FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
8	GA	TSAP-193(9)		55-A	135

DELETED 5-19-83

REINFORCING STEEL - BARRELS

BARREL DESIGN NO. 1 — FOR 1.5' TO 12.0 DEPTH OF FILL OVER BBL. INCL. PAVING

	CLEAR SPAN	CLEAR HEIGHT	"A" BARS Size	"A" No.	"A" Length	"A" Spacing	"G" BARS Size	"G" No.	"G" Length	"G" Spacing	"H" BARS Size	"H" No.	"H" Length	"H" Spacing
DOUBLE	3'	2'-6"	3/4" φ	2 x ("L" in inches ÷ Spacing) + 2 Bars	7'-2"	8"			~	~	3/4" φ	Same as "A" Bars	4'-6"	8"
		3'			7'-2"	8"			~	~			4'-6"	8"
	4'	2'-6"			9'-2"	8"			~	~			4'-6"	8"
		3'			9'-2"	8"			~	~			4'-6"	8"
		4'			9'-8"	8"			~	~			4'-6"	8"
	5'	2'-6"			11'-2"	14"	3/4" φ	2 x ("L" in inches ÷ Spacing)	11'-6"	14"	7/8" φ		5'-0"	14"
		3'			11'-2"	14"			11'-6"	14"			5'-0"	14"
		4'			11'-8"	15"			12'-1"	15"			5'-0"	15"
		5'			11'-8"	15"			12'-1"	15"			5'-0"	15"
	6'	3'			13'-5"	15"			13'-10"	15"			5'-0"	15"
		4'			13'-8"	15"			14'-1"	15"			5'-0"	15"
		5'			13'-11"	15"			14'-4"	15"			5'-0"	15"
		6'			13'-11"	15"			14'-4"	15"			5'-0"	15"
TRIPLE	3'	2'-6"	3/4" φ	2 x ("L" in inches ÷ Spacing) + 2 Bars	10'-8"	8"			~	~	3/4" φ	Same as "A" Bars	7'-8"	8"
		3'			10'-8"	8"			~	~			7'-8"	8"
	4'	2'-6"			13'-8"	8"			~	~			8'-8"	8"
		3'			13'-8"	8"			~	~			8'-8"	8"
		4'			14'-4"	8"			~	~			8'-10"	8"
	5'	2'-6"			16'-8"	14"	3/4" φ	2 x ("L" in inches ÷ Spacing)	17'-5"	14"	7/8" φ		9'-8"	14"
		3'			16'-8"	14"			17'-5"	14"			9'-8"	14"
		4'			17'-4"	15"			18'-2"	15"			9'-10"	15"
		5'			17'-4"	15"			18'-2"	15"			9'-10"	15"
	6'	3'			20'-0"	15"			20'-9"	15"			10'-9"	15"
		4'			20'-4"	15"			21'-1"	15"			10'-10"	15"
		5'			20'-8"	15"			21'-5"	15"			11'-0"	15"
		6'			20'-8"	15"			21'-5"	15"			11'-0"	15"

	CLEAR SPAN	CLEAR HEIGHT	"B" ½" φ No.	"B" Length	"B" Spacing	"C" ½" φ No.	"C" Length *	"C" Spacing	"D" ½" φ No.	"D" Length	"D" Spacing
DOUBLE	3'	2'-6"	3 x "L" in Ft. + 3 Bars	3'-4"	12"	16	½ of "L" in Ft + 5'-2" + 2'-0" for each lap	12"	9	⅔ of "L" in Ft. + 4'-6" + 2'-0" for each lap	12"
		3'		3'-10"	12"	16	½ of "L" in Ft + 5'-10" + 2'-0" for each lap	12"	9	⅓ of "L" in Ft. + 1'-8" + 2'-0" for each lap	12"
	4'	2'-6"		3'-4"	12"	20		12"	9		12"
		3'		3'-10"	12"	20		12"	9		12"
		4'		4'-11"	12"	20		12"	12		12"
	5'	2'-6"		3'-5"	12"	24		12"	9		12"
		3'		3'-11"	12"	24		12"	9		12"
		4'		5'-1"	12"	24		12"	12		12"
		5'		6'-1"	12"	24		12"	15		12"
	6'	3'		4'-1"	12"	28		12"	9		12"
		4'		5'-1"	12"	28		12"	12		12"
		5'		6'-1"	12"	28		12"	15		12"
		6'		7'-1"	12"	28		12"	18		12"
TRIPLE	3'	2'-6"	4 x "L" in Ft. + 4 Bars	3'-4"	12"	24	½ of "L" in Ft + 5'-2" + 2'-0" for each lap	12"	12	⅔ of "L" in Ft. + 4'-6" + 2'-0" for each lap	12"
		3'		3'-10"	12"	24	½ of "L" in Ft + 5'-10" + 2'-0" for each lap	12"	12	⅓ of "L" in Ft. + 1'-8" + 2'-0" for each lap	12"
	4'	2'-6"		3'-4"	12"	30		12"	12		12"
		3'		3'-10"	12"	30		12"	12		12"
		4'		4'-11"	12"	30		12"	16		12"
	5'	2'-6"		3'-5"	12"	36		12"	12		12"
		3'		3'-11"	12"	36		12"	12		12"
		4'		5'-1"	12"	36		12"	16		12"
		5'		6'-1"	12"	36		12"	20		12"
	6'	3'		4'-1"	12"	42		12"	12		12"
		4'		5'-1"	12"	42		12"	16		12"
		5'		6'-1"	12"	42		12"	20		12"
		6'		7'-1"	12"	42		12"	24		12"

