

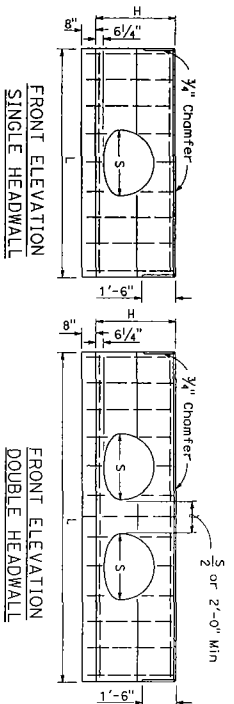
DIST. COUNTY	ROUTE	POST MILES	TOTAL PROJECT	SHEET TOTALS
				NO. SHEETS

REGISTERED CIVIL ENGINEER
 MAY 1, 2006
 PLANS APPROVAL DATE
 The State of California or its officers or agents shall not be responsible for the consequences or use of any plans or specifications prepared by any engineer or architect who is not duly licensed by the State of California.
 To get to the Office web site go to: <http://www.dbs.ca.gov>

REGISTERED PROFESSIONAL ENGINEER
 OLIVER DEBOER
 No. 50303
 State of California

NOTES:

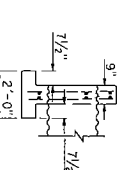
- No deduction made in quantities for thickness of pipe walls.
- All reinforcing steel #4 bars. All vertical and horizontal tie bars 1/2" maximum spacing.
- Length of wall "W" may be varied to suit conditions encountered in the field, and straight line interpolation may be used to calculate quantities.
- Quantities are for design purposes only.
- All rebar to be installed on top of headwall. See Standard Plans D81-47 for cable railing details.



CWP ARCH SIZE	SINGLE			DOUBLE		
	H	L	Steel Conc	L	Steel Conc	Steel Conc
24" x 15"	2'-11"	6'-6"	45 0.80	10'-0"	60	1.22
24" x 18"	3'-2"	7'-6"	50 0.96	11'-6"	70	1.45
28" x 18"	3'-4"	8'-6"	60 1.12	13'-6"	90	1.76
35" x 20"	3'-8"	10'-6"	85 1.47	15'-6"	120	2.16
42" x 24"	4'-1"	12'-6"	110 1.76	18'-0"	145	2.57
48" x 30"	4'-5"	14'-6"	130 2.26	21'-0"	170	3.13
54" x 36"	4'-10"	17'-0"	155 2.81	24'-6"	210	3.86
60" x 42"	5'-3"	19'-0"	175 3.31	27'-0"	230	4.42
72" x 48"	5'-7"	21'-0"	195 3.81	30'-0"	255	5.09

STRAIGHT HEADWALLS

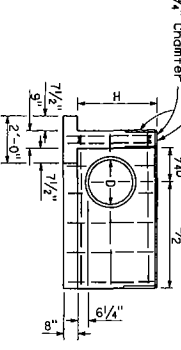
SECTION, SINGLE & DOUBLE HEADWALLS



D	H	L	SINGLE		DOUBLE	
			Steel LB	Conc CY	Steel LB	Conc CY
12"	2'-6"	2'-6"	35	0.60	8'-0"	50
15"	2'-11"	3'-0"	40	0.75	9'-6"	60
18"	3'-2"	3'-6"	50	0.91	10'-6"	75
21"	3'-5"	4'-0"	60	1.02	11'-6"	90
24"	3'-8"	4'-6"	75	1.20	12'-6"	100
27"	3'-11"	5'-0"	85	1.39	14'-0"	115
30"	4'-2"	5'-6"	90	1.52	15'-0"	126
33"	4'-5"	6'-0"	100	1.73	16'-0"	130
36"	4'-8"	6'-6"	105	1.95	17'-0"	145
39"	4'-11"	7'-0"	130	2.09	18'-0"	170
42"	5'-2"	7'-6"	140	2.34	19'-0"	185
45"	5'-5"	8'-0"	150	2.60	20'-0"	195
48"	5'-8"	8'-6"	160	2.75	21'-0"	200
51"	5'-11"	9'-0"	180	3.03	22'-6"	225
54"	6'-2"	9'-6"	180	3.31	23'-6"	240

STRAIGHT HEADWALLS

Omit rounding for pipes less than 48" diameter



FRONT ELEVATION "L" HEADWALL

SECTION "L" HEADWALL

D	H	L	LENGTH OF W					
			3'-4"	4'-10"	6'-4"	7'-10"	9'-4"	
12"	2'-6"	2'-6"	50	0.79	60	0.98	—	—
15"	2'-11"	3'-0"	55	0.91	65	1.11	—	—
18"	3'-2"	3'-6"	65	1.04	75	1.25	—	—
21"	3'-5"	4'-0"	75	1.15	90	1.36	—	—
24"	3'-8"	4'-6"	85	1.29	100	1.51	—	—
27"	3'-11"	5'-0"	90	1.44	105	1.74	—	—
30"	4'-2"	5'-6"	95	1.55	110	1.91	—	—
33"	4'-5"	6'-0"	105	1.71	120	2.05	—	—
36"	4'-8"	6'-6"	105	1.88	120	2.23	—	—
39"	4'-11"	7'-0"	110	2.08	130	2.41	—	—
42"	5'-2"	7'-6"	—	—	140	2.68	—	—
45"	5'-5"	8'-0"	—	—	150	2.84	—	—
48"	5'-8"	8'-6"	—	—	155	2.42	—	—
51"	5'-11"	9'-0"	—	—	180	2.97	—	—
54"	6'-2"	9'-6"	—	—	190	3.13	—	—

CIRCULAR PIPE CULVERT HEADWALLS

"L" HEADWALLS

CWP ARCH SIZE	H	L	LENGTH OF W					
			3'-4"	4'-10"	6'-4"	7'-10"	9'-4"	
24" x 15"	2'-11"	3'-3"	60	1.00	65	1.18	75	1.28
24" x 18"	3'-2"	3'-4"	70	1.02	70	1.32	80	1.42
28" x 18"	3'-4"	4'-2"	80	1.07	80	1.48	90	1.58
35" x 20"	3'-8"	5'-0"	100	1.51	100	1.74	120	1.90
42" x 24"	4'-1"	6'-3"	115	1.82	130	2.06	140	2.25
48" x 30"	4'-5"	7'-3"	130	2.12	145	2.37	155	2.55
54" x 36"	4'-10"	8'-6"	145	2.52	160	2.79	175	2.90
60" x 42"	5'-3"	9'-6"	185	2.89	200	3.11	215	3.07
72" x 48"	5'-7"	10'-6"	200	3.25	215	3.56	235	3.77

CORRUGATED METAL PIPE ARCH CULVERT HEADWALLS

"L" HEADWALLS

PIPE CULVERT HEADWALLS
 STRAIGHT AND "L"

D89

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION