DESIGN (S;H; FILL OVER TOP)	DBL 5-4-10	DBL 5-4-20	DBL 5-4-30	DBL 5-4-40	DBL 5-4-50	DBL 5-4-60 ⚠1	DBL 5-4-70 ⚠1	DBL 5-4-80	DBL 4x5x10 ⚠2								
T_1	7"	7½"	8"	9½"	10½"	11 1/4"	12"	12 3/4"	8"								
T_2	7"	7½"	8"	9½"	10½"	11 1/4"	12"	12 3/4"	8"								
T_3	7"	7"	7"	7"	7½"	7 1/2"	7 1/2"	7 1/2"	8"								
BARS AT	--	406T @ 10½"	407 @ 9"	503 @ 10½"	506 @ 10½"	509 @ 10 1/2"	512 @ 10 1/2"	527 @ 10 1/2"									
BARS BT	401 @ 9"	401 @ 10½"	502 @ 9"	502 @ 10½"	505 @ 10½"	510 @ 10 1/2"	510 @ 10 1/2"	528 @ 10 1/2"	438 @ 18"								
BARS DT	402 @ 4½"	1-402; 1-501	1-402; 1-501	1-501; 1-601	2-601	2-601	2-601	2 - 601	439 @ 12"								
NO. BARS JT EXT. CORNER	--	--	--	1	1	1	1	1									
NO. BARS JT INT. CORNER	--	1	2 @ 4"	2 @ 6"	3 @ 4"	3 @ 4"	4@ 3 1/2"	5 @ 3 1/2"									
BARS AB	--	406B @ 10½"	407 @ 9"	503 @ 10½"	506B @ 10½"	509 @ 10 1/2"	512@ 10 1/2"	527 @ 10 1/2"									
BARS BB	401 @ 9"	401 @ 10½"	502 @ 9"	502 @ 10½"	505 @ 10½"	510 @ 10 1/2"	510@ 10 1/2"	528 @ 10 1/2"	438 @ 18"								
BARS DB	402 @ 4½"	1-402; 1-501	1-402; 1-501	1-501; 1-601	2-601	2-601	2-601	2 - 601	439 @ 12"								
NO. BARS JB EXT. CORNER	--	--	--	1	1	1	1	1									
NO. BARS JB INT. CORNER	--	1	2 @ 4"	2 @ 6"	3 @ 4"	3 @ 4"	4@ 3 1/2"	5 @ 3 1/2"									
BARS C	403 @ 8"	405 @ 10½"	408 @ 9"	504 @ 10½"	507 @ 10½"	511 @ 10 1/2"	513@ 10 1/2"	529 @ 10 1/2"	440 @ 18"								
NO. BARS E IN 2 SLABS	36	36	36	36	36	36	36	36	32								
BARS F	402 @ 10½"	404 @ 10½"	409 @ 10½"	410 @ 10½"	411 @ 10½"	416@ 10 1/2"	417 @ 10 1/2"	437 @ 10 1/2"	441 @ 18"								
BARS G	402 @ 10½"	404 @ 10½"	409 @ 10½"	410 @ 10½"	411 @ 10½"	416 @10 1/2"	417 @ 10 1/2"	437 @ 10 1/2"	441 @ 18"								
NO. BARS H IN INT. WALL	7	7	7	7	7	7	7	7	7								
NO. BARS K IN 2 EXT. WALLS	6	6	6	6	6	6	6	6	6								
NO. BARS L IN 2 EXT. WALLS	8	8	8	8	8	8	8	8	8								
CU. YDS. CONC. PER FT.	.786	.905	.987	1.059	1.075	1.112	1.167	1.221	0.863								
LB. REINF. STEEL PER FT.	108.09	128.23	160.45	181.30	202.26	204.04	211.09	217.86	68.50								