BARREL DESIGN NO. 2 — FOR 12.1 TO 20.0 DEPTH OF FILL

	CLEAR SPAN	CLEAR HEIGHT	"A" BARS Size	"A" No.	"A" Length	"A" Spacing	"G" BARS Size	"G" No.	"G" Length	"G" Spacing	"H" BARS Size	"H" No.	"H" Length	"H" Spacing
DOUBLE	3'	2'-6"	3/4" φ	2 x ("L" in inches ÷ Spacing) + 2 Bars	7'-2"	8"			~	~	3/4" φ	Same as "A" Bars	4'-6"	8"
		3'			7'-2"	8"			~	~			4'-6"	8"
	4'	2'-6"			9'-2"	8"			~	~			4'-6"	8"
		3'			9'-2"	8"			~	~			4'-6"	8"
		4'			9'-8"	8"			~	~			4'-6"	8"
	5'	2'-6"	5/8" φ		12'-8"	17"	3/4" φ	2 x ("L" in inches ÷ Spacing)	13'-0"	17"	1" φ		5'-0"	17"
		3'			12'-8"	17"			13'-0"	17"			5'-0"	17"
		4'			13'-2"	17"			13'-6"	17"			5'-0"	17"
		5'			13'-2"	17"			13'-6"	17"			5'-0"	17"
	6'	3'			15'-1"	15"			15'-5"	15"			5'-0"	15"
		4'			15'-4"	14"			15'-8"	14"			5'-0"	14"
		5'			15'-7"	14"			15'-11"	14"			5'-0"	14"
		6'			15'-7"	14"			15'-11"	14"			5'-0"	14"
TRIPLE	3'	2'-6"	3/4" φ	2 x ("L" in inches ÷ Spacing) + 2 Bars	10'-8"	8"			~	~	3/4" φ	Same as "A" Bars	7'-8"	8"
		3'			10'-8"	8"			~	~			7'-8"	8"
	4'	2'-6"			13'-8"	8"			~	~			8'-8"	8"
		3'			13'-8"	8"			~	~			8'-8"	8"
		4'			14'-4"	8"			~	~			8'-10"	8"
	5'	2'-6"	5/8" φ		18'-3"	17"	3/4" φ	2 x ("L" in inches ÷ Spacing)	18'-10"	17"	1" φ		9'-8"	17"
		3'			18'-3"	17"			18'-10"	17"			9'-8"	17"
		4'			19'-0"	17"			19'-6"	17"			9'-10"	17"
		5'			19'-0"	17"			19'-6"	17"			9'-10"	17"
	6'	3'			21'-8"	15"			22'-5"	15"			10'-9"	15"
		4'			22'-0"	14"			22'-9"	14"			10'-10"	14"
		5'			22'-4"	14"			23'-1"	14"			11'-0"	14"
		6'			22'-4"	14"			23'-1"	14"			11'-0"	14"

	CLEAR SPAN	CLEAR HEIGHT	"B" ½" φ No.	"B" Length	"B" Spacing	"C" ½" φ No.	"C" Length *	"C" Spacing	"D" ½" φ No.	"D" Length	"D" Spacing
DOUBLE	3'	2'-6"	3 x "L" in Ft. + 3 Bars	3'-4"	12"	16	Same as for Design No. 1	12"	9	Same as for Design No. 1	12"
		3'		3'-10"	12"	16		12"	9		12"
	4'	2'-6"		3'-4"	12"	20		12"	9		12"
		3'		3'-10"	12"	20		12"	9		12"
		4'		4'-11"	12"	20		12"	12		12"
	5'	2'-6"		3'-7"	12"	24		12"	9		12"
		3'		4'-1"	12"	24		12"	9		12"
		4'		5'-1"	12"	24		12"	12		12"
		5'		6'-1"	12"	24		12"	15		12"
	6'	3'		4'-3"	12"	28		12"	9		12"
		4'		5'-3"	12"	28		12"	12		12"
		5'		6'-3"	12"	28		12"	15		12"
		6'		7'-3"	12"	28		12"	18		12"
TRIPLE	3'	2'-6"	4 x "L" in Ft. + 4 Bars	3'-4"	12"	24	Same as for Design No. 1	12"	12	Same as for Design No. 1	12"
		3'		3'-10"	12"	24		12"	12		12"
	4'	2'-6"		3'-4"	12"	30		12"	12		12"
		3'		3'-10"	12"	30		12"	12		12"
		4'		4'-11"	12"	30		12"	16		12"
	5'	2'-6"		3'-7"	12"	36		12"	12		12"
		3'		4'-1"	12"	36		12"	12		12"
		4'		5'-1"	12"	36		12"	16		12"
		5'		6'-1"	12"	36		12"	20		12"
	6'	3'		4'-3"	12"	42		12"	12		12"
		4'		5'-3"	12"	42		12"	16		12"
		5'		6'-3"	12"	42		12"	20		12"
		6'		7'-3"	12"	42		12"	24		12"

