TABLE OF COLUMN LOAD FOR EACH FLOOR (SEISMIC CONDITION)

FL+5.5 ~ ±0

	A	B	D	F	G	H	K	TOTAL
101	76.8	55.0	85.7	77.7	159.2	72.2		526.6
102	108.5	71.9	110.5	106.2	234.1	169.2		800.4
103	108.5	45.9		62.6	302.8	238.2		758.0
104	85.1	17.6		22.2	306.7	262.7		694.3
105	86.1	18.6		22.2	241.5	193.7		562.1
106	116.4	62.8		48.7	223.1	301.2	143.1	895.3
107	131.7	86.1	81.7	95.3	295.2	495.4	276.3	1,461.7
108	123.9	57.3	145.8	141.1	337.1	557.6	282.0	1,644.8
201	123.9	49.3	135.0	132.2	327.8	525.9	259.4	1,553.5
202	131.7	86.1	81.7	95.3	279.7	487.8	224.2	1,386.5
203	116.4	62.8		54.2	226.5	334.6	166.0	960.5
204	86.1	18.6		22.2	227.1	197.2		551.2
205	85.1	17.6		22.2	306.7	262.7		694.3
206	108.5	45.9		59.8	321.9	235.2		771.3
207	108.5	71.9	110.5	106.2	231.1	166.2		794.4
208	76.8	55.0	85.7	77.7	159.2	72.2		526.6
TOTAL	1,674.0	822.4	836.6	1,145.8	4,179.7	4,572.0	1,357.0	14,581.5

	A	B	D	F	G	H	K	TOTAL
101								
102								
103								
104								
105								
106								
107								
108								
201								
202								
203								
204								
205								
206								
207								
208								
TOTAL								

FORM 04

SEISMIC LOAD
[地震荷重]

UNIT-1 only.

ITEM	CALCULATION		
ZONE FACTOR (Z)	Z = 1.0		
STANDARD SHEAR COEFFICIENT (Co)	Co = 0.1		
GROUND CONDITION (Tc)	Tc = 0.8		
Hard	Tc = 0.4 ☐		
Medium	Tc = 0.6 ☐		
Soft	Tc = 0.8 ☑		
DIRECTION	X DIRECTION (LONG SPAN)		Y DIRECTION (SHORT SPAN)
NATURAL PERIOD OF BUILDING (T)	T = 0.39		T = 0.57
Heigh h= 27.1 m	Length of Span D= m		Length of Span D=32.0 m
T=0.03*h	=		=
T=0.05*h/4√ D	=		= 0.57
T=h/70	= 0.39		=
CHARACTERISTICS OF VIBRATION OF THE BUILDING (Rt)	Rt = 1.0		Rt = 1.0

		T	Rt		T	Rt
Rt=1			=			=
	Tc	–	–	Tc	–	–
Rt=1-0.2*(T/Tc-1)^2			=			=
	2*Tc	–	–	2*Tc	–	–
Rt=1.6*Tc/T			=			=

	X DIRECTION	Y DIRECTION
2*T/(1+3*T)	= 0.359	= 0.421

SEISMIC LOAD FOR EACH FLOOR (Qi)

STORY	Wi	α i	Ai	Ci	Qi	Wi	α i	Ai	Ci	Qi
RF	972.8	0.10	2.10	0.21	204.3		0.10	2.29	0.23	223.7
5TH	2,353.2	0.23	1.67	0.17	400.0		0.23	1.78	0.18	423.6
4TH	3,958.2	0.39	1.43	0.14	554.1		0.39	1.51	0.15	593.7
OPE	6,958.1	0.68	1.19	0.12	835.0		0.68	1.22	0.12	835.0
MEZ	10,193.5	1.00	1.00	0.1	1,019.4		1.00	1.00	0.1	1,019.4

NOTE: $\alpha i = Wi/\Sigma W$

$Ai = 1 + (1/\sqrt{\alpha i} - \alpha i)*2*T/(1 + 3*T)$

$Ci = Z*Rt*Ai*Co$

TABLE OF COLUMN LOAD FOR EACH FLOOR (SEISMIC CONDITION)

FL+27.1 ~ 21.0

	A	B	D	F	G	H	K	TOTAL
101	33.9				33.9			67.8
102	49.1				49.1			98.2
103	49.1				49.1			98.2
104	49.1				49.1			98.2
105	49.1				49.1			98.2
106	49.1				49.1			98.2
107	59.7				59.7			119.4
108	70.5				70.5			141.0
201	76.8				76.8			153.6
202								
203								
204								
205								
206								
207								
208								
TOTAL	486.4				486.4			972.8

FL+21.0 ~ 16.0

	A	B	D	F	G	H	K	TOTAL
101	40.9				50.1	27.2		118.2
102	57.1				74.4	26.9		158.4
103	57.1				143.1	95.9		296.1
104	57.1				143.1	95.9		296.1
105	57.1				74.4	26.9		158.4
106	57.1				71.8	51.6	25.7	206.2
107	68.9				87.4	63.5	48.2	268.0
108	81.0				103.3	75.5	45.6	305.4
201	84.9				110.9	75.5	45.6	316.9
202					28.2	63.5	48.2	139.9
203					26.7	37.2	25.7	89.6
204								
205								
206								
207								
208								
TOTAL	561.2				913.4	639.6	239.0	2,353.2

FORM 04

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TABLE OF COLUMN LOAD FOR EACH FLOOR (SEISMIC CONDITION)

FL+16.0~11.0

	A	B	D	F	G	H	K	TOTAL
101	40.9				66.4	38.5		145.8
102	57.1				103.8	55.0		215.9
103	57.1				172.5	124.0		353.6
104	57.1				179.5	136.5		373.1
105	57.1				110.8	67.5		235.4
106	57.1				95.7	116.9	57.0	326.7
107	68.9				143.7	188.4	127.1	528.1
108	81.0				173.9	227.4	116.1	598.4
201	84.9				176.2	215.6	104.2	580.9
202					87.1	196.6	92.2	375.9
203					45.1	130.2	49.1	224.4
204								
205								
206								
207								
208								
TOTAL	561.2				1,354.7	1,496.6	545.7	3,958.2

FL+11.0~5.5

	A	B	D	F	G	H	K	TOTAL
101	51.4	21.3	47.4	40.9	109.7	47.7		318.4
102	74.0	29.7	56.3	50.1	169.1	110.5		489.7
103	74.0	19.0		29.9	237.8	179.5		540.2
104	68.5	13.0		14.6	259.2	189.0		544.3
105	69.5	14.0		14.6	190.5	120.0		408.6
106	75.0	20.0		16.0	157.6	206.7	93.0	568.3
107	89.4	31.7	29.9	35.9	206.6	348.0	198.9	940.4
108	108.7	20.9	64.6	63.0	237.3	396.6	188.8	1,079.9
201	92.0	4.5	27.9	49.6	265.6	365.6	176.4	981.6
202					154.1	356.2	164.0	674.3
203					78.9	209.4	124.1	412.4
204								
205								
206								
207								
208								
TOTAL	702.5	174.1	226.1	314.6	2,066.4	2,529.2	945.2	6,958.1

FORM 04

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TABLE OF COLUMN LOAD FOR EACH FLOOR (SEISMIC CONDITION)

FL+5.5~10

	A	B	D	F	G	H	K	TOTAL
101	76.8	55.0	85.7	77.7	159.2	72.2		526.6
102	108.5	71.9	110.5	106.2	234.1	169.2		800.4
103	108.5	45.9		62.6	302.8	238.2		758.0
104	85.1	17.6		22.2	306.7	262.7		694.3
105	86.1	18.6		22.2	241.5	193.7		562.1
106	116.4	62.8		48.7	223.1	301.2	143.1	895.3
107	131.7	86.1	81.7	95.3	295.2	495.4	276.3	1,461.7
108	123.9	57.3	145.8	141.1	337.1	557.6	282.0	1,644.8
201	94.1	6.9	52.4	89.1	342.2	525.9	259.4	1,370.0
202					211.7	487.8	224.2	923.7
203					108.5	282.1	166.0	556.6
204								
205								
206								
207								
208								
TOTAL	931.1	422.1	476.1	665.1	2,762.1	3586.0	1,357.0	10,193.5

	A	B	D	F	G	H	K	TOTAL
101								
102								
103								
104								
105								
106								
107								
108								
201								
202								
203								
204								
205								
206								
207								
208								
TOTAL								

DISTRIBUTION OF SEISMIC LOAD
[地震力の架構への配分]

NOTE: Ki --- HORIZONTAL STIFFNESS OF EACH FRAME AT EACH FLOOR
Qi --- SEISMIC SHEAR FORCE OF EACH FRAME AT EACH FLOOR (ton)
Pi --- SEISMIC LOAD OF EACH FRAME AT EACH FLOOR (ton)
Σ --- SUMMATION OF ALL FRAMES AT EACH FLOOR

ITEM	FLOOR	X DIRECTION (LONG SPAN)								Y DIRECTION (SHORT SPAN)								REMARKS	
		ΣKi		ΣQi		ΣPi		ΣQi/ΣK		ΣKi		ΣQi		ΣPi		ΣQi/ΣK			
WHOLE FRAME	RF	1156.8		327.7				0.283				360.4							
	5TH	2290.4		576.9				0.252		4263.8		613.0		252.6		0.144			
	4TH	2871.8		830.1				0.289		4537.6		830.1		217.1		0.183			
	OPE	3862.2		1173.6				0.304		5764.8		1173.6		343.5		0.204			
	MEZ	3765.4		1458.2				0.387		3807.2		1458.2		284.6		0.383			
LINE ※ DIRECTION		A	B	D	F	G	H	K		101 208	102 207	103 206	104 205	105 204	106 203	107 202	108 201		
Ki ~~Qi~~	RF	578.4				578.4													
	5TH	710.4					1032.4	547.6		355.8		516.5	516.5		387.3	355.8			
	4TH	861.0					1299.2	711.6		273.8	273.8	355.8	355.8	355.8	298.0		355.8		
	OPE	785.0	662.0		662.0		1140.6	612.6		429.8	324.6	407.5	235.7	235.7	521.3	171.8	556.0		
	MEZ	649.6	453.6		453.6	909.8	1086.6	212.2		469.3	295.9	131.9			414.7	295.9	295.9		
LINE ※ DIRECTION																			
~~Ki~~ Qi	RF	163.7				163.7				14.9	21.6	21.6	21.6	21.6	21.6	26.3	31.0		
	5TH	179.0					260.2	138.0		51.2		74.4	74.4		55.8	51.2			
	4TH	248.8					375.5	205.7		50.1	50.1	65.1	65.1	65.1	54.5		65.1		
	OPE	238.6	201.2		201.2		346.7	186.2		87.7	66.2	83.1	48.1	48.1	106.3	35.0	113.4		
	MEZ	251.4	175.5		175.5	352.1	420.5	82.1		179.7	113.3	50.5			158.8	113.3	113.3		

NOTE: Ki --- HORIZONTAL STIFFNESS OF EACH FRAME AT EACH FLOOR
Qi --- SEISMIC SHEAR FORCE OF EACH FRAME AT EACH FLOOR (ton)
Pi --- SEISMIC LOAD OF EACH FRAME AT EACH FLOOR (ton)
Σ --- SUMMATION OF ALL FRAMES AT EACH FLOOR

DISTRIBUTION OF SEISMIC LOAD
[地震力の架構への配分] UNIT-1 only

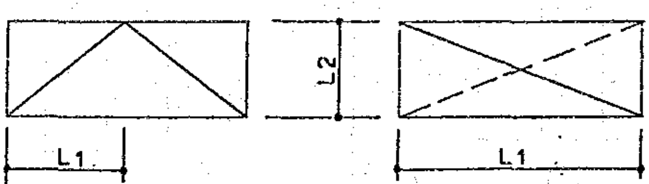
ITEM	FLOOR	X DIRECTION (LONG SPAN) ΣKi	ΣQi	ΣPi	ΣQi/ΣK	Y DIRECTION (SHORT SPAN) ΣKi	ΣQi	ΣPi	ΣQi/ΣK	REMARKS
WHOLE FRAME	RF	578.4	204.3		0.353		223.7			
	5TH	1,692.8	400.0		0.236	2,875.0	423.6		0.147	
	4TH	2,117.7	554.1		0.262	2,922.6	593.7		0.203	
	OPE	2,491.9	835.0		0.335	3,787.9	835.0		0.220	
	ME8	2,548.0	1,019.4		0.400	2,482.3	1,019.4		0.411	

ITEM	LINE X DIRECTION	A	B	D	F	G	H	K		101	102	103	104	105	106	107	108 201	202	203
Ki ~~Qi~~	RF	289.2				289.2													
	5TH	355.2					790.0	547.6		355.8		516.5	516.5		387.3	355.8		355.8	387.3
	4TH	430.5					975.6	711.6		273.8	273.8	355.8	355.8	355.8	298.0		355.8		298.0
	OPE	392.5	331.0		331.0		824.8	612.6		429.8	324.6	407.5	235.7	235.7	521.3	171.8	556.0		349.5
	ME8	324.8	226.8		226.8	683.0	874.4	212.2		469.3	295.9	131.9			414.7	295.9	295.9		282.8
	LINE Y DIRECTION																		
~~Ki~~ Qi	RF	102.2				102.2				15.6	22.6	22.6	22.6	22.6	22.6	27.5	22.5	22.5	
	5TH	83.8					186.4	129.2		52.3		75.9	75.9		56.9	52.3		52.3	56.9
	4TH	112.8					255.6	186.4		55.6	55.6	72.2	72.2	72.2	60.5		72.2		60.5
	OPE	131.5	110.9		110.9		276.3	205.2		94.6	71.4	89.7	51.9	51.9	114.7	37.8	127.3		76.9
	ME8	129.9	90.7		90.7	273.2	349.8	84.9		192.9	121.6	54.2			170.4	121.6	121.6		116.2

HORIZONTAL STIFFNESS OF VERTICAL BRACE
[鉛直ブレースの水平剛性]

LINE	FLOOR	NUMBER	TYPE	MEMBER SIZE	AREA (cm2)	L1 (cm)	L2 (cm)	L3 (cm)	J (t/cm)
Y	Direction								
	5TH		K	H-300²	119.8	500	500	707	355.8
			K	H-350²	173.9	500	500	707	516.5
			K	H-300²	119.8	700	500	860	387.3
	4TH		K	H-250²	92.18	500	500	707	273.8
			K	H-300²	119.8	500	500	707	355.8
			K	H-250²	92.18	700	500	860	298.0
	OPE		N	2L-130x12	59.52	450	550	711	70.5
			X	2L-120x8	37.52	450	550	711	88.9
			X	2L-120x8	37.52	550	550	778	101.3
			X	2L-120x8	37.52	600	550	814	105.2
			K	H-250²	92.18	500	550	743	235.7
			K	H-300²	119.8	700	550	890	349.5
	MEZ		N	H-200²	63.53	450	650	791	54.7
			X	2L-120x8	37.52	450	650	791	64.6
			X	2L-120x8	37.52	550	650	851	77.2
			X	2L-120x8	37.52	600	650	885	82.0
			K	H-300²	119.8	500	650	820	228.1
			K	H-300²	119.8	700	650	955	282.8

NOTE:



TYPE : K   TYPE : X or N

$L3 = \sqrt{L1*L1+L2*L2}$
(Length of Brace)
J = 2*A*E*L1^2/L3^3
(TYPE : K or X)
J = A*E*L1^2/L3^3
(TYPE : N)
E -- Young Modulus (t/cm2)
(2100 for steel)

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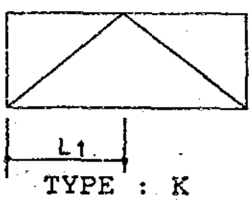
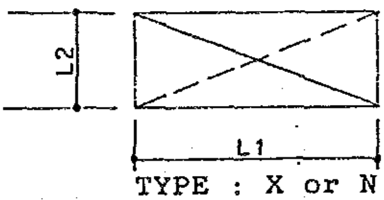
HORIZONTAL STIFFNESS OF VERTICAL BRACE
[鉛直ブレースの水平剛性]

LINE	FLOOR	NUMBER	TYPE	MEMBER SIZE	AREA (cm2)	L1 (cm)	L2 (cm)	L3 (cm)	J (t/cm)
X	Direction								
A, G	RF		X	2L-120×8	37.52	680	610	914	95.6
			X	2L-120×8	37.52	1000	610	1171	98.0
A, H	5TH		X	2L-120×8	37.52	680	500	844	121.2
A			X	2L-120×8	37.52	1000	500	1118	112.8
H, K			K	H-250²	92.18	500	500	707	273.8
A, H	4TH		X	2L-130×9	45.48	680	500	844	146.9
A			X	2L-130×9	45.48	1000	500	1118	136.7
H, K			K	H-300²	119.8	500	500	707	355.8
A, H	OPE		X	2L-130×9	45.48	680	550	875	132.0
A			X	2L-130×9	45.48	1000	550	1141	128.5
B, F			K	H-250²	92.18	340	550	647	165.5
H, K			K	H-300²	119.8	500	550	743	306.3
A, K, H	MEZ		X	2L-130×9	45.48	680	650	941	106.1
A			X	2L-130×9	45.48	1000	650	1193	112.6
B, F, G			K	H-250²	92.18	340	650	734	113.4
G			K	H-300²	119.8	500	650	820	228.1
H			K	H-350²	173.9	500	650	820	331.1

NOTE:



TYPE : K



TYPE : X or N

$L3 = \sqrt{L1*L1+L2*L2}$
(Length of Brace)

$J = 2*A*E*L1^2/L3^3$
(TYPE : K or X)

$J = A*E*L1^2/L3^3$
(TYPE : N)

E -- Young Modulus (t/cm2)
(2100 for steel)

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2. Design of crane support girder (クレーン・ガーダの設計)

(1) Design Condition

- Dead load : 45.0 ton (including 16.5 ton trolley)

  Main hook : 60.0 ton

  Aux hook : 15.0 ton

- The beam for the crane girder will be a simple beam each for 6.8 m span and 10.0 m span.

- Maximum wheel load (P)

  Due to the previous calculation, the maximum wheel load is 25.2 ton / wheel

- Stress of Girder

a. 6.8 m span

$M_{X1} = 67.3$ t·m , $M_Y = 5.6$ t·m , $N = 8.9$ t

$M_{X2} = \frac{1}{8} \times 0.36 \times \overline{6.8}^2 = 2.1$ T·m

Girder	D.L	306.9 kg/m
Rail	D.L	50
		356.9 kg/m

b. 10.0 m span

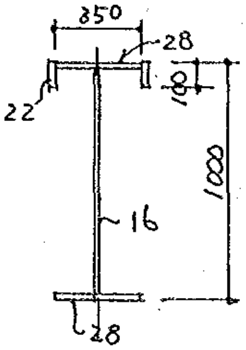
$M_{X1} = 155.1$ t·m , $M_Y = 12.9$ t·m , $N = 10.1$ t

$M_{X2} = \frac{1}{8} \times 0.522 \times \overline{10}^2 = 6.5$ T·m

Girder	D.L	472 kg/m
Rail	D.L	50
		522 kg/m

(2) Design of cross section

a. 6.8 m span



$A = 391.0\ cm^2$, $i_x = 40.9\ cm$, $i_Y = 13.3\ cm$

$Z_c = 14{,}571\ cm^3$ $\quad I_x = 654{,}677\ cm^4$

$Z_t = 11{,}888\ cm^3$ $\quad i_b = 12.4\ cm$

$Z_Y = 1{,}282\ cm^3$ $\quad I_Y = 25{,}267\ cm^4$

$\lambda_b = \frac{\ell_b}{i_b} = 55$ $\quad f_b = 1.6\ t/cm^2$

$\lambda_c = \frac{\ell_k}{i_Y} = 51.1$ $\quad f_c = 1.37\ t/cm^2$

$$\sigma_{bxt} = \frac{67.3 + 2.1}{11{,}888} \times 10^2 = 0.58\ t/cm^2$$

$$\sigma_{bxc} = \frac{67.3 + 2.1}{14571} \times 10^2 = 0.48 \quad ''$$

$$\sigma_{bY} = \frac{5.6 \times 10^2}{1282} = 0.44 \quad ''$$

$$\sigma_t = \sigma_c = \frac{8.9/2}{391.0} = 0.01 \quad ''$$

Compression side : $\frac{0.48}{1.6} + \frac{0.44}{1.6} + \frac{0.01}{1.37} = 0.58 < 1.0$

Tension side : $\frac{0.58}{1.6} + \frac{0.01}{1.6} = 0.37 < 1.0$

Deflection : $\delta = \frac{5 \times 0.15 \times 680^4}{384 \times 2100 \times 654{,}677} = 0.3\ cm$

$$\frac{\delta}{\ell} = \frac{0.3}{680} = \frac{1}{2266} < \frac{1}{1000}$$

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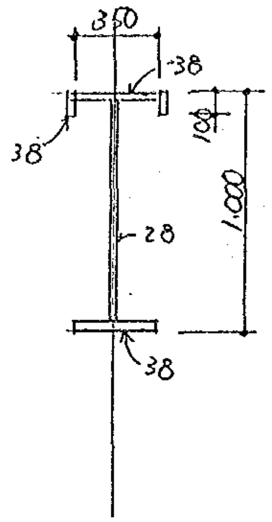
b. 10 m span



$A = 600.7\,cm^2$, $i_x = 39.4\,cm$, $i_Y = 14.2\,cm$

$Z_c = 21091\,cm^3$, $I_x = 934,560\,cm^4$

$Z_t = 16,781\,cm^3$, $i_b = 13.1\,cm$

$Z_Y = 1985\,cm^3$, $I_Y = 42,295\,cm^4$

$\lambda_b = \frac{l_b}{\lambda_b} = 76.$ $\quad f_b = 1.6\ t/cm^2$

$\lambda_c = \frac{l_k}{\lambda_Y} = 70.4$ $\quad f_c = 1.2\ t/cm^2$

$$\sigma_{bxt} = \frac{155.1+6.5}{16,781} \times 10^2 = 0.96\ t/cm^2$$

$$\sigma_{bxc} = \frac{155.1+6.5}{21,091} \times 10^2 = 0.77 \quad ''$$

$$\sigma_{bY} = \frac{12.9\times10^2}{1985} = 0.65 \quad ''$$

$$\sigma_t = \sigma_c = \frac{10.1/2}{600.7} = 0.008 \quad ''$$

Compression side : $\frac{0.77}{1.6} + \frac{0.65}{1.6} + \frac{0.008}{1.2} = 0.89 < 1.0$

Tension side : $\frac{0.96}{1.6} + \frac{0.008}{1.6} = 0.61 < 1.0$

Deflection : $\delta = \frac{5\times0.1\times1000^4}{384\times2100\times934560} = 0.66$ cm

$$\frac{\delta}{l} = \frac{0.66}{1000} = \frac{1}{1515} < \frac{1}{1000}$$

FORM 04

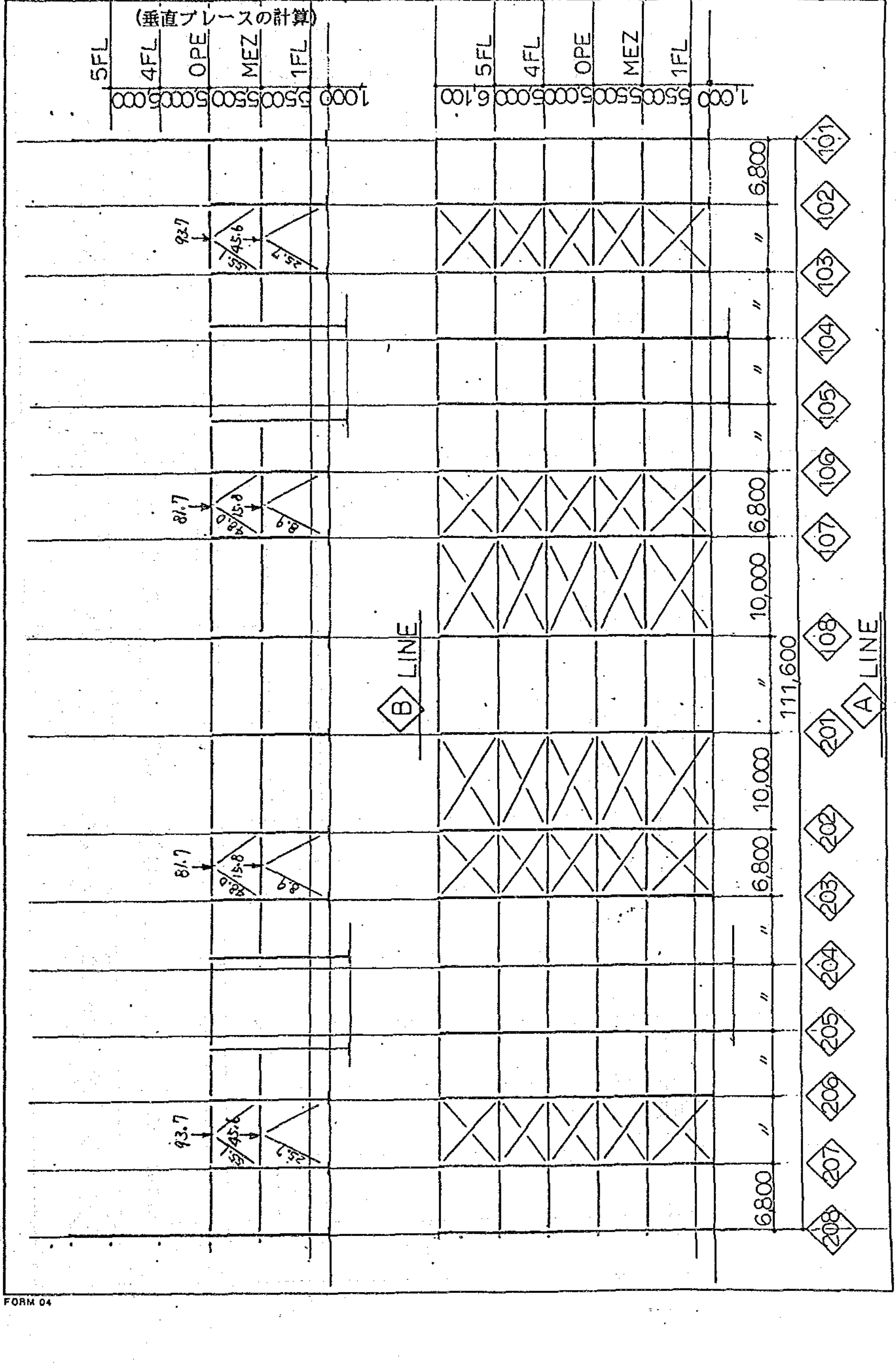
77

3. Structural Analysis of Frames (構造解析)

3.1 Calculation of vertical bracing by vertical load

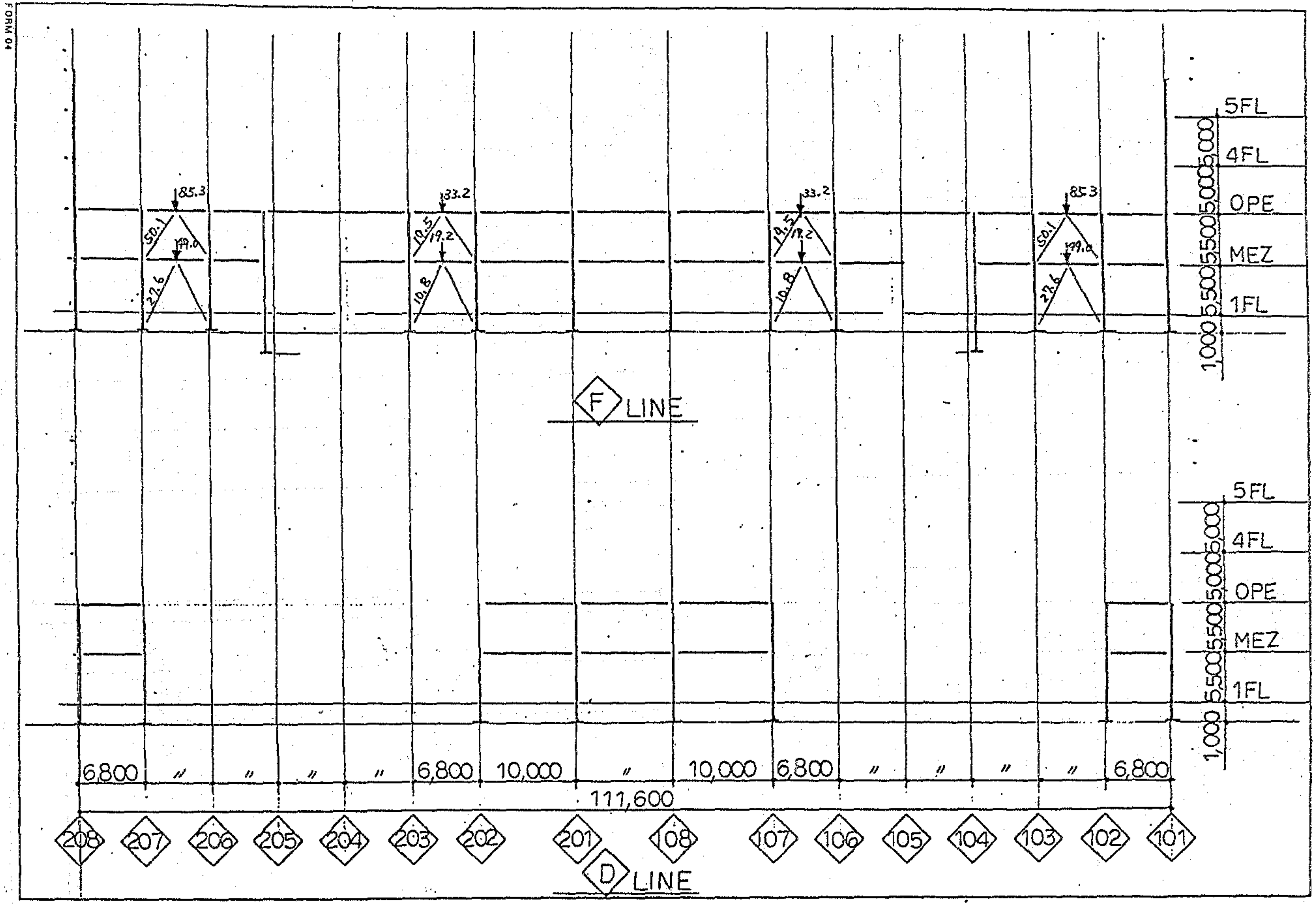
SHEET 75 OF

(垂直ブレースの計算)



