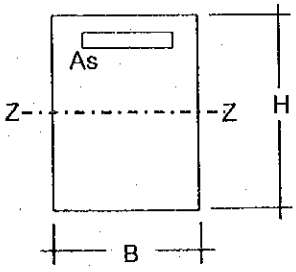
BEAM DESIGN (B-5)

Outer End



H = 40.00 cm

b = 25.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	2.70
Live Load	1.20
Seismic Load x	5.01
Seismic Load z	0.81

15.66

3.72

56.55

COMBINATION	Mu z-z
C1	5.82
C2	11.39
C3	5.50

C1 = 1.4 DL + 1.7 LL

C2 = 0.75(1.4DL + 1.7LL + 1.87SLy)

C3 = 0.75(1.4DL + 1.7LL + 1.87SLz)

Force for design: Mu z-z = 11.39 ton-m

d = 32.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\,As^2 - fyd\,As + Mu/\phi = 0$ $\phi = 0.90$

$1482.4As^2 - 136332\,As + 1265725 = 0$ As = 10.48 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 13.97 cm²
(14/fy) b d = 2.71 cm²
} Asmin = 2.71 cm²

Asmax : ρb = 0.0459 Asmax (0.75ρb) = 27.97 cm²

As = 10.48 cm² o.k!! As < Amax

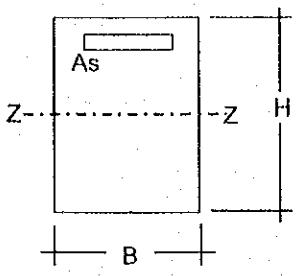
Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 2.07 **Use 3 - N 8**

PROJECT: Detailed Design on Port Reactivation Project in La Union Province	Calc. File No.		Prepared by	R.Martinez
SECTION: Port Administration Building	Calc. Index No.		Checked by	A.MORIOKA
SUBJECT: 5th & 6th Floor Beam	Date	July-02	Page	155 / 232

BEAM DESIGN (B-5)

Inner end



H = 40.00 cm

b = 25.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	6.27
Live Load	1.80
Seismic Load x	2.95
Seismic Load z	5.96

COMBINATION	Mu z-z
C1	11.84
C2	13.02
C3	17.24

C1 = 1.4 DL + 1.7 LL

C2 = 0.75(1.4DL + 1.7LL + 1.87SLy)

C3 = 0.75(1.4DL + 1.7LL + 1.87SLz)

Force for design: Mu z-z = 17.24 ton-m

d = 33.46 cm Clear cover = 4.00 cm

$fy^2/1.7bf'c\,As^2 - fyd\,As + Mu/\phi = 0$ $\phi = 0.90$

$1482.4As^2 - 140532\,As + 1915266.7 = 0$ As = 16.50 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 22.00 cm²
(14/fy) b d = 2.79 cm² } Asmin = 2.79 cm²

Asmax : ρb = 0.0459 Asmax (0.75ρb) = 28.83 cm²

As = 16.50 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 3.26 **Use 4 - N 8**

b) Shear Reinforcement

Base = 40 cm

d = 33.46 cm

fy = 4200 kg/cm² (411.89)

f'c = 280 kg/cm² (27.46 Mpa)

$Vc = (1/6)\sqrt{f'c}\ bod$ = 11.92 ton

Vn = Vc + Vs Vs = Vu/ϕ - Vc ϕ = 0.85

TYPE OF LOAD	SHEAR Vy
Dead Load	3.79
Live Load	1.53
Seismic Load x	1.70
Seismic Load z	1.55

COMBINATION	Vy
C1	7.91
C2	8.31
C3	8.10

C1 = 1.4 DL + 1.7 LL
C2 = 0.75(1.4DL + 1.7LL + 1.87SLy)
C3 = 0.75(1.4DL + 1.7LL + 1.87SLz)

Force for design: Vu = 8.31 ton

Vs = (2,141.1) kg

Bar denomination = 3 Bar area = 0.71 cm²

# of legs = 2 Spacing, S_{req} = -93.54 cm

Max. spacing of shear reinforcement.

d/2 = 16.73 cm
30 mm = 30 cm
} S_2 = 16.73 cm

$(1/3)\sqrt{f'c}/6)\ bw\ d$ = 746523.9 Newton
76,122 kg > Vs, o.k.

S_2 = 16.73 cm

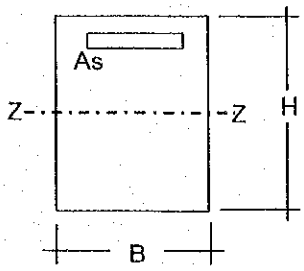
Minimun Shear Reinforcement

Av = (1/3) bw S / fy S_3 = 3 Av fy / bw S_3 = 4402.5 cm

Use 2 legs of N 3 @ 16 cm

BEAM DESIGN (B-7)

Column end



H = 60.00 cm

b = 35.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	24.99
Live Load	4.47
Seismic Load x	28.94
Seismic Load z	28.00

COMBINATION	Mu z-z
C1	42.59
C2	72.53
C3	71.21

C1 = 1.4 DL + 1.7 LL

C2 = 0.75(1.4DL + 1.7LL + 1.87SLy)

C3 = 0.75(1.4DL + 1.7LL + 1.87SLz)

Force for design: Mu z-z = 72.53 ton-m

d = 52.14 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\,As^2 - fyd\,As + Mu/\phi = 0$ $\phi = 0.90$

$1058.8As^2 - 218999\,As + 8058566.7 = 0$ As = 47.88 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 63.84 cm²
(14/fy) b d = 6.08 cm² } Asmin = 6.08 cm²

Asmax : ρb = 0.0459 Asmax (0.75ρb) = 62.89 cm²

As = 47.88 cm² o.k!! As < Amax

Bar denomination, N = 10 Bar Area (Av) = 8.17 cm²

Number of bars = 5.86 **Use 6 - N10**

b) Shear Reinforcement

Base = 35.00 cm

d = 52.14 cm

fy = 4200 kg/cm² (411.89)

f'c = 280 kg/cm² (27.46 Mpa)

$Vc = (1/6)\sqrt{f'c}\ bod$ = 16.26 ton

$Vn = Vc + Vs$ $\quad Vs = Vu/\phi - Vc$ $\quad \phi = 0.85$

TYPE OF LOAD	SHEAR Vy
Dead Load	12.55
Live Load	2.26
Seismic Load x	6.78
Seismic Load z	4.42

COMBINATION	Vy
C1	21.41
C2	25.57
C3	22.26

C1 = 1.4 DL + 1.7 LL

C2 = 0.75(1.4DL + 1.7LL + 1.87SLy)

C3 = 0.75(1.4DL + 1.7LL + 1.87SLz)

Force for design: Vu = 25.57 ton

Vs = 13,822.4 kg

Bar denomination = 4 $\quad$ Bar area = 1.27 cm²

# of legs = 2 $\quad$ Spacing, S_{req} = 40.14 cm

Max. spacing of shear reinforcement.

d/2 = 26.07 cm

30 mm = 30 cm

S_2 = 26.07 cm

$(1/3)(\sqrt{f'c}/6)\ bw\ d$ = 1017929 Newton

103,796 kg > Vs, o.k.

S_2 = 26.07 cm

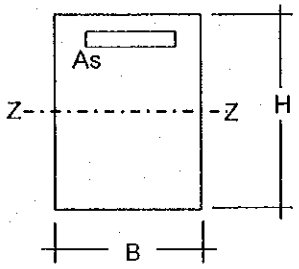
Minimun Shear Reinforcement

$Av = (1/3)\ bw\ S / fy$ $\quad S_3 = 3\ Av\ fy / bw$ $\quad S_3$ = 8944.7 cm

Use 2 legs of N 4 @ 26 cm

BEAM DESIGN (B-7A)

Column End



H = 60.00 cm

b = 35.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	32.51
Live Load	2.90
Seismic Load x	15.80
Seismic Load z	10.90

COMBINATION	Mu z-z
C1	50.44
C2	59.99
C3	53.12

C1 = 1.4 DL + 1.7 LL

C2 = 0.75(1.4DL + 1.7LL + 1.87SLy)

C3 = 0.75(1.4DL + 1.7LL + 1.87SLz)

Force for design: Mu z-z = 59.99 ton-m

d = 53.14 cm Clear cover = 4.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/\phi = 0$ $\phi = 0.90$

$1058.8As^2 - 223199\ As + 6665833.3 = 0$ As = 36.02 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 48.03 cm²
(14/fy) b d = 6.20 cm²
} Asmin = 6.20 cm²

Asmax : ρb = 0.0459 Asmax (0.75ρb) = 64.10 cm²

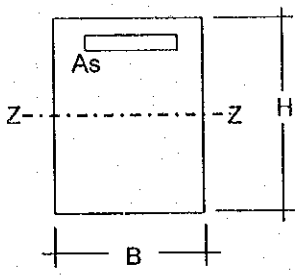
As = 36.02 cm² o.k!! As < Amax

Bar denomination, N = 10 Bar Area (Av) = 8.17 cm²

Number of bars = 4.41 **Use 5 - N10**

BEAM DESIGN (B-2a)

Outer End



H = 65.00 cm

b = 35.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	16.17
Live Load	2.72
Seismic Load x	1.25
Seismic Load z	30.00

15.66

3.72

56.55

COMBINATION	Mu z-z
C1	27.26
C2	22.20
C3	62.52

C1 = 1.4 DL + 1.7 LL

C2 = 0.75(1.4DL + 1.7LL + 1.87SLy)

C3 = 0.75(1.4DL + 1.7LL + 1.87SLz)

Force for design: Mu z-z = 62.52 ton-m

d = 57.14 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/\phi = 0$ $\phi = 0.90$

$1058.8As^2 - 239999\ As + 6946833.3 = 0$ As = 34.06 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 45.42 cm²
(14/fy) b d = 6.67 cm² } Asmin = 6.67 cm²

Asmax : ρb = 0.0459 Asmax (0.75ρb) = 68.92 cm²

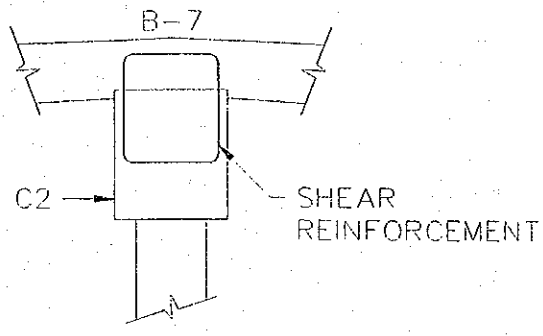
As = 34.06 cm² o.k!! As < Amax

Bar denomination, N = 10 Bar Area (Av) = 8.17 cm²

Number of bars = 4.17 **Use 5 - N10**

BEAM-COLUMN CONNECTION

5-C Axis Intersection



f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces from Structural Analysis (ton , m) :

TYPE OF LOAD	SHEAR Vy
Dead Load	12.87
Live Load	3.85
Seismic Load x	4.70
Seismic Load z	3.71

COMBINATION	Vy
C1	24.56
C2	25.01
C3	23.63

C1 = 1.4 DL + 1.7 LL

C2 = 0.75(1.4DL + 1.7LL + 1.87SLy)

C3 = 0.75(1.4DL + 1.7LL + 1.87SLz)

Use Vy = 25.01 ton

Shear

Avf = Vn / fyxμ

Vn = Vu / ϕ ϕ = 0.85 Vu = 29.43 ton

μ = 1.0λ

λ = 1.0 (Normal weight concrete) Increase = 1.2

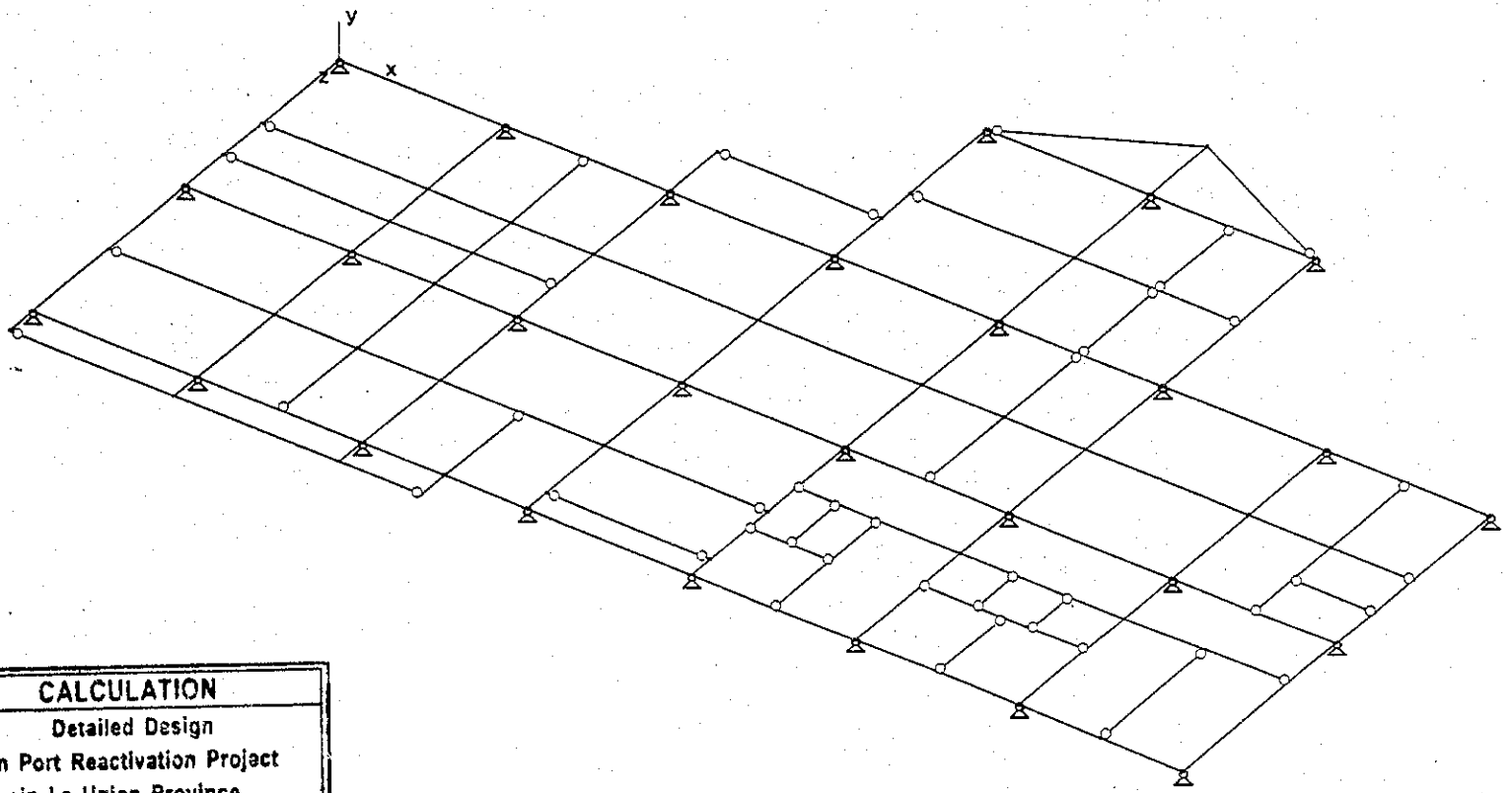
Avf = 8.41 cm²

Bar denomination = 4 Bar area = 1.27 cm²

# of legs = 2 # of hoops = 3.32

Use 4 Hoops N 4

ADMINISTRATION



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CHECKED BY	A. M	July/02

FOUNDATION BEAM MODEL

Administration Building Foundation Beam

Node Coordinate

Node No.	x (m)	y (m)	z (m)
1	0	0	0
2	6	0	0
3	12	0	0
4	18	0	0
5	24	0	0
6	30	0	0
7	36	0	0
8	42	0	0
9	0	0	8
10	6	0	8
11	12	0	8
12	18	0	8
13	24	0	8
14	30	0	8
15	36	0	8
16	42	0	8
17	0	0	16
18	6	0	16
19	12	0	16
20	18	0	16
21	24	0	16
22	30	0	16
23	36	0	16
24	42	0	16
25	18	0	-8
26	24	0	-8
27	30	0	-8
28	0	0	17.2
29	6	0	17.2
30	12	0	17.2
31	24	0	-11
32	12	0	-2.5
33	18	0	-2.5
34	18	0	-4
35	24	0	-4
36	30	0	-4
37	27	0	0
38	27	0	-8
39	27	0	-4
40	0	0	6
41	6	0	6
42	12	0	6
43	12	0	4
44	18	0	4
45	24	0	4
46	30	0	4
47	36	0	4

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Node Coordinate

Node No.	x (m)	y (m)	z (m)
48	42	0	4
49	27	0	8
50	27	0	4
51	39	0	0
52	39	0	8
53	39	0	4
54	0	0	12
55	6	0	12
56	12	0	12
57	18	0	12
58	24	0	12
59	9	0	0
60	9	0	8
61	9	0	16
62	9	0	6
63	9	0	12
64	15	0	16
65	15	0	12
66	15	0	17.2
67	18	0	15
68	24	0	15
69	24	0	10.5
70	30	0	10.5
71	36	0	10.5
72	42	0	10.5
73	27	0	16
74	27	0	10.5
75	24	0	13
76	27	0	13
77	25.5	0	10.5
78	25.5	0	13
79	42	0	6
80	39	0	6
81	39	0	16
82	39	0	10.5
83	30	0	12.5
84	36	0	12.5
85	32	0	10.5
86	34	0	10.5
87	32	0	12.5
88	34	0	12.5
89	33	0	12.5
90	33	0	16
91	0	0	4
92	6	0	4
93	9	0	4

