SPAN, S			4′						5′								6′								7′								8′									
HEIGHT, H			2′		3′		4′		2′		3′		4′		5′		3′		4′		5′		6′		3′		4′		5′		6′		7′		4′		5′		6′		7′		8′	
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′	10′	20′	10′	20′	10′	20′
Conc	ROOF	T_1	7″	7½″	7″	7½″	7″	7½″	7″	9″	7″	9″	7″	9″	7″	9″	7″	10½″	7″	10½″	7″	10½″	7″	10½″	7½″	11½″	7½″	11¼″	7½″	11½″	7½″	11½″	8″	11½″	8½″	13″	8½″	13″	8½″	13″	8½″	13″	8½″	13″
	WALLS	T_2	6″	6½″	6½″	7″	7″	8″	6″	6½″	6½″	7½″	7½″	8″	8″	9½″	6½″	7½″	7″	8½″	7½″	10″	8½″	11″	6½″	7½″	7½″	8″	7½″	9½″	8½″	11″	9½″	13″	6½″	8″	7½″	9½″	8½″	11½″	9½″	13″	11″	15″
	INVERT	T_3	7″	7½″	7″	7½″	7″	7½″	7½″	9″	7½″	9″	8″	9″	8″	9″	8½″	10½″	8½″	10½″	8½″	10½″	8½″	10½″	9½″	12″	9½″	12″	9½″	12″	9½″	12″	9½″	12″	10½″	13½″	10½″	13½″	10½″	13½″	10½″	13½″	10½″	13½″
Reinf	SPACING		12″	12″	12″	12″	12″	12″	11½″	12″	11½″	12″	11½″	12″	11½″	12″	11½″	12″	11½″	12″	11½″	12″	11½″	12″	11″	10½″	11″	10½″	11″	10½″	11″	10½″	11″	10½″	9″	10″	9″	10″	9″	10″	9″	10″	9″	10″
	"g"	SIZE BAR	#4	#7	#4	#7	#4	#7	#4	#7	#4	#7	#4	#7	#4	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
	"f"	SIZE BAR	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#6	#5	#6	#6	#5	#6	#5	#6	#6	#6	#6	#6	#6	#5	#6	#5	#6	#5	#6	#5	#6	#5	#6
	"a"	SIZE BAR	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#7	#4	#7	#4	#7	#4	#7	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4
	"e"	SIZE BAR	#4	#4	#4	#5	#5	#6	#4	#4	#4	#5	#5	#6	#5	#7	#4	#5	#5	#6	#6	#6	#6	#7	#4	#5	#5	#6	#6	#6	#6	#7	#6	#7	#5	#6	#5	#6	#5	#6	#5	#6	#6	#7
QUANTITIES	CONCRETE	CF/LF	14.1	15.1	15.9	17.1	17.9	19.6	16.9	20.5	18.8	22.9	21.7	25.1	24.0	28.5	22.3	29.3	24.3	32.0	26.5	35.6	29.5	38.5	26.8	36.1	29.3	38.3	31.1	41.9	34.0	46.0	38.0	51.3	34.2	46.7	36.9	50.4	39.9	55.2	43.2	59.9	47.7	66.0
	REINFORCEMENT	LB/LF	109	109	115	122	130	141	133	130	139	145	156	164	163	192	202	167	218	188	239	213	250	243	237	209	254	232	275	262	287	298	299	317	334	287	345	301	376	317	390	359	406	378
** SOIL PRESSURE (ksf)			2.1	4.1	2.2	4.1	2.2	4.1	3.2	4.1	3.2	4.1	3.2	4.1	3.3	4.2	3.1	4.1	3.1	4.2	3.1	4.2	3.1	4.2	3.0	4.1	3.0	4.2	3.0	4.2	3.0	4.2	3.1	4.3	2.9	4.2	2.9	4.2	3.0	4.3	3.0	4.3	3.0	4.4

