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 OF PILE SPACING: CLASS 400 - CONCRETE PILES

Design H	1800	2400	3000	3600	4200	4800	5500	6100	6700	7300	7900	8500	9100	9800
W	2200	2250	2400	2600	2900	3100	3350	3750	4250	4500	5250	5800	6500	6950
F	450	450	450	450	450	550	600	700	850	900	1000	1150	1200	1400
M	300	300	300	300	300	300	300	300	300	300	300	300	300	300
N	1600	1700	1800	2000	2300	2500	2750	3100	3650	3900	4650	5200	5850	6300
Row 1	2400	2400	2400	2150	1800	1350	1200	1200	1200	1200	1200	1200	1200	1200
Row 2	4800	4800	4800	4200	4600	3400	3000	3600	1800	1200	1200	1200	1200	1200
Row 3								2400	2400	1800	1800	1200	1200	1200
Row 4											1800	1800	1200	1200
Row 5													1800	1800
Configuration	I	I	I	I	I	I	I	II	II	II	III	III	IV	IV

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
ⓐ BARS				#19 @ 450XX	#22 @ 450XX	#25 @ 450XX	#29 @ 450XX	#32 @ 450XX	#25 @ 225X	#25 @ 225X	#22 @ 150X	#32 @ 300XX	#29 @ 225X	#36 @ 300XX
Y				2400	1950	2250	2400	2750	2900	3350	3500	3950	4250	4700
ⓑ Bars	#16 @ 300	#16 @ 300	#16 @ 225	#19 @ 450XX	#22 @ 450XX	#25 @ 450XX	#29 @ 450XX	#32 @ 450XX	#25 @ 225X	#25 @ 225X	#22 @ 150X	#32 @ 300XX	#29 @ 225X	#36 @ 300XX
Y	Cont	Cont	Cont	Cont	3200	3950	4550	5350	5950	6400	5650	5800	7750	7150
ⓒ Bars					#19 @ 450	#19 @ 450	#19 @ 450	#19 @ 450	#19 @ 450	#19 @ 450	#19 @ 300	#22 @ 300	#22 @ 450	#22 @ 300
Short ⓓ Bars					#25 @ 450XX	#25 @ 450XX	#29 @ 450XX	#25 @ 300XX	#25 @ 300XX	#19 @ 150X	#25 @ 225X	#22 @ 150X	#29 @ 225X	#29 @ 225X
X					1700	2000	2000	2300	2900	3050	3650	3950	4500	4900
ⓓ Bars	#16 @ 300	#16 @ 225	#19 @ 225	#22 @ 225	#25 @ 450XX	#25 @ 450XX	#29 @ 450XX	#25 @ 300XX	#25 @ 300XX	#19 @ 150X	#25 @ 225X	#22 @ 150X	#29 @ 225X	#29 @ 225X
X	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont
Total e Bars	12 #19	12 #19	10 #16	12 #16	12 #16	14 #16	14 #16	16 #16	18 #16	18 #16	20 #16	22 #16	26 #16	26 #16

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

Design H		2400	3000	3600	4200	4800	5500	6100	6700	7300	7900	8500	9100	9800
Stem Batter		0	0	0	0	0	0	0	0	0	100:2	100:4	100:4	100:4
Stem Thickness @ Top		305	305	305	305	380	380	450	610	610	610	610	610	610
ⓐ BARS				#19 @ 300XX	#16 @ 150X	#29 @ 450XX	#29 @ 300XX	#29 @ 300XX	#29 @ 300XX	#22 @ 150X	#22 @ 150X	#22 @ 150X	#29 @ 225X	#36 @ 300XX
Y				1700	1700	2150	2150	2450	2600	2900	3350	3800	4100	4400
ⓑ Bars		#16 @ 225	#19 @ 225	#19 @ 300XX	#16 @ 150X	#29 @ 450XX	#29 @ 300XX	#29 @ 300XX	#29 @ 300XX	#22 @ 150X	#22 @ 150X	#22 @ 150X	#29 @ 225X	#36 @ 300XX
Y		Cont	Cont	Cont	Cont	2900	2900	3350	3500	5200	5950	6550	7300	7300
ⓒ Bars						#22 @ 450	#22 @ 300	#22 @ 300	#22 @ 300	#19 @ 300	#19 @ 300	#19 @ 300	#22 @ 450	#22 @ 300
Short ⓓ Bars					#25 @ 450XX	#25 @ 450XX	#29 @ 450XX	#25 @ 300XX	#25 @ 300XX	#19 @ 150X	#25 @ 225X	#22 @ 150X	#29 @ 225X	#29 @ 225X
X					1700	2000	2000	2300	2900	3050	3650	3950	4500	4900
ⓓ Bars		#16 @ 225	#19 @ 225	#22 @ 225	#25 @ 450XX	#25 @ 450XX	#29 @ 450XX	#25 @ 300XX	#25 @ 300XX	#19 @ 150X	#25 @ 225X	#22 @ 150X	#29 @ 225X	#29 @ 225X
X		Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont	Cont
Total ⓔ Bars		12 #19	10 #16	12 #16	12 #16	14 #16	14 #16	16 #16	18 #16	18 #16	20 #16	22 #16	26 #16	26 #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 4875mm 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: ϕ = 34° γ = 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 + 1.7 E + 1.7 SC
Group B : βD + 1.7 E + 1.3 W
Group C (stem) : 1.0 D + 1.0 E + 1.0 EQD + 1.0 EQE
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 400KN-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	DESIGN	BY Madon Sah	CHECKED Overcomer Hor	RELEASED BY
	DETAILS	BY A R Dudsak	CHECKED J C Moese	
FILE NO. xs14-360-1	SUBMITTED	BY Overcomer Hor	DRAWING DATE 4/01	OFFICE CHIEF

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO.
KILOMETER POST

RETAINING WALL TYPE 5SWP - 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

xs14-360-1.dgn

DATE PLOTTED => 16-JAN-2004 TIME PLOTTED => 14:45