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Element data

Member No.	node 1	node 2	length (m)	Member No.	node 1	node 2	length (m)
1	1	2	6	50	34	25	4
2	2	59	3	51	35	26	4
3	3	4	6	52	36	27	4
4	4	5	6	53	25	31	6.708
5	5	37	3	54	31	27	6.708
6	6	7	6	55	34	35	6
7	7	51	3	56	35	39	3
8	9	10	6	57	37	6	3
9	10	60	3	58	38	27	3
10	11	12	6	59	39	36	3
11	12	13	6	60	39	38	4
12	13	49	3	61	37	39	4
13	14	15	6	62	40	91	2
14	15	52	3	63	41	92	2
15	17	18	6	64	42	43	2
16	18	61	3	65	40	41	6
17	19	64	3	66	41	62	3
18	20	21	6	67	43	3	4
19	21	73	3	68	44	4	4
20	22	90	3	69	45	5	4
21	23	81	3	70	46	6	4
22	9	40	2	71	47	7	4
23	17	54	4	72	48	8	4
24	10	41	2	73	43	44	6
25	18	55	4	74	44	45	6
26	11	42	2	75	45	50	3
27	19	56	4	76	46	47	6
28	12	44	4	77	47	53	3
29	20	67	1	78	49	14	3
30	13	45	4	79	50	46	3
31	21	68	1	80	50	37	4
32	14	46	4	81	49	50	4
33	22	83	3.5	82	51	8	3
34	15	47	4	83	52	16	3
35	23	84	3.5	84	53	48	3
36	16	79	2	85	53	51	4
37	24	72	5.5	86	52	80	2
38	4	33	2.5	87	54	9	4
39	5	35	4	88	55	10	4
40	6	36	4	89	56	11	4
41	25	26	6	90	57	12	4
42	26	38	3	91	58	69	1.5
43	28	17	1.2	92	54	55	6
44	29	18	1.2	93	55	63	3
45	30	19	1.2	94	56	65	3
46	26	31	3	95	57	58	6
47	3	32	2.5	96	59	3	3
48	33	34	1.5	97	60	11	3
49	32	33	6	98	61	19	3

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Member No.	node 1	node 2	length (m)	Member No.	node 1	node 2	length (m)
99	62	42	3	150	92	2	4
100	63	56	3	151	93	59	4
101	62	93	2	152	91	92	6
102	60	62	2	153	92	93	3
103	63	60	4	154	93	43	3
104	61	63	4				
105	64	20	3				
106	65	57	3				
107	64	65	4				
108	66	64	1.2				
109	28	29	6				
110	29	30	6				
111	30	66	3				
112	67	57	3				
113	68	75	2				
114	67	68	6				
115	69	13	2.5				
116	70	14	2.5				
117	71	15	2.5				
118	72	16	2.5				
119	69	77	1.5				
120	70	85	2				
121	71	82	3				
122	73	22	3				
123	74	70	3				
124	73	76	3				
125	75	58	1				
126	76	74	2.5				
127	75	78	1.5				
128	77	74	1.5				
129	78	76	1.5				
130	78	77	2.5				
131	79	48	2				
132	80	53	2				
133	80	79	3				
134	81	24	3				
135	82	72	3				
136	81	82	5.5				
137	83	70	2				
138	84	71	2				
139	83	87	2				
140	85	86	2				
141	86	71	2				
142	87	89	1				
143	88	84	2				
144	87	85	2				
145	88	86	2				
146	89	88	1				
147	90	23	3				
148	90	89	3.5				
149	91	1	4				

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Section

Member group	section	direction		Member group	section	direction	
1	Custom	bd-35x8	0	51	Custom	bd-35x8	0
2	Custom	bd-40x8	0	52	Custom	bd-35x8	0
3	Custom	bd-40x8	0	53	Custom	bd-30x6	0
4	Custom	bd-40x8	0	54	Custom	bd-30x6	0
5	Custom	bd-40x8	0	55	Custom	bd-30x6	0
6	Custom	bd-40x8	0	56	Custom	bd-30x6	0
7	Custom	bd-40x8	0	57	Custom	bd-40x8	0
8	Custom	bd-35x8	0	58	Custom	bd-35x8	0
9	Custom	bd-40x8	0	59	Custom	bd-30x6	0
10	Custom	bd-40x8	0	60	Custom	bd-25x4	0
11	Custom	bd-40x8	0	61	Custom	bd-25x4	0
12	Custom	bd-40x8	0	62	Custom	bd-35x8	0
13	Custom	bd-40x8	0	63	Custom	bd-40x8	0
14	Custom	bd-40x8	0	64	Custom	bd-40x8	0
15	Custom	bd-35x8	0	65	Custom	bd-30x6	0
16	Custom	bd-40x8	0	66	Custom	bd-30x6	0
17	Custom	bd-40x8	0	67	Custom	bd-40x8	0
18	Custom	bd-40x8	0	68	Custom	bd-40x8	0
19	Custom	bd-40x8	0	69	Custom	bd-40x8	0
20	Custom	bd-40x8	0	70	Custom	bd-40x8	0
21	Custom	bd-40x8	0	71	Custom	bd-40x8	0
22	Custom	bd-35x8	0	72	Custom	bd-40x8	0
23	Custom	bd-35x8	0	73	Custom	bd-30x6	0
24	Custom	bd-40x8	0	74	Custom	bd-30x6	0
25	Custom	bd-40x8	0	75	Custom	bd-30x6	0
26	Custom	bd-40x8	0	76	Custom	bd-30x6	0
27	Custom	bd-40x8	0	77	Custom	bd-30x6	0
28	Custom	bd-40x8	0	78	Custom	bd-40x8	0
29	Custom	bd-40x8	0	79	Custom	bd-30x6	0
30	Custom	bd-40x8	0	80	Custom	bd-25x4	0
31	Custom	bd-40x8	0	81	Custom	bd-25x4	0
32	Custom	bd-40x8	0	82	Custom	bd-40x8	0
33	Custom	bd-40x8	0	83	Custom	bd-40x8	0
34	Custom	bd-40x8	0	84	Custom	bd-30x6	0
35	Custom	bd-40x8	0	85	Custom	bd-25x4	0
36	Custom	bd-40x8	0	86	Custom	bd-25x4	0
37	Custom	bd-40x8	0	87	Custom	bd-35x8	0
38	Custom	bd-35x8	0	88	Custom	bd-40x8	0
39	Custom	bd-35x8	0	89	Custom	bd-40x8	0
40	Custom	bd-35x8	0	90	Custom	bd-40x8	0
41	Custom	bd-35x8	0	91	Custom	bd-40x8	0
42	Custom	bd-35x8	0	92	Custom	bd-30x6	0
43	Custom	bd-30x6	0	93	Custom	bd-30x6	0
44	Custom	bd-30x6	0	94	Custom	bd-30x6	0
45	Custom	bd-30x6	0	95	Custom	bd-30x6	0
46	Custom	bd-35x8	0	96	Custom	bd-40x8	0
47	Custom	bd-40x8	0	97	Custom	bd-40x8	0
48	Custom	bd-35x8	0	98	Custom	bd-40x8	0
49	Custom	bd-30x6	0	99	Custom	bd-30x6	0
50	Custom	bd-35x8	0	100	Custom	bd-30x6	0

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Section

Member group	section	direction		Member group	section	direction	
101	Custom	bd-25x4	0	151	Custom	bd-25x4	0
102	Custom	bd-25x4	0	152	Custom	bd-30x6	0
103	Custom	bd-25x4	0	153	Custom	bd-30x6	0
104	Custom	bd-25x4	0	154	Custom	bd-30x6	0
105	Custom	bd-40x8	0				
106	Custom	bd-30x6	0				
107	Custom	bd-25x4	0				
108	Custom	bd-25x4	0				
109	Custom	bd-30x6	0				
110	Custom	bd-30x6	0				
111	Custom	bd-25x4	0				
112	Custom	bd-40x8	0				
113	Custom	bd-40x8	0				
114	Custom	bd-30x6	0				
115	Custom	bd-40x8	0				
116	Custom	bd-40x8	0				
117	Custom	bd-40x8	0				
118	Custom	bd-40x8	0				
119	Custom	bd-30x6	0				
120	Custom	bd-30x6	0				
121	Custom	bd-30x6	0				
122	Custom	bd-40x8	0				
123	Custom	bd-30x6	0				
124	Custom	bd-25x4	0				
125	Custom	bd-40x8	0				
126	Custom	bd-25x4	0				
127	Custom	bd-25x4	0				
128	Custom	bd-30x6	0				
129	Custom	bd-25x4	0				
130	Custom	bd-25x4	0				
131	Custom	bd-40x8	0				
132	Custom	bd-25x4	0				
133	Custom	bd-25x4	0				
134	Custom	bd-40x8	0				
135	Custom	bd-30x6	0				
136	Custom	bd-30x6	0				
137	Custom	bd-40x8	0				
138	Custom	bd-40x8	0				
139	Custom	bd-30x6	0				
140	Custom	bd-30x6	0				
141	Custom	bd-30x6	0				
142	Custom	bd-30x6	0				
143	Custom	bd-30x6	0				
144	Custom	bd-25x4	0				
145	Custom	bd-25x4	0				
146	Custom	bd-30x6	0				
147	Custom	bd-40x8	0				
148	Custom	bd-25x4	0				
149	Custom	bd-35x8	0				
150	Custom	bd-40x8	0				

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Nodal Load

DL

Node No.	directio	(t)
84	Py	-0.89

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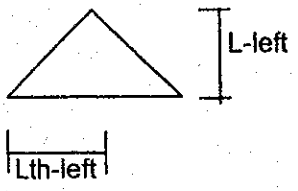
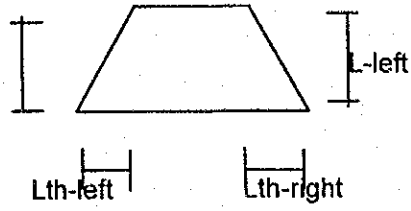
CHECKED BY	A. M.	JULY/02

Member Load

u : uniformly distributed load
con : concentrated load
Lth-left : length from left end
Lth-right: length from right end
L-left: load at left side
L-right: load at right side



triangle load



trilinear load

DL

member	load	type	Lth-left	Lth-right	L-left	L-right
53	Wy	u	-	-	-0.48	-
54	Wy	u	-	-	-0.48	-
65	Wy	u	-	-	-1.43	-
66	Wy	u	-	-	-1.43	-
101	Wy	trilinear	0	0	-1.43	-1.43
102	Wy	u	-	-	-1.43	-
1	Wy	u	-	-	-1.43	-
62	Wy	trilinear	0	0	-0.71	-0.71
23	Wy	u	-	-	-0.71	-
87	Wy	u	-	-	-0.71	-
109	Wy	u	-	-	-1.43	-
110	Wy	u	-	-	-1.43	-
104	Wy	u	-	-	-1.43	-
103	Wy	u	-	-	-0.71	-
2	Wy	u	-	-	-0.71	-
96	Wy	u	-	-	-0.71	-
100	Wy	u	-	-	-1.43	-
111	Wy	u	-	-	-1.43	-
107	Wy	u	-	-	-1.43	-
108	Wy	u	-	-	-1.43	-
105	Wy	trilinear	0	0	-0.71	-0.71
94	Wy	u	-	-	-0.71	-
106	Wy	u	-	-	-0.71	-
3	Wy	u	-	-	-1.43	-
47	Wy	u	-	-	-1.43	-
49	Wy	u	-	-	-0.35	-
114	Wy	u	-	-	-0.49	-
95	Wy	u	-	-	-0.49	-
4	Wy	u	-	-	-0.71	-
19	Wy	u	-	-	-1.43	-

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member	load	type	Lth-left	Lth-right	L-left	L-right
122	Wy	u	-	-	-1.43	-
127	Wy	u	-	-	-2.11	-
129	Wy	u	-	-	-2.11	-
130	Wy	u	-	-	-2.11	-
91	Wy	u	-	-	-2.11	-
125	Wy	u	-	-	-2.11	-
31	Wy	u	-	-	-1.43	-
113	Wy	u	-	-	-1.43	-
124	Wy	u	-	-	-2.11	-
126	Wy	u	-	-	-2.11	-
123	Wy	u	-	-	-1.06	-
12	Wy	u	-	-	-0.3	-
80	Wy	u	-	-	-1.43	-
81	Wy	u	-	-	-1.43	-
5	Wy	u	-	-	-1.43	-
57	Wy	u	-	-	-1.43	-
61	Wy	u	-	-	-1.43	-
59	Wy	trilinear	2	0	-1.43	-1.43
60	Wy	u	-	-	-1.43	-
58	Wy	u	-	-	-1.43	-
40	Wy	u	-	-	-0.71	-
52	Wy	u	-	-	-0.71	-
20	Wy	trilinear	1.5	0	-1.47	-1.47
147	Wy	trilinear	0	1.5	-1.47	-1.47
148	Wy	u	-	-	-1.43	-
146	Wy	u	-	-	-1.43	-
144	Wy	u	-	-	-1.43	-
145	Wy	u	-	-	-1.43	-
120	Wy	u	-	-	-1.43	-
141	Wy	u	-	-	-1.43	-
13	Wy	u	-	-	-1.43	-
6	Wy	u	-	-	-0.71	-
7	Wy	u	-	-	-0.71	-
85	Wy	trilinear	2	0	-1.43	-1.43
77	Wy	u	-	-	-1.43	-
84	Wy	trilinear	1.5	0	-1.43	-1.43
86	Wy	u	-	-	-1.43	-
132	Wy	u	-	-	-1.43	-
133	Wy	u	-	-	-1.43	-
14	Wy	trilinear	1.5	0	-1.43	-1.43
83	Wy	u	-	-	-1.43	-
136	Wy	u	-	-	-1.43	-
21	Wy	u	-	-	-1.43	-
134	Wy	u	-	-	-1.43	-
37	Wy	u	-	-	-1.43	-
72	Wy	u	-	-	-1.43	-
131	Wy	u	-	-	-1.43	-
149	Wy	trilinear	0	0	-0.71	-0.71
151	Wy	trilinear	0	0	-1.43	-1.43
1	Wy	u	-	-	-0.65	-
2	Wy	u	-	-	-0.743	-
3	Wy	u	-	-	-0.743	-

member	load	type	Lth-left	Lth-right	L-left	L-right
4	Wy	u	-	-	-0.743	-
5	Wy	u	-	-	-0.743	-
6	Wy	u	-	-	-0.743	-
7	Wy	u	-	-	-0.743	-
8	Wy	u	-	-	-0.65	-
9	Wy	u	-	-	-0.743	-
10	Wy	u	-	-	-0.743	-
11	Wy	u	-	-	-0.743	-
12	Wy	u	-	-	-0.743	-
13	Wy	u	-	-	-0.743	-
14	Wy	u	-	-	-0.743	-
15	Wy	u	-	-	-0.65	-
16	Wy	u	-	-	-0.743	-
17	Wy	u	-	-	-0.743	-
18	Wy	u	-	-	-0.743	-
19	Wy	u	-	-	-0.743	-
20	Wy	u	-	-	-0.743	-
21	Wy	u	-	-	-0.743	-
22	Wy	u	-	-	-0.65	-
23	Wy	u	-	-	-0.65	-
24	Wy	u	-	-	-0.743	-
25	Wy	u	-	-	-0.743	-
26	Wy	u	-	-	-0.743	-
27	Wy	u	-	-	-0.743	-
28	Wy	u	-	-	-0.743	-
29	Wy	u	-	-	-0.743	-
30	Wy	u	-	-	-0.743	-
31	Wy	u	-	-	-0.743	-
32	Wy	u	-	-	-0.743	-
33	Wy	u	-	-	-0.743	-
34	Wy	u	-	-	-0.743	-
35	Wy	u	-	-	-0.743	-
36	Wy	u	-	-	-0.743	-
37	Wy	u	-	-	-0.743	-
38	Wy	u	-	-	-0.65	-
39	Wy	u	-	-	-0.65	-
40	Wy	u	-	-	-0.65	-
41	Wy	u	-	-	-0.65	-
42	Wy	u	-	-	-0.65	-
43	Wy	u	-	-	-0.453	-
44	Wy	u	-	-	-0.453	-
45	Wy	u	-	-	-0.453	-
46	Wy	u	-	-	-0.65	-
47	Wy	u	-	-	-0.743	-
48	Wy	u	-	-	-0.65	-
49	Wy	u	-	-	-0.418	-
50	Wy	u	-	-	-0.65	-
51	Wy	u	-	-	-0.65	-
52	Wy	u	-	-	-0.65	-
53	Wy	u	-	-	-0.418	-
54	Wy	u	-	-	-0.418	-
55	Wy	u	-	-	-0.418	-

