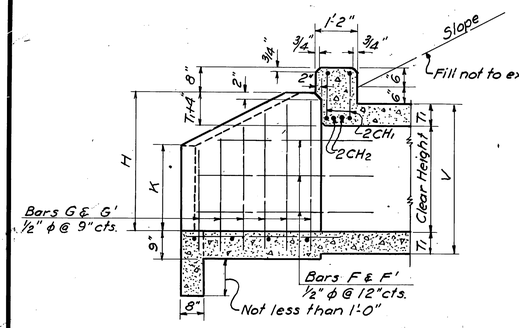
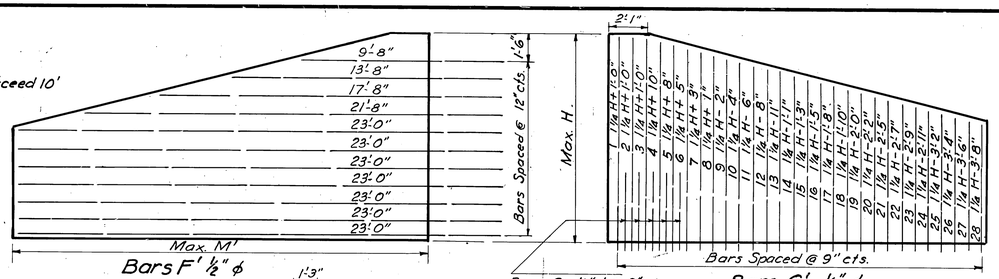
FED. ROAD DIST. NO.	STATE	AID PROJ. NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
6	OKLA.				

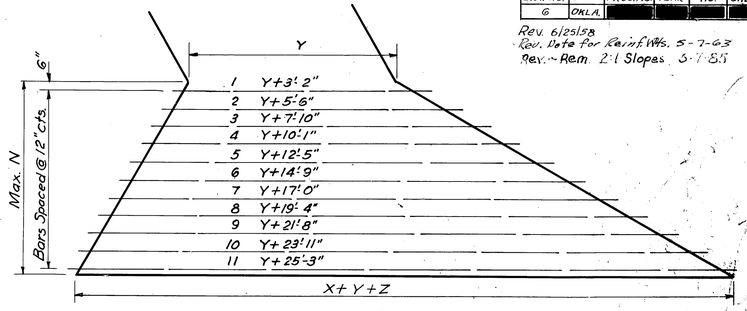
Rev. 6/25/58
Rev. Date for Reinf. Wts. 5-7-63
Rev. - Rem. 2:1 Slopes 5-7-85

