DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

CHIEF OFFICE OF STRUCTURE DESIGN
REGISTERED CIVIL ENGINEER

January 4, 1988
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
J. E. ROBERTS
No. 11428
Exp. 12-31-88
CIVIL
STATE OF CALIFORNIA

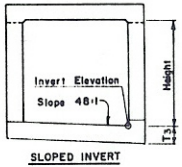
SPAN		4					5						6						7						8					
HEIGHT		2		3		4	2		3		4		3		4		5		3		4		5		4		5		6	
Maximum Earth Cover	'	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20
Conc. Roof	T1 "	7	7	7	7	7	7½	7½	7½	7½	7½	7½	7½	7½	8	8	8	8	8	8	8	8	8	8	8	9	8	9	8½	9
Conc. Walls	T2 "	6	6	6	6	6½	6	6	6	6	6	7	6½	7½	6	6	6	7	6½	7½	7	8½	8	9½	6	6	7	6½	7½	7
Conc. Invert	T3 "	6	6	6	6	6½	6½	7	6½	7	6½	7	6½	7	7	8	7	8	7	8	7	8	8	9	6½	7	6½	7½	7	8½
Reinf. Spacing	"	7	7	7	7	7	8½	6	8½	5½	8½	5½	8½	5½	7½	5	7½	5	7½	5	7½	4½	6½	5	6½	4½	6½	5½	6½	5½
Reinf. "a" Size Bar #		6	6	6	6	6	7	6	7	6	7	6	7	6	7	6	7	6	7	6	7	6	7	6	7	7	7	7	7	7
Reinf. "e" Size Bar #		4	4	4	5	5	6	4	4	4	5	5	6	6	4	4	5	5	6	6	7	6	7	7	7	5	5	5	6	6
Quan. Concrete	CF/LF	7.4	7.4	8.4	8.4	9.4	10.1	8.9	9.2	10.0	10.2	11.0	12.0	12.5	13.7	11.7	12.3	12.7	14.2	14.2	15.9	15.9	18.3	13.7	14.9	14.6	16.8	16.1	18.5	18.1
Quan. Reinforcement	lbs/LF	48	48	50	55	58	67	58	60	58	68	67	81	82	105	70	81	82	96	97	120	124	148	94	94	105	118	121	147	130

SPAN		8									
HEIGHT		6		7		8					
Maximum Earth Cover	'	10	20	10	20	10	20	10	20	10	20
Conc. Roof	T1 "	9½	9½	8½	9½	8½	10	8½	10	8½	10
Conc. Walls	T2 "	7½	7½	8½	8	9	9½	8½	9	9½	10½
Conc. Invert	T3 "	8	9½	8	10	8	10	8	10	8	10
Reinf. Spacing	"	6	5	6	5	6	4½	6	5	6	4½
Reinf. "a" Size Bar #		7	7	7	7	7	7	7	7	7	7
Reinf. "e" Size Bar #		5	5	5	6	6	6	6	7	7	7
Quan. Concrete	CF/LF	19.0	17.9	21.1	19.5	24.1	22.1	26.9	24.1	30.1	
Quan. Reinforcement	lbs/LF	151	131	171	137	198	160	215	192	252	

