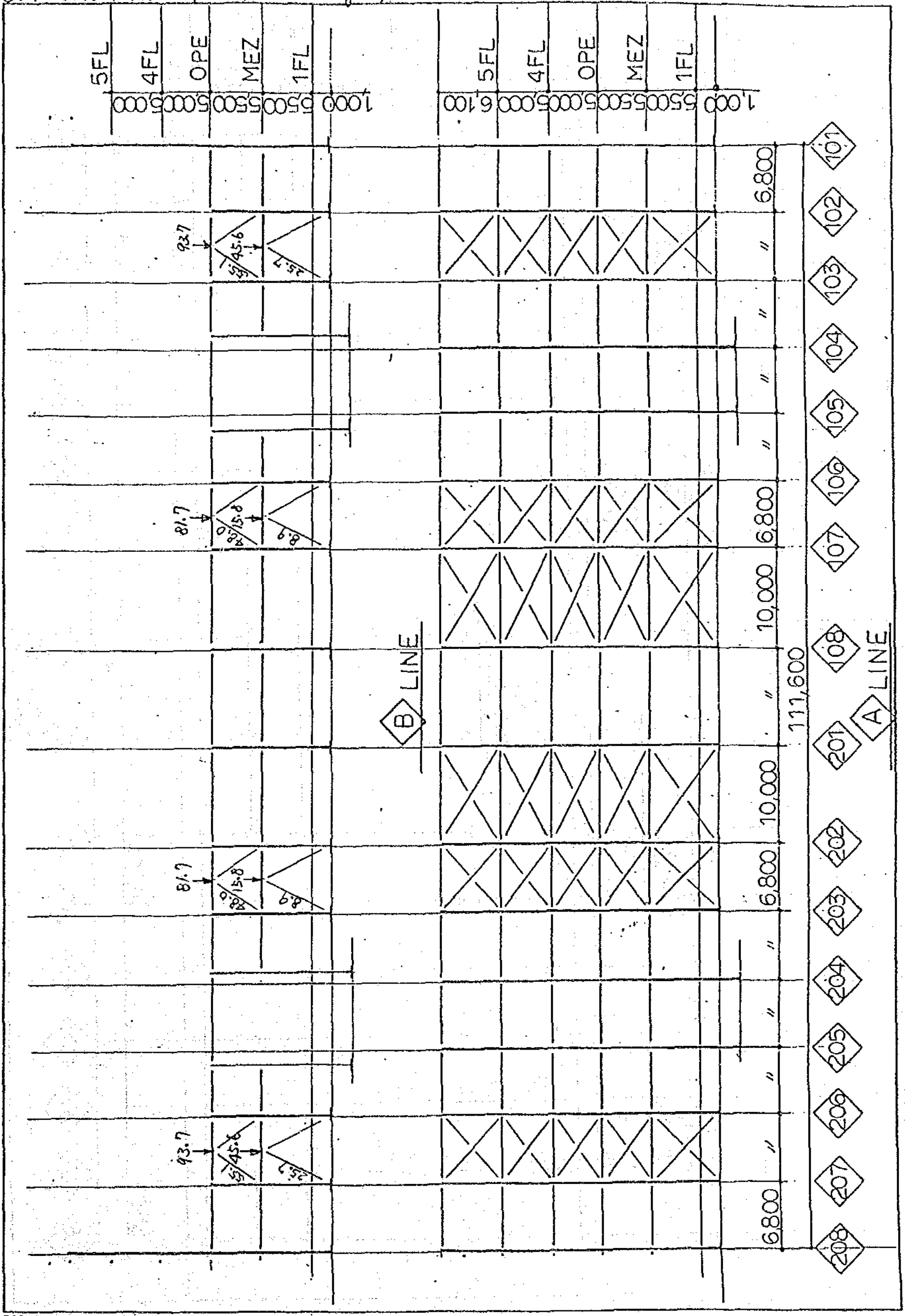
3. Structural Analysis of Frames

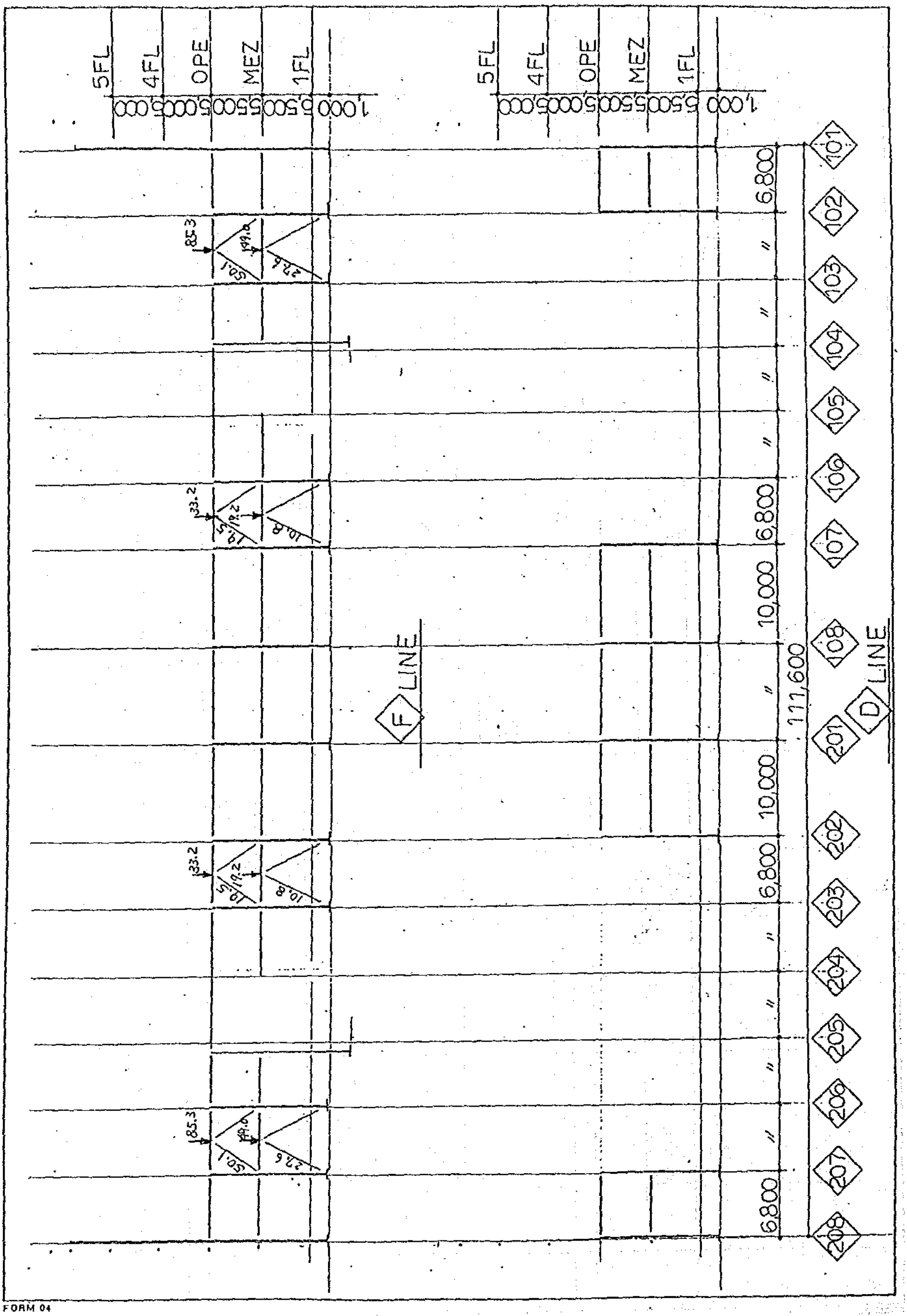
3.1 Calculation of vertical bracing by vertical load

SHEET 75 OF



7Λ

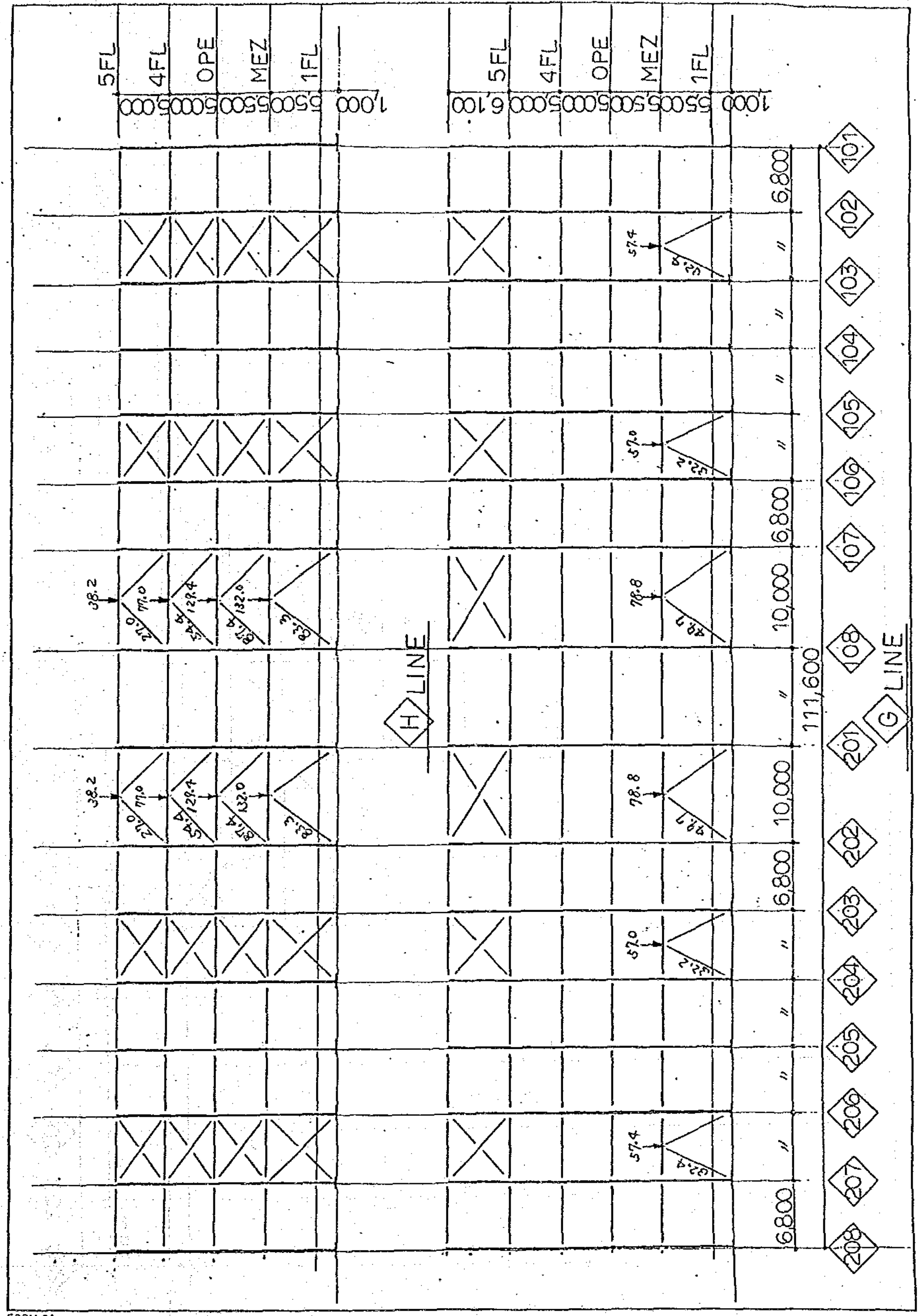
SHEET 76 OF



FORM 04

79

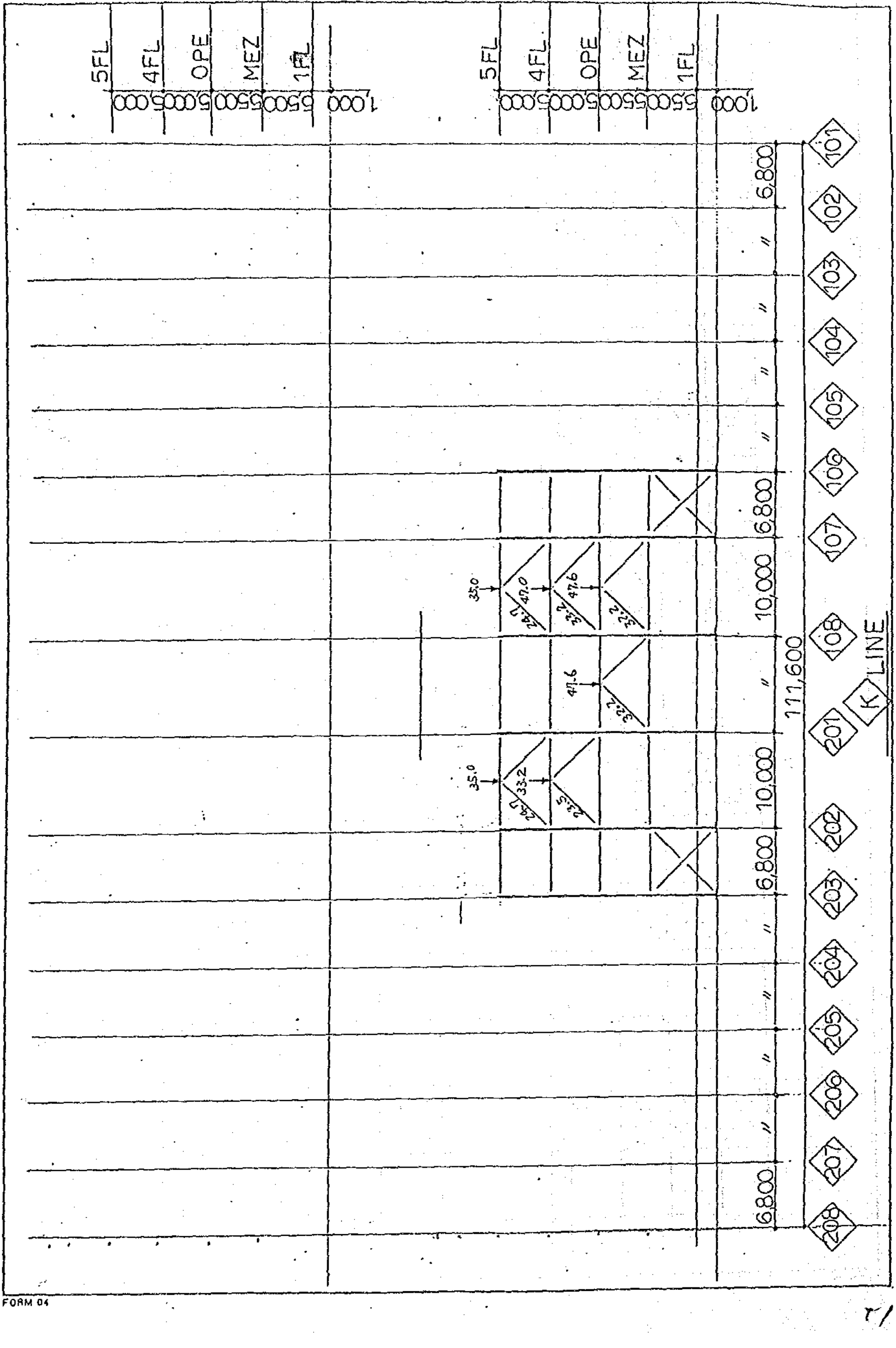
SHEET 77 OF



FORM 04

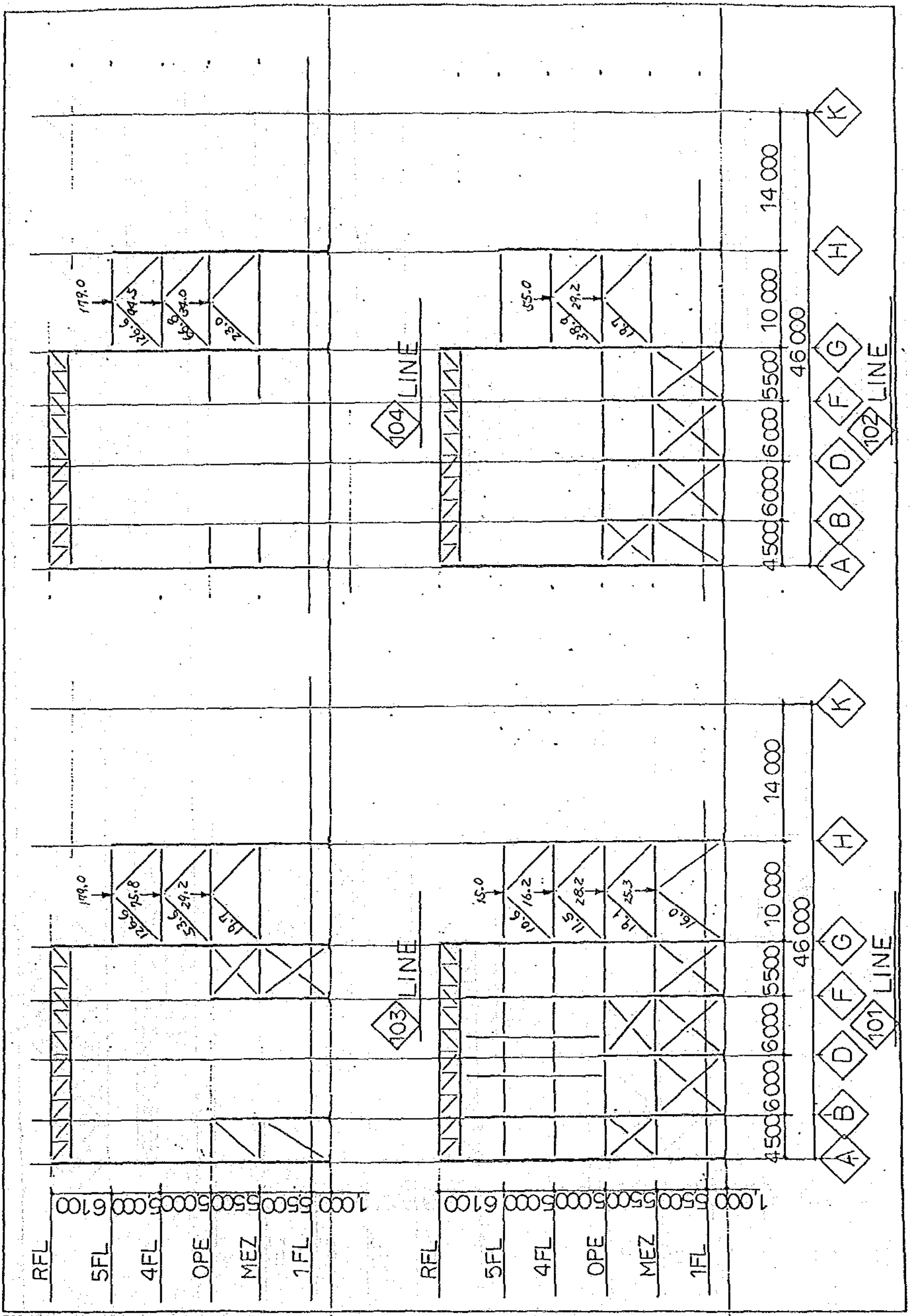
80

SHEET 78 OF



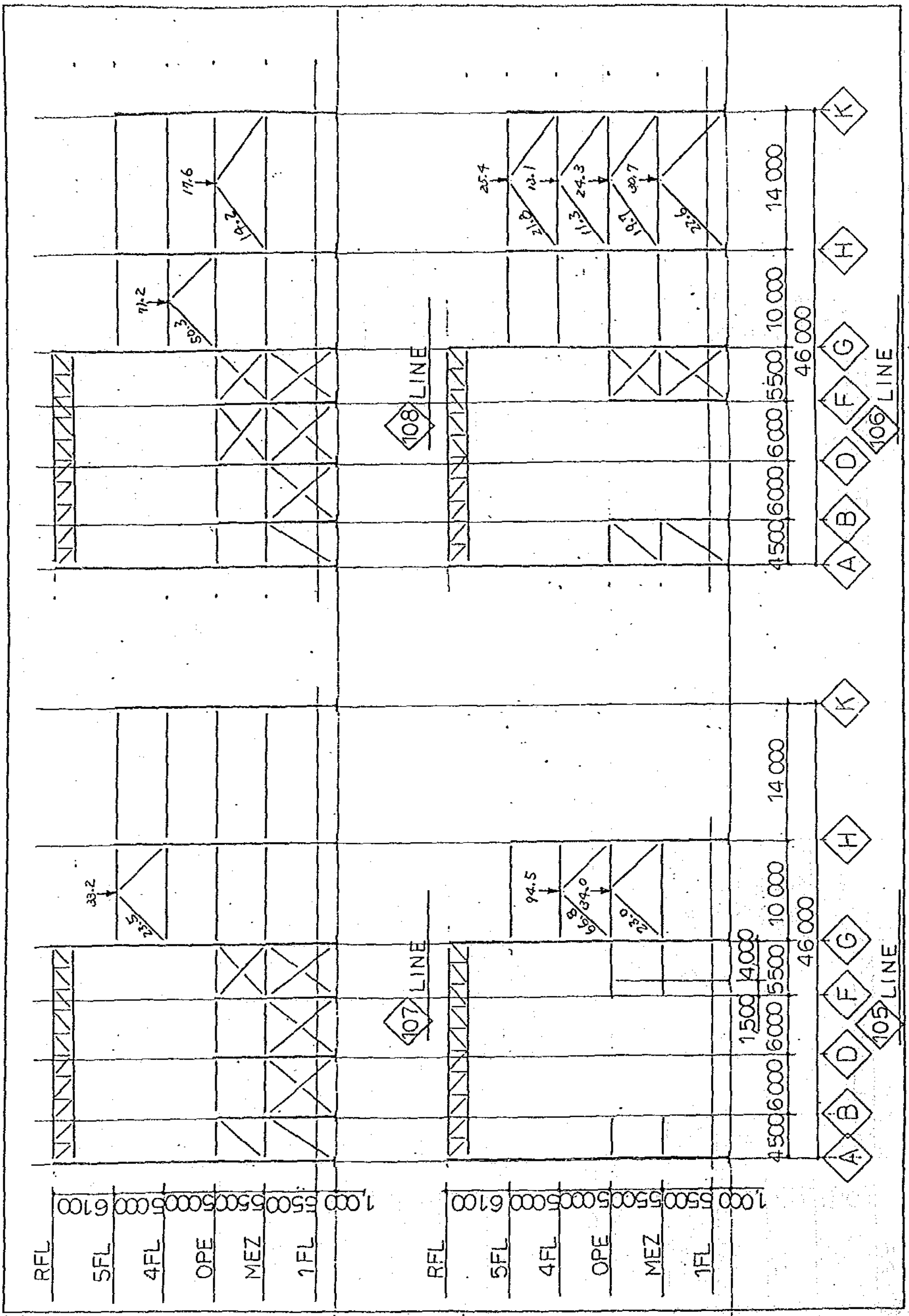
FORM 04

r/


104 LINE
102 LINE
103 LINE
101 LINE
RFL
5FL
4FL
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
A
B
D
F
G
H
K
4500
6000
6000
5500
10000
14000
46000
179.0
155.0
94.5
34.0
29.2
125.8
16.2
28.2
25.3
23.0
16.0

FORM 04

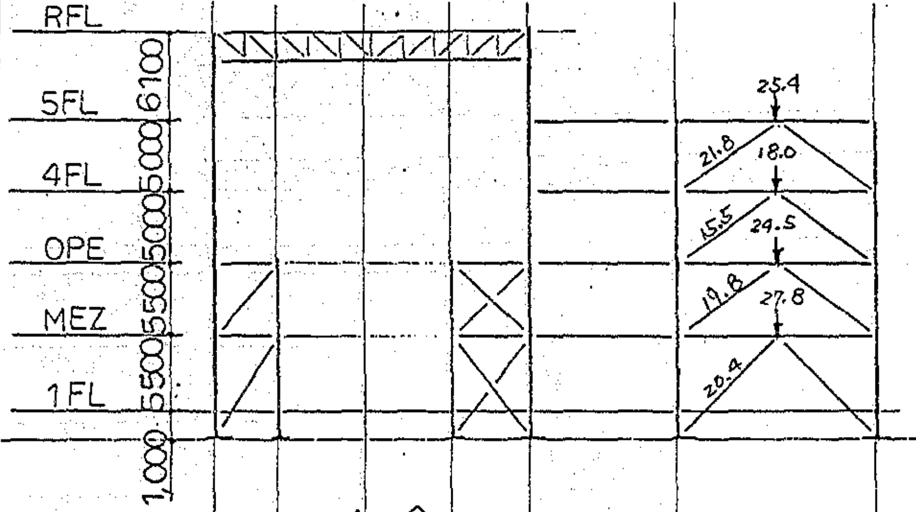
82

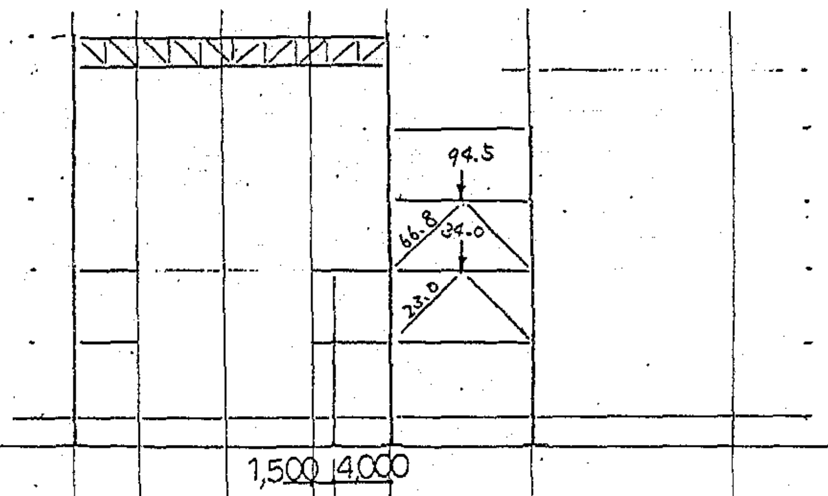

108 LINE
106 LINE
107 LINE
105 LINE
A
B
D
F
G
H
K
4500
6000
6000
5500
10 000
14 000
46 000
1500
4000
RFL
5FL
4FL
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1,000
17.6
14.2
71.2
50.3
25.4
21.8
13.1
11.3
24.3
10.1
20.7
23.9
33.2
23.5
94.5
34.0
96.8
23.0

82

TX

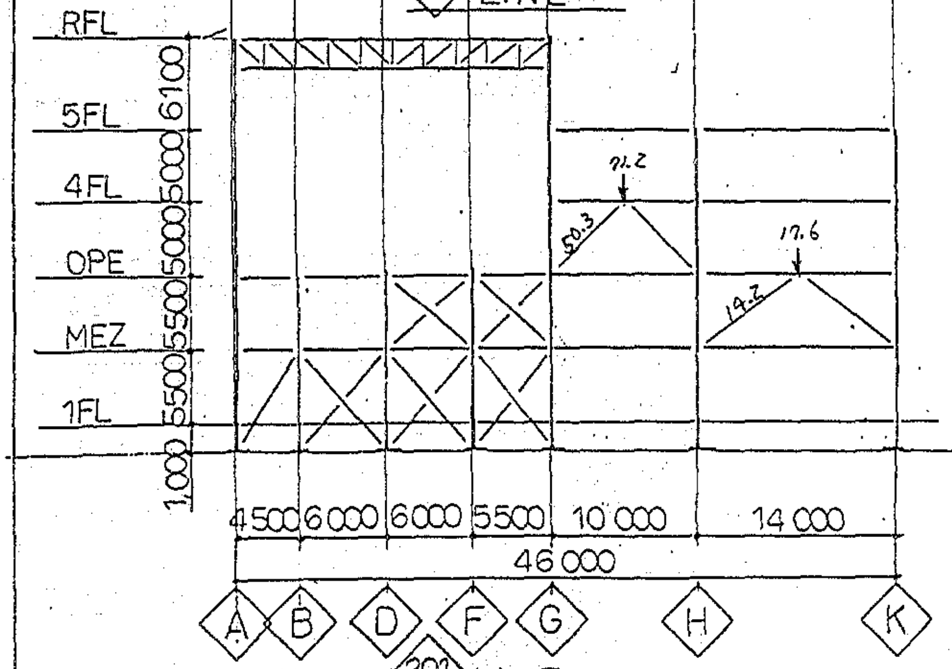
FORM 04



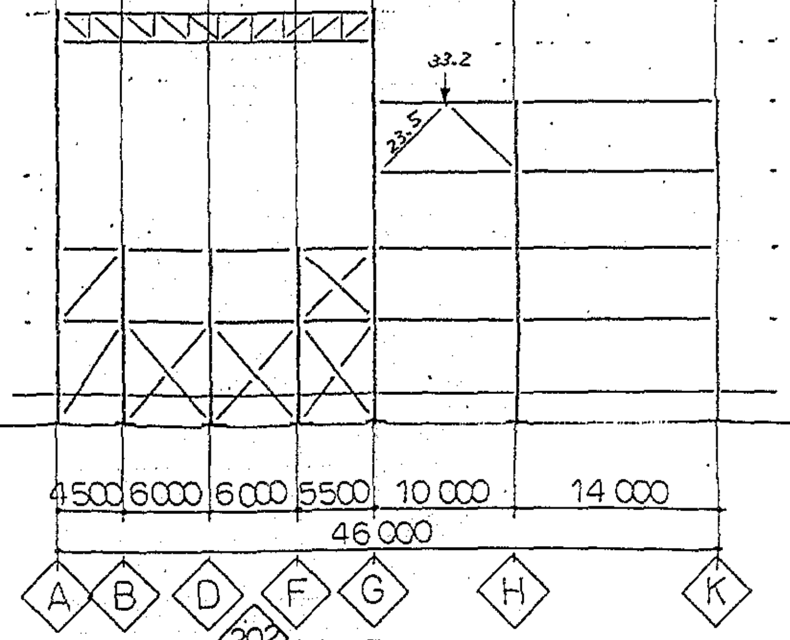


203 LINE

204 LINE

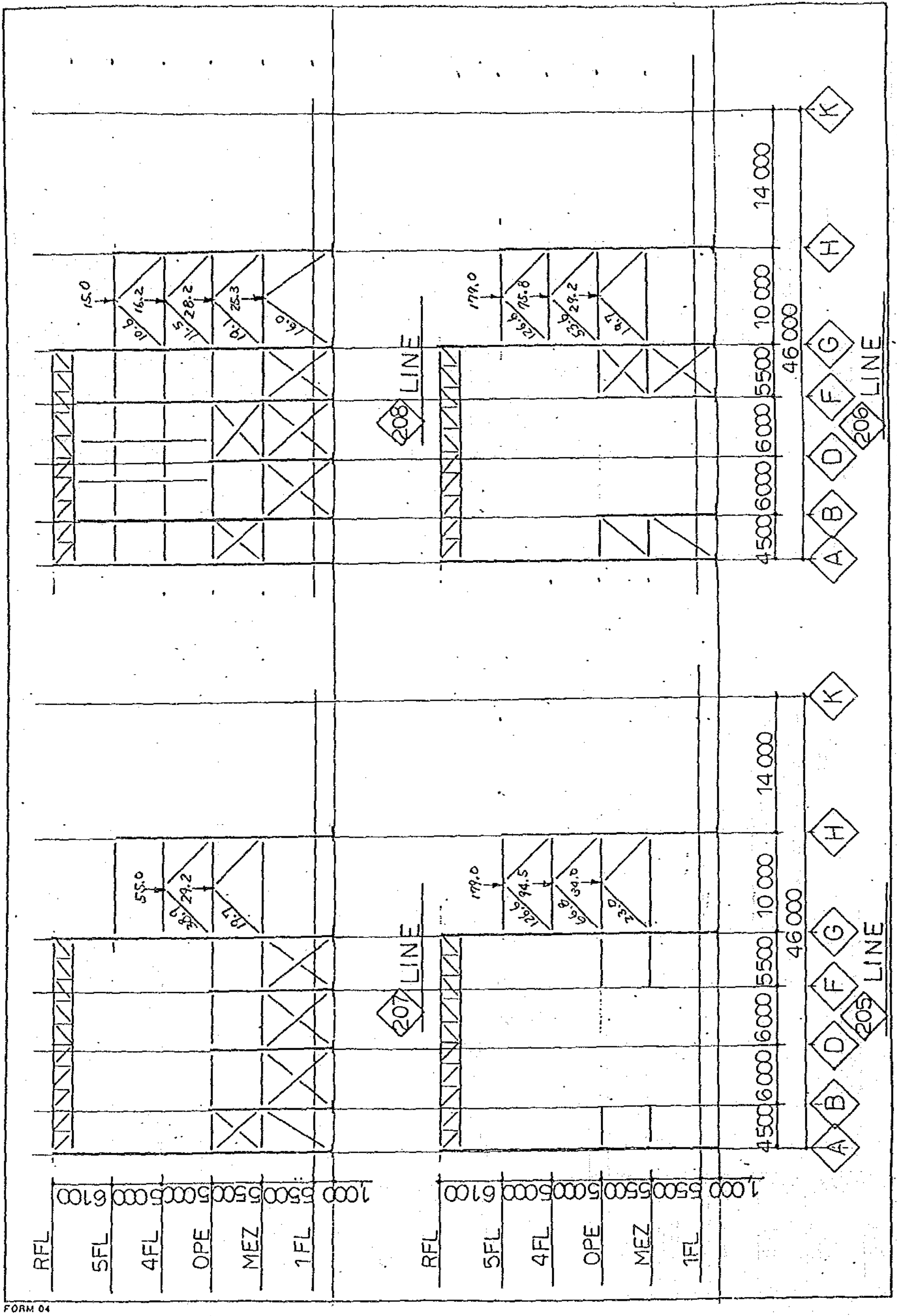


201 LINE

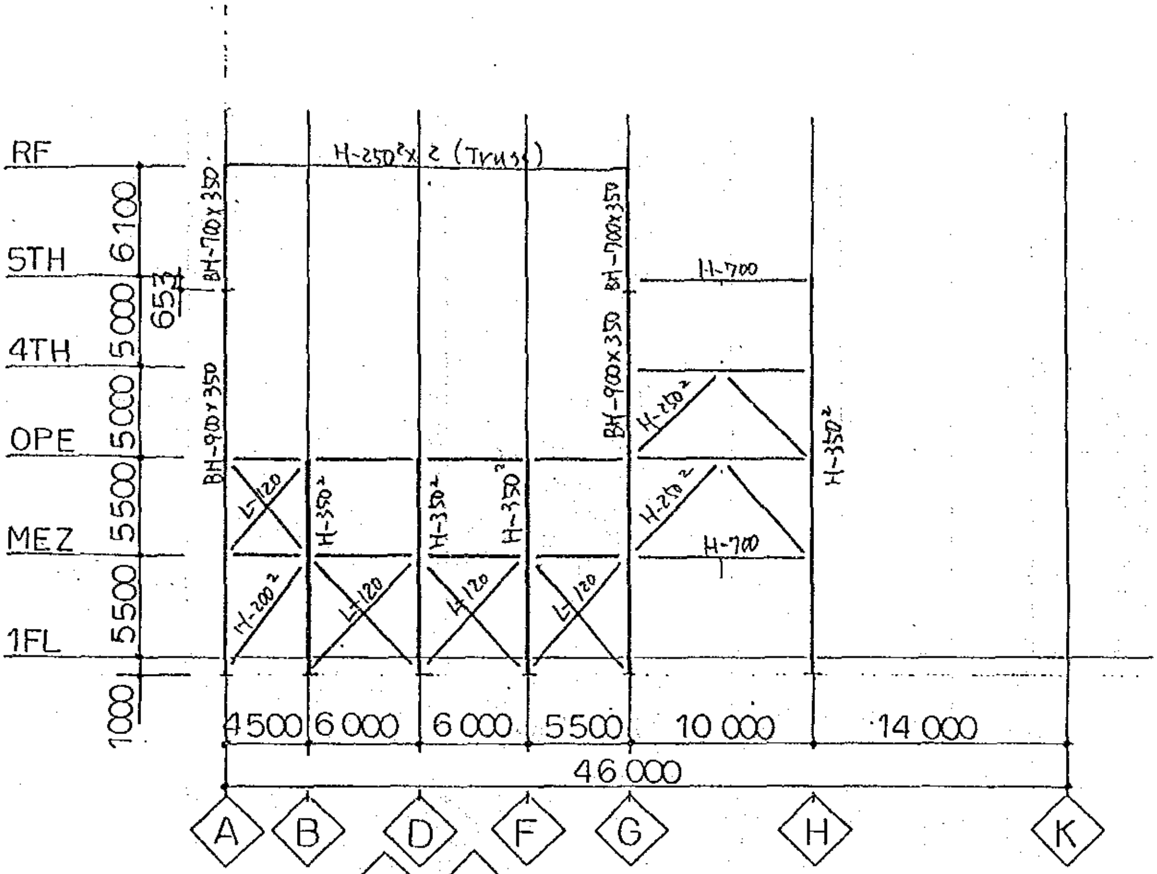


202 LINE

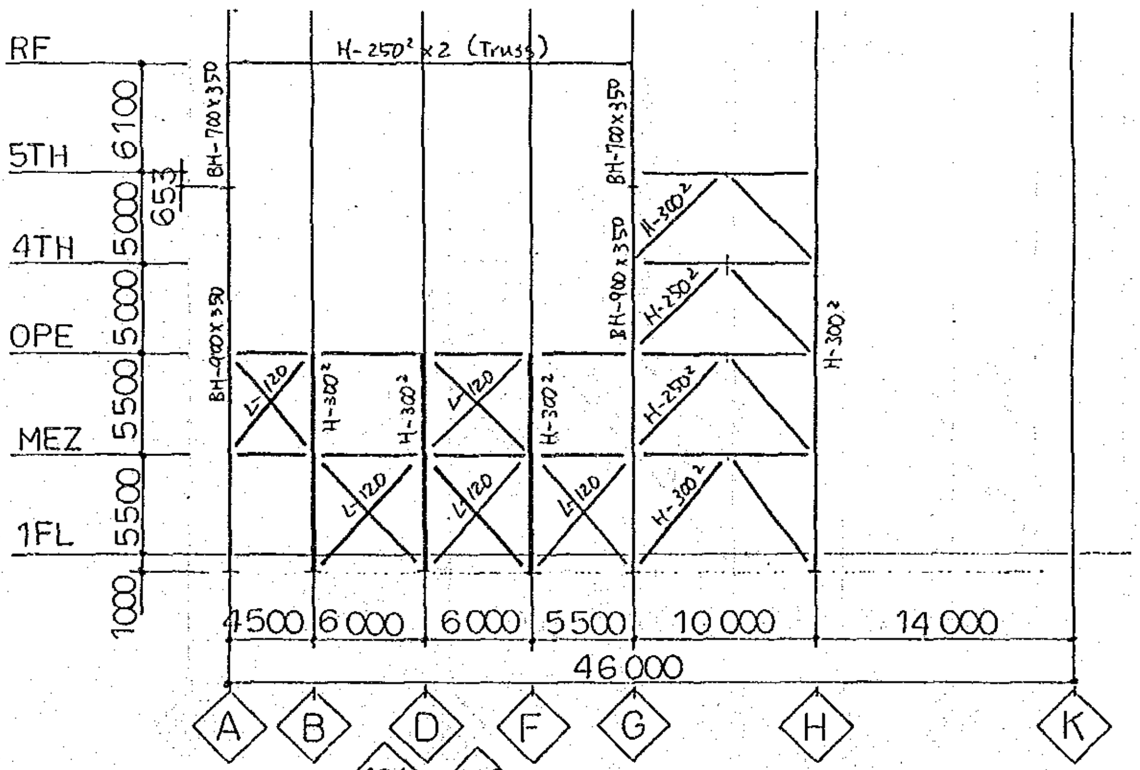
SHEET 81 OF


RFL
5FL
4FL
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
208 LINE
206 LINE
207 LINE
205 LINE
A
B
D
F
G
H
K
4500
6000
6000
5500
10 000
14 000
46 000
15.0
16.2
28.2
25.3
179.0
75.8
29.2
55.0
29.2
179.0
94.5
34.0

