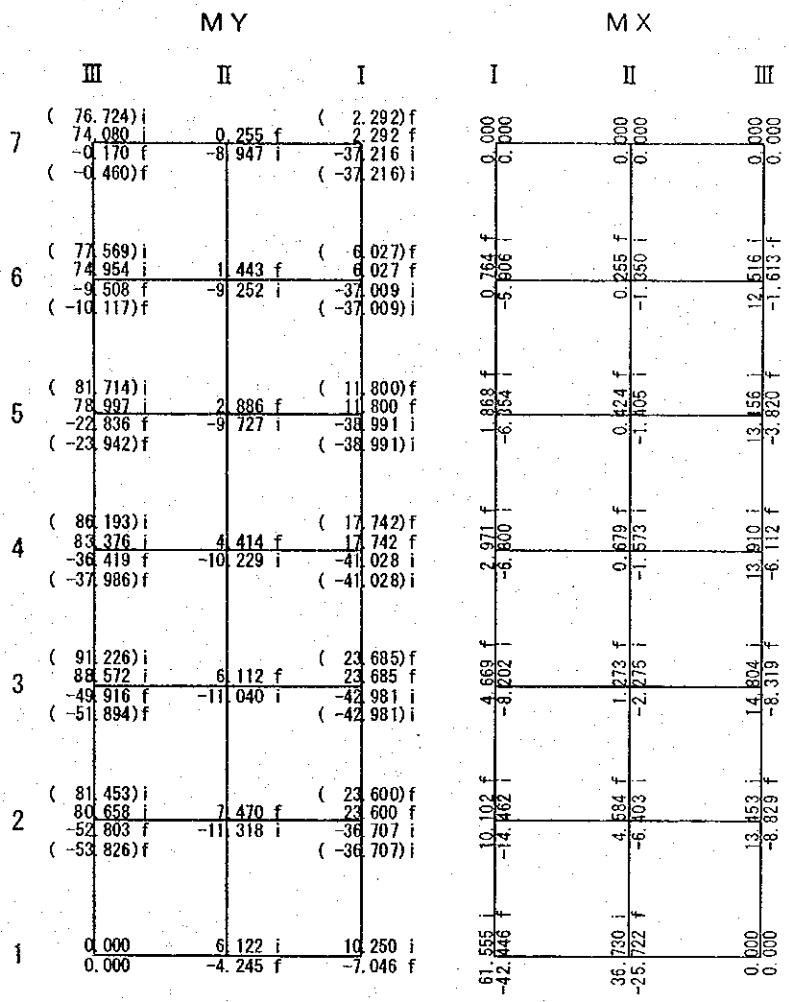
Sidewall(perpendicular to levee normal,seaside) Colligation of bending moment

Top(left)side : +moment

Bottom(right)side : −moment

( ) : The moment after correction of corner



f : While afloat

i : from inside After Construction

o : from outside After Construction

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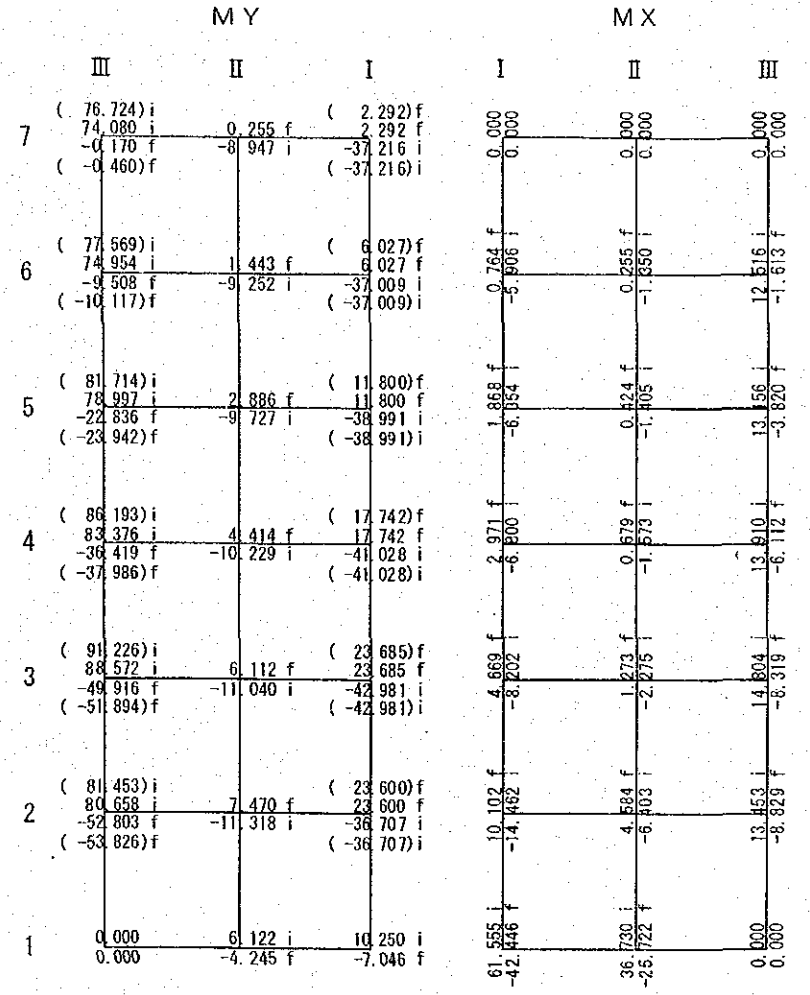
CHECKED BY	K. NISHIMURA	01/08/2002

Sidewall(perpendicular to levee normal,landside) Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : -moment
( ) : The moment after correction of corner



f : While afloat
i : from inside After Construction
o : from outside After Construction

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CHECKED BY	R. NISHIMURA	07/08/2002

Front wall(parallel to centerline,seaside) Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment
( ) : The moment after correction of corner

MY

	III	II	I
7	(76.724)i 79.264 i -0.738 f (-0.460)f	0.277 f -9.603 i	(2.815)f 2.676 f -39.984 i (-41.254)i
6	(77.569)i 80.082 i -10.703 f (-10.117)f	1.569 f -9.911 i	(6.844)f 6.551 f -39.551 i (-40.807)i
5	(81.714)i 84.325 i -25.005 f (-23.942)f	3.137 f -10.397 i	(13.357)f 12.826 f -41.673 i (-42.978)i
4	(86.193)i 88.899 i -39.492 f (-37.986)f	4.798 f -11.001 i	(20.038)f 19.285 f -43.854 i (-45.207)i
3	(91.226)i 93.776 i -53.794 f (-51.894)f	6.643 f -11.753 i	(26.509)f 25.559 f -45.523 i (-46.798)i
2	(81.453)i 82.216 i -54.809 f (-53.826)f	7.935 f -11.791 i	(24.758)f 24.267 f -37.056 i (-37.438)i
1	0.000 0.000	6.503 i -4.614 f	10.889 i -7.658 f

MX

	I	II	III
7	0.000 0.000	0.000 0.000	0.000 0.000
6	0.738 f -6.301 i	0.185 f -1.417 i	13.322 i -1.753 f
5	2.030 f -6.791 i	0.461 f -1.503 i	14.065 i -4.152 f
4	3.229 f -7.344 i	0.738 f -1.769 i	14.807 i -6.551 f
3	5.444 f -9.207 i	1.661 f -2.780 i	15.640 i -8.950 f
2	11.349 f -15.838 i	5.852 f -7.276 i	13.703 i -9.135 f
1	65.370 i -45.766 f	39.257 i -27.866 f	0.000 0.000

f : While afloat
i : from inside After Construction
o : from outside After Construction

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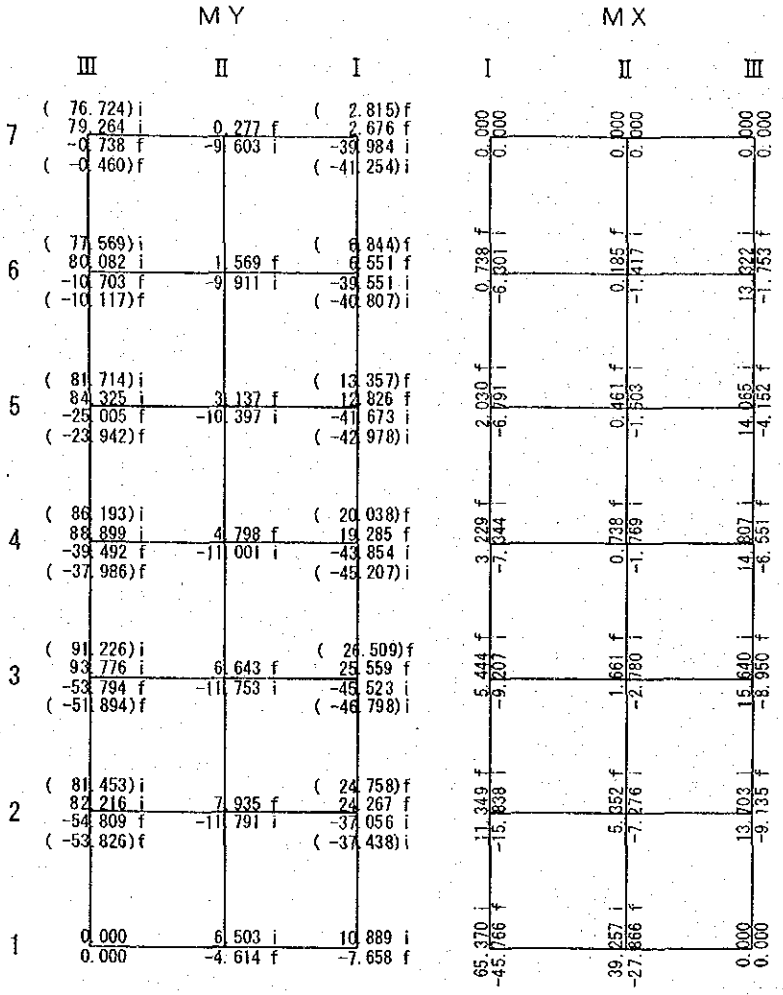
CHECKED BY	E. Nishimura	09/08/2002

Rear wall (parallel to centerline, andside) Colligation of bending moment
Top (left) side : +moment
Bottom (right) side : −moment
( ) : The moment after correction of corner



f : While afloat
i : from inside After Construction
o : from outside After Construction

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Bottom slab

Bottom slab is calculated as a slab fixed on four sides

Note) The mark of bending moment (+): upper tensile
(-): downside tensile

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	E. NISHIMURA	07/08/2002

A Room

While afloat

slab fixed on four sides

P1 = 32.75(kN/m²)

P2 = 32.75(kN/m²)

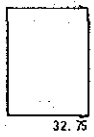
LX = 4.700(m)

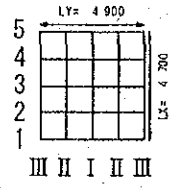
LY = 4.900(m)

The ratio of a length of sides

$$\lambda = \frac{4.700}{4.900} = 0.96$$

The coefficient table of λ = 1.00 is used.





Section force by equivalent uniform load

P = 32.75(kN/m²)

MX = P・LX²・X = 32.75 × 4.700² × X = 723.45 × X

MY = P・LX²・Y = 32.75 × 4.700² × Y = 723.45 × Y

		X	MX	Y	MY
I	5	-0.0513	-37.113	-0.0086	-6.222
	4	0.0096	6.945	0.0116	8.392
	3	0.0206	14.903	0.0206	14.903
	2	0.0096	6.945	0.0116	8.392
	1	-0.0513	-37.113	-0.0086	-6.222
II	5	-0.0324	-23.440	-0.0054	-3.907
	4	0.0059	4.268	0.0059	4.268
	3	0.0116	8.392	0.0096	6.945
	2	0.0059	4.268	0.0059	4.268
	1	-0.0324	-23.440	-0.0054	-3.907
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-3.907	-0.0324	-23.440
	3	-0.0086	-6.222	-0.0513	-37.113
	2	-0.0054	-3.907	-0.0324	-23.440
	1	0.0000	0.000	0.0000	0.000

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CHECKED BY	E. NISHIMURA	01/08/2002

A Room

After Construction

Upward load (above)

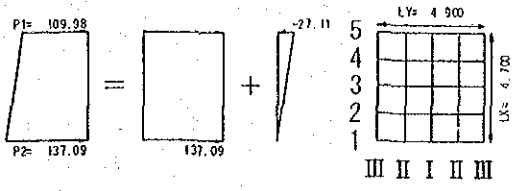
slab fixed on four sides

P1 = 109.98(kN/m²)

P2 = 137.09(kN/m²)

LX = 4.700(m)

LY = 4.900(m)



The ratio of a length of sides

$$\lambda = \frac{4.700}{4.900} = 0.96$$

The coefficient table of λ = 1.00 is used.

(i)Section force by equivalent uniform load

P = 137.09(kN/m²)

MX = P・LX²・X = 137.09 × 4.700² × X = 3028.32 × X

MY = P・LX²・Y = 137.09 × 4.700² × Y = 3028.32 × Y

		X	MX	Y	MY
I	5	-0.0513	-155.353	-0.0086	-26.044
	4	0.0096	29.072	0.0116	35.128
	3	0.0206	62.383	0.0206	62.383
	2	0.0096	29.072	0.0116	35.128
	1	-0.0513	-155.353	-0.0086	-26.044
II	5	-0.0324	-98.118	-0.0054	-16.353
	4	0.0059	17.867	0.0059	17.867
	3	0.0116	35.128	0.0096	29.072
	2	0.0059	17.867	0.0059	17.867
	1	-0.0324	-98.118	-0.0054	-16.353
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-16.353	-0.0324	-98.118
	3	-0.0086	-26.044	-0.0513	-155.353
	2	-0.0054	-16.353	-0.0324	-98.118
	1	0.0000	0.000	0.0000	0.000

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CHECKED	E.NISHIMURA	09/08/2002

(ii) Section force by triangular distribution load

P = -27.11(kN/m²)

MX = P・LX²・X = -27.11 × 4.700² × X = -598.86 × X

MY = P・LX²・Y = -27.11 × 4.700² × Y = -598.86 × Y

		X	MX	Y	MY
I	5	-0.0334	20.002	-0.0056	3.354
	4	0.0080	-4.791	0.0069	-4.132
	3	0.0103	-6.168	0.0103	-6.168
	2	0.0015	-0.898	0.0047	-2.815
	1	-0.0179	10.720	-0.0030	1.797
II	5	-0.0223	13.355	-0.0037	2.216
	4	0.0052	-3.114	0.0040	-2.395
	3	0.0058	-3.473	0.0048	-2.875
	2	0.0006	-0.359	0.0018	-1.078
	1	-0.0101	6.048	-0.0017	1.018
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	2.156	-0.0208	12.456
	3	-0.0043	2.575	-0.0257	15.391
	2	-0.0019	1.138	-0.0116	6.947
	1	0.0000	0.000	0.0000	0.000

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CHECKED BY	E. MORIMURA	07/08/2000

The sum total of (i) and (ii)

		MX	MY
I	5	-135.351	-22.690
	4	24.281	30.996
	3	56.215	56.215
	2	28.174	32.313
	1	-144.633	-24.247
II	5	-84.763	-14.137
	4	14.753	15.472
	3	31.655	26.197
	2	17.508	16.789
	1	-92.070	-15.335
III	5	0.000	0.000
	4	-14.197	-85.662
	3	-23.469	-139.962
	2	-15.215	-91.171
	1	0.000	0.000

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CHECKED BY	E.NISHIMURA	09/08/2002

B Room

While afloat

slab fixed on four sides

P1 = 32.75(kN/m²)

P2 = 32.75(kN/m²)

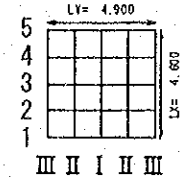
LX = 4.600(m)

LY = 4.900(m)

The ratio of a length of sides

$$\lambda = \frac{4.600}{4.900} = 0.94$$

The coefficient table of λ = 1.00 is used.



Section force by equivalent uniform load

P = 32.75(kN/m²)

MX = P・LX²・X = 32.75 × 4.600² × X = 692.99 × X

MY = P・LX²・Y = 32.75 × 4.600² × Y = 692.99 × Y

		X	MX	Y	MY
I	5	-0.0513	-35.550	-0.0086	-5.960
	4	0.0096	6.653	0.0116	8.039
	3	0.0206	14.276	0.0206	14.276
	2	0.0096	6.653	0.0116	8.039
	1	-0.0513	-35.550	-0.0086	-5.960
II	5	-0.0324	-22.453	-0.0054	-3.742
	4	0.0059	4.089	0.0059	4.089
	3	0.0116	8.039	0.0096	6.653
	2	0.0059	4.089	0.0059	4.089
	1	-0.0324	-22.453	-0.0054	-3.742
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-3.742	-0.0324	-22.453
	3	-0.0086	-5.960	-0.0513	-35.550
	2	-0.0054	-3.742	-0.0324	-22.453
	1	0.0000	0.000	0.0000	0.000

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	E.NISHIMURA	07/08/2002

B Room

After Construction

Upward load (above)

slab fixed on four sides

P1 = 83.46(kN/m²)

P2 = 109.98(kN/m²)

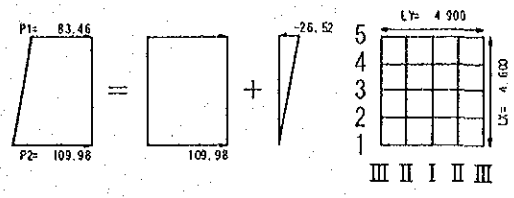
LX = 4.600(m)

LY = 4.900(m)

The ratio of a length of sides

$$\lambda = \frac{4.600}{4.900} = 0.94$$

The coefficient table of λ = 1.00 is used.



