

## BAB V

### KESIMPULAN DAN SARAN

#### 5.1 Kesimpulan

Pada Perancangan Struktur Hotel 11 lantai di Jalan Kaliurang, komponen struktural yang di tinjau meliputi pelat lantai dan atap, tangga, balok, kolom, dan juga fondasi berupa *bored pile*. Setelah dilakukan estimasi dimensi, analisis struktur, dan perhitungan komponen stuktur, dapat kesimpulan sebagai berikut:

1. Pelat lantai dan atap memiliki ketebalan 125 mm dengan tulangan pokok dan susut D8-200.
2. Pelat tangga dan pelat bordes memiliki ketebalan 150 mm dengan tulangan tumpuan D13-150, tulangan lapangan D13-300, dan tulangan susut D10-250. Balok bordes menggunakan dimensi 250 x 350 dengan detail penulangan sebagai berikut:

Tabel 5.1 Penulangan Balok Bordes

	Tumpuan	Lapangan
Tulangan Atas	3D16	2D16
Tulangan Bawah	2D16	2D16
Sengkang	2P10-50	2P10-100

3. Berdasarkan nilai SPT tanah di lokasi perencanaan termasuk kelas situs SD dengan  $SDS = 0,820$  g dan  $SD1 = 0,461$  g.
4. Kategori desain seismic adalah KDS D
5. Sistem struktur yang digunakan merupakan sistem rangka pemikul momen khusus.
6. Perhitungan balok yang dihitung adalah balok B1 pada portal A dan Portal D. Dapat disimpulkan kebutuhan tulangan pada portal tengah

(D) lebih banyak dibandingkan portal tepi (A). Hasil Perhitungan

balok dapat dilihat sebagai berikut :

Tabel 5.2 Penulangan balok B1 portal A

Balok		Tumpuan Tulangan	Lapangan Tulangan
B1 (40x60) Roof & Lt. 9	Tul. Atas	5D22	2D22
	Tul. Bawah	3D22	2D22
	Sengkang	3P12-100	3P12-150
B1 (40x60) Lt. 6, 7, 8	Tul. Atas	8D22	3D22
	Tul. Bawah	4D22	4D22
	Sengkang	4P12-100	4P12-150
B1 (40x60) Lt. 3, 4, 5	Tul. Atas	8D22	3D22
	Tul. Bawah	5D22	4D22
	Sengkang	4P12-100	4P12-150
B1 (40x60) Lt. 1, Mezz, Lt. Dasar	Tul. Atas	7D22	3D22
	Tul. Bawah	5D22	4D22
	Sengkang	4P12-100	4P12-150

Tabel 5.3 Penulangan balok B1 portal D

Balok		Tumpuan Tulangan	Lapangan Tulangan
B1 (40x60) Roof & Lt. 9	Tul. Atas	7D22	2D22
	Tul. Bawah	3D22	4D22
	Sengkang	4P12-100	4P12-150
B1 (40x60) Lt. 6, 7, 8	Tul. Atas	9D22	2D22
	Tul. Bawah	4D22	4D22
	Sengkang	4P12-100	4P12-150
B1 (40x60) Lt. 3, 4, 5	Tul. Atas	10D22	3D22
	Tul. Bawah	5D22	4D22
	Sengkang	4P12-100	4P12-125
B1 (40x60) Lt. 1, Mezz, Lt. Dasar	Tul. Atas	9D22	3D22
	Tul. Bawah	4D22	4D22
	Sengkang	4P12-100	4P12-125

7. Penulangan Kolom yang dihitung yaitu kolom pada portal A (C16) dan portal D (C13). Dengan hasil perhitungan sebagai berikut :

Tabel 5.4 Penulangan Kolom portal A

Kolom	Tulangan Longitudinal	Tul. Geser area $l_o$	Tul. Geser luar $l_o$
K4 Roof & Lt 9 (60 x 90)	12D25	4D13-75	4D13-150
K3 Lt 6, 7, 8(60 x 100)	16D25	4D13-75	4D13-150
K2 Lt 3, 4, 5 (60 x 110)	16D25	4D13-75	4D13-150
K1 Lt. mezz, 1, 2 (60 x 120)	16D25	5D13-75	5D13-150

Tabel 5.5 Penulangan Kolom portal D

Kolom	Tulangan Longitudinal	Tul. Geser area $l_o$	Tul. Geser luar $l_o$
K4 Roof & Lt 9 (60 x 90)	12D25	4D13-75	4D13-150
K3 Lt 6, 7, 8(60 x 100)	16D25	4D13-75	4D13-150
K2 Lt 3, 4, 5 (60 x 110)	16D25	4D13-75	4D13-150
K1 Lt. mezz, 1, 2 (60 x 120)	16D25	5D13-75	5D13-150

8. Fondasi *bored pile* menggunakan 4 buah tiang bor. *Pile cape* yang digunakan menggunakan ukuran 3600 mm x 3600 mm dengan tebal 900 mm, menggunakan tulangan pokok D32-150 dengan tulangan susut D25-200. Penulangan *bored pile* menggunakan tulangan pokok 8D22 dengan tulangan geser spiral D13-40.

## 5.2 Saran

Dari pengerjaan tugas akhir ini, penulis dapat menyarankan:

1. Dalam melakukan analisis struktur, penggunaan *software* seperti *ETABS* sangat membantu dalam mempercepat proses pengerjaan.
2. Dalam perencanaan sebaiknya dilakukan penjinjauan terhadap beban angin.
3. Pemahaman perencana terhadap gambar struktural sangat penting dalam proses perencanaan dan mempengaruhi pada pembebanan.

4. Banyak membaca buku, jurnal dan modul kuliah untuk memperluas wawasan dalam perencanaan.
5. Perhitungan daya dukung tanah sebaiknya dilakukan beberapa metode untuk meningkatkan keamanan, misalnya membandingkan data hasil CPT dengan SPT.



## DAFTAR PUSTAKA

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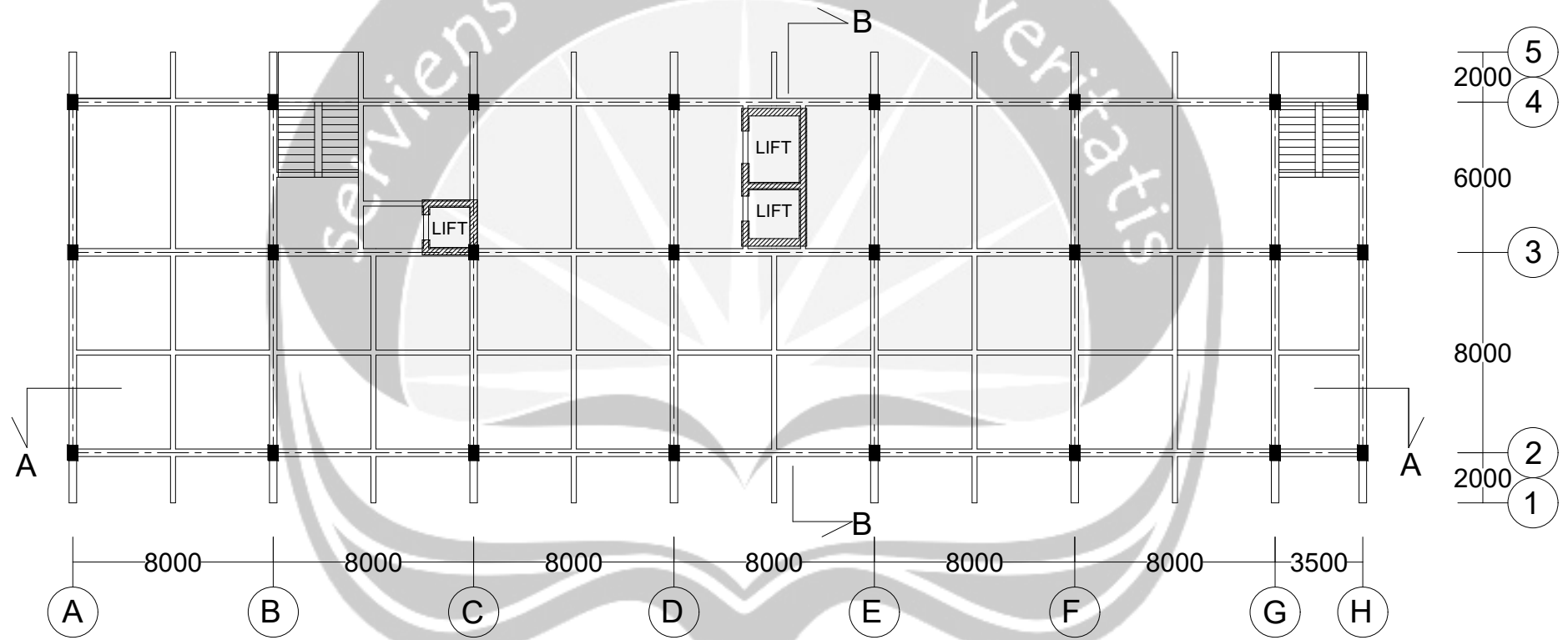


