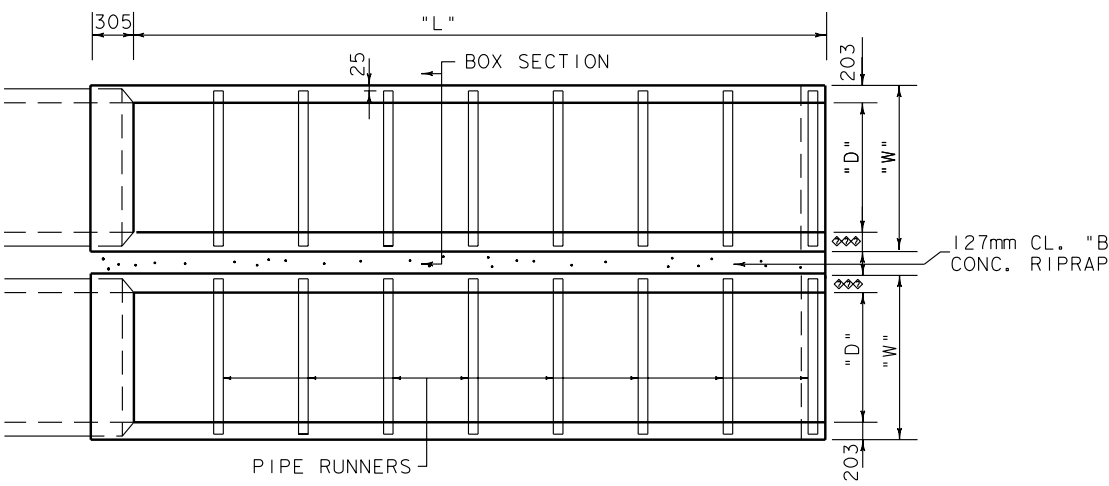
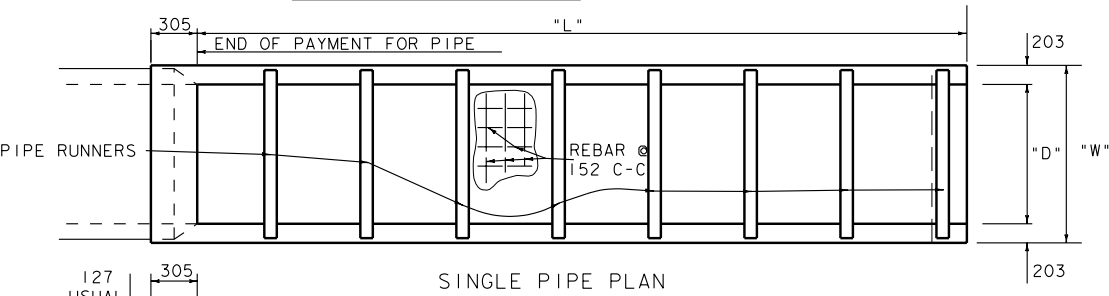


"D"	SLOPE	"L"	"W"	CL "A" CONC. (m ³)	125mm CL. B CONC RIPRAP (m ³)	PIPE RUNNERS	
						LENGTH	NO.
825	1:6	5448	1244	2.54 (N)	0.11 (N-1)	1194	10
825	1:8	7366	1244	3.36 (N)	0.14 (N-1)	1194	13
900	1:6	5944	1320	2.94 (N)	0.15 (N-1)	1270	10
900	1:8	8026	1320	3.88 (N)	0.19 (N-1)	1270	14
1050	1:6	6934	1473	3.81 (N)	0.24 (N-1)	1422	12
1050	1:8	9347	1473	5.04 (N)	0.31 (N-1)	1422	16
1200	1:6	7925	1625	4.80 (N)	0.35 (N-1)	1575	14
1200	1:8	10668	1625	6.35 (N)	0.47 (N-1)	1575	18
1350	1:6	8915	1778	5.89 (N)	0.54 (N-1)	1727	15
1350	1:8	11989	1778	7.81 (N)	0.72 (N-1)	1727	20
1500	1:6	9906	1930	7.10 (N)	0.67 (N-1)	1880	17
1500	1:8	13310	1930	9.42 (N)	0.89 (N-1)	1880	22

