DESIGN (S;H; FILL OVER TOP)	DBL 6-7-10		DBL 6-7-20	DBL 6-7-30	DBL 6-7-40	DBL 6-7-50	
T_1	9"		10"	12"	13"	15"	
T_2	9"		9"	12"	12"	12"	
BARS "A"	506 AT 12"		501 AT 12"	602 AT 12"	504 AT 12"	606 AT 12"	
BARS "B"	401 AT 12"		401 AT 12"	406 AT 12"	604 AT 12"	604 AT 12"	
BARS "C"	402 AT 12"		502 AT 12"	503 AT 12"	605 AT 12"	505 AT 12"	
BARS "D"	403		601	603	701	702	
NO. BARS "E" IN 2 SLABS	36		36	36	36	36	
BARS "F"	404 AT 12"		405 AT 12"	407 AT 12"	408 AT 12"	409 AT 12"	
BARS "G"	404 AT 12"		405 AT 12"	407 AT 12"	408 AT 12"	409 AT 12"	
NO. BARS "H" IN INT. WALL	10 AT 16"		10 AT 16"	10 AT 16"	10 AT 16"	10 AT 16"	
NO. BARS "K" IN 2 EXT. WALLS	10 AT 16"		10 AT 16"	10 AT 16"	10 AT 16"	10 AT 16"	
NO. BARS "L" IN 2 EXT. WALLS	10 AT 16"		10 AT 16"	10 AT 16"	10 AT 16"	10 AT 16"	
NO. BARS "J" EXT. CORNER	0		0	0	1	1	
NO. BARS "J" INT. CORNER	0		0	1	2 AT 6"	2 AT 6"	
CU. YDS. CONC. PER FT.	1.472		1.562	1.907	2.000	2.185	
LBS. REINF. STEEL PER FT.	⑦ 146.97		⑦ 177.37	⑦ 207.99	⑦ 265.73	⑦ 287.50	

DESIGN (S;H; FILL OVER TOP)	DBL 6-5-10	DBL 6-5-20	DBL 6-5-30	DBL 6-5-40	DBL 6-5-50	DBL 6-5-60	DBL 6-5-70	②
T_1	8"	10"	12"	12½"	14"	15½"	15½	
T_2	8"	9"	10"	11"	12"	12"	13½	
BARS "A"	410 AT 16"	415 AT 12"	417 AT 12"	420 AT 11"	510 AT 12"	512 AT 12"	633 AT 12"	
BARS "B"	411 AT 16"	401 AT 12"	507 AT 12"	509 AT 11"	511 AT 12"	511 AT 12"	531 AT 12"	
BARS "C"	412 AT 16"	412 AT 12"	418 AT 12"	807 AT 11"	703 AT 12"	⑦423 AT 12"	459 AT 12"	
BARS "D"	413	413	508	608	609	704	634	
NO. BARS "E" IN 2 SLABS	40	40	40	40	40	40	40	
BARS "F"	414 AT 16"	416 AT 12"	419 AT 12"	421 AT 11"	422 AT 12"	424 AT 12"	460 AT 12"	
BARS "G"	414 AT 16"	416 AT 12"	419 AT 12"	421 AT 11"	422 AT 12"	424 AT 12"	460 AT 12"	
NO. BARS "H" IN INT. WALL	7 AT 12"	7 AT 12"	7 AT 12"	7 AT 12"	7 AT 12"	7 AT 12"	7 AT 12"	
NO. BARS "K" IN 2 EXT. WALLS	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	
NO. BARS "L" IN 2 EXT. WALLS	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	
NO. BARS "J" EXT. CORNER	0	0	0	1	1	2 AT 9"	2 AT 8"	③
NO. BARS "J" INT. CORNER	0	0	1	3 AT 6"	3 AT 5"	4 AT 4"	5 AT 3½"	
CU. YDS. CONC. PER FT.	1.158	1.377	1.599	1.688	1.870	2.009	2.068	
LBS. REINF. STEEL PER FT.	104.05	126.09	155.25	218.30	240.71	233.80	239.91	③