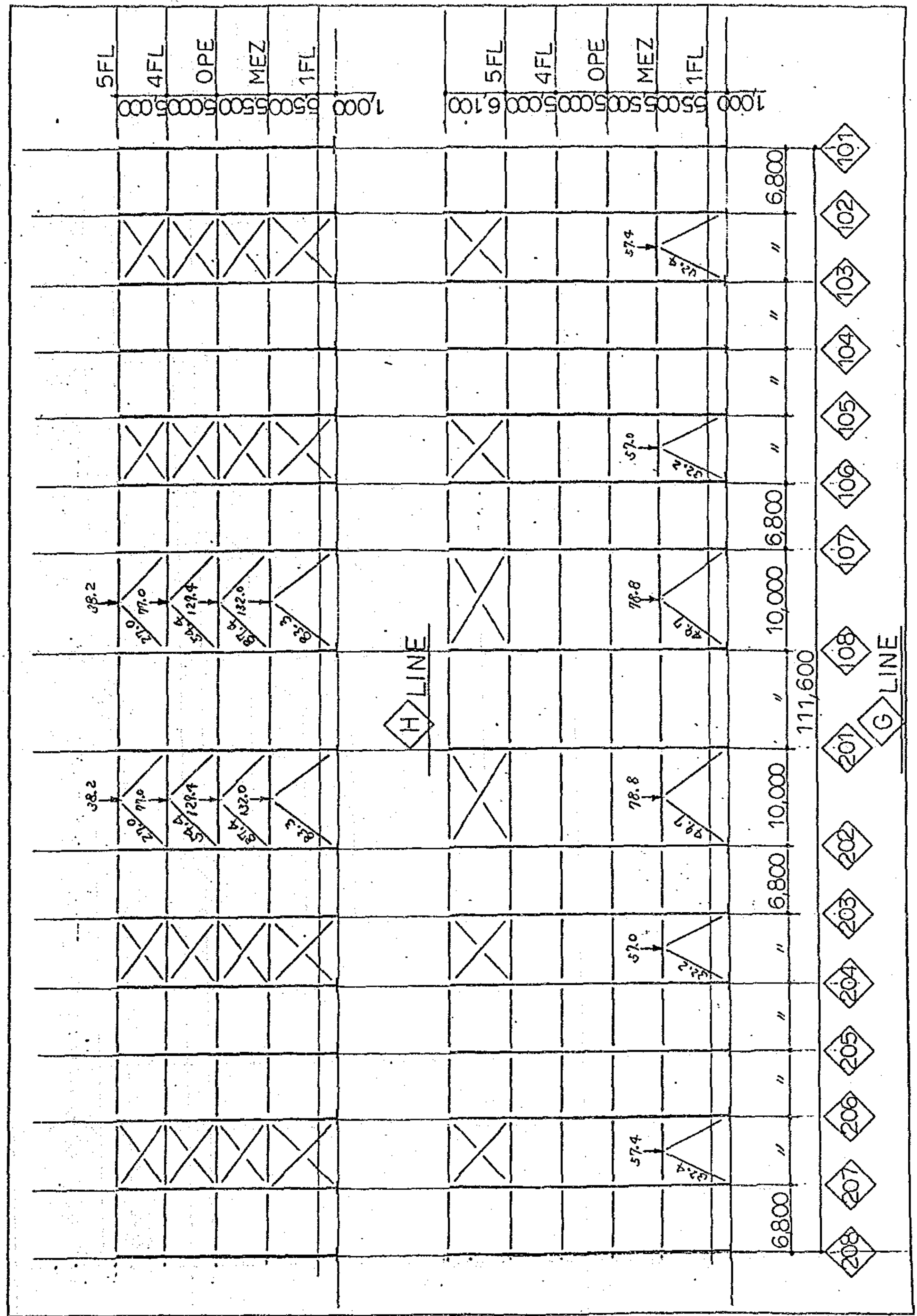
FORM 04

FORM 04



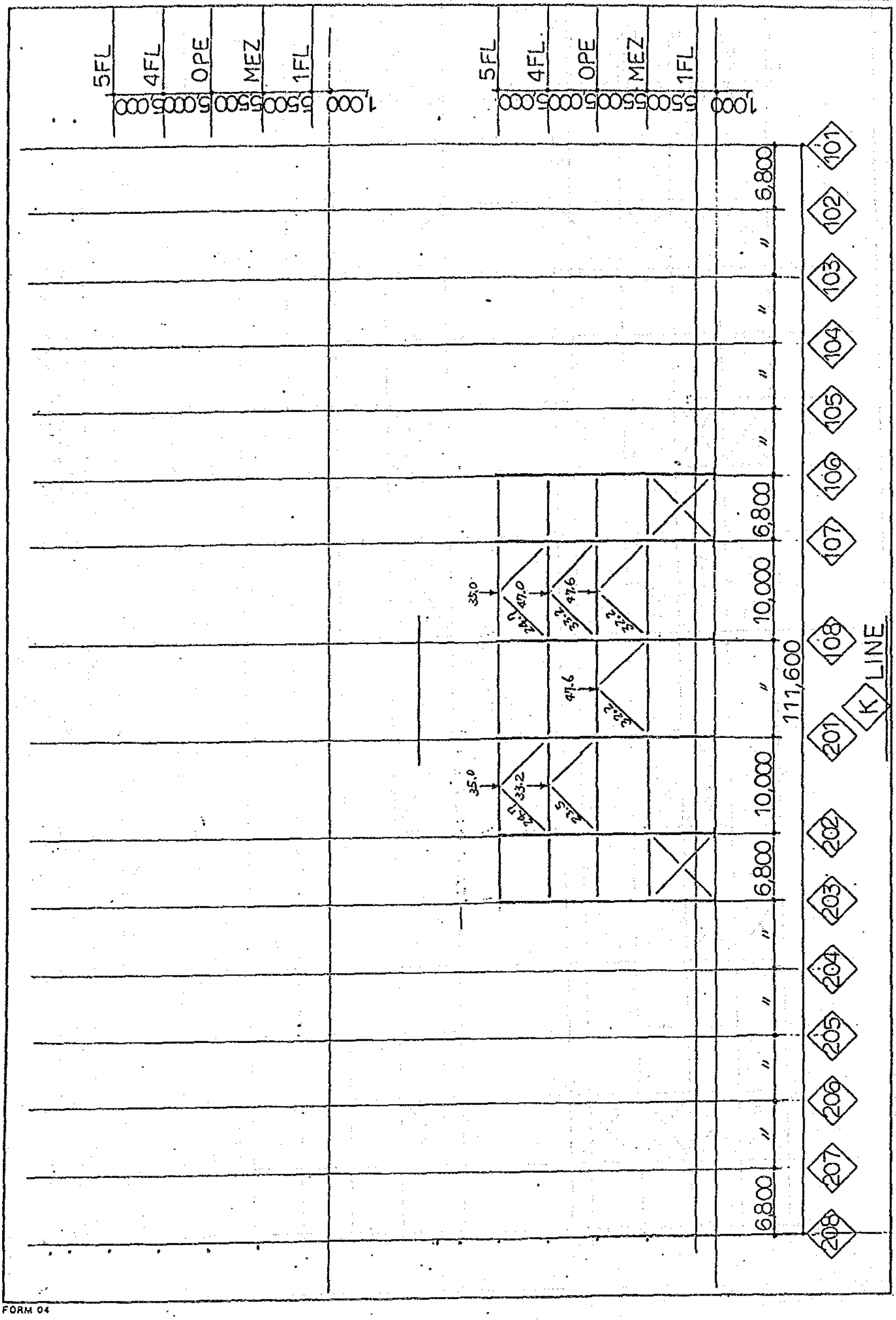
SHEET 76 OF

79

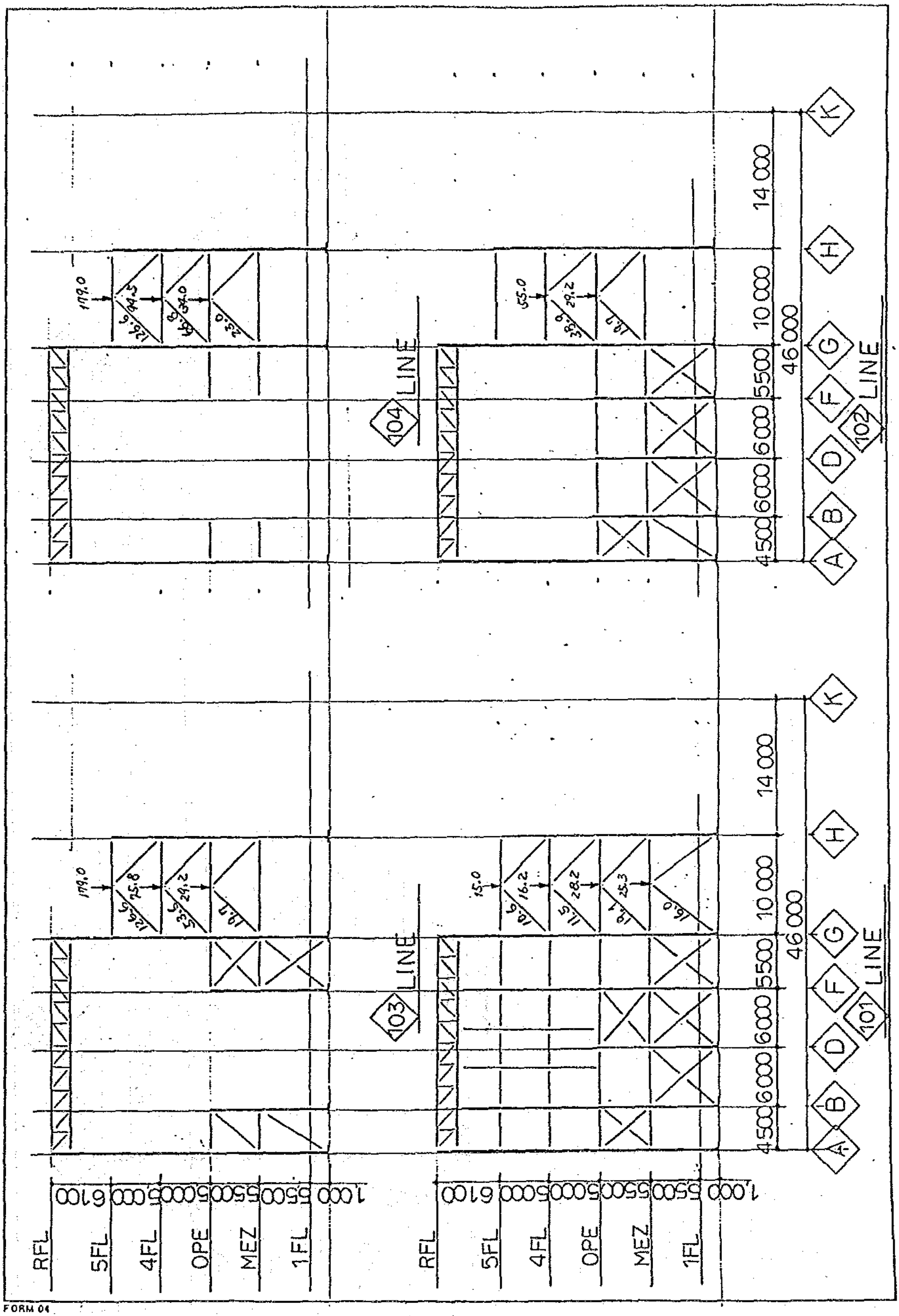

5FL
4FL
OPE
MEZ
1FL
H LINE
G LINE
111,600
10,000
6,800
101
102
103
104
105
106
107
108
201
202
203
204
205
206
207
208

FORM 04

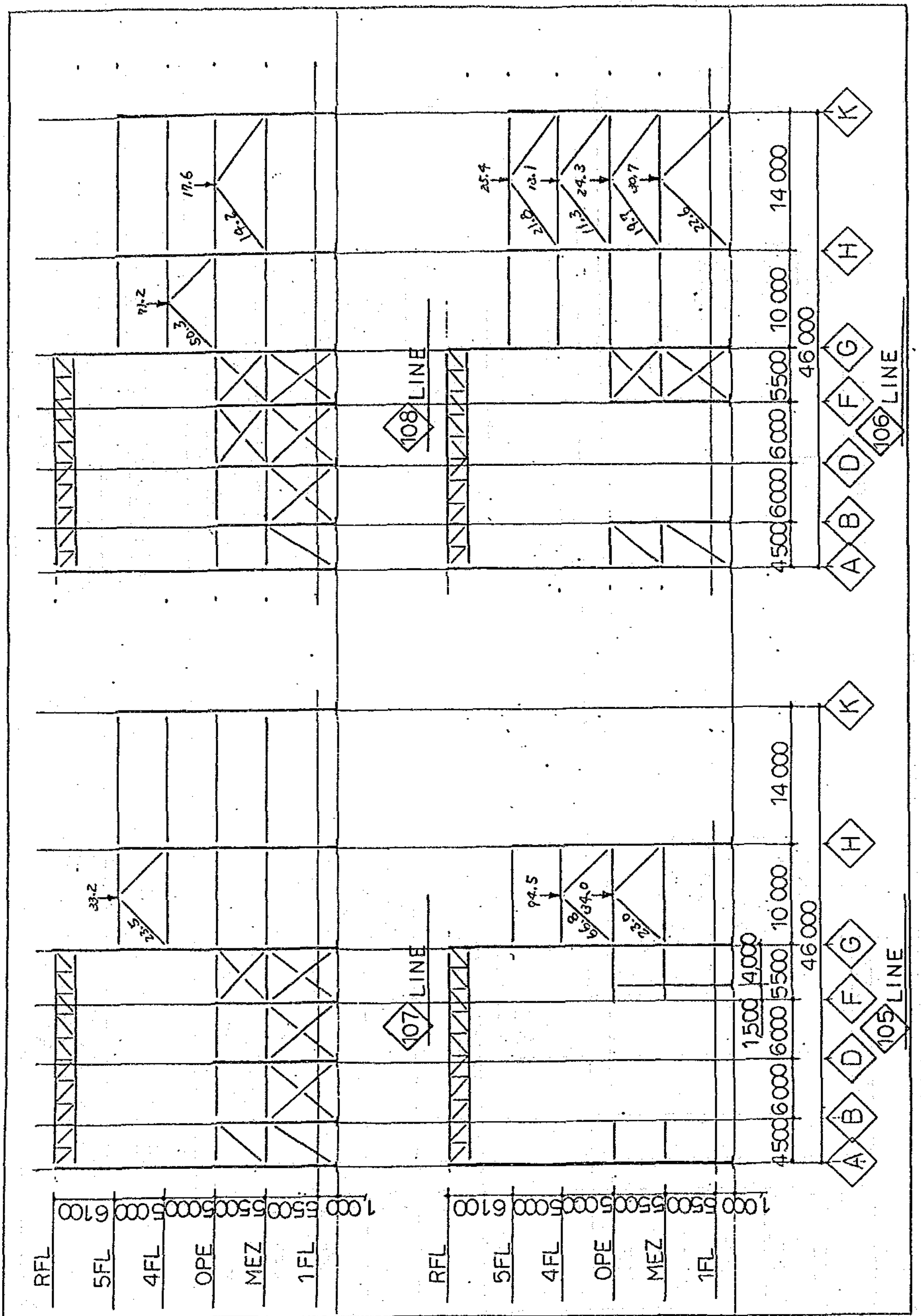
SHEET 18 OF



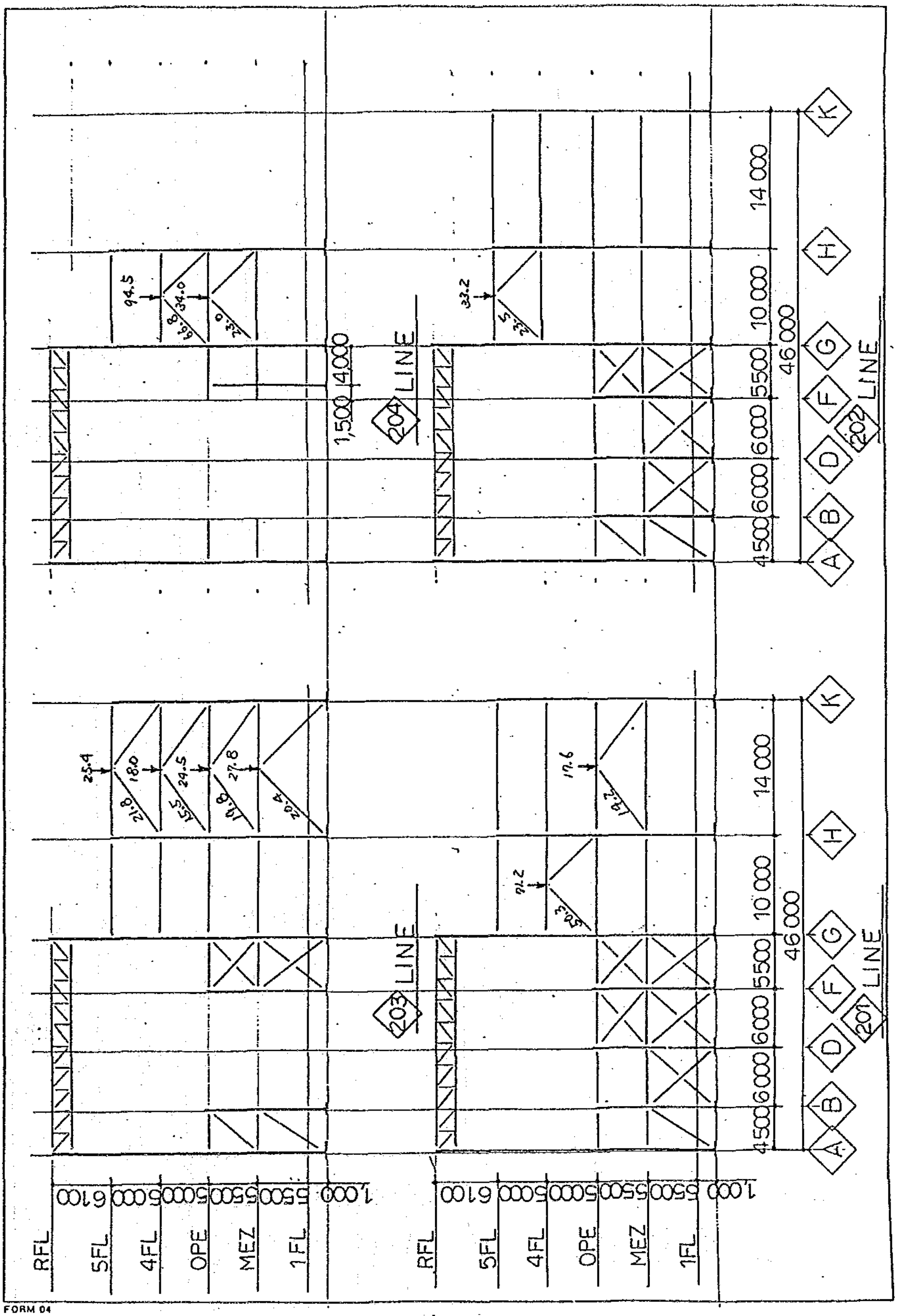
FORM 04


101 LINE
102 LINE
103 LINE
104 LINE
RFL
5FL
4FL
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
A
B
D
F
G
H
K
4500
6000
6000
5500
10 000
14 000
46 000
179.0
55.0
15.0

FORM 04


108 LINE
106 LINE
107 LINE
105 LINE
RFL
5FL
4FL
OPE
MEZ
1FL
A
B
D
F
G
H
K
4500
6000
6000
5500
10 000
14 000
46 000
1 500
4 000
6100
5000
5000
5500
5500
1 000
17.6
19.3
33.2
50.3
25.4
13.1
21.8
24.3
11.3
30.7
19.7
22.9
33.2
23.5
94.5
34.0
60.8
23.0

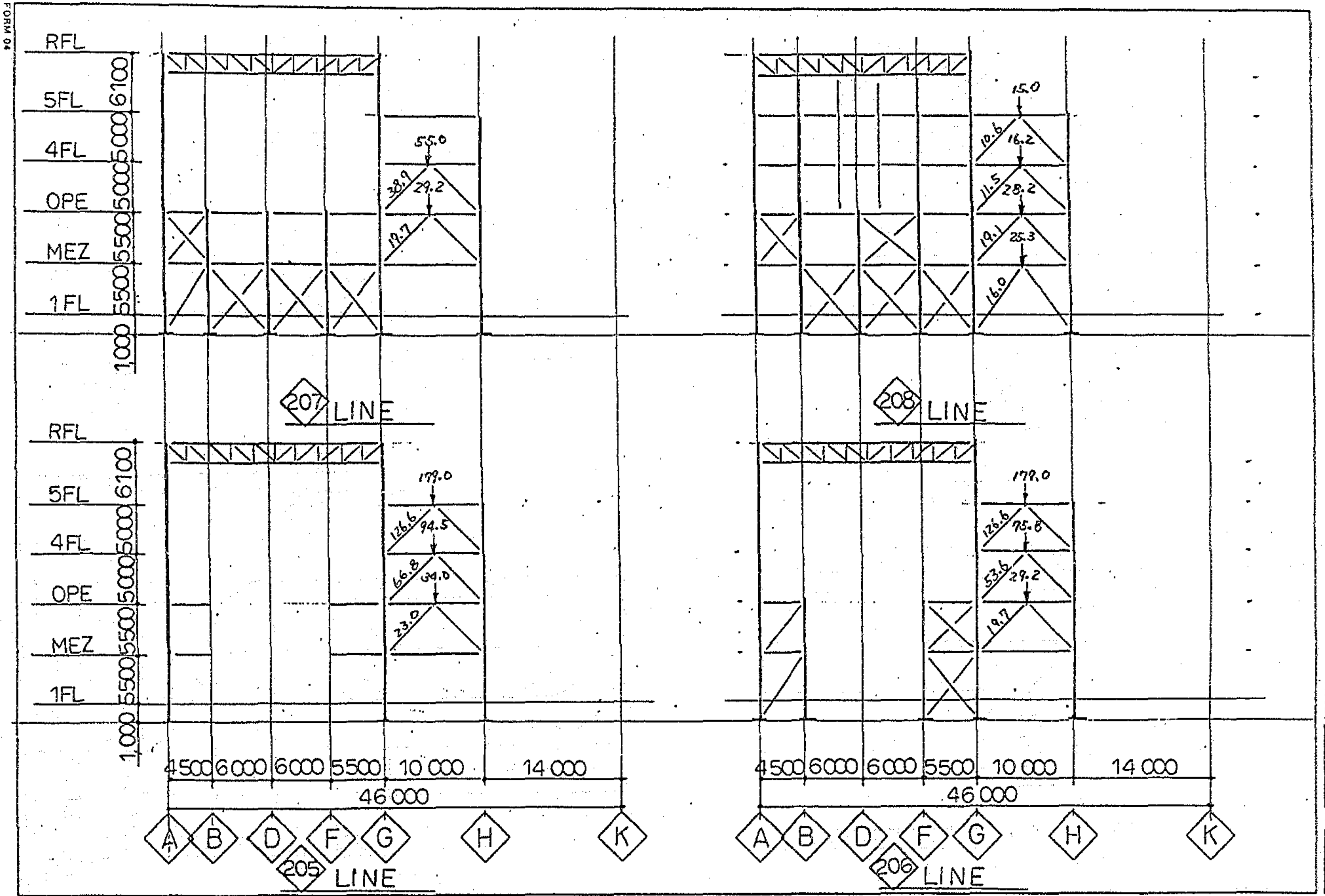
FORM 04


203 LINE
201 LINE
204 LINE
202 LINE
RFL
5FL
4FL
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1,000
4500
6000
6000
5500
10 000
14 000
46 000
1,500
4,000
A
B
D
F
G
H
K

FORM 04

TX

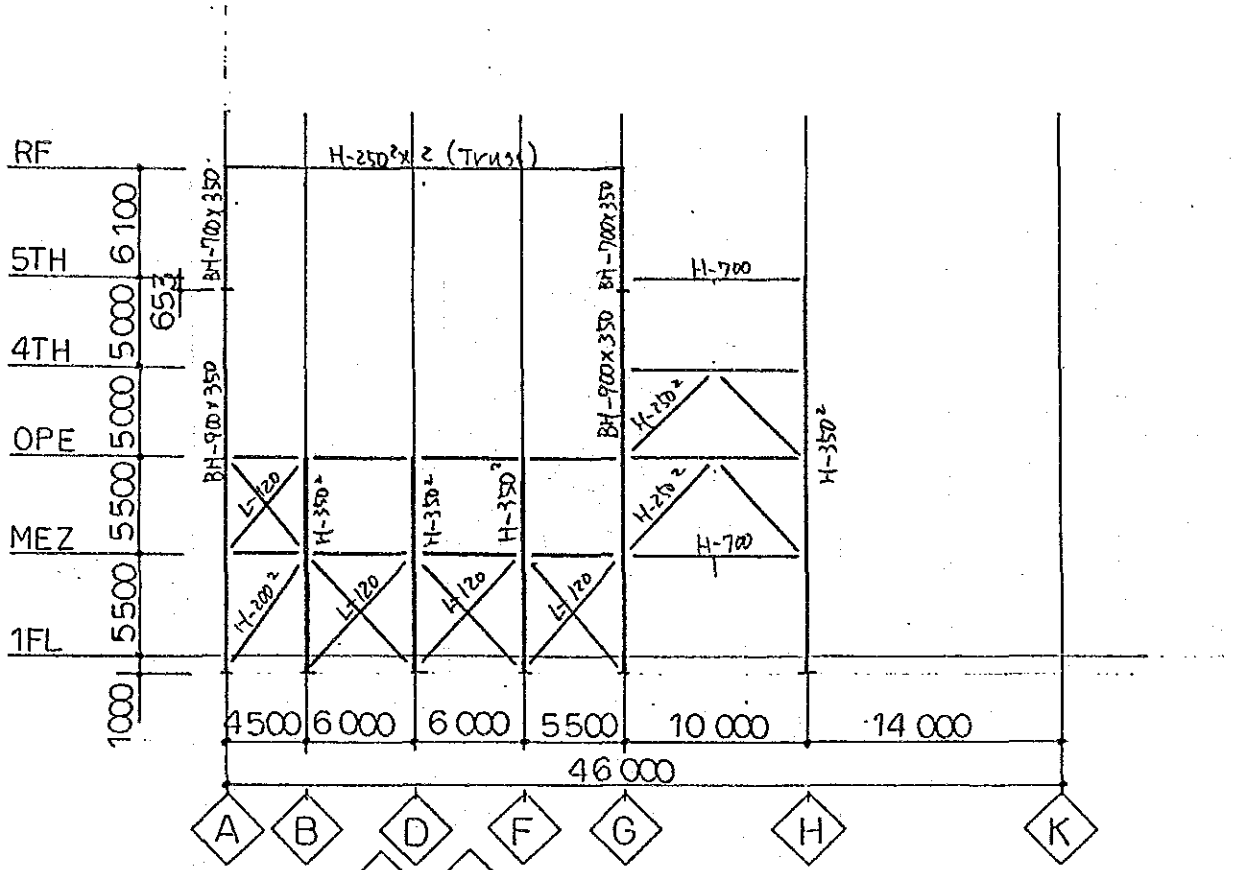
SHEET 82 OF



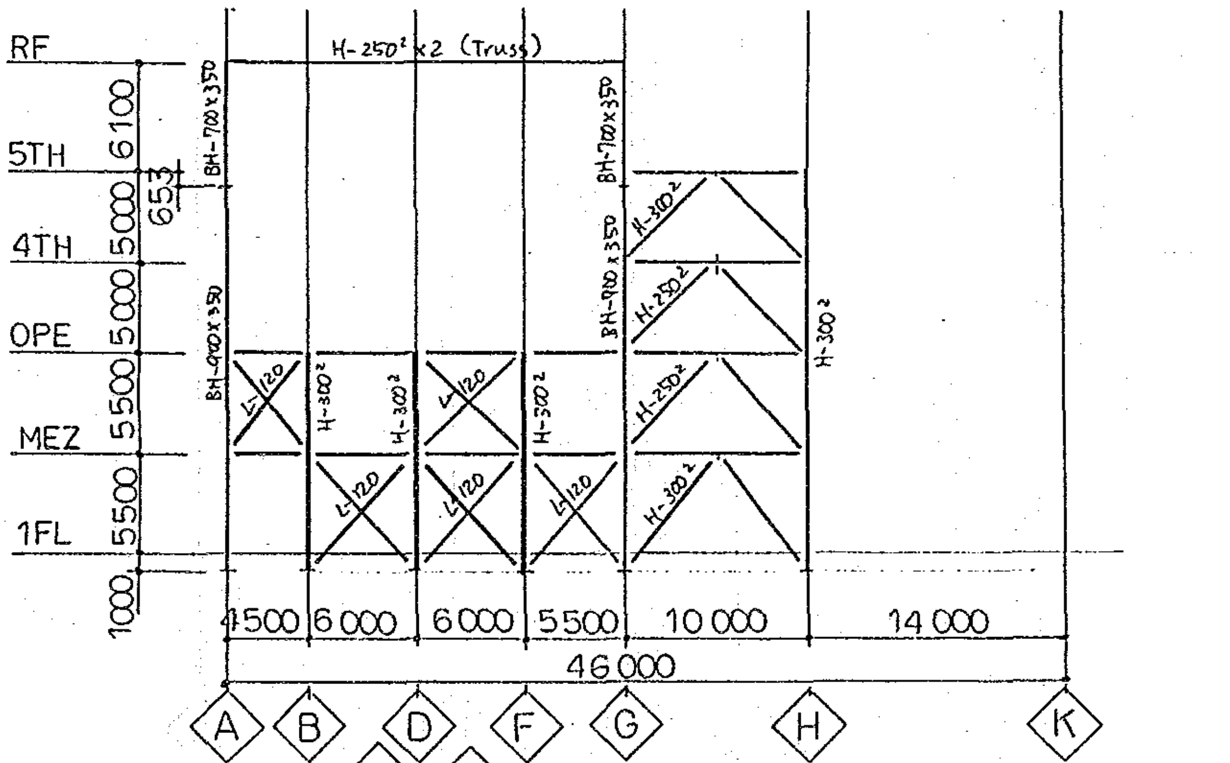
FORM 04

85

3.2 Input data (入力データ)

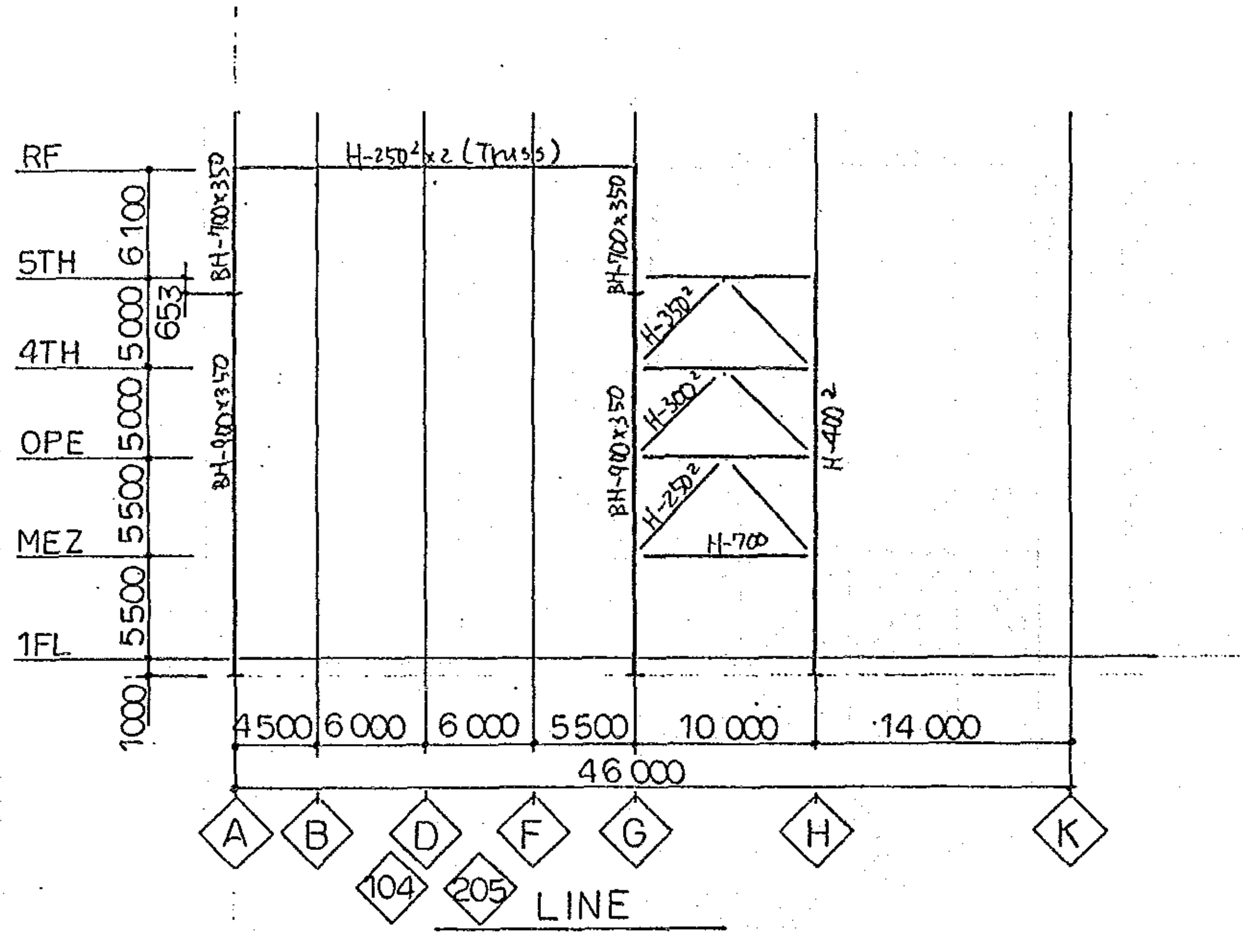


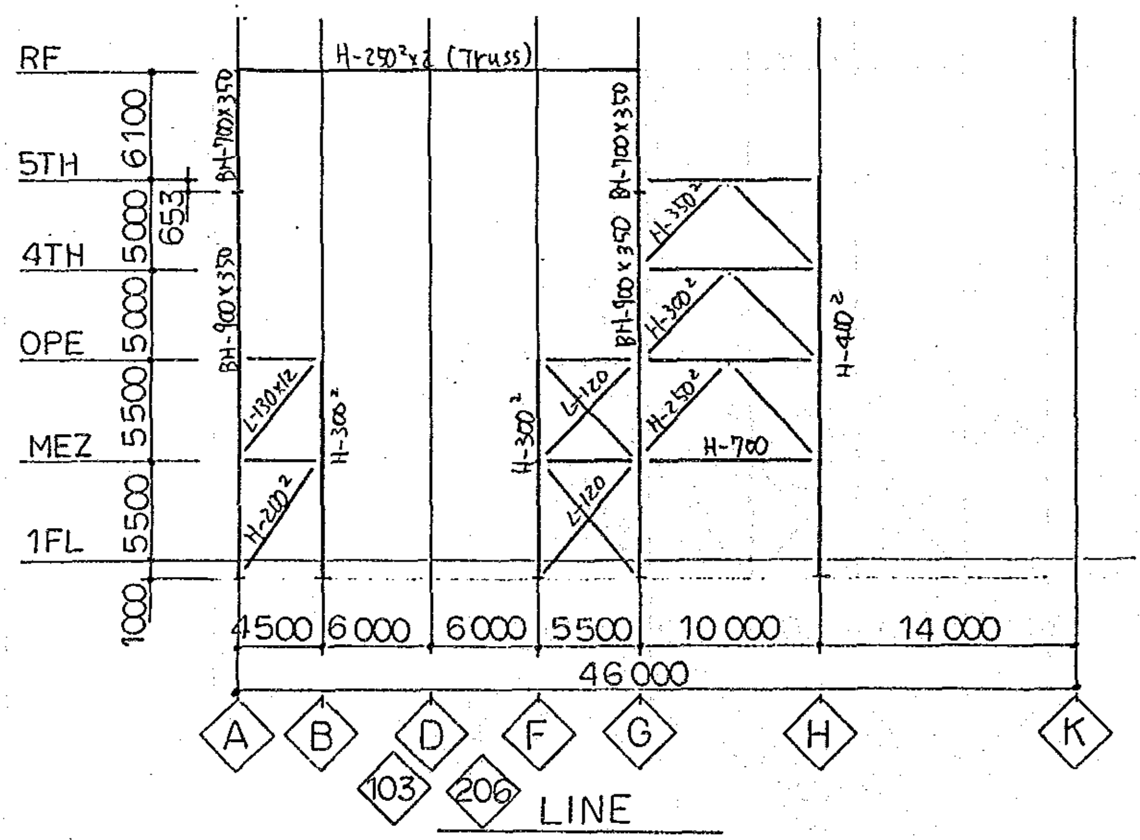
102 207 LINE



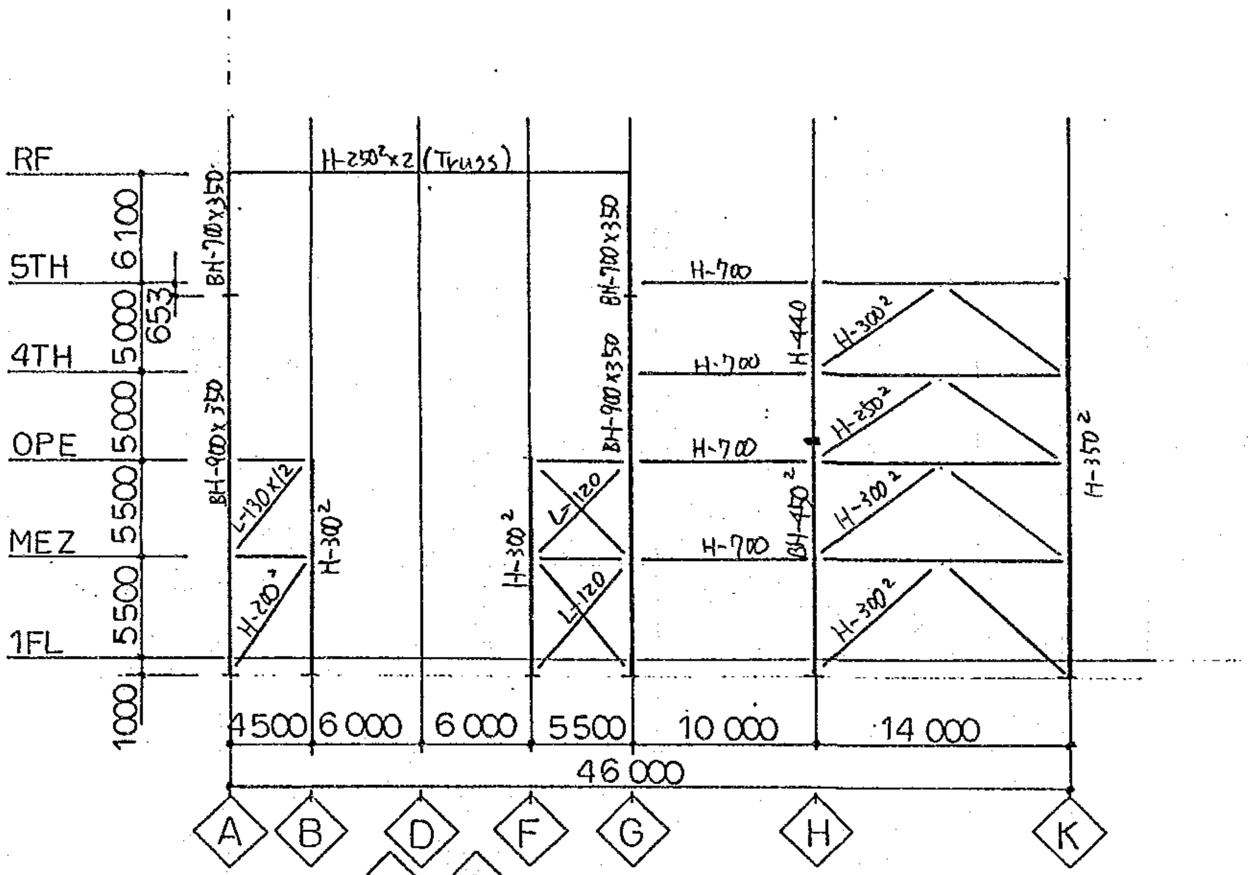
101 208 LINE

86

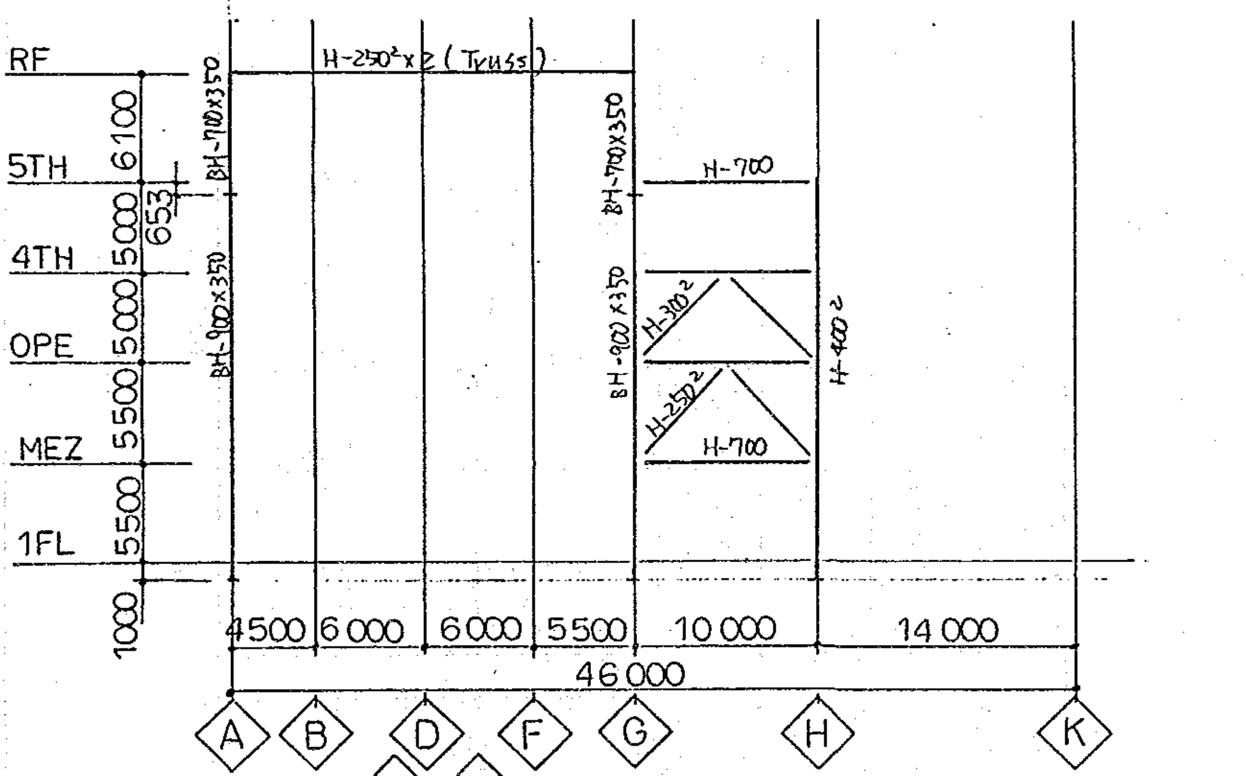

RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
H-250²x2 (Truss)
BH-700x350
BH-900x350
H-350²
H-300²
H-250²
H-700
H-400²
4500
6000
6000
5500
10000
14000
46000
A
B
D
F
G
H
K
104
205
LINE


RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
H-250²x2 (Truss)
BH-700x350
BH-900x350
L-130x12
H-200²
H-300²
L-120
H-350²
H-300²
H-250²
H-700
H-400²
4500
6000
6000
5500
10000
14000
46000
A
B
D
F
G
H
K
103
206
LINE

