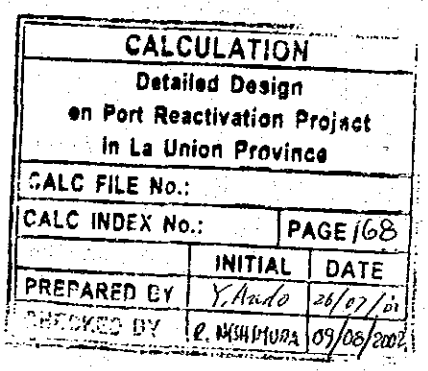
Ultimate limit state (Under ordinary conditions)
Sidewall(parallel to centerline:landside)--Perpendicular outside steel reinforcement

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	20.0	6.34	53.833	0.00
	6	14.361	29.0	1.83	D13	20.0	6.34	53.833	0.29
	5	15.111	29.0	1.92	D13	20.0	6.34	53.833	0.31
	4	16.033	29.0	2.04	D13	20.0	6.34	53.833	0.33
	3	19.686	29.0	2.51	D13	20.0	6.34	53.833	0.40
	2	33.275	29.0	4.28	D13,D13	10.0	12.67	104.945	0.35
	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	3.223	29.0	0.41	D13	40.0	3.17	27.249	0.13
	5	3.339	29.0	0.42	D13	40.0	3.17	27.249	0.13
	4	3.874	29.0	0.49	D13	40.0	3.17	27.249	0.16
	3	5.938	29.0	0.75	D13	40.0	3.17	27.249	0.24
	2	15.244	29.0	1.94	D13	20.0	6.34	53.833	0.31
	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



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 (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{lim} (cm)
I	7	0.000	29.0	D13	20.0	6.34	0.000	0.0000	
	6	13.055	29.0	D13	20.0	6.34	75.283	0.0200	0.0035×10.0
	5	13.738	29.0	D13	20.0	6.34	79.222	0.0210	=0.0350
	4	14.575	29.0	D13	20.0	6.34	84.049	0.0223	
	3	17.897	29.0	D13	20.0	6.34	103.206	0.0274	
	2	30.251	29.0	D13,D13	10.0	12.67	89.224	0.0206	
	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	2.930	29.0	D13	40.0	3.17	33.242	0.0112	0.0035×10.0
	5	3.036	29.0	D13	40.0	3.17	34.445	0.0116	=0.0350
	4	3.522	29.0	D13	40.0	3.17	39.958	0.0134	
	3	5.399	29.0	D13	40.0	3.17	61.254	0.0206	
	2	13.858	29.0	D13	20.0	6.34	79.914	0.0212	
	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	

CALCULATION		
Detailed Design on Port Reactivation Project In La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE K69
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	K. 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	505.61	1.15	1.10	18.54	D16,D19	10.0	24.26	727.800	0.76
Perpendicular	754.35	1.00	1.00	21.87	D16,D22	10.0	29.29	1010.505	0.75

Partition wall(parallel to centerline)

B = 100cm

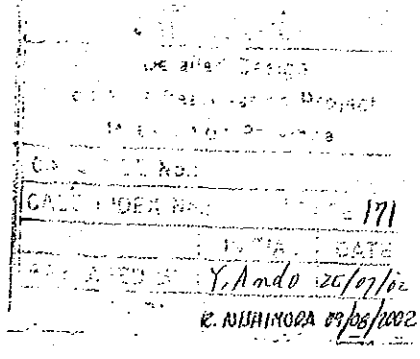
Section	Td (kN/m)	γb	γi	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Nud (kN/m)	γi·Td/Nud
Horizontal	487.13	1.15	1.10	17.86	D16,D19	10.0	24.26	727.800	0.74
Perpendicular	784.51	1.00	1.00	22.74	D16,D22	10.0	29.29	1010.505	0.78

Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:		
CALC INDEX No.:		PAGE 170
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	K. NISHIMURA	03/08/2002

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	D16,D19	10.0	24.26	53.411	0.22
	6	10.185	10.0	3.90	D16,D19	10.0	24.26	53.411	0.21
	5	10.209	10.0	3.91	D16,D19	10.0	24.26	53.411	0.21
	4	10.234	10.0	3.92	D16,D19	10.0	24.26	53.411	0.21
	3	10.234	10.0	3.92	D16,D19	10.0	24.26	53.411	0.21
	2	8.418	10.0	3.20	D16,D19	10.0	24.26	53.411	0.17
	1	2.307	10.0	0.85	D16,D19	10.0	24.26	53.411	0.05
II	7	2.577	10.0	0.95	D16,D19	10.0	24.26	53.411	0.05
	6	2.552	10.0	0.95	D16,D19	10.0	24.26	53.411	0.05
	5	2.552	10.0	0.95	D16,D19	10.0	24.26	53.411	0.05
	4	2.552	10.0	0.95	D16,D19	10.0	24.26	53.411	0.05
	3	2.626	10.0	0.97	D16,D19	10.0	24.26	53.411	0.05
	2	2.577	10.0	0.95	D16,D19	10.0	24.26	53.411	0.05
	1	1.374	10.0	0.51	D16,D19	10.0	24.26	53.411	0.03
III	7	21.523	10.0	8.73	D16,D19	10.0	24.26	53.411	0.44
	6	20.885	10.0	8.44	D16,D19	10.0	24.26	53.411	0.43
	5	20.787	10.0	8.40	D16,D19	10.0	24.26	53.411	0.43
	4	20.763	10.0	8.38	D16,D19	10.0	24.26	53.411	0.43
	3	20.983	10.0	8.48	D16,D19	10.0	24.26	53.411	0.43
	2	18.407	10.0	7.34	D16,D19	10.0	24.26	53.411	0.38
	1	0.000	10.0	0.00	D16,D19	10.0	24.26	53.411	0.00



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 (cm^2)	σse (N/mm^2)	Crack width W(cm)	Permission crack width W_{lim} (cm)
I	7	4.819	10.0	D16,D19	10.0	24.26	23.447	0.0054	
	6	4.630	10.0	D16,D19	10.0	24.26	22.528	0.0052	0.0040×10.0
	5	4.641	10.0	D16,D19	10.0	24.26	22.581	0.0052	=0.0400
	4	4.652	10.0	D16,D19	10.0	24.26	22.635	0.0052	
	3	4.652	10.0	D16,D19	10.0	24.26	22.635	0.0052	
	2	3.826	10.0	D16,D19	10.0	24.26	18.616	0.0043	
	1	1.049	10.0	D16,D19	10.0	24.26	5.104	0.0012	
II	7	1.171	10.0	D16,D19	10.0	24.26	5.698	0.0013	
	6	1.160	10.0	D16,D19	10.0	24.26	5.644	0.0013	0.0040×10.0
	5	1.160	10.0	D16,D19	10.0	24.26	5.644	0.0013	=0.0400
	4	1.160	10.0	D16,D19	10.0	24.26	5.644	0.0013	
	3	1.194	10.0	D16,D19	10.0	24.26	5.809	0.0013	
	2	1.171	10.0	D16,D19	10.0	24.26	5.698	0.0013	
	1	0.625	10.0	D16,D19	10.0	24.26	3.041	0.0007	
III	7	9.783	10.0	D16,D19	10.0	24.26	47.600	0.0109	
	6	9.493	10.0	D16,D19	10.0	24.26	46.189	0.0106	0.0040×10.0
	5	9.449	10.0	D16,D19	10.0	24.26	45.975	0.0105	=0.0400
	4	9.438	10.0	D16,D19	10.0	24.26	45.921	0.0105	
	3	9.538	10.0	D16,D19	10.0	24.26	46.408	0.0106	
	2	8.367	10.0	D16,D19	10.0	24.26	40.710	0.0093	
	1	0.000	10.0	D16,D19	10.0	24.26	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project In La Union Province		
CALC FILE No.:		
CALC INDEX No :		PAGE 172
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	R. 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 (cm^2)	Diameter (mm)	Pitch (cm)	As (cm^2)	Mud (kN·m)	$\gamma i \cdot Md/Mud$
I	7	0.000	10.0	0.00	D16	40.0	4.97	14.097	0.00
	6	1.644	10.0	0.61	D16	40.0	4.97	14.097	0.13
	5	1.669	10.0	0.62	D16	40.0	4.97	14.097	0.13
	4	1.693	10.0	0.63	D16	40.0	4.97	14.097	0.13
	3	1.939	10.0	0.72	D16	40.0	4.97	14.097	0.15
	2	3.240	10.0	1.20	D16	40.0	4.97	14.097	0.25
	1	13.842	10.0	5.39	D16, D22	10.0	29.29	59.637	0.26
II	7	0.000	10.0	0.00	D16	40.0	4.97	14.097	0.00
	6	0.368	10.0	0.14	D16	40.0	4.97	14.097	0.03
	5	0.368	10.0	0.14	D16	40.0	4.97	14.097	0.03
	4	0.393	10.0	0.14	D16	40.0	4.97	14.097	0.03
	3	0.540	10.0	0.20	D16	40.0	4.97	14.097	0.04
	2	1.423	10.0	0.52	D16	40.0	4.97	14.097	0.11
	1	8.222	10.0	3.12	D16, D22	10.0	29.29	59.637	0.15
III	7	0.000	10.0	0.00	D16	40.0	4.97	14.097	0.00
	6	3.485	10.0	1.30	D16	40.0	4.97	14.097	0.27
	5	3.460	10.0	1.29	D16	40.0	4.97	14.097	0.27
	4	3.460	10.0	1.29	D16	40.0	4.97	14.097	0.27
	3	3.510	10.0	1.31	D16	40.0	4.97	14.097	0.27
	2	3.068	10.0	1.14	D16	40.0	4.97	14.097	0.24
	1	0.000	10.0	0.00	D16, D22	10.0	29.29	59.637	0.00

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_{lim}(cm)
I	7	0.000	10.0	D16	40.0	4.97	0.000	0.0000	
	6	0.747	10.0	D16	40.0	4.97	16.367	0.0055	0.0040×10.0
	5	0.759	10.0	D16	40.0	4.97	16.630	0.0056	=0.0400
	4	0.770	10.0	D16	40.0	4.97	16.871	0.0056	
	3	0.881	10.0	D16	40.0	4.97	19.303	0.0065	
	2	1.473	10.0	D16	40.0	4.97	32.274	0.0108	
	1	6.292	10.0	D16,D22	10.0	29.29	25.668	0.0059	
II	7	0.000	10.0	D16	40.0	4.97	0.000	0.0000	
	6	0.167	10.0	D16	40.0	4.97	3.659	0.0012	0.0040×10.0
	5	0.167	10.0	D16	40.0	4.97	3.659	0.0012	=0.0400
	4	0.178	10.0	D16	40.0	4.97	3.900	0.0013	
	3	0.245	10.0	D16	40.0	4.97	5.368	0.0018	
	2	0.647	10.0	D16	40.0	4.97	14.176	0.0047	
	1	3.737	10.0	D16,D22	10.0	29.29	15.245	0.0035	
III	7	0.000	10.0	D16	40.0	4.97	0.000	0.0000	
	6	1.584	10.0	D16	40.0	4.97	34.706	0.0116	0.0040×10.0
	5	1.573	10.0	D16	40.0	4.97	34.465	0.0115	=0.0400
	4	1.573	10.0	D16	40.0	4.97	34.465	0.0115	
	3	1.595	10.0	D16	40.0	4.97	34.947	0.0117	
	2	1.394	10.0	D16	40.0	4.97	30.543	0.0102	
	1	0.000	10.0	D16,D22	10.0	29.29	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 179
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
	K.NISHIMURA	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 (cm^2)	Diameter (mm)	Pitch (cm)	As (cm^2)	Mud (kN·m)	$\gamma i \cdot Md/Mud$
I	7	11.524	10.0	4.44	D16, D19	10.0	24.26	53.411	0.24
	6	11.043	10.0	4.25	D16, D19	10.0	24.26	53.411	0.23
	5	11.097	10.0	4.27	D16, D19	10.0	24.26	53.411	0.23
	4	11.150	10.0	4.29	D16, D19	10.0	24.26	53.411	0.23
	3	11.070	10.0	4.26	D16, D19	10.0	24.26	53.411	0.23
	2	8.696	10.0	3.31	D16, D19	10.0	24.26	53.411	0.18
	1	2.507	10.0	0.93	D16, D19	10.0	24.26	53.411	0.05
II	7	2.801	10.0	1.04	D16, D19	10.0	24.26	53.411	0.06
	6	2.774	10.0	1.03	D16, D19	10.0	24.26	53.411	0.06
	5	2.774	10.0	1.03	D16, D19	10.0	24.26	53.411	0.06
	4	2.801	10.0	1.04	D16, D19	10.0	24.26	53.411	0.06
	3	2.854	10.0	1.06	D16, D19	10.0	24.26	53.411	0.06
	2	2.748	10.0	1.02	D16, D19	10.0	24.26	53.411	0.06
	1	1.494	10.0	0.55	D16, D19	10.0	24.26	53.411	0.03
III	7	23.261	10.0	9.52	D16, D19	10.0	24.26	53.411	0.48
	6	22.594	10.0	9.22	D16, D19	10.0	24.26	53.411	0.47
	5	22.540	10.0	9.19	D16, D19	10.0	24.26	53.411	0.46
	4	22.567	10.0	9.20	D16, D19	10.0	24.26	53.411	0.46
	3	22.701	10.0	9.27	D16, D19	10.0	24.26	53.411	0.47
	2	19.206	10.0	7.69	D16, D19	10.0	24.26	53.411	0.40
	1	0.000	10.0	0.00	D16, D19	10.0	24.26	53.411	0.00

