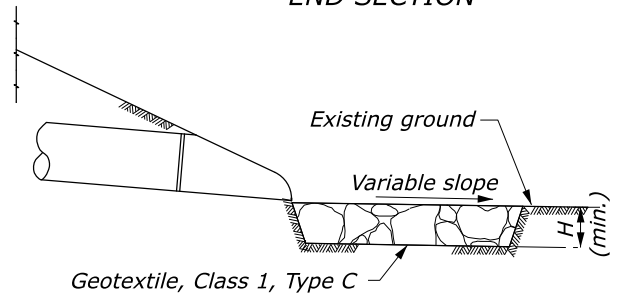
1. Use for aprons serving culverts with slopes of less than 10%.
2. For arch or elliptical pipes, use equivalent diameter for (D) dimension.



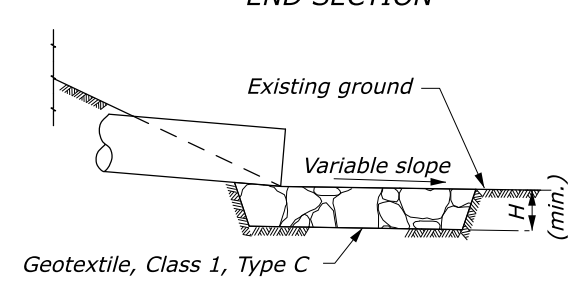
PLAN VIEW
CULVERT WITH STANDARD END SECTION



PLAN VIEW
CULVERT WITHOUT STANDARD END SECTION

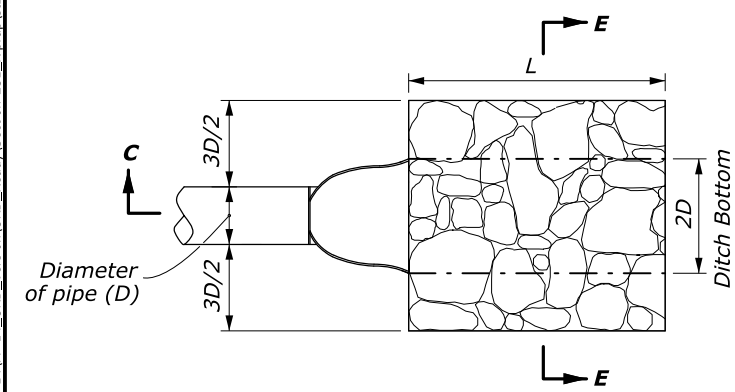


SECTION A-A

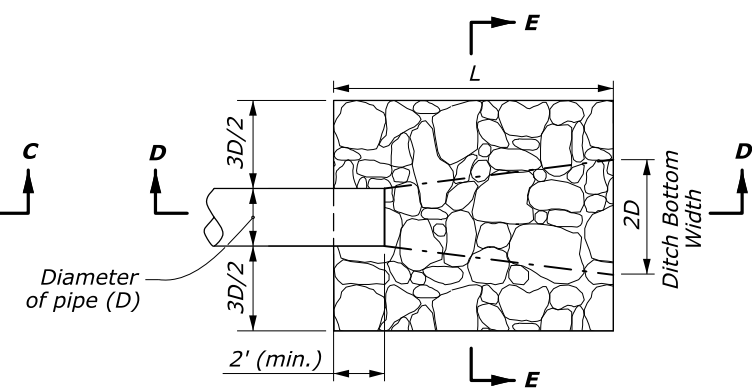


SECTION B-B

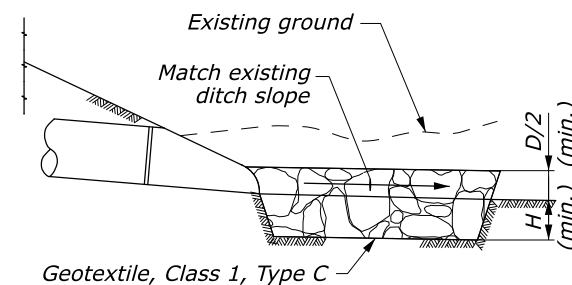
PROTECTIVE APRON AT CULVERT OUTLET WITHOUT DITCH



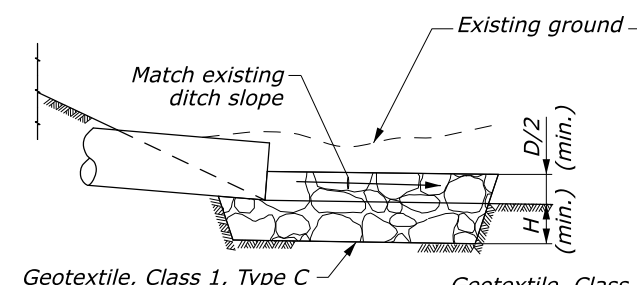
PLAN VIEW
CULVERT WITH STANDARD END SECTION



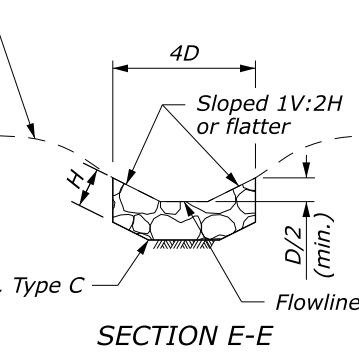
PLAN VIEW
CULVERT WITHOUT STANDARD END SECTION



SECTION C-C



SECTION D-D



SECTION E-E

PROTECTIVE APRON AT CULVERT OUTLET WITH DITCH

OUTLET WITHOUT DITCH TABLE
PROTECTIVE APRON DIMENSIONS AND ESTIMATED QUANTITIES

	CULVERT SIZE (D) INCHES	RIPRAP CLASS	LENGTH OF APRON (L) LNFT	DEPTH OF APRON (H) LNFT	ESTIMATED RIPRAP QUANTITY CUYD	ESTIMATED GEOTEXTILE QUANTITY SQYD
