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

REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. 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.

Caltrans Metric

TABLE OF PILE SPACING: CLASS 400 - CONCRETE PILES

Design H	1800	2400	3000	3600	4200	4800	5500	6100	6700	7300	7900	8500	9100	9800
W	2050	2150	2250	2500	2800	3100	3350	3650	4000	4350	4950	5100	5500	6250
C	850	850	900	1000	1050	1200	1300	1450	1550	1700	1900	2050	2200	2350
B	1200	1300	1350	1500	1750	1900	2050	2200	2450	2650	3050	3050	3300	3900
F	450	450	450	550	550	600	750	850	900	900	1000	1050	1150	1200
M	400	400	450	550	600	750	850	1000	1100	1250	1450	1600	1750	1900
N	750	850	900	1050	1300	1450	1600	1750	2000	2200	2600	2600	2850	3450
Row 1	4800	4200	3600	3000	2400	1950	1650	1350	1200	1200	1200	1200	1200	1200
Row 2	7200	6300	5400	4500	4200	3900	3300	2700	2400	3600	3000	1800	1200	1200
Row 3										2400	1500	1200	1200	1800
Row 4														1800
Configuration	I	I	I	I	I	I	I	I	I	II	II	II	II	III

ALTERNATIVE A: (CONSTANT TOP OF WALL THICKNESS) TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

Design H	1800	2400	3000	3600	4200	4800	5500	6100	6700	7300	7900	8500	9100	9800
Stem Batter	0	100:4	100:4	100:4	100:4	100:4	100:4	100:4	100:4	100:5	100:6	100:7	100:8	100:8
Stem Thickness @ Top	305	305	305	305	305	305	305	305	305	305	305	305	305	305
(a) Bars				#19 @ 450**	#22 @ 450**	#25 @ 450**	#29 @ 450**	#32 @ 450**	#25 @ 225 *	#25 @ 225 *	#22 @ 150 *	#32 @ 300**	#29 @ 225 *	#36 @ 300**
X				Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont
Y				2400	1950	2250	2550	2900	2900	3350	3500	3950	4250	4700
(b) Bars	#16@300	#16@300	#16@225	#19 @ 450**	#22 @ 450**	#25 @ 450**	#29 @ 450**	#32 @ 450**	#25 @ 225 *	#25 @ 225 *	#22 @ 150 *	#32 @ 300**	#29 @ 225 *	#36 @ 300**
X	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont
Y	Cont	Cont	Cont	Cont	3200	4000	4600	5350	5950	6400	5650	5800	7800	7200
(c) Bars					#19@450	#19@450	#19@450	#19@450	#19@450	#19@450	#19@300	#22@300	#22@450	#22@300
(d) Bars	#16@300	#16@300	#16@300	#16@300	#16@300	#16@300	#16@225	#16@225	#19@225	#16@150	#22@225	#22@225	#19@150	#22@150
Total (e) Bars	6 #16	6 #16	6 #16	6 #16	8 #16	8 #16	10 #16	10 #16	10 #16	10 #16	12 #16	12 #16	12 #16	14 #16
Total (f) Bars	6 #16	6 #16	6 #16	6 #16	6 #16	8 #16	8 #16	8 #16	8 #16	10 #16	10 #16	10 #16	12 #16	12 #16

ALTERNATIVE B: (VARIABLE TOP OF WALL THICKNESS) TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

Design H	1800	2400	3000	3600	4200	4800	5500	6100	6700	7300	7900	8500	9100	9800
Batter	0	0	0	0	0	0	0	0	0	0	100:2	100:4	100:4	100:4
Stem Thickness @ Top	305	305	305	305	305	380	380	450	610	610	610	610	610	610
(a) Bars				#19 @ 300**	#16 @ 150 *	#29 @ 450**	#29 @ 300**	#29 @ 300**	#29 @ 300**	#22 @ 150 *	#22 @ 150 *	#22 @ 150 *	#29 @ 225 *	#36 @ 300**
X				Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont
Y				1700	1700	2600	2600	2600	2600	2900	3350	3800	4100	4400
(b) Bars	#16@300	#19@225	#19@225	#19 @ 300**	#16 @ 150 *	#29 @ 450**	#29 @ 300**	#29 @ 300**	#29 @ 300**	#22 @ 150 *	#22 @ 150 *	#22 @ 150 *	#29 @ 225 *	#36 @ 300**
X	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont
Y	Cont	Cont	Cont	Cont	Cont	3500	3500	3700	3700	5350	6100	6550	7300	7300
(c) Bars						#22@450	#22@300	#22@300	#22@300	#19@300	#19@300	#19@300	#22@450	#22@300
(d) Bars	#16@300	#16@300	#16@300	#16@300	#16@300	#16@300	#16@225	#16@225	#19@225	#16@150	#22@225	#22@225	#19@150	#22@150
Total (e) Bars	6 #16	6 #16	6 #16	6 #16	8 #16	8 #16	10 #16	10 #16	10 #16	10 #16	12 #16	12 #16	12 #16	14 #16
Total (f) Bars	6 #16	6 #16	6 #16	6 #16	6 #16	8 #16	8 #16	8 #16	8 #16	10 #16	10 #16	10 #16	12 #16	12 #16

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 = 20.6 kN/m

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

SOIL: $\emptyset = 34°$ $\gamma = 19$ kN/m³
Equivalent fluid pressure:
= 5.6 KPa/m for determination of toe pressure
= 4.2 KPa/m 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
Group C (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 400 kN-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 450 mm.
4. Reduction factors:
   Groups A & B : Ø = 0.75
   Group C : Ø = 1.0
5. Lateral resistance of each pile:
   Groups A & B : = 130 kN
   Group C : = 175 kN
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 900 mm.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

STANDARD DRAWING

RELEASE DATE 2/25/03
FILE NO. xs14-310-1

DESIGN	BY Madon Sah	CHECKED Overcomer Hor	RELEASED BY Roberto Ercelle, OFFICE CHIEF
DETAILS	BY A R Dudsak	CHECKED J C Moese	
SUBMITTED	BY Overcomer Hor	DRAWING DATE 3/01	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO.
KILOMETER POST

RETAINING WALL TYPE 1SWP - 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

xs14-310-1.dgn

DATE PLOTTED => 16-JAN-2004 TIME PLOTTED => 14:43