**BOR LOG**

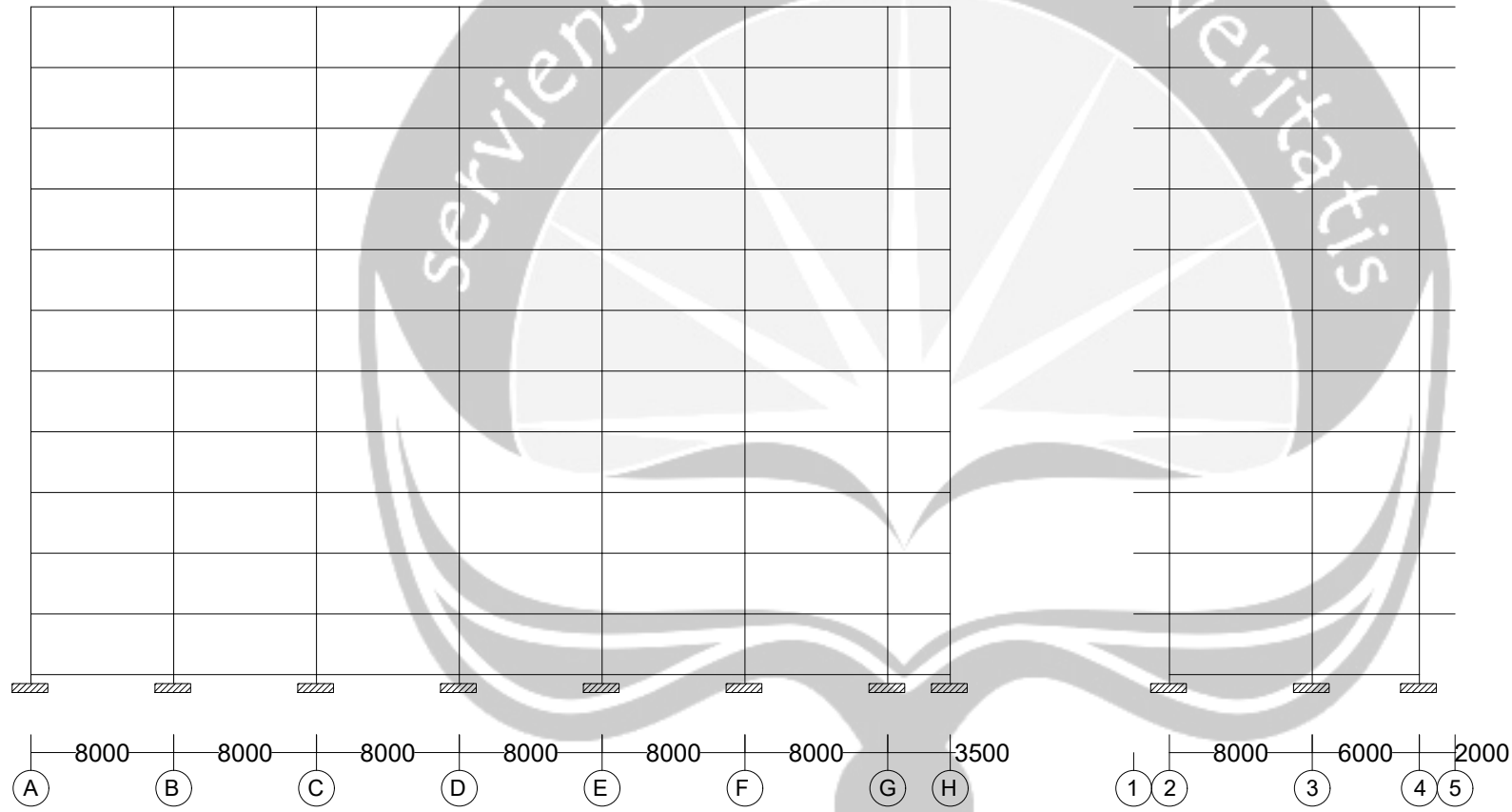
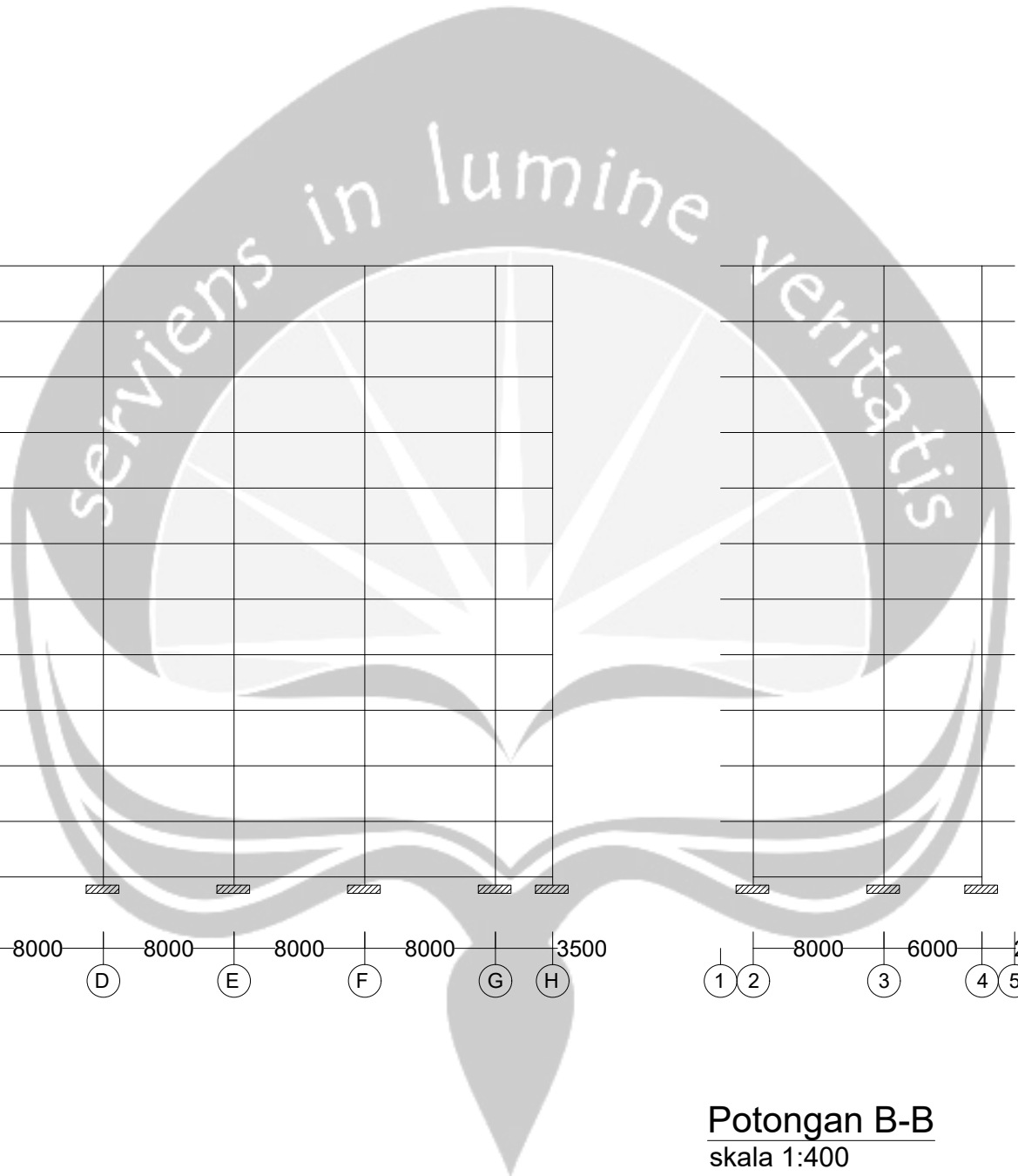
CLIENT:	PROJECT TITLE : 1
PROJECT CONTRACT NUMBER:	PROJECT LOCATION : Jl. Kaliurang Km. 5,3 CT IV No. 72 Karangwuni RT. 0
DATE STARTED: 01 April 2014	GROUND ELEVATION : + 0,15 m from road level
DATE COMPLETED : 01 April 2014	HOLE SIZE : 7.295cm
DRILLING CONTRACTOR: SOIL MECH. LAB. UAJY	GROUND WATER LEVEL : - 9,00 m
DRILLING METHOD: ROTARY SPINDLE, SKID MOUNTED TYPE	WEATHER CONDITION : FINE
LOGGED BY: Mukarob, CS.	ESTIMATED SEASONAL HIGH : -
CHECKED BY: SOIL MECH. LAB, UAJY	

