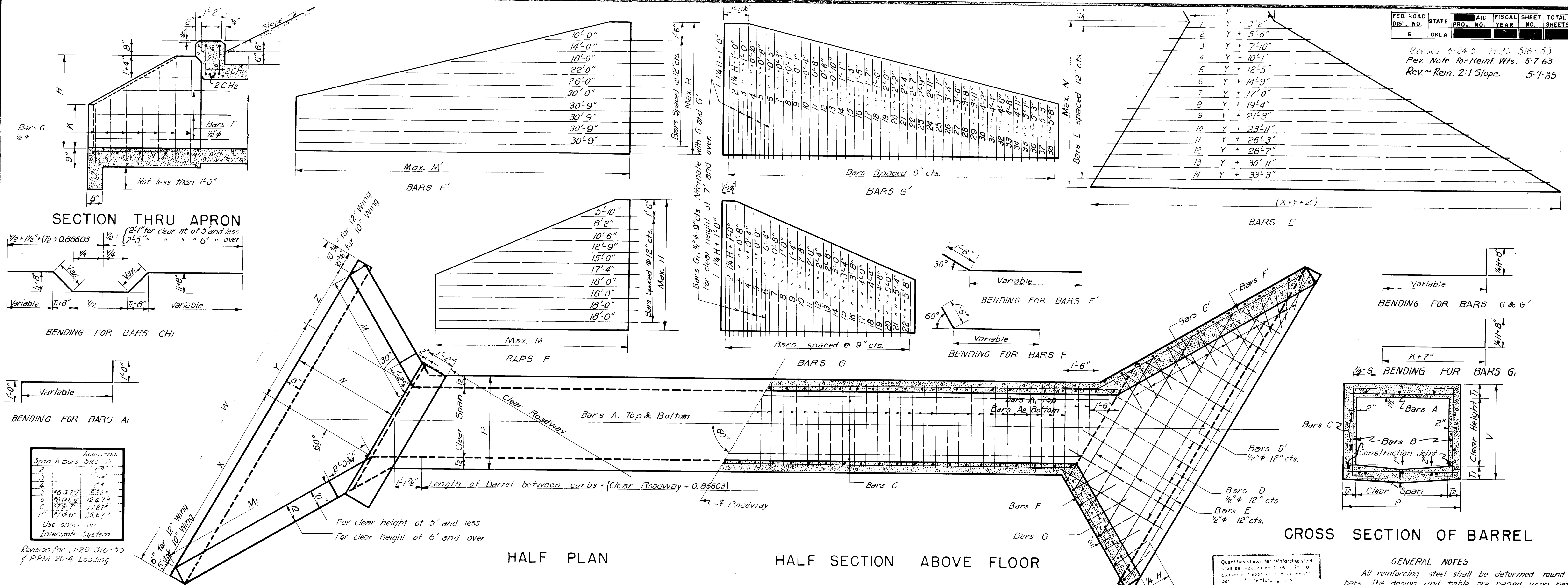


Revised 6-24-53 14-25 516-53
 Rev. Note for Reinf. Wts. 5-7-63
 Rev. ~ Rem. 2:1 Slope. 5-7-85



DESIGN NO.	WATERWAY	BARREL OF CULVERT										TWO WINGS AND ONE APRON										TWO CURBS			TOTAL QUANTITIES		DESIGN NO.													
		DIMENSIONS					REINFORCING STEEL					DIMENSIONS					REINFORCING STEEL					QUANTITIES			QUANTITIES															
		Clear Span	Clear Height	Area of Opening	T ₁	T ₂	V	P	Bars A	Bars A ₁ & A ₂	Bars B Bent	Bars C	H	K	M	M'	N	W	X	Y	Z	Bars D	Bars D'	Bars E	Bars F	Bars F'		Bars G	Bars G'	Bars G ₁	Steel Lbs.	Concrete Cu. Yds.	Steel Lbs.	Concrete Cu. Yds.						