DESIGN (S;H; FILL OVER TOP)	DBL 9-9-10	DBL 9-9-20	DBL 9-9-30	DBL 9-9-40	DBL 9-9-50				
T_1	11½"	14½"	17½"	19½"	21½"				
T_2	9"	11½"	13"	15"	17"				
BARS A	513 AT 12"	611 AT 12"	612 AT 12"	517 AT 12"	519 AT 12"				
BARS B	425 AT 12"	427 AT 12"	429 AT 12"	518 AT 12"	614 AT 12"				
BARS C	514 AT 12"	515 AT 12"	516 AT 12"	613 AT 12"	707 AT 12"				
BARS D	610	705	706	801	802				
NO. BARS E IN 2 SLABS	48	48	48	48	48				
BARS F	426 AT 12"	428 AT 12"	430 AT 12"	431 AT 12"	432 AT 12"				
BARS G	426 AT 12"	428 AT 12"	430 AT 12"	431 AT 12"	432 AT 12"				
NO. BARS H IN INT. WALL	9 AT 12"	9 AT 12"	9 AT 12"	9 AT 12"	9 AT 12"				
NO. BARS K IN 2 EXT. WALLS	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"				
NO. BARS L IN 2 EXT. WALLS	10 AT 2'-0"	10 AT 2'-0"	10 AT 2'-0"	10 AT 2'-0"	10 AT 2'-0"				
NO. BARS J EXT. CORNER	0	0	0	0	1 AT 16"				
NO. BARS J INT. CORNER	0	0	2 AT 12"	3 AT 8"	4 AT 6"				
CU. YDS. CONCRETE PER FT.	2.307	2.863	3.361	3.773	4.194				
LBS. REINF. STEEL PER FT.	⑦ 242.62	⑦ 293.53	⑦ 316.70	⑦ 356.65	⑦ 421.40				

DESIGN (S;H; FILL OVER TOP)	DBL 10-8-10	DBL 10-8-20	DBL 10-8-30	DBL 10-8-40	DBL 10-8-50	DBL 10-8-60	DBL 10-8-70	DBL 10-8-80
T_1	10½"	13"	15½"	17½"	19½"	22"	23½"	25½"
T_2	8"	9½"	10½"	11½"	13½"	16½"	17½"	19½"
BARS A	520 AT 12"	617 AT 12"	618 AT 12"	619 AT 12"	620 AT 12"	724 AT 12"	646 AT 12"	726 AT 12"
BARS B	615 AT 12"	708 AT 12"	803 AT 12"	901 AT 12"	903 AT 12"	725 AT 12"	810 AT 12"	811 AT 12"
BARS C	433 AT 12"	435 AT 12"	521 AT 12"	522 AT 12"	523 AT 12"	488 AT 12"	490 AT 12"	492 AT 12"
BARS D	616	709	804	902	904	809	907	908
NO. BARS E IN 2 SLABS	52	52	52	52	52	52	52	52
BARS F	434 AT 12"	436 AT 12"	437 AT 12"	438 AT 12"	439 AT 12"	489 AT 12"	491 AT 12"	493 AT 12"
BARS G	434 AT 12"	436 AT 12"	437 AT 12"	438 AT 12"	439 AT 12"	489 AT 12"	491 AT 12	493 AT 12"
NO. BARS H IN INT. WALL	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"
NO. BARS K IN 2 EXT. WALLS	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"
NO. BARS L IN 2 EXT. WALLS	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"
NO. BARS J EXT. CORNER	0	0	1	1	1	2 AT 4"	2 AT 6"	2 AT 6"
NO. BARS J INT. CORNER	0	2 AT 12"	3 AT 8"	5 AT 5½"	7 AT 4½"	8 AT 4"	11 AT 3½"	12 AT 3½"
CU. YDS. CONCRETE PER FT.	2.123	2.580	3.010	3.375	3.744	4.3369	4.7038	5.0760
LBS. REINF. STEEL PER FT.	257.50	352.41	445.43	539.33	577.67	479.63	533.66	586.69
						②	②	②

FOR A DOUBLE 6'x 7' CULVERT, USE WINGWALLS & PARAPETS DESIGN FOR A DOUBLE 7'x 7' WITH PARAPETS AND K BARS REDUCED BY 2 FT. IN LENGTH. CONCRETE AND STEEL (FOR BOTH PARAPETS) SHALL BE REDUCED BY 0.64 CU. YDS. AND 21 LBS. RESPECTIVELY. FOR SKEWED ENDS, DIVIDE THE REDUCTION BY THE SINE OF THE SKEW ANGLE. ⑧

NOTE: THE DESIGN OF CULVERT SHALL BE DETERMINED BY THE MAXIMUM HEIGHT OF FILL WITH ONLY A SINGLE DESIGN BEING USED FOR THE ENTIRE INSTALLATION.