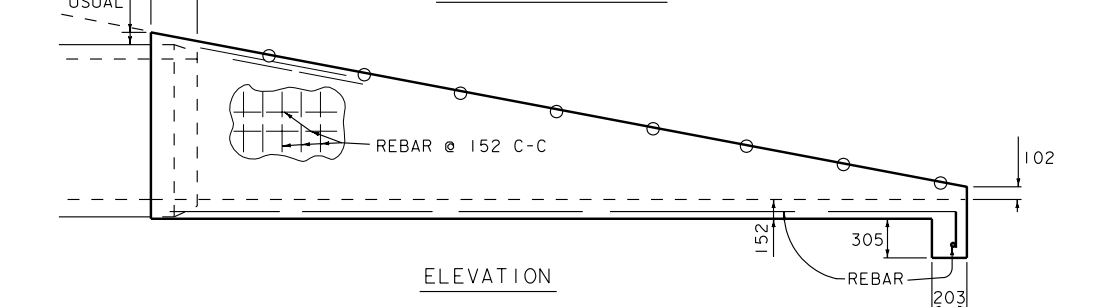
NOTE: "N" = # OF CULVERT PIPES



MULTIPLE PIPE PLAN

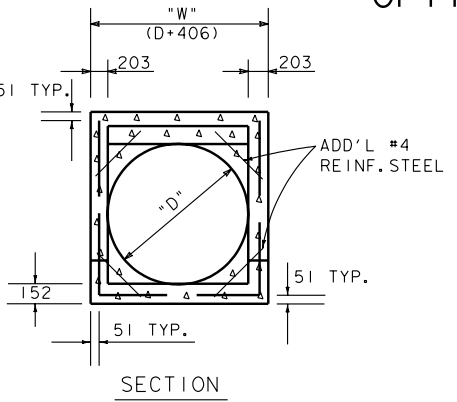


SINGLE PIPE PLAN

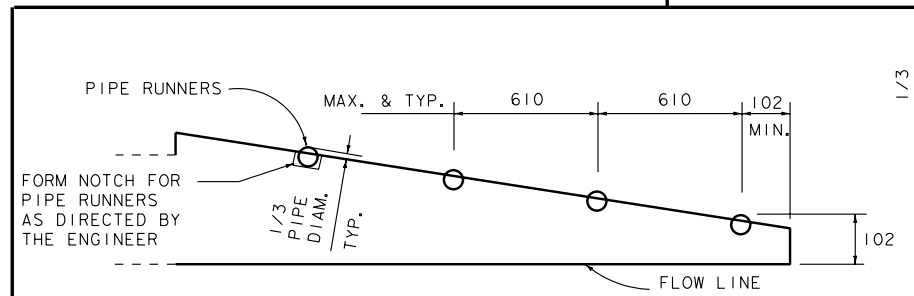


ELEVATION

SLOPED CLASS "A" CONCRETE BOX
OPTION TWO

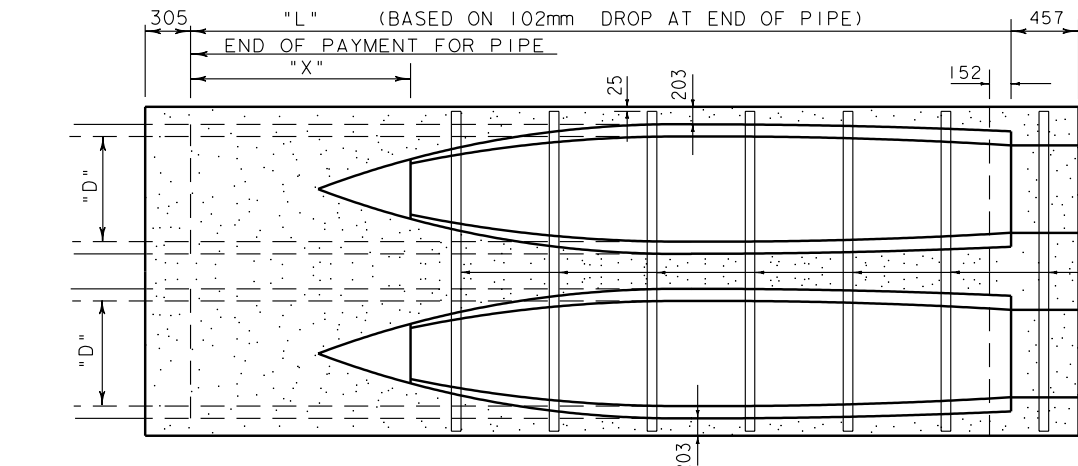


SECTION

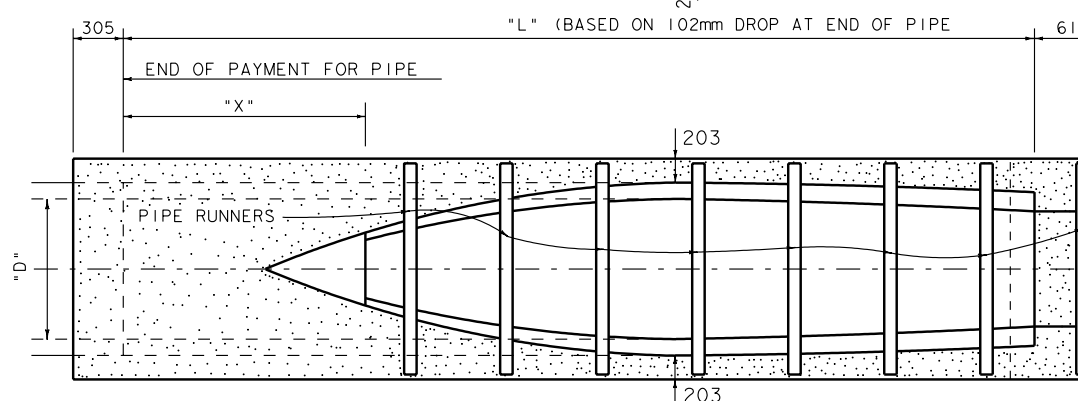


TYPICAL PLACEMENT FOR PIPE RUNNERS
(ALL OPTIONS)

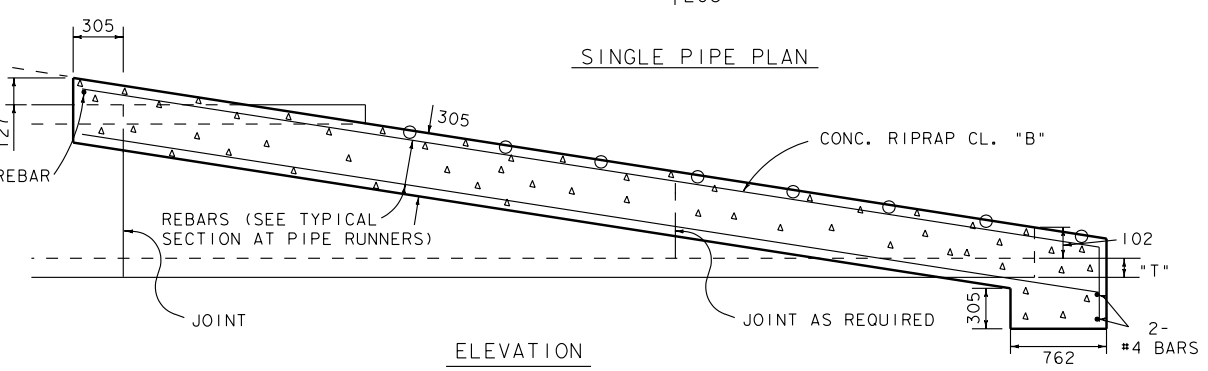
"D"	SLOPE	"T"	"L"	"X"	"W"	SINGLE PIPE		MULTIPLE PIPES N=# OF CULVERT PIPES		PIPE RUNNERS	
						CL "B" RIPRAP	"W" (mm)	CL "B" RIPRAP (m ³)	LENGTH	NO.	
825	1:6	95	5448	1029	1434	1.67m ³	1384(N)+51	0.109+1.565(N)	"W-51"	9	
825	1:8	95	7366	1473	1434	2.06m ³	1384(N)+51	0.139+1.921(N)	"W-51"	11	