1	2'-0"	4.0	6"	6"	3'-0"	3'-0"	1/2" φ-6"	2'-8"	2	4'-6"	2'-6"	1/2" φ-9"	3'-8"	8	19.34	0.185	2'-10"	1'-7"	4'-2"	7'-2"	3'-7"	11'-9"	6'-2"	2'-3"	2'-1"	4	4'-0"	5	3'-8"	4	108	1.72	6'-1"	3'-5"	26	0.41	0.291	12.55	1.097	1
2	2'-0"	6.0	6"	6"	3'-0"	4'-0"	1/2" φ-6"	3'-8"	2	4'-6"	2'-6"	1/2" φ-9"	4'-2"	8	22.97	0.222	2'-10"	1'-7"	4'-2"	7'-2"	3'-7"	12'-11"	6'-2"	3'-5"	2'-1"	5	4'-0"	5	3'-8"	4	114	1.83	7'-3"	4'-6"	32	0.52	0.319	14.56	1.223	2
3	2'-0"	7.5	6"	6"	3'-0"	4'-0"	1/2" φ-6"	3'-8"	2	4'-6"	2'-6"	1/2" φ-9"	4'-2"	8	23.88	0.241	3'-4"	1'-9"	4'-10"	8'-6"	4'-3"	14'-5"	7'-4"	2'-5"	2'-1"	5	4'-8"	6	4'-8"	4	133	2.39	7'-3"	4'-6"	32	0.52	0.356	16.58	1.350	3
4	3'-0"	9.0	6"	6"	4'-0"	4'-0"	1/2" φ-6"	3'-8"	2	4'-6"	2'-6"	1/2" φ-9"	5'-2"	10	26.14	0.259	3'-10"	1'-11"	5'-7"	9'-8"	4'-10"	15'-9"	8'-4"	2'-9"	2'-1"	5	5'-3"	7	5'-6"	5	179	2.98	7'-3"	4'-6"	32	0.52	0.389	18.62	1.544	4
5	2'-0"	8.0	7"	6"	3'-0"	5'-0"	3/8" φ-8"	4'-8"	4	4'-8"	4	1/2" φ-9"	4'-10"	10	30.40	0.290	2'-11"	1'-7"	4'-3"	7'-4"	3'-8"	14'-3"	6'-4"	4'-7"	2'-4"	6	4'-9"	5	3'-10"	4	122	2.02	8'-5"	5'-7"	59	0.60	0.352	18.06	1.649	5
6	2'-6"	10.0	7"	6"	3'-6"	5'-0"	3/8" φ-8"	4'-8"	4	4'-8"	4	1/2" φ-9"	5'-2"	10	31.31	0.308	3'-5"	1'-9"	5'-0"	8'-8"	4'-4"	15'-9"	8'-4"	2'-6"	2'-1"	6	4'-9"	6	4'-9"	4	142	2.61	8'-5"	5'-7"	59	0.60	0.369	20.11	1.728	6
7	3'-0"	12.0	7"	6"	4'-2"	5'-0"	3/8" φ-8"	4'-8"	4	4'-8"	4	1/2" φ-9"	5'-2"	12	33.58	0.327	3'-11"	1'-11"	5'-9"	9'-11"	4'-11"	17'-3"	8'-7"	2'-10"	2'-1"	6	5'-5"	7	5'-2"	5	190	3.27	8'-5"	5'-7"	59	0.60	0.426	22.34	1.927	7
8	4'-0"	16.0	7"	6"	5'-2"	5'-4"	3/8" φ-8"	5'-4"	4	5'-4"	4	1/2" φ-9"	6'-10"	12	36.45	0.428	4'-11"	2'-4"	7'-2"	12'-5"	6'-2"	20'-1"	10'-9"	3'-7"	2'-1"	6	6'-8"	8	6'-2"	6	274	4.72	8'-7"	5'-10"	62	0.62	0.496	29.83	2.222	8