Depth (m)	Graph Log	Material Description (field observations)	Contact Depth (m)	Sample Number	Blow Counts (N Value)				Water Level Elevation (m)	SPT Value	
					N1	N2	N3	Nv			
1		Pasir kasar (coklat, abu-abu)	2						0		
2			2	3	3	6		1			
3		Pasir kasar (coklat, abu-abu)	2		2	4	6	10	2		
4									3		
5		Pasir kasar (coklat, hitam)	6		3	6	12	18	4		
6				4	12	10	22	5			
7										6	
8				4	6	11	17	7			
9				5	7	10	17	8			
10									9		
11		Pasir sedang (coklat, hitam)	2		4	8	8	16	10		
12					6	12	12	24	11		
13									12		
14		Pasir (coklat, hitam)	4	I	6	15	21	36	13		
15					10	21	27	48	14		
16											15
17					12	22	29	51	16		
18					12	24	30	54	17		
19									18		
20		Pasir (coklat, abu-abu)	9,5	II	13	25	30	55	19		
21	15				25	30	55	20			
22										21	
23	16				27	29	56	22			
24	16				26	31	57	23			
25							24				
26				18	27	30	57	25			
27	Pasir halus (coklat, hitam)	1,5		13	22	25	47	26			
28								27			
29	Pasir (coklat, hitam)	6		17	20	28	48	28			
30				17	23	27	50	29			
31										30	
32				17	23	27	50	31			
33				17	24	28	52	32			
34							33				
35	Pasir (coklat, hitam)	7	III	16	25	28	53	34			
36				17	25	28	53	35			
37										36	
38				16	24	30	54	37			
39				16	24	31	55	38			
40							39				

Catatan: Pada pengamatan di lapangan, lanau bisa tampak seperti pasir halus atau pasir sangat halus



**Denah Balok Kolom**  
 skala 1:250



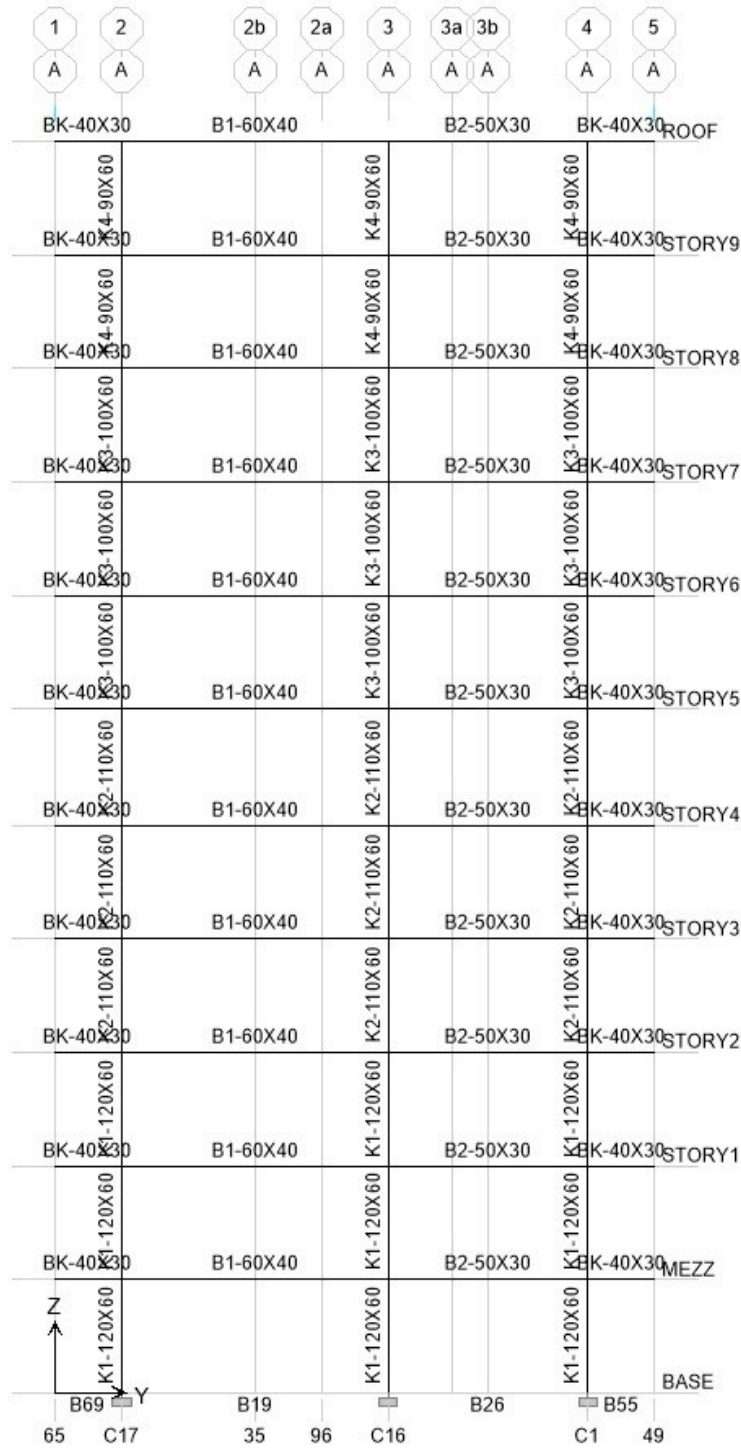
	Roof Top
	+37400
3400	9th Floor
	+34000
3400	8th Floor
	+30600
3400	7th Floor
	+27200
3400	6th Floor
	+23800
3400	5th Floor
	+20400
3400	4th Floor
	+17000
3400	3rd Floor
	+13600
3400	2nd Floor
	+10200
3400	1st Floor
	+6800
3400	Mezz Floor
	+3400
3400	Base
	+0
500	