900	1:6	102	5944	1067	1524	1.84m ³	1499(N)+25	0.058+1.775(N)	"W-51"	9	
900	1:8	102	8026	1524	1524	2.26m ³	1499(N)+25	0.074+2.186(N)	"W-51"	12	
1050	1:6	114	6934	1143	1701	2.16m ³	1727(N)-25	-0.06+2.230(N)	"W-51"	11	
1050	1:8	114	9347	1626	1701	2.68m ³	1727(N)-25	-0.08+2.764(N)	"W-51"	14	
1200	1:6	127	7925	1219	1879	2.52m ³	1956(N)-76	-0.22+2.735(N)	"W-51"	12	
1200	1:8	127	10668	1727	1879	3.12m ³	1956(N)-76	-0.28+3.454(N)	"W-51"	16	
1350	1:6	140	8915	1295	2058	2.88m ³	2235(N)-178	-0.97+3.454(N)	"W-51"	14	
1350	1:8	140	11989	1829	2058	3.59m ³	2235(N)-178	-0.73+4.331(N)	"W-51"	18	
1500	1:6	152	9906	1372	2234	3.27m ³	2438(N)-203	-0.71+3.987(N)	"W-51"	15	
1500	1:8	152	13310	1930	2234	4.08m ³	2438(N)-203	-0.93+5.014(N)	"W-51"	20	