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member	load	type	Lth-left	Lth-right	L-left	L-right
56	Wy	u	-	-	-0.418	-
57	Wy	u	-	-	-0.743	-
58	Wy	u	-	-	-0.65	-
59	Wy	u	-	-	-0.418	-
60	Wy	u	-	-	-0.232	-
61	Wy	u	-	-	-0.232	-
62	Wy	u	-	-	-0.65	-
63	Wy	u	-	-	-0.743	-
64	Wy	u	-	-	-0.743	-
65	Wy	u	-	-	-0.418	-
66	Wy	u	-	-	-0.418	-
67	Wy	u	-	-	-0.743	-
68	Wy	u	-	-	-0.743	-
69	Wy	u	-	-	-0.743	-
70	Wy	u	-	-	-0.743	-
71	Wy	u	-	-	-0.743	-
72	Wy	u	-	-	-0.743	-
73	Wy	u	-	-	-0.418	-
74	Wy	u	-	-	-0.418	-
75	Wy	u	-	-	-0.418	-
76	Wy	u	-	-	-0.418	-
77	Wy	u	-	-	-0.418	-
78	Wy	u	-	-	-0.743	-
79	Wy	u	-	-	-0.418	-
80	Wy	u	-	-	-0.232	-
81	Wy	u	-	-	-0.232	-
82	Wy	u	-	-	-0.743	-
83	Wy	u	-	-	-0.743	-
84	Wy	u	-	-	-0.418	-
85	Wy	u	-	-	-0.232	-
86	Wy	u	-	-	-0.232	-
87	Wy	u	-	-	-0.65	-
88	Wy	u	-	-	-0.743	-
89	Wy	u	-	-	-0.743	-
90	Wy	u	-	-	-0.743	-
91	Wy	u	-	-	-0.743	-
92	Wy	u	-	-	-0.418	-
93	Wy	u	-	-	-0.418	-
94	Wy	u	-	-	-0.418	-
95	Wy	u	-	-	-0.418	-
96	Wy	u	-	-	-0.743	-
97	Wy	u	-	-	-0.743	-
98	Wy	u	-	-	-0.743	-
99	Wy	u	-	-	-0.418	-
100	Wy	u	-	-	-0.418	-
101	Wy	u	-	-	-0.232	-
102	Wy	u	-	-	-0.232	-
103	Wy	u	-	-	-0.232	-
104	Wy	u	-	-	-0.232	-
105	Wy	u	-	-	-0.743	-
106	Wy	u	-	-	-0.418	-
107	Wy	u	-	-	-0.232	-

member	load	type	Lth-left	Lth-right	L-left	L-right
108	Wy	u	-	-	-0.232	-
109	Wy	u	-	-	-0.418	-
110	Wy	u	-	-	-0.418	-
111	Wy	u	-	-	-0.232	-
112	Wy	u	-	-	-0.743	-
113	Wy	u	-	-	-0.743	-
114	Wy	u	-	-	-0.418	-
115	Wy	u	-	-	-0.743	-
116	Wy	u	-	-	-0.743	-
117	Wy	u	-	-	-0.743	-
118	Wy	u	-	-	-0.743	-
119	Wy	u	-	-	-0.418	-
120	Wy	u	-	-	-0.418	-
121	Wy	u	-	-	-0.418	-
122	Wy	u	-	-	-0.743	-
123	Wy	u	-	-	-0.418	-
124	Wy	u	-	-	-0.232	-
125	Wy	u	-	-	-0.743	-
126	Wy	u	-	-	-0.232	-
127	Wy	u	-	-	-0.232	-
128	Wy	u	-	-	-0.418	-
129	Wy	u	-	-	-0.232	-
130	Wy	u	-	-	-0.232	-
131	Wy	u	-	-	-0.743	-
132	Wy	u	-	-	-0.232	-
133	Wy	u	-	-	-0.232	-
134	Wy	u	-	-	-0.743	-
135	Wy	u	-	-	-0.418	-
136	Wy	u	-	-	-0.418	-
137	Wy	u	-	-	-0.743	-
138	Wy	u	-	-	-0.743	-
139	Wy	u	-	-	-0.418	-
140	Wy	u	-	-	-0.418	-
141	Wy	u	-	-	-0.418	-
142	Wy	u	-	-	-0.418	-
143	Wy	u	-	-	-0.418	-
144	Wy	u	-	-	-0.232	-
145	Wy	u	-	-	-0.232	-
146	Wy	u	-	-	-0.418	-
147	Wy	u	-	-	-0.743	-
148	Wy	u	-	-	-0.232	-
149	Wy	u	-	-	-0.65	-
150	Wy	u	-	-	-0.743	-
151	Wy	u	-	-	-0.232	-
152	Wy	u	-	-	-0.418	-
153	Wy	u	-	-	-0.418	-
154	Wy	u	-	-	-0.418	-
1	Wy	u	-	-	-0.175	-
2	Wy	u	-	-	-0.175	-
3	Wy	u	-	-	-0.175	-
4	Wy	u	-	-	-0.175	-
8	Wy	u	-	-	-0.175	-

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CHECKED BY	A	June/02

member	load	type	Lth-left	Lth-right	L-left	L-right
9	Wy	u	-	-	-0.175	-
10	Wy	u	-	-	-0.175	-
11	Wy	u	-	-	-0.175	-
15	Wy	u	-	-	-0.175	-
16	Wy	u	-	-	-0.175	-
17	Wy	u	-	-	-0.175	-
18	Wy	u	-	-	-0.175	-
22	Wy	u	-	-	-0.175	-
23	Wy	u	-	-	-0.175	-
24	Wy	u	-	-	-0.175	-
25	Wy	u	-	-	-0.175	-
26	Wy	u	-	-	-0.175	-
27	Wy	u	-	-	-0.175	-
28	Wy	u	-	-	-0.175	-
29	Wy	u	-	-	-0.175	-
38	Wy	u	-	-	-0.175	-
41	Wy	u	-	-	-0.175	-
43	Wy	u	-	-	-0.175	-
44	Wy	u	-	-	-0.175	-
45	Wy	u	-	-	-0.175	-
47	Wy	u	-	-	-0.175	-
48	Wy	u	-	-	-0.175	-
49	Wy	u	-	-	-0.175	-
50	Wy	u	-	-	-0.175	-
53	Wy	u	-	-	-0.175	-
55	Wy	u	-	-	-0.175	-
62	Wy	trilinear	0	0	-0.175	-0.175
63	Wy	trilinear	0	0	-0.175	-0.175
64	Wy	u	-	-	-0.175	-
65	Wy	u	-	-	-0.175	-
66	Wy	u	-	-	-0.175	-
67	Wy	u	-	-	-0.175	-
68	Wy	u	-	-	-0.175	-
73	Wy	u	-	-	-0.175	-
74	Wy	u	-	-	-0.175	-
87	Wy	u	-	-	-0.175	-
88	Wy	u	-	-	-0.175	-
89	Wy	u	-	-	-0.175	-
90	Wy	u	-	-	-0.175	-
92	Wy	u	-	-	-0.175	-
93	Wy	u	-	-	-0.175	-
94	Wy	u	-	-	-0.175	-
95	Wy	u	-	-	-0.175	-
96	Wy	u	-	-	-0.175	-
97	Wy	u	-	-	-0.175	-
98	Wy	u	-	-	-0.175	-
99	Wy	u	-	-	-0.175	-
100	Wy	u	-	-	-0.175	-
101	Wy	trilinear	0	0	-0.175	-0.175
102	Wy	u	-	-	-0.175	-
103	Wy	u	-	-	-0.175	-
104	Wy	u	-	-	-0.175	-

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CHECKED BY	A.M.	JULY/02

member	load	type	Lth-left	Lth-right	L-left	L-right
105	Wy	u	-	-	-0.175	-
106	Wy	u	-	-	-0.175	-
107	Wy	u	-	-	-0.175	-
108	Wy	u	-	-	-0.175	-
109	Wy	u	-	-	-0.175	-
110	Wy	u	-	-	-0.175	-
111	Wy	u	-	-	-0.175	-
112	Wy	u	-	-	-0.175	-
114	Wy	u	-	-	-0.175	-
5	Wy	u	-	-	-0.175	-
6	Wy	u	-	-	-0.175	-
7	Wy	u	-	-	-0.175	-
12	Wy	u	-	-	-0.175	-
13	Wy	u	-	-	-0.175	-
14	Wy	u	-	-	-0.175	-
19	Wy	u	-	-	-0.175	-
21	Wy	u	-	-	-0.175	-
30	Wy	u	-	-	-0.175	-
31	Wy	u	-	-	-0.175	-
32	Wy	u	-	-	-0.175	-
34	Wy	u	-	-	-0.175	-
36	Wy	u	-	-	-0.175	-
37	Wy	u	-	-	-0.175	-
39	Wy	u	-	-	-0.175	-
40	Wy	u	-	-	-0.175	-
42	Wy	u	-	-	-0.175	-
46	Wy	u	-	-	-0.175	-
51	Wy	u	-	-	-0.175	-
52	Wy	u	-	-	-0.175	-
54	Wy	u	-	-	-0.175	-
56	Wy	u	-	-	-0.175	-
57	Wy	u	-	-	-0.175	-
58	Wy	u	-	-	-0.175	-
59	Wy	u	-	-	-0.175	-
60	Wy	u	-	-	-0.175	-
61	Wy	u	-	-	-0.175	-
69	Wy	u	-	-	-0.175	-
70	Wy	u	-	-	-0.175	-
71	Wy	u	-	-	-0.175	-
72	Wy	u	-	-	-0.175	-
75	Wy	u	-	-	-0.175	-
76	Wy	u	-	-	-0.175	-
77	Wy	u	-	-	-0.175	-
78	Wy	u	-	-	-0.175	-
79	Wy	u	-	-	-0.175	-
80	Wy	u	-	-	-0.175	-
81	Wy	u	-	-	-0.175	-
82	Wy	u	-	-	-0.175	-
84	Wy	u	-	-	-0.175	-
85	Wy	u	-	-	-0.175	-
86	Wy	u	-	-	-0.175	-
113	Wy	u	-	-	-0.175	-

CALCULATION

Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:

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PREPARED BY	H.W.	JUNE/02
CHECKED BY	A.M.	JULY/02

member	load	type	Lth-left	Lth-right	L-left	L-right
115	Wy	u	-	-	-0.175	-
116	Wy	u	-	-	-0.175	-
117	Wy	u	-	-	-0.175	-
118	Wy	u	-	-	-0.175	-
121	Wy	u	-	-	-0.175	-
122	Wy	u	-	-	-0.175	-
123	Wy	u	-	-	-0.175	-
124	Wy	u	-	-	-0.175	-
131	Wy	u	-	-	-0.175	-
132	Wy	u	-	-	-0.175	-
134	Wy	u	-	-	-0.175	-
135	Wy	u	-	-	-0.175	-
136	Wy	u	-	-	-0.175	-
91	Wy	u	-	-	-0.77	-
125	Wy	u	-	-	-0.77	-
126	Wy	u	-	-	-0.77	-
130	Wy	u	-	-	-1.53	-
120	Wy	u	-	-	-0.58	-
140	Wy	u	-	-	-0.58	-
141	Wy	u	-	-	-0.58	-
119	Wy	u	-	-	-0.17	-
127	Wy	u	-	-	-0.17	-
128	Wy	u	-	-	-0.17	-
129	Wy	u	-	-	-0.17	-
137	Wy	u	-	-	-0.17	-
138	Wy	u	-	-	-0.17	-
144	Wy	u	-	-	-0.17	-
145	Wy	u	-	-	-0.17	-
33	Wy	trilinear	1.5	1.5	-1.16	-1.16
139	Wy	triangle	1.5	-	-1.16	-
143	Wy	triangle	1.5	-	-1.16	-
148	Wy	trilinear	1.5	1.5	-3.32	-3.32
20	Wy	triangle	1.5	-	-1.16	-
147	Wy	triangle	1.5	-	-1.16	-
35	Wy	trilinear	1.5	1.5	-1.16	-1.16
136	Wy	trilinear	3	0	-0.77	-0.77
121	Py	con	1.5	1.5	-0.89	-0.89
83	Wy	u	-	-	-0.77	-
133	Wy	u	-	-	-0.77	-
149	Wy	trilinear	0	0	-0.175	-0.175
150	Wy	trilinear	0	0	-0.175	-0.175
151	Wy	trilinear	0	0	-0.175	-0.175
152	Wy	u	-	-	-0.175	-
153	Wy	u	-	-	-0.175	-
154	Wy	u	-	-	-0.175	-

CALCULATION		
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CHECKED BY	A.M.	JULY/02

Member Load

LL

member	load	type	Lth-left	Lth-right	L-left	L-right
1	Wy	u	-	-	-0.18	-
2	Wy	u	-	-	-0.18	-
3	Wy	u	-	-	-0.18	-
4	Wy	u	-	-	-0.18	-
5	Wy	u	-	-	-0.18	-
6	Wy	u	-	-	-0.18	-
7	Wy	u	-	-	-0.18	-
8	Wy	u	-	-	-0.18	-
9	Wy	u	-	-	-0.18	-
10	Wy	u	-	-	-0.18	-
11	Wy	u	-	-	-0.18	-
12	Wy	u	-	-	-0.18	-
13	Wy	u	-	-	-0.18	-
14	Wy	u	-	-	-0.18	-
15	Wy	u	-	-	-0.18	-
16	Wy	u	-	-	-0.18	-
17	Wy	u	-	-	-0.18	-
18	Wy	u	-	-	-0.18	-
19	Wy	u	-	-	-0.18	-
20	Wy	u	-	-	-0.18	-
21	Wy	u	-	-	-0.18	-
22	Wy	u	-	-	-0.18	-
23	Wy	u	-	-	-0.18	-
24	Wy	u	-	-	-0.18	-
25	Wy	u	-	-	-0.18	-
26	Wy	u	-	-	-0.18	-
27	Wy	u	-	-	-0.18	-
28	Wy	u	-	-	-0.18	-
29	Wy	u	-	-	-0.18	-
30	Wy	u	-	-	-0.18	-
31	Wy	u	-	-	-0.18	-
32	Wy	u	-	-	-0.18	-
34	Wy	u	-	-	-0.18	-
36	Wy	u	-	-	-0.18	-
38	Wy	u	-	-	-0.18	-
39	Wy	u	-	-	-0.18	-
40	Wy	u	-	-	-0.18	-
41	Wy	u	-	-	-0.18	-
42	Wy	u	-	-	-0.18	-
43	Wy	u	-	-	-0.18	-
44	Wy	u	-	-	-0.18	-
45	Wy	u	-	-	-0.18	-
46	Wy	u	-	-	-0.18	-
47	Wy	u	-	-	-0.18	-
48	Wy	u	-	-	-0.18	-
49	Wy	u	-	-	-0.18	-
50	Wy	u	-	-	-0.18	-
51	Wy	u	-	-	-0.18	-

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CHECKED BY	A.M	JULY/02

member	load	type	Lth-left	Lth-right	L-left	L-right
52	Wy	u	-	-	-0.18	-
53	Wy	u	-	-	-0.18	-
54	Wy	u	-	-	-0.18	-
55	Wy	u	-	-	-0.18	-
56	Wy	u	-	-	-0.18	-
57	Wy	u	-	-	-0.18	-
58	Wy	u	-	-	-0.18	-
59	Wy	u	-	-	-0.18	-
60	Wy	u	-	-	-0.18	-
61	Wy	u	-	-	-0.18	-
62	Wy	trilinear	0	0	-0.18	-0.18
63	Wy	trilinear	0	0	-0.18	-0.18
64	Wy	u	-	-	-0.18	-
65	Wy	u	-	-	-0.18	-
66	Wy	u	-	-	-0.18	-
67	Wy	u	-	-	-0.18	-
68	Wy	u	-	-	-0.18	-
69	Wy	u	-	-	-0.18	-
70	Wy	u	-	-	-0.18	-
71	Wy	u	-	-	-0.18	-
72	Wy	u	-	-	-0.18	-
73	Wy	u	-	-	-0.18	-
74	Wy	u	-	-	-0.18	-
75	Wy	u	-	-	-0.18	-
76	Wy	u	-	-	-0.18	-
77	Wy	u	-	-	-0.18	-
78	Wy	u	-	-	-0.18	-
79	Wy	u	-	-	-0.18	-
80	Wy	u	-	-	-0.18	-
81	Wy	u	-	-	-0.18	-
82	Wy	u	-	-	-0.18	-
83	Wy	u	-	-	-0.18	-
84	Wy	u	-	-	-0.18	-
85	Wy	u	-	-	-0.18	-
86	Wy	u	-	-	-0.18	-
87	Wy	u	-	-	-0.18	-
88	Wy	u	-	-	-0.18	-
89	Wy	u	-	-	-0.18	-
90	Wy	u	-	-	-0.18	-
91	Wy	u	-	-	-0.18	-
92	Wy	u	-	-	-0.18	-
93	Wy	u	-	-	-0.18	-
94	Wy	u	-	-	-0.18	-
95	Wy	u	-	-	-0.18	-
96	Wy	u	-	-	-0.18	-
97	Wy	u	-	-	-0.18	-
98	Wy	u	-	-	-0.18	-
99	Wy	u	-	-	-0.18	-
100	Wy	u	-	-	-0.18	-
101	Wy	trilinear	0	0	-0.18	-0.18
102	Wy	u	-	-	-0.18	-
103	Wy	u	-	-	-0.18	-