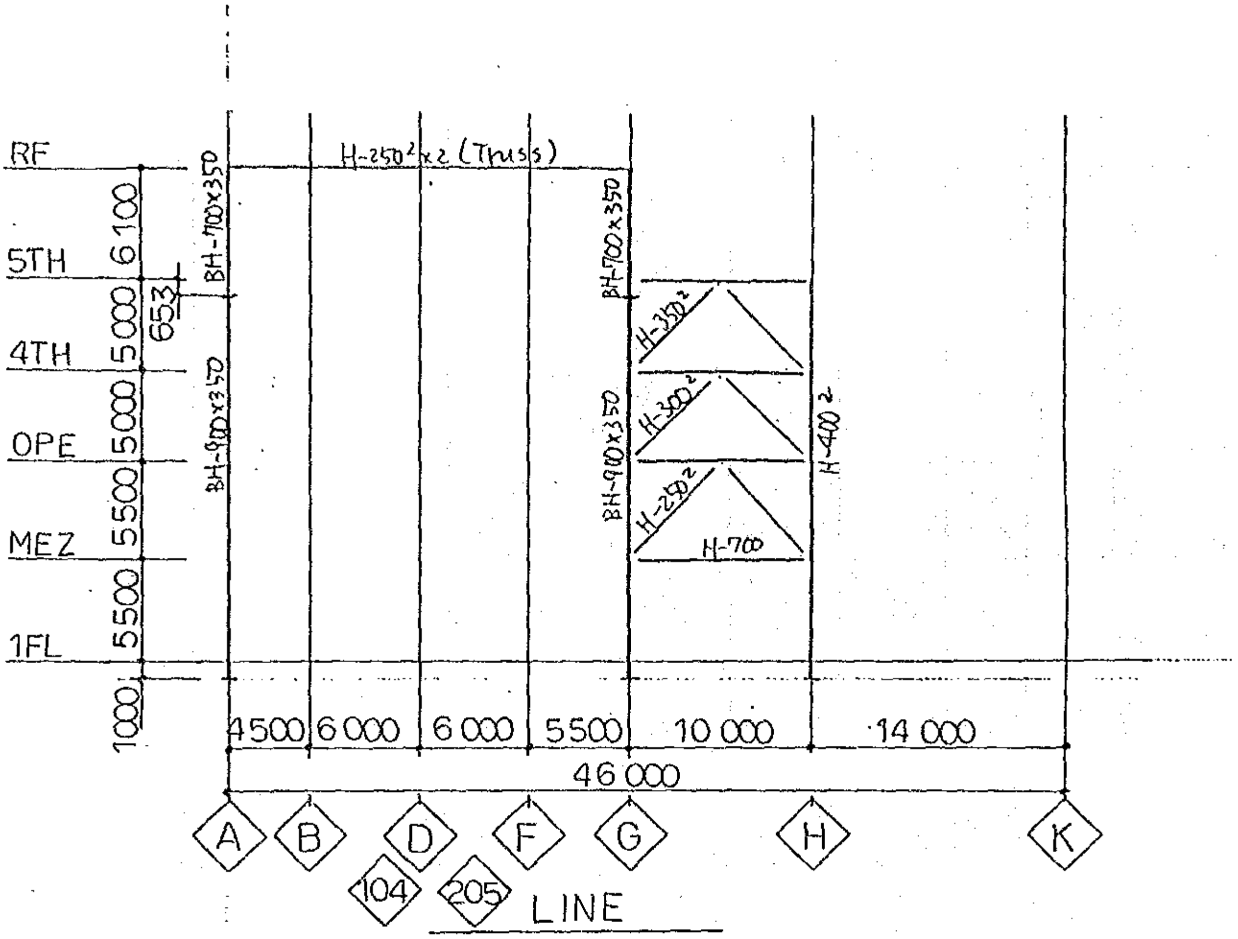
3.2 Input data

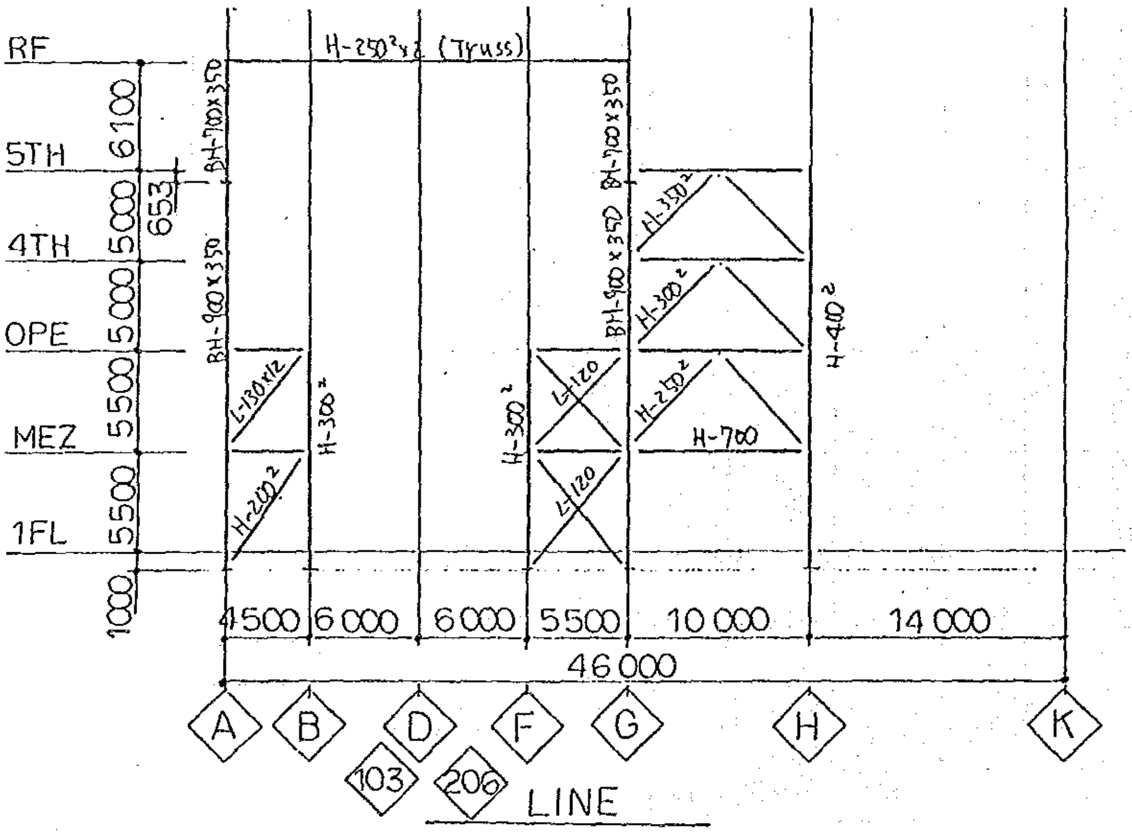


102 207 LINE

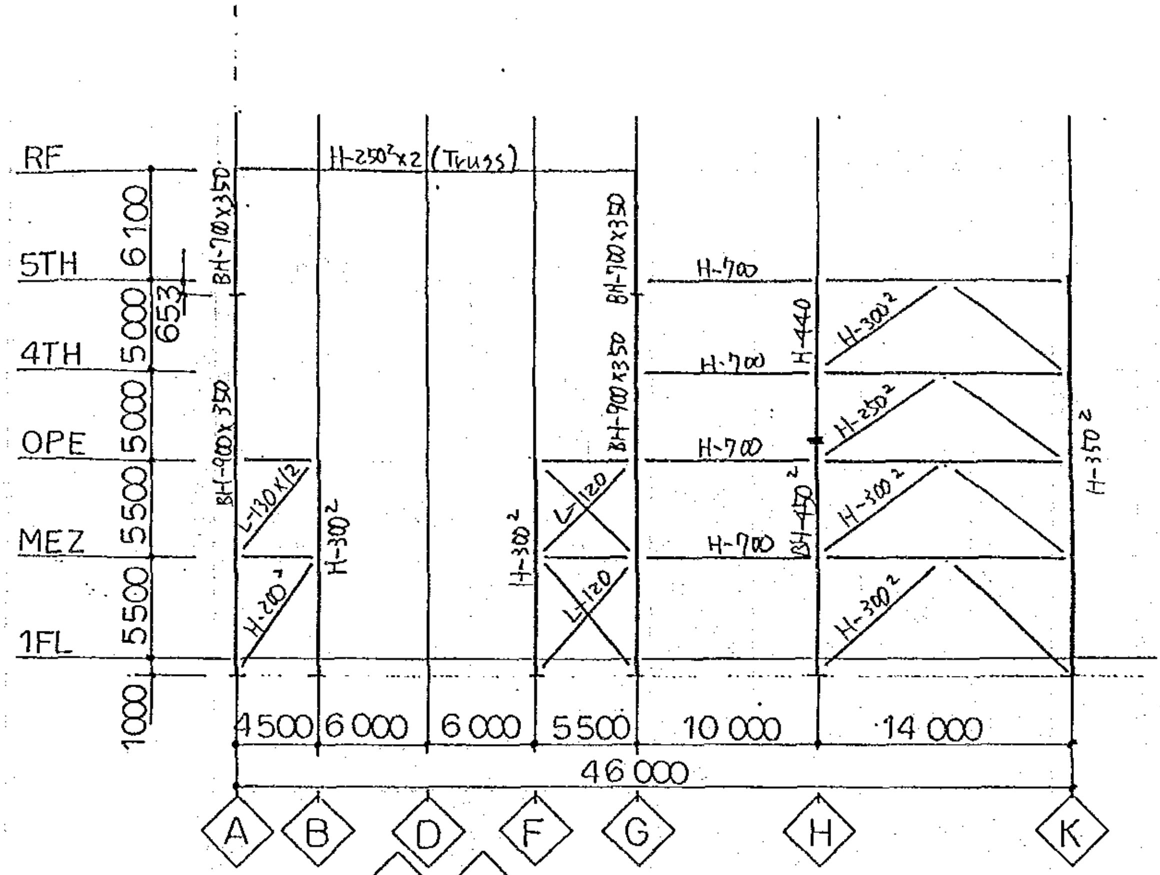


101 208 LINE

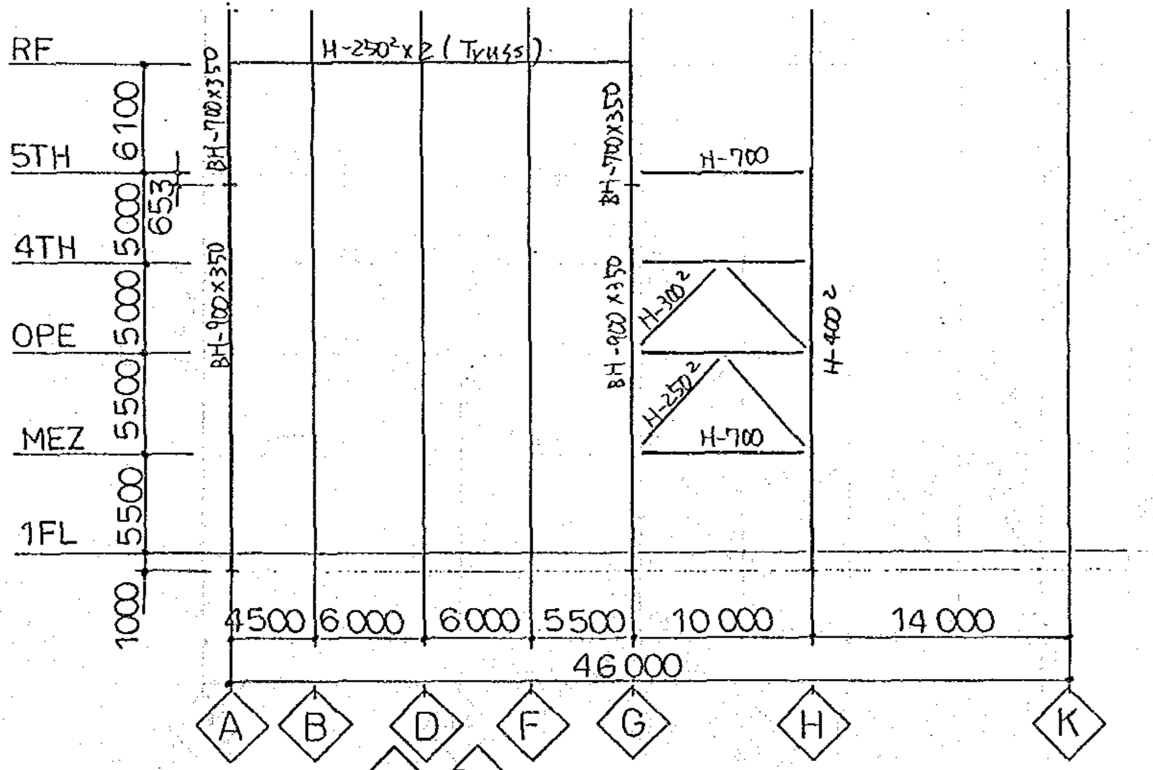

RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
BH-700x350
BH-900x350
H-250²x2 (Truss)
BH-700x350
BH-900x350
H-350²
H-300²
H-250²
H-700
H-400²
4500
6 000
6 000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
104
205
LINE


RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
BH-700x350
BH-900x350
H-250²x2 (Truss)
L-130x12
H-200²
H-300²
H-300²
L-120
L-120
BH-700x350
BH-900x350
H-350²
H-300²
H-250²
H-700
H-400²
4500
6 000
6000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
103
206
LINE

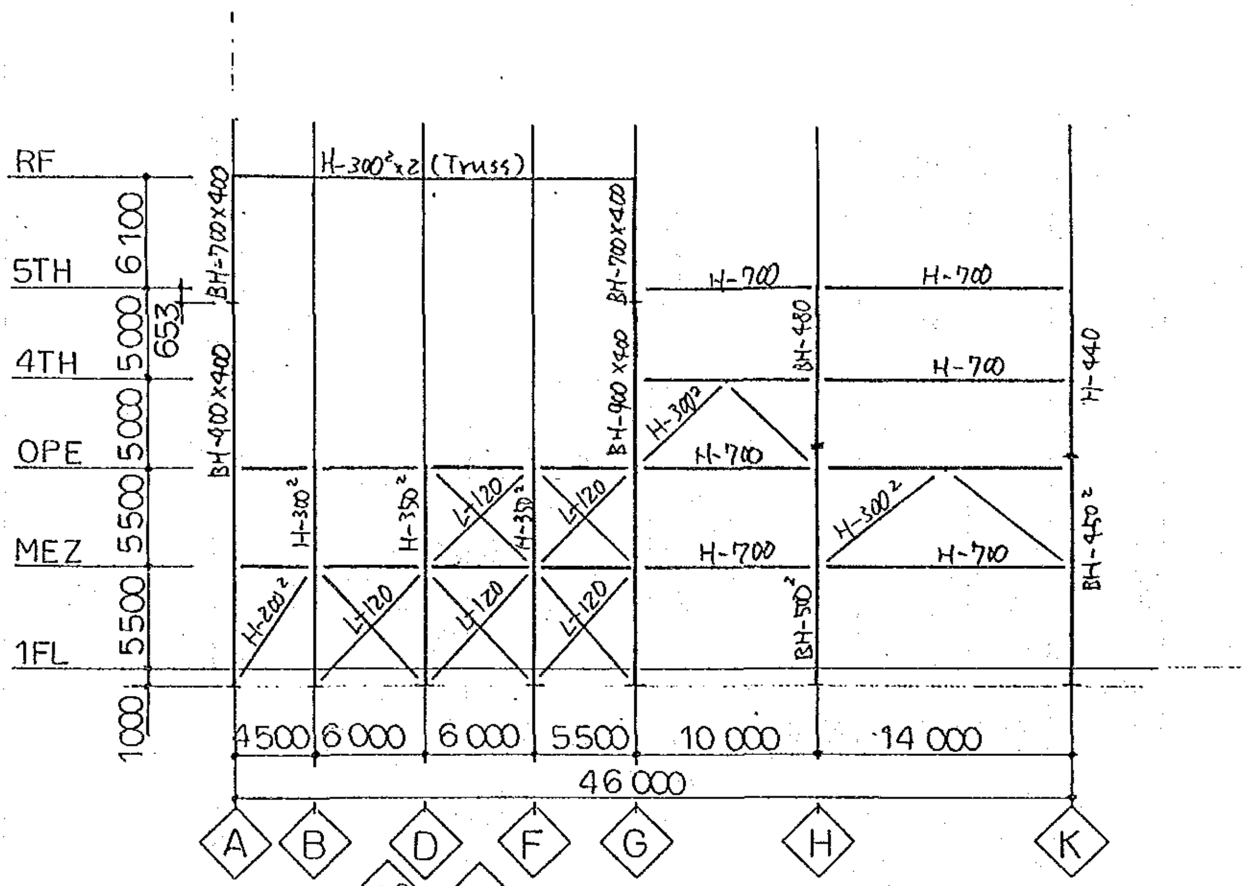
77



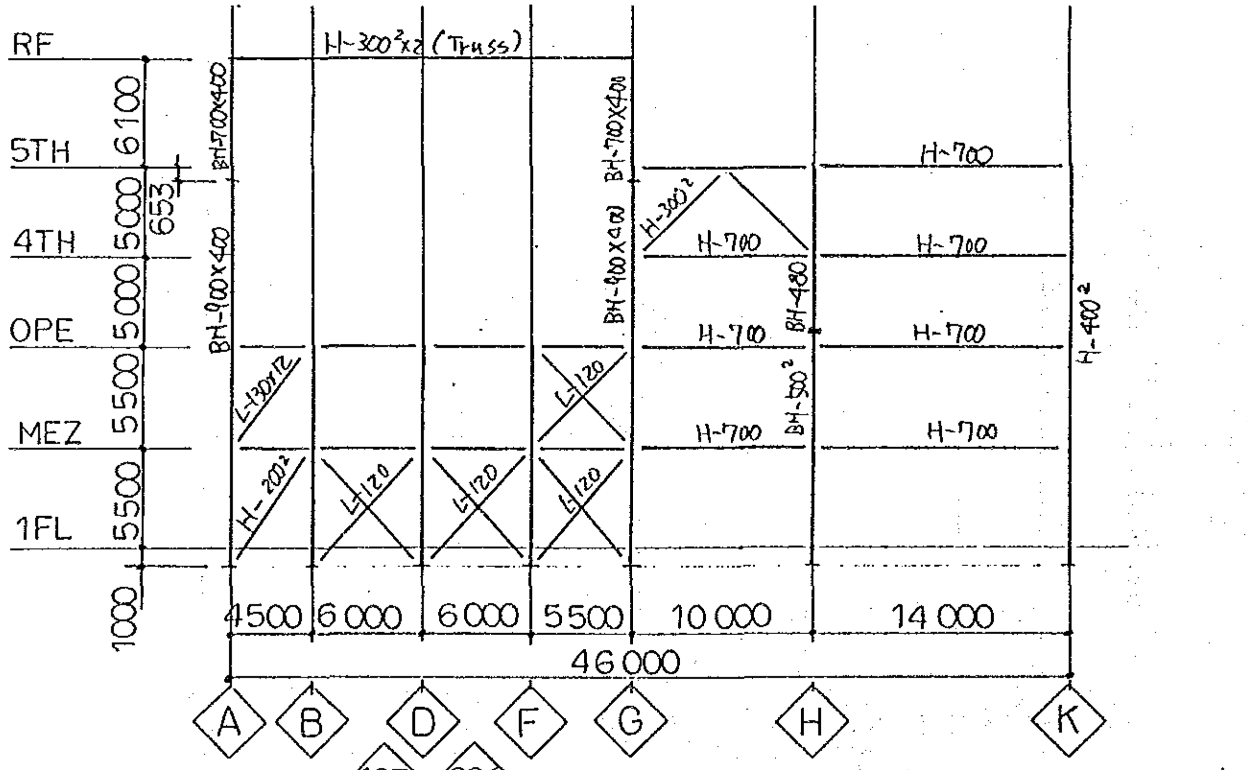
106 203 LINE



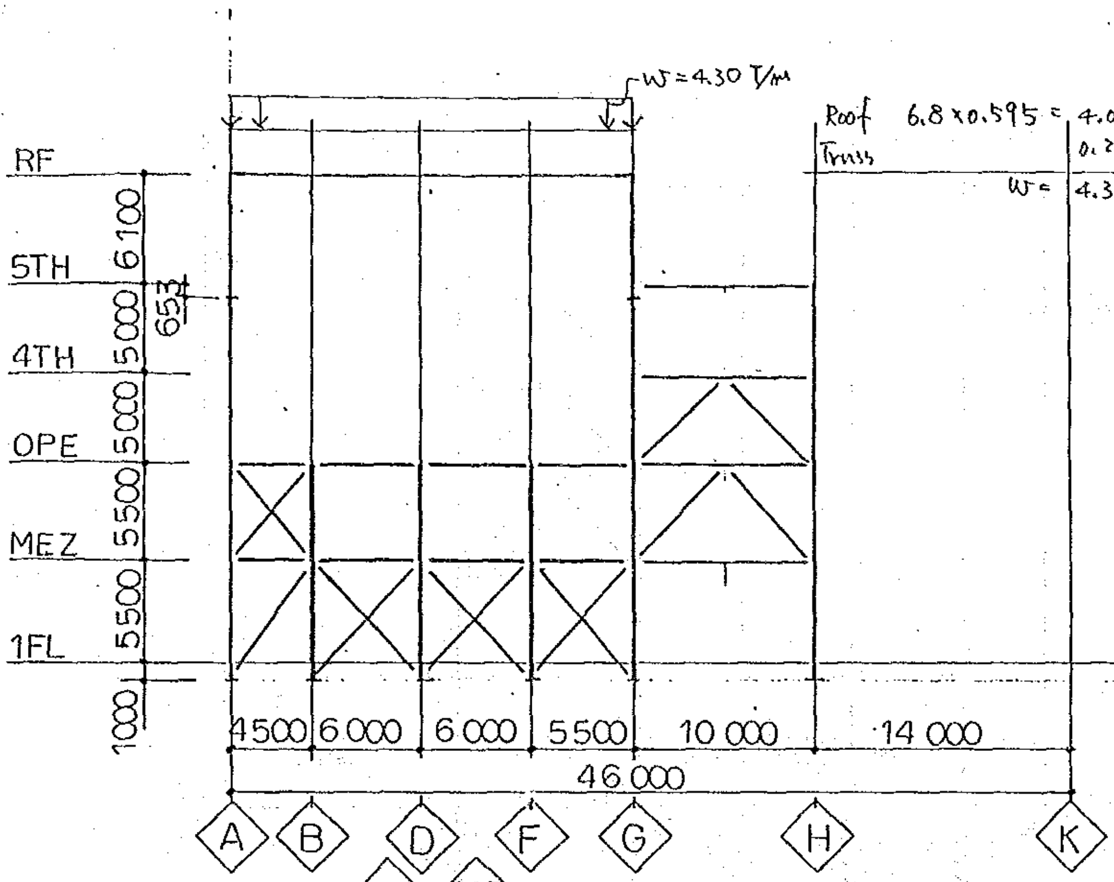
105 204 LINE



108 201 LINE

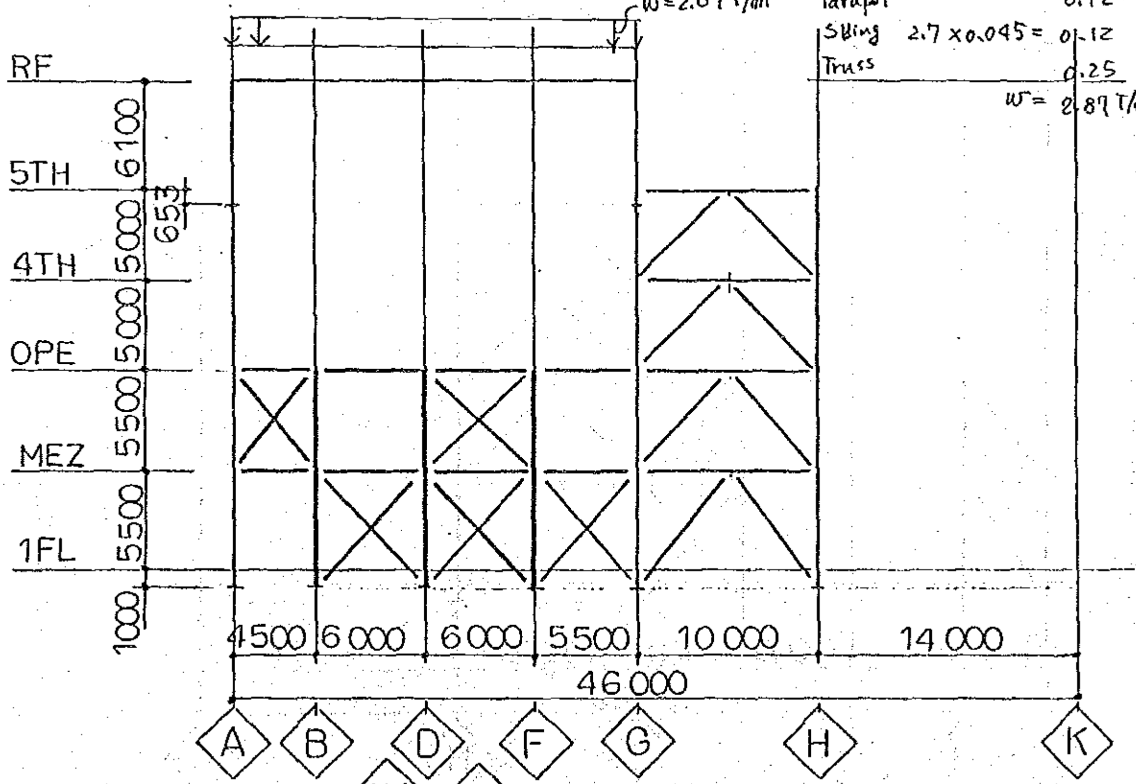


107 202 LINE



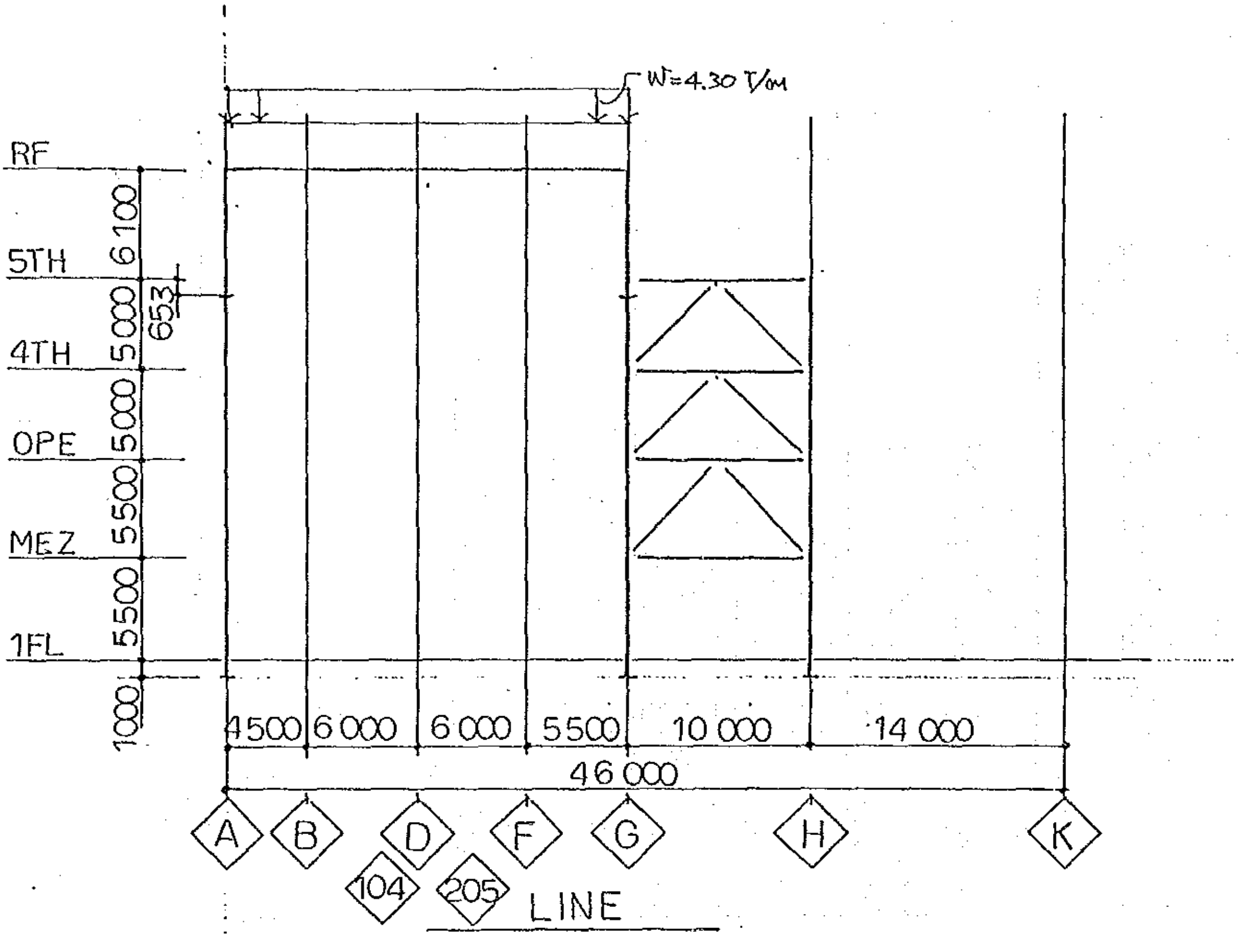
Roof 6.8×0.595 = 4.05
Truss 0.25
W = 4.30 T/m

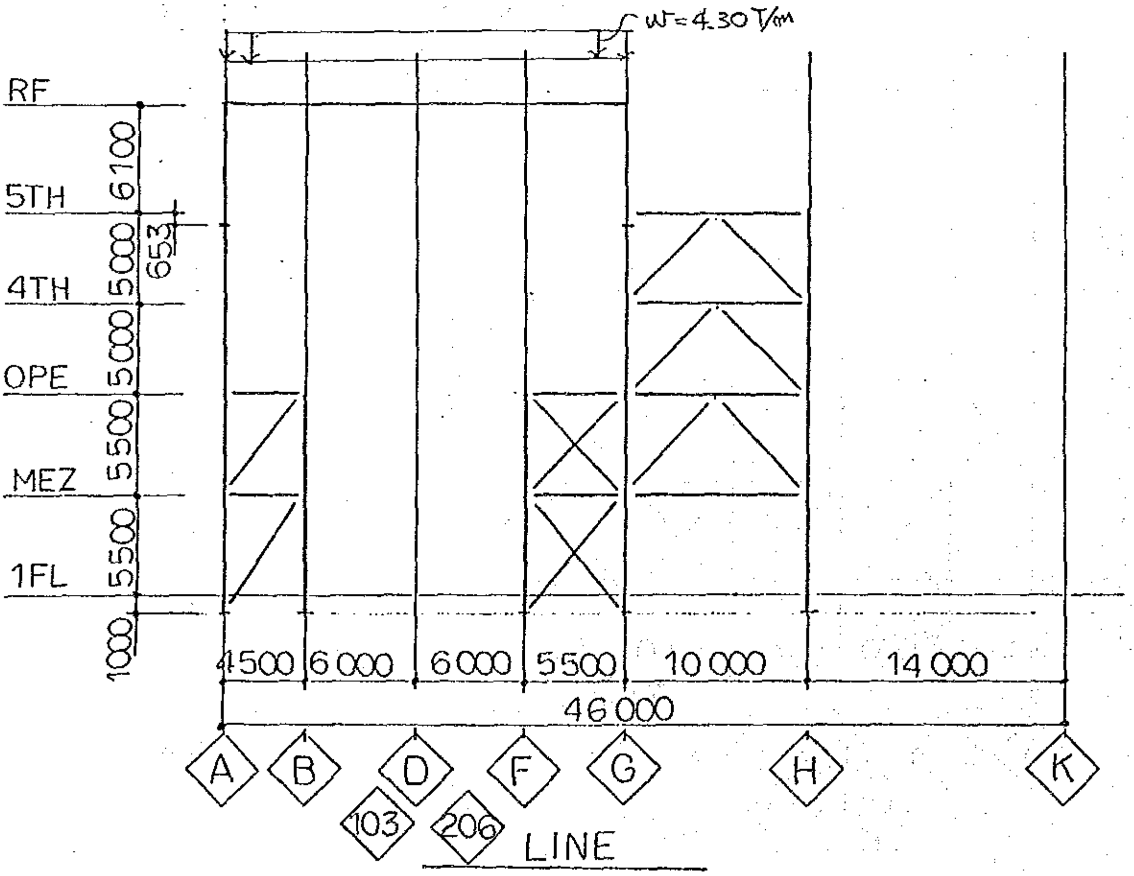
102 207 LINE

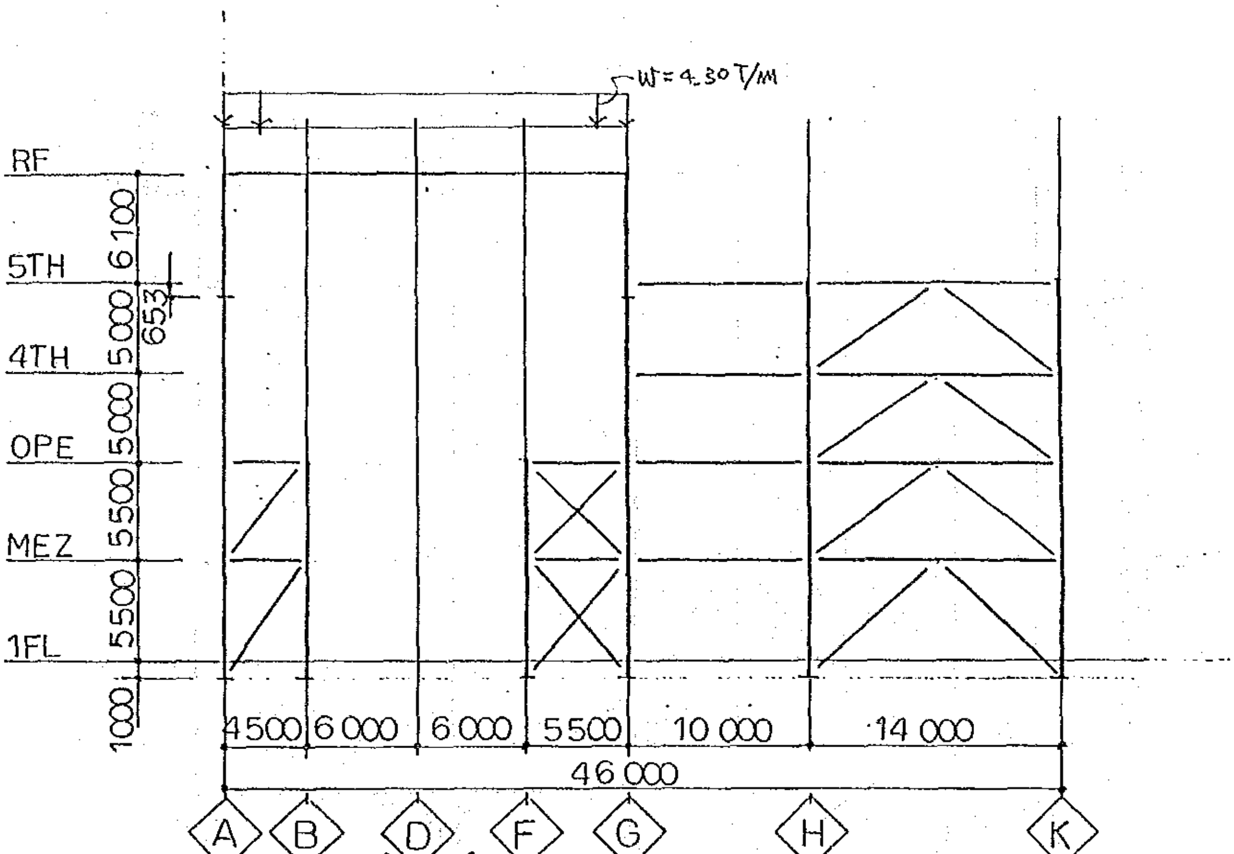


Roof 4.0×0.595 = 2.38
Parapet 0.12
Siding 2.7×0.045 = 0.12
Truss 0.25
W = 2.87 T/m

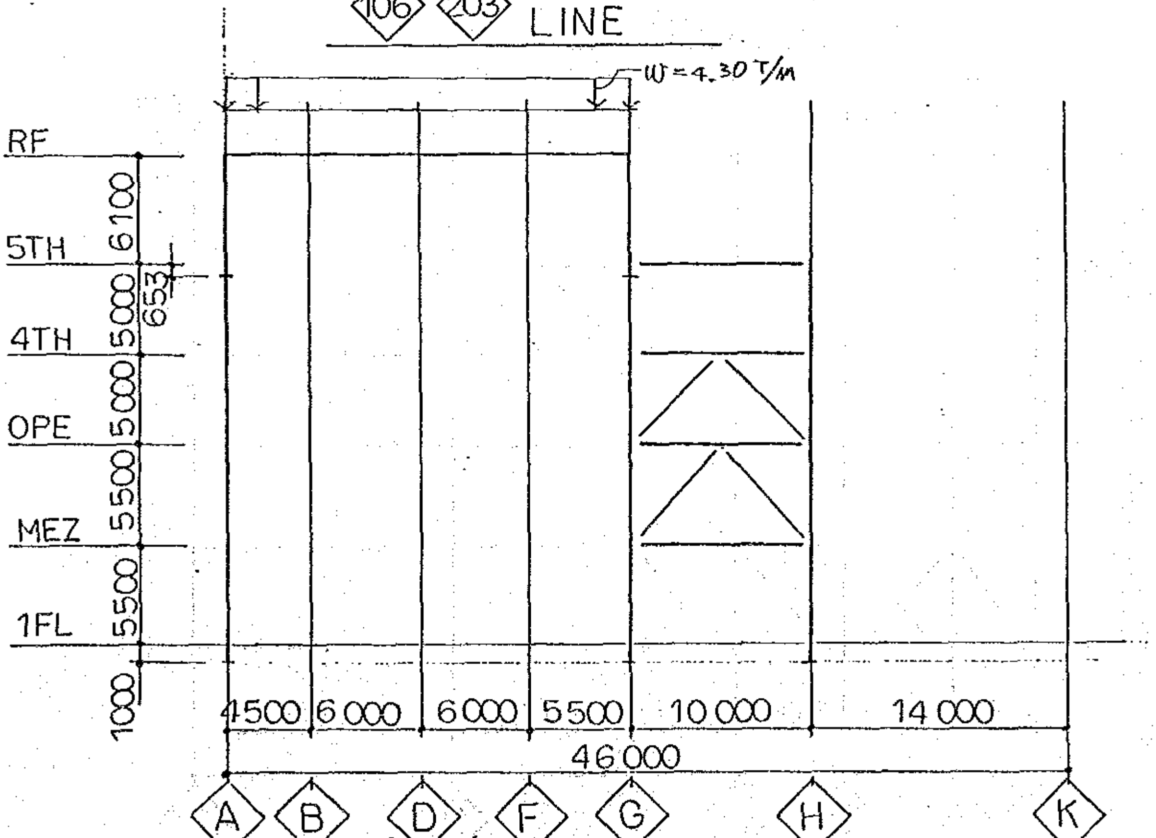
101 208 LINE


W=4.30 T/m
RF
6100
5TH
653
5000
4TH
5000
OPE
5500
MEZ
5500
1FL
1000
4500
6 000
6 000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
104
205
LINE

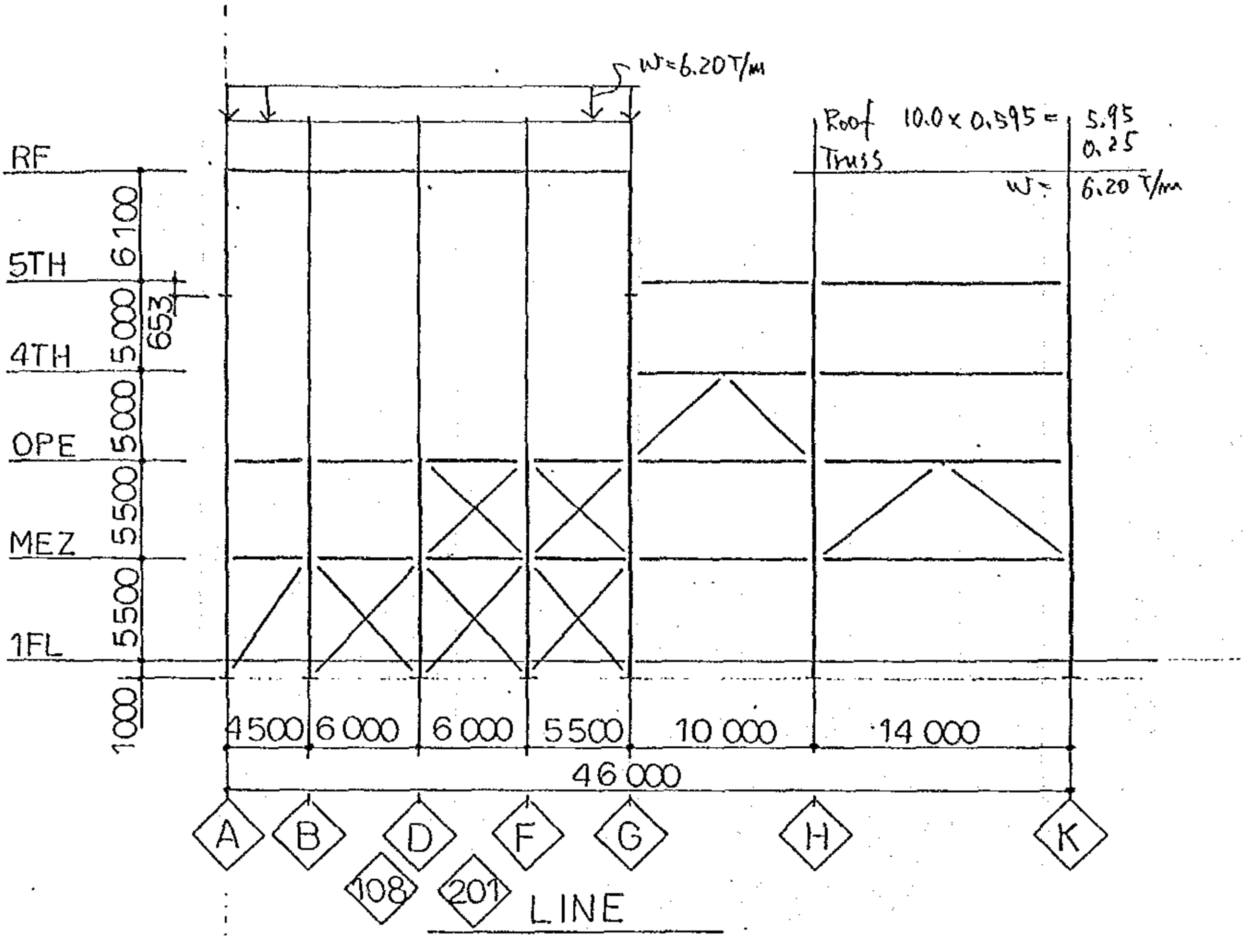

W=4.30 T/m
RF
6100
5TH
653
5000
4TH
5000
OPE
5500
MEZ
5500
1FL
1000
4500
6 000
6 000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
103
206
LINE