(i)Section force by equivalent uniform load

P = 109.98(kN/m²)

MX = P・LX²・X = 109.98 × 4.600² × X = 2327.18 × X

MY = P・LX²・Y = 109.98 × 4.600² × Y = 2327.18 × Y

		X	MX	Y	MY
Ⅰ	5	-0.0513	-119.384	-0.0086	-20.014
	4	0.0096	22.341	0.0116	26.995
	3	0.0206	47.940	0.0206	47.940
	2	0.0096	22.341	0.0116	26.995
	1	-0.0513	-119.384	-0.0086	-20.014
Ⅱ	5	-0.0324	-75.401	-0.0054	-12.567
	4	0.0059	13.730	0.0059	13.730
	3	0.0116	26.995	0.0096	22.341
	2	0.0059	13.730	0.0059	13.730
	1	-0.0324	-75.401	-0.0054	-12.567
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-12.567	-0.0324	-75.401
	3	-0.0086	-20.014	-0.0513	-119.384
	2	-0.0054	-12.567	-0.0324	-75.401
	1	0.0000	0.000	0.0000	0.000

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	E. NAKAMURA	09/08/2002

(ii) Section force by triangular distribution load

P = -26.52(kN/m²)

MX = P・LX²・X = -26.52 × 4.600² × X = -561.16 × X

MY = P・LX²・Y = -26.52 × 4.600² × Y = -561.16 × Y

		X	MX	Y	MY
I	5	-0.0334	18.743	-0.0056	3.143
	4	0.0080	-4.489	0.0069	-3.872
	3	0.0103	-5.780	0.0103	-5.780
	2	0.0015	-0.842	0.0047	-2.637
	1	-0.0179	10.045	-0.0030	1.683
II	5	-0.0223	12.514	-0.0037	2.076
	4	0.0052	-2.918	0.0040	-2.245
	3	0.0058	-3.255	0.0048	-2.694
	2	0.0006	-0.337	0.0018	-1.010
	1	-0.0101	5.668	-0.0017	0.954
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	2.020	-0.0208	11.672
	3	-0.0043	2.413	-0.0257	14.422
	2	-0.0019	1.066	-0.0116	6.509
	1	0.0000	0.000	0.0000	0.000

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CHECKED BY	E. MIYAMOTO	01/08/2002

The sum total of (i) and (ii)

		MX	MY
Ⅰ	5	-100.641	-16.871
	4	17.852	23.123
	3	42.160	42.160
	2	21.499	24.358
	1	-109.339	-18.331
Ⅱ	5	-62.887	-10.491
	4	10.812	11.485
	3	23.740	19.647
	2	13.393	12.720
	1	-69.733	-11.613
Ⅲ	5	0.000	0.000
	4	-10.547	-63.729
	3	-17.601	-104.962
	2	-11.501	-68.892
	1	0.000	0.000

CALCULATION

Detailed Design
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PREPARED BY	Y.Ando	26/07/02
	E. NISHINUDA	09/08/2002

C Room

While afloat

slab fixed on four sides

P1 = 32.75(kN/m²)

P2 = 32.75(kN/m²)

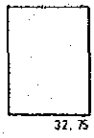
LX = 4.600(m)

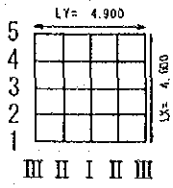
LY = 4.900(m)

The ratio of a length of sides

$$\lambda = \frac{4.600}{4.900} = 0.94$$

The coefficient table of λ = 1.00 is used.





Section force by equivalent uniform load

P = 32.75(kN/m²)

MX = P・LX²・X = 32.75 × 4.600² × X = 692.99 × X

MY = P・LX²・Y = 32.75 × 4.600² × Y = 692.99 × Y

		X	MX	Y	MY
I	5	-0.0513	-35.550	-0.0086	-5.960
	4	0.0096	6.653	0.0116	8.039
	3	0.0206	14.276	0.0206	14.276
	2	0.0096	6.653	0.0116	8.039
	1	-0.0513	-35.550	-0.0086	-5.960
II	5	-0.0324	-22.453	-0.0054	-3.742
	4	0.0059	4.089	0.0059	4.089
	3	0.0116	8.039	0.0096	6.653
	2	0.0059	4.089	0.0059	4.089
	1	-0.0324	-22.453	-0.0054	-3.742
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-3.742	-0.0324	-22.453
	3	-0.0086	-5.960	-0.0513	-35.550
	2	-0.0054	-3.742	-0.0324	-22.453
	1	0.0000	0.000	0.0000	0.000

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CHECKED BY	E. NISHIMURA	07/08/2002

C Room

After Construction

Upward load (above)

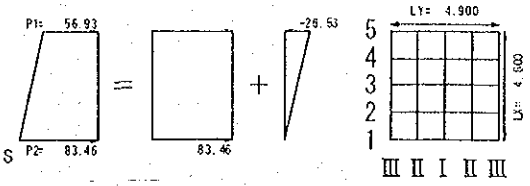
slab fixed on four sides

P1 = 56.93(kN/m²)

P2 = 83.46(kN/m²)

LX = 4.600(m)

LY = 4.900(m)



The ratio of a length of sides

$$\lambda = \frac{4.600}{4.900} = 0.94$$

The coefficient table of λ = 1.00 is used.

(i)Section force by equivalent uniform load

P = 83.46(kN/m²)

MX = P・LX²・X = 83.46 × 4.600² × X = 1766.01 × X

MY = P・LX²・Y = 83.46 × 4.600² × Y = 1766.01 × Y

		X	MX	Y	MY
Ⅰ	5	-0.0513	-90.597	-0.0086	-15.188
	4	0.0096	16.954	0.0116	20.486
	3	0.0206	36.380	0.0206	36.380
	2	0.0096	16.954	0.0116	20.486
	1	-0.0513	-90.597	-0.0086	-15.188
Ⅱ	5	-0.0324	-57.219	-0.0054	-9.536
	4	0.0059	10.419	0.0059	10.419
	3	0.0116	20.486	0.0096	16.954
	2	0.0059	10.419	0.0059	10.419
	1	-0.0324	-57.219	-0.0054	-9.536
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-9.536	-0.0324	-57.219
	3	-0.0086	-15.188	-0.0513	-90.597
	2	-0.0054	-9.536	-0.0324	-57.219
	1	0.0000	0.000	0.0000	0.000

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CHECKED BY	R. NISHIMURA	26/08/2002

(ii) Section force by triangular distribution load

P = -26.53(kN/m²)

MX = P・LX²・X = -26.53 × 4.600² × X = -561.38 × X

MY = P・LX²・Y = -26.53 × 4.600² × Y = -561.38 × Y

		X	MX	Y	MY
I	5	-0.0334	18.750	-0.0056	3.144
	4	0.0080	-4.491	0.0069	-3.873
	3	0.0103	-5.782	0.0103	-5.782
	2	0.0015	-0.842	0.0047	-2.638
	1	-0.0179	10.049	-0.0030	1.684
II	5	-0.0223	12.519	-0.0037	2.077
	4	0.0052	-2.919	0.0040	-2.246
	3	0.0058	-3.256	0.0048	-2.695
	2	0.0006	-0.337	0.0018	-1.010
	1	-0.0101	5.670	-0.0017	0.954
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	2.021	-0.0208	11.677
	3	-0.0043	2.414	-0.0257	14.427
	2	-0.0019	1.067	-0.0116	6.512
	1	0.0000	0.000	0.0000	0.000

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The sum total of (i) and (ii)

		MX	MY
I	5	-71.847	-12.044
	4	12.463	16.613
	3	30.598	30.598
	2	16.112	17.848
	1	-80.548	-13.504
II	5	-44.700	-7.459
	4	7.500	8.173
	3	17.230	14.259
	2	10.082	9.409
	1	-51.549	-8.582
III	5	0.000	0.000
	4	-7.515	-45.542
	3	-12.774	-76.170
	2	-8.469	-50.707
	1	0.000	0.000

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D Room

While afloat

slab fixed on four sides

P1 = 32.75(kN/m²)

P2 = 32.75(kN/m²)

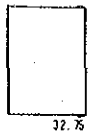
LX = 4.700(m)

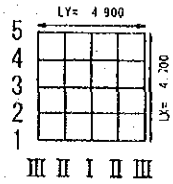
LY = 4.900(m)

The ratio of a length of sides

$$\lambda = \frac{4.700}{4.900} = 0.96$$

·The coefficient table of λ = 1.00 is used.





Section force by equivalent uniform load

P = 32.75(kN/m²)

MX = P・LX²・X = 32.75 × 4.700² × X = 723.45 × X

MY = P・LX²・Y = 32.75 × 4.700² × Y = 723.45 × Y

		X	MX	Y	MY
I	5	-0.0513	-37.113	-0.0086	-6.222
	4	0.0096	6.945	0.0116	8.392
	3	0.0206	14.903	0.0206	14.903
	2	0.0096	6.945	0.0116	8.392
	1	-0.0513	-37.113	-0.0086	-6.222
II	5	-0.0324	-23.440	-0.0054	-3.907
	4	0.0059	4.268	0.0059	4.268
	3	0.0116	8.392	0.0096	6.945
	2	0.0059	4.268	0.0059	4.268
	1	-0.0324	-23.440	-0.0054	-3.907
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-3.907	-0.0324	-23.440
	3	-0.0086	-6.222	-0.0513	-37.113
	2	-0.0054	-3.907	-0.0324	-23.440
	1	0.0000	0.000	0.0000	0.000

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D Room

After Construction

Upward load (above)

slab fixed on four sides

P1 = 29.82(kN/m²)

P2 = 56.93(kN/m²)

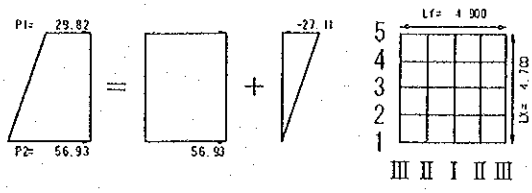
LX = 4.700(m)

LY = 4.900(m)

The ratio of a length of sides

$$\lambda = \frac{4.700}{4.900} = 0.96$$

The coefficient table of λ = 1.00 is used.



(i)Section force by equivalent uniform load

P = 56.93(kN/m²)

MX = P・LX²・X = 56.93 × 4.700² × X = 1257.58 × X

MY = P・LX²・Y = 56.93 × 4.700² × Y = 1257.58 × Y

		X	MX	Y	MY
I	5	-0.0513	-64.514	-0.0086	-10.815
	4	0.0096	12.073	0.0116	14.588
	3	0.0206	25.906	0.0206	25.906
	2	0.0096	12.073	0.0116	14.588
	1	-0.0513	-64.514	-0.0086	-10.815
II	5	-0.0324	-40.746	-0.0054	-6.791
	4	0.0059	7.420	0.0059	7.420
	3	0.0116	14.588	0.0096	12.073
	2	0.0059	7.420	0.0059	7.420
	1	-0.0324	-40.746	-0.0054	-6.791
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-6.791	-0.0324	-40.746
	3	-0.0086	-10.815	-0.0513	-64.514
	2	-0.0054	-6.791	-0.0324	-40.746
	1	0.0000	0.000	0.0000	0.000

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(ii) Section force by triangular distribution load

P = -27.11(kN/m²)

MX = P・LX²・X = -27.11 × 4.700² × X = -598.86 × X

MY = P・LX²・Y = -27.11 × 4.700² × Y = -598.86 × Y

		X	MX	Y	MY
I	5	-0.0334	20.002	-0.0056	3.354
	4	0.0080	-4.791	0.0069	-4.132
	3	0.0103	-6.168	0.0103	-6.168
	2	0.0015	-0.898	0.0047	-2.815
	1	-0.0179	10.720	-0.0030	1.797
II	5	-0.0223	13.355	-0.0037	2.216
	4	0.0052	-3.114	0.0040	-2.395
	3	0.0058	-3.473	0.0048	-2.875
	2	0.0006	-0.359	0.0018	-1.078
	1	-0.0101	6.048	-0.0017	1.018
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	2.156	-0.0208	12.456
	3	-0.0043	2.575	-0.0257	15.391
	2	-0.0019	1.138	-0.0116	6.947
	1	0.0000	0.000	0.0000	0.000

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The sum total of (i) and (ii)

		MX	MY
I	5	-44.512	-7.461
	4	7.282	10.456
	3	19.738	19.738
	2	11.175	11.773
	1	-53.794	-9.018
II	5	-27.391	-4.575
	4	4.306	5.025
	3	11.115	9.198
	2	7.061	6.342
	1	-34.698	-5.773
III	5	0.000	0.000
	4	-4.635	-28.290
	3	-8.240	-49.123
	2	-5.653	-33.799
	1	0.000	0.000

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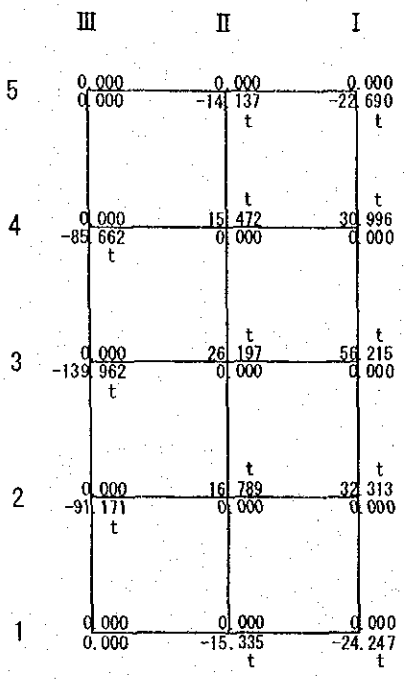
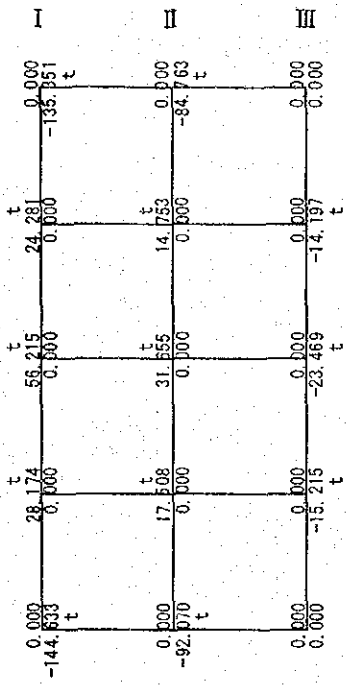
Bottom slab A Room　Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : -moment

MY



MX



f : While afloat
t : Load from a top
b : Load from the bottom

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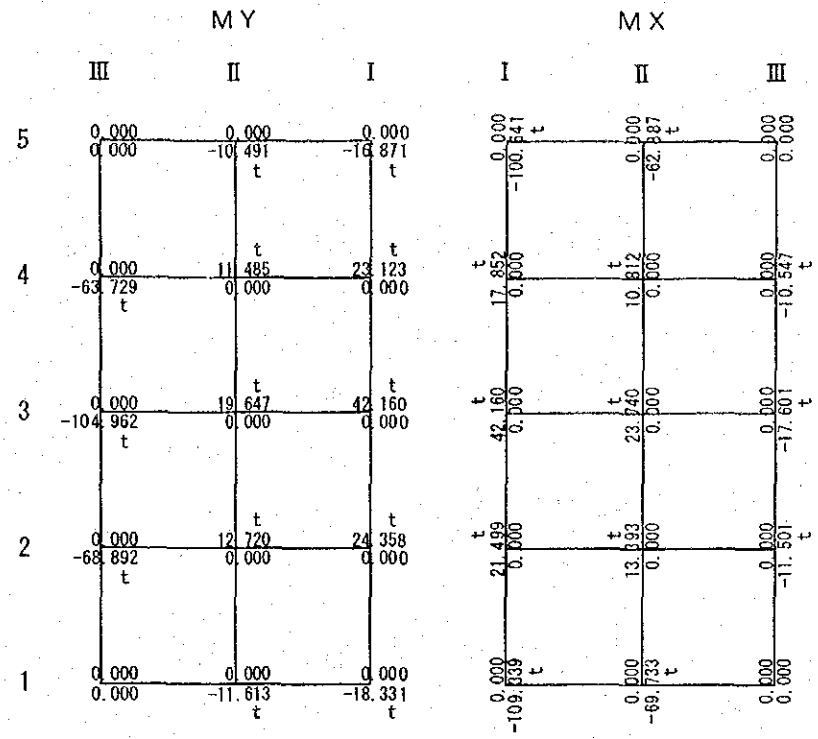
Bottom slab B Room　Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : --moment



f : While afloat
t : Load from a top
b : Load from the bottom

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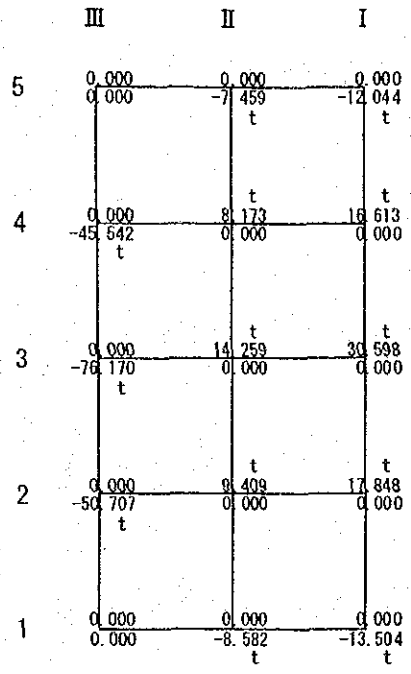
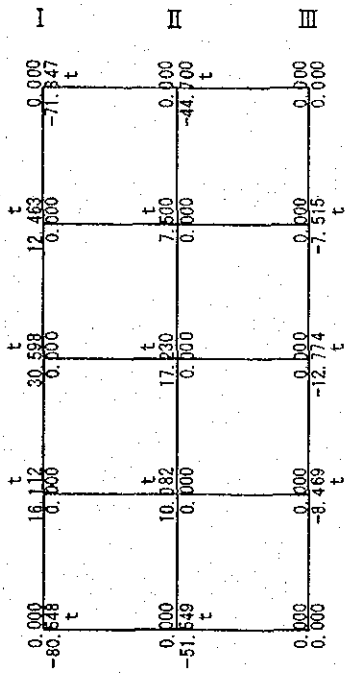
Bottom slab C Room　Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment

MY



MX



f : While afloat
t : Load from a top
b : Load from the bottom

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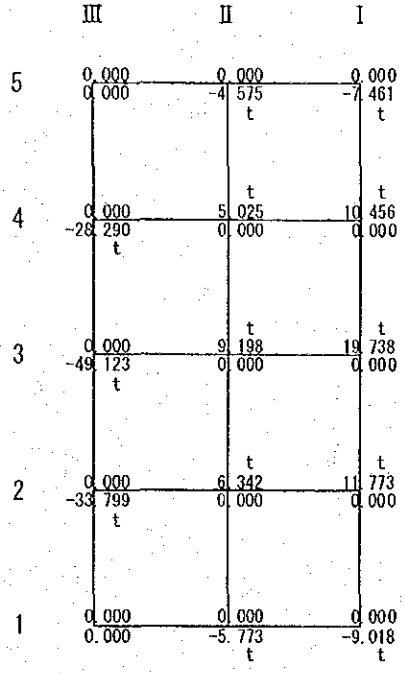
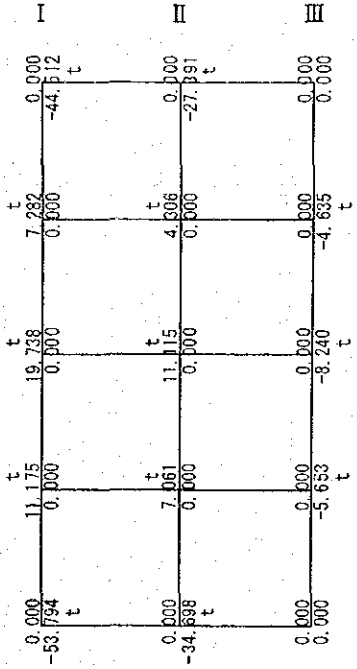
Bottom slab D Room Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment

MY



MX



f : While afloat
t : Load from a top
b : Load from the bottom

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Footing

Footing is examined as cantilever beam supported with the wall of before or back.