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CHECKED BY:	A.M.	JULY/02

member	load	type	Lth-left	Lth-right	L-left	L-right
104	Wy	u	-	-	-0.18	-
105	Wy	u	-	-	-0.18	-
106	Wy	u	-	-	-0.18	-
107	Wy	u	-	-	-0.18	-
108	Wy	u	-	-	-0.18	-
109	Wy	u	-	-	-0.18	-
110	Wy	u	-	-	-0.18	-
111	Wy	u	-	-	-0.18	-
112	Wy	u	-	-	-0.18	-
113	Wy	u	-	-	-0.18	-
114	Wy	u	-	-	-0.18	-
115	Wy	u	-	-	-0.18	-
116	Wy	u	-	-	-0.18	-
117	Wy	u	-	-	-0.18	-
118	Wy	u	-	-	-0.18	-
119	Wy	u	-	-	-0.18	-
121	Wy	u	-	-	-0.18	-
122	Wy	u	-	-	-0.18	-
123	Wy	u	-	-	-0.18	-
124	Wy	u	-	-	-0.18	-
125	Wy	u	-	-	-0.18	-
126	Wy	u	-	-	-0.18	-
127	Wy	u	-	-	-0.18	-
128	Wy	u	-	-	-0.18	-
129	Wy	u	-	-	-0.18	-
130	Wy	u	-	-	-0.18	-
131	Wy	u	-	-	-0.18	-
132	Wy	u	-	-	-0.18	-
133	Wy	u	-	-	-0.18	-
134	Wy	u	-	-	-0.18	-
135	Wy	u	-	-	-0.18	-
137	Wy	u	-	-	-0.18	-
138	Wy	u	-	-	-0.18	-
147	Wy	u	-	-	-0.18	-
37	Wy	u	-	-	-0.3	-
136	Wy	u	-	-	-0.3	-
120	Wy	u	-	-	-0.35	-
140	Wy	u	-	-	-0.35	-
141	Wy	u	-	-	-0.35	-
139	Wy	u	-	-	-0.35	-
142	Wy	u	-	-	-0.35	-
143	Wy	u	-	-	-0.35	-
146	Wy	u	-	-	-0.35	-
33	Wy	u	-	-	-0.525	-
35	Wy	u	-	-	-0.525	-
148	Wy	u	-	-	-1.05	-
149	Wy	trilinear	0	0	-0.18	-0.18
150	Wy	trilinear	0	0	-0.18	-0.18
151	Wy	trilinear	0	0	-0.18	-0.18
152	Wy	u	-	-	-0.18	-
153	Wy	u	-	-	-0.18	-
154	Wy	u	-	-	-0.18	-

CALCULATION		
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CHECKED BY	A. M.	JULY/02

Member	From Node	To Node	Section name	Length m	Max compr t	Max tens tens	Strong Shear t	Weak Shear t	Strong Mnt t-m	Weak Mnt t-m
DL										
60	39	38	bd-25x4	4	0	0	3.7	0	-3.7	0
61	37	39	bd-25x4	4	0	0	3.7	0	-3.7	0
80	50	37	bd-25x4	4	0	0	4.5	0	3.3	0
81	49	50	bd-25x4	4	0	0	-4.5	0	3.5	0
85	53	51	bd-25x4	4	0	0	-2.7	0	-2	0
86	52	80	bd-25x4	2	0	0	4.8	0	-5.9	0
102	60	62	bd-25x4	2	0	0	4.9	0	4.9	0
103	63	60	bd-25x4	4	0	0	-3	0	3.5	0
104	61	63	bd-25x4	4	0	0	-4	0	-3	0
107	64	65	bd-25x4	4	0	0	4.5	0	3.2	0
108	66	64	bd-25x4	1.2	0	0	-3.8	0	3.4	0
111	30	66	bd-25x4	3	0	0	3.9	0	3.4	0
124	73	76	bd-25x4	3	0	0	9.7	0	-17.9	0
126	76	74	bd-25x4	2.5	0	0	-11.1	0	-18.1	0
127	75	78	bd-25x4	1.5	0	0	6.8	0	-7.4	0
129	78	76	bd-25x4	1.5	0	0	-5.6	0	-5.5	0
130	78	77	bd-25x4	2.5	0	0	4.8	0	-3	0
132	80	53	bd-25x4	2	0	0	-6.2	0	-5.9	0
133	80	79	bd-25x4	3	0	0	-3.6	0	-2.7	0
144	87	85	bd-25x4	2	0	0	-1.8	0	-0.9	0
145	88	86	bd-25x4	2	0	0	-1.8	0	-0.9	0
148	90	89	bd-25x4	3.5	0	0	-6.2	0	-6.4	0
49	32	33	bd-30x6	6	0	0	2.8	0	-4.2	0
53	25	31	bd-30x6	6.71	0	0	-4.6	0	6.5	0
54	31	27	bd-30x6	6.71	0	0	4.5	0	6.1	0
55	34	35	bd-30x6	6	0	0	-2.9	0	6.9	0
56	35	39	bd-30x6	3	0	0	7	0	-9.9	0
59	39	36	bd-30x6	3	0	0	-5.3	0	-9.7	0
65	40	41	bd-30x6	6	0	0	-7.6	0	9.4	0
66	41	62	bd-30x6	3	0	0	9	0	9.4	0
73	43	44	bd-30x6	6	0	0	-2.1	0	-1.8	0
74	44	45	bd-30x6	6	0	0	-2.4	0	4.8	0
75	45	50	bd-30x6	3	0	0	6.1	0	-9.6	0
76	46	47	bd-30x6	6	0	0	1.8	0	5.3	0
77	47	53	bd-30x6	3	0	0	11	0	-13.6	0
79	50	46	bd-30x6	3	0	0	-6.5	0	-9.6	0
84	53	48	bd-30x6	3	0	0	-7	0	-13.4	0
92	54	55	bd-30x6	6	0	0	-2.7	0	5.6	0
93	55	63	bd-30x6	3	0	0	5.8	0	7.6	0
94	56	65	bd-30x6	3	0	0	5.6	0	7	0
95	57	58	bd-30x6	6	0	0	4.3	0	6.6	0
99	62	42	bd-30x6	3	0	0	-3.8	0	-8.7	0
100	63	56	bd-30x6	3	0	0	-7.6	0	-6.9	0
101	62	59	bd-30x6	6	0	0	6.1	0	-8.9	0
106	65	57	bd-30x6	3	0	0	-5.1	0	5.4	0
109	28	29	bd-30x6	6	0	0	-7.3	0	6.8	0
110	29	30	bd-30x6	6	0	0	6.4	0	-4.9	0
114	67	68	bd-30x6	6	0	0	-3.2	0	-12.4	0
119	69	77	bd-30x6	1.5	0	0	8.7	0		

Member	From Node	To Node	Section name	Length m	Max compr t	Max tens tens	Strong Shear t		Weak Shear t		Strong Mnt t-m		Weak Mnt t-m	
DL														
120	70	85	bd-30x6	2	0	0	8.2	0	0	0	11.6	0	0	0
121	71	82	bd-30x6	3	0	0	7.3	0	0	0	-9.7	0	0	0
123	74	70	bd-30x6	3	0	0	-14	0	0	0	-18.2	0	0	0
128	77	74	bd-30x6	1.5	0	0	3	0	0	0	-18.2	0	0	0
135	82	72	bd-30x6	3	0	0	-4.2	0	0	0	-9.9	0	0	0
136	81	82	bd-30x6	5.5	0	0	-7.1	0	0	0	-8.9	0	0	0
139	83	87	bd-30x6	2	0	0	7.9	0	0	0	-13.9	0	0	0
140	85	86	bd-30x6	2	0	0	1.5	0	0	0	-1.8	0	0	0
141	86	71	bd-30x6	2	0	0	-7.2	0	0	0	8.6	0	0	0
142	87	89	bd-30x6	1	0	0	4	0	0	0	-17.1	0	0	0
143	88	84	bd-30x6	2	0	0	-8.3	0	0	0	-14.4	0	0	0
146	89	88	bd-30x6	1	0	0	-4.5	0	0	0	-17.2	0	0	0
43	28	17	bd-30x6	1.2	0	0	-5.6	0	0	0	6.6	0	0	0
44	29	18	bd-30x6	1.2	0	0	-14.5	0	0	0	16.1	0	0	0
45	30	19	bd-30x6	1.2	0	0	-10.4	0	0	0	12.4	0	0	0
1	1	2	bd-35x8	6	0	0	-8.4	0	0	0	10	0	0	0
8	9	10	bd-35x8	6	0	0	-3.6	0	0	0	6.7	0	0	0
15	17	18	bd-35x8	6	0	0	-3.1	0	0	0	4	0	0	0
22	9	40	bd-35x8	2	0	0	10	0	0	0	13.5	0	0	0
23	17	54	bd-35x8	4	0	0	5.7	0	0	0	6.9	0	0	0
38	4	33	bd-35x8	2.5	0	0	6.3	0	0	0	7.7	0	0	0
39	5	35	bd-35x8	4	0	0	6.6	0	0	0	-11.8	0	0	0
40	6	36	bd-35x8	4	0	0	10.1	0	0	0	-15.2	0	0	0
41	25	26	bd-35x8	6	0	0	-3.6	0	0	0	7.1	0	0	0
42	26	38	bd-35x8	3	0	0	6.4	0	0	0	-8.7	0	0	0
46	26	31	bd-35x8	3	0	0	11.6	0	0	0	23.8	0	0	0
48	33	34	bd-35x8	1.5	0	0	1.4	0	0	0	-7	0	0	0
50	34	25	bd-35x8	4	0	0	-3.8	0	0	0	-6.9	0	0	0
51	35	26	bd-35x8	4	0	0	-10	0	0	0	21.3	0	0	0
52	36	27	bd-35x8	4	0	0	-7.5	0	0	0	-15.1	0	0	0
58	38	27	bd-35x8	3	0	0	-6.5	0	0	0	-8.8	0	0	0
62	40	1	bd-35x8	6	0	0	-5.4	0	0	0	-9.5	0	0	0
87	54	9	bd-35x8	4	0	0	-7.4	0	0	0	13.7	0	0	0
2	2	59	bd-40x8	3	0	0	8.1	0	0	0	9.7	0	0	0
3	3	4	bd-40x8	6	0	0	7.8	0	0	0	8.9	0	0	0
4	4	5	bd-40x8	6	0	0	-5.9	0	0	0	10.2	0	0	0
5	5	37	bd-40x8	3	0	0	10.4	0	0	0	-11.8	0	0	0
6	6	7	bd-40x8	6	0	0	5.2	0	0	0	9	0	0	0
7	7	51	bd-40x8	3	0	0	6.5	0	0	0	-7.6	0	0	0
9	10	60	bd-40x8	3	0	0	6.5	0	0	0	-9.3	0	0	0
10	11	12	bd-40x8	6	0	0	3.7	0	0	0	6.5	0	0	0
11	12	13	bd-40x8	6	0	0	-3.5	0	0	0	5.7	0	0	0
12	13	49	bd-40x8	3	0	0	5.1	0	0	0	-5.4	0	0	0
13	14	15	bd-40x8	6	0	0	-7.9	0	0	0	12.4	0	0	0
14	15	52	bd-40x8	3	0	0	9.6	0	0	0	-12.9	0	0	0
16	18	61	bd-40x8	3	0	0	3.6	0	0	0	8.4	0	0	0
17	19	64	bd-40x8	3	0	0	8.2	0	0	0	-10.4	0	0	0
18	20	21	bd-40x8	6	0	0	-3.3	0	0	0	8.2	0	0	0
19	21	73	bd-40x8	3	0	0	11.1	0	0	0	-14.3	0	0	0

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:

CALC INDEX No.: PAGE/82

	INITIAL	DATE
PREPARED BY	H. W.	June/02
CHECKED BY	A. M.	July/02

Member	From Node	To Node	Section name	Length m	Max compr t	Max tens tens	Strong Shear t	Weak Shear t	Strong Mnt t-m	Weak Mnt t-m	DL
20	22	90	bd-40x8	3	0	0	9.4	0	14.7	0	
21	23	81	bd-40x8	3	0	0	12.4	0	13.8	0	
24	10	41	bd-40x8	2	0	0	18.5	0	21.2	0	
25	18	55	bd-40x8	4	0	0	7.3	0	14.3	0	
26	11	42	bd-40x8	2	0	0	7.3	0	14	0	
27	19	56	bd-40x8	4	0	0	10	0	-19.9	0	
28	12	44	bd-40x8	4	0	0	6.3	0	16.1	0	
29	20	67	bd-40x8	1	0	0	9.2	0	-9	0	
30	13	45	bd-40x8	4	0	0	10.7	0	30.5	0	
31	21	68	bd-40x8	1	0	0	17.7	0	-14.7	0	
32	14	46	bd-40x8	4	0	0	10.5	0	32.2	0	
33	22	83	bd-40x8	3.5	0	0	12.2	0	-33.4	0	
34	15	47	bd-40x8	4	0	0	14.3	0	34.1	0	
35	23	84	bd-40x8	3.5	0	0	10.4	0	-27.3	0	
36	16	79	bd-40x8	2	0	0	16.6	0	27.7	0	
37	24	72	bd-40x8	5.5	0	0	6.7	0	-11.1	0	
47	3	32	bd-40x8	2.5	0	0	8.7	0	14.2	0	
57	37	6	bd-40x8	3	0	0	-10.2	0	-11.9	0	
63	41	2	bd-40x8	6	0	0	-5.5	0	-14.4	0	
64	42	43	bd-40x8	2	0	0	1.7	0	-1.7	0	
67	43	3	bd-40x8	4	0	0	-5.3	0	11.9	0	
68	44	4	bd-40x8	4	0	0	-4.3	0	7.9	0	
69	45	5	bd-40x8	4	0	0	-5.1	0	8.3	0	
70	46	6	bd-40x8	4	0	0	-5.1	0	10.6	0	
71	47	7	bd-40x8	4	0	0	-5.8	0	-14.8	0	
72	48	8	bd-40x8	4	0	0	-10	0	-20.1	0	
78	49	14	bd-40x8	3	0	0	-4.1	0	-5.3	0	
82	51	8	bd-40x8	3	0	0	-3.8	0	-7.7	0	
83	52	16	bd-40x8	3	0	0	-8.9	0	-13	0	
88	55	10	bd-40x8	4	0	0	-8.6	0	20	0	
89	56	11	bd-40x8	4	0	0	-10.6	0	-19.3	0	
90	57	12	bd-40x8	4	0	0	-10.8	0	-20.4	0	
91	58	69	bd-40x8	1.5	0	0	-10.7	0	-32.3	0	
96	59	3	bd-40x8	3	0	0	-7.7	0	8.8	0	
97	60	11	bd-40x8	3	0	0	-6.8	0	-9.3	0	
98	61	19	bd-40x8	3	0	0	-5.2	0	8.3	0	
105	64	20	bd-40x8	3	0	0	-7.8	0	-10.4	0	
112	67	57	bd-40x8	3	0	0	5	0	-20.4	0	
113	68	75	bd-40x8	2	0	0	12.1	0	-33.7	0	
115	69	13	bd-40x8	2.5	0	0	-21.7	0	30.9	0	
116	70	14	bd-40x8	2.5	0	0	-26.9	0	33.9	0	
117	71	15	bd-40x8	2.5	0	0	-22.3	0	34.4	0	
118	72	16	bd-40x8	2.5	0	0	-12.7	0	26.2	0	
122	73	22	bd-40x8	3	0	0	-12.7	0	-14.3	0	
125	75	58	bd-40x8	1	0	0	-3.1	0	-33.5	0	
131	79	48	bd-40x8	2	0	0	11.1	0	-21	0	
134	81	24	bd-40x8	3	0	0	-7.7	0	-12.8	0	
137	83	70	bd-40x8	2	0	0	-2.4	0	33.5	0	
138	84	71	bd-40x8	2	0	0	-5.5	0	-27.1	0	
147	90	23	bd-40x8	3	0	0	-9.1	0	13.8	0	

CALCULATION		
Detailed Design on Port Rehabilitation Project in Lai Chau Province		
CALC FILE No.:		
CALC INDEX No.:		PAGE 183
	INITIAL	DATE
PREPARED BY	H. W.	JUNE/02
CHECKED BY	A.M.	JULY/02

Member	From Node	To Node	Section name	Length m	Max compr t	Max tens tens	Strong Shear t	Weak Shear t	Strong Mnt t-m	Weak Mnt t-m
LL										
60	39	38	bd-25x4	4	0	0	-0.4	0	-0.4	0
61	37	39	bd-25x4	4	0	0	-0.4	0	-0.4	0
80	50	37	bd-25x4	4	0	0	0.4	0	0.3	0
81	49	50	bd-25x4	4	0	0	-0.4	0	0.3	0
85	53	51	bd-25x4	4	0	0	0.4	0	-0.3	0
86	52	80	bd-25x4	2	0	0	0.4	0	-0.5	0
102	60	62	bd-25x4	2	0	0	0.6	0	0.6	0
103	63	60	bd-25x4	4	0	0	-0.5	0	0.5	0
104	61	63	bd-25x4	4	0	0	-0.4	0	-0.3	0
107	64	65	bd-25x4	4	0	0	0.4	0	0.3	0
108	66	64	bd-25x4	1.2	0	0	-0.4	0	0.3	0
111	30	66	bd-25x4	3	0	0	0.4	0	0.3	0
124	73	76	bd-25x4	3	0	0	0.7	0	-1.2	0
126	76	74	bd-25x4	2.5	0	0	-0.7	0	-1.2	0
127	75	78	bd-25x4	1.5	0	0	0.4	0	-0.4	0
129	78	76	bd-25x4	1.5	0	0	-0.4	0	-0.3	0
130	78	77	bd-25x4	2.5	0	0	-0.2	0	-0.1	0
132	80	53	bd-25x4	2	0	0	-0.6	0	-0.5	0
133	80	79	bd-25x4	3	0	0	0.3	0	-0.2	0
144	87	85	bd-25x4	2	0	0	0	0	0	0
145	88	86	bd-25x4	2	0	0	0	0	0	0
148	90	89	bd-25x4	3.5	0	0	-1.8	0	-1.6	0
49	32	33	bd-30x6	6	0	0	0.5	0	-0.8	0
53	25	31	bd-30x6	6.71	0	0	-0.8	0	1.1	0
54	31	27	bd-30x6	6.71	0	0	0.8	0	1.1	0
55	34	35	bd-30x6	6	0	0	-0.7	0	1.2	0
56	35	39	bd-30x6	3	0	0	1.1	0	1.4	0
59	39	36	bd-30x6	3	0	0	-0.7	0	-1.2	0
65	40	41	bd-30x6	6	0	0	-0.7	0	0.9	0
66	41	62	bd-30x6	3	0	0	0.9	0	0.9	0
73	43	44	bd-30x6	6	0	0	-0.7	0	0.7	0
74	44	45	bd-30x6	6	0	0	-0.6	0	0.7	0
75	45	50	bd-30x6	3	0	0	0.9	0	-1.1	0
76	46	47	bd-30x6	6	0	0	0.5	0	0.9	0
77	47	53	bd-30x6	3	0	0	1.2	0	-1.6	0
79	50	46	bd-30x6	3	0	0	-1	0	-1.1	0
84	53	48	bd-30x6	3	0	0	-0.8	0	-1.6	0
92	54	55	bd-30x6	6	0	0	-0.7	0	0.9	0
93	55	63	bd-30x6	3	0	0	0.9	0	1	0
94	56	65	bd-30x6	3	0	0	0.7	0	0.9	0
95	57	58	bd-30x6	6	0	0	0.7	0	0.8	0
99	62	42	bd-30x6	3	0	0	-0.5	0	-0.8	0
100	63	56	bd-30x6	3	0	0	-0.8	0	0.9	0
101	62	59	bd-30x6	6	0	0	-0.5	0	-0.8	0
106	65	57	bd-30x6	3	0	0	-0.6	0	0.7	0
109	28	29	bd-30x6	6	0	0	-0.7	0	0.8	0
110	29	30	bd-30x6	6	0	0	0.6	0	0.8	0
114	67	68	bd-30x6	6	0	0	0.5	0	0.8	0
119	69	77	bd-30x6	1.5	0	0	0.8	0	1	0

CALCULATION
Detailed Design of Port Reactivation Project in La Union Province
CALC FILE No.:
CALC INDEX No.: PAGE 184

	INITIAL	DATE
PREPARED BY	H. W.	JUNE/02
CHECKED BY	A. M.	JULY/02

Member	From Node	To Node	Section name	Length m	Max compr t	Max tens tens	Strong Shear t	Weak Shear t	Strong Mnt t-m	Weak Mnt t-m
LL										
120	70	85	bd-30x6	2	0	0	1	0	1.1	0
121	71	82	bd-30x6	3	0	0	1.2	0	-1.4	0
123	74	70	bd-30x6	3	0	0	-1.2	0	-1.4	0
128	77	74	bd-30x6	1.5	0	0	0.3	0	-1.4	0
135	82	72	bd-30x6	3	0	0	-0.8	0	-1.4	0
136	81	82	bd-30x6	5.5	0	0	-0.8	0	-1.1	0
139	83	87	bd-30x6	2	0	0	2	0	-3.2	0
140	85	86	bd-30x6	2	0	0	-0.4	0	-0.5	0
141	86	71	bd-30x6	2	0	0	-1.1	0	1.2	0
142	87	89	bd-30x6	1	0	0	1.3	0	-4.2	0
143	88	84	bd-30x6	2	0	0	-2	0	-3.2	0
146	89	88	bd-30x6	1	0	0	-1.3	0	-4.2	0
43	28	17	bd-30x6	1.2	0	0	-0.6	0	0.7	0
44	29	18	bd-30x6	1.2	0	0	-1.5	0	1.6	0
45	30	19	bd-30x6	1.2	0	0	-1.1	0	1.2	0
1	1	2	bd-35x8	6	0	0	-0.7	0	0.9	0
8	9	10	bd-35x8	6	0	0	-0.7	0	1.1	0
15	17	18	bd-35x8	6	0	0	-0.7	0	0.8	0
22	9	40	bd-35x8	2	0	0	1.2	0	1.8	0
23	17	54	bd-35x8	4	0	0	0.8	0	-1	0
38	4	33	bd-35x8	2.5	0	0	1.5	0	2.2	0
39	5	35	bd-35x8	4	0	0	1.4	0	-2.2	0
40	6	36	bd-35x8	4	0	0	1.2	0	1.8	0
41	25	26	bd-35x8	6	0	0	-0.7	0	1	0
42	26	38	bd-35x8	3	0	0	0.9	0	0.9	0
46	26	31	bd-35x8	3	0	0	2.1	0	4.2	0
48	33	34	bd-35x8	1.5	0	0	0.5	0	-1.5	0
50	34	25	bd-35x8	4	0	0	-0.8	0	-1.5	0
51	35	26	bd-35x8	4	0	0	-1.9	0	3.8	0
52	36	27	bd-35x8	4	0	0	-0.9	0	-1.7	0
58	38	27	bd-35x8	3	0	0	-0.6	0	-0.8	0
62	40	1	bd-35x8	6	0	0	-0.6	0	-1	0
87	54	9	bd-35x8	4	0	0	-1.1	0	1.8	0
2	2	59	bd-40x8	3	0	0	0.8	0	0.9	0
3	3	4	bd-40x8	6	0	0	0.6	0	0.8	0
4	4	5	bd-40x8	6	0	0	-0.6	0	1	0
5	5	37	bd-40x8	3	0	0	0.9	0	-1	0
6	6	7	bd-40x8	6	0	0	-0.6	0	0.9	0
7	7	51	bd-40x8	3	0	0	0.8	0	-0.9	0
9	10	60	bd-40x8	3	0	0	1.1	0	-1.3	0
10	11	12	bd-40x8	6	0	0	0.7	0	1	0
11	12	13	bd-40x8	6	0	0	-0.6	0	0.8	0
12	13	49	bd-40x8	3	0	0	0.7	0	0.7	0
13	14	15	bd-40x8	6	0	0	-0.6	0	1	0
14	15	52	bd-40x8	3	0	0	0.9	0	-1	0
16	18	61	bd-40x8	3	0	0	0.7	0	0.7	0
17	19	64	bd-40x8	3	0	0	1	0	1.1	0
18	20	21	bd-40x8	6	0	0	0.6	0	0.8	0
19	21	73	bd-40x8	3	0	0	0.7	0	-0.7	0

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:

CALC INDEX No.: PAGE 185

	INITIAL	DATE
PREPARED BY	H.W.	June/02
	A.M.	July/02

Member	From Node	To Node	Section name	Length	Max compr	Max tens	Strong Shear	Weak Shear	Strong Mnt	Weak Mnt	LL
				m	t	tens	t	t	t-m	t-m	
20	22	90	bd-40x8	3	0	0	1.4	0	-1.8	0	
21	23	81	bd-40x8	3	0	0	1.3	0	1.9	0	
24	10	41	bd-40x8	2	0	0	2.3	0	3.2	0	
25	18	55	bd-40x8	4	0	0	1.3	0	-2.2	0	
26	11	42	bd-40x8	2	0	0	1.4	0	2.5	0	
27	19	56	bd-40x8	4	0	0	1.3	0	-2.7	0	
28	12	44	bd-40x8	4	0	0	1.4	0	2.9	0	
29	20	67	bd-40x8	1	0	0	1.5	0	-1.3	0	
30	13	45	bd-40x8	4	0	0	1.6	0	3.5	0	
31	21	68	bd-40x8	1	0	0	1.5	0	-1.6	0	
32	14	46	bd-40x8	4	0	0	2	0	5.5	0	
33	22	83	bd-40x8	3.5	0	0	2.8	0	-6.2	0	
34	15	47	bd-40x8	4	0	0	2.4	0	6.1	0	
35	23	84	bd-40x8	3.5	0	0	2.7	0	-6	0	
36	16	79	bd-40x8	2	0	0	1.7	0	3.3	0	
37	24	72	bd-40x8	5.5	0	0	1	0	-1.9	0	
47	3	32	bd-40x8	2.5	0	0	1	0	1.9	0	
57	37	6	bd-40x8	3	0	0	-0.8	0	-1	0	
63	41	2	bd-40x8	6	0	0	-0.7	0	-1.3	0	
64	42	43	bd-40x8	2	0	0	0.5	0	-0.8	0	
67	43	3	bd-40x8	4	0	0	-1	0	1.7	0	
68	44	4	bd-40x8	4	0	0	-1.2	0	2.2	0	
69	45	5	bd-40x8	4	0	0	-1.3	0	2.2	0	
70	46	6	bd-40x8	4	0	0	-1	0	1.6	0	
71	47	7	bd-40x8	4	0	0	-0.9	0	-1.9	0	
72	48	8	bd-40x8	4	0	0	-0.8	0	-1.6	0	
78	49	14	bd-40x8	3	0	0	-0.6	0	-0.6	0	
82	51	8	bd-40x8	3	0	0	-0.6	0	-1	0	
83	52	16	bd-40x8	3	0	0	-0.6	0	-1.1	0	
88	55	10	bd-40x8	4	0	0	-1.7	0	3.2	0	
89	56	11	bd-40x8	4	0	0	-1.7	0	2.6	0	
90	57	12	bd-40x8	4	0	0	-1.8	0	2.9	0	
91	58	69	bd-40x8	1.5	0	0	-0.9	0	-2.7	0	
96	59	3	bd-40x8	3	0	0	-0.8	0	0.8	0	
97	60	11	bd-40x8	3	0	0	-1.1	0	-1.3	0	
98	61	19	bd-40x8	3	0	0	-0.8	0	1	0	
105	64	20	bd-40x8	3	0	0	-0.9	0	-1	0	
112	67	57	bd-40x8	3	0	0	0.8	0	-2.9	0	
113	68	75	bd-40x8	2	0	0	0.8	0	-2.8	0	
115	69	13	bd-40x8	2.5	0	0	-2.1	0	3.3	0	
116	70	14	bd-40x8	2.5	0	0	-4	0	5.7	0	
117	71	15	bd-40x8	2.5	0	0	-4.1	0	6.2	0	
118	72	16	bd-40x8	2.5	0	0	-1.9	0	3.1	0	
122	73	22	bd-40x8	3	0	0	-1	0	1.5	0	
125	75	58	bd-40x8	1	0	0	-0.2	0	-2.8	0	
131	79	48	bd-40x8	2	0	0	1.1	0	-1.7	0	
134	81	24	bd-40x8	3	0	0	-0.6	0	-1.1	0	
137	83	70	bd-40x8	2	0	0	-1.4	0	0.2	0	
138	84	71	bd-40x8	2	0	0	-1.4	0	0.2	0	
147	90	23	bd-40x8	3	0	0	-1.5	0	0.1	0	

CALCULATION
Detailed Design
on Port Reactivation Project
in La Union Province

CALC FILE No.:

CALC INDEX No.: PAGE 186

	INITIAL	DATE
PREPARED BY	H.W.	June/02
	A.M.	July/02

REACTION

DL

Node	Rx	Ry	Rz	Mx	My	Mz
1	0	11.276	0	0	0	0
2	0	22.801	0	0	0	0
3	0	30.255	0	0	0	0
4	0	20.429	0	0	0	0
5	0	28.024	0	0	0	0
6	0	30.585	0	0	0	0
7	0	16.9	0	0	0	0
8	0	13.812	0	0	0	0
9	0	19.967	0	0	0	0
10	0	38.868	0	0	0	0
11	0	30.838	0	0	0	0
12	0	20.402	0	0	0	0
13	0	41.098	0	0	0	0
14	0	47.645	0	0	0	0
15	0	54.146	0	0	0	0
16	0	38.116	0	0	0	0
17	0	12.972	0	0	0	0
18	0	28.09	0	0	0	0
19	0	33.339	0	0	0	0
20	0	19.173	0	0	0	0
21	0	32.141	0	0	0	0
22	0	34.372	0	0	0	0
23	0	31.956	0	0	0	0
24	0	14.416	0	0	0	0
25	0	7.725	0	0	0	0
26	0	31.535	0	0	0	0
27	0	16.67	0	0	0	0

	INITIAL	DATE
PREPARED BY	H.W.	June/02
	A.M.	July/02

REACTION

LL

Node	Rx	Ry	Rz	Mx	My	Mz
1	0	1.162	0	0	0	0
2	0	2.712	0	0	0	0
3	0	3.661	0	0	0	0
4	0	3.563	0	0	0	0
5	0	4.282	0	0	0	0
6	0	3.619	0	0	0	0
7	0	2.232	0	0	0	0
8	0	1.36	0	0	0	0
9	0	2.984	0	0	0	0
10	0	6.514	0	0	0	0
11	0	5.345	0	0	0	0
12	0	3.98	0	0	0	0
13	0	5.131	0	0	0	0
14	0	7.143	0	0	0	0
15	0	7.954	0	0	0	0
16	0	4.247	0	0	0	0
17	0	1.777	0	0	0	0
18	0	3.965	0	0	0	0
19	0	4.072	0	0	0	0
20	0	2.99	0	0	0	0
21	0	2.696	0	0	0	0
22	0	5.212	0	0	0	0
23	0	5.502	0	0	0	0
24	0	1.597	0	0	0	0
25	0	1.643	0	0	0	0
26	0	5.495	0	0	0	0
27	0	1.889	0	0	0	0

administration

Dead Load

	room	material	thickness	density	(kg/m2) weight
		finish	30		60
1F	all room	slab	150		360
					420

Live Load

Floor	Room	Dead Load	Live Load	otal Loa	Notes
1F	cafeteria kitchen waiting quarantine toilet vestibule corridor staircase	420	350 150	770 570	
1F	office banks first aid police inf.	420	240 180	660 600	
1F	guard rm janitor	420	170 120	590 540	
1F	strage machine	420	600 540	1020 960	
Canopy	roof	50	20 0	70 50	

C.B t=200mm 293 kg/m2

t=150mm 226 kg/m2

Case CB+WALL (DL)

member		t	unit w	h, L		
53,54	RC	200	480	1	0.48 t/m	
65,66	CB		295	4.85	1.43 t/m	
101,102	CB		295	4.85	1.43 t/m	
1	CB		295	4.85	1.43 t/m	
62	CB		295	2.4	0.71 t/m	
23,87	CB		295	2.4	0.71 t/m	
109	CB		295	4.85	1.43 t/m	
110	CB		295	4.85	1.43 t/m	
103	CB		295	2.4	0.71 t/m	
104	CB		295	4.85	1.43 t/m	
2	CB		295	4.85	1.43 t/m	
96	CB		295	2.4	0.71 t/m	
100	CB		295	4.85	1.43 t/m	
111	CB		295	4.85	1.43 t/m	
107,108	CB		295	4.85	1.43 t/m	
105	CB		295	2.4	0.71 t/m	
94,106	CB		295	2.4	0.71 t/m	
3	CB		295	4.85	1.43 t/m	
47	CB		295	4.85	1.43 t/m	
49	CB		295	1.2	0.35 t/m	
114	CW		100	4.85	0.49 t/m	
95	CW		100	4.85	0.49 t/m	
4	CB		295	2.4	0.71 t/m	
19,122	CB		295	4.85	1.43 t/m	
127,129	RC	200	480	4.4	2.11 t/m	
130	RC	200	480	4.4	2.11 t/m	
91,125	RC	200	480	4.4	2.11 t/m	
31,113	CB		295	4.85	1.43 t/m	
124,126	RC	200	480	4.4	2.11 t/m	
123	RC	200	480	2.2	1.06 t/m	
12	CB		295	1	0.30 t/m	
80,81	CB		295	4.85	1.43 t/m	
5,57	CB		295	4.85	1.43 t/m	
61	CB		295	4.85	1.43 t/m	
57	CB		295	4.85	1.43 t/m	2/L
60	CB		295	4.85	1.43 t/m	
58	CB		295	4.85	1.43 t/m	
40	CB		295	2.4	0.71 t/m	
52	CB		295	2.4	0.71 t/m	
20	CB		295	4.85	1.43 t/m	
147	CB		295	4.85	1.43 t/m	
148	CB		295	4.85	1.43 t/m	
146	CB		295	4.85	1.43 t/m	

Additional Load for model
Case CB+WALL (DL)

member

144,145	CB	295	4.85	1.43 t/m	
120,141	CB	295	4.85	1.43 t/m	
13	CB	295	4.85	1.43 t/m	
6	CB	295	2.4	0.71 t/m	
7	CB	295	2.4	0.71 t/m	
85	CB	295	4.85	1.43 t/m	upper side
77	CB	295	4.85	1.43 t/m	
84	CB	295	4.85	1.43 t/m	right side
86,132	CB	295	4.85	1.43 t/m	
133	CB	295	4.85	1.43 t/m	
14	CB	295	4.85	1.43 t/m	right side
83	CB	295	4.85	1.43 t/m	
136	CB	295	4.85	1.43 t/m	
21,134	CB	295	4.85	1.43 t/m	
37	CB	295	4.85	1.43 t/m	
72,131	CB	295	4.85	1.43 t/m	

CASE SLAB (DL)

member	t	unit w	h, L		
except structural slab		350	0.5	0.18 t/m	
91,125,126		1020	0.75	0.77 t/m	
130		1020	1.5	1.53 t/m	
120,140,141		770	0.75	0.58 t/m	
33		770	1.5	1.16 t/m	trapezoid
139,143		770	1.5	1.16 t/m	triangle
148		770	1.5	1.16 t/m	trapezoidx2
20,147		770	1.5	1.16 t/m	triangle
35		770	1.5	1.16 t/m	trapezoid
136		770	1	0.77 t/m	upper side
121		770	1.155	0.89 t/m	
83,133		770	1	0.77 t/m	

NIPPON KOEI CO.,LTD.