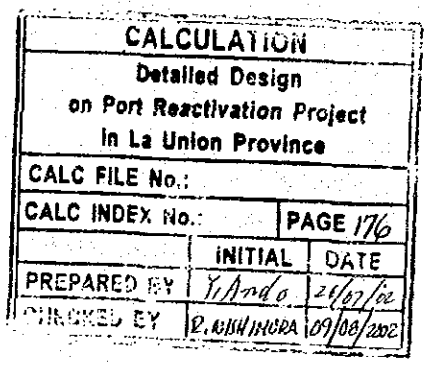
CALCULATION
Detailed Design
on Port Reactivation Project
In La Union Province
CALC FILE No.:
CALC INDEX No.: PAGE 175
INITIAL DATE
PREPARED BY: Y.Ando 26/07/02
R.NISHIMURA 09/08/2002

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_{lim}(cm)
I 7	5.238	10.0	D16, D19	10.0	24.26	25.486	0.0058	
6	5.020	10.0	D16, D19	10.0	24.26	24.425	0.0056	0.0040×10.0
5	5.044	10.0	D16, D19	10.0	24.26	24.542	0.0056	=0.0400
4	5.068	10.0	D16, D19	10.0	24.26	24.659	0.0057	
3	5.032	10.0	D16, D19	10.0	24.26	24.484	0.0056	
2	3.953	10.0	D16, D19	10.0	24.26	19.234	0.0044	
1	1.140	10.0	D16, D19	10.0	24.26	5.547	0.0013	
II 7	1.273	10.0	D16, D19	10.0	24.26	6.194	0.0014	
6	1.261	10.0	D16, D19	10.0	24.26	6.135	0.0014	0.0040×10.0
5	1.261	10.0	D16, D19	10.0	24.26	6.135	0.0014	=0.0400
4	1.273	10.0	D16, D19	10.0	24.26	6.194	0.0014	
3	1.297	10.0	D16, D19	10.0	24.26	6.311	0.0014	
2	1.249	10.0	D16, D19	10.0	24.26	6.077	0.0014	
1	0.679	10.0	D16, D19	10.0	24.26	3.304	0.0008	
III 7	10.573	10.0	D16, D19	10.0	24.26	51.444	0.0118	
6	10.270	10.0	D16, D19	10.0	24.26	49.969	0.0115	0.0040×10.0
5	10.246	10.0	D16, D19	10.0	24.26	49.853	0.0114	=0.0400
4	10.258	10.0	D16, D19	10.0	24.26	49.911	0.0115	
3	10.318	10.0	D16, D19	10.0	24.26	50.203	0.0115	
2	8.730	10.0	D16, D19	10.0	24.26	42.476	0.0097	
1	0.000	10.0	D16, D19	10.0	24.26	0.000	0.0000	



Ultimate limit state (Under ordinary conditions)
Partition wall (parallele to centerline) — Perpendicular 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	10.0	0.00	D16	40.0	4.97	14.097	0.00
	6	1.787	10.0	0.66	D16	40.0	4.97	14.097	0.14
	5	1.814	10.0	0.67	D16	40.0	4.97	14.097	0.14
	4	1.867	10.0	0.69	D16	40.0	4.97	14.097	0.15
	3	2.214	10.0	0.82	D16	40.0	4.97	14.097	0.17
	2	3.628	10.0	1.35	D16	40.0	4.97	14.097	0.28
	1	15.071	10.0	5.91	D16, D22	10.0	29.29	59.637	0.28
II	7	0.000	10.0	0.00	D16	40.0	4.97	14.097	0.00
	6	0.400	10.0	0.15	D16	40.0	4.97	14.097	0.03
	5	0.400	10.0	0.15	D16	40.0	4.97	14.097	0.03
	4	0.453	10.0	0.17	D16	40.0	4.97	14.097	0.04
	3	0.667	10.0	0.25	D16	40.0	4.97	14.097	0.05
	2	1.654	10.0	0.61	D16	40.0	4.97	14.097	0.13
	1	9.016	10.0	3.44	D16, D22	10.0	29.29	59.637	0.17
III	7	0.000	10.0	0.00	D16	40.0	4.97	14.097	0.00
	6	3.761	10.0	1.40	D16	40.0	4.97	14.097	0.29
	5	3.761	10.0	1.40	D16	40.0	4.97	14.097	0.29
	4	3.761	10.0	1.40	D16	40.0	4.97	14.097	0.29
	3	3.788	10.0	1.41	D16	40.0	4.97	14.097	0.30
	2	3.201	10.0	1.19	D16	40.0	4.97	14.097	0.25
	1	0.000	10.0	0.00	D16, D22	10.0	29.29	59.637	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 177
	INITIAL	DATE
PREPARED BY		
CHECKED BY	K. NISHIHARA	09/06/2002

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_{lim}(cm)
I	7	0.000	10.0	D16	40.0	4.97	0.000	0.0000	
	6	0.812	10.0	D16	40.0	4.97	17.791	0.0060	0.0040×10.0
	5	0.825	10.0	D16	40.0	4.97	18.076	0.0060	=0.0400
	4	0.849	10.0	D16	40.0	4.97	18.602	0.0062	
	3	1.006	10.0	D16	40.0	4.97	22.042	0.0074	
	2	1.649	10.0	D16	40.0	4.97	36.130	0.0121	
	1	6.851	10.0	D16,D22	10.0	29.29	27.948	0.0064	
II	7	0.000	10.0	D16	40.0	4.97	0.000	0.0000	
	6	0.182	10.0	D16	40.0	4.97	3.988	0.0013	0.0040×10.0
	5	0.182	10.0	D16	40.0	4.97	3.988	0.0013	=0.0400
	4	0.206	10.0	D16	40.0	4.97	4.513	0.0015	
	3	0.303	10.0	D16	40.0	4.97	6.639	0.0022	
	2	0.752	10.0	D16	40.0	4.97	16.476	0.0055	
	1	4.098	10.0	D16,D22	10.0	29.29	16.717	0.0038	
III	7	0.000	10.0	D16	40.0	4.97	0.000	0.0000	
	6	1.710	10.0	D16	40.0	4.97	37.466	0.0125	0.0040×10.0
	5	1.710	10.0	D16	40.0	4.97	37.466	0.0125	=0.0400
	4	1.710	10.0	D16	40.0	4.97	37.466	0.0125	
	3	1.722	10.0	D16	40.0	4.97	37.729	0.0126	
	2	1.455	10.0	D16	40.0	4.97	31.879	0.0107	
	1	0.000	10.0	D16,D22	10.0	29.29	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project In La Union Province		
CALC FILE No :		
CALC INDEX No.		PAGE 178
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	K. NISHIHODA	09/08/2002

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	27.163	53.0	1.89	D13	20.0	6.34	99.479	0.30
	3	62.811	53.0	4.39	D13,D13	10.0	12.67	196.171	0.35
	2	31.445	53.0	2.19	D13	20.0	6.34	99.479	0.35
	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	16.508	53.0	1.14	D13	20.0	6.34	99.479	0.18
	3	35.369	53.0	2.46	D13	20.0	6.34	99.479	0.39
	2	19.538	53.0	1.36	D13	20.0	6.34	99.479	0.22
	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

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
CALC FILE No.:
CALC INDEX No.: PAGE 179
INITIAL DATE
PREPARED BY Y. Ando 26/07/02
CHECKED BY E. NISHIHARA 09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(A Room)—Perpendicular to levee norrmal An upper 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	5	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	4	41.050	53.0	2.26	D13	20.0	6.34	114.401	0.36
	3	111.361	53.0	6.17	D13,D13	10.0	12.67	225.597	0.49
	2	63.082	53.0	3.47	D13	20.0	6.34	114.401	0.55
	1	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
II	5	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	4	24.269	53.0	1.33	D13	20.0	6.34	114.401	0.21
	3	62.708	53.0	3.45	D13	20.0	6.34	114.401	0.55
	2	39.860	53.0	2.19	D13	20.0	6.34	114.401	0.35
	1	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
III	5	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	4	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	3	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	2	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	1	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 180
	INITIAL	DATE
PREPARED BY	T.Ando	26/07/01
CHECKED BY	R.NISHIHARA	09/08/2002

Serviceability limit state
Bottom slab(A Room)—Perpendicular to levee norrmal An upper 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	5	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	4	10.709	53.0	D13	20.0	6.34	33.306	0.0062	0.0040×6.0
	3	27.092	53.0	D13,D13	10.0	12.67	42.880	0.0065	=0.0240
	2	14.602	53.0	D13	20.0	6.34	45.413	0.0084	
	1	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
II	5	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	4	6.412	53.0	D13	20.0	6.34	19.942	0.0037	0.0040×6.0
	3	15.256	53.0	D13	20.0	6.34	47.447	0.0088	=0.0240
	2	9.167	53.0	D13	20.0	6.34	28.510	0.0053	
	1	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
III	5	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	4	0.000	53.0	D13	20.0	6.34	0.000	0.0000	0.0040×6.0
	3	0.000	53.0	D13	20.0	6.34	0.000	0.0000	=0.0240
	2	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	1	0.000	53.0	D13	20.0	6.34	0.000	0.0000	

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
CALC FILE No.:
CALC INDEX No.: PAGE 181

	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/03
CHECKED BY	E. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(A Room) —Perpendicular to levee norrmal A lower 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	151.313	57.6	9.82	D13,D16	10.0	16.27	272.448	0.61	※
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	1	161.523	57.6	10.49	D13,D19	10.0	20.66	342.945	0.52	
II	5	94.772	57.6	6.10	D13,D13	10.0	12.67	213.654	0.49	
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	1	102.809	57.6	6.63	D13,D13	10.0	12.67	213.654	0.53	
III	5	0.000	57.6	0.00	D13	20.0	6.34	108.233	0.00	
	4	15.873	57.6	1.01	D13	20.0	6.34	108.233	0.16	
	3	26.222	57.6	1.67	D13	20.0	6.34	108.233	0.27	
	2	16.992	57.6	1.08	D13	20.0	6.34	108.233	0.17	
	1	0.000	57.6	0.00	D13	20.0	6.34	108.233	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 182
	INITIAL / DATE
PREPARED BY	
CHECKED BY	R. NISHIMURA 09/05/2002

Ultimate limit state (During an earthquake)
Bottom slab(A Room)—Perpendicular to levee norrmal A lower steel reinforcement
B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm^2)	Diameter (mm)	Pitch (cm)	As (cm^2)	Mud (kN·m)	γi·Md/Mud	
I	5	251.052	57.6	12.95	D13,D16	10.0	16.27	313.316	0.80	※
	4	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	1	303.589	57.6	15.75	D13,D19	10.0	20.66	394.387	0.77	
II	5	154.474	57.6	7.89	D13,D13	10.0	12.67	245.702	0.63	
	4	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	1	195.826	57.6	10.05	D13,D13	10.0	12.67	245.702	0.80	
III	5	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00	
	4	26.141	57.6	1.32	D13	20.0	6.34	124.468	0.21	
	3	46.490	57.6	2.35	D13	20.0	6.34	124.468	0.37	
	2	31.903	57.6	1.61	D13	20.0	6.34	124.468	0.26	
	1	0.000	57.6	0.00	D13	20.0	6.34	124.468	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 183
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	R. NISHIHARA	09/08/2002

Serviceability limit state
Bottom slab(A Room)—Perpendicular to levee norrmal A lower 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	5	62.825	57.6	D13,D16	10.0	16.27	71.598	0.0136	
	4	0.000	51.0	D13	20.0	6.34	0.000	0.0000	0.0035×8.0
	3	0.000	51.0	D13	20.0	6.34	0.000	0.0000	=0.0280
	2	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	1	72.107	57.6	D13,D19	10.0	20.66	65.217	0.0124	
II	5	38.957	57.6	D13,D13	10.0	12.67	56.605	0.0108	
	4	0.000	51.0	D13	20.0	6.34	0.000	0.0000	0.0035×8.0
	3	0.000	51.0	D13	20.0	6.34	0.000	0.0000	=0.0280
	2	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	1	46.264	57.6	D13,D13	10.0	12.67	67.222	0.0128	
III	5	0.000	57.6	D13	20.0	6.34	0.000	0.0000	
	4	6.563	57.6	D13	20.0	6.34	18.748	0.0042	0.0035×8.0
	3	11.310	57.6	D13	20.0	6.34	32.308	0.0073	=0.0280
	2	7.581	57.6	D13	20.0	6.34	21.656	0.0049	
	1	0.000	57.6	D13	20.0	6.34	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project In La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 184
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E.NISHIMURA	07/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(A Room)--Parallel to centerline An upper 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	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	34.645	51.0	2.50	D13	20.0	6.34	95.683	0.40
	3	62.811	51.0	4.56	D13,D13	10.0	12.67	188.577	0.37
	2	36.094	51.0	2.61	D13	20.0	6.34	95.683	0.41
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
II	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	17.298	51.0	1.25	D13	20.0	6.34	95.683	0.20
	3	29.271	51.0	2.11	D13	20.0	6.34	95.683	0.34
	2	18.747	51.0	1.35	D13	20.0	6.34	95.683	0.22
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
III	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00

