

BAB VI

KESIMPULAN DAN SARAN

6.1 Kesimpulan

Setelah melakukan analisis dan perancangan pada struktur hotel 10 lantai, dapat diambil beberapa kesimpulan seperti yang tercantum di bawah ini.

1. Pelat lantai digunakan tebal 120 mm dan tebal pelat atap digunakan tebal 100 mm. Baik pelat atap maupun pelat lantai menggunakan 2 lapis tulangan utama P10-250.
2. Dalam perencanaan balok induk, digunakan 2 macam dimensi yaitu sebesar 250 mm x 450 mm dan 350 mm x 600 mm. Balok-balok tersebut direncanakan dengan tulangan lentur dan geser yang berbeda-beda.
3. Dalam perencanaan kolom, dimensi yang digunakan untuk kolom *semibasement* dan lantai 1 sebesar 700 mm x 800 mm, dimensi yang digunakan untuk kolom lantai 2 sampai lantai 4 sebesar 600 mm x 700 mm, dimensi yang digunakan untuk kolom lantai 5 dan lantai 7 sebesar 500 mm x 600 mm, dimensi yang digunakan untuk kolom lantai 8 - lantai 10 sebesar 400 mm x 400 mm.. Kolom – kolom tersebut direncanakan dengan jumlah tulangan longitudinal dan transversal yang berbeda –beda pula.

6.2 Saran

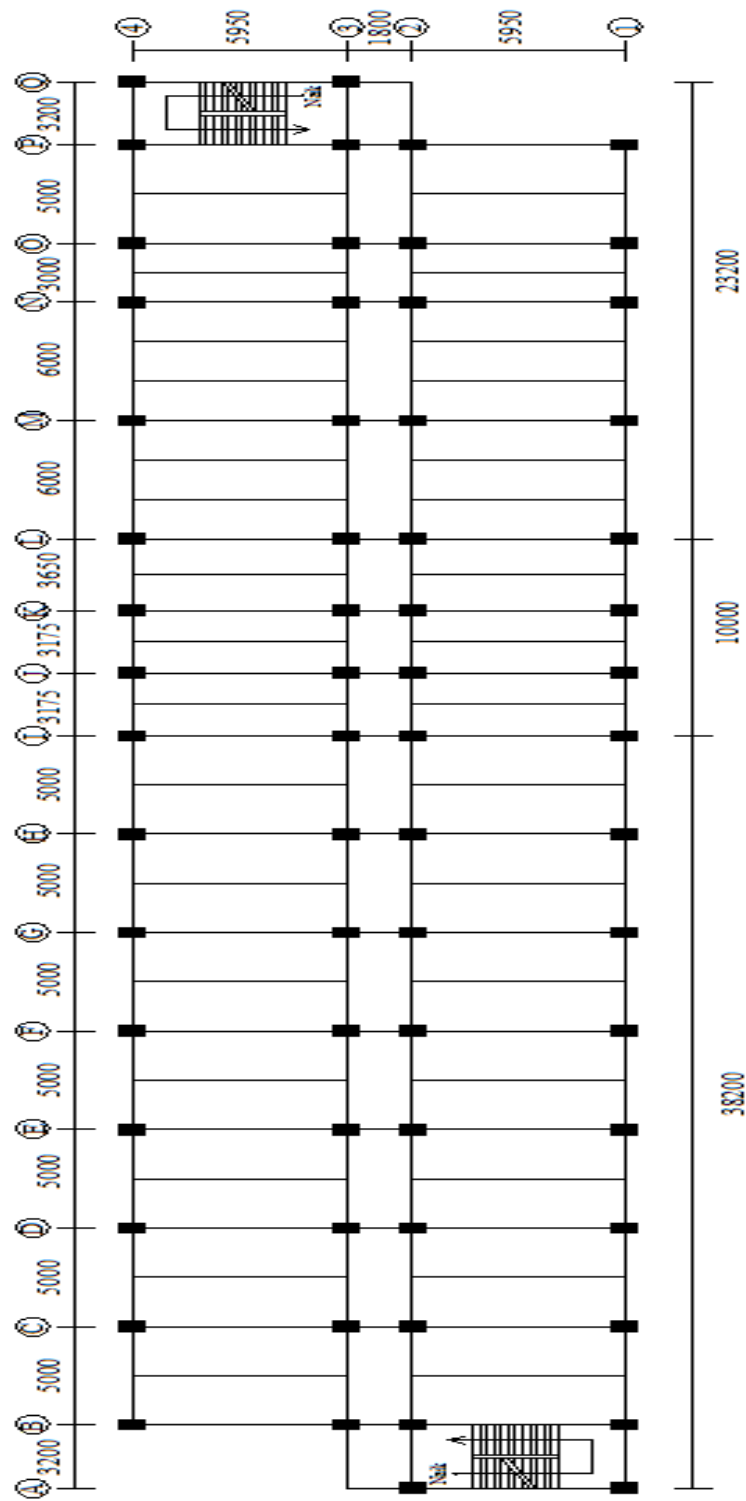
Saran-saran yang dapat diberikan penulis dari hasil Tugas Akhir yang disusun tercantum seperti di bawah ini.

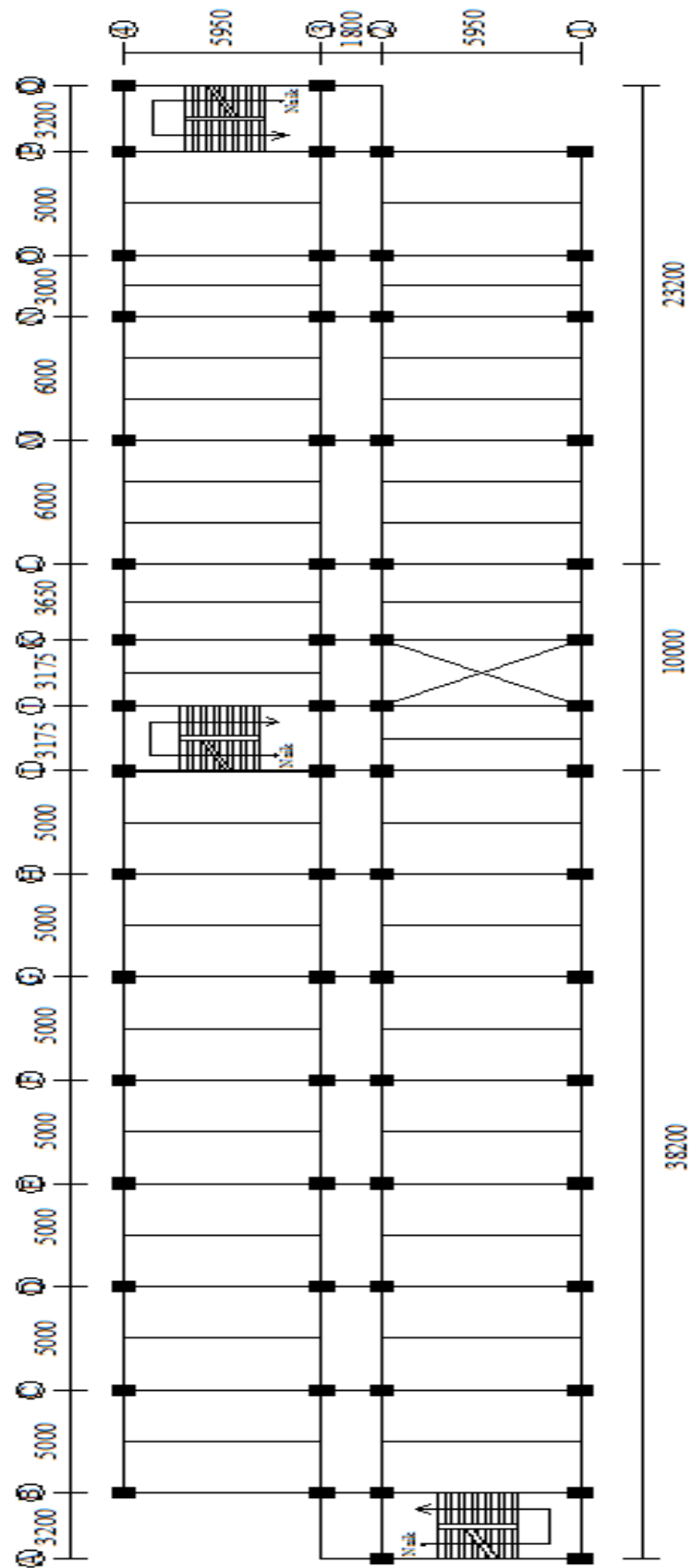
1. Sebelum perencanaan struktur sebaiknya dilakukan estimasi awal pada ukuran elemen struktur, sehingga tidak terjadi penentuan elemen struktur berulang-ulang.
2. Untuk kemudahan dalam melaksanakan analisis struktur terutama dalam pembuatan model struktur gedung akan lebih mudah jika memakai program analisis struktur ETABS dan program-program bantu lainnya termasuk dalam melakukan cek desain.