106 203 LINE

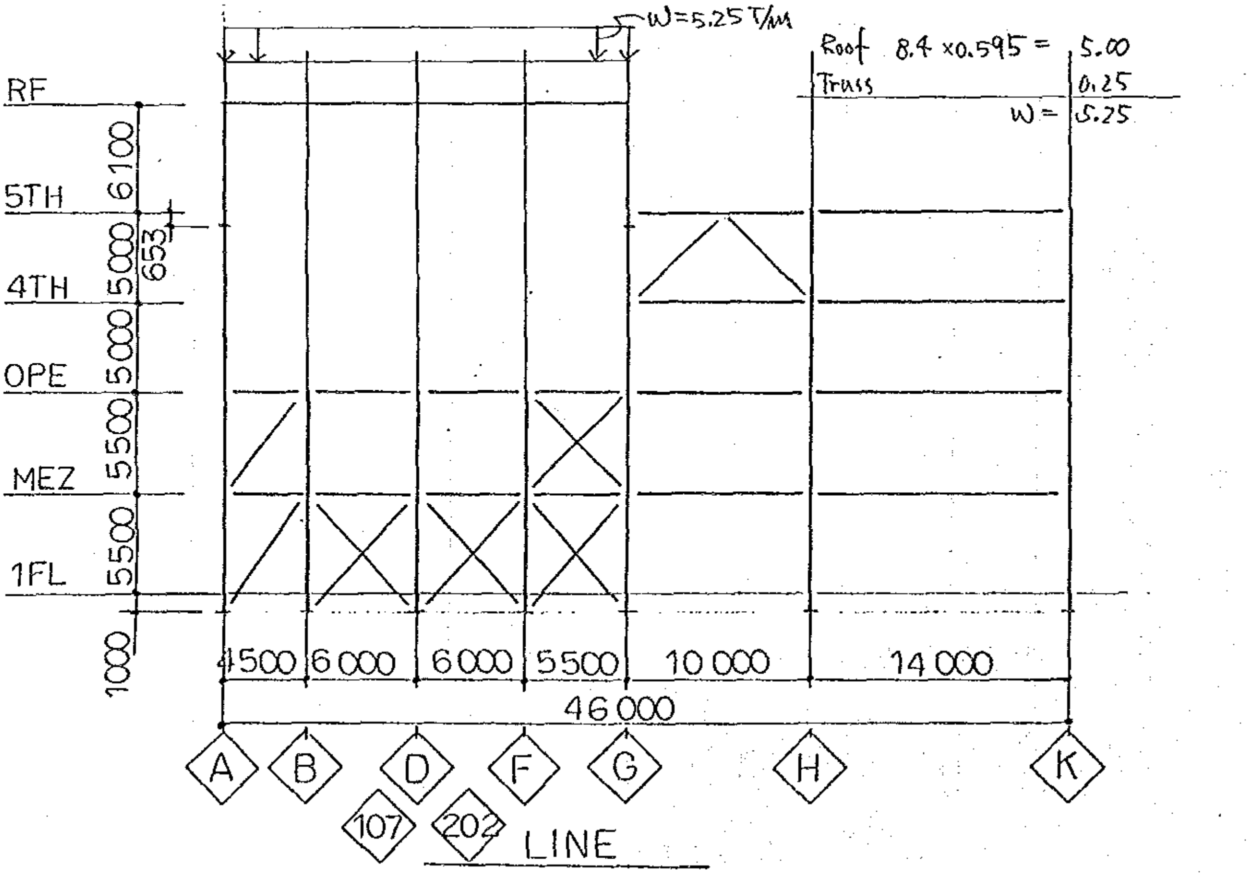


105 204 LINE



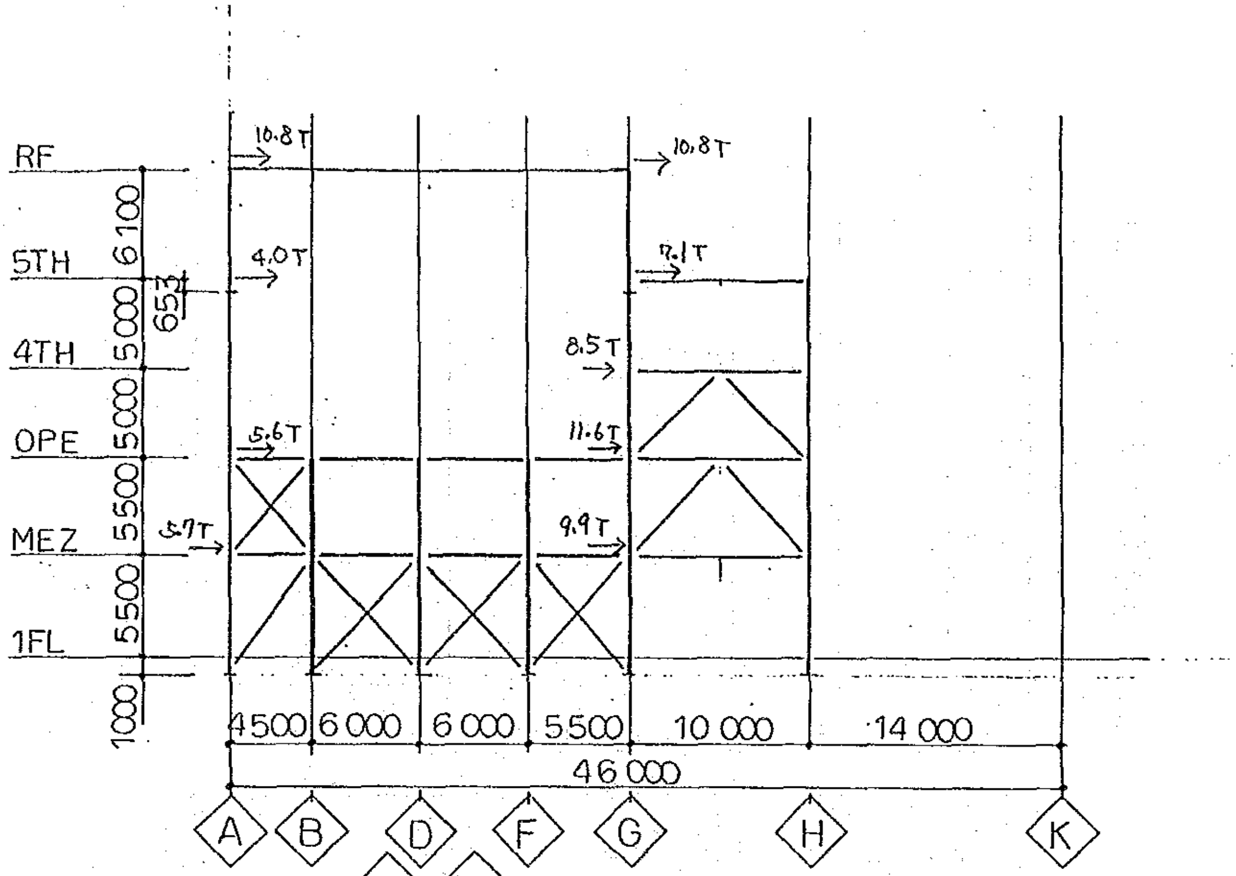
Roof 10.0 × 0.595 = 5.95
Truss 0.25
W = 6.20 T/m

108 201 LINE

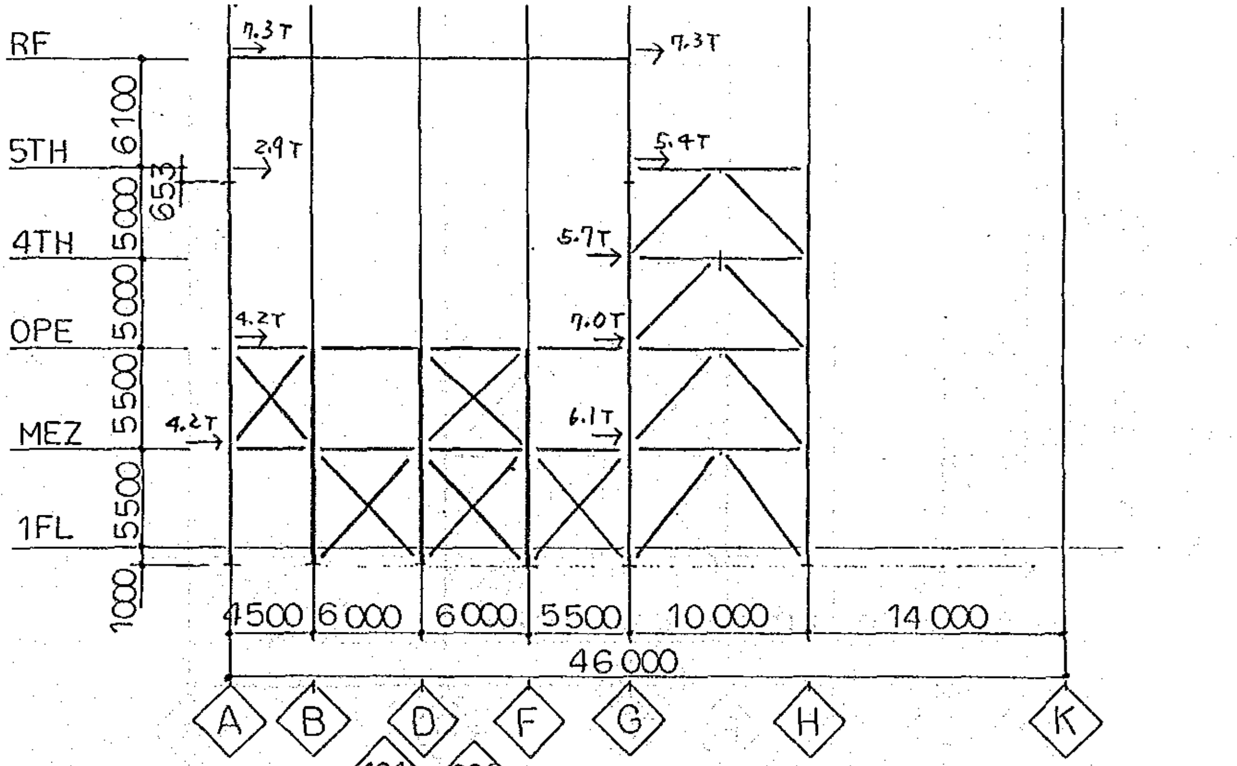


Roof 8.4 × 0.595 = 5.00
Truss 0.25
W = 5.25

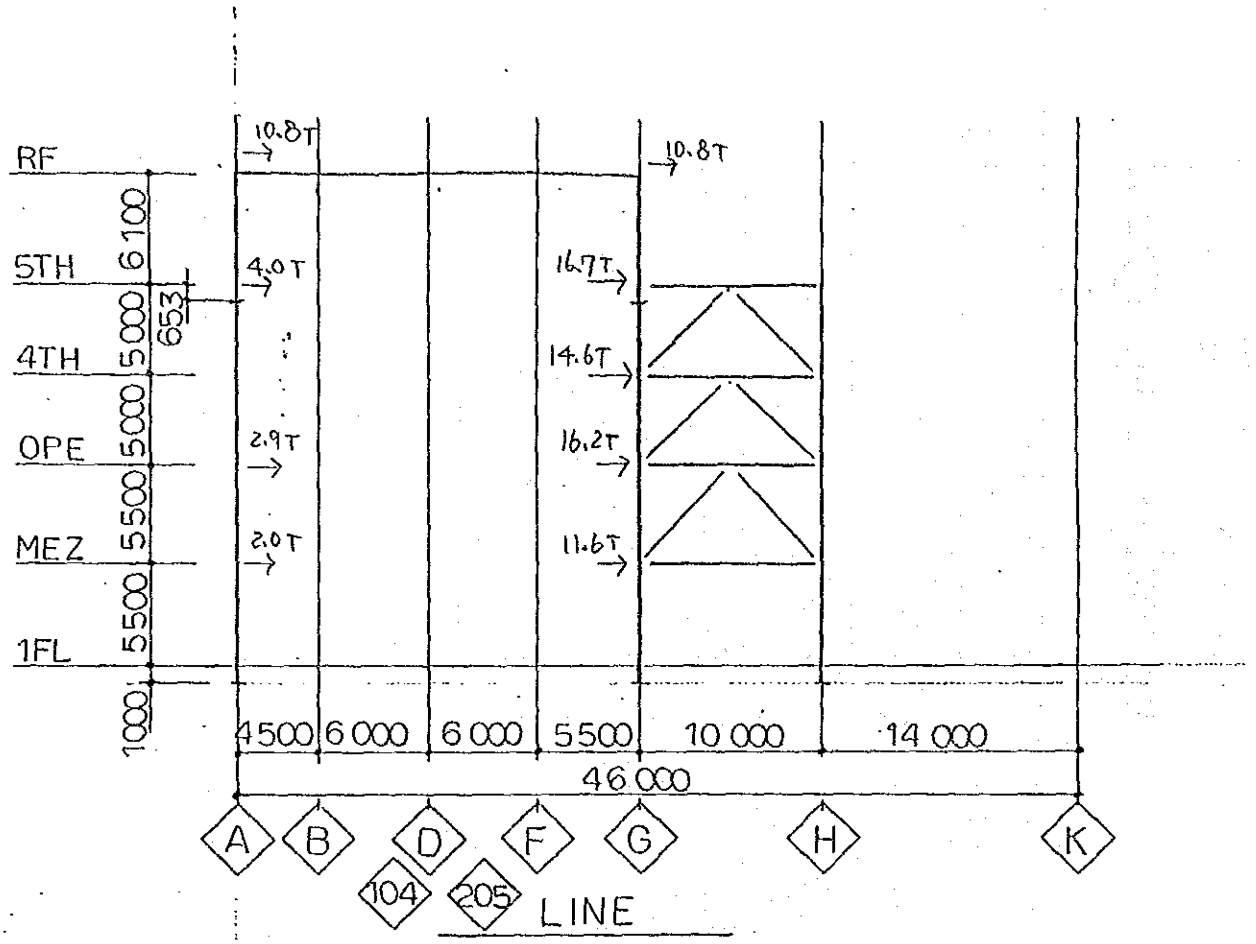
107 202 LINE

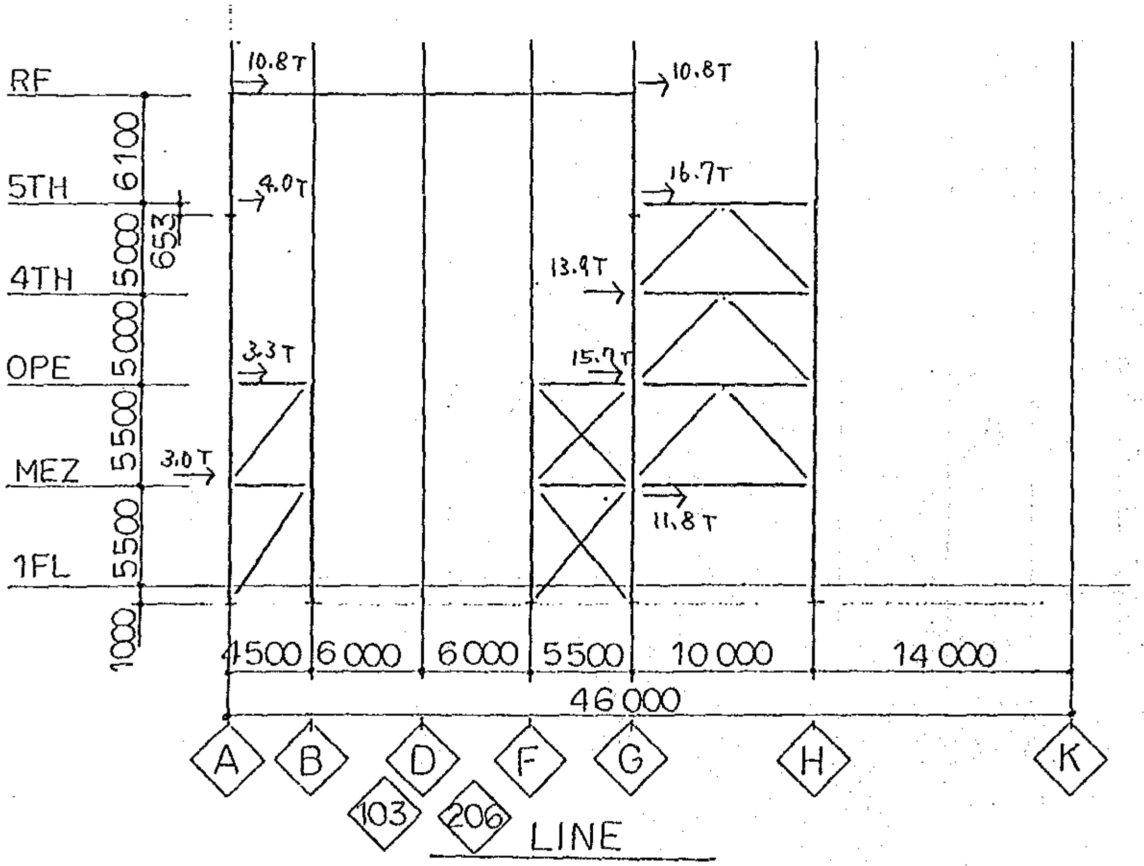


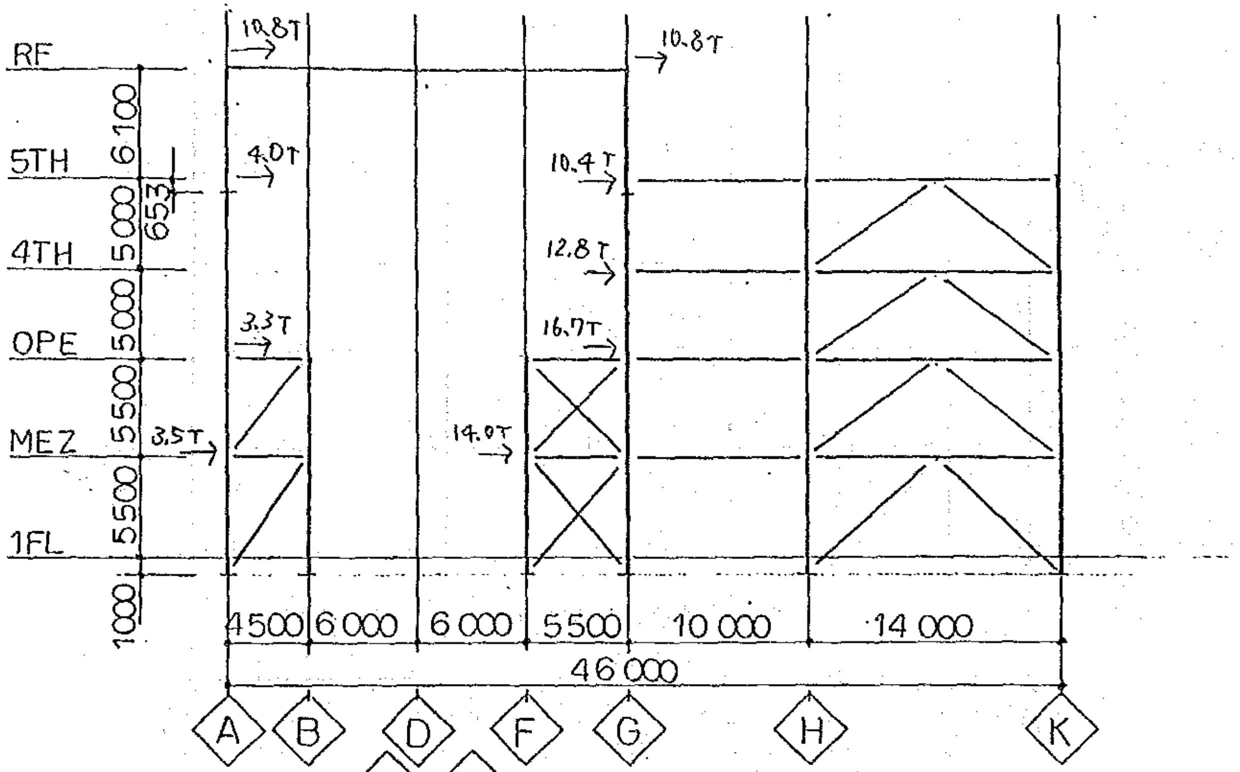
102 207 LINE



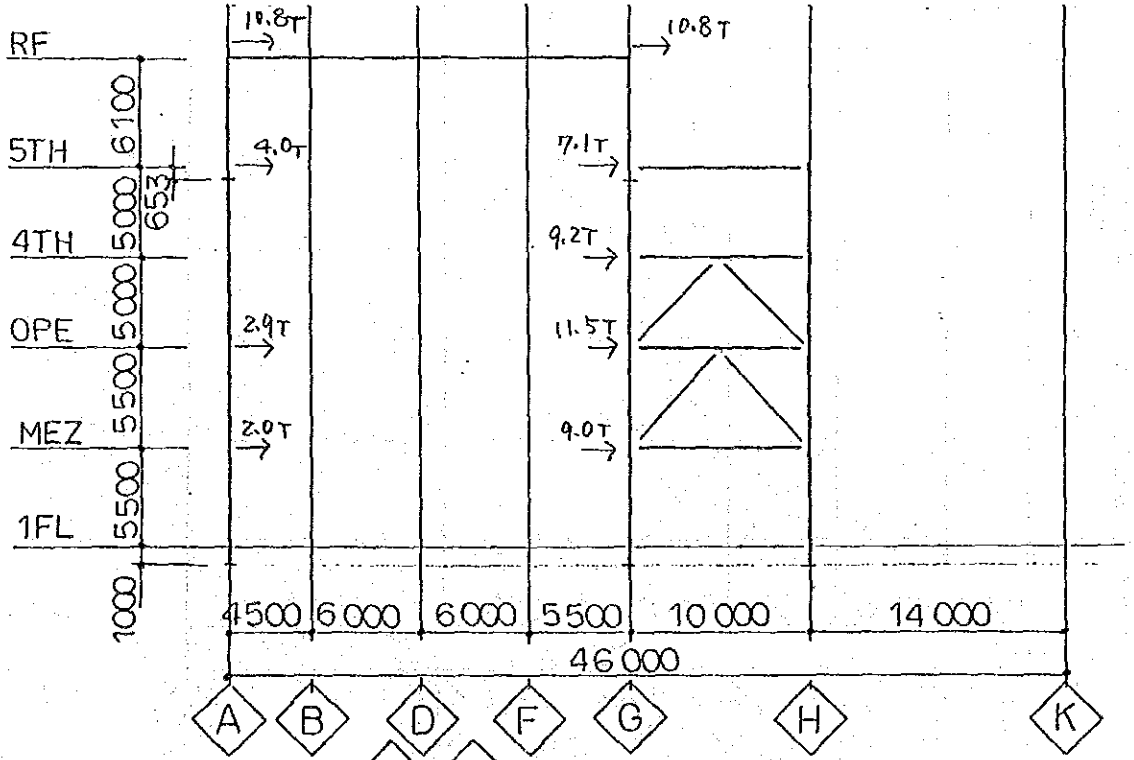
101 208 LINE


RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
10.8T
10.8T
4.0T
16.7T
14.6T
2.9T
16.2T
2.0T
11.6T
4500
6000
6000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
104
205
LINE

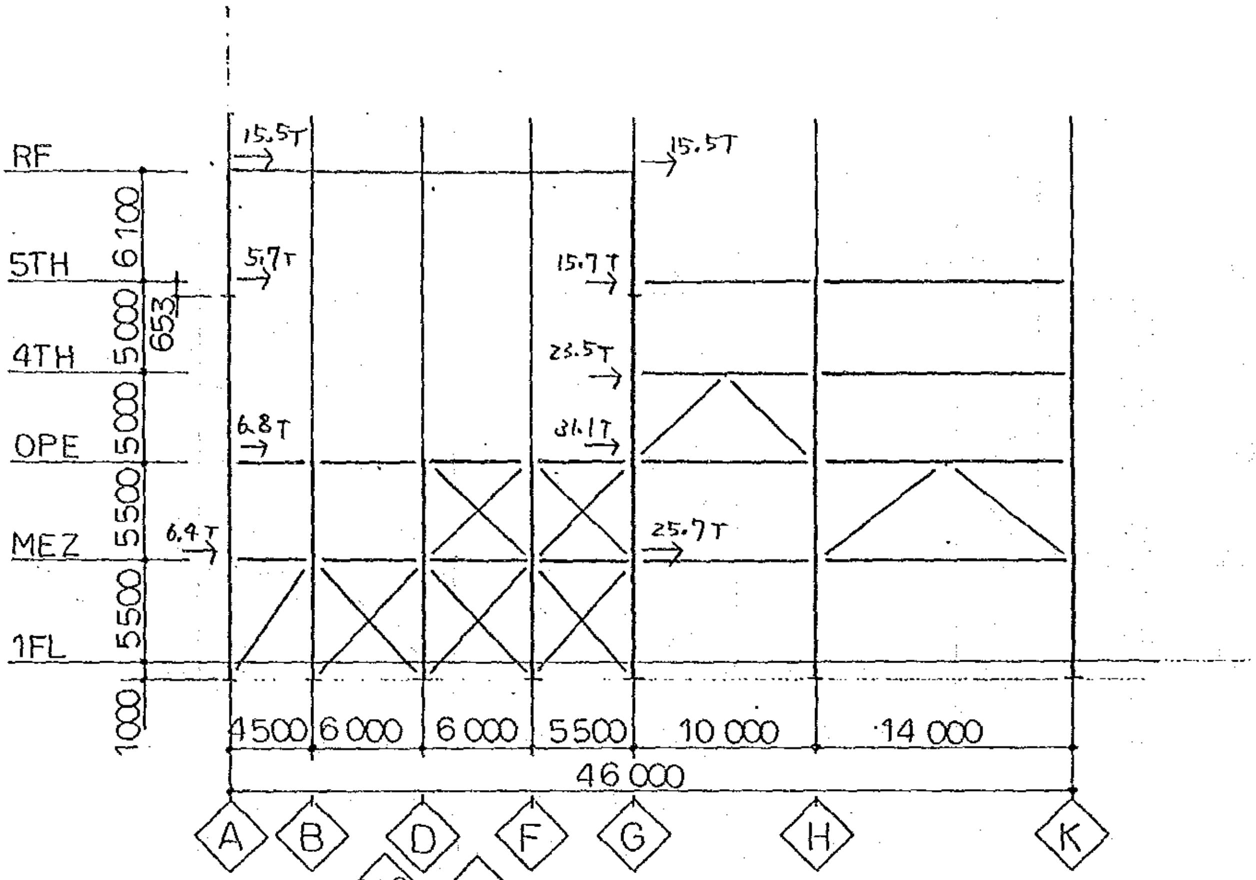

RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
10.8T
10.8T
4.0T
16.7T
13.9T
3.3T
15.7T
3.0T
11.8T
4500
6000
6000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
103
206
LINE



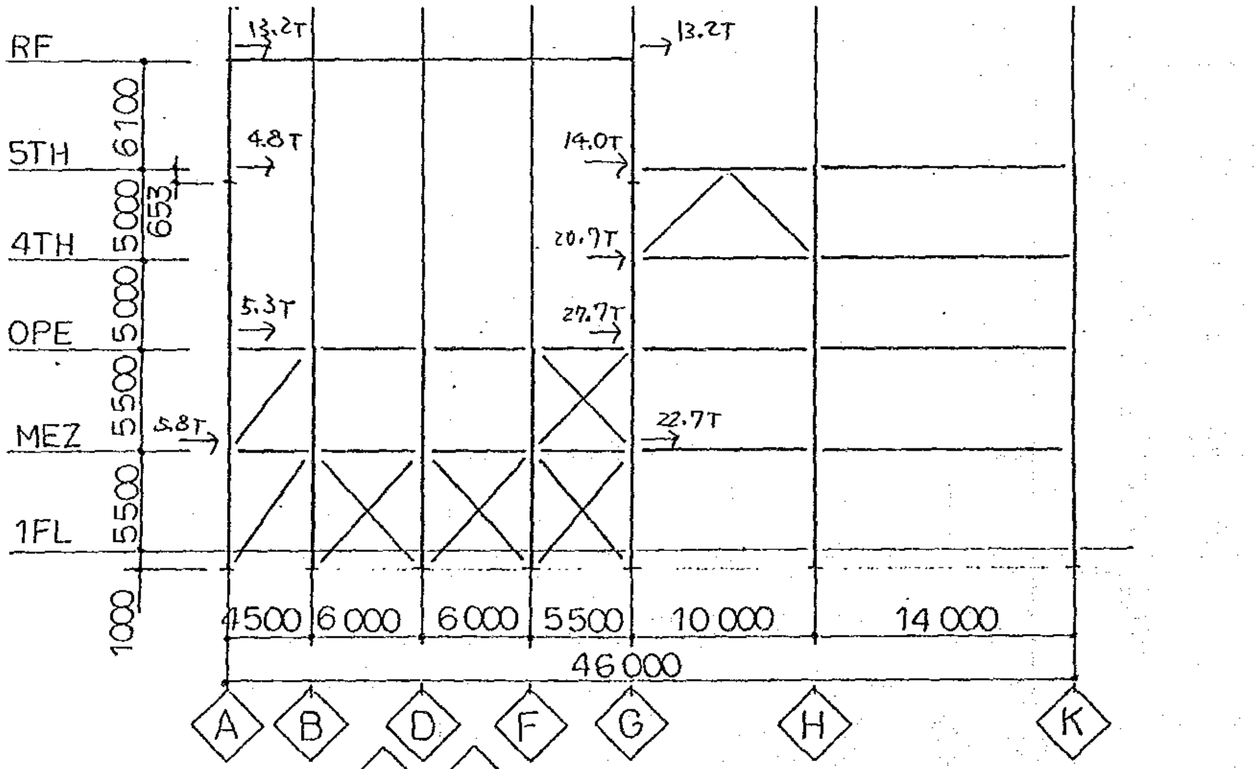
106 203 LINE



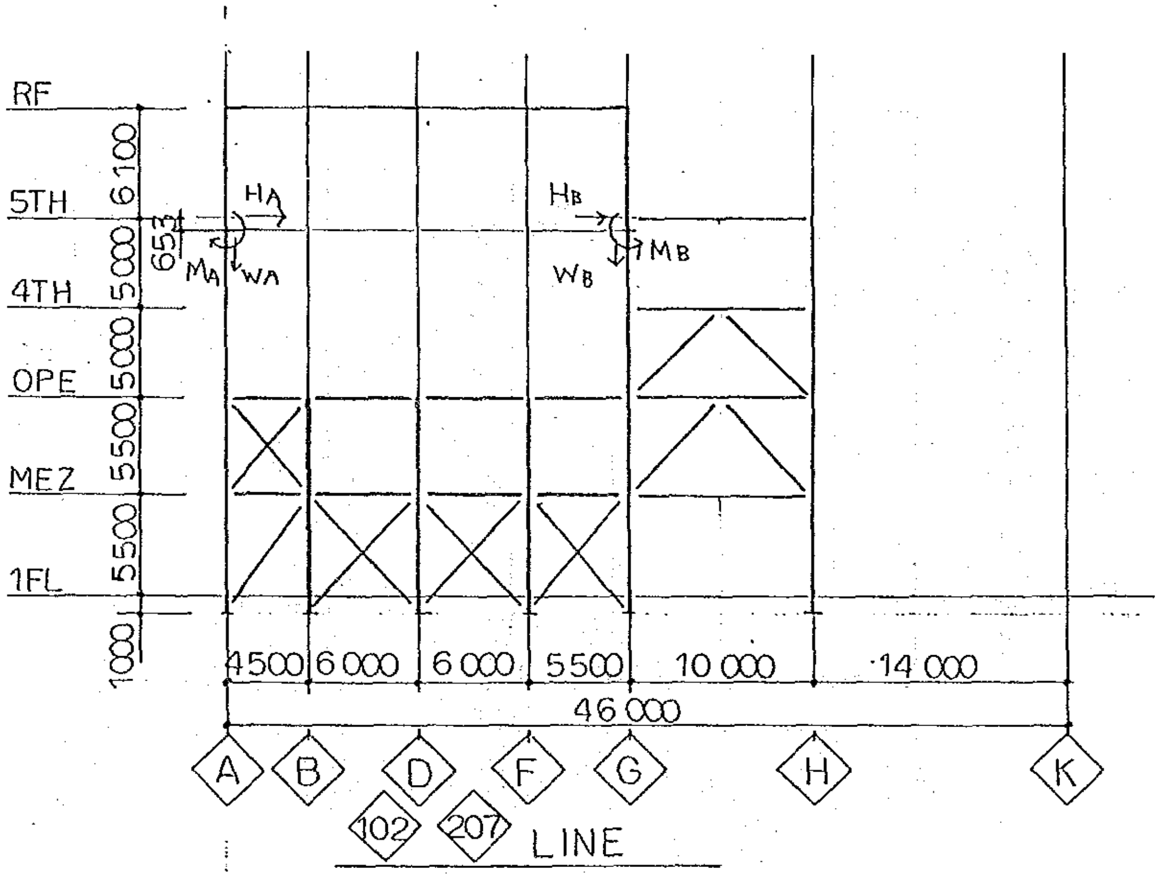
105 204 LINE



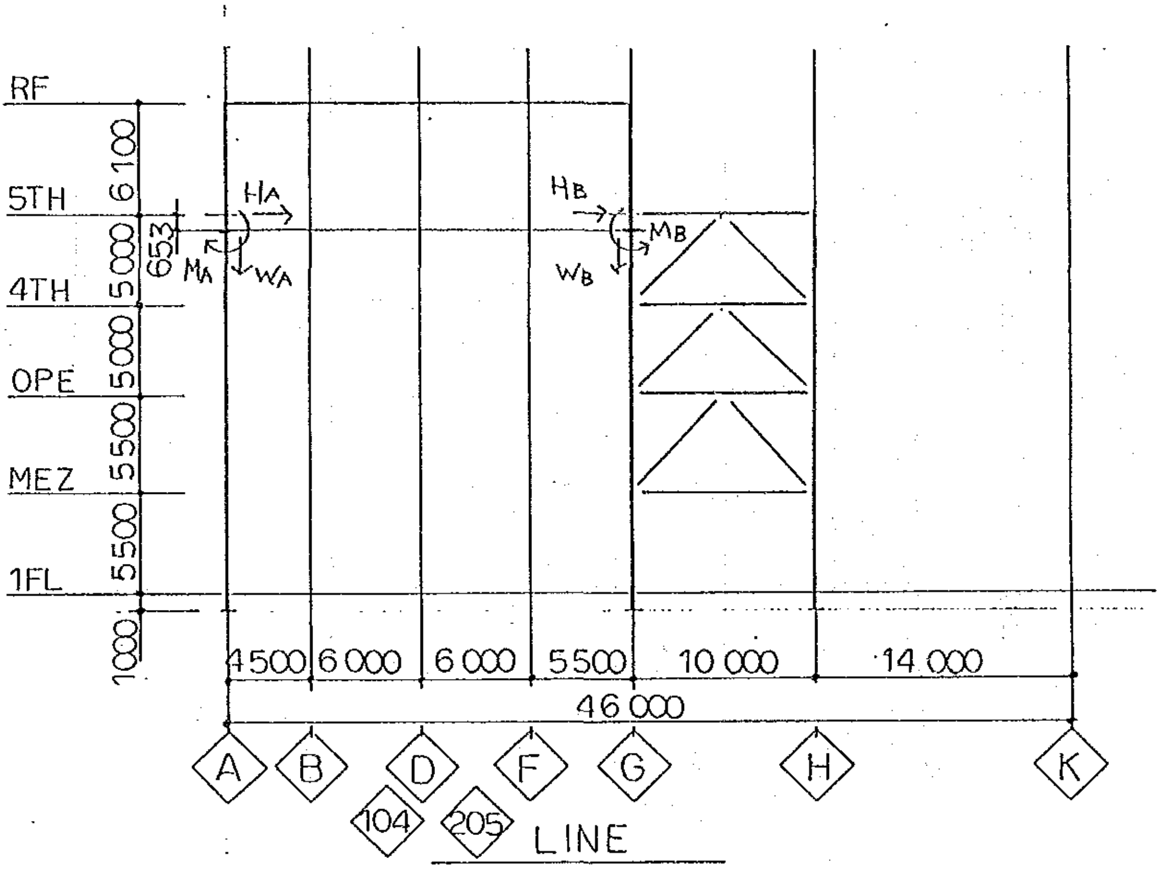
108 201 LINE



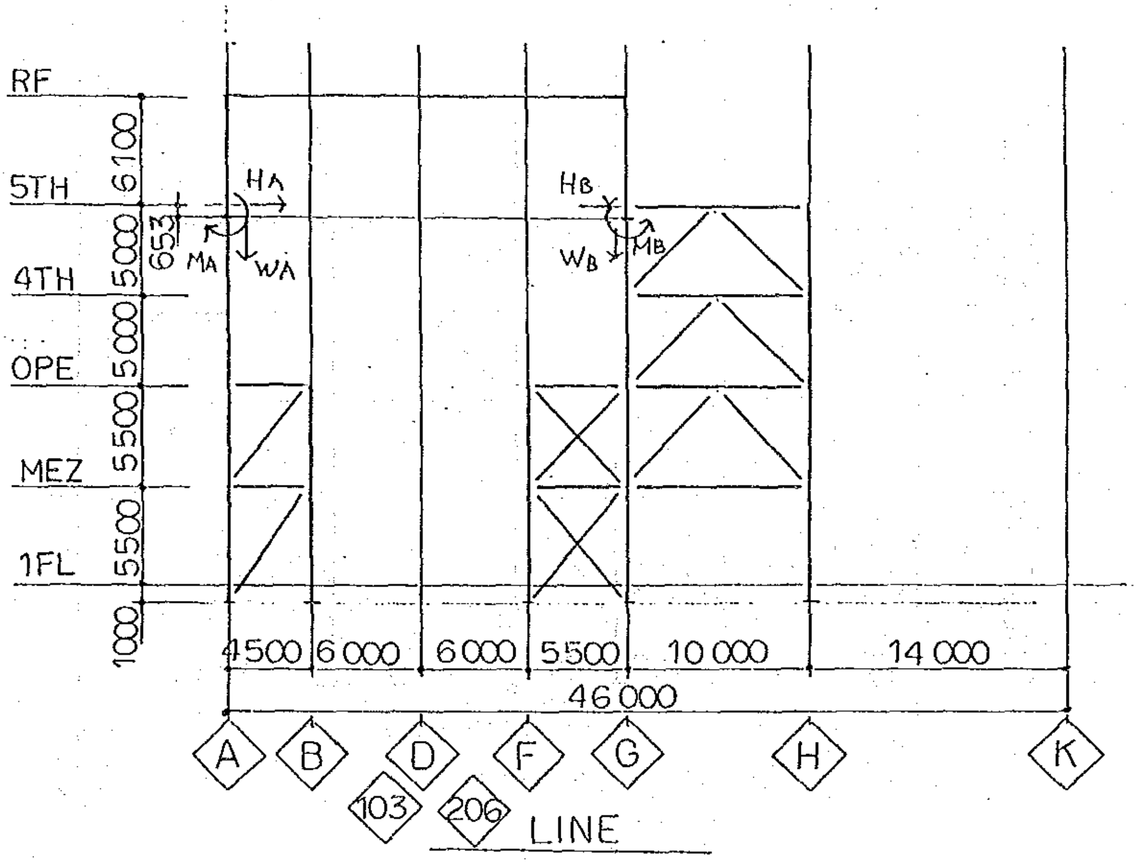
107 202 LINE



C.D.L.	WA =	24.8 T	WB =	13.3 T
	HA =	2.1 T	HB =	1.1 T
	MA =	19.8 T·m	MB =	10.6 T·m
C.L.L.	WA =	71.2 T	WB =	17.8 T
	HA =	5.9 T	HB =	1.5 T
	MA =	57.0 T·m	MB =	14.2 T·m
C.H.L. (K=0.17)	HA =	4.2 T	HB =	2.3 T



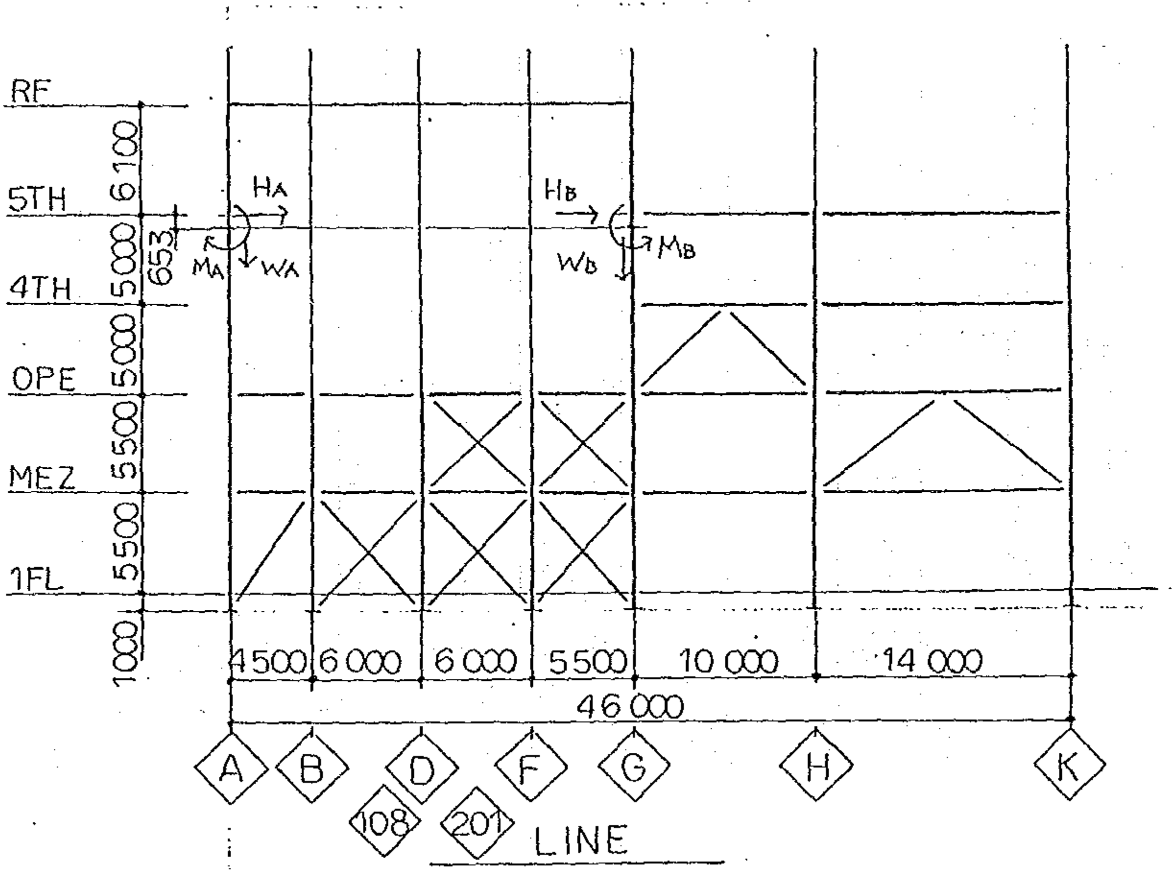
C.D.L.	WA =	24.8T	WB =	13.3T
	HA =	2.1T	HB =	1.1T
	MA =	19.8T.m	MB =	10.6T.m
C.L.L.	WA =	71.2T	WB =	17.8T
	HA =	5.9T	HB =	1.5T
	MA =	57.0T.m	MB =	14.2T.m
C.H.L.	HA =	4.2T	HB =	2.3T