DIMENSIONS

	CLEAR SPAN	CLEAR HEIGHT	Des. No. 1 T_1	T_2	V	H	W_1	Des. No. 2 T_1	T_2	V	H	W_1	All Designs P	M	W_2	R
DOUBLE	3'	2'-6"	7"	6"	3'-8"	3'-7"	2'-2"	7"	6"	3'-8"	3'-7"	2'-2"	7'-6"	5'-6"	1'-5"	9'-1"
		3'	7"	6"	4'-2"	4'-1"	2'-3½"	7"	6"	4'-2"	4'-1"	2'-3½"	7'-6"	6'-0"	1'-9½"	9'-1"
	4'	2'-6"	7"	6"	3'-8"	3'-7"	2'-2"	7"	6"	3'-8"	3'-7"	2'-2"	9'-6"	5'-6"	1'-5"	11'-1"
		3'	7"	6"	4'-2"	4'-1"	2'-3½"	7"	6"	4'-2"	4'-1"	2'-3½"	9'-6"	6'-0"	1'-9½"	11'-1"
		4'	7½"	8"	5'-3"	5'-1½"	2'-11"	7½"	8"	5'-3"	5'-1½"	2'-11"	10'-0"	7'-6"	2'-2½"	11'-3"
	5'	2'-6"	7½"	6"	3'-9"	3'-7½"	2'-2½"	8½"	6"	3'-11"	3'-8½"	2'-3½"	11'-6"	5'-6"	1'-5"	13'-1"
		3'	7½"	6"	4'-3"	4'-1½"	2'-4"	8½"	6"	4'-5"	4'-2½"	2'-5"	11'-6"	6'-0"	1'-9½"	13'-1"
		4'	8½"	8"	5'-5"	5'-2½"	3'-0"	8½"	8"	5'-5"	5'-2½"	3'-0"	12'-0"	7'-6"	2'-2½"	13'-3"
		5'	8½"	8"	6'-5"	6'-2½"	3'-8½"	8½"	8"	6'-5"	6'-2½"	3'-8½"	12'-0"	9'-0"	2'-6"	13'-3"
	6'	3'	8½"	7"	4'-5"	4'-2½"	2'-4"	9½"	7"	4'-7"	4'-3½"	2'-5	13'-9"	6'-0"	1'-10½"	15'-2"
		4'	8½"	8"	5'-5"	5'-2½"	3'-0"	9½"	8"	5'-7"	5'-3½"	3'-1"	14'-0"	7'-6"	2'-2½"	15'-3"
		5'	8½"	9"	6'-5"	6'-2½"	3'-8½"	9½"	9"	6'-7"	6'-3½"	3'-9½"	14'-3"	9'-0"	2'-6"	15'-4"
		6'	8½"	9"	7'-5"	7'-2½"	4'-2½"	9½"	9"	7'-7"	7'-3½"	4'-3½"	14'-3	10'-6"	3'-0"	15'-4"
TRIPLE	3'	2'-6"	7"	6"	3'-8"	3'-7"	2'-2"	7"	6"	3'-8"	3'-7"	2'-2"	11'-0"	5'-6"	1'-5"	12'-7"
		3'	7"	6"	4'-2"	4'-1"	2'-3½"	7"	6"	4'-2"	4'-1"	2'-3½"	11'-0"	6'-0"	1'-9½"	12'-7"
	4'	2'-6"	7"	6"	3'-8"	3'-7"	2'-2"	7"	6"	3'-8"	3'-7"	2'-2"	14'-0"	5'-6"	1'-5"	15'-7"
		3'	7"	6"	4'-2"	4'-1"	2'-3½"	7"	6"	4'-2"	4'-1"	2'-3½"	14'-0"	6'-0"	1'-9½"	15'-7"
		4'	7½"	8"	5'-3"	5'-1½"	2'-11"	7½"	8"	5'-3"	5'-1½"	2'-11"	14'-0"	7'-6"	2'-2½"	15'-11"
	5'	2'-6"	7½"	6"	3'-9"	3'-7½"	2'-2½"	8½"	6"	3'-11"	3'-8½"	2'-3½"	17'-0"	5'-6"	1'-5"	18'-7"
		3'	7½"	6"	4'-3"	4'-1½"	2'-4"	8½"	6"	4'-5"	4'-2½"	2'-5"	17'-0"	6'-0"	1'-9½"	18'-7"
		4'	8½"	8"	5'-5"	5'-2½"	3'-0"	8½"	8"	5'-5"	5'-2½"	3'-0"	17'-8"	7'-6"	2'-2½"	18'-11"
		5'	8½"	8"	6'-5"	6'-2½"	3'-8½"	8½"	8"	6'-5"	6'-2½"	3'-8½"	17'-8"	9'-0"	2'-6"	18'-11"
	6'	3'	8½"	7"	4'-5"	4'-2½"	2'-4"	9½"	7"	4'-7"	4'-3½"	2'-5"	20'-4"	6'-0"	1'-10½"	21'-5"
		4'	8½"	8"	5'-5"	5'-2½"	3'-0"	9½"	8"	5'-7"	5'-3½"	3'-1"	20'-8"	7'-6"	2'-2½"	21'-11"
		5'	8½"	9"	6'-5"	6'-2½"	3'-8"	9½"	9"	6'-7"	6'-3½"	3'-9½"	21'-0"	9'-0"	2'-6"	22'-1"
		6'	8½"	9"	7'-5"	7'-2½"	4'-2"	9½"	9"	7'-7"	7'-3½"	4'-3½"	21'-0"	10'-6"	3'-0"	22'-1"

