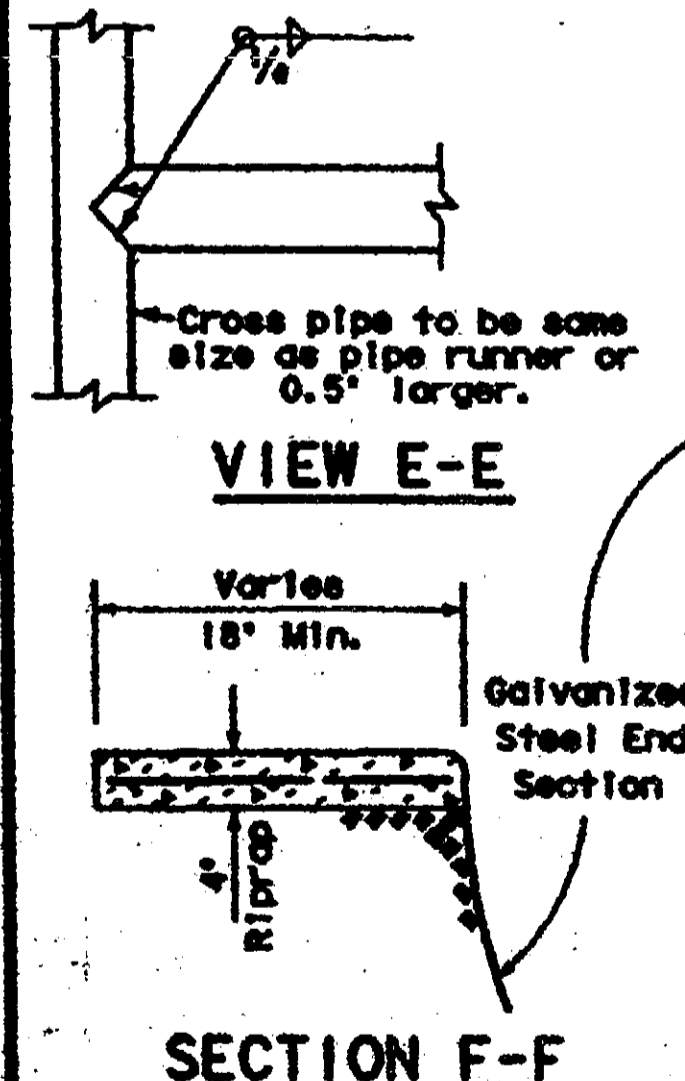
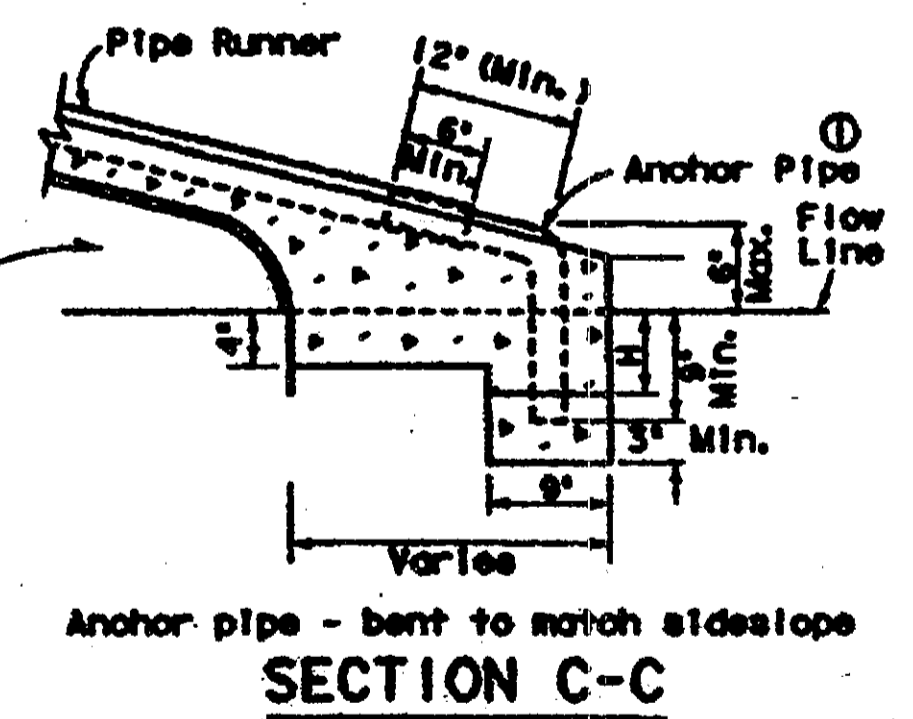