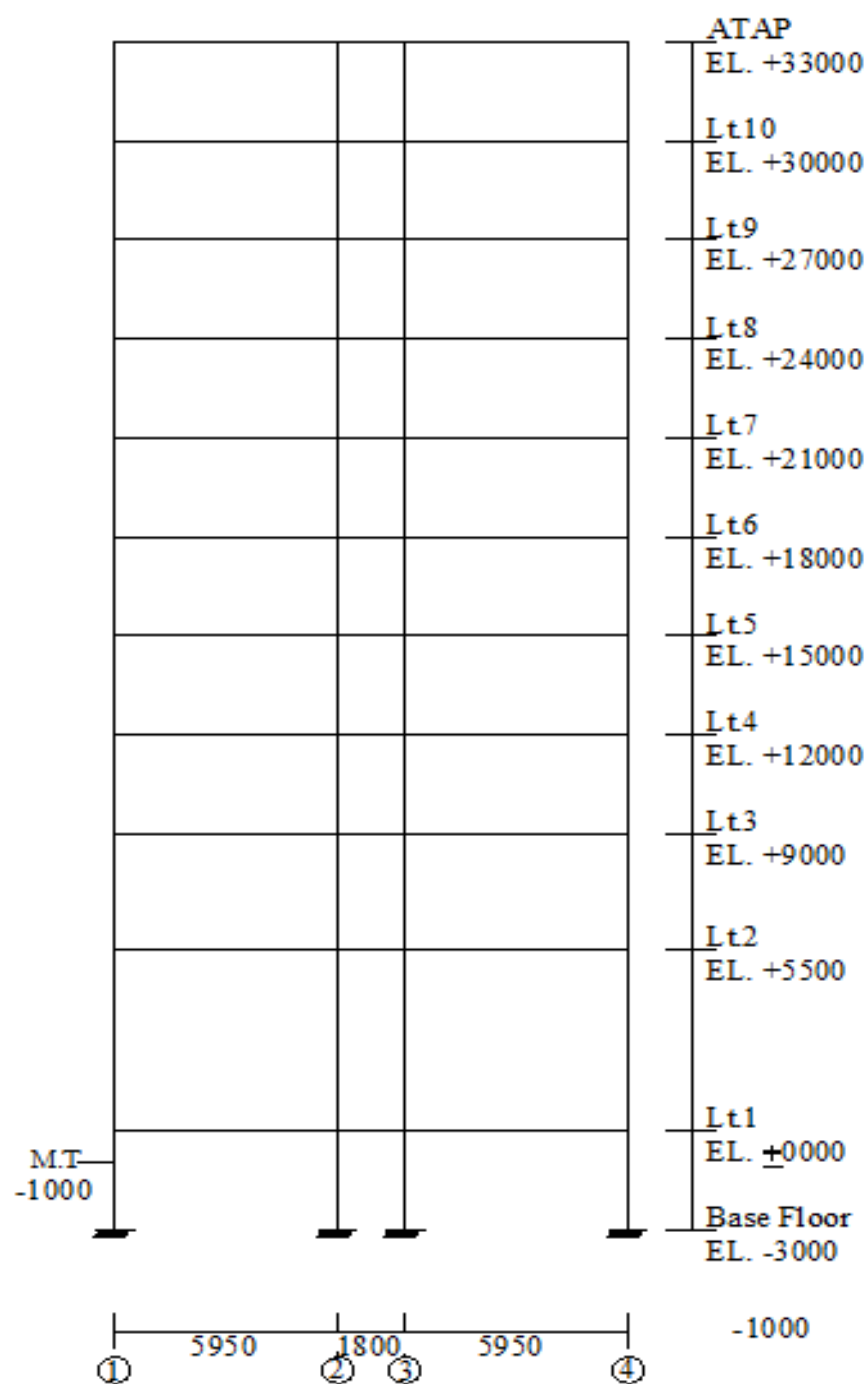
DAFTAR PUSTAKA

- Badan Standarisasi Nasional, 2002, *Tata Cara Perencanaan Struktur Beton Untuk Bangunan Gedung*, SNI 03-2847-2002, Yayasan LPMB, Bandung.
- Badan Standarisasi Nasional, 2002, *Tata Cara Perencanaan Ketahanan Gempa untuk Bangunan Gedung*, SNI 03-1726-2002, Yayasan LPMB, Bandung.
- Departemen Pekerjaan Umum, 1983, *Peraturan Pembebanan Indonesia untuk Gedung*, Yayasan LPMB, Bandung.
- Imran, Iswandi dan Hendrik Fajar, 2010, *Perencanaan Struktur Gedung Beton Bertulang Tahan Gempa*, Penerbit ITB, Bandung.
- Kusuma, Gideon dan Vis, W.C., 1993,c, *Grafik dan Tabel Perhitungan Beton Bertulang*, Erlangga, Jakarta.
- McCormac, J.C., 2004, *Desain Beton Bertulang*, Penerbit Erlangga, Jakarta.
- Nasution, Amrinsyah, 2009, *Analisis dan Desain Struktur Beton Bertulang*, Penerbit ITB, Bandung.
- Nawy, E., G., 1990, *Beton Bertulang Suatu Pendekatan Dasar*, PT. Eresco, Bandung.
- Wang, C.K. dan Salmon Charles G., 1985, *Disain Beton Bertulang*, Penerbit Erlangga, Jakarta.

