DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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TABLE 1: TABLE OF DIMENSIONS AND PILE LAYOUT

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′-0"	1′-0"	1′-3"	1′-3"	1′-6"	1′-9"	1′-9"	2′-0"	2′-0"	2′-0"	2′-0"	2′-3"	2′-3"
Batter	0	0	0	0	0	0	0	0	¼:12	¼:12	½:12	½:12	½:12
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"	2′-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′
ⓐ 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"
ⓑ 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, ◯			Ⓐ	Ⓑ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓐ
ⓒ Bars					#8@18	#8@18	#8@12	#8@12	#6@6	#6@6	#9@12	#9@12	#10@12
Placement, ◯					Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ
ⓓ 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
ⓔ Bars	10#8	10#8	8#5	8#5	8#5	8#5	8#5	8#5	20#5	16#5	10#5	10#5	8#5
ⓕ Bars					#9@18	#9@18	#9@18	#9@18	#9@6	#7@6	#10@6	#10@6	#11@6
ⓖ 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"
ⓗ Bars	#5	#5	#5	#5									
U									7′-6"	7′-6"	8′-9"	9′-10"	11′-10"

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 ft Soundwall

Seismic Load = 0.3 Dead Load
Wind Load = 30 psf
Dead Load of Soundwall = 1414 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 : $\beta D + 1.7 E + 1.7 P_{av} + 1.7 SC + 0.75 T$
Group B1 : $\beta D + 1.7 E + 1.3 W + 0.75 T$
Group B2 : $\beta D + 1.7 E + 1.7 P_{av} + 1.3 W + 0.75 T$
Group C :
Stem : 1.0 D + 1.0 E + 1.0 EQD + 1.0 EQE
Footing : D + PYM + P_{av} + 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)
T = Design Force for Vertical Tiedown
V = Possible Shear at Base of Stem associated with Probable Yield Moment

LEGEND FOR BAR PLACEMENT

Ⓐ : Alternate placement of ⓐ Bars and ⓑ Bars are shown in "DETAIL B" on "DETAIL NO. 2" sheet.
Ⓑ : Bundle ⓐ and ⓑ Bars.
Ⓒ : Splice ⓒ Bars to ⓑ Bars.
Cont = Continuous

STANDARD DRAWING

RELEASE DATE 12/1/05	DESIGN	BY MADON SAH	CHECKED OVERCOMER HOR	RELEASED BY
FILE NO. xs14-400-1e	DETAILS	BY A R DUDSAK	CHECKED J.C.MOESE	
	SUBMITTED	BY OVERCOMER HOR	DRAWING DATE 12/1/05	OFFICE CHIEF

DS OSD 2147A (REV. X/XX/XX)

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

CU
EA

BRIDGE NO.

POST MILE

RETAINING WALL TYPE 7SWP - DETAIL NO. 1

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) SHEET OF

USERNAME => rwu

xs14-400-1e.dgn

DATE PLOTTED => 24-MAR-2006 TIME PLOTTED => 13:33