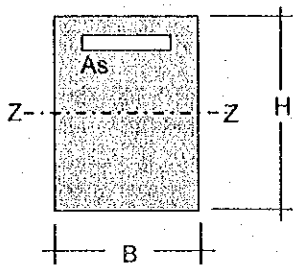
PROJECT: Detailed Design on Port Reactivation Project In La Union Province	Calc. File No.		Prepared by	R.Martinez
SECTION: Port Administration Building	Calc. Index No.		Checked by	A.MORIOKA
SUBJECT: Dead & Live Load for 1st Floor	Date	July-02	Page	192 / 232

CASE LL

	t	unit w	h, L	
		350	0.5	0.18 t/m
37,136		600	0.5	0.30 t/m
120,140,141		350	1	0.35 t/m
139,142,143,146		350	1	0.35 t/m
33,35		350	1.5	0.53 t/m
148		350	3	1.05 t/m

2/3 axi FB-3 center

BEAM DESIGN



H = 60.00 cm

b = 30.00 cm

f'c = 210 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	5.60
Live Load	0.30
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	8.35
0.75(1.4DL+1.7LL+1.87	6.26
0.75(1.4DL+1.7LL+1.87	6.26

Force for design: Mu z-z = 8.35 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1647.06\ As^2 - 220332\ As + 927777.78 = 0$ As = 4.35 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 5.80 cm²
(14/fy) b d = 5.25 cm² } Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 5.25 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.04 **Use 2 - N 8** 3-D25

Minimun Base Required:

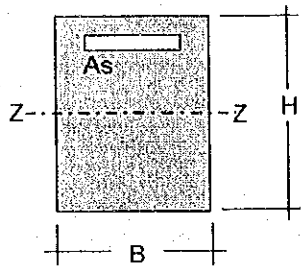
Max. bars per layer = 3 Minimum Base = 27.78 cm

NIPPON KOEI CO.,LTD.

PROJECT: Detailed Design on Port Reactivation Project in La Union Province	Calc. File No.		Prepared by	H.WATANABE
SECTION: Port Administration Building	Calc. Index No.		Checked by	A.MORIOKA
SUBJECT: Design for foundation beam	Date	July-02	Page	196 / 232

2/3 axi FB-4 end

BEAM DESIGN



H = 40.00 cm

b = 25.00 cm

f'c = 210 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	3.30
Live Load	0.20
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	4.96
0.75(1.4DL+1.7LL+1.87	3.72
0.75(1.4DL+1.7LL+1.87	3.72

Force for design: Mu z-z = 4.96 ton-m

d = 32.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1976.47\ As^2 - 136332\ As + 551111.11 = 0$ As = 4.31 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 5.75 cm²
(14/fy) b d = 2.71 cm² } Asmin = 2.71 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 20.97 cm²

As = 4.31 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

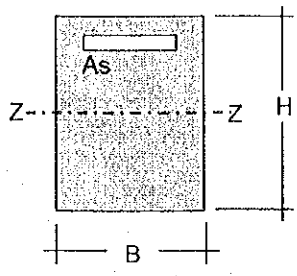
Number of bars = 0.85 **Use 1 - N 8** 2-D25

Minimun Base Required:

Max. bars per layer = 2 Minimum Base = 22.70 cm

2 span FB-4 end

BEAM DESIGN



H = 40.00 cm

b = 25.00 cm

f'c = 210 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	3.10
Live Load	0.20
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	4.68
0.75(1.4DL+1.7LL+1.87	3.51
0.75(1.4DL+1.7LL+1.87	3.51

Force for design: Mu z-z = 4.68 ton-m

d = 32.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\,As^2 - fyd\,As + Mu/f = f = 0.90$

$1976.47\,As^2 - 136332\,As + 520000 = 0$ As = 4.05 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 5.40 cm²
(14/fy) b d = 2.71 cm² } Asmin = 2.71 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 20.97 cm²

As = 4.05 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

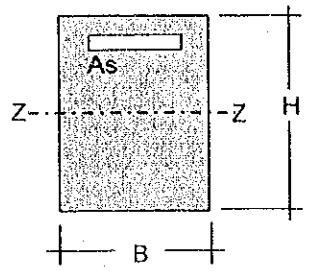
Number of bars = 0.80 **Use 1 - N 8** 2-D25

Minimun Base Required:

Max. bars per layer = 2 Minimum Base = 22.70 cm

1 span FB-4 center

BEAM DESIGN



H = 40.00 cm

b = 25.00 cm

f'c = 210 kg/cm² *

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	3.40
Live Load	0.30
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	5.27
0.75(1.4DL+1.7LL+1.87	3.95
0.75(1.4DL+1.7LL+1.87	3.95

Force for design: Mu z-z = 5.30 ton-m

d = 32.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1976.47\ As^2 - 36332\ As + 588888.89 = 0$ As = 4.63 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 6.17 cm²
(14/fy) b d = 2.71 cm² } Asmin = 2.71 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 20.97 cm²

As = 4.63 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 0.91 **Use 1 - N 8** 2-D25

Minimun Base Required:

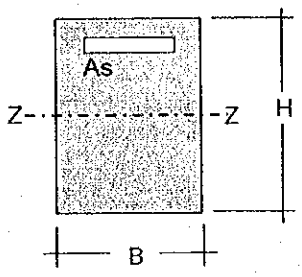
Max. bars per layer = 2 Minimum Base = 22.70 cm

NIPPON KOEI CO.,LTD.

PROJECT: Detailed Design on Port Reactivation Project in La Union Province	Calc. File No.		Prepared by	H.WATANABE
SECTION: Port Administration Building	Calc. Index No.		Checked by	A.MORIOKA
SUBJECT: Design for foundation beam	Date	July-02	Page	187 / 232

1 span FB-4a center

BEAM DESIGN



H = 40.00 cm

b = 25.00 cm

f'c = 210 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	7.30
Live Load	0.60
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	11.24
0.75(1.4DL+1.7LL+1.87	8.43
0.75(1.4DL+1.7LL+1.87	8.43

Force for design: Mu z-z = 11.24 ton-m

d = 32.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\,As^2 - fyd\,As + Mu/f = f = 0.90$

$1976.47\,As^2 - 136332\,As + 1248888.9 = 0$ As = 10.88 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 14.50 cm²
(14/fy) b d = 2.71 cm²
} Asmin = 2.71 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 20.97 cm²

As = 10.88 cm² o.k!! As < Amax

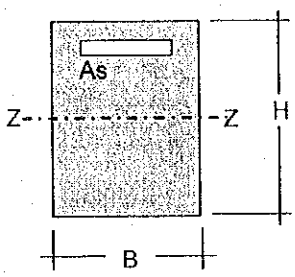
Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 2.15 **Use 3 - N 8** 2/2-D25

Minimun Base Required:

Max. bars per layer = 2 Minimum Base = 22.70 cm

1 span FB-4a center toilet **BEAM DESIGN**



H = 40.00 cm

b = 25.00 cm

f'c = 210 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	6.70
Live Load	1.70
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	12.27
0.75(1.4DL+1.7LL+1.87	9.20
0.75(1.4DL+1.7LL+1.87	9.20

Force for design: Mu z-z = 12.27 ton-m

d = 32.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1976.47\ As^2 - 36332\ As + 1363333.3 = 0$ As = 12.13 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 16.18 cm²
(14/fy) b d = 2.71 cm²
} Asmin = 2.71 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 20.97 cm²

As = 12.13 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

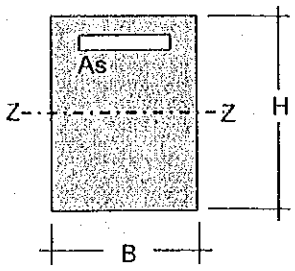
Number of bars = 2.39 **Use 3 - N 8** 2/2-D25

Minimun Base Required:

Max. bars per layer = 2 Minimum Base = 22.70 cm

B/C axi FB-3 END

BEAM DESIGN



H = 60.00 cm

b = 30.00 cm

f'c = 210 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	8.00
Live Load	0.70
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	12.39
0.75(1.4DL+1.7LL+1.87	9.29
0.75(1.4DL+1.7LL+1.87	9.29

Force for design: Mu z-z = 12.39 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\,As^2 - fyd\,As + Mu/f = f = 0.90$

$1647.06\,As^2 - 220332\,As + 1376666.7 = 0$ As = 6.57 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 8.76 cm²
(14/fy) b d = 5.25 cm² } Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 6.57 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

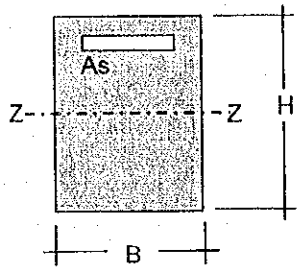
Number of bars = 1.30 **Use 2 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

B/C axi FB-3 CENTER

BEAM DESIGN



H = 60.00 cm

b = 30.00 cm

f'c = 210 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	10.00
Live Load	0.80
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	15.36
0.75(1.4DL+1.7LL+1.87	11.52
0.75(1.4DL+1.7LL+1.87	11.52

Force for design: Mu z-z = 15.40 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1647.06\ As^2 - 220332\ As + 1711111.1 = 0$ As = 8.28 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 11.04 cm²
(14/fy) b d = 5.25 cm² } Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 8.28 cm² o.k!! As < Amax

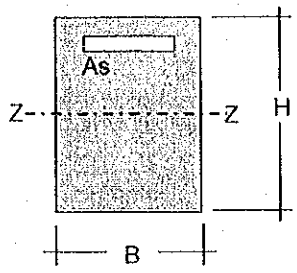
Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.63 **Use 2 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

B/C axi FB-3 END
1/2 axis **BEAM DESIGN**



H = 60.00 cm
b = 30.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	11.50
Live Load	0.50
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	16.95
0.75(1.4DL+1.7LL+1.87	12.71
0.75(1.4DL+1.7LL+1.87	12.71

Force for design: Mu z-z = 16.95 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1647.06\ As^2 - 220332\ As + 1883333.3 = 0$ As = 9.18 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 12.24 cm²
(14/fy) b d = 5.25 cm²
Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 9.18 cm² o.k!! As < Amax

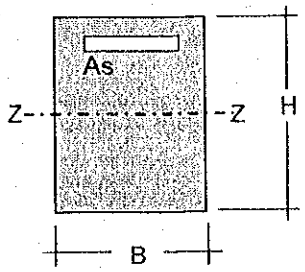
Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.81 **Use 2 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

B/C axi FB-3 CENTER
1/2 axis **BEAM DESIGN**



H = 60.00 cm
b = 30.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	12.40
Live Load	0.80
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	18.72
0.75(1.4DL+1.7LL+1.87	14.04
0.75(1.4DL+1.7LL+1.87	14.04

Force for design: Mu z-z = 18.72 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\,As^2 - fyd\,As + Mu/f = f = 0.90$

$1647.06\,As^2 - 220332\,As + 2080000 = 0$ As = 10.22 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 13.63 cm²
(14/fy) b d = 5.25 cm²
} Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 10.22 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 2.02 **Use 3 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

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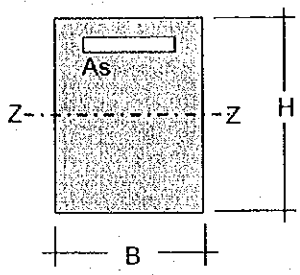
A/B axi FB-3 END
1/5 axis **BEAM DESIGN**



H = 60.00 cm
b = 30.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	9.80
Live Load	0.60
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	14.74
0.75(1.4DL+1.7LL+1.87	11.06
0.75(1.4DL+1.7LL+1.87	11.06

Force for design: Mu z-z = 14.74 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1647.06\ As^2 - 220332\ As + 1637777.8 = 0$ As = 7.90 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 10.53 cm²
(14/fy) b d = 5.25 cm²
} Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 7.90 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.56 **Use 2 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

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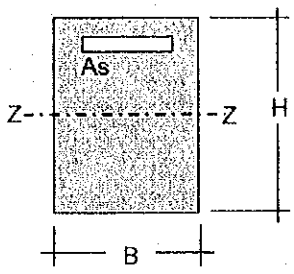
A/B axi FB-3 CENTER
1/5 axis **BEAM DESIGN**



H = 60.00 cm
b = 30.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	9.60
Live Load	0.40
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	14.12
0.75(1.4DL+1.7LL+1.87	10.59
0.75(1.4DL+1.7LL+1.87	10.59

Force for design: Mu z-z = 14.12 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\,As^2 - fyd\,As + Mu/f = f = 0.90$

$1647.06\,As^2 - 220332\,As + 1568888.9 = 0$ As = 7.55 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 10.06 cm²
(14/fy) b d = 5.25 cm²
Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 7.55 cm² o.k!! As < Amax

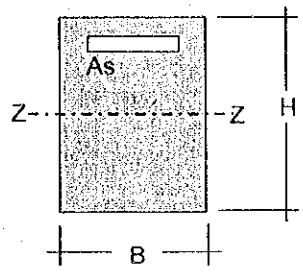
Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.49 **Use 2 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

A/B axi FB-3a CENTER
6/7 axis **BEAM D E S I G N**



H = 60.00 cm
b = 30.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	19.70
Live Load	2.90
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	32.51
0.75(1.4DL+1.7LL+1.87	24.38
0.75(1.4DL+1.7LL+1.87	24.38

Force for design: Mu z-z = 32.51 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\,As^2 - fyd\,As + Mu/f = f = 0.90$

$1647.06\,As^2 - 220332\,As + 3612222.2 = 0$ As = 19.13 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 25.51 cm²
(14/fy) b d = 5.25 cm²
} Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 19.13 cm² o.k!! As < Amax

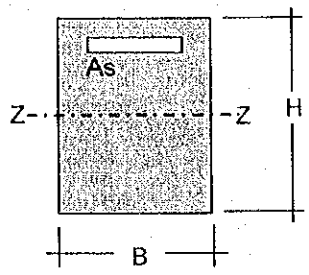
Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 3.78 **Use 4 - N 8** 3/2-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

A/B axi FB-3a END
6/8 axis **BEAM DESIGN**



H = 60.00 cm
b = 30.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	13.50
Live Load	1.50
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	21.45
0.75(1.4DL+1.7LL+1.87	16.09
0.75(1.4DL+1.7LL+1.87	16.09

Force for design: Mu z-z = 21.45 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1647.06\ As^2 - 220332\ As + 2383333.3 = 0$ As = 11.87 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 15.83 cm²
(14/fy) b d = 5.25 cm²
} Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 11.87 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 2.34 **Use 3 - N 8** 3/2-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

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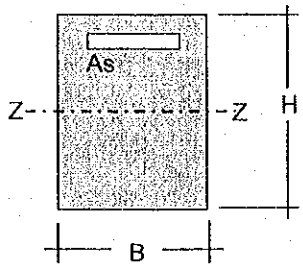
A/B axi FB-3a CENTER
6/8 axis **BEAM DESIGN**



H = 60.00 cm
b = 30.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	10.80
Live Load	0.90
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	16.65
0.75(1.4DL+1.7LL+1.87	12.49
0.75(1.4DL+1.7LL+1.87	12.49

Force for design: Mu z-z = 16.65 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1647.06\ As^2 - 220332\ As + 1850000 = 0$ As = 9.00 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 12.00 cm²
(14/fy) b d = 5.25 cm²
} Asmin = 5.25 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 40.68 cm²

As = 9.00 cm² o.k!! As < Amax

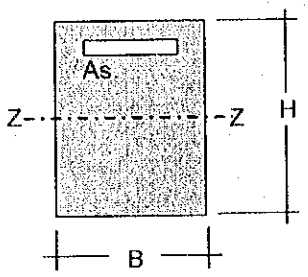
Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.78 **Use 2 - N 8** 3/2-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

D axis FB-2 END
4 axis **BEAM DESIGN**



H = 80.00 cm
b = 35.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	0.40
Live Load	0.10
Seismic x	23.60
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	0.73
0.75(1.4DL+1.7LL+1.87	33.65
0.75(1.4DL+1.7LL+1.87	0.55

Force for design: Mu z-z = 33.70 ton-m

d = 72.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1411.76\ As^2 304332\ \ 3744444.4 = 0$ As = 13.10 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 17.47 cm²
(14/fy) b d = 8.45 cm² } Asmin = 8.45 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 65.55 cm²

As = 13.10 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 2.59 **Use 3 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