QUANTITIES

	CLEAR SPAN	CLEAR HEIGHT	Reinf. Steel lbs. per lineal ft. of Barrel DES. NO. 1	DES. NO. 2	WINGWALLS & PARAPETS TOTAL LBS.	Concrete Cu. Yds. per lineal ft. of Barrel DES. NO. 1	DES. NO. 2	WINGWALLS & PARAPETS TOTAL CU. YDS. DES. NO. 1	DES. NO. 2
DOUBLE	3'	2'-6"	79.8	79.8	185	.481	.481	7.92	7.92
		3'	80.9	80.9	212	.509	.509	8.73	8.73
	4'	2'-6"	92.2	92.2	191	.568	.568	8.56	8.56
		3'	93.2	93.2	217	.596	.596	9.37	9.37
		4'	100.0	100.0	296	.778	.778	11.66	11.66
	5'	2'-6"	104.8	99.1	196	.650	.761	9.24	9.33
		3'	105.8	100.1	223	.718	.789	10.05	[illegible]
		4'	113.4	106.3	301	.944	.944	12.40	12.40
		5'	117.8	110.6	377	1.019	1.019	14.72	14.72
	6'	3'	120.8	122.8	228	.934	1.019	10.89	10.99
		4'	126.4	133.5	306	1.049	1.136	13.05	13.16
		5'	131.9	138.9	383	1.183	1.271	15.47	15.59
		6'	136.3	143.2	488	1.266	1.354	18.17	18.30
TRIPLE	3'	2'-6"	121.2	121.2	195	.688	.688	9.15	9.15
		3'	122.6	122.6	221	.725	.725	9.98	9.98
	4'	2'-6"	144.3	144.3	203	.818	.818	10.10	10.10
		3'	145.6	145.6	229	.855	.855	10.93	10.93
		4'	155.4	155.4	308	1.102	1.102	13.37	13.37
	5'	2'-6"	160.6	152.0	211	1.000	1.105	11.11	11.23
		3'	162.0	153.4	237	1.037	1.142	11.95	12.07
		4'	174.3	162.3	316	1.350	1.350	14.46	14.46
		5'	180.0	168.1	392	1.449	1.449	16.83	16.83
	6'	3'	189.2	192.5	246	1.354	1.479	13.18	13.31
		4'	196.9	208.6	324	1.507	1.635	15.44	15.58
		5'	204.8	216.6	401	1.685	1.815	17.98	18.11
		6'	210.6	222.3	506	1.796	1.926	20.75	20.88