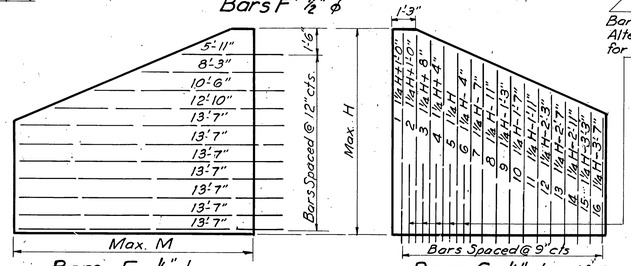


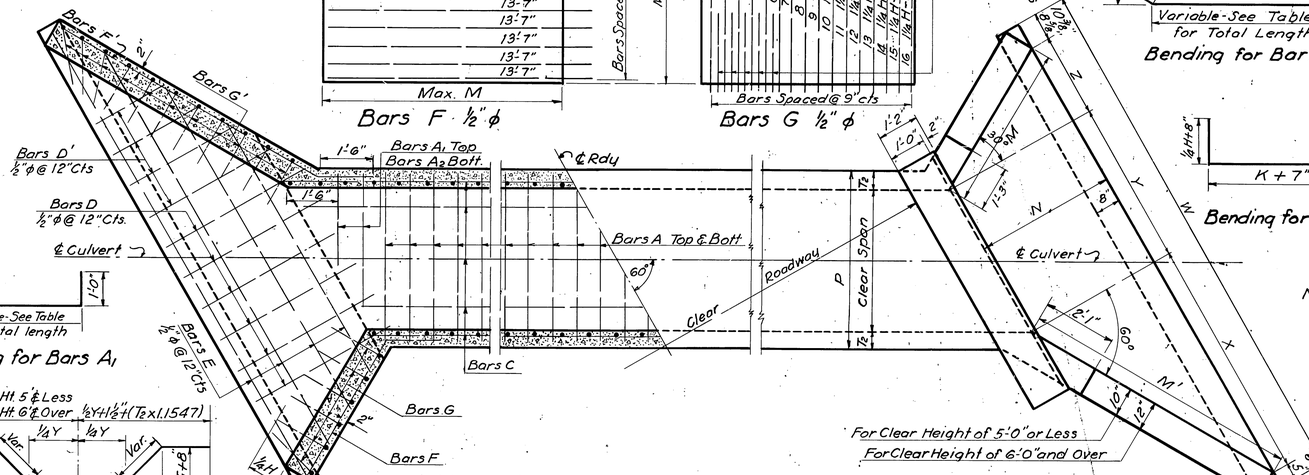
SECTION THRU APRON

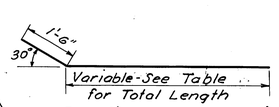


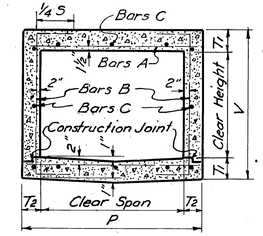
Bars G1 - 1/2" ϕ @ 9" cts.
Alternate with G and G'
for Clear Height of 7'-0" and over



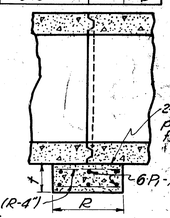








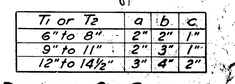
Size of Barrel	R	t
2'x2' to 4'x4'	2'-0"	9"
5'x2' to 6'x6'	2'-6"	9"
8'x3' to 10'x10'	3'-0"	1'-0"



NOTE: Quantities for 50' Roadway do not include Pedestal quantities. Grooved Construction Joints and Pedestals shall be used when and where noted on Summary Sheet. In general, Grooved Construction Joints and Pedestals shall be placed as follows:
60' to 100' of Barrel use 1 Constr. Joint and Pedestal
100' to 140' of Barrel use 2 Constr. Joints and Pedestals
140' to 180' of Barrel use 3 Constr. Joints and Pedestals.
The Grooved Construction Joints and Pedestals shall be constructed perpendicular to ℄ of Barrel.

Joint to be painted with a coat of bituminous material

DESIGN DATA: Dead Load 1000 Lbs.
Live Load None.
Impact None
Design is sufficient for H20-S16-53 and PPM 20-4 Loading.



T1 or T2	a	b	c
6" to 8"	2"	2"	1"
9" to 11"	2"	3"	1"
12" to 14 1/2"	3"	4"	2"

DETAILS OF GROOVED CONSTRUCTION JOINT

GENERAL NOTES:-
All reinforcing steel shall be deformed round bars. The design and table are based upon net areas of bars as follows: 1/2" ϕ = 0.1963 sq.in., 5/8" ϕ = 0.3068 sq.in., 3/4" ϕ = 0.442 sq.in. Other sizes may be used provided they are spaced so as to give as much net sectional area per foot width of slab. Plans showing such changed sizes and spacing must be approved. When necessary, reinforcing bars shall be lapped 40 diameters. Total quantities for 50' Rdy. include lap of 1'-8" on C bars.
All exposed concrete surfaces shall have a carborundum finish and this shall be included in the unit price bid per Cu.Yd. for Concrete.
All exposed concrete edges shall have a 3/4" chamfer.

Quantities shown for reinforcing steel shall be reduced by 1% (.015) to comply with approved C.R.S.I. weights per foot for reinforcing bars.

Designed by M.W. Hefley & W. Jones
Supervised by C. H. X. White & D. J. McCullough
Detailed by C. H. D. April 1947
Traced by N.A.L. June 1947
Checked by (Original) G.L.M. 1941. WEW June 1947.