Bending moment and Shearing force are calculated by the lower formula.

Bending moment

$M = 1/6 \cdot L^2 \cdot (2 \cdot P_1 + P_2)$

Shearing force

$V = 1/2 \cdot L \cdot (P_1 + P_2)$

Let the examination position of shearing force be the position which separated h/2 from the footing end.

Moment , Shearing force

Sea side

Above

$M = 1/6 \times 1.00^2 \times (2 \times 0.00 + 0.00) = 0.000$ (kN·m/m)

$V = 1/2 \times 0.65 \times (0.00 + 0.00) = 0.000$ (kN/m)

Below

$M = 1/6 \times 1.00^2 \times (2 \times 313.81 + 305.26) = 155.480$ (kN·m/m)

$V = 1/2 \times 0.65 \times (313.81 + 308.25) = 202.170$ (kN/m)

Land side

Above

$M = 1/6 \times 1.00^2 \times (2 \times 38.98 + 33.99) = 18.658$ (kN·m/m)

$V = 1/2 \times 0.65 \times (38.98 + 35.74) = 24.284$ (kN/m)

Below

$M = 1/6 \times 1.00^2 \times (2 \times 0.00 + 0.00) = 0.000$ (kN·m/m)

$V = 1/2 \times 0.65 \times (0.00 + 0.00) = 0.000$ (kN/m)

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Partition Wall

(1)Equivalent uniform load by the difference of the water level in during installation

(a) Partition wall(perpendicular to levee normal)

slab fixed on three sides and free on one side

P1 = 5.05(kN/m²)

P2 = 5.05(kN/m²)

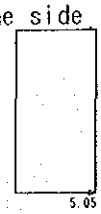
LX = 16.200(m)

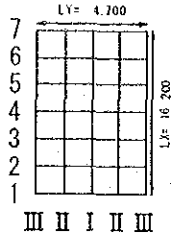
LY = 4.700(m)

The ratio of a length of sides

$$\lambda = \frac{16.200}{4.700} = 3.45$$

The coefficient table of λ = 3.50 is used.





Section force by equivalent uniform load

P = 5.05(kN/m²)

MX = P・LY²・X = 5.05 × 4.700² × X = 111.56 × X

MY = P・LY²・Y = 5.05 × 4.700² × Y = 111.56 × Y

		X	MX	Y	MY
I	7	0.0000	0.000	0.0432	4.819
	6	0.0067	0.747	0.0415	4.630
	5	0.0068	0.759	0.0416	4.641
	4	0.0069	0.770	0.0417	4.652
	3	0.0079	0.881	0.0417	4.652
	2	0.0132	1.473	0.0343	3.826
	1	-0.0564	-6.292	-0.0094	-1.049
II	7	0.0000	0.000	0.0105	1.171
	6	0.0015	0.167	0.0104	1.160
	5	0.0015	0.167	0.0104	1.160
	4	0.0016	0.178	0.0104	1.160
	3	0.0022	0.245	0.0107	1.194
	2	0.0058	0.647	0.0105	1.171
	1	-0.0335	-3.737	-0.0056	-0.625
III	7	0.0000	0.000	-0.0877	-9.783
	6	-0.0142	-1.584	-0.0851	-9.493
	5	-0.0141	-1.573	-0.0847	-9.449
	4	-0.0141	-1.573	-0.0846	-9.438
	3	-0.0143	-1.595	-0.0855	-9.538
	2	-0.0125	-1.394	-0.0750	-8.367
	1	0.0000	0.000	0.0000	0.000

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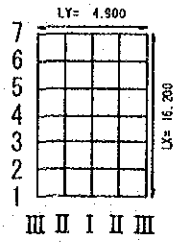
(b) Partition wall(parallel to centerline)

slab fixed on three sides and free on one side



P1 = 5.05(kN/m²)
P2 = 5.05(kN/m²)
LX = 16.200(m)
LY = 4.900(m)
The ratio of a length of sides

$$\lambda = \frac{16.200}{4.900} = 3.31$$

The coefficient table of λ = 3.25 is used.

Section force by equivalent uniform load

P = 5.05(kN/m²)

MX = P・LY²・X = 5.05 × 4.900² × X = 121.25 × X

MY = P・LY²・Y = 5.05 × 4.900² × Y = 121.25 × Y

		X	MX	Y	MY
I	7	0.0000	0.000	0.0432	5.238
	6	0.0067	0.812	0.0414	5.020
	5	0.0068	0.825	0.0416	5.044
	4	0.0070	0.849	0.0418	5.068
	3	0.0083	1.006	0.0415	5.032
	2	0.0136	1.649	0.0326	3.953
	1	-0.0565	-6.851	-0.0094	-1.140
II	7	0.0000	0.000	0.0105	1.273
	6	0.0015	0.182	0.0104	1.261
	5	0.0015	0.182	0.0104	1.261
	4	0.0017	0.206	0.0105	1.273
	3	0.0025	0.303	0.0107	1.297
	2	0.0062	0.752	0.0103	1.249
	1	-0.0338	-4.098	-0.0056	-0.679
III	7	0.0000	0.000	-0.0872	-10.573
	6	-0.0141	-1.710	-0.0847	-10.270
	5	-0.0141	-1.710	-0.0845	-10.246
	4	-0.0141	-1.710	-0.0846	-10.258
	3	-0.0142	-1.722	-0.0851	-10.318
	2	-0.0120	-1.455	-0.0720	-8.730
	1	0.0000	0.000	0.0000	0.000

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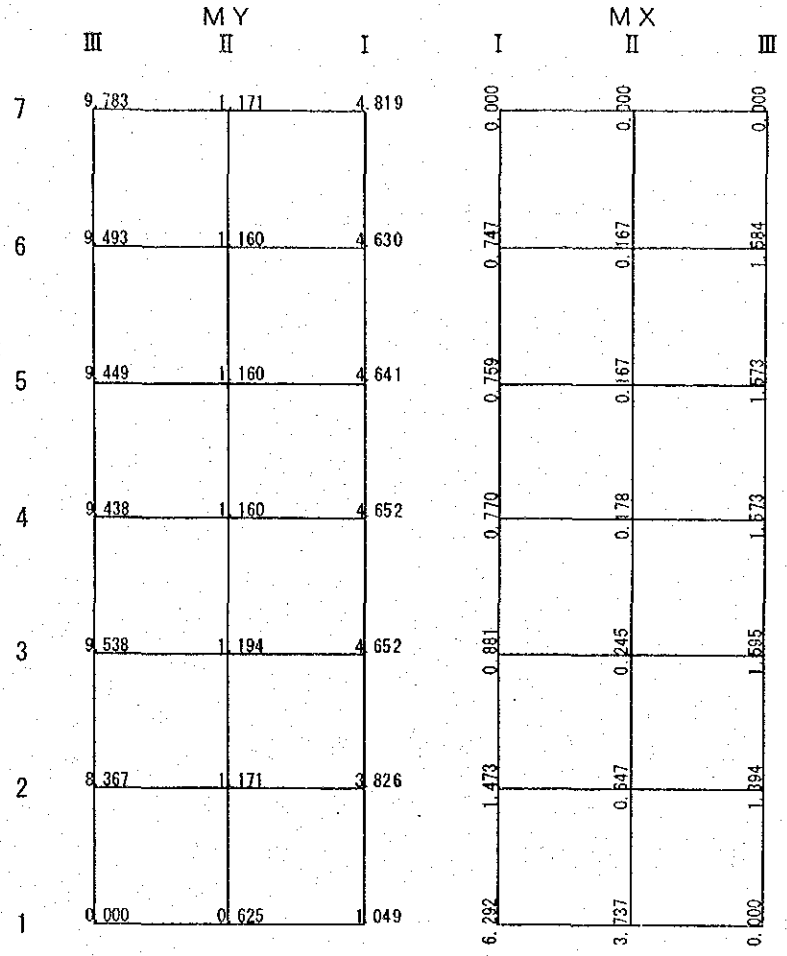
Partition wall(perpendicular to levee normal) Colligation of bending moment



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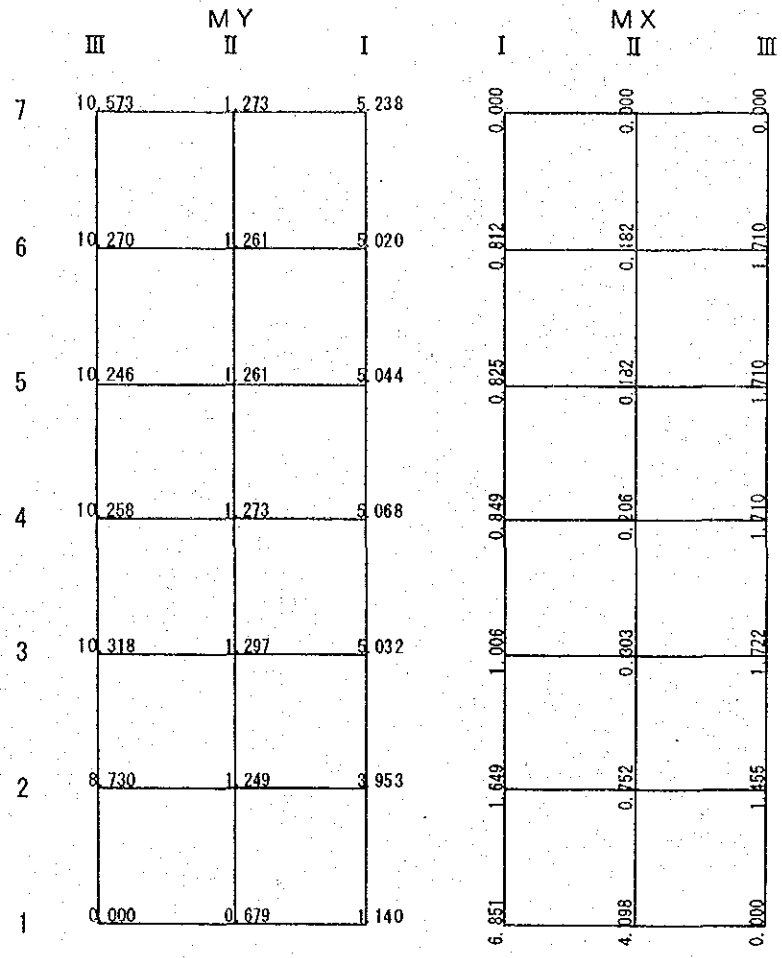
400

Partition wall (parallel to centerline) Colligation of bending moment



CALCULATION		
Detailed Design on Port Reactivation Project In La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 360
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/06
CHECKED BY	E. NISHIMURA	07/08/2006

4. Design of Members

Effective height of each part material

(1) Side wall

It arranges horizontally outside.

h = 40.0(cm)

An inner side cover = 6.0(cm)

An outside cover = 8.0(cm)

Effective height

Outside steel reinforcement

Horizontal d = 31.0(37.6)(cm)

Perpendicular d = 29.0(35.6)(cm)

Inner side steel reinforcement

Horizontal d = 33.0(cm)

Perpendicular d = 31.0(cm)

※ ( ) : Effective quantity in consideration of haunch

(2) Bottom slab

The steel reinforcement of the perpendicular to levee normal is arranged outside.

h = 60.0(cm)

An upper cover = 6.0(cm)

A lower cover = 8.0(cm)

Effective height

Lower steel reinforcement

Perpendicular to levee normal d = 51.0(57.6)(cm)

Parallel to center line d = 49.0(55.6)(cm)

Upper steel reinforcement

Perpendicular to levee normal d = 53.0(cm)

Parallel to center line d = 51.0(cm)

※ ( ) : Effective quantity in consideration of haunch

(3) Partition wall

One half of partition wall thickness is considered to be effective thickness

d = 10.0(16.6)(cm)

※ ( ) : Effective quantity in consideration of haunch

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
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CALC INDEX No.:		PAGE 361
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(perpendicular to levee normal:seaside)—Horizontal inner side steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	5.043	33.0	0.56	D16	20.0	9.93	95.061	0.06	
	6	13.261	33.0	1.48	D16	20.0	9.93	95.061	0.15	
	5	25.961	33.0	2.91	D16	20.0	9.93	95.061	0.30	
	4	39.035	33.0	4.40	D16	20.0	9.93	95.061	0.45	
	3	52.109	33.0	5.91	D16	20.0	9.93	95.061	0.60	
	2	51.922	33.0	5.88	D16	20.0	9.93	95.061	0.60	
	1	11.274	33.0	1.26	D16	20.0	9.93	95.061	0.13	
II	7	0.560	33.0	0.06	D16	20.0	9.93	95.061	0.01	
	6	3.175	33.0	0.35	D16	20.0	9.93	95.061	0.04	
	5	6.350	33.0	0.71	D16	20.0	9.93	95.061	0.07	
	4	9.712	33.0	1.08	D16	20.0	9.93	95.061	0.11	
	3	13.448	33.0	1.50	D16	20.0	9.93	95.061	0.16	
	2	16.436	33.0	1.84	D16	20.0	9.93	95.061	0.19	
	1	6.733	33.0	0.75	D16	20.0	9.93	95.061	0.08	
III	7	81.485	33.0	9.34	D16,D19	10.0	24.26	220.809	0.41	※
	6	82.447	33.0	9.46	D16,D19	10.0	24.26	220.809	0.41	※
	5	86.893	33.0	9.99	D16,D19	10.0	24.26	220.809	0.43	※
	4	91.709	33.0	10.56	D16,D19	10.0	24.26	220.809	0.46	※
	3	97.424	33.0	11.25	D16,D19	10.0	24.26	220.809	0.49	※
	2	88.718	33.0	10.20	D16,D19	10.0	24.26	220.809	0.44	※
	1	0.000	33.0	0.00	D16,D19	10.0	24.26	220.809	0.00	
I'	7	5.043	33.0	0.56	D16	20.0	9.93	95.061	0.06	
	6	13.261	33.0	1.48	D16	20.0	9.93	95.061	0.15	
	5	25.961	33.0	2.91	D16	20.0	9.93	95.061	0.30	
	4	39.035	33.0	4.40	D16	20.0	9.93	95.061	0.45	
	3	52.109	33.0	5.91	D16	20.0	9.93	95.061	0.60	
	2	51.922	33.0	5.88	D16	20.0	9.93	95.061	0.60	
	1	11.274	33.0	1.26	D16	20.0	9.93	95.061	0.13	
III'	7	84.400	33.0	9.69	D16,D19	10.0	24.26	220.809	0.42	※
	6	85.329	33.0	9.80	D16,D19	10.0	24.26	220.809	0.43	※
	5	89.886	33.0	10.34	D16,D19	10.0	24.26	220.809	0.45	※
	4	94.810	33.0	10.93	D16,D19	10.0	24.26	220.809	0.47	※
	3	100.345	33.0	11.60	D16,D19	10.0	24.26	220.809	0.50	※
	2	89.593	33.0	10.31	D16,D19	10.0	24.26	220.809	0.45	※
	1	0.000	33.0	0.00	D16,D19	10.0	24.26	220.809	0.00	

※ It determines from serviceability limit state.
Notes) I ～III : Before correction Slab of a middle part
Notes) I' ～III' : After correction Slab of side wall corner

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 362
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	R.NISHIMURA	09/06/2002

Serviceability limit state

Sidewall(perpendicular to levee normal:seaside)—Horizontal inner side steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{all}(cm)
I	7	2.292	33.0	D16	20.0	9.93	7.485	0.0014	
	6	6.027	33.0	D16	20.0	9.93	19.683	0.0036	0.0040×6.0
	5	11.800	33.0	D16	20.0	9.93	38.536	0.0071	=0.0240
	4	17.742	33.0	D16	20.0	9.93	57.941	0.0107	
	3	23.685	33.0	D16	20.0	9.93	77.350	0.0143	
	2	23.600	33.0	D16	20.0	9.93	77.072	0.0142	
	1	10.250	33.0	D16	20.0	9.93	33.474	0.0062	
II	7	0.255	33.0	D16	20.0	9.93	0.833	0.0002	
	6	1.443	33.0	D16	20.0	9.93	4.713	0.0009	0.0040×6.0
	5	2.886	33.0	D16	20.0	9.93	9.425	0.0017	=0.0240
	4	4.414	33.0	D16	20.0	9.93	14.415	0.0027	
	3	6.112	33.0	D16	20.0	9.93	19.960	0.0037	
	2	7.470	33.0	D16	20.0	9.93	24.395	0.0045	
	1	6.122	33.0	D16	20.0	9.93	19.993	0.0037	
III	7	74.080	33.0	D16,D19	10.0	24.26	102.402	0.0153	
	6	74.954	33.0	D16,D19	10.0	24.26	103.611	0.0155	0.0040×6.0
	5	78.997	33.0	D16,D19	10.0	24.26	109.199	0.0163	=0.0240
	4	83.376	33.0	D16,D19	10.0	24.26	115.253	0.0172	
	3	88.572	33.0	D16,D19	10.0	24.26	122.435	0.0183	
	2	80.658	33.0	D16,D19	10.0	24.26	111.495	0.0167	
	1	0.000	33.0	D16,D19	10.0	24.26	0.000	0.0000	
I'	7	2.292	33.0	D16	20.0	9.93	7.485	0.0014	
	6	6.027	33.0	D16	20.0	9.93	19.683	0.0036	0.0040×6.0
	5	11.800	33.0	D16	20.0	9.93	38.536	0.0071	=0.0240
	4	17.742	33.0	D16	20.0	9.93	57.941	0.0107	
	3	23.685	33.0	D16	20.0	9.93	77.350	0.0143	
	2	23.600	33.0	D16	20.0	9.93	77.072	0.0142	
	1	10.250	33.0	D16	20.0	9.93	33.474	0.0062	
III'	7	76.724	33.0	D16,D19	10.0	24.26	106.057	0.0158	
	6	77.569	33.0	D16,D19	10.0	24.26	107.225	0.0160	0.0040×6.0
	5	81.714	33.0	D16,D19	10.0	24.26	112.955	0.0169	=0.0240
	4	86.193	33.0	D16,D19	10.0	24.26	119.147	0.0178	
	3	91.226	33.0	D16,D19	10.0	24.26	126.104	0.0188	
	2	81.453	33.0	D16,D19	10.0	24.26	112.594	0.0168	
	1	0.000	33.0	D16,D19	10.0	24.26	0.000	0.0000	