**PLAN VIEW
CROSS DRAINAGE
W/ PIPE RUNNER**

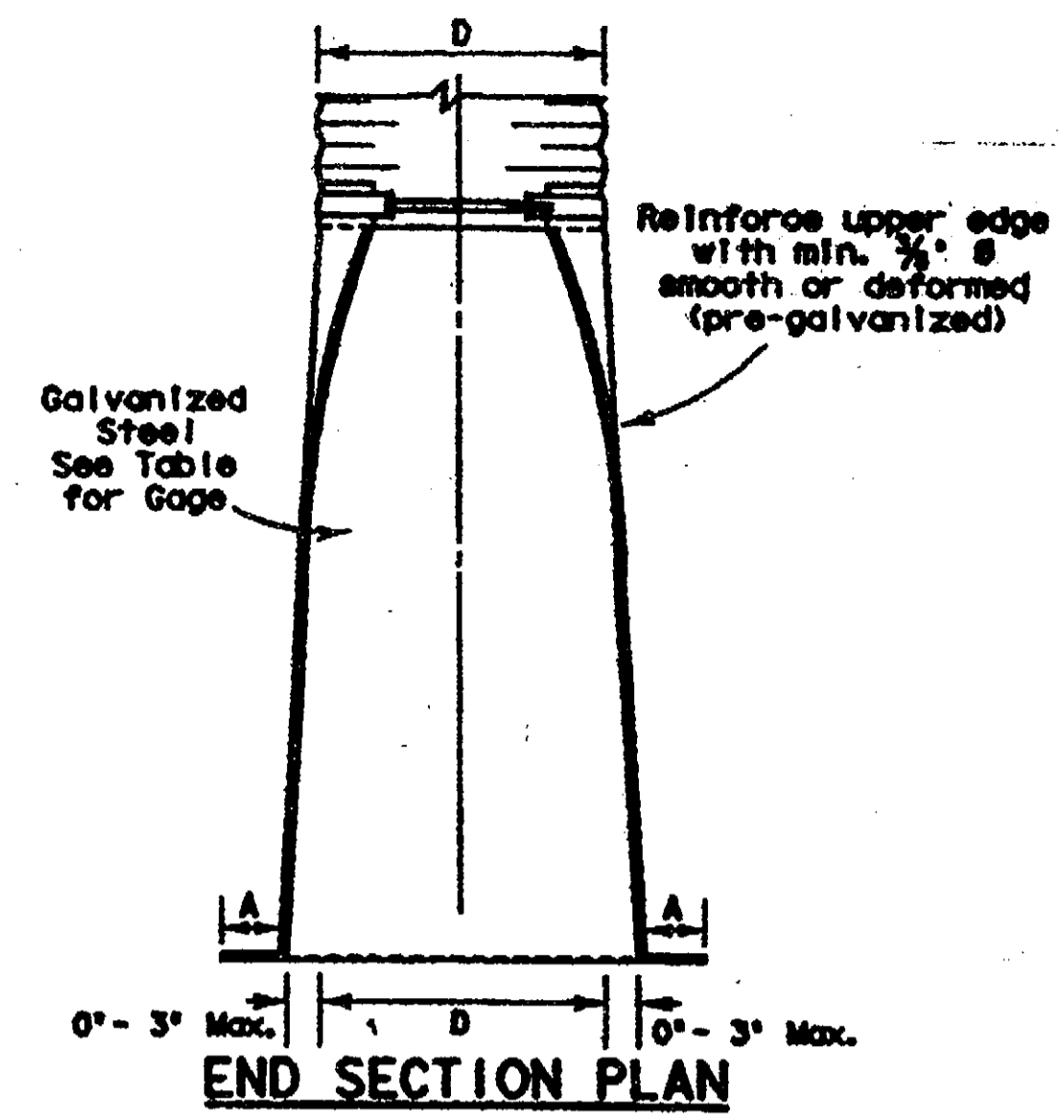


SECTION F-F

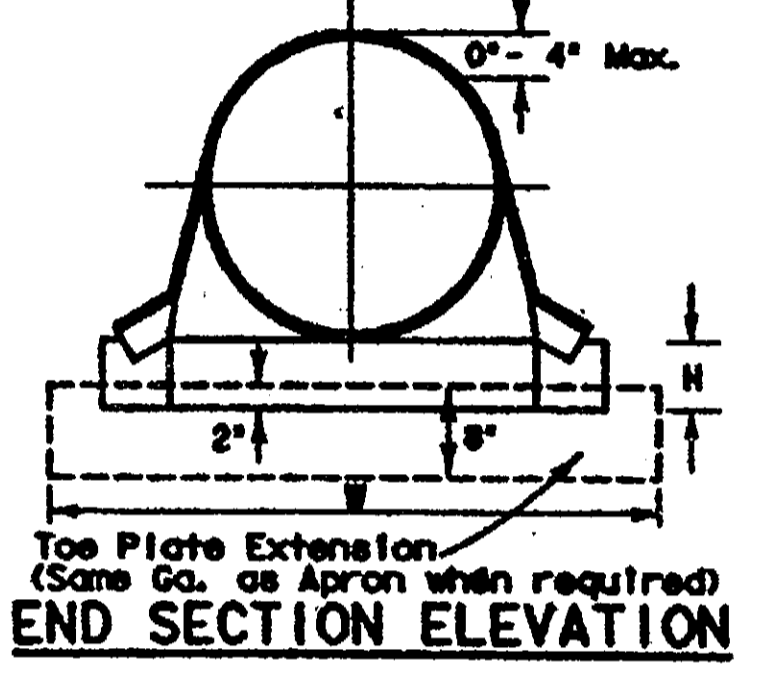


SECTION C-C

L FOR VARIOUS CULVERT SIZES AND SIDE SLOPES				
Slope Size	3:1	4:1	5:1	6:1
D=36"	8'- 2"	10'- 8"	13'- 2"	15'- 9"
D=42"	9'- 9"	12'- 9"	15'- 9"	18'- 9"
D=48"	11'- 4"	14'- 9"	18'- 3"	21'- 10"
D=54"	12'- 11"	16'- 10"	20'- 10"	24'- 10"
