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 1: TABLE OF DIMENSIONS AND PILE LAYOUT

	Stem With Haunch						Stem Without Haunch						
Design H	8′	10′	12′	14′	16′	18′	20′	22′	24′	26′	28′	30′	32′
W	7′-6"	8′-0"	9′-3"	10′-9"	12′-3"	13′-9"	15′-3"	16′-9"	18′-3"	19′-6"	21′-0"	22′-6"	24′-0"
C	6′-0"	6′-6"	7′-6"	9′-0"	10′-3"	11′-6"	13′-0"	14′-3"	15′-3"	16′-6"	17′-6"	18′-6"	20′-0"
B	1′-6"	1′-6"	1′-9"	1′-9"	2′-0"	2′-3"	2′-3"	2′-6"	3′-0"	3′-0"	3′-6"	4′-0"	4′-0"
F	2′-9"	2′-9"	2′-9"	2′-9"	2′-9"	2′-9"	3′-3"	3′-6"	3′-6"	4′-0"	4′-3"	4′-3"	4′-6"
Stem thickness @ Top							1′-9"	2′-0"	2′-0"	2′-0"	2′-0"	2′-3"	2′-3"
Stem thickness @ Haunch	1′-0"	1′-0"	1′-3"	1′-3"	1′-6"	1′-9"							
Batter	0	0	0	0	0	0	0	0	1/4 :12	1/4 :12	1/2 :12	1/2 :12	1/2 :12
Tie Down Design Force (T) K/FT	0	0	3	3	3	8	8	14	14	21	25	29	34
Tie Down Max. Spacing (S) Ft	0	0	24	24	20	18	16	16	14	14	14	13	12
M	4′-6"	5′-0"	6′-0"	6′-6"	7′-0"	8′-3"	9′-3"	10′-6"	13′-3"	14′-3"	15′-0"	15′-9"	17′-0"
N	0	0	0	0	0′-3"	0′-3"	0′-6"	1′-0"	1′-0"	1′-6"	2′-0"	12′-3"	2′-3"
Row 1	26′-0"	23′-0"	13′-0"	10′-0"	8′-0"	6′-0"	5′-0"	4′-0"	7′-6"	6′-6"	5′-6"	5′-0"	4′-0"
Row 2	26′-0"	23′-0"	13′-0"	10′-0"	8′-0"	6′-0"	5′-0"	4′-0"	7′-6"	6′-6"	5′-6"	5′-0"	4′-0"
Row 3									7′-6"	6′-6"	5′-6"	5′-0"	4′-0"
Row 4									7′-6"	6′-6"	5′-6"	5′-0"	4′-0"
Configuration	I	I	I	I	I	I	I	I	II	II	II	II	II

TABLE 2: TABLE OF REINFORCING STEEL

Design H	8′	10′	12′	14′	16′	18′	20′	22′	24′	26′	28′	30′	32′
(a) Bars			#7@18	#5@6	#9@18	#9@18	#9@12	#9@12	#7@6	#7@6	#10@12	#10@12	#11@12
X			Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont
Y			5′-6"	5′-6"	8′-6"	8′-9"	8′-9"	9′-0"	9′-9"	11′-3"	13′-3"	14′-3"	15′-3"
(b) Bars	#5@9	#6@9	#7@18	#5@6	#9@18	#9@12	#9@18	#9@12	#7@6	#7@6	#10@12	#10@12	#11@12
X	Cont	Cont	3′-6"	2′-6"	6′-3"	7′-9"	6′-9"	7′-9"	8′-6"	8′-0"	12′-6"	13′-6"	14′-9"
Y	Cont	Cont	Cont	Cont	12′-0"	13′-6"	14′-0"	15′-9"	17′-9"	20′-3"	22′-3"	24′-9"	24′-9"
Placement, ◯			(A)	(B)	(A)	(A)	(A)	(A)	(B)	(B)	(B)	(B)	(A)
(c) Bars					#8@18	#8@18	#8@12	#8@12	#6@6	#6@6	#9@12	#9@12	#10@12
Placement, ◯					(C)	(C)	(C)	(C)	(C)	(C)	(C)	(C)	(C)
(d) Bars	#5@18	#5@18	#5@18	#5@18	#5@18	#5@18	#5@18	#5@18	#5@18	#5@18	#5@18	#5@18	#5@18
(e) Bars	10#8	10#8	8#5	8#5	8#5	8#5	8#5	8#5	8#5	8#5	8#5	8#5	8#5
(f) Bars					#9@18	#9@18	#9@18	#9@18	#9@6	#7@6	#10@6	#10@6	#11@6
(g) Bars (Shear ties)									#4@12	#4@12	#4@12	#4@12	#4@12
X					3′-9"	6′-0"	5′-0"	6′-0"	5′-3"	5′-3"	6′-6"	8′-2"	8′-8"
(h) Bars	#5	#5	#5	#5									
U									7′-6"	7′-6"	8′-9"	9′-10"	11′-10"

LEGEND FOR BAR PLACEMENT

(A) : Alternate Placement of (a) Bars and (b) Bars are shown in "Detail B" on "Details No 2" sheet.

(B) : Bundle (a) and (b) Bars.

(C) : Splice (c) Bars to (b) Bars.

Cont = Continuous

DESIGN DATA

DESIGN: Load Factor Design (LFD)

CONCRETE: Reinforced Concrete, f′c = 3600 psi
fy = 60,000 psi

LOADING CASE:

Level ground with 240 psf live load surcharge and 16 feet Soundwall

Seismic Load = 0.3 Dead Load
Wind Load = 30 psf
Dead Load of Soundwall = 1414 Lb/ft
Dead Load of Barrier = 372 Lb/ft

SEISMIC LOAD: SOIL

Kh = 0.3g
Kv = 0.0
Kae : Mononobe-Okabe Method

SOIL: $\phi = 34°$ $\gamma = 120$ pcf

Equivalent fluid pressure
Static = 36 pcf for determination of toe pressure
Seismic = Coulomb's Theory

LOAD COMBINATIONS:

75% Earth Pressure (For back row piles):

Loading 1: $\beta D + 0.75 *(1.0E) + 0.75 *(1.0 P_{av}) + 0.75 T$
Loading 2: $\beta D + 0.75 *(1.7E) + 0.75 *(1.7 P_{av}) + 0.75 T$

100% Earth Pressure (For front row piles):

Group A1 : $\beta D + 1.7 E + 1.7 SC + 0.75 T$
Group A2 : $\beta D + 1.7 E + 1.7 Pav + 1.7 SC + 0.75 T$
Group B1 : $\beta D + 1.7 E + 1.3 W + 0.75 T$
Group B2 : $\beta D + 1.7 E + 1.7 Pav + 1.3 W + 0.75 T$
Group C :
Stem : 1.0 D + 1.0 E + 1.0 EQD + 1.0 EQE
Footing : D + PYM + Pav + V + 1.0 T

Where : β = 1.0 or 1.3 whichever controls design
D = Dead Load
E = Lateral Earth Pressure
P_{av} = Vertical 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)
V = Possible Shear at Base of Stem associated with Probable Yield Moment.
T = Design Force for Vertical Tiedown

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

STANDARD DRAWING
FILE NO. xs14-410-1x
APPROVAL DATE July 2011

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO. X
POST MILE X

X

RETAINING WALL TYPE 7SWBP - 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