SPAN	4'						5'								6'							
HEIGHT	2'		3'		4'		2'		3'		4'		5'		3'		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'
Conc Roof T1	7"	7"	7"	7"	7"	7"	7"	7½"	7"	7½"	7"	7½"	7"	7½"	7"	9"	7"	9"	7"	9"	7"	9"
Conc Walls T2	6"	6"	6"	6"	6"	7"	6"	6"	6"	6"	6"	7"	6½"	7½"	6"	6"	6"	7"	6½"	8"	7"	8½"
Conc Invert T3	7"	7"	7"	7"	7"	7"	7"	8"	7"	8"	7"	8"	7"	8"	7"	9"	7"	9"	7"	9"	7"	9"
Reinf Spacing	1'-4"	1'-3"	1'-4"	1'-3"	1'-4"	1'-3"	11½"	1'-2"	11½"	1'-2"	11½"	1'-2"	11½"	1'-3"	11½"	1'-0"	11½"	1'-0"	11½"	1'-0"	11½"	1'-0"
Reinf "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
Reinf "f" Size Bar	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5
Reinf "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
Reinf "e" Size Bar	#4	#4	#4	#5	#5	#6	#4	#4	#4	#5	#5	#6	#5	#7	#4	#5	#4	#6	#5	#6	#6	#7
Quantities Concrete CF/LF	14.0	14.0	15.5	15.5	17.0	17.8	16.3	17.8	17.8	19.3	19.3	21.6	21.3	23.8	20.1	24.6	21.6	27.0	23.6	29.7	25.8	32.2
Quantities Reinforcement LB/LF	78	89	84	95	93	112	119	112	122	121	134	137	145	162	186	162	192	179	206	190	227	212

SPAN	7'										8'									
HEIGHT	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'
Conc Roof T1	7½"	10"	7½"	10"	7½"	10"	7½"	10"	8"	10"	8"	11"	8"	11"	8"	11"	8"	11"	8"	11"
Conc Walls T2	6"	6"	6"	7"	6½"	7½"	7"	9"	8"	9½"	6"	7½"	6½"	8"	7"	9"	8"	10"	8½"	11"
Conc Invert T3	7½"	10½"	7½"	10½"	7½"	10½"	7½"	10½"	7½"	10½"	8"	11½"	8"	11½"	8"	11½"	8"	11½"	8"	11½"
Reinf Spacing	11"	10½"	11"	10½"	11"	10½"	11"	10½"	11"	10½"	9"	10"	9"	10"	9"	10"	9"	10"	9"	10"
Reinf "g" Size Bar	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf "f" Size Bar	#6	#5	#6	#5	#6	#5	#6	#5	#6	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5
Reinf "a" Size Bar	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4
Reinf "e" Size Bar	#4	#5	#5	#5	#5	#6	#6	#7	#6	#7	#4	#5	#5	#6	#6	#6	#6	#7	#6	#7
Quantities Concrete CF/LF	23.7	30.8	25.2	33.3	27.2	35.5	29.4	39.1	32.4	41.8	29.2	40.1	31.2	42.4	33.4	45.5	36.4	48.9	39.0	52.6
Quantities Reinforcement LB/LF	207	197	220	208	227	228	252	262	260	276	283	237	302	266	340	279	350	312	360	326

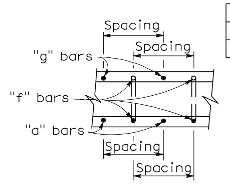
SPAN	10'-0											
HEIGHT	5'		6'		7'		8'		9'		10'	
Maximum Earth Cover	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc Roof T1	9"	1'-½"	9"	1'-½"	9"	1'-½"	9"	1'-½"	9½"	1'-½"	9½"	1'-½"
Conc Walls T2	8"	8"	8"	8½"	8"	9½"	8"	10½"	8½"	11½"	9½"	1'-½"
Conc Invert T3	9"	1'-½"	9"	1'-½"	9"	1'-½"	9"	1'-½"	9"	1'-½"	9"	1'-½"
Reinf Spacing	11"	7½"	10½"	7½"	10"	8"	10"	8"	10½"	8"	10½"	8½"
Reinf "g" Size Bar	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf "f" Size Bar	#7	#5	#6	#5	#6	#5	#6	#5	#6	#5	#6	#5
Reinf "a" Size Bar	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
Reinf "b" Size Bar	#5	#5	#4	#5	#5	#5	#6	#5	#6	#6	#6	#6
Reinf "b" Dim "B" Ft-inches	1-9	2-7	2-0	2-9	2-3	2-9	2-7	3-1	2-7	3-1	2-7	3-1
Reinf "b" Dim "Bw" Ft-inches	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11
Reinf "c" Size Bar	#5	#5	#6	#6	#6	#6	#6	#6	#7	#6	#7	#6
Reinf "c" Dim "C" Ft-inches	3-1	2-9	3-9	3-3	4-6	4-3	5-6	4-6	6-0	4-9	6-0	4-9
Reinf * "e" Size Bar	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5
Quantities Concrete CF/LF	42.7	55.6	44.7	58.2	46.7	61.8	48.7	65.6	52.5	70.0	56.3	74.5
Quantities Reinforcement LB/LF	370	454	381	494	418	494	460	510	486	550	518	568