D=60"	14'- 6"	18'- 11"	23'- 4"	27'- 11"



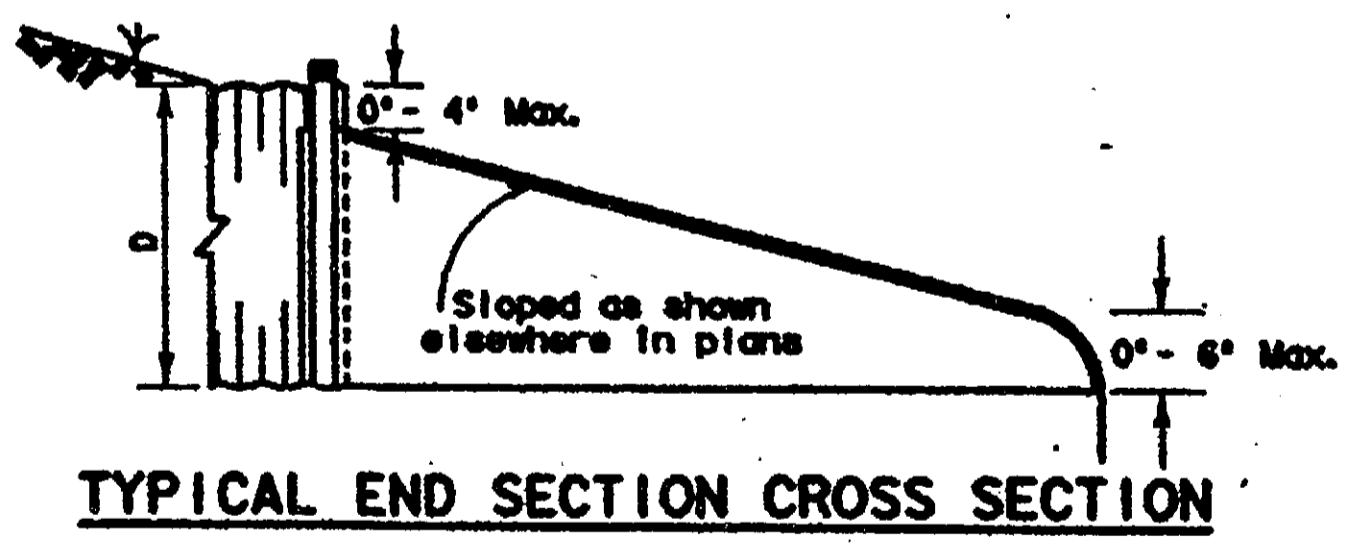
END SECTION PLAN



END SECTION ELEVATION

D	H	A	W	GAGE*
24" & LESS	6"	8"	D+24"	16
30" - 36"	9"	12"	D+32"	14
42" & UP	12"	16"	D+40"	12/10**

* Values shown are minimum requirements.
** All 3-piece apron sections shall have 12 gage sides and 10 gage center panels

