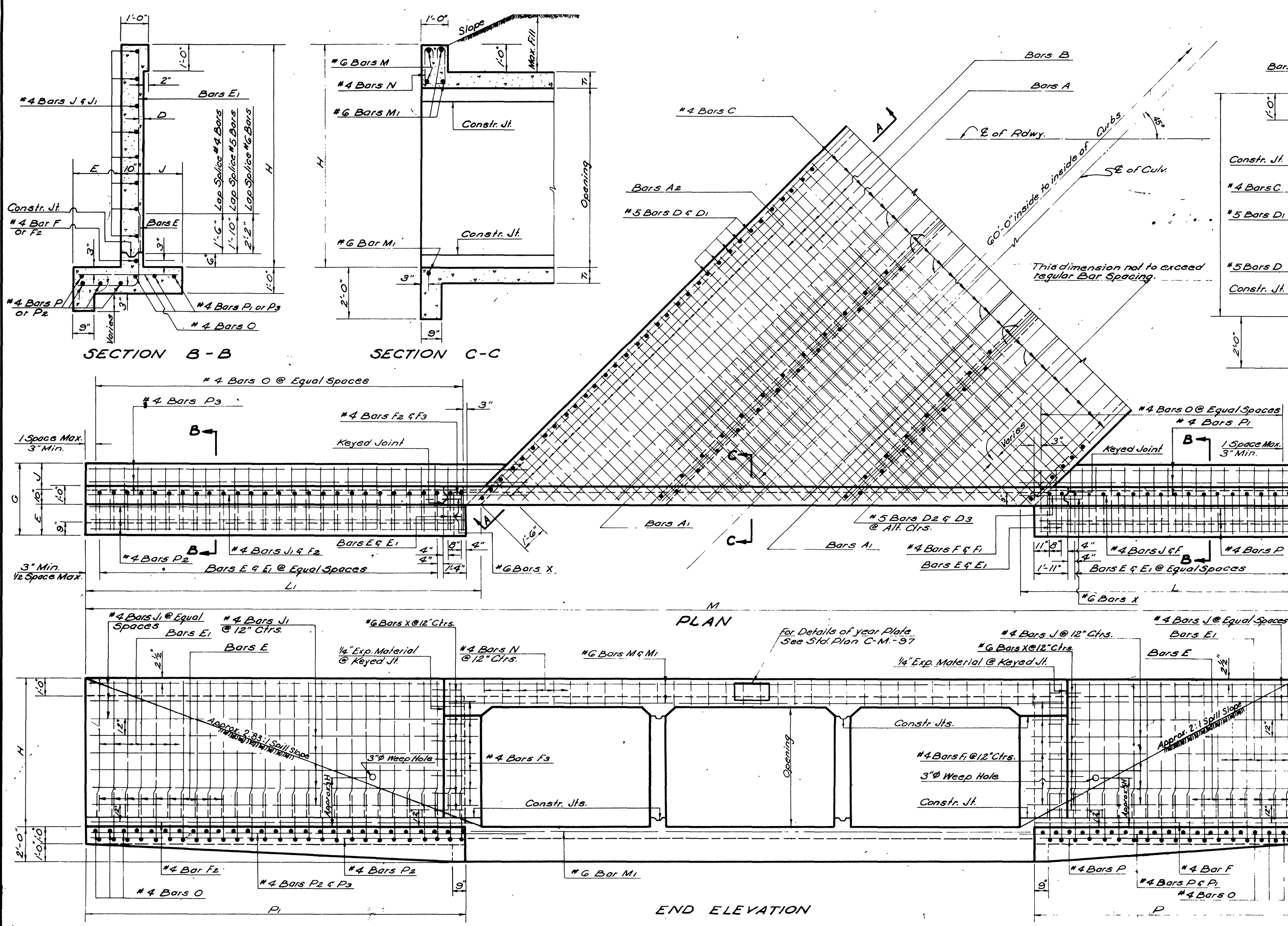
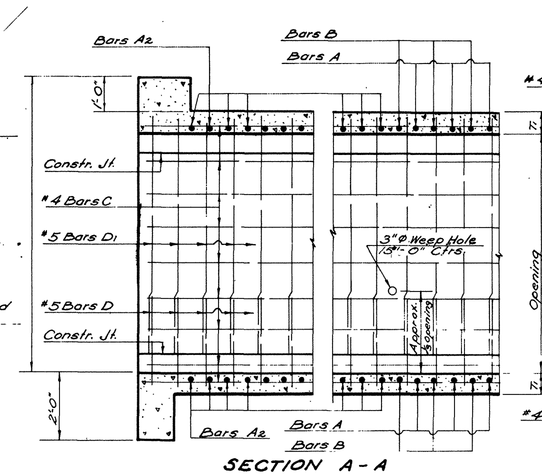