**Potongan A-A**  
skala 1:400

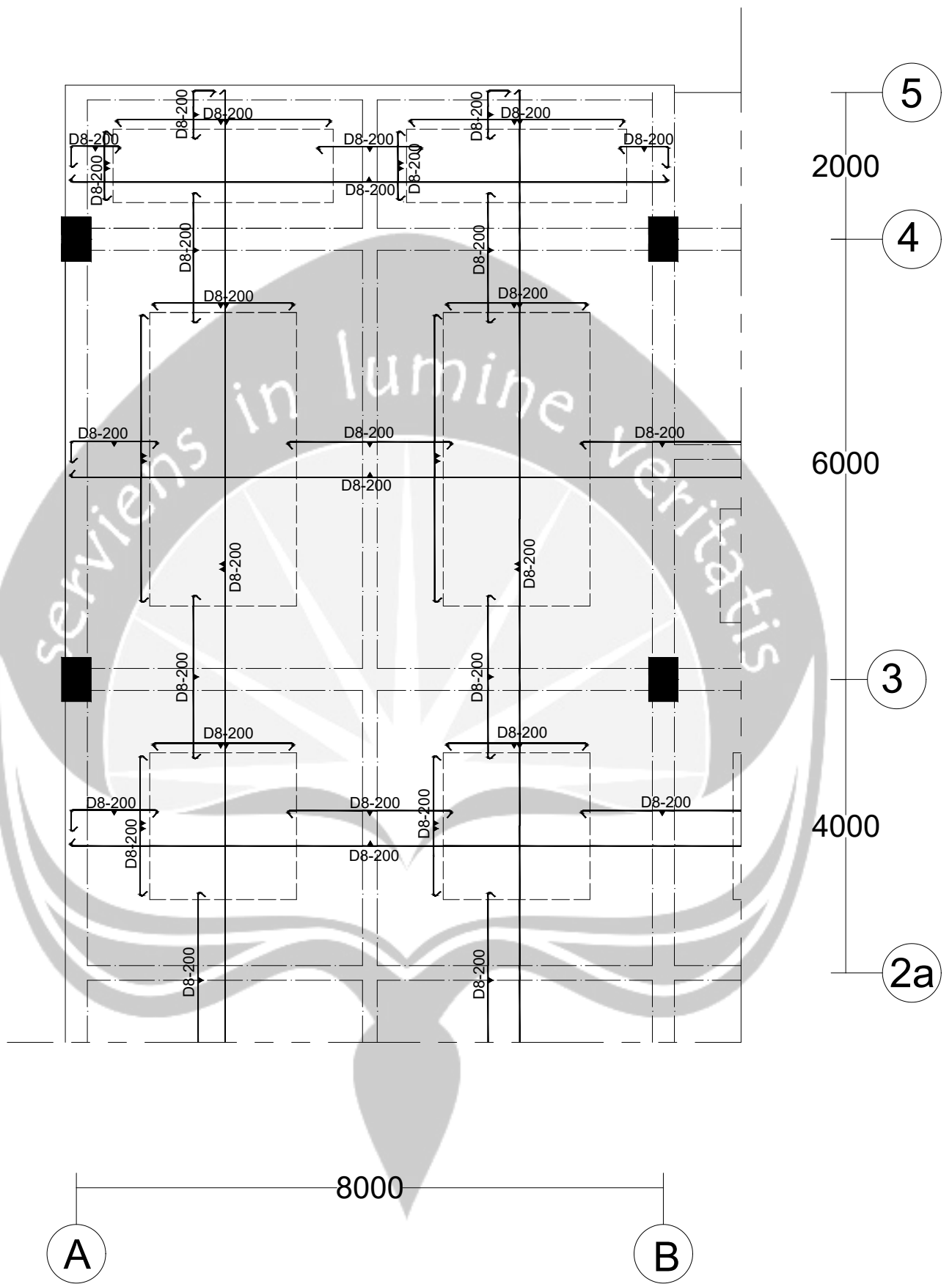
**Potongan B-B**  
skala 1:400



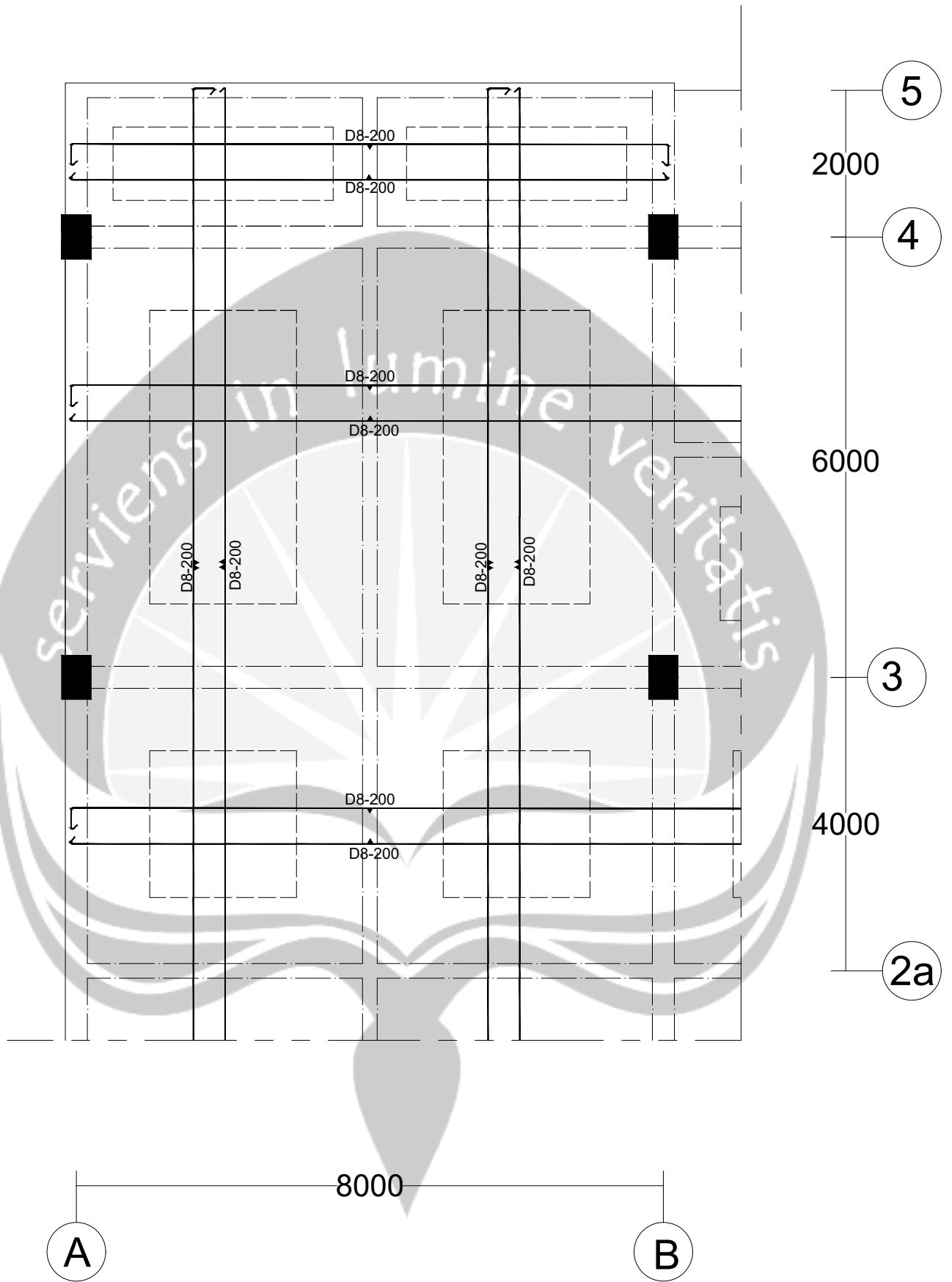
Portal A





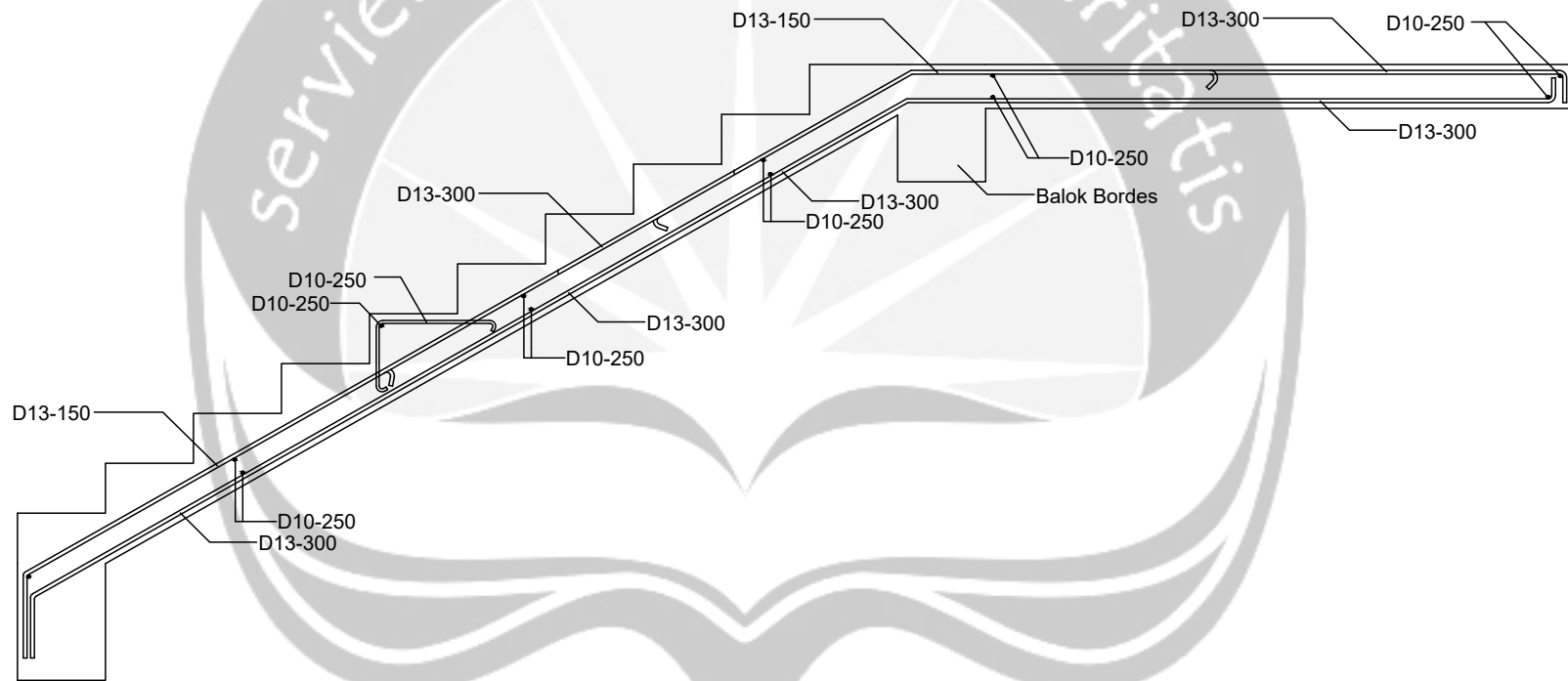


**Detail Pelat Lantai**  
 Skala 1:100

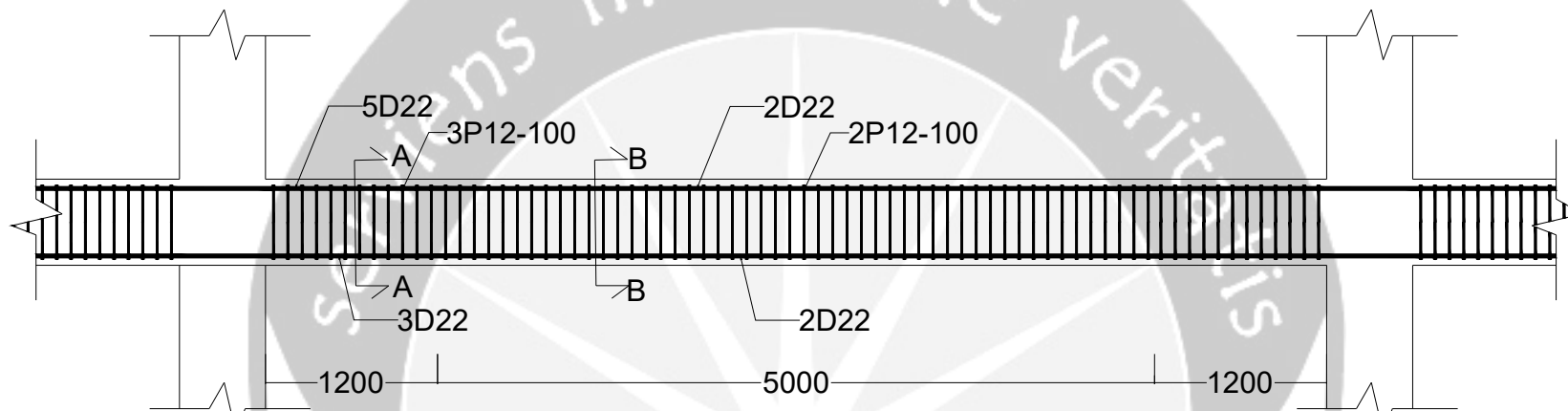


## Detail Pelat Atap

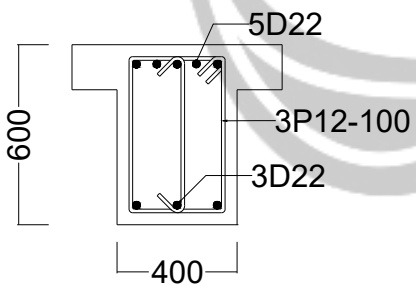