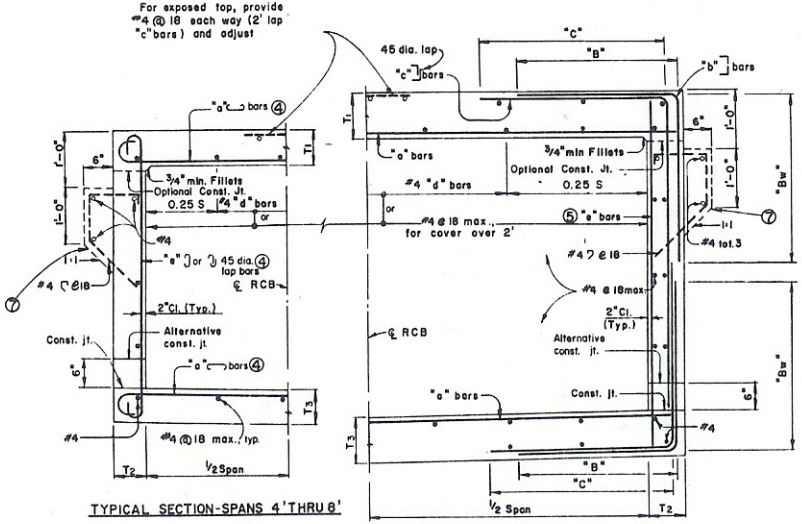
"d" bars, for earth covers of 2' and less								
Span	4'	5'	6'	7'	8'	10'	12'	14'
Number	5	6	7	8	9	10	12	16

SPAN		10												12												14											
HEIGHT		5		6		7		8		9		10		6		7		8		9		10		11		12		7		8		9		10		11		12	
Maximum Earth Cover	'	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20
Conc. Roof	T1 "	8	10½	8	10½	8	10½	8	10½	8	10½	8½	11	8½	12	8½	12	8½	12	8½	12	8½	12	9½	12	9½	12	9½	14	9½	14	9½	14	9½	14	10	14
Conc. Walls	T2 "	8	8	8	9	8	9	8	10	8½	11½	9½	12½	8	10	8½	10½	8½	10½	8½	11½	9	12½	10½	13½	11½	15	9½	11	9½	11½	9½	11½	10	12½	10½	14
Conc. Invert	T3 "	8	11	8	11	8	11	8	11	8	11	8½	11	8½	12½	9	12½	9	12½	9	12½	9	12½	9½	13	10	13	10	14½	10	14½	10	14½	10½	14½	10½	15
Reinf. Spacing	"	13	12	12	12	11	11	10	11	10	11	10	10	9	10	9	10	9	10	8	10	8	10	8	10	8	10	10	9	9	9	10	8	10	8	10	10
Reinf. "a" Size Bar #		6	7	6	7	6	7	6	7	6	6	6	6	6	7	6	7	6	7	6	7	6	7	6	6	6	6	7	7	7	7	7	7	7	7	6	7
Reinf. "b" Size Bar #		6	7	6	7	6	7	6	7	6	6	7	7	6	7	6	7	6	7	6	7	6	7	6	7	6	7	6	7	7	7	7	7	7	7	6	8
Reinf. "b" Dimension "B"	"	2-11	2-11	2-11	3-0	2-11	3-9	2-11	3-9	2-11	3-9	2-11	3-9	3-1	3-2	3-9	3-9	3-9	3-9	3-7	3-9	3-7	4-4	3-7	4-4	4-4	4-4	2-9	4-2	3-4	4-4	3-4	4-6	3-4	4-6	3-6	4-6
Reinf. "b" Dimension "Bw"	"	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-7	4-7	6-0	5-10	6-2	6-7	6-2	6-7	4-11	4-11	4-11	4-11	4-11	4-11	4-4	4-4	6-5	7-0	7-0	8-4	6-0	6-0	6-0	6-0	6-0	6-0
Reinf. "c" Size Bar #		6	7	6	7	6	7	6	7	7	7	7	7	6	7	6	7	6	7	6	7	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8
Reinf. "c" Dimension "C"	"	3-4	3-4	7-4	4-8	7-7	4-8	8-2	4-8	7-7	4-8	7-7	4-8	4-4	3-7	8-1	5-7	8-1	5-7	8-1	5-7	8-1	5-7	8-1	5-7	8-1	5-7	4-0	4-2	6-9	6-9	5-10	5-10	6-0	6-4	8-11	6-4
Reinf. "e" Size Bar #		4	4	4	4	4	4	4	4	4	4	5	5	4	4	4	4	4	4	4	4	4	4	5	5	5	5	4	4	4	4	4	4	4	4	4	4
Quan. Concrete	CF/LF	21.6	26.8	23.0	29.5	24.3	31.0	25.6	34.1	27.8	37.7	32.1	42.3	26.8	37.7	29.3	40.1	30.3	41.9	32.2	45.4	34.5	49.8	40.7	54.2	45.4	59.9	36.2	51.0	37.8	53.1	39.5	54.9	41.9	58.7	45.9	64.1
Quan. Reinforcement	lbs/LF	191	267	233	285	260	325	300	339	314	327	360	373	295	362	353	409	365	420	402	413	415	424	440	471	468	534	374	471	449	522	446	587	449	580	492	596