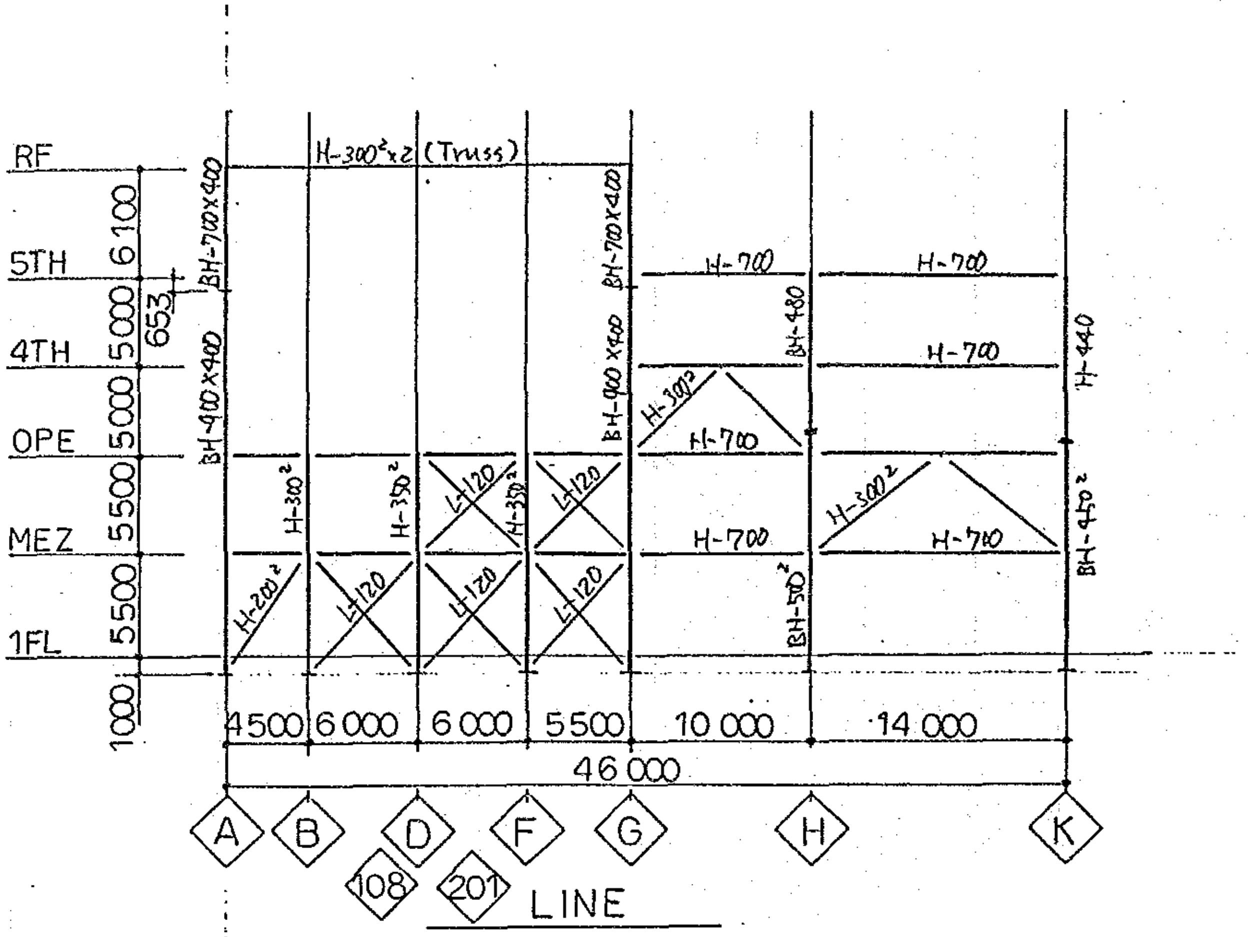
FORM 04

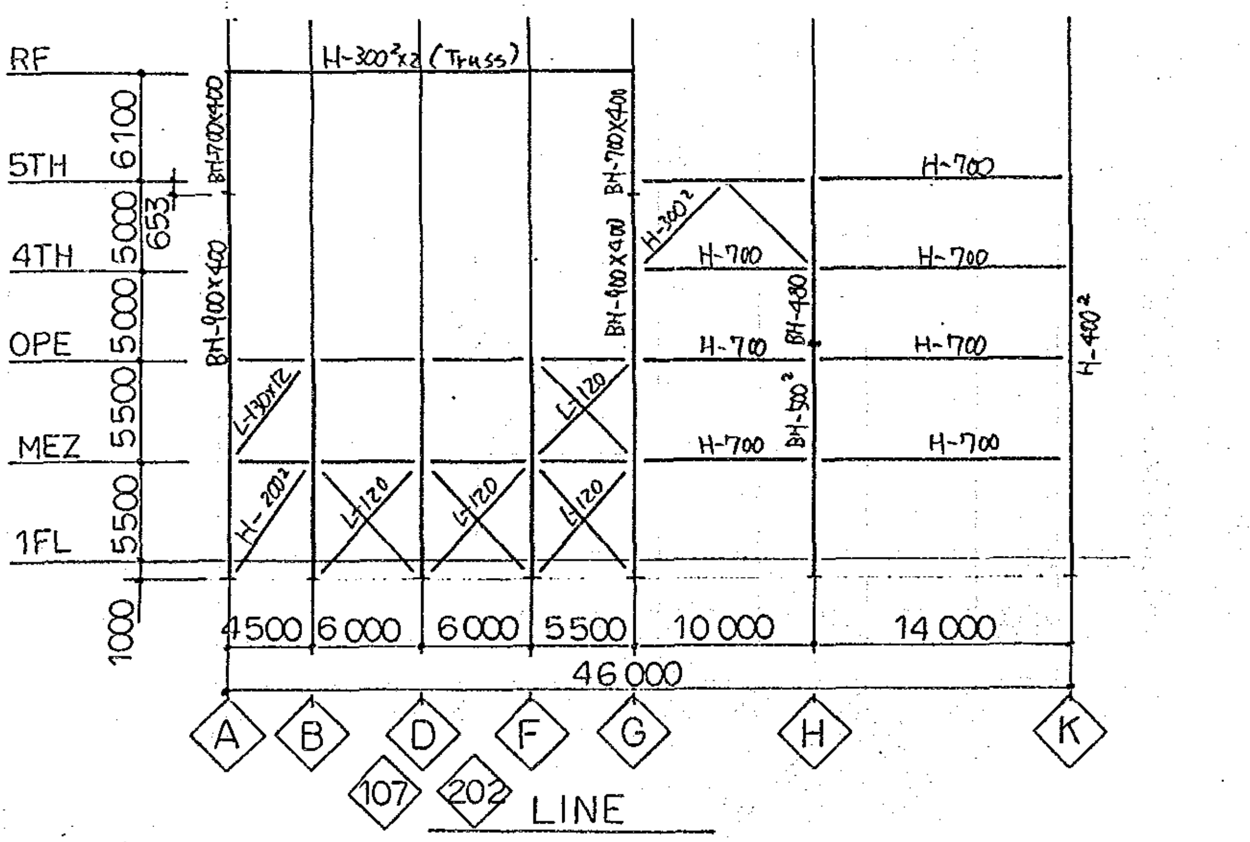


106 203 LINE

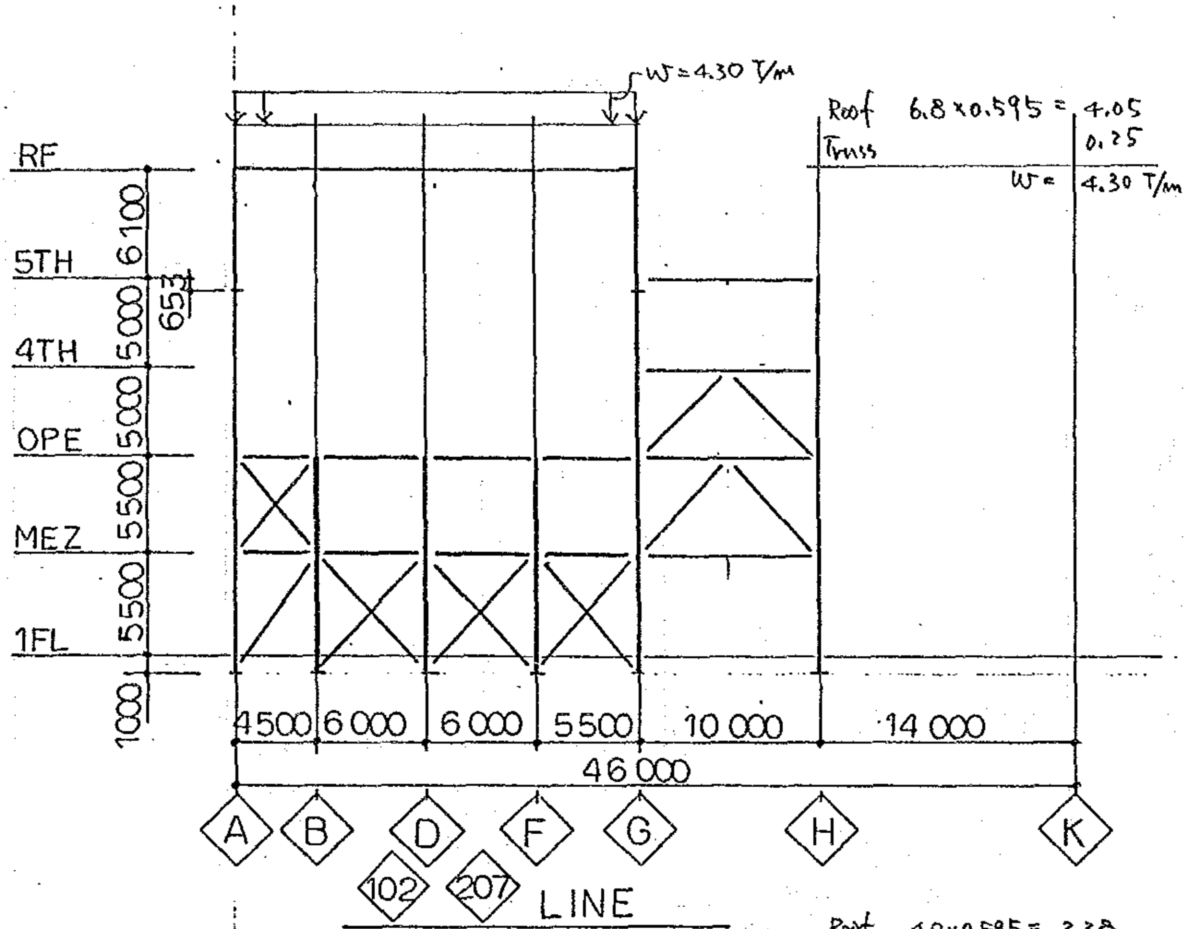


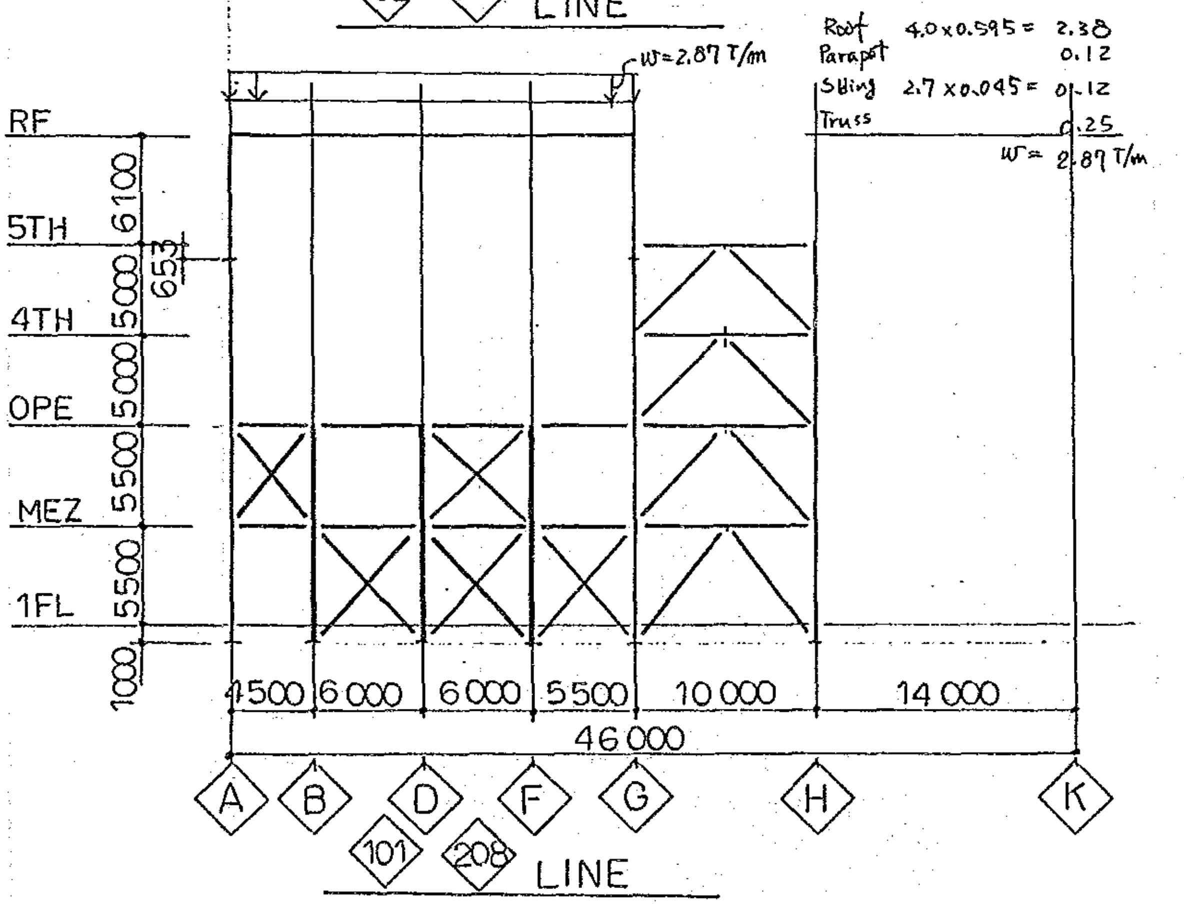
105 204 LINE

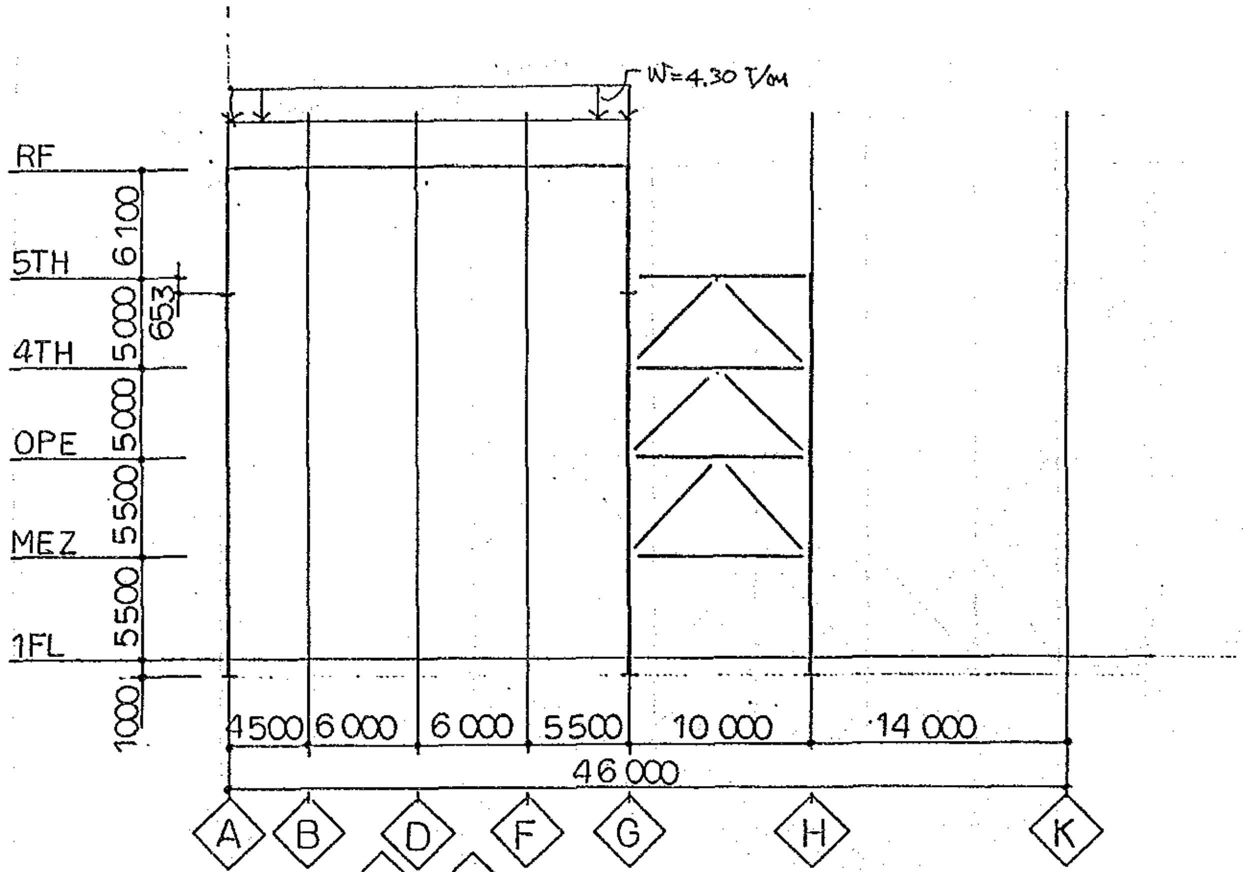

RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
H-300²x2 (Truss)
BH-700X400
BH-900X400
H-700
BH-480
H-440
H-300²
H-350²
L-120
H-200²
BH-500²
BH-450²
4500
6000
6000
5500
10000
14000
46000
A
B
D
F
G
H
K
108
201
LINE


RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
H-300²x2 (Truss)
BH-700X400
BH-900X400
H-700
BH-480
H-480²
H-300²
L-130x12
L-120
H-200²
BH-500²
4500
6000
6000
5500
10000
14000
46000
A
B
D
F
G
H
K
107
202
LINE

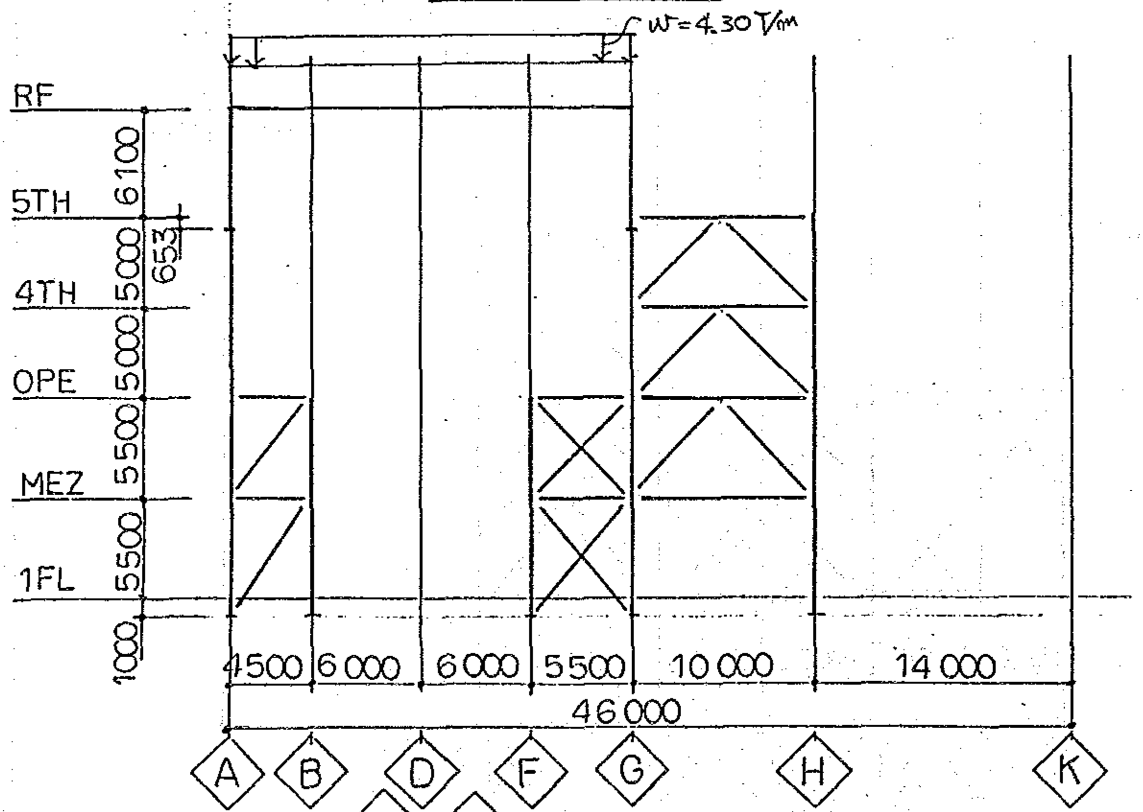
FORM 04


W=4.30 T/m
Roof 6.8×0.595 = 4.05
Truss 0.25
W= 4.30 T/m
RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
4500
6000
6000
5500
10000
14000
46000
A
B
D
F
G
H
K
102
207
LINE

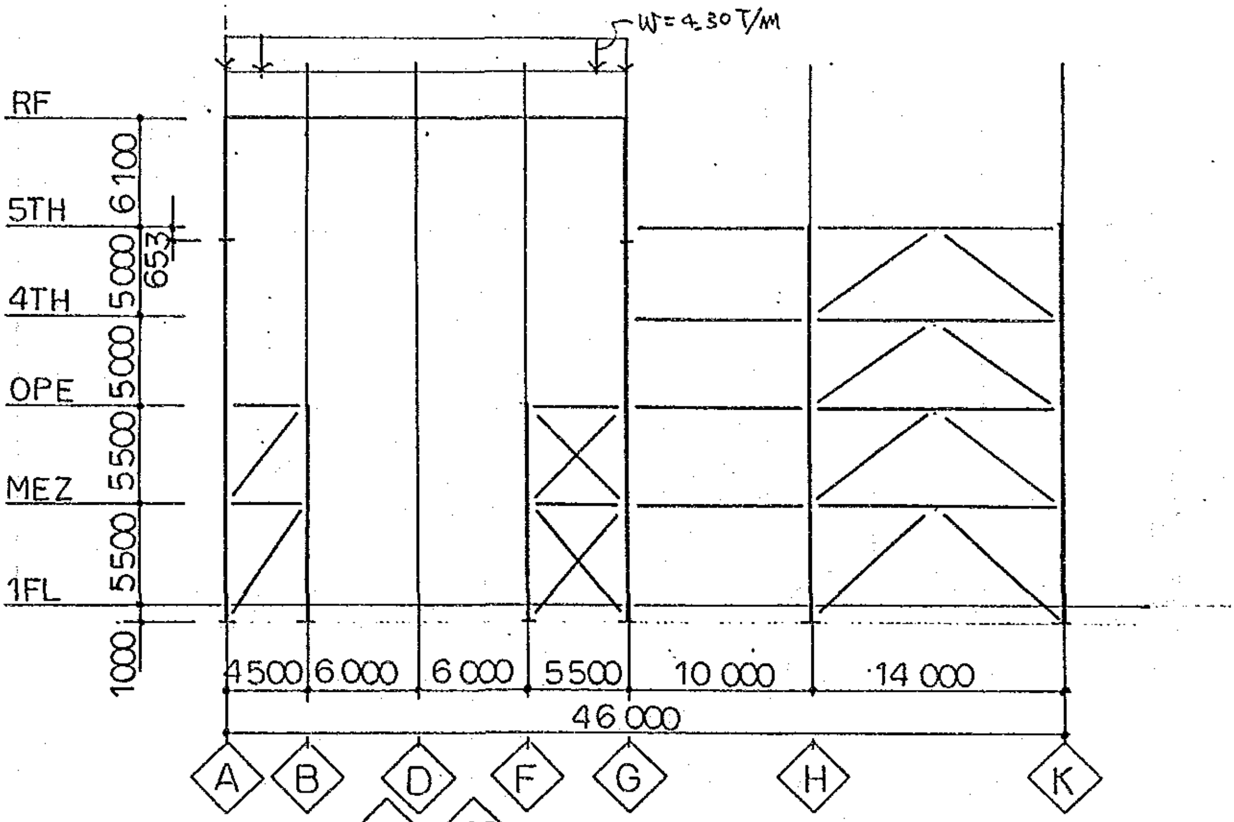

W=2.87 T/m
Roof 4.0×0.595 = 2.38
Parapet 0.12
Siding 2.7×0.045 = 0.12
Truss 0.25
W= 2.87 T/m
RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
4500
6000
6000
5500
10000
14000
46000
A
B
D
F
G
H
K
101
208
LINE



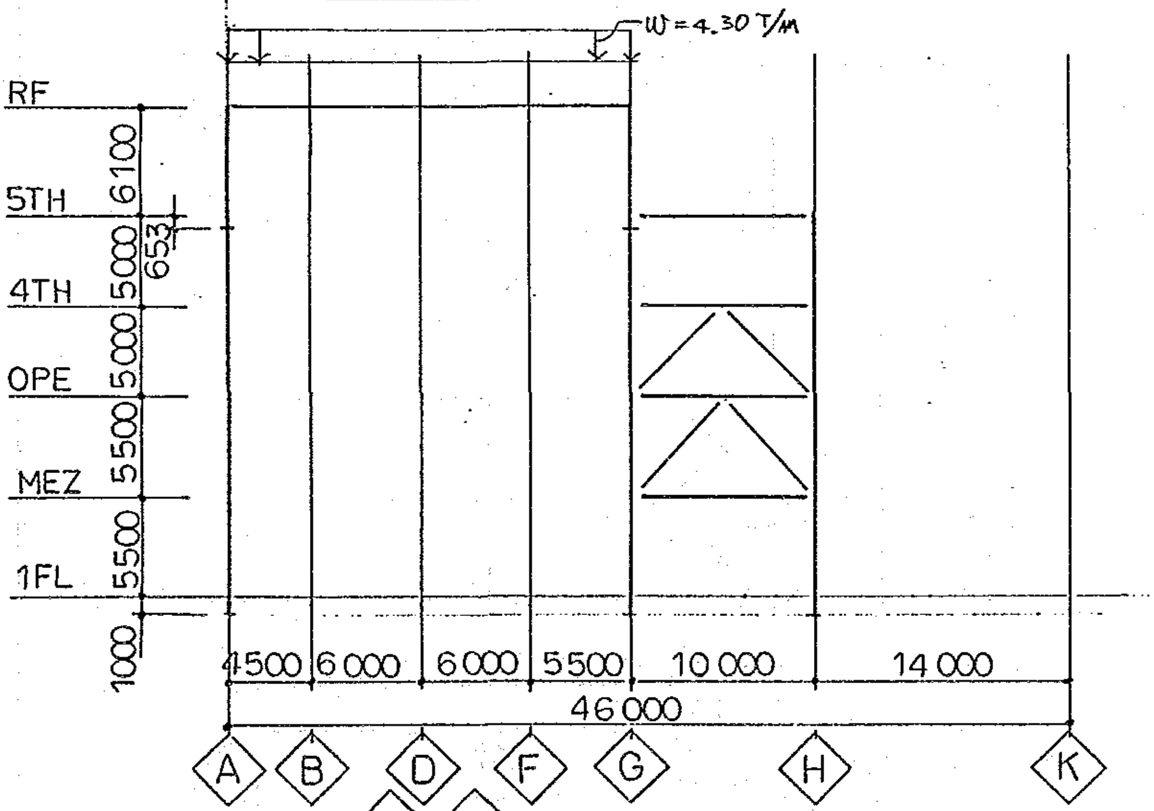
104 205 LINE



103 206 LINE

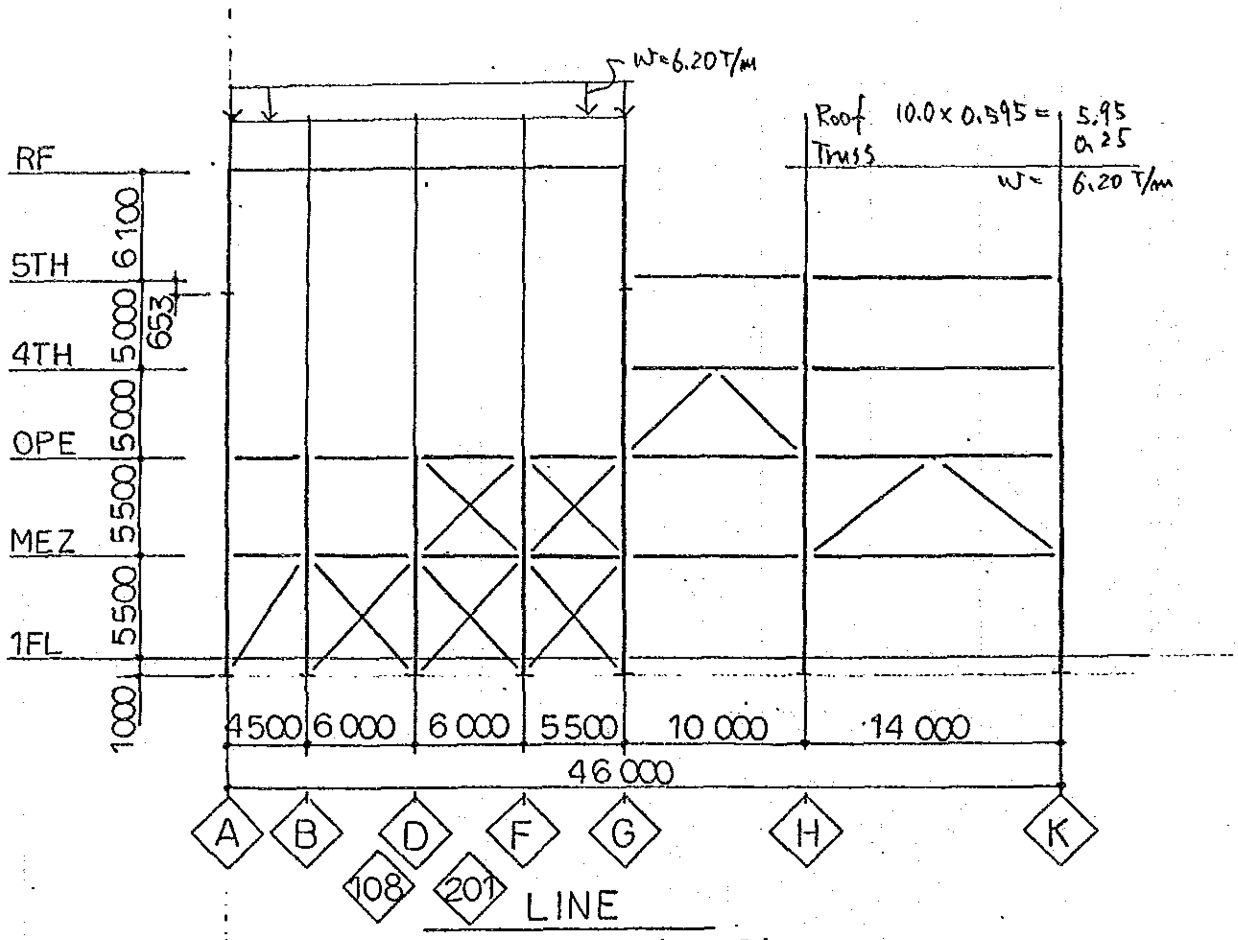


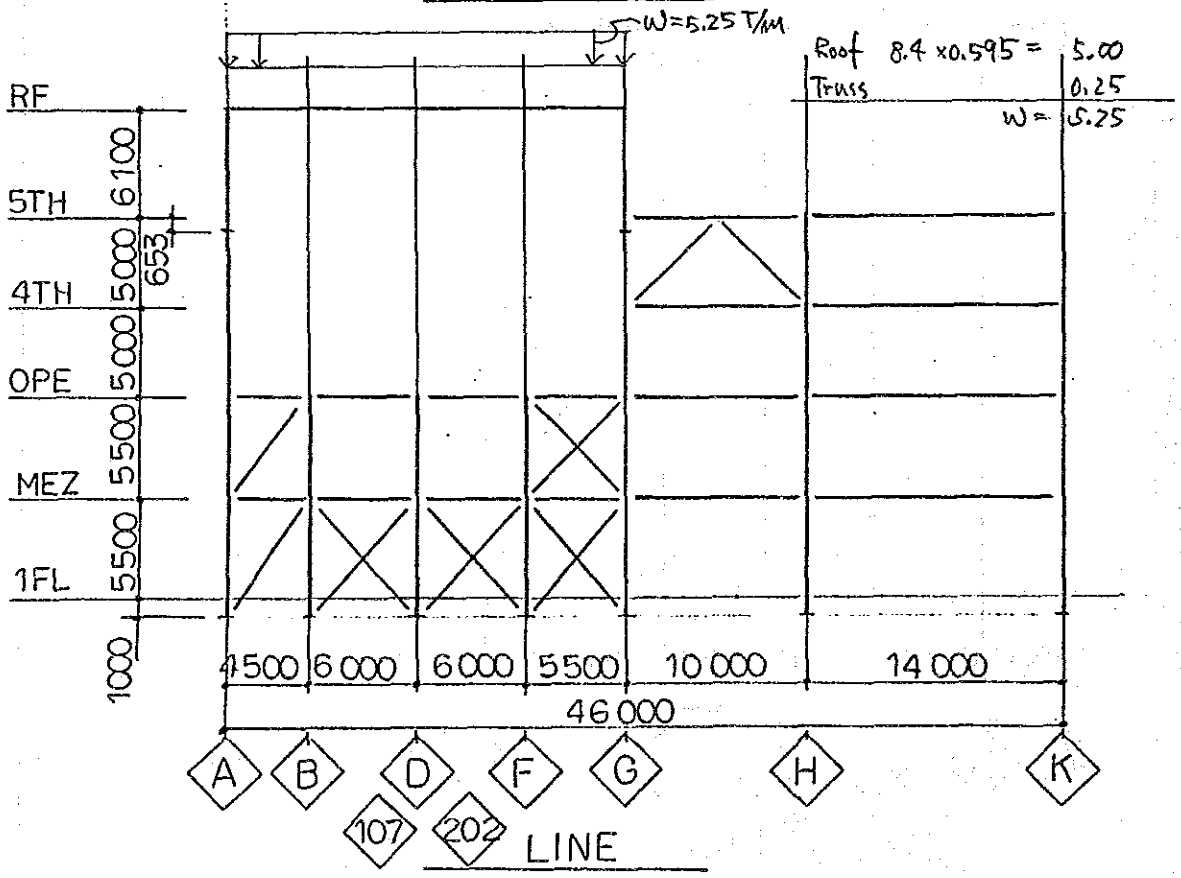
106 203 LINE



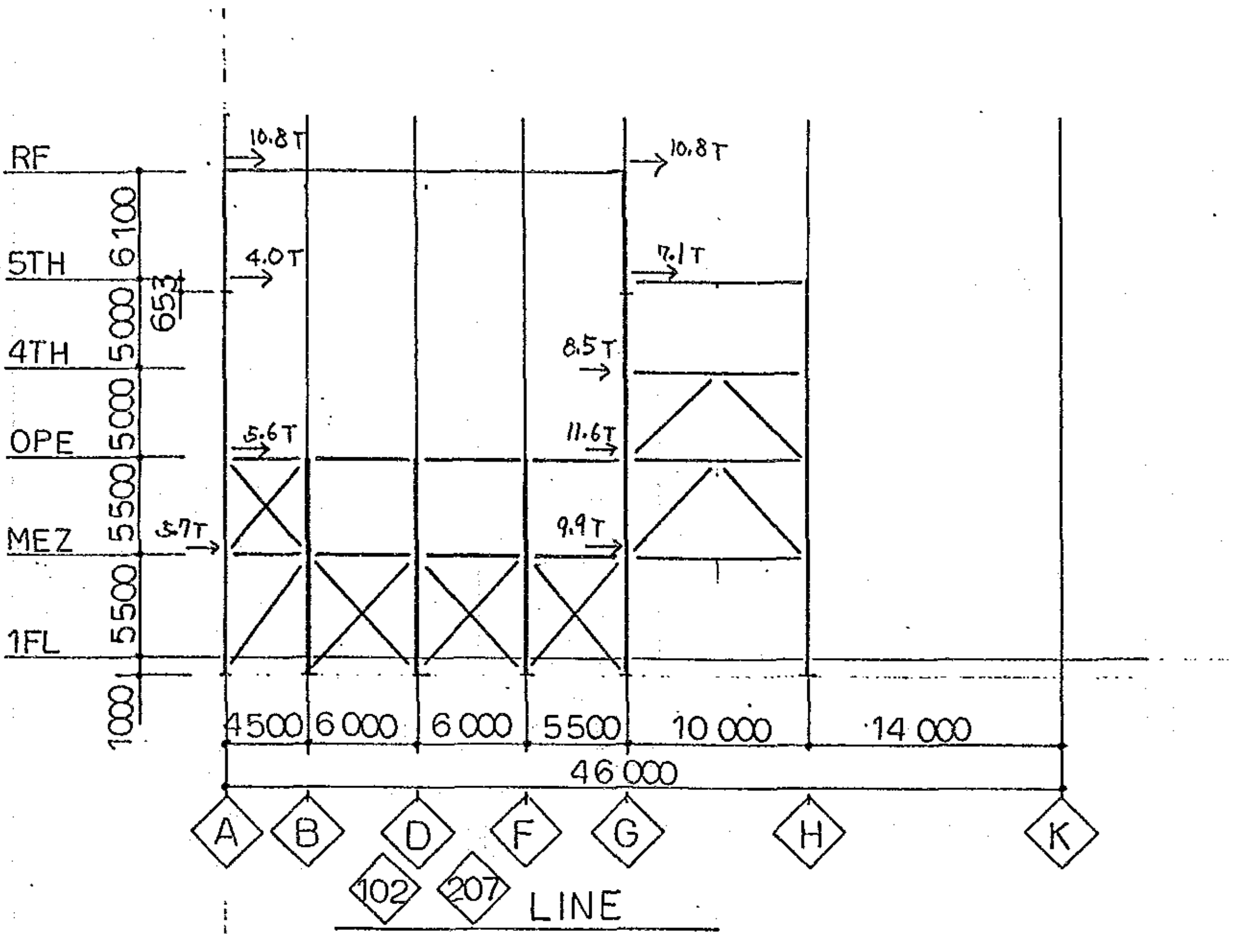
105 204 LINE

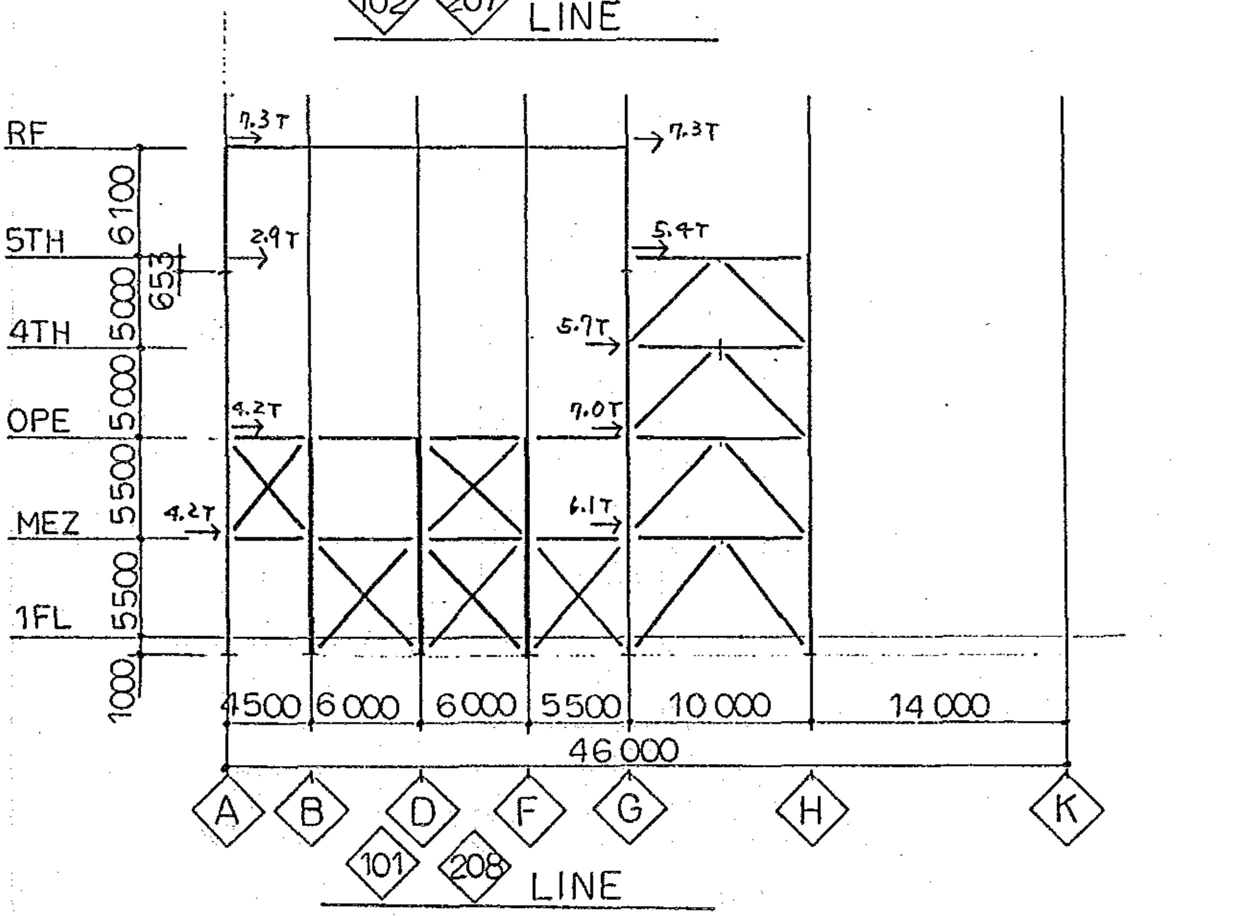
92


W=6.20T/M
Roof 10.0 x 0.595 = 5.95
Truss 0.25
W= 6.20 T/m
RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
653
5000
5500
5500
1000
4500
6 000
6 000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
108
201
LINE