SPAN, S			10′												12′																													
HEIGHT, H			5′		6′		7′		8′		9′		10′		6′		7′		8′		9′		10′		11′		12′		7′		8′		9′		10′		11′		12′		13′		14′	
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′	10′	20′	10′	20′	10′	20′
Conc	ROOF	T_1	10½″	15½″	10½″	15½″	10½″	15½″	10½″	15½″	10½″	15½″	10½″	15½″	11½″	18″	11½″	18″	11½″	18″	11½″	18″	11½″	18″	11½″	18″	11½″	18″	13″	20½″	13″	20½″	13″	20½″	13″	20½″	13″	20½″	13″	20½″	13″	20½″	13″	20½″
	WALLS	T_2	8½″	8½″	8½″	9½″	8½″	10½″	9″	12″	10″	13½″	11″	15″	8½″	9½″	8½″	10½″	9″	12″	10″	13½″	11″	15″	12½″	16½″	13½″	18½″	9″	11″	9″	12″	10″	13½″	11½″	15″	12½″	17″	13½″	18½″	15″	20″	16½″	22″
	INVERT	T_3	10½″	16″	10½″	16″	10½″	16″	10½″	16″	10½″	16″	10½″	16″	12″	19″	12″	19″	12″	19″	12″	19″	12″	19″	12″	19″	12″	19″	13½″	21½″	13½″	21½″	13½″	21½″	13½″	21½″	13½″	21½″	13½″	21½″	13½″	21½″	13½″	21½″
Reinf	SPACING		11″	7½″	10½″	7½″	10″	8″	10″	8″	10½″	8″	10½″	8½″	9″	8″	9″	8″	8″	7½″	8″	7½″	8½″	7½″	8½″	8″	8½″	8″	8½″	8″	8½″	8″	8½″	8″	8½″	8″	8½″	8″	8½″	8″	8½″	8″	9″	8″	9″	8″
	"g"	SIZE BAR	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8
	"f"	SIZE BAR	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#8	#7	#8	#7	#7	#7	#7	#7	#7	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8
	"a"	SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
	"b"	SIZE BAR	#5	#5	#4	#5	#5	#5	#6	#5	#6	#6	#6	#6	#5	#6	#5	#6	#6	#6	#6	#6	#6	#6	#5	#6	#6	#6	#5	#6	#6	#5	#5	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7	#7
		Dim "B" ft-inch	1-9	2-7	2-0	2-9	2-3	2-9	2-7	3-1	2-7	3-1	2-7	3-1	2-7	3-1	3-0	3-2	3-6	3-2	3-6	3-4	3-9	3-4	3-9	3-4	3-9	3-4	2-7	2-7	3-3	3-3	4-0	4-0	4-0	4-0	4-7	4-4	4-7	4-11	5-3	4-11	5-3	4-11
		Dim "Bw" ft-inch	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11	4-1	3-2	4-1	3-4	4-1	3-4	4-1	3-7	3-9	3-7	3-9	3-7	3-7	3-7	5-0	3-9	5-0	4-6	5-0	5-0	5-0	5-0	4-9	5-6	4-9	6-2	5-2	6-2	5-2	6-2
	"c"	SIZE BAR	#5	#6	#6	#6	#6	#6	#6	#6	#7	#6	#7	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7	#6	#6	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8
		Dim "C" ft-inch	3-1	2-9	3-9	3-3	4-6	4-3	5-6	4-6	6-0	4-9	6-0	4-9	3-10	3-7	4-6	4-4	5-7	5-0	6-6	5-2	7-2	5-4	7-5	5-7	7-5	5-7	4-3	3-11	5-6	5-2	7-9	5-8	8-6	6-5	8-10	6-6	9-0	6-10	9-3	6-10	9-3	6-10
	* "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	#5	#5	#5	#5	#6	#6
QUANTITIES	CONCRETE	CF/LF	49.1	68.4	51.1	71.9	53.2	75.8	56.1	80.8	60.1	86.4	64.4	92.5	63.6	94.4	65.7	98.4	68.6	104	72.6	109	76.9	115	82.6	122	87.7	131	88.8	124	84.0	129	88.0	134	93.4	141	98	149	103	156	110	164	117	174
	REINFORCEMENT	LB/LF	393	520	427	542	473	538	509	559	534	599	568	636	563	686	584	711	691	721	715	745	700	764	767	867	804	890	734	878	785	919	842	956	892	985	916	1015	964	1120	980	1141	1095	1269
** SOIL PRESSURE (ksf)			2.8	4.8	2.8	4.9	2.9	4.9	2.9	4.9	2.9	4.9	2.9	5.0	2.8	4.8	2.8	4.9	2.8	4.9	2.8	4.9	2.8	4.9	2.9	5.0	2.9	5.0	2.8	4.8	2.8	4.9	2.8	4.9	2.8	4.9	2.8	5.0	2.9	5.0	2.9	5.0	2.9	5.1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

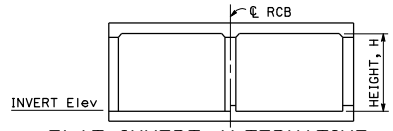
May 20, 2011
PLANS APPROVAL DATE

Dallas Forester
No. C37765
Exp. 12-31-12
CIVIL
STATE OF CALIFORNIA
REGISTERED PROFESSIONAL ENGINEER