REINFORCING STEEL - 4 WINGS & 2 PARAPETS

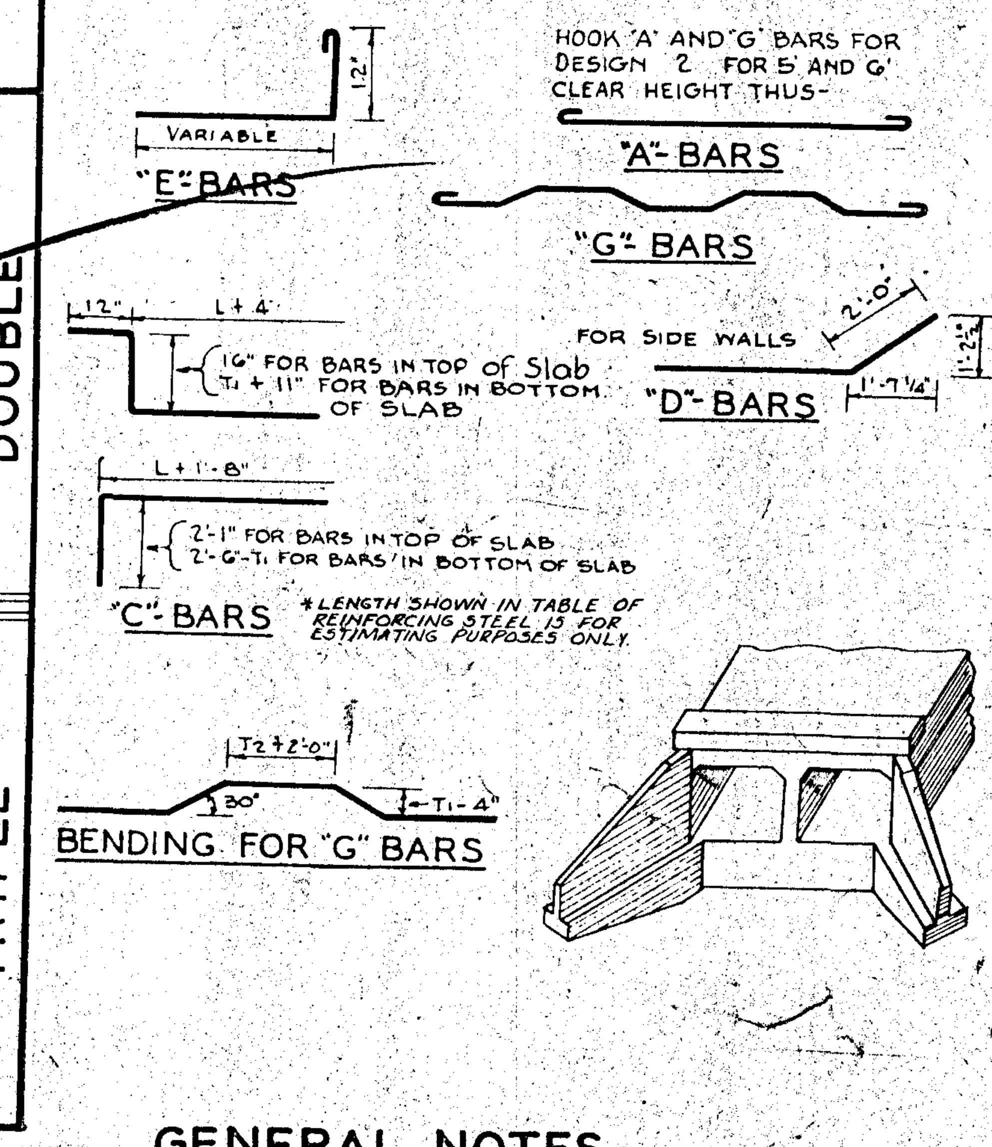
SAME FOR ALL DEPTHS OF FILL

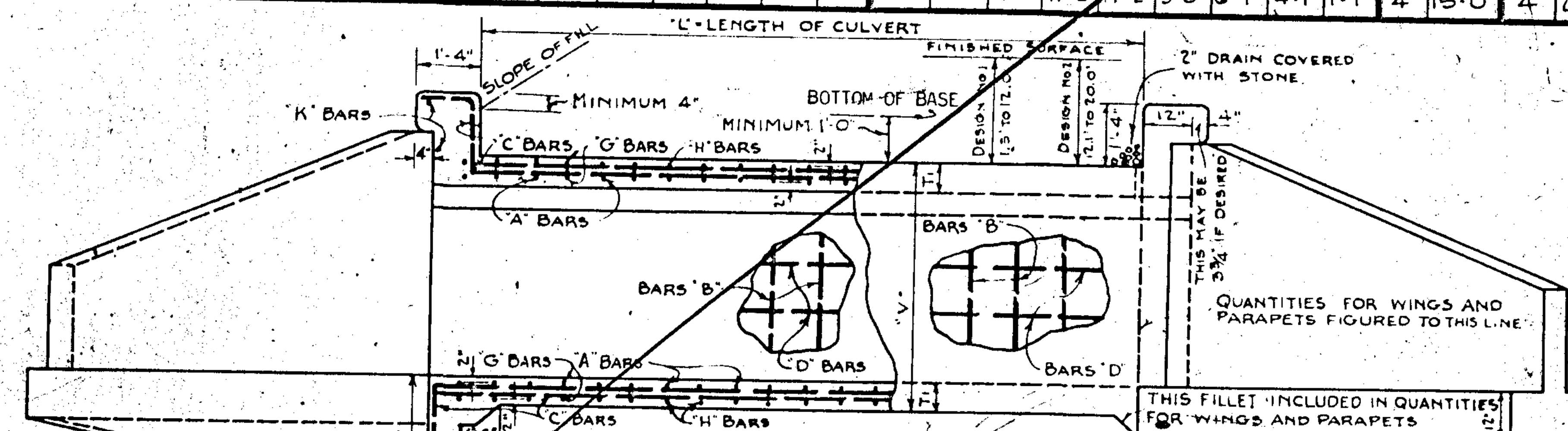
"E" BARS ½" φ AT 12" C. TO C. — 4 BARS OF EACH LENGTH SHOWN

DOUBLES & TRIPLES CLEAR SPAN	CLEAR HEIGHT												
3'	2'-6"	5'-10"	5'-9"	5'-4"	5'-0"	4'-7"	4'-2"	3'-9"					
	3'	6'-5"	6'-4"	5'-11"	5'-7"	5'-2"	4'-9"	4'-4"					
4'	2'-6"	5'-10"	5'-9"	5'-4"	5'-0"	4'-7"	4'-2"	3'-9"					
	3'	6'-5"	6'-4"	5'-11"	5'-7"	5'-2"	4'-9"	4'-4"					
	4'	7'-5"	7'-4"	6'-11"	6'-7"	6'-2"	5'-9"	5'-4"	4'-11"	4'-6"			
5'	2'-6"	5'-10"	5'-9"	5'-4"	5'-0"	4'-7"	4'-2"	3'-9"					
	3'	6'-5"	6'-4"	5'-11"	5'-7"	5'-2"	4'-9"	4'-4"					
	4'	7'-5"	7'-4"	6'-11"	6'-7"	6'-2"	5'-9"	5'-4"	4'-11"	4'-6"			
	5'	8'-6"	8'-4"	7'-11"	7'-6"	7'-2"	6'-9"	6'-4"	5'-11"	5'-6"	5'-1"		
6'	3'	6'-5"	6'-4"	5'-11"	5'-7"	5'-2"	4'-9"	4'-4"					
	4'	7'-5"	7'-4"	6'-11"	6'-7"	6'-2"	5'-9"	5'-4"	4'-11"	4'-6"			
	5'	8'-6"	8'-4"	7'-11"	7'-6"	7'-2"	6'-9"	6'-4"	5'-11"	5'-6"	5'-1"		
	6'	9'-6"	9'-4"	9'-0"	8'-7"	8'-2"	7'-9"	7'-4"	7'-0"	6'-7"	6'-2"	5'-9"	5'-5"

"F" BARS ½" φ AT 12" C. TO C. — 4 BARS OF EACH LENGTH SHOWN; ½" φ "K" BARS

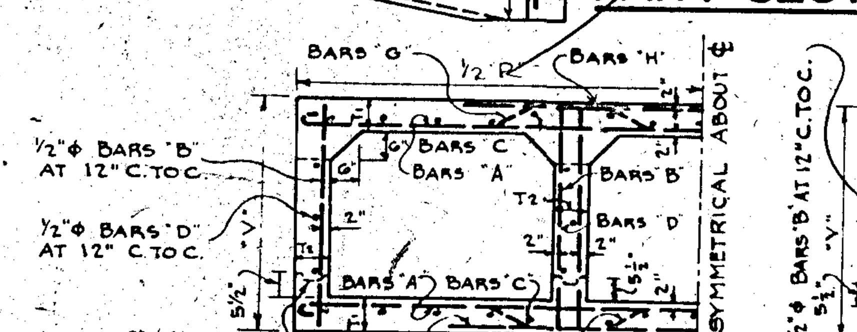
CLEAR SPAN	CLEAR HEIGHT										K DOUBLE No.	K DOUBLE Length	K TRIPLE No.	K TRIPLE Length
3'	2'-6"	6'-2"	6'-2"	6'-2"	5'-1"	2'-7"					4	8'-9"	4	12'-3"
	3'	6'-8"	6'-8"	6'-8"	6'-6"	4'-0"	1'-6"				4	8'-9"	4	12'-3"
4'	2'-6"	6'-2"	6'-2"	6'-2"	5'-1"	2'-7"					4	10'-9"	4	15'-3"
	3'	6'-8"	6'-8"	6'-8"	6'-6"	4'-0"	1'-6"				4	10'-9"	4	15'-3"
	4'	8'-2"	8'-2"	8'-2"	8'-2"	6'-6"	4'-0"	1'-7"			4	10'-11"	4	15'-7"
5'	2'-6"	6'-2"	6'-2"	6'-2"	5'-1"	2'-7"					4	12'-9"	4	18'-3"
	3'	6'-8"	6'-8"	6'-8"	6'-6"	4'-0"	1'-6"				4	12'-9"	4	18'-3"
	4'	8'-2"	8'-2"	8'-2"	8'-2"	6'-6"	4'-0"	1'-7"			4	12'-11"	4	18'-7"
	5'	9'-8"	9'-8"	9'-8"	9'-8"	8'-10"	6'-4"	3'-11"	1'-6"		4	12'-11"	4	18'-7"
6'	3'	6'-8"	6'-8"	6'-8"	6'-6"	4'-0"	1'-6"				4	14'-10"	4	21'-5"
	4'	8'-2"	8'-2"	8'-2"	8'-2"	6'-6"	4'-0"	1'-7"			4	14'-11"	4	21'-7"
	5'	9'-8"	9'-8"	9'-8"	9'-8"	8'-10"	6'-4"	3'-11"	1'-6"		4	15'-0"	4	21'-9"
	6'	11'-2"	11'-2"	11'-2"	11'-2"	11'-2"	9'-0"	6'-7"	4'-1"	1'-7"	4	15'-0"	4	21'-9"



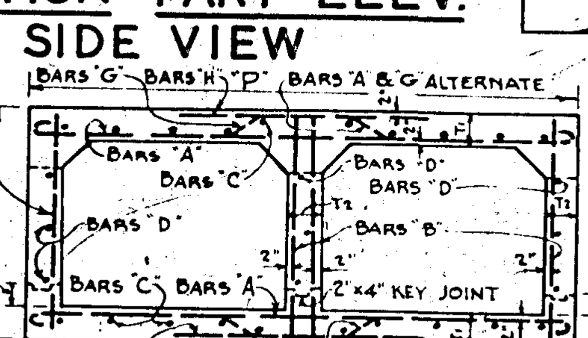


PART SECTION PART ELEV.