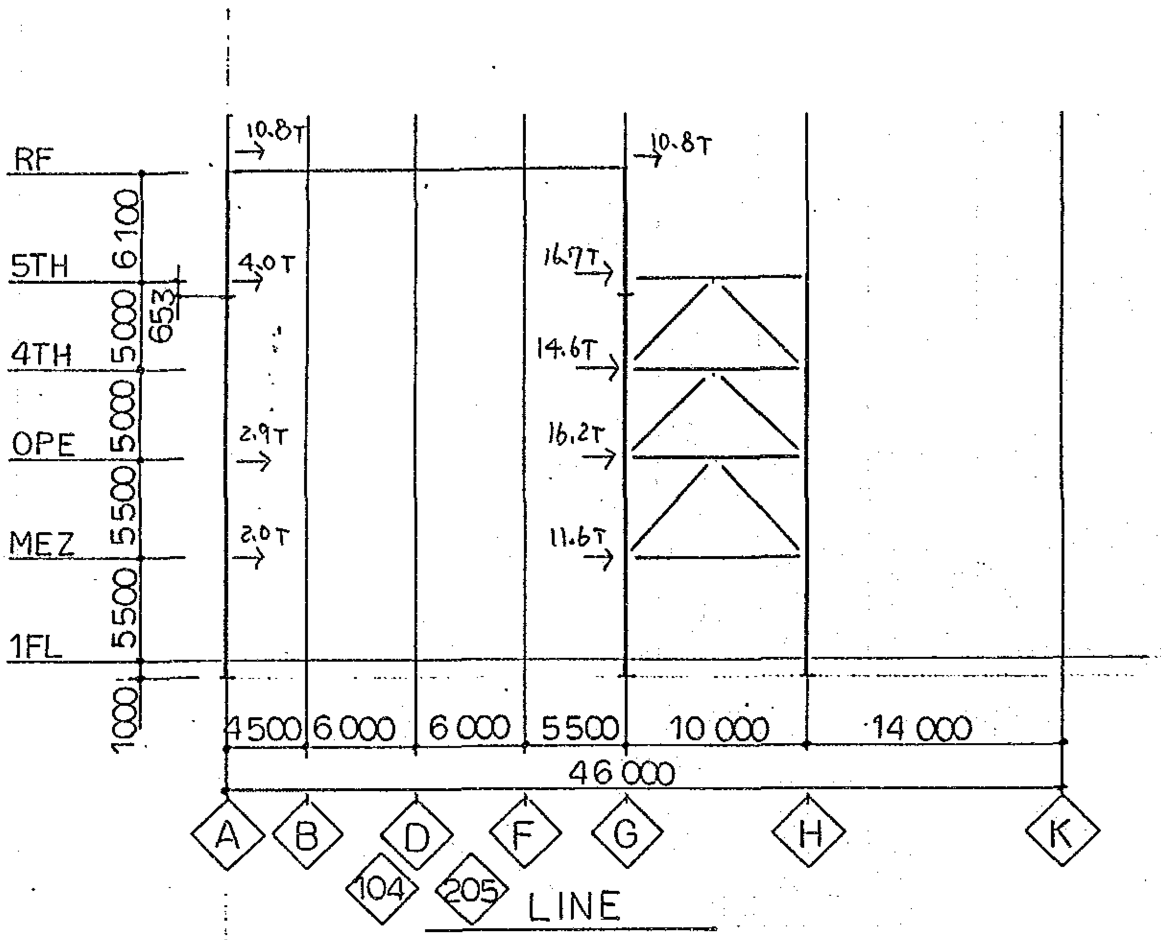

W=5.25 T/M
Roof 8.4 x 0.595 = 5.00
Truss 0.25
W= 5.25
RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
653
5000
5500
5500
1000
4500
6 000
6000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
107
202
LINE

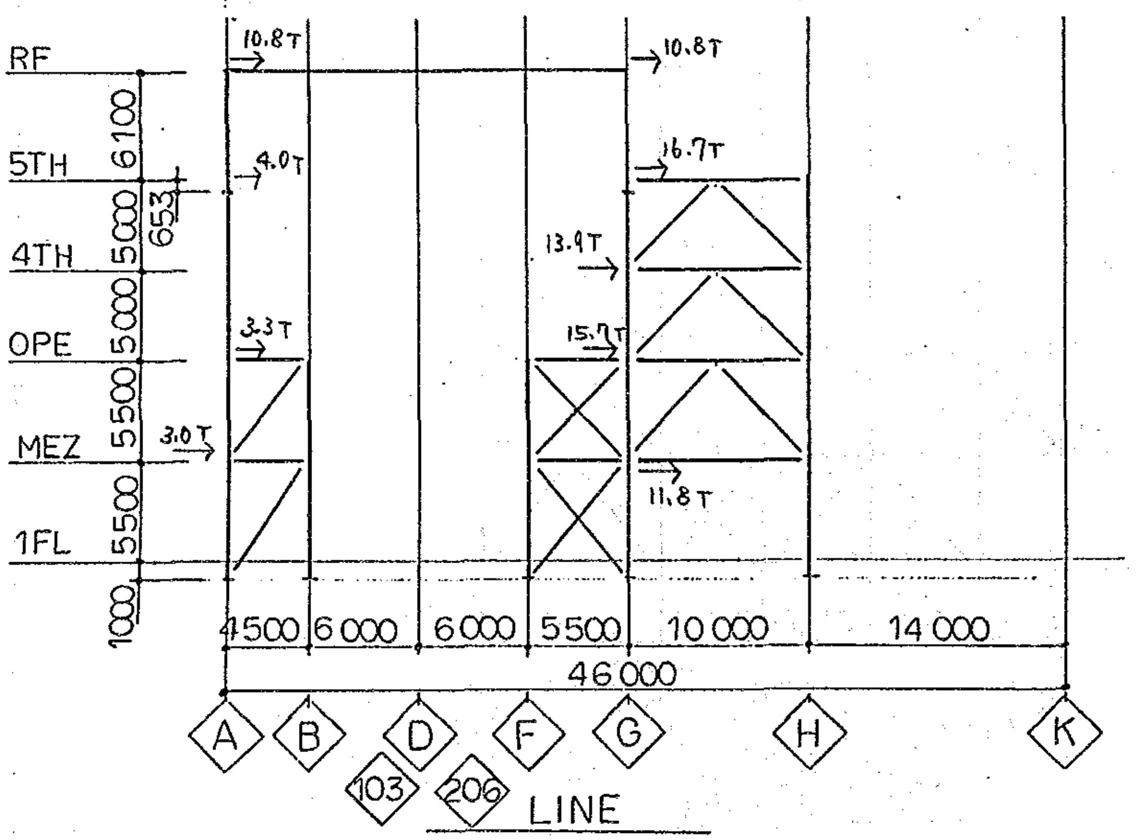
93

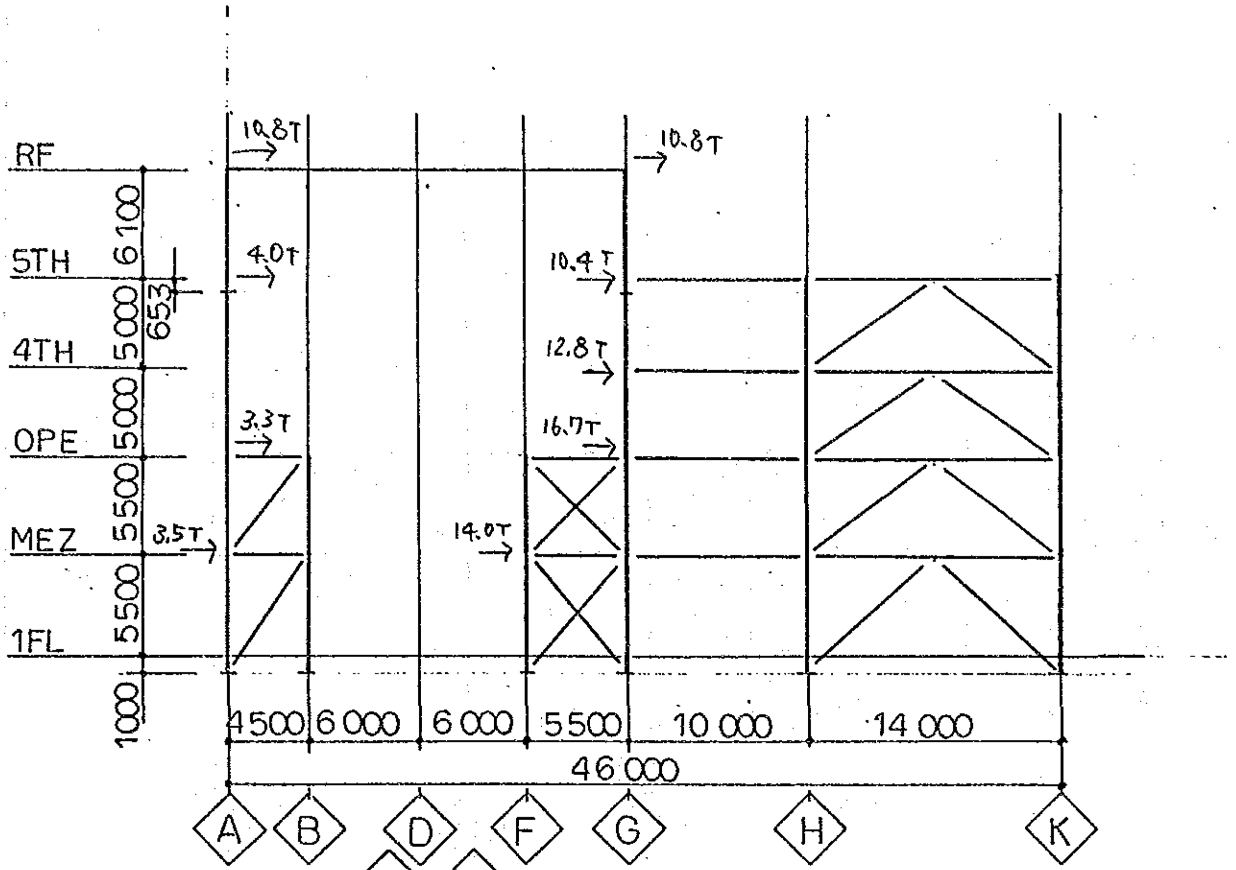

RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
10.8T
10.8T
4.0T
7.1T
8.5T
5.6T
11.6T
5.7T
9.9T
4500
6 000
6 000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
102
207
LINE


RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
7.3T
7.3T
2.9T
5.4T
5.7T
4.2T
7.0T
4.2T
6.1T
4500
6 000
6000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
101
208
LINE

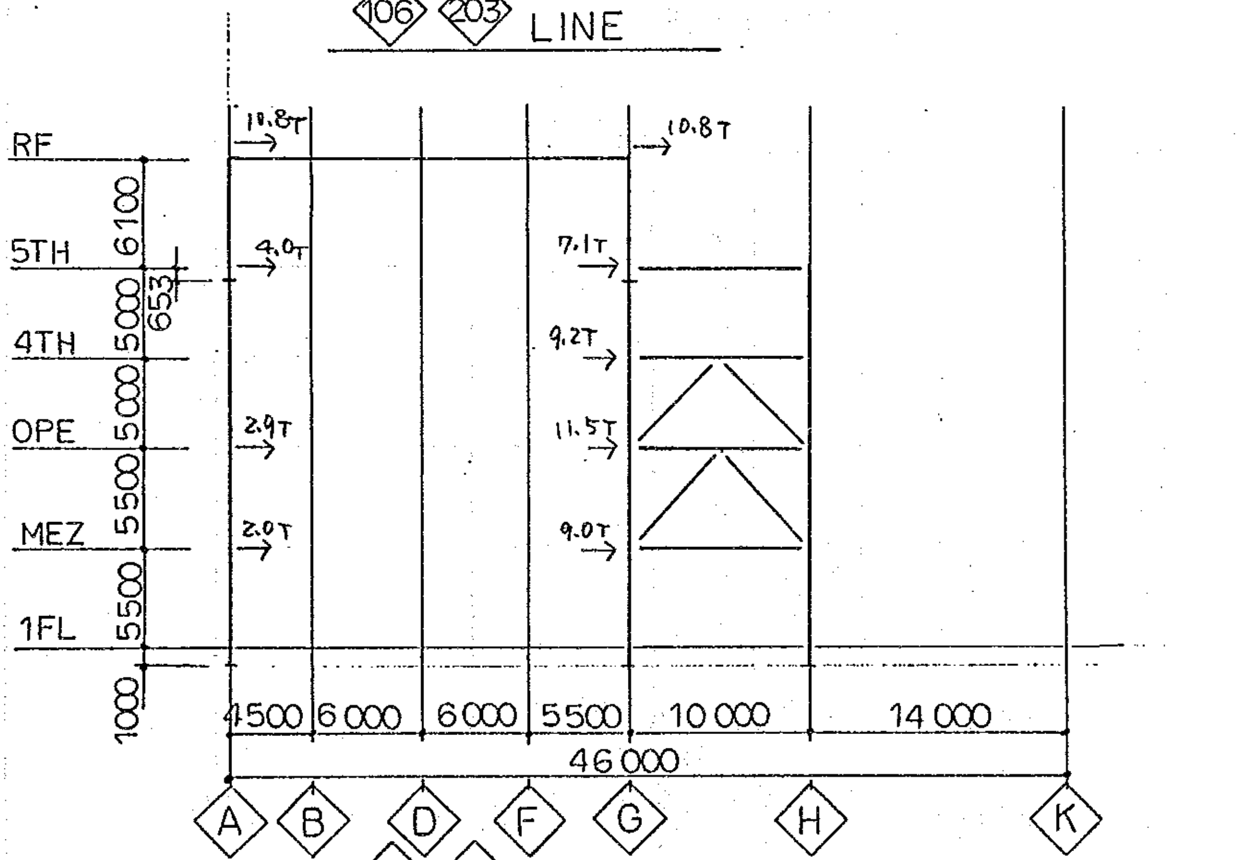
94


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
10000
14000
46000
A
B
D
F
G
H
K
104
205
LINE

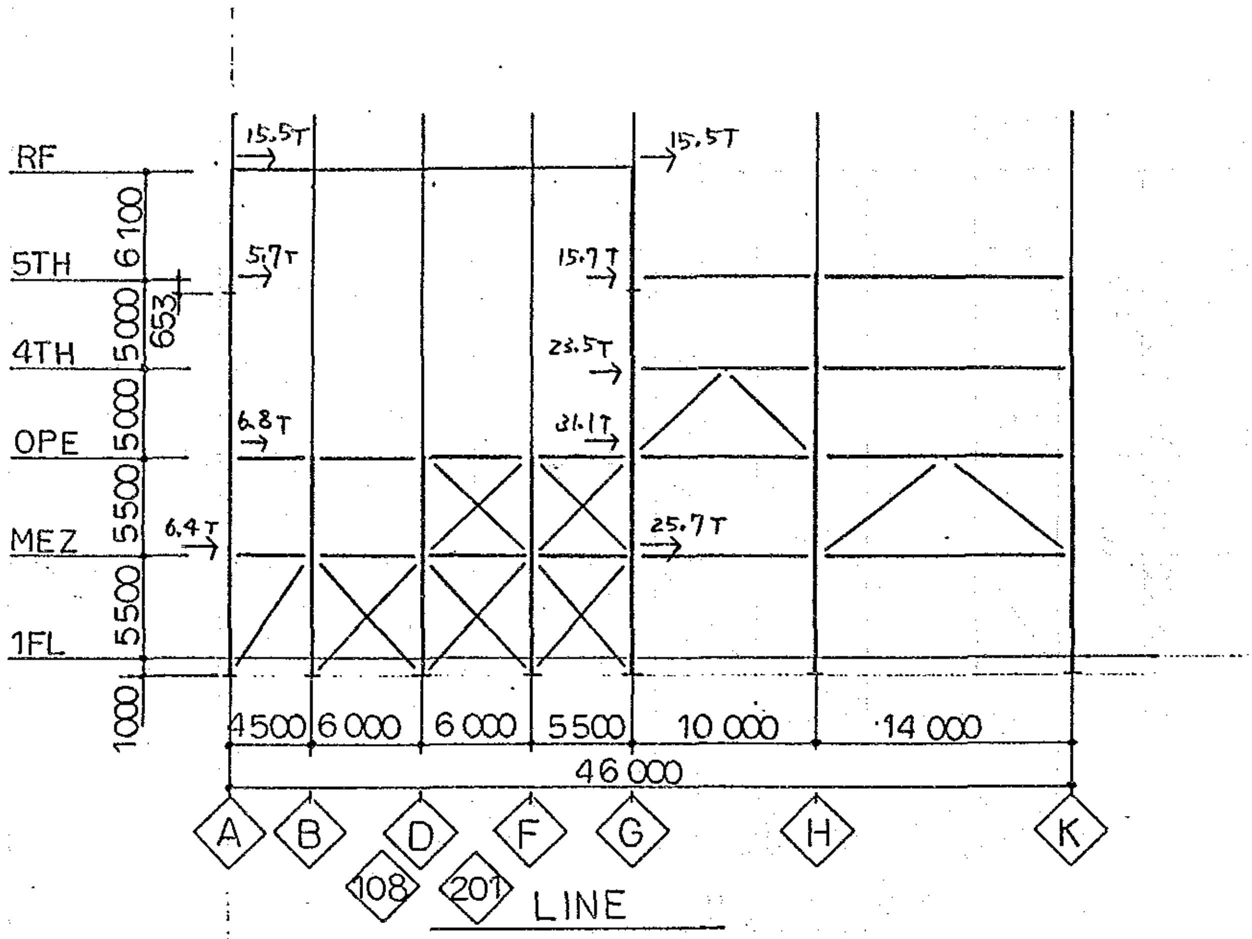

RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
5000
5500
5500
1000
653
10.8T
10.8T
4.0T
16.7T
13.9T
3.3T
15.7T
3.0T
11.8T
4500
6000
6000
5500
10000
14000
46000
A
B
D
F
G
H
K
103
206
LINE

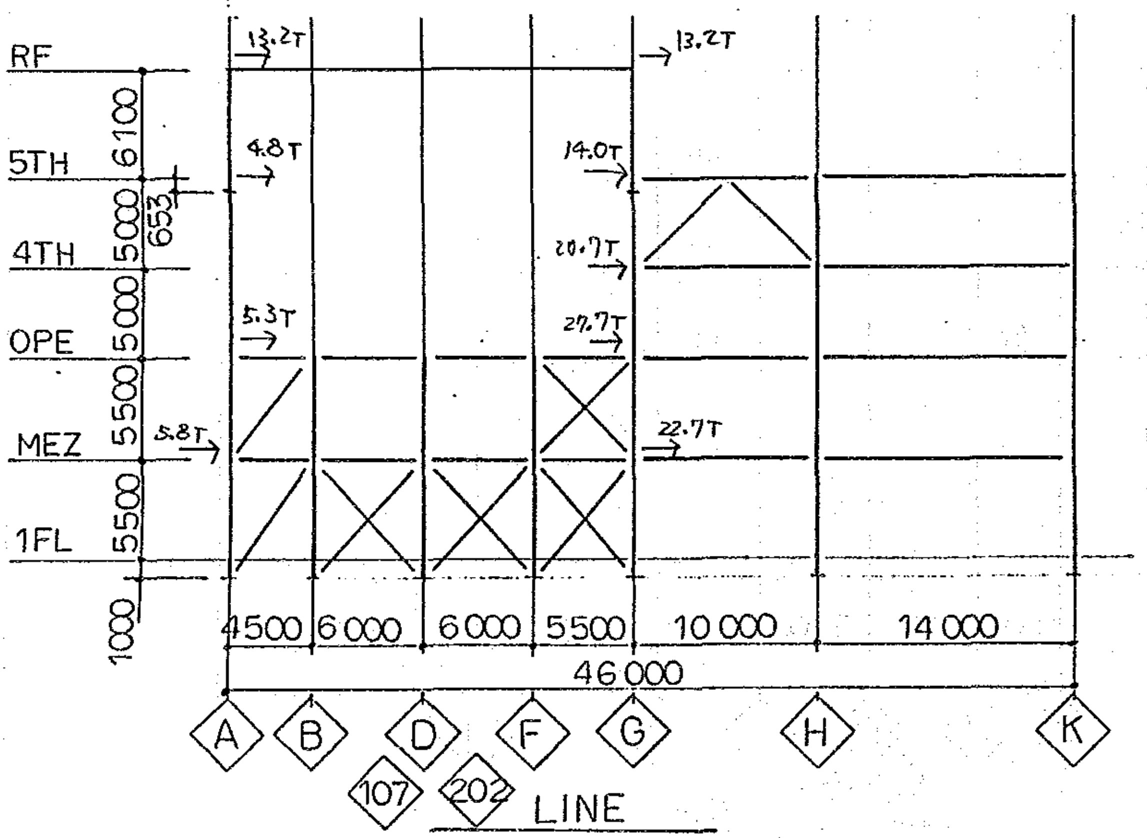


106 203 LINE

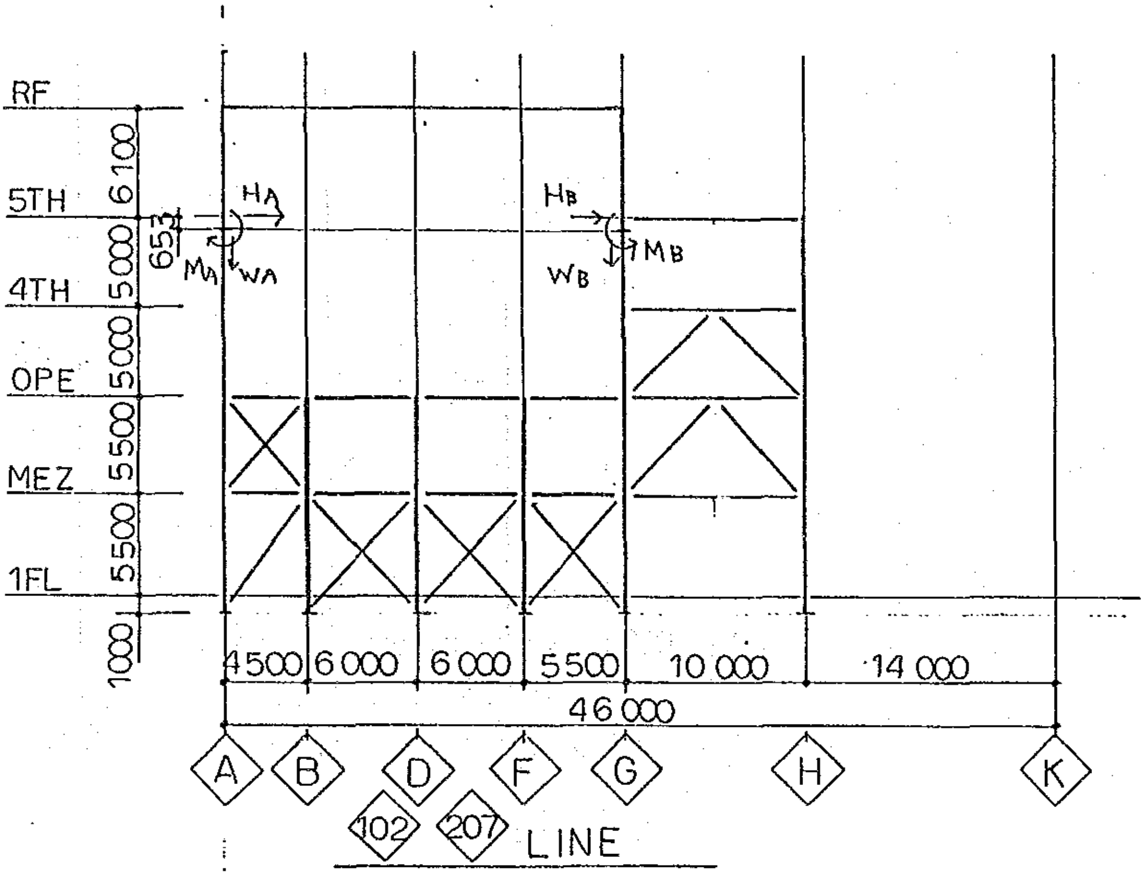


105 204 LINE

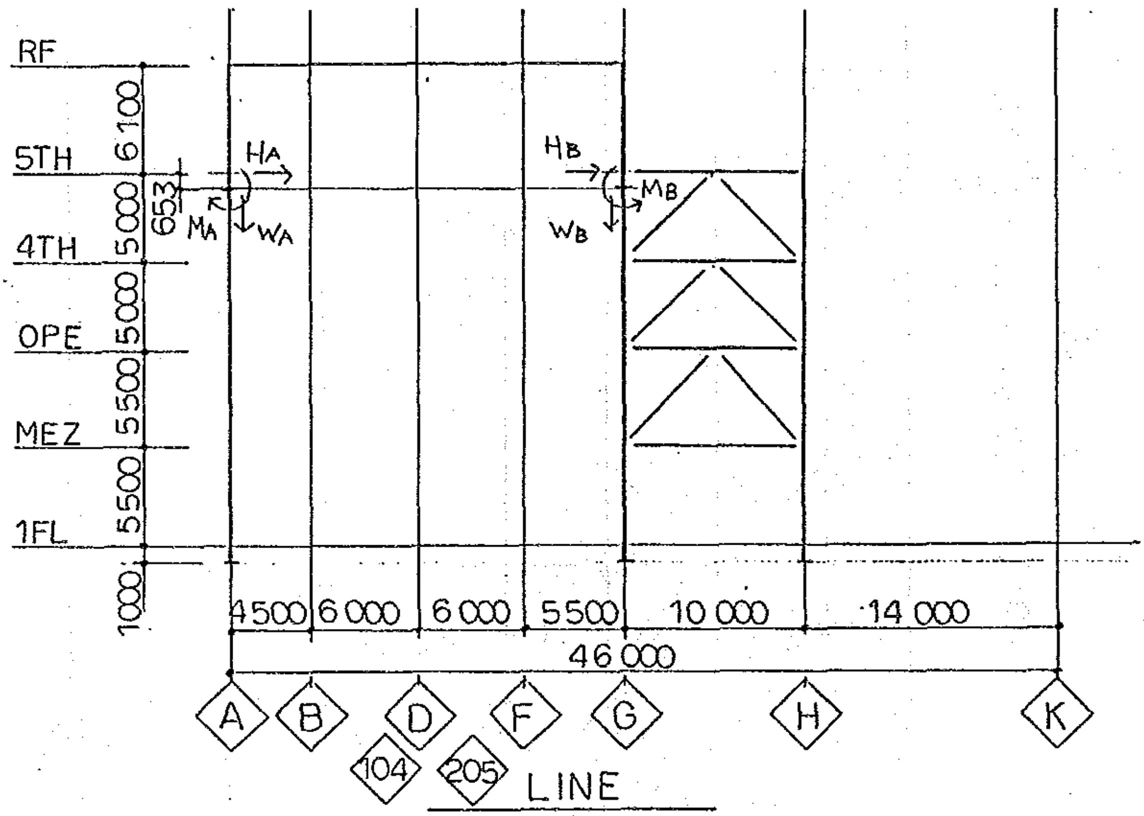

RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
653
5000
5500
5500
1000
15.5T
15.5T
5.7T
15.7T
23.5T
6.8T
31.1T
6.4T
25.7T
4500
6000
6000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
108
201
LINE


RF
5TH
4TH
OPE
MEZ
1FL
6100
5000
653
5000
5500
5500
1000
13.2T
13.2T
4.8T
14.0T
20.7T
5.3T
27.7T
5.8T
22.7T
4500
6000
6000
5500
10 000
14 000
46 000
A
B
D
F
G
H
K
107
202
LINE

37

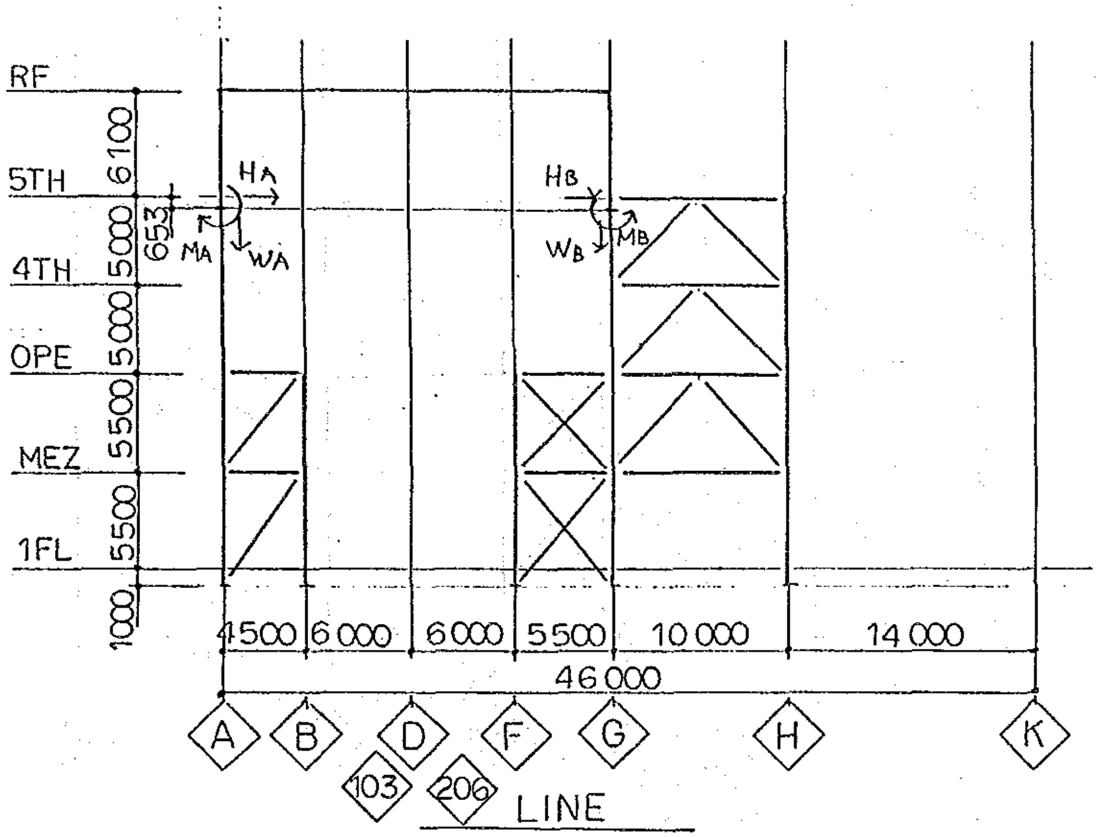


C.D.L.	W_A =	24.8 T	W_B =	13.3 T
	H_A =	2.1 T	H_B =	1.1 T
	M_A =	19.8 T.m	M_B =	10.6 T.m
C.L.L.	W_A =	71.2 T	W_B =	17.8 T
	H_A =	5.9 T	H_B =	1.5 T
	M_A =	57.0 T.m	M_B =	14.2 T.m
C.H.L. (K=0.17)	H_A =	4.2 T	H_B =	2.3 T



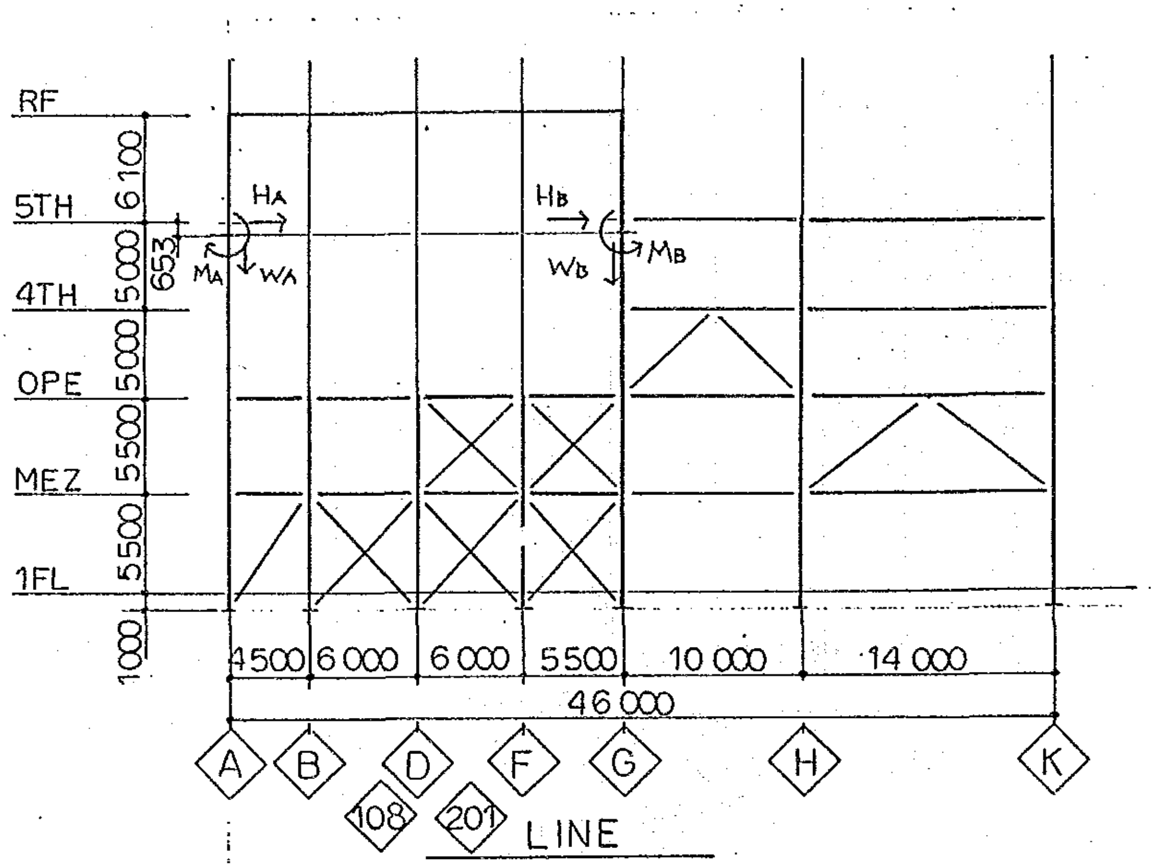
C.D.L.	W_A =	24.8 T	W_B =	13.3 T
	H_A =	2.1 T	H_B =	1.1 T
	M_A =	19.8 T.m	M_B =	10.6 T.m
C.L.L.	W_A =	71.2 T	W_B =	17.8 T
	H_A =	5.9 T	H_B =	1.5 T
	M_A =	57.0 T.m	M_B =	14.2 T.m
C.H.L.	H_A =	4.2 T	H_B =	2.3 T

FORM 04

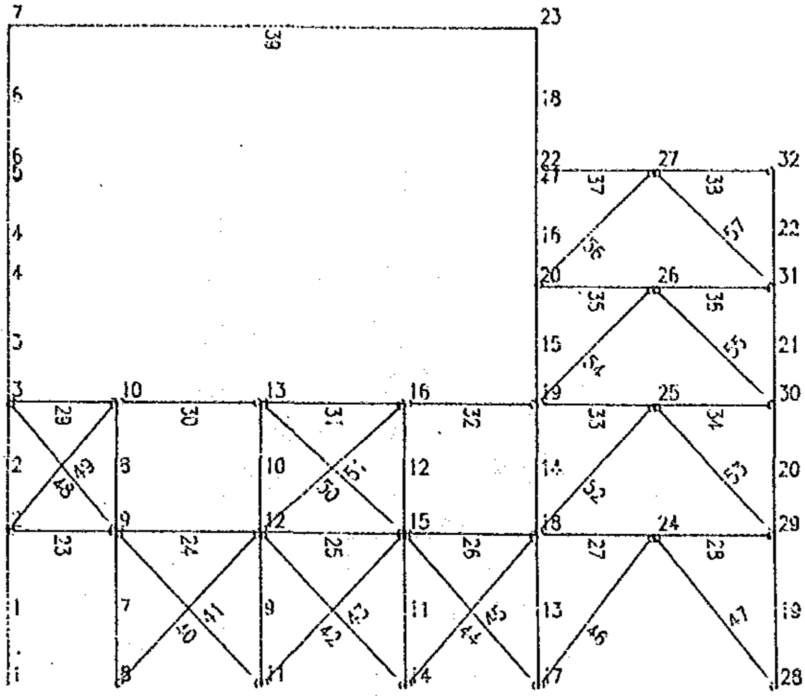


C.D.L.	WA =	24.8 T	WB =	13.3 T
	HA =	2.1 T	HB =	1.1 T
	MA =	19.8 T·m	MB =	10.6 T
C.L.L.	WA =	71.2 T	WB =	17.8 T
	HA =	5.9 T	HB =	1.5 T
	MA =	57.0 T·m	MB =	14.2 T·m
C.H.L.	HA =	4.2 T	HB =	2.3 T

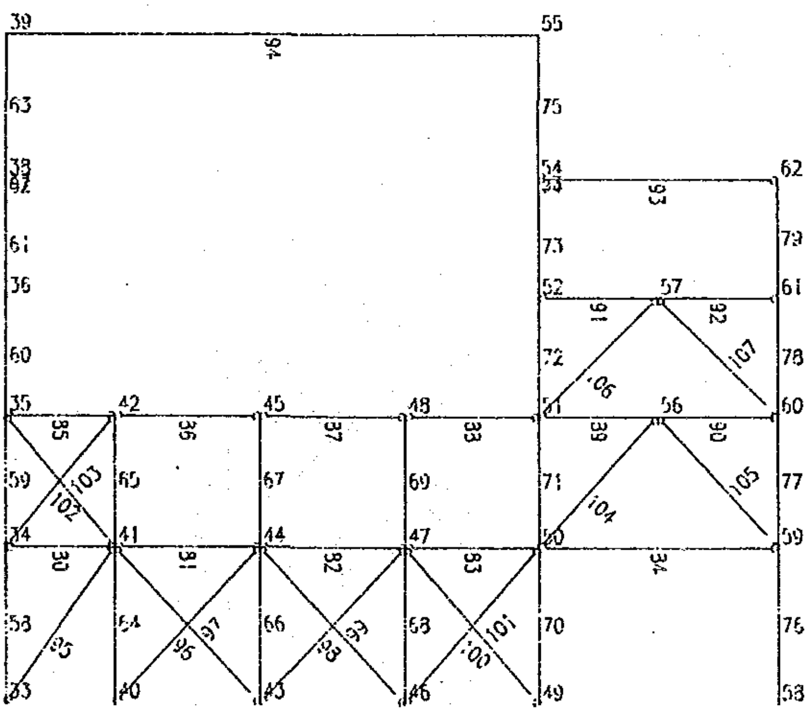
100



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

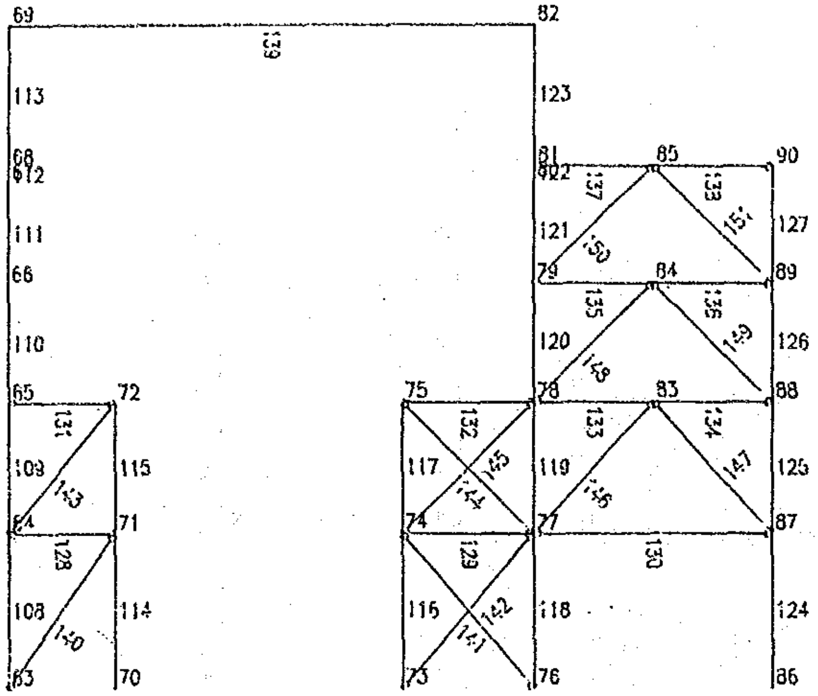


フレーム モデル 図
(101 - LINE SCALE 1/300)