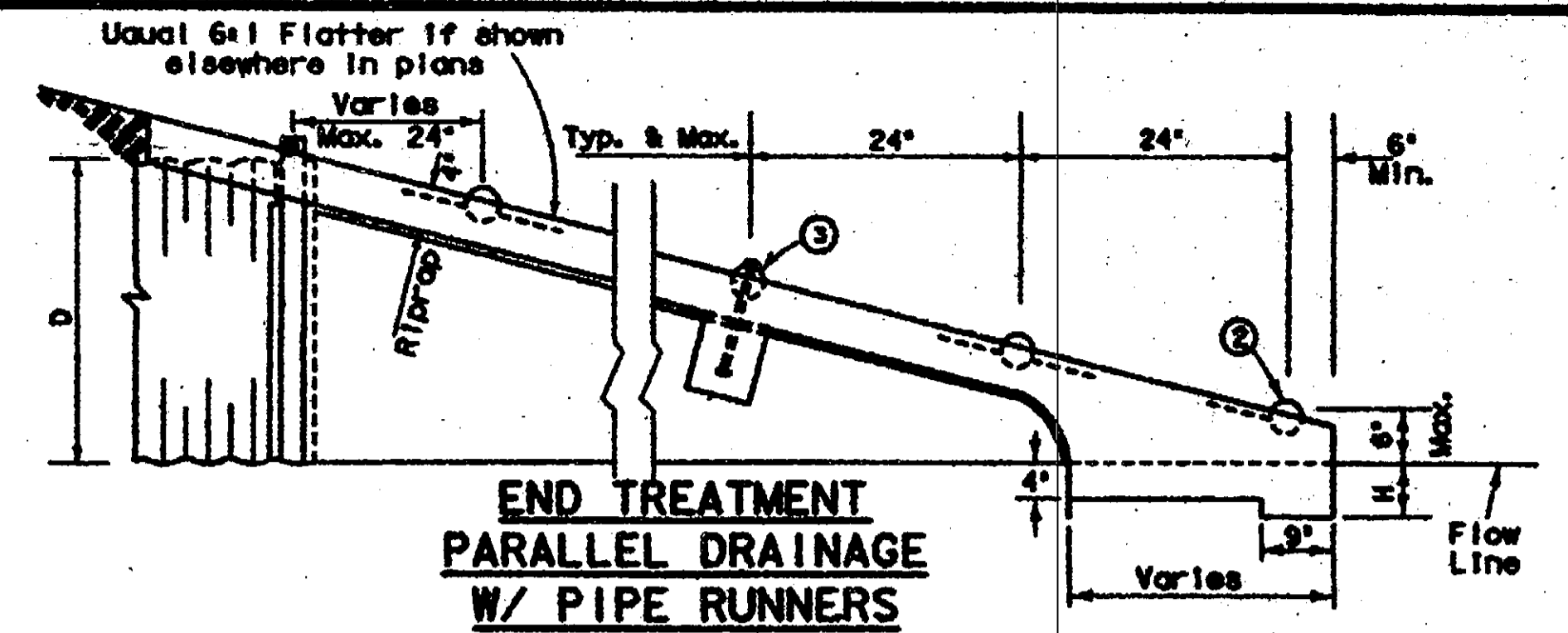


TYPICAL END SECTION CROSS SECTION

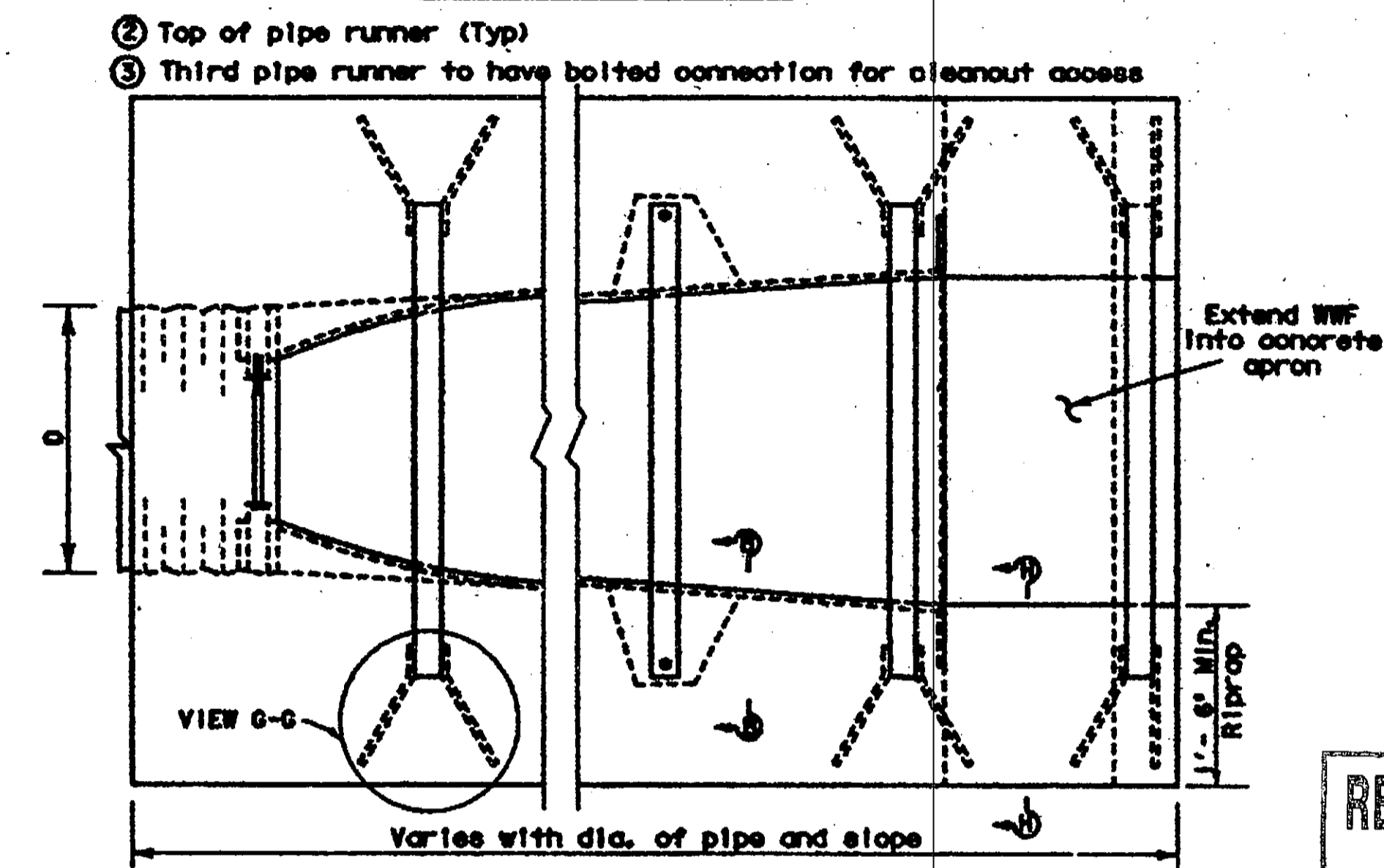
FOR CROSS DRAINAGE

MAXIMUM PIPE L FOR A GIVEN PIPE SIZE AND YIELD			
Yield	35 ksi ASTM A53 Type E & S Gr. B	42 ksi ASTM A500 Gr. B	52 ksi API 5LXS2
3"	11'- 2"	13'- 4"	16'- 7"
3 1/2"	15'- 6"	18'- 7"	23'- 0"
4"	20'- 10"	25'- 0"	30'- 11"
5"	35'- 4"	~	~