SPAN	12'													
HEIGHT	6'		7'		8'		9'		10'		11'		12'	
Maximum Earth Cover	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc Roof T1	10"	1'-2½"	10"	1'-2½"	10"	1'-2½"	10"	1'-2½"	10"	1'-2½"	10"	1'-2½"	10"	1'-2½"
Conc Walls T2	8"	8½"	8"	9"	8½"	10½"	9"	11½"	9½"	12½"	10"	1'-2"	11"	1'-3"
Conc Invert T3	10"	1'-3"	10"	1'-3"	10"	1'-3"	10"	1'-3"	10"	1'-3"	10"	1'-3"	10"	1'-3"
Reinf Spacing	9"	8"	9"	8"	8"	7½"	8"	7½"	8½"	7½"	8½"	8"	8½"	8"
Reinf "g" Size Bar	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf "f" Size Bar	#7	#7	#7	#7	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6
Reinf "a" Size Bar	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
Reinf "b" Size Bar	#5	#5	#5	#6	#5	#6	#5	#6	#6	#6	#5	#6	#6	#6
Reinf "b" Dim "B" Ft-inches	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
Reinf "b" Dim "Bw" Ft-inches	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
Reinf "c" Size Bar	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7
Reinf "c" Dim "C" Ft-inches	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
Reinf * "e" Size Bar	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#5	#5
Quantities Concrete CF/LF	55.0	76.3	57.0	79.1	59.8	83.8	62.7	88.1	65.9	92.7	69.1	98.8	73.7	104.0
Quantities Reinforcement LB/LF	543	604	563	646	600	663	614	688	627	691	701	749	733	764

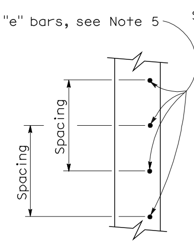
SPAN	14'															
HEIGHT	7'		8'		9'		10'		11'		12'		13'		14'	
Maximum Earth Cover	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc Roof T1	11½"	1'-4½"	11½"	1'-4½"	11½"	1'-4½"	11½"	1'-4½"	11½"	1'-4½"	11½"	1'-4½"	11½"	1'-4½"	11½"	1'-4½"
Conc Walls T2	8½"	9½"	8½"	10½"	9"	11½"	9½"	12½"	10½"	1'-2"	11½"	1'-3"	12½"	1'-4½"	1'-1"	1'-5½"
Conc Invert T3	11½"	1'-5"	11½"	1'-5"	11½"	1'-5"	11½"	1'-5"	11½"	1'-5"	11½"	1'-5"	11½"	1'-5"	11½"	1'-5"
Reinf Spacing	8½"	8"	8½"	8"	8½"	8"	8½"	8"	8½"	8"	8½"	8"	9"	8"	9"	8"
Reinf "g" Size Bar	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8
Reinf "f" Size Bar	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6
Reinf "a" Size Bar	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
Reinf "b" Size Bar	#5	#6	#6	#6	#5	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7	#7
Reinf "b" Dim "B" Ft-inches	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
Reinf "b" Dim "Bw" Ft-inches	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
Reinf "c" Size Bar	#6	#6	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8
Reinf "c" Dim "C" Ft-inches	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
Reinf * "e" Size Bar	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#5	#5	#6	#6
Quantities Concrete CF/LF	71.8	99.7	73.9	104.0	76.9	108.0	80.0	113.0	84.2	119.1	88.8	124.0	94.1	131.0	98.1	137.0
Quantities Reinforcement LB/LF	662	710	715	783	756	820	807	846	833	873	881	958	884	978	1002	1110