CALCULATION		
Detailed Design on Port Reactivation Project In La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 185
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E.NISHIHARA	09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(A Room)--Parallel to centerline An upper 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	5	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	4	58.980	51.0	3.38	D13	20.0	6.34	110.035	0.54
	3	111.361	51.0	6.42	D13,D13	10.0	12.67	216.864	0.51
	2	66.436	51.0	3.81	D13	20.0	6.34	110.035	0.60
	1	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
II	5	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	4	28.336	51.0	1.62	D13	20.0	6.34	110.035	0.26
	3	51.896	51.0	2.97	D13	20.0	6.34	110.035	0.47
	2	35.793	51.0	2.04	D13	20.0	6.34	110.035	0.33
	1	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
III	5	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	4	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	3	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	2	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	1	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00

Serviceability limit state
Bottom slab(A Room)—Parallel to centerline An upper 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 5	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
4	14.597	51.0	D13	20.0	6.34	47.210	0.0106	0.0040×8.0
3	27.092	51.0	D13,D13	10.0	12.67	44.608	0.0085	=0.0320
2	15.914	51.0	D13	20.0	6.34	51.470	0.0116	
1	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
II 5	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
4	7.131	51.0	D13	20.0	6.34	23.063	0.0052	0.0040×8.0
3	12.625	51.0	D13	20.0	6.34	40.832	0.0092	=0.0320
2	8.448	51.0	D13	20.0	6.34	27.323	0.0062	
1	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
III 5	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
4	0.000	51.0	D13	20.0	6.34	0.000	0.0000	0.0040×8.0
3	0.000	51.0	D13	20.0	6.34	0.000	0.0000	=0.0320
2	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
1	0.000	51.0	D13	20.0	6.34	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.		PAGE 187
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E.Nishimura	09/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(A Room)—Parallel to centerline A lower 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	5	25.366	55.6	1.68	D13	20.0	6.34	104.429	0.27	
	4	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	3	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	2	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	1	27.079	55.6	1.79	D13	20.0	6.34	104.429	0.29	
II	5	15.807	55.6	1.04	D13	20.0	6.34	104.429	0.17	
	4	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	3	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	2	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	1	17.124	55.6	1.13	D13	20.0	6.34	104.429	0.18	
III	5	0.000	55.6	0.00	D13	20.0	6.34	104.429	0.00	
	4	95.761	55.6	6.40	D13,D13	10.0	12.67	206.050	0.51	
	3	156.385	55.6	10.53	D13,D19	10.0	20.66	330.546	0.52	※
	2	101.821	55.6	6.81	D13,D13	10.0	12.67	206.050	0.54	
	1	0.000	55.6	0.00	D13	20.0	6.34	104.429	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 188

	INITIAL	DATE
PREPARED BY	Y. Ando	06/07/12
CHECKED BY	E. NISHIHARA	09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(A Room)--Parallel to centerline A lower 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	5	42.084	55.6	2.20	D13	20.0	6.34	120.093	0.35	
	4	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	3	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	2	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	1	50.897	55.6	2.67	D13	20.0	6.34	120.093	0.42	
II	5	25.802	55.6	1.35	D13	20.0	6.34	120.093	0.21	
	4	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	3	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	2	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	1	32.581	55.6	1.70	D13	20.0	6.34	120.093	0.27	
III	5	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00	
	4	159.559	55.6	8.46	D13,D13	10.0	12.67	236.957	0.67	
	3	277.151	55.6	14.89	D13,D19	10.0	20.66	380.128	0.73	※
	2	190.742	55.6	10.15	D13,D13	10.0	12.67	236.957	0.80	
	1	0.000	55.6	0.00	D13	20.0	6.34	120.093	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 189
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Bottom slab(A Room)—Parallel to centerline A lower 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	5	10.531	55.6	D13	20.0	6.34	31.187	0.0083	
	4	0.000	49.0	D13	20.0	6.34	0.000	0.0000	0.0035×10.0
	3	0.000	49.0	D13	20.0	6.34	0.000	0.0000	=0.0350
	2	0.000	49.0	D13	20.0	6.34	0.000	0.0000	
	1	12.088	55.6	D13	20.0	6.34	35.798	0.0095	
II	5	6.503	55.6	D13	20.0	6.34	19.258	0.0051	
	4	0.000	49.0	D13	20.0	6.34	0.000	0.0000	0.0035×10.0
	3	0.000	49.0	D13	20.0	6.34	0.000	0.0000	=0.0350
	2	0.000	49.0	D13	20.0	6.34	0.000	0.0000	
	1	7.701	55.6	D13	20.0	6.34	22.806	0.0061	
III	5	0.000	55.6	D13	20.0	6.34	0.000	0.0000	
	4	39.856	55.6	D13,D13	10.0	12.67	60.053	0.0138	0.0035×10.0
	3	67.436	55.6	D13,D19	10.0	20.66	63.262	0.0146	=0.0350
	2	45.365	55.6	D13,D13	10.0	12.67	68.354	0.0158	
	1	0.000	55.6	D13	20.0	6.34	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project In La Union Province		
CALC FILE No.:		
CALC INDEX No..		PAGE 190
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(B Room)--Perpendicular to levee norrmal An upper steel reinforcement
B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm^2)	Diameter (mm)	Pitch (cm)	As (cm^2)	Mud (kN·m)	γi·Md/Mud	
I	5	0.000	53.0	0.00	D13	20.0	6.34	99.479	0.00	
	4	20.072	53.0	1.39	D13	20.0	6.34	99.479	0.22	
	3	47.310	53.0	3.30	D13	20.0	6.34	99.479	0.52	※
	2	24.084	53.0	1.67	D13	20.0	6.34	99.479	0.27	
	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	12.161	53.0	0.84	D13	20.0	6.34	99.479	0.13	
	3	26.641	53.0	1.85	D13	20.0	6.34	99.479	0.29	
	2	15.001	53.0	1.04	D13	20.0	6.34	99.479	0.17	
	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	

※ It determines from serviceability limit state.

CALCULATION		
Detailed Design on Port Reactivation in La Union Province		
CALC FILE No.		
CALC INDEX		PAGE 191
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E.NISHIHARA	09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(B 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	114.401	0.00	
	4	8.705	53.0	0.48	D13	20.0	6.34	114.401	0.08	
	3	40.500	53.0	2.23	D13	20.0	6.34	114.401	0.35	※
	2	29.360	53.0	1.61	D13	20.0	6.34	114.401	0.26	
	1	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00	
II	5	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00	
	4	4.449	53.0	0.24	D13	20.0	6.34	114.401	0.04	
	3	22.806	53.0	1.25	D13	20.0	6.34	114.401	0.20	
	2	19.067	53.0	1.05	D13	20.0	6.34	114.401	0.17	
	1	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00	
III	5	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00	
	4	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00	
	3	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00	
	2	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00	
	1	0.000	53.0	0.00	D13	20.0	6.34	114.401	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 192
INITIAL DATE
PREPARED BY T. Ando 26/07/02
R. NISHIMODA 09/08/2002

Serviceability limit state

Bottom slab(B Room)—Perpendicular to levee norrmal An upper 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	5	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	4	6.653	53.0	D13	20.0	6.34	20.691	0.0038	0.0040×6.0
	3	14.276	53.0	D13	20.0	6.34	44.399	0.0082	=0.0240
	2	8.498	53.0	D13	20.0	6.34	26.429	0.0049	
	1	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
II	5	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	4	4.089	53.0	D13	20.0	6.34	12.717	0.0024	0.0040×6.0
	3	8.039	53.0	D13	20.0	6.34	25.002	0.0046	=0.0240
	2	5.403	53.0	D13	20.0	6.34	16.804	0.0031	
	1	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
III	5	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	4	0.000	53.0	D13	20.0	6.34	0.000	0.0000	0.0040×6.0
	3	0.000	53.0	D13	20.0	6.34	0.000	0.0000	=0.0240
	2	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	1	0.000	53.0	D13	20.0	6.34	0.000	0.0000	

CALCULATION

Detailed Design on Port Reactivation Project in La Union Province

CALC FILE No.:

CALC INDEX No.: PAGE 193

INITIAL DATE

PREPARED BY: R. Arde 26/07/02

R. NISHIHARA 09/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(B Room)—Perpendicular to levee norrmal A lower 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	5	113.032	57.6	7.30	D13,D13	10.0	12.67	213.654	0.58	
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	1	122.599	57.6	7.92	D13,D13	10.0	12.67	213.654	0.63	※
II	5	70.645	57.6	4.54	D13	20.0	6.34	108.233	0.72	
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	1	78.175	57.6	5.02	D13	20.0	6.34	108.233	0.79	※
III	5	0.000	57.6	0.00	D13	20.0	6.34	108.233	0.00	
	4	11.846	57.6	0.76	D13	20.0	6.34	108.233	0.12	
	3	19.751	57.6	1.26	D13	20.0	6.34	108.233	0.20	
	2	12.895	57.6	0.82	D13	20.0	6.34	108.233	0.13	
	1	0.000	57.6	0.00	D13	20.0	6.34	108.233	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 194
	INITIAL	DATE
PREPARED BY	Y. Ando	24/07/02
CHECKED BY	E. NISHIHORA	09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(B Room)—Perpendicular to levee norrmal A lower 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	76.226	57.6	3.86	D13,D13	10.0	12.67	245.702	0.31	
	4	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	1	125.482	57.6	6.39	D13,D13	10.0	12.67	245.702	0.51	※
II	5	44.313	57.6	2.24	D13	20.0	6.34	124.468	0.36	
	4	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00	
	1	83.082	57.6	4.21	D13	20.0	6.34	124.468	0.67	※
III	5	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00	
	4	7.756	57.6	0.39	D13	20.0	6.34	124.468	0.06	
	3	16.907	57.6	0.85	D13	20.0	6.34	124.468	0.14	
	2	13.158	57.6	0.66	D13	20.0	6.34	124.468	0.11	
	1	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00	

※ It determines from serviceability limit state.

Detailed E... on Port Reactivation Project In La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 195
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	Y. NISHIMURA	09/08/2002

Serviceability limit state

Bottom slab(B Room) —Perpendicular to levee norrmal A lower 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	5	35.550	57.6	D13,D13	10.0	12.67	51.654	0.0098	
	4	0.000	51.0	D13	20.0	6.34	0.000	0.0000	0.0035×8.0
	3	0.000	51.0	D13	20.0	6.34	0.000	0.0000	=0.0280
	2	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	1	39.867	57.6	D13,D13	10.0	12.67	57.927	0.0110	
II	5	22.453	57.6	D13	20.0	6.34	64.139	0.0145	
	4	0.000	51.0	D13	20.0	6.34	0.000	0.0000	0.0035×8.0
	3	0.000	51.0	D13	20.0	6.34	0.000	0.0000	=0.0280
	2	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	1	25.855	57.6	D13	20.0	6.34	73.857	0.0167	
III	5	0.000	57.6	D13	20.0	6.34	0.000	0.0000	
	4	3.742	57.6	D13	20.0	6.34	10.689	0.0024	0.0035×8.0
	3	5.960	57.6	D13	20.0	6.34	17.025	0.0038	=0.0280
	2	4.188	57.6	D13	20.0	6.34	11.963	0.0027	
	1	0.000	57.6	D13	20.0	6.34	0.000	0.0000	

CALCULATION

Detailed Desig

on Port Reactivation

In La Union Province

CALC FILE No.:

CALC INDEX No.: PAGE 196

INITIAL DATE

PREPARED BY: Y. Ando 26/07/02

CHECKED BY: J. NISHIMURA 09/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(B Room) —Parallel to centerline An upper 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	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	25.962	51.0	1.87	D13	20.0	6.34	95.683	0.30
	3	47.310	51.0	3.43	D13	20.0	6.34	95.683	0.54
	2	27.320	51.0	1.97	D13	20.0	6.34	95.683	0.31
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
II	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	12.902	51.0	0.93	D13	20.0	6.34	95.683	0.15
	3	22.047	51.0	1.59	D13	20.0	6.34	95.683	0.25
	2	14.260	51.0	1.03	D13	20.0	6.34	95.683	0.16
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
III	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No:		PAGE 197
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E.NISHIMURA	09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(B Room)—Parallel to centerline 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	51.0	0.00	D13	20.0	6.34	110.035	0.00
	4	19.310	51.0	1.10	D13	20.0	6.34	110.035	0.18
	3	40.500	51.0	2.31	D13	20.0	6.34	110.035	0.37
	2	26.301	51.0	1.50	D13	20.0	6.34	110.035	0.24
	1	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
II	5	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	4	8.263	51.0	0.47	D13	20.0	6.34	110.035	0.08
	3	18.874	51.0	1.08	D13	20.0	6.34	110.035	0.17
	2	15.254	51.0	0.87	D13	20.0	6.34	110.035	0.14
	1	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
III	5	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	4	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	3	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	2	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	1	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00

Serviceability limit state

Bottom slab(B Room)—Parallel to centerline An upper 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	5	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	4	8.039	51.0	D13	20.0	6.34	26.000	0.0059	0.0040×8.0
	3	14.276	51.0	D13	20.0	6.34	46.172	0.0104	=0.0320
	2	8.649	51.0	D13	20.0	6.34	27.973	0.0063	
	1	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
II	5	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	4	4.089	51.0	D13	20.0	6.34	13.225	0.0030	0.0040×8.0
	3	6.653	51.0	D13	20.0	6.34	21.517	0.0049	=0.0320
	2	4.730	51.0	D13	20.0	6.34	15.298	0.0035	
	1	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
III	5	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	4	0.000	51.0	D13	20.0	6.34	0.000	0.0000	0.0040×8.0
	3	0.000	51.0	D13	20.0	6.34	0.000	0.0000	=0.0320
	2	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	1	0.000	51.0	D13	20.0	6.34	0.000	0.0000	

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
CALC FILE NO.:
CALC INCH: PAGE 199
PREPARED: Y. Ando 26/07/02
CHECKED BY: K. NISHIHORA 09/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(B Room)--Parallel to centerline A lower 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	18.948	55.6	1.25	D13	20.0	6.34	104.429	0.20	
	4	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	3	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	2	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	1	20.553	55.6	1.36	D13	20.0	6.34	104.429	0.22	
II	5	11.784	55.6	0.78	D13	20.0	6.34	104.429	0.12	
	4	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	3	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	2	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00	
	1	13.019	55.6	0.86	D13	20.0	6.34	104.429	0.14	
III	5	0.000	55.6	0.00	D13	20.0	6.34	104.429	0.00	
	4	71.570	55.6	4.76	D13	20.0	6.34	104.429	0.75	
	3	117.785	55.6	7.89	D13,D13	10.0	12.67	206.050	0.63	※
	2	77.249	55.6	5.15	D13,D13	10.0	12.67	206.050	0.41	
	1	0.000	55.6	0.00	D13	20.0	6.34	104.429	0.00	

※ It determines from serviceability limit state.

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
ALC FILE No.:
CALC NO.: A PAGE 200
SHEET
PREPARED BY: Y.Ando 26/07/02
CHECKED BY: E.NISHIMURA 09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(B Room)—Parallel to centerline A lower steel reinforcement
B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm^2)	Diameter (mm)	Pitch (cm)	As (cm^2)	Mud (kN·m)	γi·Md/Mud	
I	5	12.776	55.6	0.67	D13	20.0	6.34	120.093	0.11	
	4	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	3	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	2	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	1	21.039	55.6	1.10	D13	20.0	6.34	120.093	0.18	
II	5	7.438	55.6	0.39	D13	20.0	6.34	120.093	0.06	
	4	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	3	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	2	0.000	49.0	0.00	D13	20.0	6.34	105.661	0.00	
	1	13.794	55.6	0.72	D13	20.0	6.34	120.093	0.11	
III	5	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00	
	4	49.080	55.6	2.57	D13	20.0	6.34	120.093	0.41	
	3	100.695	55.6	5.30	D13,D13	10.0	12.67	236.957	0.42	※
	2	78.315	55.6	4.12	D13,D13	10.0	12.67	236.957	0.33	
	1	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00	

※ It determines from serviceability limit state.

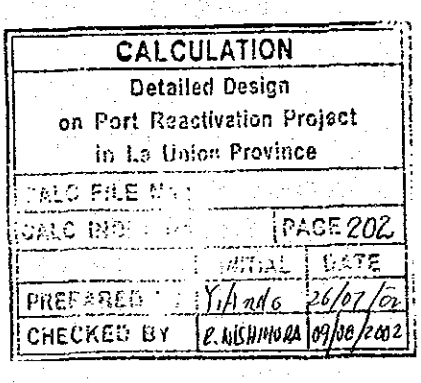
CALCULATION		
Detailed Design on Port Reactivation Project In La Union Province		
CALC FILE No.:		
CALC INDEX No.		PAGE 201
	INITIAL	DATE
PREPARED BY	Y. Ando	21/07/02
CHECKED BY	R. NISHIHARA	03/08/2002

Serviceability limit state

Bottom slab(B Room) —Parallel to centerline A lower 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	5	5.960	55.6	D13	20.0	6.34	17.650	0.0047	
	4	0.000	49.0	D13	20.0	6.34	0.000	0.0000	0.0035×10.0
	3	0.000	49.0	D13	20.0	6.34	0.000	0.0000	=0.0350
	2	0.000	49.0	D13	20.0	6.34	0.000	0.0000	
	1	6.684	55.6	D13	20.0	6.34	19.794	0.0053	
II	5	3.742	55.6	D13	20.0	6.34	11.082	0.0029	
	4	0.000	49.0	D13	20.0	6.34	0.000	0.0000	0.0035×10.0
	3	0.000	49.0	D13	20.0	6.34	0.000	0.0000	=0.0350
	2	0.000	49.0	D13	20.0	6.34	0.000	0.0000	
	1	4.300	55.6	D13	20.0	6.34	12.734	0.0034	
III	5	0.000	55.6	D13	20.0	6.34	0.000	0.0000	
	4	22.453	55.6	D13	20.0	6.34	66.494	0.0177	0.0035×10.0
	3	35.550	55.6	D13, D13	10.0	12.67	53.565	0.0123	=0.0350
	2	25.014	55.6	D13, D13	10.0	12.67	37.690	0.0087	
	1	0.000	55.6	D13	20.0	6.34	0.000	0.0000	



Ultimate limit state (Under ordinary conditions)
Bottom slab(C 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,D13	10.0	12.67	196.171	0.00
	4	15.219	53.0	1.06	D13	20.0	6.34	99.479	0.17
	3	34.590	53.0	2.41	D13	20.0	6.34	99.479	0.38
	2	18.159	53.0	1.26	D13	20.0	6.34	99.479	0.20
	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	9.353	53.0	0.65	D13	20.0	6.34	99.479	0.10
	3	19.479	53.0	1.35	D13	20.0	6.34	99.479	0.22
	2	11.358	53.0	0.79	D13	20.0	6.34	99.479	0.13
	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

Ultimate limit state (During an earthquake)
Bottom slab(C Room)—Perpendicular to levee norrmal An upper 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	5	93.545	53.0	5.17	D13,D13	10.0	12.67	225.597	0.41
	4	0.603	53.0	0.03	D13	20.0	6.34	114.401	0.01
	3	3.884	53.0	0.21	D13	20.0	6.34	114.401	0.03
	2	3.054	53.0	0.17	D13	20.0	6.34	114.401	0.03
	1	50.133	53.0	2.76	D13	20.0	6.34	114.401	0.44
II	5	62.456	53.0	3.44	D13	20.0	6.34	114.401	0.55
	4	0.264	53.0	0.01	D13	20.0	6.34	114.401	0.00
	3	2.187	53.0	0.12	D13	20.0	6.34	114.401	0.02
	2	1.999	53.0	0.11	D13	20.0	6.34	114.401	0.02
	1	28.287	53.0	1.55	D13	20.0	6.34	114.401	0.25
III	5	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	4	10.083	53.0	0.55	D13	20.0	6.34	114.401	0.09
	3	12.043	53.0	0.66	D13	20.0	6.34	114.401	0.11
	2	5.321	53.0	0.29	D13	20.0	6.34	114.401	0.05
	1	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.		
CALC INDEX		PAGE 204
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Bottom slab(C Room)—Perpendicular to levee norrmal An upper 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	5	4.997	53.0	D13,D13	10.0	12.67	7.909	0.0012	
	4	6.653	53.0	D13	20.0	6.34	20.691	0.0038	0.0040×6.0
	3	14.276	53.0	D13	20.0	6.34	44.399	0.0082	=0.0240
	2	6.653	53.0	D13	20.0	6.34	20.691	0.0038	
	1	2.678	53.0	D13	20.0	6.34	8.329	0.0015	
II	5	3.336	53.0	D13	20.0	6.34	10.375	0.0019	
	4	4.089	53.0	D13	20.0	6.34	12.717	0.0024	0.0040×6.0
	3	8.039	53.0	D13	20.0	6.34	25.002	0.0046	=0.0240
	2	4.089	53.0	D13	20.0	6.34	12.717	0.0024	
	1	1.511	53.0	D13	20.0	6.34	4.699	0.0009	
III	5	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	4	0.539	53.0	D13	20.0	6.34	1.676	0.0003	0.0040×6.0
	3	0.643	53.0	D13	20.0	6.34	2.000	0.0004	=0.0240
	2	0.284	53.0	D13	20.0	6.34	0.883	0.0002	
	1	0.000	53.0	D13	20.0	6.34	0.000	0.0000	

Ultimate limit state (Under ordinary conditions)
Bottom slab(C Room) —Perpendicular to levee norrmal A lower 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	81.353	57.6	5.23	D13,D13	10.0	12.67	213.654	0.42	※
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	1	90.927	57.6	5.85	D13,D13	10.0	12.67	213.654	0.47	
II	5	51.364	57.6	3.29	D13	20.0	6.34	108.233	0.52	※
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00	
	1	58.173	57.6	3.73	D13	20.0	6.34	108.233	0.59	
III	5	0.000	57.6	0.00	D13	20.0	6.34	108.233	0.00	
	4	8.561	57.6	0.55	D13	20.0	6.34	108.233	0.09	
	3	14.441	57.6	0.92	D13	20.0	6.34	108.233	0.15	
	2	9.561	57.6	0.61	D13	20.0	6.34	108.233	0.10	
	1	0.000	57.6	0.00	D13	20.0	6.34	108.233	0.00	

※ It determines from serviceability limit state.

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC No.:	PAGE 206	
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	R. NISHIMURA	09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(C Room)—Perpendicular to levee norrmal A lower 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	6.750	57.6	0.34	D13, D13	10.0	12.67	245.702	0.03	※
	4	22.406	51.0	1.28	D13	20.0	6.34	110.035	0.20	
	3	28.848	51.0	1.65	D13	20.0	6.34	110.035	0.26	
	2	4.201	51.0	0.24	D13	20.0	6.34	110.035	0.04	
	1	12.594	57.6	0.63	D13, D13	10.0	12.67	245.702	0.05	
II	5	3.808	57.6	0.19	D13	20.0	6.34	124.468	0.03	※
	4	14.564	51.0	0.83	D13	20.0	6.34	110.035	0.13	
	3	16.244	51.0	0.93	D13	20.0	6.34	110.035	0.15	
	2	1.680	51.0	0.10	D13	20.0	6.34	110.035	0.02	
	1	8.409	57.6	0.42	D13	20.0	6.34	124.468	0.07	
III	5	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00	
	4	0.679	57.6	0.03	D13	20.0	6.34	124.468	0.01	
	3	1.622	57.6	0.08	D13	20.0	6.34	124.468	0.01	
	2	1.320	57.6	0.07	D13	20.0	6.34	124.468	0.01	
	1	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00	

※ It determines from serviceability limit state.