DESIGN (S;H; FILL OVER TOP)	DBL 4-4-10	DBL 4-4-20	DBL 4-4-30	DBL 4-4-40	DBL 4-4-50	DBL 4-4-60	DBL 4-4-70	DBL 4-4-80	DBL 4-4-90	DBL 4-4-100
T_1	7"	8"	8"	8"	8¼"	9"	10"	10¼"	11"	11¼"
T_2	7"	8"	8"	8"	8¼"	9"	10"	10¼	11"	11¼
T_3	7"	8"	8"	8"	8"	8"	9"	10¼"	11¼"	13"
BARS AT	412 @ 18"	418 @ 12"	418 @ 12"	418 @ 12"	422 @ 12"	515 @ 12"	516 @ 12"	517 @ 12"	519 @ 12"	522 @ 12"
BARS BT	413 @ 18"	419 @ 12"	419 @ 12"	514 @ 12"	514 @ 12"	514 @ 12"	525 @ 12"	518 @ 12"	520 @ 12"	523 @ 12"
BARS DT	414 @ 6"	420 @ 4"	420 @ 41	420 @ 4"	1-420;1-521	1-420 @ 4"	1-420 1-521	1-420;1-521	1-427;1-526	524 @ 4"
NO. BAR JT EXT. CORNER	——			1	1	1	1	1	1	1
NO. BAR JT. INT. CORNER	——		1	2 @ 4"	2 @ 5"	3 @ 4"	3 @ 3¼"	3 @ 3"	4 @ 3"	4 @ 2½"
BARS AB	412 @ 18"	418 @ 12"	418 @ 12"	418 @ 12"	422 @ 12"	515 @ 12"	516 @ 12"	517 @ 12"	519 @ 12"	522 @ 12"
BARS BB	413 @ 18"	419 @ 12"	419 @ 12"	514 @ 12"	514 @ 12"	514 @ 12"	525 @ 12"	518 @ 12"	520 @ 12"	523 @ 12"
BARS DB	414 @ 6"	420 @ 4"	420 @ 4"	420 @ 4"	1-420;1-521	420 @ 4"	1-420;1-521	1-420;1-521	1-427;1-526	524 @ 4"
NO. BARS JB EXT. CORNER	——			1	1	1	1	1	1	1
NO. BARS JB INT. CORNER	——		1	2 @ 4"	2 @ 5"	3 @ 4"	3 @ 3¼"	3 @ 3"	4 @ 3"	4 @ 3"
BARS C	508 @ 18"	421 @ 12"	421 @ 12"	421 @ 12"	423 @ 12"	425 @ 12"	428 @ 12"	430 @ 12"	432 @ 12"	434 @ 12"
NO. BARS E IN 2 SLABS	36	36	36	36	36	36	36	36	36	36
BARS F	415 @ 12"	436 @ 12"	436 @ 12"	436 @ 12"	424 @ 12"	426 @ 12"	429 @ 12"	431 @ 12"	433 @ 12"	435 @ 12"
BARS G	415 @ 12"	436 @ 12"	436 @ 12"	436 @ 12"	424 @ 12"	426 @ 12"	429 @ 12"	431 @ 12"	433 @ 12"	435 @ 12"
NO. BARS H IN INT. WALL	7	7	7	7	7	7	7	7	7	7
NO. BARS K IN 2 EXT. WALL	6	6	6	6	6	6	6	6	6	6
NO. BARS L IN 2 EXT. WALL	8	8	8	8	8	8	8	8	8	8
CU. YDS. CONC. PER FT.	.699	0.792	0.792	0.792	0.823	0.853	0.950	1.009	1.102	1.189
LB. REINF. STEEL PER FT.	95.24	106.32	110.16	125.03	128.89	140.96	147.09	148.79	156.11	161.64

BOX CULVERT REQUIREMENTS:

MINIMUM FILL HEIGHT FROM TOP OF CULVERT TO BOTTOM OF BASE WITHIN TRAVELWAY SHALL BE 12 INCHES.

MAXIMUM POUR LENGTH SHALL NOT EXCEED 30 FEET ALONG THE LENGTH OF THE CULVERT.

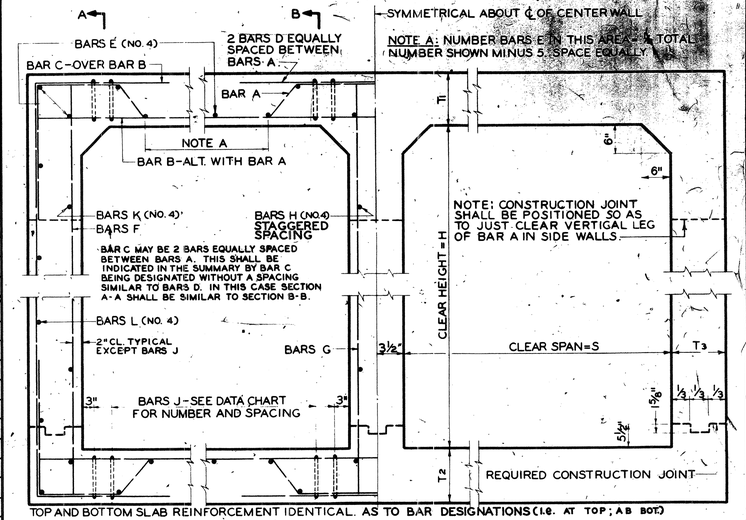
TRANSVERSE CONSTRUCTION JOINTS SHALL BE PLACED IN THE BARREL, NORMAL TO THE CENTERLINE OF CULVERT, AT THE OUTSIDE SHOULDER BREAK POINTS. LONGITUDINAL BARREL REINFORCING STEEL SHALL NOT BE CONTINUOUS THROUGH THESE JOINTS, PROVIDED THAT THE JOINTS ARE MORE THAN 15 FEET FROM THE BARREL ENDS.
WHEN TRANSVERSE CONSTRUCTION JOINTS OCCUR WITHIN 15 FEET OF THE BARREL ENDS OR WITHIN THE LIMITS OF THE PAVEMENT, THE LONGITUDINAL BARREL REINFORCING SHALL THEN BE CONTINOUS THROUGH SUCH JOINTS. THE MINIMUM LENGTH OF LAP SPLICE FOR LONGITUDINAL REINFORCING SHALL BE 24 INCHES.

