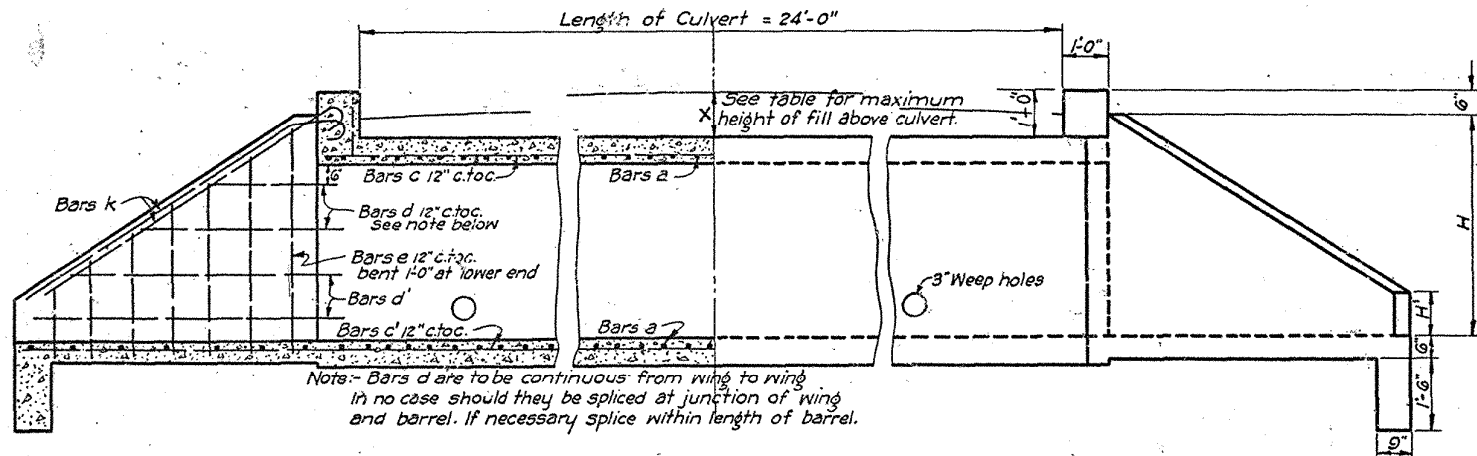
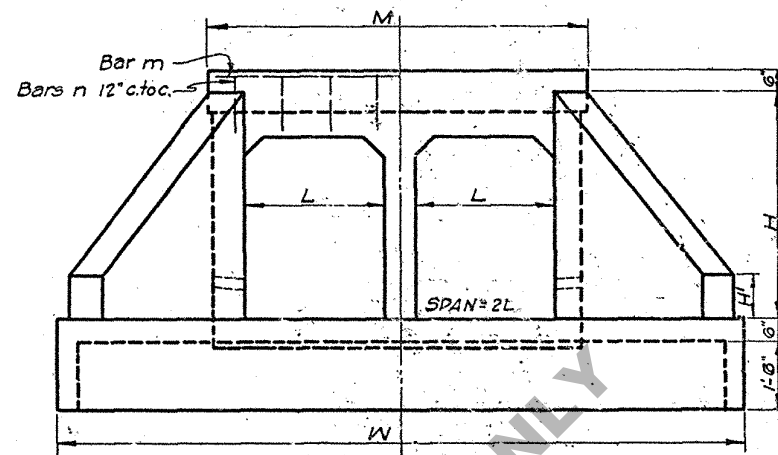


