SPAN (mm)	1220						1520							
HEIGHT (mm)	610		915		1220		610		915		1220		1520	
Maximum Earth Cover (m)	3	6	3	6	3	6	3	6	3	6	3	6	3	6
Conc: Roof T_1 (mm)	180	180	180	180	180	180	180	190	180	190	180	190	180	190
Conc: Exterior Walls T_2 (mm)	150	150	150	150	150	180	150	150	150	150	150	180	165	190
Conc: Invert T_3 (mm)	180	180	180	180	180	180	180	205	180	205	180	205	180	205
Reinf: Spacing (mm)	400	375	400	375	400	375	290	350	290	350	290	350	290	380
Reinf: "g" Size Bar #	13	22	13	22	13	22	13	22	13	22	13	22	13	22
Reinf: "f" Size Bar #	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Reinf: "a" Size Bar #	19	13	19	13	19	13	19	13	19	13	19	13	19	13
Reinf: * "e" Size Bar #	13	13	13	16	16	19	13	13	13	16	16	19	16	22
Quantity: Concrete (m^3/m)	1.30	1.30	1.44	1.44	1.58	1.65	1.51	1.65	1.65	1.79	1.79	2.00	1.98	2.21
Quantity: Reinforcement (kg/m)	116	132	125	141	138	167	177	167	182	180	199	204	216	241

SPAN (mm)	1830								2135									
HEIGHT (mm)	915		1220		1520		1830		915		1220		1520		1830		2135	
Maximum Earth Cover (m)	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6
Conc: Roof T_1 (mm)	180	230	180	230	180	230	180	230	190	255	190	255	190	255	190	255	205	255
Conc: Exterior Walls T_2 (mm)	150	150	150	180	165	205	180	215	150	150	150	180	165	190	180	230	205	240
Conc: Invert T_3 (mm)	180	230	180	230	180	230	180	230	190	270	190	270	190	270	190	270	190	270
Reinf: Spacing (mm)	290	300	290	300	290	300	290	300	275	265	275	265	275	265	275	265	275	265
Reinf: "g" Size Bar #	19	22	19	22	19	22	19	22	19	22	19	22	19	22	19	22	19	22
Reinf: "f" Size Bar #	16	16	16	16	16	16	16	16	19	16	19	16	19	16	19	16	19	16
Reinf: "a" Size Bar #	22	13	22	13	22	13	22	13	19	13	19	13	19	13	19	13	19	13
Reinf: * "e" Size Bar #	13	16	13	19	16	19	19	22	13	16	16	16	16	19	19	22	19	22
Quantity: Concrete (m^3/m)	1.87	2.29	2.00	2.51	2.19	2.76	2.40	3.00	2.20	2.86	2.34	3.10	2.53	3.30	2.73	3.63	3.00	3.88
Quantity: Reinforcement (kg/m)	277	241	286	266	307	283	338	315	308	293	327	310	338	339	375	390	387	411

SPAN (mm)	2440									
HEIGHT (mm)	1220		1520		1830		2135		2440	
Maximum Earth Cover (m)	3	6	3	6	3	6	3	6	3	6
Conc: Roof T_1 (mm)	205	280	205	280	205	280	205	280	205	280
Conc: Exterior Walls T_2 (mm)	150	190	165	205	180	230	205	255	215	280
Conc: Invert T_3 (mm)	205	290	205	290	205	290	205	290	205	290
Reinf: Spacing (mm)	225	250	225	250	225	250	225	250	225	250
Reinf: "g" Size Bar #	22	22	22	22	22	22	22	22	22	22
Reinf: "f" Size Bar #	16	16	16	16	16	16	16	16	16	16
Reinf: "a" Size Bar #	19	13	19	13	19	13	19	13	19	13
Reinf: * "e" Size Bar #	13	16	16	19	19	19	19	22	19	22
Quantity: Concrete (m^3/m)	2.71	3.73	2.90	3.94	3.10	4.23	3.38	4.54	3.62	4.89
Quantity: Reinforcement (kg/m)	421	353	449	396	506	415	521	464	536	485