Skala 1:100



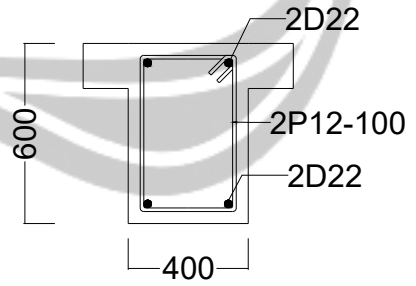
**Detail Tulangan Pelat Tangga dan Pelat Bordes**  
Skala 1:25



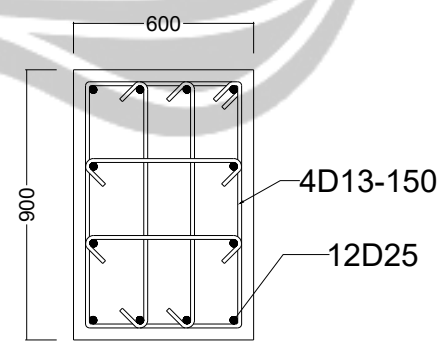
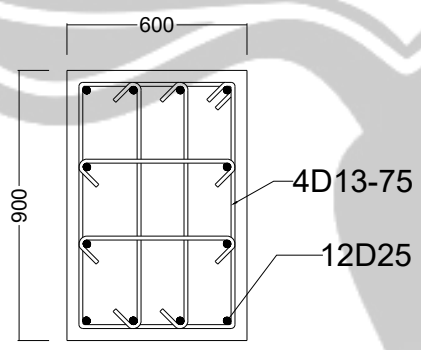
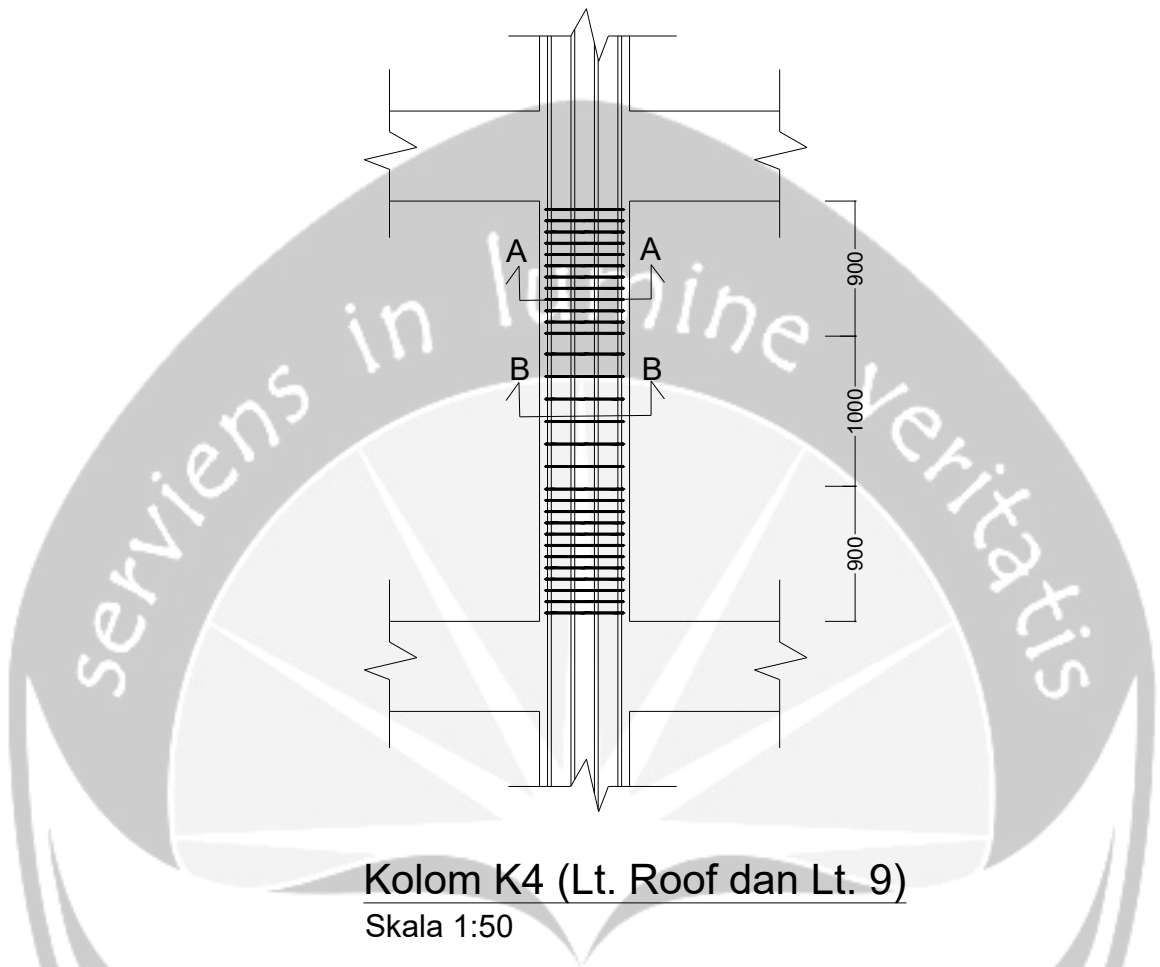
**Balok B1 (Lt. Roof dan Lt. 9)**  
Skala 1:50