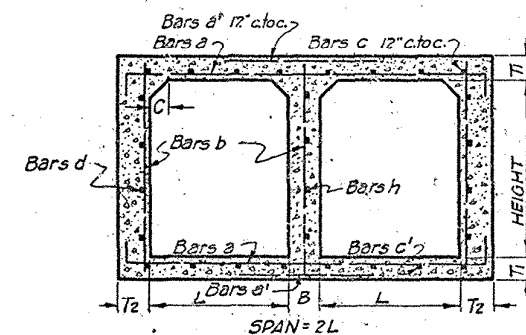


HALF LONGITUDINAL SECTION

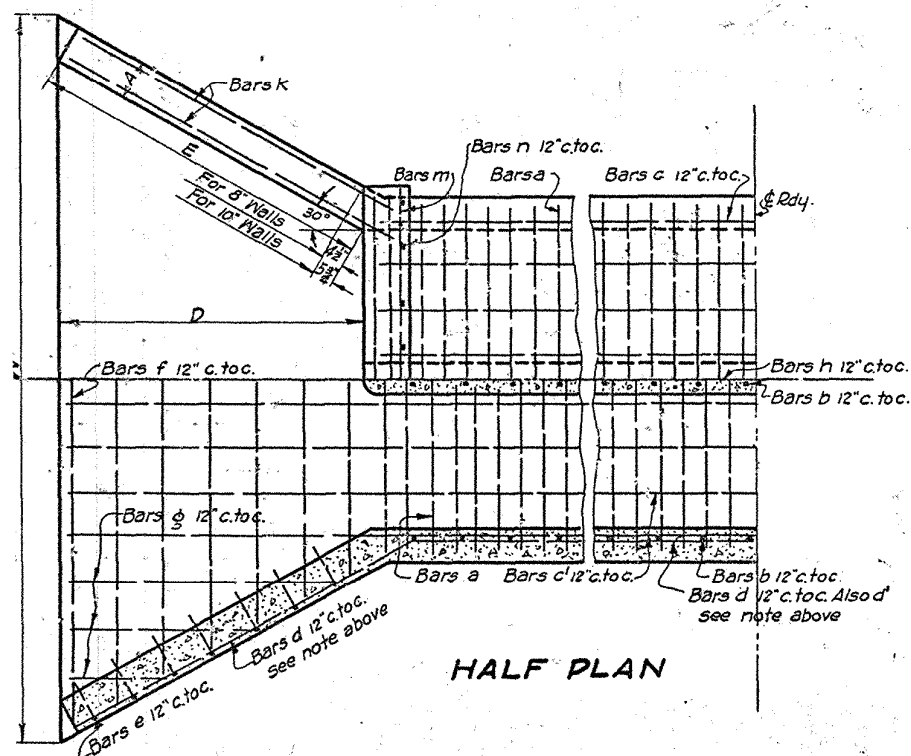
HALF SIDE ELEVATION



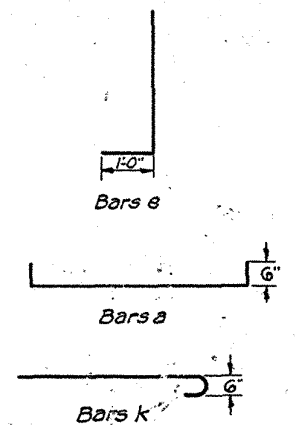
END VIEW



SECTION OF BARREL



HALF PLAN



BENDING DIAGRAMS

STEEL SCHEDULE FOR 24'-0" CULVERT

OPENING CLEAR SPAN (=2L) FT.-IN.		BARREL REINFORCEMENT - All 1/2" Bars (except 'a' for 16' span)														WING WALL AND FLOOR REINFORCEMENT All 1/2" Bars																							
		Bars a		Bars a'		Bars b		Bars c		Bars c'		Bars d		Bars d'		Bars e		Bars e'		Bars f		Bars f'		Bars g		Bars g'		Bars h											
		No.	SIZE	Length	Spac.	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length										
8'	2'-0"	104	1/2"	10'-5"	6"	50	4'-0"	75	2'-10"	10	32'-6"	10	25'-9"	31'-6"	3'-6"	2	2	33'-4"	2'-4"	7"	4'-11"	4	10'-8"	1'-2"	13'-0"	2	1'-9"	1'-9"	3'-6"	4	8"	5'-6"	2	10'-0"	22	1'-4"	2	25'-0"	
	2'-6"	104	1/2"	10'-5"	6"	50	4'-0"	75	3'-4"	10	33'-6"	10	25'-9"	31'-6"	3'-6"	2	2	34'-4"	2'-6"	7"	4'-11"	4	10'-8"	1'-2"	13'-0"	2	1'-9"	1'-9"	3'-6"	4	8"	6'-2"	2	10'-0"	22	1'-4"	2	25'-0"	
	3'-0"	104	1/2"	10'-5"	6"	50	4'-0"	75	3'-10"	10	34'-6"	10	25'-9"	31'-6"	3'-6"	35'-0"	2	2	35'-6"	2'-8"	7"	5'-0"	4	10'-8"	1'-2"	14'-2"	2	2'-3"	1'-9"	4'-0"	4	8"	6'-10"	2	10'-0"	22	1'-4"	3	25'-0"
	4'-0"	104	1/2"	10'-11"	6"	50	4'-0"	75	4'-10"	10	36'-6"	10	25'-9"	31'-6"	3'-6"	35'-0"	2	4	37'-8"	3'-0"	7"	5'-11"	4	10'-8"	1'-2"	15'-4"	2	1'-6"	1'-9"	5'-0"	4	8"	8'-3"	2	10'-0"	22	1'-4"	4	25'-0"