DESIGN (S;H; FILL OVER TOP)	DBL 10-9-10	DBL 10-9-20	DBL 10-9-30	DBL 10-9-40				
T_1	10½"	13"	15½"	17½"				
T_2	8½"	9½"	11½"	12½"				
BARS "A"	524 AT 12"	623 AT 12"	624 AT 12"	626 AT 12"				
BARS "B"	621 AT 12"	710 AT 12"	805 AT 12"	905 AT 12"				
BARS "C"	525 AT 12"	526 AT 12"	625 AT 12"	807 AT 12"				
BARS "D"	622	711	806	906				
NO. BARS "E" IN 2 SLABS	52	52	52	52				
BARS "F"	440 AT 12"	441 AT 12"	442 AT 12"	443 AT 12"				
BARS "G"	440 AT 12"	441 AT 12"	442 AT 12"	443 AT 12"				
NO. BARS "H" IN INT. WALL	9 AT 12"	9 AT 12"	9 AT 12"	9 AT 12"				
NO. BARS "K" IN 2 EXT. WALLS	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"	8 AT 2'-0"				
NO. BARS "L" IN 2 EXT. WALLS	10 AT 2'-0"	10 AT 2'-0"	10 AT 2'-0"	10 AT 2'-0"				
NO. BARS "J" EXT. CORNER	0	0	1	1				
NO. BARS "J" INT. CORNER	0	2 AT 12"	3 AT 9"	5 AT 6"				
CU. YDS. CONC. PER FT.	2.226	2.709	3.165	3.558				
LBS. REINF. STEEL PER FT.	279.32	364.47	451.01	576.50				

DESIGN (S;H; FILL OVER TOP)	DBL 5-5-10	DBL 5-5-20	DBL 5-5-30	DBL 5-5-40	DBL 5-5-50	DBL 5-5-60	④
T_1	7"	7½"	8½"	9½"	10½"	12"	
T_2	7"	7"	7½"	7½"	9"	10½"	
BARS "A"	444 AT 12"	449 AT 12"	452 AT 12"	529 AT 12"	530 AT 12"	542 AT 12"	
BARS "B"	445 AT 12"	527 AT 12"	627 AT 12"	629 AT 12"	632 AT 12"	543 AT 12"	
BARS "C"	446 AT 12"	450 AT 12"	453 AT 12"	455 AT 12"	457 AT 12"	494 AT 12"	
BARS "D"	447	528	628	630	631	647	
NO. BARS "E" IN 2 SLABS	36	36	36	36	36	36	
BARS "F"	448 AT 12"	451 AT 12"	454 AT 12"	456 AT 12"	458 AT 12"	495 AT 12"	
BARS "G"	448 AT 12"	451 AT 12"	454 AT 12"	456 AT 12"	458 AT 12"	495 AT 12"	
NO. BARS "H" IN INT. WALL	5 AT 12" ALT	5 AT 12" ALT	5 AT 12" ALT	5 AT 12" ALT	5 AT 12" ALT.	5 AT 12" ALT.	
NO. BARS "K" IN 2 EXT. WALLS	4 AT 2'-0"	4 AT 2'-0"	4 AT 2'-0"	4 AT 2'-0"	4 AT 2'-0"	4 AT 2'-0"	
NO. BARS "L" IN 2 EXT. WALLS	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	
NO. BARS "J" IN EXT. CORNER	0	0	0	1	1	1	
NO. BARS "J" IN INT. CORNER	0	0	1	2 AT 5"	3 AT 4"	3 AT 4½"	
CU. YDS. CONC. PER FT.	0.9454	0.9830	1.0869	1.1826	1.2916	1.4614	
LBS. REINF. STEEL PER FT.	108.10	127.24	152.39	174.13	182.39	188.33	