WITH END SECTION	12	2	4	1.5	1	5
	18	2	6	1.5	2.2	9
	24	2	8	1.5	3.9	14
	30	3	12.5	2	10.9	28
	36	3	15	2	15.6	37
	42	4	21	2.5	34.1	63
WITHOUT END SECTION	12	2	6	1.5	1.7	8
	18	2	8	1.5	3.2	12
	24	2	10	1.5	5.2	17
	30	3	14.5	2	13.3	33
	36	3	17	2	18.5	43
	42	4	23	2.5	38.7	70
	48	4	26	2.5	49.8	87

OUTLET WITH DITCH TABLE
PROTECTIVE APRON DIMENSIONS AND ESTIMATED QUANTITIES

	CULVERT SIZE (D) INCHES	RIPRAP CLASS	LENGTH OF APRON (L) LNFT	DEPTH OF APRON (H) LNFT	ESTIMATED RIPRAP QUANTITY CUYD	ESTIMATED GEOTEXTILE QUANTITY SQYD
WITH END SECTION	12	2	4	1.5	0.9	5
	18	2	6	1.5	2	8
	24	2	8	1.5	3.6	13
	30	3	12.5	2	9.3	24
	36	3	15	2	13.4	32
	42	4	21	2.5	27.3	53
WITHOUT END SECTION	12	2	6	1.5	1.4	6
	18	2	8	1.5	2.7	10
	24	2	10	1.5	4.5	15
	30	3	14.5	2	10.8	27
	36	3	17	2	15.2	36
	42	4	23	2.5	29.9	57
	48	4	26	2.5	38.6	70

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

EFLHD DETAIL

PLACED RIPRAP AT CULVERT OUTLETS

DETAIL APPROVED FOR USE
APPROVED: MAY 2017
REVISED: SEPTEMBER 2020

DETAIL
E251-03