SPAN		14											
HEIGHT		10		11		12		13		14			
Maximum Earth Cover	'	10	20	10	20	10	20	10	20	10	20		
Conc. Roof	T1 "	9½	14	10	14	10	14	10½	14	11	14		
Conc. Walls	T2 "	11½	15	12½	16	12½	16½	13½	17½				
Conc. Invert	T3 "	10½	15	11	15	11½	15						
Reinf. Spacing	"	8	10	10	10	10	9						
Reinf. "a" Size Bar #		7	7	7	7	7	7						
Reinf. "b" Size Bar #		7	7	7	7	7	8						
Reinf. "b" Dimension "B"	"	4-6	3-6	4-6	3-6	4-6	4-9						
Reinf. "b" Dimension "Bw"	"	6-0	6-0	6-0	6-0	6-0	6-0						
Reinf. "c" Size Bar #		7	8	8	8	8	8						
Reinf. "c" Dimension "C"	"	6-4	8-11	6-4	8-11	6-4	8-11						
Reinf. "e" Size Bar #		4	6	6	6	6	6						
Quan. Concrete	CF/LF	49.9	69.5	55.6	75.8	61.6	81.3						
Quan. Reinforcement	lbs/LF	449	605	564	634	604	759						

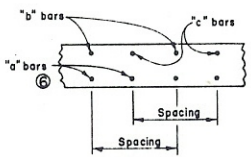


SLOPED INVERT

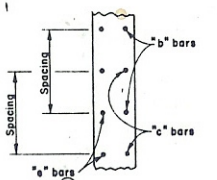


TYPICAL SECTION-SPANS 4' THRU 8'

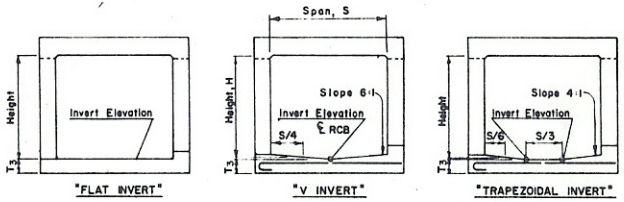
TYPICAL SECTION-SPANS 10' THRU 14'



ROOF SECTION
SPANS 10' THRU 14'
Invert similar



WALL SECTION
SPANS 10' THRU 14'



"FLAT INVERT"

"V INVERT"

"TRAPEZOIDAL INVERT"

ALTERNATIVE INVERTS

GENERAL NOTES

1. For boxes with Span or Height less than any of those shown in table, use next greater size box concrete dimensions and reinforcement. Make necessary changes in bar lengths and quantities.
2. Quantities are approximate and for design purposes only.
3. For boxes with Span or Height or cover greater than those shown in tables, a special design is required.
4. It is permissable to eliminate the 180° hooks on every other bar.
5. "e" bars are at half spacing. (spans 10'-14' only)
6. "a" bars are at half spacing. (spans 10'-14' only)
7. Provide paving notch when top is exposed and when pavement is P.C.C., and adjust quantities.
8. For design and details not shown, see Standard Plan "D83", Box Culvert Miscellaneous Details

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SINGLE BOX CULVERT

D80