* See Note 5

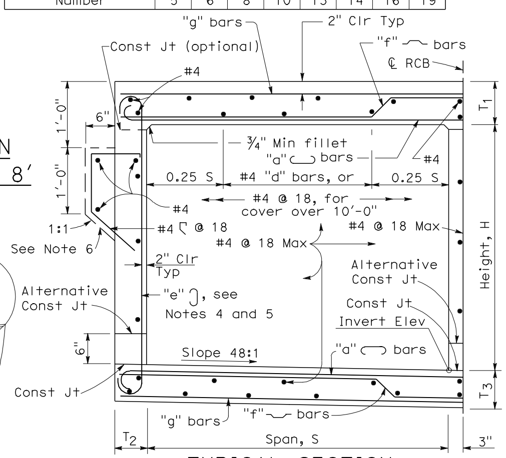
"d" bars, for earth covers up to and including 10'-0"								
Span	4'	5'	6'	7'	8'	10'	12'	14'
Number	5	6	8	10	13	14	16	19



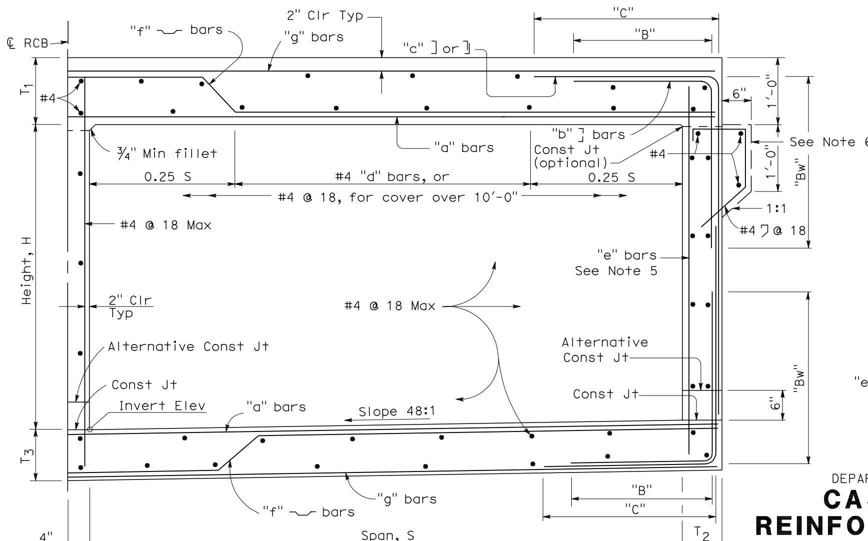
ROOF SECTION
SPANS 4' THRU 8'
INVERT SIMILAR



EXTERIOR WALL SECTION
SPANS 4' THRU 8'



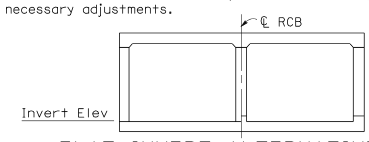
TYPICAL SECTION
SPANS 4' THRU 8'



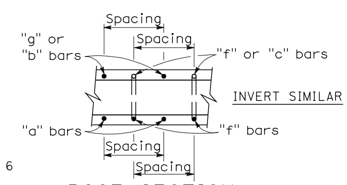
TYPICAL SECTION
SPANS 10' THRU 14'

NOTES:

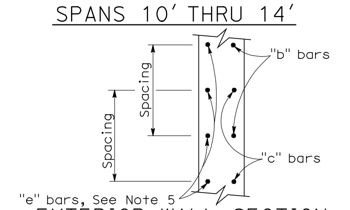
1. For boxes with span or height less than any of those shown in table, use next greater size box concrete dimensions and reinforcement. Make necessary changes in bar lengths and quantities.
2. For boxes with span or height or cover greater than those shown in tables, a special design is required.
3. 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 portland cement 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.



FLAT INVERT ALTERNATIVE



ROOF SECTION
SPANS 10' THRU 14'



EXTERIOR WALL SECTION
SPANS 10' THRU 14'

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

Dallas J. Forester
REGISTERED CIVIL ENGINEER

May 1, 2006
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Dallas Forester
No. C37765
Exp. 12-31-06
CIVIL
STATE OF CALIFORNIA

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2006 STANDARD PLAN D81

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE REINFORCED CONCRETE DOUBLE BOX CULVERT

NO SCALE

D81

1-24-06