Case.1 Date

1. Design Conditions

(1) Dimensions

Crest elevation	+ 5.000 (m)
Crest elevation of caisson	+ 2.000 (m)
Bottom end of caisson	− 14.500 (m)

(2) Tidal levels

R.W.L	± 1.040 (m)
L.W.L	− 0.130 (m)

(3) Unit Weight

Reinforced concrete	24.00 (kN/m³)
Concrete lid	22.60 (kN/m³)
Filling materials(Air)	20.00 (kN/m³)
Filling materials(submerged)	10.00 (kN/m³)
Seawater	10.10 (kN/m³)
Materials of ballast (while afloat)	18.00 (kN/m³)
Materials of ballast (after construction)	20.00 (kN/m³)
Friction increasing mat	22.60 (kN/m³)

(4) Materials

Steel reinforcements

Tensile yield strength $f'_{yk} =$ 345.0 (N/mm²)

Design tensile yield strength $f'_{yd} = f'_{yk}/\gamma_s$

Modulus of elasticty $E_s =$ 200.0 (kN/mm²)

Concrete

Compressive yield strength $f'_{ck} =$ 24.0 (N/mm²)

Design compressive yield strength $f'_{cd} = f'_{ck}/\gamma_c$

Modulus of elasticty $E_c =$ 25.0 (kN/mm²)

(5) Arrangement of a steel reinforcement

Coverring for steel reinforcement

Outer wall Outer side	8.0 (cm)
Outer wall Inner side	6.0 (cm)
Bottom slab Outer side	8.0 (cm)
Bottom slab Inner side	6.0 (cm)
Footing Outer side	8.0 (cm)
Footing Inner side	8.0 (cm)

Use path

D 29 ~ D 13

Steel reinforcement interval

20.0 cm or 10.0 cm

Coefficient of earth pressure of filling

K = 0.60

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2. Design Loads

(1) While afloat

Sidewall

hydrostatic pressure of draft +1.000 (m) is considered.

$Sf = (6.910 + 1.000 - 0.600 / 2 - 0.000) \times 10.10 = 76.86 (kN/m^2)$

Ultimate limit state

$P = 1.1 \cdot Sf = 84.55 (kN/m^2)$

Serviceability limit state

$P = 0.5 \cdot Sf = 38.43 (kN/m^2)$

Bottom Slab

It considers as the load which pulled the bottom slab deadweight from hydrostatic pressure at the bottom of caisson

$Sf = (6.910 + 1.000) \times 10.10 = 79.89 (kN/m^2)$

$Df = (-0.600 \times 24.00) + (0.000 \times 18.00) + (0.000 \times 22.60)$

$= -14.40 (kN/m^2)$

Ultimate limit state

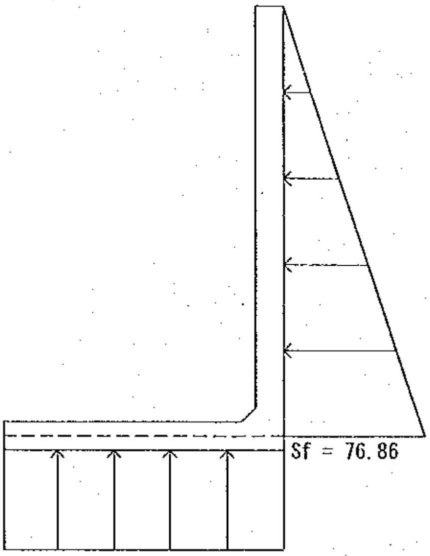
$P = 1.1 \cdot Sf + 0.9 \cdot Df = 74.92 (kN/m^2)$

Serviceability limit state

$P = 0.5 \cdot Sf + 0.5 \cdot Df = 32.75 (kN/m^2)$

Partition Walls

Although water pressure receives and compression power is received, since it is generally safe, examination is omitted.



Ultimate limit state 74.92 Serviceability limit state 32.75

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(2) During Installation

Partition Walls

The hydrostatic head(1.00(m)) between chambers should be applied

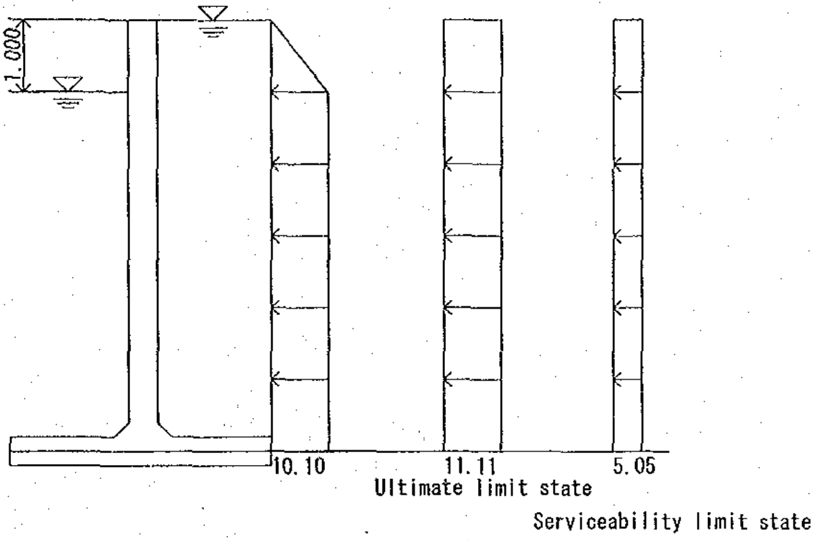
S = 1.000 × 10.10 = 10.10(kN/m²)

Ultimate limit state

Q = 1.1 · S = 11.11(kN/m²)

Serviceability limit state

Q = 0.5 · S = 5.05(kN/m²)



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(3) After Construction

Sidewall(perpendicular to levee normal

Internal earth pressure (K = 0.60)

P1 = (20.000 + 54.000 + 0.500 × 22.60) × 0.60 = 51.18(kN/m^2)
P2 = 51.18 + (4.600 × 10.00) × 0.60 = 78.78(kN/m^2)
D = 1/2 × (51.18 + 78.78) × 4.600 + 78.78 × 11.100
= 1173.37(kN/m)

Internal water pressure

P = 1.630 × 10.10 = 16.46(kN/m^2)
S = 1/2 × 16.46 × 1.630 + 16.46 × 14.070 = 245.01(kN/m)

Design loads

It converts into uniform load and triangular distribution load to which sum total load and load area become equal, and considers as design load.

Ultimate limit state

P = 1.1 · D + 1.1 · S = 1560.22(kN/m)

Trapezoid load

Lower bottom

P = 78.78 × 1.1 + 16.46 × 1.1 = 104.76(kN/m^2)

Raised bottom

$$P = 2 \times \frac{1560.22}{16.200} - 104.76 = 87.86(\mathrm{kN/m^2})$$

Serviceability limit state

P = 1.0 · D + 1.0 · S = 1418.38(kN/m)

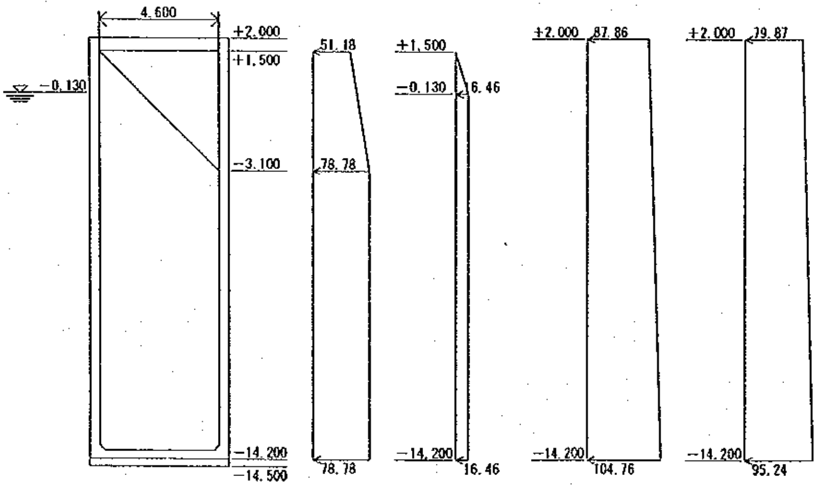
Trapezoid load

Lower bottom

P = 78.78 × 1.0 + 16.46 × 1.0 = 95.24(kN/m^2)

Raised bottom

$$P = 2 \times \frac{1418.38}{16.200} - 95.24 = 79.87(\mathrm{kN/m^2})$$



Internal earth pressure
D

Internal water pressure
S

Ultimate limit state
Design load
W

Serviceability limit state
Design load
W

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Front wall(parallel to centerline : seaside)

Internal earth pressure (K = 0.60)

P1 = (20.000 + 54.000 + 0.500 × 22.60) × 0.60 = 51.18 (kN/m^2)

P2 = 51.18 + (4.400 × 10.00) × 0.60 = 77.58 (kN/m^2)

D = 1/2 × (51.18 + 77.58) × 4.400 + 77.58 × 11.300
= 1159.93 (kN/m)

Internal water pressure

P = 1.630 × 10.10 = 16.46 (kN/m^2)

S = 1/2 × 16.46 × 1.630 + 16.46 × 14.070 = 245.01 (kN/m)

Design loads

It converts into uniform load and triangular distribution load to which sum total load and load area become equal, and considers as design load.

Ultimate limit state

P = 1.1 · D + 1.1 · S = 1545.43 (kN/m)

Trapezoid load

Lower bottom

P = 77.58 × 1.1 + 16.46 × 1.1 = 103.44 (kN/m^2)

Raised bottom

$$P = 2 \times \frac{1545.43}{16.200} - 103.44 = 87.35\ (\mathrm{kN/m^2})$$

Serviceability limit state

P = 1.0 · D + 1.0 · S = 1404.94 (kN/m)

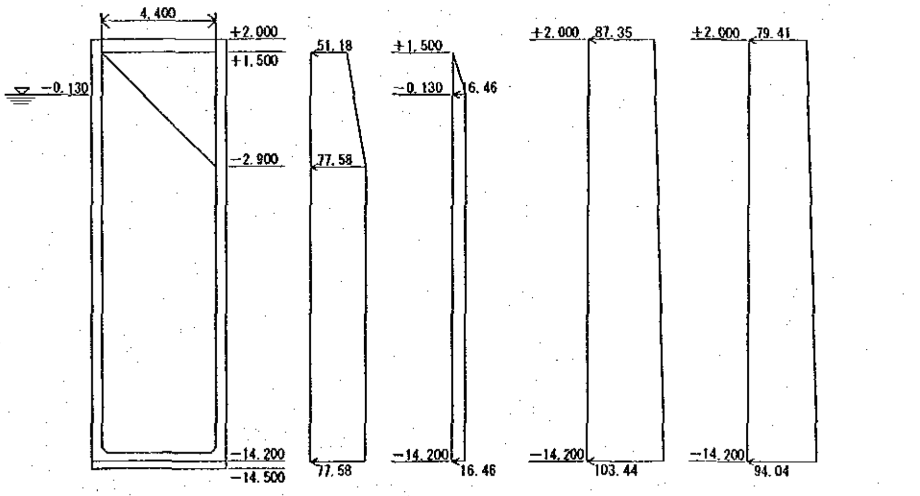
Trapezoid load

Lower bottom

P = 77.58 × 1.0 + 16.46 × 1.0 = 94.04 (kN/m^2)

Raised bottom

$$P = 2 \times \frac{1404.94}{16.200} - 94.04 = 79.41\ (\mathrm{kN/m^2})$$



Internal earth pressure
D

Internal water pressure
S

Ultimate limit state
Design load
W

Serviceability limit state
Design load
W

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Rear wall(parallel to centerline : landside)

Internal earth pressure (K = 0.60)

P1 = (20.000 + 54.000 + 0.500 × 22.60) × 0.60 = 51.18 (kN/m²)

P2 = 51.18 + (4.400 × 10.00) × 0.60 = 77.58 (kN/m²)

D = 1/2 × (51.18 + 77.58) × 4.400 + 77.58 × 11.300

= 1159.93 (kN/m)

Internal water pressure

P = 1.630 × 10.10 = 16.46 (kN/m²)

S = 1/2 × 16.46 × 1.630 + 16.46 × 14.070 = 245.01 (kN/m)

Design loads

It converts into uniform load and triangular distribution load to which sum total load and load area become equal, and considers as design load.

Ultimate limit state

P = 1.1 · D + 1.1 · S = 1545.43 (kN/m)

Trapezoid load

Lower bottom

P = 77.58 × 1.1 + 16.46 × 1.1 = 103.44 (kN/m²)

Raised bottom

$$P = 2 \times \frac{1545.43}{16.200} - 103.44 = 87.35\ (\mathrm{kN/m^2})$$

Serviceability limit state

P = 1.0 · D + 1.0 · S = 1404.94 (kN/m)

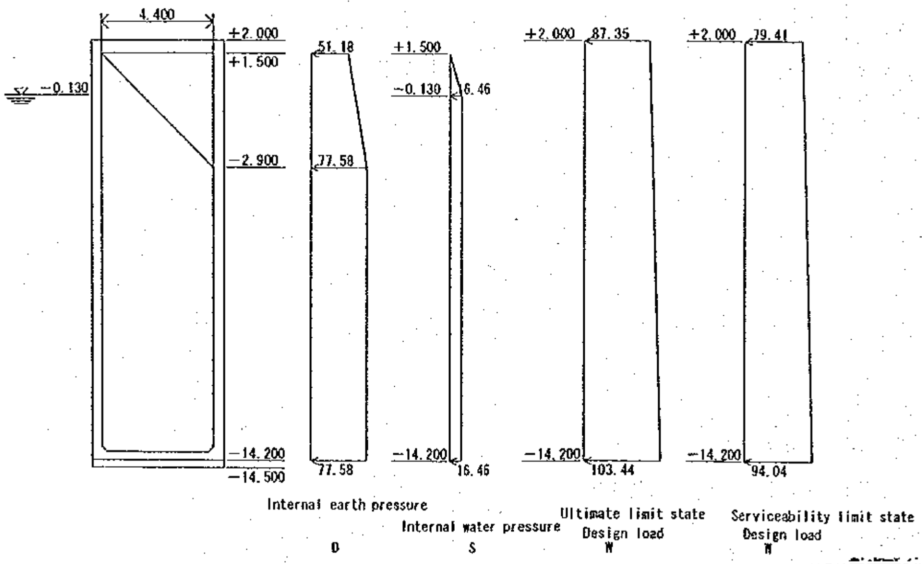
Trapezoid load

Lower bottom

P = 77.58 × 1.0 + 16.46 × 1.0 = 94.04 (kN/m²)

Raised bottom

$$P = 2 \times \frac{1404.94}{16.200} - 94.04 = 79.41\ (\mathrm{kN/m^2})$$



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Summary of design load

- Ultimate limit state
- Sidewall(perpendicular to levee normal)
    - Load from an inner side
        - Raised bottom = 87.86(kN/m^2)
        - Lower bottom = 104.76(kN/m^2)
    - Load from an outside
        - Raised bottom = 0.00(kN/m^2)
        - Lower bottom = 0.00(kN/m^2)
- Front wall(parallel to centerline:seaside)
    - Load from an inner side
        - Raised bottom = 87.35(kN/m^2)
        - Lower bottom = 103.44(kN/m^2)
    - Load from an outside
        - Raised bottom = 0.00(kN/m^2)
        - Lower bottom = 0.00(kN/m^2)
- Front wall(parallel to centerline:landside)
    - Load from an inner side
        - Raised bottom = 87.35(kN/m^2)
        - Lower bottom = 103.44(kN/m^2)
    - Load from an outside
        - Raised bottom = 0.00(kN/m^2)
        - Lower bottom = 0.00(kN/m^2)
- Serviceability limit state
- Sidewall(perpendicular to levee normal)
    - Load from an inner side
        - Raised bottom = 79.87(kN/m^2)
        - Lower bottom = 95.24(kN/m^2)
    - Load from an outside
        - Raised bottom = 0.00(kN/m^2)
        - Lower bottom = 0.00(kN/m^2)
- Front wall(parallel to centerline:seaside)
    - Load from an inner side
        - Raised bottom = 79.41(kN/m^2)
        - Lower bottom = 94.04(kN/m^2)
    - Load from an outside
        - Raised bottom = 0.00(kN/m^2)
        - Lower bottom = 0.00(kN/m^2)
- Front wall(parallel to centerline:landside)
    - Load from an inner side
        - Raised bottom = 79.41(kN/m^2)
        - Lower bottom = 94.04(kN/m^2)
    - Load from an outside
        - Raised bottom = 0.00(kN/m^2)
        - Lower bottom = 0.00(kN/m^2)

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Bottom Slab , Footing

Under ordinary conditions

Combination of load (Design loads)

Deadweight—Partition room

D =concrete lid + sand of filling + materials of ballast + bottom slab + loading load

= 0.50 × 22.60 + 15.40 × 20.00 + 0.00 × 20.00

\+ 0.60 × 24.00 + 54.00

= 387.70(kN/m^2)

Deadweight—Footing

Deadweight+Loading load

The tip by the side of the sea = 0.50 ×(24.00 - 10.10) + 0.000 = 6.95(kN/m^2)

The root by the side of the sea = 0.70 ×(24.00 - 10.10) + 0.000 = 9.73(kN/m^2)

The root by the side of land = 0.70 ×(24.00 - 10.10) + 219.680 = 229.41(kN/m ^{2})

The tip by the side of land = 0.50 ×(24.00 - 10.10) + 221.680 = 228.63(kN/m ^{2})

Bottom slab reaction — under ordinary condition D0

sea side= 320.76(kN/m^2), land side = 199.65(kN/m^2)、Action width = 21.000(m)

Hydrostatic pressure Under R.W.L

F = (R.W.L - Installation depth of water) ・ γw

= { 1.040 - (-14.500)} × 10.10 = 156.95(kN/m^2)

Surcharge—Partition room

W = 20.00(kN/m^2)

Surcharge—Footing

The tip by the side of the sea = = 0.00(kN/m^2)

The root by the side of the sea = = 0.00(kN/m^2)

The root by the side of land = = 20.00(kN/m^2)

The tip by the side of land = = 20.00(kN/m^2)

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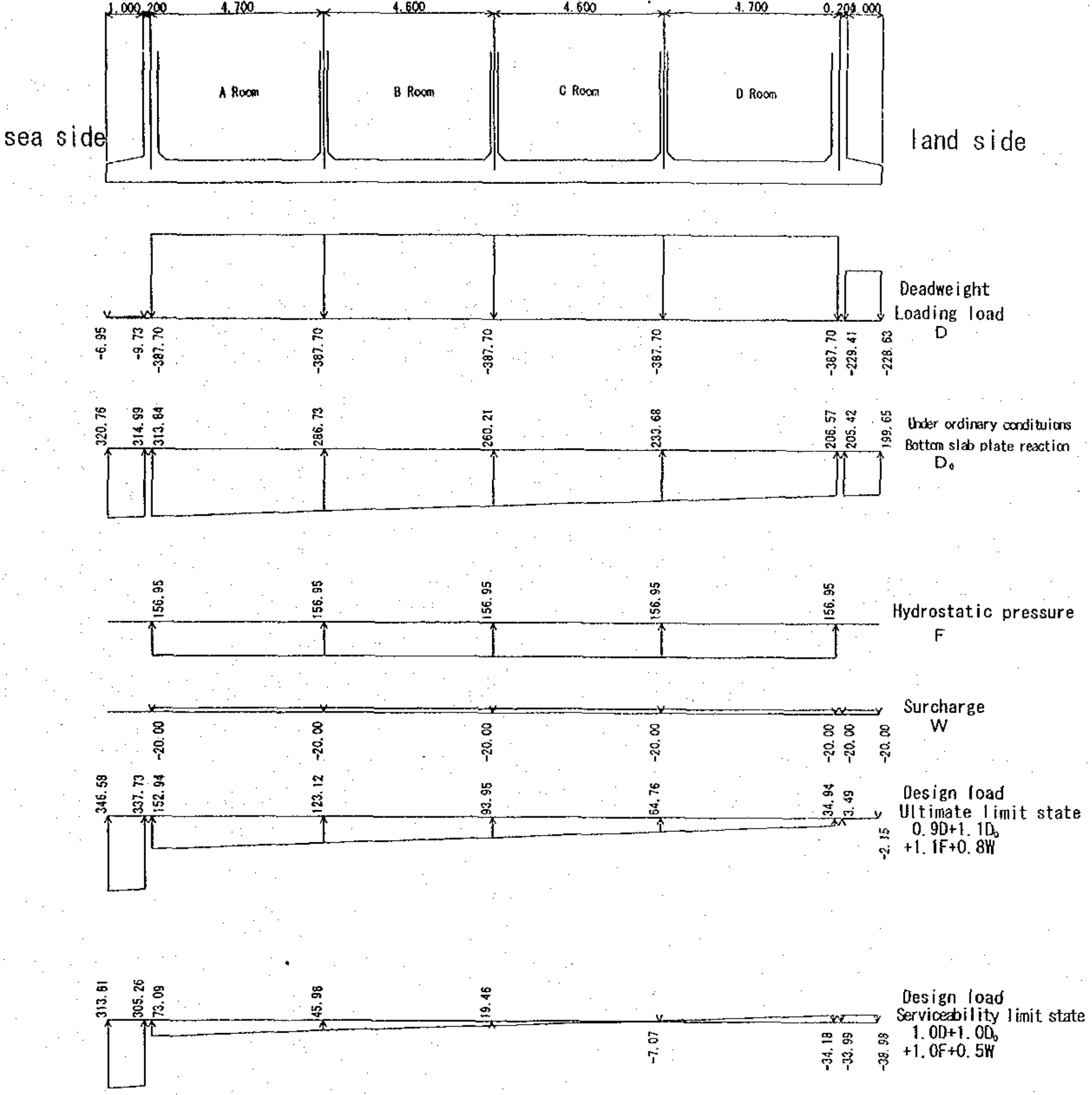
Loads Diagram



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During an earthquake
Combination of load (Design loads)

Deadweight—Partition room
D =concrete lid + sand of filling + materials of ballast + bottom slab + loading load
= 0.50 × 22.60 + 15.40 × 20.00 + 0.00 × 20.00
+ 0.60 × 24.00 + 54.00
= 387.70 (kN/m^2)

Deadweight—Footing
Deadweight+Loading load
Sea side tip = 0.50 ×(24.00 - 10.10) + 0.000 = 6.95 (kN/m^2)
Sea side root = 0.70 ×(24.00 - 10.10) + 0.000 = 9.73 (kN/m^2)
Land side root = 0.70 ×(24.00 - 10.10) + 219.680 = 229.41 (kN/m^2)
Land side tip = 0.50 ×(24.00 - 10.10) + 221.680 = 228.63 (kN/m^2)

Bottom slab reaction —During an eathquake R''
Sea side= 601.37 (kN/m^2)、Land side= 0.00 (kN/m^2)、Action width = 18.420 (m)

Hydrostatic pressure Under R.W.L
F = (R.W.L - Installation depth of water) · γw
= { 1.040 - (-14.500)} × 10.10 = 156.95 (kN/m^2)

Surcharge—Partition room
W = 10.00 (kN/m^2)

Surcharge—Footing
The tip by the side of the sea = 0.00 (kN/m^2)
The root by the side of the sea = 0.00 (kN/m^2)
The root by the side of land = 10.00 (kN/m^2)
The tip by the side of land = 10.00 (kN/m^2)

The irregular form in case of an earthquake is converted into uniform load and triangular distribution load

- Calculation of Σ A
1/2 ×(-132.360 - 240.750) × 3.320 = -619.36 (kN/m^2)
1/2 ×(-240.750 - 240.750) × 1.380 = -332.24 (kN/m^2)
Σ A = -951.60 (kN/m^2)

- Conversion load
P1 = -240.75 (kN/m^2)
P2 = (2 · Σ A / L) - P1
= (2 ×(-951.60) / 4.700) - (-240.75) = -164.19 (kN/m^2)

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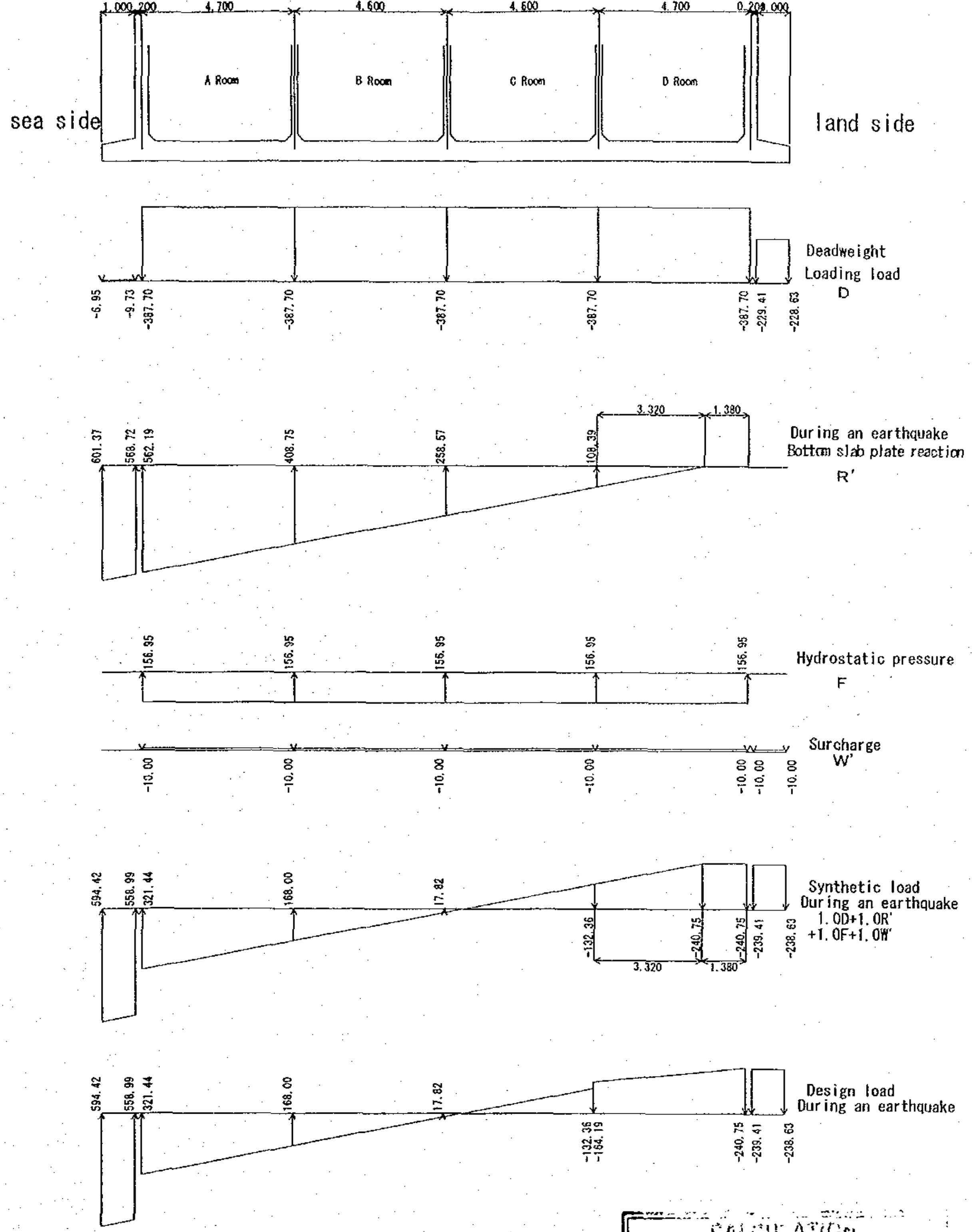
Loads Diagram



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(4) Dislodging of partition wall

To dislodging of a side wall, the maximum load strength of the composite load calculated on the occasion of the design of a side wall is used. (as the load per unit length)

a) Dislodging of partition wall and side wall

1) Partition wall(perpendicular to levee normal) and Side wall(parallel to centerline)

$$L = \frac{4.900 + 4.875}{2} = 4.888 \text{(m)}$$

$$T_d = 103.44 \times 4.888 = 505.61 \text{(kN/m)}$$

2) Partition wall(parallel to centerline) and Side wall(perpendicular to levee normal)

$$L = \frac{4.700 + 4.600}{2} = 4.650 \text{(m)}$$

$$T_d = 104.76 \times 4.650 = 487.13 \text{(kN/m)}$$

b) Dislodging of partition wall and bottom wall

The maximum facing-down load is used for load among the external force which acts on the bottom slab at the time of completion

Load calculation of the bottom slab is used $W = 240.75 \text{(kN/m}^2\text{)}$

1) Partition wall(perpendicular to levee normal) and Bottom slab

$$P1 = \frac{2}{3} \cdot W \cdot LX$$

$$= \frac{2}{3} \times 240.75 \times 4.700 = 754.35 \text{(kN/m)}$$

2) Partition wall(parallel to centerline) and Bottom slab

$$P2 = W \cdot LX \cdot (1 - \frac{LX^2}{3 \times LY^2})$$

$$= 240.75 \times 4.700 \times (1 - \frac{4.700^2}{3 \times 4.900^2}) = 784.51 \text{(kN/m)}$$

3. The component which acts on each part material calculation of power

Side wall

Calculation of bending moment uses the monography of slab

Note) The mark of bending moment (+) : inside tensile
(-) : outside tensile

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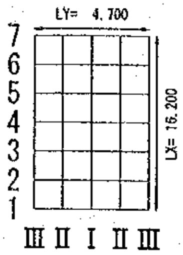
Ultimate limit state

Sidewall(perpendicular to levee normal)

(1) While afloat

slab fixed on three sides and free on one side



P1 = 0.00(kN/m^2)
P2 = 84.55(kN/m^2)
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 triangular distribution load

P = 84.55(kN/m^2)
$MX = P \cdot LY^2 \cdot X = 84.55 \times 4.700^2 \times X = 1867.71 \times X$
$MY = P \cdot LY^2 \cdot Y = 84.55 \times 4.700^2 \times Y = 1867.71 \times Y$

		X	MX	Y	MY
Ⅰ	7	0.0000	0.000	0.0027	5.043
	6	0.0009	1.681	0.0071	13.261
	5	0.0022	4.109	0.0139	25.961
	4	0.0035	6.537	0.0209	39.035
	3	0.0055	10.272	0.0279	52.109
	2	0.0119	22.226	0.0278	51.922
	1	-0.0500	-93.386	-0.0083	-15.502
Ⅱ	7	0.0000	0.000	0.0003	0.560
	6	0.0003	0.560	0.0017	3.175
	5	0.0005	0.934	0.0034	6.350
	4	0.0008	1.494	0.0052	9.712
	3	0.0015	2.802	0.0072	13.448
	2	0.0054	10.086	0.0088	16.436
	1	-0.0303	-56.592	-0.0050	-9.339
Ⅲ	7	0.0000	0.000	-0.0002	-0.374
	6	-0.0019	-3.549	-0.0112	-20.918
	5	-0.0045	-8.405	-0.0269	-50.241
	4	-0.0072	-13.448	-0.0429	-80.125
	3	-0.0098	-18.304	-0.0588	-109.821
	2	-0.0104	-19.424	-0.0622	-116.172
	1	0.0000	0.000	0.0000	0.000

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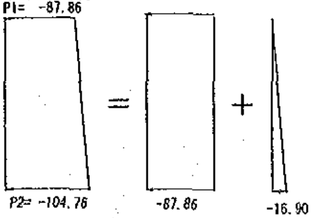
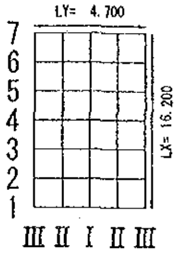
(2) After Construction

slab fixed on three sides and free on one side

P1 = -87.86(kN/m^2)
P2 = -104.76(kN/m^2)
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.

(i) Section force by equivalent uniform load

P = -87.86(kN/m^2)
$MX = P \cdot LY^2 \cdot X = -87.86 \times 4.700^2 \times X = -1940.83 \times X$
$MY = P \cdot LY^2 \cdot Y = -87.86 \times 4.700^2 \times Y = -1940.83 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0432	-83.844
	6	0.0067	-13.004	0.0415	-80.544
	5	0.0068	-13.198	0.0416	-80.738
	4	0.0069	-13.392	0.0417	-80.932
	3	0.0079	-15.333	0.0417	-80.932
	2	0.0132	-25.619	0.0343	-66.570
	1	-0.0564	109.463	-0.0094	18.244
II	7	0.0000	0.000	0.0105	-20.379
	6	0.0015	-2.911	0.0104	-20.185
	5	0.0015	-2.911	0.0104	-20.185
	4	0.0016	-3.105	0.0104	-20.185
	3	0.0022	-4.270	0.0107	-20.767
	2	0.0058	-11.257	0.0105	-20.379
	1	-0.0335	65.018	-0.0056	10.869
III	7	0.0000	0.000	-0.0877	170.211
	6	-0.0142	27.560	-0.0851	165.164
	5	-0.0141	27.366	-0.0847	164.388
	4	-0.0141	27.366	-0.0846	164.194
	3	-0.0143	27.754	-0.0855	165.941
	2	-0.0125	24.260	-0.0750	145.562
	1	0.0000	0.000	0.0000	0.000

(ii)Section force by triangular distribution load

$P = -16.90 (kN/m^2)$

$MX = P \cdot LY^2 \cdot X = -16.90 \times 4.700^2 \times X = -373.32 \times X$

$MY = P \cdot LY^2 \cdot Y = -16.90 \times 4.700^2 \times Y = -373.32 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0027	-1.008
	6	0.0009	-0.336	0.0071	-2.651
	5	0.0022	-0.821	0.0139	-5.189
	4	0.0035	-1.307	0.0209	-7.802
	3	0.0055	-2.053	0.0279	-10.416
	2	0.0119	-4.443	0.0278	-10.378
	1	-0.0500	18.666	-0.0083	3.099
II	7	0.0000	0.000	0.0003	-0.112
	6	0.0003	-0.112	0.0017	-0.635
	5	0.0005	-0.187	0.0034	-1.269
	4	0.0008	-0.299	0.0052	-1.941
	3	0.0015	-0.560	0.0072	-2.688
	2	0.0054	-2.016	0.0088	-3.285
	1	-0.0303	11.312	-0.0050	1.867
III	7	0.0000	0.000	-0.0002	0.075
	6	-0.0019	0.709	-0.0112	4.181
	5	-0.0045	1.680	-0.0269	10.042
	4	-0.0072	2.688	-0.0429	16.015
	3	-0.0098	3.659	-0.0588	21.951
	2	-0.0104	3.883	-0.0622	23.221
	1	0.0000	0.000	0.0000	0.000

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CHECKED	R.NISHIMURA	09/08/2002

The sum total of (i) and (ii)

		MX	MY
I	7	0. 000	-84. 852
	6	-13. 340	-83. 195
	5	-14. 019	-85. 927
	4	-14. 699	-88. 734
	3	-17. 386	-91. 348
	2	-30. 062	-76. 948
	1	128. 129	21. 343
II	7	0. 000	-20. 491
	6	-3. 023	-20. 820
	5	-3. 098	-21. 454
	4	-3. 404	-22. 126
	3	-4. 830	-23. 455
	2	-13. 273	-23. 664
	1	76. 330	12. 736
III	7	0. 000	170. 286
	6	28. 269	169. 345
	5	29. 046	174. 430
	4	30. 054	180. 209
	3	31. 413	187. 892
	2	28. 143	168. 783
	1	0. 000	0. 000

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R. [illegible] 09/08/2002

Sidewall(parallel to centerline)

(1) While afloat

slab fixed on three sides and free on one side

$P1 = 0.00 (kN/m^2)$

$P2 = 84.55 (kN/m^2)$

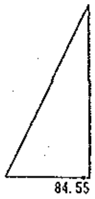
$LX = 16.200 (m)$

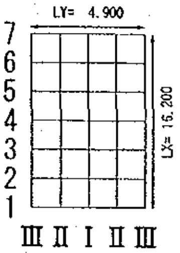
$LY = 4.900 (m)$

The ratio of a length of sides

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

The coefficient table of $\lambda = 3.25$ is used.