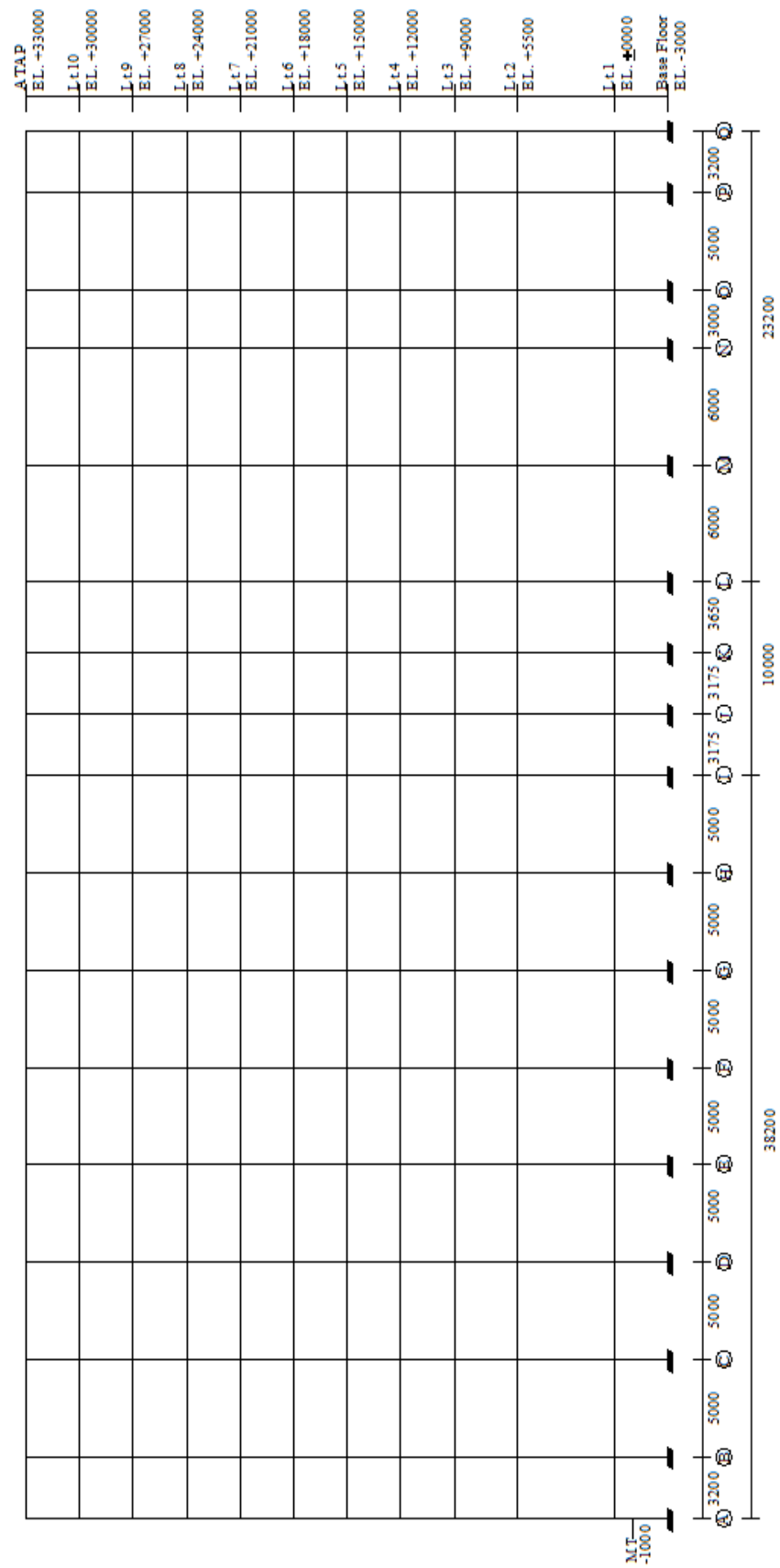
LAMPIRAN



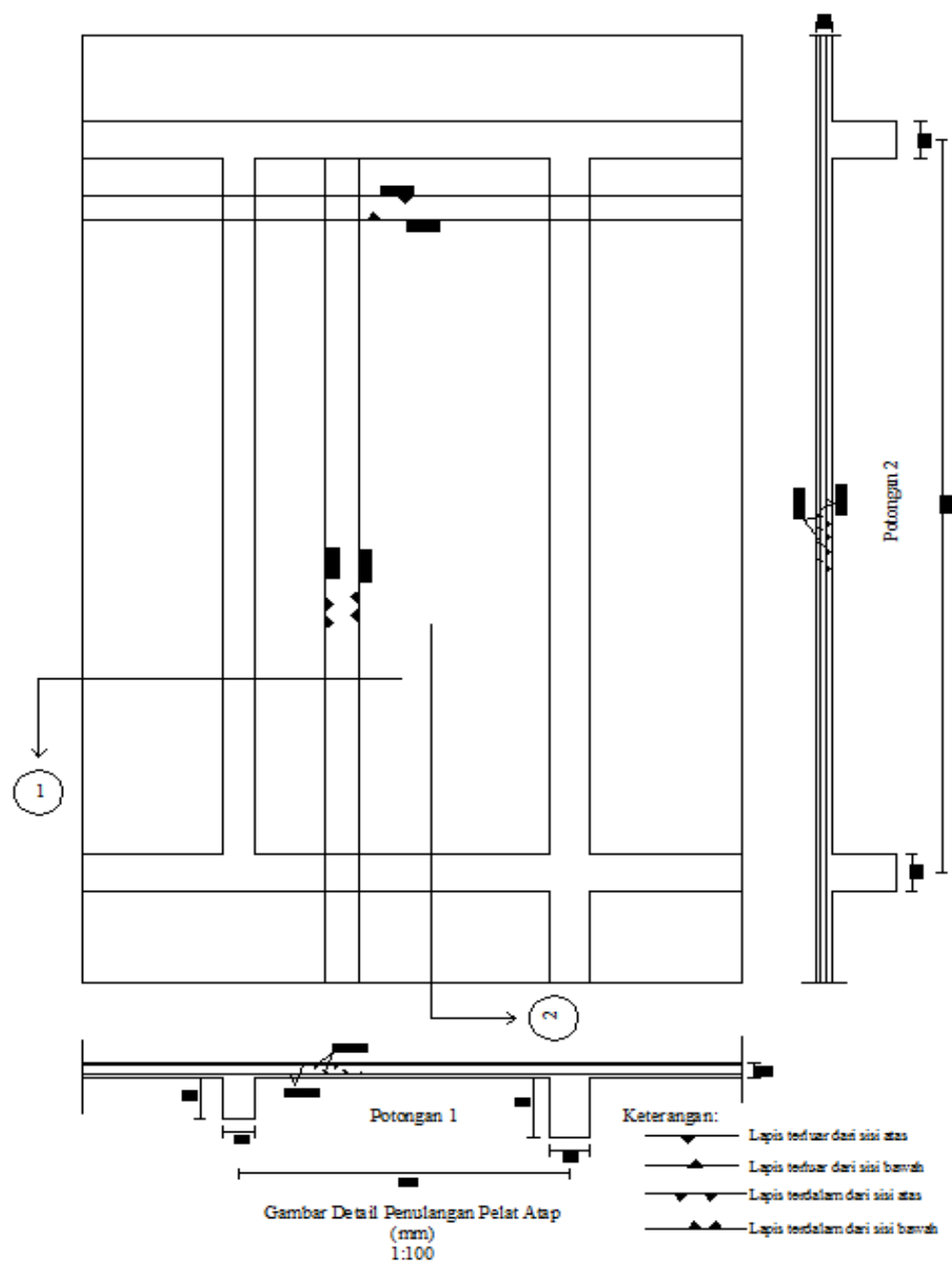


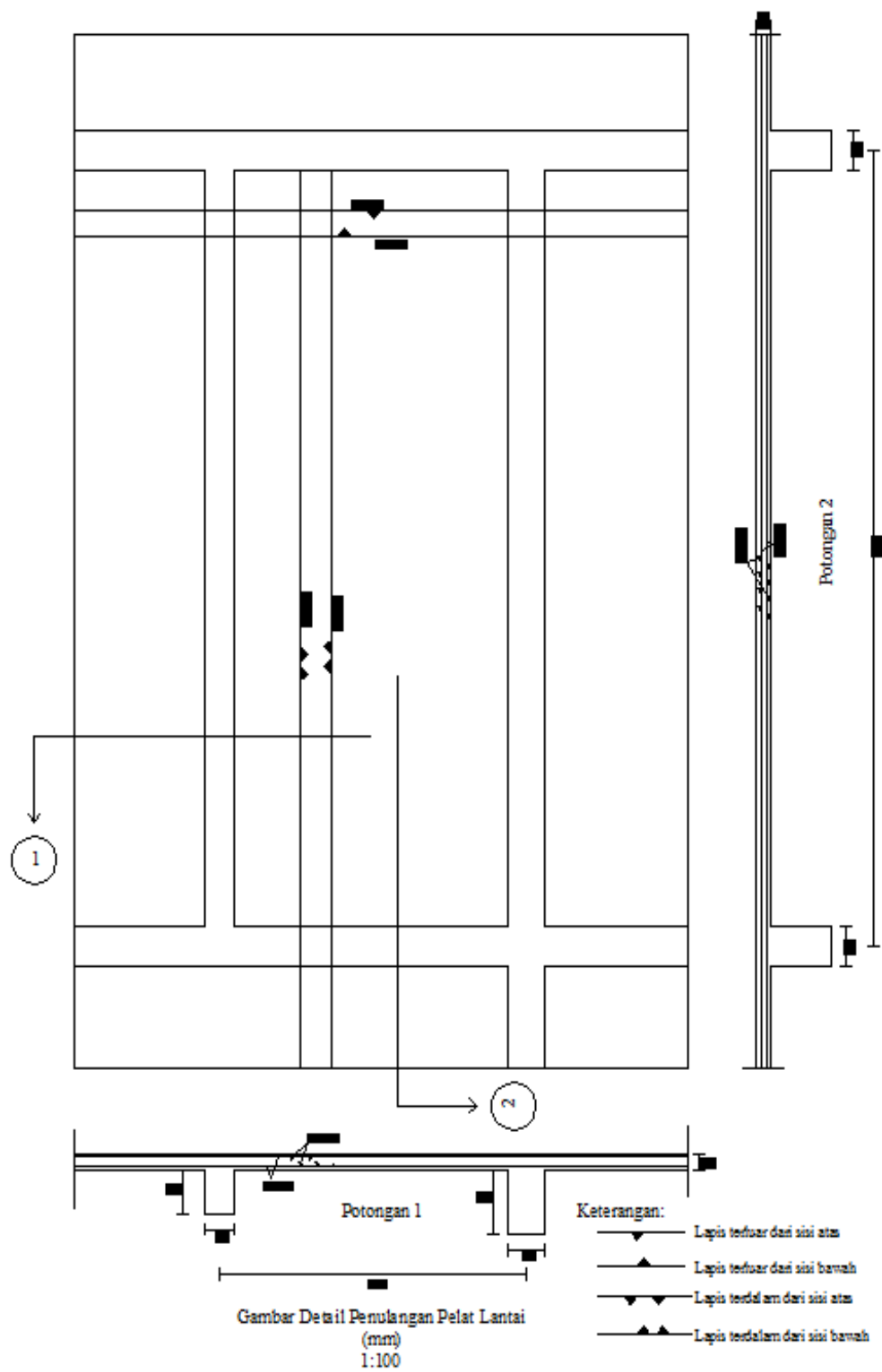


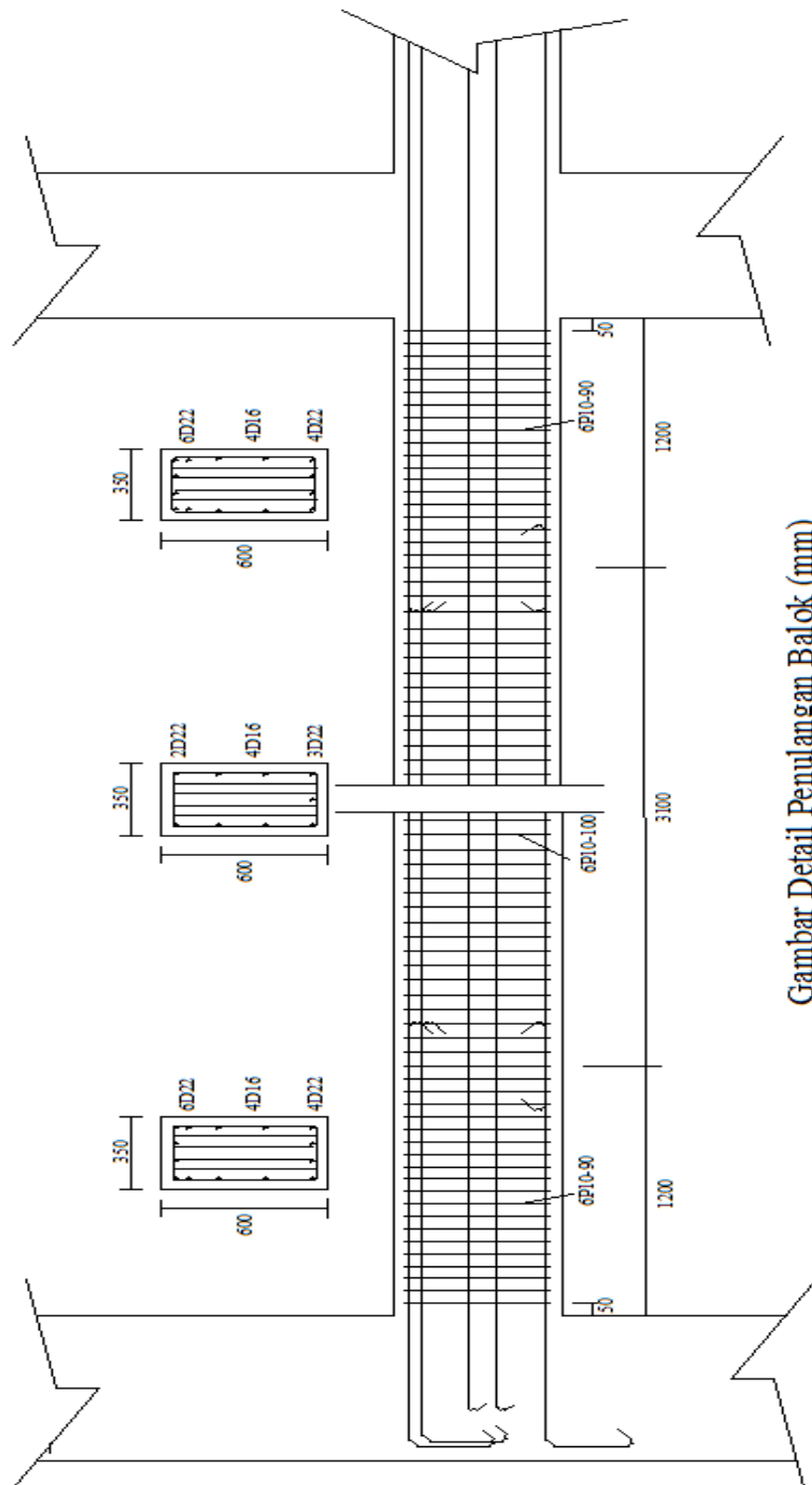
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Skala 1: 1000



PORTAL AS 3
Skala 1: 1000

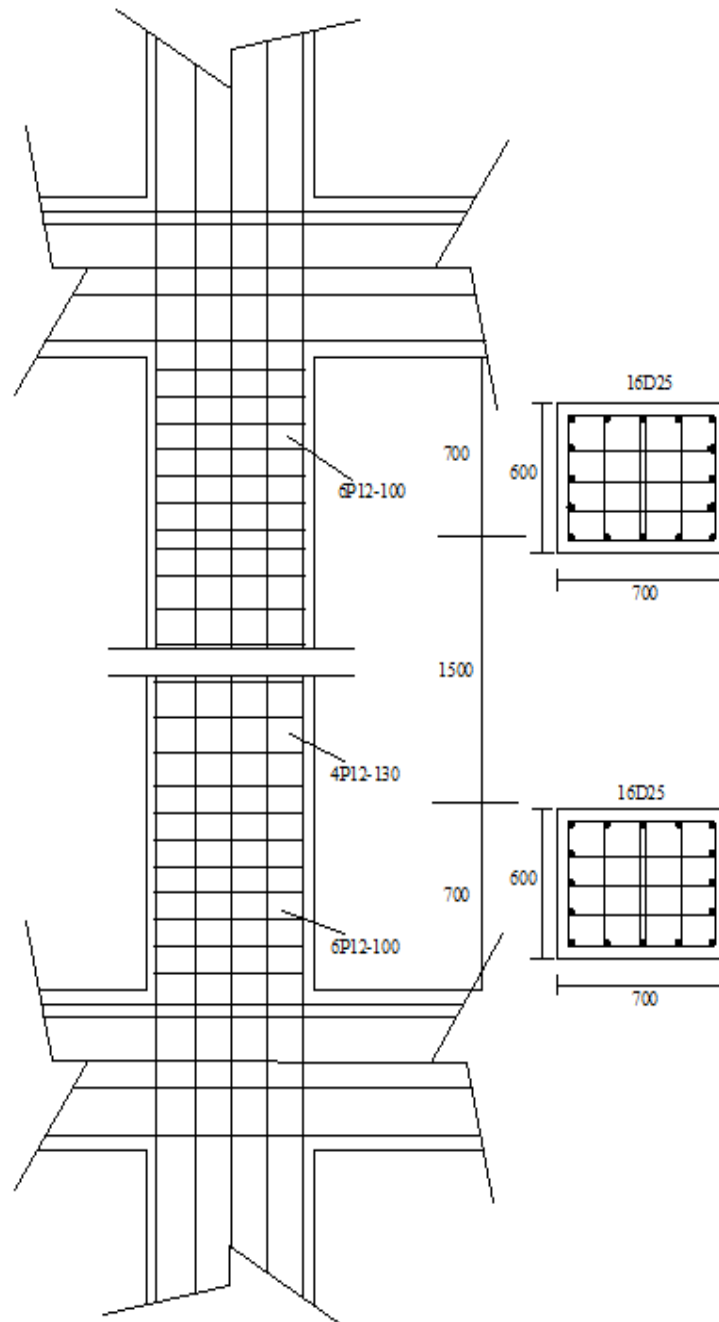






Gambar Detail Penulangan Balok (mm)

1:100



Gambar Detail Penulangan Kolom (mm)
1:100

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PROJECT INFORMATION

Company Name = UAJY

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S T O R Y D A T A

STORY	SIMILAR TO	HEIGHT	ELEVATION
ATAP	None	3,000	36,000
LT10	None	3,000	33,000
LT9	LT10	3,000	30,000
LT8	LT10	3,000	27,000
LT7	LT10	3,000	24,000
LT6	LT10	3,000	21,000
LT5	LT10	3,000	18,000
LT4	LT10	3,000	15,000
LT3	LT10	3,500	12,000
LT2	LT10	5,500	8,500
LT1	LT10	3,000	3,000
BASE	None		0,000

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S T A T I C L O A D C A S E S

STATIC	CASE	AUTO LAT	SELF WT
CASE	TYPE	LOAD	MULTIPLIER
DL	DEAD	N/A	1,0000
LL	LIVE	N/A	0,0000
R	LIVE	N/A	0,0000
EX	QUAKE	USER_LOADS	0,0000
EY	QUAKE	USER_LOADS	0,0000

