FOUNDATION PRESSURE-BATTERED WALL

(kPa)

TYPE	LOADING CASE	WALL HEIGHT 425	700	975	1250	1525	1800	2075	2350	2625	2900	3175	3450	3725	4000	4275	4550	4825	5100	5375	5650	5925	6200	6475	6750	7025	7300	7575	7850	8125
A	I II III	35* 40* 45*	40* 45* 50*	50* 50* 50*	55* 60* 55*	60* 65* 55*	65* 70* 65	70* 75* 80	70* 75* 100	70* 75* 125	75 75* 155 ▮	90 85	110 100	130 120	150 140	175 165 ▮														
B	I II III									65* 65 105	70 80 125	80 90 150	90 105 175 ▮	105 120	120 135	130 155	145 170	165 190	180 215	205 240 ▮	225	250 ▮								
C	I II III											75* 90* 110*	85 85 120	95 100 140	105 115 160	110 125 185	120 135 205	130 150 230	140 165 260	155 180 290 ▮	165 195	180 215	195 230	210 250	225 270	245 295	265 320	285 345 ▮	305	325
D	I II III																105 125* 180*	115 120* 165*	120 130 170	130 140 190	140 155 210	150 170 235	160 185 255	170 200 280	180 210 305	190 225 330	200 240 355	210 255 385	220 275 415 ▮	235 290
E	I II III																						140 170* 250*	145 165* 235*	155 170 220*	165 180 240	175 195 260	185 210 280	195 220 300	205 235 325
F	I II III																													180 200* 290*

TYPE	LOADING CASE	8400	8675	8950	9225	9500	9775	10050	10325	10600	10875	11150	11425	11700	11975	12250	12525	12800	13075	13350	13625	13900	14175	14450	14725	15000	15275	15550	15825	16100
A	I II III																													
B	I II III																													
C	I II III	350 ▮																												
D	I II III	245 310	260 325	270 345	285 365	300 385	315 410	330 430	350 455 ▮	365	385	405	425	445	470	490 ▮														
E	I II III	215 250 350	225 270 375	235 285 400	250 300 425	260 315 450	270 330 480	280 350 505	290 365 535	300 380 565 ▮	315 400	325 420	340 435	350 455	365 475	375 500	390 520	405 540	420 565 ▮	440	455	470	490	505	525	545	565	585	610	630 ▮
F	I II III	190 210 280*	200 225 290	210 235 310	220 250 330	230 265 350	240 280 375	250 290 395	260 305 420	270 320 445	280 340 470	290 355 495	305 370 520	315 390 545	325 405 575	335 420 600	345 435 630	355 455 660	365 470 690 ▮	380 490	390 510	400 525	415 545	425 565	440 585	455 610	470 630	480 650	495 675 ▮	510 ▮

* Indicates pressure at heel

▮ Heavy vertical line indicates maximum allowable wall height for particular wall type and particular loading case.

DESIGN EXAMPLES

Example No. 1:

Given: Wall height 6100 mm
1:2 cut slope to be retained. Foundation site investigation indicates lateral pressure from material above will be equivalent to design loading case II condition and an allowable soil bearing capacity of 240 kPa.

Select: Battered Type C or Type D wall. Actual H = 6200 mm. Type D vertical wall can be used by increasing the allowable bearing capacity of the original ground.

Example No. 2:

Given: Wall height 2750 mm
Design Loading Case I (600 mm level ground surcharge plus 11.5 kPa of surcharge) to be retained. Base founded in embankment.

Select: Battered or vertical Type A or Type B wall. Actual H = 2900 mm.

Example No. 3:

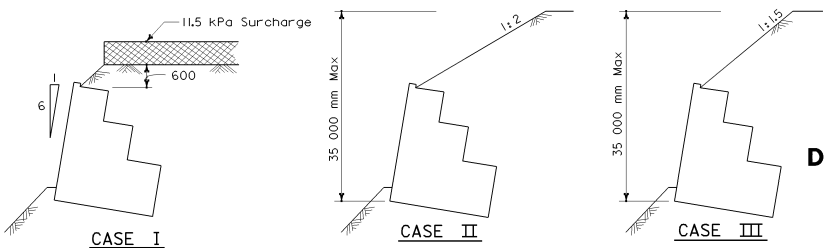
Given: Wall height 3050 mm
Design Loading Case III (1:1.5 embankment slope) to be retained. Base in original ground, sloping away from toe of wall at 1:2. Foundation investigation determines the allowable soil bearing capacity is 190 kPa (considering the sloping ground in front of wall).

Select: Battered Type B or Type C wall or Vertical Type C wall. Actual H = 3175 mm

Example No. 4:

Given: Wall height 9150 mm
Design Loading Case II (1:2 embankment slope) to be retained. Base in embankment (1525 mm depth minimum).

Select: Battered Type D, Type E or Type F wall or Vertical Type F wall. Actual H = 9225 mm. For all types the foundation pressure is between 240 and 385 kPa. Embankment material below the wall must be "Structure Backfill" (See Design Example Footnote 1).



DETAIL OF DESIGN LOADING CASES

DESIGN EXAMPLE FOOTNOTES

1. To constitute a "wall base in embankment" condition, a minimum of 1525 mm of embankment at 95 percent relative compaction is required below the base of the wall. When the foundation pressure is between 240 and 385 kPa, the embankment below the wall shall be constructed with structure backfill material to the limits specified for embankments constructed with relative compaction of 95 percent. The maximum allowable soil bearing capacity is 385 kPa.

2. For walls with "wall base in original ground" condition, the allowable soil bearing capacity, design lateral loads, and slope stability shall be determined by a foundation site investigation and by an analysis. Walls shall not be founded in original ground having an allowable soil bearing capacity of less than 145 kPa.

Caltrans Metric

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

REGISTERED CIVIL ENGINEER

July 1, 2004
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Overcomer Y. Hor No. 45803 Exp. 12-31-06 CIVIL STATE OF CALIFORNIA

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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DESIGN DATA FOR REINFORCED CONCRETE CRIB WALL FOUNDATION PRESSURE-BATTERED WALL

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

C7F

2004 Std PLAN C7F

03-26-04