Section force by triangular distribution load

$P = 84.55 (kN/m^2)$

$MX = P \cdot LY^2 \cdot X = 84.55 \times 4.900^2 \times X = 2030.05 \times X$

$MY = P \cdot LY^2 \cdot Y = 84.55 \times 4.900^2 \times Y = 2030.05 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0029	5.887
	6	0.0008	1.624	0.0071	14.413
	5	0.0022	4.466	0.0139	28.218
	4	0.0035	7.105	0.0209	42.428
	3	0.0059	11.977	0.0277	56.232
	2	0.0123	24.970	0.0263	53.390
	1	-0.0496	-100.690	-0.0083	-16.849
Ⅱ	7	0.0000	0.000	0.0003	0.609
	6	0.0002	0.406	0.0017	3.451
	5	0.0005	1.015	0.0034	6.902
	4	0.0008	1.624	0.0052	10.556
	3	0.0018	3.654	0.0072	14.616
	2	0.0058	11.774	0.0086	17.458
	1	-0.0302	-61.307	-0.0050	-10.150
Ⅲ	7	0.0000	0.000	-0.0008	-1.624
	6	-0.0019	-3.857	-0.0116	-23.549
	5	-0.0045	-9.135	-0.0271	-55.014
	4	-0.0071	-14.413	-0.0428	-86.886
	3	-0.0097	-19.691	-0.0583	-118.352
	2	-0.0099	-20.097	-0.0594	-120.585
	1	0.0000	0.000	0.0000	0.000

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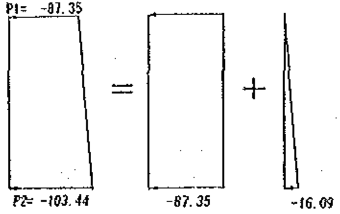
[illegible]	R.NISHIMURA	09/08/2002

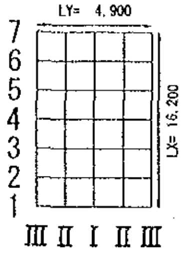
(2) After Construction

A. Sidewall (parallel to centerline:seaside)

slab fixed on three sides and free on one side

P1 = -87.35 $(\mathrm{kN/m^2})$
P2 = -103.44 $(\mathrm{kN/m^2})$
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.

(i) Section force by equivalent uniform load

P = -87.35 $(\mathrm{kN/m^2})$
$MX = P \cdot LY^2 \cdot X = -87.35 \times 4.900^2 \times X = -2097.27 \times X$
$MY = P \cdot LY^2 \cdot Y = -87.35 \times 4.900^2 \times Y = -2097.27 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0432	-90.602
	6	0.0067	-14.052	0.0414	-86.827
	5	0.0068	-14.261	0.0416	-87.247
	4	0.0070	-14.681	0.0418	-87.666
	3	0.0083	-17.407	0.0415	-87.037
	2	0.0136	-28.523	0.0326	-68.371
	1	-0.0565	118.496	-0.0094	19.714
II	7	0.0000	0.000	0.0105	-22.021
	6	0.0015	-3.146	0.0104	-21.812
	5	0.0015	-3.146	0.0104	-21.812
	4	0.0017	-3.565	0.0105	-22.021
	3	0.0025	-5.243	0.0107	-22.441
	2	0.0062	-13.003	0.0103	-21.602
	1	-0.0338	70.888	-0.0056	11.745
III	7	0.0000	0.000	-0.0872	182.882
	6	-0.0141	29.572	-0.0847	177.639
	5	-0.0141	29.572	-0.0845	177.220
	4	-0.0141	29.572	-0.0846	177.429
	3	-0.0142	29.781	-0.0851	178.478
	2	-0.0120	25.167	-0.0720	151.004
	1	0.0000	0.000	0.0000	0.000

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(ii)Section force by triangular distribution load

$P = -16.09 (\mathrm{kN/m^2})$

$MX = P \cdot LY^2 \cdot X = -16.09 \times 4.900^2 \times X = -386.32 \times X$

$MY = P \cdot LY^2 \cdot Y = -16.09 \times 4.900^2 \times Y = -386.32 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0029	-1.120
	6	0.0008	-0.309	0.0071	-2.743
	5	0.0022	-0.850	0.0139	-5.370
	4	0.0035	-1.352	0.0209	-8.074
	3	0.0059	-2.279	0.0277	-10.701
	2	0.0123	-4.752	0.0263	-10.160
	1	-0.0496	19.162	-0.0083	3.206
II	7	0.0000	0.000	0.0003	-0.116
	6	0.0002	-0.077	0.0017	-0.657
	5	0.0005	-0.193	0.0034	-1.313
	4	0.0008	-0.309	0.0052	-2.009
	3	0.0018	-0.695	0.0072	-2.782
	2	0.0058	-2.241	0.0086	-3.322
	1	-0.0302	11.667	-0.0050	1.932
III	7	0.0000	0.000	-0.0008	0.309
	6	-0.0019	0.734	-0.0116	4.481
	5	-0.0045	1.738	-0.0271	10.469
	4	-0.0071	2.743	-0.0428	16.535
	3	-0.0097	3.747	-0.0583	22.523
	2	-0.0099	3.825	-0.0594	22.947
	1	0.0000	0.000	0.0000	0.000

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The sum total of (i) and (ii)

		MX	MY
I	7	0.000	-91.722
	6	-14.361	-89.570
	5	-15.111	-92.617
	4	-16.033	-95.740
	3	-19.686	-97.738
	2	-33.275	-78.531
	1	137.658	22.920
II	7	0.000	-22.137
	6	-3.223	-22.469
	5	-3.339	-23.125
	4	-3.874	-24.030
	3	-5.938	-25.223
	2	-15.244	-24.924
	1	82.555	13.677
III	7	0.000	183.191
	6	30.306	182.120
	5	31.310	187.689
	4	32.315	193.964
	3	33.528	201.001
	2	28.992	173.951
	1	0.000	0.000

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B. Sidewall (parallel to centerline: landside)

slab fixed on three sides and free on one side

P1 = -87.35 (kN/m²)

P2 = -103.44 (kN/m²)

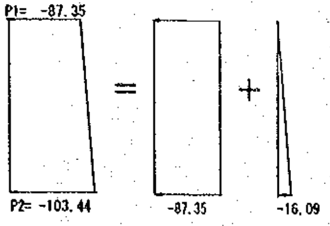
LX = 16.200 (m)

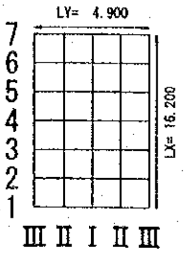
LY = 4.900 (m)

The ratio of a length of sides

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

The coefficient table of λ = 3.25 is used.





(i) Section force by equivalent uniform load

P = -87.35 (kN/m²)

$MX = P \cdot LY^2 \cdot X = -87.35 \times 4.900^2 \times X = -2097.27 \times X$

$MY = P \cdot LY^2 \cdot Y = -87.35 \times 4.900^2 \times Y = -2097.27 \times Y$

		X	MX	Y	MY
Ⅰ	7	0.0000	0.000	0.0432	-90.602
	6	0.0067	-14.052	0.0414	-86.827
	5	0.0068	-14.261	0.0416	-87.247
	4	0.0070	-14.681	0.0418	-87.666
	3	0.0083	-17.407	0.0415	-87.037
	2	0.0136	-28.523	0.0326	-68.371
	1	-0.0565	118.496	-0.0094	19.714
Ⅱ	7	0.0000	0.000	0.0105	-22.021
	6	0.0015	-3.146	0.0104	-21.812
	5	0.0015	-3.146	0.0104	-21.812
	4	0.0017	-3.565	0.0105	-22.021
	3	0.0025	-5.243	0.0107	-22.441
	2	0.0062	-13.003	0.0103	-21.602
	1	-0.0338	70.888	-0.0056	11.745
Ⅲ	7	0.0000	0.000	-0.0872	182.882
	6	-0.0141	29.572	-0.0847	177.639
	5	-0.0141	29.572	-0.0845	177.220
	4	-0.0141	29.572	-0.0846	177.429
	3	-0.0142	29.781	-0.0851	178.478
	2	-0.0120	25.167	-0.0720	151.004
	1	0.0000	0.000	0.0000	0.000

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(ii)Section force by triangular distribution load

$P = -16.09 (kN/m^2)$

$MX = P \cdot LY^2 \cdot X = -16.09 \times 4.900^2 \times X = -386.32 \times X$

$MY = P \cdot LY^2 \cdot Y = -16.09 \times 4.900^2 \times Y = -386.32 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0029	-1.120
	6	0.0008	-0.309	0.0071	-2.743
	5	0.0022	-0.850	0.0139	-5.370
	4	0.0035	-1.352	0.0209	-8.074
	3	0.0059	-2.279	0.0277	-10.701
	2	0.0123	-4.752	0.0263	-10.160
	1	-0.0496	19.162	-0.0083	3.206
II	7	0.0000	0.000	0.0003	-0.116
	6	0.0002	-0.077	0.0017	-0.657
	5	0.0005	-0.193	0.0034	-1.313
	4	0.0008	-0.309	0.0052	-2.009
	3	0.0018	-0.695	0.0072	-2.782
	2	0.0058	-2.241	0.0086	-3.322
	1	-0.0302	11.667	-0.0050	1.932
III	7	0.0000	0.000	-0.0008	0.309
	6	-0.0019	0.734	-0.0116	4.481
	5	-0.0045	1.738	-0.0271	10.469
	4	-0.0071	2.743	-0.0428	16.535
	3	-0.0097	3.747	-0.0583	22.523
	2	-0.0099	3.825	-0.0594	22.947
	1	0.0000	0.000	0.0000	0.000

The sum total of (i) and (ii)

		MX	MY
I	7	0.000	-91.722
	6	-14.361	-89.570
	5	-15.111	-92.617
	4	-16.033	-95.740
	3	-19.686	-97.738
	2	-33.275	-78.531
	1	137.658	22.920
II	7	0.000	-22.137
	6	-3.223	-22.469
	5	-3.339	-23.125
	4	-3.874	-24.030
	3	-5.938	-25.223
	2	-15.244	-24.924
	1	82.555	13.677
III	7	0.000	183.191
	6	30.306	182.120
	5	31.310	187.689
	4	32.315	193.964
	3	33.528	201.001
	2	28.992	173.951
	1	0.000	0.000

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Correction of the non-balance bending moment in a side wall corner

Non-balance arises in bending moment of a transverse direction on the intersection of side wall(perpendicular to levee normal) and side wall(parallel to centerline)
Since it is calculated as slab fixed on three sides and free on one side, moment is distributed and corrected by the rigid ratio of slab.
Correction is made about corner (ⅢAxis) and the central part of span(ⅠAxis)

Rigid ratio

$$K1 = \frac{E1 \cdot I1}{L1} \qquad K2 = \frac{E2 \cdot I2}{L2}$$

$$E1 = E2 \qquad I1 = I2$$

The relative share of moment

$$e1 = \frac{K1}{K1 + K2} = \frac{L2}{L1 + L2} = \frac{4.900}{4.900 + 4.700} = 0.510$$

$$e2 = \frac{K2}{K1 + K2} = \frac{L1}{L1 + L2} = \frac{4.700}{4.900 + 4.700} = 0.490$$

Correction of moment in corner (ⅢAxis)

When referred to as ($M1 > M2$)

$$\Delta M = M1 - M2$$

Correction moment

$$M1' = M1 - \Delta M \cdot e1 = M1 - 0.510 \cdot \Delta M$$

$$M2' = M2 + \Delta M \cdot e2 = M2 + 0.490 \cdot \Delta M$$

Correction of the moment in the central part (ⅠAxis) of span

Let 50% of the quantity of corrections in Ⅲ Axis be the quantity of corrections
However, when a correction value is smaller than the original moment, a safe value is taken, and the value before correction is used.

$$M_{1B}' = M_{1B} - 1/2 \cdot \Delta M \cdot e1 = M_{1B} - 0.255 \cdot \Delta M$$

$$M_{2B}' = M_{2B} + 1/2 \cdot \Delta M \cdot e2 = M_{2B} + 0.245 \cdot \Delta M$$

The table of a correction moment

Sidewall(perpendicular to levee normal) e1			Sidewall(parallel to centerline) e2	
Ⅰ	Ⅲ		Ⅲ	Ⅰ
M_{1B} $>$ 1/2·ΔM·e1 M_{1B}'	M1 $>$ ΔM·e1 M1'	(ΔM)	ΔM·e2 M2 $<$ M2'	M_{2B} 1/2·ΔM·e2 $<$ M_{2B}'

(a) Sidewall(perpendicular to levee normal:seaside) and Front wall(parallel to centerline:seaside)
(1) While afloat

	Sidewall(perpendicular to levee normal:seaside) e1 = 0.510				Front wall(parallel to centerline:seaside) e2 = 0.490			
	I		III			III		I
7	5.043		-0.374			-1.624		5.887
	>	0.319	>	0.638 (1.250)	0.613	<	0.306	<
7'	4.724		-1.012			-1.011		6.193
6	13.261		-20.918			-23.549		14.413
	>	0.671	>	1.342 (2.631)	1.289	<	0.645	<
6'	12.590		-22.260			-22.260		15.058
5	25.961		-50.241			-55.014		28.218
	>	1.217	>	2.434 (4.773)	2.339	<	1.169	<
5'	24.744		-52.675			-52.675		29.387
4	39.035		-80.125			-86.886		42.428
	>	1.724	>	3.448 (6.761)	3.313	<	1.656	<
4'	37.311		-83.573			-83.573		44.084
3	52.109		-109.821			-118.352		56.232
	>	2.175	>	4.351 (8.531)	4.180	<	2.090	<
3'	49.934		-114.172			-114.172		58.322
2	51.922		-116.172			-120.585		53.390
	>	1.125	>	2.251 (4.413)	2.162	<	1.081	<
2'	50.797		-118.423			-118.423		54.471
1	-15.502		0.000			0.000		-16.849
	>	0.000	>	0.000 (0.000)	0.000	<	0.000	<
1'	-15.502		0.000			0.000		-16.849

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CHECKED BY	E. NISHIMURA	09/08/2002

The moment after correction

	Sidewall(perpendicular to levee normal:seaside) e1 = 0.510		Front wall(parallel to centerline:seaside) e2 = 0.490	
	I	Ⅲ	Ⅲ	I
7'	5.043	-1.012	-1.011	6.193
6'	13.261	-22.260	-22.260	15.058
5'	25.961	-52.675	-52.675	29.387
4'	39.035	-83.573	-83.573	44.084
3'	52.109	-114.172	-114.172	58.322
2'	51.922	-118.423	-118.423	54.471
1'	-15.502	0.000	0.000	-16.849

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[illegible]	R. OUCHIMURA	09/08/2002

(2) After Construction

Sidewall(perpendicular to levee normal:seaside) e1 = 0.510							Front wall(parallel to centerline:seaside) e2 = 0.490					
	I			Ⅲ					Ⅲ			I
7 7'	-84.852 -81.561	>	3.291	170.286 176.868	>	6.582 (12.905)	6.323	<	183.191 176.868	3.162	<	-91.722 -94.884
6 6'	-83.195 -79.937	>	3.258	169.345 175.860	>	6.515 (12.775)	6.260	<	182.120 175.860	3.130	<	-89.570 -92.700
5 5'	-85.927 -82.546	>	3.381	174.430 181.192	>	6.762 (13.259)	6.497	<	187.689 181.192	3.248	<	-92.617 -95.865
4 4'	-88.734 -85.226	>	3.508	180.209 187.224	>	7.015 (13.755)	6.740	<	193.964 187.224	3.370	<	-95.740 -99.110
3 3'	-91.348 -88.005	>	3.343	187.892 194.578	>	6.686 (13.109)	6.423	<	201.001 194.578	3.212	<	-97.738 -100.950
2 2'	-76.948 -75.630	>	1.318	168.783 171.419	>	2.636 (5.168)	2.532	<	173.951 171.419	1.266	<	-78.531 -79.797
1 1'	21.343 21.343	>	0.000	0.000 0.000	>	0.000 (0.000)	0.000	<	0.000 0.000	0.000	<	22.920 22.920

The moment after correction

	Sidewall(perpendicular to levee normal:Iseaside) e1 = 0.510		Front wall(parallel to centerline:seaside) e2 = 0.490	
	I	III	III	I
7'	-84.852	176.868	176.868	-94.884
6'	-83.195	175.860	175.860	-92.700
5'	-85.927	181.192	181.192	-95.865
4'	-88.734	187.224	187.224	-99.110
3'	-91.348	194.578	194.578	-100.950
2'	-76.948	171.419	171.419	-79.797
1'	21.343	0.000	0.000	22.920

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CHECKED BY	E. NUNHURA	09/08/2002

(b) Sidewall(perpendicular to levee normal:landside) and Rear wall(parallel to centerline : landside)
(1) While afloat

	Sidewall(perpendicular to levee normal:landside) e1 = 0.510				Rear wall(parallel to centerline : landside) e2 = 0.490			
	I		III			III		I
7	5.043		-0.374			-1.624		5.887
	>	0.319	>	0.638 (1.250)	0.613	<	0.306	<
7'	4.724		-1.012			-1.011		6.193
6	13.261		-20.918			-23.549		14.413
	>	0.671	>	1.342 (2.631)	1.289	<	0.645	<
6'	12.590		-22.260			-22.260		15.058
5	25.961		-50.241			-55.014		28.218
	>	1.217	>	2.434 (4.773)	2.339	<	1.169	<
5'	24.744		-52.675			-52.675		29.387
4	39.035		-80.125			-86.886		42.428
	>	1.724	>	3.448 (6.761)	3.313	<	1.656	<
4'	37.311		-83.573			-83.573		44.084
3	52.109		-109.821			-118.352		56.232
	>	2.175	>	4.351 (8.531)	4.180	<	2.090	<
3'	49.934		-114.172			-114.172		58.322
2	51.922		-116.172			-120.585		53.390
	>	1.125	>	2.251 (4.413)	2.162	<	1.081	<
2'	50.797		-118.423			-118.423		54.471
1	-15.502		0.000			0.000		-16.849
	>	0.000	>	0.000 (0.000)	0.000	<	0.000	<
1'	-15.502		0.000			0.000		-16.849

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The moment after correction

	Sidewall(perpendicular to levee normal:landside) e1 = 0.510		Rear wall(parallel to centerline:landside) e2 = 0.490	
	I	Ⅲ	Ⅲ	I
7'	5.043	-1.012	-1.011	6.193
6'	13.261	-22.260	-22.260	15.058
5'	25.961	-52.675	-52.675	29.387
4'	39.035	-83.573	-83.573	44.084
3'	52.109	-114.172	-114.172	58.322
2'	51.922	-118.423	-118.423	54.471
1'	-15.502	0.000	0.000	-16.849

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(2) After Construction

	Sidewall(perpendicular to levee normal:landside) e1 = 0.510						Rear wall(parallel to centerline:landside) e2 = 0.490					
	I			Ⅲ					Ⅲ			I
7	-84.852			170.286					183.191			-91.722
		>	3.291		>	6.582 (12.905)	6.323	<		3.162	<	
7'	-81.561			176.868					176.868			-94.884
6	-83.195			169.345					182.120			-89.570
		>	3.258		>	6.515 (12.775)	6.260	<		3.130	<	
6'	-79.937			175.860					175.860			-92.700
5	-85.927			174.430					187.689			-92.617
		>	3.381		>	6.762 (13.259)	6.497	<		3.248	<	
5'	-82.546			181.192					181.192			-95.865
4	-88.734			180.209					193.964			-95.740
		>	3.508		>	7.015 (13.755)	6.740	<		3.370	<	
4'	-85.226			187.224					187.224			-99.110
3	-91.348			187.892					201.001			-97.738
		>	3.343		>	6.686 (13.109)	6.423	<		3.212	<	
3'	-88.005			194.578					194.578			-100.950
2	-76.948			168.783					173.951			-78.531
		>	1.318		>	2.636 (5.168)	2.532	<		1.266	<	
2'	-75.630			171.419					171.419			-79.797
1	21.343			0.000					0.000			22.920
		>	0.000		>	0.000 (0.000)	0.000	<		0.000	<	
1'	21.343			0.000					0.000			22.920

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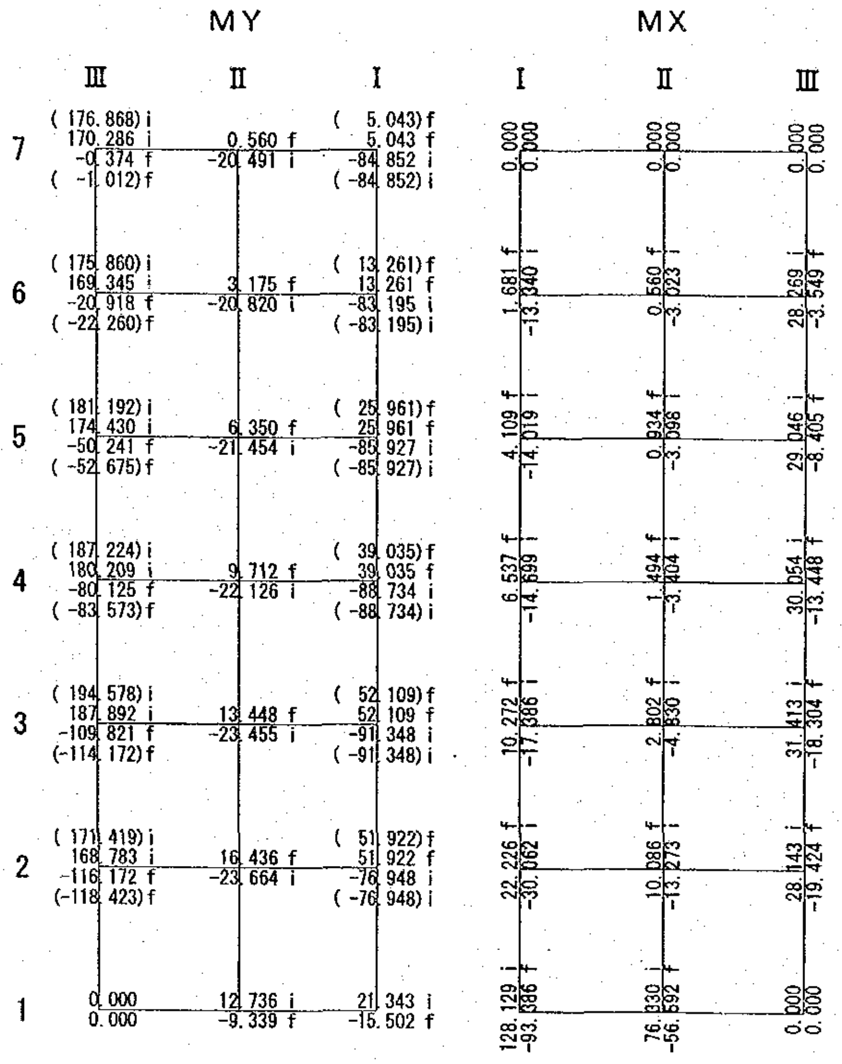
The moment after correction

Sidewall(perpendicular to levee normal:landside) el = 0.510			Rear wall(parallel to centerline:landside) e2 = 0.490	
	I	Ⅲ	Ⅲ	I
7'	-84.852	176.868	176.868	-94.884
6'	-83.195	175.860	175.860	-92.700
5'	-85.927	181.192	181.192	-95.865
4'	-88.734	187.224	187.224	-99.110
3'	-91.348	194.578	194.578	-100.950
2'	-76.948	171.419	171.419	-79.797
1'	21.343	0.000	0.000	22.920

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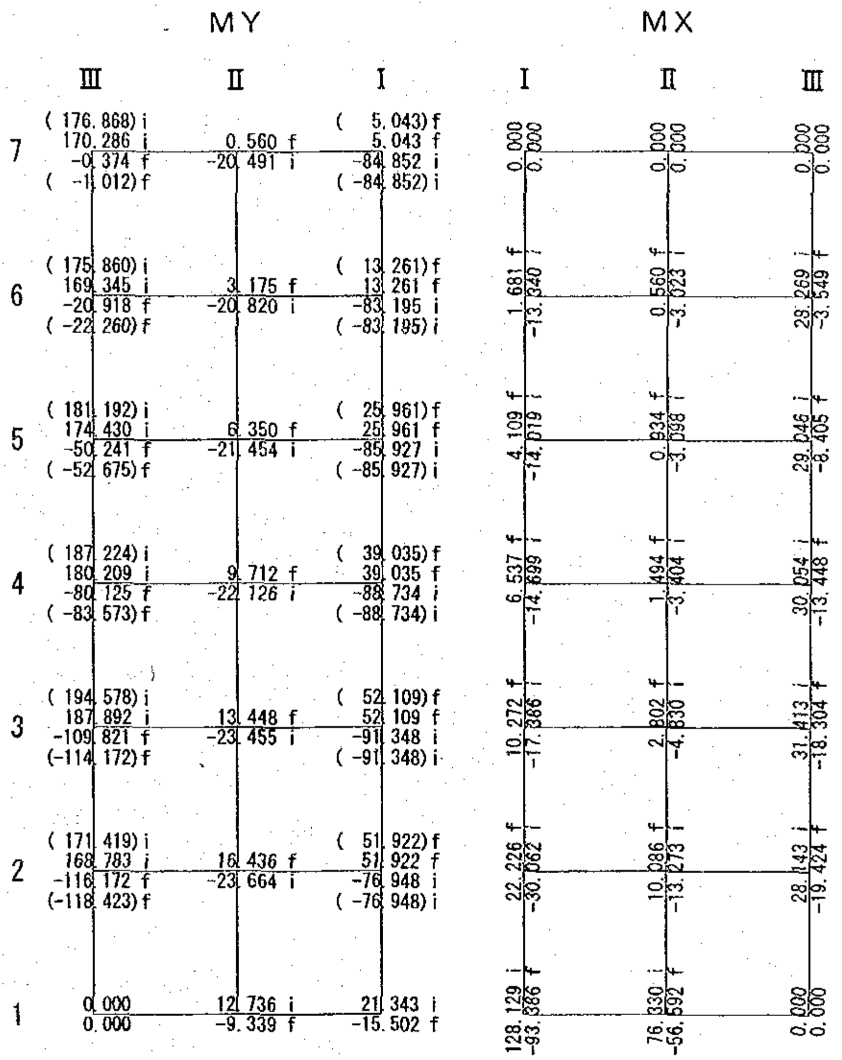
Sidewall(perpendicular to levee normal, landside) Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment
( ) : The moment after correction of corner



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

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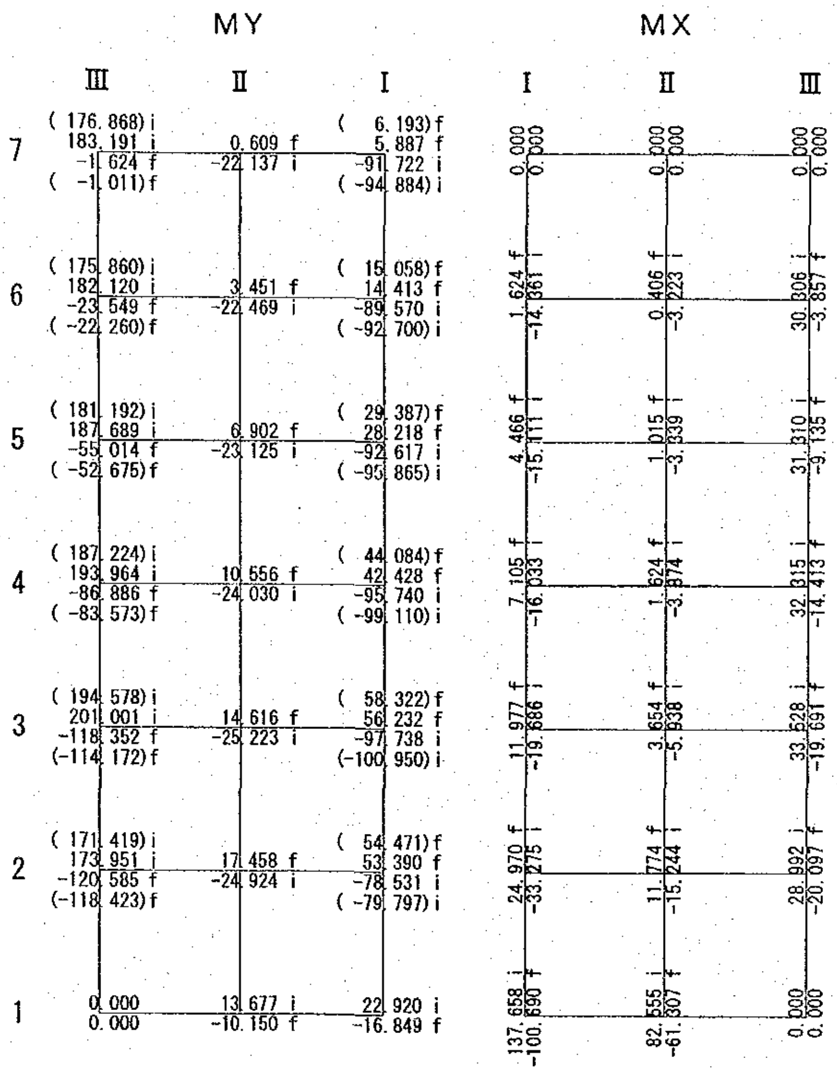
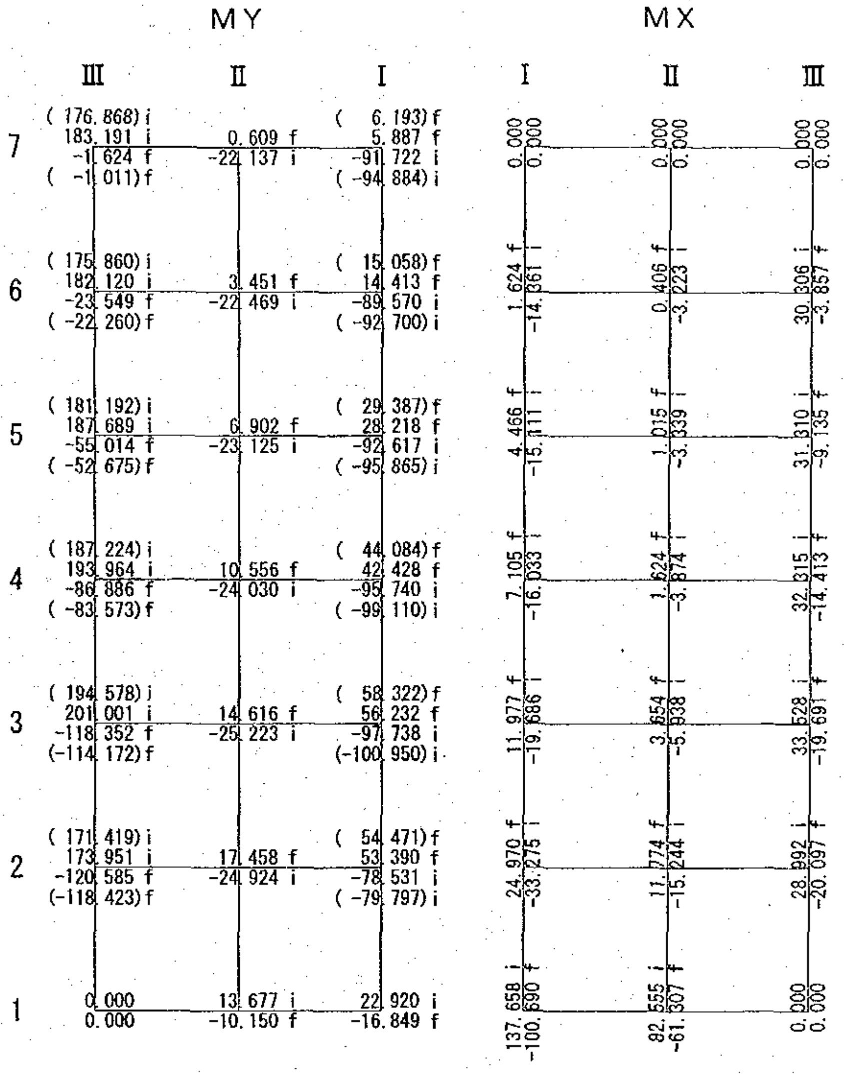
Front wall(parallel to centerline, seaside) Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment
( ) : The moment after correction of corner



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

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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Y. Ando 26/07/02

CHECKED BY: R. NISHIMURA 09/08/2002

Bottom slab

Bottom slab is calculated as a slab fixed on four sides

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

(a)Under ordinary conditions

A Room

While afloat

slab fixed on four sides

P1 = 74.92(kN/m²)

P2 = 74.92(kN/m²)

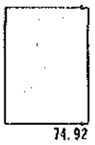
LX = 4.700(m)

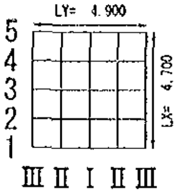
LY = 4.900(m)

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 = 74.92(kN/m²)

$MX = P \cdot LX^2 \cdot X = 74.92 \times 4.700^2 \times X = 1654.98 \times X$

$MY = P \cdot LX^2 \cdot Y = 74.92 \times 4.700^2 \times Y = 1654.98 \times Y$

		X	MX	Y	MY
I	5	-0.0513	-84.901	-0.0086	-14.233
	4	0.0096	15.888	0.0116	19.198
	3	0.0206	34.093	0.0206	34.093
	2	0.0096	15.888	0.0116	19.198
	1	-0.0513	-84.901	-0.0086	-14.233
II	5	-0.0324	-53.621	-0.0054	-8.937
	4	0.0059	9.764	0.0059	9.764
	3	0.0116	19.198	0.0096	15.888
	2	0.0059	9.764	0.0059	9.764
	1	-0.0324	-53.621	-0.0054	-8.937
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-8.937	-0.0324	-53.621
	3	-0.0086	-14.233	-0.0513	-84.901
	2	-0.0054	-8.937	-0.0324	-53.621
	1	0.0000	0.000	0.0000	0.000

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A Room

After Construction

Upward load (above)

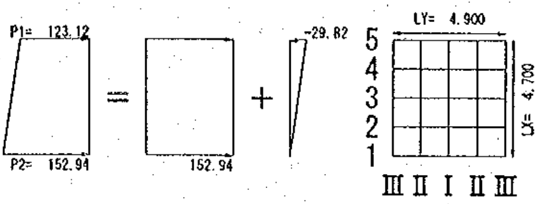
slab fixed on four sides

$P1 = 123.12 (kN/m^2)$

$P2 = 152.94 (kN/m^2)$

$LX = 4.700 (m)$

$LY = 4.900 (m)$



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

$P = 152.94 (kN/m^2)$

$MX = P \cdot LX^2 \cdot X = 152.94 \times 4.700^2 \times X = 3378.45 \times X$

$MY = P \cdot LX^2 \cdot Y = 152.94 \times 4.700^2 \times Y = 3378.45 \times Y$

		X	MX	Y	MY
I	5	-0.0513	-173.314	-0.0086	-29.055
	4	0.0096	32.433	0.0116	39.190
	3	0.0206	69.596	0.0206	69.596
	2	0.0096	32.433	0.0116	39.190
	1	-0.0513	-173.314	-0.0086	-29.055
Ⅱ	5	-0.0324	-109.462	-0.0054	-18.244
	4	0.0059	19.933	0.0059	19.933
	3	0.0116	39.190	0.0096	32.433
	2	0.0059	19.933	0.0059	19.933
	1	-0.0324	-109.462	-0.0054	-18.244
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-18.244	-0.0324	-109.462
	3	-0.0086	-29.055	-0.0513	-173.314
	2	-0.0054	-18.244	-0.0324	-109.462
	1	0.0000	0.000	0.0000	0.000

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(ii)Section force by triangular distribution load

P = -29.82(kN/m²)

$MX = P \cdot LX^2 \cdot X = -29.82 \times 4.700^2 \times X = -658.72 \times X$

$MY = P \cdot LX^2 \cdot Y = -29.82 \times 4.700^2 \times Y = -658.72 \times Y$

		X	MX	Y	MY
I	5	-0.0334	22.001	-0.0056	3.689
	4	0.0080	-5.270	0.0069	-4.545
	3	0.0103	-6.785	0.0103	-6.785
	2	0.0015	-0.988	0.0047	-3.096
	1	-0.0179	11.791	-0.0030	1.976
II	5	-0.0223	14.690	-0.0037	2.437
	4	0.0052	-3.425	0.0040	-2.635
	3	0.0058	-3.821	0.0048	-3.162
	2	0.0006	-0.395	0.0018	-1.186
	1	-0.0101	6.653	-0.0017	1.120
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	2.371	-0.0208	13.701
	3	-0.0043	2.833	-0.0257	16.929
	2	-0.0019	1.252	-0.0116	7.641
	1	0.0000	0.000	0.0000	0.000

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The sum total of (i) and (ii)

		MX	MY
I	5	-151.313	-25.366
	4	27.163	34.645
	3	62.811	62.811
	2	31.445	36.094
	1	-161.523	-27.079
II	5	-94.772	-15.807
	4	16.508	17.298
	3	35.369	29.271
	2	19.538	18.747
	1	-102.809	-17.124
III	5	0.000	0.000
	4	-15.873	-95.761
	3	-26.222	-156.385
	2	-16.992	-101.821
	1	0.000	0.000

B Room

While afloat

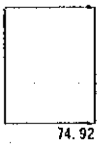
slab fixed on four sides

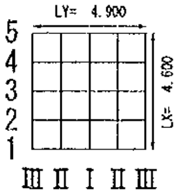
P1 = 74.92 (kN/m²)

P2 = 74.92 (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 = 74.92 (kN/m²)

$MX = P \cdot LX^2 \cdot X = 74.92 \times 4.600^2 \times X = 1585.31 \times X$

$MY = P \cdot LX^2 \cdot Y = 74.92 \times 4.600^2 \times Y = 1585.31 \times Y$

		X	MX	Y	MY
Ⅰ	5	-0.0513	-81.326	-0.0086	-13.634
	4	0.0096	15.219	0.0116	18.390
	3	0.0206	32.657	0.0206	32.657
	2	0.0096	15.219	0.0116	18.390
	1	-0.0513	-81.326	-0.0086	-13.634
Ⅱ	5	-0.0324	-51.364	-0.0054	-8.561
	4	0.0059	9.353	0.0059	9.353
	3	0.0116	18.390	0.0096	15.219
	2	0.0059	9.353	0.0059	9.353
	1	-0.0324	-51.364	-0.0054	-8.561
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-8.561	-0.0324	-51.364
	3	-0.0086	-13.634	-0.0513	-81.326
	2	-0.0054	-8.561	-0.0324	-51.364
	1	0.0000	0.000	0.0000	0.000

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B Room

After Construction

Upward load (above)

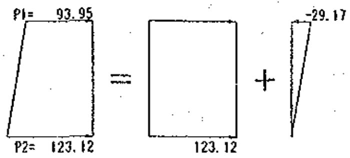
slab fixed on four sides

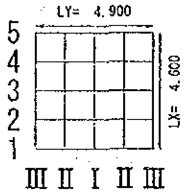
P1 = 93.95(kN/m²)

P2 = 123.12(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 = 123.12(kN/m²)

MX = P・LX²・X = 123.12 × 4.600² × X = 2605.22 × X

MY = P・LX²・Y = 123.12 × 4.600² × Y = 2605.22 × Y

		X	MX	Y	MY
Ⅰ	5	-0.0513	-133.648	-0.0086	-22.405
	4	0.0096	25.010	0.0116	30.221
	3	0.0206	53.668	0.0206	53.668
	2	0.0096	25.010	0.0116	30.221
	1	-0.0513	-133.648	-0.0086	-22.405
Ⅱ	5	-0.0324	-84.409	-0.0054	-14.068
	4	0.0059	15.371	0.0059	15.371
	3	0.0116	30.221	0.0096	25.010
	2	0.0059	15.371	0.0059	15.371
	1	-0.0324	-84.409	-0.0054	-14.068
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-14.068	-0.0324	-84.409
	3	-0.0086	-22.405	-0.0513	-133.648
	2	-0.0054	-14.068	-0.0324	-84.409
	1	0.0000	0.000	0.0000	0.000

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on Port Reactivation Project

in La Union Province

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

(ii)Section force by triangular distribution load

P = -29.17(kN/m^2)

MX = P・LX^2・X = -29.17 × 4.600^2 × X = -617.24 × X

MY = P・LX^2・Y = -29.17 × 4.600^2 × Y = -617.24 × Y

		X	MX	Y	MY
I	5	-0.0334	20.616	-0.0056	3.457
	4	0.0080	-4.938	0.0069	-4.259
	3	0.0103	-6.358	0.0103	-6.358
	2	0.0015	-0.926	0.0047	-2.901
	1	-0.0179	11.049	-0.0030	1.852
II	5	-0.0223	13.764	-0.0037	2.284
	4	0.0052	-3.210	0.0040	-2.469
	3	0.0058	-3.580	0.0048	-2.963
	2	0.0006	-0.370	0.0018	-1.111
	1	-0.0101	6.234	-0.0017	1.049
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	2.222	-0.0208	12.839
	3	-0.0043	2.654	-0.0257	15.863
	2	-0.0019	1.173	-0.0116	7.160
	1	0.0000	0.000	0.0000	0.000

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	INITIAL	DATE
PREPARED BY	Y. Ando	20/07/02
CHECKED BY	E. NISHIHURA	09/08/2002

The sum total of (i) and (ii)

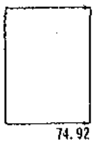
		MX	MY
I	5	-113.032	-18.948
	4	20.072	25.962
	3	47.310	47.310
	2	24.084	27.320
	1	-122.599	-20.553
II	5	-70.645	-11.784
	4	12.161	12.902
	3	26.641	22.047
	2	15.001	14.260
	1	-78.175	-13.019
III	5	0.000	0.000
	4	-11.846	-71.570
	3	-19.751	-117.785
	2	-12.895	-77.249
	1	0.000	0.000

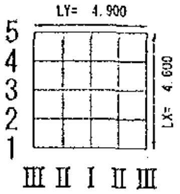
C Room

While afloat

slab fixed on four sides

P1 = 74.92 (kN/m²)
P2 = 74.92 (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 = 74.92 (kN/m²)
$MX = P \cdot LX^2 \cdot X = 74.92 \times 4.600^2 \times X = 1585.31 \times X$
$MY = P \cdot LX^2 \cdot Y = 74.92 \times 4.600^2 \times Y = 1585.31 \times Y$

		X	MX	Y	MY
Ⅰ	5	-0.0513	-81.326	-0.0086	-13.634
	4	0.0096	15.219	0.0116	18.390
	3	0.0206	32.657	0.0206	32.657
	2	0.0096	15.219	0.0116	18.390
	1	-0.0513	-81.326	-0.0086	-13.634
Ⅱ	5	-0.0324	-51.364	-0.0054	-8.561
	4	0.0059	9.353	0.0059	9.353
	3	0.0116	18.390	0.0096	15.219
	2	0.0059	9.353	0.0059	9.353
	1	-0.0324	-51.364	-0.0054	-8.561
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-8.561	-0.0324	-51.364
	3	-0.0086	-13.634	-0.0513	-81.326
	2	-0.0054	-8.561	-0.0324	-51.364
	1	0.0000	0.000	0.0000	0.000

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	INITIAL	DATE
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CHECKED BY	E. NISHIMURA	09/08/2002

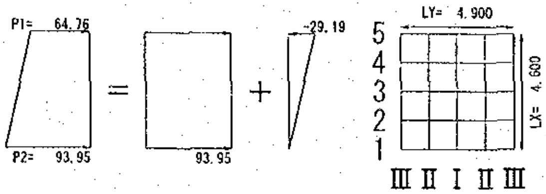
C Room

After Construction

Upward load (above)

slab fixed on four sides

P1 = 64.76(kN/m²)
P2 = 93.95(kN/m²)
LX = 4.600(m)
LY = 4.900(m)



The ratio of a length of sides

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

The coefficient table of λ = 1.00 is used.

(i)Section force by equivalent uniform load

P = 93.95(kN/m²)

$MX = P \cdot LX^2 \cdot X = 93.95 \times 4.600^2 \times X = 1987.98 \times X$

$MY = P \cdot LX^2 \cdot Y = 93.95 \times 4.600^2 \times Y = 1987.98 \times Y$

		X	MX	Y	MY
I	5	-0.0513	-101.983	-0.0086	-17.097
	4	0.0096	19.085	0.0116	23.061
	3	0.0206	40.952	0.0206	40.952
	2	0.0096	19.085	0.0116	23.061
	1	-0.0513	-101.983	-0.0086	-17.097
II	5	-0.0324	-64.411	-0.0054	-10.735
	4	0.0059	11.729	0.0059	11.729
	3	0.0116	23.061	0.0096	19.085
	2	0.0059	11.729	0.0059	11.729
	1	-0.0324	-64.411	-0.0054	-10.735
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-10.735	-0.0324	-64.411
	3	-0.0086	-17.097	-0.0513	-101.983
	2	-0.0054	-10.735	-0.0324	-64.411
	1	0.0000	0.000	0.0000	0.000

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Detailed Design
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	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	R. NISHIMURA	09/08/2002

(ii) Section force by triangular distribution load

P = -29.19 (kN/m²)

MX = P · LX² · X = -29.19 × 4.600² × X = -617.66 × X

MY = P · LX² · Y = -29.19 × 4.600² × Y = -617.66 × Y

		X	MX	Y	MY
I	5	-0.0334	20.630	-0.0056	3.459
	4	0.0080	-4.941	0.0069	-4.262
	3	0.0103	-6.362	0.0103	-6.362
	2	0.0015	-0.926	0.0047	-2.903
	1	-0.0179	11.056	-0.0030	1.853
II	5	-0.0223	13.774	-0.0037	2.285
	4	0.0052	-3.212	0.0040	-2.471
	3	0.0058	-3.582	0.0048	-2.965
	2	0.0006	-0.371	0.0018	-1.112
	1	-0.0101	6.238	-0.0017	1.050
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	2.224	-0.0208	12.847
	3	-0.0043	2.656	-0.0257	15.874
	2	-0.0019	1.174	-0.0116	7.165
	1	0.0000	0.000	0.0000	0.000

The sum total of (i) and (ii)

		MX	MY
I	5	-81.353	-13.638
	4	14.144	18.799
	3	34.590	34.590
	2	18.159	20.158
	1	-90.927	-15.244
II	5	-50.637	-8.450
	4	8.517	9.258
	3	19.479	16.120
	2	11.358	10.617
	1	-58.173	-9.685
III	5	0.000	0.000
	4	-8.511	-51.564
	3	-14.441	-86.109
	2	-9.561	-57.246
	1	0.000	0.000

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

D Room

While afloat

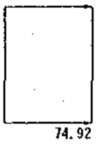
slab fixed on four sides

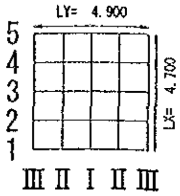
P1 = 74.92(kN/m²)
P2 = 74.92(kN/m²)
LX = 4.700(m)
LY = 4.900(m)

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 = 74.92(kN/m²)

$MX = P \cdot LX^2 \cdot X = 74.92 \times 4.700^2 \times X = 1654.98 \times X$

$MY = P \cdot LX^2 \cdot Y = 74.92 \times 4.700^2 \times Y = 1654.98 \times Y$

		X	MX	Y	MY
Ⅰ	5	-0.0513	-84.901	-0.0086	-14.233
	4	0.0096	15.888	0.0116	19.198
	3	0.0206	34.093	0.0206	34.093
	2	0.0096	15.888	0.0116	19.198
	1	-0.0513	-84.901	-0.0086	-14.233
Ⅱ	5	-0.0324	-53.621	-0.0054	-8.937
	4	0.0059	9.764	0.0059	9.764
	3	0.0116	19.198	0.0096	15.888
	2	0.0059	9.764	0.0059	9.764
	1	-0.0324	-53.621	-0.0054	-8.937
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-8.937	-0.0324	-53.621
	3	-0.0086	-14.233	-0.0513	-84.901
	2	-0.0054	-8.937	-0.0324	-53.621
	1	0.0000	0.000	0.0000	0.000

CALCULATION

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CHECKED BY	R. NISHIMURA	09/08/2002

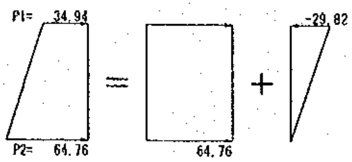
D Room

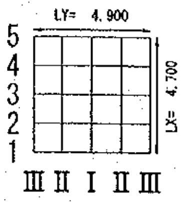
After Construction

Upward load (above)

slab fixed on four sides

P1 = 34.94(kN/m²)
P2 = 64.76(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 = 64.76(kN/m²)

$MX = P \cdot LX^2 \cdot X = 64.76 \times 4.700^2 \times X = 1430.55 \times X$

$MY = P \cdot LX^2 \cdot Y = 64.76 \times 4.700^2 \times Y = 1430.55 \times Y$

		X	MX	Y	MY
Ⅰ	5	-0.0513	-73.387	-0.0086	-12.303
	4	0.0096	13.733	0.0116	16.594
	3	0.0206	29.469	0.0206	29.469
	2	0.0096	13.733	0.0116	16.594
	1	-0.0513	-73.387	-0.0086	-12.303
Ⅱ	5	-0.0324	-46.350	-0.0054	-7.725
	4	0.0059	8.440	0.0059	8.440
	3	0.0116	16.594	0.0096	13.733
	2	0.0059	8.440	0.0059	8.440
	1	-0.0324	-46.350	-0.0054	-7.725
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-7.725	-0.0324	-46.350
	3	-0.0086	-12.303	-0.0513	-73.387
	2	-0.0054	-7.725	-0.0324	-46.350
	1	0.0000	0.000	0.0000	0.000

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(ii)Section force by triangular distribution load

$P = -29.82 (\mathrm{kN/m^2})$

$MX = P \cdot LX^2 \cdot X = -29.82 \times 4.700^2 \times X = -658.72 \times X$

$MY = P \cdot LX^2 \cdot Y = -29.82 \times 4.700^2 \times Y = -658.72 \times Y$

		X	MX	Y	MY
I	5	-0.0334	22.001	-0.0056	3.689
	4	0.0080	-5.270	0.0069	-4.545
	3	0.0103	-6.785	0.0103	-6.785
	2	0.0015	-0.988	0.0047	-3.096
	1	-0.0179	11.791	-0.0030	1.976
II	5	-0.0223	14.690	-0.0037	2.437
	4	0.0052	-3.425	0.0040	-2.635
	3	0.0058	-3.821	0.0048	-3.162
	2	0.0006	-0.395	0.0018	-1.186
	1	-0.0101	6.653	-0.0017	1.120
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	2.371	-0.0208	13.701
	3	-0.0043	2.833	-0.0257	16.929
	2	-0.0019	1.252	-0.0116	7.641
	1	0.0000	0.000	0.0000	0.000

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CHECKED BY	R. NISHIMURA	09/08/2002

The sum total of (i) and (ii)

		MX	MY
I	5	-51.386	-8.614
	4	8.463	12.049
	3	22.684	22.684
	2	12.745	13.498
	1	-61.596	-10.327
II	5	-31.660	-5.288
	4	5.015	5.805
	3	12.773	10.571
	2	8.045	7.254
	1	-39.697	-6.605
III	5	0.000	0.000
	4	-5.354	-32.649
	3	-9.470	-56.458
	2	-6.473	-38.709
	1	0.000	0.000

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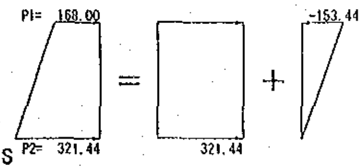
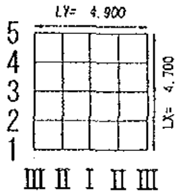
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	R. NISHIMORA	09/08/2002

(b)During an earthquake
A Room

Upward load (above)
slab fixed on four sides
P1 = 168.00(kN/m²)
P2 = 321.44(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 = 321.44(kN/m²)

$MX = P \cdot LX^2 \cdot X = 321.44 \times 4.700^2 \times X = 7100.61 \times X$

$MY = P \cdot LY^2 \cdot Y = 321.44 \times 4.700^2 \times Y = 7100.61 \times Y$

		X	MX	Y	MY
I	5	-0.0513	-364.261	-0.0086	-61.065
	4	0.0096	68.166	0.0116	82.367
	3	0.0206	146.273	0.0206	146.273
	2	0.0096	68.166	0.0116	82.367
	1	-0.0513	-364.261	-0.0086	-61.065
II	5	-0.0324	-230.060	-0.0054	-38.343
	4	0.0059	41.894	0.0059	41.894
	3	0.0116	82.367	0.0096	68.166
	2	0.0059	41.894	0.0059	41.894
	1	-0.0324	-230.060	-0.0054	-38.343
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-38.343	-0.0324	-230.060
	3	-0.0086	-61.065	-0.0513	-364.261
	2	-0.0054	-38.343	-0.0324	-230.060
	1	0.0000	0.000	0.0000	0.000

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CHECKED BY	E.NISHIHARA	09/08/2002

(ii)Section force by triangular distribution load

P = −153.44(kN/m²)

MX = P · LX² · X = −153.44 × 4.700² × X = −3389.49 × X

MY = P · LX² · Y = −153.44 × 4.700² × Y = −3389.49 × Y

		X	MX	Y	MY
I	5	-0.0334	113.209	-0.0056	18.981
	4	0.0080	-27.116	0.0069	-23.387
	3	0.0103	-34.912	0.0103	-34.912
	2	0.0015	-5.084	0.0047	-15.931
	1	-0.0179	60.672	-0.0030	10.168
II	5	-0.0223	75.586	-0.0037	12.541
	4	0.0052	-17.625	0.0040	-13.558
	3	0.0058	-19.659	0.0048	-16.270
	2	0.0006	-2.034	0.0018	-6.101
	1	-0.0101	34.234	-0.0017	5.762
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	12.202	-0.0208	70.501
	3	-0.0043	14.575	-0.0257	87.110
	2	-0.0019	6.440	-0.0116	39.318
	1	0.0000	0.000	0.0000	0.000

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

The sum total of (i) and (ii)

		MX	MY
I	5	-251.052	-42.084
	4	41.050	58.980
	3	111.361	111.361
	2	63.082	66.436
	1	-303.589	-50.897
II	5	-154.474	-25.802
	4	24.269	28.336
	3	62.708	51.896
	2	39.860	35.793
	1	-195.826	-32.581
III	5	0.000	0.000
	4	-26.141	-159.559
	3	-46.490	-277.151
	2	-31.903	-190.742
	1	0.000	0.000

CALCULATION
Detailed Design
on Port Rehabilitation Project
in [illegible]

CALC. ITEM		
[illegible]	PAGE	61
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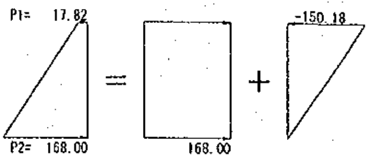
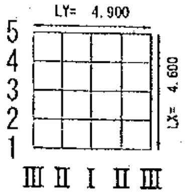
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	R. NISHIMURA	09/08/2002

B Room

Upward load (above)
slab fixed on four sides
P1 = 17.82 (kN/m²)
P2 = 168.00 (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 = 168.00 (kN/m²)
$MX = P \cdot LX^2 \cdot X = 168.00 \times 4.600^2 \times X = 3554.88 \times X$
$MY = P \cdot LX^2 \cdot Y = 168.00 \times 4.600^2 \times Y = 3554.88 \times Y$

		X	MX	Y	MY
I	5	-0.0513	-182.365	-0.0086	-30.572
	4	0.0096	34.127	0.0116	41.237
	3	0.0206	73.231	0.0206	73.231
	2	0.0096	34.127	0.0116	41.237
	1	-0.0513	-182.365	-0.0086	-30.572
II	5	-0.0324	-115.178	-0.0054	-19.196
	4	0.0059	20.974	0.0059	20.974
	3	0.0116	41.237	0.0096	34.127
	2	0.0059	20.974	0.0059	20.974
	1	-0.0324	-115.178	-0.0054	-19.196
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-19.196	-0.0324	-115.178
	3	-0.0086	-30.572	-0.0513	-182.365
	2	-0.0054	-19.196	-0.0324	-115.178
	1	0.0000	0.000	0.0000	0.000

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(ii)Section force by triangular distribution load

$P = -150.18 (kN/m^2)$

$MX = P \cdot LX^2 \cdot X = -150.18 \times 4.600^2 \times X = -3177.81 \times X$

$MY = P \cdot LY^2 \cdot Y = -150.18 \times 4.600^2 \times Y = -3177.81 \times Y$

		X	MX	Y	MY
I	5	-0.0334	106.139	-0.0056	17.796
	4	0.0080	-25.422	0.0069	-21.927
	3	0.0103	-32.731	0.0103	-32.731
	2	0.0015	-4.767	0.0047	-14.936
	1	-0.0179	56.883	-0.0030	9.533
II	5	-0.0223	70.865	-0.0037	11.758
	4	0.0052	-16.525	0.0040	-12.711
	3	0.0058	-18.431	0.0048	-15.253
	2	0.0006	-1.907	0.0018	-5.720
	1	-0.0101	32.096	-0.0017	5.402
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	11.440	-0.0208	66.098
	3	-0.0043	13.665	-0.0257	81.670
	2	-0.0019	6.038	-0.0116	36.863
	1	0.0000	0.000	0.0000	0.000

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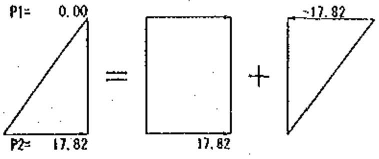
The sum total of (i) and (ii)

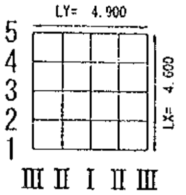
		MX	MY
I	5	-76.226	-12.776
	4	8.705	19.310
	3	40.500	40.500
	2	29.360	26.301
	1	-125.482	-21.039
II	5	-44.313	-7.438
	4	4.449	8.263
	3	22.806	18.874
	2	19.067	15.254
	1	-83.082	-13.794
III	5	0.000	0.000
	4	-7.756	-49.080
	3	-16.907	-100.695
	2	-13.158	-78.315
	1	0.000	0.000

C Room

Upward load (above)
slab fixed on four sides
P1 = 0.00(kN/m²)
P2 = 17.82(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 = 17.82(kN/m²)
$MX = P \cdot LX^2 \cdot X = 17.82 \times 4.600^2 \times X = 377.07 \times X$
$MY = P \cdot LX^2 \cdot Y = 17.82 \times 4.600^2 \times Y = 377.07 \times Y$

		X	MX	Y	MY
I	5	-0.0513	-19.344	-0.0086	-3.243
	4	0.0096	3.620	0.0116	4.374
	3	0.0206	7.768	0.0206	7.768
	2	0.0096	3.620	0.0116	4.374
	1	-0.0513	-19.344	-0.0086	-3.243
II	5	-0.0324	-12.217	-0.0054	-2.036
	4	0.0059	2.225	0.0059	2.225
	3	0.0116	4.374	0.0096	3.620
	2	0.0059	2.225	0.0059	2.225
	1	-0.0324	-12.217	-0.0054	-2.036
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	-2.036	-0.0324	-12.217
	3	-0.0086	-3.243	-0.0513	-19.344
	2	-0.0054	-2.036	-0.0324	-12.217
	1	0.0000	0.000	0.0000	0.000

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(ii)Section force by triangular distribution load

$P = -17.82(\mathrm{kN/m^2})$

$MX = P \cdot LX^2 \cdot X = -17.82 \times 4.600^2 \times X = -377.07 \times X$

$MY = P \cdot LX^2 \cdot Y = -17.82 \times 4.600^2 \times Y = -377.07 \times Y$

		X	MX	Y	MY
I	5	-0.0334	12.594	-0.0056	2.112
	4	0.0080	-3.017	0.0069	-2.602
	3	0.0103	-3.884	0.0103	-3.884
	2	0.0015	-0.566	0.0047	-1.772
	1	-0.0179	6.750	-0.0030	1.131
II	5	-0.0223	8.409	-0.0037	1.395
	4	0.0052	-1.961	0.0040	-1.508
	3	0.0058	-2.187	0.0048	-1.810
	2	0.0006	-0.226	0.0018	-0.679
	1	-0.0101	3.808	-0.0017	0.641
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	1.357	-0.0208	7.843
	3	-0.0043	1.621	-0.0257	9.691
	2	-0.0019	0.716	-0.0116	4.374
	1	0.0000	0.000	0.0000	0.000

The sum total of (i) and (ii)

		MX	MY
I	5	-6.750	-1.131
	4	0.603	1.772
	3	3.884	3.884
	2	3.054	2.602
	1	-12.594	-2.112
II	5	-3.808	-0.641
	4	0.264	0.717
	3	2.187	1.810
	2	1.999	1.546
	1	-8.409	-1.395
III	5	0.000	0.000
	4	-0.679	-4.374
	3	-1.622	-9.653
	2	-1.320	-7.843
	1	0.000	0.000

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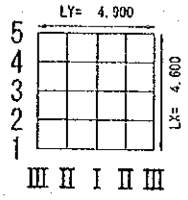
C Room

Downward load (below)
slab fixed on four sides
P1 = -132.36 (kN/m²)
P2 = 0.00 (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 triangular distribution load
P = -132.36 (kN/m²)

$$MX = P \cdot LX^2 \cdot X = -132.36 \times 4.600^2 \times X = -2800.74 \times X$$
$$MY = P \cdot LX^2 \cdot Y = -132.36 \times 4.600^2 \times Y = -2800.74 \times Y$$

		X	MX	Y	MY
I	5	-0.0334	93.545	-0.0056	15.684
	4	0.0080	-22.406	0.0069	-19.325
	3	0.0103	-28.848	0.0103	-28.848
	2	0.0015	-4.201	0.0047	-13.163
	1	-0.0179	50.133	-0.0030	8.402
II	5	-0.0223	62.456	-0.0037	10.363
	4	0.0052	-14.564	0.0040	-11.203
	3	0.0058	-16.244	0.0048	-13.444
	2	0.0006	-1.680	0.0018	-5.041
	1	-0.0101	28.287	-0.0017	4.761
III	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	10.083	-0.0208	58.255
	3	-0.0043	12.043	-0.0257	71.979
	2	-0.0019	5.321	-0.0116	32.489
	1	0.0000	0.000	0.0000	0.000

D Room

Downward load (below)

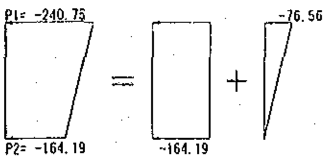
slab fixed on four sides

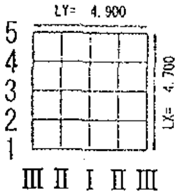
$P1 = -240.75 (kN/m^2)$

$P2 = -164.19 (kN/m^2)$

$LX = 4.700 (m)$

$LY = 4.900 (m)$





The ratio of a length of sides

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

The coefficient table of $\lambda = 1.00$ is used.

(i)Section force by equivalent uniform load

$P = -164.19 (kN/m^2)$

$MX = P \cdot LX^2 \cdot X = -164.19 \times 4.700^2 \times X = -3626.96 \times X$

$MY = P \cdot LX^2 \cdot Y = -164.19 \times 4.700^2 \times Y = -3626.96 \times Y$

		X	MX	Y	MY
Ⅰ	5	-0.0513	186.063	-0.0086	31.192
	4	0.0096	-34.819	0.0116	-42.073
	3	0.0206	-74.715	0.0206	-74.715
	2	0.0096	-34.819	0.0116	-42.073
	1	-0.0513	186.063	-0.0086	31.192
Ⅱ	5	-0.0324	117.513	-0.0054	19.586
	4	0.0059	-21.399	0.0059	-21.399
	3	0.0116	-42.073	0.0096	-34.819
	2	0.0059	-21.399	0.0059	-21.399
	1	-0.0324	117.513	-0.0054	19.586
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0054	19.586	-0.0324	117.513
	3	-0.0086	31.192	-0.0513	186.063
	2	-0.0054	19.586	-0.0324	117.513
	1	0.0000	0.000	0.0000	0.000

(ii)Section force by triangular distribution load

P = -76.56(kN/m²)

$MX = P \cdot LX^2 \cdot X = -76.56 \times 4.700^2 \times X = -1691.21 \times X$

$MY = P \cdot LX^2 \cdot Y = -76.56 \times 4.700^2 \times Y = -1691.21 \times Y$

		X	MX	Y	MY
Ⅰ	5	-0.0334	56.486	-0.0056	9.471
	4	0.0080	-13.530	0.0069	-11.669
	3	0.0103	-17.419	0.0103	-17.419
	2	0.0015	-2.537	0.0047	-7.949
	1	-0.0179	30.273	-0.0030	5.074
Ⅱ	5	-0.0223	37.714	-0.0037	6.257
	4	0.0052	-8.794	0.0040	-6.765
	3	0.0058	-9.809	0.0048	-8.118
	2	0.0006	-1.015	0.0018	-3.044
	1	-0.0101	17.081	-0.0017	2.875
Ⅲ	5	0.0000	0.000	0.0000	0.000
	4	-0.0036	6.088	-0.0208	35.177
	3	-0.0043	7.272	-0.0257	43.464
	2	-0.0019	3.213	-0.0116	19.618
	1	0.0000	0.000	0.0000	0.000

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The sum total of (i) and (ii)

		MX	MY
I	5	242.549	40.663
	4	-48.349	-53.742
	3	-92.134	-92.134
	2	-37.356	-50.022
	1	216.336	36.266
II	5	155.227	25.843
	4	-30.193	-28.164
	3	-51.882	-42.937
	2	-22.414	-24.443
	1	134.594	22.461
III	5	0.000	0.000
	4	25.674	152.690
	3	38.464	229.527
	2	22.799	137.131
	1	0.000	0.000

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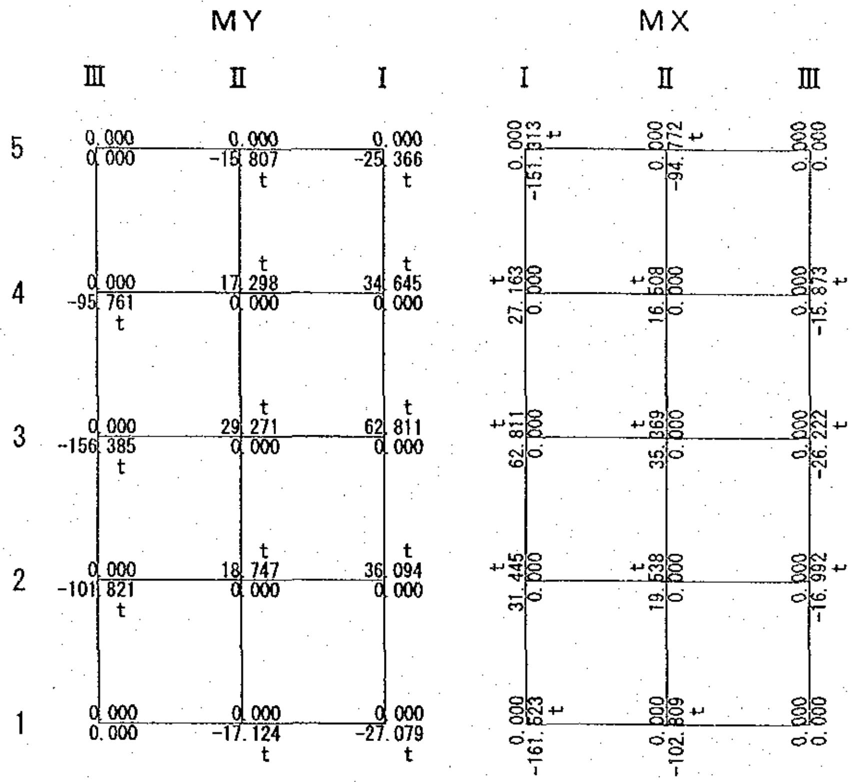
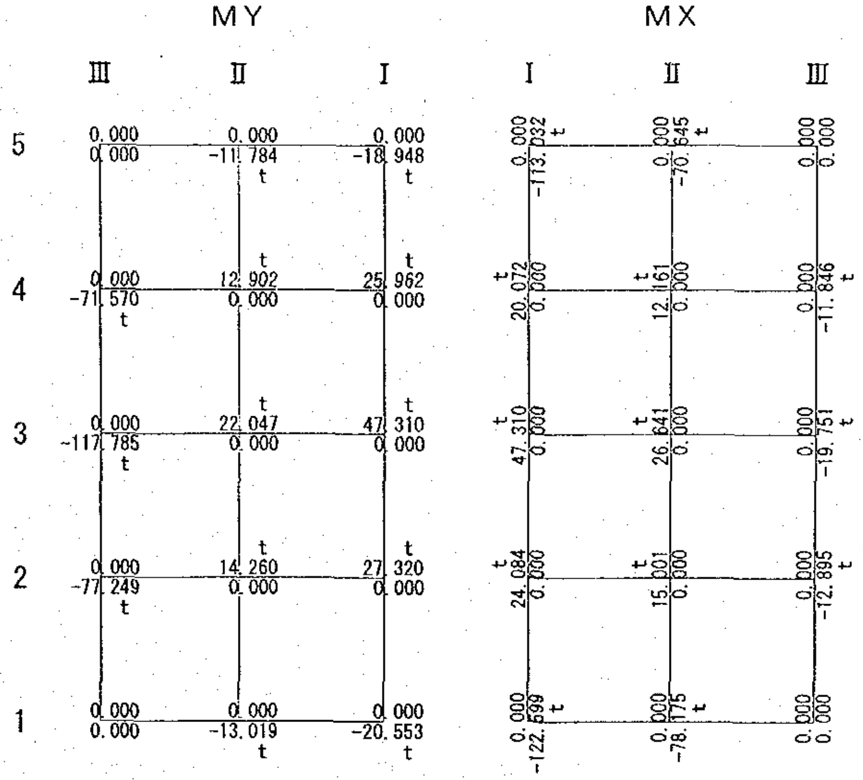
Under ordinary conditions　Bottom slab A Room　Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment



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

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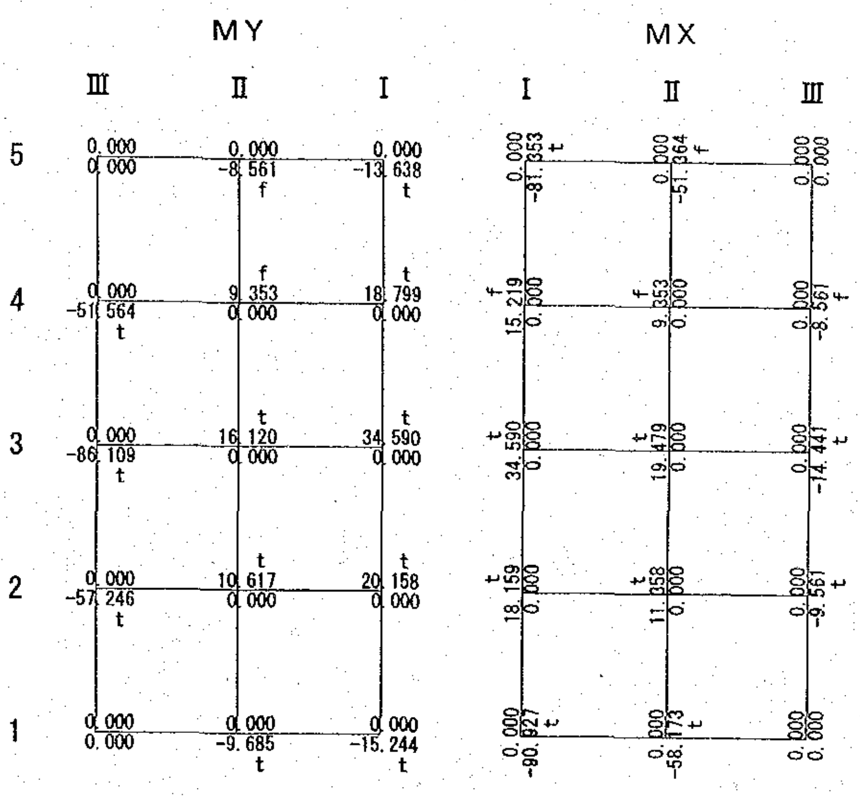
Under ordinary conditions Bottom slab C Room Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment



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

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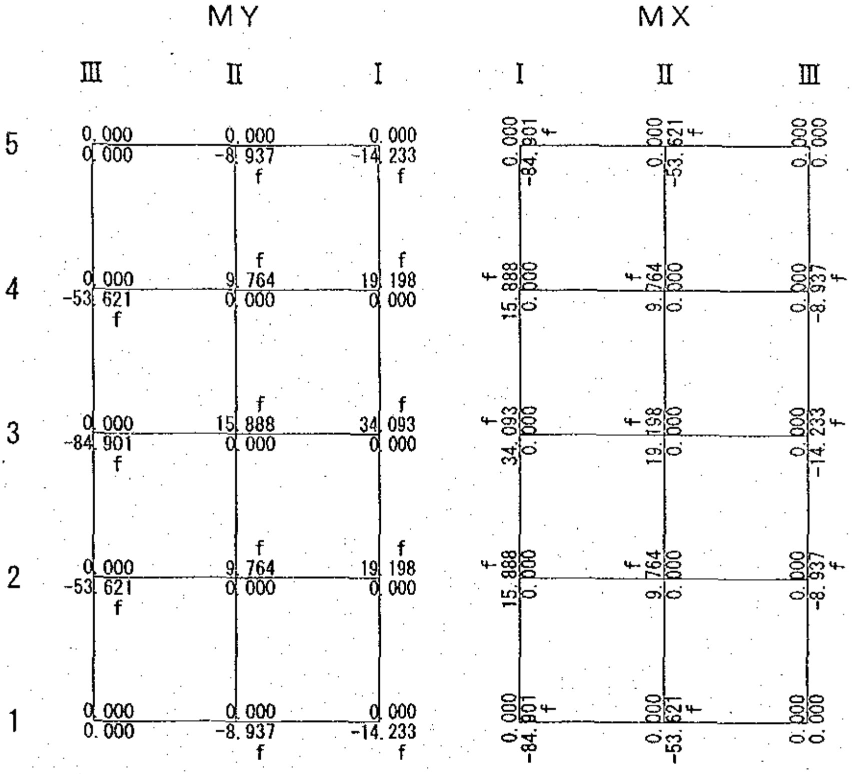
Under ordinary conditions　Bottom slab D room　Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment



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

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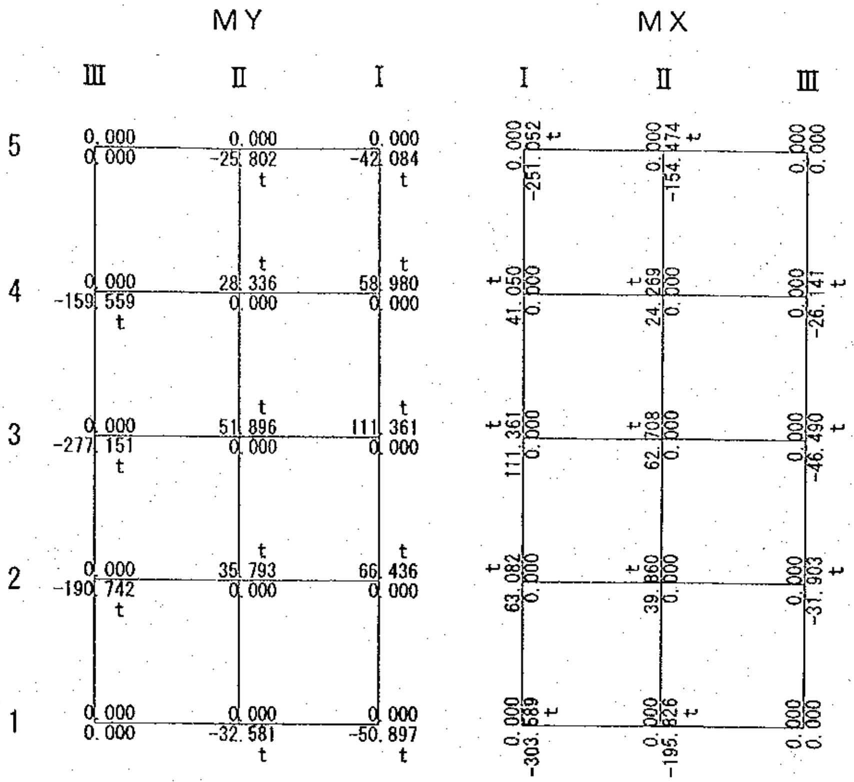
During an earthquake Bottom slab A Room Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment



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

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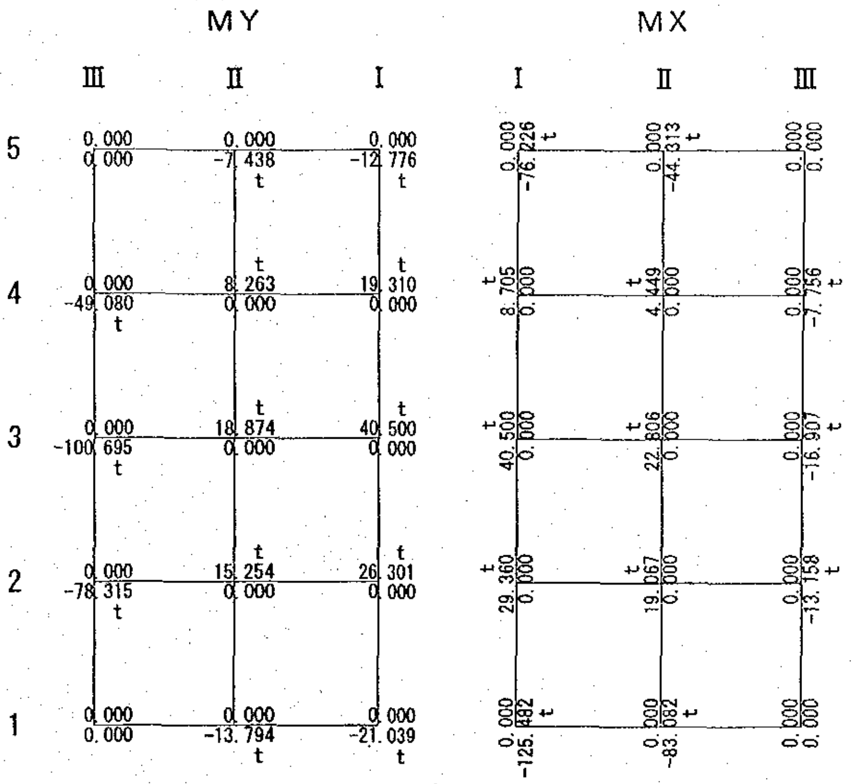
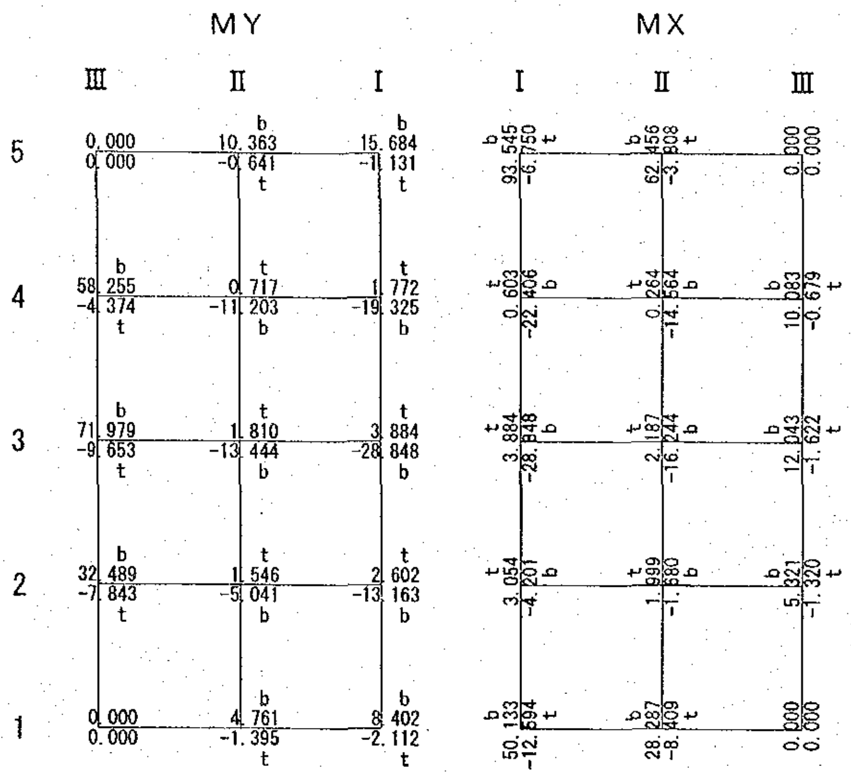
During an earthquake   Bottom slab B Room   Colligation of bending moment
Top(left)side : +moment
Bottom(right)side : −moment



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

During an earthquake Bottom slab C 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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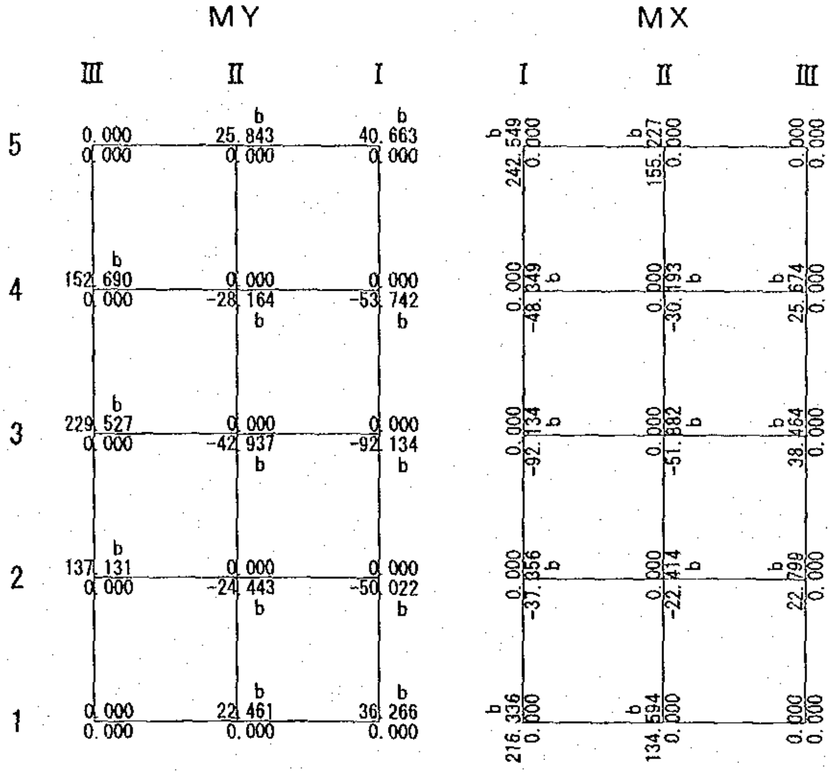
CHECKED BY | Y. NISHIMORA | 09/08/2002

During an earthquake　Bottom slab D 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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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.

(a)Under ordinary conditions

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

$M = 1/6 \times 1.00^2 \times (2 \times 346.58 + 337.73) = 171.815$ (kN·m/m)

$V = 1/2 \times 0.65 \times (346.58 + 340.83) = 223.408$ (kN/m)

Land side

Above

$M = 1/6 \times 1.00^2 \times (2 \times 2.15 + 0.00) = 0.717$ (kN·m/m)

$V = 1/2 \times 0.65 \times (2.15 + 0.75) = 0.943$ (kN/m)

Below

$M = 1/6 \times 1.00^2 \times (2 \times 0.00 + 3.49) = 0.582$ (kN·m/m)

$V = 1/2 \times 0.65 \times (0.00 + 2.27) = 0.738$ (kN/m)

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(b)During an earthquake

Moment , Shearing force

Sea side

Above

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

V = 1/2 × 0.65 × (0.00 + 0.00) = 0.000 (kN/m)

Below

M = 1/6 × 1.00^2 × (2 × 594.42 + 558.99) = 291.305 (kN·m/m)

V = 1/2 × 0.65 × (594.42 + 571.39) = 378.888 (kN/m)

Land side

Above

M = 1/6 × 1.00^2 × (2 × 238.63 + 239.41) = 119.445 (kN·m/m)

V = 1/2 × 0.65 × (238.63 + 239.14) = 155.275 (kN/m)

Below

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

V = 1/2 × 0.65 × (0.00 + 0.00) = 0.000 (kN/m)

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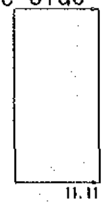
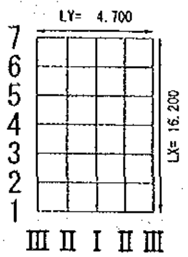
Partition Wall

(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 = 11.11(kN/m²)
P2 = 11.11(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 = 11.11(kN/m²)

$MX = P \cdot LY^2 \cdot X = 11.11 \times 4.700^2 \times X = 245.42 \times X$

$MY = P \cdot LY^2 \cdot Y = 11.11 \times 4.700^2 \times Y = 245.42 \times Y$

		X	MX	Y	MY
Ⅰ	7	0.0000	0.000	0.0432	10.602
	6	0.0067	1.644	0.0415	10.185
	5	0.0068	1.669	0.0416	10.209
	4	0.0069	1.693	0.0417	10.234
	3	0.0079	1.939	0.0417	10.234
	2	0.0132	3.240	0.0343	8.418
	1	-0.0564	-13.842	-0.0094	-2.307
Ⅱ	7	0.0000	0.000	0.0105	2.577
	6	0.0015	0.368	0.0104	2.552
	5	0.0015	0.368	0.0104	2.552
	4	0.0016	0.393	0.0104	2.552
	3	0.0022	0.540	0.0107	2.626
	2	0.0058	1.423	0.0105	2.577
	1	-0.0335	-8.222	-0.0056	-1.374
Ⅲ	7	0.0000	0.000	-0.0877	-21.523
	6	-0.0142	-3.485	-0.0851	-20.885
	5	-0.0141	-3.460	-0.0847	-20.787
	4	-0.0141	-3.460	-0.0846	-20.763
	3	-0.0143	-3.510	-0.0855	-20.983
	2	-0.0125	-3.068	-0.0750	-18.407
	1	0.0000	0.000	0.0000	0.000

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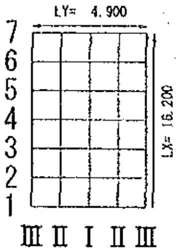
(b) Partition wall(parallel to centerline)

slab fixed on three sides and free on one side

P1 = 11.11(kN/m²)
P2 = 11.11(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 = 11.11(kN/m²)
$MX = P \cdot LY^2 \cdot X = 11.11 \times 4.900^2 \times X = 266.75 \times X$
$MY = P \cdot LY^2 \cdot Y = 11.11 \times 4.900^2 \times Y = 266.75 \times Y$

		X	MX	Y	MY
Ⅰ	7	0.0000	0.000	0.0432	11.524
	6	0.0067	1.787	0.0414	11.043
	5	0.0068	1.814	0.0416	11.097
	4	0.0070	1.867	0.0418	11.150
	3	0.0083	2.214	0.0415	11.070
	2	0.0136	3.628	0.0326	8.696
	1	-0.0565	-15.071	-0.0094	-2.507
Ⅱ	7	0.0000	0.000	0.0105	2.801
	6	0.0015	0.400	0.0104	2.774
	5	0.0015	0.400	0.0104	2.774
	4	0.0017	0.453	0.0105	2.801
	3	0.0025	0.667	0.0107	2.854
	2	0.0062	1.654	0.0103	2.748
	1	-0.0338	-9.016	-0.0056	-1.494
Ⅲ	7	0.0000	0.000	-0.0872	-23.261
	6	-0.0141	-3.761	-0.0847	-22.594
	5	-0.0141	-3.761	-0.0845	-22.540
	4	-0.0141	-3.761	-0.0846	-22.567
	3	-0.0142	-3.788	-0.0851	-22.701
	2	-0.0120	-3.201	-0.0720	-19.206
	1	0.0000	0.000	0.0000	0.000

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

	MY			MX		
	III	II	I	I	II	III
7	21.523	2.577	10.602	0.000	0.000	0.000
6	20.885	2.552	10.185	1.644	0.368	3.485
5	20.787	2.552	10.209	1.669	0.368	3.460
4	20.763	2.552	10.234	1.693	0.393	3.460
3	20.983	2.626	10.234	1.939	0.540	3.510
2	18.407	2.577	8.418	3.240	1.423	3.068
1	0.000	1.374	2.307	13.842	8.222	0.000

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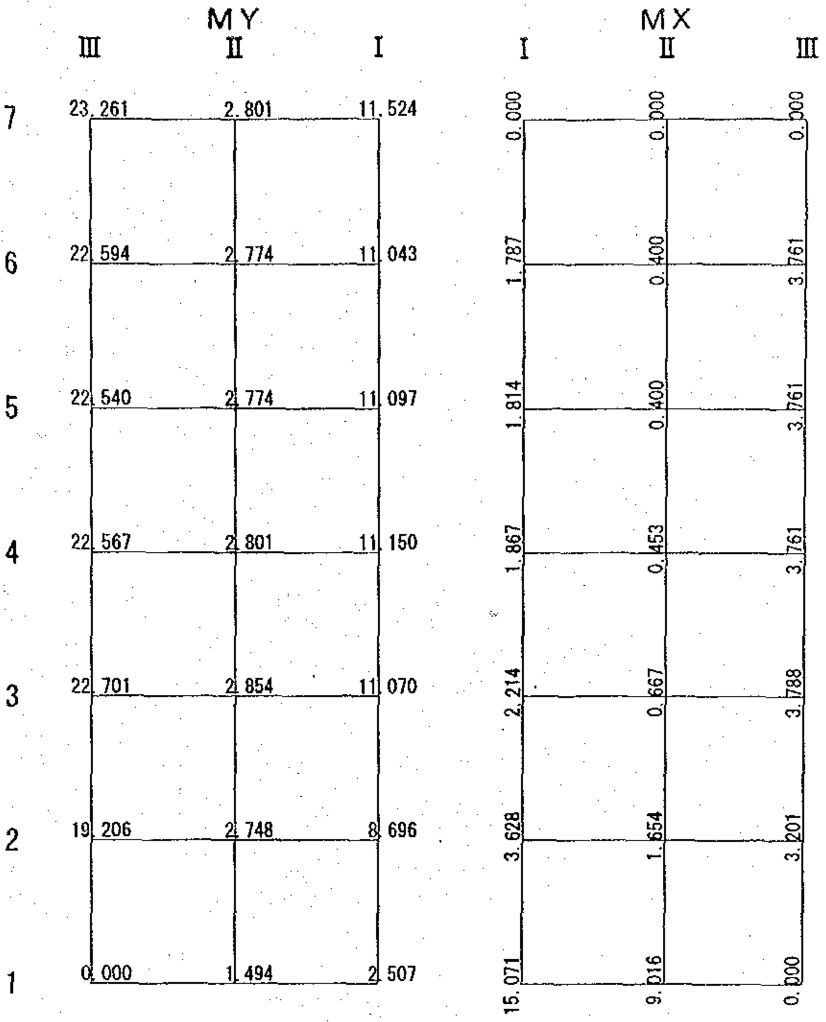
Partition wall(parallel to centerline) Colligation of bending moment



	MY			MX		
	Ⅲ	Ⅱ	Ⅰ	Ⅰ	Ⅱ	Ⅲ
7	23.261	2.801	11.524	0.000	0.000	0.000
6	22.594	2.774	11.043	1.787	0.400	3.761
5	22.540	2.774	11.097	1.814	0.400	3.761
4	22.567	2.801	11.150	1.867	0.453	3.761
3	22.701	2.854	11.070	2.214	0.667	3.788
2	19.206	2.748	8.696	3.628	1.654	3.201
1	0.000	1.494	2.507	15.071	9.016	0.000

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Serviceability limit state

Sidewall(perpendicular to levee normal)

(1) While afloat

slab fixed on three sides and free on one side

$P1 = 0.00 (kN/m^2)$

$P2 = 38.43 (kN/m^2)$

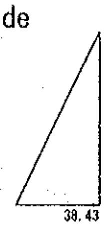
$LX = 16.200 (m)$

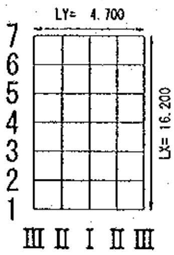
$LY = 4.700 (m)$

The ratio of a length of sides

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

The coefficient table of $\lambda = 3.50$ is used.





Section force by triangular distribution load

$P = 38.43 (kN/m^2)$

$MX = P \cdot LY^2 \cdot X = 38.43 \times 4.700^2 \times X = 848.92 \times X$

$MY = P \cdot LY^2 \cdot Y = 38.43 \times 4.700^2 \times Y = 848.92 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0027	2.292
	6	0.0009	0.764	0.0071	6.027
	5	0.0022	1.868	0.0139	11.800
	4	0.0035	2.971	0.0209	17.742
	3	0.0055	4.669	0.0279	23.685
	2	0.0119	10.102	0.0278	23.600
	1	-0.0500	-42.446	-0.0083	-7.046
II	7	0.0000	0.000	0.0003	0.255
	6	0.0003	0.255	0.0017	1.443
	5	0.0005	0.424	0.0034	2.886
	4	0.0008	0.679	0.0052	4.414
	3	0.0015	1.273	0.0072	6.112
	2	0.0054	4.584	0.0088	7.470
	1	-0.0303	-25.722	-0.0050	-4.245
III	7	0.0000	0.000	-0.0002	-0.170
	6	-0.0019	-1.613	-0.0112	-9.508
	5	-0.0045	-3.820	-0.0269	-22.836
	4	-0.0072	-6.112	-0.0429	-36.419
	3	-0.0098	-8.319	-0.0588	-49.916
	2	-0.0104	-8.829	-0.0622	-52.803
	1	0.0000	0.000	0.0000	0.000

(2) After Construction

slab fixed on three sides and free on one side

$P1 = -79.87 (kN/m^2)$

$P2 = -95.24 (kN/m^2)$

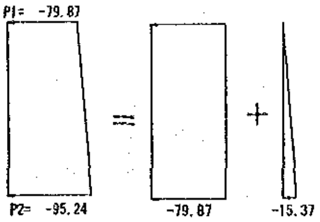
$LX = 16.200 (m)$

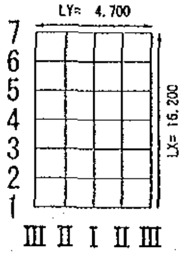
$LY = 4.700 (m)$

The ratio of a length of sides

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

The coefficient table of λ = 3.50 is used.





(i) Section force by equivalent uniform load

$P = -79.87 (kN/m^2)$

$MX = P \cdot LY^2 \cdot X = -79.87 \times 4.700^2 \times X = -1764.33 \times X$

$MY = P \cdot LY^2 \cdot Y = -79.87 \times 4.700^2 \times Y = -1764.33 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0432	-76.219
	6	0.0067	-11.821	0.0415	-73.220
	5	0.0068	-11.997	0.0416	-73.396
	4	0.0069	-12.174	0.0417	-73.572
	3	0.0079	-13.938	0.0417	-73.572
	2	0.0132	-23.289	0.0343	-60.516
	1	-0.0564	99.508	-0.0094	16.585
II	7	0.0000	0.000	0.0105	-18.525
	6	0.0015	-2.646	0.0104	-18.349
	5	0.0015	-2.646	0.0104	-18.349
	4	0.0016	-2.823	0.0104	-18.349
	3	0.0022	-3.882	0.0107	-18.878
	2	0.0058	-10.233	0.0105	-18.525
	1	-0.0335	59.105	-0.0056	9.880
III	7	0.0000	0.000	-0.0877	154.732
	6	-0.0142	25.053	-0.0851	150.144
	5	-0.0141	24.877	-0.0847	149.439
	4	-0.0141	24.877	-0.0846	149.262
	3	-0.0143	25.230	-0.0855	150.850
	2	-0.0125	22.054	-0.0750	132.325
	1	0.0000	0.000	0.0000	0.000

(ii)Section force by triangular distribution load

$P = -15.37 (kN/m^2)$

$MX = P \cdot LY^2 \cdot X = -15.37 \times 4.700^2 \times X = -339.52 \times X$

$MY = P \cdot LY^2 \cdot Y = -15.37 \times 4.700^2 \times Y = -339.52 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0027	-0.917
	6	0.0009	-0.306	0.0071	-2.411
	5	0.0022	-0.747	0.0139	-4.719
	4	0.0035	-1.188	0.0209	-7.096
	3	0.0055	-1.867	0.0279	-9.473
	2	0.0119	-4.040	0.0278	-9.439
	1	-0.0500	16.976	-0.0083	2.818
Ⅱ	7	0.0000	0.000	0.0003	-0.102
	6	0.0003	-0.102	0.0017	-0.577
	5	0.0005	-0.170	0.0034	-1.154
	4	0.0008	-0.272	0.0052	-1.766
	3	0.0015	-0.509	0.0072	-2.445
	2	0.0054	-1.833	0.0088	-2.988
	1	-0.0303	10.288	-0.0050	1.698
Ⅲ	7	0.0000	0.000	-0.0002	0.068
	6	-0.0019	0.645	-0.0112	3.803
	5	-0.0045	1.528	-0.0269	9.133
	4	-0.0072	2.445	-0.0429	14.566
	3	-0.0098	3.327	-0.0588	19.964
	2	-0.0104	3.531	-0.0622	21.118
	1	0.0000	0.000	0.0000	0.000

The sum total of (i) and (ii)

		MX	MY
I	7	0.000	-77.136
	6	-12.127	-75.631
	5	-12.744	-78.115
	4	-13.362	-80.668
	3	-15.805	-83.045
	2	-27.329	-69.955
	1	116.484	19.403
II	7	0.000	-18.627
	6	-2.748	-18.926
	5	-2.816	-19.503
	4	-3.095	-20.115
	3	-4.391	-21.323
	2	-12.066	-21.513
	1	69.393	11.578
III	7	0.000	154.800
	6	25.698	153.947
	5	26.405	158.572
	4	27.322	163.828
	3	28.557	170.814
	2	25.585	153.443
	1	0.000	0.000

Sidewall(parallel to centerline)

(1) While afloat

slab fixed on three sides and free on one side

P1 = 0.00(kN/m²)

P2 = 38.43(kN/m²)

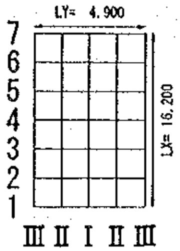
LX = 16.200(m)

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 triangular distribution load

P = 38.43(kN/m²)

$MX = P \cdot LY^2 \cdot X = 38.43 \times 4.900^2 \times X = 922.70 \times X$

$MY = P \cdot LY^2 \cdot Y = 38.43 \times 4.900^2 \times Y = 922.70 \times Y$

		X	MX	Y	MY
Ⅰ	7	0.0000	0.000	0.0029	2.676
	6	0.0008	0.738	0.0071	6.551
	5	0.0022	2.030	0.0139	12.826
	4	0.0035	3.229	0.0209	19.285
	3	0.0059	5.444	0.0277	25.559
	2	0.0123	11.349	0.0263	24.267
	1	-0.0496	-45.766	-0.0083	-7.658
Ⅱ	7	0.0000	0.000	0.0003	0.277
	6	0.0002	0.185	0.0017	1.569
	5	0.0005	0.461	0.0034	3.137
	4	0.0008	0.738	0.0052	4.798
	3	0.0018	1.661	0.0072	6.643
	2	0.0058	5.352	0.0086	7.935
	1	-0.0302	-27.866	-0.0050	-4.614
Ⅲ	7	0.0000	0.000	-0.0008	-0.738
	6	-0.0019	-1.753	-0.0116	-10.703
	5	-0.0045	-4.152	-0.0271	-25.005
	4	-0.0071	-6.551	-0.0428	-39.492
	3	-0.0097	-8.950	-0.0583	-53.794
	2	-0.0099	-9.135	-0.0594	-54.809
	1	0.0000	0.000	0.0000	0.000

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(2) After Construction

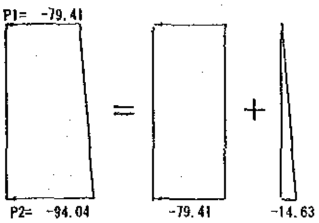
A. Sidewall (parallel to centerline:seaside)

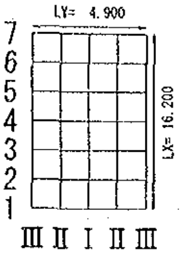
slab fixed on three sides and free on one side

$P1 = -79.41 (kN/m^2)$
$P2 = -94.04 (kN/m^2)$
$LX = 16.200 (m)$
$LY = 4.900 (m)$

The ratio of a length of sides

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





The coefficient table of $\lambda = 3.25$ is used.

(i) Section force by equivalent uniform load

$P = -79.41 (kN/m^2)$
$MX = P \cdot LY^2 \cdot X = -79.41 \times 4.900^2 \times X = -1906.63 \times X$
$MY = P \cdot LY^2 \cdot Y = -79.41 \times 4.900^2 \times Y = -1906.63 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0432	-82.367
	6	0.0067	-12.774	0.0414	-78.935
	5	0.0068	-12.965	0.0416	-79.316
	4	0.0070	-13.346	0.0418	-79.697
	3	0.0083	-15.825	0.0415	-79.125
	2	0.0136	-25.930	0.0326	-62.156
	1	-0.0565	107.725	-0.0094	17.922
II	7	0.0000	0.000	0.0105	-20.020
	6	0.0015	-2.860	0.0104	-19.829
	5	0.0015	-2.860	0.0104	-19.829
	4	0.0017	-3.241	0.0105	-20.020
	3	0.0025	-4.767	0.0107	-20.401
	2	0.0062	-11.821	0.0103	-19.638
	1	-0.0338	64.444	-0.0056	10.677
III	7	0.0000	0.000	-0.0872	166.258
	6	-0.0141	26.884	-0.0847	161.492
	5	-0.0141	26.884	-0.0845	161.111
	4	-0.0141	26.884	-0.0846	161.301
	3	-0.0142	27.074	-0.0851	162.255
	2	-0.0120	22.880	-0.0720	137.278
	1	0.0000	0.000	0.0000	0.000

(ii)Section force by triangular distribution load

$P = -14.63 (kN/m^2)$

$MX = P \cdot LY^2 \cdot X = -14.63 \times 4.900^2 \times X = -351.27 \times X$

$MY = P \cdot LY^2 \cdot Y = -14.63 \times 4.900^2 \times Y = -351.27 \times Y$

		X	MX	Y	MY
I	7	0.0000	0.000	0.0029	-1.019
	6	0.0008	-0.281	0.0071	-2.494
	5	0.0022	-0.773	0.0139	-4.883
	4	0.0035	-1.229	0.0209	-7.341
	3	0.0059	-2.072	0.0277	-9.730
	2	0.0123	-4.321	0.0263	-9.238
	1	-0.0496	17.423	-0.0083	2.916
II	7	0.0000	0.000	0.0003	-0.105
	6	0.0002	-0.070	0.0017	-0.597
	5	0.0005	-0.176	0.0034	-1.194
	4	0.0008	-0.281	0.0052	-1.827
	3	0.0018	-0.632	0.0072	-2.529
	2	0.0058	-2.037	0.0086	-3.021
	1	-0.0302	10.608	-0.0050	1.756
III	7	0.0000	0.000	-0.0008	0.281
	6	-0.0019	0.667	-0.0116	4.075
	5	-0.0045	1.581	-0.0271	9.519
	4	-0.0071	2.494	-0.0428	15.034
	3	-0.0097	3.407	-0.0583	20.479
	2	-0.0099	3.478	-0.0594	20.865
	1	0.0000	0.000	0.0000	0.000

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The sum total of (i) and (ii)

		MX	MY
I	7	0.000	-83.386
	6	-13.055	-81.429
	5	-13.738	-84.199
	4	-14.575	-87.038
	3	-17.897	-88.855
	2	-30.251	-71.394
	1	125.148	20.838
II	7	0.000	-20.125
	6	-2.930	-20.426
	5	-3.036	-21.023
	4	-3.522	-21.847
	3	-5.399	-22.930
	2	-13.858	-22.659
	1	75.052	12.433
III	7	0.000	166.539
	6	27.551	165.567
	5	28.465	170.630
	4	29.378	176.335
	3	30.481	182.734
	2	26.358	158.143
	1	0.000	0.000

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