9	2'-0"	10.0	7 1/2"	6"	3'-3"	6'-0"	3/8" φ-7 1/2"	5'-8"	6	6'-8"	6	1/2" φ-9"	5'-5"	14	37.20	0.352	2'-11"	1'-7"	4'-4"	7'-6"	3'-9"	18'-6"	6'-6"	5'-9"	2'-2"	7	4'-2"	5	4'-6"	4	130	2.19	9'-8"	6'-9"	70	0.70	0.385	21.30	1.978	9
10	3'-0"	15.0	7 1/2"	6"	4'-3"	6'-0"	3/8" φ-7 1/2"	5'-8"	6	6'-8"	6	1/2" φ-9"	6'-5"	14	40.38	0.389	3'-11"	1'-11"	5'-9"	10'-1"	5'-0"	18'-6"	8'-8"	2'-10"	2'-1"	7	5'-7"	7	5'-7"	4	200	3.50	9'-8"	6'-9"	70	0.70	0.458	25.69	2.260	10
11	4'-0"	20.0	7 1/2"	6"	5'-3"	6'-4"	3/8" φ-7 1/2"	6'-0"	6	6'-0"	6	1/2" φ-9"	7'-5"	16	43.32	0.490	4'-11"	2'-4"	7'-2"	12'-6"	6'-3"	21'-4"	10'-0"	3'-7"	2'-1"	7	6'-8"	9	6'-8"	4	286	4.99	9'-10"	7'-0"	71	0.72	0.528	33.26	2.560	11
12	5'-0"	25.0	7 1/2"	6"	6'-3"	6'-8"	3/8" φ-7 1/2"	6'-4"	6	6'-4"	6	1/2" φ-9"	8'-5"	16	42.62	0.617	5'-11"	2'-8"	8'-9"	15'-2"	7'-7"	24'-5"	13'-1 1/2"	4'-4"	2'-1"	8	7'-0"	12	7'-0"	4	403	6.82	10'-0"	7'-3"	78	0.73	0.603	42.65	2.862	12
13	7'-0"	35.0	7 1/2"	6"	8'-3"	6'-8"	3/8" φ-7 1/2"	6'-4"	6	7'-0"	6	1/2" φ-9"	10'-5"	18	52.60	0.741	7'-11"	3'-5"	11'-8"	22'-2"	10'-1 1/4"	30'-5"	17'-6"	5'-10"	2'-1"	8	8'-0"	16	8'-0"	4	520	12.56	10'-4"	7'-5"	75	0.76	0.753	59.90	4.065	13
14	2'-0"	12.0	8 1/2"	6"	3'-5"	7'-0"	3/8" φ-6 1/2"	6'-8"	8	7'-4"	8	1/2" φ-9"	10'-5"	18	45.28	0.441	3'-10"	1'-8"	4'-5"	7'-8"	3'-10"	16'-10"	6'-7"	6'-11"	2'-2"	8	4'-3"	5	4'-6"	4	136	2.41	10'-10"	8'-0"	80	0.79	0.417	25.79	2.360	14
15	3'-0"	18.0	8 1/2"	6"	4'-5"	7'-4"	3/8" φ-6 1/2"	7'-0"	8	7'-4"	8	1/2" φ-9"	12'-11"	14	49.76	0.533	4'-10"	2'-0"	5'-11"	10'-3"	5'-11"	19'-10"	8'-10"	2'-10"	2'-1"	9	5'-7"	7	5'-7"	4	212	3.74	11'-1"	8'-2"	82	0.81	0.491	32.66	2.707	15
16	4'-0"	24.0	8 1/2"	6"	5'-5"	7'-4"	3/8" φ-6 1/2"	7'-0"	8	7'-4"	8	1/2" φ-9"	14'-0"	14	51.37	0.582	5'-10"	2'-4"	7'-4"	12'-10"	6'-5"	22'-0"	11'-3"	3'-8"	2'-1"	9	6'-10"	9	6'-10"	4	316	5.37	11'-1"	8'-2"	82	0.81	0.565	38.22	2.996	16