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

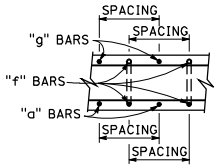
NOTES:

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. For boxes with span or height or cover greater than those shown in tables, a special design is required.
3. Quantities are approximate and for design purposes only.
4. It is permissible to eliminate the 180° hooks on every other "e" bar.
5. "e" bars are at half spacing.
6. Provide paving notch when top is exposed and when pavement is concrete, and adjust quantities.
7. For design and details not shown, see Standard Plan D82.
8. This plan sheet may be used for multiple cell culverts by making necessary adjustments.
9. Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.



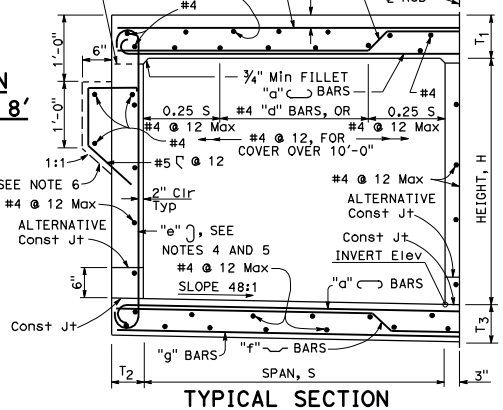
FLAT INVERT ALTERNATIVE

* See Note 5
** See Note 9

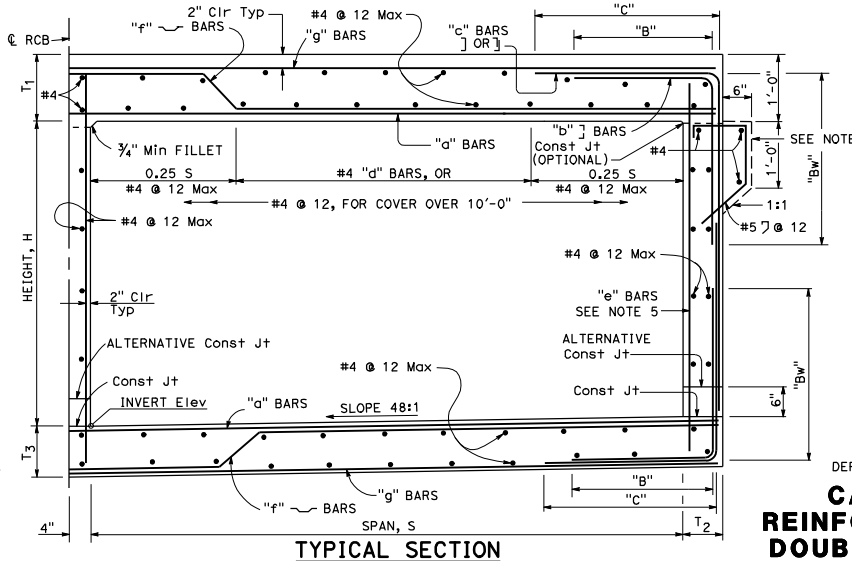


ROOF SECTION
SPANS 4′ THRU 8′
INVERT SIMILAR

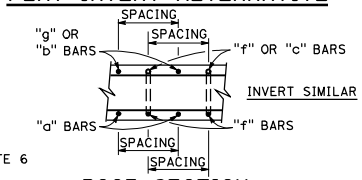
"d" BARS, FOR EARTH COVERS UP TO AND INCLUDING 10′-0"							
SPAN	4′	5′	6′	7′	8′	10′	12′	14′
NUMBER	5	6	8	10	13	14	16	19



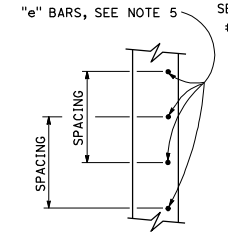
TYPICAL SECTION
SPANS 4′ THRU 8′



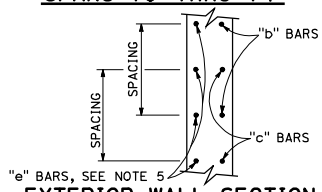
TYPICAL SECTION
SPANS 10′ THRU 14′



ROOF SECTION
SPANS 10′ THRU 14′



EXTERIOR WALL SECTION
SPANS 4′ THRU 8′



EXTERIOR WALL SECTION
SPANS 10′ THRU 14′

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE REINFORCED CONCRETE DOUBLE BOX CULVERT

NO SCALE

D81

2010 STANDARD PLAN D81

9-21-10