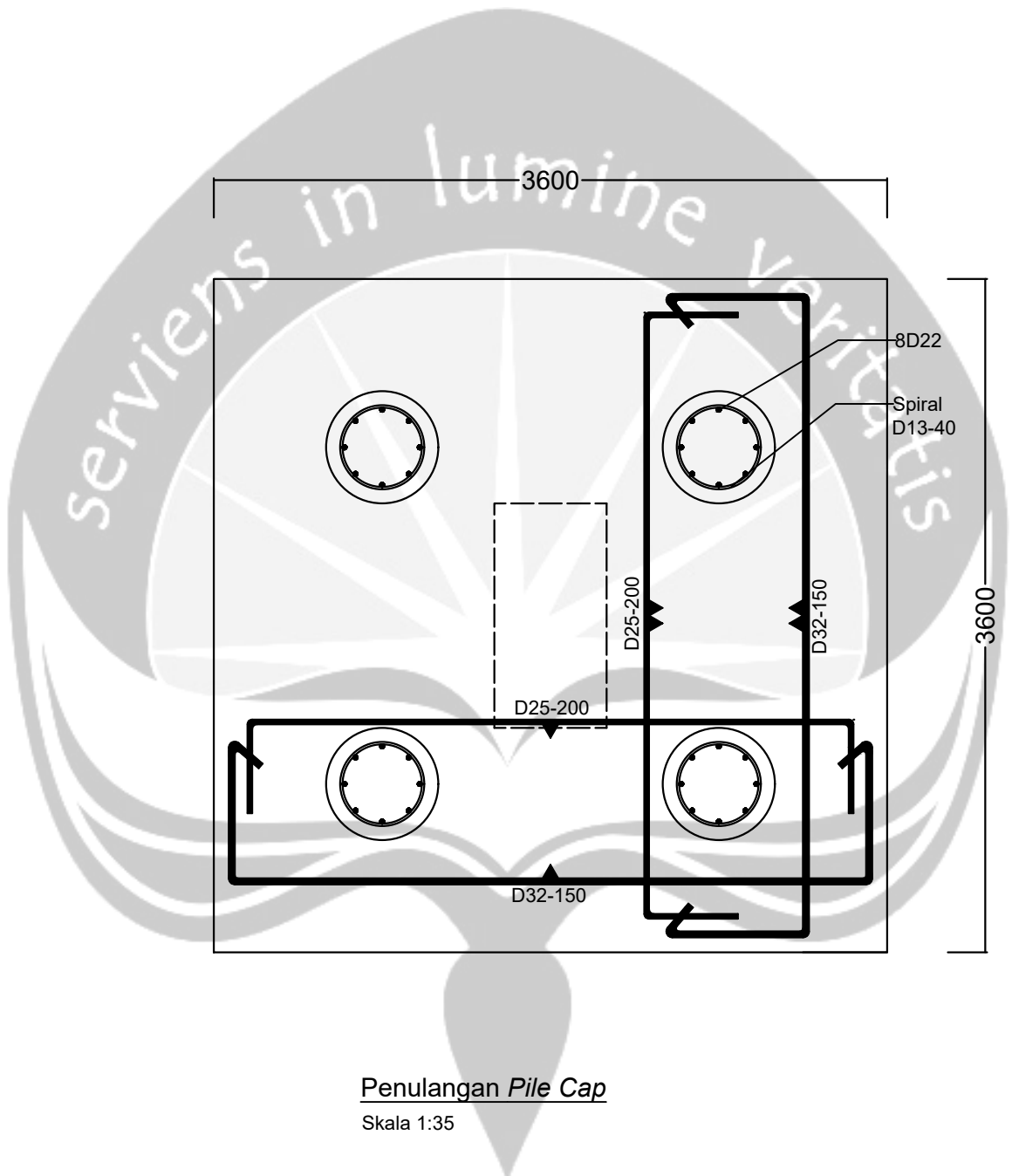


**Potongan A-A**  
Skala 1:100



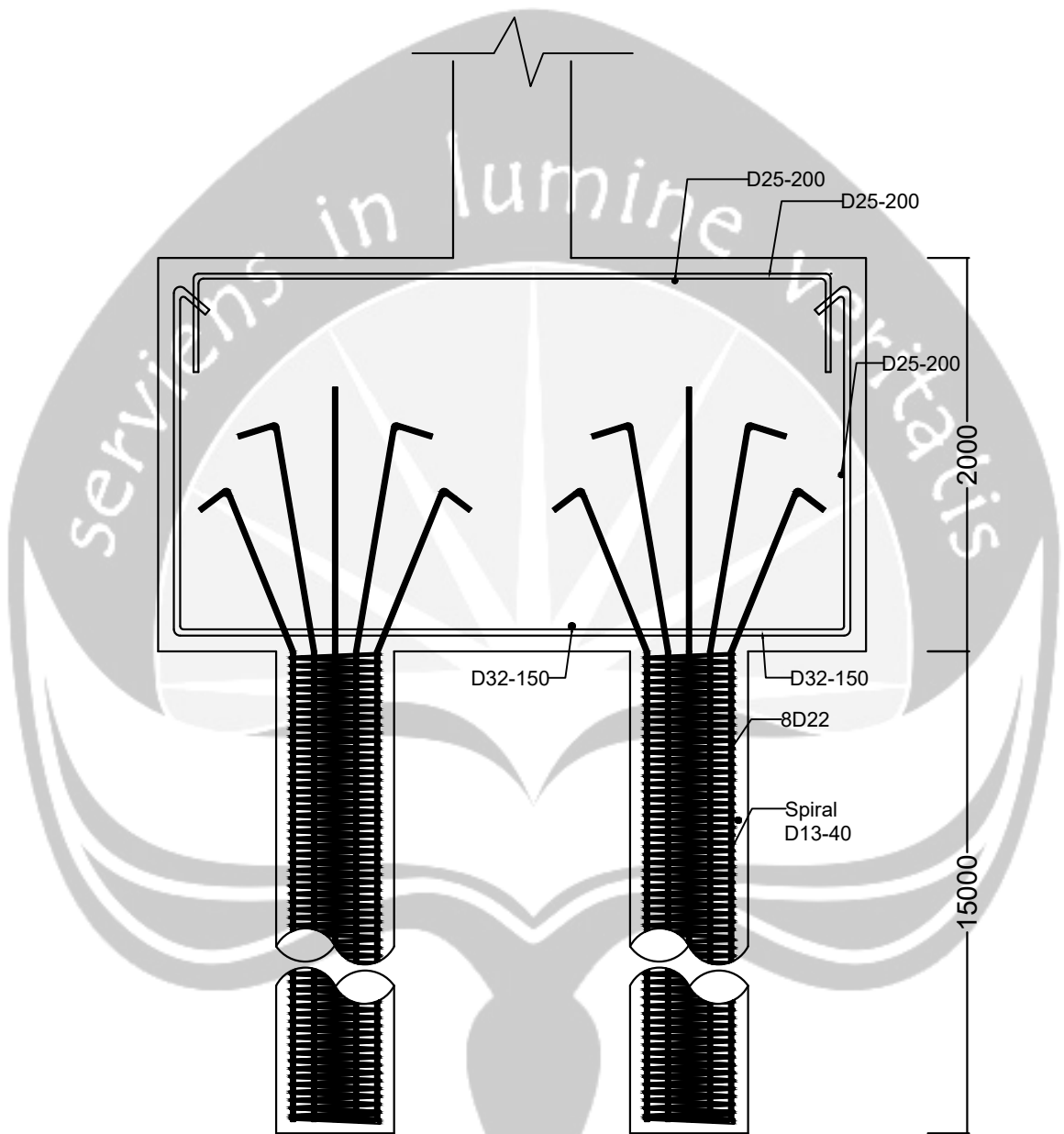
**Potongan B-B**  
Skala 1:100





Penulangan *Pile Cap*  
Skala 1:35





Penulangan tiang bor

Skala 1:35

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

STORY	COLUMN	LOAD	LOC	P	V2	V3	T	M2	M3
ROOF	C16	ENVE MAX	0.0000	-152.40	106.16	163.00	2.549	254.523	68.474
			2.8000	-125.69	106.16	163.00	2.549	-45.341	154.699
ROOF	C16	ENVE MIN	0.0000	-350.31	-45.42	61.77	-1.236	82.438	27.536
			2.8000	-300.81	-45.42	61.77	-1.236	-247.056	-228.778
STORY9	C16	ENVE MAX	0.0000	-337.47	124.07	152.90	3.143	210.407	71.989
			2.8000	-310.76	124.07	152.90	3.143	46.778	232.206
STORY9	C16	ENVE MIN	0.0000	-824.76	-83.48	8.70	-1.847	71.149	-1.550
			2.8000	-775.26	-83.48	8.70	-1.847	-217.724	-275.413
STORY8	C16	ENVE MAX	0.0000	-509.37	178.64	183.19	4.392	256.719	141.153
			2.8000	-479.70	178.64	183.19	4.392	50.266	297.912
STORY8	C16	ENVE MIN	0.0000	-1321.59	-128.73	-1.47	-2.900	46.158	-62.532
			2.8000	-1266.59	-128.73	-1.47	-2.900	-256.213	-359.051
STORY7	C16	ENVE MAX	0.0000	-667.03	208.75	194.63	4.956	287.374	212.685
			2.8000	-637.35	208.75	194.63	4.956	68.148	315.898
STORY7	C16	ENVE MIN	0.0000	-1832.77	-161.74	-20.82	-3.537	9.849	-136.974
			2.8000	-1777.77	-161.74	-20.82	-3.537	-257.578	-371.827
STORY6	C16	ENVE MAX	0.0000	-812.00	233.53	205.15	5.395	311.060	278.354
			2.8000	-782.33	233.53	205.15	5.395	73.177	314.587
STORY6	C16	ENVE MIN	0.0000	-2355.91	-187.81	-35.32	-4.080	-25.728	-211.284
			2.8000	-2300.91	-187.81	-35.32	-4.080	-263.370	-375.524
