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

Caltrans Metric

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

	Stem With Haunch						Stem Without Haunch						
Design H	2400	3000	3600	4200	4800	5500	6100	6700	7300	7900	8500	9100	9800
W	2300	2400	2750	2900	3150	3500	3900	4400	5250	5700	6100	6400	6800
C	1850	2000	2300	2450	2600	2950	3300	3650	4500	4800	5050	5250	5650
B	450	450	450	450	550	550	600	750	750	900	1050	1150	1150
F	750	750	750	750	750	750	900	1000	1000	1150	1200	1200	1300
Stem Thickness @ Top							550	600	600	600	600	685	685
Stem Thickness @ Haunch	305	305	400	400	450	550							
Batter	0	0	0	0	0	0	0	0	100:2	100:2	100:4	100:4	100:4
Tie Down Design Force Force (T) kN/m	0	0	44	44	44	117	117	205	205	308	366	425	498
Tie Down Max Spacing Spacing (S) mm	0	0	7300	7300	7300	6100	6100	3600	3600	2750	2750	2450	2150
M	1350	1500	1850	2000	2150	2500	2800	3200	4050	4350	4550	4800	5200
N	0	0	0	0	75	75	150	300	300	450	600	700	700
Row 1	8000	7000	3950	3050	2400	1850	1500	1200	2300	2000	1700	1500	1200
Row 2	8000	7000	3950	3050	2400	1850	1500	1200	2300	2000	1700	1500	1200
Row 3									2300	2000	1700	1500	1200
Row 4									2300	2000	1700	1500	1200
Configuration	I	I	I	I	I	I	I	I	II	II	II	II	II

TABLE 2: TABLE OF REINFORCING STEEL

	Stem With or Without Haunch												
Design H	2400	3000	3600	4200	4800	5500	6100	6700	7300	7900	8500	9100	9800
ⓐ Bars			#22@450	#16@150	#29@450	#29@450	#29@300	#29@300	#22@150	#22@150	#32@300	#32@300	#36@300
X			Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont
Y			1700	1750	2650	2750	2750	2850	3050	3600	4100	4400	4800
ⓑ Bars	#16@225	#19@225	#22@450	#16@150	#29@450	#29@450	#29@300	#29@300	#22@150	#22@150	#32@300	#32@300	#36@300
X	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	3950	4400	4900	5050	5500
Y	Cont	Cont	Cont	Cont	3650	4100	4250	4800	5500	6300	6800	7600	7700
Placement, ◯			Ⓐ	Ⓑ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓐ
ⓒ Bars					#25@450	#25@450	#25@300	#25@300	#19@150	#19@150	#29@300	#29@300	#32@300
Placement, ◯					Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ	Ⓒ
ⓓ Bars	#16@450	#16@450	#16@450	#16@450	#16@450	#16@450	#16@450	#16@450	#16@450	#16@450	#16@450	#16@450	#16@450
ⓔ Bars	12#25	12#25	12#25	16#16	16#16	18#16	20#16	22#16	24#16	24#16	26#16	28#16	30#16
ⓕ Bars			#22	#22	#19	#16							
ⓖ Bars					#29@450	#29@450	#29@450	#29@450	#29@150	#22@150	#32@150	#32@150	#36@150
X					1150	1850	1500	1850	1600	1600	2000	2500	2650
ⓗ Bars (Shear ties)									#13@380	#13@380	#13@380	#13@300	#13@300
U									2280	2280	2660	3000	3600

LEGEND FOR BAR PLACEMENT

Ⓐ : Alternate Placement of ⓐ Bars and ⓑ Bars.

Ⓑ : Bundle ⓐ and ⓑ Bars.

Ⓒ : Splice ⓒ Bars to ⓑ Bars.

Cont = Continuous

DESIGN DATA

DESIGN: Load Factor Design (LFD)

CONCRETE: Reinforced Concrete, f'c = 25 MPa
fy = 420 MPa

LOADING CASE:

Level ground with 11.5 KPa live load surcharge and 4875 mm Soundwall

Seismic Load = 0.3 Dead Load
Wind Load = 1435 Pa
Dead Load of Soundwall = 20.5 kN/m
Dead Load of Barrier = 6.8 kN/m

SEISMIC LOAD: SOIL

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

SOIL: $\phi = 34°$ $\gamma = 19$ KN/m^3

Equivalent fluid pressure
Static = 5.6 kPa/m 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

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

DATE PLOTTED => 16-JAN-2008TIME PLOTTED => 14:49

STANDARD DRAWING

RELEASE DATE 8/8/03	DESIGN	BY Madon Sah	CHECKED Lisa Tanaka	RELEASED BY
FILE NO. xs14-410-1	DETAILS	BY A R Dudsak	CHECKED Overcomer Hor	
	SUBMITTED	BY Overcomer Hor	DRAWING DATE 12/94	OFFICE CHIEF

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO.

KILOMETER POST

RETAINING WALL TYPE 7SWBP DETAIL NO. 1

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

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU
EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) SHEET OF

USERNAME => jsanchez

xs14-410-1.dgn