SIDE VIEW



HALF SECTION OF BARREL



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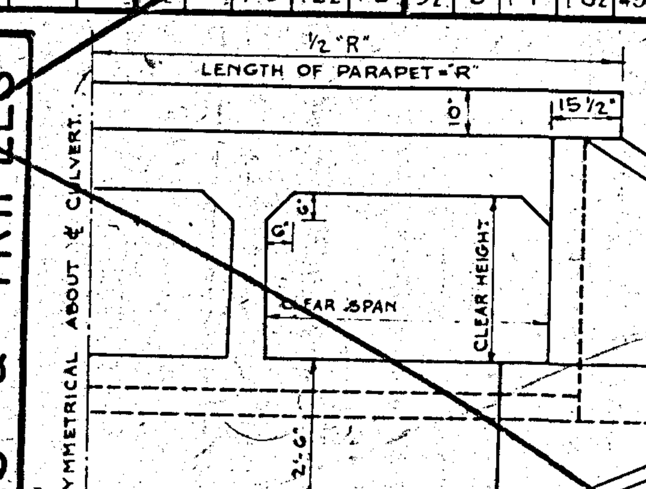
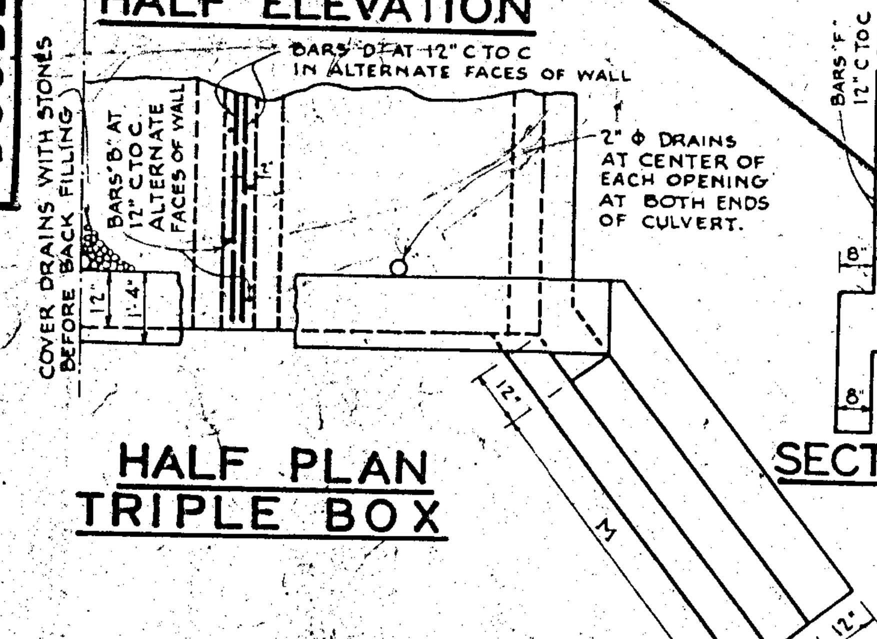
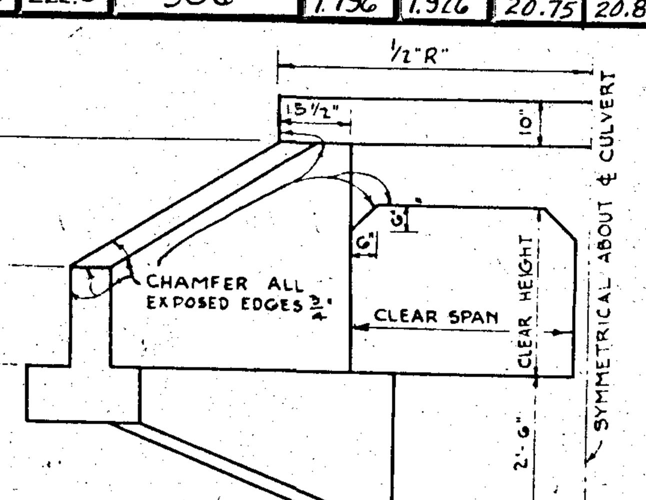