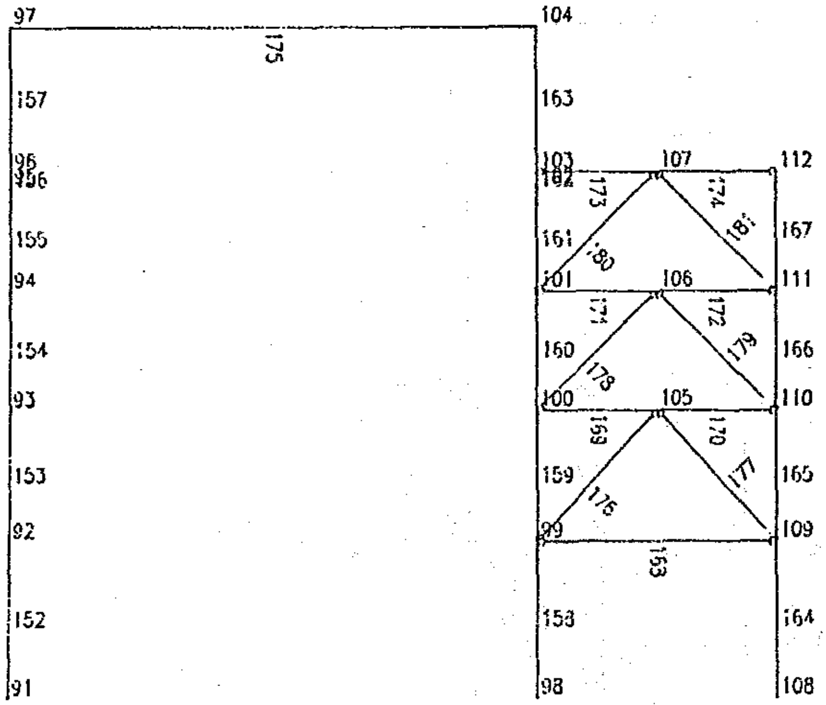


フレーム モデル 図
(102 - LINE SCALE 1/300)

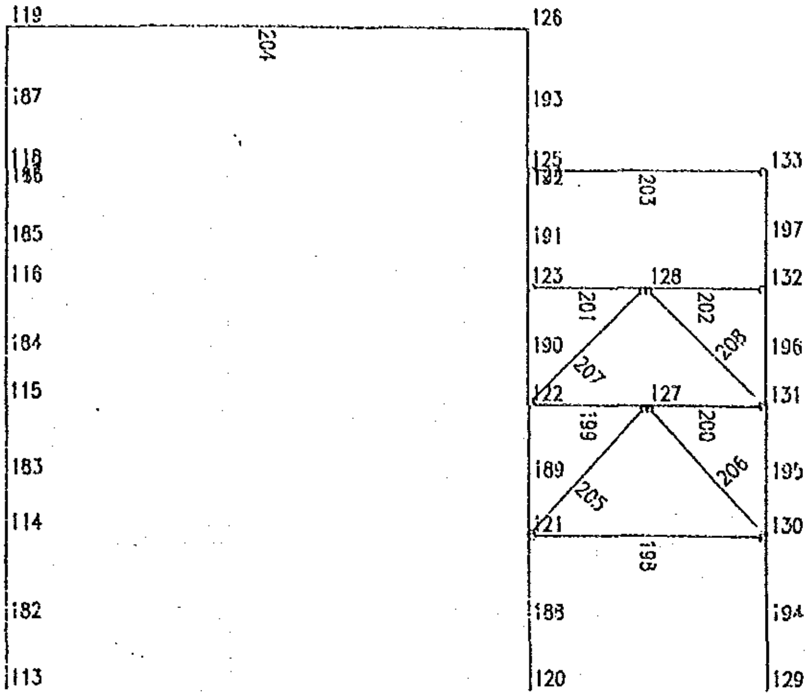
102



フレーム モデル 図
(103 -- LINE SCALE 1/300)

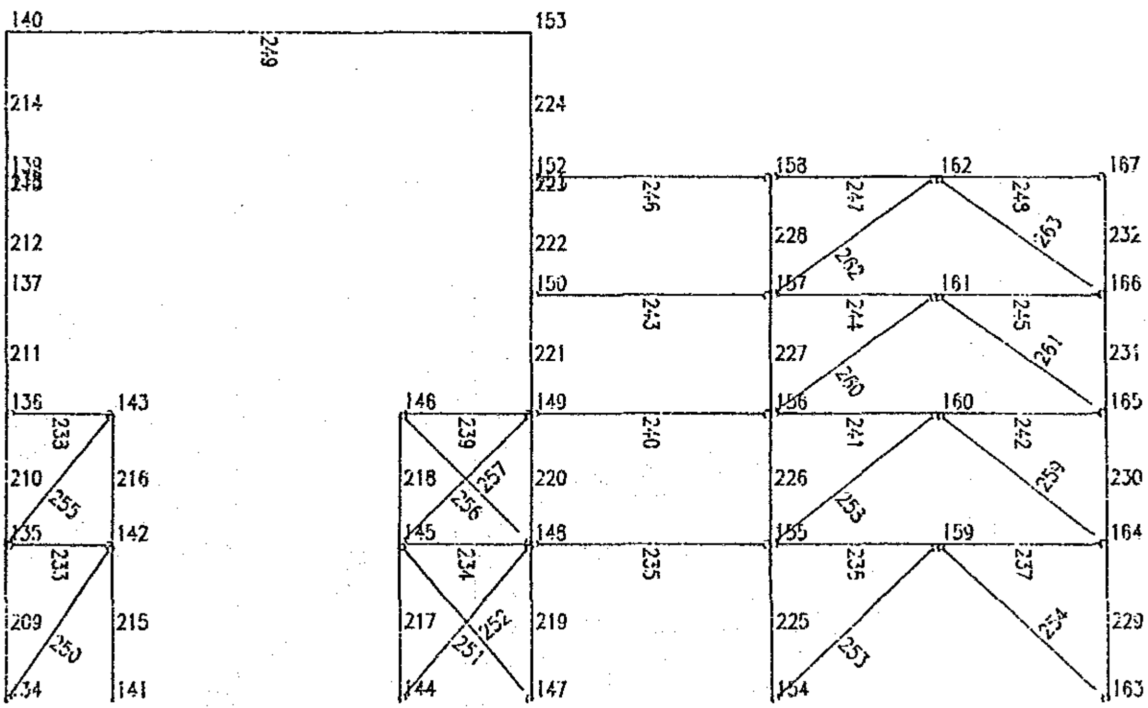


フレーム モデル 図
(104 - LINE SCALE 1/300)



フレーム　モデル　図

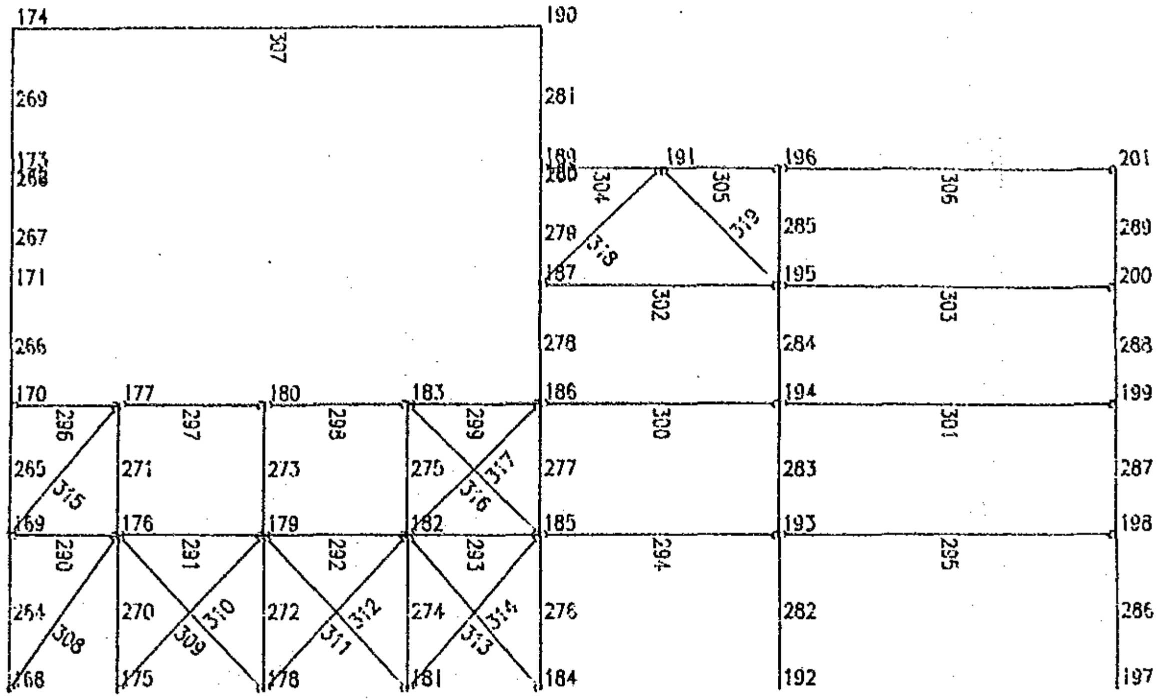
（ 105 - LINE　SCALE 1/300 ）



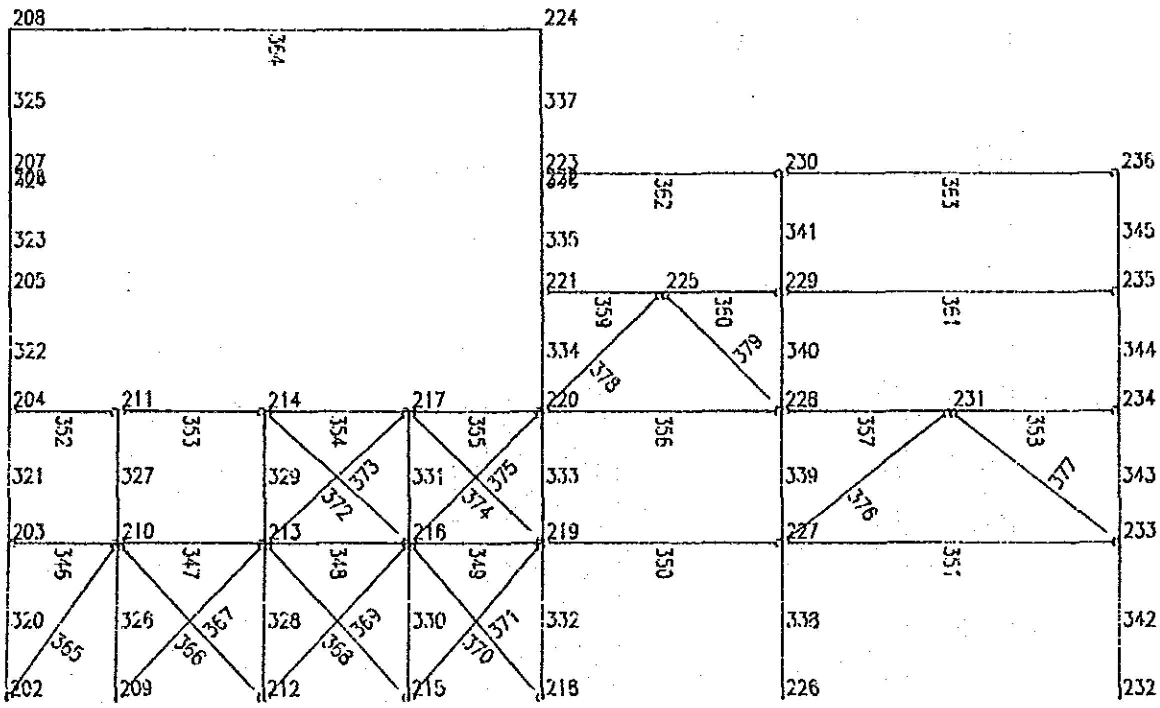
フレーム　モデル　図

（ 106 - LINE　SCALE 1/300 ）

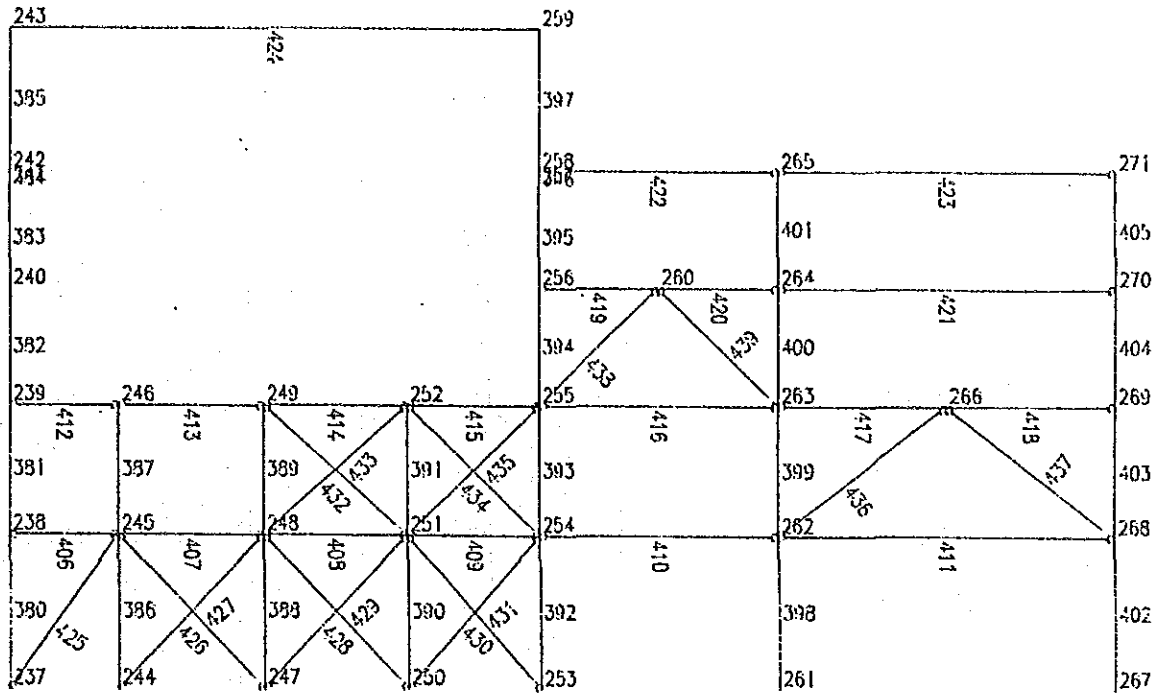
106



フレーム　モデル　図
（ 107 -- LINE　SCALE 1/300 ）

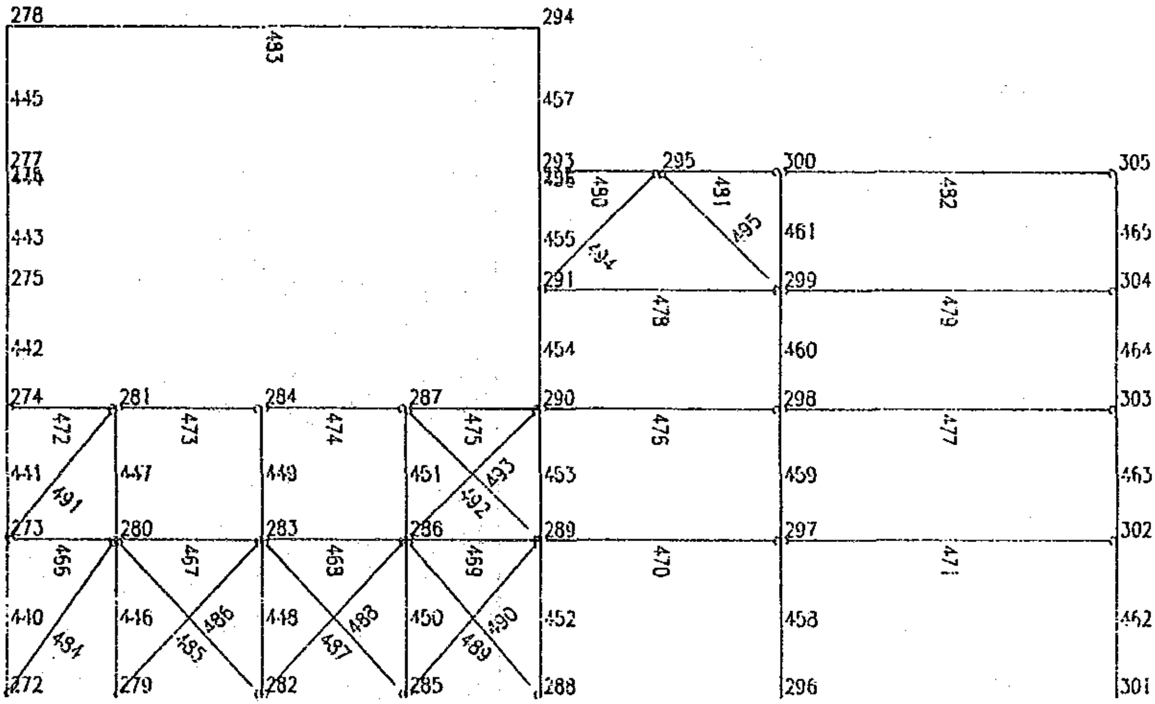


フレーム　モデル　図
（ 108 -- LINE　SCALE 1/300 ）



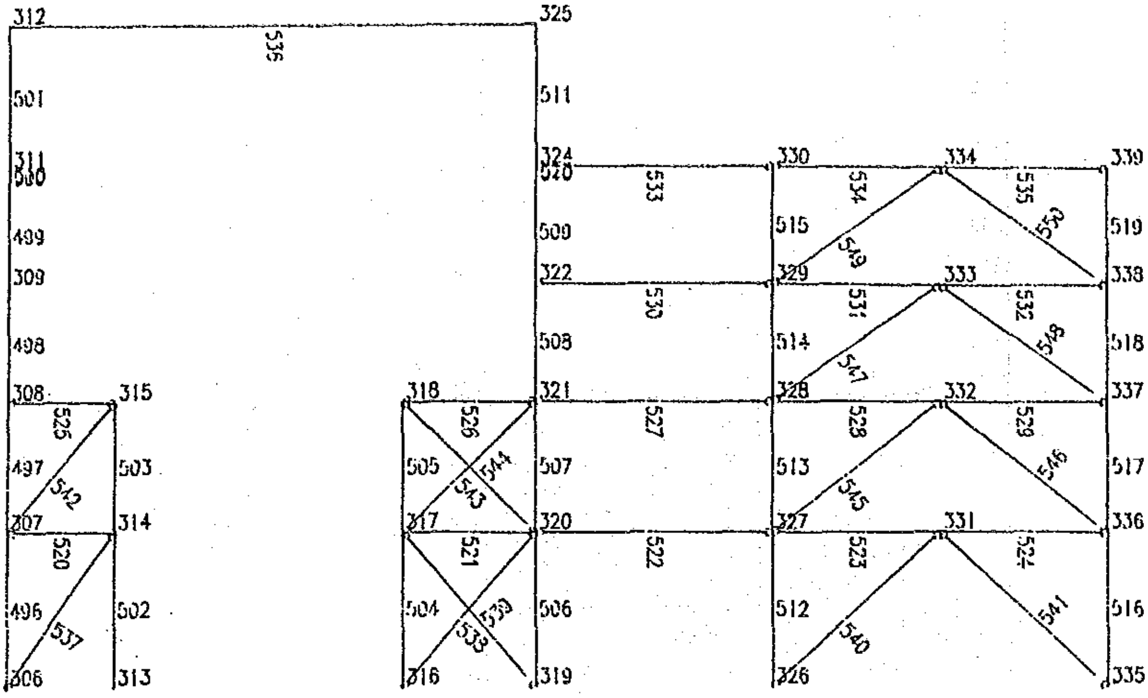
フレーム　モデル　図

（ 201 － LINE　SCALE 1/300 ）

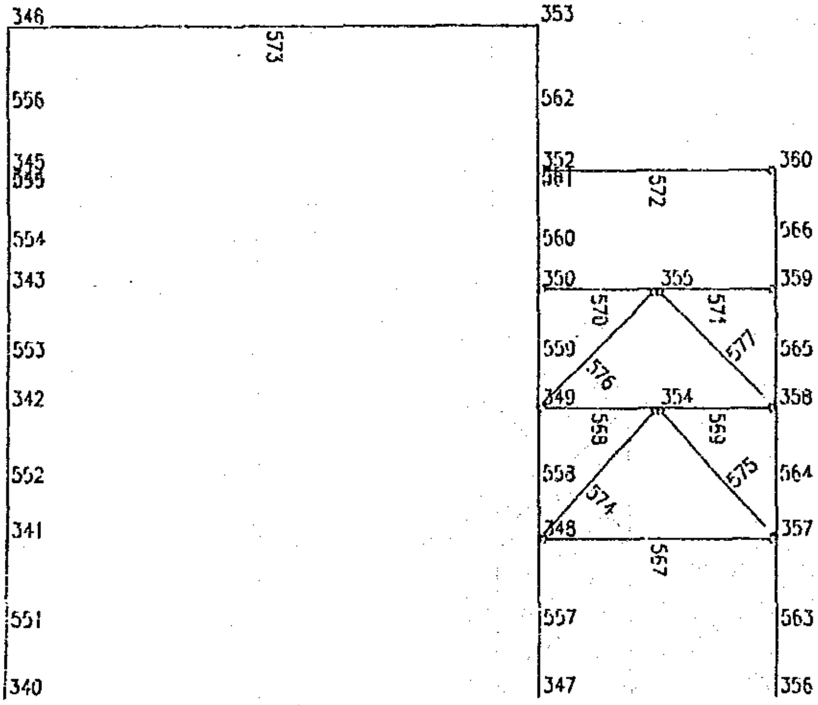


フレーム　モデル　図

（ 202 － LINE　SCALE 1/300 ）

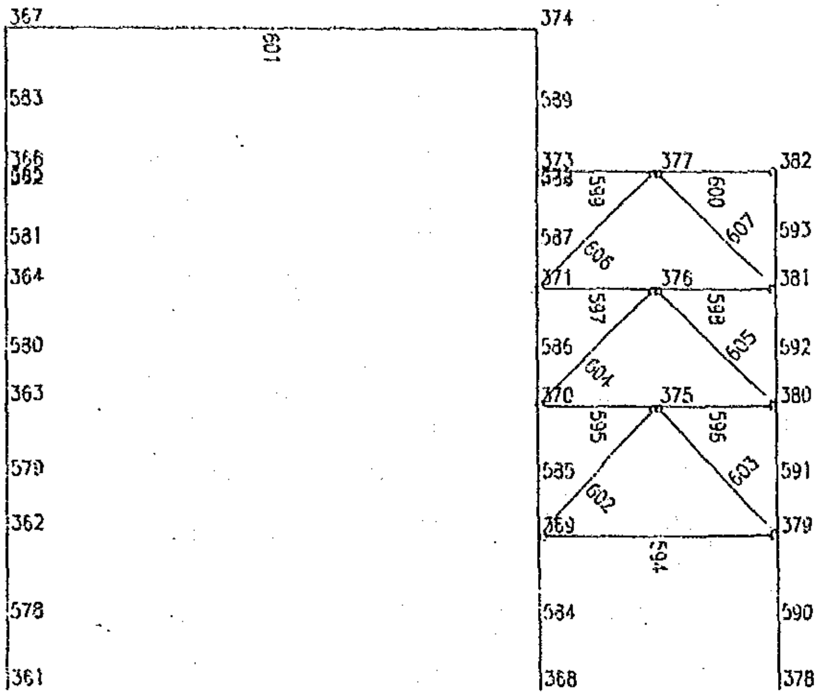


フレーム　モデル　図
(203 -- LINE　SCALE 1/300)

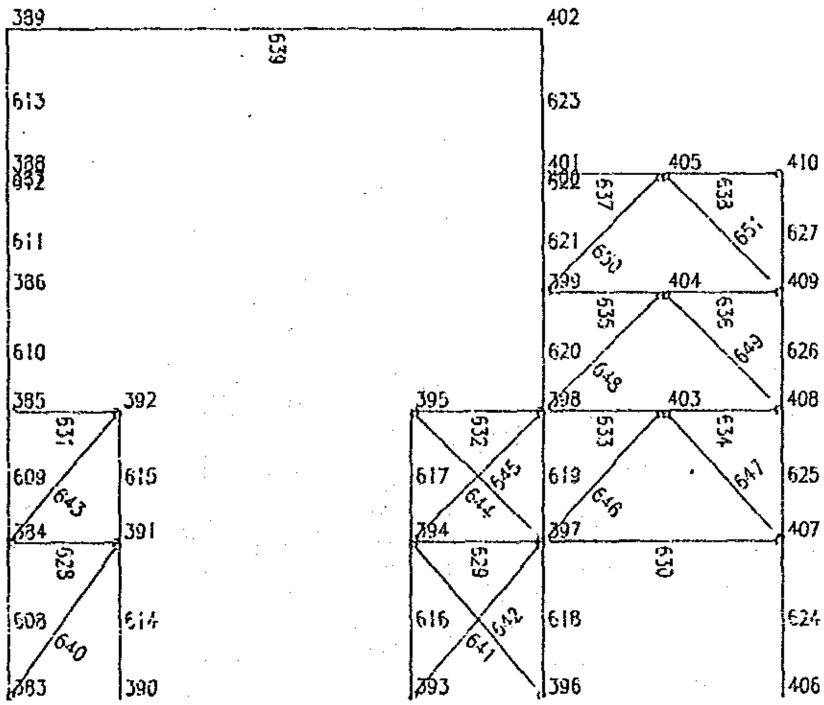


フレーム　モデル　図
(204 - LINE　SCALE 1/300)

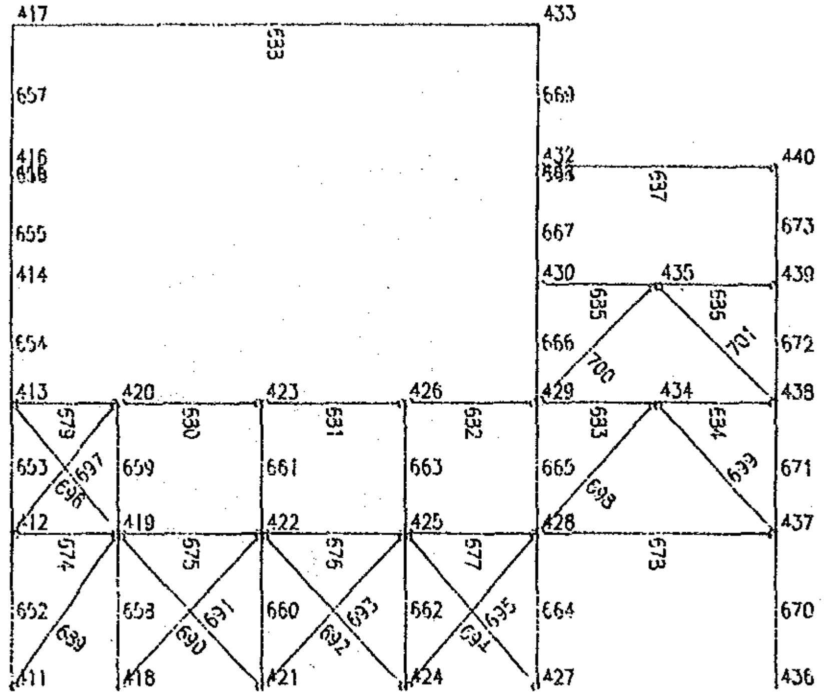
107



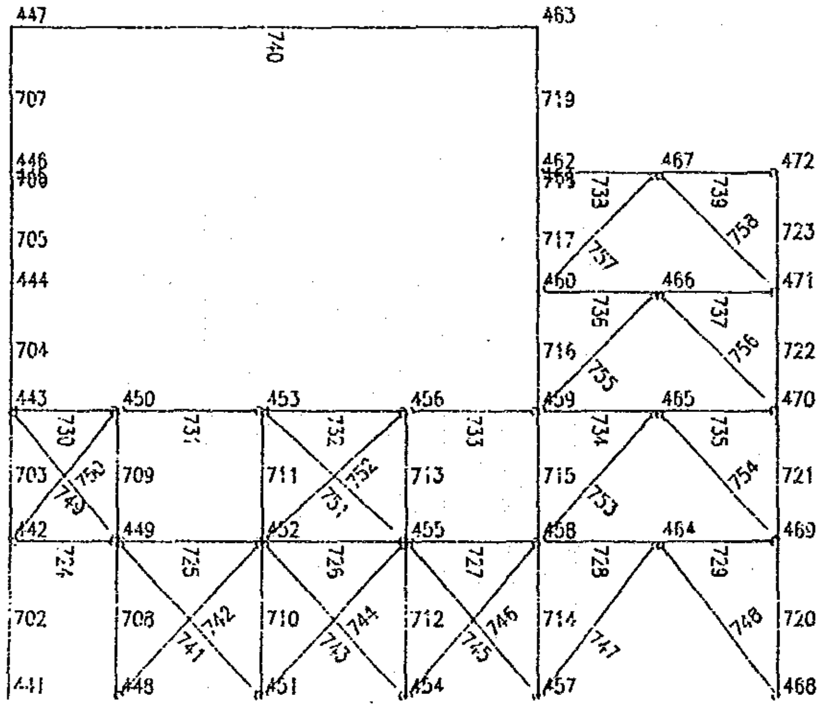
フレーム　モデル　図
(205 - LINE　SCALE 1/300)



フレーム　モデル　図
(206 - LINE　SCALE 1/300)

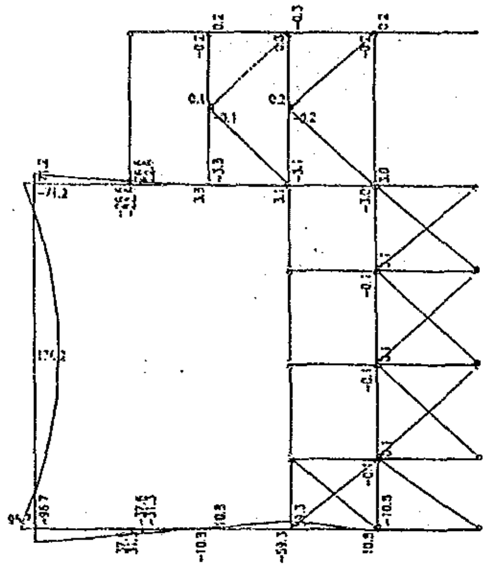


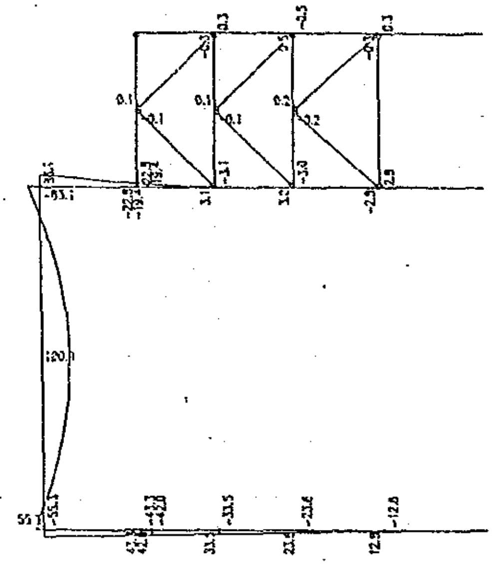
フレーム　モデル　図
（ 207 -- LINE　SCALE 1/300 ）

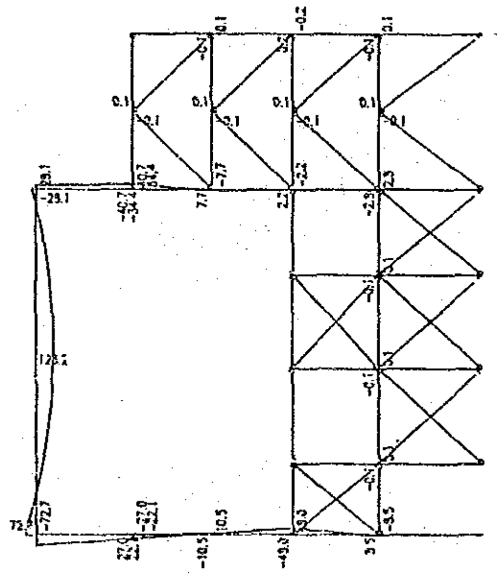


フレーム　モデル　図
（ 208 -- LINE　SCALE 1/300 ）

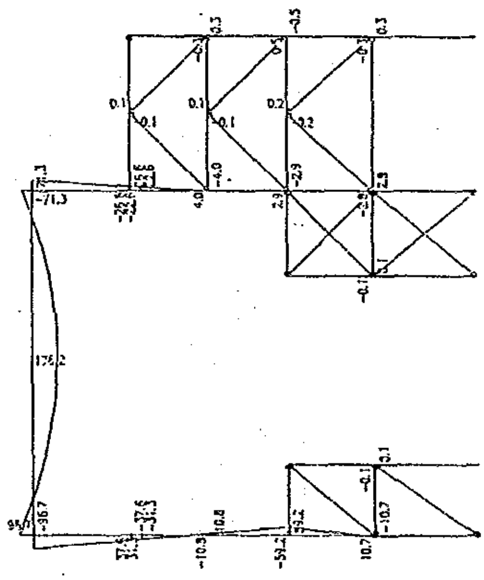
3.3 Stress (応　　力)



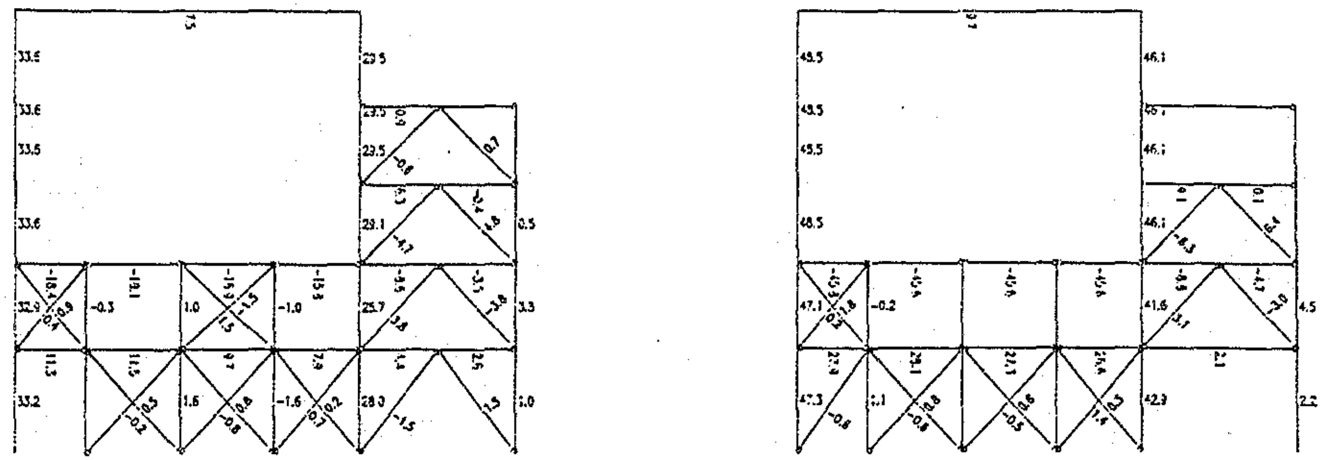




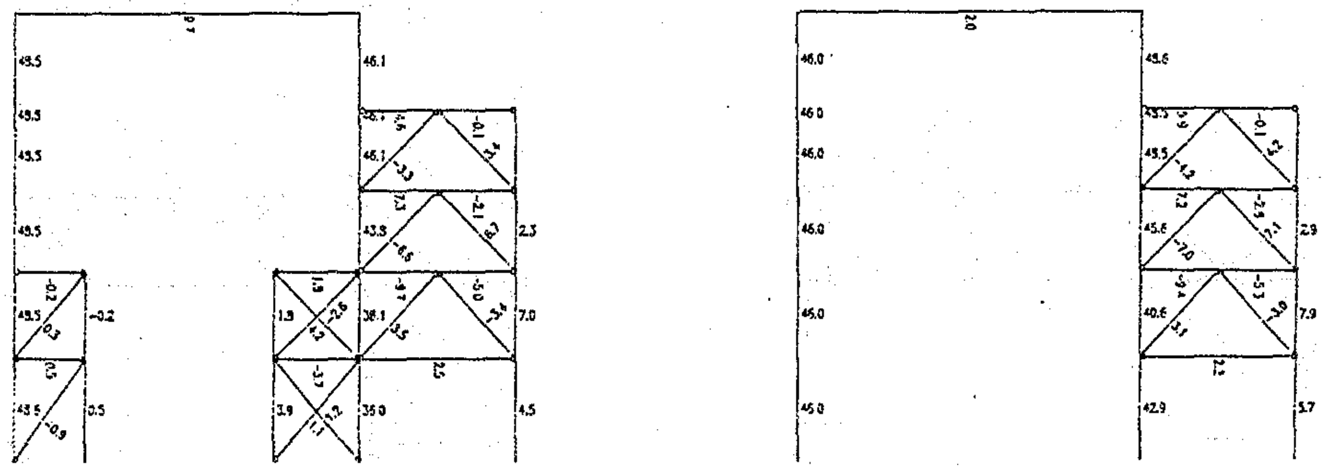
荷重ケース　1　　曲げモーメント図 B.M.D.
(101-102 - LINE)



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



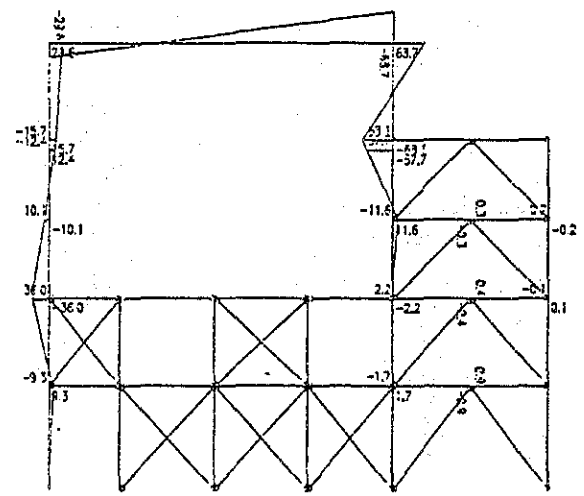
A.F.D.
荷重ケース　1　　軸　力　図
(101-102 - LINE)

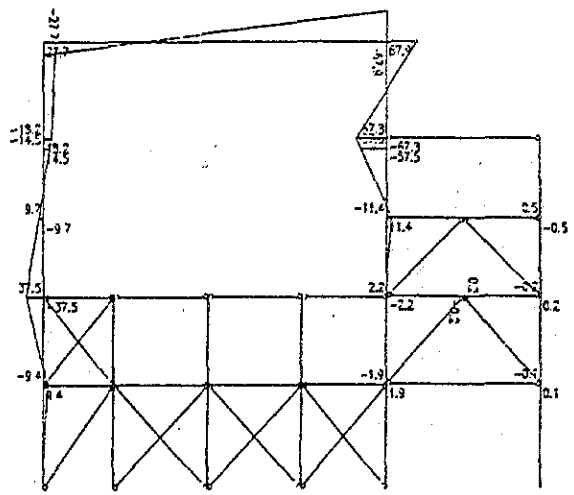


A.F.D.
荷重ケース　1　　軸　力　図
(103-104 - LINE)

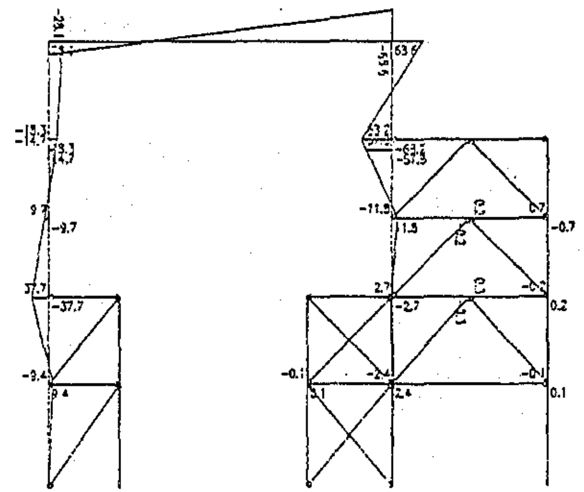
108

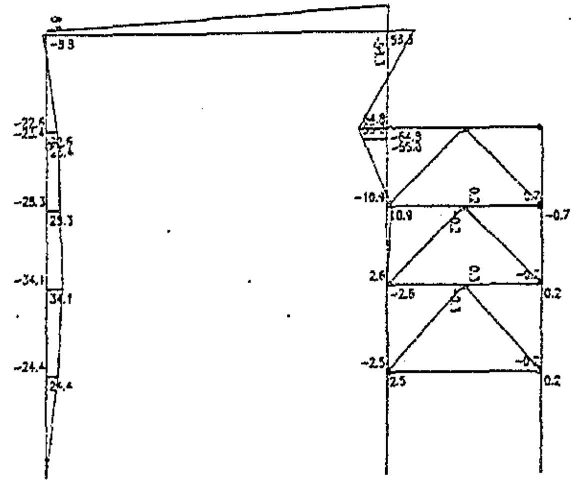
111



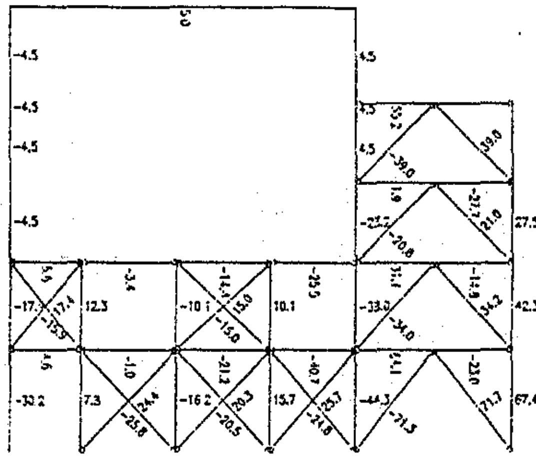


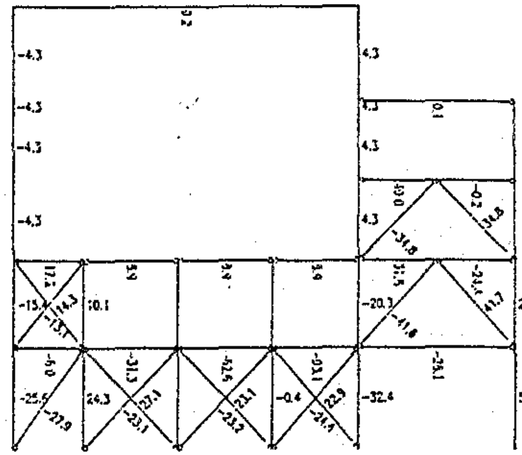
荷重ケース　2　　B.M.D.
曲げモーメント図
(101-102 - LINE)



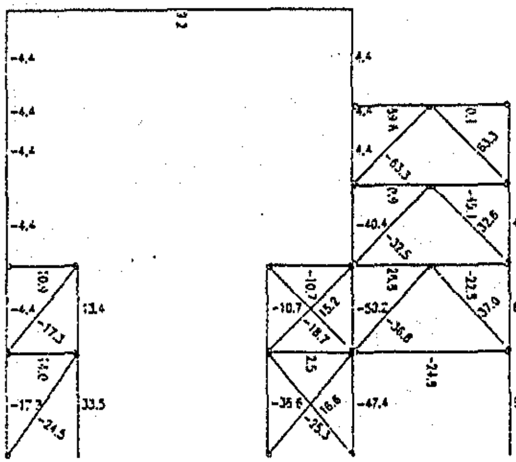


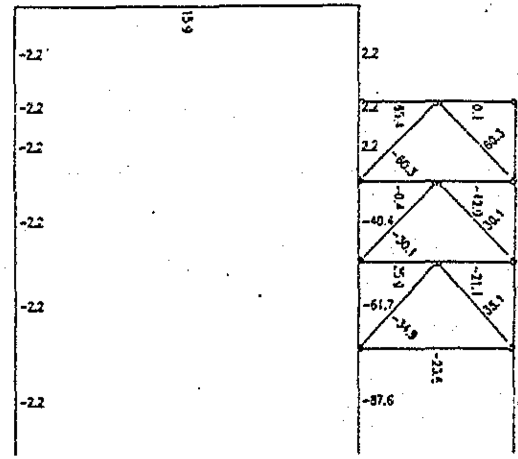
荷重ケース　2　　B.M.D.
曲げモーメント図
(103-104 - LINE)





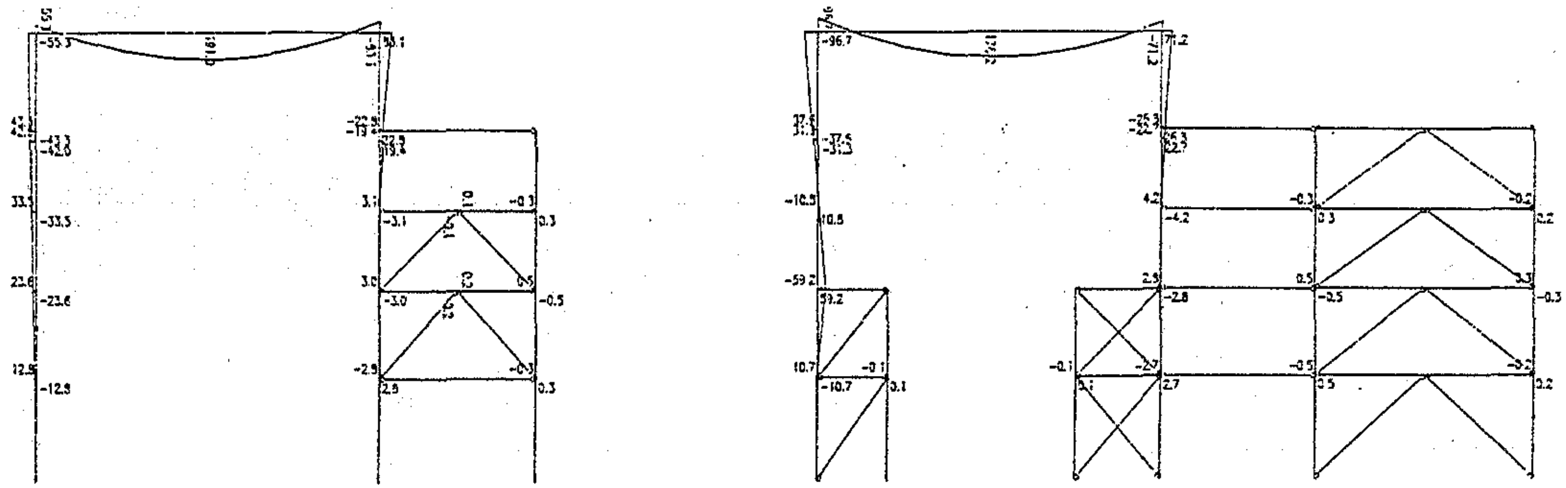
A.F.D.
荷重ケース　2　軸　力　図
(101-102 - LINE)





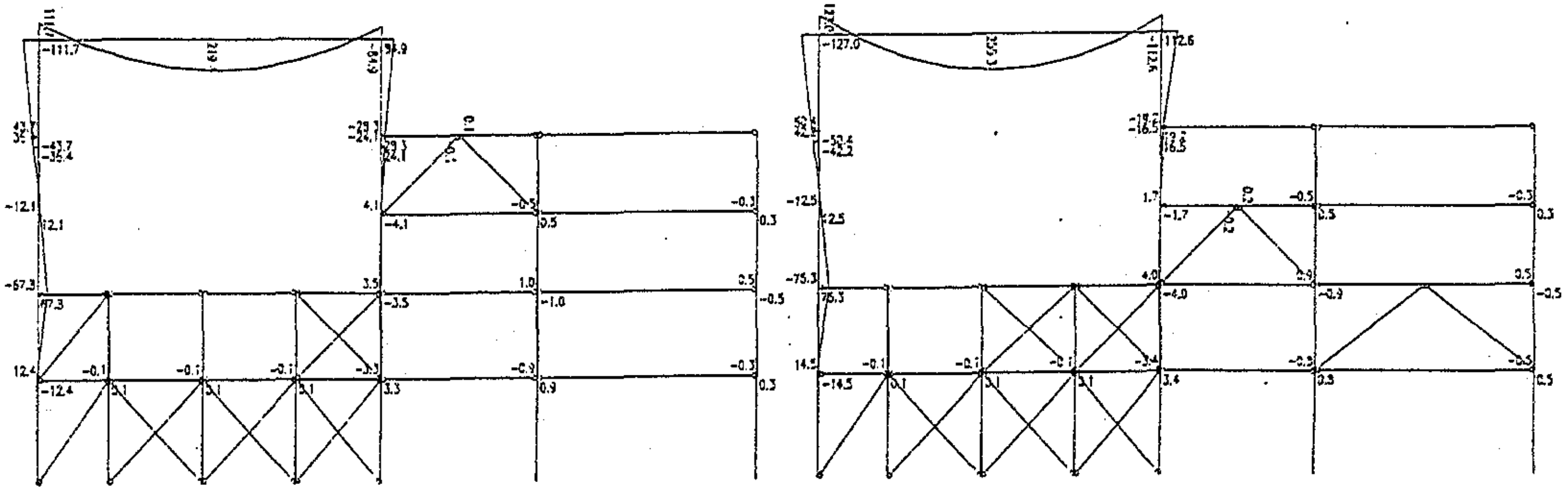
A.F.D.
荷重ケース　2　軸　力　図
(103-104 - LINE)

113



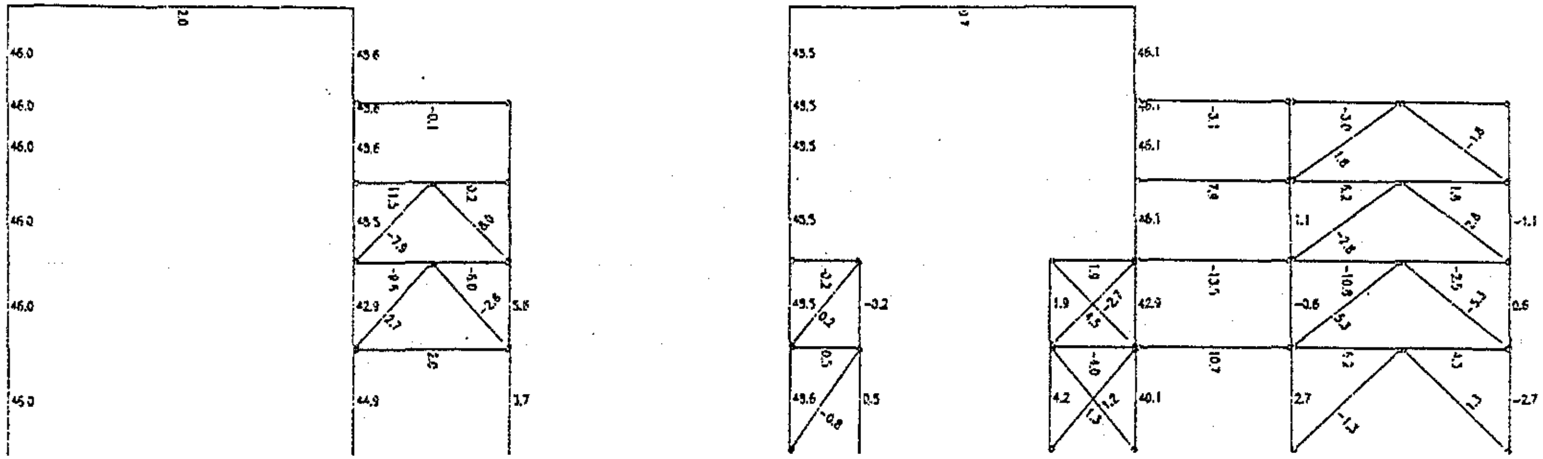
荷重ケース　1　　B.M.D. 曲げモーメント図

(105-106 - LINE)

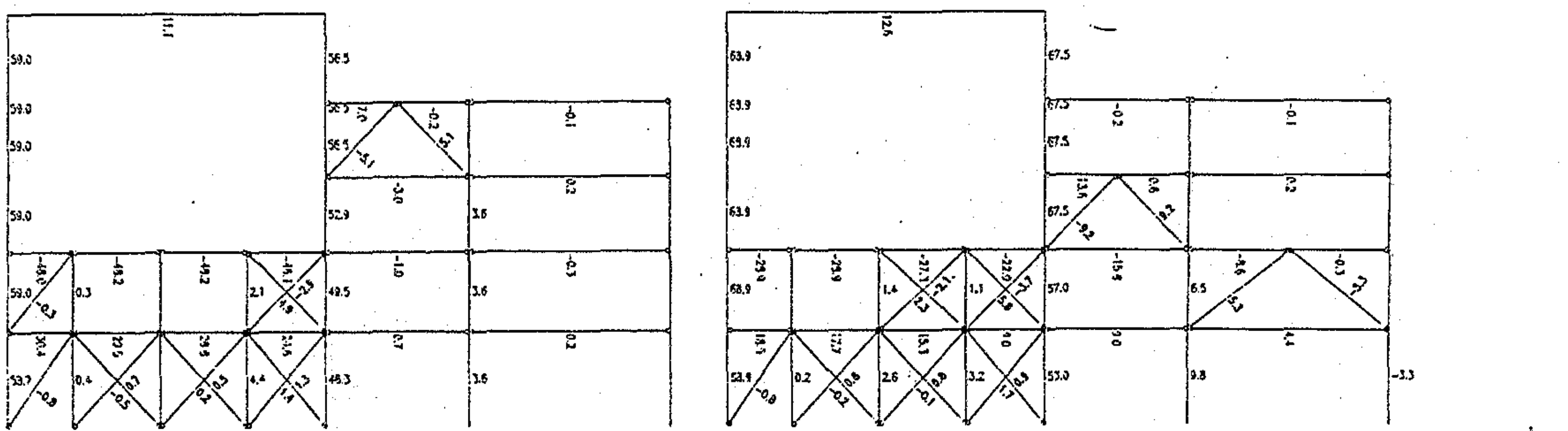


荷重ケース　1　　B.M.D. 曲げモーメント図

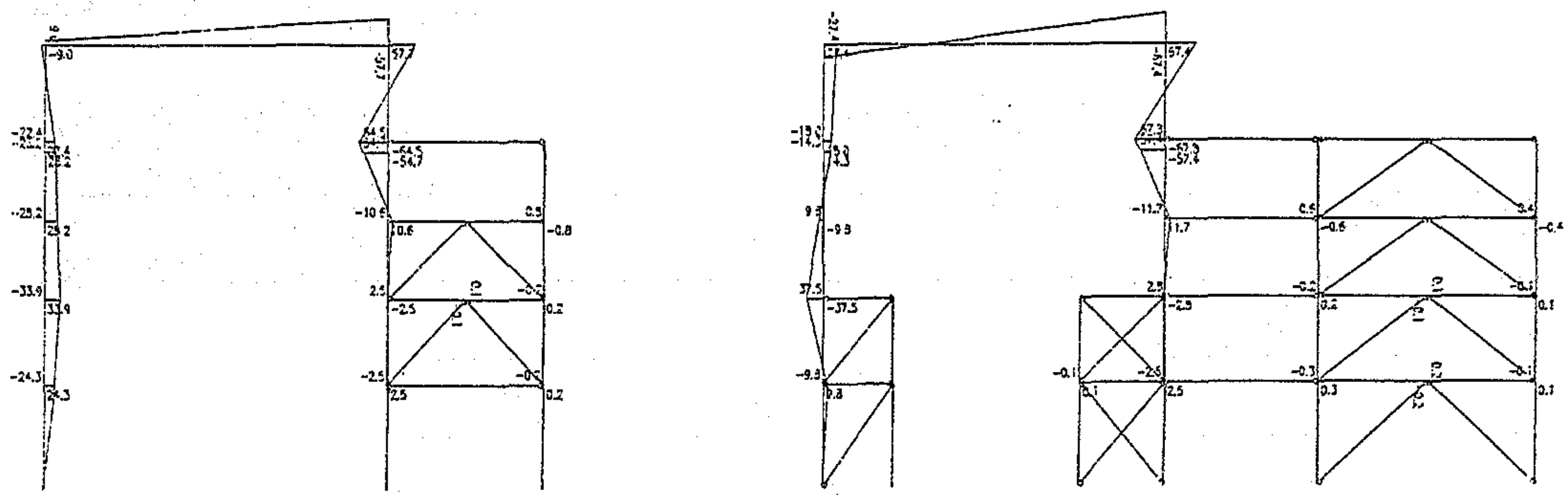
(107--108 - LINE)



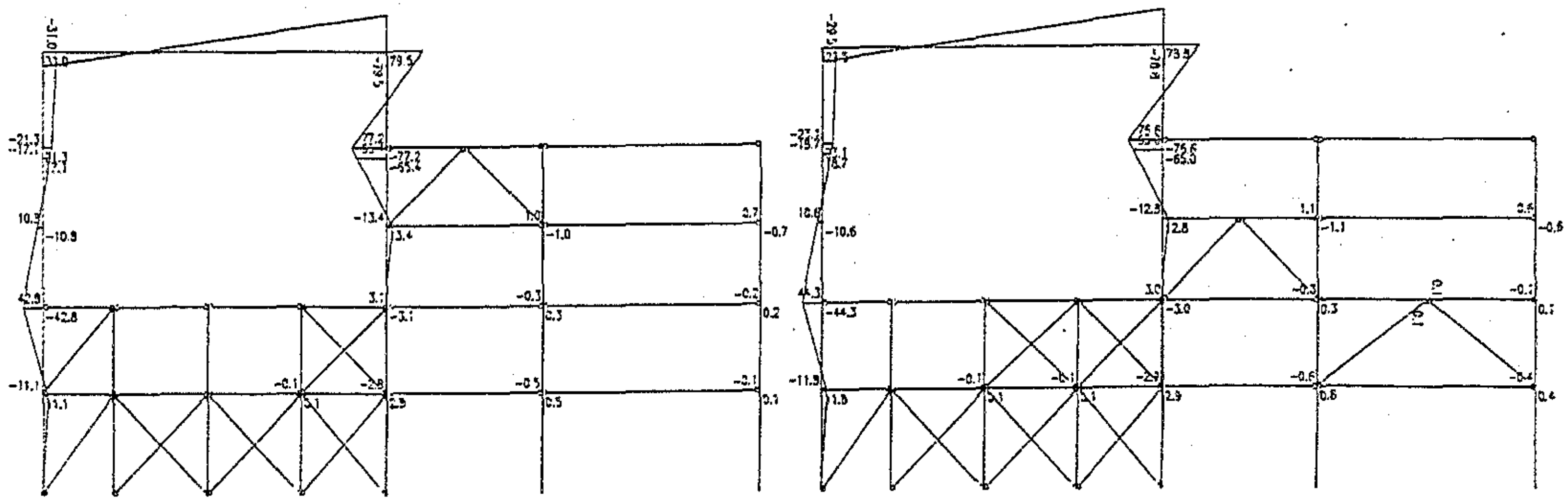
荷重ケース　1　　軸力　図　A.F.D.
(105-106 - LINE)



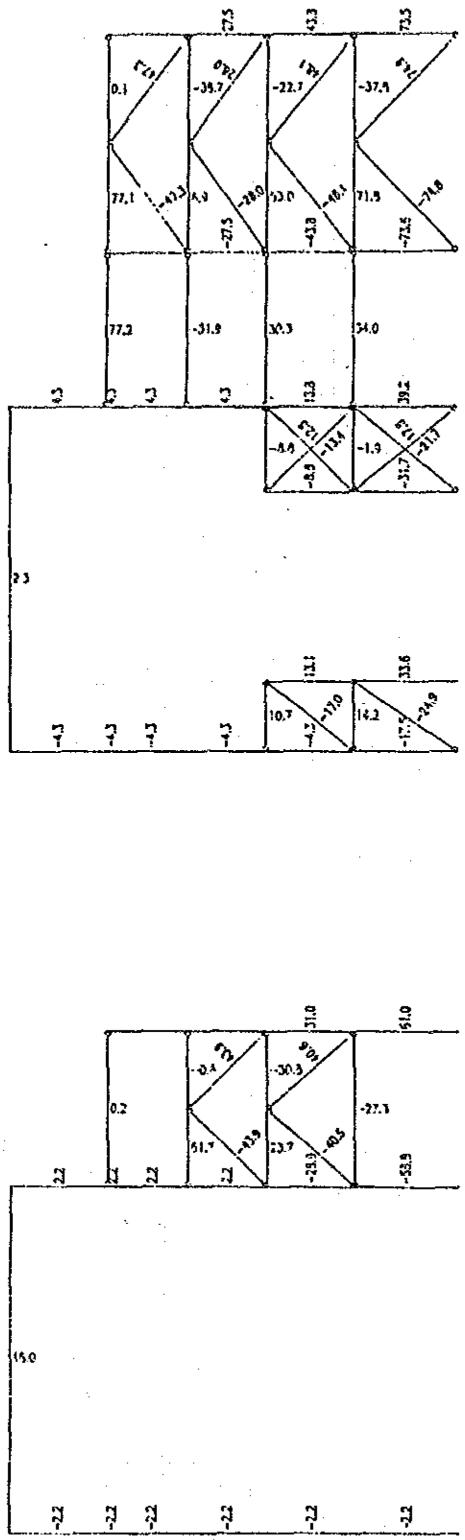
荷重ケース　1　　軸力　図　A.F.D.
(107-103 - LINE)



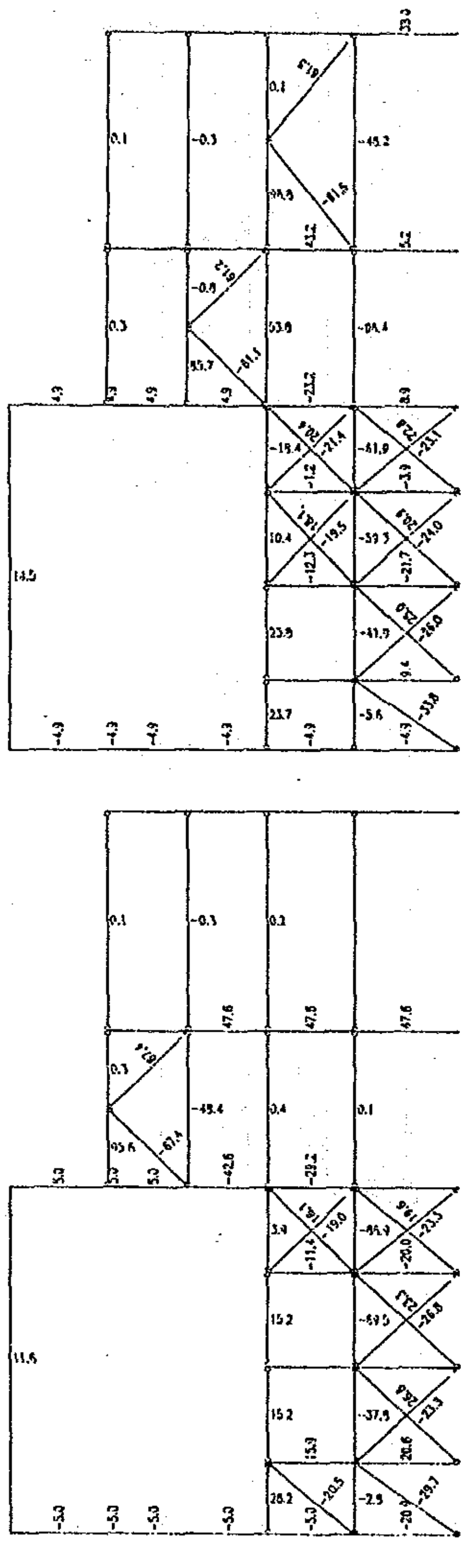
荷重ケース　2　　B.M.D. 曲げモーメント図
(105-106 - LINE)



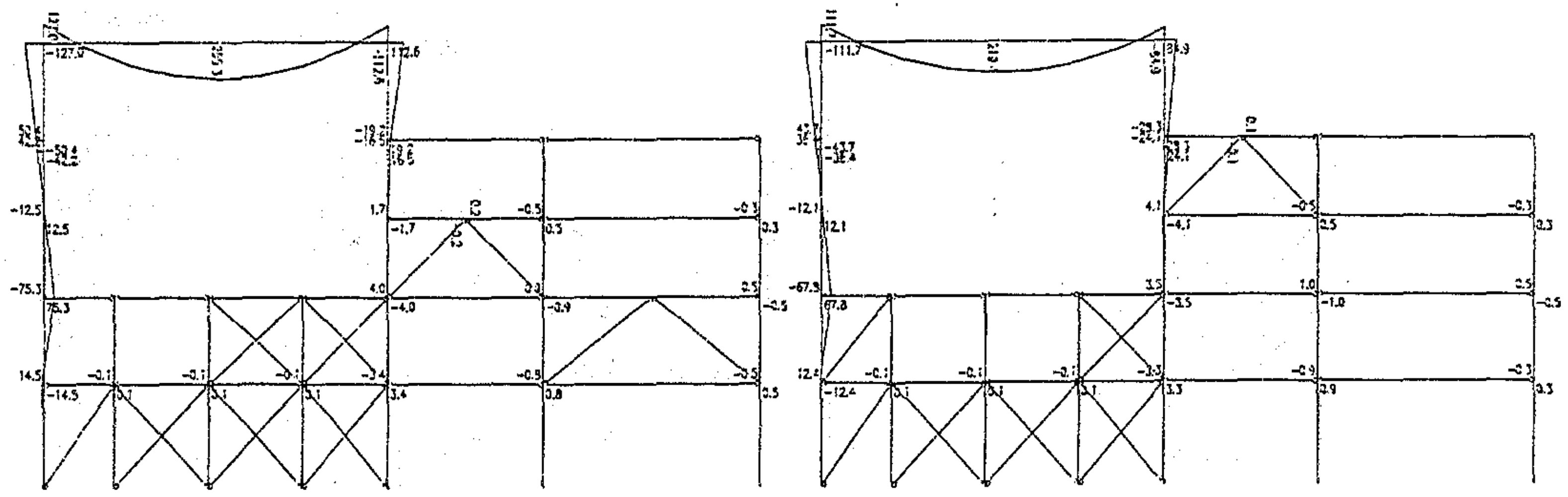
荷重ケース　2　　B.M.D. 曲げモーメント図
(107-108 - LINE)



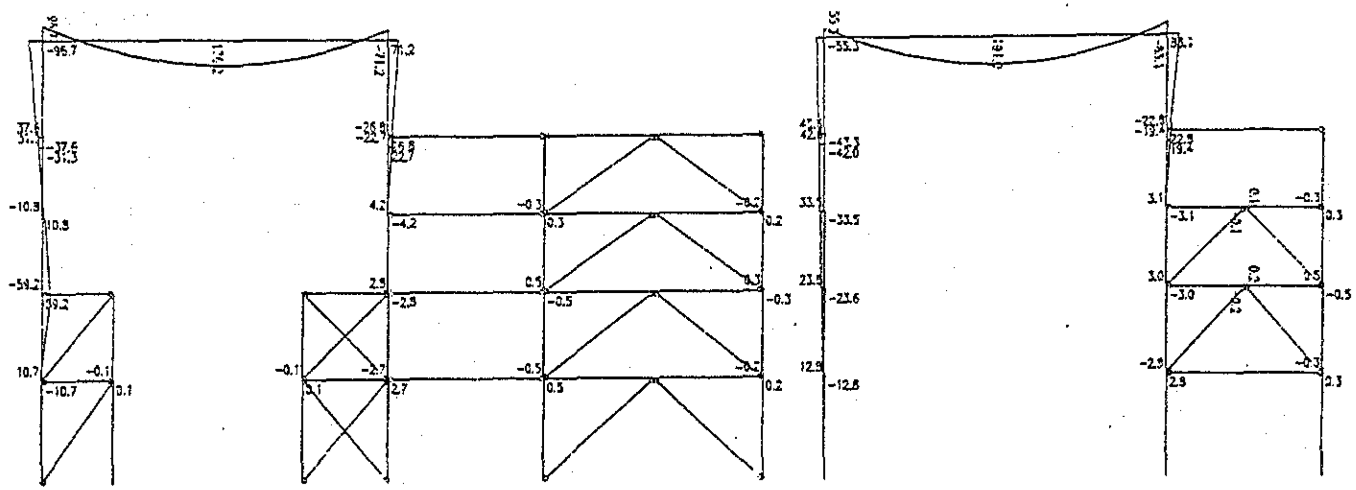
荷重ケース 2 軸力 A.F.D. 図
(105-105 - LINE)



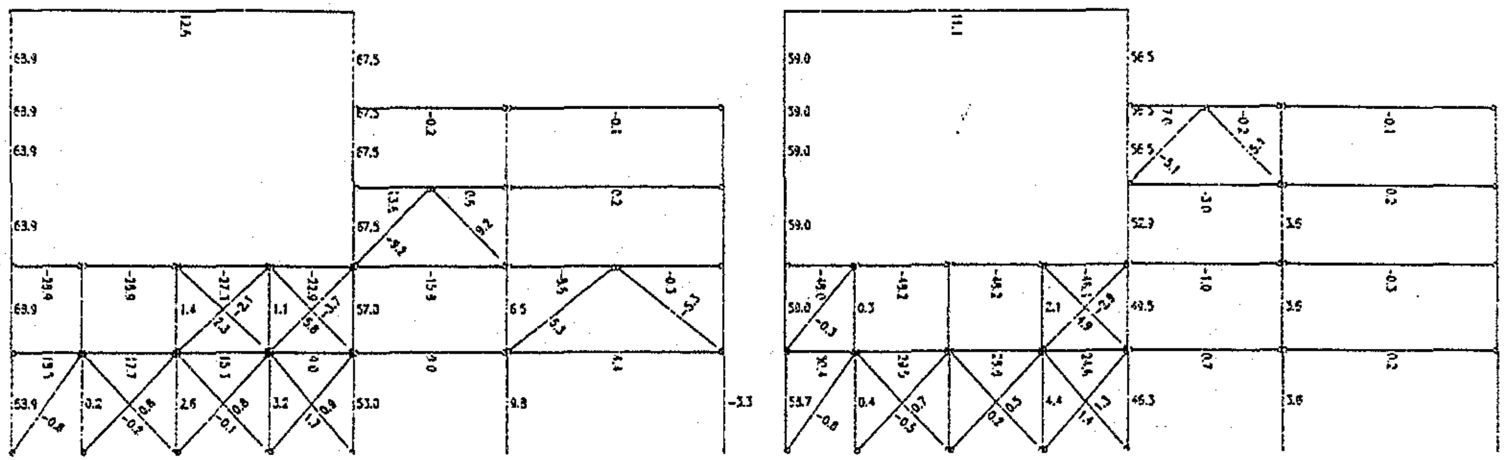
荷重ケース 2 軸力 A.F.D. 図
(107-103 - LINE)



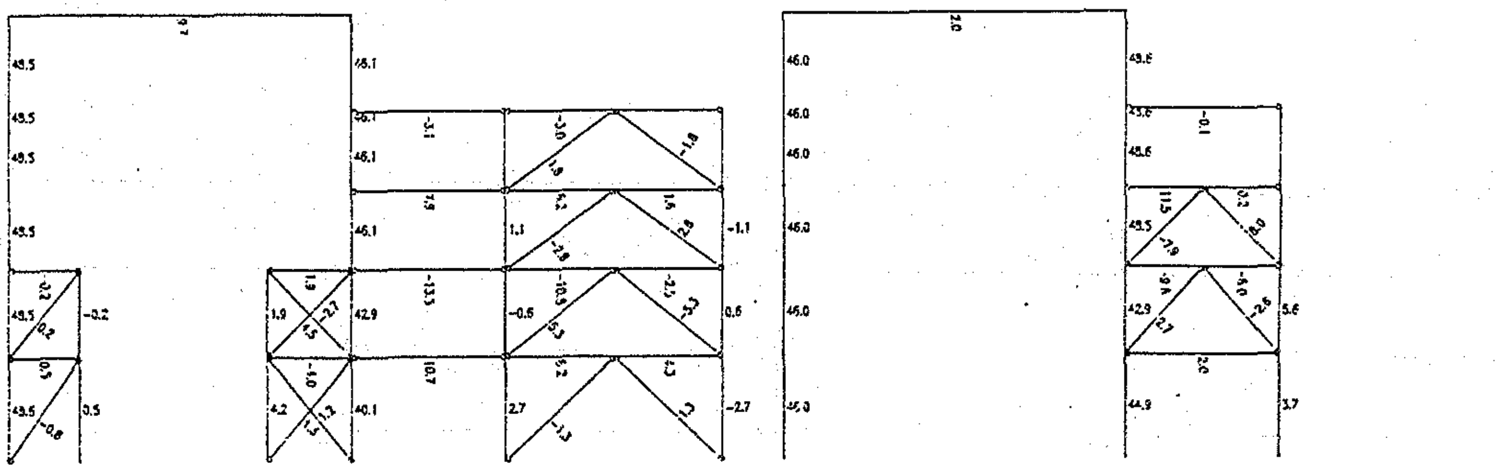
荷重ケース　1　　B.M.D. 曲げモーメント図
(201-202 - LINE)



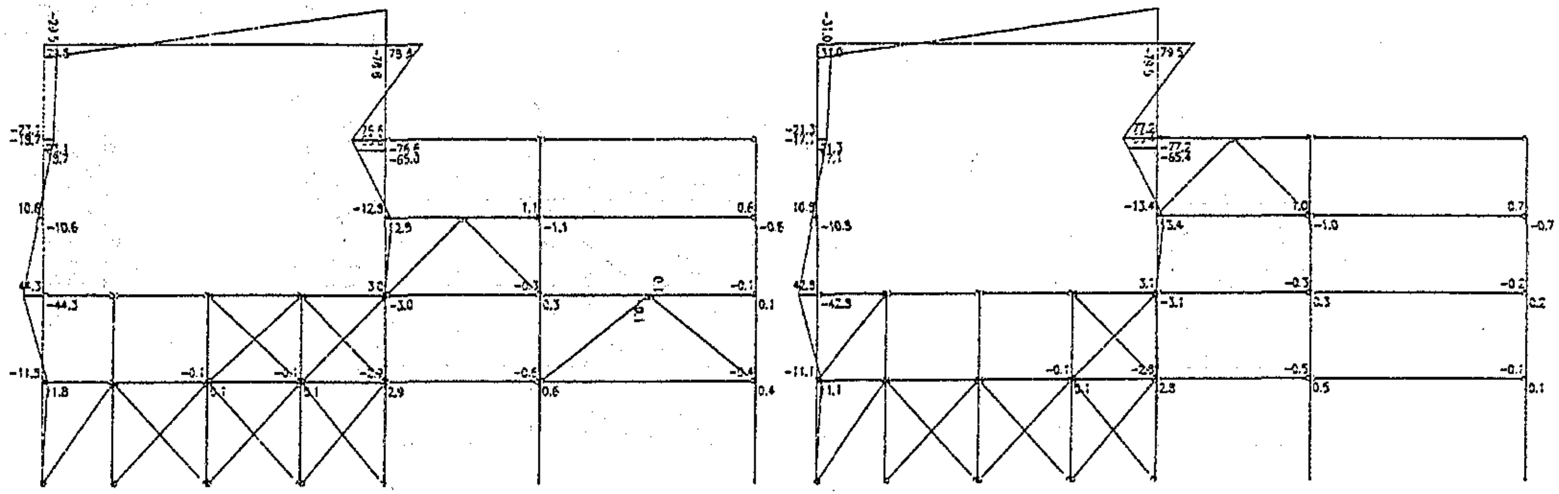
荷重ケース　1　　B.M.D. 曲げモーメント図
(203-204 - LINE)



荷重ケース 1 軸力 図 A.F.D.
(201-202 - LINE)

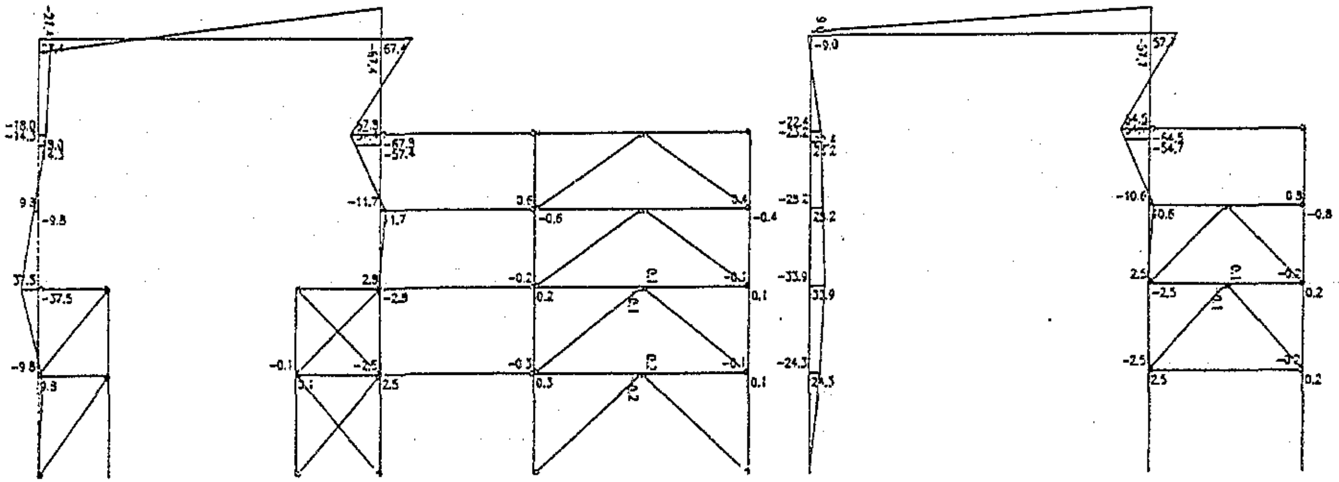


荷重ケース 1 軸力 図 A.F.D.
(203-204 - LINE)



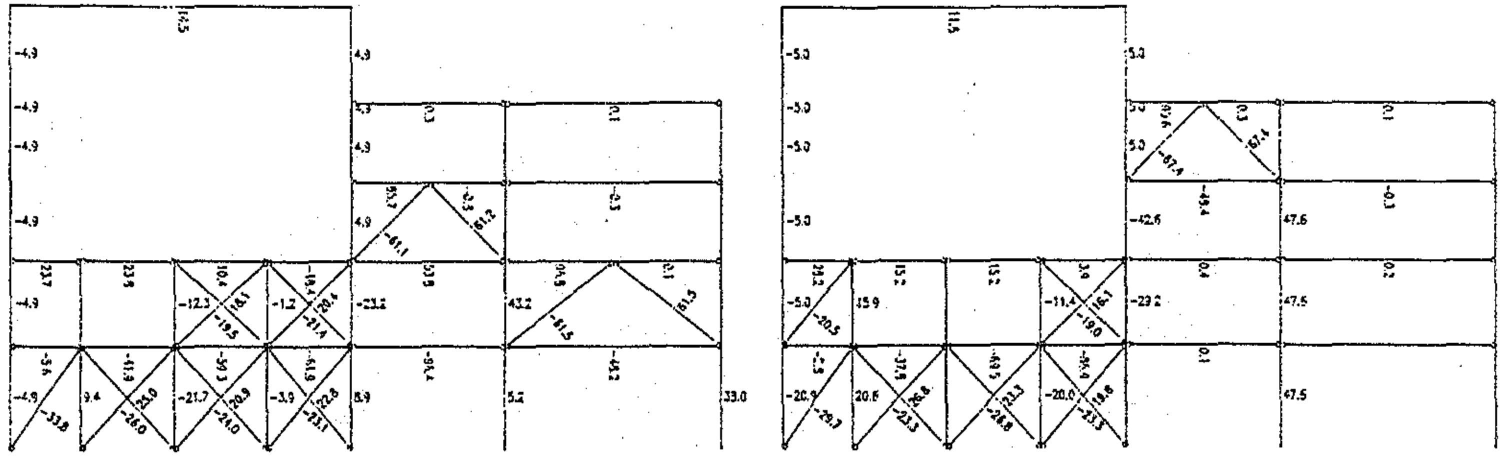
荷重ケース　2　　B.M.D. 曲げモーメント図

(201--202 - LINE)

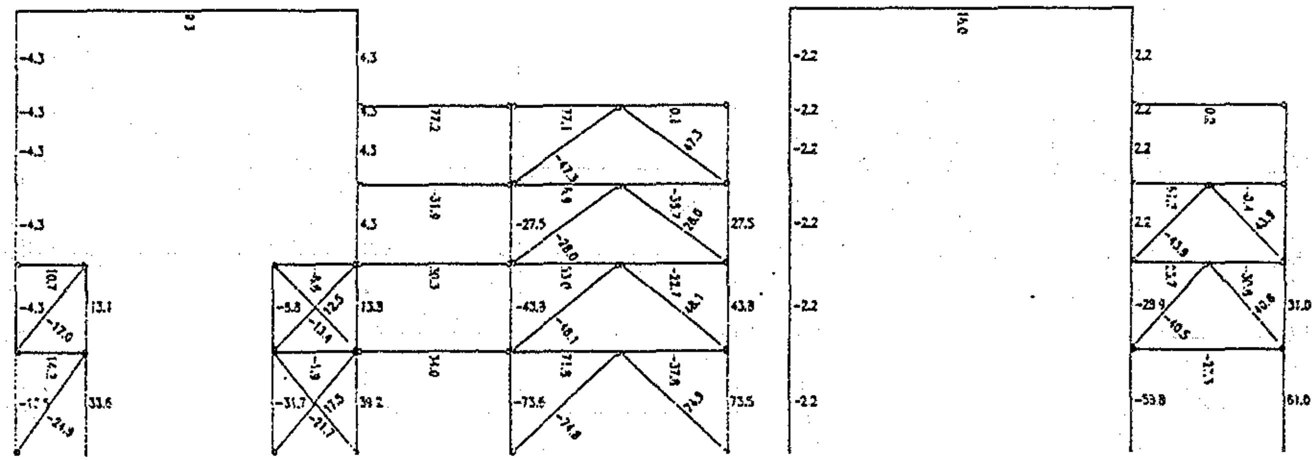


荷重ケース　2　　B.M.D. 曲げモーメント図

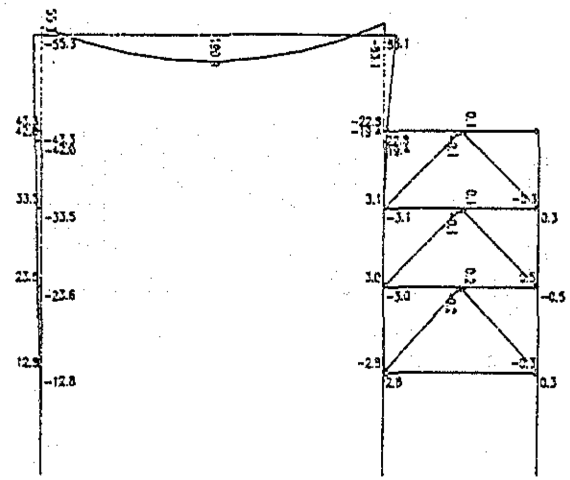
(203--204 - LINE)

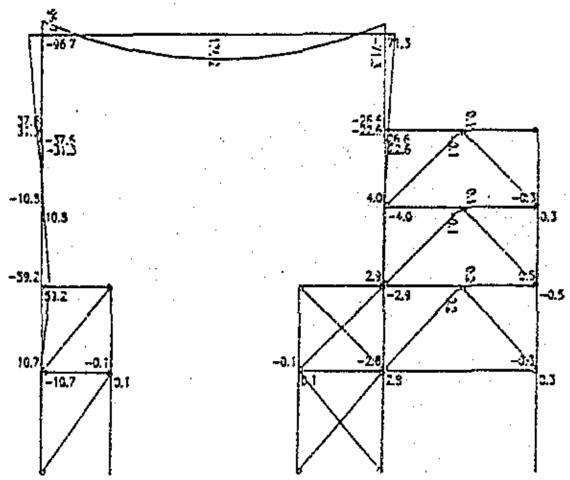


荷重ケース 2 軸力図 A.F.D.
(201-202 - LINE)



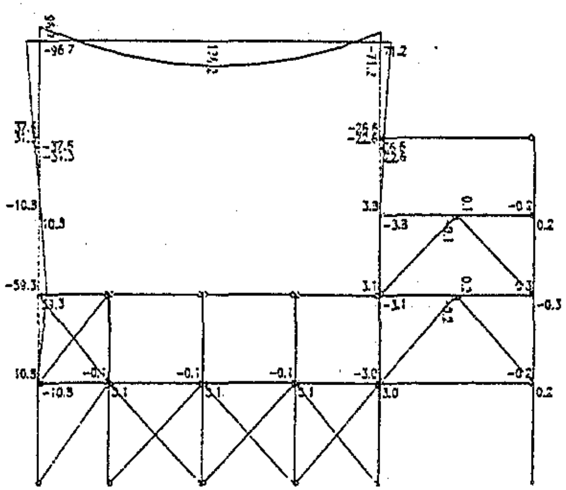
荷重ケース 2 軸力図 A.F.D.
(203-204 - LINE)

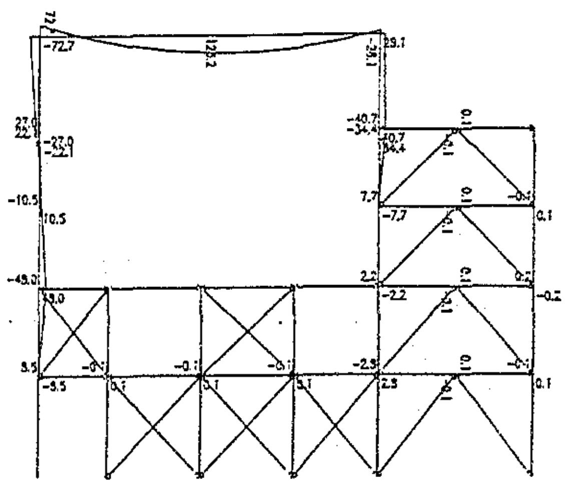




荷重ケース　1　　B.M.D.
曲げモーメント図

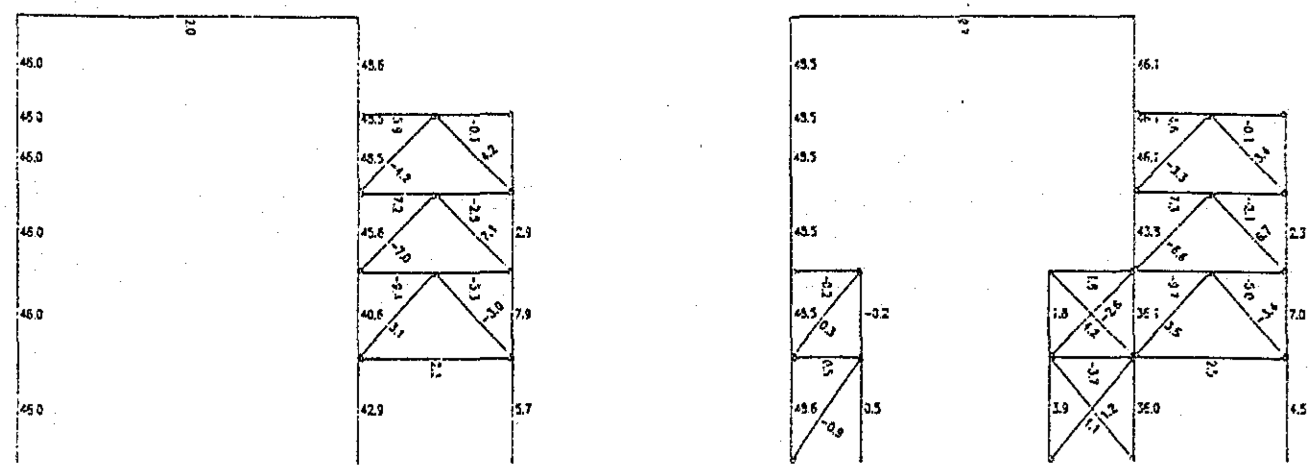
(205~206 - LINE)



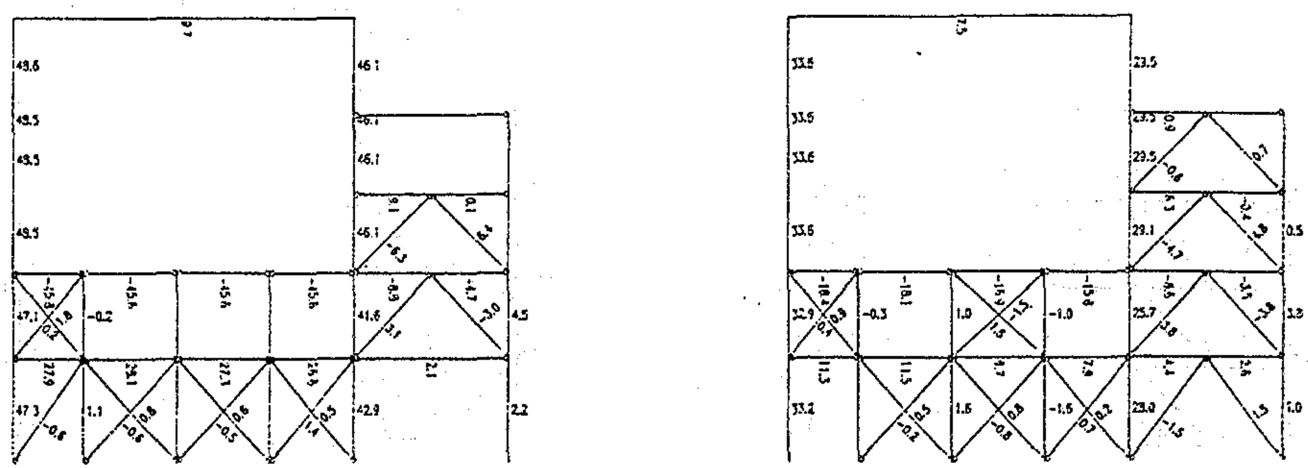


荷重ケース　1　　B.M.D.
曲げモーメント図

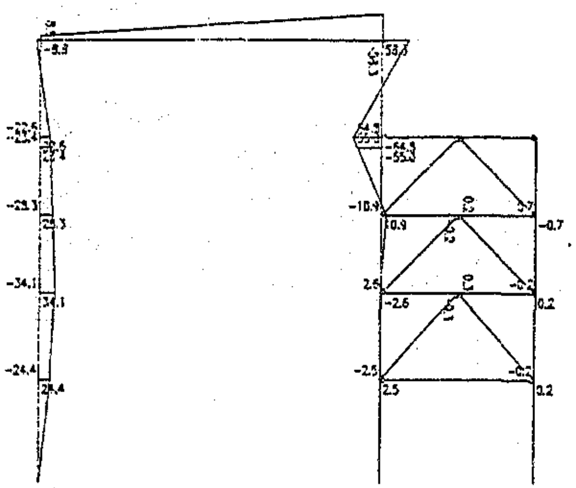
(207~203 - LINE)

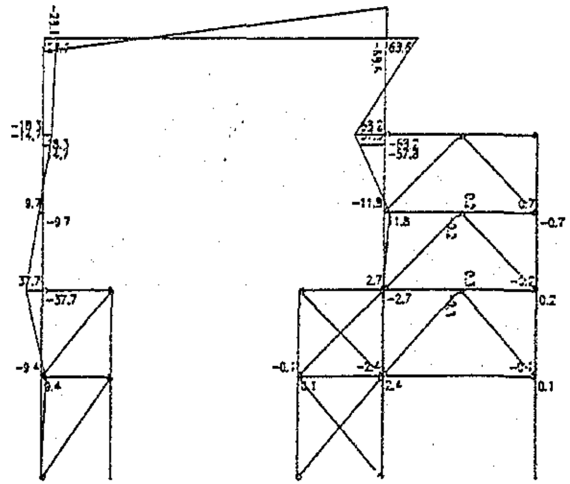


A.F.D.
荷重ケース　1　軸　力　図
(205-206 - LINE)

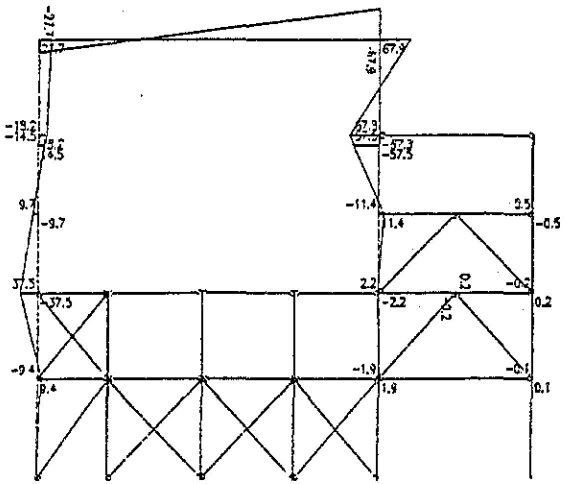


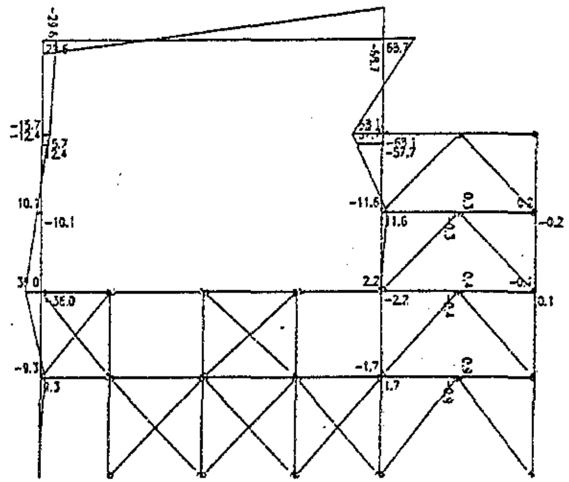
A.F.D.
荷重ケース　1　軸　力　図
(207-208 - LINE)



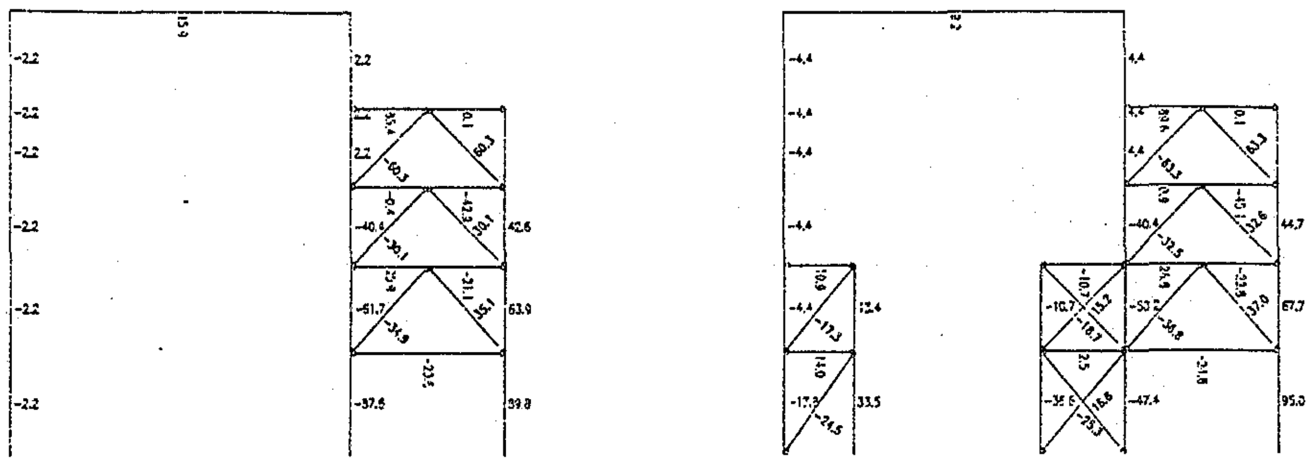


荷重ケース　2　　B.M.D. 曲げモーメント図
(205-206 - LINE)

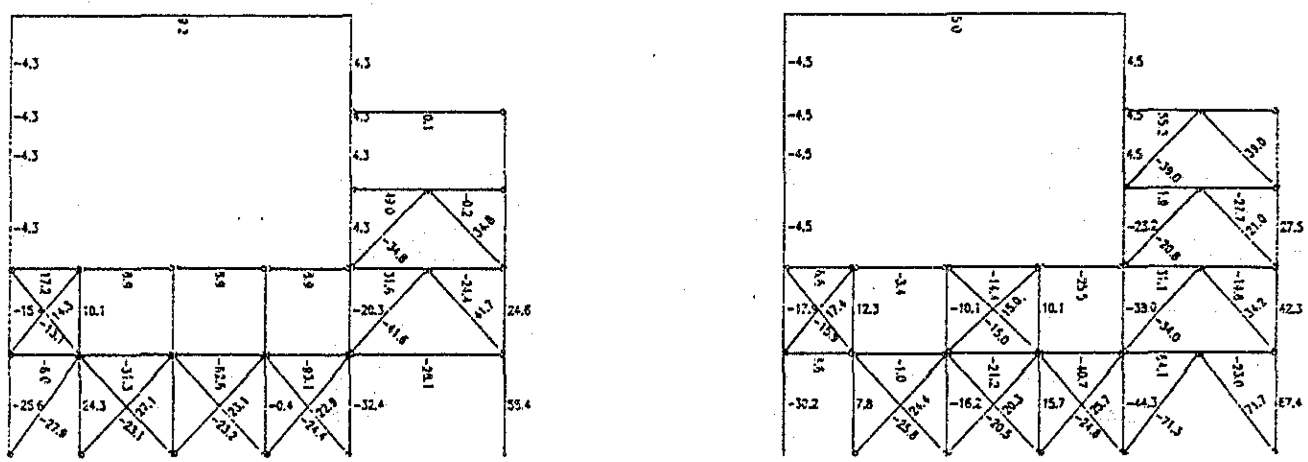




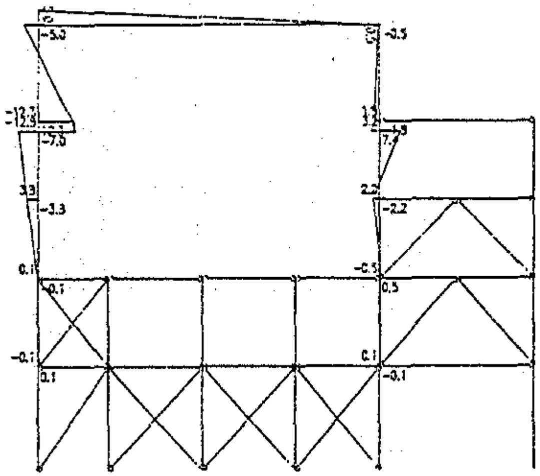
荷重ケース　2　　B.M.D. 曲げモーメント図
(207-208 - LINE)



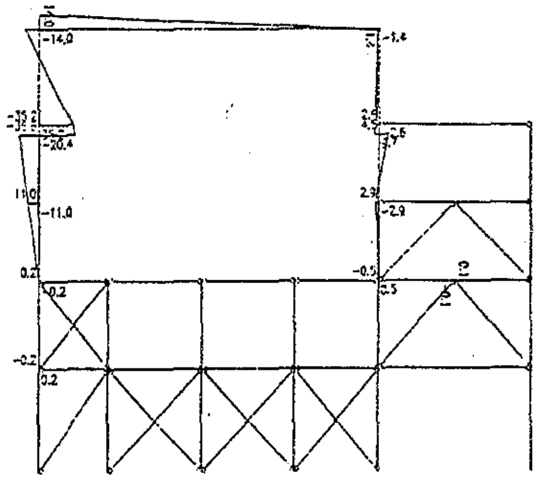
荷重ケース　2　　軸　力　図　A.F.D.
(205-206 - LINE)



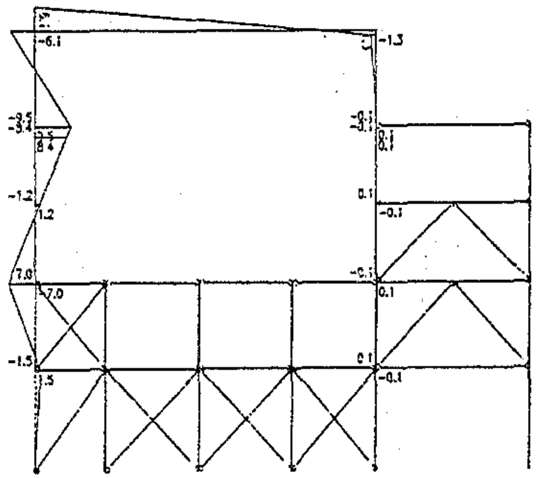
荷重ケース　2　　軸　力　図　A.F.D.
(207-208 - LINE)



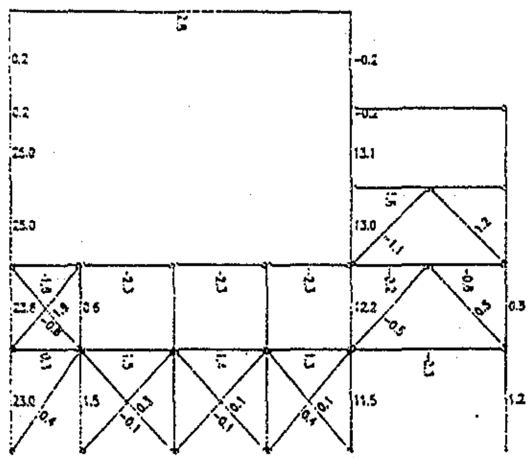
C.D.L.
荷重ケース　1　　B.M.D.
曲げモーメント図
(102 - LINE)



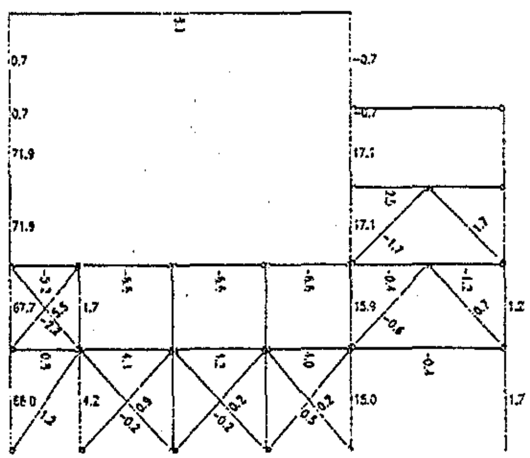
C.L.L.
荷重ケース　2　　B.M.D.
曲げモーメント図
(102 - LINE)



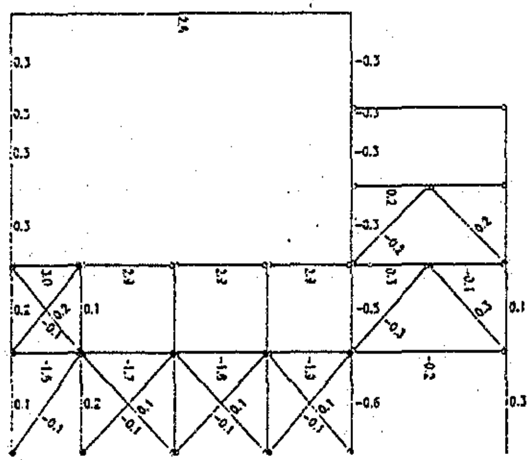
C.H.L.
荷重ケース　3　　B.M.D.
曲げモーメント図
(102 - LINE)



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

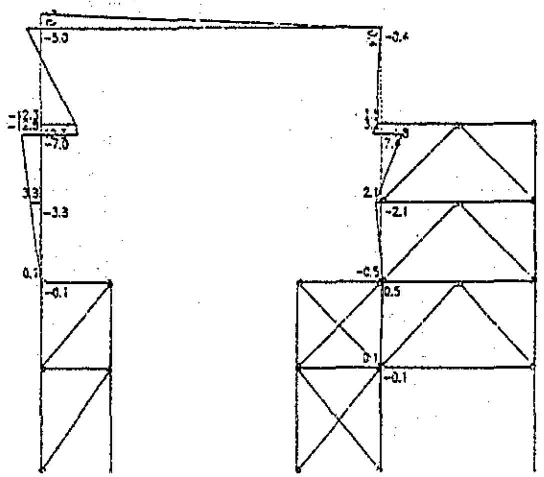


C.L.L. A.F.D.
荷重ケース 2 軸 力 図
(102 - LINE)

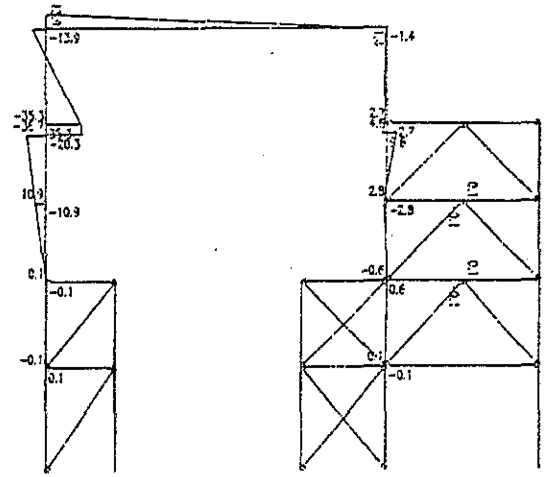


C.H.L. A.F.D.
荷重ケース 3 軸 力 図
(102 - LINE)

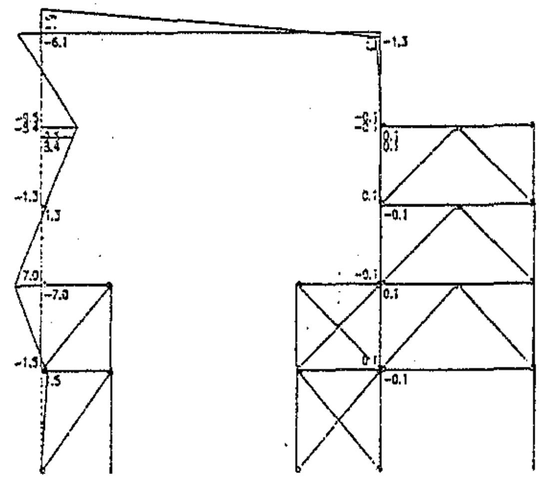
127



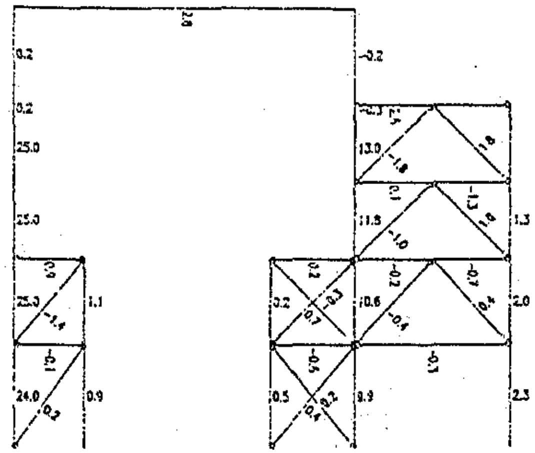
C.D.L.
荷重ケース 1　　曲げモーメント図 B.M.D.
(103 -- LINE)



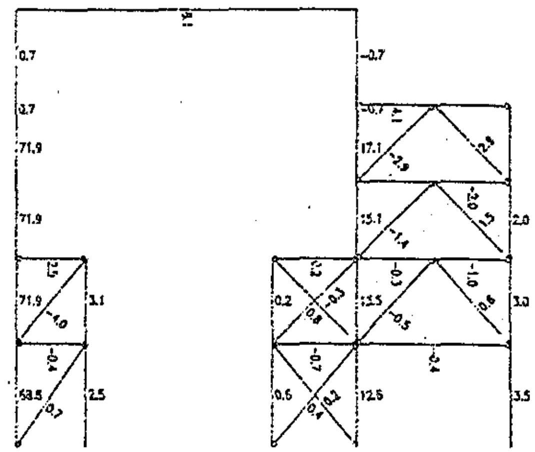
C.L.L.
荷重ケース 2　　曲げモーメント図 B.M.D.
(103 -- LINE)



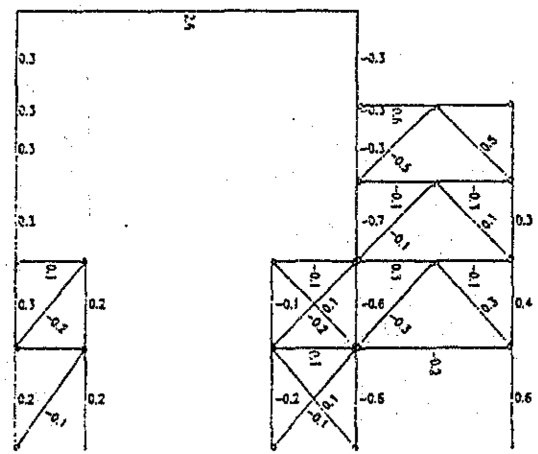
C.H.L.
荷重ケース 3　　曲げモーメント図 B.M.D.
(103 -- LINE)



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

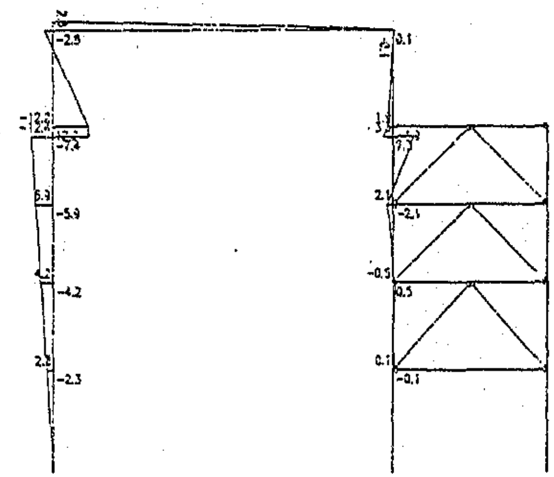


C.L.L. A.F.D.
荷重ケース 2 軸 力 図
(103 - LINE)

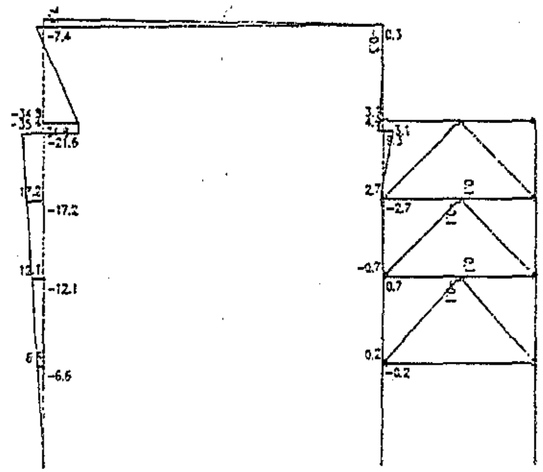


C.H.L. A.F.D.
荷重ケース 3 軸 力 図
(103 - LINE)

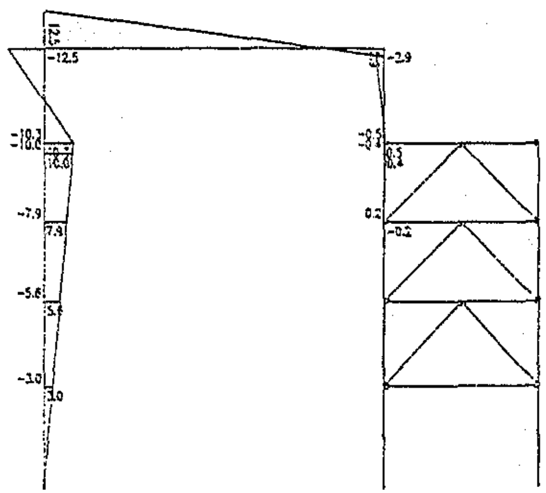
129



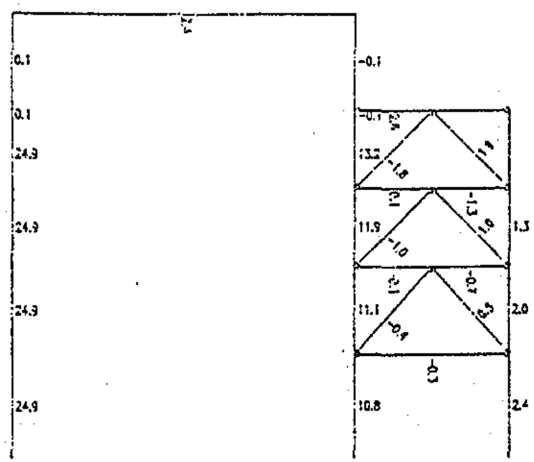
C.D.L.　　　B.M.D.
荷重ケース　1　曲げモーメント図
(104 - LINE)



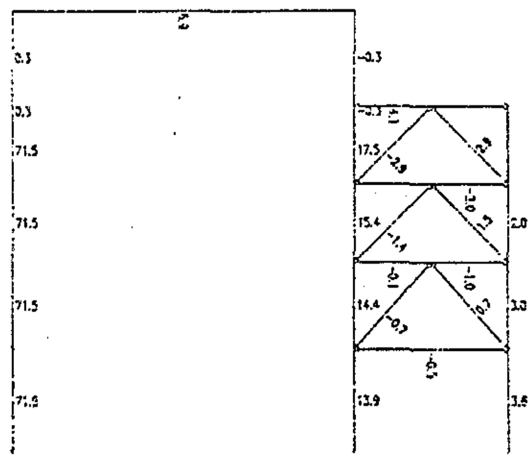
C.L.L.　　　B.M.D.
荷重ケース　2　曲げモーメント図
(104 - LINE)



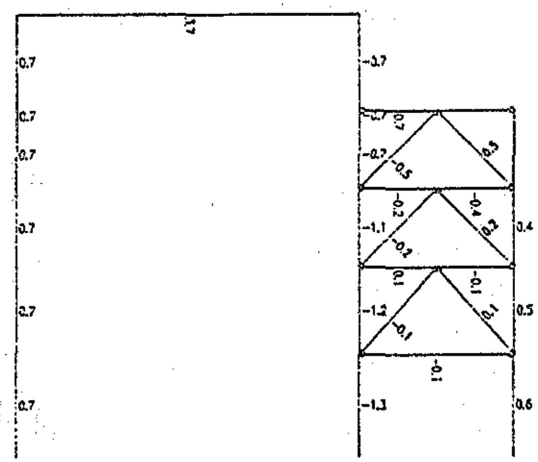
C.H.L.　　　B.M.D.
荷重ケース　3　曲げモーメント図
(104 - LINE)



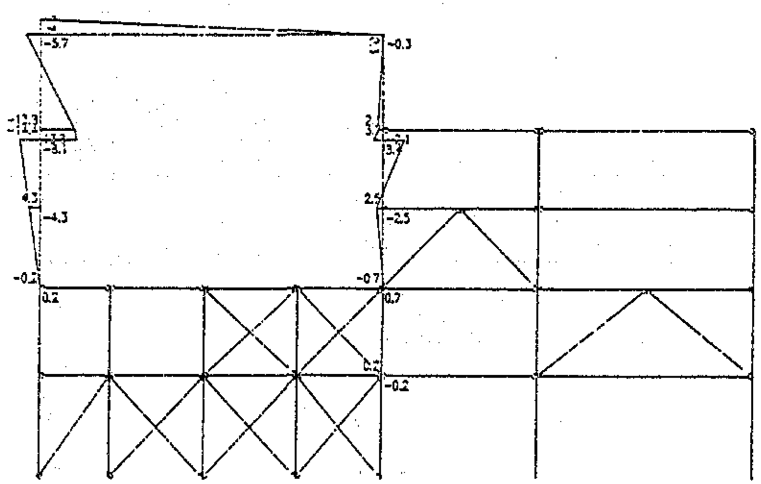
C.D.L.
荷重ケース 1 軸力図 A.F.D.
(104 - LINE)



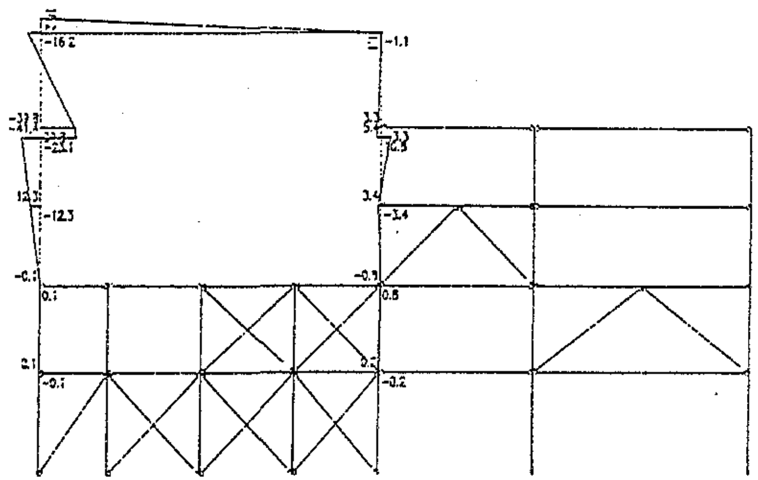
C.L.L.
荷重ケース 2 軸力図 A.F.D.
(104 - LINE)