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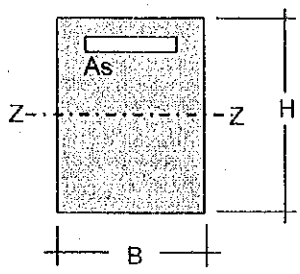
6 axis FB-2 CENTER
C/D axis BEAM D E S I G N



H = 80.00 cm
b = 35.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	15.10
Live Load	1.70
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	24.03
0.75(1.4DL+1.7LL+1.87	18.02
0.75(1.4DL+1.7LL+1.87	18.02

Force for design: Mu z-z = 24.03 ton-m

d = 72.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1411.76\ As^2 - 304332\ As + 2670000 = 0$ As = 9.16 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 12.22 cm²
(14/fy) b d = 8.45 cm²
Asmin = 8.45 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 65.55 cm²

As = 9.16 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.81 **Use 2 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

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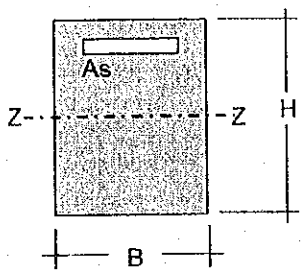
3 axis FB-1 OUTEREND
C axis BEAM DESIGN



H = 80.00 cm
b = 40.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	12.80
Live Load	1.80
Seismic x	67.10
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	20.98
0.75(1.4DL+1.7LL+1.87	109.84
0.75(1.4DL+1.7LL+1.87	15.74

Force for design: Mu z-z = 109.84 ton-m

d = 72.14 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1235.29\ As^2 - 302999\ As + 12204444 = 0$ As = 50.80 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 67.73 cm²
(14/fy) b d = 9.62 cm² } Asmin = 9.62 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 74.58 cm²

As = 50.80 cm² o.k!! As < Amax

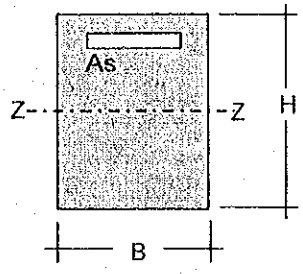
Bar denomination, N = 10 Bar Area (Av) = 8.17 cm²

Number of bars = 6.22 **Use 7 - N 10** 4/3-D32

Minimun Base Required:

Max. bars per layer = 4 Minimum Base = 37.94 cm

7 axis FB-1 INNEREND
B axis BEAM DESIGN



H = 80.00 cm
b = 40.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	34.40
Live Load	6.20
Seismic x	34.60
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	58.70
0.75(1.4DL+1.7LL+1.87	92.55
0.75(1.4DL+1.7LL+1.87	44.03

Force for design: Mu z-z = 92.55 ton-m

d = 72.14 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1235.29\ As^2 - 302999\ As + 10283333 = 0$ As = 40.69 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 54.25 cm²
(14/fy) b d = 9.62 cm²
Asmin = 9.62 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 74.58 cm²

As = 40.69 cm² o.k!! As < Amax

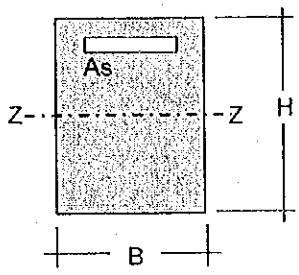
Bar denomination, N = 10 Bar Area (Av) = 8.17 cm²

Number of bars = 4.98 **Use 5 - N 10** 4/1-D32

Minimun Base Required:

Max. bars per layer = 4 Minimum Base = 37.94 cm

6 axis FB-1 CENTER
C/D axis BEAM DESIGN



H = 80.00 cm
b = 40.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	36.40
Live Load	6.20
Seismic x	0.00
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	61.50
0.75(1.4DL+1.7LL+1.87	46.13
0.75(1.4DL+1.7LL+1.87	46.13

Force for design: Mu z-z = 61.50 ton-m

d = 72.14 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$1235.29\ As^2 - 302999\ As + 6833333.3 = 0$ As = 25.13 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 33.50 cm²
(14/fy) b d = 9.62 cm² } Asmin = 9.62 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 74.58 cm²

As = 25.13 cm² o.k!! As < Amax

Bar denomination, N = 10 Bar Area (Av) = 8.17 cm²

Number of bars = 3.08 **Use 4 - N 10** 4-D32

Minimun Base Required:

Max. bars per layer = 4 Minimum Base = 37.94 cm

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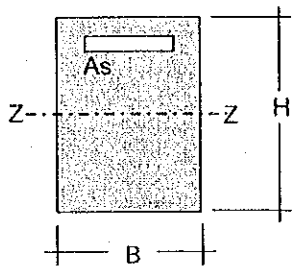
5 axis FB-1A OUTEREND
D axis BEAM DESIGN



H = 80.00 cm
b = 55.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	21.30
Live Load	3.80
Seismic x	91.50
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	36.28
0.75(1.4DL+1.7LL+1.87	155.54
0.75(1.4DL+1.7LL+1.87	27.21

Force for design: Mu z-z = 155.54 ton-m

d = 72.14 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$898.40\ As^2 - 302999\ As + 17282222 = 0$ As = 72.71 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 96.95 cm²
(14/fy) b d = 13.23 cm²
} Asmin = 13.23 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 102.55 cm²

As = 72.71 cm² o.k!! As < Amax

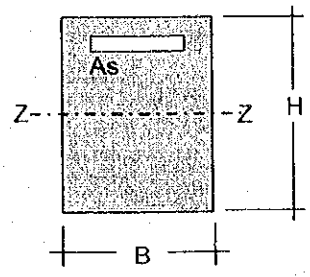
Bar denomination, N = 10 Bar Area (Av) = 8.17 cm²

Number of bars = 8.90 **Use 9 - N 10** 6/3-D32

Minimun Base Required:

Max. bars per layer = 6 Minimum Base = 50.64 cm

6 axis FB-1A INNEREND
B axis BEAM DESIGN



H = 80.00 cm
b = 55.00 cm
f'c = 210 kg/cm²
fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

TYPE OF LOAD	MOMENT Mz-z
Dead Load	33.90
Live Load	5.70
Seismic x	53.30
Seismic y	0.00

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	57.15
0.75(1.4DL+1.7LL+1.87	117.62
0.75(1.4DL+1.7LL+1.87	42.86

Force for design: Mu z-z = 117.62 ton-m

d = 72.14 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f = f = 0.90$

$898.40\ As^2 - 302999\ As + 13068889 = 0$ As = 50.78 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 67.70 cm²
(14/fy) b d = 13.23 cm²
Asmin = 13.23 cm²

Asmax : rb = 0.0345 Asmax (0.75rb) = 102.55 cm²

As = 50.78 cm² o.k!! As < Amax

Bar denomination, N = 10 Bar Area (Av) = 8.17 cm²

Number of bars = 6.21 **Use 7 - N 10** 5/2-D32

Minimun Base Required:

Max. bars per layer = 5 Minimum Base = 44.29 cm

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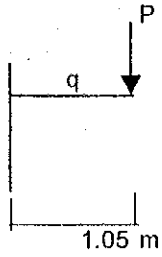
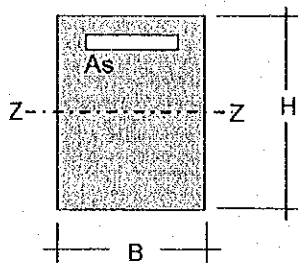
2nd Floor CB-1



q= 0.30 t/m (self weight)

PDL= 4.57875 t PLL= 1.1025 t

MDL= 4.97 tm MLL= 1.16 tm



H = 50.00 cm

b = 30.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

Dead Loa	4.97
Live Load	1.16

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	8.93

Force for design: Mu z-z = 8.93 ton-m

d = 42.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f \quad f = 0.90$

$1235.29\ As^2 - 78332\ As + 992222.2 = 0$ As = 5.80 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 7.73 cm²
(14/fy) b d = 4.25 cm² } Asmin = 4.25 cm²

Asmax : rb = 0.0459 Asmax (0.75rb) = 43.90 cm²

As = 5.80 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.14 **Use 2 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

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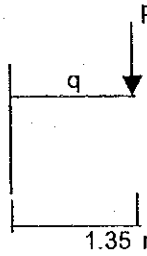
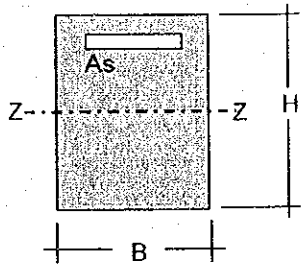
4th Floor CB-1



q= 0.30 t/m (self weight)

PDL= 5.681 t PLL= 0.081 t

MDL= 7.94 tm MLL= 0.11 tm



H = 50.00 cm

b = 30.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

Dead Loa	7.94
Live Load	0.11

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	11.31

Force for design: Mu z-z = 14.37 ton-m

d = 42.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f$ f = 0.90

$1235.29\ As^2 - 78332\ As + 1596667 = 0$ As = 9.59 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 12.79 cm²
(14/fy) b d = 4.25 cm² } Asmin = 4.25 cm²

Asmax : rb = 0.0459 Asmax (0.75rb) = 43.90 cm²

As = 9.59 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.89 **Use 2 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

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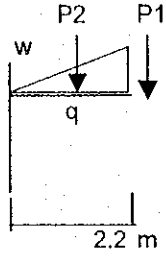
2nd Floor CB-2



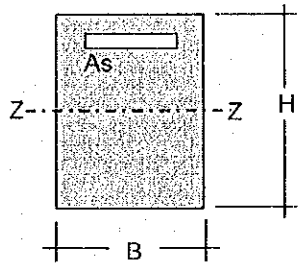
q= 0.25 t/m (self weight)

wDL= 0.43 t/m2 wLL= 0.35 t/m2

P1DL= 0.06 t P1LL= 0.44 t stairs

P2DL= 0.125 t P2LL= 0.875 t

MDL= 2.46 tm MLL= 3.22 tm



H = 40.00 cm

b = 40.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

Dead Loa	2.46
Live Load	3.22

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	8.92

Force for design: Mu z-z = 8.92 ton-m

d = 32.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f$ f = 0.90

$926.47\ As^2 - 136332\ As + 991111.1 = 0$ As = 7.67 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 10.23 cm²
(14/fy) b d = 4.33 cm² } Asmin = 4.33 cm²

Asmax : rb = 0.0459 Asmax (0.75rb) = 44.74 cm²

As = 7.67 cm² o.k!! As < Amax

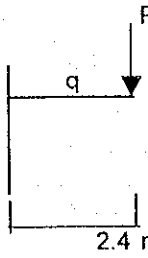
Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 1.51 **Use 2 - N 8** 3-D25

Minimun Base Required:

Max. bars per layer = 3 Minimum Base = 27.78 cm

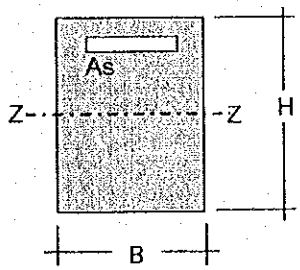
4th Floor CB-3



q= 0.35 t/m (self weight)

PDL= 7.020 t PLL= 0.144 t

MDL= 17.86 tm MLL= 0.35 tm



H = 60.00 cm

b = 40.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

Dead Loa	17.86
Live Load	0.35

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	25.59

Force for design: Mu z-z = 25.59 ton-m

d = 52.46 cm Clear cover = 5.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f$ f = 0.90

$926.47\ As^2 220332\ 2843333 = 0$ As = 13.69 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 18.26 cm²
(14/fy) b d = 6.99 cm² } Asmin = 6.99 cm²

Asmax : rb = 0.0459 Asmax (0.75rb) = 72.31 cm²

As = 13.69 cm² o.k!! As < Amax

Bar denomination, N = 8 Bar Area (Av) = 5.07 cm²

Number of bars = 2.70 **Use 3 - N 8** 4-D25

Minimun Base Required:

Max. bars per layer = 4 Minimum Base = 32.86 cm

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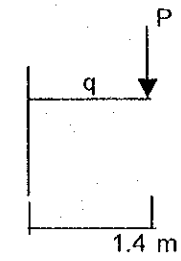
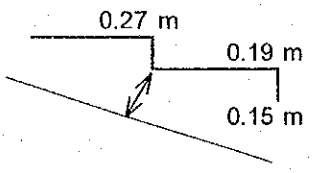
RC STAIRS

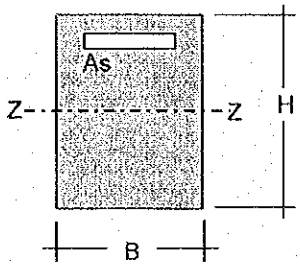


qDL= 0.20 t/m qLL= 0.0945 t/m

PDL= 0.08 t

MDL= 0.30 tm MLL= 0.09 tm





H = 27.50 cm

b = 27.00 cm

f'c = 280 kg/cm²

fy = 4200 kg/cm²

Forces and Moments, from Structural Analysis (ton , m) :

Dead Loa	0.30
Live Load	0.09

COMBINATION	Mu z-z
C1=1.4 DL+1.7 LL	0.58

Force for design: Mu z-z = 0.58 ton-m

d = 21.60 cm Clear cover = 4.00 cm

$fy^2/1.7bf'c\ As^2 - fyd\ As + Mu/f \quad f = 0.90$

$1372.55\ As^2 - 90699\ As + 64444.44 = 0$ As = 0.72 cm²

Asmin = (4/3)Asreq :

(4/3)Asreq = 0.96 cm²
(14/fy) b d = 1.94 cm² } Asmin = 0.96 cm²

Asmax : rb = 0.0459 Asmax (0.75rb) = 20.09 cm²

As = 0.96 cm² o.k!! As < Amax

Bar denomination, N = 4 Bar Area (Av) = 1.27 cm²

Number of bars = 0.76 **Use 1 - N 4** 2-D13

Minimun Base Required:

Max. bars per layer = 2 Minimum Base = 18.08 cm

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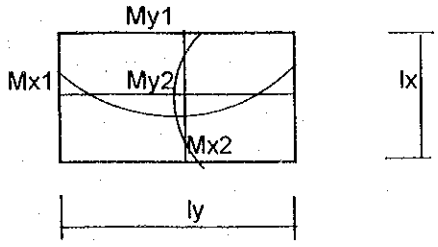
Slab S1 for 2nd roof



lx= 3.0 m

ly= 4.0 m

1.3

t= 15 cm

coefficient of bend (thioretical result fix end)

Mx1/(w lx^2) =	0.068
Mx2/(w lx^2) =	0.030
My1/(w lx^2) =	0.056
My2/(w lx^2) =	0.015

d= 10.35 cm
fc= 280 kg/cm2
fy= 4200 kg/cm2

wDL= 0.515 t/m2
wLL= 0.350 t/m2

DL		LL	
Mx1=	0.32 tm/m	Mx1=	0.21 tm/m
Mx2=	0.14 tm/m	Mx2=	0.09 tm/m
My1=	0.26 tm/m	My1=	0.18 tm/m
My2=	0.07 tm/m	My2=	0.05 tm/m

1.4DL+1.7LL			fy2/1.7bfc'	fyd	Mu/f		
Mx1=	0.81	tm/m	370.6	43470	89488	As=	2.10 cm²/m
Mx2=	0.36	tm/m	370.6	43470	39480	As=	0.92 cm²/m
My1=	0.66	tm/m	370.6	43470	73696	As=	1.72 cm²/m
My2=	0.18	tm/m	370.6	43470	19740	As=	0.46 cm²/m

	Short Span			Long Span		
	Use Bar	Area cm2	Pitch cm	Use Bar	Area cm2	Pitch cm
End	3	0.71	34.0	3	0.71	41.4
Center	3	0.71	77.8	3	0.71	156.3

Thicknes (mm)	Location	Shorter Side (Direction)				Longer Side (Direction)			
		Edge Strip		Middle Strip		Edge Strip		Middle Strip	
		End	Center	End	Center	End	Center	End	Center
S1	Top	D10-@200			-	D10-@250			-
150	Bottom	D10-@200				D10-@250			

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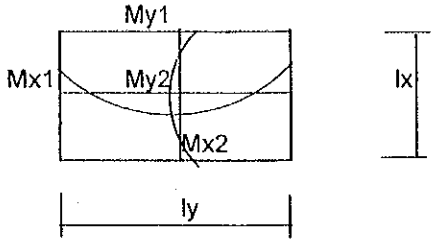
Slab S1 for 4th meeting room



lx= 3.5 m

ly= 6.0 m

1.7

t= 15 cm

coefficient of bend (thioretical result fix end)

Mx1/(w lx^2) =	0.080
Mx2/(w lx^2) =	0.038
My1/(w lx^2) =	0.057
My2/(w lx^2) =	0.020

d= 10.35 cm
fc= 280 kg/cm2
fy= 4200 kg/cm2

wDL= 0.435 t/m2
wLL= 0.350 t/m2

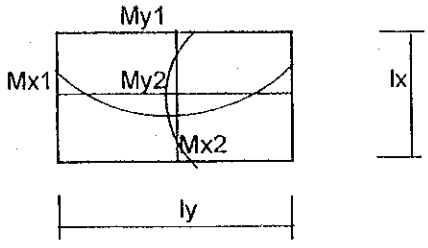
DL		LL	
Mx1=	0.43 tm/m	Mx1=	0.34 tm/m
Mx2=	0.20 tm/m	Mx2=	0.16 tm/m
My1=	0.30 tm/m	My1=	0.24 tm/m
My2=	0.11 tm/m	My2=	0.09 tm/m

