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 OF PILE SPACING: CLASS 45 - CONCRETE PILES

DESIGN H	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'	32'
W	6'-9"	7'-0"	7'-6"	8'-3"	9'-3"	10'-3"	11'-0"	12'-0"	13'-0"	14'-3"	16'-3"	16'-9"	18'-0"	20'-6"
C	2'-9"	2'-9"	3'-0"	3'-3"	3'-6"	4'-0"	4'-3"	4'-9"	5'-0"	5'-6"	6'-3"	6'-9"	7'-3"	7'-9"
B	4'-0"	4'-3"	4'-6"	5'-0"	5'-9"	6'-3"	6'-9"	7'-3"	8'-0"	8'-9"	10'-0"	10'-0"	10'-9"	12'-9"
F	1'-6'	1'-6"	1'-6"	1'-9"	1'-9"	2'-0"	2'-6"	2'-9"	3'-0"	3'-0"	3'-3"	3'-6"	3'-9"	4'-0"
M	1'-3"	1'-3"	1'-6"	1'-9"	2'-0"	2'-6"	2'-9"	3'-3"	3'-6"	4'-0"	4'-9"	5'-3"	5'-9"	6'-3"
N	2'-6"	2'-9"	3'-0"	3'-6"	4'-3"	4'-9"	5'-3"	5'-9"	6'-6"	7'-3"	8'-6"	8'-6"	9'-3"	11'-3"
ROW 1	16'-0"	14'-0"	12'-0"	10'-0"	8'-0"	6'-6"	5'-6"	4'-6"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"
ROW 2	24'-0"	21'-0"	18'-0"	15'-0"	14'-0"	13'-0"	11'-0"	9'-0"	8'-0"	12'-0"	10'-0"	6'-0"	4'-0"	4'-0"
ROW 3										8'-0"	5'-0"	4'-0"	4'-0"	6'-0"
ROW 4														6'-0"
CONFIGURATION	I	I	I	I	I	I	I	I	I	II	II	II	II	III

ALTERNATIVE A: TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

DESIGN H	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'	32'
STEM BATTER	0	1/2 :12	1/2 :12	1/2 :12	1/2 :12	1/2 :12	1/2 :12	1/2 :12	1/2 :12	5/8 :12	3/4 :12	7/8 :12	1 :12	1 :12
STEM THICKN @ TOP	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
(a) BARS				*6 @ 18**	*7 @ 18**	*8 @ 18**	*9 @ 18**	*10 @ 18**	*8 @ 9*	*8 @ 9*	*7 @ 6*	*10 @ 12**	*9 @ 9*	*11 @ 12**
X				CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
Y				8'-0"	6'-6"	7'-6"	8'-6"	9'-6"	9'-6"	11'-0"	11'-6"	13'-0"	14'-0"	15'-6"
(b) BARS	*5 @ 12	*5 @ 12	*5 @ 9	*6 @ 18**	*7 @ 18**	*8 @ 18**	*9 @ 18**	*10 @ 18**	*8 @ 9*	*8 @ 9*	*7 @ 6*	*10 @ 12**	*9 @ 9*	*11 @ 12**
X	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
Y	CONT	CONT	CONT	CONT	10'-6"	13'-0"	15'-0"	17'-6"	19'-6"	21'-0"	18'-6"	19'-0"	25'-6"	23'-6"
(c) BARS					*6 @ 18	*6 @ 18	*6 @ 18	*6 @ 18	*6 @ 18	*6 @ 18	*6 @ 12	*7 @ 12	*7 @ 18	*7 @ 12
(d) BARS	*5 @ 12	*5 @ 12	*5 @ 12	*5 @ 12	*5 @ 12	*5 @ 12	*5 @ 9	*5 @ 9	*6 @ 9	*5 @ 6	*7 @ 9	*7 @ 9	*6 @ 6	*7 @ 6
TOTAL (e) BARS	6 *5	6 *5	6 *5	6 *5	8 *5	8 *5	10 *5	10 *5	10 *5	10 *5	12 *5	12 *5	12 *5	14 *5
TOTAL (f) BARS	6 *5	6 *5	6 *5	6 *5	6 *5	8 *5	8 *5	8 *5	8 *5	10 *5	10 *5	10 *5	12 *5	12 *5