C.D.L.
WA = 24.8 T
HA = 2.1 T
MA = 19.8 T·m
WB = 13.3 T
HB = 1.1 T
MB = 10.6 T

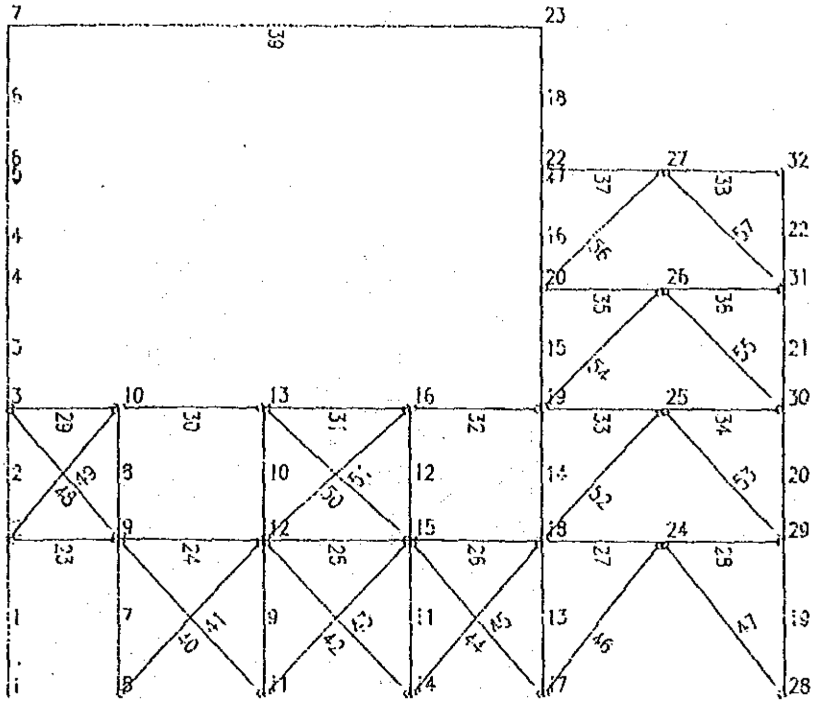
C.L.L.
WA = 71.2 T
HA = 5.9 T
MA = 57.0 T·m
WB = 17.8 T
HB = 1.5 T
MB = 14.2 T·m

C.H.L.
HA = 4.2 T
HB = 2.3 T



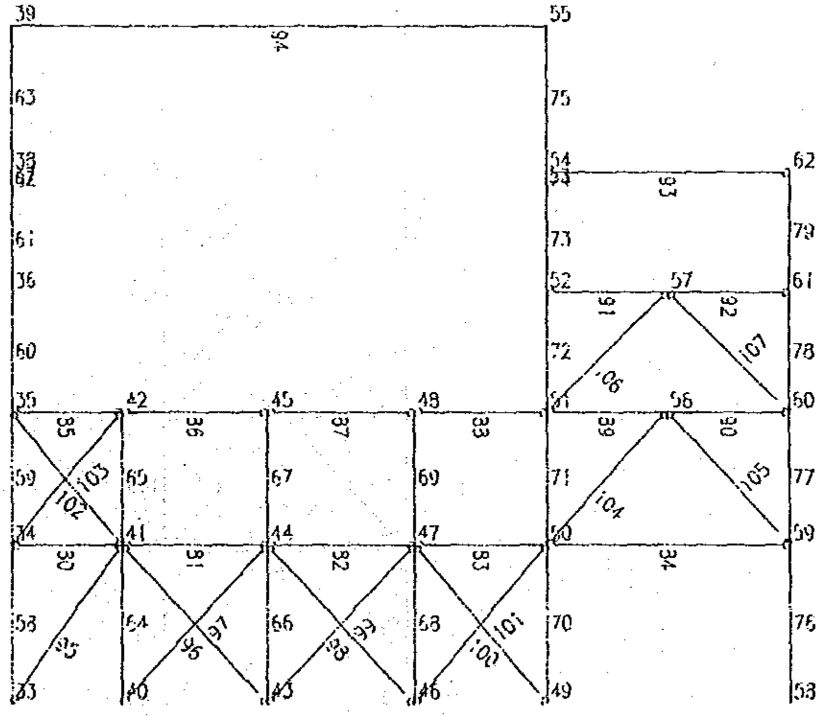
C.D.L.	WA = 28.1 T	WB = 15.1 T
	HA = 2.3 T	HB = 1.3 T
	MA = 22.5 T.m	MB = 12.1 T.m
C.L.L.	WA = 80.6 T	WB = 20.2 T
	HA = 6.7 T	HB = 1.7 T
	MA = 64.5 T.m	MB = 16.2 T.m
C.H.L.	HA = 4.8 T	HB = 2.6 T

101



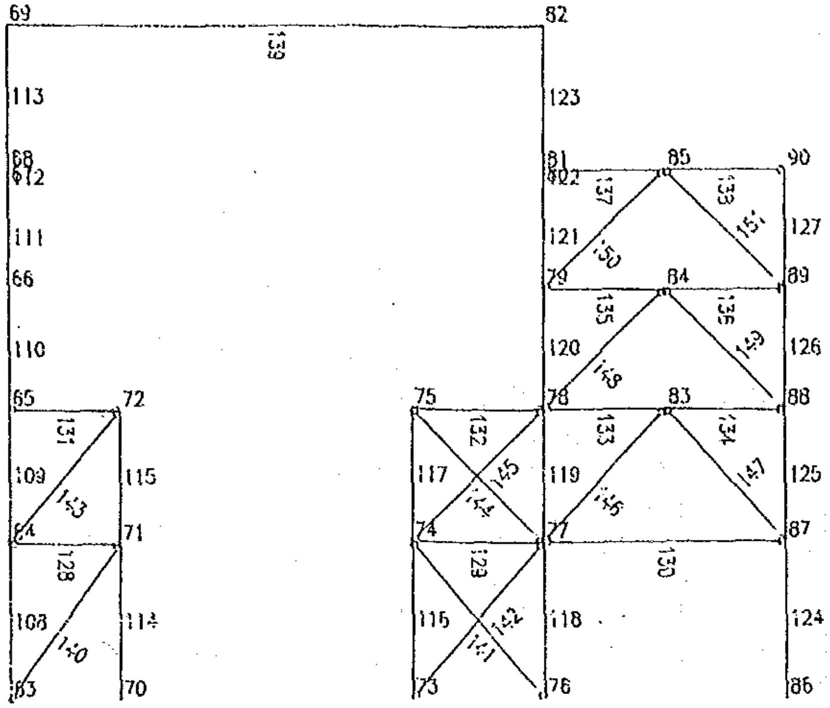
フレーム モデル 図

(101 - LINE SCALE 1/300)



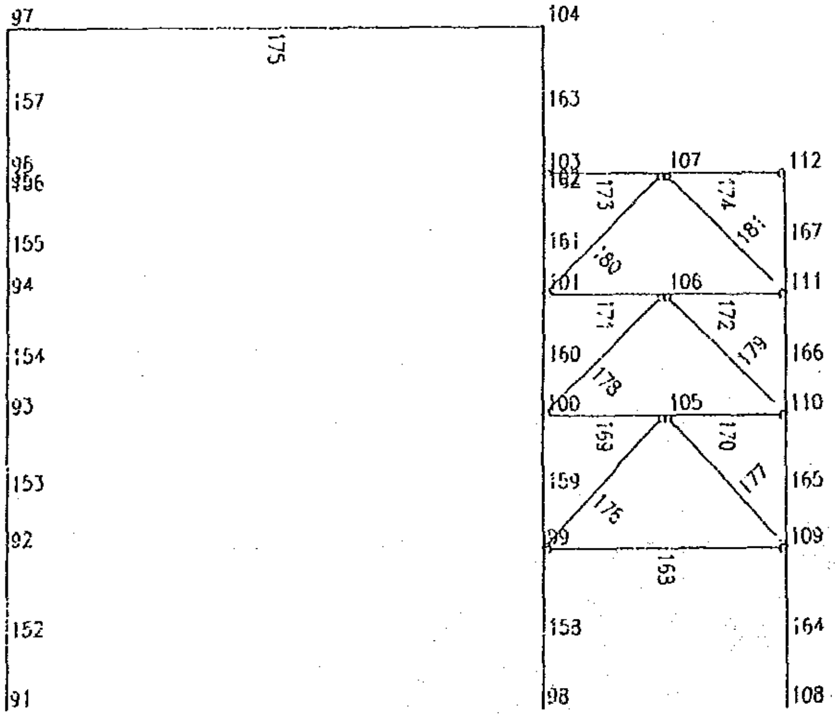
フレーム モデル 図

(102 - LINE SCALE 1/300)



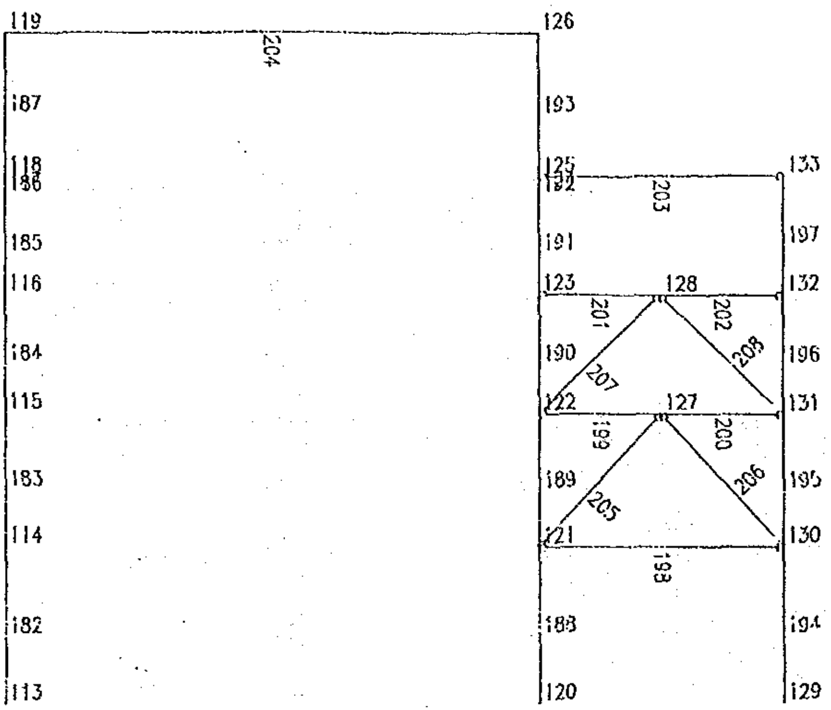
フレーム　モデル　図

（ 103 -- LINE　SCALE 1/300 ）



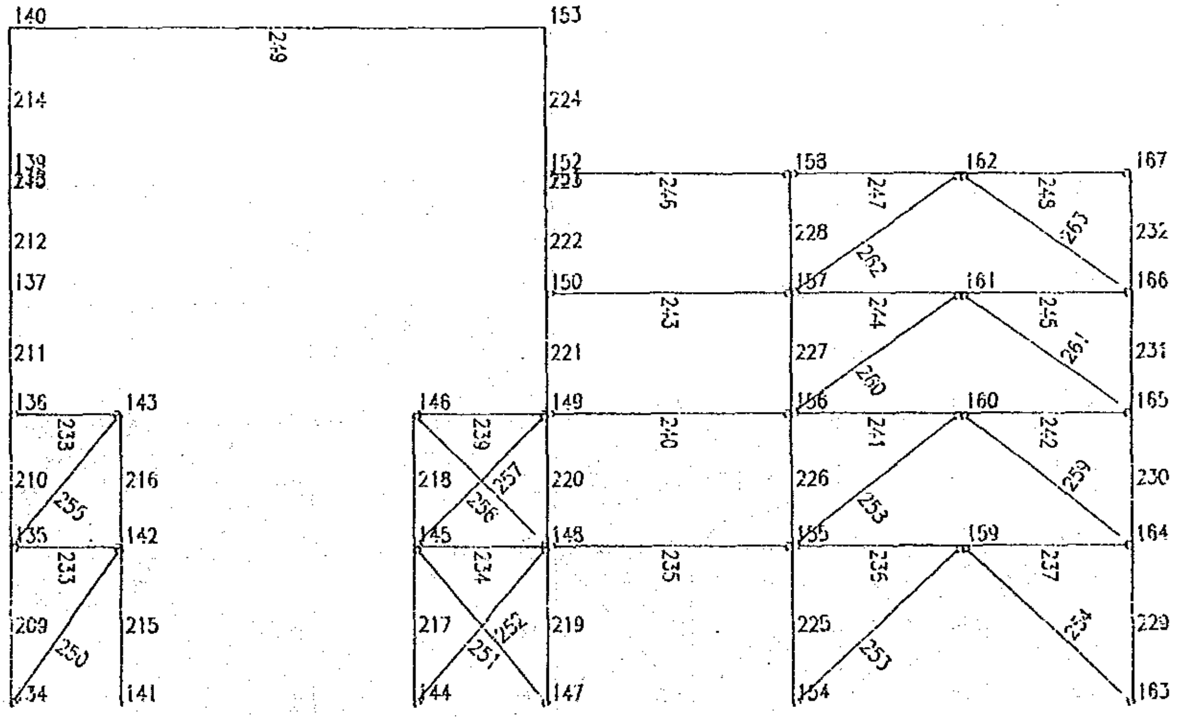
フレーム　モデル　図

（ 104 - LINE　SCALE 1/300 ）



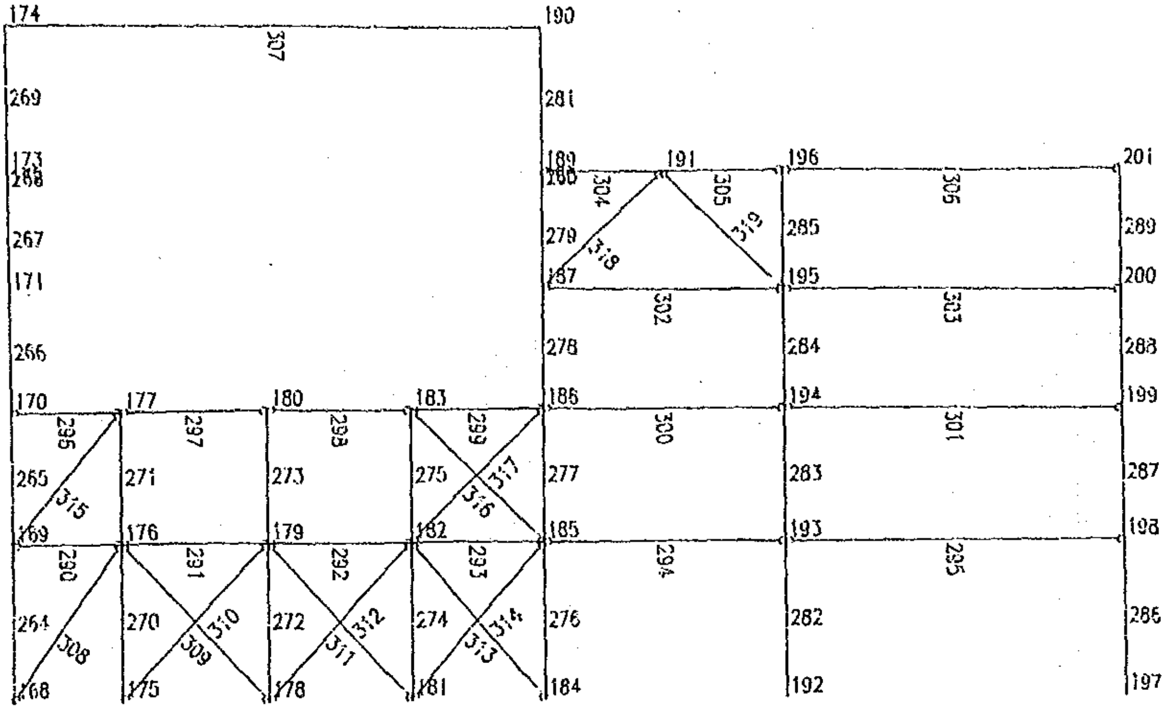
フレーム モデル 図

(105 - LINE SCALE 1/300)



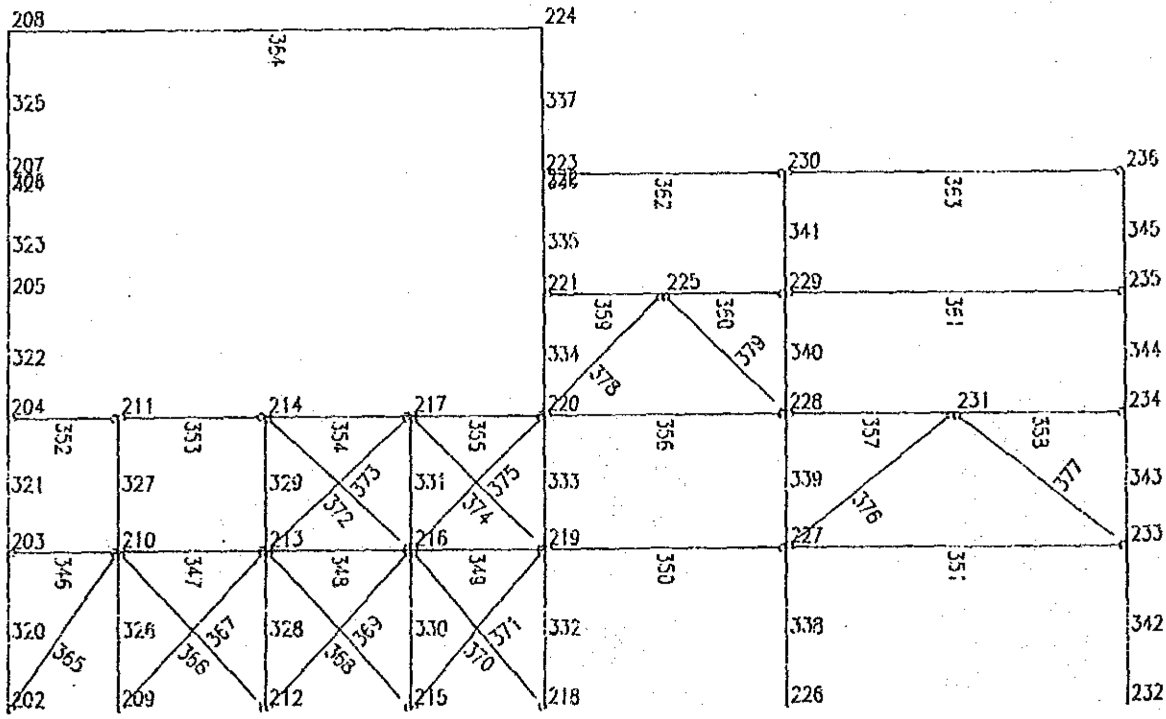
フレーム モデル 図

(106 - LINE SCALE 1/300)



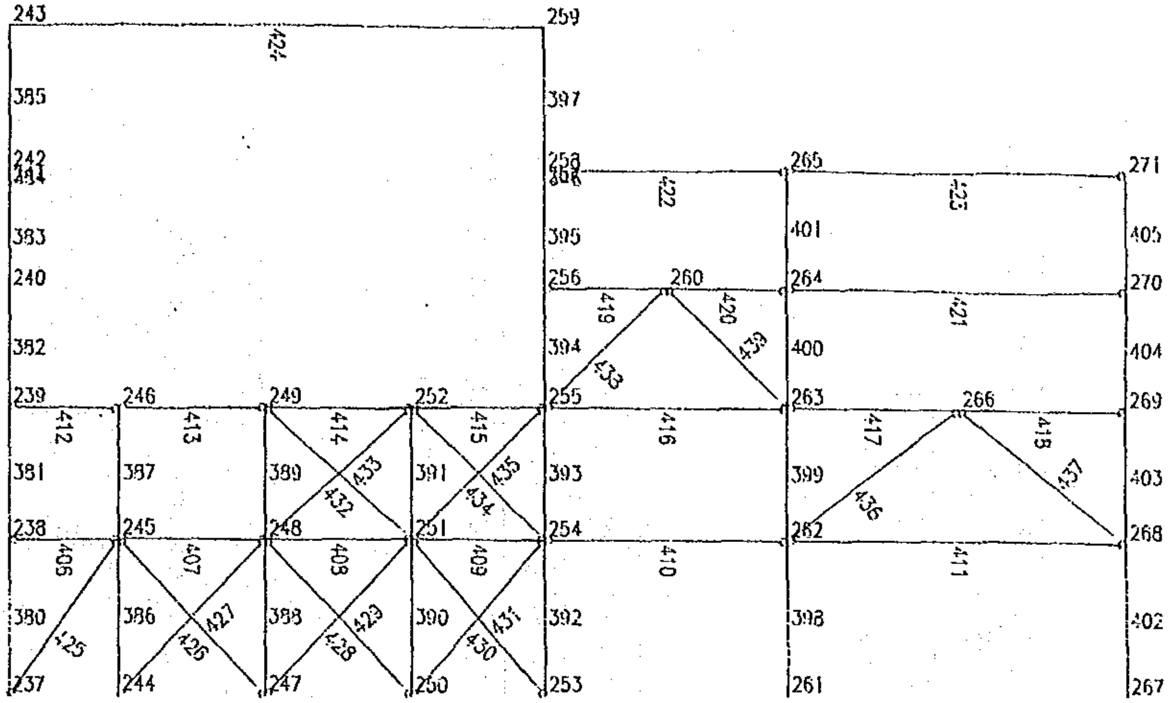
フレーム　モデル　図

（ 107 -- LINE　SCALE 1/300 ）



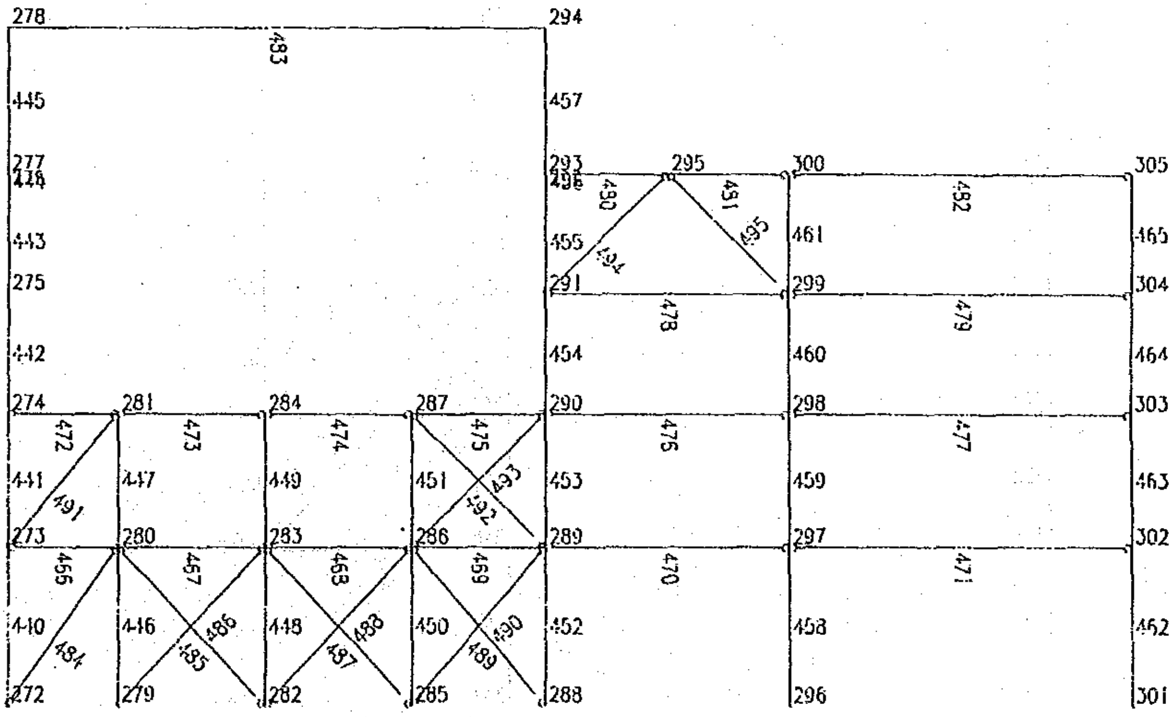
フレーム　モデル　図

（ 108 -- LINE　SCALE 1/300 ）



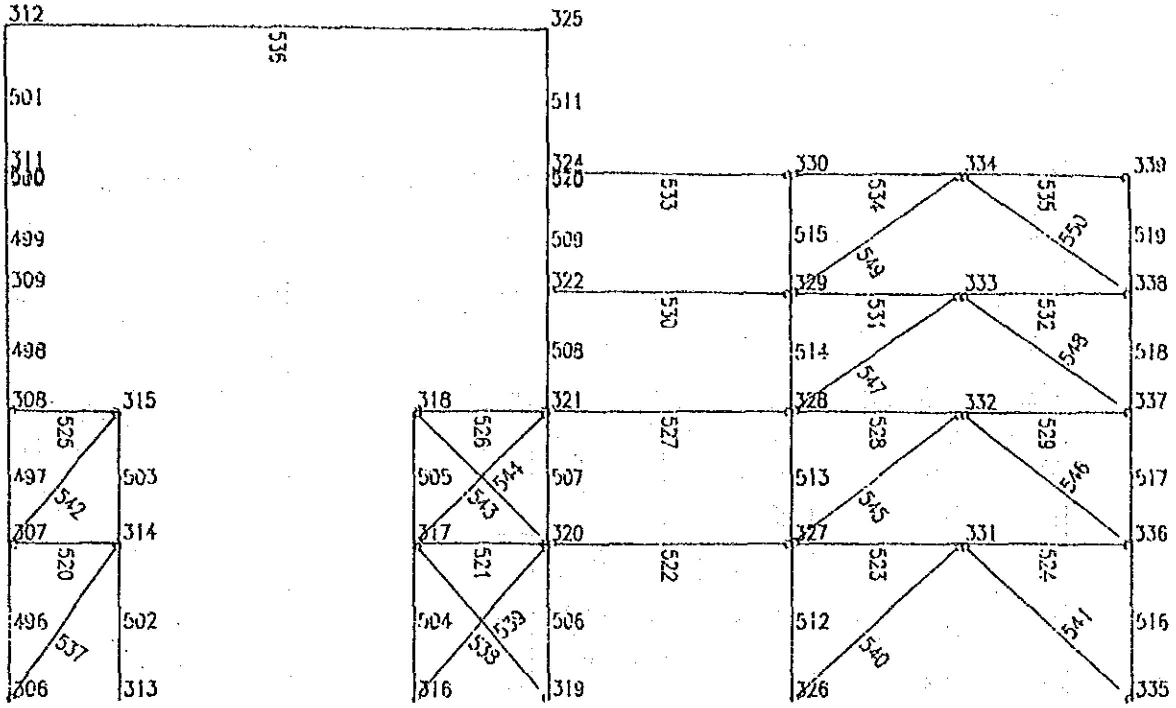
フレーム　モデル　図

（ 201 － LINE　SCALE 1/300 ）



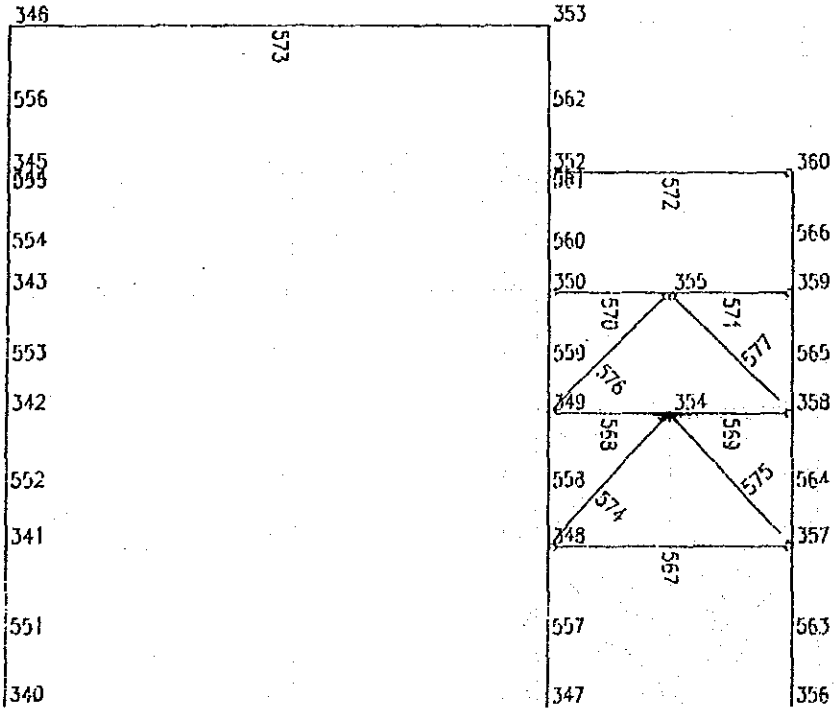
フレーム　モデル　図

（ 202 － LINE　SCALE 1/300 ）



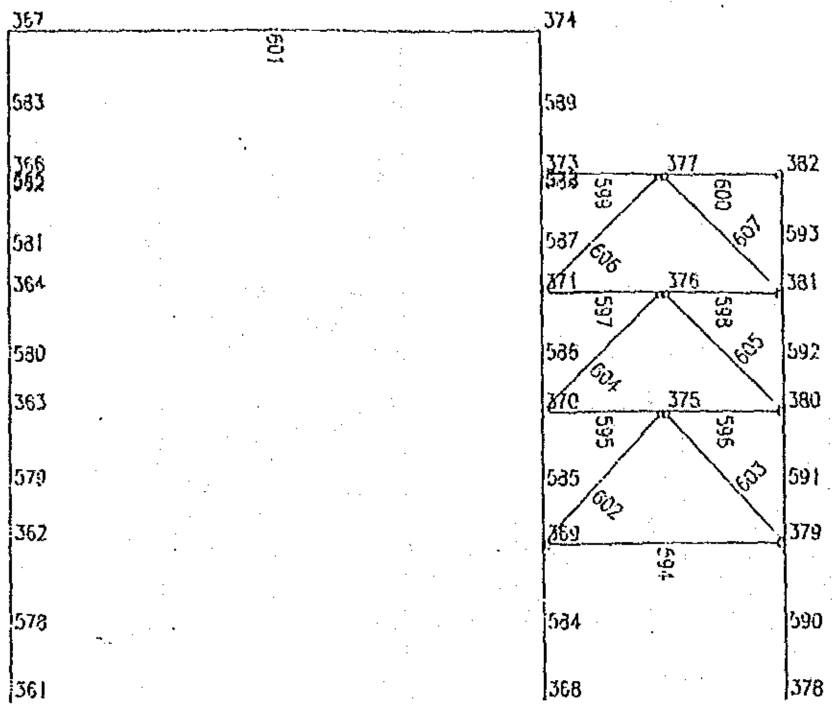
フレーム モデル 図

(203 -- LINE SCALE 1/300)



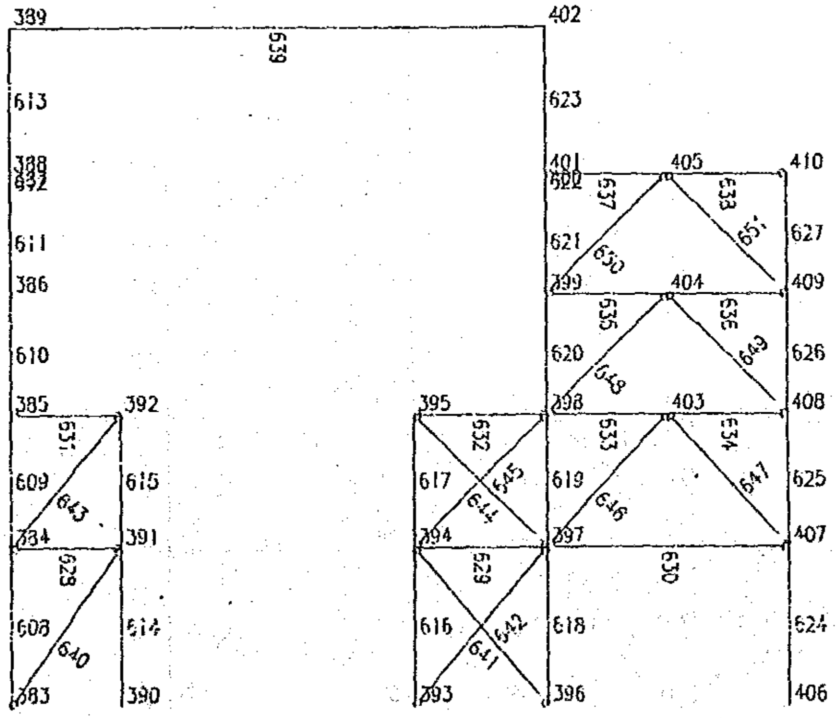
フレーム モデル 図

(204 - LINE SCALE 1/300)



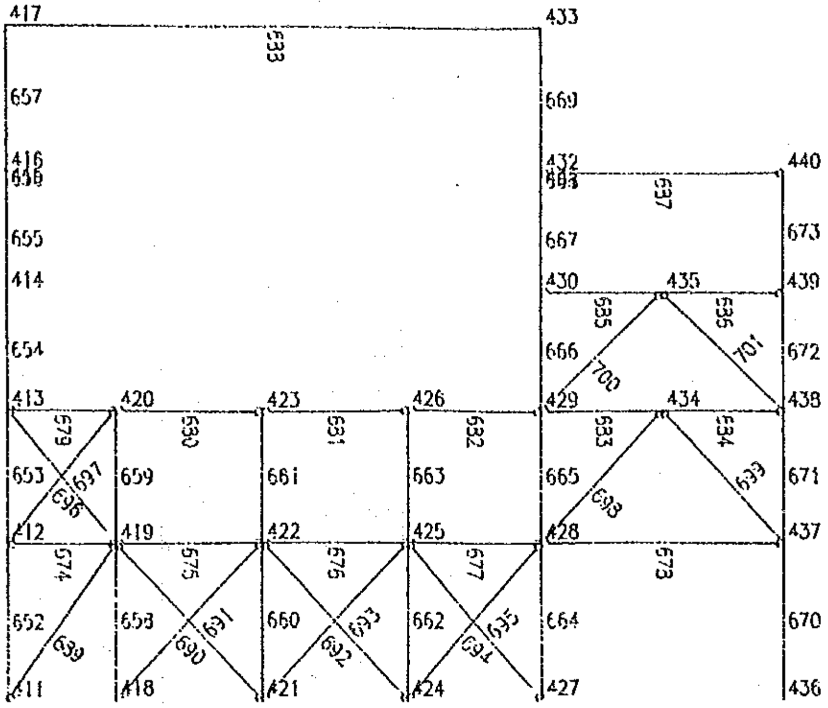
フレーム モデル 図

(205 - LINE SCALE 1/300)



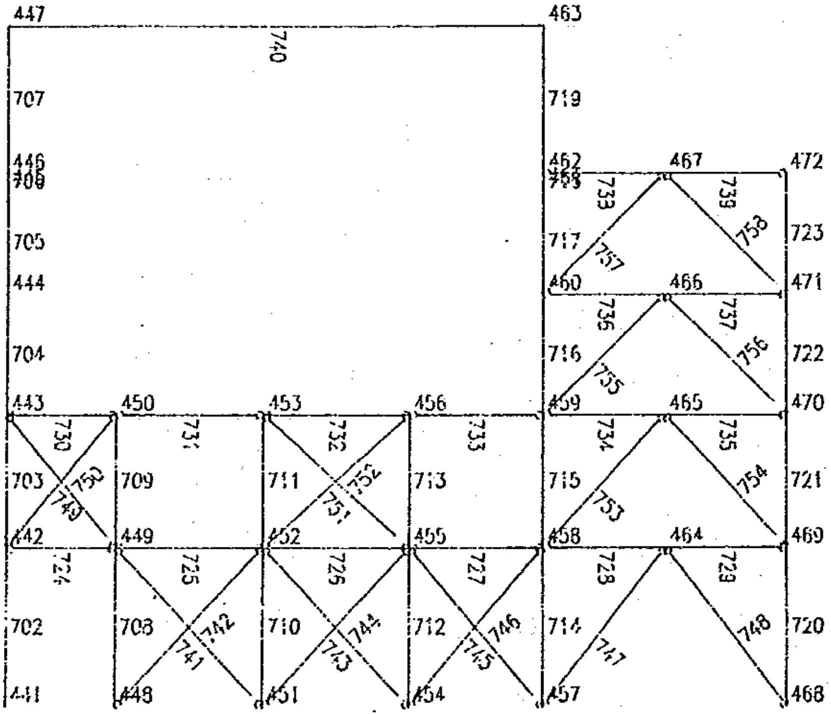
フレーム モデル 図

(206 - LINE SCALE 1/300)



フレーム　モデル　図

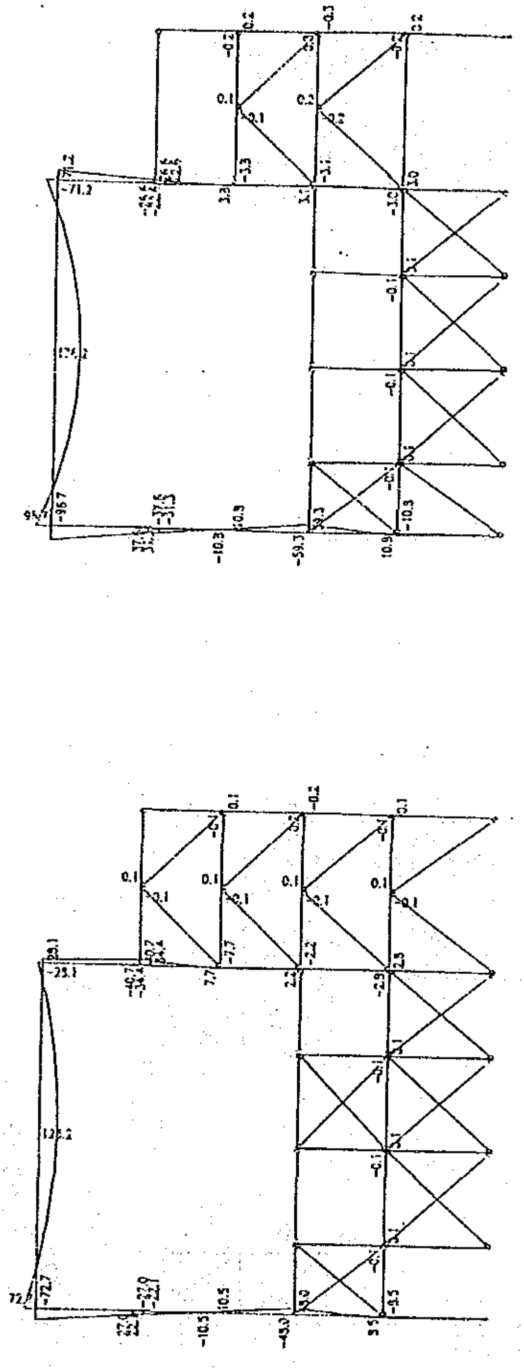
(207 -- LINE　SCALE 1/300)



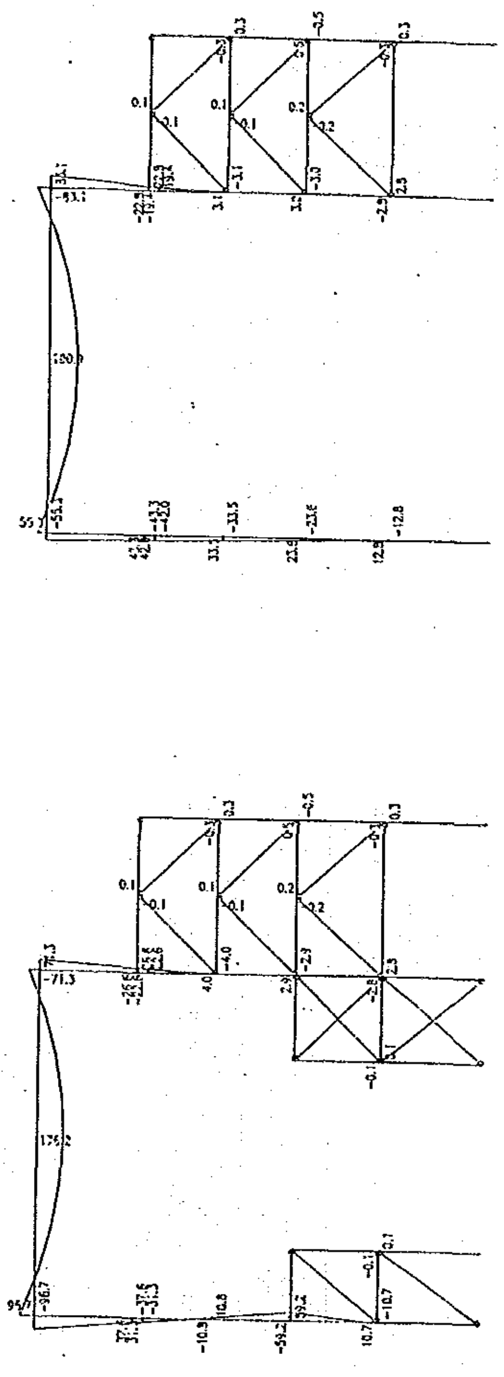
フレーム　モデル　図

(208 -- LINE　SCALE 1/300)

3.3 Stress

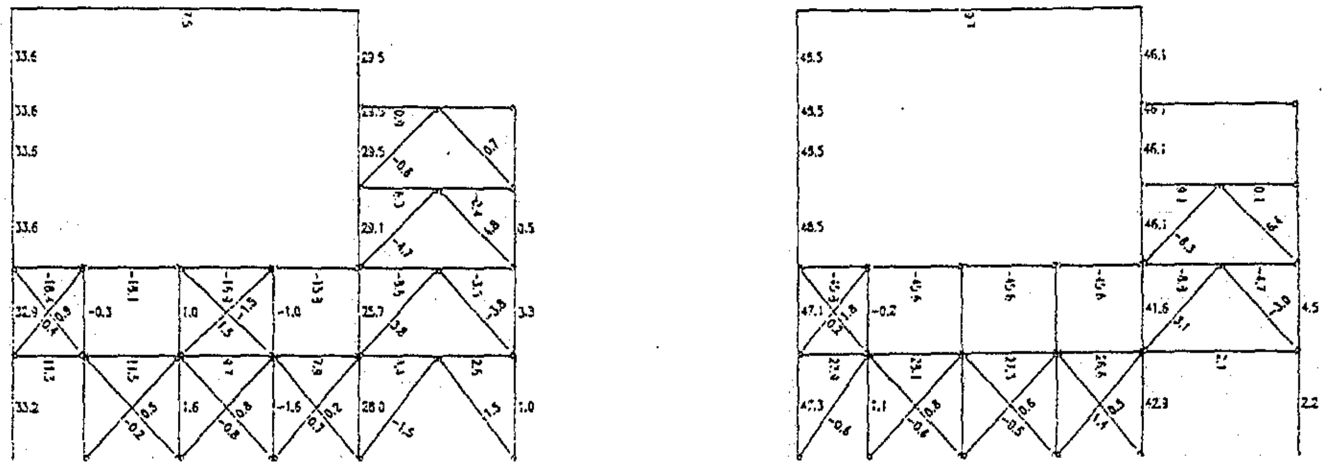


荷重ケース 1 曲げモーメント図 B.M.D.
(101-102 - LINE)

