

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
X	X	X	X	X	X

REGISTERED CIVIL ENGINEER	DATE
	X

PLANS APPROVAL DATE

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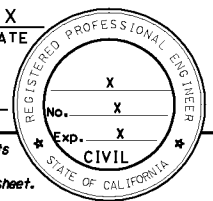


TABLE OF PILE SPACING: CLASS 45 - CONCRETE PILES

DESIGN H	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'	32'
W	6'-9"	7'-0"	7'-6"	8'-3"	9'-3"	10'-3"	11'-0"	12'-0"	13'-0"	14'-3"	16'-3"	16'-9"	18'-0"	20'-6"
C	2'-9"	2'-9"	3'-0"	3'-3"	3'-6"	4'-0"	4'-3"	4'-9"	5'-0"	5'-6"	6'-3"	6'-9"	7'-3"	7'-9"
B	4'-0"	4'-3"	4'-6"	5'-0"	5'-9"	6'-3"	6'-9"	7'-3"	8'-0"	8'-9"	10'-0"	10'-0"	10'-9"	12'-9"
F	1'-6"	1'-6"	1'-6"	1'-9"	1'-9"	2'-0"	2'-6"	2'-9"	3'-0"	3'-0"	3'-3"	3'-6"	3'-9"	4'-0"
M	1'-3"	1'-3"	1'-6"	1'-9"	2'-0"	2'-6"	2'-9"	3'-3"	3'-6"	4'-0"	4'-9"	5'-3"	5'-9"	6'-3"
N	2'-6"	2'-9"	3'-0"	3'-6"	4'-3"	4'-9"	5'-3"	5'-9"	6'-6"	7'-3"	8'-6"	8'-6"	9'-3"	11'-3"
ROW 1	16'-0"	14'-0"	12'-0"	10'-0"	8'-0"	6'-6"	5'-6"	4'-6"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"
ROW 2	24'-0"	21'-0"	18'-0"	15'-0"	14'-0"	13'-0"	11'-0"	9'-0"	8'-0"	12'-0"	10'-0"	6'-0"	4'-0"	4'-0"
ROW 3										8'-0"	5'-0"	4'-0"	4'-0"	6'-0"
ROW 4														6'-0"
CONFIGURATION	I	I	I	I	I	I	I	I	I	II	II	II	II	III

DESIGN DATA

DESIGN: LOAD FACTOR DESIGN ( LFD )  
 CONCRETE: REINFORCED CONCRETE, f'c = 3,600 psi  
 fy = 60,000 psi  
 LOADING CASE:  
 LEVEL GROUND WITH 240 psf LIVE LOAD SURCHARGE AND 16' SOUNDWALL.  
 SEISMIC LOAD DEAD LOAD = 0.3 DEAD LOAD  
 WIND LOAD = 30 psf  
 DEAD LOAD OF SOUNDWALL = 1414 lb/lf

SEISMIC LOAD: SOIL  
 Kh = 0.3g  
 Kv = 0.0  
 Kae : MONONOBE-OKABE METHOD  
 SOIL:  $\phi = 34^\circ$   $\gamma = 120$  pcf  
 EQUIVALENT FLUID PRESSURE:  
 = 36 pcf FOR DETERMINATION OF TOE PRESSURE  
 = 27 pcf FOR DETERMINATION OF HEEL PRESSURE

LOAD COMBINATIONS:  
 GROUP A : BD+1.7 E+1.7 SC  
 GROUP B : BD+1.7 E+1.3 W  
 GROUP C :  
 STEM : 1.0 D + 1.0 E + 1.0 EOD + 1.0 EOE  
 FOOTING : D+PYM  
 WHERE : B = 1.0 OR 1.3 WHICHEVER CONTROLS DESIGN

D = DEAD LOAD  
 E = LATERAL EARTH PRESSURE  
 SC = LIVE LOAD SURCHARGE  
 W = WIND LOAD  
 EOD = SEISMIC DEAD LOAD  
 EOE = SEISMIC LATERAL EARTH PRESSURE  
 PYM = PROBABLE YIELD MOMENT (1.3 X NOMINAL YIELD MOMENT OF STEM)

GENERAL NOTES

- CLASS 45-CONCRETE PILES WERE USED FOR THE DESIGN.
- PILE BATTER SHOWN ARE 1 : 3.
- MINIMUM DISTANCE BETWEEN CENTER PILE AND EDGE OF FOOTING IS 1'-6".
- REDUCTION FACTORS:  
 GROUPS A & B :  $\phi = 0.75$   
 GROUP C :  $\phi = 1.0$
- LATERAL RESISTANCE OF EACH PILE:  
 GROUPS A & B : = 30 kip  
 GROUP C : = 40 kip
- MAXIMUM SPACING BETWEEN PILES IS SHOWN IN THE TABLE. REDUCE TO SUIT THE LENGTH OF FOOTING.
- MINIMUM DISTANCE BETWEEN ANY TWO PILES IS 3'-0".
- LIMIT OF NO SPLICING FOR REBARS = 3 TIMES OF THE BOTTOM THICKNESS OF THE STEM.