DESIGN NO.	WATERWAY Clear Span	Clear Height	Area of Opening - Sq. Ft.	BARREL OF CULVERT DIMENSIONS T1	T2	V	P	REINFORCING STEEL Bars A, A1, & A2 Size & Spacing	A Length	A1 A2 No.	Bars A1 Length	Bars A2 Length	Bars B Size & Spacing	B Length	Bars C No.	Steel per Lin. Ft. Lbs.	QUANTS. Conc. per Lin. Ft. Cu. Yds.
1	2	2'-0"	4.0	6"	6"	3'-0"	3'-0"	1/2" ϕ @ 6"	2'-8"				1/2" ϕ @ 9"	3'-8"	8	19.34	0.185
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
3	3	2'-6"	7.5	6"	6"	3'-6"	4'-0"	1/2" ϕ @ 6"	3'-8"	2	4'-6"	2'-6"	1/2" ϕ @ 9"	4'-8"	8	23.88	0.241
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
5		2'-0"	8.0	7"	6"	3'-2"	5'-0"	5/8" ϕ @ 8"	4'-8"	4	4'-6" to 5'-8"	2'-6" to 3'-8"	1/2" ϕ @ 9"	4'-10"	10	30.40	0.290
6	4	2'-6"	10.0	7"	6"	3'-8"	5'-0"	5/8" ϕ @ 8"	4'-8"	4	4'-6" to 5'-8"	2'-6" to 3'-8"	1/2" ϕ @ 9"	5'-4"	10	31.31	0.308
7		3'-0"	12.0	7"	6"	4'-2"	5'-0"	5/8" ϕ @ 8"	4'-8"	4	4'-6" to 5'-8"	2'-6" to 3'-8"	1/2" ϕ @ 9"	5'-10"	12	33.58	0.327
8		4'-0"	16.0	7"	8"	5'-2"	5'-4"	5/8" ϕ @ 8"	5'-0"	4	4'-8" to 5'-10"	2'-8" to 3'-10"	1/2" ϕ @ 9"	6'-10"	12	36.45	0.428
9		2'-0"	10.0	8"	6"	3'-4"	6'-0"	5/8" ϕ @ 7"	5'-8"	6	4'-6" to 6'-6"	2'-6" to 4'-6"	1/2" ϕ @ 9"	5'-6"	12	38.72	0.370
10		3'-0"	15.0	8"	6"	4'-4"	6'-0"	5/8" ϕ @ 7"	5'-8"	6	4'-6" to 6'-6"	2'-6" to 4'-6"	1/2" ϕ @ 9"	7'-6"	14	41.90	0.407
11	5	4'-0"	20.0	8"	6"	6'-4"	6'-0"	5/8" ϕ @ 7"	6'-0"	6	4'-8" to 6'-8"	2'-8" to 4'-8"	1/2" ϕ @ 9"	7'-6"	14	44.92	0.511
12		5'-0"	25.0	8"	10"	6'-4"	6'-4"	5/8" ϕ @ 7"	6'-4"	6	4'-10" to 6'-10"	2'-10" to 4'-10"	1/2" ϕ @ 9"	8'-6"	16	49.30	0.638
13		6'-0"	30.0	8"	10"	7'-4"	6'-8"	5/8" ϕ @ 7"	6'-4"	6	4'-10" to 6'-10"	2'-10" to 4'-10"	1/2" ϕ @ 9"	9'-6"	16	52.47	0.700
14		7'-0"	35.0	8"	10"	8'-4"	6'-8"	5/8" ϕ @ 6"	6'-4"	6	4'-10" to 6'-10"	2'-10" to 4'-10"	1/2" ϕ @ 9"	10'-6"	18	54.30	0.761
15		2'-0"	12.0	9"	6"	3'-6"	7'-0"	5/8" ϕ @ 6"	6'-8"	8	4'-6" to 7'-2"	2'-6" to 5'-2"	1/2" ϕ @ 9"	6'-2"	12	47.61	0.463
16		3'-0"	18.0	9"	8"	4'-6"	7'-4"	5/8" ϕ @ 6"	7'-0"	8	4'-8" to 7'-4"	2'-8" to 5'-4"	1/2" ϕ @ 9"	7'-2"	14	52.19	0.556
17	6	4'-0"	24.0	9"	8"	5'-6"	7'-4"	5/8" ϕ @ 6"	7'-0"	8	4'-8" to 7'-4"	2'-8" to 5'-4"	1/2" ϕ @ 9"	8'-2"	14	54.01	0.605
18		5'-0"	30.0	9"	10"	6'-6"	7'-8"	5/8" ϕ @ 6"	7'-4"	8	4'-10" to 7'-6"	2'-10" to 5'-6"	1/2" ϕ @ 9"	9'-10"	16	58.59	0.734
19		6'-0"	36.0	9"	10"	7'-6"	7'-8"	5/8" ϕ @ 6"	7'-4"	8	4'-10" to 7'-6"	2'-10" to 5'-6"	1/2" ϕ @ 9"	10'-2"	18	61.76	0.796
20		3'-0"	24.0	12"	8"	5'-0"	9'-4"	3/4" ϕ @ 6 1/2"	9'-0"	12	4'-8" to 9'-4"	2'-8" to 7'-4"	1/2" ϕ @ 9"	8'-8"	18	78.46	0.830
21		4'-0"	32.0	12"	8"	6'-0"	9'-4"	3/4" ϕ @ 6 1/2"	9'-0"	12	4'-8" to 9'-4"	2'-8" to 7'-4"	1/2" ϕ @ 9"	9'-8"	18	80.27	0.889
22		5'-0"	40.0	12"	10"	7'-0"	9'-8"	3/4" ϕ @ 6 1/2"	9'-4"	12	4'-10" to 9'-6"	2'-10" to 7'-6"	1/2" ϕ @ 9"	10'-8"	20	85.32	1.025
23	8	6'-0"	48.0	12"	10"	8'-0"	9'-8"	3/4" ϕ @ 6 1/2"	9'-4"	12	4'-10" to 9'-6"	2'-10" to 7'-6"	1/2" ϕ @ 9"	11'-8"	22	88.49	1.086
24		7'-0"	56.0	12"	10"	9'-0"	9'-8"	3/4" ϕ @ 6 1/2"	9'-4"	12	4'-10" to 9'-6"	2'-10" to 7'-6"	1/2" ϕ @ 9"	12'-6"	22	90.30	1.148
25		8'-0"	64.0	12"	11"	10'-0"	9'-10"	3/4" ϕ @ 6"	9'-6"	12	4'-11" to 9'-7"	2'-11" to 7'-7"	1/2" ϕ @ 8"	13'-8"	24	113.10	1.272
26		6'-0"	60.0	14 1/2"	10"	8'-5"	11'-8"	3/4" ϕ @ 5"	11'-4"	22	4'-10" to 12'-0"	2'-10" to 10'-0"	1/2" ϕ @ 9"	13'-1"	24	122.72	1.415
27		7'-0"	70.0	14 1/2"	10"	9'-5"	11'-8"	3/4" ϕ @ 5"	11'-4"	22	4'-10" to 12'-0"	2'-10" to 10'-0"	1/2" ϕ @ 9"	14'-1"	24	124.54	1.477
28	10	8'-0"	80.0	14 1/2"	11"	10'-10"	11'-10"	3/4" ϕ @ 5"	11'-8"	22	4'-11" to 12'-1"	2'-11" to 10'-1"	3/4" ϕ @ 5"	15'-1"	26	149.55	1.603
29		0'-0"	90.0	14 1/2"	12"	11'-5"	12'-0"	3/4" ϕ @ 5"	11'-8"	22	5'-0" to 12'-2"	3'-0" to 10'-2"	3/4" ϕ @ 5"	16'-1"	28	162.61	1.741
30		10'-0"	100.0	14 1/2"	12"	12'-5"	12'-0"	3/4" ϕ @ 5"	11'-8"	22	5'-0" to 12'-2"	3'-0" to 10'-2"	3/4" ϕ @ 4 1/2"	16'-1"	28	182.06	1.815