Notes) I ～III : Before correction Slab of a middle part

Notes) I' ～III' : After correction Slab of side wall corner

CALCULATION		
Detailed Design on Port Reactivation Project In La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 363
	INITIAL	DATE
PREPARED BY	Y-A and G	26/07/02
CHECKED BY	R. NISHIMURA	05/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(perpendicular to levee normal:seaside) —Horizontal outside steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	40.937	31.0	4.93	D22	20.0	19.36	167.704	0.27	※
	6	40.708	31.0	4.90	D22	20.0	19.36	167.704	0.27	※
	5	42.888	31.0	5.17	D22	20.0	19.36	167.704	0.28	※
	4	45.129	31.0	5.44	D22	20.0	19.36	167.704	0.30	※
	3	47.277	31.0	5.71	D22	20.0	19.36	167.704	0.31	※
	2	40.376	31.0	4.86	D22	20.0	19.36	167.704	0.26	※
	1	15.502	37.6	1.52	D22	20.0	19.36	206.044	0.08	
II	7	9.841	31.0	1.17	D22	20.0	19.36	167.704	0.06	
	6	10.178	31.0	1.21	D22	20.0	19.36	167.704	0.07	
	5	10.699	31.0	1.27	D22	20.0	19.36	167.704	0.07	
	4	11.252	31.0	1.34	D22	20.0	19.36	167.704	0.07	
	3	12.143	31.0	1.44	D22	20.0	19.36	167.704	0.08	
	2	12.449	31.0	1.48	D22	20.0	19.36	167.704	0.08	
	1	9.339	37.6	0.91	D22	20.0	19.36	206.044	0.05	
III	7	0.374	37.6	0.04	D22	20.0	19.36	206.044	0.00	
	6	20.918	37.6	2.05	D22	20.0	19.36	206.044	0.11	
	5	50.241	37.6	4.97	D22	20.0	19.36	206.044	0.27	
	4	80.125	37.6	8.00	D22	20.0	19.36	206.044	0.43	
	3	109.821	37.6	11.07	D22	20.0	19.36	206.044	0.59	
	2	116.172	37.6	11.73	D22	20.0	19.36	206.044	0.62	
	1	0.000	37.6	0.00	D22	20.0	19.36	206.044	0.00	
I'	7	40.937	31.0	4.93	D22	20.0	19.36	167.704	0.27	※
	6	40.708	31.0	4.90	D22	20.0	19.36	167.704	0.27	※
	5	42.888	31.0	5.17	D22	20.0	19.36	167.704	0.28	※
	4	45.129	31.0	5.44	D22	20.0	19.36	167.704	0.30	※
	3	47.277	31.0	5.71	D22	20.0	19.36	167.704	0.31	※
	2	40.376	31.0	4.86	D22	20.0	19.36	167.704	0.26	※
	1	15.502	37.6	1.52	D22	20.0	19.36	206.044	0.08	
III'	7	1.012	37.6	0.10	D22	20.0	19.36	206.044	0.01	
	6	22.260	37.6	2.18	D22	20.0	19.36	206.044	0.12	
	5	52.675	37.6	5.22	D22	20.0	19.36	206.044	0.28	
	4	83.573	37.6	8.35	D22	20.0	19.36	206.044	0.45	
	3	114.172	37.6	11.52	D22	20.0	19.36	206.044	0.61	
	2	118.423	37.6	11.97	D22	20.0	19.36	206.044	0.63	
	1	0.000	37.6	0.00	D22	20.0	19.36	206.044	0.00	

※ It determines from serviceability limit state.
Notes) I ～III : Before correction Slab of a middle part
Notes) I' ～III' : After correction Slab of side wall corner

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
CALC FILE No.:
CALC INDEX No.: PAGE 364

	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E.NISHIHORA	09/08/2002

Serviceability limit state

Sidewall(perpendicular to levee normal:seaside)—Horizontal outside steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{lim}(cm)
I	7	37.216	31.0	D22	20.0	19.36	68.147	0.0151	
	6	37.009	31.0	D22	20.0	19.36	67.768	0.0151	0.0035×8.0
	5	38.991	31.0	D22	20.0	19.36	71.397	0.0159	=0.0280
	4	41.028	31.0	D22	20.0	19.36	75.127	0.0167	
	3	42.981	31.0	D22	20.0	19.36	78.703	0.0175	
	2	36.707	31.0	D22	20.0	19.36	67.215	0.0149	
	1	7.046	37.6	D22	20.0	19.36	10.555	0.0023	
II	7	8.947	31.0	D22	20.0	19.36	16.383	0.0036	
	6	9.252	31.0	D22	20.0	19.36	16.941	0.0038	0.0035×8.0
	5	9.727	31.0	D22	20.0	19.36	17.811	0.0040	=0.0280
	4	10.229	31.0	D22	20.0	19.36	18.730	0.0042	
	3	11.040	31.0	D22	20.0	19.36	20.216	0.0045	
	2	11.318	31.0	D22	20.0	19.36	20.725	0.0046	
	1	4.245	37.6	D22	20.0	19.36	6.359	0.0014	
III	7	0.170	37.6	D22	20.0	19.36	0.255	0.0001	
	6	9.508	37.6	D22	20.0	19.36	14.243	0.0032	0.0035×8.0
	5	22.836	37.6	D22	20.0	19.36	34.208	0.0076	=0.0280
	4	36.419	37.6	D22	20.0	19.36	54.555	0.0121	
	3	49.916	37.6	D22	20.0	19.36	74.773	0.0166	
	2	52.803	37.6	D22	20.0	19.36	79.098	0.0176	
	1	0.000	37.6	D22	20.0	19.36	0.000	0.0000	
I'	7	37.216	31.0	D22	20.0	19.36	68.147	0.0151	
	6	37.009	31.0	D22	20.0	19.36	67.768	0.0151	0.0035×8.0
	5	38.991	31.0	D22	20.0	19.36	71.397	0.0159	=0.0280
	4	41.028	31.0	D22	20.0	19.36	75.127	0.0167	
	3	42.981	31.0	D22	20.0	19.36	78.703	0.0175	
	2	36.707	31.0	D22	20.0	19.36	67.215	0.0149	
	1	7.046	37.6	D22	20.0	19.36	10.555	0.0023	
III'	7	0.460	37.6	D22	20.0	19.36	0.689	0.0002	
	6	10.117	37.6	D22	20.0	19.36	15.155	0.0034	0.0035×8.0
	5	23.942	37.6	D22	20.0	19.36	35.864	0.0080	=0.0280
	4	37.986	37.6	D22	20.0	19.36	56.902	0.0126	
	3	51.894	37.6	D22	20.0	19.36	77.736	0.0173	
	2	53.826	37.6	D22	20.0	19.36	80.630	0.0179	
	1	0.000	37.6	D22	20.0	19.36	0.000	0.0000	

Notes) I ～III : Before correction Slab of a middle part

Notes) I' ～III' : After correction Slab of side wall corner

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
CALC FILE No.:
CALC INDEX No.: PAGE 365
INITIAL DATE
PREPARED BY Y. Ando 26/07/02
CHECKED BY E. NISHIHARA 09/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(perpendicular to levee normal:seaside)—Perpendicular inner side steel reinforcement
B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	0.000	31.0	0.00	D13	40.0	3.17	29.151	0.00	
	6	1.681	31.0	0.20	D13	40.0	3.17	29.151	0.06	
	5	4.109	31.0	0.49	D13	40.0	3.17	29.151	0.16	
	4	6.537	31.0	0.78	D13	40.0	3.17	29.151	0.25	
	3	10.272	31.0	1.22	D13	40.0	3.17	29.151	0.39	
	2	22.226	31.0	2.65	D13	20.0	6.34	57.636	0.42	
	1	67.706	31.0	8.25	D13,D16	10.0	16.27	142.597	0.52	※
II	7	0.000	31.0	0.00	D13	40.0	3.17	29.151	0.00	
	6	0.560	31.0	0.07	D13	40.0	3.17	29.151	0.02	
	5	0.934	31.0	0.11	D13	40.0	3.17	29.151	0.04	
	4	1.494	31.0	0.18	D13	40.0	3.17	29.151	0.06	
	3	2.802	31.0	0.33	D13	40.0	3.17	29.151	0.11	
	2	10.086	31.0	1.20	D13	40.0	3.17	29.151	0.38	
	1	40.400	31.0	4.86	D13,D13	10.0	12.67	112.544	0.39	※
III	7	0.000	31.0	0.00	D13	20.0	6.34	57.636	0.00	
	6	13.767	31.0	1.64	D13	20.0	6.34	57.636	0.26	
	5	14.472	31.0	1.72	D13	20.0	6.34	57.636	0.28	
	4	15.300	31.0	1.82	D13	20.0	6.34	57.636	0.29	
	3	16.284	31.0	1.94	D13	20.0	6.34	57.636	0.31	
	2	14.797	31.0	1.76	D13	20.0	6.34	57.636	0.28	
	1	0.000	31.0	0.00	D13	20.0	6.34	57.636	0.00	

※ It determines from serviceability limit state.

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 366
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Sidewall(perpendicular to levee normal:seaside)--Perpendicular inner side steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{lim}(cm)
I	7	0.000	31.0	D13	40.0	3.17	0.000	0.0000	
	6	0.764	31.0	D13	40.0	3.17	8.098	0.0024	0.0040×8.0
	5	1.868	31.0	D13	40.0	3.17	19.800	0.0059	=0.0320
	4	2.971	31.0	D13	40.0	3.17	31.491	0.0093	
	3	4.669	31.0	D13	40.0	3.17	49.489	0.0146	
	2	10.102	31.0	D13	20.0	6.34	54.399	0.0123	
	1	61.555	31.0	D13,D16	10.0	16.27	133.180	0.0254	
II	7	0.000	31.0	D13	40.0	3.17	0.000	0.0000	
	6	0.255	31.0	D13	40.0	3.17	2.703	0.0008	0.0040×8.0
	5	0.424	31.0	D13	40.0	3.17	4.494	0.0013	=0.0320
	4	0.679	31.0	D13	40.0	3.17	7.197	0.0021	
	3	1.273	31.0	D13	40.0	3.17	13.493	0.0040	
	2	4.584	31.0	D13	40.0	3.17	48.588	0.0144	
	1	36.730	31.0	D13,D13	10.0	12.67	101.104	0.0193	
III	7	0.000	31.0	D13	20.0	6.34	0.000	0.0000	
	6	12.516	31.0	D13	20.0	6.34	67.399	0.0152	0.0040×8.0
	5	13.156	31.0	D13	20.0	6.34	70.845	0.0160	=0.0320
	4	13.910	31.0	D13	20.0	6.34	74.905	0.0169	
	3	14.804	31.0	D13	20.0	6.34	79.720	0.0180	
	2	13.453	31.0	D13	20.0	6.34	72.444	0.0163	
	1	0.000	31.0	D13	20.0	6.34	0.000	0.0000	

CALCULATION		
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PREPARED BY	Y. Ando	26/07/02
CHECKED BY	K. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall (perpendicular to levee normal : seaside) --Perpendicular outside steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm^2)	Diameter (mm)	Pitch (cm)	As (cm^2)	Mud (kN·m)	$\gamma i \cdot Md/Mud$
I	7	0.000	29.0	0.00	D13	40.0	3.17	27.249	0.00
	6	6.497	29.0	0.82	D13	40.0	3.17	27.249	0.26
	5	6.988	29.0	0.89	D13	40.0	3.17	27.249	0.28
	4	7.480	29.0	0.95	D13	40.0	3.17	27.249	0.30
	3	9.023	29.0	1.15	D13	20.0	6.34	53.833	0.18
	2	15.906	29.0	2.03	D13	20.0	6.34	53.833	0.33
	1	93.386	35.6	9.92	D13,D13	10.0	12.67	130.031	0.79
II	7	0.000	29.0	0.00	D13	40.0	3.17	27.249	0.00
	6	1.485	29.0	0.19	D13	40.0	3.17	27.249	0.06
	5	1.546	29.0	0.20	D13	40.0	3.17	27.249	0.06
	4	1.731	29.0	0.22	D13	40.0	3.17	27.249	0.07
	3	2.503	29.0	0.32	D13	40.0	3.17	27.249	0.10
	2	7.042	29.0	0.89	D13	40.0	3.17	27.249	0.28
	1	56.592	35.6	5.94	D13,D13	10.0	12.67	130.031	0.48
III	7	0.000	35.6	0.00	D13	40.0	3.17	33.525	0.00
	6	3.549	35.6	0.37	D13	40.0	3.17	33.525	0.12
	5	8.405	35.6	0.87	D13	40.0	3.17	33.525	0.28
	4	13.448	35.6	1.39	D13	40.0	3.17	33.525	0.44
	3	18.304	35.6	1.90	D13	40.0	3.17	33.525	0.60
	2	19.424	35.6	2.01	D13	40.0	3.17	33.525	0.64
	1	0.000	35.6	0.00	D13	40.0	3.17	33.525	0.00

CALCULATION		
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PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. Nishimura	09/08/2002

Serviceability limit state

Sidewall(perpendicular to levee normal:seaside) —Perpendicular outside steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm²)	σse (N/mm²)	Crack width W(cm)	Permission crack width W_{lim} (cm)
I	7	0.000	29.0	D13	40.0	3.17	0.000	0.0000	
	6	5.906	29.0	D13	40.0	3.17	67.006	0.0225	0.0035×10.0
	5	6.354	29.0	D13	40.0	3.17	72.089	0.0242	=0.0350
	4	6.800	29.0	D13	40.0	3.17	77.149	0.0259	
	3	8.202	29.0	D13	20.0	6.34	47.298	0.0126	
	2	14.462	29.0	D13	20.0	6.34	83.397	0.0221	
	1	42.446	35.6	D13,D13	10.0	12.67	101.256	0.0233	
II	7	0.000	29.0	D13	40.0	3.17	0.000	0.0000	
	6	1.350	29.0	D13	40.0	3.17	15.316	0.0051	0.0035×10.0
	5	1.405	29.0	D13	40.0	3.17	15.940	0.0053	=0.0350
	4	1.573	29.0	D13	40.0	3.17	17.846	0.0060	
	3	2.275	29.0	D13	40.0	3.17	25.811	0.0087	
	2	6.403	29.0	D13	40.0	3.17	72.645	0.0244	
	1	25.722	35.6	D13,D13	10.0	12.67	61.361	0.0141	
III	7	0.000	35.6	D13	40.0	3.17	0.000	0.0000	
	6	1.613	35.6	D13	40.0	3.17	14.849	0.0050	0.0035×10.0
	5	3.820	35.6	D13	40.0	3.17	35.167	0.0118	=0.0350
	4	6.112	35.6	D13	40.0	3.17	56.268	0.0189	
	3	8.319	35.6	D13	40.0	3.17	76.586	0.0257	
	2	8.829	35.6	D13	40.0	3.17	81.281	0.0273	
	1	0.000	35.6	D13	40.0	3.17	0.000	0.0000	

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CHECKED BY	E. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(perpendicular to levee normal:landside)—Horizontal inner side steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	5.043	33.0	0.56	D16	20.0	9.93	95.061	0.06	
	6	13.261	33.0	1.48	D16	20.0	9.93	95.061	0.15	
	5	25.961	33.0	2.91	D16	20.0	9.93	95.061	0.30	
	4	39.035	33.0	4.40	D16	20.0	9.93	95.061	0.45	
	3	52.109	33.0	5.91	D16	20.0	9.93	95.061	0.60	
	2	51.922	33.0	5.88	D16	20.0	9.93	95.061	0.60	
	1	11.274	33.0	1.26	D16	20.0	9.93	95.061	0.13	
II	7	0.560	33.0	0.06	D16	20.0	9.93	95.061	0.01	
	6	3.175	33.0	0.35	D16	20.0	9.93	95.061	0.04	
	5	6.350	33.0	0.71	D16	20.0	9.93	95.061	0.07	
	4	9.712	33.0	1.08	D16	20.0	9.93	95.061	0.11	
	3	13.448	33.0	1.50	D16	20.0	9.93	95.061	0.16	
	2	16.436	33.0	1.84	D16	20.0	9.93	95.061	0.19	
	1	6.733	33.0	0.75	D16	20.0	9.93	95.061	0.08	
III	7	81.485	33.0	9.34	D16,D19	10.0	24.26	220.809	0.41	※
	6	82.447	33.0	9.46	D16,D19	10.0	24.26	220.809	0.41	※
	5	86.893	33.0	9.99	D16,D19	10.0	24.26	220.809	0.43	※
	4	91.709	33.0	10.56	D16,D19	10.0	24.26	220.809	0.46	※
	3	97.424	33.0	11.25	D16,D19	10.0	24.26	220.809	0.49	※
	2	88.718	33.0	10.20	D16,D19	10.0	24.26	220.809	0.44	※
	1	0.000	33.0	0.00	D16,D19	10.0	24.26	220.809	0.00	
I'	7	5.043	33.0	0.56	D16	20.0	9.93	95.061	0.06	
	6	13.261	33.0	1.48	D16	20.0	9.93	95.061	0.15	
	5	25.961	33.0	2.91	D16	20.0	9.93	95.061	0.30	
	4	39.035	33.0	4.40	D16	20.0	9.93	95.061	0.45	
	3	52.109	33.0	5.91	D16	20.0	9.93	95.061	0.60	
	2	51.922	33.0	5.88	D16	20.0	9.93	95.061	0.60	
	1	11.274	33.0	1.26	D16	20.0	9.93	95.061	0.13	
III'	7	84.400	33.0	9.69	D16,D19	10.0	24.26	220.809	0.42	※
	6	85.329	33.0	9.80	D16,D19	10.0	24.26	220.809	0.43	※
	5	89.886	33.0	10.34	D16,D19	10.0	24.26	220.809	0.45	※
	4	94.810	33.0	10.93	D16,D19	10.0	24.26	220.809	0.47	※
	3	100.345	33.0	11.60	D16,D19	10.0	24.26	220.809	0.50	※
	2	89.593	33.0	10.31	D16,D19	10.0	24.26	220.809	0.45	※
	1	0.000	33.0	0.00	D16,D19	10.0	24.26	220.809	0.00	

※ It determines from serviceability limit state.
Notes) I ～III : Before correction Slab of a middle part
Notes) I' ～III' : After correction Slab of side wall corner

CALCULATION		
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PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E/Nishimura	05/08/2002

Serviceability limit state

Sidewall(perpendicular to levee normal:landside)—Horizontal inner side steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{all} (cm)
I	7	2.292	33.0	D16	20.0	9.93	7.485	0.0014	
	6	6.027	33.0	D16	20.0	9.93	19.683	0.0036	0.0040×6.0
	5	11.800	33.0	D16	20.0	9.93	38.536	0.0071	=0.0240
	4	17.742	33.0	D16	20.0	9.93	57.941	0.0107	
	3	23.685	33.0	D16	20.0	9.93	77.350	0.0143	
	2	23.600	33.0	D16	20.0	9.93	77.072	0.0142	
	1	10.250	33.0	D16	20.0	9.93	33.474	0.0062	
II	7	0.255	33.0	D16	20.0	9.93	0.833	0.0002	
	6	1.443	33.0	D16	20.0	9.93	4.713	0.0009	0.0040×6.0
	5	2.886	33.0	D16	20.0	9.93	9.425	0.0017	=0.0240
	4	4.414	33.0	D16	20.0	9.93	14.415	0.0027	
	3	6.112	33.0	D16	20.0	9.93	19.960	0.0037	
	2	7.470	33.0	D16	20.0	9.93	24.395	0.0045	
	1	6.122	33.0	D16	20.0	9.93	19.993	0.0037	
III	7	74.080	33.0	D16,D19	10.0	24.26	102.402	0.0153	
	6	74.954	33.0	D16,D19	10.0	24.26	103.611	0.0155	0.0040×6.0
	5	78.997	33.0	D16,D19	10.0	24.26	109.199	0.0163	=0.0240
	4	83.376	33.0	D16,D19	10.0	24.26	115.253	0.0172	
	3	88.572	33.0	D16,D19	10.0	24.26	122.435	0.0183	
	2	80.658	33.0	D16,D19	10.0	24.26	111.495	0.0167	
	1	0.000	33.0	D16,D19	10.0	24.26	0.000	0.0000	
I'	7	2.292	33.0	D16	20.0	9.93	7.485	0.0014	
	6	6.027	33.0	D16	20.0	9.93	19.683	0.0036	0.0040×6.0
	5	11.800	33.0	D16	20.0	9.93	38.536	0.0071	=0.0240
	4	17.742	33.0	D16	20.0	9.93	57.941	0.0107	
	3	23.685	33.0	D16	20.0	9.93	77.350	0.0143	
	2	23.600	33.0	D16	20.0	9.93	77.072	0.0142	
	1	10.250	33.0	D16	20.0	9.93	33.474	0.0062	
III'	7	76.724	33.0	D16,D19	10.0	24.26	106.057	0.0158	
	6	77.569	33.0	D16,D19	10.0	24.26	107.225	0.0160	0.0040×6.0
	5	81.714	33.0	D16,D19	10.0	24.26	112.955	0.0169	=0.0240
	4	86.193	33.0	D16,D19	10.0	24.26	119.147	0.0178	
	3	91.226	33.0	D16,D19	10.0	24.26	126.104	0.0188	
	2	81.453	33.0	D16,D19	10.0	24.26	112.594	0.0168	
	1	0.000	33.0	D16,D19	10.0	24.26	0.000	0.0000	

Notes) I ～III : Before correction Slab of a middle part

Notes) I' ～III' : After correction Slab of side wall corner

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PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	05/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(perpendicular to levee normal:landside)—Horizontal outside steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	40.937	31.0	4.93	D22	20.0	19.36	167.704	0.27	※
	6	40.708	31.0	4.90	D22	20.0	19.36	167.704	0.27	※
	5	42.888	31.0	5.17	D22	20.0	19.36	167.704	0.28	※
	4	45.129	31.0	5.44	D22	20.0	19.36	167.704	0.30	※
	3	47.277	31.0	5.71	D22	20.0	19.36	167.704	0.31	※
	2	40.376	31.0	4.86	D22	20.0	19.36	167.704	0.26	※
	1	15.502	37.6	1.52	D22	20.0	19.36	206.044	0.08	
II	7	9.841	31.0	1.17	D22	20.0	19.36	167.704	0.06	
	6	10.178	31.0	1.21	D22	20.0	19.36	167.704	0.07	
	5	10.699	31.0	1.27	D22	20.0	19.36	167.704	0.07	
	4	11.252	31.0	1.34	D22	20.0	19.36	167.704	0.07	
	3	12.143	31.0	1.44	D22	20.0	19.36	167.704	0.08	
	2	12.449	31.0	1.48	D22	20.0	19.36	167.704	0.08	
	1	9.339	37.6	0.91	D22	20.0	19.36	206.044	0.05	
III	7	0.374	37.6	0.04	D22	20.0	19.36	206.044	0.00	
	6	20.918	37.6	2.05	D22	20.0	19.36	206.044	0.11	
	5	50.241	37.6	4.97	D22	20.0	19.36	206.044	0.27	
	4	80.125	37.6	8.00	D22	20.0	19.36	206.044	0.43	
	3	109.821	37.6	11.07	D22	20.0	19.36	206.044	0.59	
	2	116.172	37.6	11.73	D22	20.0	19.36	206.044	0.62	
	1	0.000	37.6	0.00	D22	20.0	19.36	206.044	0.00	
I'	7	40.937	31.0	4.93	D22	20.0	19.36	167.704	0.27	※
	6	40.708	31.0	4.90	D22	20.0	19.36	167.704	0.27	※
	5	42.888	31.0	5.17	D22	20.0	19.36	167.704	0.28	※
	4	45.129	31.0	5.44	D22	20.0	19.36	167.704	0.30	※
	3	47.277	31.0	5.71	D22	20.0	19.36	167.704	0.31	※
	2	40.376	31.0	4.86	D22	20.0	19.36	167.704	0.26	※
	1	15.502	37.6	1.52	D22	20.0	19.36	206.044	0.08	
III'	7	1.012	37.6	0.10	D22	20.0	19.36	206.044	0.01	
	6	22.260	37.6	2.18	D22	20.0	19.36	206.044	0.12	
	5	52.675	37.6	5.22	D22	20.0	19.36	206.044	0.28	
	4	83.573	37.6	8.35	D22	20.0	19.36	206.044	0.45	
	3	114.172	37.6	11.52	D22	20.0	19.36	206.044	0.61	
	2	118.423	37.6	11.97	D22	20.0	19.36	206.044	0.63	
	1	0.000	37.6	0.00	D22	20.0	19.36	206.044	0.00	

※ It determines from serviceability limit state.
Notes) I ～III : Before correction Slab of a middle part
Notes) I' ～III' : After correction Slab of side wall corner

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Detailed Design on Port Reactivation Project in La Union Province		
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PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHINOMI	01/08/2002

Serviceability limit state

Sidewall (perpendicular to levee normal : landside) —Horizontal outside steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{lim} (cm)
I	7	37.216	31.0	D22	20.0	19.36	68.147	0.0151	
	6	37.009	31.0	D22	20.0	19.36	67.768	0.0151	0.0035×8.0
	5	38.991	31.0	D22	20.0	19.36	71.397	0.0159	=0.0280
	4	41.028	31.0	D22	20.0	19.36	75.127	0.0167	
	3	42.981	31.0	D22	20.0	19.36	78.703	0.0175	
	2	36.707	31.0	D22	20.0	19.36	67.215	0.0149	
	1	7.046	37.6	D22	20.0	19.36	10.555	0.0023	
II	7	8.947	31.0	D22	20.0	19.36	16.383	0.0036	
	6	9.252	31.0	D22	20.0	19.36	16.941	0.0038	0.0035×8.0
	5	9.727	31.0	D22	20.0	19.36	17.811	0.0040	=0.0280
	4	10.229	31.0	D22	20.0	19.36	18.730	0.0042	
	3	11.040	31.0	D22	20.0	19.36	20.216	0.0045	
	2	11.318	31.0	D22	20.0	19.36	20.725	0.0046	
	1	4.245	37.6	D22	20.0	19.36	6.359	0.0014	
III	7	0.170	37.6	D22	20.0	19.36	0.255	0.0001	
	6	9.508	37.6	D22	20.0	19.36	14.243	0.0032	0.0035×8.0
	5	22.836	37.6	D22	20.0	19.36	34.208	0.0076	=0.0280
	4	36.419	37.6	D22	20.0	19.36	54.555	0.0121	
	3	49.916	37.6	D22	20.0	19.36	74.773	0.0166	
	2	52.803	37.6	D22	20.0	19.36	79.098	0.0176	
	1	0.000	37.6	D22	20.0	19.36	0.000	0.0000	
I'	7	37.216	31.0	D22	20.0	19.36	68.147	0.0151	
	6	37.009	31.0	D22	20.0	19.36	67.768	0.0151	0.0035×8.0
	5	38.991	31.0	D22	20.0	19.36	71.397	0.0159	=0.0280
	4	41.028	31.0	D22	20.0	19.36	75.127	0.0167	
	3	42.981	31.0	D22	20.0	19.36	78.703	0.0175	
	2	36.707	31.0	D22	20.0	19.36	67.215	0.0149	
	1	7.046	37.6	D22	20.0	19.36	10.555	0.0023	
III'	7	0.460	37.6	D22	20.0	19.36	0.689	0.0002	
	6	10.117	37.6	D22	20.0	19.36	15.155	0.0034	0.0035×8.0
	5	23.942	37.6	D22	20.0	19.36	35.864	0.0080	=0.0280
	4	37.986	37.6	D22	20.0	19.36	56.902	0.0126	
	3	51.894	37.6	D22	20.0	19.36	77.736	0.0173	
	2	53.826	37.6	D22	20.0	19.36	80.630	0.0179	
	1	0.000	37.6	D22	20.0	19.36	0.000	0.0000	

Notes) I ～III : Before correction Slab of a middle part

Notes) I' ～III' : After correction Slab of side wall corner

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CHECKED BY	E. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)

Sidewall(perpendicular to levee normal:landside)—Perpendicular inner side steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	0.000	31.0	0.00	D13	40.0	3.17	29.151	0.00	
	6	1.681	31.0	0.20	D13	40.0	3.17	29.151	0.06	
	5	4.109	31.0	0.49	D13	40.0	3.17	29.151	0.16	
	4	6.537	31.0	0.78	D13	40.0	3.17	29.151	0.25	
	3	10.272	31.0	1.22	D13	40.0	3.17	29.151	0.39	
	2	22.226	31.0	2.65	D13	20.0	6.34	57.636	0.42	
	1	67.706	31.0	8.25	D13,D16	10.0	16.27	142.597	0.52	※
II	7	0.000	31.0	0.00	D13	40.0	3.17	29.151	0.00	
	6	0.560	31.0	0.07	D13	40.0	3.17	29.151	0.02	
	5	0.934	31.0	0.11	D13	40.0	3.17	29.151	0.04	
	4	1.494	31.0	0.18	D13	40.0	3.17	29.151	0.06	
	3	2.802	31.0	0.33	D13	40.0	3.17	29.151	0.11	
	2	10.086	31.0	1.20	D13	40.0	3.17	29.151	0.38	
	1	40.400	31.0	4.86	D13,D13	10.0	12.67	112.544	0.39	※
III	7	0.000	31.0	0.00	D13	20.0	6.34	57.636	0.00	
	6	13.767	31.0	1.64	D13	20.0	6.34	57.636	0.26	
	5	14.472	31.0	1.72	D13	20.0	6.34	57.636	0.28	
	4	15.300	31.0	1.82	D13	20.0	6.34	57.636	0.29	
	3	16.284	31.0	1.94	D13	20.0	6.34	57.636	0.31	
	2	14.797	31.0	1.76	D13	20.0	6.34	57.636	0.28	
	1	0.000	31.0	0.00	D13	20.0	6.34	57.636	0.00	

※ It determines from serviceability limit state.

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CHECKED BY	R. NISHIMURA	09/08/2002

Serviceability limit state

Sidewall(perpendicular to levee normal:landside)—Perpendicular inner side steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{lim} (cm)
I	7	0.000	31.0	D13	40.0	3.17	0.000	0.0000	
	6	0.764	31.0	D13	40.0	3.17	8.098	0.0024	0.0040×8.0
	5	1.868	31.0	D13	40.0	3.17	19.800	0.0059	=0.0320
	4	2.971	31.0	D13	40.0	3.17	31.491	0.0093	
	3	4.669	31.0	D13	40.0	3.17	49.489	0.0146	
	2	10.102	31.0	D13	20.0	6.34	54.399	0.0123	
	1	61.555	31.0	D13,D16	10.0	16.27	133.180	0.0254	
II	7	0.000	31.0	D13	40.0	3.17	0.000	0.0000	
	6	0.255	31.0	D13	40.0	3.17	2.703	0.0008	0.0040×8.0
	5	0.424	31.0	D13	40.0	3.17	4.494	0.0013	=0.0320
	4	0.679	31.0	D13	40.0	3.17	7.197	0.0021	
	3	1.273	31.0	D13	40.0	3.17	13.493	0.0040	
	2	4.584	31.0	D13	40.0	3.17	48.588	0.0144	
	1	36.730	31.0	D13,D13	10.0	12.67	101.104	0.0193	
III	7	0.000	31.0	D13	20.0	6.34	0.000	0.0000	
	6	12.516	31.0	D13	20.0	6.34	67.399	0.0152	0.0040×8.0
	5	13.156	31.0	D13	20.0	6.34	70.845	0.0160	=0.0320
	4	13.910	31.0	D13	20.0	6.34	74.905	0.0169	
	3	14.804	31.0	D13	20.0	6.34	79.720	0.0180	
	2	13.453	31.0	D13	20.0	6.34	72.444	0.0163	
	1	0.000	31.0	D13	20.0	6.34	0.000	0.0000	

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CHECKED BY	R. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(perpendicular to levee normal:landside)--Perpendicular outside steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
I	7	0.000	29.0	0.00	D13	40.0	3.17	27.249	0.00
	6	6.497	29.0	0.82	D13	40.0	3.17	27.249	0.26
	5	6.988	29.0	0.89	D13	40.0	3.17	27.249	0.28
	4	7.480	29.0	0.95	D13	40.0	3.17	27.249	0.30
	3	9.023	29.0	1.15	D13	20.0	6.34	53.833	0.18
	2	15.906	29.0	2.03	D13	20.0	6.34	53.833	0.33
	1	93.386	35.6	9.92	D13,D13	10.0	12.67	130.031	0.79
II	7	0.000	29.0	0.00	D13	40.0	3.17	27.249	0.00
	6	1.485	29.0	0.19	D13	40.0	3.17	27.249	0.06
	5	1.546	29.0	0.20	D13	40.0	3.17	27.249	0.06
	4	1.731	29.0	0.22	D13	40.0	3.17	27.249	0.07
	3	2.503	29.0	0.32	D13	40.0	3.17	27.249	0.10
	2	7.042	29.0	0.89	D13	40.0	3.17	27.249	0.28
	1	56.592	35.6	5.94	D13,D13	10.0	12.67	130.031	0.48
III	7	0.000	35.6	0.00	D13	40.0	3.17	33.525	0.00
	6	3.549	35.6	0.37	D13	40.0	3.17	33.525	0.12
	5	8.405	35.6	0.87	D13	40.0	3.17	33.525	0.28
	4	13.448	35.6	1.39	D13	40.0	3.17	33.525	0.44
	3	18.304	35.6	1.90	D13	40.0	3.17	33.525	0.60
	2	19.424	35.6	2.01	D13	40.0	3.17	33.525	0.64
	1	0.000	35.6	0.00	D13	40.0	3.17	33.525	0.00

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CHECKED BY	E. NISHIMURA	08/08/2002

Serviceability limit state

Sidewall (perpendicular to levee normal : landside) --Perpendicular outside steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{all} (cm)
I	7	0.000	29.0	D13	40.0	3.17	0.000	0.0000	
	6	5.906	29.0	D13	40.0	3.17	67.006	0.0225	0.0035×10.0
	5	6.354	29.0	D13	40.0	3.17	72.089	0.0242	=0.0350
	4	6.800	29.0	D13	40.0	3.17	77.149	0.0259	
	3	8.202	29.0	D13	20.0	6.34	47.298	0.0126	
	2	14.462	29.0	D13	20.0	6.34	83.397	0.0221	
	1	42.446	35.6	D13,D13	10.0	12.67	101.256	0.0233	
II	7	0.000	29.0	D13	40.0	3.17	0.000	0.0000	
	6	1.350	29.0	D13	40.0	3.17	15.316	0.0051	0.0035×10.0
	5	1.405	29.0	D13	40.0	3.17	15.940	0.0053	=0.0350
	4	1.573	29.0	D13	40.0	3.17	17.846	0.0060	
	3	2.275	29.0	D13	40.0	3.17	25.811	0.0087	
	2	6.403	29.0	D13	40.0	3.17	72.645	0.0244	
	1	25.722	35.6	D13,D13	10.0	12.67	61.361	0.0141	
III	7	0.000	35.6	D13	40.0	3.17	0.000	0.0000	
	6	1.613	35.6	D13	40.0	3.17	14.849	0.0050	0.0035×10.0
	5	3.820	35.6	D13	40.0	3.17	35.167	0.0118	=0.0350
	4	6.112	35.6	D13	40.0	3.17	56.268	0.0189	
	3	8.319	35.6	D13	40.0	3.17	76.586	0.0257	
	2	8.829	35.6	D13	40.0	3.17	81.281	0.0273	
	1	0.000	35.6	D13	40.0	3.17	0.000	0.0000	

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CHECKED BY	E. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(parallel to centerline:seaside)—Horizontal inner side steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	5.887	33.0	0.66	D16	20.0	9.93	95.061	0.07	
	6	14.413	33.0	1.61	D16	20.0	9.93	95.061	0.17	
	5	28.218	33.0	3.17	D16	20.0	9.93	95.061	0.33	
	4	42.428	33.0	4.79	D16	20.0	9.93	95.061	0.49	
	3	56.232	33.0	6.38	D16	20.0	9.93	95.061	0.65	
	2	53.390	33.0	6.05	D16	20.0	9.93	95.061	0.62	
	1	11.978	33.0	1.34	D16	20.0	9.93	95.061	0.14	
II	7	0.609	33.0	0.07	D16	20.0	9.93	95.061	0.01	
	6	3.451	33.0	0.38	D16	20.0	9.93	95.061	0.04	
	5	6.902	33.0	0.77	D16	20.0	9.93	95.061	0.08	
	4	10.556	33.0	1.18	D16	20.0	9.93	95.061	0.12	
	3	14.616	33.0	1.63	D16	20.0	9.93	95.061	0.17	
	2	17.458	33.0	1.95	D16	20.0	9.93	95.061	0.20	
	1	7.153	33.0	0.80	D16	20.0	9.93	95.061	0.08	
III	7	87.201	33.0	10.02	D16,D19	10.0	24.26	220.809	0.43	※
	6	88.097	33.0	10.13	D16,D19	10.0	24.26	220.809	0.44	※
	5	92.762	33.0	10.69	D16,D19	10.0	24.26	220.809	0.46	※
	4	97.789	33.0	11.29	D16,D19	10.0	24.26	220.809	0.49	※
	3	103.151	33.0	11.93	D16,D19	10.0	24.26	220.809	0.51	※
	2	90.434	33.0	10.41	D16,D19	10.0	24.26	220.809	0.45	※
	1	0.000	33.0	0.00	D16,D19	10.0	24.26	220.809	0.00	
I'	7	6.193	33.0	0.69	D16	20.0	9.93	95.061	0.07	
	6	15.058	33.0	1.68	D16	20.0	9.93	95.061	0.17	
	5	29.387	33.0	3.30	D16	20.0	9.93	95.061	0.34	
	4	44.084	33.0	4.98	D16	20.0	9.93	95.061	0.51	
	3	58.322	33.0	6.63	D16	20.0	9.93	95.061	0.67	
	2	54.471	33.0	6.18	D16	20.0	9.93	95.061	0.63	
	1	11.978	33.0	1.34	D16	20.0	9.93	95.061	0.14	
III'	7	84.400	33.0	9.69	D16,D19	10.0	24.26	220.809	0.42	※
	6	85.328	33.0	9.80	D16,D19	10.0	24.26	220.809	0.43	※
	5	89.886	33.0	10.34	D16,D19	10.0	24.26	220.809	0.45	※
	4	94.810	33.0	10.93	D16,D19	10.0	24.26	220.809	0.47	※
	3	100.345	33.0	11.60	D16,D19	10.0	24.26	220.809	0.50	※
	2	89.593	33.0	10.31	D16,D19	10.0	24.26	220.809	0.45	※
	1	0.000	33.0	0.00	D16,D19	10.0	24.26	220.809	0.00	

※ It determines from serviceability limit state.
Notes) I ～III : Before correction Slab of a middle part
Notes) I' ～III' : After correction Slab of side wall corner

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PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Sidewall(parallel to centerline:seaside)—Horizontal inner side steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{ca} (cm)
I	7	2.676	33.0	D16	20.0	9.93	8.739	0.0016	
	6	6.551	33.0	D16	20.0	9.93	21.394	0.0039	0.0040×6.0
	5	12.826	33.0	D16	20.0	9.93	41.887	0.0077	=0.0240
	4	19.285	33.0	D16	20.0	9.93	62.980	0.0116	
	3	25.559	33.0	D16	20.0	9.93	83.470	0.0154	
	2	24.267	33.0	D16	20.0	9.93	79.250	0.0146	
	1	10.889	33.0	D16	20.0	9.93	35.561	0.0066	
II	7	0.277	33.0	D16	20.0	9.93	0.905	0.0002	
	6	1.569	33.0	D16	20.0	9.93	5.124	0.0009	0.0040×6.0
	5	3.137	33.0	D16	20.0	9.93	10.245	0.0019	=0.0240
	4	4.798	33.0	D16	20.0	9.93	15.669	0.0029	
	3	6.643	33.0	D16	20.0	9.93	21.695	0.0040	
	2	7.935	33.0	D16	20.0	9.93	25.914	0.0048	
	1	6.503	33.0	D16	20.0	9.93	21.237	0.0039	
III	7	79.264	33.0	D16,D19	10.0	24.26	109.568	0.0164	
	6	80.082	33.0	D16,D19	10.0	24.26	110.699	0.0165	0.0040×6.0
	5	84.325	33.0	D16,D19	10.0	24.26	116.564	0.0174	=0.0240
	4	88.899	33.0	D16,D19	10.0	24.26	122.887	0.0184	
	3	93.776	33.0	D16,D19	10.0	24.26	129.629	0.0194	
	2	82.216	33.0	D16,D19	10.0	24.26	113.649	0.0170	
	1	0.000	33.0	D16,D19	10.0	24.26	0.000	0.0000	
I'	7	2.815	33.0	D16	20.0	9.93	9.193	0.0017	
	6	6.844	33.0	D16	20.0	9.93	22.351	0.0041	0.0040×6.0
	5	13.357	33.0	D16	20.0	9.93	43.621	0.0080	=0.0240
	4	20.038	33.0	D16	20.0	9.93	65.439	0.0121	
	3	26.509	33.0	D16	20.0	9.93	86.572	0.0160	
	2	24.758	33.0	D16	20.0	9.93	80.854	0.0149	
	1	10.889	33.0	D16	20.0	9.93	35.561	0.0066	
III'	7	76.724	33.0	D16,D19	10.0	24.26	106.057	0.0158	
	6	77.569	33.0	D16,D19	10.0	24.26	107.225	0.0160	0.0040×6.0
	5	81.714	33.0	D16,D19	10.0	24.26	112.955	0.0169	=0.0240
	4	86.193	33.0	D16,D19	10.0	24.26	119.147	0.0178	
	3	91.226	33.0	D16,D19	10.0	24.26	126.104	0.0188	
	2	81.453	33.0	D16,D19	10.0	24.26	112.594	0.0168	
	1	0.000	33.0	D16,D19	10.0	24.26	0.000	0.0000	

Notes) I ～III : Before correction Slab of a middle part

Notes) I' ～III' : After correction Slab of side wall corner

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PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. Nishimura	01/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(parallel to centerline:seaside)—Horizontal outside steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	43.986	31.0	5.30	D22	20.0	19.36	167.704	0.29	※
	6	43.509	31.0	5.24	D22	20.0	19.36	167.704	0.29	※
	5	45.843	31.0	5.53	D22	20.0	19.36	167.704	0.30	※
	4	48.239	31.0	5.83	D22	20.0	19.36	167.704	0.32	※
	3	50.074	31.0	6.05	D22	20.0	19.36	167.704	0.33	※
	2	40.760	31.0	4.91	D22	20.0	19.36	167.704	0.27	※
	1	16.849	37.6	1.65	D22	20.0	19.36	206.044	0.09	
II	7	10.564	31.0	1.26	D22	20.0	19.36	167.704	0.07	
	6	10.903	31.0	1.30	D22	20.0	19.36	167.704	0.07	
	5	11.437	31.0	1.36	D22	20.0	19.36	167.704	0.08	
	4	12.102	31.0	1.44	D22	20.0	19.36	167.704	0.08	
	3	12.928	31.0	1.54	D22	20.0	19.36	167.704	0.08	
	2	12.969	31.0	1.54	D22	20.0	19.36	167.704	0.09	
	1	10.150	37.6	0.99	D22	20.0	19.36	206.044	0.05	
III	7	1.624	37.6	0.16	D22	20.0	19.36	206.044	0.01	
	6	23.549	37.6	2.31	D22	20.0	19.36	206.044	0.13	
	5	55.014	37.6	5.45	D22	20.0	19.36	206.044	0.29	
	4	86.886	37.6	8.69	D22	20.0	19.36	206.044	0.46	
	3	118.352	37.6	11.96	D22	20.0	19.36	206.044	0.63	
	2	120.585	37.6	12.19	D22	20.0	19.36	206.044	0.64	
	1	0.000	37.6	0.00	D22	20.0	19.36	206.044	0.00	
I'	7	45.386	31.0	5.47	D22	20.0	19.36	167.704	0.30	※
	6	44.893	31.0	5.41	D22	20.0	19.36	167.704	0.29	※
	5	47.281	31.0	5.71	D22	20.0	19.36	167.704	0.31	※
	4	49.729	31.0	6.01	D22	20.0	19.36	167.704	0.33	※
	3	51.477	31.0	6.23	D22	20.0	19.36	167.704	0.34	※
	2	41.180	31.0	4.96	D22	20.0	19.36	167.704	0.27	※
	1	16.849	37.6	1.65	D22	20.0	19.36	206.044	0.09	
III'	7	1.011	37.6	0.10	D22	20.0	19.36	206.044	0.01	
	6	22.260	37.6	2.18	D22	20.0	19.36	206.044	0.12	
	5	52.675	37.6	5.22	D22	20.0	19.36	206.044	0.28	
	4	83.573	37.6	8.35	D22	20.0	19.36	206.044	0.45	
	3	114.172	37.6	11.52	D22	20.0	19.36	206.044	0.61	
	2	118.423	37.6	11.97	D22	20.0	19.36	206.044	0.63	
	1	0.000	37.6	0.00	D22	20.0	19.36	206.044	0.00	

※ It determines from serviceability limit state.
Notes) I ～III : Before correction Slab of a middle part
Notes) I' ～III' : After correction Slab of side wall corner

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PREPARED BY	Y. Ando	26/07/02
CHECKED BY	R. NISHIMURA	09/08/2002

Serviceability limit state

Sidewall(parallel to centerline:seaside)—Horizontal outside steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm²)	σse (N/mm²)	Crack width W(cm)	Permission crack width W_{lim} (cm)
I	7	39.984	31.0	D22	20.0	19.36	73.215	0.0163	
	6	39.551	31.0	D22	20.0	19.36	72.422	0.0161	0.0035×8.0
	5	41.673	31.0	D22	20.0	19.36	76.308	0.0170	=0.0280
	4	43.854	31.0	D22	20.0	19.36	80.302	0.0178	
	3	45.523	31.0	D22	20.0	19.36	83.358	0.0185	
	2	37.056	31.0	D22	20.0	19.36	67.854	0.0151	
	1	7.658	37.6	D22	20.0	19.36	11.471	0.0025	
II	7	9.603	31.0	D22	20.0	19.36	17.584	0.0039	
	6	9.911	31.0	D22	20.0	19.36	18.148	0.0040	0.0035×8.0
	5	10.397	31.0	D22	20.0	19.36	19.038	0.0042	=0.0280
	4	11.001	31.0	D22	20.0	19.36	20.144	0.0045	
	3	11.753	31.0	D22	20.0	19.36	21.521	0.0048	
	2	11.791	31.0	D22	20.0	19.36	21.591	0.0048	
	1	4.614	37.6	D22	20.0	19.36	6.912	0.0015	
III	7	0.738	37.6	D22	20.0	19.36	1.106	0.0002	
	6	10.703	37.6	D22	20.0	19.36	16.033	0.0036	0.0035×8.0
	5	25.005	37.6	D22	20.0	19.36	37.457	0.0083	=0.0280
	4	39.492	37.6	D22	20.0	19.36	59.158	0.0131	
	3	53.794	37.6	D22	20.0	19.36	80.582	0.0179	
	2	54.809	37.6	D22	20.0	19.36	82.102	0.0182	
	1	0.000	37.6	D22	20.0	19.36	0.000	0.0000	
I'	7	41.254	31.0	D22	20.0	19.36	75.541	0.0168	
	6	40.807	31.0	D22	20.0	19.36	74.722	0.0166	0.0035×8.0
	5	42.978	31.0	D22	20.0	19.36	78.698	0.0175	=0.0280
	4	45.207	31.0	D22	20.0	19.36	82.779	0.0184	
	3	46.798	31.0	D22	20.0	19.36	85.692	0.0190	
	2	37.438	31.0	D22	20.0	19.36	68.553	0.0152	
	1	7.658	37.6	D22	20.0	19.36	11.471	0.0025	
III'	7	0.460	37.6	D22	20.0	19.36	0.689	0.0002	
	6	10.117	37.6	D22	20.0	19.36	15.155	0.0034	0.0035×8.0
	5	23.942	37.6	D22	20.0	19.36	35.864	0.0080	=0.0280
	4	37.986	37.6	D22	20.0	19.36	56.902	0.0126	
	3	51.894	37.6	D22	20.0	19.36	77.736	0.0173	
	2	53.826	37.6	D22	20.0	19.36	80.630	0.0179	
	1	0.000	37.6	D22	20.0	19.36	0.000	0.0000	

Notes) I ～III : Before correction Slab of a middle part

Notes) I' ～III' : After correction Slab of side wall corner

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CHECKED BY	R. NISHIHARA	07/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(parallel to centerline:seaside)--Perpendicular inner side steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	0.000	31.0	0.00	D13	40.0	3.17	29.151	0.00	
	6	1.624	31.0	0.19	D13	40.0	3.17	29.151	0.06	
	5	4.466	31.0	0.53	D13	40.0	3.17	29.151	0.17	
	4	7.105	31.0	0.84	D13	40.0	3.17	29.151	0.27	
	3	11.977	31.0	1.42	D13	40.0	3.17	29.151	0.45	
	2	24.970	31.0	2.98	D13	20.0	6.34	57.636	0.48	
	1	71.903	31.0	8.78	D13,D19	10.0	20.66	178.101	0.44	※
II	7	0.000	31.0	0.00	D13	40.0	3.17	29.151	0.00	
	6	0.406	31.0	0.05	D13	40.0	3.17	29.151	0.02	
	5	1.015	31.0	0.12	D13	40.0	3.17	29.151	0.04	
	4	1.624	31.0	0.19	D13	40.0	3.17	29.151	0.06	
	3	3.654	31.0	0.43	D13	40.0	3.17	29.151	0.14	
	2	11.774	31.0	1.40	D13	40.0	3.17	29.151	0.44	
	1	43.180	31.0	5.20	D13,D13	10.0	12.67	112.544	0.42	※
III	7	0.000	31.0	0.00	D13	20.0	6.34	57.636	0.00	
	6	14.656	31.0	1.74	D13	20.0	6.34	57.636	0.28	
	5	15.472	31.0	1.84	D13	20.0	6.34	57.636	0.30	
	4	16.288	31.0	1.94	D13	20.0	6.34	57.636	0.31	
	3	17.203	31.0	2.05	D13	20.0	6.34	57.636	0.33	
	2	15.073	31.0	1.79	D13	20.0	6.34	57.636	0.29	
	1	0.000	31.0	0.00	D13	20.0	6.34	57.636	0.00	

※ It determines from serviceability limit state.

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CHECKED BY	R. NISHIMURA	07/08/2002

Serviceability limit state

Sidewall(parallel to centerline:seaside)--Perpendicular inner side steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{all} (cm)
I	7	0.000	31.0	D13	40.0	3.17	0.000	0.0000	
	6	0.738	31.0	D13	40.0	3.17	7.822	0.0023	0.0040×8.0
	5	2.030	31.0	D13	40.0	3.17	21.517	0.0064	$=0.0320$
	4	3.229	31.0	D13	40.0	3.17	34.226	0.0101	
	3	5.444	31.0	D13	40.0	3.17	57.704	0.0171	
	2	11.349	31.0	D13	20.0	6.34	61.114	0.0138	
	1	65.370	31.0	D13,D19	10.0	20.66	112.470	0.0214	
II	7	0.000	31.0	D13	40.0	3.17	0.000	0.0000	
	6	0.185	31.0	D13	40.0	3.17	1.961	0.0006	0.0040×8.0
	5	0.461	31.0	D13	40.0	3.17	4.886	0.0014	$=0.0320$
	4	0.738	31.0	D13	40.0	3.17	7.822	0.0023	
	3	1.661	31.0	D13	40.0	3.17	17.606	0.0052	
	2	5.352	31.0	D13	40.0	3.17	56.729	0.0168	
	1	39.257	31.0	D13,D13	10.0	12.67	108.060	0.0206	
III	7	0.000	31.0	D13	20.0	6.34	0.000	0.0000	
	6	13.322	31.0	D13	20.0	6.34	71.739	0.0162	0.0040×8.0
	5	14.065	31.0	D13	20.0	6.34	75.740	0.0171	$=0.0320$
	4	14.807	31.0	D13	20.0	6.34	79.736	0.0180	
	3	15.640	31.0	D13	20.0	6.34	84.221	0.0190	
	2	13.703	31.0	D13	20.0	6.34	73.791	0.0166	
	1	0.000	31.0	D13	20.0	6.34	0.000	0.0000	

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CHECKED BY	E. NISHIMURA	05/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(parallel to centerline:seaside)—Perpendicular outside steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
I	7	0.000	29.0	0.00	D13	40.0	3.17	27.249	0.00
	6	6.932	29.0	0.88	D13	40.0	3.17	27.249	0.28
	5	7.471	29.0	0.95	D13	40.0	3.17	27.249	0.30
	4	8.078	29.0	1.03	D13	40.0	3.17	27.249	0.33
	3	10.127	29.0	1.29	D13	20.0	6.34	53.833	0.21
	2	17.421	29.0	2.22	D13	20.0	6.34	53.833	0.36
	1	100.690	35.6	10.73	D13,D13	10.0	12.67	130.031	0.85
II	7	0.000	29.0	0.00	D13	40.0	3.17	27.249	0.00
	6	1.559	29.0	0.20	D13	40.0	3.17	27.249	0.06
	5	1.653	29.0	0.21	D13	40.0	3.17	27.249	0.07
	4	1.946	29.0	0.25	D13	40.0	3.17	27.249	0.08
	3	3.058	29.0	0.39	D13	40.0	3.17	27.249	0.12
	2	8.002	29.0	1.02	D13	40.0	3.17	27.249	0.32
	1	61.307	35.6	6.44	D13,D13	10.0	12.67	130.031	0.52
III	7	0.000	35.6	0.00	D13	40.0	3.17	33.525	0.00
	6	3.857	35.6	0.40	D13	40.0	3.17	33.525	0.13
	5	9.135	35.6	0.94	D13	40.0	3.17	33.525	0.30
	4	14.413	35.6	1.49	D13	40.0	3.17	33.525	0.47
	3	19.691	35.6	2.04	D13	40.0	3.17	33.525	0.65
	2	20.097	35.6	2.08	D13	40.0	3.17	33.525	0.66
	1	0.000	35.6	0.00	D13	40.0	3.17	33.525	0.00

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PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Sidewall(parallel to centerline:seaside)—Perpendicular outside steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{allow} (cm)
I	7	0.000	29.0	D13	40.0	3.17	0.000	0.0000	
	6	6.301	29.0	D13	40.0	3.17	71.487	0.0240	0.0035×10.0
	5	6.791	29.0	D13	40.0	3.17	77.047	0.0259	=0.0350
	4	7.344	29.0	D13	40.0	3.17	83.321	0.0280	
	3	9.207	29.0	D13	20.0	6.34	53.093	0.0141	
	2	15.838	29.0	D13	20.0	6.34	91.332	0.0243	
	1	45.766	35.6	D13,D13	10.0	12.67	109.176	0.0252	
II	7	0.000	29.0	D13	40.0	3.17	0.000	0.0000	
	6	1.417	29.0	D13	40.0	3.17	16.076	0.0054	0.0035×10.0
	5	1.503	29.0	D13	40.0	3.17	17.052	0.0057	=0.0350
	4	1.769	29.0	D13	40.0	3.17	20.070	0.0067	
	3	2.780	29.0	D13	40.0	3.17	31.540	0.0106	
	2	7.276	29.0	D13	40.0	3.17	82.549	0.0277	
	1	27.866	35.6	D13,D13	10.0	12.67	66.475	0.0153	
III	7	0.000	35.6	D13	40.0	3.17	0.000	0.0000	
	6	1.753	35.6	D13	40.0	3.17	16.138	0.0054	0.0035×10.0
	5	4.152	35.6	D13	40.0	3.17	38.224	0.0128	=0.0350
	4	6.551	35.6	D13	40.0	3.17	60.309	0.0202	
	3	8.950	35.6	D13	40.0	3.17	82.395	0.0276	
	2	9.135	35.6	D13	40.0	3.17	84.098	0.0282	
	1	0.000	35.6	D13	40.0	3.17	0.000	0.0000	

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PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIHUDA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(parallel to centerline:landside)--Horizontal inner side steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	5.887	33.0	0.66	D16	20.0	9.93	95.061	0.07	
	6	14.413	33.0	1.61	D16	20.0	9.93	95.061	0.17	
	5	28.218	33.0	3.17	D16	20.0	9.93	95.061	0.33	
	4	42.428	33.0	4.79	D16	20.0	9.93	95.061	0.49	
	3	56.232	33.0	6.38	D16	20.0	9.93	95.061	0.65	
	2	53.390	33.0	6.05	D16	20.0	9.93	95.061	0.62	
	1	11.978	33.0	1.34	D16	20.0	9.93	95.061	0.14	
II	7	0.609	33.0	0.07	D16	20.0	9.93	95.061	0.01	
	6	3.451	33.0	0.38	D16	20.0	9.93	95.061	0.04	
	5	6.902	33.0	0.77	D16	20.0	9.93	95.061	0.08	
	4	10.556	33.0	1.18	D16	20.0	9.93	95.061	0.12	
	3	14.616	33.0	1.63	D16	20.0	9.93	95.061	0.17	
	2	17.458	33.0	1.95	D16	20.0	9.93	95.061	0.20	
	1	7.153	33.0	0.80	D16	20.0	9.93	95.061	0.08	
III	7	87.201	33.0	10.02	D16,D19	10.0	24.26	220.809	0.43	※
	6	88.097	33.0	10.13	D16,D19	10.0	24.26	220.809	0.44	※
	5	92.762	33.0	10.69	D16,D19	10.0	24.26	220.809	0.46	※
	4	97.789	33.0	11.29	D16,D19	10.0	24.26	220.809	0.49	※
	3	103.151	33.0	11.93	D16,D19	10.0	24.26	220.809	0.51	※
	2	90.434	33.0	10.41	D16,D19	10.0	24.26	220.809	0.45	※
	1	0.000	33.0	0.00	D16,D19	10.0	24.26	220.809	0.00	
I'	7	6.193	33.0	0.69	D16	20.0	9.93	95.061	0.07	
	6	15.058	33.0	1.68	D16	20.0	9.93	95.061	0.17	
	5	29.387	33.0	3.30	D16	20.0	9.93	95.061	0.34	
	4	44.084	33.0	4.98	D16	20.0	9.93	95.061	0.51	
	3	58.322	33.0	6.63	D16	20.0	9.93	95.061	0.67	
	2	54.471	33.0	6.18	D16	20.0	9.93	95.061	0.63	
	1	11.978	33.0	1.34	D16	20.0	9.93	95.061	0.14	
III'	7	84.400	33.0	9.69	D16,D19	10.0	24.26	220.809	0.42	※
	6	85.328	33.0	9.80	D16,D19	10.0	24.26	220.809	0.43	※
	5	89.886	33.0	10.34	D16,D19	10.0	24.26	220.809	0.45	※
	4	94.810	33.0	10.93	D16,D19	10.0	24.26	220.809	0.47	※
	3	100.345	33.0	11.60	D16,D19	10.0	24.26	220.809	0.50	※
	2	89.593	33.0	10.31	D16,D19	10.0	24.26	220.809	0.45	※
	1	0.000	33.0	0.00	D16,D19	10.0	24.26	220.809	0.00	

※ It determines from serviceability limit state.
Notes) I ～III : Before correction Slab of a middle part
Notes) I' ～III' : After correction Slab of side wall corner

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PREPARED BY	V. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Sidewall(parallel to centerline:landside)—Horizontal inner side steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm²)	σse (N/mm²)	Crack width W(cm)	Permission crack width W_{all} (cm)
I	7	2.676	33.0	D16	20.0	9.93	8.739	0.0016	
	6	6.551	33.0	D16	20.0	9.93	21.394	0.0039	0.0040×6.0
	5	12.826	33.0	D16	20.0	9.93	41.887	0.0077	=0.0240
	4	19.285	33.0	D16	20.0	9.93	62.980	0.0116	
	3	25.559	33.0	D16	20.0	9.93	83.470	0.0154	
	2	24.267	33.0	D16	20.0	9.93	79.250	0.0146	
	1	10.889	33.0	D16	20.0	9.93	35.561	0.0066	
II	7	0.277	33.0	D16	20.0	9.93	0.905	0.0002	
	6	1.569	33.0	D16	20.0	9.93	5.124	0.0009	0.0040×6.0
	5	3.137	33.0	D16	20.0	9.93	10.245	0.0019	=0.0240
	4	4.798	33.0	D16	20.0	9.93	15.669	0.0029	
	3	6.643	33.0	D16	20.0	9.93	21.695	0.0040	
	2	7.935	33.0	D16	20.0	9.93	25.914	0.0048	
	1	6.503	33.0	D16	20.0	9.93	21.237	0.0039	
III	7	79.264	33.0	D16,D19	10.0	24.26	109.568	0.0164	
	6	80.082	33.0	D16,D19	10.0	24.26	110.699	0.0165	0.0040×6.0
	5	84.325	33.0	D16,D19	10.0	24.26	116.564	0.0174	=0.0240
	4	88.899	33.0	D16,D19	10.0	24.26	122.887	0.0184	
	3	93.776	33.0	D16,D19	10.0	24.26	129.629	0.0194	
	2	82.216	33.0	D16,D19	10.0	24.26	113.649	0.0170	
	1	0.000	33.0	D16,D19	10.0	24.26	0.000	0.0000	
I'	7	2.815	33.0	D16	20.0	9.93	9.193	0.0017	
	6	6.844	33.0	D16	20.0	9.93	22.351	0.0041	0.0040×6.0
	5	13.357	33.0	D16	20.0	9.93	43.621	0.0080	=0.0240
	4	20.038	33.0	D16	20.0	9.93	65.439	0.0121	
	3	26.509	33.0	D16	20.0	9.93	86.572	0.0160	
	2	24.758	33.0	D16	20.0	9.93	80.854	0.0149	
	1	10.889	33.0	D16	20.0	9.93	35.561	0.0066	
III'	7	76.724	33.0	D16,D19	10.0	24.26	106.057	0.0158	
	6	77.569	33.0	D16,D19	10.0	24.26	107.225	0.0160	0.0040×6.0
	5	81.714	33.0	D16,D19	10.0	24.26	112.955	0.0169	=0.0240
	4	86.193	33.0	D16,D19	10.0	24.26	119.147	0.0178	
	3	91.226	33.0	D16,D19	10.0	24.26	126.104	0.0188	
	2	81.453	33.0	D16,D19	10.0	24.26	112.594	0.0168	
	1	0.000	33.0	D16,D19	10.0	24.26	0.000	0.0000	

Notes) I ～III : Before correction Slab of a middle part

Notes) I' ～III' : After correction Slab of side wall corner

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CHECKED BY	E.NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(parallel to centerline:landside)—Horizontal outside steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	43.986	31.0	5.30	D22	20.0	19.36	167.704	0.29	※
	6	43.509	31.0	5.24	D22	20.0	19.36	167.704	0.29	※
	5	45.843	31.0	5.53	D22	20.0	19.36	167.704	0.30	※
	4	48.239	31.0	5.83	D22	20.0	19.36	167.704	0.32	※
	3	50.074	31.0	6.05	D22	20.0	19.36	167.704	0.33	※
	2	40.760	31.0	4.91	D22	20.0	19.36	167.704	0.27	※
	1	16.849	37.6	1.65	D22	20.0	19.36	206.044	0.09	
II	7	10.564	31.0	1.26	D22	20.0	19.36	167.704	0.07	
	6	10.903	31.0	1.30	D22	20.0	19.36	167.704	0.07	
	5	11.437	31.0	1.36	D22	20.0	19.36	167.704	0.08	
	4	12.102	31.0	1.44	D22	20.0	19.36	167.704	0.08	
	3	12.928	31.0	1.54	D22	20.0	19.36	167.704	0.08	
	2	12.969	31.0	1.54	D22	20.0	19.36	167.704	0.09	
	1	10.150	37.6	0.99	D22	20.0	19.36	206.044	0.05	
III	7	1.624	37.6	0.16	D22	20.0	19.36	206.044	0.01	
	6	23.549	37.6	2.31	D22	20.0	19.36	206.044	0.13	
	5	55.014	37.6	5.45	D22	20.0	19.36	206.044	0.29	
	4	86.886	37.6	8.69	D22	20.0	19.36	206.044	0.46	
	3	118.352	37.6	11.96	D22	20.0	19.36	206.044	0.63	
	2	120.585	37.6	12.19	D22	20.0	19.36	206.044	0.64	
	1	0.000	37.6	0.00	D22	20.0	19.36	206.044	0.00	
I'	7	45.386	31.0	5.47	D22	20.0	19.36	167.704	0.30	※
	6	44.893	31.0	5.41	D22	20.0	19.36	167.704	0.29	※
	5	47.281	31.0	5.71	D22	20.0	19.36	167.704	0.31	※
	4	49.729	31.0	6.01	D22	20.0	19.36	167.704	0.33	※
	3	51.477	31.0	6.23	D22	20.0	19.36	167.704	0.34	※
	2	41.180	31.0	4.96	D22	20.0	19.36	167.704	0.27	※
	1	16.849	37.6	1.65	D22	20.0	19.36	206.044	0.09	
III'	7	1.011	37.6	0.10	D22	20.0	19.36	206.044	0.01	
	6	22.260	37.6	2.18	D22	20.0	19.36	206.044	0.12	
	5	52.675	37.6	5.22	D22	20.0	19.36	206.044	0.28	
	4	83.573	37.6	8.35	D22	20.0	19.36	206.044	0.45	
	3	114.172	37.6	11.52	D22	20.0	19.36	206.044	0.61	
	2	118.423	37.6	11.97	D22	20.0	19.36	206.044	0.63	
	1	0.000	37.6	0.00	D22	20.0	19.36	206.044	0.00	

※ It determines from serviceability limit state.
Notes) I ～III : Before correction Slab of a middle part
Notes) I' ～III' : After correction Slab of side wall corner

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CHECKED BY	E. NISHIMURA	04/07/2002

Serviceability limit state

Sidewall(parallel to centerline:landside)—Horizontal outside steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm²)	σse (N/mm²)	Crack width W(cm)	Permission crack width W_{allo} (cm)
Ⅰ	7	39.984	31.0	D22	20.0	19.36	73.215	0.0163	
	6	39.551	31.0	D22	20.0	19.36	72.422	0.0161	0.0035×8.0
	5	41.673	31.0	D22	20.0	19.36	76.308	0.0170	=0.0280
	4	43.854	31.0	D22	20.0	19.36	80.302	0.0178	
	3	45.523	31.0	D22	20.0	19.36	83.358	0.0185	
	2	37.056	31.0	D22	20.0	19.36	67.854	0.0151	
	1	7.658	37.6	D22	20.0	19.36	11.471	0.0025	
Ⅱ	7	9.603	31.0	D22	20.0	19.36	17.584	0.0039	
	6	9.911	31.0	D22	20.0	19.36	18.148	0.0040	0.0035×8.0
	5	10.397	31.0	D22	20.0	19.36	19.038	0.0042	=0.0280
	4	11.001	31.0	D22	20.0	19.36	20.144	0.0045	
	3	11.753	31.0	D22	20.0	19.36	21.521	0.0048	
	2	11.791	31.0	D22	20.0	19.36	21.591	0.0048	
	1	4.614	37.6	D22	20.0	19.36	6.912	0.0015	
Ⅲ	7	0.738	37.6	D22	20.0	19.36	1.106	0.0002	
	6	10.703	37.6	D22	20.0	19.36	16.033	0.0036	0.0035×8.0
	5	25.005	37.6	D22	20.0	19.36	37.457	0.0083	=0.0280
	4	39.492	37.6	D22	20.0	19.36	59.158	0.0131	
	3	53.794	37.6	D22	20.0	19.36	80.582	0.0179	
	2	54.809	37.6	D22	20.0	19.36	82.102	0.0182	
	1	0.000	37.6	D22	20.0	19.36	0.000	0.0000	
Ⅰ'	7	41.254	31.0	D22	20.0	19.36	75.541	0.0168	
	6	40.807	31.0	D22	20.0	19.36	74.722	0.0166	0.0035×8.0
	5	42.978	31.0	D22	20.0	19.36	78.698	0.0175	=0.0280
	4	45.207	31.0	D22	20.0	19.36	82.779	0.0184	
	3	46.798	31.0	D22	20.0	19.36	85.692	0.0190	
	2	37.438	31.0	D22	20.0	19.36	68.553	0.0152	
	1	7.658	37.6	D22	20.0	19.36	11.471	0.0025	
Ⅲ'	7	0.460	37.6	D22	20.0	19.36	0.689	0.0002	
	6	10.117	37.6	D22	20.0	19.36	15.155	0.0034	0.0035×8.0
	5	23.942	37.6	D22	20.0	19.36	35.864	0.0080	=0.0280
	4	37.986	37.6	D22	20.0	19.36	56.902	0.0126	
	3	51.894	37.6	D22	20.0	19.36	77.736	0.0173	
	2	53.826	37.6	D22	20.0	19.36	80.630	0.0179	
	1	0.000	37.6	D22	20.0	19.36	0.000	0.0000	

Notes) Ⅰ ～Ⅲ : Before correction Slab of a middle part

Notes) Ⅰ' ～Ⅲ' : After correction Slab of side wall corner

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CHECKED BY	E. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Sidewall(parallel to centerline:landside)--Perpendicular inner side steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud	
I	7	0.000	31.0	0.00	D13	40.0	3.17	29.151	0.00	
	6	1.624	31.0	0.19	D13	40.0	3.17	29.151	0.06	
	5	4.466	31.0	0.53	D13	40.0	3.17	29.151	0.17	
	4	7.105	31.0	0.84	D13	40.0	3.17	29.151	0.27	
	3	11.977	31.0	1.42	D13	40.0	3.17	29.151	0.45	
	2	24.970	31.0	2.98	D13	20.0	6.34	57.636	0.48	
	1	71.903	31.0	8.78	D13,D19	10.0	20.66	178.101	0.44	※
II	7	0.000	31.0	0.00	D13	40.0	3.17	29.151	0.00	
	6	0.406	31.0	0.05	D13	40.0	3.17	29.151	0.02	
	5	1.015	31.0	0.12	D13	40.0	3.17	29.151	0.04	
	4	1.624	31.0	0.19	D13	40.0	3.17	29.151	0.06	
	3	3.654	31.0	0.43	D13	40.0	3.17	29.151	0.14	
	2	11.774	31.0	1.40	D13	40.0	3.17	29.151	0.44	
	1	43.180	31.0	5.20	D13,D13	10.0	12.67	112.544	0.42	※
III	7	0.000	31.0	0.00	D13	20.0	6.34	57.636	0.00	
	6	14.656	31.0	1.74	D13	20.0	6.34	57.636	0.28	
	5	15.472	31.0	1.84	D13	20.0	6.34	57.636	0.30	
	4	16.288	31.0	1.94	D13	20.0	6.34	57.636	0.31	
	3	17.203	31.0	2.05	D13	20.0	6.34	57.636	0.33	
	2	15.073	31.0	1.79	D13	20.0	6.34	57.636	0.29	
	1	0.000	31.0	0.00	D13	20.0	6.34	57.636	0.00	

※ It determines from serviceability limit state.

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CHECKED BY	R. NISHIMURA	09/08/2002

Serviceability limit state

Sidewall(parallel to centerline:landside)—Perpendicular inner side steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{lim}(cm)
I	7	0.000	31.0	D13	40.0	3.17	0.000	0.0000	
	6	0.738	31.0	D13	40.0	3.17	7.822	0.0023	0.0040×8.0
	5	2.030	31.0	D13	40.0	3.17	21.517	0.0064	=0.0320
	4	3.229	31.0	D13	40.0	3.17	34.226	0.0101	
	3	5.444	31.0	D13	40.0	3.17	57.704	0.0171	
	2	11.349	31.0	D13	20.0	6.34	61.114	0.0138	
	1	65.370	31.0	D13,D19	10.0	20.66	112.470	0.0214	
II	7	0.000	31.0	D13	40.0	3.17	0.000	0.0000	
	6	0.185	31.0	D13	40.0	3.17	1.961	0.0006	0.0040×8.0
	5	0.461	31.0	D13	40.0	3.17	4.886	0.0014	=0.0320
	4	0.738	31.0	D13	40.0	3.17	7.822	0.0023	
	3	1.661	31.0	D13	40.0	3.17	17.606	0.0052	
	2	5.352	31.0	D13	40.0	3.17	56.729	0.0168	
	1	39.257	31.0	D13,D13	10.0	12.67	108.060	0.0206	
III	7	0.000	31.0	D13	20.0	6.34	0.000	0.0000	
	6	13.322	31.0	D13	20.0	6.34	71.739	0.0162	0.0040×8.0
	5	14.065	31.0	D13	20.0	6.34	75.740	0.0171	=0.0320
	4	14.807	31.0	D13	20.0	6.34	79.736	0.0180	
	3	15.640	31.0	D13	20.0	6.34	84.221	0.0190	
	2	13.703	31.0	D13	20.0	6.34	73.791	0.0166	
	1	0.000	31.0	D13	20.0	6.34	0.000	0.0000	

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Ultimate limit state (Under ordinary conditions)
Sidewall(parallel to centerline:landside)--Perpendicular outside steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
I	7	0.000	29.0	0.00	D13	40.0	3.17	27.249	0.00
	6	6.932	29.0	0.88	D13	40.0	3.17	27.249	0.28
	5	7.471	29.0	0.95	D13	40.0	3.17	27.249	0.30
	4	8.078	29.0	1.03	D13	40.0	3.17	27.249	0.33
	3	10.127	29.0	1.29	D13	20.0	6.34	53.833	0.21
	2	17.421	29.0	2.22	D13	20.0	6.34	53.833	0.36
	1	100.690	35.6	10.73	D13,D13	10.0	12.67	130.031	0.85
II	7	0.000	29.0	0.00	D13	40.0	3.17	27.249	0.00
	6	1.559	29.0	0.20	D13	40.0	3.17	27.249	0.06
	5	1.653	29.0	0.21	D13	40.0	3.17	27.249	0.07
	4	1.946	29.0	0.25	D13	40.0	3.17	27.249	0.08
	3	3.058	29.0	0.39	D13	40.0	3.17	27.249	0.12
	2	8.002	29.0	1.02	D13	40.0	3.17	27.249	0.32
	1	61.307	35.6	6.44	D13,D13	10.0	12.67	130.031	0.52
III	7	0.000	35.6	0.00	D13	40.0	3.17	33.525	0.00
	6	3.857	35.6	0.40	D13	40.0	3.17	33.525	0.13
	5	9.135	35.6	0.94	D13	40.0	3.17	33.525	0.30
	4	14.413	35.6	1.49	D13	40.0	3.17	33.525	0.47
	3	19.691	35.6	2.04	D13	40.0	3.17	33.525	0.65
	2	20.097	35.6	2.08	D13	40.0	3.17	33.525	0.66
	1	0.000	35.6	0.00	D13	40.0	3.17	33.525	0.00

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CHECKED BY	E.NISHIMURA	07/02/2002

Serviceability limit state

Sidewall(parallel to centerline:landside)--Perpendicular outside steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm²)	σse (N/mm²)	Crack width W(cm)	Permission crack width W_{lim}(cm)
I	7	0.000	29.0	D13	40.0	3.17	0.000	0.0000	
	6	6.301	29.0	D13	40.0	3.17	71.487	0.0240	0.0035×10.0
	5	6.791	29.0	D13	40.0	3.17	77.047	0.0259	=0.0350
	4	7.344	29.0	D13	40.0	3.17	83.321	0.0280	
	3	9.207	29.0	D13	20.0	6.34	53.093	0.0141	
	2	15.838	29.0	D13	20.0	6.34	91.332	0.0243	
	1	45.766	35.6	D13,D13	10.0	12.67	109.176	0.0252	
II	7	0.000	29.0	D13	40.0	3.17	0.000	0.0000	
	6	1.417	29.0	D13	40.0	3.17	16.076	0.0054	0.0035×10.0
	5	1.503	29.0	D13	40.0	3.17	17.052	0.0057	=0.0350
	4	1.769	29.0	D13	40.0	3.17	20.070	0.0067	
	3	2.780	29.0	D13	40.0	3.17	31.540	0.0106	
	2	7.276	29.0	D13	40.0	3.17	82.549	0.0277	
	1	27.866	35.6	D13,D13	10.0	12.67	66.475	0.0153	
III	7	0.000	35.6	D13	40.0	3.17	0.000	0.0000	
	6	1.753	35.6	D13	40.0	3.17	16.138	0.0054	0.0035×10.0
	5	4.152	35.6	D13	40.0	3.17	38.224	0.0128	=0.0350
	4	6.551	35.6	D13	40.0	3.17	60.309	0.0202	
	3	8.950	35.6	D13	40.0	3.17	82.395	0.0276	
	2	9.135	35.6	D13	40.0	3.17	84.098	0.0282	
	1	0.000	35.6	D13	40.0	3.17	0.000	0.0000	

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CHECKED BY	E. NISHIMURA	09/08/2002

Examination of as opposed to slip out and load of a partition wall
(Ultimate limit state is examined)

Partition wall(perpendicular to levee normal)

B = 100cm

Section	Td (kN/m)	γb	γi	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Nud (kN/m)	γi·Td/Nud
Horizontal	266.88	1.15	1.10	9.79	D13,D13	10.0	12.67	380.100	0.77
Perpendicular	553.82	1.00	1.00	16.05	D13,D19	10.0	20.66	712.770	0.78

Partition wall(parallel to centerline)

B = 100cm

Section	Td (kN/m)	γb	γi	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Nud (kN/m)	γi·Td/Nud
Horizontal	260.03	1.15	1.10	9.53	D13,D13	10.0	12.67	380.100	0.75
Perpendicular	575.96	1.00	1.00	16.69	D13,D19	10.0	20.66	712.770	0.81

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CHECKED BY	R.NISHIKAWA	07/08/2002

Ultimate limit state (Under ordinary conditions)
Partition wall (perpendicular to levee normal) — Horizontal steel reinforcement
B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
I	7	10.602	10.0	4.07	D13,D13	10.0	12.67	32.727	0.36
	6	10.185	10.0	3.90	D13,D13	10.0	12.67	32.727	0.34
	5	10.209	10.0	3.91	D13,D13	10.0	12.67	32.727	0.34
	4	10.234	10.0	3.92	D13,D13	10.0	12.67	32.727	0.34
	3	10.234	10.0	3.92	D13,D13	10.0	12.67	32.727	0.34
	2	8.418	10.0	3.20	D13,D13	10.0	12.67	32.727	0.28
	1	2.307	10.0	0.85	D13,D13	10.0	12.67	32.727	0.08
II	7	2.577	10.0	0.95	D13,D13	10.0	12.67	32.727	0.09
	6	2.552	10.0	0.95	D13,D13	10.0	12.67	32.727	0.09
	5	2.552	10.0	0.95	D13,D13	10.0	12.67	32.727	0.09
	4	2.552	10.0	0.95	D13,D13	10.0	12.67	32.727	0.09
	3	2.626	10.0	0.97	D13,D13	10.0	12.67	32.727	0.09
	2	2.577	10.0	0.95	D13,D13	10.0	12.67	32.727	0.09
	1	1.374	10.0	0.51	D13,D13	10.0	12.67	32.727	0.05
III	7	21.523	10.0	8.73	D13,D13	10.0	12.67	32.727	0.72
	6	20.885	10.0	8.44	D13,D13	10.0	12.67	32.727	0.70
	5	20.787	10.0	8.40	D13,D13	10.0	12.67	32.727	0.70
	4	20.763	10.0	8.38	D13,D13	10.0	12.67	32.727	0.70
	3	20.983	10.0	8.48	D13,D13	10.0	12.67	32.727	0.71
	2	18.407	10.0	7.34	D13,D13	10.0	12.67	32.727	0.62
	1	0.000	10.0	0.00	D13,D13	10.0	12.67	32.727	0.00

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CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Partition wall(perpendicular to levee normal)－Horizontal steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm²)	σse (N/mm²)	Crack width W(cm)	Permission crack width W_{all}(cm)
I	7	4.819	10.0	D13,D13	10.0	12.67	43.224	0.0100	
	6	4.630	10.0	D13,D13	10.0	12.67	41.529	0.0096	0.0040×10.0
	5	4.641	10.0	D13,D13	10.0	12.67	41.627	0.0096	=0.0400
	4	4.652	10.0	D13,D13	10.0	12.67	41.726	0.0096	
	3	4.652	10.0	D13,D13	10.0	12.67	41.726	0.0096	
	2	3.826	10.0	D13,D13	10.0	12.67	34.317	0.0079	
	1	1.049	10.0	D13,D13	10.0	12.67	9.409	0.0022	
II	7	1.171	10.0	D13,D13	10.0	12.67	10.503	0.0024	
	6	1.160	10.0	D13,D13	10.0	12.67	10.405	0.0024	0.0040×10.0
	5	1.160	10.0	D13,D13	10.0	12.67	10.405	0.0024	=0.0400
	4	1.160	10.0	D13,D13	10.0	12.67	10.405	0.0024	
	3	1.194	10.0	D13,D13	10.0	12.67	10.710	0.0025	
	2	1.171	10.0	D13,D13	10.0	12.67	10.503	0.0024	
	1	0.625	10.0	D13,D13	10.0	12.67	5.606	0.0013	
III	7	9.783	10.0	D13,D13	10.0	12.67	87.748	0.0202	
	6	9.493	10.0	D13,D13	10.0	12.67	85.147	0.0196	0.0040×10.0
	5	9.449	10.0	D13,D13	10.0	12.67	84.752	0.0195	=0.0400
	4	9.438	10.0	D13,D13	10.0	12.67	84.654	0.0195	
	3	9.538	10.0	D13,D13	10.0	12.67	85.551	0.0197	
	2	8.367	10.0	D13,D13	10.0	12.67	75.047	0.0173	
	1	0.000	10.0	D13,D13	10.0	12.67	0.000	0.0000	

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CHECKED BY	E. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Partition wall(perpendicular to levee normal)—Perpendicular steel reinforcement
B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
I	7	0.000	10.0	0.00	D13	40.0	3.17	9.179	0.00
	6	1.644	10.0	0.61	D13	40.0	3.17	9.179	0.20
	5	1.669	10.0	0.62	D13	40.0	3.17	9.179	0.20
	4	1.693	10.0	0.63	D13	40.0	3.17	9.179	0.20
	3	1.939	10.0	0.72	D13	40.0	3.17	9.179	0.23
	2	3.240	10.0	1.20	D13	40.0	3.17	9.179	0.39
	1	13.842	10.0	5.39	D13,D19	10.0	20.66	47.933	0.32
II	7	0.000	10.0	0.00	D13	40.0	3.17	9.179	0.00
	6	0.368	10.0	0.14	D13	40.0	3.17	9.179	0.04
	5	0.368	10.0	0.14	D13	40.0	3.17	9.179	0.04
	4	0.393	10.0	0.14	D13	40.0	3.17	9.179	0.05
	3	0.540	10.0	0.20	D13	40.0	3.17	9.179	0.06
	2	1.423	10.0	0.52	D13	40.0	3.17	9.179	0.17
	1	8.222	10.0	3.12	D13,D19	10.0	20.66	47.933	0.19
III	7	0.000	10.0	0.00	D13	40.0	3.17	9.179	0.00
	6	3.485	10.0	1.30	D13	40.0	3.17	9.179	0.42
	5	3.460	10.0	1.29	D13	40.0	3.17	9.179	0.41
	4	3.460	10.0	1.29	D13	40.0	3.17	9.179	0.41
	3	3.510	10.0	1.31	D13	40.0	3.17	9.179	0.42
	2	3.068	10.0	1.14	D13	40.0	3.17	9.179	0.37
	1	0.000	10.0	0.00	D13,D19	10.0	20.66	47.933	0.00

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CHECKED BY	E. NISHIMURA	03/08/2002

Serviceability limit state

Partition wall (perpendicular to levee normal) --Perpendicular steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W (cm)	Permission crack width W_{ca} (cm)
I	7	0.000	10.0	D13	40.0	3.17	0.000	0.0000	
	6	0.747	10.0	D13	40.0	3.17	25.259	0.0085	0.0040×10.0
	5	0.759	10.0	D13	40.0	3.17	25.665	0.0086	=0.0400
	4	0.770	10.0	D13	40.0	3.17	26.037	0.0087	
	3	0.881	10.0	D13	40.0	3.17	29.790	0.0100	
	2	1.473	10.0	D13	40.0	3.17	49.809	0.0167	
	1	6.292	10.0	D13,D19	10.0	20.66	35.592	0.0082	
II	7	0.000	10.0	D13	40.0	3.17	0.000	0.0000	
	6	0.167	10.0	D13	40.0	3.17	5.647	0.0019	0.0040×10.0
	5	0.167	10.0	D13	40.0	3.17	5.647	0.0019	=0.0400
	4	0.178	10.0	D13	40.0	3.17	6.019	0.0020	
	3	0.245	10.0	D13	40.0	3.17	8.285	0.0028	
	2	0.647	10.0	D13	40.0	3.17	21.878	0.0073	
	1	3.737	10.0	D13,D19	10.0	20.66	21.139	0.0049	
III	7	0.000	10.0	D13	40.0	3.17	0.000	0.0000	
	6	1.584	10.0	D13	40.0	3.17	53.562	0.0180	0.0040×10.0
	5	1.573	10.0	D13	40.0	3.17	53.190	0.0178	=0.0400
	4	1.573	10.0	D13	40.0	3.17	53.190	0.0178	
	3	1.595	10.0	D13	40.0	3.17	53.934	0.0181	
	2	1.394	10.0	D13	40.0	3.17	47.137	0.0158	
	1	0.000	10.0	D13,D19	10.0	20.66	0.000	0.0000	

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CHECKED BY	E. NISHIHARA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Partition wall(parallele to centerline)—Horizontal steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
I	7	11.524	10.0	4.44	D13,D13	10.0	12.67	32.727	0.39
	6	11.043	10.0	4.25	D13,D13	10.0	12.67	32.727	0.37
	5	11.097	10.0	4.27	D13,D13	10.0	12.67	32.727	0.37
	4	11.150	10.0	4.29	D13,D13	10.0	12.67	32.727	0.37
	3	11.070	10.0	4.26	D13,D13	10.0	12.67	32.727	0.37
	2	8.696	10.0	3.31	D13,D13	10.0	12.67	32.727	0.29
	1	2.507	10.0	0.93	D13,D13	10.0	12.67	32.727	0.08
II	7	2.801	10.0	1.04	D13,D13	10.0	12.67	32.727	0.09
	6	2.774	10.0	1.03	D13,D13	10.0	12.67	32.727	0.09
	5	2.774	10.0	1.03	D13,D13	10.0	12.67	32.727	0.09
	4	2.801	10.0	1.04	D13,D13	10.0	12.67	32.727	0.09
	3	2.854	10.0	1.06	D13,D13	10.0	12.67	32.727	0.10
	2	2.748	10.0	1.02	D13,D13	10.0	12.67	32.727	0.09
	1	1.494	10.0	0.55	D13,D13	10.0	12.67	32.727	0.05
III	7	23.261	10.0	9.52	D13,D13	10.0	12.67	32.727	0.78
	6	22.594	10.0	9.22	D13,D13	10.0	12.67	32.727	0.76
	5	22.540	10.0	9.19	D13,D13	10.0	12.67	32.727	0.76
	4	22.567	10.0	9.20	D13,D13	10.0	12.67	32.727	0.76
	3	22.701	10.0	9.27	D13,D13	10.0	12.67	32.727	0.76
	2	19.206	10.0	7.69	D13,D13	10.0	12.67	32.727	0.65
	1	0.000	10.0	0.00	D13,D13	10.0	12.67	32.727	0.00

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CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Partition wall (parallele to centerline) — Horizontal steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W (cm)	Permission crack width W_{all} (cm)
I	7	5.238	10.0	D13,D13	10.0	12.67	46.982	0.0108	
	6	5.020	10.0	D13,D13	10.0	12.67	45.027	0.0104	0.0040×10.0
	5	5.044	10.0	D13,D13	10.0	12.67	45.242	0.0104	=0.0400
	4	5.068	10.0	D13,D13	10.0	12.67	45.457	0.0105	
	3	5.032	10.0	D13,D13	10.0	12.67	45.134	0.0104	
	2	3.953	10.0	D13,D13	10.0	12.67	35.456	0.0082	
	1	1.140	10.0	D13,D13	10.0	12.67	10.225	0.0024	
II	7	1.273	10.0	D13,D13	10.0	12.67	11.418	0.0026	
	6	1.261	10.0	D13,D13	10.0	12.67	11.310	0.0026	0.0040×10.0
	5	1.261	10.0	D13,D13	10.0	12.67	11.310	0.0026	=0.0400
	4	1.273	10.0	D13,D13	10.0	12.67	11.418	0.0026	
	3	1.297	10.0	D13,D13	10.0	12.67	11.633	0.0027	
	2	1.249	10.0	D13,D13	10.0	12.67	11.203	0.0026	
	1	0.679	10.0	D13,D13	10.0	12.67	6.090	0.0014	
III	7	10.573	10.0	D13,D13	10.0	12.67	94.834	0.0219	
	6	10.270	10.0	D13,D13	10.0	12.67	92.116	0.0212	0.0040×10.0
	5	10.246	10.0	D13,D13	10.0	12.67	91.901	0.0212	=0.0400
	4	10.258	10.0	D13,D13	10.0	12.67	92.009	0.0212	
	3	10.318	10.0	D13,D13	10.0	12.67	92.547	0.0213	
	2	8.730	10.0	D13,D13	10.0	12.67	78.303	0.0181	
	1	0.000	10.0	D13,D13	10.0	12.67	0.000	0.0000	

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CHECKED BY	R. NISHIHUDA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Partition wall(parallele to centerline)—Perpendicular steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
I	7	0.000	10.0	0.00	D13	40.0	3.17	9.179	0.00
	6	1.787	10.0	0.66	D13	40.0	3.17	9.179	0.21
	5	1.814	10.0	0.67	D13	40.0	3.17	9.179	0.22
	4	1.867	10.0	0.69	D13	40.0	3.17	9.179	0.22
	3	2.214	10.0	0.82	D13	40.0	3.17	9.179	0.27
	2	3.628	10.0	1.35	D13	40.0	3.17	9.179	0.43
	1	15.071	10.0	5.91	D13,D19	10.0	20.66	47.933	0.35
II	7	0.000	10.0	0.00	D13	40.0	3.17	9.179	0.00
	6	0.400	10.0	0.15	D13	40.0	3.17	9.179	0.05
	5	0.400	10.0	0.15	D13	40.0	3.17	9.179	0.05
	4	0.453	10.0	0.17	D13	40.0	3.17	9.179	0.05
	3	0.667	10.0	0.25	D13	40.0	3.17	9.179	0.08
	2	1.654	10.0	0.61	D13	40.0	3.17	9.179	0.20
	1	9.016	10.0	3.44	D13,D19	10.0	20.66	47.933	0.21
III	7	0.000	10.0	0.00	D13	40.0	3.17	9.179	0.00
	6	3.761	10.0	1.40	D13	40.0	3.17	9.179	0.45
	5	3.761	10.0	1.40	D13	40.0	3.17	9.179	0.45
	4	3.761	10.0	1.40	D13	40.0	3.17	9.179	0.45
	3	3.788	10.0	1.41	D13	40.0	3.17	9.179	0.45
	2	3.201	10.0	1.19	D13	40.0	3.17	9.179	0.38
	1	0.000	10.0	0.00	D13,D19	10.0	20.66	47.933	0.00

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CHECKED BY	R. NISHIMURA	01/08/2002

Serviceability limit state

Partition wall(parallele to centerline)--Perpendicular steel reinforcement

B = 100cm

NO		Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{ia}(cm)
I	7	0.000	10.0	D13	40.0	3.17	0.000	0.0000	
	6	0.812	10.0	D13	40.0	3.17	27.457	0.0092	0.0040×10.0
	5	0.825	10.0	D13	40.0	3.17	27.897	0.0094	=0.0400
	4	0.849	10.0	D13	40.0	3.17	28.708	0.0096	
	3	1.006	10.0	D13	40.0	3.17	34.017	0.0114	
	2	1.649	10.0	D13	40.0	3.17	55.760	0.0187	
	1	6.851	10.0	D13,D19	10.0	20.66	38.754	0.0089	
II	7	0.000	10.0	D13	40.0	3.17	0.000	0.0000	
	6	0.182	10.0	D13	40.0	3.17	6.154	0.0021	0.0040×10.0
	5	0.182	10.0	D13	40.0	3.17	6.154	0.0021	=0.0400
	4	0.206	10.0	D13	40.0	3.17	6.966	0.0023	
	3	0.303	10.0	D13	40.0	3.17	10.246	0.0034	
	2	0.752	10.0	D13	40.0	3.17	25.428	0.0085	
	1	4.098	10.0	D13,D19	10.0	20.66	23.181	0.0053	
III	7	0.000	10.0	D13	40.0	3.17	0.000	0.0000	
	6	1.710	10.0	D13	40.0	3.17	57.823	0.0194	0.0040×10.0
	5	1.710	10.0	D13	40.0	3.17	57.823	0.0194	=0.0400
	4	1.710	10.0	D13	40.0	3.17	57.823	0.0194	
	3	1.722	10.0	D13	40.0	3.17	58.228	0.0195	
	2	1.455	10.0	D13	40.0	3.17	49.200	0.0165	
	1	0.000	10.0	D13,D19	10.0	20.66	0.000	0.0000	

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CHECKED BY	E. NISHIMURA	09/06/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(A Room)—Perpendicular to levee norrmal An upper steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
I	5	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00
	4	40.862	53.0	2.84	D13	20.0	6.34	99.479	0.45
	3	92.207	53.0	6.47	D13,D13	10.0	12.67	196.171	0.52
	2	45.144	53.0	3.14	D13	20.0	6.34	99.479	0.50
	1	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00
II	5	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00
	4	24.927	53.0	1.73	D13	20.0	6.34	99.479	0.28
	3	51.922	53.0	3.62	D13	20.0	6.34	99.479	0.57
	2	27.957	53.0	1.94	D13	20.0	6.34	99.479	0.31
	1	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00
III	5	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00
	4	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00
	3	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00
	2	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00
	1	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00

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CHECKED BY	E. NISHIMURA	07/08/2001