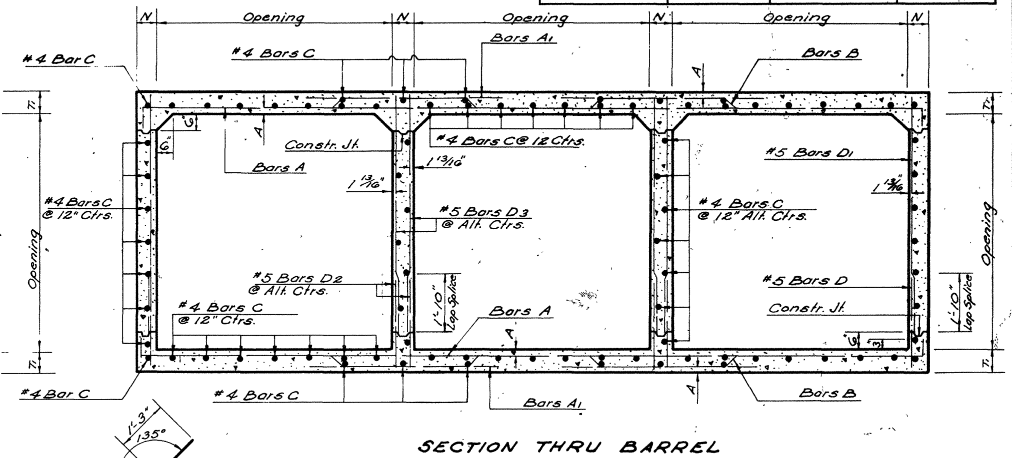
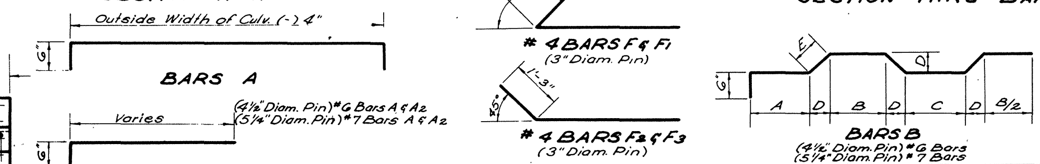
STATE PROJECT	PARISH	SHEET NO.