DESIGN NO.	TWO WINGS AND ONE APRON DIMENSIONS H	K	M	M'	N	W	X	Y	Z	REINFORCING STEEL Bars D No.	Bars D Length	Bars D' No.	Bars D' Length	Bars E No.	Bars E Length	Bars F No.	Bars F Length	Bars F' No.	Bars F' Length	Bars G No.	Bars G Length	Bars G' No.	Bars G' Length	Bars G1 No.	Bars G1 Length
1	2'-10"	1'-10 1/2"	3'-5"	5'-11"	2'-11 1/2"	10'-3 3/4"	5'-1 1/2"	2'-3 3/4"	1'-8 1/2"	4	3'-5"	3	1'-8" to 2'-10"	3	See Diagram	2	4'-11"	2	8'-0"	5	See Diagram	8	See Diagram		
2	2'-10"	1'-10 1/2"	3'-5"	5'-11"	2'-11 1/2"	11'-5 1/2"	5'-1 1/2"	3'-5 3/4"	1'-8 1/2"	5	3'-5"	3	1'-9" to 2'-11"			2	4'-11"	2	8'-0"	5		8			
3	2'-10"	1'-10 1/2"	3'-5"	5'-11"	2'-11 1/2"	12'-7 1/2"	5'-1 1/2"	3'-5 3/4"	1'-8 1/2"	5	3'-10"	3	2'-1" to 3'-3"			2	5'-5"			5		8			
4	3'-0"	1'-9"	3'-10"	6'-3"	3'-2 1/2"	13'-3 1/2"	6'-1 3/4"	4'-1 3/4"	2'-0" to 3'-9"	5	4'-3"	4	2'-0" to 3'-9"			3	5'-11"			5		8			
5	2'-0"	2'-0"	3'-6 1/2"	6'-1"	3'-0 1/2"	12'-9 3/4"	5'-3 1/2"	4'-7 3/4"	1'-9 1/2"	6	3'-6"	3	1'-10" to 3'-0"			2	5'-0"			5		8			
6	2'-6"	2'-0"	3'-11"	6'-11"	3'-5 1/2"	13'-8 1/2"	5'-11 3/4"	4'-7 3/4"	2'-0"	6	4'-4"	4	2'-2" to 3'-11"			2	5'-6"			5		8			
7	3'-0"	2'-0"	4'-5 3/4"	7'-9"	3'-10 1/2"	14'-8 3/4"	6'-8 1/2"	4'-7 3/4"	2'-2 1/2"	6	4'-4"	4	2'-2" to 3'-11"			2	5'-11"	2	6'-0"	1	9'-8"	2	9'-10"	6	
8	4'-0"	2'-0"	5'-5"	8'-6"	4'-3"	16'-8 5/8"	8'-2 1/2"	4'-7 3/4"	2'-8" to 4'-5"	6	5'-2"	6	1'-10" to 4'-9"			2	5'-11"	3	7'-0"	1	9'-8"	3	11'-7"	7	
9	2'-0"	2'-0"	3'-6 3/4"	6'-2"	3'-1"	14'-0 3/4"	5'-4 1/2"	5'-9 1/4"	1'-9 3/4"	7	3'-6"	3	2'-0" to 3'-2"			2	5'-1"			2	8'-3"	5		8	
10	3'-0"	2'-0"	4'-6"	6'-9"	3'-4"	15'-0 3/4"	6'-10 1/2"	5'-9 1/4"	2'-3 1/2"	7	4'-5"	5	1'-9" to 4'-1"			1	5'-11"	2	6'-1"	1	9'-8"	2	10'-0"	6	
11	4'-0"	2'-0"	5'-7"	9'-8"	4'-10"	18'-0 1/2"	8'-4 1/2"	5'-9 1/4"	2'-9 1/2"	7	5'-9"	6	2'-0" to 4'-11"			1	5'-11"	3	7'-1"	1	9'-8"	3	11'-9"	7	
12	5'-0"	2'-0"	6'-8"	11'-4"	5'-9"	19'-11 1/2"	9'-9 3/4"	5'-9 1/4"	3'-3 1/2"	7	6'-1"	8	1'-9" to 5'-9"			1	5'-11"	4	8'-0"	1	9'-8"	4	13'-5"	9	
13	6'-0"	2'-0"	7'-6 3/4"	13'-1"	6'-6 1/2"	22'-3"	11'-1 3/4"	5'-9 1/4"	3'-9 3/4"	7	7'-0"	9	2'-2" to 6'-10"			2	Var.	4	9'-0"	2	Var.	4	15'-2"	10	
14	7'-0"	2'-0"	8'-5"	14'-10"	7'-3"	24'-3 1/2"	12'-10 1/4"	5'-9 1/4"	4'-3 3/4"	7	7'-10"	11	1'-11" to 7'-8"			2	Var.	5	10'-1"	2	Var.	5	16'-11"	11	