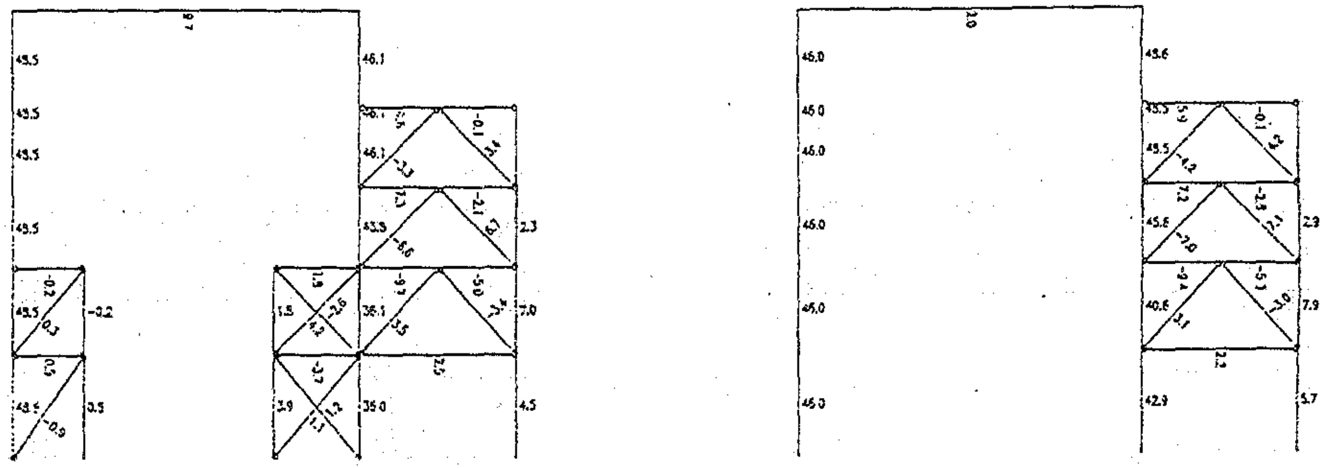


荷重ケース 1 曲げモーメント図 B.M.D.
(103-104 - LINE)

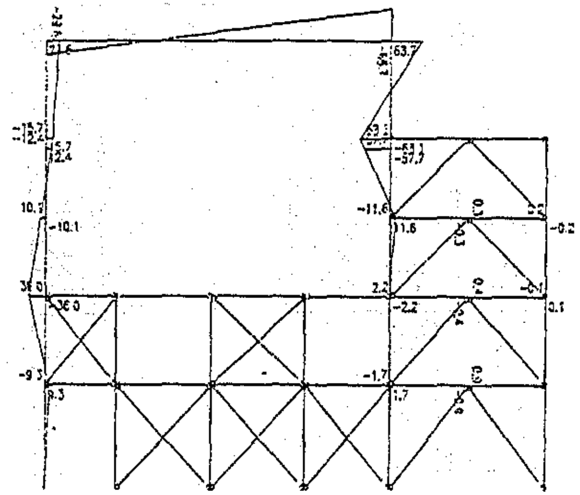
10

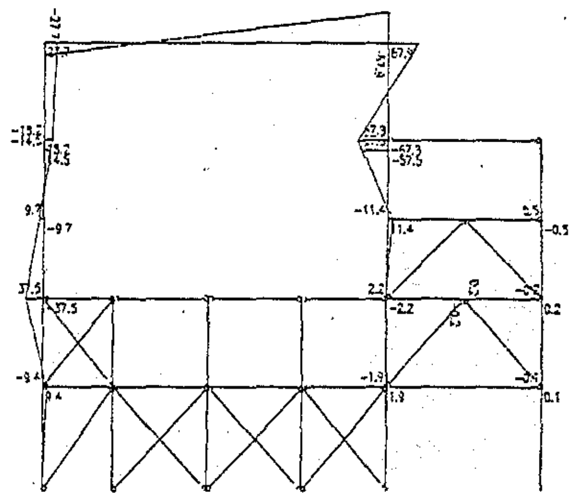


荷重ケース　1　　軸力図 A.F.D.
(101-102 - LINE)

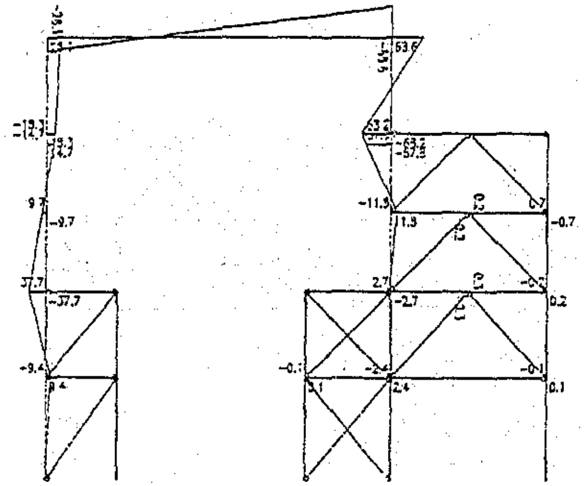


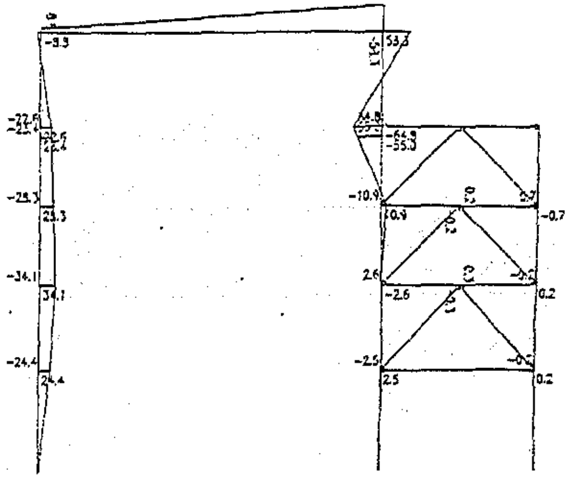
荷重ケース　1　　軸力図 A.F.D.
(103-104 - LINE)



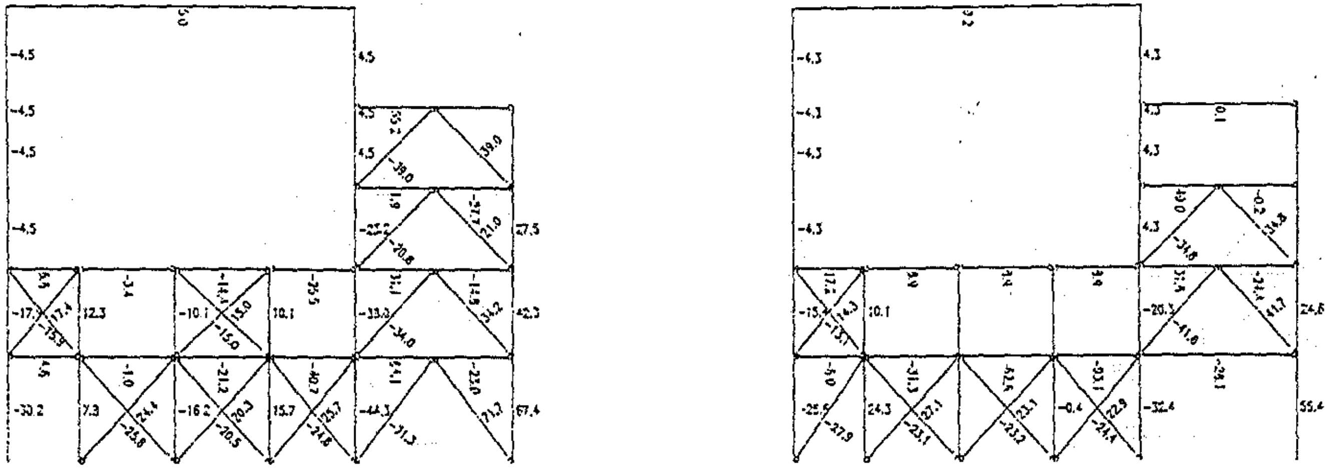


荷重ケース　2　　B.M.D.
曲げモーメント図
（ 101-102 - LINE ）

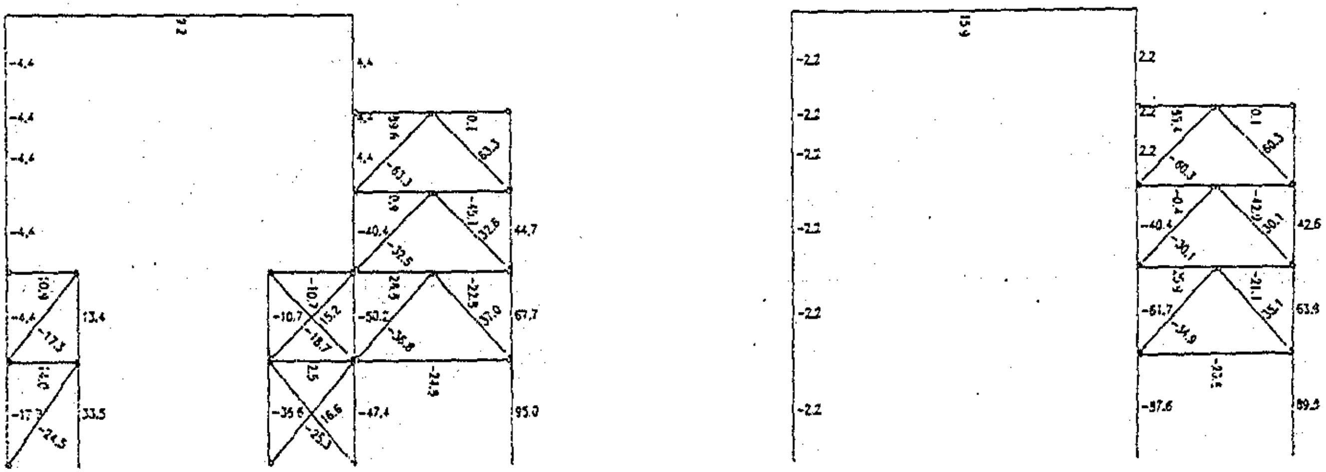




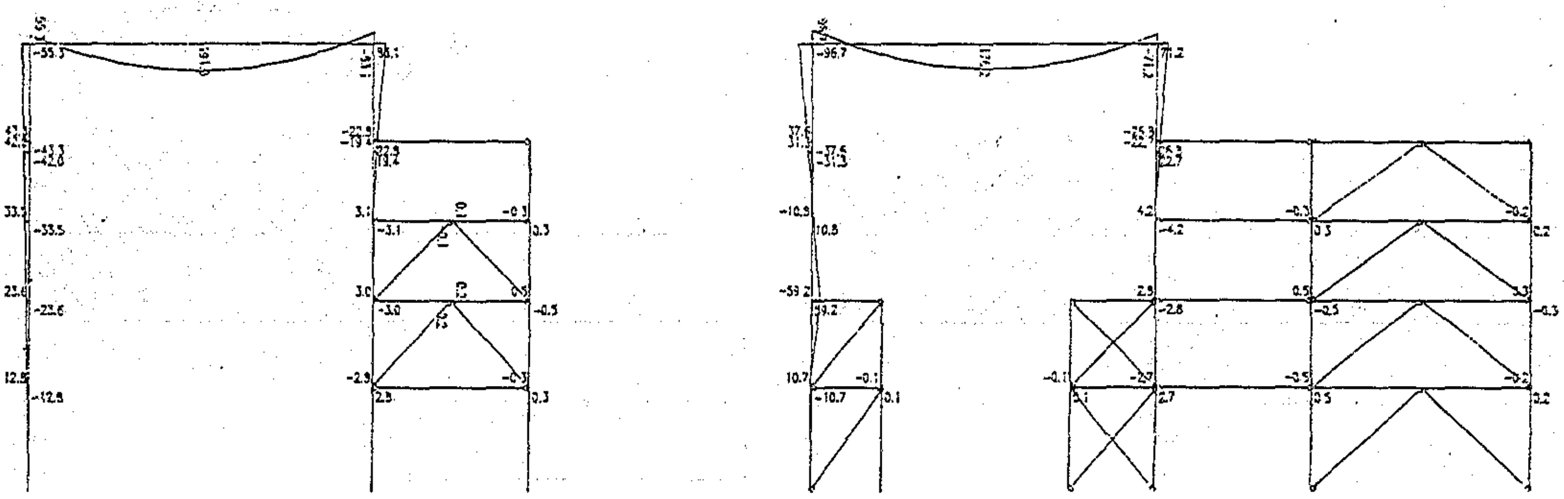
荷重ケース　2　　B.M.D.
曲げモーメント図
（ 103-104 - LINE ）



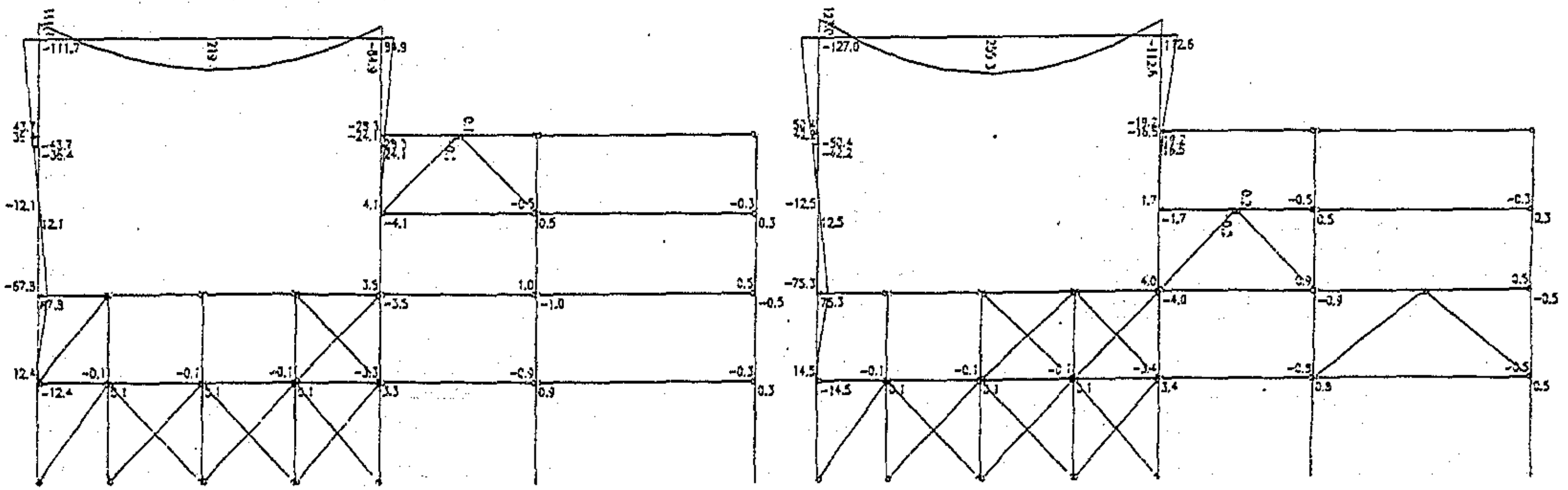
荷重ケース　2　軸　力　図 A.F.D.
(101-102 - LINE)



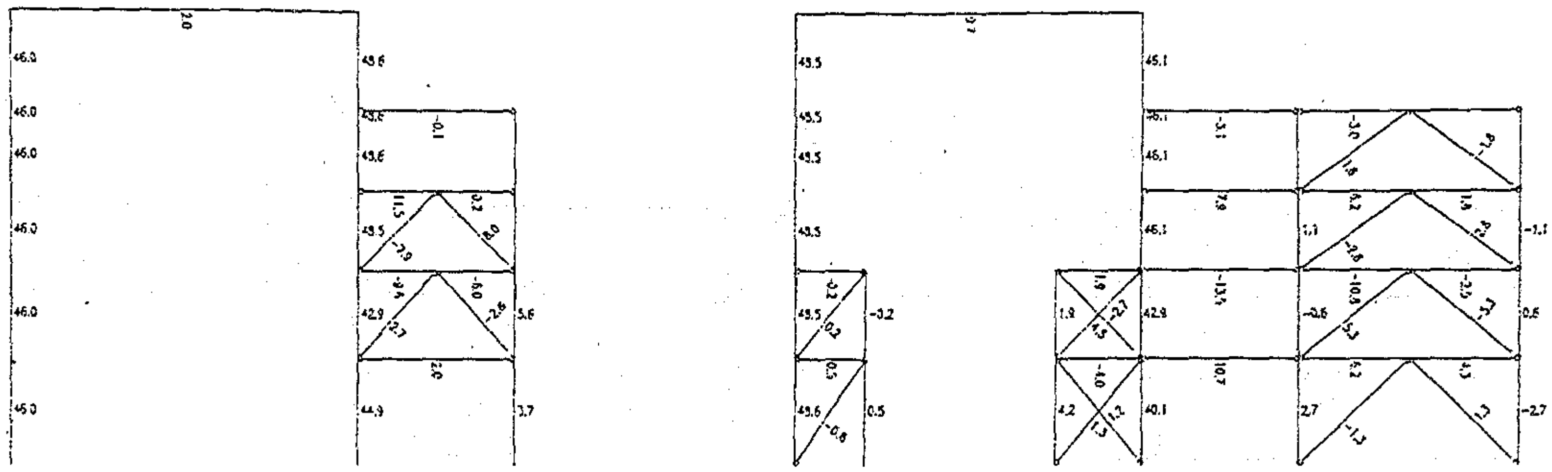
荷重ケース　2　軸　力　図 A.F.D.
(103-104 - LINE)



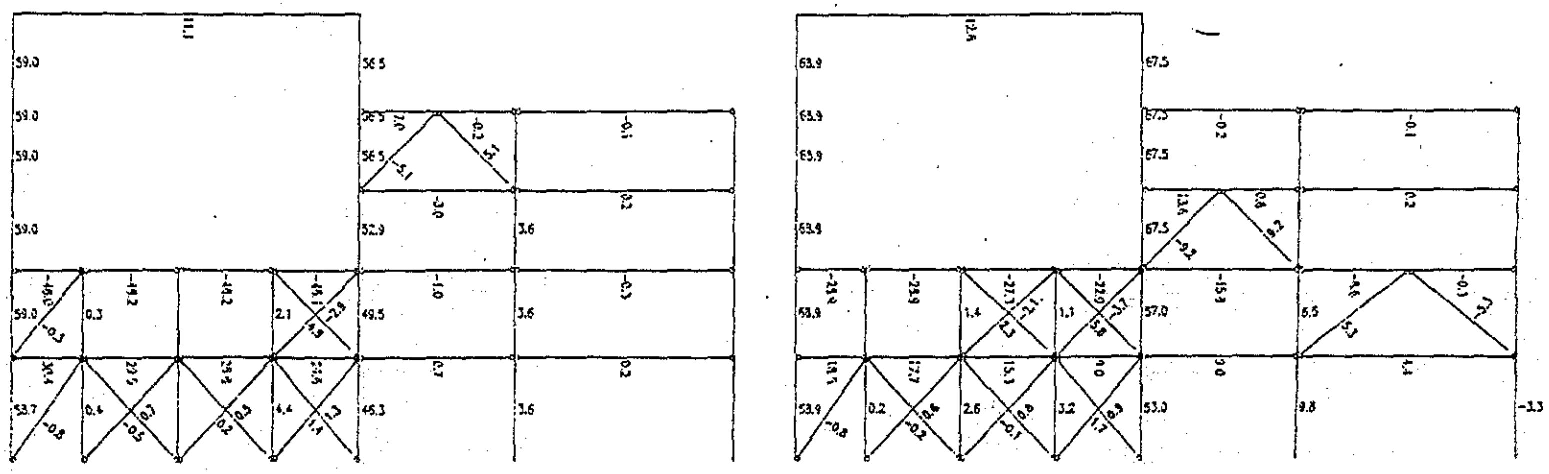
荷重ケース　1　　B.M.D.
曲げモーメント図
(105-105 - LINE)



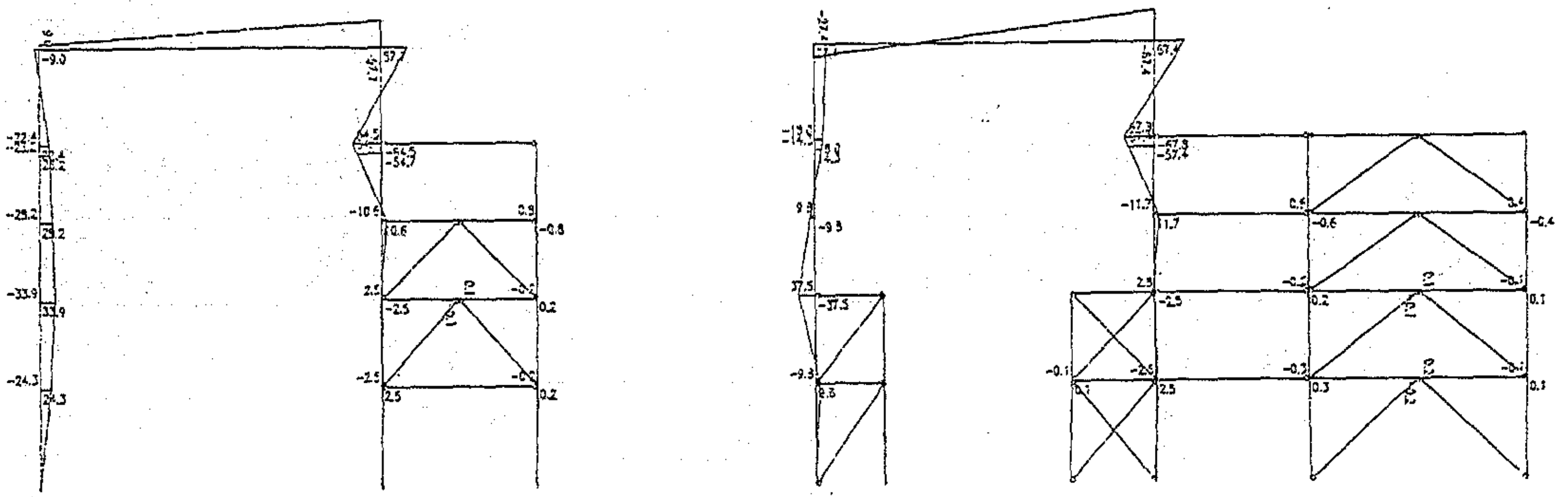
荷重ケース　1　　B.M.D.
曲げモーメント図
(107--103 - LINE)



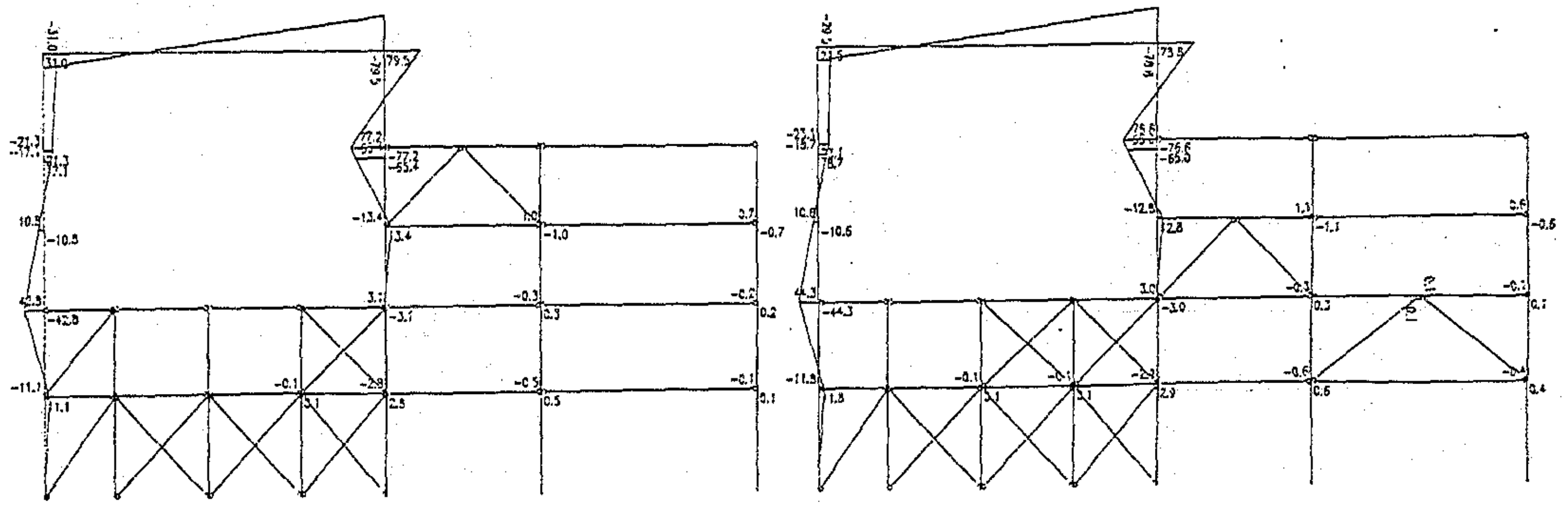
A.F.D.
荷重ケース　1　　軸力　図
（ 105-106 - LINE ）



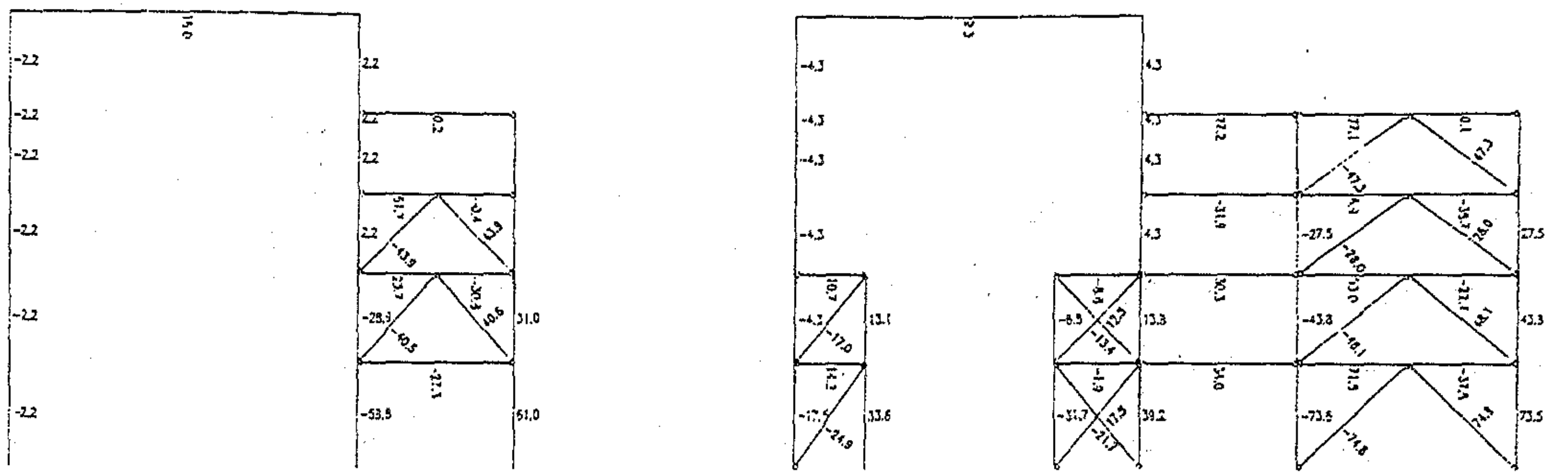
A.F.D.
荷重ケース　1　　軸力　図
（ 107-108 - LINE ）



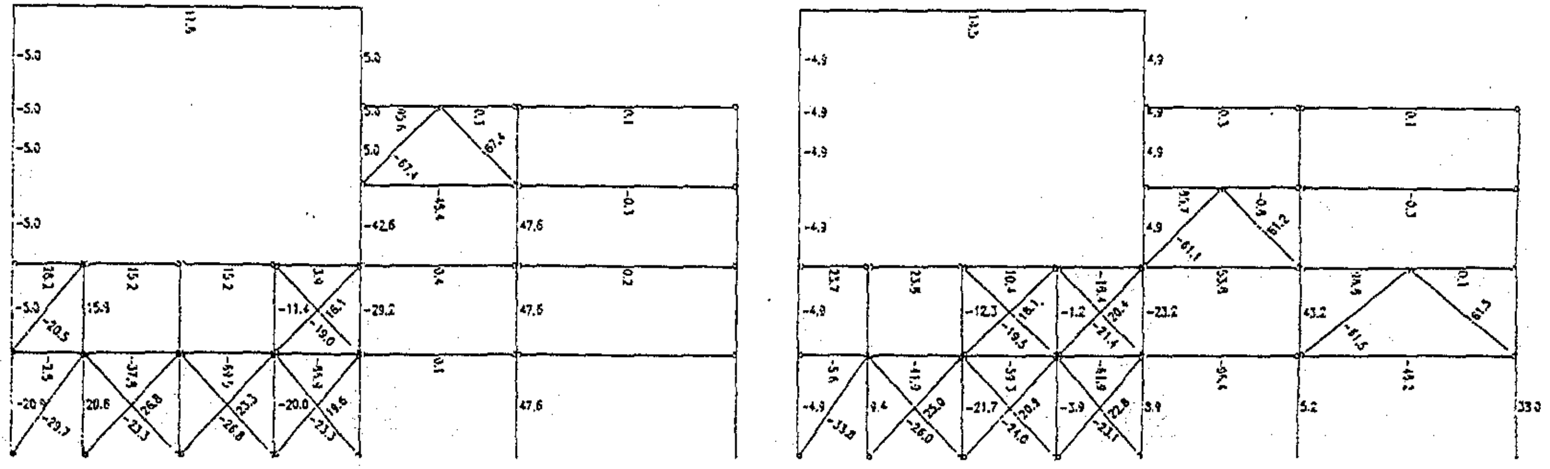
B.M.D.
荷重ケース　2　　曲げモーメント図
（ 105-106 - LINE ）



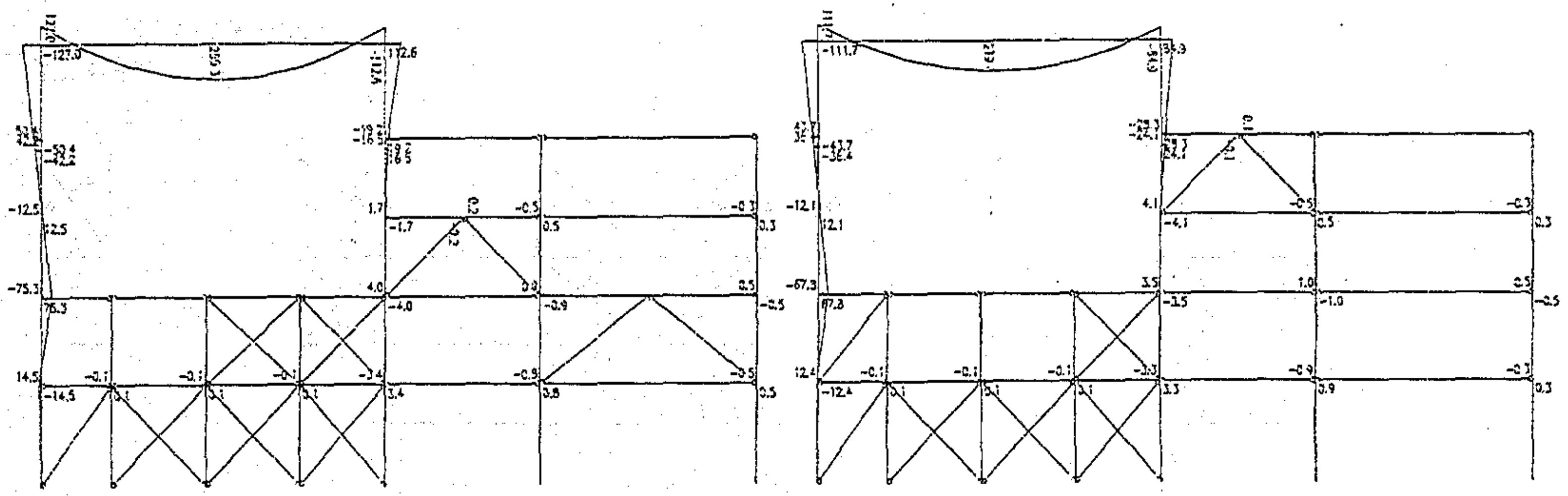
B.M.D.
荷重ケース　2　　曲げモーメント図
（ 107-108 - LINE ）



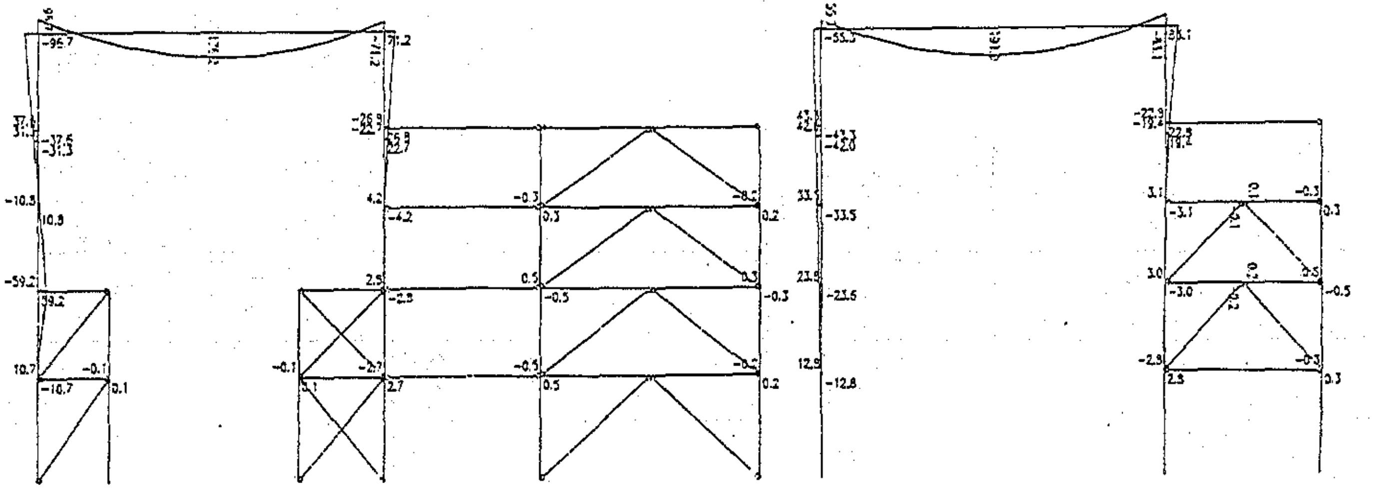
A.F.D.
荷重ケース 2 軸 力 図
(105--106 - LINE)



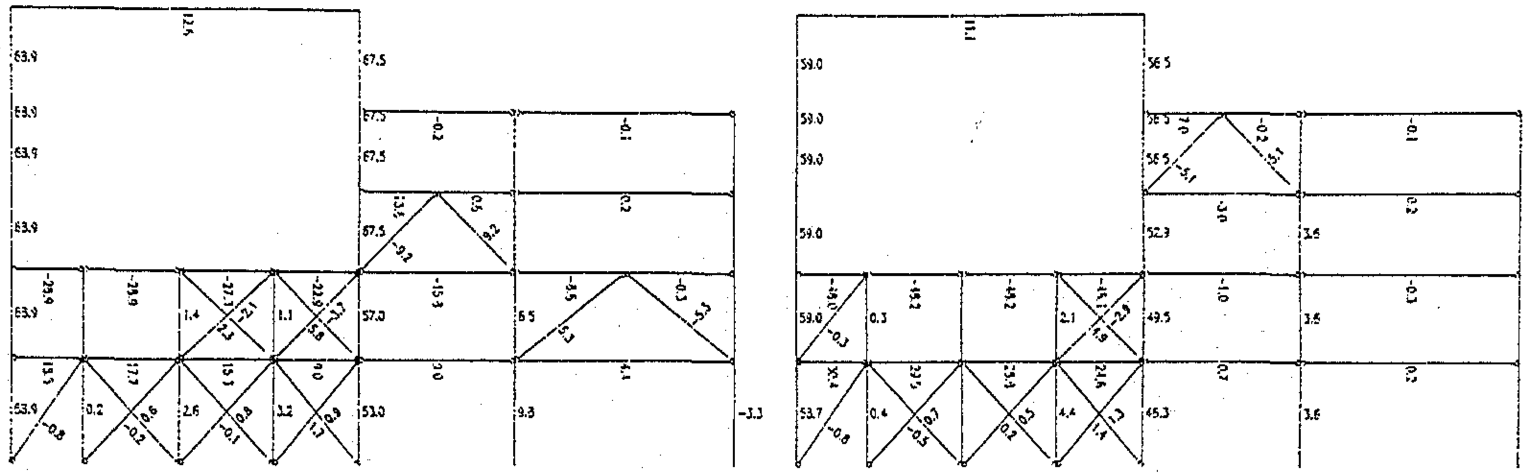
A.F.D.
荷重ケース 2 軸 力 図
(107--108 - LINE)



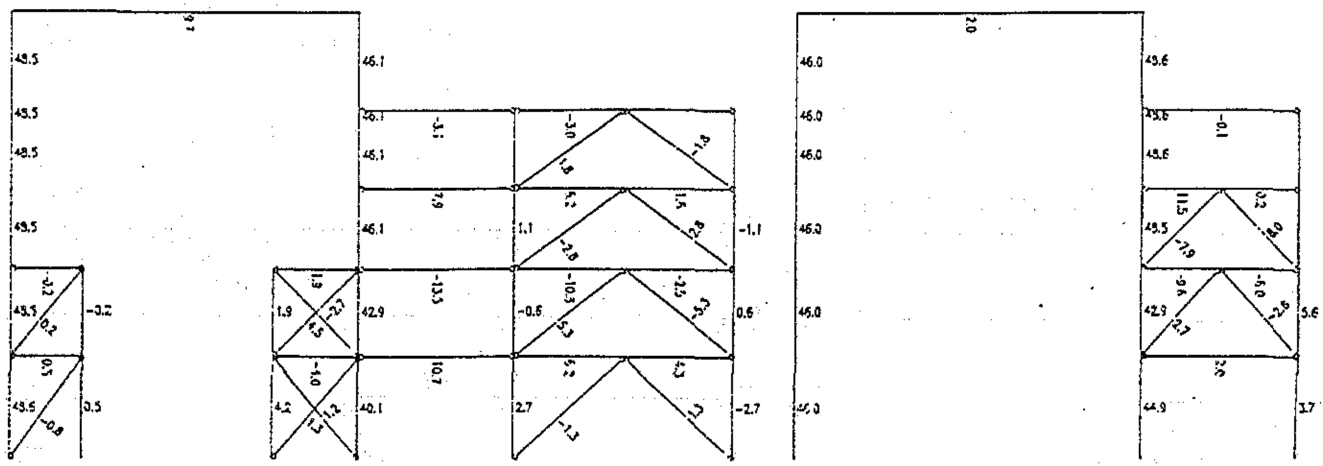
B.M.D.
荷重ケース　1　　曲げモーメント図
（ 201-202 - LINE ）



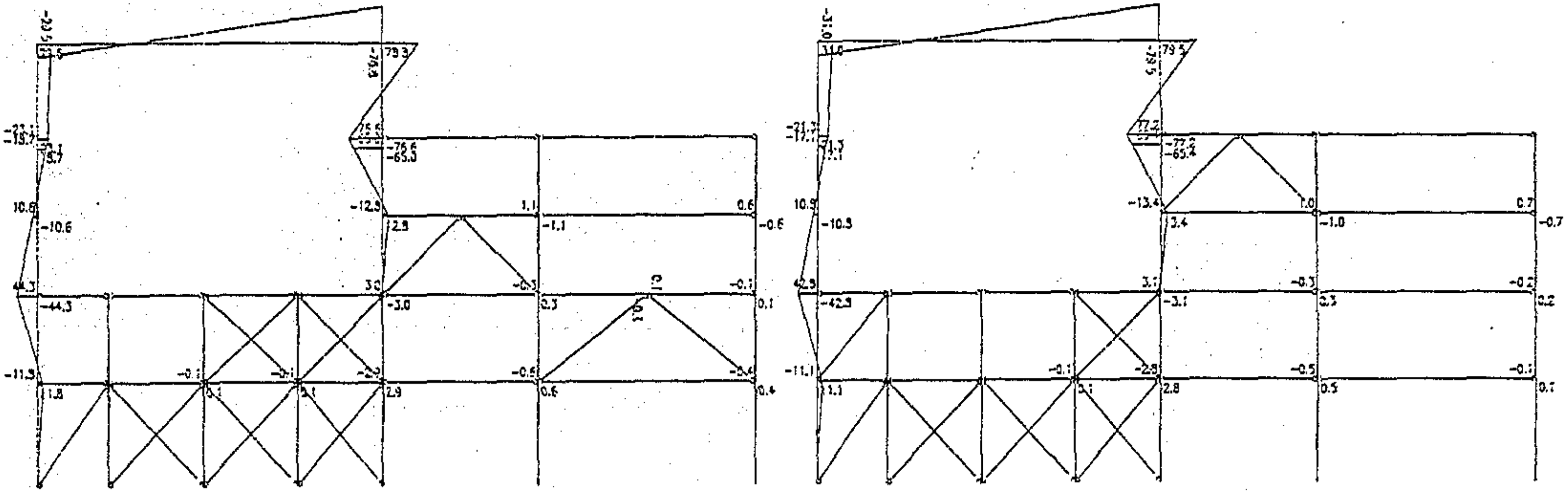
B.M.D.
荷重ケース　1　　曲げモーメント図
（ 203-204 - LINE ）