	5'-0"	104	1/2"	10'-11"	6"	50	4'-0"	75	5'-10"	10	38'-6"	10	25'-9"	31'-6"	3'-6"	38'-6"	2	4	40'-8"	3'-2"	7"	7'-3"	4	10'-8"	1'-2"	16'-6"	2	2'-9"	1'-9"	6'-3"	4	8"	10'-0"	2	10'-0"	22	1'-4"	5	25'-0"
10'	2'-0"	104	1/2"	12'-5"	6"	50	5'-0"	75	3'-0"	12	32'-9"	12	25'-9"	31'-8"	3'-6"	2	2	33'-6"	2'-4"	7"	4'-11"	4	12'-8"	1'-2"	15'-0"	2	1'-9"	1'-9"	3'-6"	4	8"	5'-8"	2	12'-0"	26	1'-4"	2	25'-0"	
	2'-6"	104	1/2"	12'-5"	6"	50	5'-0"	75	3'-6"	12	33'-9"	12	25'-9"	31'-8"	3'-6"	2	2	34'-6"	2'-6"	7"	4'-11"	4	12'-8"	1'-2"	15'-0"	2	1'-9"	1'-9"	3'-6"	4	8"	6'-3"	2	12'-0"	26	1'-4"	2	25'-0"	
	3'-0"	104	1/2"	12'-5"	6"	50	5'-0"	75	4'-0"	12	34'-9"	12	25'-9"	31'-8"	3'-6"	35'-2"	2	2	35'-6"	2'-8"	7"	5'-0"	4	12'-8"	1'-2"	16'-2"	2	2'-3"	1'-9"	4'-0"	4	8"	7'-0"	2	12'-0"	26	1'-4"	3	25'-0"
	4'-0"	104	1/2"	12'-11"	6"	50	5'-0"	75	5'-0"	12	37'-0"	12	25'-9"	31'-8"	3'-6"	35'-2"	2	4	37'-10"	3'-0"	7"	5'-11"	4	12'-8"	1'-2"	17'-4"	2	1'-6"	1'-9"	5'-0"	4	8"	8'-4"	2	12'-0"	26	1'-4"	4	25'-0"
	5'-0"	104	1/2"	12'-11"	6"	50	5'-0"	75	6'-0"	12	39'-6"	12	25'-9"	31'-8"	3'-6"	38'-8"	2	4	40'-10"	3'-2"	7"	7'-3"	4	12'-8"	1'-2"	18'-6"	2	2'-10"	1'-9"	6'-4"	4	8"	10'-0"	2	12'-0"	26	1'-4"	5	25'-0"
12'	2'-0"	124	1/2"	14'-9"	5"	50	6'-0"	75	3'-0"	14	33'-0"	14	25'-9"	31'-10"	3'-6"	2	2	33'-8"	2'-4"	7"	4'-11"	4	14'-8"	1'-2"	17'-0"	2	1'-9"	1'-9"	3'-6"	4	8"	5'-8"	2	14'-0"	30	1'-5"	2	25'-0"	
	2'-6"	124	1/2"	14'-9"	5"	50	6'-0"	75	3'-6"	14	34'-0"	14	25'-9"	31'-10"	3'-6"	2	2	34'-10"	2'-6"	7"	4'-11"	4	14'-8"	1'-2"	18'-2"	2	1'-9"	1'-9"	3'-6"	4	8"	6'-6"	2	14'-0"	30	1'-5"	2	25'-0"	