15	2'-0"	2'-0"	3'-7 1/2"	6'-4"	3'-2"	15'-4 1/2"	5'-5 1/4"	6'-11 1/4"	1'-10"	8	3'-7"	3	2'-2" to 3'-4"	3	See Diagram	1	5'-11"	2	6'-2"	1	9'-8"	2	10'-2"	6	See Diagram
16	3'-0"	2'-0"	4'-8"	7'-4"	3'-8"	17'-4 1/2"	7'-0"	6'-11 1/4"	2'-4"	8	4'-6"	5	1'-11" to 4'-3"			1	5'-11"	3	7'-1"	1	9'-8"	3	11'-10"	8	
17	4'-0"	2'-0"	5'-9 1/2"	9'-9"	4'-7"	19'-5 1/2"	8'-5 1/4"	6'-11 1/4"	2'-9 1/2"	8	5'-4"	6	2'-2" to 5'-1"			1	5'-11"	4	8'-1"	1	9'-8"	4	13'-7"	9	
18	5'-0"	2'-0"	6'-11"	12'-3"	5'-10"	21'-6 1/2"	9'-9 3/4"	6'-11 1/4"	3'-3 1/2"	8	6'-2"	8	1'-10" to 5'-5"			2	Var.	4	9'-2"	2	Var.	4	15'-4"	10	
19	6'-0"	2'-0"	8'-1 1/2"	14'-8"	6'-11 1/2"	23'-7 1/2"	11'-2 3/4"	6'-11 1/4"	3'-9 3/4"	8	7'-1"	10	1'-10" to 7'-0"			2	Var.	5	9'-11"	2	Var.	5	16'-7"	11	
20	3'-0"	2'-0"	3'-9"	6'-9"	3'-4"	20'-3 3/4"	7'-4 1/8"	9'-2 1/8"	2'-5 1/2"	11	4'-8"	5	1'-8" to 4'-0"	4	See Diagram	1	5'-11"	2	6'-5"	1	9'-8"	2	10'-7"	7	See Diagram
21	4'-0"	2'-0"	5'-1"	9'-1"	4'-5 1/2"	22'-2 1/2"	8'-10 1/2"	9'-2 1/8"	2'-11 1/2"	11	5'-7"	6	2'-0" to 4'-11"			1	5'-11"	3	7'-5"	1	9'-8"	3	12'-4"	8	
22	5'-0"	2'-0"	6'-4 1/2"	11'-1"	5'-5 1/2"	24'-1 1/2"	10'-3 1/2"	9'-2 1/8"	3'-5 1/4"	11	6'-5"	8	1'-8" to 5'-9"			2	Var.	4	9'-4"	2	Var.	4	14'-0"	9	
23	6'-0"	2'-0"	7'-8"	13'-1"	6'-6"	25'-10 1/2"	11'-10"	9'-2 1/8"	4'-0"	11	8'-1"	10	1'-8" to 6'-10"			2	Var.	4	9'-4"	2	Var.	4	14'-5"	9	
24	7'-0"	2'-0"	8'-11"	15'-4"	7'-7"	28'-3 3/4"	13'-3 3/4"	9'-2 1/8"	4'-5 1/2"	11	8'-11"	11	1'-11" to 7'-8"			2	Var.	5	10'-4"	2	Var.	5	17'-5"	12	
25	8'-0"	2'-0"	10'-2"	17'-6"	8'-8"	30'-4"	14'-9 1/2"	9'-2 1/8"	4'-11 1/2"	11	9'-8"	12	2'-0" to 8'-7"			3	Var.	4	11'-4"	3	Var.	5	19'-2"	13	
26	6'-0"	2'-0"	7'-5"	12'-9"	6'-4"	27'-1"	12'-6"	11'-6 3/8"	4'-0 1/2"	13	7'-5"	10	2'-0" to 7'-2"			3	Var.	5	9'-7"	2	Var.	5	16'-1"	11	
27	7'-0"	2'-0"	8'-6 1/2"	14'-5"	7'-1 1/2"	29'-11"	13'-7 1/2"	11'-6 3/8"	4'-5 1/2"	13	8'-4"	12	1'-8" to 8'-0"			3	Var.	5	10'-7"	3	Var.	5	17'-10"	12	
28	8'-0"	2'-0"	9'-8"	16'-1"	8'-2 1/2"	32'-8 1/2"	14'-8 3/4"	11'-6 3/8"	4'-10 1/2"	13	9'-2"	13	1'-11" to 8'-10"			3	Var.	6	11'-6"	3	Var.	6	19'-6"	13	
29	9'-0"	2'-0"	10'-11"	17'-10"	9'-5"	35'-6"	16'-1 3/4"	11'-6 3/8"	5'-4 3/4"	13	10'-0"	14	2'-0" to 9'-9"			3	Var.	7	12'-7"	3	Var.	7	21'-3"	15	
30	10'-0"	2'-0"	12'-1"	19'-2"	9'-7"	38'-0 1/2"	17'-5 1/2"	11'-6 3/8"	5'-10 1/2"	13	10'-11"	16	1'-11" to 10'-7"			4	Var.	7	13'-7"	4	Var.	7	23'-0"	16	