CALCULATION
Detailed Design
on Port Reactivation Project
In La Union Province
PAGE 207
PREPARED BY: Y.Ando 26/07/07
CHECKED BY: R.NISHIMURA 09/08/2007

Serviceability limit state
Bottom slab(C Room) —Perpendicular to levee norrmal A lower 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	5	35.550	57.6	D13,D13	10.0	12.67	51.654	0.0098	
	4	1.197	51.0	D13	20.0	6.34	3.871	0.0009	0.0035×8.0
	3	1.541	51.0	D13	20.0	6.34	4.984	0.0011	=0.0280
	2	0.224	51.0	D13	20.0	6.34	0.724	0.0002	
	1	35.550	57.6	D13,D13	10.0	12.67	51.654	0.0098	
II	5	22.453	57.6	D13	20.0	6.34	64.139	0.0145	
	4	0.778	51.0	D13	20.0	6.34	2.516	0.0006	0.0035×8.0
	3	0.868	51.0	D13	20.0	6.34	2.807	0.0006	=0.0280
	2	0.090	51.0	D13	20.0	6.34	0.291	0.0001	
	1	22.453	57.6	D13	20.0	6.34	64.139	0.0145	
III	5	0.000	57.6	D13	20.0	6.34	0.000	0.0000	
	4	3.742	57.6	D13	20.0	6.34	10.689	0.0024	0.0035×8.0
	3	5.960	57.6	D13	20.0	6.34	17.025	0.0038	=0.0280
	2	3.742	57.6	D13	20.0	6.34	10.689	0.0024	
	1	0.000	57.6	D13	20.0	6.34	0.000	0.0000	

Ultimate limit state (Under ordinary conditions)
Bottom slab(C Room)—Parallel to centerline 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	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	18.799	51.0	1.36	D13	20.0	6.34	95.683	0.22
	3	34.590	51.0	2.50	D13	20.0	6.34	95.683	0.40
	2	20.158	51.0	1.45	D13	20.0	6.34	95.683	0.23
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
II	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	9.353	51.0	0.67	D13	20.0	6.34	95.683	0.11
	3	16.120	51.0	1.16	D13	20.0	6.34	95.683	0.19
	2	10.617	51.0	0.76	D13	20.0	6.34	95.683	0.12
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
III	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX		PAGE 209
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	R. NISHIMURA	29/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(C Room)---Parallel to centerline An upper 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	5	15.684	51.0	0.89	D13	20.0	6.34	110.035	0.14
	4	1.772	51.0	0.10	D13	20.0	6.34	110.035	0.02
	3	3.884	51.0	0.22	D13	20.0	6.34	110.035	0.04
	2	2.602	51.0	0.15	D13	20.0	6.34	110.035	0.02
	1	8.402	51.0	0.48	D13	20.0	6.34	110.035	0.08
II	5	10.363	51.0	0.59	D13	20.0	6.34	110.035	0.09
	4	0.717	51.0	0.04	D13	20.0	6.34	110.035	0.01
	3	1.810	51.0	0.10	D13	20.0	6.34	110.035	0.02
	2	1.546	51.0	0.09	D13	20.0	6.34	110.035	0.01
	1	4.761	51.0	0.27	D13	20.0	6.34	110.035	0.04
III	5	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	4	58.255	51.0	3.33	D13	20.0	6.34	110.035	0.53
	3	71.979	51.0	4.13	D13	20.0	6.34	110.035	0.65
	2	32.489	51.0	1.85	D13	20.0	6.34	110.035	0.30
	1	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX BY		PAGE 210
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	P. NUHINUDA	09/08/2002

Serviceability limit state

Bottom slab(C Room)—Parallel to centerline An upper 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	5	0.838	51.0	D13	20.0	6.34	2.710	0.0006	
	4	8.039	51.0	D13	20.0	6.34	26.000	0.0059	0.0040×8.0
	3	14.276	51.0	D13	20.0	6.34	46.172	0.0104	=0.0320
	2	8.039	51.0	D13	20.0	6.34	26.000	0.0059	
	1	0.449	51.0	D13	20.0	6.34	1.452	0.0003	
II	5	0.554	51.0	D13	20.0	6.34	1.792	0.0004	
	4	4.089	51.0	D13	20.0	6.34	13.225	0.0030	0.0040×8.0
	3	6.653	51.0	D13	20.0	6.34	21.517	0.0049	=0.0320
	2	4.089	51.0	D13	20.0	6.34	13.225	0.0030	
	1	0.254	51.0	D13	20.0	6.34	0.822	0.0002	
III	5	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	4	3.112	51.0	D13	20.0	6.34	10.065	0.0023	0.0040×8.0
	3	3.845	51.0	D13	20.0	6.34	12.436	0.0028	=0.0320
	2	1.735	51.0	D13	20.0	6.34	5.611	0.0013	
	1	0.000	51.0	D13	20.0	6.34	0.000	0.0000	

Ultimate limit state (Under ordinary conditions)
Bottom slab(C Room)--Parallel to centerline A lower steel reinforcement

B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm^2)	Diameter (mm)	Pitch (cm)	As (cm^2)	Mud (kN·m)	γi·Md/Mud
I	5	13.638	55.6	0.90	D13	20.0	6.34	104.429	0.14
	4	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	3	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	2	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	1	15.244	55.6	1.01	D13	20.0	6.34	104.429	0.16
II	5	8.561	55.6	0.57	D13	20.0	6.34	104.429	0.09
	4	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	3	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	2	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	1	9.685	55.6	0.64	D13	20.0	6.34	104.429	0.10
III	5	0.000	55.6	0.00	D13	20.0	6.34	104.429	0.00
	4	51.564	55.6	3.42	D13	20.0	6.34	104.429	0.54
	3	86.109	55.6	5.74	D13,D13	10.0	12.67	206.050	0.46
	2	57.246	55.6	3.80	D13	20.0	6.34	104.429	0.60
	1	0.000	55.6	0.00	D13	20.0	6.34	104.429	0.00

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
ALS FILE No.:
CALC INST. : PAGE 212
INITIAL DATE
PREPARED BY
CHECKED BY E. NISHIMURA 09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(C Room)—Parallel to centerline A lower 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	5	1.131	55.6	0.06	D13	20.0	6.34	120.093	0.01
	4	19.325	49.0	1.15	D13	20.0	6.34	105.661	0.18
	3	28.848	49.0	1.71	D13	20.0	6.34	105.661	0.27
	2	13.163	49.0	0.78	D13	20.0	6.34	105.661	0.12
	1	2.112	55.6	0.11	D13	20.0	6.34	120.093	0.02
II	5	0.641	55.6	0.03	D13	20.0	6.34	120.093	0.01
	4	11.203	49.0	0.66	D13	20.0	6.34	105.661	0.11
	3	13.444	49.0	0.80	D13	20.0	6.34	105.661	0.13
	2	5.041	49.0	0.30	D13	20.0	6.34	105.661	0.05
	1	1.395	55.6	0.07	D13	20.0	6.34	120.093	0.01
III	5	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00
	4	4.374	55.6	0.23	D13	20.0	6.34	120.093	0.04
	3	9.653	55.6	0.50	D13,D13	10.0	12.67	236.957	0.04
	2	7.843	55.6	0.41	D13	20.0	6.34	120.093	0.07
	1	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 213
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Bottom slab(C Room)--Parallel to centerline A lower 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	5	5.960	55.6	D13	20.0	6.34	17.650	0.0047	
	4	1.032	49.0	D13	20.0	6.34	3.477	0.0009	0.0035×10.0
	3	1.541	49.0	D13	20.0	6.34	5.192	0.0014	=0.0350
	2	0.703	49.0	D13	20.0	6.34	2.368	0.0006	
	1	5.960	55.6	D13	20.0	6.34	17.650	0.0047	
II	5	3.742	55.6	D13	20.0	6.34	11.082	0.0029	
	4	0.598	49.0	D13	20.0	6.34	2.015	0.0005	0.0035×10.0
	3	0.718	49.0	D13	20.0	6.34	2.419	0.0006	=0.0350
	2	0.269	49.0	D13	20.0	6.34	0.906	0.0002	
	1	3.742	55.6	D13	20.0	6.34	11.082	0.0029	
III	5	0.000	55.6	D13	20.0	6.34	0.000	0.0000	
	4	22.453	55.6	D13	20.0	6.34	66.494	0.0177	0.0035×10.0
	3	35.550	55.6	D13,D13	10.0	12.67	53.565	0.0123	=0.0350
	2	22.453	55.6	D13	20.0	6.34	66.494	0.0177	
	1	0.000	55.6	D13	20.0	6.34	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:	PAGE 214	
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMODA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(D 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,D19	10.0	20.66	314.440	0.00
	4	15.888	53.0	1.10	D13	20.0	6.34	99.479	0.18
	3	34.093	53.0	2.37	D13	20.0	6.34	99.479	0.38
	2	15.888	53.0	1.10	D13	20.0	6.34	99.479	0.18
	1	0.000	53.0	0.00	D13,D16	10.0	16.27	249.981	0.00
II	5	0.000	53.0	0.00	D13,D13	10.0	12.67	196.171	0.00
	4	9.764	53.0	0.68	D13	20.0	6.34	99.479	0.11
	3	19.198	53.0	1.33	D13	20.0	6.34	99.479	0.21
	2	9.764	53.0	0.68	D13	20.0	6.34	99.479	0.11
	1	0.000	53.0	0.00	D13,D13	10.0	12.67	196.171	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

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
FILE NO.
CALC NO. PAGE 215
INITIAL DATE
PREPARED BY Y. Ando 26/12/02
CHECKED BY R. NISHIMURA 09/00/2002

Ultimate limit state (During an earthquake)
Bottom slab(D Room)--Perpendicular to levee norrmal An upper 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	5	242.549	53.0	13.65	D13,D19	10.0	20.66	361.606	0.67
	4	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	3	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	2	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	1	216.336	53.0	12.14	D13,D16	10.0	16.27	287.478	0.75
II	5	155.227	53.0	8.64	D13,D13	10.0	12.67	225.597	0.69
	4	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	3	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	2	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	1	134.594	53.0	7.48	D13,D13	10.0	12.67	225.597	0.60
III	5	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00
	4	25.674	53.0	1.41	D13	20.0	6.34	114.401	0.22
	3	38.464	53.0	2.11	D13	20.0	6.34	114.401	0.34
	2	22.799	53.0	1.25	D13	20.0	6.34	114.401	0.20
	1	0.000	53.0	0.00	D13	20.0	6.34	114.401	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC NO.:		PAGE 216
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	19/08/2002

Serviceability limit state
Bottom slab(D Room)--Perpendicular to levee norrmal An upper 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	5	28.014	53.0	D13,D19	10.0	20.66	27.614	0.0042	
	4	6.945	53.0	D13	20.0	6.34	21.599	0.0040	0.0040×6.0
	3	14.903	53.0	D13	20.0	6.34	46.349	0.0086	=0.0240
	2	6.945	53.0	D13	20.0	6.34	21.599	0.0040	
	1	18.732	53.0	D13,D16	10.0	16.27	23.262	0.0035	
II	5	18.415	53.0	D13,D13	10.0	12.67	29.146	0.0044	
	4	4.268	53.0	D13	20.0	6.34	13.274	0.0025	0.0040×6.0
	3	8.392	53.0	D13	20.0	6.34	26.100	0.0048	=0.0240
	2	4.268	53.0	D13	20.0	6.34	13.274	0.0025	
	1	11.108	53.0	D13,D13	10.0	12.67	17.581	0.0026	
III	5	0.000	53.0	D13	20.0	6.34	0.000	0.0000	
	4	2.999	53.0	D13	20.0	6.34	9.327	0.0017	0.0040×6.0
	3	3.918	53.0	D13	20.0	6.34	12.185	0.0023	=0.0240
	2	1.981	53.0	D13	20.0	6.34	6.161	0.0011	
	1	0.000	53.0	D13	20.0	6.34	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE NO. :		
CALC INDEX ...		PAGE 217
	INITIAL	DATE
PREPARED BY		
CHECKED BY	E. NISHIMURA	09/06/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(D Room)—Perpendicular to levee norrmal A lower 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	84.901	57.6	5.46	D13,D13	10.0	12.67	213.654	0.44
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	3	0.000	51.0	0.00	D13,D13	10.0	12.67	188.577	0.00
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	1	84.901	57.6	5.46	D13,D13	10.0	12.67	213.654	0.44
II	5	53.621	57.6	3.44	D13	20.0	6.34	108.233	0.54
	4	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	3	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	2	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	1	53.621	57.6	3.44	D13	20.0	6.34	108.233	0.54
III	5	0.000	57.6	0.00	D13	20.0	6.34	108.233	0.00
	4	8.937	57.6	0.57	D13	20.0	6.34	108.233	0.09
	3	14.233	57.6	0.91	D13	20.0	6.34	108.233	0.14
	2	8.937	57.6	0.57	D13	20.0	6.34	108.233	0.09
	1	0.000	57.6	0.00	D13	20.0	6.34	108.233	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No. :		
CALC INDEX No. :		PAGE 218
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/01
CHECKED BY	R.NISHIMURA	09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(D Room)--Perpendicular to levee norrmal A lower steel reinforcement
B = 100cm

NO		Md (kN·m)	d (cm)	Asn (cm^2)	Diameter (mm)	Pitch (cm)	As (cm^2)	Mud (kN·m)	γi·Md/Mud
I	5	0.000	57.6	0.00	D13,D13	10.0	12.67	245.702	0.00
	4	48.349	51.0	2.76	D13	20.0	6.34	110.035	0.44
	3	92.134	51.0	5.30	D13,D13	10.0	12.67	216.864	0.42
	2	37.356	51.0	2.13	D13	20.0	6.34	110.035	0.34
	1	0.000	57.6	0.00	D13,D13	10.0	12.67	245.702	0.00
II	5	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00
	4	30.193	51.0	1.72	D13	20.0	6.34	110.035	0.27
	3	51.882	51.0	2.97	D13	20.0	6.34	110.035	0.47
	2	22.414	51.0	1.28	D13	20.0	6.34	110.035	0.20
	1	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00
III	5	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00
	4	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00
	3	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00
	2	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00
	1	0.000	57.6	0.00	D13	20.0	6.34	124.468	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.		
CALC IND[illegible]		PAGE 219
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	K. NISHIMURA	09/08/2002