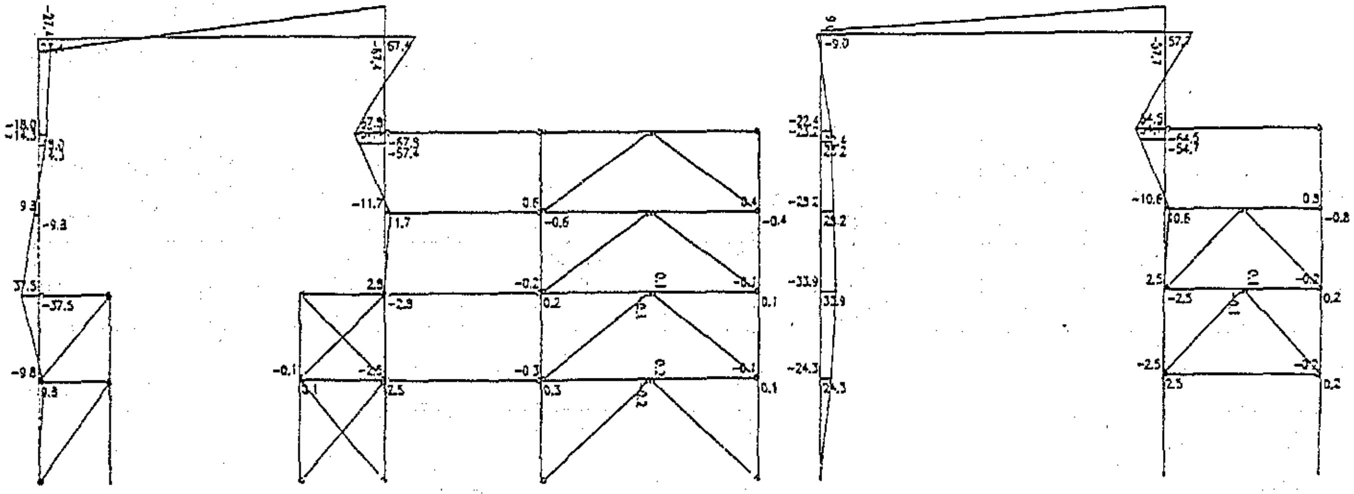
荷重ケース　1　軸 $\overset{\text{A.F.D.}}{\text{力}}$ 図
(201-202 - LINE)



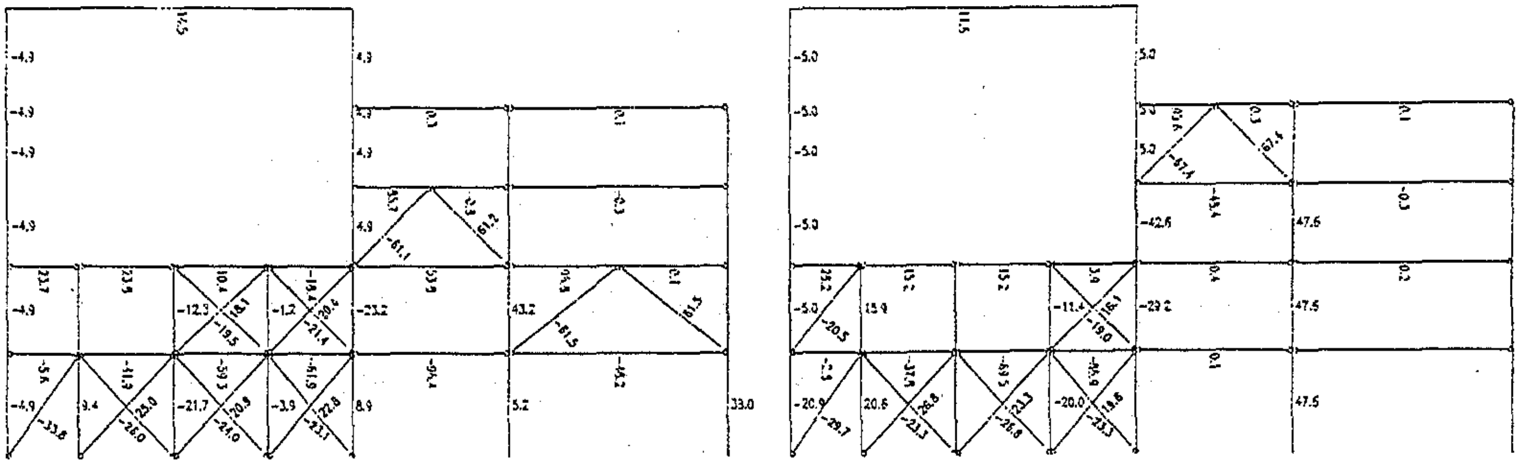
荷重ケース　1　軸 $\overset{\text{A.F.D.}}{\text{力}}$ 図
(203-204 - LINE)



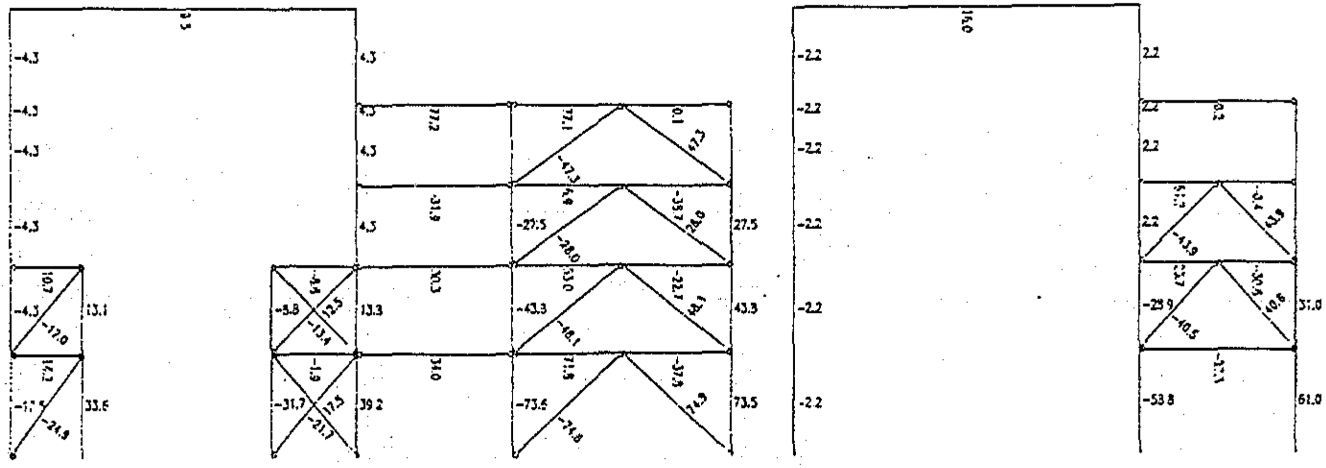
B.M.D.
荷重ケース　2　　曲げモーメント図
（ 201--202 － LINE ）



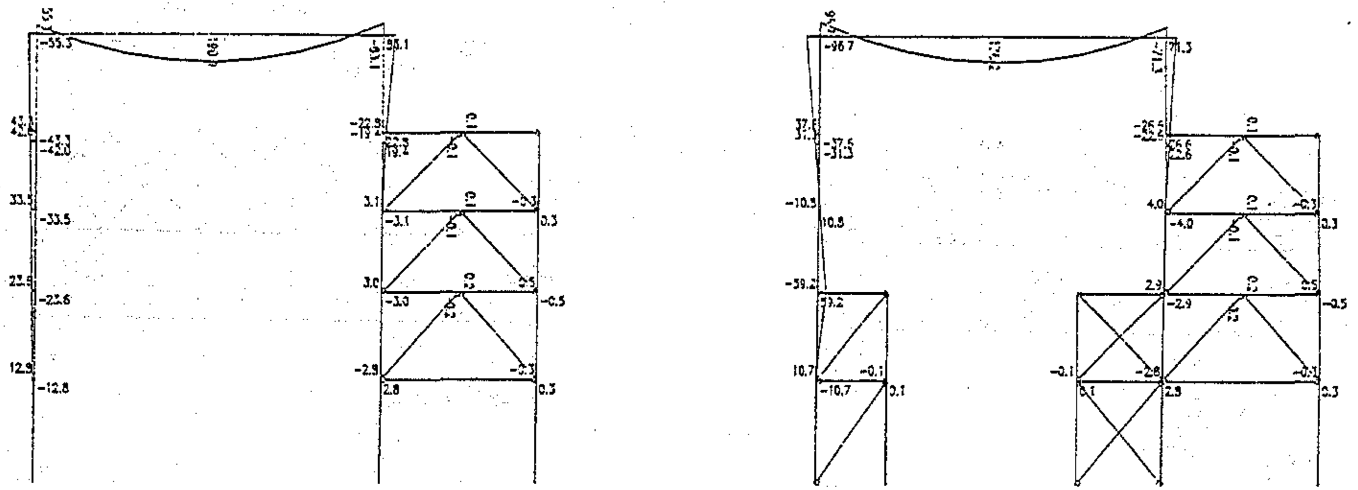
B.M.D.
荷重ケース　2　　曲げモーメント図
（ 203--204 － LINE ）



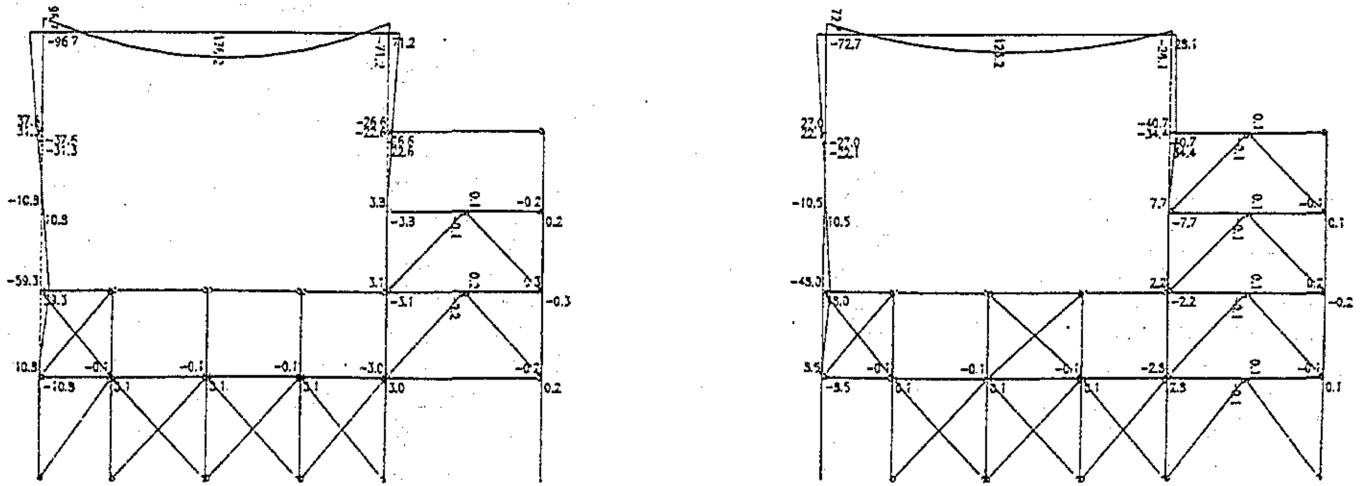
A.F.D.
荷重ケース 2 軸 力 図
(201-202 - LINE)



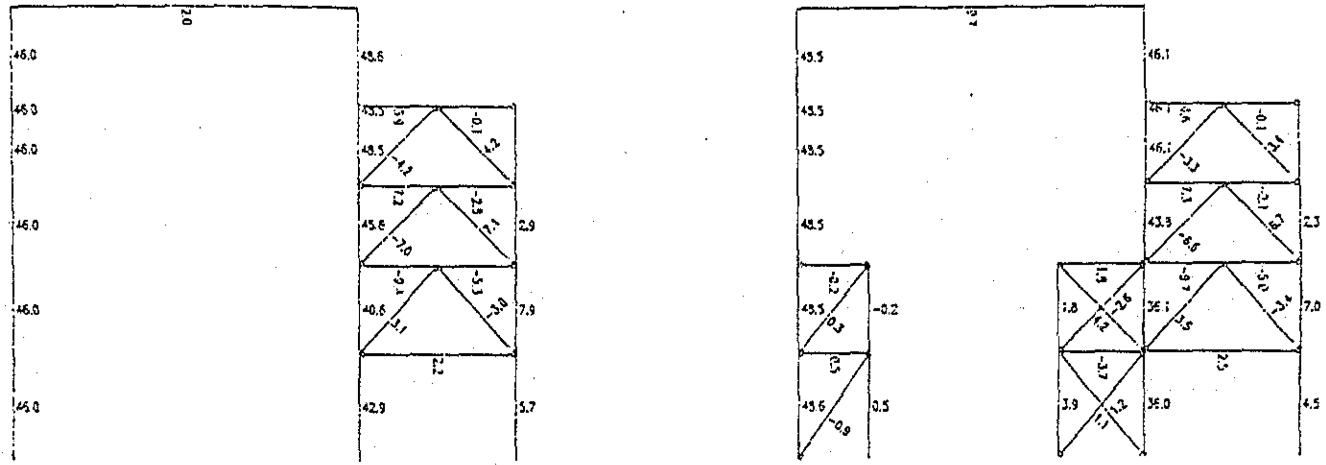
A.F.D.
荷重ケース 2 軸 力 図
(203-204 - LINE)



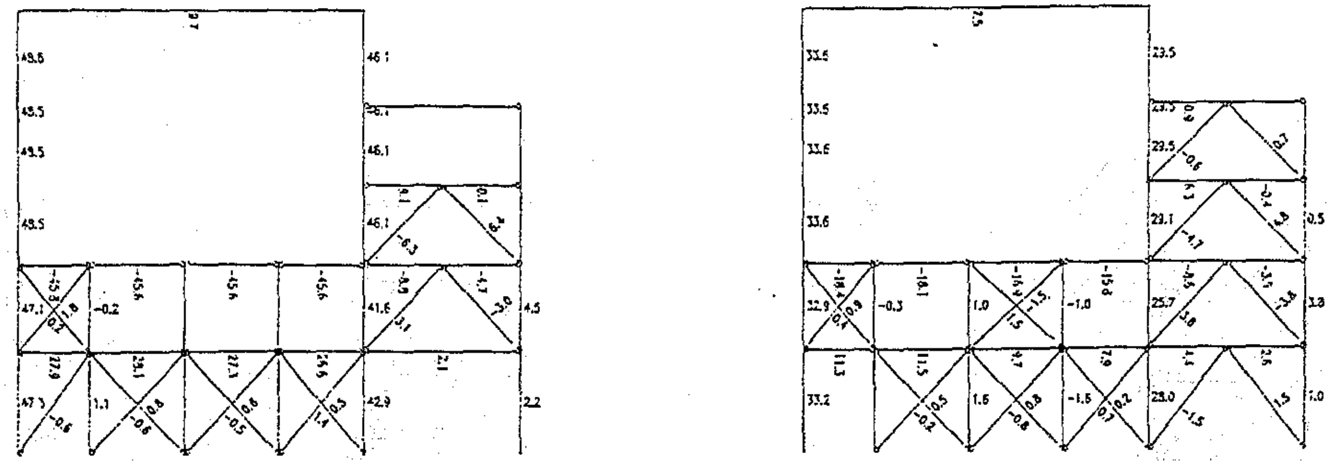
荷重ケース　1　　B.M.D.
曲げモーメント図
（ 205-206 - LINE ）



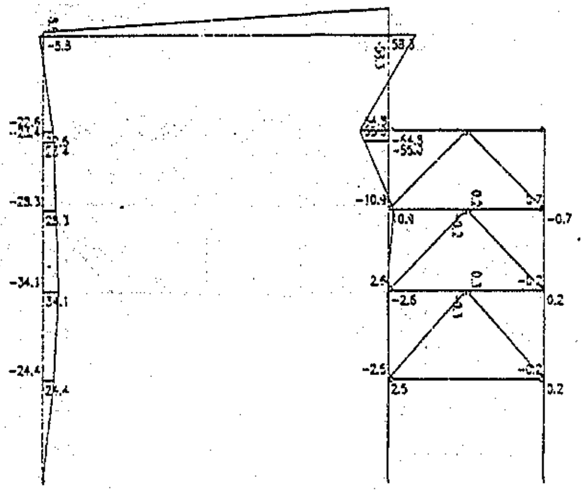
荷重ケース　1　　B.M.D.
曲げモーメント図
（ 207--208 - LINE ）

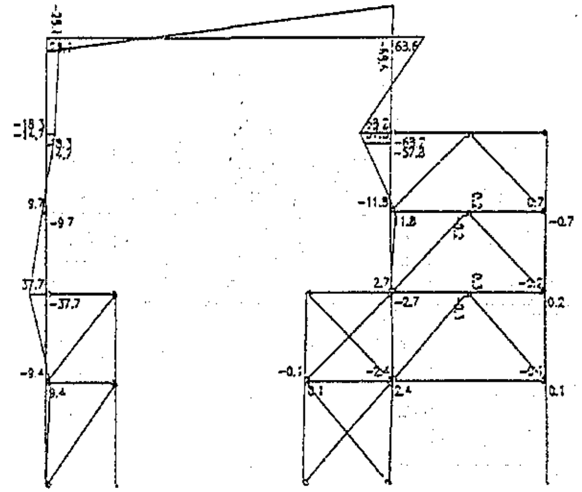


荷重ケース　1　　軸　力　図
A.F.D.
(205-206 - LINE)



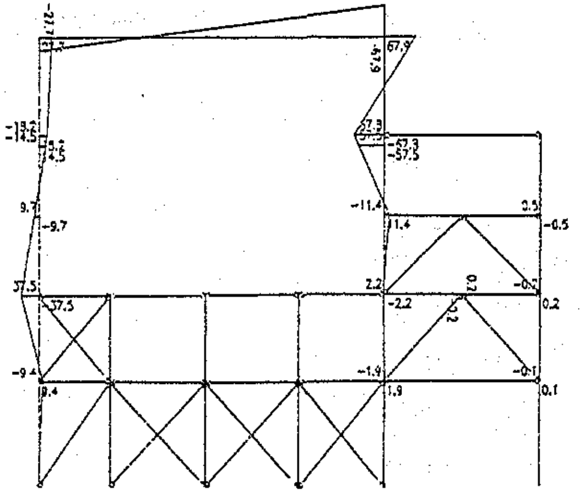
荷重ケース　1　　軸　力　図
A.F.D.
(207-208 - LINE)

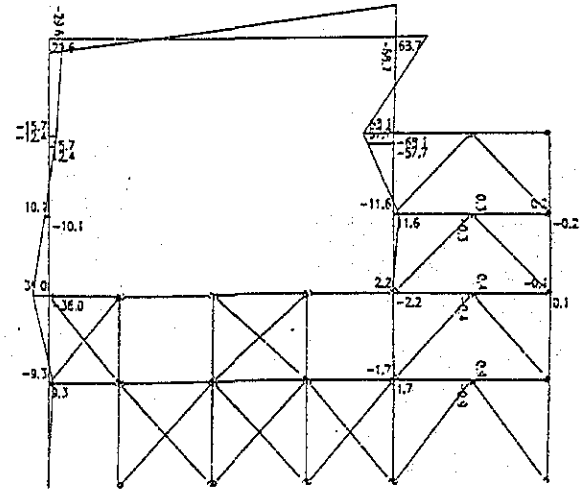




荷重ケース　2　　B.M.D. 曲げモーメント図

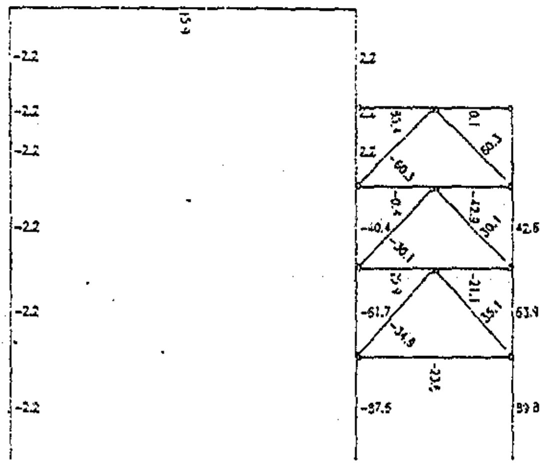
（ 205-206 - LINE ）





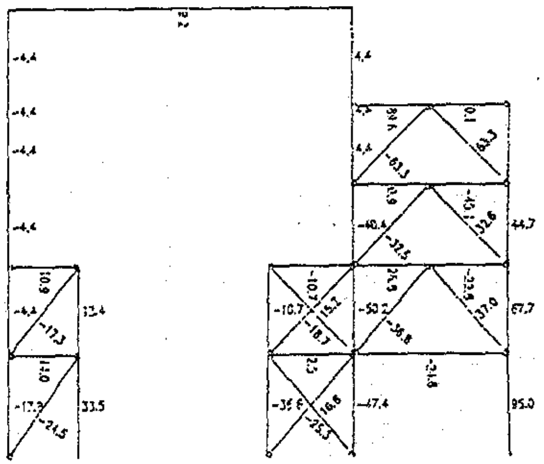
荷重ケース　2　　B.M.D. 曲げモーメント図

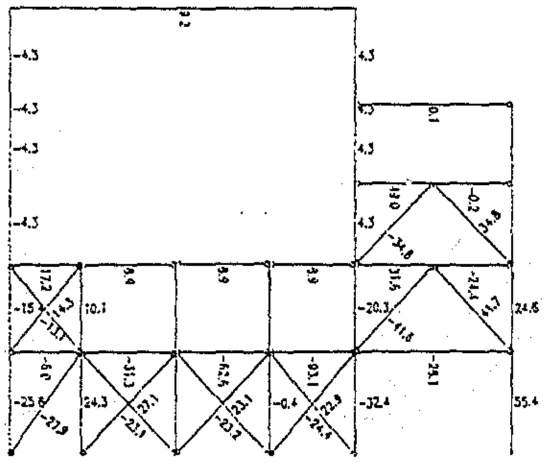
（ 207-208 - LINE ）



荷重ケース　2　軸　力　図　A.F.D.

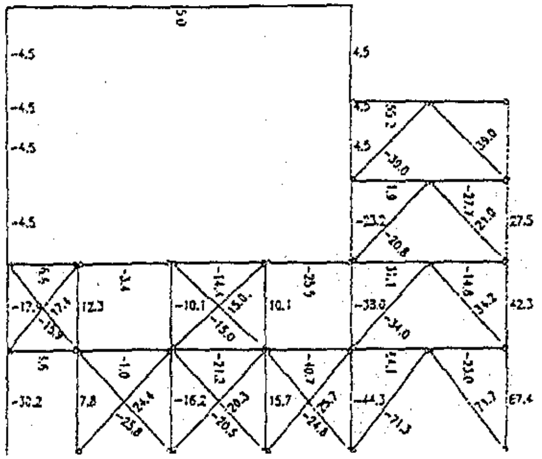
（ 205-206 - LINE ）



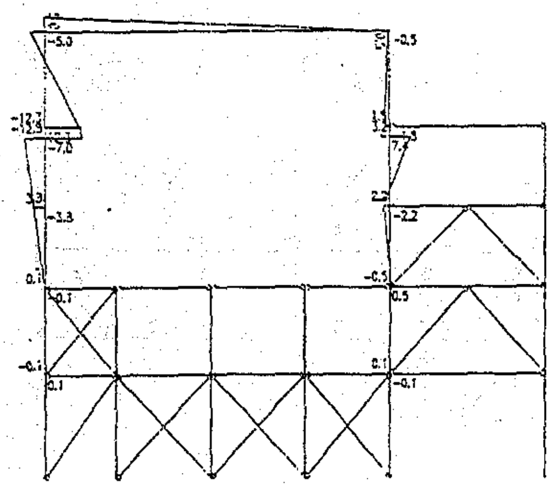


荷重ケース　2　軸　力　図　A.F.D.

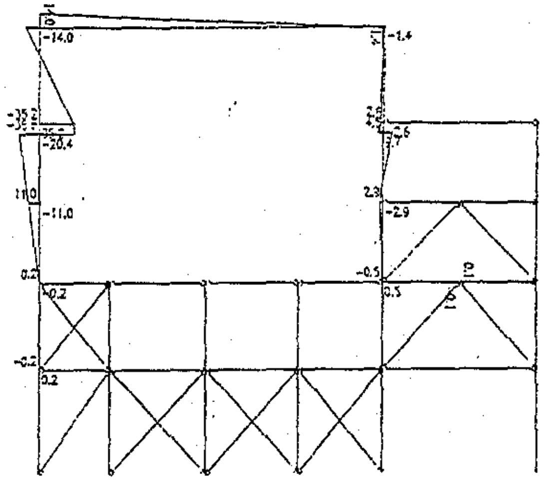
（ 207-208 - LINE ）



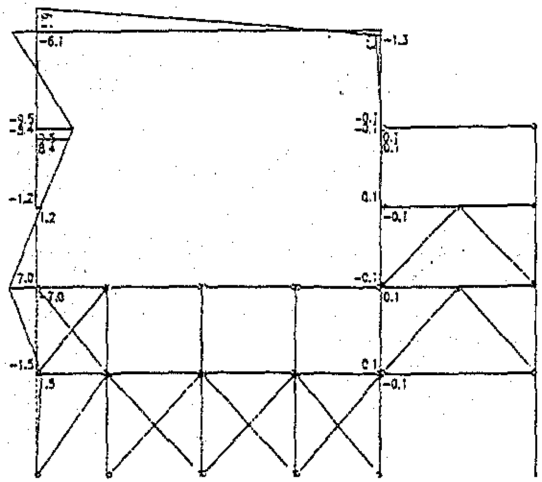
124



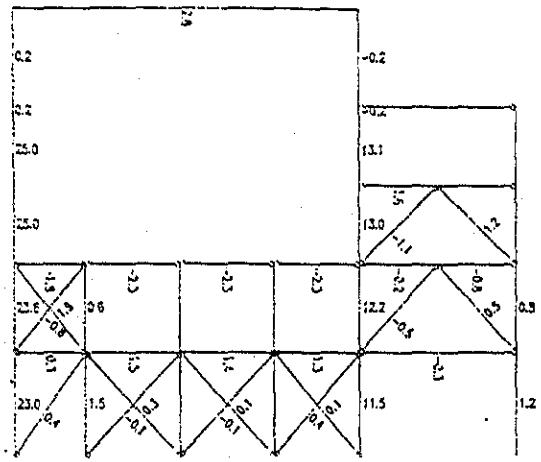
C.D.L.
荷重ケース　1　　B.M.D.
曲げモーメント図
(102 - LINE)



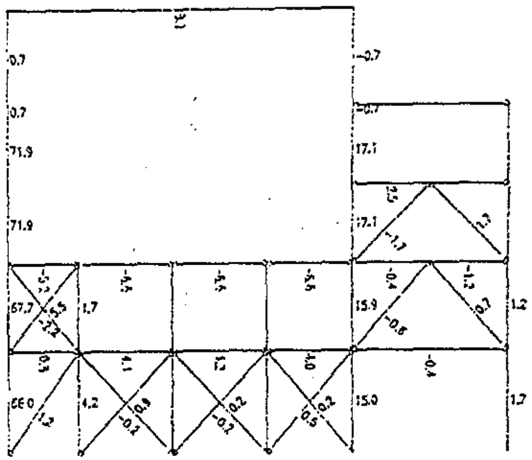
C.L.L.
荷重ケース　2　　B.M.D.
曲げモーメント図
(102 - LINE)



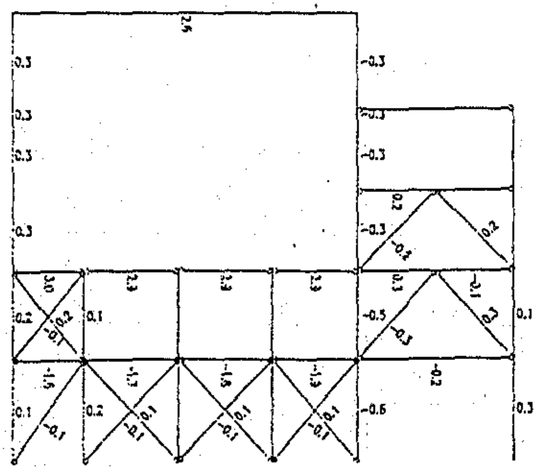
C.H.L.
荷重ケース　3　　B.M.D.
曲げモーメント図
(102 - LINE)



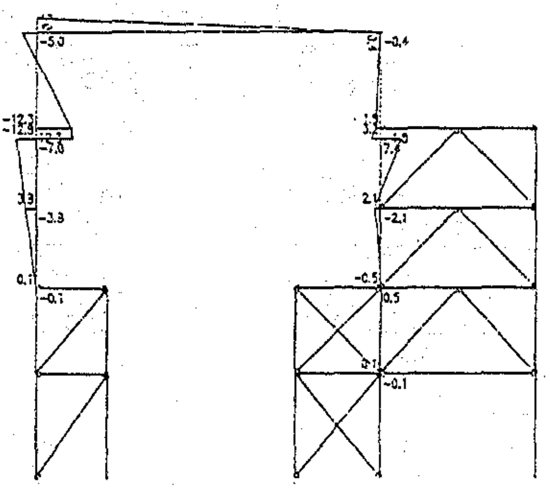
C.D.L.
荷重ケース　1　　軸　力　図
A.F.D.
（ 102 － LINE ）



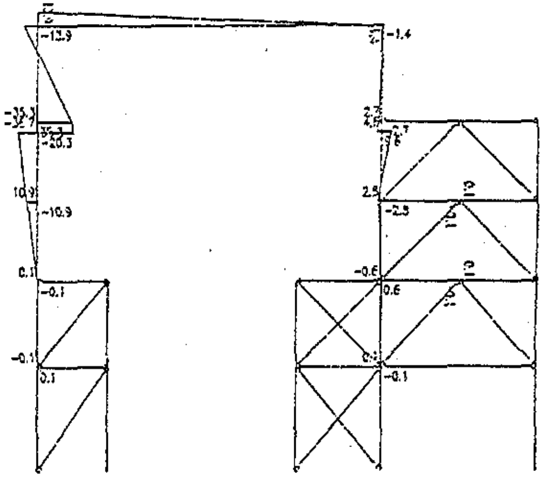
C.L.L.
荷重ケース　2　　軸　力　図
A.F.D.
（ 102 － LINE ）



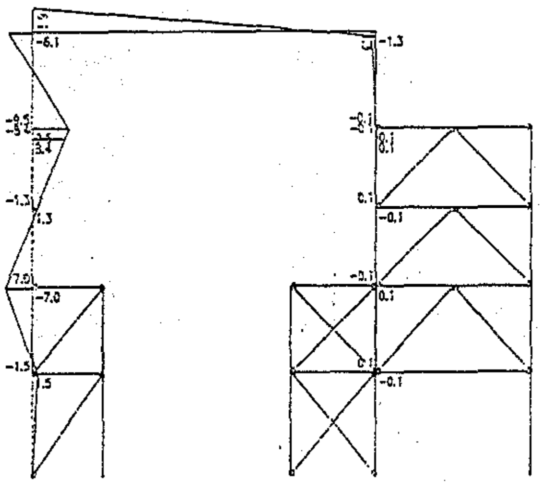
C.H.L.
荷重ケース　3　　軸　力　図
A.F.D.
（ 102 － LINE ）



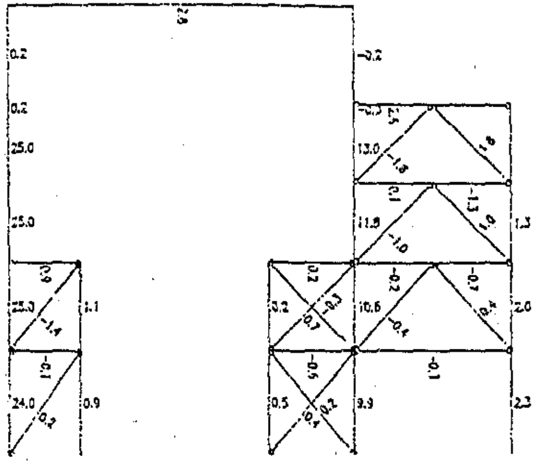
C.D.L.
荷重ケース　1　　　B.M.D.
曲げモーメント図
(103 -- LINE)



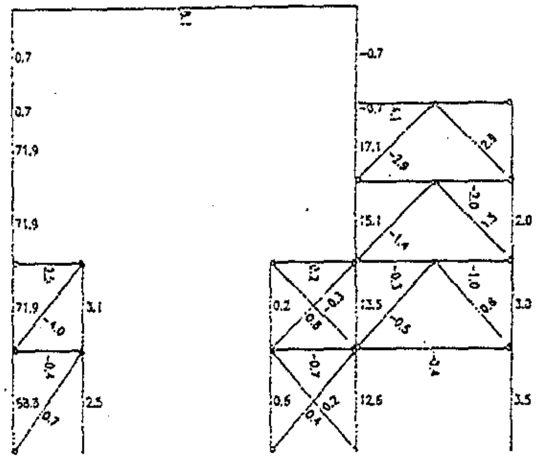
C.L.L.
荷重ケース　2　　　B.M.D.
曲げモーメント図
(103 -- LINE)



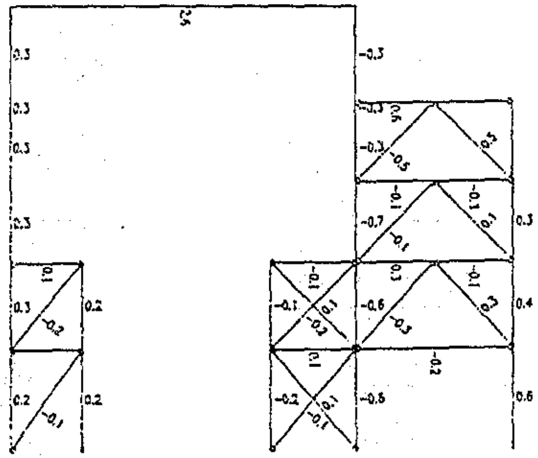
C.H.L.
荷重ケース　3　　　B.M.D.
曲げモーメント図
(103 -- LINE)



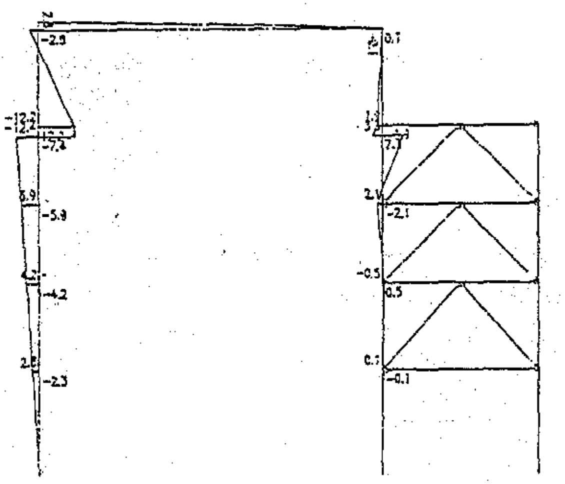
荷重ケース 1 C.D.L. 軸 力 A.F.D. 図
(103 - LINE)



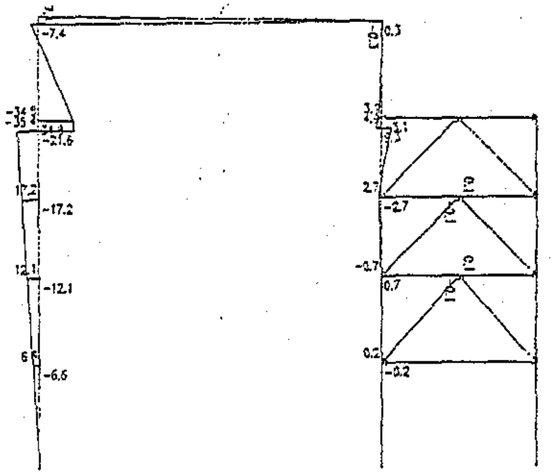
荷重ケース 2 C.L.L. 軸 力 A.F.D. 図
(103 - LINE)



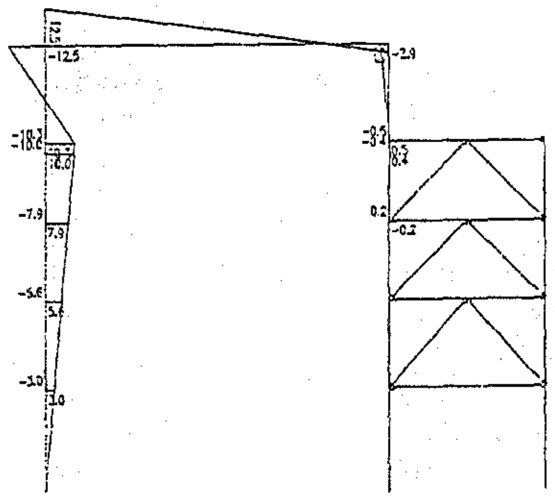
荷重ケース 3 C.H.L. 軸 力 A.F.D. 図
(103 - LINE)



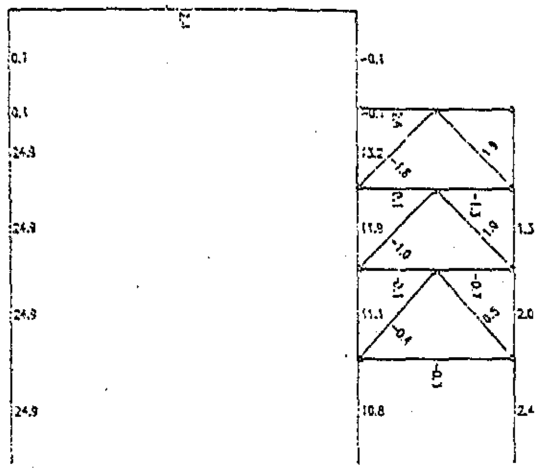
C.DL.
荷重ケース　1　　B.M.D.
曲げモーメント図
(104 - LINE)



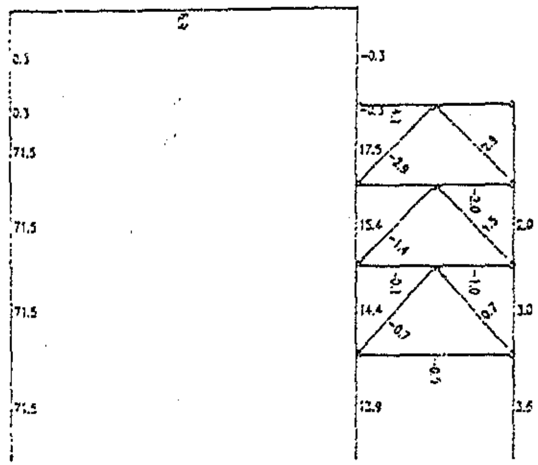
C.L.L.
荷重ケース　2　　B.M.D.
曲げモーメント図
(104 - LINE)



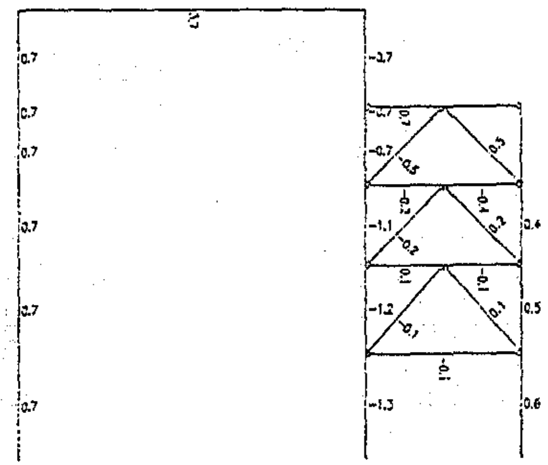
C.H.L.
荷重ケース　3　　B.M.D.
曲げモーメント図
(104 - LINE)



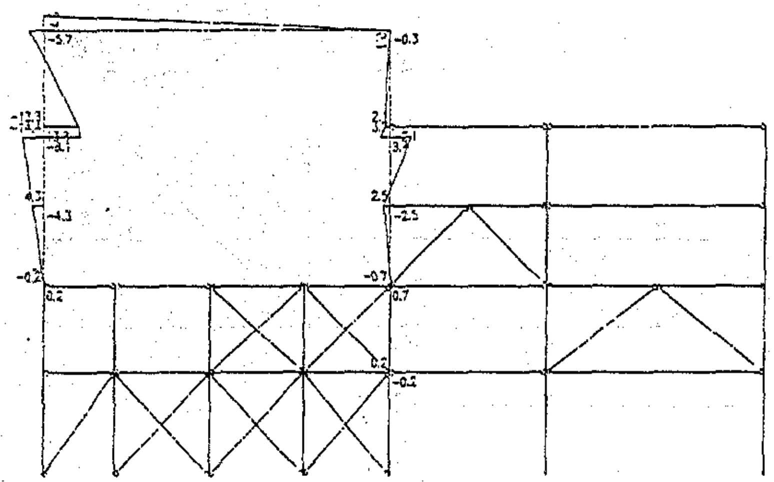
C.D.L.　　　　　　A.F.D.
荷重ケース　1　　軸　力　図
(104 – LINE)



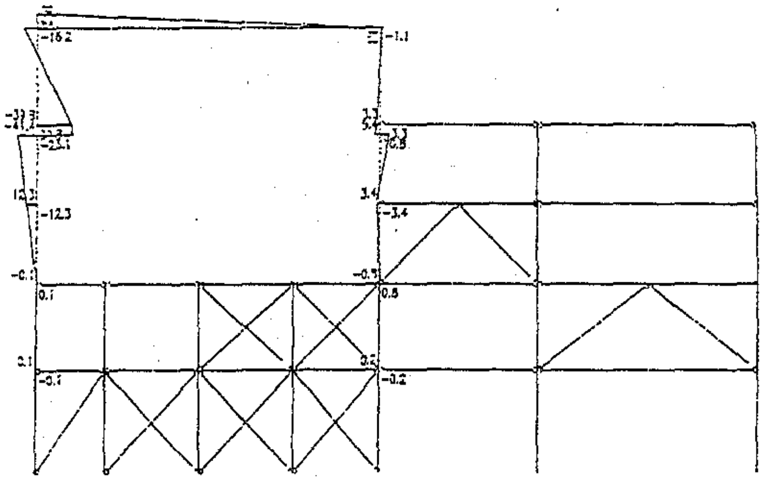
C.L.L.　　　　　　A.F.D.
荷重ケース　2　　軸　力　図
(104 – LINE)



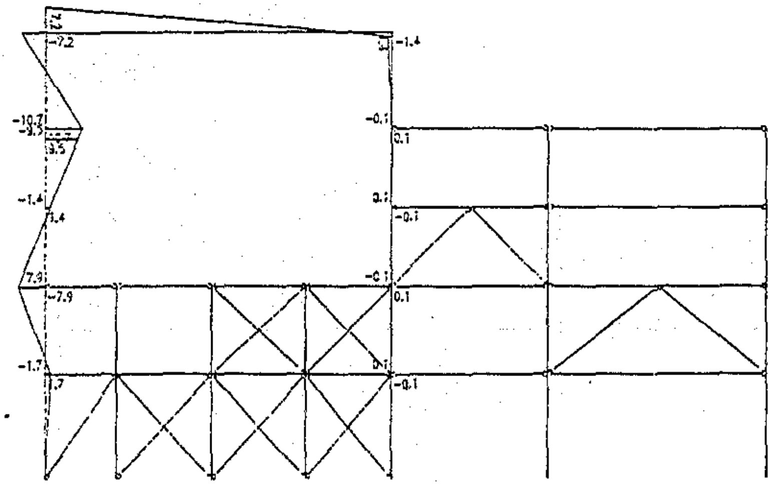
C.H.L.　　　　　　A.F.D.
荷重ケース　3　　軸　力　図
(104 – LINE)