	3'-0"	124	1/2"	14'-9"	5"	50	6'-0"	75	4'-0"	14	35'-0"	14	25'-9"	31'-10"	3'-6"	35'-4"	2	2	36'-0"	2'-8"	7"	5'-0"	4	14'-8"	1'-2"	18'-2"	2	2'-3"	1'-9"	4'-0"	4	8"	7'-2"	2	14'-0"	30	1'-5"	3	25'-0"
	4'-0"	124	1/2"	14'-11"	5"	50	6'-0"	75	5'-0"	14	37'-0"	14	25'-9"	31'-10"	3'-6"	35'-4"	2	4	38'-2"	3'-0"	7"	5'-11"	4	14'-8"	1'-2"	19'-4"	2	1'-8"	1'-9"	5'-2"	4	8"	8'-6"	2	14'-0"	30	1'-5"	4	25'-0"
	5'-0"	124	1/2"	14'-11"	5"	50	6'-0"	75	6'-0"	14	39'-6"	14	25'-9"	31'-10"	3'-6"	38'-10"	2	4	40'-10"	3'-2"	7"	7'-3"	4	14'-8"	1'-2"	20'-6"	2	3'-0"	1'-9"	6'-6"	4	8"	10'-3"	2	14'-0"	30	1'-5"	5	25'-0"
16'	2'-0"	104	3/4"	18'-9"	6"	50	8'-0"	75	3'-4"	18	33'-9"	18	25'-9"	32'-3"	3'-6"	2	2	34'-2"	2'-4"	7"	4'-11"	4	18'-8"	1'-2"	21'-0"	2	2'-0"	1'-9"	3'-3"	4	8"	6'-0"	2	18'-0"	38	1'-6"	2	25'-0"	
	2'-6"	104	3/4"	18'-9"	6"	50	8'-0"	75	3'-10"	18	34'-9"	18	25'-9"	32'-3"	3'-6"	2	2	35'-4"	2'-6"	7"	4'-11"	4	18'-8"	1'-2"	22'-2"	2	2'-0"	1'-9"	3'-9"	4	8"	6'-6"	2	18'-0"	38	1'-6"	2	25'-0"	
	3'-0"	104	3/4"	18'-9"	6"	50	8'-0"	75	4'-4"	18	35'-9"	18	25'-9"	32'-3"	3'-6"	35'-0"	2	2	36'-6"	2'-8"	7"	5'-0"	4	18'-8"	1'-2"	22'-2"	2	2'-6"	1'-9"	4'-3"	4	8"	7'-3"	2	18'-0"	38	1'-6"	3	25'-0"
	4'-0"	104	3/4"	18'-11"	6"	50	8'-0"	75	5'-4"	18	37'-6"	18	25'-9"	32'-3"	3'-6"	35'-0"	2	4	38'-8"	3'-0"	7"	6'-6"	4	18'-8"	1'-2"	23'-4"	2	2'-10"	1'-9"	5'-4"	4	8"	8'-10"	2	18'-0"	38	1'-6"	4	25'-0"
	5'-0"	104	3/4"	18'-11"	6"	50	8'-0"	75	6'-4"	18	40'-0"	18	25'-9"	32'-3"	3'-6"	38'-3"	2	4	41'-6"	3'-2"	7"	7'-3"	4	18'-8"	1'-2"	25'-8"	2	3'-0"	1'-9"	6'-6"	4	8"	10'-6"	2	18'-0"	38	1'-6"	5	25'-0"