STORY5	C16	ENVE MAX	0.0000	-950.23	264.24	216.41	6.459	337.944	375.104
			2.8000	-917.59	264.24	216.41	6.459	73.645	294.944
STORY5	C16	ENVE MIN	0.0000	-2895.66	-213.25	-42.46	-5.075	-45.253	-302.144
			2.8000	-2835.16	-213.25	-42.46	-5.075	-268.013	-364.777
STORY4	C16	ENVE MAX	0.0000	-1080.94	274.20	220.50	6.439	355.058	471.048
			2.8000	-1048.30	274.20	220.50	6.439	78.306	228.622
STORY4	C16	ENVE MIN	0.0000	-3442.37	-224.64	-52.48	-5.210	-68.639	-400.376
			2.8000	-3381.87	-224.64	-52.48	-5.210	-262.343	-296.699
STORY3	C16	ENVE MAX	0.0000	-1206.24	278.39	225.30	6.060	375.542	581.451
			2.8000	-1173.60	278.39	225.30	6.060	73.494	123.785
STORY3	C16	ENVE MIN	0.0000	-3993.46	-229.12	-61.06	-5.025	-97.472	-517.742
			2.8000	-3932.96	-229.12	-61.06	-5.025	-255.302	-198.040
STORY2	C16	ENVE MAX	0.0000	-1333.09	280.92	220.05	5.936	377.699	750.065
			2.8000	-1297.48	280.92	220.05	5.936	55.882	3.523
STORY2	C16	ENVE MIN	0.0000	-4552.31	-230.17	-61.09	-5.004	-115.184	-693.922
			2.8000	-4486.31	-230.17	-61.09	-5.004	-238.451	-89.472
STORY1	C16	ENVE MAX	0.0000	-1452.70	285.36	247.40	4.800	508.183	1042.391
			2.8000	-1417.09	285.36	247.40	4.800	27.240	280.148
STORY1	C16	ENVE MIN	0.0000	-5091.84	-230.35	-93.67	-4.120	-235.049	-968.041
			2.8000	-5025.84	-230.35	-93.67	-4.120	-184.536	-359.831
MEZZ	C16	ENVE MAX	0.0000	-1624.74	249.45	231.95	2.303	682.606	1396.739
			2.8000	-1589.13	249.45	231.95	2.303	90.908	730.181
MEZZ	C16	ENVE MIN	0.0000	-5677.79	-215.76	-149.68	-2.029	-598.382	-1415.337
			2.8000	-5611.79	-215.76	-149.68	-2.029	-237.019	-843.125