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A U T O S E I S M I C U S E R L O A D S

Case: EX

SPECIFIED AUTO SEISMIC LOADS

STORY	DIAPHRAGM	FX	FY	MZ	X	Y
ATAP	D1	289,15	86,75	0,000	0,000	0,000
LT10	D1	381,49	114,45	0,000	0,000	0,000
LT9	D1	346,81	104,04	0,000	0,000	0,000
LT8	D1	321,15	96,34	0,000	0,000	0,000
LT7	D1	295,99	88,80	0,000	0,000	0,000
LT6	D1	258,99	77,70	0,000	0,000	0,000
LT5	D1	229,58	68,87	0,000	0,000	0,000
LT4	D1	199,21	59,76	0,000	0,000	0,000

LT3	D1	163,05	48,92	0,000	0,000	0,000
LT2	D1	145,30	43,59	0,000	0,000	0,000
LT1	D1	60,39	18,12	0,000	0,000	0,000

AUTO SEISMIC CALCULATION RESULTS

AUTO SEISMIC STORY FORCES

STORY	FX	FY	FZ	MX	MY	MZ
ATAP	289,15	86,75	0,00	0,000	0,000	-1151,514
LT10	381,49	114,45	0,00	0,000	0,000	-1502,026
LT9	346,81	104,04	0,00	0,000	0,000	-1365,276
LT8	321,15	96,34	0,00	0,000	0,000	-1265,167
LT7	295,99	88,80	0,00	0,000	0,000	-1167,459
LT6	258,99	77,70	0,00	0,000	0,000	-1021,535
LT5	229,58	68,87	0,00	0,000	0,000	-906,074
LT4	199,21	59,76	0,00	0,000	0,000	-787,026
LT3	163,05	48,92	0,00	0,000	0,000	-644,792
LT2	145,30	43,59	0,00	0,000	0,000	-576,607
LT1	60,39	18,12	0,00	0,000	0,000	-241,757

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A U T O S E I S M I C U S E R L O A D S

Case: EY

SPECIFIED AUTO SEISMIC LOADS

STORY	DIAPHRAGM	FX	FY	MZ	X	Y
ATAP	D1	86,75	289,15	0,000	0,000	0,000
LT10	D1	114,45	381,49	0,000	0,000	0,000
LT9	D1	104,04	346,81	0,000	0,000	0,000
LT8	D1	96,34	321,15	0,000	0,000	0,000
LT7	D1	88,80	295,99	0,000	0,000	0,000
LT6	D1	77,70	258,99	0,000	0,000	0,000
LT5	D1	68,87	229,58	0,000	0,000	0,000
LT4	D1	59,76	199,21	0,000	0,000	0,000
LT3	D1	48,92	163,05	0,000	0,000	0,000
LT2	D1	43,59	145,30	0,000	0,000	0,000
LT1	D1	18,12	60,39	0,000	0,000	0,000

AUTO SEISMIC CALCULATION RESULTS

AUTO SEISMIC STORY FORCES

STORY	FX	FY	FZ	MX	MY	MZ
ATAP	86,75	289,15	0,00	0,000	0,000	-9845,798
LT10	114,45	381,49	0,00	0,000	0,000	-12933,099
LT9	104,04	346,81	0,00	0,000	0,000	-11757,433
LT8	96,34	321,15	0,00	0,000	0,000	-10890,819
LT7	88,80	295,99	0,00	0,000	0,000	-10041,329

LT6	77,70	258,99	0,00	0,000	0,000	-8786,118
LT5	68,87	229,58	0,00	0,000	0,000	-7791,044
LT4	59,76	199,21	0,00	0,000	0,000	-6763,051
LT3	48,92	163,05	0,00	0,000	0,000	-5536,579
LT2	43,59	145,30	0,00	0,000	0,000	-4941,116
LT1	18,12	60,39	0,00	0,000	0,000	-2060,279

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M A S S S O U R C E D A T A

MASS LATERAL LUMP MASS
 FROM MASS ONLY AT STORIES
 Masses Yes Yes

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D I A P H R A G M M A S S D A T A

STORY	DIAPHRAGM	MASS-X	MASS-Y	MMI	X-M	Y-M
ATAP	D1	422,0875	422,0875	173464,1857	36,106	6,850
LT10	D1	607,5007	607,5007	260488,6122	35,957	6,850
LT9	D1	607,5007	607,5007	260488,6122	35,957	6,850
LT8	D1	625,0523	625,0523	268870,7007	35,967	6,850
LT7	D1	648,0990	648,0990	279708,1956	35,980	6,850
LT6	D1	648,0990	648,0990	279708,1956	35,980	6,850
LT5	D1	670,2598	670,2598	290257,4567	35,991	6,850
LT4	D1	697,9159	697,9159	303261,9907	36,004	6,850
LT3	D1	714,0486	714,0486	310847,8617	36,012	6,850
LT2	D1	848,3702	848,3702	374134,2541	36,061	6,850
LT1	D1	576,9626	576,9626	267666,9368	36,172	6,850

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A S S E M B L E D P O I N T M A S S E S

STORY	UX	UY	UZ	RX	RY	RZ
ATAP	422,087473	422,087473	0,000000	0,000000	0,000000	173464,18571
LT10	607,500736	607,500736	0,000000	0,000000	0,000000	260488,61215
LT9	607,500736	607,500736	0,000000	0,000000	0,000000	260488,61215
LT8	625,052254	625,052254	0,000000	0,000000	0,000000	268870,70067
LT7	648,098974	648,098974	0,000000	0,000000	0,000000	279708,19563
LT6	648,098974	648,098974	0,000000	0,000000	0,000000	279708,19563
LT5	670,259835	670,259835	0,000000	0,000000	0,000000	290257,45675
LT4	697,915899	697,915899	0,000000	0,000000	0,000000	303261,99065
LT3	714,048603	714,048603	0,000000	0,000000	0,000000	310847,86175
LT2	848,370169	848,370169	0,000000	0,000000	0,000000	374134,2541
LT1	576,962632	576,962632	0,000000	0,000000	0,000000	267666,93680
BASE	129,061632	129,061632	0,000000	0,000000	0,000000	60673,86427
Totals	7194,957918	7194,957918	0,000000	0,000000	0,000000	3129570,8663

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C E N T E R S O F C U M U L A T I V E M A S S & C E N T E R S O F R I G I D I T Y

STORY	DIAPHRAGM	/-----CENTER OF MASS-----//			--CENTER OF RIGIDITY--/	
LEVEL	NAME	MASS	ORDINATE-X	ORDINATE-Y	ORDINATE-X	ORDINATE-Y
ATAP	D1	422,0875	36,106	6,850	36,432	6,860
LT10	D1	1029,5882	36,018	6,850	36,425	6,860
LT9	D1	1637,0889	35,995	6,850	36,423	6,859
LT8	D1	2262,1412	35,987	6,850	36,422	6,858
LT7	D1	2910,2402	35,986	6,850	36,417	6,858
LT6	D1	3558,3391	35,984	6,850	36,412	6,857
LT5	D1	4228,5990	35,986	6,850	36,405	6,856
LT4	D1	4926,5149	35,988	6,850	36,394	6,856
LT3	D1	5640,5635	35,991	6,850	36,380	6,855
LT2	D1	6488,9337	36,000	6,850	36,358	6,853
LT1	D1	7065,8963	36,014	6,850	36,333	6,852

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MODAL INFORMATION

Modal Analysis not done.

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TOTAL REACTIVE FORCES (RECOVERED LOADS) AT ORIGIN

LOAD	FX	FY	FZ	MX	MY	MZ
DL	0,00	0,00	155783,62	1069055,189	-5577978,30	0,000
LL	0,00	0,00	20347,36	139379,442	-721576,533	0,000
R	0,00	0,00	360,81	2471,535	-12880,846	0,000
EX	-2691,11	-807,34	0,00	19533,105	-65109,880	0,000
EY	-807,34	-2691,11	0,00	65109,880	-19533,105	0,000

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S T O R Y F O R C E S

STORY	LOAD	P	VX	VY	T	MX	MY
ATAP	EX	0,00	-289,15	-86,75	0,000	260,250	-867,450
LT10	EX	0,00	-670,64	-201,20	0,000	863,850	-2879,370
LT9	EX	0,00	-1017,45	-305,24	0,000	1779,570	-5931,720
LT8	EX	0,00	-1338,60	-401,58	0,000	2984,310	-9947,520
LT7	EX	0,00	-1634,59	-490,38	0,000	4455,450	-14851,290
LT6	EX	0,00	-1893,58	-568,08	0,000	6159,690	-20532,030
LT5	EX	0,00	-2123,16	-636,95	0,000	8070,540	-26901,510
LT4	EX	0,00	-2322,37	-696,71	0,000	10160,670	-33868,620
LT3	EX	0,00	-2485,42	-745,63	0,000	12770,375	-42567,590
LT2	EX	0,00	-2630,72	-789,22	0,000	17111,085	-57036,550
LT1	EX	0,00	-2691,11	-807,34	0,000	19533,105	-65109,880
ATAP	EY	0,00	-86,75	-289,15	0,000	867,450	-260,250
LT10	EY	0,00	-201,20	-670,64	0,000	2879,370	-863,850
LT9	EY	0,00	-305,24	-1017,45	0,000	5931,720	-1779,570
LT8	EY	0,00	-401,58	-1338,60	0,000	9947,520	-2984,310

LT7	EY	0,00	-490,38	-1634,59	0,000	14851,290	-4455,450
LT6	EY	0,00	-568,08	-1893,58	0,000	20532,030	-6159,690
LT5	EY	0,00	-636,95	-2123,16	0,000	26901,510	-8070,540
LT4	EY	0,00	-696,71	-2322,37	0,000	33868,620	-10160,670
LT3	EY	0,00	-745,63	-2485,42	0,000	42567,590	-12770,375
LT2	EY	0,00	-789,22	-2630,72	0,000	57036,550	-17111,085
LT1	EY	0,00	-807,34	-2691,11	0,000	65109,880	-19533,105

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STORY DRIFTS

STORY	DIRECTION	LOAD	MAX DRIFT
ATAP	X	EX	1/5394
ATAP	Y	EX	1/6334
LT10	X	EX	1/3244
LT10	Y	EX	1/4588
LT9	X	EX	1/2226
LT9	Y	EX	1/3389
LT8	X	EX	1/2514
LT8	Y	EX	1/3353
LT7	X	EX	1/2109
LT7	Y	EX	1/2908
LT6	X	EX	1/1839
LT6	Y	EX	1/2600
LT5	X	EX	1/2014
LT5	Y	EX	1/2674
LT4	X	EX	1/1800
LT4	Y	EX	1/2474
LT3	X	EX	1/1433
LT3	Y	EX	1/2146
LT2	X	EX	1/1325
LT2	Y	EX	1/2181
LT1	X	EX	1/3321
LT1	Y	EX	1/5553
ATAP	X	EY	1/5664
ATAP	Y	EY	1/1031
LT10	X	EY	1/3830
LT10	Y	EY	1/751
LT9	X	EY	1/2743
LT9	Y	EY	1/556
LT8	X	EY	1/2846
LT8	Y	EY	1/550
LT7	X	EY	1/2435

LT7	Y	EY	1/477
LT6	X	EY	1/2155
LT6	Y	EY	1/427
LT5	X	EY	1/2264
LT5	Y	EY	1/439
LT4	X	EY	1/2066
LT4	Y	EY	1/407
LT3	X	EY	1/1735
LT3	Y	EY	1/354
LT2	X	EY	1/1702
LT2	Y	EY	1/361
LT1	X	EY	1/4303
LT1	Y	EY	1/921

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DISPLACEMENTS AT DIAPHRAGM CENTER OF MASS

STORY	DIAPHRAGM	LOAD	UX	UY	RZ
ATAP	D1	EX	0,0165	0,0058	-0,00017
LT10	D1	EX	0,0160	0,0056	-0,00017
LT9	D1	EX	0,0152	0,0053	-0,00016
LT8	D1	EX	0,0139	0,0049	-0,00015
LT7	D1	EX	0,0128	0,0044	-0,00013
LT6	D1	EX	0,0115	0,0039	-0,00012
LT5	D1	EX	0,0100	0,0034	-0,00010
LT4	D1	EX	0,0086	0,0029	-0,00008
LT3	D1	EX	0,0070	0,0023	-0,00007
LT2	D1	EX	0,0048	0,0015	-0,00004
LT1	D1	EX	0,0009	0,0003	-0,00001
BASE	D1	EX	0,0000	0,0000	0,00000
ATAP	D1	EY	0,0047	0,0205	-0,00147
LT10	D1	EY	0,0046	0,0198	-0,00142
LT9	D1	EY	0,0043	0,0187	-0,00134
LT8	D1	EY	0,0040	0,0172	-0,00123
LT7	D1	EY	0,0037	0,0156	-0,00112
LT6	D1	EY	0,0033	0,0139	-0,00099
LT5	D1	EY	0,0029	0,0119	-0,00085
LT4	D1	EY	0,0025	0,0100	-0,00072
LT3	D1	EY	0,0020	0,0079	-0,00057
LT2	D1	EY	0,0014	0,0051	-0,00037
LT1	D1	EY	0,0002	0,0009	-0,00007

BASE D1 EY 0,0000 0,0000 0,00000

ETABS v9.0.0 File:MARTIN_SKRIPSI Units:KN-m Februari 8, 2011 0:38 STORY

MAXIMUM AND AVERAGE LATERAL DISPLACEMENTS

STORY	LOAD	DIR	MAXIMUM	AVERAGE	RATIO
ATAP	EX	X	0,0177	0,0165	1,072
LT10	EX	X	0,0172	0,0160	1,072
LT9	EX	X	0,0162	0,0152	1,071
LT8	EX	X	0,0149	0,0139	1,072
LT7	EX	X	0,0137	0,0128	1,071
LT6	EX	X	0,0123	0,0115	1,070
LT5	EX	X	0,0107	0,0100	1,069
LT4	EX	X	0,0092	0,0086	1,068
LT3	EX	X	0,0075	0,0070	1,066
LT2	EX	X	0,0051	0,0048	1,063
LT1	EX	X	0,0009	0,0009	1,062
ATAP	EY	Y	0,0737	0,0211	3,497
LT10	EY	Y	0,0707	0,0202	3,500
LT9	EY	Y	0,0668	0,0191	3,503
LT8	EY	Y	0,0614	0,0175	3,506
LT7	EY	Y	0,0559	0,0159	3,509
LT6	EY	Y	0,0496	0,0141	3,511
LT5	EY	Y	0,0426	0,0121	3,514
LT4	EY	Y	0,0358	0,0102	3,516
LT3	EY	Y	0,0284	0,0081	3,518
LT2	EY	Y	0,0185	0,0053	3,517
LT1	EY	Y	0,0033	0,0009	3,519

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LOADING COMBINATIONS

COMBO	CASE	SCALE		
COMBO	TYPE	CASE	TYPE	FACTOR
COMB20	ENVE	COMB1	Combo	1,0000
	COMB2	Combo		1,0000

COMB3	Combo	1,0000
COMB4	Combo	1,0000
COMB5	Combo	1,0000
COMB6	Combo	1,0000
COMB7	Combo	1,0000
COMB8	Combo	1,0000
COMB9	Combo	1,0000
COMB10	Combo	1,0000
COMB11	Combo	1,0000
COMB12	Combo	1,0000
COMB13	Combo	1,0000
COMB14	Combo	1,0000
COMB15	Combo	1,0000
COMB16	Combo	1,0000
COMB17	Combo	1,0000
COMB18	Combo	1,0000
COMB19	Combo	1,0000

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SUPPORT REACTIONS

STORY	POINT	LOAD	FX	FY	FZ	MX	MY	MZ
BASE	1	COMB20 Max	40,43	138,47	2134,71	557,595	124,968	8,280
BASE	1	COMB20 Min	-28,45	-111,96	335,81	-574,220	-112,891	-8,104
BASE	2	COMB20 Max	43,39	140,86	2262,36	584,476	131,625	8,280
BASE	2	COMB20 Min	-39,30	-140,64	956,19	-577,508	-127,696	-8,104
BASE	3	COMB20 Max	52,66	124,72	3018,49	521,853	136,238	8,280
BASE	3	COMB20 Min	-40,81	-104,45	890,83	-533,505	-124,282	-8,104
BASE	4	COMB20 Max	58,43	186,37	3718,69	616,085	145,491	8,280
BASE	4	COMB20 Min	-42,74	-208,22	850,28	-589,926	-130,869	-8,104

BASE	5	COMB20 Max	48,41	209,06	4297,62	597,998	141,127	8,280
BASE	5	COMB20 Min	-51,31	-189,28	498,40	-609,201	-143,896	-8,104
BASE	6	COMB20 Max	45,84	103,34	2939,13	544,067	154,741	8,280
BASE	6	COMB20 Min	-30,39	-127,98	1046,72	-515,401	-141,482	-8,104
BASE	7	COMB20 Max	42,77	107,38	4114,90	467,779	127,130	8,280
BASE	7	COMB20 Min	-40,02	-94,05	1636,23	-474,169	-123,550	-8,104
BASE	9	COMB20 Max	44,47	167,63	4998,07	549,356	132,621	8,280
BASE	9	COMB20 Min	-42,14	-184,54	1530,95	-528,600	-130,316	-8,104
BASE	10	COMB20 Max	47,28	181,43	5037,45	535,959	140,058	8,280
BASE	10	COMB20 Min	-44,61	-169,98	1537,58	-540,653	-137,704	-8,104
BASE	11	COMB20 Max	54,57	92,51	4145,62	481,951	162,792	8,280
BASE	11	COMB20 Min	-53,12	-109,44	1650,80	-461,169	-162,437	-8,104
BASE	12	COMB20 Max	41,55	95,60	4147,71	411,530	126,006	8,280
BASE	12	COMB20 Min	-40,84	-82,05	1782,72	-419,072	-124,305	-8,104
BASE	13	COMB20 Max	43,22	147,13	4989,45	484,961	131,470	8,280
BASE	13	COMB20 Min	-42,97	-163,45	1722,81	-465,690	-131,078	-8,104
BASE	14	COMB20 Max	45,72	160,89	5012,90	471,650	138,628	8,280
BASE	14	COMB20 Min	-45,65	-149,04	1739,57	-477,666	-138,668	-8,104
BASE	15	COMB20 Max	53,29	80,78	4171,51	425,569	161,780	8,280
BASE	15	COMB20 Min	-53,67	-97,29	1797,55	-406,138	-163,106	-8,104
BASE	16	COMB20 Max	41,45	83,91	4070,26	355,232	125,912	8,280
BASE	16	COMB20 Min	-40,89	-70,04	1865,85	-364,026	-124,351	-8,104
BASE	17	COMB20 Max	43,12	126,61	4864,21	420,635	131,377	8,280

BASE	17	COMB20 Min	-43,02	-142,45	1854,21	-402,764	-131,126	-8,104
BASE	18	COMB20 Max	45,65	140,44	4883,40	407,326	138,576	8,280
BASE	18	COMB20 Min	-45,71	-128,11	1867,37	-414,741	-138,737	-8,104
BASE	19	COMB20 Max	53,23	69,04	4089,38	369,269	161,725	8,280
BASE	19	COMB20 Min	-53,77	-85,22	1878,49	-351,094	-163,198	-8,104
BASE	20	COMB20 Max	41,45	72,21	3991,31	298,935	125,912	8,280
BASE	20	COMB20 Min	-40,89	-58,02	1948,08	-308,983	-124,350	-8,104
BASE	21	COMB20 Max	43,12	106,09	4737,60	356,310	131,377	8,280
BASE	21	COMB20 Min	-43,02	-121,44	1984,48	-339,838	-131,126	-8,104
BASE	22	COMB20 Max	45,65	119,99	4752,25	343,056	138,575	8,280
BASE	22	COMB20 Min	-45,71	-107,17	1994,27	-351,870	-138,738	-8,104
BASE	23	COMB20 Max	53,23	57,30	4006,07	312,970	161,724	8,280
BASE	23	COMB20 Min	-53,77	-73,16	1957,79	-296,048	-163,199	-8,104
BASE	24	COMB20 Max	41,42	60,51	3912,68	242,837	125,884	8,280
BASE	24	COMB20 Min	-40,93	-46,00	2030,37	-254,139	-124,388	-8,104
BASE	25	COMB20 Max	43,07	85,57	4610,71	291,985	131,326	8,280
BASE	25	COMB20 Min	-43,09	-100,44	2114,13	-276,912	-131,179	-8,104
BASE	26	COMB20 Max	45,62	99,54	4620,30	278,955	138,547	8,280
BASE	26	COMB20 Min	-45,79	-86,24	2121,19	-289,168	-138,812	-8,104
BASE	27	COMB20 Max	53,20	45,56	3921,13	256,672	161,693	8,280
BASE	27	COMB20 Min	-53,86	-61,10	2036,65	-241,001	-163,285	-8,104
BASE	28	COMB20 Max	41,02	48,82	3784,17	186,739	125,355	8,280
BASE	28	COMB20 Min	-41,44	-33,98	2081,40	-199,301	-124,704	-8,104

BASE	29	COMB20 Max	42,55	65,01	4411,19	227,730	130,836	8,280
BASE	29	COMB20 Min	-43,96	-79,51	2189,88	-213,952	-131,971	-8,104
BASE	30	COMB20 Max	44,98	79,10	4400,80	214,859	137,963	8,280
BASE	30	COMB20 Min	-46,85	-65,31	2201,94	-226,479	-139,786	-8,104
BASE	31	COMB20 Max	52,59	33,78	3734,23	200,449	161,129	8,280
BASE	31	COMB20 Min	-54,94	-49,12	2070,82	-185,920	-164,278	-8,104
BASE	32	COMB20 Max	41,20	38,43	3127,57	129,940	125,511	8,280
BASE	32	COMB20 Min	-52,51	-21,18	1740,22	-145,627	-134,892	-8,104
BASE	33	COMB20 Max	43,41	42,93	3535,25	165,893	131,629	8,280
BASE	33	COMB20 Min	-54,51	-61,28	1730,48	-149,627	-141,697	-8,104
BASE	34	COMB20 Max	44,88	61,19	3225,23	149,888	137,868	8,280
BASE	34	COMB20 Min	-59,26	-43,41	1748,22	-166,057	-151,220	-8,104
BASE	35	COMB20 Max	55,65	19,68	2741,40	148,421	163,950	8,280
BASE	35	COMB20 Min	-64,97	-41,81	1648,06	-128,755	-173,525	-8,104
BASE	36	COMB20 Max	50,59	35,47	2423,91	92,125	134,248	8,280
BASE	36	COMB20 Min	-50,99	-11,11	1411,56	-114,814	-133,569	-8,104
BASE	37	COMB20 Max	53,03	28,55	2796,21	126,953	140,495	8,280
BASE	37	COMB20 Min	-53,22	-50,06	1503,15	-108,458	-140,501	-8,104
BASE	38	COMB20 Max	57,97	50,25	2743,80	107,760	149,913	8,280
BASE	38	COMB20 Min	-54,92	-28,53	1484,34	-128,080	-147,207	-8,104
BASE	39	COMB20 Max	65,25	11,45	2463,35	113,650	172,801	8,280
BASE	39	COMB20 Min	-67,06	-35,24	1453,07	-93,111	-175,450	-8,104
BASE	40	COMB20 Max	51,32	15,75	2332,02	64,889	135,008	8,280
BASE	40	COMB20 Min	-47,86	-13,01	1392,48	-68,775	-130,773	-8,104

BASE	41	COMB20 Max	50,03	26,27	2725,70	75,234	137,727	8,280
BASE	41	COMB20 Min	-53,64	-24,34	1613,61	-78,388	-140,887	-8,104
BASE	42	COMB20 Max	58,04	36,27	3044,36	67,142	149,973	8,280
BASE	42	COMB20 Min	-52,65	-15,33	1734,19	-87,364	-145,110	-8,104
BASE	43	COMB20 Max	67,11	5,81	2860,20	74,486	174,342	8,280
BASE	43	COMB20 Min	-62,06	-23,78	1662,17	-59,783	-170,669	-8,104
BASE	44	COMB20 Max	52,25	15,54	3470,05	25,151	135,863	8,280
BASE	44	COMB20 Min	-35,51	0,70	2104,12	-41,855	-119,390	-8,104
BASE	45	COMB20 Max	57,46	6,21	3934,27	42,345	144,597	8,280
BASE	45	COMB20 Min	-35,03	-18,86	2376,75	-33,127	-123,764	-8,104
BASE	46	COMB20 Max	55,32	21,26	3993,50	29,753	147,469	8,280
BASE	46	COMB20 Min	-41,31	-4,43	2269,04	-46,995	-134,655	-8,104
BASE	47	COMB20 Max	63,34	-0,08	3635,33	38,606	170,873	8,280
BASE	47	COMB20 Min	-49,56	-14,69	2053,44	-27,478	-159,150	-8,104
BASE	48	COMB20 Max	37,81	18,65	4357,79	44,803	122,556	8,280
BASE	48	COMB20 Min	-37,26	-4,21	2679,50	-61,055	-121,003	-8,104
BASE	49	COMB20 Max	39,21	14,27	4976,46	63,521	127,759	8,280
BASE	49	COMB20 Min	-39,31	-25,24	2978,44	-56,962	-127,687	-8,104
BASE	50	COMB20 Max	41,62	27,22	4960,37	52,507	134,862	8,280
BASE	50	COMB20 Min	-41,70	-12,79	2968,67	-68,748	-135,042	-8,104
BASE	51	COMB20 Max	48,50	5,20	4344,85	56,527	157,366	8,280
BASE	51	COMB20 Min	-49,09	-17,34	2672,21	-48,926	-158,889	-8,104
BASE	52	COMB20 Max	37,91	34,02	3594,02	105,152	122,483	8,280

BASE	52	COMB20 Min	-53,29	-16,05	1970,60	-125,724	-135,610	-8,104
BASE	53	COMB20 Max	40,34	36,46	4028,01	134,504	128,800	8,280
BASE	53	COMB20 Min	-54,81	-49,50	2239,10	-127,245	-141,972	-8,104
BASE	54	COMB20 Max	43,09	52,14	4095,15	121,706	136,224	8,280
BASE	54	COMB20 Min	-57,76	-34,49	2137,39	-141,988	-149,844	-8,104
BASE	55	COMB20 Max	50,84	17,38	3670,40	118,998	159,517	8,280
BASE	55	COMB20 Min	-67,37	-32,26	1853,40	-110,083	-175,733	-8,104
BASE	56	COMB20 Max	50,32	41,58	3230,74	135,734	134,081	8,280
BASE	56	COMB20 Min	-43,27	-22,43	1862,43	-157,948	-126,544	-8,104
BASE	57	COMB20 Max	51,12	48,31	3831,25	170,297	138,732	8,280
BASE	57	COMB20 Min	-46,39	-61,81	1924,09	-163,205	-134,205	-8,104
BASE	58	COMB20 Max	54,03	64,80	3746,22	156,959	146,306	8,280
BASE	58	COMB20 Min	-49,00	-46,08	1973,08	-178,790	-141,768	-8,104
BASE	59	COMB20 Max	63,23	23,92	3188,71	150,297	170,773	8,280
BASE	59	COMB20 Min	-57,57	-39,59	1876,35	-141,258	-166,537	-8,104
BASE	60	COMB20 Max	21,84	57,02	2585,18	186,118	107,673	8,280
BASE	60	COMB20 Min	-36,67	-32,40	1334,00	-214,202	-120,298	-8,104
BASE	61	COMB20 Max	39,14	65,51	3378,11	232,707	127,713	8,280
BASE	61	COMB20 Min	-35,37	-85,42	1343,93	-220,825	-124,071	-8,104
BASE	62	COMB20 Max	43,66	85,66	3084,38	214,374	136,745	8,280
BASE	62	COMB20 Min	-58,41	-63,88	1422,37	-239,911	-150,438	-8,104
BASE	63	COMB20 Max	54,80	33,69	2649,06	204,553	163,173	8,280
BASE	63	COMB20 Min	-65,93	-54,06	1209,47	-192,265	-174,410	-8,104

BASE	64	COMB20 Max	36,63	57,02	2330,80	234,903	130,263	8,280
BASE	64	COMB20 Min	-40,57	-57,28	879,52	-241,273	-134,002	-8,104

BASE	65	COMB20 Max	38,57	39,97	1752,03	243,048	148,213	8,280
BASE	65	COMB20 Min	-50,42	-66,54	715,78	-225,814	-160,113	-8,104

Summation	0, 0, Base	COMB20 MAX	3052,90	4367,42	236633,97	1637539,960	-8219841,61	86728,014
Summation	0, 0, Base	COMB20 MIN	-3052,90	-4367,42	112138,60	755302,534	-4279901,86	-86728,014

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C O L U M N F O R C E S

STORY	COLUMN	LOAD	LOC	P	V2	V3	T	M2	M3
LT2	C7	COMB20 MAX							
		0,0000	-1528,99	84,73	42,90	20,671	128,093	326,957	
		2,4500	-1499,35	84,73	42,90	20,671	23,113	125,353	
		4,9000	-1469,72	84,73	42,90	20,671	72,285	212,960	
LT2	C7	COMB20 MIN							
		0,0000	-3826,22	-127,04	-39,11	-21,092	-119,337	-409,526	
		2,4500	-3786,71	-127,04	-39,11	-21,092	-23,641	-104,267	
		4,9000	-3747,20	-127,04	-39,11	-21,092	-82,098	-88,220	
LT2	C9	COMB20 MAX							
		0,0000	-1669,69	190,86	44,61	20,671	132,991	575,424	
		2,4500	-1640,06	190,86	44,61	20,671	23,857	111,712	
		4,9000	-1610,42	190,86	44,61	20,671	76,243	256,583	
LT2	C9	COMB20 MIN							
		0,0000	-4459,36	-153,80	-41,12	-21,092	-125,222	-497,057	
		2,4500	-4419,84	-153,80	-41,12	-21,092	-24,653	-124,124	
		4,9000	-4380,33	-153,80	-41,12	-21,092	-85,605	-359,774	
LT2	C10	COMB20 MAX							
		0,0000	-1672,73	155,36	47,13	20,671	140,728	502,396	
		2,4500	-1643,09	155,36	47,13	20,671	25,417	126,475	
		4,9000	-1613,46	155,36	47,13	20,671	81,127	356,919	
LT2	C10	COMB20 MIN							

			0,0000	-4496,42	-188,72	-43,68	-21,092	-132,886	-567,831
			2,4500	-4456,91	-188,72	-43,68	-21,092	-26,026	-110,160
			4,9000	-4417,40	-188,72	-43,68	-21,092	-90,187	-258,854
LT1	C7	COMB20 MAX							
			0,0000	-1636,23	94,05	42,77	8,104	127,130	467,779
			1,2000	-1621,72	94,05	42,77	8,104	75,807	355,396
			2,4000	-1607,20	94,05	42,77	8,104	25,227	243,014
LT1	C7	COMB20 MIN							
			0,0000	-4114,90	-107,38	-40,02	-8,280	-123,550	-474,169
			1,2000	-4095,55	-107,38	-40,02	-8,280	-75,531	-345,779
			2,4000	-4076,19	-107,38	-40,02	-8,280	-28,254	-217,390
LT1	C9	COMB20 MAX							
			0,0000	-1530,95	184,54	44,47	8,104	132,621	549,356
			1,2000	-1516,43	184,54	44,47	8,104	79,399	327,913
			2,4000	-1501,92	184,54	44,47	8,104	26,724	107,285
LT1	C9	COMB20 MIN							
			0,0000	-4998,07	-167,63	-42,14	-8,280	-130,316	-528,600
			1,2000	-4978,72	-167,63	-42,14	-8,280	-79,883	-327,442
			2,4000	-4959,36	-167,63	-42,14	-8,280	-29,996	-127,099
LT1	C10	COMB20 MAX							
			0,0000	-1537,58	169,98	47,28	8,104	140,058	535,959
			1,2000	-1523,06	169,98	47,28	8,104	83,514	332,427
			2,4000	-1508,55	169,98	47,28	8,104	27,506	128,894
LT1	C10	COMB20 MIN							
			0,0000	-5037,45	-181,43	-44,61	-8,280	-137,704	-540,653
			1,2000	-5018,09	-181,43	-44,61	-8,280	-84,358	-323,381
			2,4000	-4998,74	-181,43	-44,61	-8,280	-31,549	-106,110

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BEAM FORCES

STORY	BEAM	LOAD	LOC	P	V2	V3	T	M2	M3
LT2	B8	COMB20 MAX							

			0,4000	0,00	54,12	0,00	4,039	0,000	229,965
			0,8682	0,00	62,07	0,00	4,039	0,000	202,827
			1,3364	0,00	71,58	0,00	4,039	0,000	176,135
			1,8045	0,00	81,61	0,00	4,039	0,000	146,563
			2,2727	0,00	91,64	0,00	4,039	0,000	110,046
			2,7409	0,00	101,67	0,00	4,039	0,000	66,583
			3,2091	0,00	115,09	0,00	4,039	0,000	83,214
			3,6773	0,00	129,92	0,00	4,039	0,000	123,931
			4,1455	0,00	144,76	0,00	4,039	0,000	157,702
			4,6136	0,00	159,59	0,00	4,039	0,000	184,528
			5,0818	0,00	173,55	0,00	4,039	0,000	212,641
			5,5500	0,00	184,89	0,00	4,039	0,000	237,960
LT2	B8	COMB20 MIN							
			0,4000	0,00	-179,03	0,00	-3,930	0,000	-305,710
			0,8682	0,00	-167,68	0,00	-3,930	0,000	-224,446
			1,3364	0,00	-153,73	0,00	-3,930	0,000	-153,650
			1,8045	0,00	-138,89	0,00	-3,930	0,000	-91,437
			2,2727	0,00	-124,06	0,00	-3,930	0,000	-33,920
			2,7409	0,00	-109,22	0,00	-3,930	0,000	18,901
			3,2091	0,00	-97,78	0,00	-3,930	0,000	-0,013
			3,6773	0,00	-87,75	0,00	-3,930	0,000	-54,654
			4,1455	0,00	-77,72	0,00	-3,930	0,000	-113,991
			4,6136	0,00	-67,69	0,00	-3,930	0,000	-178,024
			5,0818	0,00	-58,19	0,00	-3,930	0,000	-254,807
			5,5500	0,00	-50,24	0,00	-3,930	0,000	-338,818
LT1	B8	COMB20 MAX							
			0,4000	0,00	28,22	0,00	2,670	0,000	149,583
			0,8682	0,00	36,14	0,00	2,670	0,000	134,516
			1,3364	0,00	44,06	0,00	2,670	0,000	117,637
			1,8045	0,00	51,98	0,00	2,670	0,000	98,626
			2,2727	0,00	59,89	0,00	2,670	0,000	74,673
			2,7409	0,00	67,81	0,00	2,670	0,000	45,778
			3,2091	0,00	77,55	0,00	2,670	0,000	55,790

		3,6773	0,00	88,11	0,00	2,670	0,000	83,244
		4,1455	0,00	98,67	0,00	2,670	0,000	105,756
		4,6136	0,00	109,22	0,00	2,670	0,000	123,326
		5,0818	0,00	119,78	0,00	2,670	0,000	140,894
		5,5500	0,00	130,34	0,00	2,670	0,000	154,994
LT1	B8	COMB20 MIN						
		0,4000	0,00	-127,26	0,00	-2,094	0,000	-212,726
		0,8682	0,00	-116,70	0,00	-2,094	0,000	-155,618
		1,3364	0,00	-106,14	0,00	-2,094	0,000	-105,346
		1,8045	0,00	-95,59	0,00	-2,094	0,000	-61,592
		2,2727	0,00	-85,03	0,00	-2,094	0,000	-21,545
		2,7409	0,00	-74,48	0,00	-2,094	0,000	14,795
		3,2091	0,00	-65,74	0,00	-2,094	0,000	3,579
		3,6773	0,00	-57,83	0,00	-2,094	0,000	-33,729
		4,1455	0,00	-49,91	0,00	-2,094	0,000	-74,744
		4,6136	0,00	-41,99	0,00	-2,094	0,000	-119,465
		5,0818	0,00	-34,07	0,00	-2,094	0,000	-172,835
		5,5500	0,00	-26,16	0,00	-2,094	0,000	-231,385