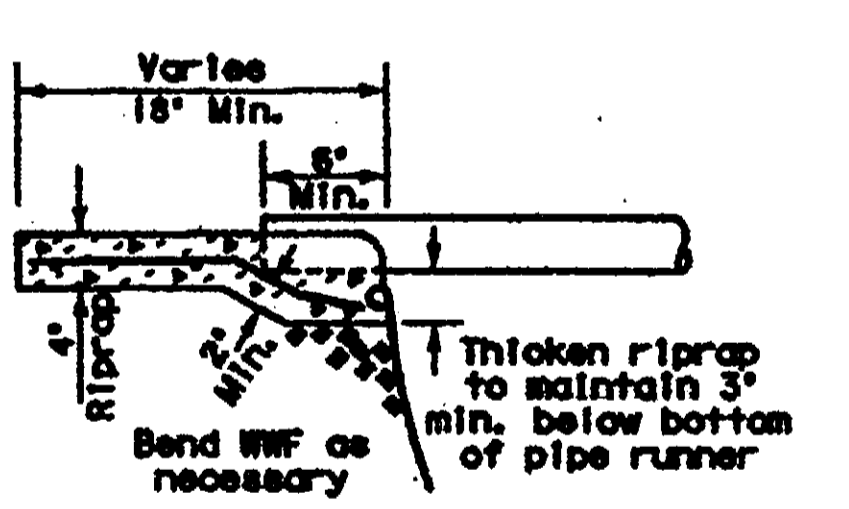
① Anchor Pipe may be any of the above materials and shall have an O.D. of 1/4" to 3/8" less than the I.D. of the Pipe Runners. Anchor Pipe may also be fabricated with standard 90° pipe elbow and nipples.