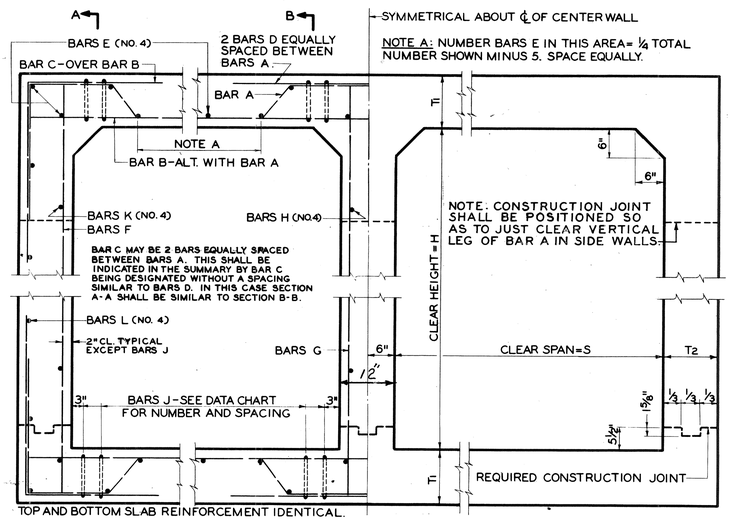
DESIGN (S; H, FILL OVER TOP)	DBL 7-5-10	DBL 7-5-20	DBL 7-5-30	DBL 7-5-40	DBL 7-5-50	DBL 7-5-60	DBL 7-5-70	DBL 7-5-80	②
T_1	8"	10"	11½"	13½"	14½"	16"	17"	18½"	
T_2	8"	8"	8½"	9½"	10½"	11½"	12½"	13½"	
BARS "A"	461 AT 12"	532 AT 12"	534 AT 12"	537 AT 12"	469 AT 12"	637 AT 12"	639 AT 12"	641 AT 12"	
BARS "B"	462 AT 12"	462 AT 12"	535 AT 12"	635 AT 12"	713 AT 12"	638 AT 12"	640 AT 12"	716 AT 12"	
BARS "C"	463 AT 12"	465 AT 12"	465 AT 12"	467 AT 12"	470 AT 12"	472 AT 12"	474 AT 12"	476 AT 12"	
BARS "D"	464	533	636	712	714	715	715	717	
NO. BARS "E" IN 2 SLABS	40	40	40	40	40	40	40	40	
BARS "F"	414 AT 12"	416 AT 12"	466 AT 12"	468 AT 12"	471 AT 12"	473 AT 12"	475 AT 12"	477 AT 12"	
BARS "G"	414 AT 12"	416 AT 12"	466 AT 12"	468 AT 12"	471 AT 12"	473 AT 12"	475 AT 12"	477 AT 12"	
NO. BARS "H" IN INT. WALL	7 AT 16"	7 AT 12"	7 AT 16"	7 AT 16"	7 AT 16"	7 AT 16"	7 AT 16"	7 AT 16"	
NO. BARS "K" IN 2 EXT. WALLS	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	
NO. BARS "L" IN 2 EXT. WALLS	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	8 AT 12"	
NO. BARS "J" IN EXT. CORNERS	0	0	0	0	1	1	2 AT 6"	2 AT 5"	
NO. BARS "J" IN INT. CORNERS	0	1	2 AT 10"	3 AT 6"	5 AT 5"	6 AT 4"	7 AT 3½"	2 AT 3½"	
CU. YDS. CONC. PER FOOT	.1.2572	1.4588	1.6568	1.8422	2.0414	2.2176	2.3822	2.5636	
LBS. REINF. STEEL PER FOOT	132.38	163.95	195.16	229.66	251.16	283.45	298.43	⑤ 326.93	

DESIGN (S;H;FILL OVER TOP)	DBL 10-6-10	DBL 10-6-20	DBL 10-6-30	DBL 10-6-40	DBL 10-6-50	②
T_1	10½"	13½"	16"	18½"	20½"	
T_2	8½"	9½"	10½"	11½"	12½"	
BARS "A"	538 AT 12"	642 AT 12"	644 AT 12"	720 AT 12"	722 AT 12"	
BARS "B"	539 AT 12"	541 AT 12"	718 AT 12"	645 AT 12"	723 AT 12"	
BARS "C"	478 AT 12"	480 AT 12"	482 AT 12"	484 AT 12"	486 AT 12"	
BARS "D"	540	643	719	721	808	
NO. BARS "E" IN 2 SLABS	52	52	52	52	52	
BARS "F"	479 AT 12"	481 AT 12"	483 AT 12"	485 AT 12"	487 AT 12"	
BARS "G"	479 AT 12"	481 AT 12"	483 AT 12"	485 AT 12"	487 AT 12"	
NO. BARS "H" IN INT. WALL	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	6 AT 12"	
NO. BARS "K" IN 2 EXT. WALLS	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	
NO. BARS "L" IN 2 EXT. WALLS	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	6 AT 2'-0"	
NO. BARS "J" IN EXT. CORNERS	0	0	0	0	0	
NO. BARS "J" IN INT. CORNERS	0	2 AT 10"	3 AT 10"	5 AT 6"	7 AT 5"	
CU. YDS. CONC. PER FOOT	1.9965	2.4618	2.8720	3.2483	3.6036	
LBS. REINF. STEEL PER FOOT	217.22	272.80	343.83	376.76	442.78	