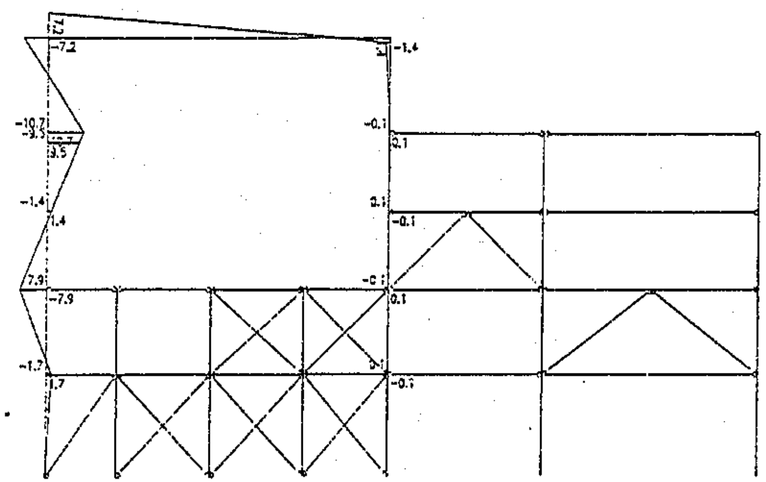
C.H.L.
荷重ケース 3 軸力図 A.F.D.
(104 - LINE)



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

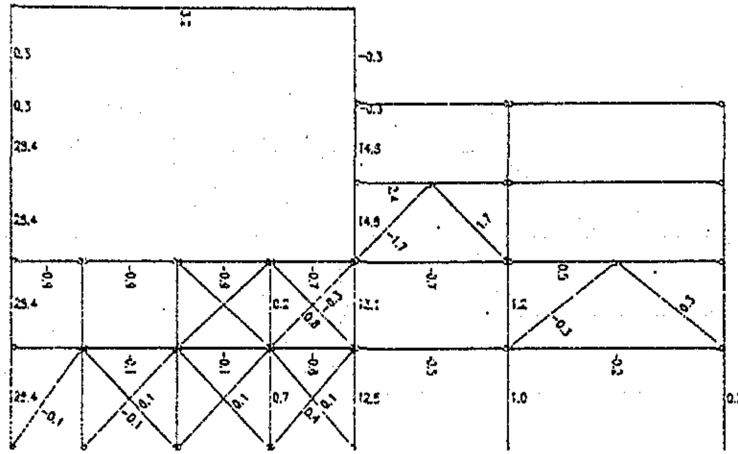


荷重ケース 2 C.L.L.　曲げモーメント図 B.M.D.
(108 - LINE)

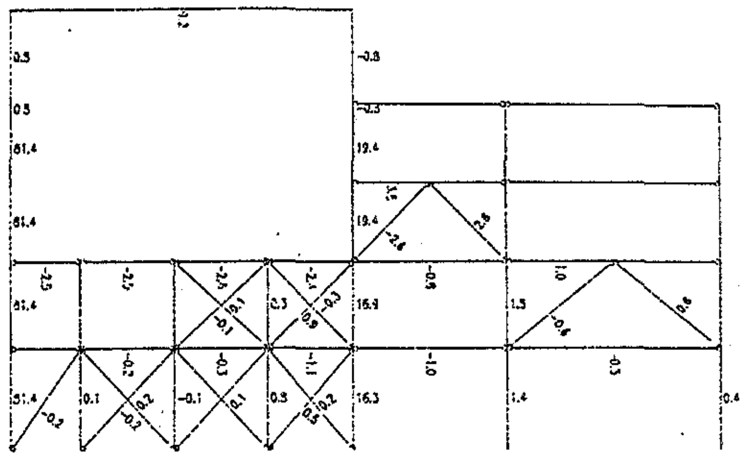


荷重ケース 3 C.H.L.　曲げモーメント図 B.M.D.
(108 - LINE)

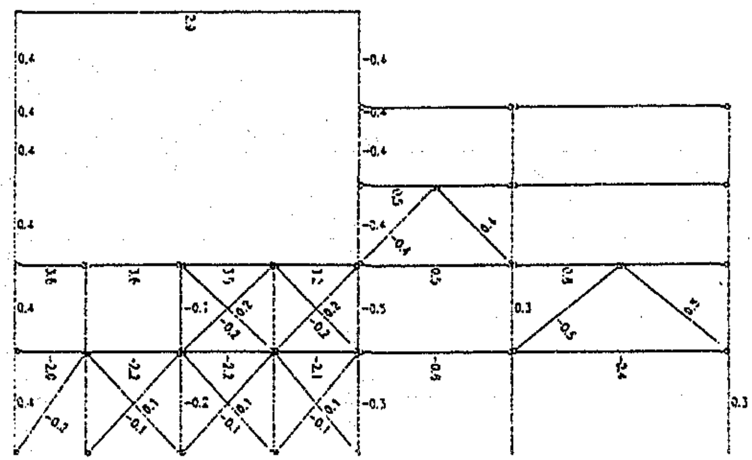
132



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



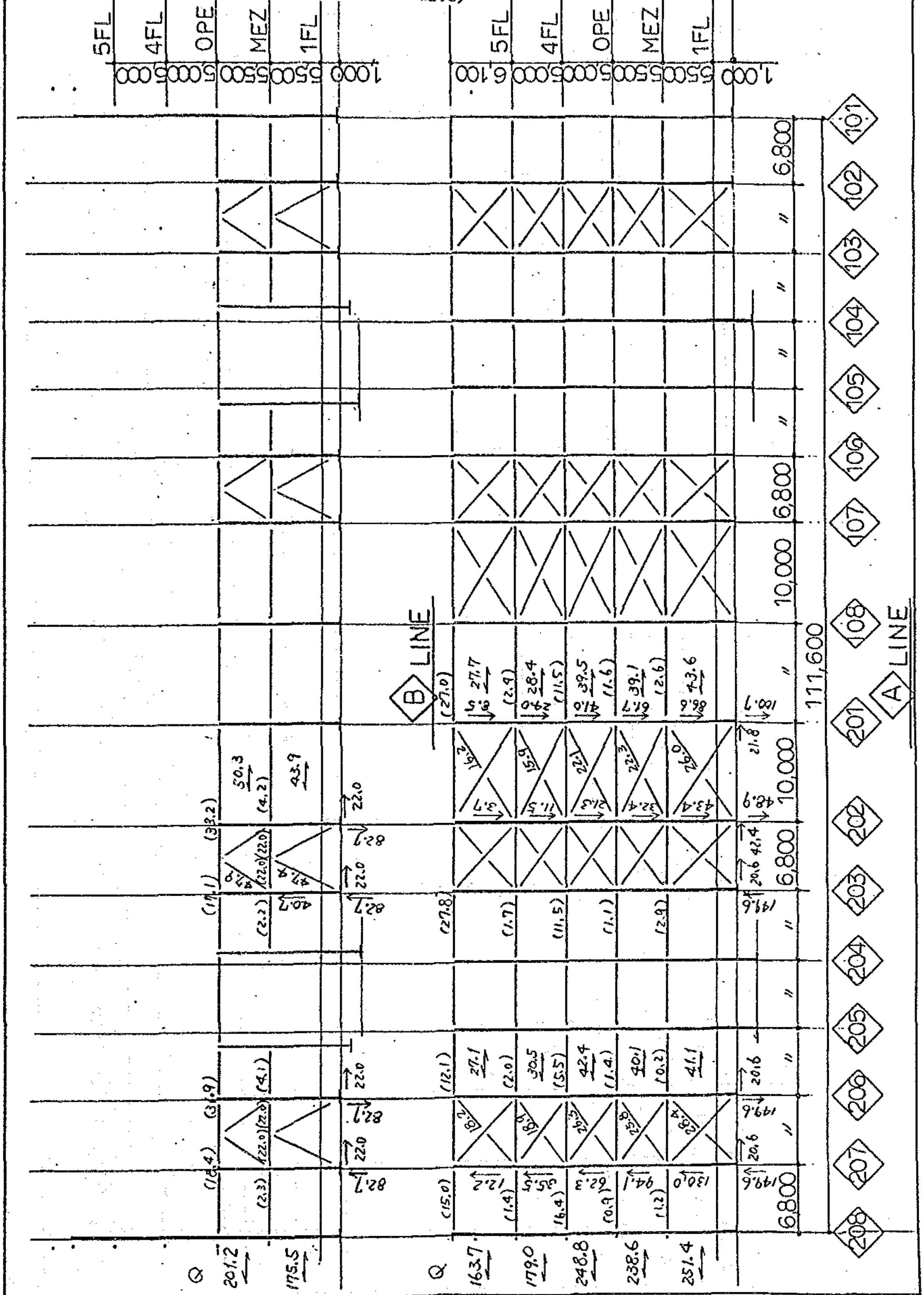
C.L.L.
荷重ケース 2 軸 力 図 A.F.D.
(103 - LINE)



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

3.4 Stress of vertical bracing, Column and Girder

(垂直ブレース，柱，ガーダーの応力)



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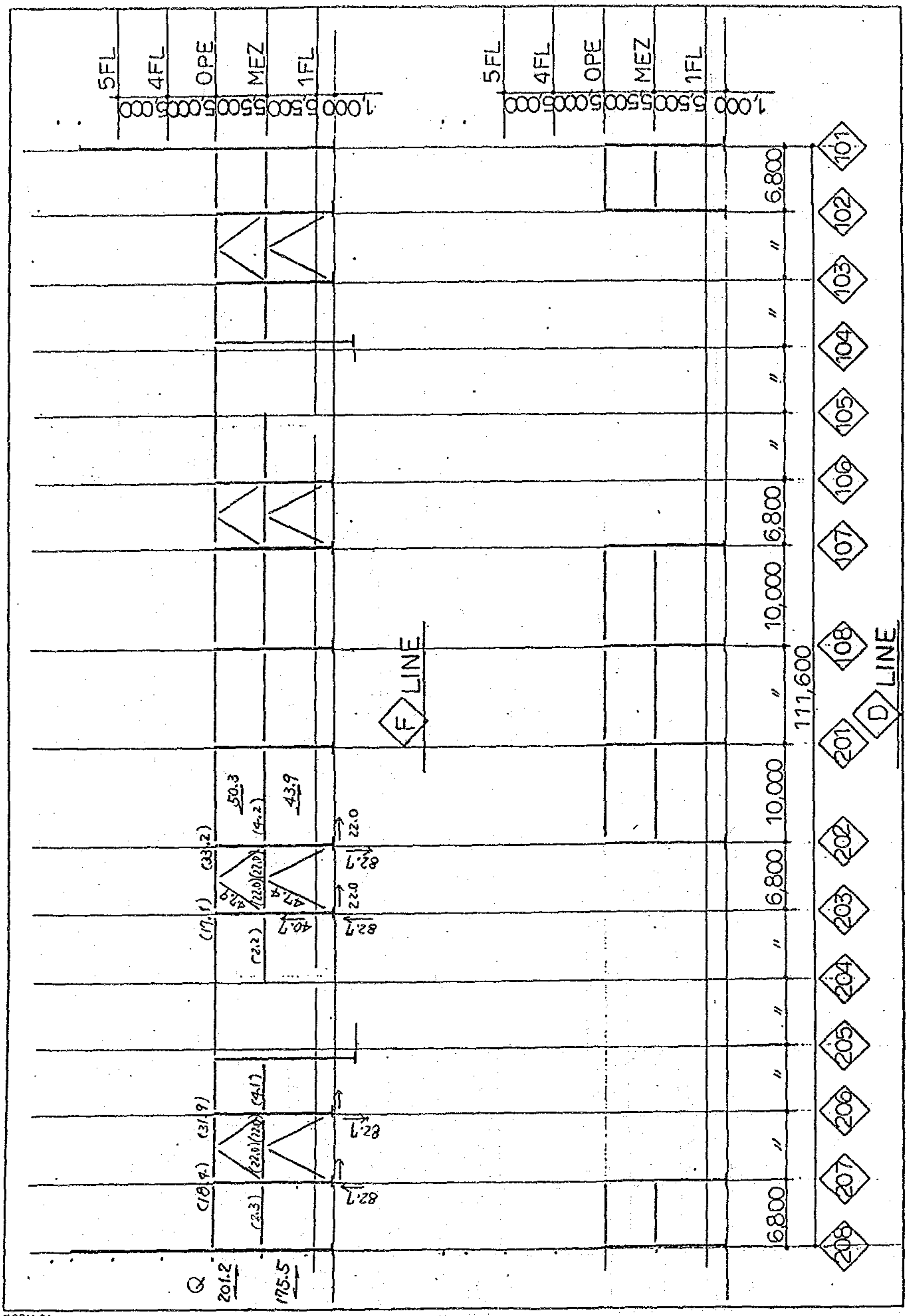
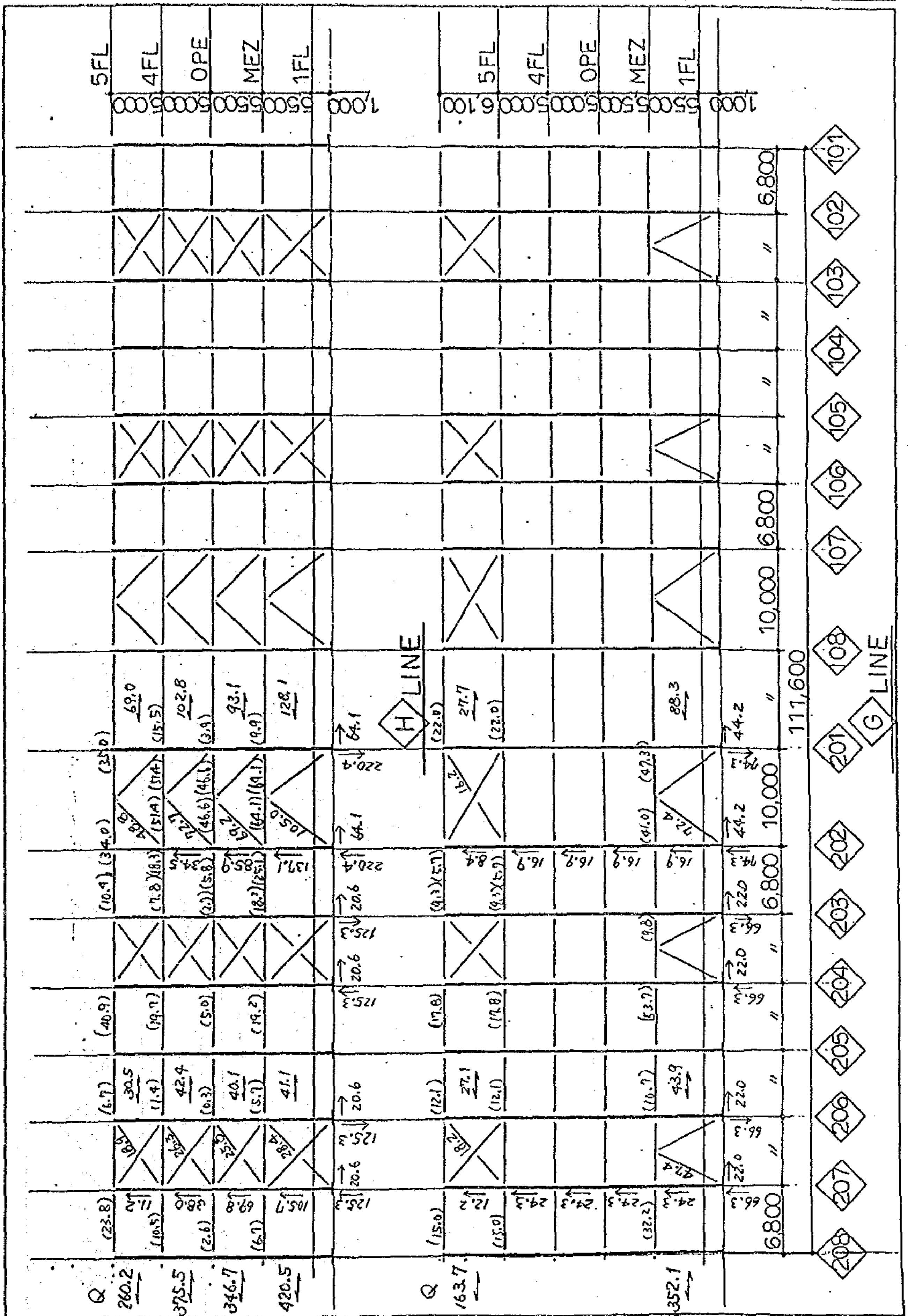
SHEET 132 OF



FORM 04

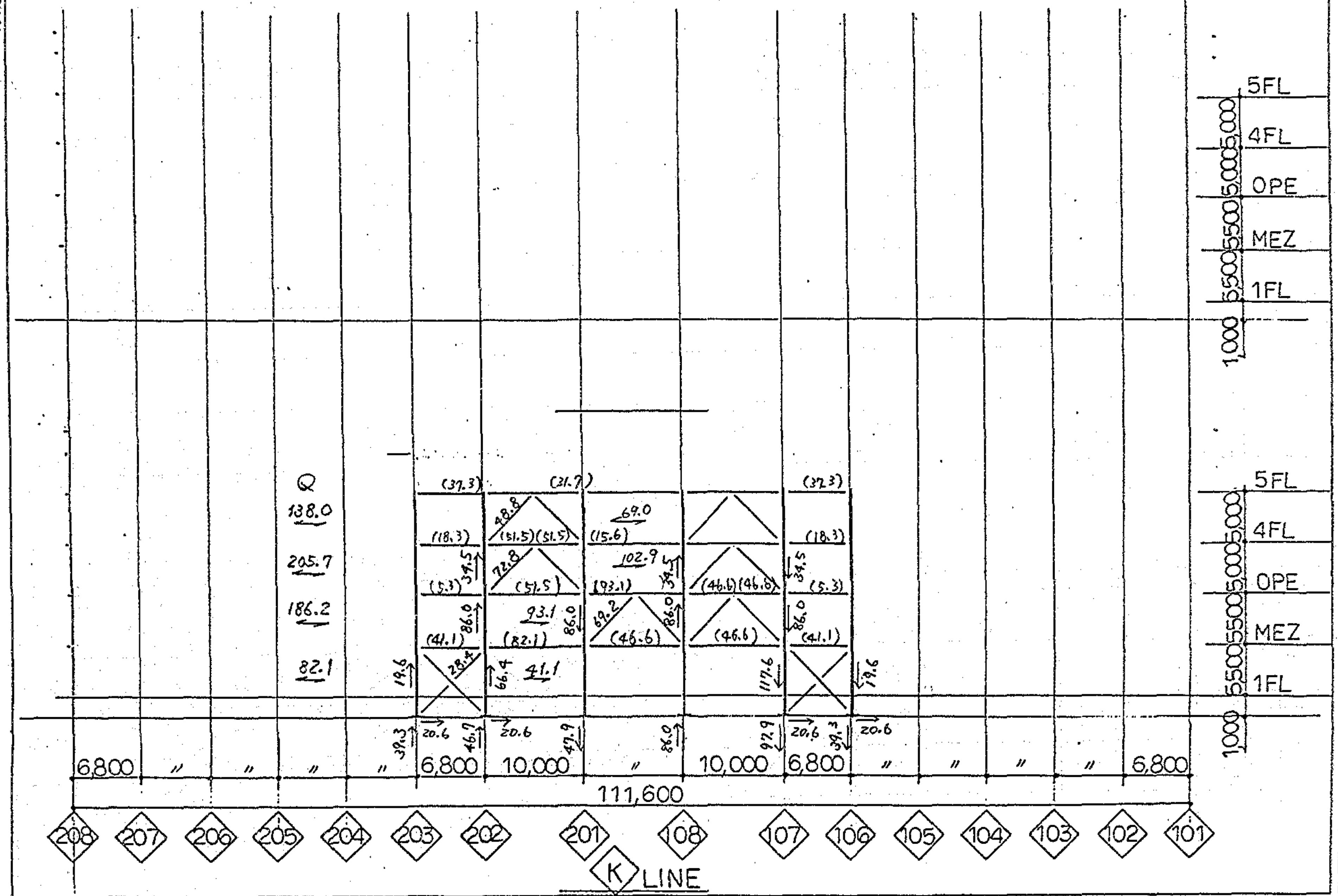
135



5FL
4FL
OPE
MEZ
1FL
H LINE
G LINE
101
102
103
104
105
106
107
108
201
202
203
204
205
206
207
208
6,800
10,000
111,600
Q
260.2
375.5
346.7
420.5
163.7
352.1

FORM 04

136


5FL
4FL
OPE
MEZ
1FL
5,000
5,000
5,500
5,500
1,000
Q
138.0
205.7
186.2
82.1
6,800
10,000
10,000
6,800
111,600
208
207
206
205
204
203
202
201
108
107
106
105
104
103
102
101
K
LINE

37

4. Design of Column (柱の設計)

4.1 Design of Column (柱の設計)

TABLE FOR COLUMN STRESS (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 N,t	VL M,tm	VL Q,t	CDL N,t	CDL M,tm	CDL Q,t	CLL N,t	CLL M,tm	CLL Q,t	SL N,t	SL M,tm	SL Q,t	CHL N,t	CHL M,tm	CHL Q,t	PC N,t	PC M,tm	PC Q,t	TC N,t	TC M,tm	TC Q,t	REMARKS
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	11.8	-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	179.1	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	0.2	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	198.0	-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	301.5 / 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)

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	
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	-43.9 -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	178.5 144.7	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 29.3			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			189.3 169.2			
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			

TABLE FOR COLUMN STRESS (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	
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-104 105 204 205		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	137.3	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)

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-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	23.4	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	-24.3 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	3.9	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			105.9 55.4			0.3			209.0			313.0 264.2			

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 (5)
[柱応力表]

LOCA-TION	DIR	LEV.	VL N,t	VL M,tm	VL Q,t	CDL N,t	CDL M,tm	CDL Q,t	CLL N,t	CLL M,tm	CLL Q,t	SL N,t	SL M,tm	SL Q,t	CHL N,t	CHL M,tm	CHL Q,t	PC N,t	PC M,tm	PC Q,t	TC N,t	TC M,tm	TC Q,t	REMARKS
H-103 206		4TH	160.9			1.3			2.0			-38.0 44.7			0.3			162.9			209.2			
		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			137.8			
		ME8	231.8			2.4			3.6			105.9 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	571.0			1.0			1.4			137.1 47.6			0.0			522.9			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			594.5			730.2			
H-203		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			34.5 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			-34.5 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			

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 (6)
[柱応力表]

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			34.5 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			-34.5 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			

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

DECISION OF COLUMN (I)
[柱の断面算定]

LOCATION	DIV NO.	DIR X Y	PERMANENT CONDITIONS N	M	Q	TEMPORARY CONDITIONS N	M	Q	MEMBER (A,I,Z)	A.STRESS i,η imin	λ b λ c	fb fc	σ b σ b / fb	σ c σ c / fc	σ b/fb + σ c/fc
A-101 ~ 106	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
203 ~ 208	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	27.0	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-900x400x28x40 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	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
203 ~ 208	2		177.0	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	437.6	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	24.1	BH-900x400x28x40 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-300^2 119.8	7.51	87	1.02		0.82 0.80	0.80
B-102 107 202 207															
	1		143.6	0.0	0.0				H-350^2 173.9	8.84	74	1.16		0.83 0.72	0.72
D-101 208															
	1		89.3	0.0	0.0				H-300^2 119.8	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: $\sigma b/fb < 1.0$
$\sigma c/fc < 1.0$
$\sigma b/fb + \sigma c/fc < 1.0$

DECISION OF COLUMN (2)

[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 λb / λc	A. STRESS fb / fc	σb / σb/fb	σc / σc/fc	σb/fb + σc/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	7.51	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	8.84	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, 207	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-480x350x16x24 223.76	8.38	60	1.30		1.07 0.82	0.82
	1		594.5						BH-516x500 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)
λb, λc --- 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 (3)
【柱の断面算定】

LOCATION	DIV NO.	DIR X Y	PERMANENT CONDITIONS N	M	Q	TEMPORARY CONDITIONS N	M	Q	MEMBER (A,I,Z)	A.STRESS i,η / imin	λ b / λ c	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-350^2 173.9	8.84	57	1.32		0.35 / 0.27	0.27
	1		179.3						Ditto	8.84	74	1.16		1.03 / 0.89	0.89
K-107 ~ 202															
	2		133.7						H-400 157.4	7.18	70	1.20		0.85 / 0.71	0.71
	1		309.0						H-450^2 289.0	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 (柱脚の設計)

TABLE FOR COLUMN BASE (/)
[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							215.3		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											-49.9		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	143.0		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)

LOCATION	DIR	LEV.	VL N,t	VL M,tm	VL Q,t	CDL N,t	CDL M,tm	CDL Q,t	CLL N,t	CLL M,tm	CLL Q,t	SL N,t	SL M,tm	SL Q,t	CHL N,t	CHL M,tm	CHL Q,t	PC N,t	PC M,tm	PC Q,t	TC N,t	TC M,tm	TC Q,t	REMARKS
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	187.9		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	176.9 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)

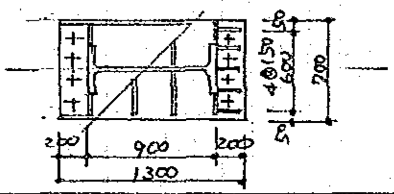
LOCATION	DIR	LEV.	VL			CDL			CLL			SL			CHL			PC			TC			REMARKS
			N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	N,t	M,tm	Q,t	
G-101																					274.9		70.1	
207			181.1		-9.7	11.6		0.0	15.1		0.1	-81.2		60.3	-0.5		0.1	196.2		-9.6	99.9		60.3	Y Direction
102					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	469.7		0.4	
105					19.9							66.3		22.0						14.9	372.8		36.9	
204			285.7			10.8		0.0	13.9		0.0	-58.0		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	181.7		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	-124.4		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	742.9		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	-124.4		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	272.7 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]

		A-105 (101, 104, 105, 204, 205, 208)		A-103 (102, 106, 203, 206, 207)	
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	(LxBxt)	1300×700×29		1300×700×29	
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)	$\frac{0.5\times10^2}{179} \fallingdotseq 0.28 < \frac{130}{6} = 21.7$			
	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/bD²f = 0.001) Pt = 0.13 %, at = 130×65×Pt/2 = 5.5 cm²	
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)	$\sqrt{6\times2.1/1.85} = 2.61 \rightarrow 2.9$		$\sqrt{6\times2.4/1.85} = 2.79 \rightarrow 2.9$	
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)			$\sqrt{6\times1.51/2.77} = 1.81 \rightarrow 2.2$	
RIB PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.022\times32.5\times35}{1.6\times50} = 0.31 < 0.9$		$\frac{1.90\times7.06}{1.6\times50} = 0.15 < 1.35$	
	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				(150×55-130×1.5)×7×1.5/cm = 45.2 T	

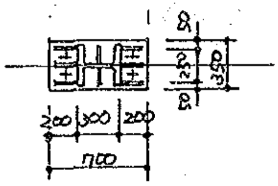
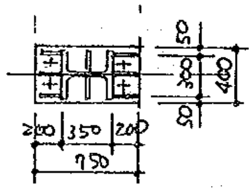
NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (2)
[柱脚の断面算定]

LOCATION			A-107, 202		A-108, 201	
COLUMN SIZE			BH-900x400x28x40		BH-900x400x28x40	
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)	1300x700x35		1300x700x35	
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)	$\frac{254.7 \times 10^3}{65 \times 130} = 30.1$ < 70			
ANCHOR BOLT	P/(n*A)<ft	(t/cm2)	N/bDf = 0.0008, M/bD²f = 0.002, P_t = 0.19%, $a_t = 130 \times 65 P_t/2$ = 8cm²		N/bDf = 0.0021, M/bD²f = 0.001, P_t = 0.02%, $a_t = 130 \times 65 P_t/2$ = 0.8 cm²	
BASE PLATE	M=α wlx^2	(tcm)	$0.09 \times 0.03 \times 32.5^2 = 2.85$			
	t>√ 6xM/fb	(cm)	$\sqrt{6 \times 2.85/1.85} = 3.1 \rightarrow 3.5$			
CAP PLATE	M=α wlx^2	(tcm)	$0.085 \times (2 \times 1.8 \times 8.0/20 \times 14)) \times 14^2 = 1.71$			
	t>√ 6xM/fb	(cm)	$\sqrt{6 \times 1.71/2.77} = 1.92 \rightarrow 2.2$			
RIB PLATE	τ =σ cA/(txH)	(t/cm2)	$\frac{0.03 \times 32.5 \times 35}{1.2 \times 50} = 0.57$ < 0.9			
	H/t					
	WELDING τ < fs	(t/cm2)				
WING PLATE	τ =σ cA/(txH)	(t/cm2)	$\frac{0.03 \times 37.5 \times 12.5}{1.6 \times 50} = 0.18$ < 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						

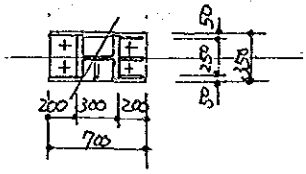
NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (3)
[柱脚の断面算定]

		B-108 (101, 201, 208) X	B-108 (101, 201, 208) Y	B-107 (102, 202, 207) X	B-107 (102, 202, 207) Y
LOCATION		B-108 (101, 201, 208)		B-107 (102, 202, 207)	
COLUMN SIZE		H-300² x10 x15		H-350² x 12 x19	
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)	700 x 350 x 22		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)				
	σ c<fc (kg/cm2)	$\frac{90.7\times10^3}{70\times35} = 37.0$ <70			
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	N/bDf = 0.027, M/bD²f = 0.0024) Pt = 0.0			
BASE PLATE	M=α wlx^2 (tcm)	$0.085\times0.037\times12.5^2 = 0.49$			
	t>$\sqrt{6xM/fb}$ (cm)	$\sqrt{6\times0.49/1.85} = 1.26 \rightarrow 2.2$			
CAP PLATE	M=α wlx^2 (tcm)				
	t>$\sqrt{6xM/fb}$ (cm)				
RIB PLATE	τ =σ cA/(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 =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 (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)	$\frac{3.6\times10^2}{98.8} = 3.6 < \frac{35}{6}$			
	σ c<fc (kg/cm2)	$\frac{98.8\times10^3}{70\times35}\times(1+\frac{6\times3.6}{35}) = 65.2 < 70$			
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	N/bDf = -0.0007, N/bD²f = 0.0019, Pt=0.3%, at=70x35Pt/2=3.7cm²			
BASE PLATE	M=α wlx^2 (tcm)	$0.085\times0.065\times\overline{15}^2 = 1.24$			
	t>√ 6xM/fb (cm)	$\sqrt{6\times1.24/1.85} = 2.0 \rightarrow 2.2$			
CAP PLATE	M=α wlx^2 (tcm)	$0.085\times(2\times3.7\times1.8/(12.5\times20))\times\overline{12.5}^2 = 0.71$			
	t>√ 6xM/fb (cm)	$\sqrt{6\times0.71/2.77} = 1.24 \rightarrow 1.6$			
RIB PLATE	τ =σ cA/(txH) (t/cm2)	$\frac{0.065\times17.5\times15}{1.2\times30} = 0.47 < 0.9$			
	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

DECISION OF COLUMN BASE (5)
[柱脚の断面算定]

		D-101 , 208		D-108(102,107,201,202,207)	
LOCATION		D-101 , 208		D-108(102,107,201,202,207)	
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)		0.2		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)			$0.085\times0.066\times\overline{17.5}^2 = 1.72$	
	t>√ 6xM/fb (cm)			$\sqrt{6\times1.72/1.85} = 2.36 \rightarrow 2.5$	
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]

		F-103 (101, 206, 208) X	F-103 (101, 206, 208) Y	F-108 (102, 107, 201, 202, 207) X	F-108 (102, 107, 201, 202, 207) Y
LOCATION		F-103 (101, 206, 208)		F-108 (102, 107, 201, 202, 207)	
COLUMN SIZE		H-300^2 x10x15		H-350^2 x12x19	
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)	$0.085\times0.055\times\overline{72.5}^2 = 0.73$			
	t>$\sqrt{6xM/fb}$ (cm)	$\sqrt{6\times0.73/1.85} = 1.5 \rightarrow 2.2$			
CAP PLATE	M=α wlx^2 (tcm)				
	t>$\sqrt{6xM/fb}$ (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

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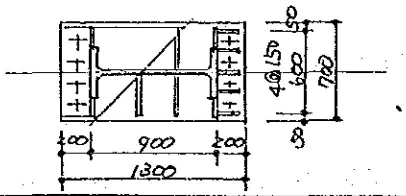
DECISION OF COLUMN BASE (7)
[柱脚の断面算定]

LOCATION			F-104 (105, 204, 205)		F-203, 106	
COLUMN SIZE			H-300² x10x15		H-300² x10x15	
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						

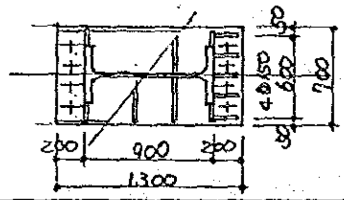
NOTATION: L,H,B,t,D --- LENGTH, HEIGHT, WIDTH, THICKNESS, DIAMETER (mm)
e --- ECCENTRICITY
σ c --- COMPRESSIVE STRESS, N/(B*L) OR OTHER EQUATION DUE TO e
P --- UP-LIFT FORCE FOR COLUMN BASE (t)
α --- COEFFICIENT FOR BENDING MOMENT OF SLAB

DECISION OF COLUMN BASE (8)
[柱脚の断面算定]

		G-101, 208		G-103 (102, 105, 106 / 203, 204, 206, 207)	
LOCATION		G-101, 208		G-103 (102, 105, 106 / 203, 204, 206, 207)	
COLUMN SIZE		BH-900×350×28×40		BH-900×350×28×40	
DIRECTION		※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)	1300×700×29		1300×700×45	
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)			$\frac{7.5\times10^2}{386.4}=1.94 < \frac{70}{6}$	
	σ c<fc (kg/cm2)			$\frac{386.4\times10^3}{130\times70}\times\left(1+\frac{6\times1.94}{70}\right)=49.5 < 70$	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)	$N/bdf_t=0.017$, $M/bd^2f_t=0.0016$) $P_t=0.0\%$		——	
BASE PLATE	M=α wlx^2 (tcm)			$0.085\times0.0495\times35^2=5.15$	
	t>√ 6xM/fb (cm)			$\sqrt{6\times5.15/1.7}=4.26\rightarrow4.5$	
CAP PLATE	M=α wlx^2 (tcm)				
	t>√ 6xM/fb (cm)				
RIB PLATE	τ =σ cA/(txH) (t/cm2)			$\frac{0.0495\times35\times35}{1.6\times50}=0.76 < 0.9$	
	H/t			$\frac{50}{1.6}=31.3 < 71$	
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)			$\frac{0.0495\times37.5\times17.5}{1.2\times50}=0.54 < 0.9$	
	H/t			$\frac{50}{1.2}=41.7 < 71$	
	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 (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)			$\frac{481.7\times10^3}{130\times70}\times(1+\frac{6\times3.16}{70})=67.3<70$	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)			—	
BASE PLATE	M=α wlx^2 (tcm)			$0.085\times0.067\times35^2=7.0$	
	t>√ 6xM/fb (cm)			$\sqrt{6\times7.0/1.70}=4.97\rightarrow5.0$	
CAP PLATE	M=α wlx^2 (tcm)				
	t>√ 6xM/fb (cm)				
RIB PLATE	τ =σ 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	τ =σ 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

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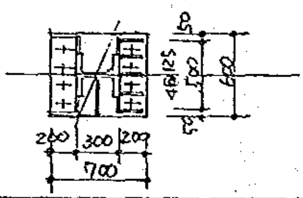
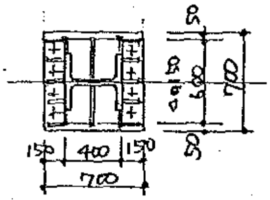
DECISION OF COLUMN BASE (10)
[柱脚の断面算定]

LOCATION		H-101, 208		H-102, 207	
COLUMN SIZE		H-300² x 10 x 15		H-400² x 13 x 21	
DIRECTION		~~X~~ Y	Y	X	~~Y~~ 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)	700 x 600 x 22		700 x 700 x 25	
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, M/bD²f = 0.0025; Pt = 0.64, at = 70×60 Pt/4 = 6.3 cm²			
BASE PLATE	M=α wlx^2 (tcm)	$0.085\times0.082\times12.5^2 = 1.09$		$0.085\times0.043\times20^2 = 1.46$	
	t>√ 6xM/fb (cm)	$\sqrt{6\times1.09/2.77} = 1.5 \rightarrow 19$		$\sqrt{6\times1.46/1.85} = 2.10 \rightarrow 2.5$	
CAP PLATE	M=α wlx^2 (tcm)	$0.085\times(2\times6.3\times1.8/(12.5\times20))\times12.5^2 = 1.20$			
	t>√ 6xM/fb (cm)	$\sqrt{6\times1.2/2.77} = 1.6 \rightarrow 19$			
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)				
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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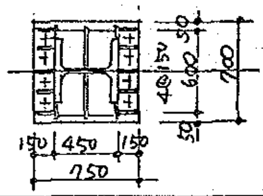
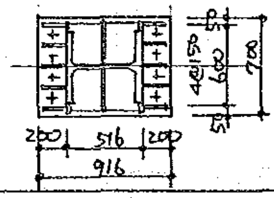
DECISION OF COLUMN BASE (11)
[柱脚の断面算定]

LOCATION		H-103 (105, 204, 206)		H-203 (104, 106, 205)	
COLUMN SIZE		$H-450^2 \times 16 \times 25$		H-516×500×22×40	
DIRECTION		X	¥X	卒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)	750×700×30		916×700×40	
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)			$\frac{4.5 \times 10^2}{375.3} = 1.2 < \frac{91.6}{6}$	
	σ c<fc (kg/cm2)			$\frac{375.3 \times 10^3}{91.6 \times 70} \times (1 + \frac{6 \times 1.2}{91.6}) = 63.1 < 70$	
ANCHOR BOLT	P/(n*A)<ft (t/cm2)				
BASE PLATE	M=α wlx^2 (tcm)			$0.085 \times 0.063 \times 25.8^2 = 3.56$	
	t>√ 6xM/fb (cm)			$\sqrt{6 \times 3.56 / 1.85} = 3.40 \rightarrow 4.0$	
CAP PLATE	M=α wlx^2 (tcm)				
	t>√ 6xM/fb (cm)				
RIB PLATE	τ =σ cA/(txH) (t/cm2)			$\frac{0.063 \times 25.8 \times 35}{2.2 \times 50} = 0.52 < 0.9$	
	H/t				
	WELDING τ < fs (t/cm2)				
WING PLATE	τ =σ cA/(txH) (t/cm2)			$\frac{0.063 \times 12.5 \times 32.9}{2.2 \times 50} = 0.23 < 0.9$	
	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