TRANSVERSE CONSTRUCTION JOINTS PLACED AT ANY OTHER LOCATION NOT SPECIFIED ABOVE SHALL BE FORMED WITH NO LONGITUDINAL REINFORCING STEEL PASSING THROUGH THE JOINTS.

⚠2 FOR A DOUBLE 4'x 5' CULVERT, USE WINGWALLS & PARAPETS DESIGN FOR A DOUBLE 5'x 5' WITH THE 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 10 LBS., RESPECTIVELY. FOR SKEWED ENDS, DIVIDE THE REDUCTION BY THE SINE OF THE SKEW ANGLE.

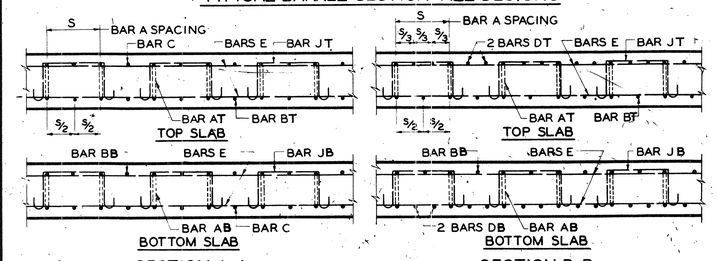
NOTE: BEND LONGITUDINAL BARS INTO WINGS AND PARAPETS SIMILAR TO STANDARDS. IF CULVERT IS SKEWED CUT TRANSVERSE STEEL AND BEND 12" INTO PARAPET OR TOEWALL AND HOOK

STATE	PROJECT NUMBER	SHEET No.	TOTAL SHEETS
GA.			

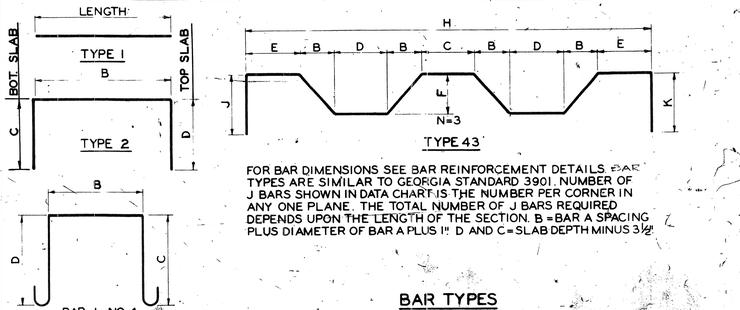


TOP AND BOTTOM SLAB REINFORCEMENT IDENTICAL. AS TO BAR DESIGNATIONS (i.e. AT TOP; AB BOT.)

TYPICAL BARREL SECTION-ALL DESIGNS



SECTION A-A SECTION B-B



FOR BAR DIMENSIONS SEE BAR REINFORCEMENT DETAILS. BAR TYPES ARE SIMILAR TO GEORGIA STANDARD 3901. 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. B = BAR A SPACING PLUS DIAMETER OF BAR A PLUS 1" D AND C = SLAB DEPTH MINUS 3½"

BAR TYPES

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION - BRIDGE DESIGN

SHEET 1 of 2
SPECIAL DESIGN DOUBLE BOX CULVERTS
5-4, 4-~~4~~-5

NO SCALE — PUTNAM COUNTY — APRIL 19~~7~~

BY	REVISIONS	DATE
S.L.W.	ADDED 4-4-10	8-3-95
R.W.S.	ADDED 5-4-60 & 8-4-70	7-20-93
R.W.S.	DELETE BAR INCREASE 10%	2-28-80
R.W.S.	ADDED DBL 5-4-80	7-31-81

ADD REINFORCEMENT NOTE 11-26-91
R.W.S. ADDED NOTE 5-24-84
R.W.S. ADDED DBL 4-5-10 10-12-82
R.W.S. ADDED DBL 5-4-80 10-26-82

DESIGNED E.E.L. — TRACED G.L.G. — REVIEWED F.B.
DRAWN E.E.L. — CHECKED R.L.M. — APPROVED

12