* Note:- To obtain lengths of intermediate bars, use variation as an increment between short and long bars. Number of bars for each length is also given.

DIMENSIONS AND QUANTITIES FOR 24'-0" CULVERT

OPENING			BARREL					WINGS AND FLOOR										PER LIN. FT.		TOTAL	
CLEAR SPAN (2L)	CLEAR HEIGHT	AREA	T ₁	T ₂	B	C	M	H	H'	E	A	W	D	X	STEEL	CONC.	QUANTITIES	STEEL	CONC.		
FT.	FT.-IN.	SQ.FT.	IN.	IN.	IN.	IN.	FEIN	FT.-IN.	FT.-IN.	FEIN	IN.	FEIN.	FT.-IN.	FT.	LBS.	CUYDS.	LBS.	CUYDS.			
8	2-0	16.0	7	6	8	4	10-2	3-1	1-0	4-0	8	14-2	3-5	9	71.5	.548	2115	13.6			
	2-6	20.0	7	6	8	4	10-2	3-7	1-2	4-6	8	14-8	3-11	9	730	.579	2185	19.9			
	3-0	24.0	7	6	8	4	10-2	4-1	1-4	5-1	8	15-3	4-5	9	765	.619	2345	21.3			
	4-0	32.0	7	8	10	6	10-9	5-1	1-8	6-4	10	17-1	5-6	9	835	.780	2637	27.9			
10	5-0	40.0	7	8	10	6	10-9	6-1	1-10	7-10	10	18-7	6-9	9	885	.861	2927	32.1			
	2-0	20.0	7 1/2	6	8	4	12-2	3-1 1/2	1-0	4-1	8	16-3	3-6	5	84.0	.672	2467	22.4			
	2-6	25.0	7 1/2	6	8	4	12-2	3-7 1/2	1-2	4-7	8	16-9	4-0	5	85.0	.702	2537	23.7			
	3-0	30.0	7 1/2	6	8	4	12-2	4-1 1/2	1-4	5-2	8	17-4	4-6	5	89.0	.733	2707	25.2			
	4-0	40.0	7 1/2	8	10	6	12-9	5-1 1/2	1-8	6-5	10	19-2	5-7	5	96.0	.902	3004	31.8			
12	5-0	50.0	7 1/2	8	10	6	12-9	6-1 1/2	1-10	7-11	10	20-8	6-10	5	101.0	.982	3294	36.3			
	2-0	24.0	8	8	8	6	14-2	3-2	1-0	4-2	8	18-4	3-7	4	107.0	.858	3090	27.7			
	2-6	30.0	8	8	8	6	14-2	3-8	1-2	4-9	8	19-11	4-1	4	108.0	.899	3195	29.5			
	3-0	36.0	8	8	8	6	14-2	4-2	1-4	5-4	8	19-6	4-7	4	112.0	.932	3335	31.1			
	4-0	48.0	8	8	10	6	14-9	5-2	1-8	6-7	10	21-4	5-8	4	117.5	1.039	3613	36.4			
16	5-0	60.0	8	8	10	6	14-9	6-2	1-10	8-0	10	22-9	6-11	4	123.0	1.119	3916	40.7			
	2-0	32.0	9 1/2	8	8	8	18-2	3-3 1/2	1-0	4-5	8	22-7	3-9	4	171.0	1.222	4829	38.7			
	2-6	40.0	9 1/2	8	8	8	18-2	3-9 1/2	1-2	5-0	8	23-2	4-3	4	172.0	1.259	4949	40.4			
	3-0	48.0	9 1/2	8	8	8	18-2	4-3 1/2	1-4	5-7	8	23-9	4-9	4	176.0	1.296	5089	42.2			
	4-0	64.0	9 1/2	8	10	6	18-9	5-3 1/2	1-8	6-10	10	25-7	5-10	4	182.0	1.401	5393	47.1			
16	5-0	80.0	9 1/2	8	10	6	18-9	6-3 1/2	1-10	8-3	10	27-0	7-1	4	187.0	1.491	5723	52.3			

GENERAL NOTES AND DESIGN DATA

General Specifications:- La. State Highway Dept. Spec. Concrete - all class "A", 1:6 Mix.

Steel- all 1/2" deformed bars. (Bars a for 16' span are 3/4").

All exposed corners to be chamfered 3/8".

All exposed surfaces to be given a smooth finish.

Design Loads:-

Concentrated load- 15 ton typical truck, with 30% impact allowance distributed as specified in general specifications.

Entire fill above culvert assumed as acting on culvert.

Horizontal component of earth pressure taken as 30% per sq. ft.

Steel in tension- 16000 lbs. Concrete in compression- 650 lbs.

Fill above slab of culvert is not to exceed the maximum height X as given in table.

All dimensions relating to bars are to centers of bars.

Bars at splices are to be lapped 2'-0" and separated 2".

Reinf. bars should be wired at intersections and properly secured against displacement during depositing of concrete.

Designed - AFJ 8/3/21.
Drawn & Traced - AFJ 8/3/21.
Checked -
Revised - 7/30/29 - 'a' bars under curbs & quantities.

DOUBLE
CONCRETE BOX CULVERT
FLARING WING WALLS
8 FT. TO 16 FT. SPANS
LOUISIANA HIGHWAY COMMISSION
NEW ORLEANS, LA. SCALE 1" = 10' JANUARY 1922

Revised 7/30/20 (JTH)