ALTERNATIVE A: TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

DESIGN H	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'	32'
STEM BATTER	0	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	5/8:12	3/4:12	7/8:12	1 : 12	1 : 12
STEM THICKNESS @ TOP	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
(a) BARS				#6@18**	#7@18**	#8@18**	#9@18**	#10@18**	#8 @ 9*	#8 @ 9*	#7 @ 6*	#10@12**	#9 @ 9*	#11@12**
X				CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
Y				8'-0"	6'-6"	7'-6"	8'-6"	9'-6"	9'-6"	11'-0"	11'-6"	13'-0"	14'-0"	15'-6"
(b) BARS	#5 @ 12	#5 @ 12	#5 @ 9	#6@18**	#7@18**	#8@18**	#9@18**	#10@18**	#8 @ 9*	#8 @ 9*	#7 @ 6*	#10@12**	#9 @ 9*	#11@12**
X	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
Y	CONT	CONT	CONT	CONT	10'-6"	13'-0"	15'-0"	17'-6"	19'-6"	21'-0"	18'-6"	19'-0"	25'-6"	23'-6"
(c) BARS					#6 @ 18	#6 @ 18	#6 @ 18	#6 @ 18	#6 @ 18	#6 @ 18	#6 @ 12	#7 @ 12	#7 @ 18	#7 @ 12
(d) BARS	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 9	#5 @ 9	#6 @ 9	#5 @ 6	#7 @ 9	#7 @ 9	#6 @ 6	#7 @ 6
TOTAL (e) BARS	6 #5	6 #5	6 #5	6 #5	8 #5	8 #5	10 #5	10 #5	10 #5	10 #5	12 #5	12 #5	12 #5	14 #5
TOTAL (f) BARS	6 #5	6 #5	6 #5	6 #5	6 #5	8 #5	8 #5	8 #5	8 #5	10 #5	10 #5	10 #5	12 #5	12 #5

ALTERNATIVE B: TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

DESIGN H	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'	32'
BATTER	0	0	0	0	0	0	0	0	0	0	1/4:12	1/2:12	1/2:12	1/2:12
STEM THICKNESS @ TOP	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-6"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
(a) BARS				#6@12**	#5 @ 6*	#9@18**	#9@12**	#9@12**	#9@12**	#9@12**	#7 @ 6*	#7 @ 6*	#7 @ 6*	#9 @ 9*
X				CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
Y				5'-6"	5'-6"	8'-6"	8'-6"	8'-6"	8'-6"	9'-6"	11'-0"	12'-6"	13'-6"	14'-6"
(b) BARS	#5 @ 12	#5 @ 9	#6 @ 9	#6@12**	#5 @ 6*	#9@18**	#9@12**	#9@12**	#9@12**	#7 @ 6*	#7 @ 6*	#7 @ 6*	#9 @ 9*	#11@12**
X	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
Y	CONT	CONT	CONT	CONT	CONT	11'-6"	11'-6"	12'-0"	12'-0"	17'-6"	20'-0"	21'-6"	24'-0"	24'-0"
(c) BARS						#7 @ 18	#7 @ 12	#7 @ 12	#7 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#7 @ 18	#7 @ 12
(d) BARS	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 9	#5 @ 9	#6 @ 9	#5 @ 6	#7 @ 9	#7 @ 9	#6 @ 6	#7 @ 6
TOTAL (e) BARS	6 #5	6 #5	6 #5	6 #5	8 #5	8 #5	10 #5	10 #5	10 #5	10 #5	12 #5	12 #5	12 #5	14 #5
TOTAL (f) BARS	6 #5	6 #5	6 #5	6 #5	6 #5	8 #5	8 #5	8 #5	8 #5	10 #5	10 #5	10 #5	12 #5	12 #5

STANDARD DRAWING

FILE NO. **xs14-310-1x**

APPROVAL DATE July 2011

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO. X

POST MILE X

RETAINING WALL TYPE 1SWP - DETAILS NO. 1