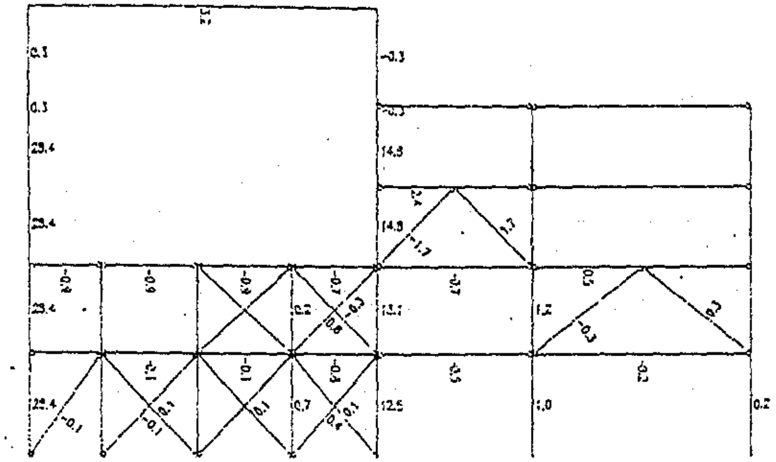
C.D.L.　　　　B.M.D.
荷重ケース　1　　曲げモーメント図
(108 - LINE)



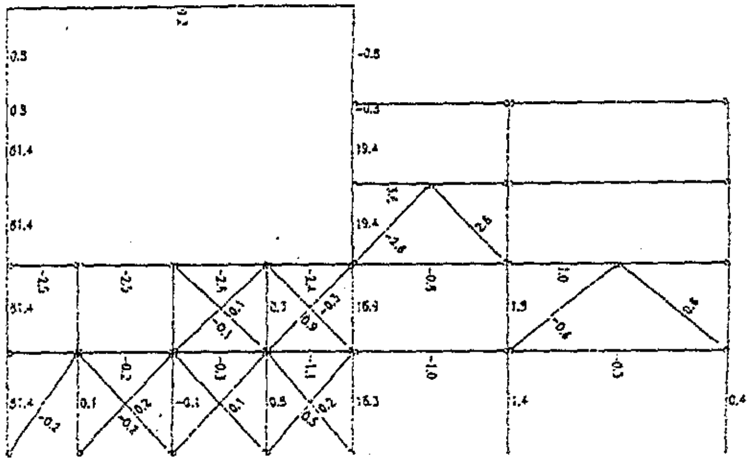
C.L.L.　　　　B.M.D.
荷重ケース　2　　曲げモーメント図
(108 - LINE)



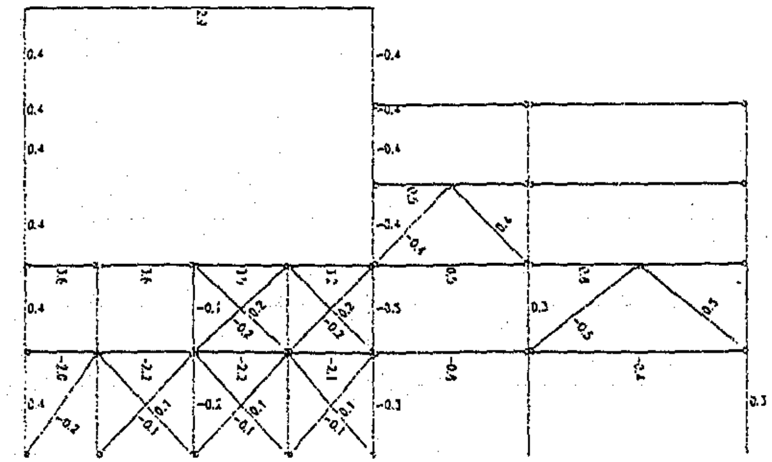
C.H.L.　　　　B.M.D.
荷重ケース　3　　曲げモーメント図
(108 - LINE)



C.D.L. A.F.D
荷重ケース 1 軸力図
(108 - LINE)



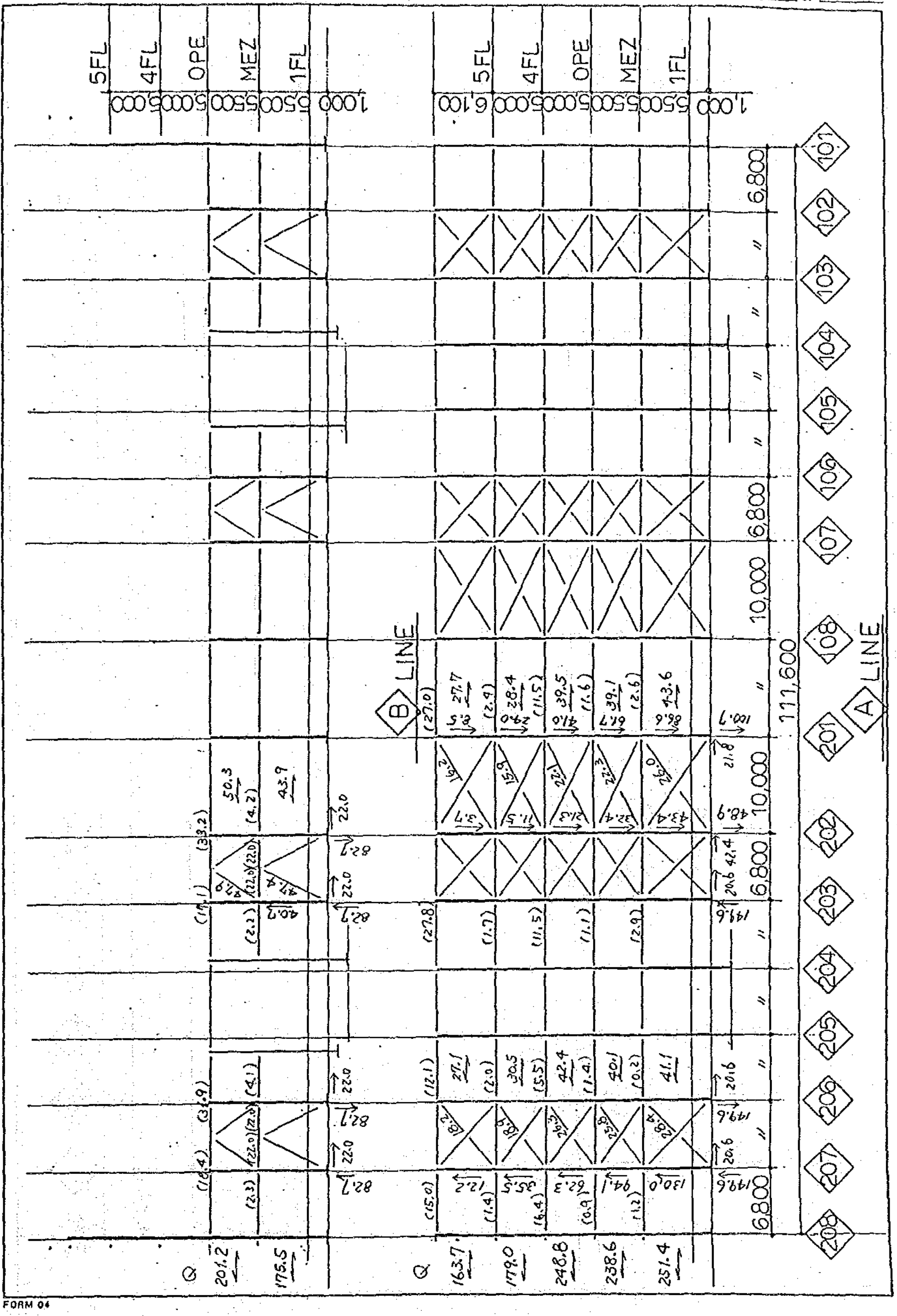
C.L.L. A.F.D.
荷重ケース 2 軸力図
(108 - LINE)



C.H.L. A.F.D.
荷重ケース 3 軸力図
(108 - LINE)

3.4 Stress of vertical bracing, Column and Girder

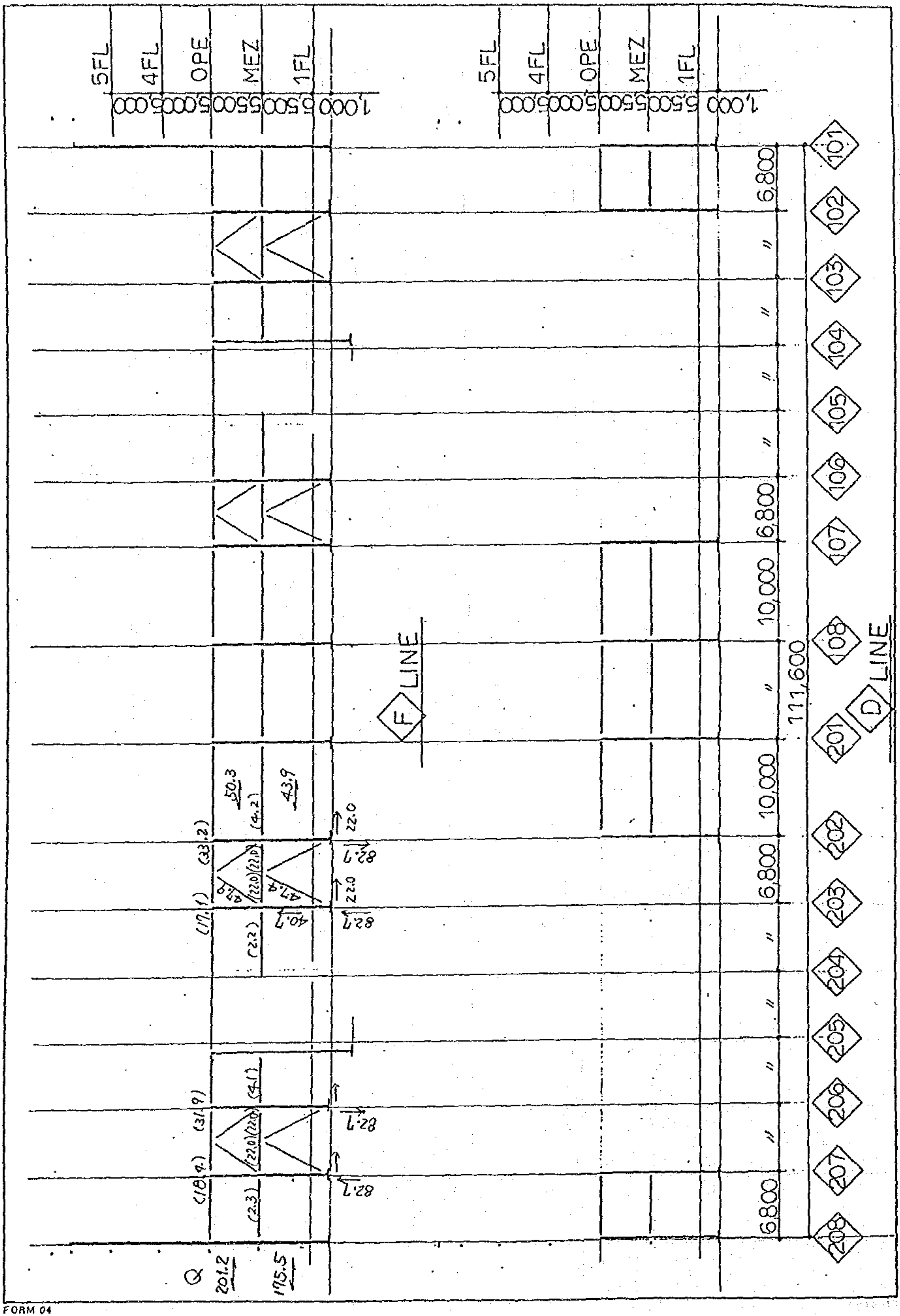
SHEET 131 OF



FORM 04

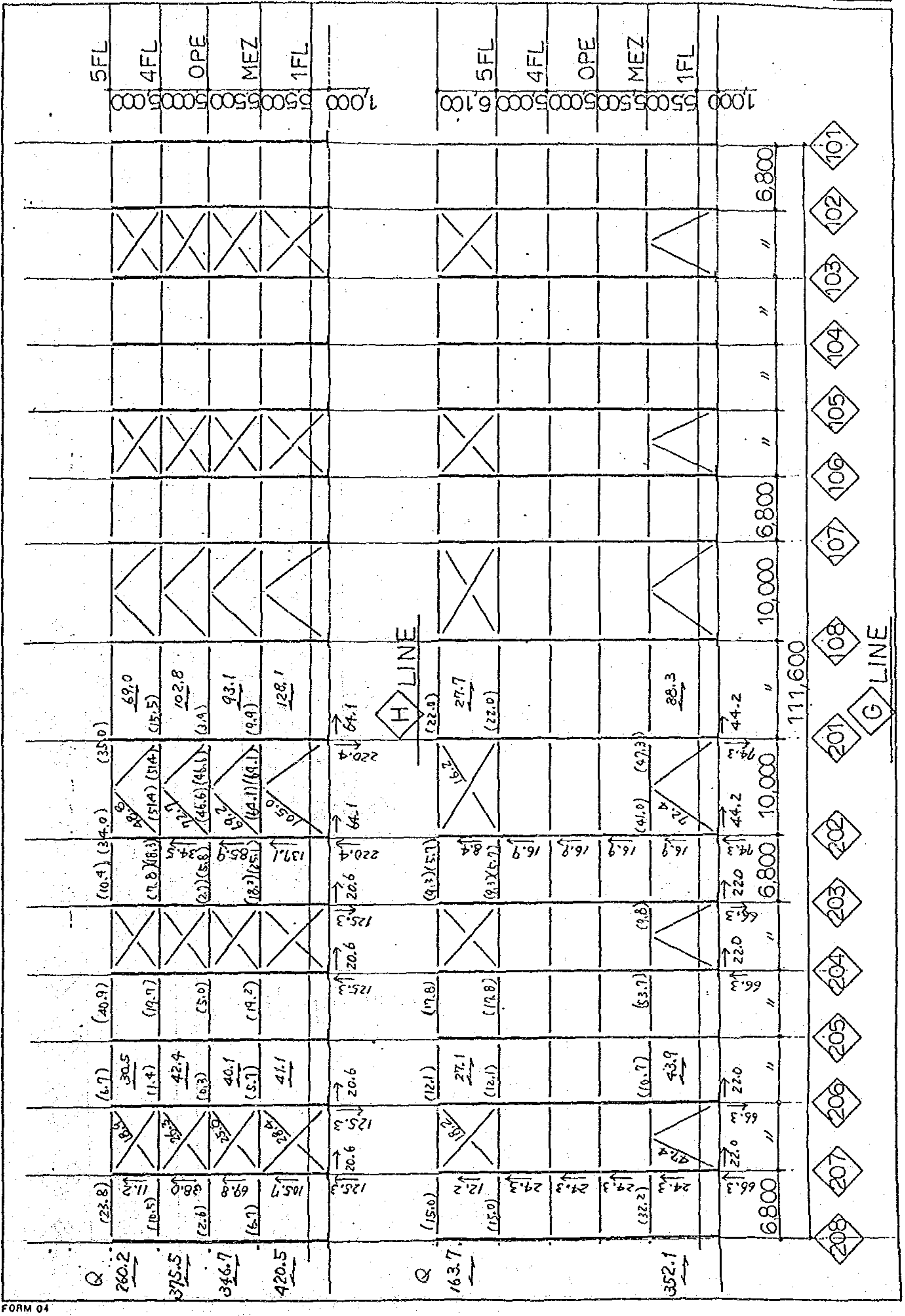
134

SHEET 132 OF



FORM 04

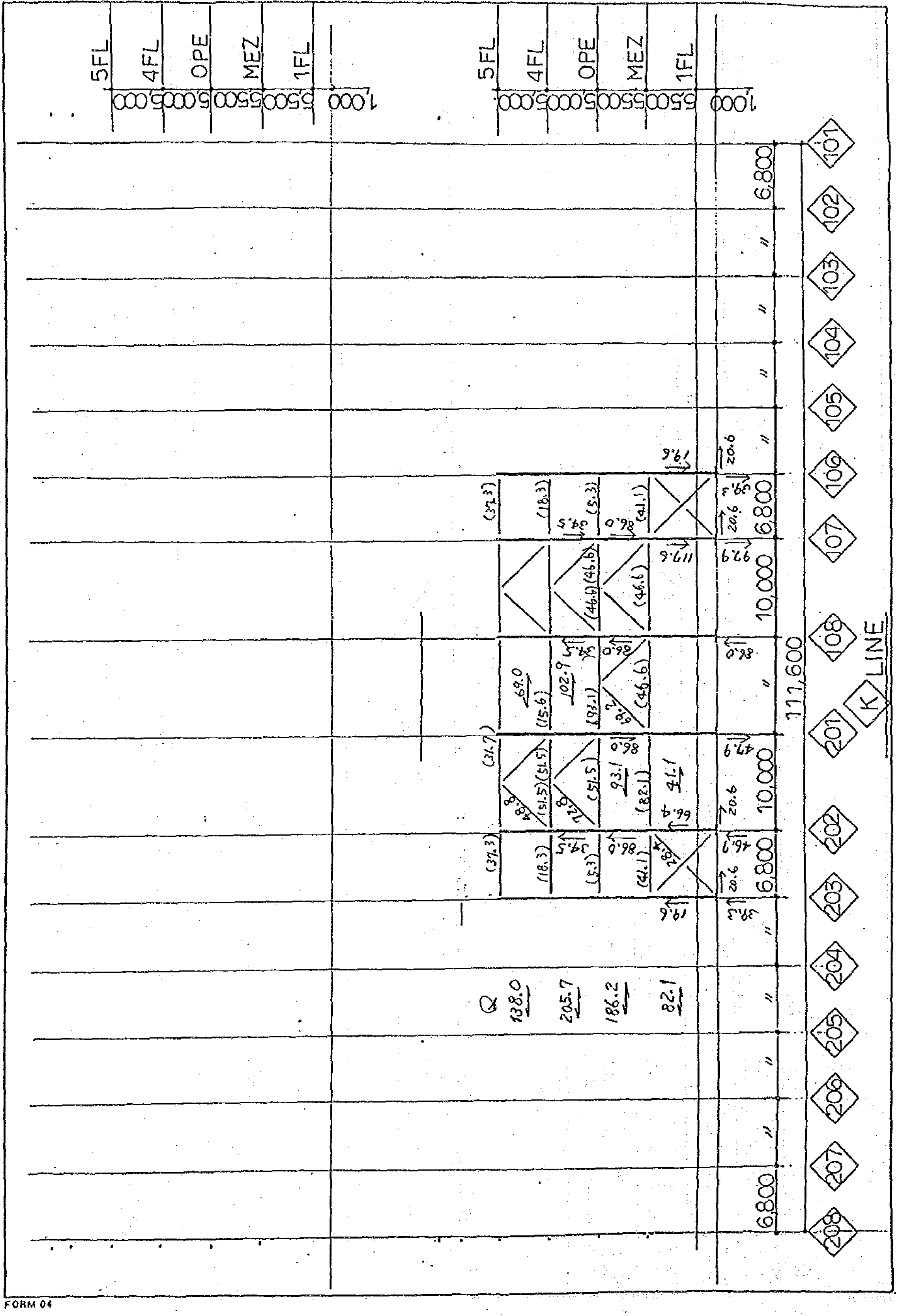
SHEET 133 OF



FORM 04

136

SHEET 134 OF



FORM 04

137

4. Design of Column

4.1 Design of Column

TABLE FOR COLUMN STRESS (/)
[柱応力表]

NOTE : VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD
CHL--- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS (VL+CDL+CHL+SL)

LOCA-TION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	
A-101 A-208		RF	36.7	-72.7	-7.5	0.2	-5.0	-2.8	0.7	-14.0	-8.1	0.0 -9.5	29.6	2.3	0.3	-6.1	-2.6	37.4	-86.7	-15.6	41.1	-101.2	-10.0	X Y
		OPE	70.5	48.0	10.3	23.6	-0.1	0.0	67.7	-0.2	-0.1	0.0 -17.9	-36.0	-8.2	0.2	-7.0	-1.5	138.2	47.8	10.2	111.8	-90.9	20.0	
		MEZ	96.8	-8.5	-1.3	23.0	0.1	0.0	66.0	0.2	0.0	0.0 -30.2	9.3	1.4	0.1	1.5	0.2	162.8	-8.3	-1.3	149.9	-19.2	-2.9	
A-102 A-207		RF	53.8	-96.7	-9.7	0.2	-5.0	-2.8	0.7	-14.0	-8.1	12.2 -9.3	27.7	1.6	0.3	-6.1	-2.6	54.5	-110.7	-17.8	58.0	-123.3	11.5	
		OPE	106.4	59.3	12.7	23.6	-0.1	0.0	67.7	-0.2	-0.1	94.1 -15.4	-37.5	-8.5	0.2	-7.0	+1.5	174.1	59.1	12.6	200.5 145.2	103.7	22.7	
		MEZ	142.4	-10.8	-1.7	23.0	0.1	0.0	66.0	0.7	0.0	130.0 -25.6	9.4	1.4	0.1	1.5	0.2	208.4	-10.6	-1.7	272.9 190.9	-21.6	3.3	
A-103 A-206		RF	53.8	-96.7	-9.7	0.2	-5.0	-2.8	0.7	-13.9	-8.1	-12.2 -4.4	28.1	1.6	0.3	-6.1	-2.6	54.5	-110.6	-17.8	58.1	123.7	11.5	
		OPE	106.4	59.2	12.7	25.0	-0.1	0.0	71.9	-0.1	0.0	-94.1 -4.4	-37.7	-8.6	0.3	-7.0	-1.5	178.3	59.1	12.7	200.5 135.5	103.8	22.8	
		MEZ	142.4	-10.7	-1.6	24.0	0.0	0.0	68.8	0.1	0.0	-130.0 -17.8	9.4	1.4	0.2	1.5	0.2	211.2	-10.6	-1.6	272.4 184.0	21.6	3.2	
A-104 A-205		RF	53.8	-55.3	-2.0	0.1	-2.8	-2.4	0.3	-7.4	-6.9	0.0 -2.2	-8.8	-5.1	0.7	-12.5	-3.7	54.1	-62.7	-8.9	58.7	79.4	13.2	
		5TH	61.8	-42.0	-2.0	24.9	-7.4	-0.3	71.5	-21.6	-1.0	0.0 -2.2	23.4	-1.1	0.7	10.0	0.5	133.3	-63.6	-3.0	88.2	82.8	6.2	
		MEZ	106.5	-12.8	-2.0	24.9	-2.3	-0.3	71.5	-6.6	-1.0	0.0 -2.2	24.4	3.8	0.7	3.0	0.5	178.0	-19.4	-3.0	132.9	92.5	6.6	
A-105 A-204		RF	53.8	-55.3	-2.0	0.1	-2.8	-2.4	0.3	-7.4	-6.9	0.0 -2.2	-9.0	-5.2	0.7	-12.5	-3.7	54.1	-62.7	-8.9	52.4	79.6	13.3	
		5TH	61.8	-42.0	-2.0	24.9	-7.4	-0.3	71.5	-21.6	-1.0	0.0 -2.2	23.2	-1.2	0.7	10.0	0.5	133.3	-63.6	-3.0	88.2	62.6	1.6	
		MEZ	107.5	-12.8	-2.0	24.9	-2.3	-0.3	71.5	-6.6	-1.0	0.0 -2.2	24.3	3.7	0.7	3.0	0.5	179.0	-19.4	-3.0	133.9	42.4	11.0	
A-106 A-203		RF	53.8	-96.7	-9.7	0.2	-5.0	-2.8	0.7	-13.9	-8.1	12.2 -9.3	27.4	1.5	0.3	-6.1	-2.6	54.5	-110.6	-17.8	58.0	123.0	11.4	
		OPE	107.4	59.2	12.7	25.0	-0.1	0.0	71.9	-0.1	0.0	94.1 -4.3	-37.5	-8.6	0.3	-7.0	-1.5	179.3	59.1	12.7	201.5 136.4	103.6	22.8	
		MEZ	150.3	-10.7	-1.7	24.0	0.0	0.0	68.8	0.1	0.0	130.0 -17.5	9.8	1.5	0.2	1.5	0.2	219.1	-10.6	-1.7	280.3 191.6	22.0	3.4	

TABLE FOR COLUMN STRESS (2)
[柱応力表]

NOTE :
VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD
CHL--- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS (VL+CDL+CHL+SL)

LOCA-TION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	
A-107 A-202		RF	65.6	-11.7	-11.1	0.3	-5.7	-3.2	0.8	-16.2	-9.2	-3.7 -5.0	31.0	1.6	0.4	-7.2	-2.9	66.4	-127.9	-20.3	70.5	141.2	13.0	
		OPE	129.9	67.8	14.6	28.4	0.2	0.0	81.4	0.1	0.0	-32.4 -5.0	-42.8	-9.8	0.4	-7.9	-1.7	210.8	67.9	14.6	162.4	118.7	26.1	
		MEZ	173.5	-12.4	-1.9	28.4	0.0	0.0	81.4	-0.1	0.0	-43.7 -20.9	11.1	1.7	0.4	1.7	0.3	254.9	-12.5	-1.9	222.4	25.2	3.9	
A-108 A-201		RF	77.4	-127.0	-12.6	0.3	-5.7	-3.2	0.8	-16.2	-9.2	-8.5 -4.9	29.5	1.0	0.4	-7.2	-2.9	78.2	-143.2	-21.8	82.2	155.0	13.9	
		OPE	116.8	75.3	16.3	28.4	0.2	0.0	81.4	0.1	0.0	-61.7 -4.9	-44.3	-10.2	0.4	-7.9	-1.7	198.2	75.4	16.3	198.5 149.7	127.7	28.2	
		MEZ	133.1	-14.5	-2.2	28.4	0.0	0.0	81.4	-0.1	0.0	-86.6 -4.9	11.8	1.8	0.4	1.7	0.3	214.5	-14.6	-2.2	219.7 166.0	24.6	4.3	
B-101 208		MEZ	86.4			1.5			4.2			0.0 7.8			0.2			90.6			95.9			
B-102 207		MEZ	125.3			1.5			4.2			40.7 27.3			0.2			129.5			151.3			
B-103 206		MEZ	79.4			0.9			2.5			-40.7 33.5			0.2			81.9			114.0			
B-104 205		MEZ	35.1			0.0			0.0			0.0 0.0			0.0			35.1			35.1			
B-105 204		MEZ	36.1			0.0			0.0			0.0 0.0			0.0			36.1			36.1			
B-106 203		MEZ	96.3			0.9			2.5			40.7 33.6			0.2			98.8			131.0			
B-107 202		MEZ	143.6			0.0			0.0			-40.7 20.6			0.0			143.6			184.3 169.2			
B-108		MEZ	90.8			0.0			0.0			0.0 9.4			0.0			90.8			100.2			
B-201		MEZ	82.8			0.0			0.0			0.0 9.4			0.0			82.8			92.2			
D-101 208		MEZ	89.3			0.0			0.0			0.0 -16.2			0.0			89.3			105.5			
D-102 207		MEZ	136.1			0.0			0.0			0.0 0.0			0.0			136.1			136.1			
D-107 202		MEZ	135.7			0.0			0.0			0.0 0.0			0.0			135.7			135.7			
D-108		MEZ	198.5			0.0			0.0			0.0 -21.7			0.0			198.5			220.2			
D-201		MEZ	187.7			0.0			0.0			0.0 -21.7			0.0			187.7			209.4			

NOTE : VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD

CHL--- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS
(VL+CDL+CHL+SL)

TABLE FOR COLUMN STRESS (3)
〔柱応力表〕

LOCATION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	
F-101 208		MEZ	81.1			0.0			0.0			0.0 15.7			0.0			81.1			96.8			
F-102 207		MEZ	128.4			0.0			0.0			40.7 -0.4			0.0			128.4			169.1 128.8			
F-103 206		MEZ	103.9			0.5			0.6			-40.7 -36.6			-0.2			104.5			145.1 141.2			
F-104 105 209 205		MEZ	43.2			0.0			0.0			0.0 0.0			0.0			43.2			43.2			
F-106		MEZ	75.4			0.5			0.6			40.7 -31.7			-0.2			76.0			116.1 107.3			
F-107 202		MEZ	160.6			0.7			0.8			-40.7 -20.0			0.0			161.4			201.3 181.3			
F-108		MEZ	188.6			0.7			0.8			0.0 -3.9			0.0			189.4			193.2			
F-201		MEZ	179.7			0.7			0.8			0.0 -3.9			0.0			180.5			184.3			
F-203		MEZ	92.6			0.5			0.6			-40.7 -31.7			-0.2			93.2			133.3 125.0			
G-101 208		RF	36.7	40.7	-2.1	-0.2	-0.5	0.2	-0.7	-1.4	0.2	0.0 4.5	68.7	22.4	-0.3	-1.3	-0.2	36.7	40.7	-2.1	40.7	107.6	22.1	
		5TH	59.9	34.4	9.7	13.1	7.4	2.2	17.1	9.7	2.9	0.0 4.5	-57.7	-15.9	-0.3	0.1	0.1	72.0	44.1	12.6	66.5	99.4	27.7	
		MEZ	181.1	2.8	0.4	11.5	-0.1	0.0	15.0	0.0	0.0	0.0 -44.3	1.7	0.3	-0.6	-0.1	0.0	196.1	2.8	0.4	237.5	1.1	0.1	
G-102 207		RF	53.8	71.2	7.3	-0.2	-0.5	0.2	-0.7	-1.4	0.2	12.2 4.3	67.9	22.2	-0.3	-1.3	-0.2	53.8	71.2	7.3	57.6	139.3	29.5	
		5TH	86.7	22.6	6.1	13.1	7.4	2.2	17.1	9.7	2.9	24.3 4.3	-57.5	-15.8	-0.3	0.1	0.1	103.8	32.3	9.0	98.5	87.4	24.0	
		MEZ	300.9	3.0	0.5	11.5	-0.1	0.0	15.0	0.0	0.0	24.3 -32.4	1.9	0.3	-0.6	-0.1	0.0	315.9	3.0	0.5	345.4	1.1	0.2	
G-103 206		RF	53.8	71.3	7.3	-0.2	-0.4	0.2	-0.7	-1.4	0.2	-12.2 4.4	68.6	22.4	-0.3	-1.3	-0.2	53.8	71.3	7.3	57.7	138.4	29.7	
		5TH	159.5	22.6	6.1	13.0	7.4	2.2	17.1	9.6	2.9	-24.3 4.4	-57.8	-16.0	-0.3	0.1	0.1	176.6	32.2	9.0	168.4	82.7	24.2	
		MEZ	373.7	2.8	0.4	9.9	-0.1	0.0	12.6	-0.1	0.0	-24.3 -47.4	2.4	0.4	-0.6	-0.1	0.0	386.3	2.7	0.4	431.6	0.4	0.0	

TABLE FOR COLUMN STRESS (4)
[柱応力表]

NOTE : VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD
CHL --- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS (VL+CDL+CHL+SL)

LOCA-TION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	
G-104 205		RF	53.8	83.1	9.9	-0.1	0.1	0.3	-0.3	0.3	0.5	0.0 2.2	58.3	20.2	-0.7	-2.9	-0.6	53.5	83.4	10.4	55.2	138.6	29.8	
		5TH	159.5	19.4	5.2	13.2	7.3	2.1	17.5	9.3	2.8	0.0 2.2	-55.0	-15.1	-0.7	0.4	0.1	177.0	28.7	8.0	171.2	81.3	22.3	
		MEZ	365.0	2.8	0.4	10.8	-0.1	0.0	13.9	-0.2	0.0	0.0 -87.6	2.5	0.4	-1.3	0.0	0.0	378.9	2.6	0.4	464.7	0.2	0.0	
G-105 204		RF	53.8	83.1	9.9	-0.1	0.1	0.3	-0.3	0.3	0.5	12.2 2.2	57.7	20.0	-0.7	-2.9	-0.6	53.5	83.4	10.4	55.2	138.0	29.6	
		5TH	86.7	19.4	5.2	13.2	7.3	2.1	17.5	9.3	2.8	24.3 2.2	-54.1	-15.0	-0.7	0.4	0.1	104.2	28.7	8.0	104.7	81.0	22.2	
		MEZ	295.7	2.8	0.4	10.8	-0.1	0.0	13.9	-0.2	0.0	24.3 -58.8	2.5	0.4	-1.3	0.0	0.0	309.6	2.6	0.4	366.6	0.2	0.0	
G-106 203		RF	53.8	71.2	7.3	-0.2	-0.4	0.2	-0.7	-1.4	0.2	-12.2 4.3	67.4	22.2	-0.3	-1.3	-0.2	53.8	71.2	7.3	57.6	136.9	29.5	
		5TH	79.9	22.7	6.2	13.0	7.4	2.2	17.1	9.6	2.9	-29.3 4.3	-57.4	-15.9	-0.3	0.1	0.1	97.0	32.3	9.1	88.9	87.4	24.2	
		MEZ	273.2	2.7	0.4	9.9	-0.1	0.0	12.6	-0.1	0.0	-24.3 39.2	2.5	0.4	-0.6	-0.1	0.0	285.8	2.6	0.4	321.7	5.0	0.0	
G-107 202		RF	65.6	84.9	9.3	-0.3	-0.3	0.3	-0.8	-1.1	0.4	8.4 5.0	79.5	25.7	-0.4	-1.4	-0.2	65.6	84.9	9.3	69.9	162.7	35.1	
		5TH	97.5	24.1	6.5	14.8	8.4	2.5	19.4	10.8	3.3	16.9 5.0	-65.4	-18.1	-0.4	0.1	0.0	116.9	34.9	9.8	111.3	97.8	27.1	
		MEZ	381.5	3.3	0.5	12.5	-0.2	0.0	16.3	-0.2	0.2	16.9 0.0	2.8	0.4	-0.3	-0.1	0.0	397.8	3.1	0.7	393.7	5.8	0.9	
G-108 201		RF	77.4	112.6	15.3	-0.3	-0.3	0.3	-0.8	-1.1	0.4	-8.4 4.9	78.8	25.5	-0.4	-1.4	-0.2	77.4	112.6	15.3	81.6	189.7	40.9	
		5TH	115.2	16.5	4.2	14.8	8.4	2.5	19.4	10.8	3.3	-16.9 4.9	-65.0	-17.9	-0.4	0.1	0.0	134.6	27.3	7.5	125.5	89.8	24.6	
		MEZ	465.2	3.4	0.5	12.5	-0.2	0.0	16.3	-0.2	0.2	-16.9 8.9	2.9	0.4	-0.3	-0.1	0.0	481.5	3.2	0.7	486.3	6.0	0.9	
H-101 208		4TH	42.8			0.0			0.0			0.0 27.5			0.0			42.8			70.3			
		MEZ	79.5			1.2			1.7			0.0 67.4			0.3			81.2			148.4			
H-102 207		4TH	87.3			0.0			0.0			38.0 0.0			0.0			87.3			125.3			
		MEZ	207.3			1.2			1.7			105.7 55.4			0.3			209.0			313.0 264.2			

TABLE FOR COLUMN STRESS (5)
[柱応力表]

NOTE :
VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD
CHL--- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS (VL+CDL+CHL+SL)

LOCA-TION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	
H-103 206		4TH	160.9			1.3			2.0			-38.0 94.7			0.3			162.9			207.2			
		ME8	280.9			2.3			3.5			-105.7 95.0			0.6			284.4			386.6 378.8			
H-104 205		4TH	173.4			1.3			2.0			0.0 42.6			0.4			175.4			217.7			
		ME8	305.4			2.4			3.6			0.0 89.8			0.6			309.0			398.2			
H-105 204		4TH	99.8			1.3			2.0			38.0 0.0			0.4			101.8			139.8			
		ME8	231.8			2.4			3.6			105.7 61.0			0.6			235.4			337.5 295.8			
H-106		4TH	146.1			1.3			2.0			-38.0 -27.5			0.3			148.1			184.1			
		ME8	338.4			2.3			3.5			-105.7 -73.6			0.6			341.9			106.2			
H-107 202		4TH	202.8			0.0			0.0			39.5 47.6			0.0			202.8			250.4			
		ME8	521.0			1.0			1.4			137.1 47.6			0.0			522.4			658.1			
H-108 201		4TH	239.4			0.0			0.0			-39.5 0.0			0.0			239.4			273.9			
		ME8	593.1			1.0			1.4			-137.1 5.2			0.0			598.5			730.2			
H-213		4TH	176.5			1.3			2.0			38.0 -27.5			0.3			178.5			214.5			
		ME8	371.8			2.3			3.5			105.7 -73.6			0.6			375.3			477.5			
K-106		4TH	60.1			0.0			0.0			0.0 27.5			0.0			60.1			87.6			
		ME8	147.8			0.2			0.4			19.6 73.5			0.3			151.8			221.8			
K-107		4TH	133.7			0.0			0.0			39.5 0.0			0.0			133.7			168.2			
		ME8	288.1			0.2			0.4			117.6 0.0			0.3			288.5			405.7			
K-108		4TH	121.1			0.0			0.0			-39.5 0.0			0.0			121.1			155.6			
		ME8	303.6			0.2			0.4			-86.0 38.0			0.3			304.0			389.6			

TABLE FOR COLUMN STRESS (6)
[柱応力表]

NOTE :
VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD
CHL --- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS (VL+CDL+CHL+SL)

LOCA-TION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	
K-201		4TH	113.7			0.0			0.0			39.5 0.0			0.0			113.7			148.2			
		MEZ	289.8			0.2			0.4			86.0 38.0			0.3			290.2			375.8			
K-202		4TH	105.2			0.0			0.0			-39.5 0.0			0.0			105.2			139.7			
		MEZ	248.7			0.2			0.4			-86.0 0.0			0.3			249.1			334.7			
K-203		4TH	55.3			0.0			0.0			0.0 27.5			0.0			55.3			82.8			
		MEZ	178.9			0.2			0.4			-19.6 73.5			0.3			179.3			252.9			

NOTE: σ b/fb < 1.0
σ c/fc < 1.0
σ b/fb + σ c/fc < 1.0

DECISION OF COLUMN (I)
[柱の断面算定]

LOCATION	DIV NO.	DIR X Y	PERMANENT CONDITIONS			TEMPORARY CONDITIONS			MEMBER	A.STRESS			σ b	σ c	σ b/fb +
			N	M	Q	N	M	Q	(A,I,Z)	i,η imin	λ b λ c	fb fc	σ b fb	σ c fc	σ c/fc
A-101 ~ 106 203 ~ 208	3		54.5	110.6	17.8	58.0	123.0	11.4	BH-700X350X28X40 453.6 10,311	9.4 7.95	46 54	1.6 1.35	1.07 0.67	0.12 0.09	0.76
	2		179.3	59.1	12.7	201.5 136.4	103.6	22.8	BH-900X350X28X40 509.6 14,372	9.15 7.5	60 73	1.6 1.17	0.41 0.26	0.35 0.30	0.56
	1		219.1	10.6	1.7	280.3 191.6	22.0	3.4	Ditto	9.15 7.5	71 87	1.6 1.02	0.07 0.04	0.43 0.42	0.46
A-107 ~ 202	3		78.2	143.2	21.8	82.2	155.0	13.9	BH-700X400X28X40 493.6 11,557	10.8 9.3	40 46	1.6 1.41	1.24 0.78	0.16 0.11	0.89
	2		210.8	67.9	14.6	162.4	118.7	26.1	BH-900X900X28X40 549.6 16,016	10.5 8.8	52 63	1.6 1.27	0.42 0.26	0.38 0.30	0.56
	1		254.9	12.5	1.9	222.4	25.2	3.9	Ditto	10.5 8.8	62 74	1.6 1.16	0.08 0.05	0.46 0.40	0.45
G-101 ~ 106 203 ~ 208	3		53.5	83.4	10.4	55.2	138.6	29.8	BH-700X350X28X40 453.6 10,311	9.4 7.95	46 54	1.6 1.35	0.81 0.51	0.12 0.09	0.60
	2		177.6	28.7	8.0	171.2	81.3	22.3	BH-900X350X28X40 509.6 14,372	9.15 7.5	55 67	1.6 1.23	0.20 0.13	0.35 0.28	0.41
	1		386.3	2.7	0.4	431.6	0.4	0.0	Ditto	9.15 7.5	71 87	1.6 1.02	0.02 0.01	0.76 0.75	0.76
G-107 ~ 202	3		77.4	112.6	15.3	81.6	189.7	40.9	BH-700X400X28X40 493.6 16,016	10.8 9.3	40 46	1.6 1.41	0.70 0.44	0.16 0.11	0.55
	2		134.6	27.3	7.5	125.5	89.8	24.6	BH-900X400X28Y40 549.6 16,016	10.5 8.8	48 57	1.6 1.32	0.17 0.11	0.24 0.18	0.29
	1		481.5	3.2	0.7	486.3	6.0	0.9	Ditto	10.5 8.8	62 74	1.6 1.16	0.02 0.01	0.88 0.76	0.77
B-101 103 ~ 106 108 201 203 ~ 206 208															
	1		98.8	0.0	0.0				H-300² 119.8	7.51	87	1.02		0.82 0.80	0.80
B-102 107 202 207															
	1		143.6	0.0	0.0				H-350² 173.9	8.84	74	1.16		0.83 0.72	0.72
D-101 208															
	1		89.3	0.0	0.0				H-300² 119.8	7.51	87	1.02		0.75 0.74	0.74

NOTATION: DIV NO. --- DIVISION NUMBER OF COLUMN
DIR --- DIRECTION, X OR Y
N,M,Q --- AXIAL FORCE(t), BENDING MOMENT(tm), SHEAR FORCE(t)
A,I,Z --- SECTION AREA (cm2), GEOMETRY MOMENT OF INERTIA (cm4),
SECTION MODULUS (cm3)
A.STRESS --- ALLOWABLE STRESS
i,η --- CONSTANTS FOR DECISION OF ALLOWABLE BENDING STRESS
imin --- MINIMUM RADIUS OF SECTION (cm)
λ b,λ c --- BUCKLING COEFFICIENT FOR BENDING MOMENT AND AXIAL FORCE
fb,fc --- ALLOWABLE STRESS FOR BENDING AND AXIAL FORCE (t/cm2)

NOTE:
σ b/fb < 1.0
σ c/fc < 1.0
σ b/fb + σ c/fc < 1.0

DECISION OF COLUMN (2)
[柱の断面算定]