Serviceability limit state

Bottom slab(D Room)--Perpendicular to levee norrmal A lower 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	5	37.113	57.6	D13,D13	10.0	12.67	53.925	0.0103	
	4	6.290	51.0	D13	20.0	6.34	20.343	0.0046	0.0035×8.0
	3	9.385	51.0	D13,D13	10.0	12.67	15.453	0.0029	=0.0280
	2	2.397	51.0	D13	20.0	6.34	7.752	0.0017	
	1	37.113	57.6	D13,D13	10.0	12.67	53.925	0.0103	
II	5	23.440	57.6	D13	20.0	6.34	66.958	0.0151	
	4	4.035	51.0	D13	20.0	6.34	13.050	0.0029	0.0035×8.0
	3	5.285	51.0	D13	20.0	6.34	17.093	0.0039	=0.0280
	2	1.280	51.0	D13	20.0	6.34	4.140	0.0009	
	1	23.440	57.6	D13	20.0	6.34	66.958	0.0151	
III	5	0.000	57.6	D13	20.0	6.34	0.000	0.0000	
	4	3.907	57.6	D13	20.0	6.34	11.161	0.0025	0.0035×8.0
	3	6.222	57.6	D13	20.0	6.34	17.774	0.0040	=0.0280
	2	3.907	57.6	D13	20.0	6.34	11.161	0.0025	
	1	0.000	57.6	D13	20.0	6.34	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.		
CALC NO.		PAGE 220
	INITIAL	DATE
PREPARED by	Y. Ando	26/07/02
CHECKED BY	E. NISHIMORA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(D Room)—Parallel to centerline 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	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	19.198	51.0	1.38	D13	20.0	6.34	95.683	0.22
	3	34.093	51.0	2.46	D13	20.0	6.34	95.683	0.39
	2	19.198	51.0	1.38	D13	20.0	6.34	95.683	0.22
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
II	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	9.764	51.0	0.70	D13	20.0	6.34	95.683	0.11
	3	15.888	51.0	1.15	D13	20.0	6.34	95.683	0.18
	2	9.764	51.0	0.70	D13	20.0	6.34	95.683	0.11
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
III	5	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00
	4	0.000	51.0	0.00	D13,D13	10.0	12.67	188.577	0.00
	3	0.000	51.0	0.00	D13,D19	10.0	20.66	302.055	0.00
	2	0.000	51.0	0.00	D13,D13	10.0	12.67	188.577	0.00
	1	0.000	51.0	0.00	D13	20.0	6.34	95.683	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.		
CALC INDEX No.		PAGE 22
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(D Room)—Parallel to centerline 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	40.663	51.0	2.32	D13	20.0	6.34	110.035	0.37
	4	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	3	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	2	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	1	36.266	51.0	2.07	D13	20.0	6.34	110.035	0.33
II	5	25.843	51.0	1.47	D13	20.0	6.34	110.035	0.23
	4	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	3	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	2	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	1	22.461	51.0	1.28	D13	20.0	6.34	110.035	0.20
III	5	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00
	4	152.690	51.0	8.85	D13,D13	10.0	12.67	216.864	0.70
	3	229.527	51.0	13.43	D13,D19	10.0	20.66	347.363	0.66
	2	137.131	51.0	7.93	D13,D13	10.0	12.67	216.864	0.63
	1	0.000	51.0	0.00	D13	20.0	6.34	110.035	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 222
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	K.NISHIMURA	09/08/2002

Serviceability limit state

Bottom slab(D Room)—Parallel to centerline An upper 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	5	4.697	51.0	D13	20.0	6.34	15.191	0.0034	
	4	8.392	51.0	D13	20.0	6.34	27.142	0.0061	0.0040×8.0
	3	14.903	51.0	D13	20.0	6.34	48.200	0.0109	=0.0320
	2	8.392	51.0	D13	20.0	6.34	27.142	0.0061	
	1	3.140	51.0	D13	20.0	6.34	10.156	0.0023	
II	5	3.059	51.0	D13	20.0	6.34	9.894	0.0022	
	4	4.268	51.0	D13	20.0	6.34	13.804	0.0031	0.0040×8.0
	3	6.945	51.0	D13	20.0	6.34	22.462	0.0051	=0.0320
	2	4.268	51.0	D13	20.0	6.34	13.804	0.0031	
	1	1.861	51.0	D13	20.0	6.34	6.019	0.0014	
III	5	0.000	51.0	D13	20.0	6.34	0.000	0.0000	
	4	17.516	51.0	D13,D13	10.0	12.67	28.841	0.0055	0.0040×8.0
	3	23.403	51.0	D13,D19	10.0	20.66	24.005	0.0046	=0.0320
	2	12.007	51.0	D13,D13	10.0	12.67	19.770	0.0038	
	1	0.000	51.0	D13	20.0	6.34	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE NO.		
CALC IND...		PAGE 223
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIHORA	09/08/2002

Ultimate limit state (Under ordinary conditions)
Bottom slab(D Room)--Parallel to centerline A lower 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	14.233	55.6	0.94	D13	20.0	6.34	104.429	0.15
	4	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	3	0.000	49.0	0.00	D13,D13	10.0	12.67	180.957	0.00
	2	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	1	14.233	55.6	0.94	D13	20.0	6.34	104.429	0.15
II	5	8.937	55.6	0.59	D13	20.0	6.34	104.429	0.09
	4	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	3	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	2	0.000	49.0	0.00	D13	20.0	6.34	91.879	0.00
	1	8.937	55.6	0.59	D13	20.0	6.34	104.429	0.09
III	5	0.000	55.6	0.00	D13	20.0	6.34	104.429	0.00
	4	53.621	55.6	3.56	D13	20.0	6.34	104.429	0.56
	3	84.901	55.6	5.66	D13,D13	10.0	12.67	206.050	0.45
	2	53.621	55.6	3.56	D13	20.0	6.34	104.429	0.56
	1	0.000	55.6	0.00	D13	20.0	6.34	104.429	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.		
CALC IND.		PAGE 224
	INITIAL	DATE
PREPARED BY	Y. Ando	26/7/02
CHECKED BY	R. NISHIMURA	09/08/2002

Ultimate limit state (During an earthquake)
Bottom slab(D Room)—Parallel to centerline A lower 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	5	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00
	4	53.742	49.0	3.20	D13	20.0	6.34	105.661	0.51
	3	92.134	49.0	5.52	D13,D13	10.0	12.67	208.101	0.44
	2	50.022	49.0	2.98	D13	20.0	6.34	105.661	0.47
	1	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00
II	5	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00
	4	28.164	49.0	1.67	D13	20.0	6.34	105.661	0.27
	3	42.937	49.0	2.55	D13	20.0	6.34	105.661	0.41
	2	24.443	49.0	1.45	D13	20.0	6.34	105.661	0.23
	1	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00
III	5	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00
	4	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00
	3	0.000	55.6	0.00	D13,D13	10.0	12.67	236.957	0.00
	2	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00
	1	0.000	55.6	0.00	D13	20.0	6.34	120.093	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No. :		
CALC INDEX :		PAGE 225
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Serviceability limit state

Bottom slab(D Room)—Parallel to centerline A lower 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	5	6.222	55.6	D13	20.0	6.34	18.426	0.0049	
	4	5.944	49.0	D13	20.0	6.34	20.026	0.0053	0.0035×10.0
	3	9.385	49.0	D13,D13	10.0	12.67	16.104	0.0037	=0.0350
	2	4.627	49.0	D13	20.0	6.34	15.589	0.0041	
	1	6.222	55.6	D13	20.0	6.34	18.426	0.0049	
II	5	3.907	55.6	D13	20.0	6.34	11.570	0.0031	
	4	3.316	49.0	D13	20.0	6.34	11.172	0.0030	0.0035×10.0
	3	4.374	49.0	D13	20.0	6.34	14.737	0.0039	=0.0350
	2	1.999	49.0	D13	20.0	6.34	6.735	0.0018	
	1	3.907	55.6	D13	20.0	6.34	11.570	0.0031	
III	5	0.000	55.6	D13	20.0	6.34	0.000	0.0000	
	4	23.440	55.6	D13	20.0	6.34	69.417	0.0184	0.0035×10.0
	3	37.113	55.6	D13,D13	10.0	12.67	55.920	0.0129	=0.0350
	2	23.440	55.6	D13	20.0	6.34	69.417	0.0184	
	1	0.000	55.6	D13	20.0	6.34	0.000	0.0000	

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.		
CALC NO.		PAGE 226
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Footing

i)Examination at the time of ultimate which receives bending
Under ordinary conditions

B = 100cm

NO	Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
Seaside above	0.000	61.0	0.00	D13	20.0	6.34	114.698	0.00
below	171.815	61.0	10.53	D16,D19	10.0	24.26	424.575	0.45
Landside above	0.717	61.0	0.04	D16	20.0	9.93	178.470	0.00
below	0.582	61.0	0.03	D13	20.0	6.34	114.698	0.01

During an earthquake

B = 100cm

NO	Md (kN·m)	d (cm)	Asn (cm²)	Diameter (mm)	Pitch (cm)	As (cm²)	Mud (kN·m)	γi·Md/Mud
Seaside above	0.000	61.0	0.00	D13	20.0	6.34	131.903	0.00
below	291.305	61.0	14.20	D16,D19	10.0	24.26	488.261	0.60
Landside above	119.445	61.0	5.73	D16	20.0	9.93	205.240	0.58
below	0.000	61.0	0.00	D13	20.0	6.34	131.903	0.00

ii)Under serviceability Examination to a crack

B = 100cm

NO	Ms (kN·m)	d (cm)	Diameter (mm)	Pitch (cm)	As (cm²)	σse (N/mm²)	Crack width W(cm)	Permission crack width Wlim (cm)
Seaside above	0.000	61.0	D13	20.0	6.34	0.000	0.0000	0.0035x8=0.0280
below	155.480	61.0	D16,D19	10.0	24.26	113.481	0.0215	0.0035x8=0.0280
Landside above	18.658	61.0	D16	20.0	9.93	32.412	0.0073	0.0035x8=0.0280
below	0.000	61.0	D13	20.0	6.34	0.000	0.0000	0.0035x8=0.0280

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.		PAGE 227
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

iii)Examination to shearing

Sea side footing

NO	Vd (kN/m)	d (cm)	γi	γb	βd	βp	βn	fvcd (N/mm²)	Vcd (kN/m)	γi·Vd/Vcd
Ultimate limit state (Under ordinary conditions)										
Sea side above	0.000	54.0	1.10	1.30	1.16655	0.48910	1	0.529	125.374	0.00
below	223.408	54.0	1.10	1.30	1.16655	0.76574	1	0.529	196.287	1.25
Ultimate limit state (During an earthquake)										
Sea side above	0.000	54.0	1.00	1.15	1.16655	0.48910	1	0.529	141.727	0.00
below	378.888	54.0	1.00	1.15	1.16655	0.76574	1	0.529	221.889	1.71
Serviceability limit state										
Sea side above	0.000	54.0	—	1.00	1.16655	0.48910	1	0.577	177.775	0.00
below	202.170	54.0	—	1.00	1.16655	0.76574	1	0.577	278.326	0.73

The steel reinforcement of D13 is arranged at intervals of 200mm.

NO	Aw (mm2)	fwyd (N/mm2)	αs (°)	Z (mm)	γb	Vcd (kN/m)	Vsd (kN/m)	Vyd (kN/m)	γi·Vd/Vyd
Ultimate limit state (Under ordinary conditions)									
Sea side above	380.1	345.00	90	469.6	1.15	125.374	267.742	393.116	0.00
below	380.1	345.00	90	469.6	1.15	196.287	267.742	464.029	0.53
Ultimate limit state (During an earthquake)									
Sea side above	380.1	345.00	90	469.6	1.00	141.727	307.904	449.631	0.00
below	380.1	345.00	90	469.6	1.00	221.889	307.904	529.793	0.72
Serviceability limit state									
Sea side above	380.1	345.00	90	469.6	1.00	177.775	307.904	485.679	0.00
below	380.1	345.00	90	469.6	1.00	278.326	307.904	586.230	0.35

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 228
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Land side Footing

NO	Vd (kN/m)	d (cm)	γi	γb	βd	βp	βn	fvcd (N/mm²)	Vcd (kN/m)	γi·Vd/Vcd
Ultimate limit state (Under ordinary conditions)										
Land side above	0.943	54.0	1.10	1.30	1.16655	0.56877	1	0.529	145.796	0.01
below	0.738	54.0	1.10	1.30	1.16655	0.48910	1	0.529	125.374	0.01
Ultimate limit state (During an earthquake)										
Land side above	155.275	54.0	1.00	1.15	1.16655	0.56877	1	0.529	164.813	0.94
below	0.000	54.0	1.00	1.15	1.16655	0.48910	1	0.529	141.727	0.00
Serviceability limit state										
Land side above	24.284	54.0	—	1.00	1.16655	0.56877	1	0.577	206.733	0.12
below	0.000	54.0	—	1.00	1.16655	0.48910	1	0.577	177.775	0.00

The steel reinforcement of D13 is arranged at intervals of 400mm.

NO	Aw (mm2)	fwyd (N/mm2)	αs (°)	Z (mm)	γb	Vcd (kN/m)	Vsd (kN/m)	Vyd (kN/m)	γi·Vd/Vyd
Utimate limit state (Under ordinary conditions)									
Land side above	126.7	345.00	90	469.6	1.15	145.796	44.624	190.420	0.01
below	126.7	345.00	90	469.6	1.15	125.374	44.624	169.998	0.01
Ultimate limit state (During an earthquake)									
Land side above	126.7	345.00	90	469.6	1.00	164.813	51.317	216.130	0.72
below	126.7	345.00	90	469.6	1.00	141.727	51.317	193.044	0.00
Serviceability limit state									
Land side above	126.7	345.00	90	469.6	1.00	206.733	51.317	258.050	0.09
below	126.7	345.00	90	469.6	1.00	177.775	51.317	229.092	0.00

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE NO.		
CALC INDEX NO.		PAGE 229
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E.NISHIHORA	09/08/2002

Case.2 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/γs		
Modulus of elasticty	Es =	200.0	(kN/mm²)

Concrete

Compressive yield strength	f'ck =	24.0	(N/mm²)
Design compressive yield strength	f'cd = f'ck/γc		
Modulus of elasticty	Ec =	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 25 ～ D 13

Steel reinforcement interval

20.0 cm or 10.0 cm

Coefficient of earth pressure of filling

K = 0.60

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No. :		
CALC INSTAL :		PAGE 230
	INITIAL	DATE
PREPARED BY	Y.Ando	12/07/02
CHECKED BY	M. NISHIMURA	09/08/2002

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) × 10.10 = 76.86(kN/m²)

Ultimate limit state

P = 1.1 · Sf = 84.55(kN/m²)

Serviceability limit state

P = 0.5 · Sf = 38.43(kN/m²)

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) × 10.10 = 79.89(kN/m²)

Df = (−0.600 × 24.00) + (0.000 × 18.00) + (0.000 × 22.60)
= −14.40(kN/m²)

Ultimate limit state

P = 1.1 · Sf + 0.9 · Df = 74.92(kN/m²)

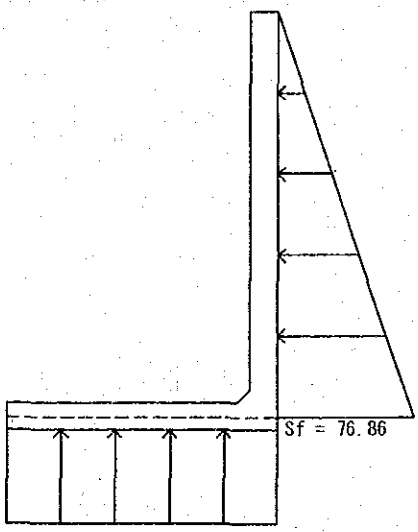
Serviceability limit state

P = 0.5 · Sf + 0.5 · Df = 32.75(kN/m²)

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

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.		
CALC SHT. No.		PAGE 23
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIHARA	07/08/2002

(2) During Installation

Partition Walls

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

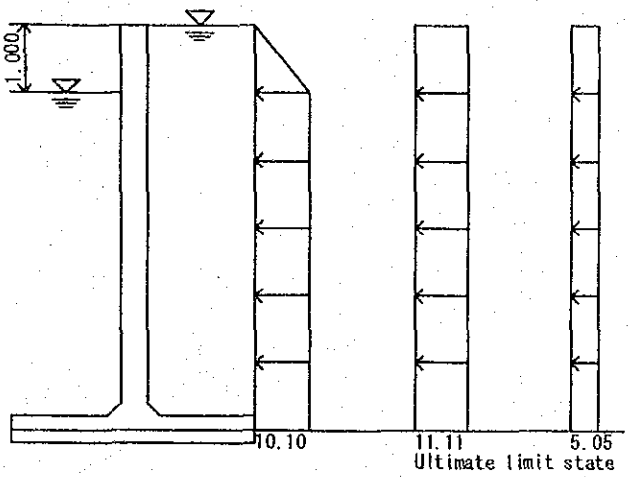
S = 1.000 × 10.10 = 10.10(kN/m²)

Ultimate limit state

Q = 1.1 ・ S = 11.11(kN/m²)

Serviceability limit state

Q = 0.5 ・ S = 5.05(kN/m²)



CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.		
CALC INDEX No.		PAGE 232
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E.Nishimura	01/08/2002

(3) After Construction

Sidewall (perpendicular to levee normal

Internal earth pressure (K = 0.60)

P1 = (0.000 + 0.000 + 0.500 × 22.60) × 0.60 = 6.78 (kN/m²)

P2 = 6.78 + (4.600 × 10.00) × 0.60 = 34.38 (kN/m²)

D = 1/2 × (6.78 + 34.38) × 4.600 + 34.38 × 11.100
= 476.29 (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 = 793.43 (kN/m)

Trapezoid load

Lower bottom

P = 34.38 × 1.1 + 16.46 × 1.1 = 55.92 (kN/m²)

Raised bottom

$$P = 2 \times \frac{793.43}{16.200} - 55.92 = 42.03 \text{ (kN/m}^2\text{)}$$

Serviceability limit state

P = 1.0 · D + 1.0 · S = 721.30 (kN/m)

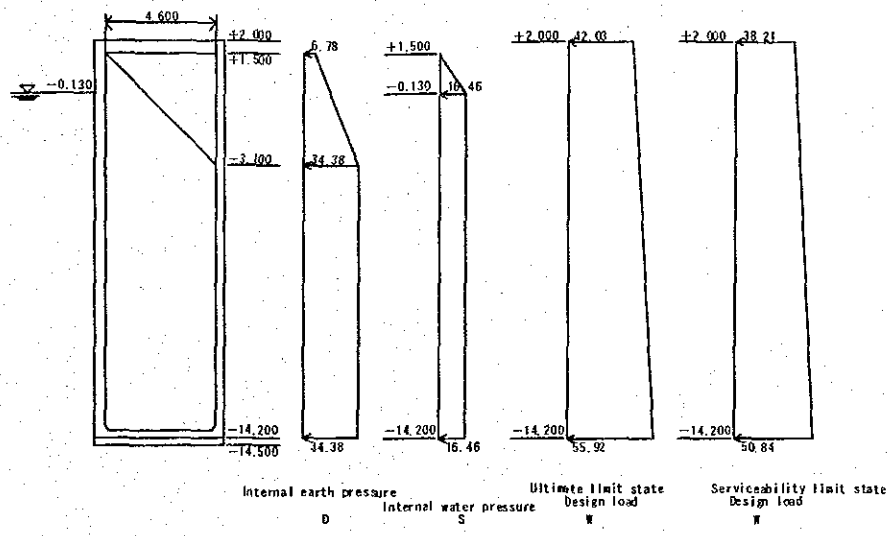
Trapezoid load

Lower bottom

P = 34.38 × 1.0 + 16.46 × 1.0 = 50.84 (kN/m²)

Raised bottom

$$P = 2 \times \frac{721.30}{16.200} - 50.84 = 38.21 \text{ (kN/m}^2\text{)}$$



CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE NO. :		
CALC INDEX :		PAGE 233
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/12
CHECKED BY	E. MIHARA	03/08/2012

Front wall(parallel to centerline : seaside)

Internal earth pressure (K = 0.60)

P1 = (0.000 + 0.000 + 0.500 × 22.60) × 0.60 = 6.78(kN/m²)

P2 = 6.78 + (4.400 × 10.00) × 0.60 = 33.18(kN/m²)

D = 1/2 × (6.78 + 33.18) × 4.400 + 33.18 × 11.300
= 462.85(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 = 778.65(kN/m)

Trapezoid load

Lower bottom

P = 33.18 × 1.1 + 16.46 × 1.1 = 54.60(kN/m²)

Raised bottom

$$P = 2 \times \frac{778.65}{16.200} - 54.60 = 41.53(kN/m^2)$$

Serviceability limit state

P = 1.0 · D + 1.0 · S = 707.86(kN/m)

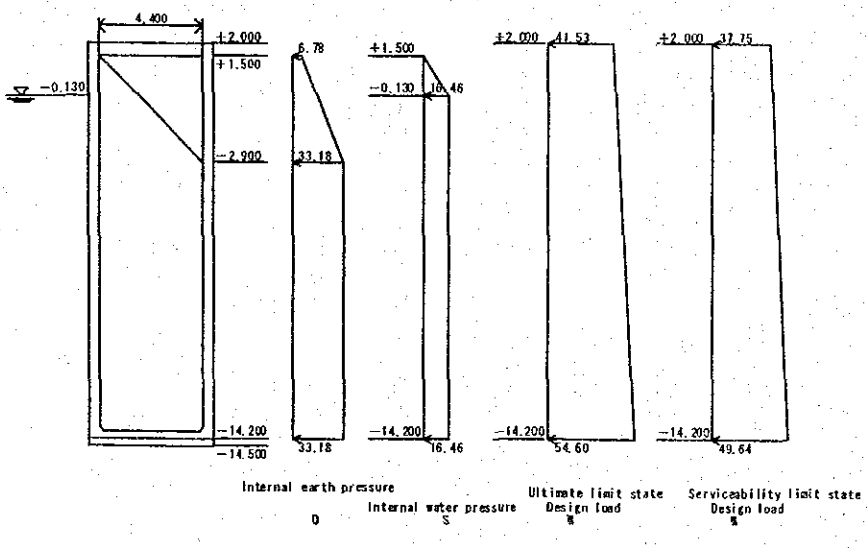
Trapezoid load

Lower bottom

P = 33.18 × 1.0 + 16.46 × 1.0 = 49.64(kN/m²)

Raised bottom

$$P = 2 \times \frac{707.86}{16.200} - 49.64 = 37.75(kN/m^2)$$



CALCULATION	
Detailed Design on Port Reactivation Project in La Union Province	
CALC FILE No.	
CALC IND.	PAGE 234
	INITIAL PAGE
PREPARED BY	Y. Hondo 26/07/02
CHECKED BY	E. NISHIHARA 09/08/2002

Rear wall(parallel to centerline : landside)

Internal earth pressure (K = 0.60)

P1 = (0.000 + 0.000 + 0.500 × 22.60) × 0.60 = 6.78(kN/m²)

P2 = 6.78 + (4.400 × 10.00) × 0.60 = 33.18(kN/m²)

D = 1/2 × (6.78 + 33.18) × 4.400 + 33.18 × 11.300
= 462.85(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 = 778.65(kN/m)

Trapezoid load

Lower bottom

P = 33.18 × 1.1 + 16.46 × 1.1 = 54.60(kN/m²)

Raised bottom

$$P = 2 \times \frac{778.65}{16.200} - 54.60 = 41.53(kN/m^2)$$

Serviceability limit state

P = 1.0 · D + 1.0 · S = 707.86(kN/m)

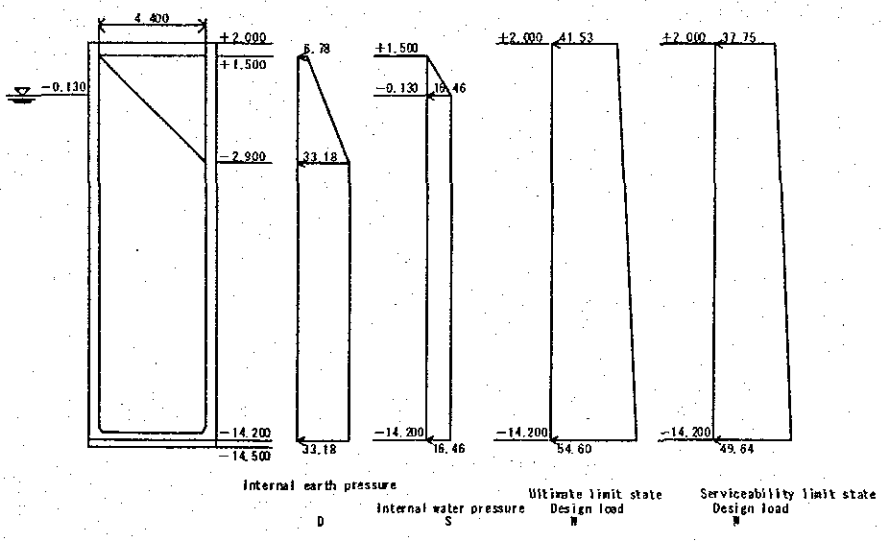
Trapezoid load

Lower bottom

P = 33.18 × 1.0 + 16.46 × 1.0 = 49.64(kN/m²)

Raised bottom

$$P = 2 \times \frac{707.86}{16.200} - 49.64 = 37.75(kN/m^2)$$



CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE NO.		
CALC NO.		PAGE 235
		DATE
PREPARED BY	Y.Ando	26/07/02
CHECKED BY	E.NISHIMURA	09/08/2002

Summary of design load

Ultimate limit state
Sidewall(perpendicular to levee normal)
Load from an inner side
Raised bottom = 42.03(kN/m²)
Lower bottom = 55.92(kN/m²)
Load from an outside
Raised bottom = 0.00(kN/m²)
Lower bottom = 0.00(kN/m²)
Front wall(parallel to centerline:seaside)
Load from an inner side
Raised bottom = 41.53(kN/m²)
Lower bottom = 54.60(kN/m²)
Load from an outside
Raised bottom = 0.00(kN/m²)
Lower bottom = 0.00(kN/m²)
Front wall(parallel to centerline:landside)
Load from an inner side
Raised bottom = 41.53(kN/m²)
Lower bottom = 54.60(kN/m²)
Load from an outside
Raised bottom = 0.00(kN/m²)
Lower bottom = 0.00(kN/m²)
Serviceability limit state
Sidewall(perpendicular to levee normal)
Load from an inner side
Raised bottom = 38.21(kN/m²)
Lower bottom = 50.84(kN/m²)
Load from an outside
Raised bottom = 0.00(kN/m²)
Lower bottom = 0.00(kN/m²)
Front wall(parallel to centerline:seaside)
Load from an inner side
Raised bottom = 37.75(kN/m²)
Lower bottom = 49.64(kN/m²)
Load from an outside
Raised bottom = 0.00(kN/m²)
Lower bottom = 0.00(kN/m²)
Front wall(parallel to centerline:landside)
Load from an inner side
Raised bottom = 37.75(kN/m²)
Lower bottom = 49.64(kN/m²)
Load from an outside
Raised bottom = 0.00(kN/m²)
Lower bottom = 0.00(kN/m²)

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
CALC FILE No.:
CALC INDEX No.: PAGE 236
REVISION DATE:
PREPARED BY: Y. Ando 25/07/02
CHECKED BY: E. Nishinaka 09/08/2002

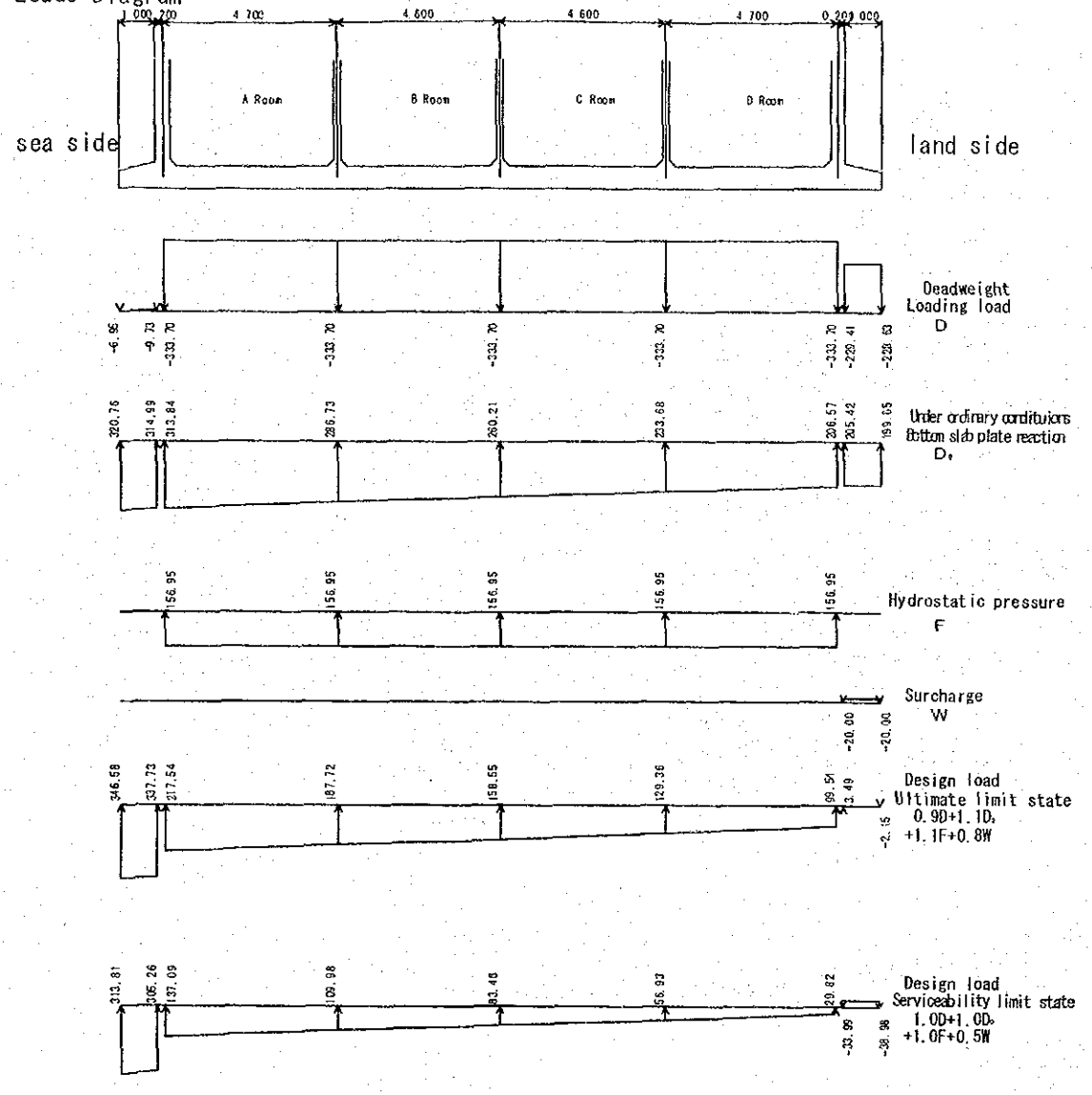
Bottom Slab , Footing
Under ordinary conditions
Combination of load (Design loads)

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 + 0.00
= 333.70 (kN/m²)

Deadweight—Footing
Deadweight+Loading load
The tip by the side of the sea = 0.50 ×(24.00 − 10.10) + 0.000 = 6.95 (kN/m²)
The root by the side of the sea = 0.70 ×(24.00 − 10.10) + 0.000 = 9.73 (kN/m²)
The root by the side of land = 0.70 ×(24.00 − 10.10) + 219.680 = 229.41 (kN/m²)
The tip by the side of land = 0.50 ×(24.00 − 10.10) + 221.680 = 228.63 (kN/m²)
Bottom slab reaction — under ordinary condition DO
sea side= 320.76(kN/m²), land side = 199.65(kN/m²)、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/m²)
Surcharge—Partition room
W = 0.00 (kN/m²)
Surcharge—Footing
The tip by the side of the sea = = 0.00 (kN/m²)
The root by the side of the sea = = 0.00 (kN/m²)
The root by the side of land = = 20.00 (kN/m²)
The tip by the side of land = = 20.00 (kN/m²)

CALCULATION	
Detailed Design on Port Reactivation Project in La Union Province	
CALC FILE NO.:	
CALC INDEX NO.	PAGE 237
PREPARED BY	Y.Ando 26/07/02
CHECKED BY	Z.NISHIMURA 09/08/2002

Loads Diagram



CALCULATION

Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:		
CALC PAGE No.	PAGE 238	
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIHARA	09/08/2002

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 + 0.00
= 333.70 (kN/m²)

Deadweight—Footing
Deadweight+Loading load
Sea side tip = 0.50 × (24.00 - 10.10) + 0.000 = 6.95 (kN/m²)
Sea side root = 0.70 × (24.00 - 10.10) + 0.000 = 9.73 (kN/m²)
Land side root = 0.70 × (24.00 - 10.10) + 219.680 = 229.41 (kN/m²)
Land side tip = 0.50 × (24.00 - 10.10) + 221.680 = 228.63 (kN/m²)

Bottom slab reaction —During an eathquake R'
Sea side= 601.37(kN/m²)、Land side= 0.00(kN/m²)、Action width = 18.420(m)

Hydrostatic pressure Under R.W.L
F = (R.W.L Hydrostatic pressure Under R.W.L
= { 1.040 - (-14.500)} × 10.10 = 156.95 (kN/m²)

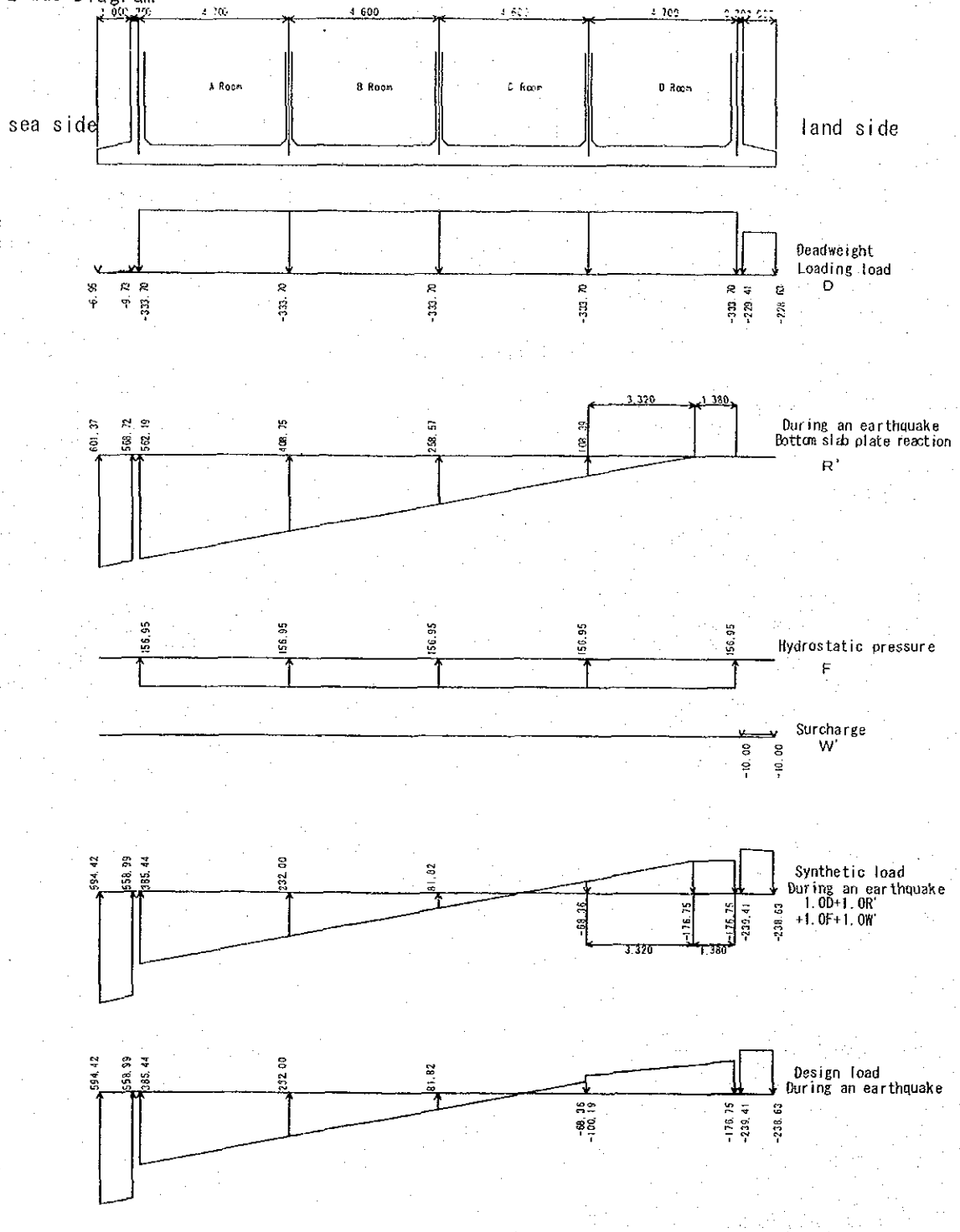
Surcharge—Partition room
W = 0.00 (kN/m²)

Surcharge—Footing
The tip by the side of the sea = = 0.00 (kN/m²)
The root by the side of the sea = = 0.00 (kN/m²)
The root by the side of land = = 10.00 (kN/m²)
The tip by the side of land = = 10.00 (kN/m²)

The irregular form in case of an earthquake is converted into uniform load and triangular distribution load.
・Calculation of Σ A
1/2 × (-68.360 - 176.750) × 3.320 = -406.88 (kN/m²)
1/2 × (-176.750 - 176.750) × 1.380 = -243.92 (kN/m²)
Σ A = -650.80 (kN/m²)
・Conversion load
P1 = -176.75 (kN/m²)
P2 = (2 ・Σ A / L) - P1
= (2 × (-650.80) / 4.700) - (-176.75) = -100.19 (kN/m²)

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 239
	INITIAL	DATE
PREPARED BY	Y. Ando	26/07/02
CHECKED BY	E. NISHIMURA	09/08/2002

Loads Diagram



CALCULATION	
Detailed Design on Port Reactivation Project in La Union Province	
CALC FILE No.:	
CALC INDEX No.:	PAGE 290
	INITIAL / DATE
PREPARED BY:	Y. Ando 26/07/02
CHECKED BY:	E. NISHIHARA 09/08/2002

(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)

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

$$T_d = 54.60 \times 4.888 = 266.88\,(kN/m)$$

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

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

$$T_d = 55.92 \times 4.650 = 260.03\,(kN/m)$$

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 $W = 176.75\,(kN/m^2)$

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

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

$$= \frac{2}{3} \times 176.75 \times 4.700 = 553.82\,(kN/m)$$

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

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

$$= 176.75 \times 4.700 \times \left(1 - \frac{4.700^2}{3 \times 4.900^2}\right) = 575.96\,(kN/m)$$

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province
CALC FILE No.
CALC NO. SHEET 241
PREPARED BY Y. Ando 26/07/02
CHECKED BY E. NISHIMURA 09/08/2002

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

CALCULATION		
Detailed Design on Port Reactivation Project in La Union Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 242
	INITIAL	DATE
PREPARED BY	Y.Ando	26/07/01
CHECKED BY	E.NISHIMURA	09/08/2002