ALTERNATIVE B: TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

DESIGN H	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'	32'
BATTER	0	0	0	0	0	0	0	0	0	0	1/4 :12	1/2 :12	1/2 :12	1/2 :12
STEM THICKN @ TOP	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-6"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
(a) BARS				*6 @ 12**	*5 @ 6*	*9 @ 18**	*9 @ 12**	*9 @ 12**	*9 @ 12**	*7 @ 6*	*7 @ 6*	*7 @ 6*	*9 @ 9*	*11 @ 12**
X				CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
Y				5'-6"	5'-6"	8'-6"	8'-6"	8'-6"	8'-6"	9'-6"	11'-0"	12'-6"	13'-6"	14'-6"
(b) BARS	*5 @ 12	*5 @ 9	*6 @ 9	*6 @ 12**	*5 @ 6*	*9 @ 18**	*9 @ 12**	*9 @ 12**	*9 @ 12**	*7 @ 6*	*7 @ 6*	*7 @ 6*	*9 @ 9*	*11 @ 12**
X	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT	CONT
Y	CONT	CONT	CONT	CONT	CONT	11'-6"	11'-6"	12'-0"	12'-0"	17'-6"	20'-0"	21'-6"	24'-0"	24'-0"
(c) BARS						*7 @ 18	*7 @ 12	*7 @ 12	*7 @ 12	*6 @ 12	*6 @ 12	*6 @ 12	*7 @ 18	*7 @ 12
(d) BARS	*5 @ 12	*5 @ 12	*5 @ 12	*5 @ 12	*5 @ 12	*5 @ 12	*5 @ 9	*5 @ 9	*6 @ 9	*5 @ 6	*7 @ 9	*7 @ 9	*6 @ 6	*7 @ 6
TOTAL (e) BARS	6 *5	6 *5	6 *5	6 *5	8 *5	8 *5	10 *5	10 *5	10 *5	10 *5	12 *5	12 *5	12 *5	14 *5
TOTAL (f) BARS	6 *5	6 *5	6 *5	6 *5	6 *5	8 *5	8 *5	8 *5	8 *5	10 *5	10 *5	10 *5	12 *5	12 *5

CONT = CONTINUOUS
* = (a) AND (b) BARS ARE BUNDLED TOGETHER.
** = ALTERNATE (a) AND (b) BARS AS SHOWN IN DETAIL A.

DESIGN DATA

DESIGN: LOAD FACTOR DESIGN (LFD)

CONCRETE: REINFORCED CONCRETE, f'c = 3,600 psi
fy = 60,000 psi

LOADING CASE:

LEVEL GROUND WITH 240 psf LIVE LOAD SURCHARGE AND 16' SOUNDWALL.

SEISMIC LOAD DEAD LOAD = 0.3 DEAD LOAD
WIND LOAD = 30 psf
DEAD LOAD OF SOUNDWALL = 1414 lb/lf

SEISMIC LOAD: SOIL

Kh = 0.3g
Kv = 0.0
Kae : MONONOBE-OKABE METHOD

SOIL: $\emptyset = 34^0$ $\gamma = 120$ pcf

EQUIVALENT FLUID PRESSURE:
= 36 pcf FOR DETERMINATION OF TOE PRESSURE
= 27 pcf 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
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 45-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 1'-6".
4. REDUCTION FACTORS:
   GROUPS A & B : Ø = 0.75
   GROUP C : Ø = 1.0
5. LATERAL RESISTANCE OF EACH PILE:
   GROUPS A & B : = 30 kip
   GROUP C : = 40 kip
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 3'-0".
8. LIMIT OF NO SPLICING FOR REBARS = 3 TIMES OF THE BOTTOM THICKNESS OF THE STEM.

DATE PLOTTED => 24-MAR-2006 TIME PLOTTED => 13:21

STANDARD DRAWING

RELEASE DATE 12/1/05 | FILE NO. xs14-310-1e
DESIGN BY MADON SAH | DETAILS BY R YEE | SUBMITTED BY OVERCOMER HOR
CHECKED OVERCOMER HOR | CHECKED J.C. MOESE | DRAWING DATE 12/1/05
RELEASED BY OFFICE CHIEF

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO.
POST MILE

RETAINING WALL TYPE 1SWP - DETAIL NO. 1

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

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU
EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET | OF

USERNAME => rwu

xs14-310-1e.dgn