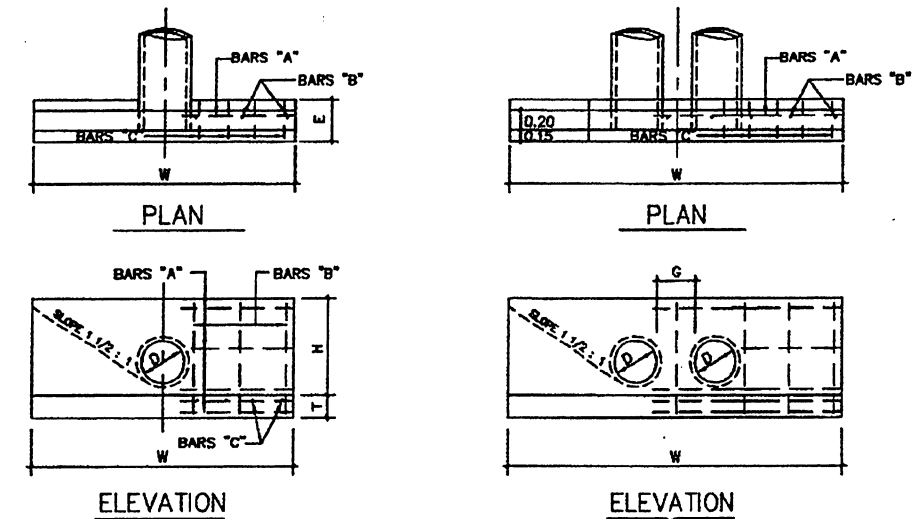


TABLE OF DIMENSIONS AND APPROXIMATE QUANTITIES FOR TYPE "B" HEADWALLS

NO. OF PIPES	DIA.	TABLE OF DIMENSIONS					BILL OF REINFORCING STEEL & QUANTITIES FOR ONE HEADWALL																
		W	X	H	L	G	5/8" # BAR "A" @ 0.30M C/C		3/8" # BAR "B" @ 0.48M C/C		3/8" # BAR "C" @ 0.30M C/C		3/8" BARS "D"		5/8" BARS "E"		3/8" # BAR "F"		STEEL (LBS.)	CONC. (C.M.)	MORTAR (C.M.)		
							NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH				NO.	LENGTH
2	18"	2.25	1.89	1.91	0.48	0.30	2	2.79	2	2.84	4	0.99	2	0.81	2	1.57	2	0.97	2	2.13	40	0.77	2
3	18"	3.01	2.45	0.91	0.48	0.30	3	3.55	3	3.60	6	0.99	2	0.81	2	2.33	2	0.97	2	2.89	50	1.14	3
2	24"	2.95	2.12	1.07	0.71	0.43	3	3.51	3	3.56	7	1.22	2	0.91	2	2.01	2	1.12	2	2.84	67	0.95	2
3	24"	3.98	3.15	1.07	0.71	0.43	4	4.54	4	4.59	9	1.22	2	0.91	2	3.04	2	1.12	2	3.87	83	1.42	3
2	30"	2.58	2.50	1.22	0.94	0.51	3	4.14	3	4.19	7	1.45	4	0.91	2	2.39	2	1.27	2	3.48	81	1.31	2
3	30"	4.85	3.77	1.22	0.94	0.51	4	5.41	4	5.46	8	1.45	2	0.80	4	0.91	2	1.27	2	4.75	100	1.79	2
2	36"	4.23	2.88	1.37	1.17	0.58	3	4.80	3	4.85	7	1.68	2	0.74	4	0.91	2	1.42	2	3.20	110	1.72	2
3	36"	5.73	4.38	1.37	1.17	0.58	4	6.30	4	6.35	10	1.68	2	0.84	4	0.91	2	1.42	2	5.61	144	2.34	3
1	42"	3.16	1.54	1.52	1.40		3	3.71	3	3.76	4	1.91	2	1.02	6	0.91	2	1.58	2	3.05	90	1.40	2
2	42"	4.88	3.28	1.52	1.40	0.66	3	5.44	3	5.49	8	1.91	2	0.99	6	0.91	2	1.58	2	4.78	128	2.20	2
3	42"	6.60	4.99	1.52	1.40	0.66	4	7.16	4	7.21	12	1.91	2	0.81	6	0.91	2	1.58	2	6.50	166	3.00	3
1	48"	3.57	1.69	1.68	1.63		3	4.11	3	4.21	5	2.13	2	1.04	6	0.91	2	1.58	2	3.46	115	1.72	2
2	48"	5.52	3.65	1.68	1.63	0.74	3	6.07	3	6.12	9	2.13	2	0.99	6	0.91	2	1.58	2	5.41	167	2.68	3
3	48"	7.48	5.59	1.68	1.63	0.74	4	8.03	4	8.08	12	2.13	2	1.63	6	0.91	2	1.58	2	7.37	217	3.64	4
1	54"	3.89	1.87	1.83	1.85		3	4.50	3	4.56	4	2.45	2	1.70	6	1.33	2	1.77	2	3.80	128	2.10	3
2	54"	6.07	4.05	1.83	1.85	0.81	3	6.68	3	6.74	10	2.45	2	1.70	6	1.33	2	1.77	2	5.98	218	3.63	3
3	54"	8.25	6.23	1.83	1.85	0.81	4	8.86	4	8.92	15	2.45	2	1.70	6	1.33	2	1.77	2	8.16	308	5.15	4
1	60"	4.48	2.04	1.98	2.06		3	5.42	3	5.48	5	2.50	2	1.95	8	1.00	2	2.62	2	4.40	184	2.52	3
2	60"	6.81	4.40	1.98	2.06	0.89	3	7.78	3	7.84	9	2.50	2	1.95	8	1.00	2	2.62	2	6.70	250	3.88	4
3	60"	9.44	7.00	1.98	2.06	0.89	4	10.88	4	10.94	15	2.50	2	1.95	8	1.00	2	2.62	2	9.35	347	5.36	6
1	72"	5.23	2.30	2.29	2.54		3	6.08	3	6.14	5	3.00	2	1.77	10	1.07	2	2.24	2	5.12	265	3.38	3
2	72"	8.10	5.17	2.29	2.54	1.04	3	8.92	3	8.98	11	3.00	2	1.91	10	1.07	2	2.24	2	8.00	385	5.25	5
3	72"	10.9	8.04	2.29	2.54	1.04	4	11.88	4	11.94	17	3.25	2	2.16	10	1.07	2	2.24	2	10.90	517	7.11	7
1	84"	5.60	2.69	2.54	2.91		3	6.08	3	6.14	4	3.70	2	1.91	8	1.10	2	2.60	2	5.50	291	4.70	5
2	84"	9.48	6.10	2.56	2.94	1.20	3	10.10	3	10.16	14	3.70	2	2.16	8	1.10	2	2.60	2	9.40	610	7.20	6
3	84"	12.81	9.43	2.54	2.91	1.20	4	13.43	4	13.49	18	3.70	2	2.95	10	1.10	2	2.60	2	12.73	915	11.97	8