17	5'-0"	30.0	8 1/2"	6"	6'-5"	7'-8"	3/8" φ-6 1/2"	7'-4"	8	7'-4"	8	1/2" φ-9"	16'-5"	16	56.04	0.711	6'-10"	2'-9"	8'-10"	15'-3"	7'-7"	25'-3"	13'-2"	4'-5"	2'-1"	10	8'-11"	12	8'-11"	4	420	7.20	11'-1"	8'-2"	82	0.81	0.635	47.70	3.403	17
18	6'-0"	36.0	8 1/2"	6"	7'-5"	7'-8"	3/8" φ-6 1/2"	7'-4"	8	7'-4"	8	1/2" φ-9"	18'-11"	18	59.22	0.772	7'-0"	3'-1"	10'-4"	17'-11"	8'-11"	28'-7"	15'-6"	5'-2"	2'-1"	10	9'-5"	14	9'-5"	4	540	10.44	11'-7"	8'-7"	85	0.83	0.716	52.03	3.787	18
19	3'-0"	24.0	10"	8"	4'-8"	9'-4"	3/4" φ-7"	9'-0"	12	9'-0"	12	1/2" φ-9"	8'-4"	18	74.24	0.724	4'-3"	2'-1"	6'-3"	10'-6"	5'-3"	22'-6"	13'-0"	9'-2"	3'-0"	11	5'-8"	7	5'-8"	4	235	4.26	13'-5"	10'-6"	145	1.00	0.557	42.40	3.899	19
20	4'-0"	32.0	10"	8"	5'-8"	9'-4"	3/4" φ-7"	9'-0"	12	9'-0"	12	1/2" φ-9"	10'-4"	18	76.06	0.773	5'-2"	2'-5"	7'-6"	13'-1"	6'-3"	25'-6"	14'-4"	3'-9"	3'-0"	11	7'-0"	9	7'-0"	4	346	6.01	13'-5"	10'-6"	145	1.00	0.631	48.20	4.200	20
21	5'-0"	40.0	10"	8"	6'-8"	9'-8"	3/4" φ-7"	9'-4"	12	9'-4"	12	1/2" φ-9"	12'-4"	18	80.96	0.905	6'-2"	2'-9"	9'-0"	15'-7"	7'-9"	28'-4"	13'-6"	4'-6"	3'-1"	11	8'-11"	11	8'-11"	4	454	7.93	13'-8"	10'-8"	148	1.02	0.701	57.99	4.633	21
22	6'-0"	48.0	10"	8"	7'-8"	9'-8"	3/4" φ-7"	9'-4"	12	9'-4"	12	1/2" φ-9"	14'-4"	18	84.14	0.967	7'-2"	3'-2"	10'-5"	18'-2"	9'-1"	31'-6"	15'-8"	5'-2"	3'-1"	11	9'-6"	14	9'-6"	4	576	11.32	14'-0"	10'-11"	152	1.04	0.780	67.67	5.026	22
23	7'-0"	56.0	10"	8"	8'-8"	9'-8"	3/4" φ-7"	9'-4"	12	9'-4"	12	1/2" φ-9"	16'-4"	18	85.95	1.028	8'-2"	3'-6"	12'-0"	20'-9"	10'-4"	34'-7"	15'-8"	5'-2"	3'-1"	11	10'-10"	16	10'-10"	4	403	6.82	10'-0"	10'-11"	152	1.04	0.855	76.26	5.843	23
24	8'-0"	64.0	10"	8"	9'-8"	9'-10"	3/4" φ-7"	9'-6"	12	9'-6"	12	1/2" φ-9"	18'-4"	18	89.99	1.150	9'-2"	3'-10"	13'-5"	23'-3"	11'-7"	37'-5"	20'-7"	5'-2"	3'-1"	11	12'-4"	18	12'-4"	4	477	7.5	11'-4"	11'-1"	153	1.05	0.925	87.28	6.382	24