1.4DL+1.7LL			fy2/1.7bfc'	fyd	Mu/f		
Mx1=	1.18	tm/m	370.6	43470	131102	As=	3.10 cm²/m
Mx2=	0.56	tm/m	370.6	43470	62273.6	As=	1.45 cm²/m
My1=	0.84	tm/m	370.6	43470	93410.3	As=	2.19 cm²/m
My2=	0.29	tm/m	370.6	43470	32775.6	As=	0.76 cm²/m

	Short Span			Long Span		
	Use Bar	Area cm2	Pitch cm	Use Bar	Area cm2	Pitch cm
End	3	0.71	23.0	3	0.71	32.5
Center	3	0.71	49.1	3	0.71	93.9

Thicknes (mm)	Location	Shorter Side (Direction)				Longer Side (Direction)			
		Edge Strip		Middle Strip		Edge Strip		Middle Strip	
		End	Center	End	Center	End	Center	End	Center
S1	Top	D10-@200			-	D10-@250			-
150	Bottom	D10-@200				D10-@250			

Slab S2 for 2nd roof



lx= 3.0 m

ly= 4.0 m

1.3

t= 12 cm

coefficient of bend (thioretical result fix end)

Mx1/(w lx^2) =	0.068
Mx2/(w lx^2) =	0.030
My1/(w lx^2) =	0.056
My2/(w lx^2) =	0.015

d= 7.35 cm
fc= 280 kg/cm2
fy= 4200 kg/cm2

wDL= 0.443 t/m2
wLL= 0.020 t/m2

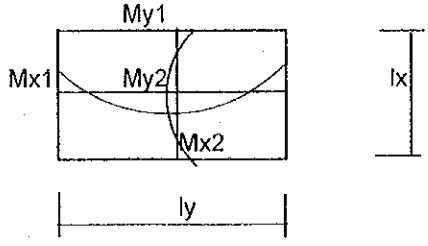
DL		LL	
Mx1=	0.27 tm/m	Mx1=	0.01 tm/m
Mx2=	0.12 tm/m	Mx2=	0.01 tm/m
My1=	0.22 tm/m	My1=	0.01 tm/m
My2=	0.06 tm/m	My2=	0.00 tm/m

1.4DL+1.7LL			fy2/1.7bfc'	fyd	Mu/f		
Mx1=	0.40	tm/m	370.6	30870	44485.6	As=	1.47 cm²/m
Mx2=	0.18	tm/m	370.6	30870	19626	As=	0.64 cm²/m
My1=	0.33	tm/m	370.6	30870	36635.2	As=	1.20 cm²/m
My2=	0.09	tm/m	370.6	30870	9813	As=	0.32 cm²/m

	Short Span			Long Span		
	Use Bar	Area cm2	Pitch cm	Use Bar	Area cm2	Pitch cm
End	3	0.71	48.6	3	0.71	59.2
Center	3	0.71	111.2	3	0.71	223.3

Thicknes (mm)	Location	Shorter Side (Direction)				Longer Side (Direction)			
		Edge Strip		Middle Strip		Edge Strip		Middle Strip	
		End	Center	End	Center	End	Center	End	Center
S2	Top	D10-@200			-	D10-@250			-
120	Bottom	D10-@200				D10-@250			

Slab S2 for top roof



lx= 3.0 m

ly= 3.5 m

1.2

t= 12 cm

coefficient of bend (thioretical result fix end)

Mx1/(w lx^2) =	0.065
Mx2/(w lx^2) =	0.030
My1/(w lx^2) =	0.055
My2/(w lx^2) =	0.028

d= 7.35 cm
fc= 280 kg/cm2
fy= 4200 kg/cm2

wDL= 0.443 t/m2
wLL= 0.020 t/m2

DL		LL	
Mx1=	0.26 tm/m	Mx1=	0.01 tm/m
Mx2=	0.12 tm/m	Mx2=	0.01 tm/m
My1=	0.22 tm/m	My1=	0.01 tm/m
My2=	0.11 tm/m	My2=	0.01 tm/m

1.4DL+1.7LL			fy2/1.7bfc'	fyd	Mu/f		
Mx1=	0.38	tm/m	370.6	30870	42523	As=	1.40 cm²/m
Mx2=	0.18	tm/m	370.6	30870	19626	As=	0.64 cm²/m
My1=	0.32	tm/m	370.6	30870	35981	As=	1.18 cm²/m
My2=	0.16	tm/m	370.6	30870	18317.6	As=	0.60 cm²/m

	Short Span			Long Span		
	Use Bar	Area cm2	Pitch cm	Use Bar	Area cm2	Pitch cm
End	3	0.71	50.9	3	0.71	60.3
Center	3	0.71	111.2	3	0.71	119.2

Thicknes (mm)	Location	Shorter Side (Direction)				Longer Side (Direction)			
		Edge Strip		Middle Strip		Edge Strip		Middle Strip	
		End	Center	End	Center	End	Center	End	Center
S2	Top	D10-@200			-	D10-@250			-
120	Bottom	D10-@200				D10-@250			

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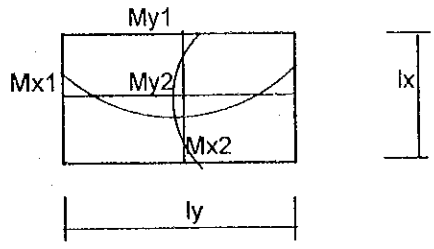
Slab S4 for 2nd landing



lx= 2.2 m

ly= 2.3 m

1.0

t= 15 cm

coefficient of bend (thioretical result 2side fix end)

$Mx1/(w\ lx^2)$ =	0.290
$Mx2/(w\ lx^2)$ =	0.040
$My1/(w\ lx^2)$ =	0.290
$My2/(w\ lx^2)$ =	0.040

d= 10.35 cm
fc= 280 kg/cm2
fy= 4200 kg/cm2

wDL= 0.425 t/m2
wLL= 0.350 t/m2

DL		LL	
Mx1=	0.60 tm/m	Mx1=	0.49 tm/m
Mx2=	0.08 tm/m	Mx2=	0.07 tm/m
My1=	0.60 tm/m	My1=	0.49 tm/m
My2=	0.08 tm/m	My2=	0.07 tm/m

1.4DL+1.7LL			fy2/1.7bfc'	fyd	Mu/f		
Mx1=	1.67	tm/m	370.6	43470	185587	As=	4.44 cm²/m
Mx2=	0.23	tm/m	370.6	43470	25598.2	As=	0.59 cm²/m
My1=	1.67	tm/m	370.6	43470	185587	As=	4.44 cm²/m
My2=	0.23	tm/m	370.6	43470	25598.2	As=	0.59 cm²/m

	Short Span			Long Span		
	Use Bar	Area cm2	Pitch cm	Use Bar	Area cm2	Pitch cm
End	4	1.27	28.5	4	1.27	28.5
Center	3	0.71	120.4	3	0.71	120.4

Thickness (mm)	Location	Shorter Side (Direction)				Longer Side (Direction)			
		Edge Strip		Middle Strip		Edge Strip		Middle Strip	
		End	Center	End	Center	End	Center	End	Center
S4 150	Top	D13-@200				D13-@200			
	Bottom	D10-@200				D10-@200			

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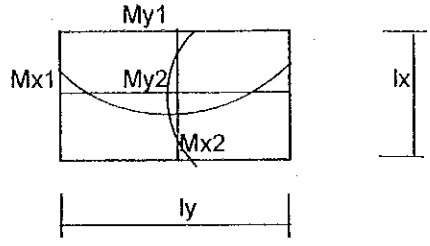
Slab S5 for 2nd landing



lx= 1.5 m

ly= 2.8 m

1.9

t= 15 cm

coefficient of bend (thioretical result 2side fix end)

Mx1/(w lx^2) =	0.200
Mx2/(w lx^2) =	0.030
My1/(w lx^2) =	0.270
My2/(w lx^2) =	0.100

d= 10.35 cm
fc= 280 kg/cm2
fy= 4200 kg/cm2

wDL= 0.425 t/m2
wLL= 0.350 t/m2

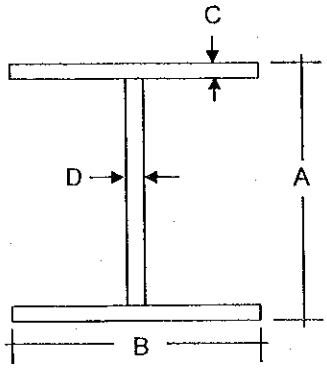
DL		LL	
Mx1=	0.19 tm/m	Mx1=	0.16 tm/m
Mx2=	0.03 tm/m	Mx2=	0.02 tm/m
My1=	0.26 tm/m	My1=	0.21 tm/m
My2=	0.10 tm/m	My2=	0.08 tm/m

1.4DL+1.7LL			fy2/1.7bfc'	fyd	Mu/f		
Mx1=	0.54	tm/m	370.6	43470	59500	As=	1.39 cm²/m
Mx2=	0.08	tm/m	370.6	43470	8925	As=	0.21 cm²/m
My1=	0.72	tm/m	370.6	43470	80325	As=	1.88 cm²/m
My2=	0.27	tm/m	370.6	43470	29750	As=	0.69 cm²/m

	Short Span			Long Span		
	Use Bar	Area cm2	Pitch cm	Use Bar	Area cm2	Pitch cm
End	3	0.71	51.4	3	0.71	37.9
Center	3	0.71	346.4	3	0.71	103.5

Thicknes (mm)	Location	Shorter Side (Direction)				Longer Side (Direction)			
		Edge Strip		Middle Strip		Edge Strip		Middle Strip	
		End	Center	End	Center	End	Center	End	Center
S5	Top	D10-@300				D10-@200			
150	Bottom	D10-@300				D10-@200			

B-1



Beam type = W14x34

A = 13.98 in

B = 6.745 in

C = 0.455 in

D = 0.285 in

Area = 10.000 in²

Yc = 6.990 in

I = 340.00 in4

S = 48.64 in³

Pd = 0.20 ton

PL = 0.00 ton

Md = 1.70 ton-m

ML = 1.70 ton-m

P/A(d+L)	3.10
P/A(d+L+s)	2.33
Md+ L/S =	426.56
Ms+d+L/S=	319.92

Fy = 36 ksi

429.66 kg/cm²

0.6 Fy = 1512.00 kg/cm² **o.k.!!**

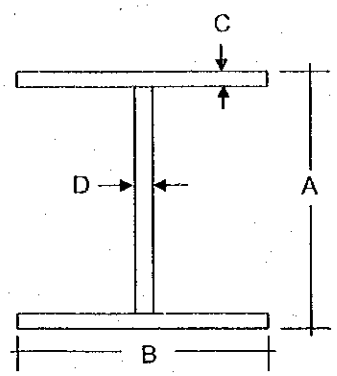
- Shear

Max. Shear = 4200.0 kg

Fv = V / (h tw) = 163.39 kg/cm²

0.4 Fy = 1008.00 kg/cm² **o.k.!!**

B-2



Beam type = W8x10

A = 7.89 in

B = 3.94 in

C = 0.205 in

D = 0.170 in

Area = 2.960 in²

Yc = 3.945 in

I = 30.80 in4

S = 7.81 in³

Pd = 0.50 ton

PL = 0.50 ton

Md = 0.60 ton-m from analysis

ML = 0.90 ton-m

P/A(d+L) 52.36

P/A(d+L+s) 39.27

Md+ L/S = 1172.43

Ms+d+L/S= 879.32

Fy = 36 ksi

1224.79 kg/cm²

0.6 Fy = 1512.00 kg/cm² **o.k.!!**

- Shear

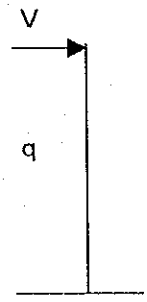
Max. Shear = 200.0 kg

Fv = V / (h tw) = 23.11 kg/cm²

0.4 Fy = 1008.00 kg/cm² **o.k.!!**

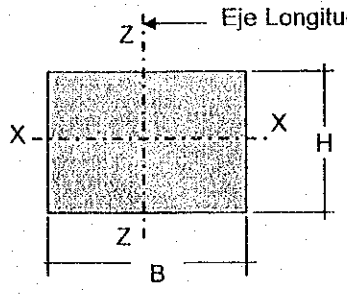
Column C1

Seismic Stress



P=	4.55	t
Cs=	0.185	
V=Cs P	0.84	t
q=	0.04	t/m
Ms=	3.79	tm

Column **C1**



H = 0.31 m

B = 0.31 m

f 'c = 280 kg/cm²

fy = 4200 kg/cm²

Area = 961 cm²

Inertia Z = 7.7E+04 cm^4

Inertia Y = 7.7E+04 cm^4

Forces and Moments

From Structural Analisis (ton , m) :

TYPE O LOAD	AXIAL P	MOMENT Mz-z	MOMENT Mx-x	SHEAR Vx	SHEAR Vz
Dead Loa	4.50	0.00	0.00	0.00	0.00
Live Load	2.40	0.00	0.00	0.00	0.00
Seismic Loa	0.00	3.79	0.00	1.00	0.00
Seismic Loa	0.00	0.00	3.79	0.00	1.00

COMBINATI	Pu	Mu z-z	Mu x-x	Vu x	Vu z
C1	10.38	0.00	0.00	0.00	0.00
C2	7.79	6.17	---	1.63	---
C3	7.79	---	6.17	---	1.63

Forces for design.

Pu z = 7.79 ton Pu x = 7.79 ton

Mu x-x = 6.17 ton-m Mu z-z = 6.17 ton-m

Vu z = 1.63 ton Vu x = 1.63 ton

C1 = 1.4 DL + 1.7 LL
C2 = 0.75(1.4DL + 1.7LL + 1.87SLy)
C3 = 0.75(1.4DL + 1.7LL + 1.87SLz)

Ortogonal Combination

MX = 100%EQX + 30%EQZ MZ = 100%EQZ + 30%EQX

$Mx = Mx + Mz(H/B)(\frac{1-b}{\beta})$ b = 0.65 $MZ = Mz + Mx(B/H)(\frac{1-b}{\beta})$ b = 0.65

Slenderness.

iF klu/r > 22 Consider Slenderness .

k = 2.0 lu = 8.2 m r = (Inetia/Area)^½

Y Direction

r = 0.089 m klu/r = 183.262 > 22 Consider slenderness

Z Direction

r = 0.089 m klu/r = 183.262 > 22 Consider slenderness

Slenderness

Mc = dbMb + dsMs

db = cm/(1 - Pu/fPc cm = 1.0

Pc = $p^2EI / (klu)^2$ E = 2526713.3 ton/m²

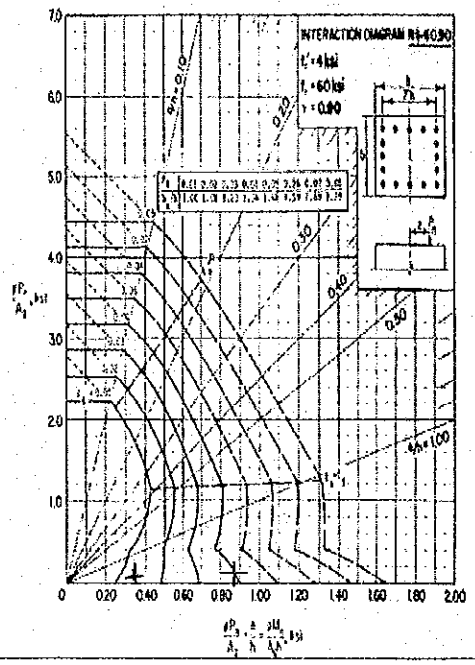
Pu = 1.3xFuerza Ax 10.38 ton

X Dir. :		Z Dir. :	
Inercia =	0.0008 m²	Inercia =	0.0008 m²
Pc =	71.36 ton	Pc =	71.36 ton
db =	1.185	db =	1.185

Mu x-x = 7.31 ton-m

Mu z-z = 7.31 ton-m

COLUMNS 7.4.4—Load-moment strength interaction diagram for R4-60.90 columns



- Design by flexure and Axial load

Z Direction : f = 0.70

Gross Area (Ag) = 0.10 m² = 148.97 in²

h = 0.31 m = 12.21 in

P = 7.79 ton = 17.16 kips

M = 7.31 ton-m = 634.42 kips-in

Pu/Ag = 0.12 Mu/Agh = 0.35

From the Load-Moment strength interaction diagram R4-60.90, the ρ value is:

r = 1.5 % As =Ag x r = 14.42 cm²

Bar denomination = 8 Bar area = 5.07 cm²

Quantity of bars = 2.84

Colocar 4 N 8 5-D25

X Direction : f = 0.7

Gross Area (Ag) = 0.10 m² = 148.97 in²

h = 0.31 m = 12.21 in

P = 7.79 ton = 17.16 kips

M = 7.31 ton = 634.42 kips-in

Pu/Ag = 0.12 Mu/Agh = 0.35

From the Load-Moment strength interaction diagram R4-60.90, the ρ value is:

r = 1.5 % As = Ag x r = 14.42 cm²

Bar Denomination = 8 Bar area = 5.07 cm²

Quantity of bars = 2.84

Use 4 N 8