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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6:1 BATTER WALL

Foundation pressure in kPa

TYPE	LOADING CASE	WALL HEIGHT (millimeters)															
		765	1275	1785	2295	2805	3315	3825	4335	4845	5355	5865	6375	6885	7395	7905	8415
I	A	30	50	90	120												
	B	60	70	80	130	160											
	C	40	60	70	80	90											
II	A	50	50	60	70	100	120	160	210								
	B	70	90	90	110	130	150	250	290								
	C	50	70	80	100	110	110	110	140								
III-I	A					100	110	140	170	210							
	B					110	160	190	270	310	420						
	C					80	100	110	140	170	210						
III-II	A							150	190	230							
	B							250	290	320	440						
	C							130	160	190	230						
IV	A									180	210	250	290				
	B									290	320	410	460	590			
	C									170	200	230	270	310			

TYPE	LOADING CASE	4845	5355	5865	6375	6885	7395	7905	8415	8925	9435	9945	10455	10965	11475	11985	12495
V	A	150	170	190	220	260	290	320	370								
	B	270	300	320	400	440	540	580	720								
	C	140	170	190	220	250	290	320	370								
VI	A		160	180	200	230	260	290	320	360	400						
	B		290	310	340	410	440	540	570	690	740						
	C		160	180	210	230	260	300	320	360	410						
VII	A					210	240	260	290	320	350	380	420	470			
	B					390	420	460	540	570	670	720	830	900			
	C					230	250	280	310	340	370	410	460	500			
VIII	A									310	320	350	390	420	460	500	
	B									560	590	670	720	820	880	940	
	C									340	360	400	430	470	510	560	

TYPE	LOADING CASE	8925	9435	9945	10455	10965	11475	11985	12495	13005	13515	14025	14535	15045	15555	16065	16575
IX	A	280	300	320	340	380	410	440	480	520							
	B	520	560	590	660	710	790	840	950	1010							
	C	310	340	360	390	430	460	500	550	580							
X	A	250	270	290	320	340	360	390	420	450	490	530	560				
	B	460	490	560	580	650	690	770	800	890	940	990	1100				
	C	290	310	340	360	390	420	450	490	520	560	600	640				
XI	A								420	450	480	510	550	580	620		
	B								790	830	910	960	1060	1120	1240		
	C								500	530	560	600	640	680	730		
XII	A										460	490	520	550	580	620	660
	B										870	920	990	1040	1140	1210	1320
	C										550	580	610	650	690	740	780

VERTICAL WALL

Foundation pressure in kPa

WALL HEIGHT (millimeters)										
765	1275	1785	2295	2805	3315	3825	4335	4845	5355	5865
40	70	110								
40	70									
30	40	80	110	180						
30	50	80	110	140	200					
50	50	100								
40	40	60	90	120	170	230				
				110	150	190	250			
				110	140	180	240	310	400	
						190	250			
						180	240	310	400	
								230	280	340
								240	290	350

4845	5355	5865	6375	6885	7395	7905	8415	8925
190	220	260	310	360				
200	250	290	340	400	480	580	710	
	200	230	270	310	350	410	490	
	220	260	310	350	410	480	560	660
				270	310	340	380	440
				320	350	400	460	530
								380
								460

8925
340
420
320
390

DESIGN NOTES

1. **WALL BASE IN EMBANKMENT:** A minimum depth of 1500 mm of embankment at 95% relative soil compaction is required below the base of all walls in order to constitute an embankment condition. When the foundation pressure is between 240 and 380 kPa, embankment below the wall shall consist of "Structure Backfill" material as set forth in Section 19-3.06 of the Standard Specifications. The limits of relative compaction (95%) shall be as set forth in Section 19-5.03 of the Standard Specifications.

2. **WALL BASE IN ORIGINAL GROUND:** Allowable soil pressure at toe of wall shall be determined by the foundation site investigation. Walls that are to retain cut slopes shall be designed for lateral and toe pressure determined from site investigation data. Overall stability of slope with wall in place must be analyzed. If original ground slopes away from toe of wall, reduction in allowable bearing capacity due to slope must be considered. Walls should not be founded in original ground having an allowable bearing capacity of less than 140 kPa. Consideration should be given to removal and replacement of unsuitable material with "Structure Backfill" material as set forth in Section 19-3.06 of the Standard Specifications. The limits of relative compaction (95%) shall be as set forth in Section 19-5.03 of the Standard Specification.

3. **SOIL PARAMETERS:**

   Backfill - $\phi = 34^\circ$

   $\delta = 22.7^\circ$

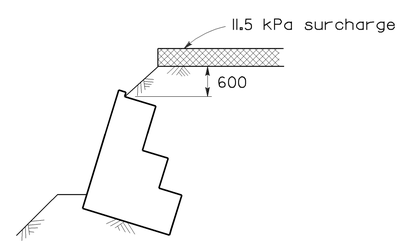
   $\gamma = 19\ kN/m^3$

   Foundation - $\phi = 34^\circ$

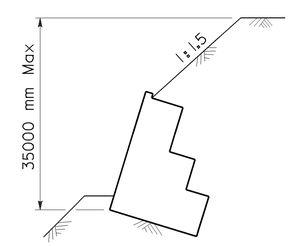
   Lateral earth pressure determined by Coulomb's theory.

4. The maximum allowable soil bearing capacity for walls founded in embankment is 400 kPa.

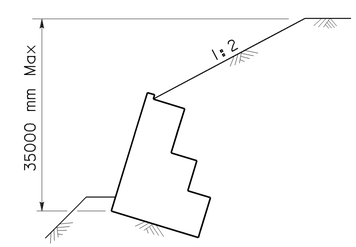
Note: Heavy line in table indicates the maximum allowable wall height for a particular wall type and loading case.



CASE A



CASE B



CASE C

DETAIL OF DESIGN LOADING CASES

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

NO SCALE

STANDARD DRAWING

RELEASE DATE 9/8/97	DESIGN	BY W. BAKER	CHECKED J.C. MOESE	RELEASED BY
FILE NO. xs12-010-5	DETAILS	BY R. YEE	CHECKED J.C. MOESE	OFFICE CHIEF
	SUBMITTED	BY J.C. MOESE	DRAWING DATE 9/97	

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

BRIDGE NO.

KILOMETER POST

REINFORCED CONCRETE CRIB WALL SHT 5 OF 5

DESIGN DATA - TYPES I THRU XII

DS OSD 2147A (METRIC) (REV. 2/25/97)

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

xs12-010-5.dgn

DATE PLOTTED => 16-JAN-2004 TIME PLOTTED => 14:36