LOCA	DIV	DIR	PERMANENT			TEMPORARY			MEMBER	A.STRESS			σ b	σ c	σ b/fb
		X	CONDITIONS			CONDITIONS				i, η	λ b	fb	σ b	σ c	+
TION	NO.	Y	N	M	Q	N	M	Q	(A,I,Z)	imin	λ c	fc	fb	fc	σ c/fc
D-102 ~ 207															
	1		198.5	0.0	0.0				H-350^2 173.9	8.84	74	1.16		1.14 0.98	0.98
F-101 103 ~ 106 203 ~ 206 208															
	1		104.5	0.0	0.0				H-300^2 119.8	7.57	87	1.02		0.87 0.85	0.85
F-102 107 ~ 202 207															
	1		189.4	0.0	0.0				H-350^2 173.9	8.24	74	1.16		1.09 0.94	0.94
H-101 208															
	2		42.8			70.3			H-300^2 119.8	7.51	67	1.23		0.36 0.29	0.29
	1		81.2			148.4			Ditto	7.51	87	1.02		1.24 0.81	0.81
H-102 209															
	2		87.3						H-390 136.0	7.28	69	1.21		0.64 0.53	0.53
	1		209.0						H-400^2 218.7	10.1	64	1.26		0.96 0.76	0.76
H-103 105 (106) 209 206															
	2		162.9						H-440 157.4	7.18	70	1.20		1.03 0.86	0.86
	1		341.9						BH-450^2 289.0	11.46	57	1.32		1.18 0.89	0.89
104 H-107 -108 -201 -202 203 205															
	2		239.4						BH-480×350×16×22 223.76	8.38	60	1.30		1.07 0.82	0.82
	1		594.5						BH-516×500 495.92	12.96	50	1.38		1.20 0.87	0.87

NOTATION: DIV NO. --- DIVISION NUMBER OF COLUMN
DIR --- DIRECTION, X OR Y
N,M,Q --- AXIAL FORCE(t), BENDING MOMENT(tm), SHEAR FORCE(t)
A,I,Z --- SECTION AREA (cm2), GEOMETRY MOMENT OF INERTIA (cm4), SECTION MODULUS (cm3)
A.STRESS --- ALLOWABLE STRESS
i, η --- CONSTANTS FOR DECISION OF ALLOWABLE BENDING STRESS
imin --- MINIMUM RADIUS OF SECTION (cm)
λ b, λ c --- BUCKLING COEFFICIENT FOR BENDING MOMENT AND AXIAL FORCE
fb,fc --- ALLOWABLE STRESS FOR BENDING AND AXIAL FORCE (t/cm2)

NOTE: $\sigma b/fb < 1.0$
$\sigma c/fc < 1.0$
$\sigma b/fb + \sigma c/fc < 1.0$

DECISION OF COLUMN (3)
[柱の断面算定]

LOCATION	DIV NO.	DIR X Y	PERMANENT CONDITIONS N	PERMANENT CONDITIONS M	PERMANENT CONDITIONS Q	TEMPORARY CONDITIONS N	TEMPORARY CONDITIONS M	TEMPORARY CONDITIONS Q	MEMBER (A,I,Z)	A.STRESS i, η / imin	A.STRESS λ b / λ c	A.STRESS fb / fc	σ b / σ b / fb	σ c / σ c / fc	σ b/fb + σ c/fc
K-106 203															
	2		60.1						H-350² 173.9	8.84	57	1.32		0.35 0.27	0.27
	1		179.3						Ditto	8.89	74	1.16		1.03 0.89	0.89
K-107 ~ 202															
	2		133.7						H-440 157.4	7.18	70	1.20		0.85 0.71	0.71
	1		309.0						H-450² 289.0	11.46	57	1.32		1.05 0.80	0.80

NOTATION: DIV NO. --- DIVISION NUMBER OF COLUMN
DIR --- DIRECTION, X OR Y
N,M,Q --- AXIAL FORCE(t), BENDING MOMENT(tm), SHEAR FORCE(t)
A,I,Z --- SECTION AREA (cm2), GEOMETRY MOMENT OF INERTIA (cm4), SECTION MODULUS (cm3)
A.STRESS --- ALLOWABLE STRESS
i, η --- CONSTANTS FOR DECISION OF ALLOWABLE BENDING STRESS
imin --- MINIMUM RADIUS OF SECTION (cm)
λ b, λ c --- BUCKLING COEFFICIENT FOR BENDING MOMENT AND AXIAL FORCE
fb, fc --- ALLOWABLE STRESS FOR BENDING AND AXIAL FORCE (t/cm2)

4.2 Design of Column Base

TABLE FOR COLUMN BASE (1)
〔柱応力表〕

NOTE :
VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD
CHL--- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS (VL+CDL+CHL+SL)

LOCA-TION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	
A-101	X																							
208	Y		96.8			23.3		-0.2	67.0		-0.7	-30		1.4	0.1		0.3	163.8		-0.7	150		1.9	
102	X											149.6		20.6							315.3		20.6	
207	Y		142.4			23.3		-0.2	67.0		-0.7	-48.5		17.3	0.1		0.3	209.4		-0.7	-7.2		20.6	X Direction
103	X											-149.6		20.6							316.1		20.6	
206	Y		142.4			24.1		-0.1	69.4		-0.4	-37.9		15.4	0.1		0.3	211.8		-0.4	-7.2		20.6	Ditto
104	X																							
205	Y		106.5			29.9		-0.3	71.5		-1.0	-2.3		3.8	0.7		0.5	178.0		-1.0	133.0		3.6	
105	X																							
204	Y		107.5			24.9		-0.3	71.5		-1.0	-2.2		3.7	0.7		0.5	179.0		-1.0	133.9		3.5	
106	X											149.6		20.6							324.9		20.6	
203	Y		150.3			24.1		-0.1	69.4		-0.4	-37.9		15.7	0.1		0.3	219.7		-0.4	0.7		20.6	X Direction
107	X											-48.9		42.4							250.7		42.4	
202	Y		173.5			28.3		0.0	81.2		0.1	-45.3		18.6	0.3		0.4	254.7		0.1	124.6		42.4	Ditto
108	X											-100.7		21.8							262.1		21.8	
201	Y		133.1			28.3		0.0	81.2		0.1	-32.8		21.1	0.3		0.4	214.3		0.1	32.4		21.8	Ditto
B-101																								
208			86.4			1.4		0.0	4.1		0.1	-11.2		17.5	0.1		0.1	90.5		0.1	98.9		17.4	
102					11.9							82.7		22.0						11.9	209.4		33.9	
207			125.3			1.4		0.0	4.1		0.1	7.3		15.7	0.1		0.1	129.4		0.1	42.6		-10.1	X Direction
103					-11.9							-82.7		22.0						-11.9	163.0		33.9	
206			79.4			0.9		0.0	2.5		0.0	33.5		0.0	0.2		0.0	81.9		0.0	-3.3		10.1	Ditto
104																								
205			35.1															35.1						
105																								
204			36.1															36.1						
106					11.9							82.7		22.0						11.9	179.9		33.9	
203			96.3			0.9		0.0	2.5		0.0	33.6		0.0	0.2		0.0	98.8		0.0	13.6		-10.1	X Direction
107					-11.9							-82.7		22.0						-11.9	226.3		33.9	
202			143.6			0.0		0.0	-0.1		0.1	3.4		15.8	-0.1		0.1	143.5		0.1	60.9		10.1	Ditto
108																								
			90.8			0.0		0.0	-0.1		0.1	-9.7		17.7	-0.1		0.1	90.7		0.1	100.6		17.8	
201																								
			82.8			0.0		0.0	-0.1		0.1	-9.7		17.7	-0.1		0.1	82.7		0.1	92.6		17.8	

TABLE FOR COLUMN BASE (2)
〔柱応力表〕

NOTE :
VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD
CHL--- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS (VL+CDL+CHL+SL)

LOCA-TION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	
D-101 208			89.3			0.2		0.3	0.5		0.7	-13.3		30.4	0.0		0.1	89.8		0.7	102.8 76.0		30.2 30.4	Y Direction
102 207			136.1			0.2		0.3	0.5		0.7	2.9		34.2	0.0		0.1	136.6		0.7	139.2		34.6	
107 202			135.1			0.1		0.0	0.0		0.1	0.0		36.4	-0.2		0.2	135.1		0.1	135.1		36.4	
108			198.5			0.1		0.0	0.0		0.1	-21.0		33.3	-0.2		0.2	198.5		0.1	219.8		33.5	
201			187.7			0.1		0.0	0.0		0.1	-21.0		33.3	-0.2		0.2	187.7		0.1	208.7		33.3	
F-101 208			81.1			0.4		-0.2	0.5		-0.2	11.6		29.8	0.0		0.1	81.6		-0.2	93.1 69.5		29.7 29.8	Y Direction
102 207			128.4		11.9	0.4		-0.2	0.5		-0.2	82.7 -2.1		22.0 31.5	0.0		0.1	128.9		11.9 -0.2	211.5 45.7		33.9 10.1	X Direction
103 206			103.9		-11.9	0.8		-0.2	0.9		-0.3	-82.7 -55.9		22.0 16.3	-0.3		0.1	104.8		-11.9 -0.3	187.4 21.2		33.9 10.1	Ditto
104 105 204 205			43.2															43.2			158.9		33.9	X Direction
106			95.4		11.9	0.8		-0.2	0.9		-0.3	82.7 -48.3		22.0 14.0	-0.3		0.1	76.3		11.9 -0.3	-7.3 27.1		10.1 14.0	Ditto Y Direction
107 202			160.6		-11.9	1.0		-0.2	1.3		0.2	-82.7 -20.6		22.0 30.9	-0.1		0.1	161.9		-11.9 0.2	243.3 140.0		33.9 30.9	
108			188.6			1.0		-0.2	1.3		0.2	-6.1		29.1	-0.1		0.1	189.9		0.2	182.5		29.1	
201			179.7			1.0		-0.2	1.3		0.2	-6.1		29.1	-0.1		0.1	181.0		0.2	173.6		29.1	
203			92.6			0.8		-0.2	0.9		-0.3	-82.7 -48.3		22.0 14.0	-0.3		0.1	93.5		-0.3	176.4 9.9 44.3		22.3 22.0 14.0	X Direction Y Direction

TABLE FOR COLUMN BASE (3)
(柱応力表)

NOTE :
VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD
CHL--- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS (VL+CDL+CHL+SL)

LOCATION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	
G-101																					274.4		70.1	
209			181.1		-9.7	11.6		0.0	15.1		0.1	-81.2		60.3	-0.5		0.1	196.2		-9.6	99.9		60.3	Y Direction
102					15.0							66.3		22.0						15.0	378.8		37.0	
207			300.9			11.6		0.0	15.1		0.1	-15.0		15.1	-0.5		0.1	316.0		0.1	285.9		15.1	
103					-15.0							-66.3		22.0						-15.0	450.0		32.0	
206			373.7			10.0		0.1	12.7		0.1	-34.7		11.1	-0.6		0.0	386.4		0.1	339.0		11.1	
104																								
205			365.0			10.8		0.0	13.9		0.0	-87.6		0.4	-1.3		0.0	378.9		0.0	464.7		0.4	
105					19.9							66.3		22.0						14.9	372.8		36.9	
204			295.7			10.8		0.0	13.9		0.0	-58.8		0.4	-1.3		0.0	309.6		0.0	236.9		0.4	
106					-19.9							-66.3		22.0						-14.9	349.5		36.9	
203			273.2			10.0		0.1	12.7		0.1	52.6		11.7	-0.6		0.0	285.9		0.1	220.6		11.7	
107					30.3							74.3		44.2						30.3	468.4		74.5	
202			381.5			12.6		0.1	16.5		0.1	14.9		13.1	-0.2		0.1	398.0		0.1	366.6		13.1	
108					-30.3							-79.3		44.2						-30.3	552.1		74.5	
201			465.2			12.6		0.1	16.5		0.1	26.3		15.2	-0.2		0.1	481.7		0.1	438.9		15.2	
H-101																					205.3		53.4	
208			79.5		9.7	1.2		0.0	1.7		0.0	124.3		43.7	0.3		0.0	81.2		9.7	-44.8		43.7	Y Direction
102												125.3		20.6							333.8		20.6	
207			207.3			1.2		0.0	1.7		0.0	55.4		0.0	0.3		0.0	209.0		0.0	82.0		20.6	X Direction
103												-125.3		20.6							408.5		20.6	
206			280.9			2.3		0.0	3.5		0.0	95.0		0.0	0.6		0.0	284.4		0.0	155.6		20.6	Ditto
104																								
205			305.4			2.4		0.0	3.6		0.0	89.8		0.0	0.6		0.0	309.0		0.0	398.2			
105												125.3		20.6							359.5		20.6	
204			231.8			2.4		0.0	3.6		0.0	61.0		0.0	0.6		0.0	235.4		0.0	106.5		20.6	X Direction
106												-125.3		20.6							465.7		71.3	
			338.4		-16.5	2.3		0.0	3.5		0.0	-124.9		54.8	0.6		0.0	341.9		-16.5	214.0		38.3	Y Direction
107					50.8							220.4		64.1						50.8	794.9		114.9	
202			521.0			1.0		0.0	1.4		0.0	47.6		0.1	0.0		0.0	522.4		0.0	300.6		13.3	X Direction
108					-50.8							-220.4		64.1						-50.8	814.5		114.9	
201			593.1			1.0		0.0	1.4		0.0	5.2		0.1	0.0		0.0	594.5		0.0	372.7		13.3	Ditto
203												125.3		20.6							499.1		69.8	
			371.8		-15.0	2.3		0.0	3.5		0.0	-124.9		54.8	0.6		0.0	375.3		-15.0	247.4		39.8	Y Direction

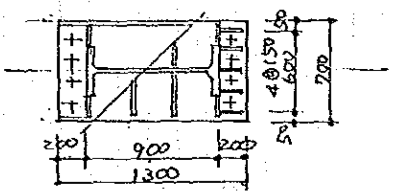
TABLE FOR COLUMN BASE (4)
【柱応力表】

NOTE :
VL --- VERTICAL LOAD
CDL --- CRANE DEAD LOAD
CLL --- CRANE LIFTING LOAD
SL --- SEISMIC LOAD
CHL--- CRANE HORIZONTAL LOAD
PC --- PERMANENT CONDITIONS (VL+CLL)
TC --- TEMPORARY CONDITIONS (VL+CDL+CHL+SL)

LOCA-TION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	N, t	M, tm	Q, t	
K-106			147.8		16.5	0.2		0.0	0.4		0.0	39.3 129.4		20.6 54.9	0.3		0.0	148.2		16.5	277.7 23.4		71.4 38.4	Y Direction
107			288.1			0.2		0.0	0.4		0.0	97.9 0.0		20.6 0.0	0.3		0.0	288.5		0.0	386.2 190.2		20.6 20.6	X Direction
108			303.6			0.2		0.0	0.4		0.0	-86.0 38.0		0.1	0.3		0.0	304.0		0.0	389.8 217.6			Ditto
201			289.8			0.2		0.0	0.4		0.0	47.9 38.0		0.1	0.3		0.0	290.2		0.0	337.9 241.9			Ditto
202			248.7			0.2		0.0	0.4		0.0	-46.7 0.0		20.6 0.0	0.3		0.0	249.1		0.0	295.6 202.0		20.6 20.6	Ditto
203			178.9		15.0	0.2		0.0	0.4		0.0	-39.3 129.4		20.6 54.9	0.3		0.0	179.1		15.0	126.0 54.5		69.9 39.9	Y Direction

DECISION OF COLUMN BASE (1)

[柱脚の断面算定]

LOCATION		A-105 (101, 104, 105, 204, 205, 208)		A-103 (102, 106, 203, 206, 207)	
COLUMN SIZE		BH-900×350×28×40		BH-900×350×28×40	
DIRECTION		X	Y	X	Y
PERMANENT CONDITIONS	M (tm)		0.5	0.2	
	N (t)		179.0	211.8	
	Q (t)		1.0	0.4	
TEMPORARY CONDITIONS	M (tm)		1.8	10.3	
	N (t)		133.9	-7.2	
	Q (t)		3.5	20.6	
FIGURE				same as A-105	
BASE PLATE	(L×B×t)	1300×700×29		1300×700×29	
CAP PLATE	(THICK.)	22		22	
RIB PLATE	(H×B×t)	16		16	
WING PLATE	(H×B×t)	22		22	
ANCHOR BOLT	(n-Dφ)	8-30φ		8-30φ	
SHEAR KEY	(H×B×t)				
CONC.	e=M/N (cm)	$\frac{0.5\times10^2}{179}=0.28<\frac{130}{6}=21.7$			
	σ c<fc (kg/cm2)	$\frac{179.0\times10^3}{65\times130}\left(1+\frac{6\times0.28}{130}\right)=21.5<70$		$\frac{211.8\times10^3}{65\times130}=25.1<70$	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	——		$N/bDf=-0.0005$ $M/bD^2f=0.001$ $P_t=0.13\%$ $a_t=130\times65\times P_t/2=5.5cm^2$	
BASE PLATE	M=α wlx^2 (tcm)	$0.09\times0.022\times32.5^2=2.1$ T·cm		$0.09\times0.025\times32.5^2=2.4$ T·cm	
	t>√ 6xM/fb (cm)	$\sqrt{6\times2.1/1.85}=2.61\rightarrow2.9$		$\sqrt{6\times2.4/1.85}=2.79\rightarrow2.9$	
CAP PLATE	M=α wlx^2 (tcm)			$0.085\times(2\times1.8\times7.06/(20\times14))\times14^2=1.51$	
	t>√ 6xM/fb (cm)			$\sqrt{6\times1.51/2.77}=1.81\rightarrow2.2$	
RIB PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.022\times32.5\times35}{1.6\times50}=0.81<0.9$		$\frac{1.90\times7.06}{1.6\times50}=0.15<1.35$	
	H/t	$\frac{50}{1.6}=31.3<71$			
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.022\times37.5\times15.0}{1.6\times50}=0.15<0.9$			
	H/t	$\frac{50}{1.6}=31.3<71$			
	WELDING τ < fs (t/cm2)				
ALLOW-ABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS				$(130\times65-130\times1.5)\times7\times1.5/1000=95.2$ T	

NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

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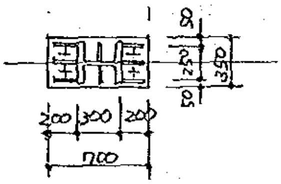
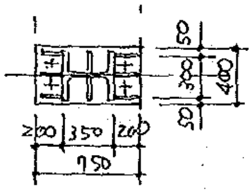
DECISION OF COLUMN BASE (2)
[柱脚の断面算定]

LOCATION		A-107, 202		A-108, 201	
COLUMN SIZE		BH-900×400×28×40		BH-900×400×28×40	
DIRECTION		X	Y	X	Y
PERMANENT CONDITIONS	M (tm)	0.1		0.1	
	N (t)	254.7		214.3	
	Q (t)	0.1		0.1	
TEMPORARY CONDITIONS	M (tm)	21.2		10.9	
	N (t)	124.6		32.4	
	Q (t)	42.4		21.8	
FIGURE		Same as G-108		Same as G-108	
BASE PLATE	(LxBxt)	1300×700×35		1300×700×35	
CAP PLATE	(THICK.)	22		22	
RIB PLATE	(HxBxt)	16		16	
WING PLATE	(HxBxt)	22		22	
ANCHOR BOLT	(n-Dϕ)	8-35ϕ		8-35ϕ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)				
	σ c<fc (kg/cm2)	$\frac{254.7\times10^3}{65\times130}=30.1$ <70			
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	N/bDf=0.0008 M/bD²f=0.002) Pt=0.19% at=130×65Pt/2=8cm²		N/bDf=0.0021 M/bD²f>0.001) Pt=0.02% at=130×65Pt/2=0.8cm²	
BASE PLATE	M=α wlx^2 (tcm)	$0.09\times0.03\times32.5^2=2.85$			
	t>√ 6xM/fb (cm)	$\sqrt{6\times2.85/1.85}=3.1\rightarrow3.5$			
CAP PLATE	M=α wlx^2 (tcm)	$0.085\times(2\times1.8\times8.0/20\times14))\times14^2=1.71$			
	t>√ 6xM/fb (cm)	$\sqrt{6\times1.71/2.77}=1.92\rightarrow2.2$			
RIB PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.03\times32.5\times35}{1.2\times50}=0.57$ <0.9			
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.03\times37.5\times12.5}{1.6\times50}=0.18$ <0.9			
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOWABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

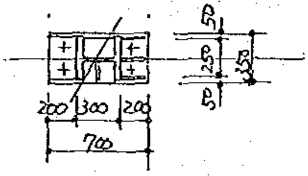
NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (3)
【柱脚の断面算定】

LOCATION		B-108 (101, 201, 208)		B-107 (102, 202, 207)	
COLUMN SIZE		$H-300^2 \times 10 \times 15$		$H-350^2 \times 12 \times 19$	
DIRECTION		X	Y	X	Y
PERMANENT CONDITIONS	M (tm)		0.1	3.6	
	N (t)		90.7	143.5	
	Q (t)		0.1	11.9	
TEMPORARY CONDITIONS	M (tm)		5.4	3.0	
	N (t)		100.6	60.9	
	Q (t)		17.8	10.1	
FIGURE					
BASE PLATE	(LxBxt)	700x350x22		750x400 x25	
CAP PLATE	(THICK.)	—		—	
RIB PLATE	(HxBxt)	12		16	
WING PLATE	(HxBxt)	—		—	
ANCHOR BOLT	(n-Dφ)	4-25Φ		4-25Φ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)				
	σc<fc (kg/cm2)	$\frac{90.7\times10^3}{90\times35}=37.0$ <70			
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	$N/bDf = 0.027$ $M/bD^2f = 0.0024$) $P_t = 0.0$			
BASE PLATE	M=α wlx^2 (tcm) t>√6xM/fb (cm)	$0.085\times0.037\times12.5^2=0.49$ $\sqrt{6\times0.49/1.85}=1.26\rightarrow2.2$			
CAP PLATE	M=α wlx^2 (tcm) t>√6xM/fb (cm)				
RIB PLATE	τ=σcA/(txH) (t/cm2)	$\frac{0.037\times12.5\times20}{1.2\times30}=0.26$ <0.9			
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ=σcA/(txH) (t/cm2)				
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOW-ABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σc --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (4)
[柱脚の断面算定]

LOCATION		B-103 (106, 203, 206)		B-105 (104, 204, 205)	
COLUMN SIZE		H-300² x10x15		H-300² x10x15	
DIRECTION		X	Y	X	Y
PERMANENT CONDITIONS	M (tm)	3.6		0.0	
	N (t)	98.8		36.1	
	Q (t)	11.9		0.0	
TEMPORARY CONDITIONS	M (tm)	3.0			
	N (t)	-3.3			
	Q (t)	10.1			
FIGURE				Same as B-108	
BASE PLATE	(LxBxt)	700 X 350 x 22		700 X 350 x 22	
CAP PLATE	(THICK.)	16		—	
RIB PLATE	(HxBxt)	12		12	
WING PLATE	(HxBxt)	—		—	
ANCHOR BOLT	(n-Dϕ)	4-25ϕ		4-25ϕ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)	$\frac{3.6 \times 10^2}{98.8} = 3.6 < \frac{35}{6}$			
	σ c<fc (kg/cm2)	$\frac{98.8 \times 10^3}{70 \times 35} \times (1 + \frac{6 \times 3.6}{35}) = 65.2 < 70$			
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	$N/bDf = -0.0007$, $N/bD^2f = 0.0019$ $\Big\}$ $P_t = 0.3\%$, $a_t = 70 \times 35 P_t/2 = 3.7 cm^2$			
BASE PLATE	M=α wlx^2 (tcm)	$0.085 \times 0.065 \times \overline{15}^2 = 1.24$			
	t>√ 6xM/fb (cm)	$\sqrt{6 \times 1.24 / 1.85} = 2.0 \rightarrow 2.2$			
CAP PLATE	M=α wlx^2 (tcm)	$0.085 \times (2 \times 3.7 \times 1.8/(12.5 \times 20)) \times \overline{12.5}^2 = 0.71$			
	t>√ 6xM/fb (cm)	$\sqrt{6 \times 0.71 / 2.77} = 1.24 \rightarrow 1.6$			
RIB PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.065 \times 17.5 \times 15}{1.2 \times 30} = 0.47 < 0.9$			
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)				
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOW-ABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

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DECISION OF COLUMN BASE (5)
[柱脚の断面算定]

LOCATION		D-101 , 208		D-108(102,107,201,202,207)	
COLUMN SIZE		H-300² x10x15		H-350² x12x19	
DIRECTION		X	Y	X	Y
PERMANENT CONDITIONS	M (tm)		0.2		0.1
	N (t)		89.8		198.5
	Q (t)		0.7		0.1
TEMPORARY CONDITIONS	M (tm)		9.1		10.1
	N (t)		76.0		219.8
	Q (t)		30.4		33.5
FIGURE		Same as B-108		Same as B-107	
BASE PLATE	(LxBxt)	700x350x22		750x400x25	
CAP PLATE	(THICK.)	—		—	
RIB PLATE	(HxBxt)	12		16	
WING PLATE	(HxBxt)	—		—	
ANCHOR BOLT	(n-Dϕ)	4-25ϕ		4-25ϕ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)				
	σ c<fc (kg/cm2)			$\frac{198.5\times10^3}{75\times40}=66.2$ <70	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)				
BASE PLATE	M=α wlx^2 (tcm) t>√ 6xM/fb (cm)			$0.085\times0.066\times17.5^2=1.72$ $\sqrt{6\times1.72/1.85}=2.36\rightarrow2.5$	
CAP PLATE	M=α wlx^2 (tcm) t>√ 6xM/fb (cm)				
RIB PLATE	τ =σ cA/(txH) (t/cm2)			$\frac{0.066\times17.5\times20}{1.6\times30}=0.48$ <0.9	
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)				
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOW-ABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (6)

[柱脚の断面算定]

LOCATION		F-103 (101, 206, 208)		F-108 (102, 107, 201, 202, 207)	
COLUMN SIZE		$H\text{-}300^2 \times 10 \times 15$		$H\text{-}350^2 \times 12 \times 19$	
DIRECTION		X	Y	X	Y
PERMANENT CONDITIONS	M (tm)		3.6		0.1
	N (t)		104.8		189.9
	Q (t)		11.9		0.2
TEMPORARY CONDITIONS	M (tm)	3.0	8.9		8.7
	N (t)	21.2	69.5		182.5
	Q (t)	10.1	29.8		29.1
FIGURE		Same as B-108		Same as B-107	
BASE PLATE	(LxBxt)	700x350x22		750x400x25	
CAP PLATE	(THICK.)	—		—	
RIB PLATE	(HxBxt)	12		16	
WING PLATE	(HxBxt)	—		—	
ANCHOR BOLT	(n-Dϕ)	4-25Φ		4-25Φ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)	$\frac{3.6\times10^2}{104.8} = 3.4 < \frac{70}{6}$			
	σ c<fc (kg/cm2)	$\frac{104.8\times10^3}{70\times35}\times\left(1+\frac{6\times3.4}{70}\right) = 55.2 < 70$			
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	←			
BASE PLATE	M=α wlx^2 (tcm)	$0.085\times0.055\times\overline{12.5}^2 = 0.73$			
	t>√ 6xM/fb (cm)	$\sqrt{6\times0.73/1.85} = 1.5 \rightarrow 22$			
CAP PLATE	M=α wlx^2 (tcm)				
	t>√ 6xM/fb (cm)				
RIB PLATE	τ =σ cA/(txH) (t/cm2)				
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)				
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOW-ABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

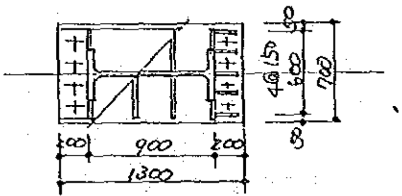
,66

DECISION OF COLUMN BASE (7)
[柱脚の断面算定]

LOCATION		F-104 (105, 204, 205)		F-203, 106	
COLUMN SIZE		H-300² x10 x15		H-300² x10 x15	
DIRECTION		X	Y	X	Y
PERMANENT CONDITIONS	M (tm)			3.6	0.1
	N (t)	43.2		76.3	93.5
	Q (t)	0.0		11.9	0.3
TEMPORARY CONDITIONS	M (tm)			6.6	4.2
	N (t)			9.9	27.1
	Q (t)			22.0	14.0
FIGURE		Same as B-108		Same as B-108	
BASE PLATE	(LxBxt)	700x350x22		700x350x22	
CAP PLATE	(THICK.)	—		—	
RIB PLATE	(HxBxt)	12		12	
WING PLATE	(HxBxt)	—		—	
ANCHOR BOLT	(n-Dφ)	4-25φ		4-25φ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)				
	σ c<fc (kg/cm2)				
ANCHOR BOLT	P/(n*A)<ft (t/cm2)				
BASE PLATE	M=α wlx^2 (tcm)				
	t>√6xM/fb (cm)				
CAP PLATE	M=α wlx^2 (tcm)				
	t>√6xM/fb (cm)				
RIB PLATE	τ =σ cA/(txH) (t/cm2)				
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)				
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOW-ABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

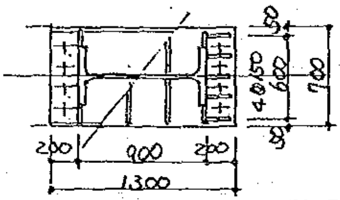
NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (8)
[柱脚の断面算定]

LOCATION		G-101, 208		G-103 (102, 105, 106 203, 204, 206, 207)	
COLUMN SIZE		BH-900X350 x28x40		BH-900x350 x28x40	
DIRECTION		X Y	Y	X	Y
PERMANENT CONDITIONS	M (tm)	4.8		7.5	
	N (t)	196.2		386.4	
	Q (t)	9.6		-15.0	
TEMPORARY CONDITIONS	M (tm)	35.1	30.2	16.0	5.6
	N (t)	274.4	99.9	450.0	339.0
	Q (t)	70.1	60.3	32.0	11.1
FIGURE		Same as A-105			
BASE PLATE	(LxBxt)	1300x700x29		1300x700x 45	
CAP PLATE	(THICK.)	22		22	
RIB PLATE	(HxBxt)	16		16	
WING PLATE	(HxBxt)	22		22	
ANCHOR BOLT	(n-Dφ)	8-30φ		8-30φ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)			$\frac{7.5 \times 10^2}{386.4} = 1.94 < \frac{70}{6}$	
	σ c<fc (kg/cm2)			$\frac{386.4 \times 10^3}{130 \times 70} \times \left(1 + \frac{6 \times 1.94}{70}\right) = 49.5 < 70$	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	$N/bDf = 0.017$ $M/bD^2f = 0.0016$) $P_t = 0.0\%$		—	
BASE PLATE	M=α wlx^2 (tcm)			$0.085 \times 0.0495 \times \overline{35}^2 = 5.15$	
	t>√ 6xM/fb (cm)			$\sqrt{6 \times 5.15 / 1.7} = 4.26 \rightarrow 4.5$	
CAP PLATE	M=α wlx^2 (tcm)				
	t>√ 6xM/fb (cm)				
RIB PLATE	τ =σ cA/(txH) (t/cm2)			$\frac{0.0495 \times 35 \times 35}{1.6 \times 50} = 0.76 < 0.9$	
	H/t			$\frac{50}{1.6} = 31.3 < 71$	
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)			$\frac{0.0495 \times 37.5 \times 17.5}{1.2 \times 50} = 0.54 < 0.9$	
	H/t			$\frac{50}{1.2} = 41.7 < 71$	
	WELDING τ < fs (t/cm2)				
ALLOW-ABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

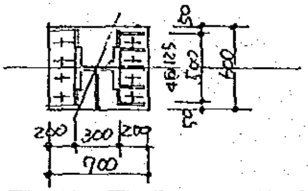
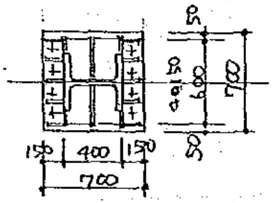
NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (9)
[柱脚の断面算定]

LOCATION		G-104, 205		G-108 (107, 201, 202)	
COLUMN SIZE		BH-900x350x28x40		BH-900x400x28x40	
DIRECTION		X	Y	X	Y
PERMANENT CONDITIONS	M (tm)		0.0	15.2	
	N (t)		378.9	481.7	
	Q (t)		0.0	30.3	
TEMPORARY CONDITIONS	M (tm)		0.2	37.3	7.6
	N (t)		464.7	552.1	438.9
	Q (t)		0.4	74.5	15.2
FIGURE		Same as G-103			
BASE PLATE	(LxBxt)	1300x700x45		1300x700x50	
CAP PLATE	(THICK.)	22		22	
RIB PLATE	(HxBxt)	16		16	
WING PLATE	(HxBxt)	22		22	
ANCHOR BOLT	(n-Dϕ)	8-30ϕ		8-35ϕ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)			$\frac{15.2\times10^2}{481.7}=3.16<\frac{70}{6}$	
	σ c<fc (kg/cm2)			$\frac{481.7\times10^3}{130\times70}\times\left(1+\frac{6\times3.16}{70}\right)=67.3<70$	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)			—	
BASE PLATE	M=α wlx^2 (tcm)			$0.085\times0.067\times35^2=7.0$	
	t>$\sqrt{6xM/fb}$ (cm)			$\sqrt{6\times7.0/1.70}=4.97\rightarrow5.0$	
CAP PLATE	M=α wlx^2 (tcm)				
	t>$\sqrt{6xM/fb}$ (cm)				
RIB PLATE	$\tau=\sigma$ cA/(txH) (t/cm2)			$\frac{0.067\times35\times35}{2.2\times50}=0.75<0.9$	
	H/t			$\frac{35}{2.2}=15.9<16$	
	WELDING τ < fs (t/cm2)				
WING PLATE	$\tau=\sigma$ cA/(txH) (t/cm2)			$\frac{0.067\times15\times37.5}{1.2\times50}$	
	H/t			$\frac{15}{1.2}=12.5<16$	
	WELDING τ < fs (t/cm2)				
ALLOWABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

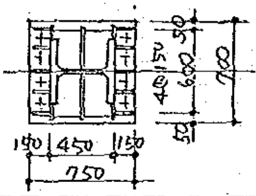
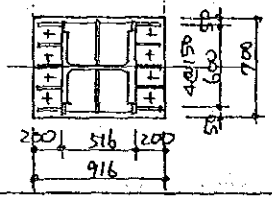
NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (10)
[柱脚の断面算定]

LOCATION		H-101, 208		H-102, 207	
COLUMN SIZE		$H\text{-}300^2 \times 10 \times 15$		$H\text{-}400^2 \times 13 \times 21$	
DIRECTION		※Y	Y	X	※X
PERMANENT CONDITIONS	M (tm)	2.9		0.0	
	N (t)	81.2		209.0	
	Q (t)	9.7		0.0	
TEMPORARY CONDITIONS	M (tm)	16.0	13.1	6.2	6.2
	N (t)	205.3	-44.8	333.8	82.0
	Q (t)	53.4	43.7	20.6	20.6
FIGURE					
BASE PLATE	(LxBxt)	700x600x22		700x700x25	
CAP PLATE	(THICK.)	19		—	
RIB PLATE	(HxBxt)	16		19	
WING PLATE	(HxBxt)	16		19	
ANCHOR BOLT	(n-Dφ)	8-30φ		8-25φ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)	$\frac{16.0\times10^2}{205.3}=7.8 < \frac{70}{6}$			
	σ c<fc (kg/cm2)	$\frac{205.3\times10^3}{70\times60}\times\left(1+\frac{6\times7.8}{70}\right)=81.6 < 140$		$\frac{209.0\times10^3}{70\times70}=42.7 < 70$	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	$N/bDf=-0.0059$, $P_t=0.6\%$ $M/bD^2f=0.0025$, $a_t=70\times60P_t/4=6.3cm^2$			
BASE PLATE	M=α wlx^2 (tcm)	$0.085\times0.082\times\overline{12.5}^2=1.09$		$0.085\times0.043\times\overline{50}^2=1.46$	
	t>√ 6xM/fb (cm)	$\sqrt{6\times1.09/2.77}=1.5\rightarrow19$		$\sqrt{6\times1.46/1.85}=2.18\rightarrow2.5$	
CAP PLATE	M=α wlx^2 (tcm)	$0.085\times(2\times6.3\times1.8/(12.5\times20))\times\overline{12.5}^2=1.20$			
	t>√ 6xM/fb (cm)	$\sqrt{6\times1.2/2.77}=1.6\rightarrow19$			
RIB PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.082\times20\times12.5}{1.2\times30}=0.57 < 1.35$		$\frac{0.043\times20\times35}{1.9\times30}=0.53 < 0.9$	
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.082\times15\times27.5}{1.2\times30}=0.94 < 1.35$		$\frac{0.043\times12.5\times25}{1.9\times30}=0.24 < 0.9$	
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOWABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

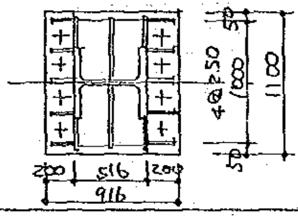
NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (11)
〔柱脚の断面算定〕

LOCATION		H-103 (105, 204, 206)		H-203 (104, 106, 205)	
COLUMN SIZE		H-450^2 x16x25		H-516x500x22x40	
DIRECTION		X	~~Y~~ X	~~X~~ Y	Y
PERMANENT CONDITIONS	M (tm)	0.0		4.5	
	N (t)	284.4		375.3	
	Q (t)	0.0		15.0	
TEMPORARY CONDITIONS	M (tm)	6.2	6.2	20.9	11.9
	N (t)	408.5	155.6	499.1	247.4
	Q (t)	20.6	20.6	69.8	39.8
FIGURE					
BASE PLATE	(LxBxt)	750x700x30		916x700x40	
CAP PLATE	(THICK.)	—		—	
RIB PLATE	(HxBxt)	19		22	
WING PLATE	(HxBxt)	19		22	
ANCHOR BOLT	(n-Dϕ)	8-25ϕ		8-25ϕ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)			$\frac{4.5\times10^2}{375.3}=1.2 < \frac{91.6}{6}$	
	$\sigma c<fc$ (kg/cm2)			$\frac{375.3\times10^3}{91.6\times70}\times(1+\frac{6\times1.2}{91.6})=13.1 < 70$	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)				
BASE PLATE	$M=\alpha$ wlx^2 (tcm)			$0.085\times0.063\times25.8^2=3.56$	
	$t>\sqrt{6xM/fb}$ (cm)			$\sqrt{6\times3.56/1.85}=3.40\rightarrow4.0$	
CAP PLATE	$M=\alpha$ wlx^2 (tcm)				
	$t>\sqrt{6xM/fb}$ (cm)				
RIB PLATE	$\tau=\sigma$ cA/(txH) (t/cm2)			$\frac{0.063\times25.8\times35}{2.2\times50}=0.52 < 0.9$	
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	$\tau=\sigma$ cA/(txH) (t/cm2)			$\frac{0.063\times12.5\times32.9}{2.2\times50}=0.23 < 0.9$	
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOW-ABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (12)
[柱脚の断面算定]

LOCATION		H-108 (107, 201, 202)		K-106, 203	
COLUMN SIZE		H-516x500x22x40		H-350²x12x19	
DIRECTION		X	※X	※Y	Y
PERMANENT CONDITIONS	M (tm)	15.2		4.5	
	N (t)	594.5		179.1	
	Q (t)	50.8		15.0	
TEMPORARY CONDITIONS	M (tm)	34.5	4.0	21.4	11.5
	N (t)	814.5	372.7	272.7	23.4
	Q (t)	114.9	13.3	71.4	38.4
FIGURE				Same as B-107	
BASE PLATE	(LxBxt)	916x1100x38		750x400x25	
CAP PLATE	(THICK.)	—		—	
RIB PLATE	(HxBxt)	22		16	
WING PLATE	(HxBxt)	22		—	
ANCHOR BOLT	(n-Dφ)	8-25φ		4-25φ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)	$\frac{15.2\times10^2}{594.5}=2.56<\frac{110}{6}$			
	σ c<fc (kg/cm2)	$\frac{594.5\times10^3}{91.6\times110}\times\left(1+\frac{6\times2.56}{110}\right)=67.2<70$			
ANCHOR BOLT	P/(n*A)<ft (t/cm2)			$N/bDf=0.004$ $Pt=0.2\%$ $M/bD^2f=0.0028$ $at=75\times40Pt/2=3cm^2$	
BASE PLATE	M=α wlx^2 (tcm)	$0.085\times0.067\times25.8^2=3.8$			
	t>√ 6xM/fb (cm)	$\sqrt{6\times3.8/1.85}=3.5\rightarrow3.8$			
CAP PLATE	M=α wlx^2 (tcm)				
	t>√ 6xM/fb (cm)				
RIB PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.067\times25.8\times55}{22\times50}=0.86<0.9$			
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.067\times30\times32.9}{2.2\times50}=0.6<0.9$			
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOWABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (13)
[柱脚の断面算定]

LOCATION		K-107, 202		K-108, 201	
COLUMN SIZE		H-450² ×16×25		H-450² ×16×25	
DIRECTION		X	X	X	Y
PERMANENT CONDITIONS	M (tm)	0.0			
	N (t)	288.5		304.0	
	Q (t)	0.0		0.0	
TEMPORARY CONDITIONS	M (tm)	6.2	6.2		
	N (t)	386.2	190.2	389.8	
	Q (t)	20.6	20.6	0.0	
FIGURE		Same as H-103		Same as H-103	
BASE PLATE	(LxBxt)	750×700×30		750×700×30	
CAP PLATE	(THICK.)	—		—	
RIB PLATE	(HxBxt)	19		19	
WING PLATE	(HxBxt)	19		19	
ANCHOR BOLT	(n-Dφ)	8-25φ		8-25φ	
SHEAR KEY	(HxBxt)				
CONC.	e=M/N (cm)				
	σ c<fc (kg/cm2)			$\frac{304\times10^3}{75\times70} = 57.9 \quad < 70.0$	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)				
BASE PLATE	M=α wlx^2 (tcm)			$0.085\times0.058\times22.5^2 = 2.50$	
	t>√ 6xM/fb (cm)			$\sqrt{6\times2.5/1.85} = 2.85 \rightarrow 3.0$	
CAP PLATE	M=α wlx^2 (tcm)				
	t>√ 6xM/fb (cm)				
RIB PLATE	τ =σ cA/(txH) (t/cm2)			$\frac{0.058\times22.5\times35}{1.9\times30} = 0.8 \quad < 0.9$	
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)			$\frac{0.058\times12.5\times26.3}{1.9\times30} = 0.33 \quad < 0.9$	
	H/t				
	WELDING τ < fs (t/cm2)				
ALLOW-ABLE STRESS	CONC. :fc(t/cm2)				
	A.BOLT :ft(t/cm2)				
	PLATE :fb(t/cm2)				
	PLATE :fs(t/cm2)				
REMARKS					

NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB