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

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER X NO. X EXP. X CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

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

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	½:12	½:12	½:12	½:12	½:12	½:12	½:12	½:12	⅝:12	¾:12	⅞:12	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"
ⓐ 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"
ⓑ 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"
ⓒ BARS					#6 @ 18	#6 @ 18	#6 @ 18	#6 @ 18	#6 @ 18	#6 @ 18	#6 @ 12	#7 @ 12	#7 @ 18	#7 @ 12
ⓓ 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 ⓔ 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 ⓕ 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

CONT = CONTINUOUS

* = ⓐ AND ⓑ BARS ARE BUNDLED TOGETHER.

** = ALTERNATE ⓐ AND ⓑ BARS AS SHOWN IN DETAIL A.

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	¼:12	½:12	½:12	½:12
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"
ⓐ BARS				#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
Y				5′-6"	5′-6"	8′-6"	8′-6"	8′-6"	8′-6"	9′-6"	11′-0"	12′-6"	13′-6"	14′-6"
ⓑ 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"
ⓒ BARS						#7 @ 18	#7 @ 12	#7 @ 12	#7 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#7 @ 18	#7 @ 12
ⓓ 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 ⓔ 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 ⓕ 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

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: Ø = 34° γ = 120 pcf

EQUIVALENT FLUID PRESSURE:
= 36 pcf FOR DETERMINATION OF TOE PRESSURE
= 27 pcf FOR DETERMINATION OF HEEL PRESSURE

LOAD COMBINATIONS:

GROUP A : βD+1.7 E+1.7 SC
GROUP B : βD+1.7 E+1.3 W
GROUP C :
STEM : 1.0 D + 1.0 E +1.0 EQD +1.0 EQE
FOOTING : D+PYM

WHERE : β = 1.0 OR 1.3 WHICHEVER CONTROLS DESIGN
D = DEAD LOAD
E = LATERAL EARTH PRESSURE
SC = LIVE LOAD SURCHARGE
W = WIND LOAD
EQD = SEISMIC DEAD LOAD
EQE = SEISMIC LATERAL EARTH PRESSURE
PYM = PROBABLE YIELD MOMENT (1.3 X NOMINAL YIELD MOMENT OF STEM)

GENERAL NOTES

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

TIME PLOTTED => $TIME
DATE PLOTTED => $DATE
USERNAME => $USER

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

X

RETAINING WALL TYPE 1SWP - DETAILS NO. 1

DS OSD 2147A (ENGLISH STANDARD DRAWING "XS" BORDER REV. (02-02-11)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: X
PROJECT NUMBER & PHASE: X
CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES

SHEET X OF X

FILE => $REQUEST