25	3'-0"	30.0	11"	8"	4'-10"	11'-4"	3/4" φ-6"	9'-0"	18	11'-4"	18	1/2" φ-9"	10'-6"	24	97.70	0.917	4'-3"	2'-1"	6'-3"	10'-6"	5'-5"	25'-2"	13'-0"	11'-6"	3'-0"	13	5'-10"	7	5'-10"	4	280	4.78	15'-10"	12'-10"	173	1.19	0.622	52.23	5.049	25
26	4'-0"	40.0	11"	8"	5'-10"	11'-4"	3/4" φ-6"	11'-0"	18	11'-0"	18	1/2" φ-9"	12'-6"	24	99.52	0.967	5'-3"	2'-5"	7'-8"	13'-3"	6'-7"	28'-0"	14'-10"	3'-10"	3'-0"	13	7'-1"	10	7'-1"	4	372	6.56	15'-10"	12'-10"	173	1.19	0.692	58.12	5.314	26
27	5'-0"	50.0	11"	8"	6'-10"	11'-8"	3/4" φ-6"	11'-4"	18	11'-4"	18	1/2" φ-9"	14'-6"	24	104.71	1.101	6'-3"	2'-10"	9'-2"	15'-10"	7'-11"	31'-0"	13'-9"	4'-2"	3'-1"	13	8'-4"	12	8'-4"	4	454	7.93	13'-8"	10'-8"	148	1.02	0.701	57.99	4.633	27
28	6'-0"	60.0	11"	8"	7'-10"	11'-8"	3/4" φ-6"	11'-4"	18	11'-4"	18	1/2" φ-9"	16'-6"	24	107.89	1.163	7'-3"	3'-2"	10'-7"	18'-4"	9'-2"	34'-0"	15'-10"	5'-2"	3'-1"	13	9'-7"	14	9'-7"	4	485	8.68	16'-4"	13'-0"	176	1.21	0.766	68.41	5.783	28
29	7'-0"	70.0	11"	8"	8'-10"	11'-8"	3/4" φ-6"	11'-4"	18	11'-4"	18	1/2" φ-9"	18'-6"	24	109.70	1.224	8'-3"	3'-6"	12'-0"	20'-11"	10'-5"	37'-0"	16'-1"	6'-0"	3'-1"	13	10'-11"	16	10'-11"	4	612	12.08	16'-4"	13'-0"	180	1.23	0.842	78.11	6.163	29
30	8'-0"	80.0	11"	8"	9'-10"	11'-8"	3/4" φ-6"	11'-4"	18	11'-4"	18	1/2" φ-9"	20'-6"	24	113.89	1.347	9'-3"	3'-11"	13'-6"	23'-6"	11'-9"	40'-0"	20'-4"	6'-9"	3'-1"	13	12'-2"	18	12'-2"	4	477	7.5	11'-4"	11'-1"	153	1.05	0.925	87.28	6.382	30
31	9'-0"	90.0	11"	8"	10'-10"	12'-0"	3/4" φ-6"	11'-8"	18	11'-8"	18	1/2" φ-9"	22'-6"	24	118.08	1.482	10'-3"	4'-3"	15'-0"	26'-0"	13'-0"	42'-10"	22'-6"	7'-6"	3'-1"	13	13'-5"	20	13'-5"	4	531	9.35	16'-7"	13'-6"	183	1.25	1.061	111.92	8.191	31
32	10'-0"	100.0	11"	8"	11'-10"	12'-0"	3/4" φ-6"	11'-8"	18	11'-8"	18	1/2" φ-9"	24'-6"	24	119.89	1.558	11'-3"	4'-7"	16'-6"	28'-7"	14'-3"	45'-10"	24'-9"	8'-3"	3'-1"	13	14'-9"	22	14'-9"	4	588	10.68	16'-7"	13'-6"	183	1.25	1.134	123.07	8.740	