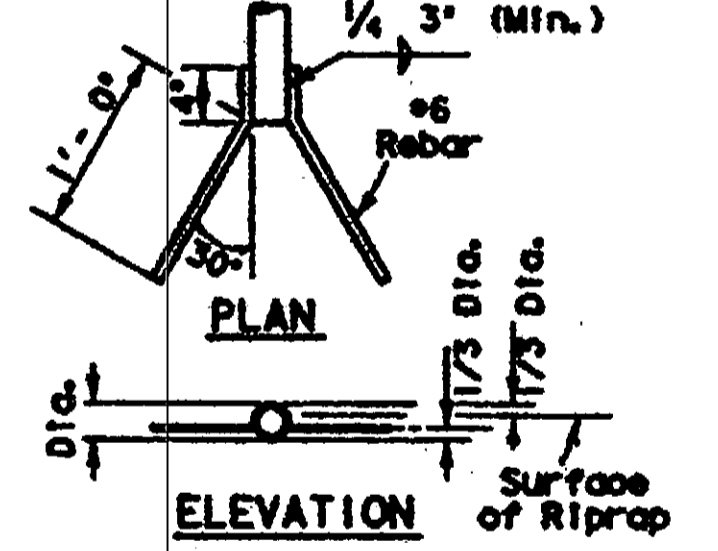
**END TREATMENT
PARALLEL DRAINAGE
W/ PIPE RUNNERS**



**PLAN VIEW
PARALLEL DRAINAGE
W/ PIPE RUNNERS**



SECTION H-H

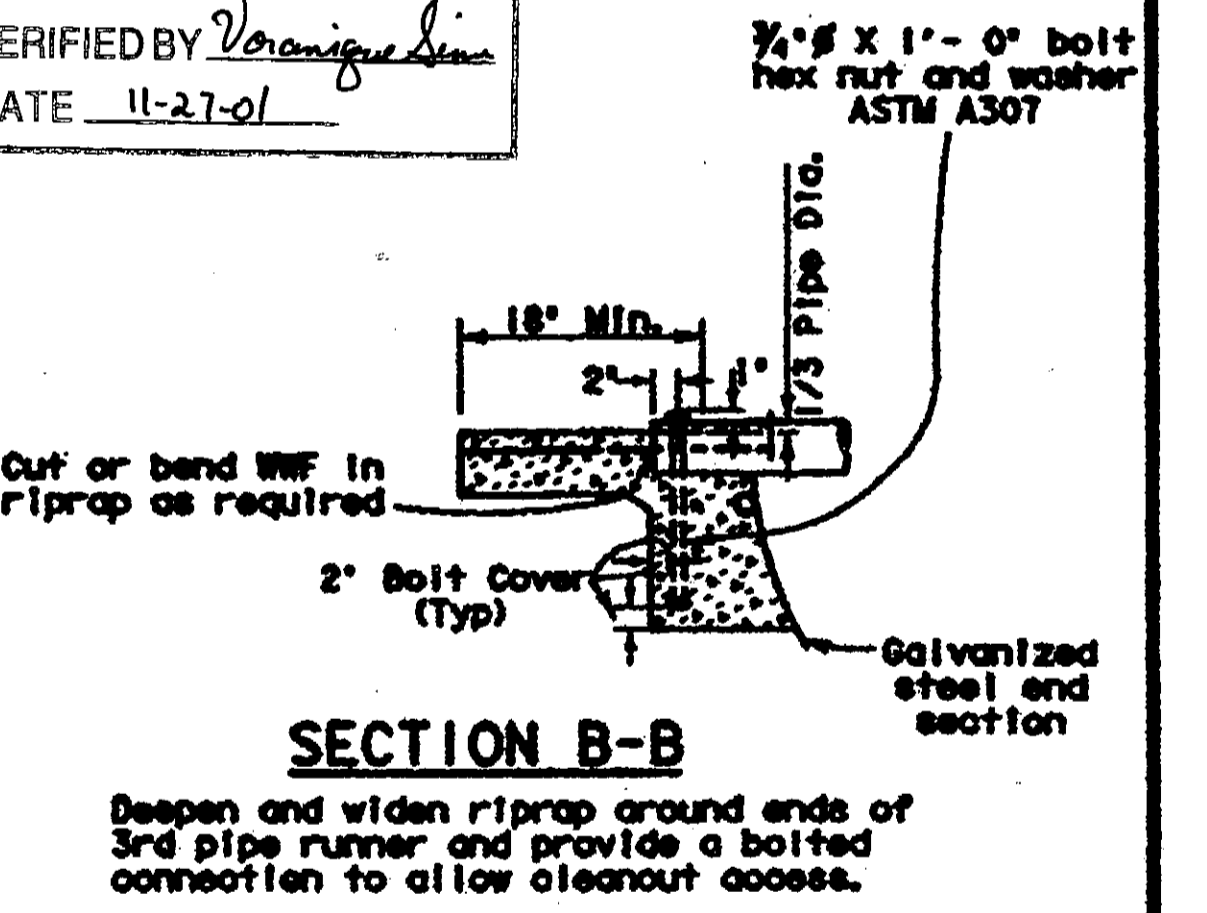


**ELEVATION
VIEW G-G**

FOR PARALLEL DRAINAGE

Culvert Size	Pipe Runner Length	REQUIRED PIPE SIZES FOR GIVEN PIPE YIELD								
		35 ksi ASTM A53 Type E & S Gr. B		42 ksi ASTM A500 Gr. B		52 ksi API 5LXS2				
36"	54'	3" XXS	3,500	2,300	3" XXS	3,500	2,300	3" XXS	3,500	2,900
		3 1/2" XS	4,000	3,364	3 1/2" XS	4,000	3,364	3 1/2" Std.	4,000	3,548
		4" Std.	4,800	4,026	4" Std.	4,800	4,026			
42"	60'	3" XXS	3,500	2,300	3" XXS	3,500	2,300	3" XXS	3,500	2,300
		3 1/2" XS	4,500	3,826	3 1/2" XS	4,000	3,364	3 1/2" Std.	4,000	3,548
		4" Std.	4,800	4,026	4" Std.	4,800	4,026			
48"	66'	4" XS	4,500	3,826	3" XXS	3,500	2,300	3" XXS	3,500	2,300
		5" Std.	5,563	5,047	4" Std.	4,800	4,026	3 1/2" XS	4,000	3,364
					4" Std.	4,800	4,026			
54"	72'	4" XS	4,800	3,826	4" XS	4,800	3,826	3" XXS	3,500	2,300
		5" Std.	5,563	5,047	5" Std.	5,563	5,047	3 1/2" XS	4,000	3,364
					4" Std.	4,800	4,026			
60"	78'	4" XXS	4,800	3,826	4" XS	4,800	3,826	3" XXS	3,500	2,300
		5" Std.	5,563	5,047	5" Std.	5,563	5,047	3 1/2" XS	4,000	3,364
					4" Std.	4,800	4,026			

RECORD DRAWING
VERIFIED BY *V. Vanique*
DATE 11-27-01



SECTION B-B

Deepen and widen riprap around ends of 3rd pipe runner and provide a bolted connection to allow cleanout access.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

PREFABRICATED GALVANIZED STEEL SAFETY END TREATMENT-TYPE II

GS-ES

REVISIONS: Oct. 1985
Rev. 7-95(Added Type)

DESIGNED BY: []
CHECKED BY: []
DATE: []