MULTIPLE PIPES
PLAN

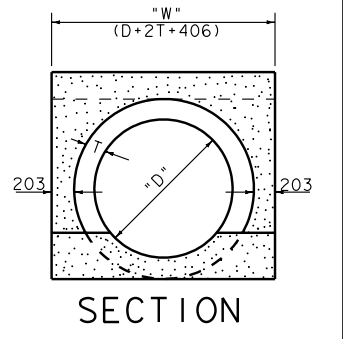


SINGLE PIPE PLAN



ELEVATION

CULVERT SIZE	REQUIRED PIPE RUNNER SIZES FOR GIVEN PIPE YIELD											
	35 ksi ASTM A53, TY. E & S GR. B				42 ksi ASTM A500, GR. B				52 ksi API 5LX52			
	NOM.	OD (in)	ID (in)	WT (lb)	NOM.	OD (in)	ID (in)	WT (lb)	NOM.	OD (in)	ID (in)	WT (lb)
825 OR 900	3"XS 3 1/2"XS	3.500 4.000	2.300 3.364	3"XS 3 1/2"Std	3.500 4.000	2.900 3.548	3"XS 3 1/2"Std	3.500 4.000	3"XS 3 1/2"Std	3.500 4.000	2.900 3.548	3"XS 3 1/2"Std
1050	3"XS 3 1/2"XS 4"Std	3.500 4.000 4.500	2.300 3.364 4.026	3"XS 3 1/2"XS 4"Std	3.500 4.000 4.500	2.300 3.364 4.026	3"XS 3 1/2"Std	3.500 4.000 4.500	3"XS 3 1/2"Std	3.500 4.000 4.500	2.300 3.548 4.026	3"XS 3 1/2"Std
1200	3"XS 4"XS	3.500 4.500	2.300 3.826	3"XS 3 1/2"XS 4"Std	3.500 4.000 4.500	2.300 3.364 4.026	3"XS 3 1/2"Std	3.500 4.000 4.500	3"XS 3 1/2"Std	3.500 4.000 4.500	2.300 3.548 4.026	3"XS 3 1/2"Std
1350	4"XS 5"Std	4.500 5.563	3.826 5.047	3"XS 4"Std	3.500 4.500	2.300 4.026	3"XS 3 1/2"Std	3.500 4.000 4.500	3"XS 3 1/2"Std	3.500 4.000 4.500	2.300 3.548 4.026	3"XS 3 1/2"Std
1500	4"XS 5"Std	4.500 5.563	3.826 5.047	4"XS 5"Std	4.500 5.563	3.826 5.047	3"XS 3 1/2"Std	3.500 4.000 4.500	3"XS 3 1/2"Std	3.500 4.000 4.500	2.300 3.548 4.026	3"XS 3 1/2"Std



SECTION

SLOPED REINFORCED CONCRETE PIPE
OPTION ONE

GENERAL NOTES:

- ALL MITERED PIPE SECTIONS, REINFORCING STEEL, BOLTS, NUTS, WASHERS, CONCRETE AND PIPE RUNNERS ARE CONSIDERED PARTS OF THE SAFETY END TREATMENT FOR PAYMENT.
- ALL REBARS ARE #4. UNLESS NOTED ALL REBARS SHALL HAVE 38mm MINIMUM COVER.
- DESIGN: SAFETY PIPE RUNNERS ARE DESIGNED FOR A TRAVERSING LOAD OF 4536 kg AT YIELD AS RECOMMENDED BY RESEARCH REPORT 280-2F, SAFETY TREATMENT OF ROADSIDE PARALLEL DRAINAGE STRUCTURES, TEXAS TRANSPORTATION INSTITUTE, JUNE 1981.
- PIPE RUNNERS MAY BE SIMPLE SPAN OR CONTINUOUS ACROSS MULTIPLE PIPES. ADEQUATE SUPPORT AND ANCHORAGE FOR PIPE RUNNERS SHALL BE PROVIDED AS SHOWN ON THIS SHEET AND AS DIRECTED BY THE ENGINEER.
- QUANTITIES IN ABOVE TABLES ARE SHOWN FOR CONTRACTOR'S INFORMATION ONLY.

REVISIONS:

Texas Department of Transportation

TYPE II SAFETY END TREATMENT PARALLEL DRAINAGE
838mm TO 1524mm
SINGLE OR MULTIPLE PIPES
SET (2) (FW) (M)

ORIG DRAW DATE: FEB. 1996

DESIGN: []
CHECKED: []
DRAWN: []
CHECKED: []

FED. REG. 6
DISTRICT []

STATE TEXAS
COUNTY []

FEDERAL AID PROJ NO. []
CONTROL SECTION []

HIGHWAY []
JOB []
SHEET []

7/0011c/me/std/set2.fwm.dgn