HALF ELEVATION



HALF PLAN TRIPLE BOX



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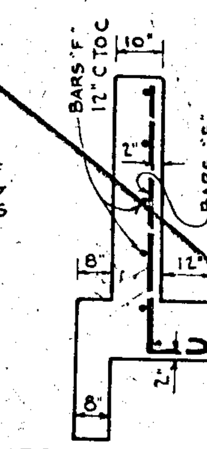
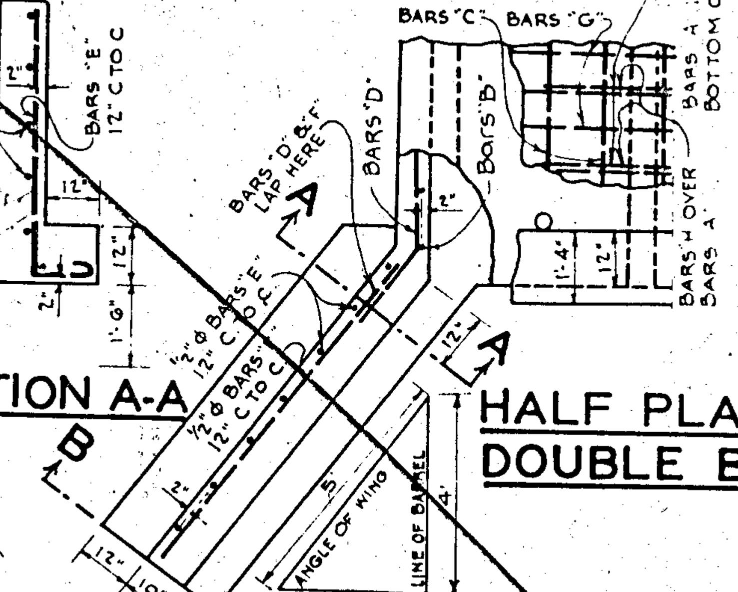
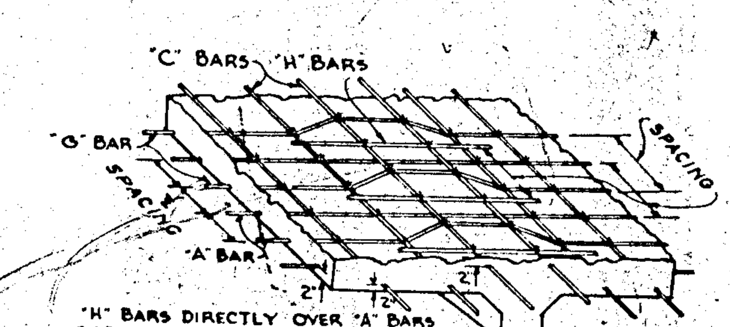


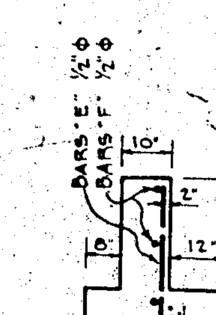
SECTION A-A



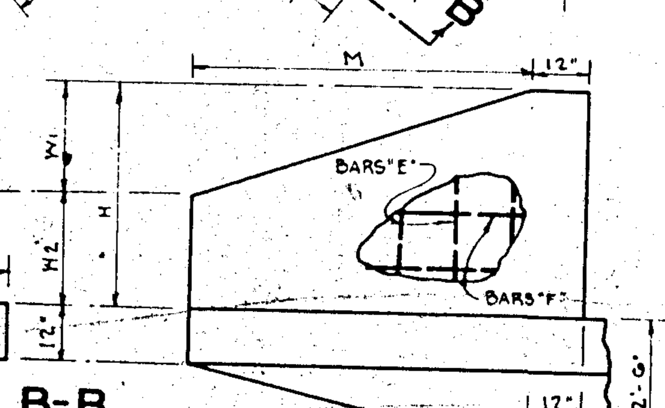
HALF PLAN DOUBLE BOX



SECTION OF SLAB SHOWING REINFORCING



SECTION B-B



ELEVATION OF WING

GENERAL NOTES

CHAMFER - CHAMFER ALL EXPOSED EDGES 3/4".

APRON WALLS - APRON WALLS MAY BE OMITTED IF ENGINEER APPROVES. ENGINEER MAY ALSO REQUIRE BOTTOM SLAB TO EXTEND TO ENDS OF WINGS AND APRON PLACED AT THIS POINT.

QUANTITIES - QUANTITIES FOR STEEL SHOWN ON THIS SHEET COMPUTED CONSIDERING ALL A, B, C, D, G AND H BARS AS PART OF BARREL QUANTITIES. STEEL PER LINEAL FOOT IS AN AVERAGE VALUE FOR A CULVERT OF 40' LENGTH ALLOWING ONE LAP IN LONGITUDINAL BARS.

SIZE OF CULVERT - IN DESIGNATING SIZES OF CULVERTS STATE CLEAR SPAN FIRST, I.E., A 6'x4' CULVERT HAS A 6' CLEAR SPAN AND A 4' CLEAR HEIGHT. L = LENGTH OF CULVERT = DISTANCE BETWEEN BACKS OF PARAPETS.

COVER - CULVERT TO HAVE MINIMUM OF 1.0' BELOW BOTTOM OF BASE OR CONCRETE PAVEMENT.

DESIGN DATA

LOADING - H20 S-16-44 AND/OR MILITARY SPECIFICATIONS. AASHO 1957; T-58.

DATE	REVISIONS	BY
4-22-69	QUANTITIES	G.H.S.-A.J.H.

STATE HIGHWAY BOARD OF GEORGIA
BRIDGE DEPARTMENT

STANDARD
REINFORCED CONCRETE BOX CULVERTS
DOUBLE 3'X2'-6" TO TRIPLE 6'X6'
FOR DEPTHS OF FILL UP TO 20' FT.

NO SCALE — DECEMBER 1959

DESIGNED R. B. D.
TRACED
CHECKED O. P. G., JR.
REVISED

SUBMITTED [signature] BRIDGE ENGINEER
APPROVED M. L. Shadburn STATE HIGHWAY ENGINEER

NUMBER 2325