DESIGN NO.	TWO CURBS Reinf. Steel same size as Bars A Steel Lbs.	Conc. Cu. Yds.	QUANTITIES Conc. in One Cur. Ion Wall Cu. Yds. per Foot of Depth	4CH Length	4CH Length	TOTAL QUANTS. 50' ROADWAY Reinf. Steel Lbs.	Conc. Cu. Yds.	QUANTS. IN ONE PEDESTAL Reinf. Steel Lbs.	Cl. "A" Conc. Cu. Yds.	DESIGN NO.
1	84	1.39	.41	6'-1"	3'-1"	1354	14.81	25	.167	1
2	89	1.48	.52	7'-3"	4'-3"	1590	17.37	33	.222	2
3	100	1.67	.52	7'-3"	4'-3"	1590	17.37	33	.222	3
4	139	2.33	.52	7'-3"	4'-3"	1882	21.40	33	.222	4
5	95	1.65	.59	8'-5"	5'-5"	2078	21.95	42	.278	5
6	109	2.06	.59	8'-5"	5'-5"	2180	23.89	42	.278	6
7	147	2.51	.59	8'-5"	5'-5"	2180	23.89	42	.278	7
8	212	3.54	.62	8'-7"	5'-9"	2576	34.23	45	.296	8
9	102	1.80	.59	9'-8"	6'-7"	2607	27.21	59	.417	9
10	157	2.73	.59	9'-8"	6'-7"	2909	31.39	59	.417	10
11	222	3.80	.59	9'-10"	6'-11"	3221	39.89	63	.440	11
12	301	5.01	.64	10'-0"	7'-4"	3645	50.05	64	.463	12
13	385	7.28	.64	10'-4"	7'-4"	4006	58.45	64	.463	13
14	644	9.15	.64	10'-4"	7'-4"	4633	65.95	64	.463	14
15	108	1.98	.64	10'-10"	7'-8"	3190	33.31	69	.486	15
16	168	2.92	.64	11'-1"	8'-1"	3557	40.89	73	.509	16
17	236	4.03	.64	11'-1"	8'-1"	3802	46.15	73	.509	17
18	313	5.32	.64	11'-3"	8'-6"	4234	56.60	74	.532	18
19	406	7.65	.64	11'-7"	8'-6"	4633	65.11	74	.532	19
20	192	3.46	.64	13'-7"	10'-5"	5261	59.90	106	1.031	20
21	266	4.70	.64	13'-7"	10'-5"	5646	64.88	106	1.031	21
22	348	6.05	.64	13'-9"	10'-9"	5866	75.86	107	1.074	22
23	444	8.55	.64	14'-1"	10'-9"	6373	84.65	107	1.074	23
24	716	10.51	.64	14'-1"	10'-9"	7035	92.39	107	1.074	24
25	874	12.69	.64	14'-3"	11'-0"	7514	104.90	111	1.093	25
26	499	9.39	.64	16'-7"	13'-1"	8576	106.41	130	1.296	26
27	785	11.49	.64	16'-7"	13'-1"	9256	114.43	130	1.296	27
28	937	13.71	.64	16'-8"	13'-3"	10044	120.54	134	1.315	28
29	1179	16.21	.64	16'-9"	13'-6"	10844	139.04	136	1.333	29
30	1314	18.93	.64	16'-9"	13'-6"	11572	149.32	136	1.333	30

OKLAHOMA STATE HIGHWAY COMMISSION
STANDARD
CONCRETE BOX CULVERTS
SKEWED 60° LF
SPANS 2 TO 10 FEET
FOR FILLS 3 TO 10 FEET

OLD 4/1/64

BC-6.S[illegible]