DBL 7-5-100	
	23"
	13½"
	648 AT 12"
	716 AT 12"
	496 AT 12"
	717
	40
⑨ ⑥ ⑦ ⑤ TYPE 36	497 AT 12"
	497 AT 12"
	7 AT 16"
	6 AT 12"
	8 AT 12"
	3 AT 4"
	4 AT 3"
	3.069
	322.87

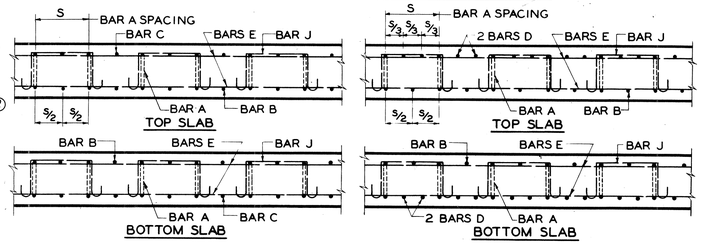
NOTE: BEND LONGITUDINAL BARS INTO WINGS AND PARAPETS SIMILAR TO STANDARDS. IF CULVERT IS SKEWED CUT TRANSVERSE STEEL AND BEND 12" INTO PARAPET OR TOE WALL AND HOOK.

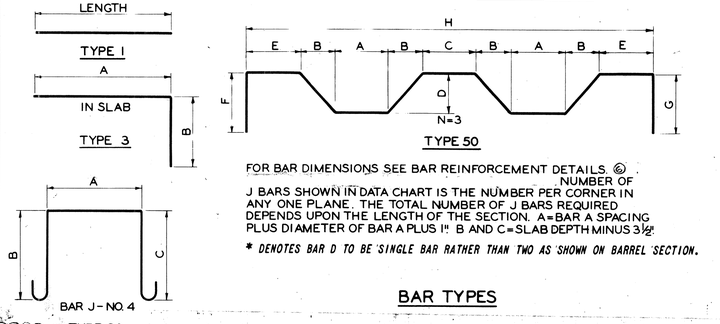
STATE	PROJECT NUMBER	SHEET No.	TOTAL SHEETS
GA.			



TOP AND BOTTOM SLAB REINFORCEMENT IDENTICAL.

TYPICAL BARREL SECTION-ALL DESIGNS





FOR BAR DIMENSIONS SEE BAR REINFORCEMENT DETAILS. ⑥

NUMBER OF J BARS SHOWN IN DATA CHART IS THE NUMBER PER CORNER IN ANY ONE PLANE. THE TOTAL NUMBER OF J BARS REQUIRED DEPENDS UPON THE LENGTH OF THE SECTION. A=BAR A SPACING PLUS DIAMETER OF BAR A PLUS 1" B AND C=SLAB DEPTH MINUS 3½".

* DENOTES BAR D TO BE SINGLE BAR RATHER THAN TWO AS SHOWN ON BARREL SECTION.

BAR TYPES

RJS - ADDED DBL 7-5-100 5/24/84
AMU - ADDED NOTE 6-7-90
RJS - LENGTH OF C BARS - 3/22/90
RJS - REF. TO STD 3900 DELETED 5/11/82
R.J.S. DELETE BAR INCREASE & REV. 2/28/90

R.M.U.	ADDED FILL HEIGHT NOTE	10-23-87	
R.J.S.	REVISION PER SK5	4-1-69	
E.E.L.	REINF. QUANT. DBL. 6-5-10	7-3-69	
R.J.S.	LENGTH OF BARS	4-22-87	
SLW	ADDED DLB 5-5-60	2-11-76	3-15-73
S.L.W.	REVISED QUANTITIES DBL 6-5-30 TO 6-5-60 REVISED NO. "J" BARS 6-5-70		2-7-75
R.J.S.	ADDED 7-5-10-80; 10-8-10-50; 10-9-10-40; 6-5-70		

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION - BRIDGE DESIGN

SHEET 1 OF 3
SPECIAL DESIGN DOUBLE BOX CULVERTS
6-7, 6-5, 9-9, 10-8, 10-9, 5-5, 7-5, 10-6

NO SCALE — MAY 1961

DESIGNED E.E.L.	TRACED R.C.K.	REVIEWED R.K.J.
DRAWN E.E.L.	CHECKED H.R.	APPROVED

⑨

KEUFFEL & ESSER CO. NO. 137 EXCELSIOR