- NOTES:
- 1- PORTLAND CEMENT CONCRETE SHALL BE CLASS A.
 - 2- IN SUCH CASES WHEN THE PIPE IS NOT PERPENDICULAR TO THE HEADWALL AND/OR IF THE NUMBER OF PIPES EXCEED THOSE TABULATED, THE CONTRACTOR SHALL MODIFY THE DIMENSIONS AND QUANTITIES AS REQUIRED AND SUCH ADJUSTMENTS MUST BE APPROVED BY THE ENGINEER.
 - 3- THE CONTRACTOR IS RESPONSIBLE TO ADJUST THE GRADING WHEN SLOPES ARE DIFFERENT TO THE SLOPES SHOWN IN THIS PLAN.
 - 4- REINFORCING STEEL SHALL BE GRADE 60, ASSHTO M-31 OR M-31M.

HEADWALL TYPE B DETAILS



HEADWALL TYPE A DETAILS

TABLE OF DIMENSIONS AND APPROXIMATE QUANTITIES FOR TYPE "A" HEADWALLS

NO. OF PIPES	DIA.	TABLE OF DIMENSIONS					BILL OF REINFORCING STEEL & QUANTITIES FOR ONE HEADWALL												
		W	H	E	T	G	5/8" # BAR "A" @ 0.48M C/C		1/2" # BAR "B" @ 0.30M C/C		1/2" # BAR "C" @ 0.30M C/C		3/8" BARS "D"		5/8" BARS "E"		STEEL (LBS.)	CONC. (C.M.)	MORTAR (C.M.)
							NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH			
2	18"	3.24	1.07	0.46	0.23	0.40	3	2.64	2	0.76	6	1.50	10	0.38	40	0.83	1		
3	18"	3.64	1.07	0.46	0.23	0.40	3	3.04	2	0.76	7	1.50	12	0.38	48	0.86	1		
2	24"	3.98	1.22	0.56	0.23	0.43	4	3.89	2	0.99	9	1.65	13	0.48	61	1.34	2		
3	24"	4.41	1.22	0.56	0.23	0.43	4	4.32	2	0.99	8	1.65	14	0.48	68	1.50	2		
2	30"	4.83	1.37	0.61	0.23	0.51	3	4.73	4	1.20	9	1.81	16	0.53	82	1.77	2		
3	30"	5.34	1.37	0.61	0.23	0.51	3	5.24	4	1.20	10	1.81	17	0.53	85	1.88	3		
2	36"	5.68	1.52	0.71	0.30	0.59	3	5.57	4	1.40	11	2.03	19	0.63	124	2.61	3		
3	36"	7.17	1.52	0.71	0.30	0.59	3	7.06	4	1.40	12	2.03	24	0.63	144	3.21	4		
1	42"	4.77	1.68	0.76	0.3		4	4.67	4	1.58	12	2.19	16	0.69	135	2.48	3		
2	42"	6.50	1.68	0.76	0.30	0.66	4	6.40	4	1.58	13	2.19	22	0.69	181	3.22	4		
3	42"	8.24	1.68	0.76	0.30	0.66	4	8.14	4	1.58	14	2.19	27	0.69	185	3.97	5		
1	48"	5.38	1.63	0.86	0.30		3	5.28	6	1.78	12	2.34	18	0.79	151	3.10	4		
2	48"	7.34	1.63	0.86	0.30	0.74	3	7.24	6	1.78	13	2.34	24	0.79	178	4.01	5		
3	48"	9.30	1.63	0.86	0.30	0.74	3	9.20	6	1.78	14	2.34	31	0.79	206	4.93	6		

EFFECTIVE DATE: DECEMBER 1998

COMMONWEALTH OF PUERTO RICO
DEPARTMENT OF TRANSPORTATION
AND PUBLIC WORKS
HIGHWAY AND TRANSPORTATION AUTHORITY

DRAINAGE REINFORCED CONCRETE HEADWALLS TYPE "A" & "B"

RECOMMENDED BY: *[Signature]*
DESIGN AREA DIRECTOR
DATE: *12-1-98*

APPROVED BY: *[Signature]*
EXECUTIVE DIRECTOR
DATE: *12-1-98*

APPROVED BY: *[Signature]*
DIV. ADM. FHWA-PR DIVISION
DATE: *12-1-98*

DATE	REVISION	BY
12-1998	PAGE RENUMBERED	LV.

STD. DR
DWG. 21 of 40