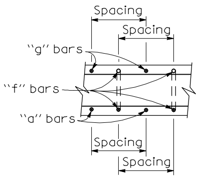
SPAN (mm)	3050											
HEIGHT (mm)	1520		1830		2135		2440		2745		3050	
Maximum Earth Cover (m)	3	6	3	6	3	6	3	6	3	6	3	6
Conc: Roof T_1 (mm)	230	320	230	320	230	320	230	320	240	320	240	320
Conc: Exterior Walls T_2 (mm)	205	205	205	215	205	240	205	270	215	290	240	320
Conc: Invert T_3 (mm)	230	320	230	320	230	320	230	320	230	320	230	320
Reinf: Spacing (mm)	275	190	265	190	250	200	250	200	265	200	265	215
Reinf: "g" Size Bar #	22	22	22	22	22	22	22	22	22	22	22	22
Reinf: "f" Size Bar #	22	16	19	16	19	16	19	16	19	16	19	16
Reinf: "a" Size Bar #	13	13	13	13	13	13	13	13	13	13	13	13
Reinf: "b" Size Bar #	16	16	13	16	16	16	19	16	19	19	19	19
Reinf: "b" Dim "B" (mm)	1550	800	625	850	700	850	800	950	800	950	800	950
Reinf: "b" Dim "Bw" (mm)	1225	1500	1225	1500	1225	1500	1225	1500	1225	1500	1225	1500
Reinf: "c" Size Bar #	16	16	19	19	19	19	19	19	22	19	22	19
Reinf: "c" Dim "C" (mm)	950	850	1150	1000	1375	1300	1675	1375	1850	1450	1850	1450
Reinf: * "e" Size Bar #	13	13	13	13	13	13	13	13	13	13	16	16
Quantity: Concrete m^3/m	3.97	5.17	4.15	5.41	4.34	5.74	4.52	6.09	4.88	6.50	5.23	6.92
Quantity: Reinforcement kg/m	551	676	567	735	622	735	684	759	723	818	771	845

SPAN (mm)	3660													
HEIGHT (mm)	1830		2135		2440		2745		3050		3350		3660	
Maximum Earth Cover (m)	3	6	3	6	3	6	3	6	3	6	3	6	3	6
Conc: Roof T_1 (mm)	255	370	255	370	255	370	255	370	255	370	255	370	255	370
Conc: Exterior Walls T_2 (mm)	205	215	205	230	215	270	230	290	240	320	255	355	280	380
Conc: Invert T_3 (mm)	255	380	255	380	255	380	255	380	255	380	255	380	255	380
Reinf: Spacing (mm)	225	200	225	200	200	190	200	190	215	190	215	200	215	200
Reinf: "g" Size Bar #	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Reinf: "f" Size Bar #	22	22	22	22	19	19	19	19	19	19	19	19	19	19
Reinf: "a" Size Bar #	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Reinf: "b" Size Bar #	16	16	16	19	16	19	16	19	19	19	16	19	19	19
Reinf: "b" Dim "B" (mm)	800	950	925	975	1075	975	1075	1025	1150	1025	1150	1025	1150	1025
Reinf: "b" Dim "Bw" (mm)	1250	975	1250	1025	1250	1025	1250	1100	1150	1100	1150	1100	1100	1100
Reinf: "c" Size Bar #	19	19	19	19	19	19	19	19	19	19	22	22	22	22
Reinf: "c" Dim "C" (mm)	1175	1100	1375	1325	1700	1525	2000	1575	2200	1625	2275	1700	2275	1700
Reinf: * "e" Size Bar #	13	13	13	13	13	13	13	13	13	13	16	16	16	16
Quantity: Concrete m^3/m	5.11	7.09	5.30	7.35	5.56	7.79	5.82	8.18	6.12	8.61	6.42	9.18	6.85	9.66
Quantity: Reinforcement kg/m	808	899	838	961	892	987	914	1024	933	1028	1043	1115	1091	1137

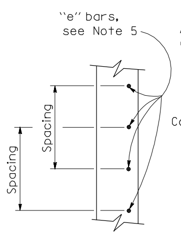
SPAN (mm)	4270															
HEIGHT (mm)	2135		2440		2745		3050		3350		3660		3960		4270	
Maximum Earth Cover (m)	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6
Conc: Roof T_1 (mm)	290	420	290	420	290	420	290	420	290	420	290	420	290	420	290	420
Conc: Exterior Walls T_2 (mm)	215	240	215	270	230	290	240	320	270	355	290	380	320	420	330	445
Conc: Invert T_3 (mm)	290	430	290	430	290	430	290	430	290	430	290	430	290	430	290	430
Reinf: Spacing (mm)	215	200	215	200	215	200	215	200	215	200	215	200	225	200	225	200
Reinf: "g" Size Bar #	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Reinf: "f" Size Bar #	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Reinf: "a" Size Bar #	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Reinf: "b" Size Bar #	16	19	19	19	16	19	19	19	19	19	19	22	22	22	22	22
Reinf: "b" Dim "B" (mm)	800	800	1000	1000	1225	1225	1225	1225	1400	1325	1400	1500	1600	1500	1600	1500
Reinf: "b" Dim "Bw" (mm)	1525	1150	1525	1375	1525	1525	1525	1525	1450	1675	1450	1875	1575	1875	1575	1875
Reinf: "c" Size Bar #	19	19	19	22	22	22	22	22	22	22	22	22	22	22	25	25
Reinf: "c" Dim "C" (mm)	1300	1200	1675	1575	2350	1725	2575	1950	2700	2000	2750	2075	2825	2075	2825	2075
Reinf: * "e" Size Bar #	13	13	13	13	13	13	13	13	13	13	16	16	16	16	19	19
Quantity: Concrete m^3/m	6.67	9.26	6.87	9.66	7.14	10.0	7.43	10.5	7.82	11.1	8.25	11.5	8.74	12.2	9.11	12.7
Quantity: Reinforcement kg/m	985	1056	1064	1165	1125	1220	1201	1259	1240	1299	1311	1426	1315	1455	1491	1652

* See Note 5

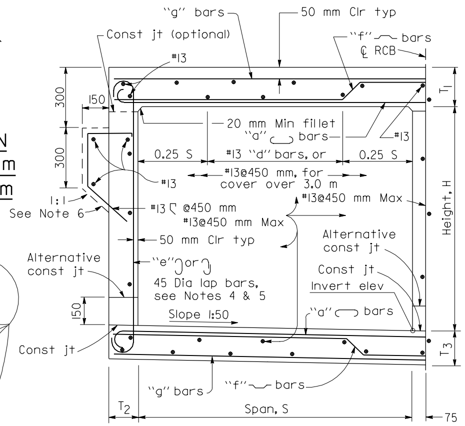
"d" bars, for earth covers up to and including 3.0 m								
Span (mm)	1220	1520	1830	2135	2440	3050	3660	4270
Number	5	6	8	10	13	14	16	19



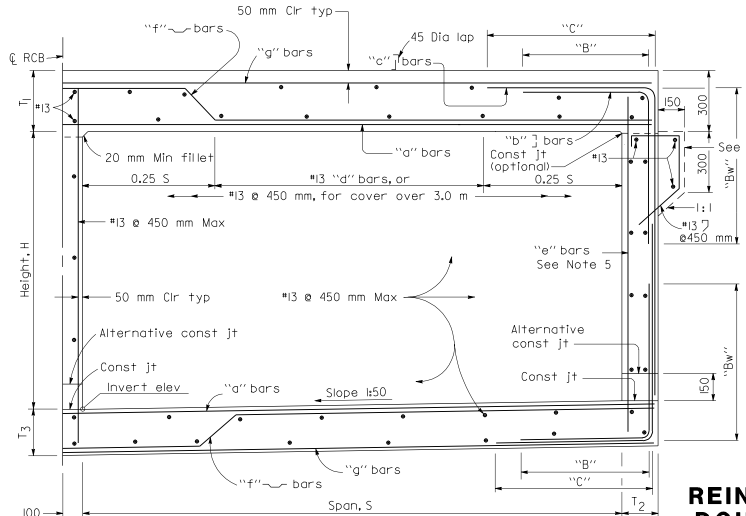
ROOF SECTION
SPANS 1220 mm THRU 2440 mm
INVERT SIMILAR



EXTERIOR WALL SECTION
SPANS 1220 mm THRU 2440 mm



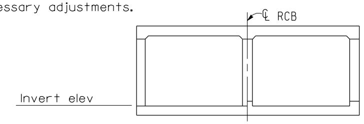
TYPICAL SECTION
SPANS 1220 mm THRU 2440 mm



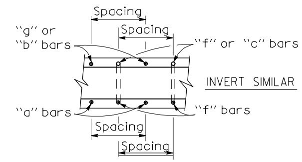
TYPICAL SECTION
SPANS 3050 mm THRU 4270 mm

NOTES

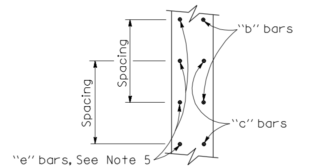
1. For boxes with span or height less than any of those shown in table, use next greater size box concrete dimensions and reinforcement. Make necessary changes in bar lengths and quantities.
2. For boxes with span or height or cover greater than those shown in tables, a special design is required.
3. Quantities are approximate and for design purposes only.
4. It is permissable 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 3050 mm THRU 4270 mm



EXTERIOR WALL SECTION
SPANS 3050 mm THRU 4270 mm

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

Caltrans Metric

Paul Cotter
REGISTERED CIVIL ENGINEER

July 1, 1999
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Paul Cotter
No. 34509
Exp. 9-30-99
CIVIL
STATE OF CALIFORNIA

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1999 STD. PLAN D81

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE REINFORCED CONCRETE DOUBLE BOX CULVERT

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

D81