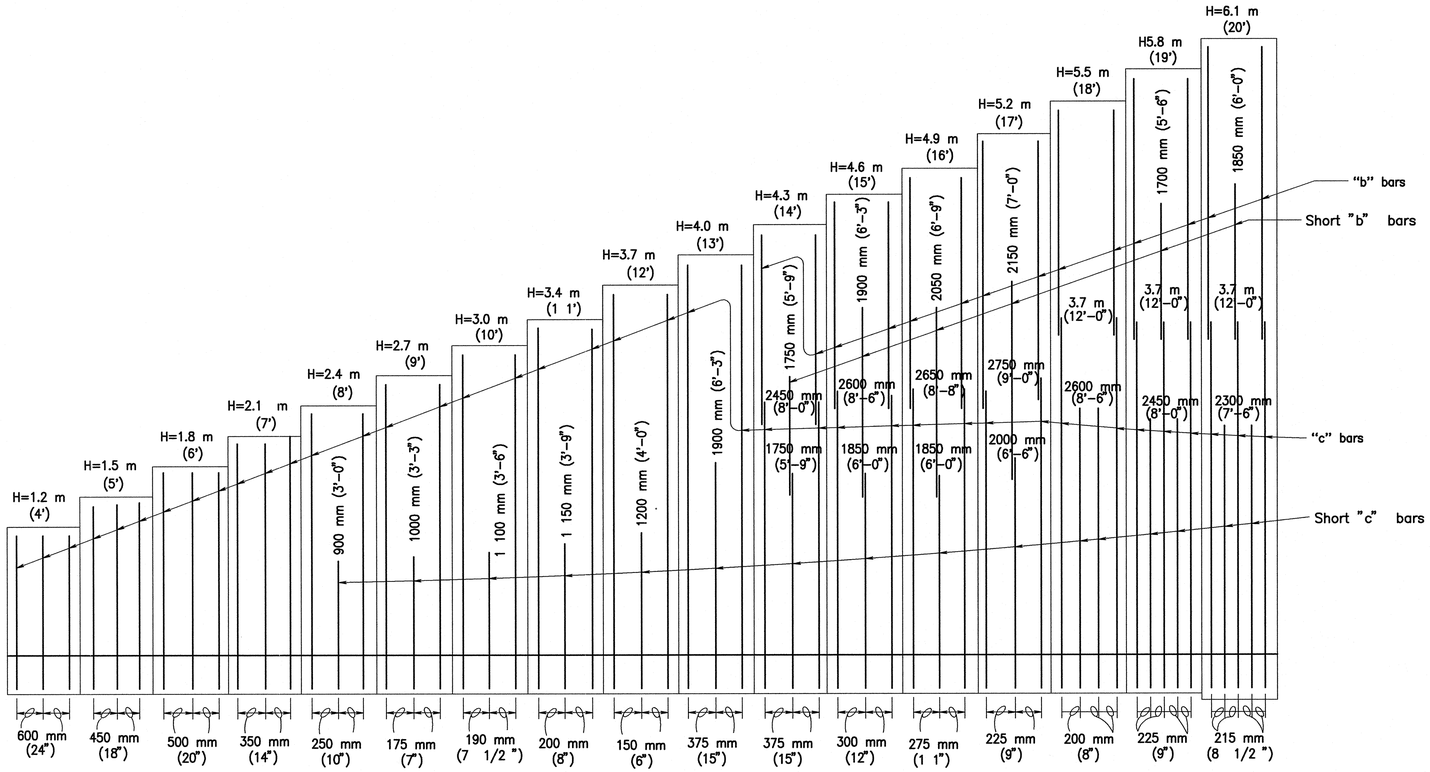

REINFORCED CONCRETE WINGWALLS

Design "H"	1.2 m (4')	1.5 m (5')	1.8 m (6')	2.1 m (7')	2.4 m (8')	2.7 m (9')	3.0 m (10')	3.4 m (1 1')	3.7 m (12')	4.0 m (13')	4.3 m (14')	4.6 m (15')	4.9 m (16')	5.2 m (17')	5.5 m (18')	5.8 m (19')	6.1 m (20')
W	965 mm (3'-2")	1120 mm (3'-8")	270 mm (4'-2")	1420 mm (4'-8")	1575 mm (5'-2")	1730 mm (5'-8")	1880 mm (6'-2")	2030 mm (6'-8")	2185 mm (7'-2")	2335 mm (7'-8")	2440 mm (8'-0")	2640 mm (8'-8")	2845 mm (9'-4")	3050 mm (10'-0")	3250 mm(10'-8")	3455 mm (11'-4")	3660 mm (12'-0")
C	305 mm (1'-0")	355 mm (1'-2")	405 mm (1'-4")	455 mm (1'-6")	510 mm (1'-8")	560 mm(1'-10")	610 mm (2'-0")	660 mm (2'-2")	710 mm (2'-4")	760 mm (2'-6")	815 mm (2'-8")	915 mm (3'-0")	1015 mm (3'-4")	1120 mm (3'-8")	1220 mm (4'-0")	1320 mm (4'-4")	1425 mm (4'-8")
B	660 mm (2'-2")	765 mm (2'-6")	865 mm (2'-10")	965 mm (3'-2")	1065 mm (3'-6")	1170 mm(3'-10")	1270 mm (4'-2")	1370 mm (4'-6")	1475 mm (4'-10")	1575 mm (5'-2")	1625 mm (5'-4")	1725 mm (5'-8")	1830 mm (6'-0")	1930 mm (6'-4")	2030 mm (6'-8")	2135 mm (7'-0")	2235 mm (7'-4")
F	355 mm (1'-2")																405 mm (1'-4")
Batter	None									4:100 (1/2 :12)							
S	305 mm (1'-0")									470mm (1'-6 1/2 ")	480 mm (1'-7")	490 mm(1'-7 1/2 ")	500 mm (1'-8")	520mm(1'-8 1/2 ")	530 mm (1'-9")	550mm(1'-9 1/2 ")	560 mm (1'-10")
"b" bars	None										#16M (#5) @ 375 mm (15")	#16M (#5) @ 300 mm (12")	#16M (#5) @ 275 mm (1 1")	#16M (#5) @ 225 mm (9")	#19M (#6) @ 600 mm (24")	#19M (#6) @ 450 mm (18")	#22M (#7) @ 430 mm (17")
"c" bars	#13M (#4) @ 600 mm (24")	#13M #4) @ 450 mm (18")	#16M (#5) @ 500 mm (20")	#16M (#5) @ 350 mm (14")	#16M (#5) @ 250 mm (10")	#16M (#5) @ 175 mm (7")	#19M (#6) @ 190 mm (7 1/2 ")	#22M (#7) @ 200 mm (8")	#22M (#7) @ 150 mm (6")	#29M (#9) @ 375 mm (15")	#32M (#10) @ 375 mm (15")	#32M (#10) @ 300 mm (12")	#32M (#10) @ 275 mm (1 1")	#32M (#10) @ 225 mm (9")	#32M (#10) @ 200 mm (8")	#36M (#1 1) @ 225 mm (9")	#36M (#1 1) @ 215 mm (8 1/2 ")