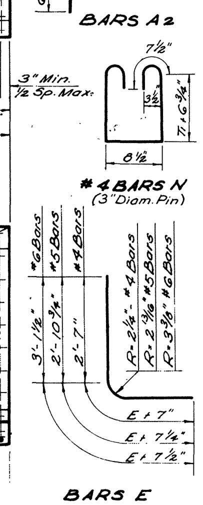








DIMENSIONS FOR BARS B					
SIZE	A	B	C	D	E
7'x 7'	5'-5⅝"	3'-8¼"	3'-1¼"	4¾"	6¾"
8'x 8'	6'-3⅜"	4'-2¾"	3'-6¾"	5¼"	7⅜"
9'x 9'	7'-1⅛"	4'-9¼"	4'-0¼"	5¾"	8⅛"
10'x 10'	7'-10 15/16"	5'-3⅞"	4'-5⅞"	6⅛"	8⅝"



DIMENSIONS / QUANTITIES 60'-0" ALONG ℄ OF CULVERT

OPENINGS SIZE (FT.)	NO.	AREA (SQ.FT.)	MAX. FILL SLAB (FT.)	MAX. FILL WALL (FT.)	BARREL T1 (IN.)	BARREL N (IN.)	BARREL A (IN.)	E (FT.-IN.)	J (FT.-IN.)	G (FT.-IN.)	D (IN.)	H (FT.-IN.)	L (FT.-IN.)	L1 (FT.-IN.)	P (FT.-IN.)	P1 (FT.-IN.)	M (FT.-IN.)	PER LINEAR FOOT OF BARREL STEEL (LBS.)	PER LINEAR FOOT OF BARREL CONC. (CU. YDS.)	TOTAL QUANTITIES STEEL (LBS.)	TOTAL QUANTITIES CONC.⊕ (CU. YDS.)
7x7	2	98	11														60-0¼	177.86	1.2986	13563	118.77
	3	147															70-8 15/16	264.85	1.8570	19530	155.42
	4	196	15	6	8½	7	1⅞	1-10	1-7	4-3	1¾	8-8½	16-3⅞	23-0⅞	15-6	22-3	81-5⅝	351.83	2.4154	25748	192.07
	5	245															92-2 5/16	438.82	2.9738	32163	228.71
	6	294															102-11	537.82	3.5322	39148	265.36
8x8	2	128	9														68-2½	210.50	1.6111	16407	147.89
	3	192															80-5 9/16	313.92	2.2994	23641	192.89
	4	256	13	5	9	8	1⅞	2-0	2-0	4-10	1 13/16	9-9	18-5 5/16	26-2 5/16	17-6	25-3	92-8⅝	417.34	2.9877	31063	237.90
	5	320															104-11 11/16	533.78	3.6759	39098	282.90
	6	384															117-2¾	637.20	4.3642	47463	327.90
9x9	2	162	7														75-10⅝	252.18	1.9560	20089	179.26
	3	243															89-8⅛	375.85	2.7870	28675	233.42
	4	324	11	5	9½	9	1⅞	2-2	2-4	5-4	1 13/16	10-9½	20-3¾	29-0¾	19-3	28-0	103-5 9/16	499.44	3.6181	37631	287.57
	5	405															117-3 1/16	637.39	4.4491	47663	341.73
10x10	2	200	5														84-5 13/16	299.05	2.3333	24979	215.00
	3	300															99-9 11/16	445.65	3.3200	35216	279.11
	4	400	9	5	10	10	1 15/16	2-5	2-8	5-11	1⅞	11-10	22-10⅛	32-2⅛	21-8	31-0	115-1½	610.35	4.3066	46472	343.23
	5	500															130-5⅜	756.94	5.2932	57911	407.34

⊕ Quantities do not include Expansion Joint Block

BILL OF REINFORCING STEEL FOR 60'-0" CULVERT

BARREL REINFORCEMENT

OPENINGS SIZE (FT.)	NO.	BARS A SIZE	BARS A NO.	BARS A LENGTH (FT.-IN.)	BARS A SP. (IN.)	BARS A1 SIZE	BARS A1 NO.	BARS A1 LENGTH (FT.-IN.)	BARS A1 SP. (IN.)	BARS A2 SIZE	BARS A2 NO.	BARS A2 SHORT BAR (FT.-IN.)	BARS A2 VARIATION (IN.)	BARS A2 LONG BAR (FT.-IN.)	BARS A2 SP. (IN.)	BARS B SIZE	BARS B NO.	BARS B LENGTH (FT.-IN.)	BARS B SP. (IN.)	#5 BARS D & D1 NO.	LGTH. BARS D (FT.-IN.)	LGTH. BARS D1 (FT.-IN.)	SP. (IN.)	#5 BARS D2 & D3 NO.	LGTH. BARS D2 (FT.-IN.)	LGTH. BARS D3 (FT.-IN.)	SP. (IN.)	#4 BARS C NO.	#4 BARS C ① LENGTH (FT.-IN.)
7x7	2	#6	86	16-5	13	#6	122	5-8	13 6½	#6	104	2-2	6.5000	15-8½	6½	#6	88	16-9	13	126	2-10	7-0	12	63	2-10	7-0	12	59	63-10
	3	#6	72	24-0	13	#6	272	5-8	13 6½	#6	160	2-2	6.5000	23-3½	6½	#6	74	24-8	13	126	2-10	7-0	12	126	2-10	7-0	12	86	63-10
	4	#6	58	31-7	13	#6	450	5-8	13 6½	#6	216	2-2	6.5000	30-10½	6½	#6	60	32-7	13	126	2-10	7-0	12	189	2-10	7-0	12	113	63-10
	5	#6	44	39-2	13	#6	656	5-8	13 6½	#6	272	2-2	6.5000	38-5½	6½	#6	46	40-6	13	126	2-10	7-0	12	252	2-10	7-0	12	140	63-10
	6	#6	30	③48-11	13	#6	890	5-8	13 6½	#6	328	2-2	6.5000	③46-0½	6½	#6	32	③50-7	13	126	2-10	7-0	12	315	2-10	7-0	12	167	63-10
8x8	2	#6	90	18-8	12	#6	134	6-3	6 12	#6	128	2-3	6.0000	17-9	6	#6	90	19-0¼	12	126	2-11	8-1	12	63	2-11	8-1	12	66	63-10
	3	#6	72	27-4	12	#6	308	6-3	6 12	#6	200	2-3	6.0000	26-9	6	#6	72	28-0½	12	126	2-11	8-1	12	126	2-11	8-1	12	96	63-10
	4	#6	54	36-0	12	#6	510	6-3	6 12	#6	268	2-3	6.0000	35-3	6	#6	56	37-0¾	12	126	2-11	8-1	12	189	2-11	8-1	12	126	63-10
	5	#6	38	③46-10	12	#6	748	6-3	6 12	#6	336	2-3	6.0000	③43-9	6	#6	38	③48-3	12	126	2-11	8-1	12	252	2-11	8-1	12	156	63-10
	6	#6	20	③55-6	12	#6	1032	6-3	6 12	#6	408	2-3	6.0000	③52-9	6	#6	20	③57-3¼	12	126	2-11	8-1	12	315	2-11	8-1	12	186	63-10
9x9	2	#6	92	20-11	11	#6	152	6-9	5½ 11	#6	160	2-4	5.5000	20-2½	5½	#6	94	21-3¾	11	144	2-11	9-1	10½	72	2-11	9-1	10½	73	63-10
	3	#6	72	30-8	11	#6	344	6-9	5½ 11	#6	244	2-4	5.5000	29-10	5½	#6	72	31-5½	11	144	2-11	9-1	10½	144	2-11	9-1	10½	106	63-10
	4	#6	48	40-5	11	#6	580	6-9	5½ 11	#6	332	2-4	5.5000	39-11	5½	#6	50	41-7¼	11	144	2-11	9-1	10½	216	2-11	9-1	10½	139	63-10
	5	#6	28	③52-4	11	#6	860	6-9	5½ 11	#6	416	2-4	5.5000	③49-6½	5½	#6	30	③53-1	11	144	2-11	9-1	10½	288	2-11	9-1	10½	172	63-10
10x10	2	#7	70	23-2	14	#7	118	7-8	7 14	#7	140	2-5	7.0000	22-3	7	#7	70	23-7	14	168	3-0	10-2	9	84	3-0	10-2	9	80	63-10
	3	#7	50	34-0	14	#7	276	7-8	7 14	#7	216	2-5	7.0000	33-4	7	#7	50	34-10	14	168	3-0	10-2	9	168	3-0	10-2	9	116	63-10
	4	#7	32	⑤47-5	14	#7	464	7-8	7 14	#7	288	2-5	7.0000	⑤43-10	7	#7	34	⑤48-8	14	168	3-0	10-2	9	252	3-0	10-2	9	152	63-10
	5	#7	12	⑤58-3	14	#7	696	7-8	7 14	#7	364	2-5	7.0000	⑤53-11	7	#7	14	⑤59-11	14	168	3-0	10-2	9	336	3-0	10-2	9	188	63-10

WINGS AND CURBS REINFORCEMENT

OPENINGS SIZE (FT.)	NO.	BARS E SIZE	BARS E NO.	BARS E LENGTH (FT.-IN.)	BARS E SP. (IN.)	BARS E1 SIZE	BARS E1 NO.	BARS E1 LENGTH (FT.-IN.)	BARS E1 SP. (IN.)	#4 BARS F NO.	#4 BARS F LENGTH (FT.-IN.)	#4 BARS F1 NO.	#4 BARS F1 LENGTH (FT.-IN.)	#4 BARS F2 NO.	#4 BARS F2 LENGTH (FT.-IN.)	#4 BARS F3 NO.	#4 BARS F3 LENGTH (FT.-IN.)	#4 BARS J NO.	#4 BARS J LENGTH (FT.-IN.)	#4 BARS J1 NO.	#4 BARS J1 LENGTH (FT.-IN.)	BARS O SIZE	BARS O NO.	BARS O LENGTH (FT.-IN.)	BARS O SP. (IN.)	#4 BARS P NO.	#4 BARS P LENGTH (FT.-IN.)	#4 BARS P1 NO.	#4 BARS P1 LENGTH (FT.-IN.)	#4 BARS P2 NO.	#4 BARS P2 LENGTH (FT.-IN.)	#4 BARS P3 NO.	#4 BARS P3 LENGTH (FT.-IN.)	#4 BARS N NO.	#4 BARS N LENGTH (FT.-IN.)	#6 BARS M NO.	#6 BARS M LENGTH (FT.-IN.)	#6 BARS M1 NO.	#6 BARS M1 LENGTH (FT.-IN.)	#6 BARS X Ⓐ NO.	#6 BARS X LENGTH (FT.-IN.)
7x7	2																																	44	4-6	4	25-0	6	21-9	32	2-0
	3																																	66	4-6	4	35-8	6	32-6	32	2-0
	4	#4	84	5-0	11	#4	84	8-0	11	2	16-6	14	2-9½	2	24-6½	14	3-6	16	13-3	16	20-7	#4	76	3-10	12	8	15-2	6	16-2	8	21-11	6	25-9	86	4-6	4	②48-7	6	②45-5	32	2-0
	5																																	108	4-6	4	②59-4	6	②56-1	32	2-0
	6																																	130	4-6	4	②70-0	6	②66-10	32	2-0
8x8	2																																	50	4-7	4	28-2	6	24-11	36	2-0
	3																																	74	4-7	4	②42-7	6	37-3	36	2-0
	4	#5	104	5-6	10	#4	104	9-1	10	2	18-7½	16	2-11	2	27-8	16	3-7½	18	15-3	18	23-7	#4	86	4-5	12	8	17-2	6	18-2	8	24-11	6	29-2	100	4-7	4	②54-10	6	②51-8	36	2-0
	5																																	124	4-7	4	②67-1	6	②63-11	36	2-0
	6																																	148	4-7	4	②79-4	6	②76-2	36	2-0
9x9	2																																	56	4-8	4	31-4	6	28-2	40	2-0
	3																																	84	4-8	4	②47-3	6	②44-1	40	2-0
	4	#5	140	5-8	8	#4	140	10-1	8	2	20-6	18	3-0½	2	30-6	18	3-8½	22	17-0	22	26-4	#4	114	4-11	10	8	18-11	6	19-11	8	27-8	6	32-1	112	4-8	4	②61-0	6	②57-11	40	2-0
	5																																	140	4-8	4	②74-10	6	②71-8	40	2-0
10x10	2																																	62	4-9	4	34-6	6	31-4	44	2-0
	3																																	94	4-9	4	②52-0	6	②48-10	44	2-0
	4	#5	148	6-2	8½	#5	148	11-2	8½	2	23-0½	20	3-2	2	33-7½	20	3-10	24	19-5	24	29-4	#5	116	5-6	11	8	21-4	6	22-4	8	30-8	6	35-7	124	4-9	4	②67-4	6	②64-1	44	2-0
	5																																	154	4-9	4	②84-10	6	②79-5	44	2-0

① Includes one 1'-6" Lap Splice
② Includes one 2'-2" Lap Splice
③ Does not include Lap Splice, when length of Bar exceeds 40'-0", add 2'-2" Lap Splice.
④ Includes One 2'-7" Lap Splice
⑤ Does not include Lap Splice, When Length of Bar Exceeds 40'-0", add 2'-7" Lap Splice
⑥ Includes Two 2'-2" Lap Splices

Ⓐ #6 Bars X to be ¾"Φ Smooth and Greased for 1'-0" of Length

GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS: Latest Approved La. Dept. of Highways Std. Specs.
DESIGN SPECIFICATIONS: A.A.S.H.O. 1961 as amended by Int. Spec. 1964
LIVE LOAD: HS 20-44, or Military Loading, whichever is Greater.
All Concrete to be Class "A"
All Exposed Corners to have ¾" Chamfer, unless otherwise noted.
Reinforcement shall be Billet Steel A.S.T.M. A 615 or Rail Steel A.S.T.M. A 616 or Axle Steel A.S.T.M. A 617
For Detail of Joints, See Std. Plan C.M.-48.
Dimensions relating to Reinforcing Steel are to Bar Ctrs.
A 1'-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.

APPROVED BY:
Original Signed by Chief Engineer
CHIEF ENGINEER DATE

DATE	DESCRIPTION	BY
1-11-78	Rev. Weep Hole Note	W.T.J.
6-10-75	Rev. Slope Intercept	W.T.J.
6-8-72	Rev. General Notes For Steel	W.E.M.
5-2-67	Added Axle Steel	W.E.M.
12-18-64	Rev. General Notes	W.E.M.
6-15-64	8x8, 9x9 & 10x10 Added	W.E.M.
4-8-64	DEFORMED DOWELS X TO SMOOTH	W.E.M.

REVISIONS

CC-S-M-7-10-S-45°-1

STANDARD PLAN
MULTIPLE OPENINGS
REINFORCED CONCRETE BOX CULVERTS
STRAIGHT WINGS 45° CROSSING
2:1 SPILL SLOPE NORMAL TO CHANNEL
DATED Jan. 26 1962 7'x7' TO 10'x10'

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED M. Yoshii	DETAILED M. Yoshii	TRACED [illegible] Mitchell
CHECKED J. A. Hester	CHECKED W. E. Marcum	CHECKED W. E. Marcum

CC-S-M-7-10-S-45°-1