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

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.

REGISTERED PROFESSIONAL ENGINEER — No. X — Exp. X — CIVIL — STATE OF CALIFORNIA

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	7′-3"	7′-6"	8′-0"	8′-6"	9′-6"	10′-3"	11′-0"	12′-3"	14′-0"	14′-9"	17′-3"	19′-0"	21′-3"	22′-9"
F	1′-6"	1′-6"	1′-6"	1′-6"	1′-6"	1′-9"	2′-0"	2′-3"	2′-9"	3′-0"	3′-3"	3′-9"	4′-0"	4′-6"
M	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"
N	5′-3"	5′-6"	6′-0"	6′-6"	7′-6"	8′-3"	9′-0"	10′-3"	12′-0"	12′-9"	15′-3"	17′-0"	19′-3"	20′-9"
ROW 1	8′-0"	8′-0"	8′-0"	7′-0"	6′-0"	4′-6"	4′-0"	4′-0"	4′-0"	4′-0"	4′-0"	4′-0"	4′-0"	4′-0"
ROW 2	16′-0"	16′-0"	16′-0"	14′-0"	15′-0"	11′-3"	10′-0"	12′-0"	6′-0"	4′-0"	4′-0"	4′-0"	4′-0"	4′-0"
ROW 3								8′-0"	8′-0"	6′-0"	6′-0"	4′-0"	4′-0"	4′-0"
ROW 4											6′-0"	6′-0"	4′-0"	4′-0"
ROW 5													6′-0"	6′-0"
CONFIGURATION	I	I	I	I	I	I	I	II	II	II	III	III	IIII	IIII

ALTERNATIVE A: (CONSTANT TOP OF WALL THICKNESS) 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"
a BARS				#6@18**	#7@18**	#8@18**	#9@18**	#10@18**	#8 @ 9*	#8 @ 9*	#7 @ 6*	#10@12**	#9 @ 9*	#11@12**
Y				8′-0"	6′-6"	7′-6"	8′-0"	9′-0"	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**
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
SHORT d BARS					#8 @ 18*	#8@18**	#9@18**	#8@12**	#8@12**	#6 @ 6*	#8 @ 9*	#7 @ 6*	#9 @ 9*	#9 @ 9*
X					5′-6"	6′-6"	6′-6"	7′-6"	9′-6"	10′-0"	12′-0"	13′-0"	15′-0"	16′-0"
d BARS	#5 @ 12	#5 @ 9	#6 @ 9	#7 @ 9	#8@18**	#8@18**	#9@18**	#8@12**	#8@12**	#6 @ 6*	#8 @ 9*	#7 @ 6*	#9 @ 9*	#9 @ 9*
X	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
TOTAL e BARS	12 #6	12 #6	10 #5	12 #5	12 #5	14 #5	14 #5	16 #5	18 #5	18 #5	20 #5	22 #5	26 #5	26 #5

ALTERNATIVE B: (VARIABLE TOP OF WALL THICKNESS) TABLE OF REINFORCING STEEL DIMENSIONS AND DATA														
DESIGN H		8′	10′	12′	14′	16′	18′	20′	22′	24′	26′	28′	30′	32′
BATTER		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′-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**	#7 @ 6*	#7 @ 6*	#7 @ 6*	#9 @ 9*	#11@12**
Y				5′-6"	5′-6"	7′-0"	7′-0"	8′-0"	8′-6"	9′-6"	11′-0"	12′-6"	13′-6"	14′-6"
b BARS		#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**
Y		CONT	CONT	CONT	CONT	9′-6"	9′-6"	11′-0"	11′-6"	17′-0"	19′-6"	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
SHORT d BARS					#8@18**	#8@18**	#9@18**	#8@12**	#8@12**	#6 @ 6*	#8 @ 9*	#7 @ 6*	#9 @ 9*	#9 @ 9*
X					5′-6"	6′-6"	6′-6"	7′-6"	9′-6"	10′-0"	12′-0"	13′-0"	15′-0"	16′-0"
d BARS		#5 @ 9	#6 @ 9	#7 @ 9	#8@18**	#8@18**	#9@18**	#8@12**	#8@12**	#6 @ 6*	#8 @ 9*	#7 @ 6*	#9 @ 9*	#9 @ 9*
X		CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
TOTAL e BARS		12 #6	10 #5	12 #5	12 #5	14 #5	14 #5	16 #5	18 #5	18 #5	20 #5	22 #5	26 #5	26 #5

CONT = CONTINUOUS

* = a AND b [SHORT d & d] BARS ARE BUNDLED TOGETHER.

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

ALTERNATE SHORT d AND d BARS.

DESIGN DATA

DESIGN: LOAD FACTOR DESIGN (LFD)

CONCRETE: REINFORCED CONCRETE, fc = 3600 psi
fy = 60000 psi

LOADING CASE:

LEVEL GROUND WITH 240 psf LIVE LOAD SURCHARGE AND 16′ SOUNDWALL.

SEISMIC LOAD = 0.3 DEAD LOAD
WIND LOAD = 30 psf
DEAD LOAD OF SOUNDWALL = 1414 lb/lf
DEAD LOAD OF BARRIER = 372 lb/lf

SEISMIC LOAD: SOIL

Kh = 0.3g
Kv = 0.0
Kae : MONOBE-OKABE METHOD

SOIL: Ø = 34°γ = 120 pcf

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

LOAD COMBINATIONS:

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

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".

STANDARD DRAWING

FILE NO. xs14-360-1x

APPROVAL DATE X-X-X

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO. X
POST MILE X

X
RETAINING WALL TYPE 5SWP - 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

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