"d" bars	#13M (#4) @ 600 mm (24")	#13M #4) @ 450 mm (18")	#16M (#5) @ 500 mm (20")	#16M (#5) @ 350 mm (14")	#16M (#5) @ 250 mm (10")	#19M (#6) @ 350 mm (14")	#22M (#7) @ 380 mm (15")	#25M (#8) @ 400 mm (16")	#22M (#7) @ 300 mm (12")	#25M (#8) @ 375 mm (15")	#29M (#9) @ 375 mm (15")	#29M (#9) @ 300 mm (12")	#29M (#9) @ 275 mm (1 1")	#29M (#9) @ 225 mm (9")	#29M (#9) @ 200 mm (8")	#32M (#10) @ 225 mm (9")	#32M (#10) @ 215 mm (8 1/2 ")
Conc m^3/m (cy/lf)	0.80 (0.32)	0.95 (0.38)	1.10 (0.44)	1.23 (0.49)	1.38 (0.55)	1.53 (0.61)	1.68 (0.67)	1.83 (0.73)	1.98 (0.79)	2.56 (1.02)	2.76 (1.10)	2.96 (1.18)	3.16 (1.26)	3.41 (1.36)	3.64 (1.45)	3.89 (1.55)	4.31 (1.72)
Reinf kg/m (lb/lf)	19 (13)	24 (16)	28 (19)	37 (25)	45 (30)	55 (37)	73 (49)	92 (62)	1 13 (76)	1 09 (73)	134 (90)	155 (104)	183 (123)	210 (1 4 1)	253 (170)	281 (189)	307 (206)

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PIPE CULVERT HEADWALLS, ENDWALLS AND WINGWALLS TYPE A, B AND C

These "Standard Plans for Construction of Local Streets and Roads" contain units in two systems of measurement: International System of Units (SI or "metric") and United States Standard Measures shown in the parentheses ( ) . The measurements expressed in the two systems are not necessarily equal or interchangeable. See the "Foreword" at the beginning of this publication.

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

FONTANA-RIALTO DRAINAGE SYSTEM

HEADWALL AND WINGWALL STRUCTURAL DETAILS

CALTRANS STD.- D90B

DATE DEC. , 2007

SCALE NO SCALE

FILE NO. 2-104-

SHEET NO. S-9

2002 DUAL UNITS STD PLAN D90B