B E A M F O R C E S

STORY	BEAM	LOAD	LOC	P	V2	V3	T	M2	M3
ROOF	B19	ENVE MAX	0.4500	0.00	-12.47	0.00	32.811	0.000	55.190
			4.0000	0.00	13.48	0.00	32.811	0.000	103.524
			4.0000	0.00	55.42	0.00	-9.008	0.000	105.771
			6.0000	0.00	77.28	0.00	-9.008	0.000	96.913
			6.0000	0.00	95.71	0.00	-9.008	0.000	96.913
			7.5500	0.00	113.41	0.00	-9.008	0.000	75.198
ROOF	B19	ENVE MIN	0.4500	0.00	-121.70	0.00	8.861	0.000	-236.212
			4.0000	0.00	-69.85	0.00	8.861	0.000	47.375
			4.0000	0.00	-21.92	0.00	-32.102	0.000	45.815
			6.0000	0.00	-10.64	0.00	-32.102	0.000	-45.465
			6.0000	0.00	-2.25	0.00	-32.102	0.000	-45.465
			7.5500	0.00	6.83	0.00	-32.102	0.000	-188.187
STORY9	B19	ENVE MAX	0.4500	0.00	-12.30	0.00	47.195	0.000	82.014
			4.0000	0.00	21.70	0.00	47.195	0.000	135.478
			4.0000	0.00	75.92	0.00	-9.804	0.000	137.562
			6.0000	0.00	105.60	0.00	-9.804	0.000	132.446
			6.0000	0.00	136.37	0.00	-9.804	0.000	132.446
			7.5500	0.00	160.41	0.00	-9.804	0.000	106.741
STORY9	B19	ENVE MIN	0.4500	0.00	-164.35	0.00	9.331	0.000	-321.878
			4.0000	0.00	-93.83	0.00	9.331	0.000	57.863
			4.0000	0.00	-33.04	0.00	-46.663	0.000	57.383
			6.0000	0.00	-18.07	0.00	-46.663	0.000	-67.918
			6.0000	0.00	-4.58	0.00	-46.663	0.000	-67.918
			7.5500	0.00	7.46	0.00	-46.663	0.000	-272.885
STORY8	B19	ENVE MAX	0.5000	0.00	5.72	0.00	51.794	0.000	144.700
			4.0000	0.00	39.35	0.00	51.794	0.000	137.597
			4.0000	0.00	94.36	0.00	-4.642	0.000	140.063
			6.0000	0.00	124.04	0.00	-4.642	0.000	167.465
			6.0000	0.00	154.80	0.00	-4.642	0.000	167.465
			7.5000	0.00	178.11	0.00	-4.642	0.000	169.867
STORY8	B19	ENVE MIN	0.5000	0.00	-181.13	0.00	4.067	0.000	-375.361
			4.0000	0.00	-111.35	0.00	4.067	0.000	55.670
			4.0000	0.00	-51.58	0.00	-51.059	0.000	54.808
			6.0000	0.00	-36.60	0.00	-51.059	0.000	-102.802
			6.0000	0.00	-23.12	0.00	-51.059	0.000	-102.802
			7.5000	0.00	-11.45	0.00	-51.059	0.000	-327.354
STORY7	B19	ENVE MAX	0.5000	0.00	20.13	0.00	56.084	0.000	194.841
			4.0000	0.00	53.77	0.00	56.084	0.000	138.917
			4.0000	0.00	109.60	0.00	-0.456	0.000	141.691
			6.0000	0.00	139.28	0.00	-0.456	0.000	195.552
			6.0000	0.00	170.04	0.00	-0.456	0.000	195.552
			7.5000	0.00	193.35	0.00	-0.456	0.000	220.893
STORY7	B19	ENVE MIN	0.5000	0.00	-195.25	0.00	-0.276	0.000	-425.117
			4.0000	0.00	-125.46	0.00	-0.276	0.000	53.670
			4.0000	0.00	-66.63	0.00	-55.241	0.000	52.497
			6.0000	0.00	-51.65	0.00	-55.241	0.000	-131.959
			6.0000	0.00	-38.16	0.00	-55.241	0.000	-131.959
			7.5000	0.00	-26.49	0.00	-55.241	0.000	-379.741
STORY6	B19	ENVE MAX	0.5000	0.00	33.30	0.00	59.475	0.000	241.220
			4.0000	0.00	66.94	0.00	59.475	0.000	140.469
			4.0000	0.00	123.58	0.00	3.438	0.000	143.535
			6.0000	0.00	153.26	0.00	3.438	0.000	220.469
			6.0000	0.00	184.02	0.00	3.438	0.000	220.469
			7.5000	0.00	207.33	0.00	3.438	0.000	266.438
STORY6	B19	ENVE MIN	0.5000	0.00	-207.59	0.00	-4.275	0.000	-468.751
			4.0000	0.00	-137.81	0.00	-4.275	0.000	51.978
			4.0000	0.00	-80.10	0.00	-58.469	0.000	50.527
			6.0000	0.00	-65.12	0.00	-58.469	0.000	-158.024
			6.0000	0.00	-51.63	0.00	-58.469	0.000	-158.024
			7.5000	0.00	-39.96	0.00	-58.469	0.000	-427.200
STORY5	B19	ENVE MAX	0.5500	0.00	44.22	0.00	62.241	0.000	275.715
			4.0000	0.00	77.48	0.00	62.241	0.000	141.241
			4.0000	0.00	134.90	0.00	6.575	0.000	144.545
			6.0000	0.00	164.58	0.00	6.575	0.000	239.725
			6.0000	0.00	195.34	0.00	6.575	0.000	239.725
			7.4500	0.00	217.90	0.00	6.575	0.000	299.837

B E A M F O R C E S

STORY	BEAM	LOAD	LOC	P	V2	V3	T	M2	M3
STORY5	B19	ENVE MIN							
			0.5500	0.00	-216.36	0.00	-7.513	0.000	-491.750
			4.0000	0.00	-147.32	0.00	-7.513	0.000	50.499
			4.0000	0.00	-90.70	0.00	-61.129	0.000	48.830
			6.0000	0.00	-75.72	0.00	-61.129	0.000	-179.405
			6.0000	0.00	-62.23	0.00	-61.129	0.000	-179.405
			7.4500	0.00	-50.94	0.00	-61.129	0.000	-455.426
STORY4	B19	ENVE MAX							
			0.5500	0.00	49.21	0.00	64.073	0.000	292.591
			4.0000	0.00	82.47	0.00	64.073	0.000	141.695
			4.0000	0.00	140.41	0.00	8.934	0.000	145.117
			6.0000	0.00	170.09	0.00	8.934	0.000	247.774
			6.0000	0.00	200.86	0.00	8.934	0.000	247.774
			7.4500	0.00	223.41	0.00	8.934	0.000	315.576
STORY4	B19	ENVE MIN							
			0.5500	0.00	-220.24	0.00	-9.930	0.000	-505.433
			4.0000	0.00	-151.20	0.00	-9.930	0.000	49.389
			4.0000	0.00	-95.45	0.00	-62.898	0.000	47.618
			6.0000	0.00	-80.47	0.00	-62.898	0.000	-189.619
			6.0000	0.00	-66.98	0.00	-62.898	0.000	-189.619
			7.4500	0.00	-55.69	0.00	-62.898	0.000	-474.436
STORY3	B19	ENVE MAX							
			0.5500	0.00	49.25	0.00	65.070	0.000	292.710
			4.0000	0.00	82.51	0.00	65.070	0.000	142.107
			4.0000	0.00	140.82	0.00	10.817	0.000	145.556
			6.0000	0.00	170.50	0.00	10.817	0.000	245.290
			6.0000	0.00	201.26	0.00	10.817	0.000	245.290
			7.4500	0.00	223.82	0.00	10.817	0.000	313.126
STORY3	B19	ENVE MIN							
			0.5500	0.00	-218.77	0.00	-11.813	0.000	-500.786
			4.0000	0.00	-149.73	0.00	-11.813	0.000	48.553
			4.0000	0.00	-94.85	0.00	-63.802	0.000	46.786
			6.0000	0.00	-79.87	0.00	-63.802	0.000	-189.547
			6.0000	0.00	-66.38	0.00	-63.802	0.000	-189.547
			7.4500	0.00	-55.09	0.00	-63.802	0.000	-475.861
STORY2	B19	ENVE MAX							
			0.6000	0.00	42.34	0.00	64.966	0.000	265.023
			4.0000	0.00	75.21	0.00	64.966	0.000	141.836
			4.0000	0.00	133.70	0.00	11.736	0.000	145.144
			6.0000	0.00	163.38	0.00	11.736	0.000	227.729
			6.0000	0.00	194.15	0.00	11.736	0.000	227.729
			7.4000	0.00	215.93	0.00	11.736	0.000	282.294
STORY2	B19	ENVE MIN							
			0.6000	0.00	-208.94	0.00	-12.714	0.000	-459.399
			4.0000	0.00	-140.68	0.00	-12.714	0.000	48.087
			4.0000	0.00	-86.47	0.00	-63.787	0.000	46.485
			6.0000	0.00	-71.49	0.00	-63.787	0.000	-175.224
			6.0000	0.00	-58.00	0.00	-63.787	0.000	-175.224
			7.4000	0.00	-47.10	0.00	-63.787	0.000	-441.628
STORY1	B19	ENVE MAX							
			0.6000	0.00	29.54	0.00	61.526	0.000	218.597
			4.0000	0.00	62.41	0.00	61.526	0.000	135.540
			4.0000	0.00	118.21	0.00	12.875	0.000	138.458
			6.0000	0.00	147.89	0.00	12.875	0.000	192.804
			6.0000	0.00	173.08	0.00	12.875	0.000	192.804
			7.4000	0.00	194.87	0.00	12.875	0.000	233.329
STORY1	B19	ENVE MIN							
			0.6000	0.00	-189.87	0.00	-13.712	0.000	-400.842
			4.0000	0.00	-121.61	0.00	-13.712	0.000	45.208
			4.0000	0.00	-71.44	0.00	-60.011	0.000	43.748
			6.0000	0.00	-56.46	0.00	-60.011	0.000	-148.792
			6.0000	0.00	-45.98	0.00	-60.011	0.000	-148.792
			7.4000	0.00	-35.07	0.00	-60.011	0.000	-388.509
MEZZ	B19	ENVE MAX							
			0.6000	0.00	-19.74	0.00	54.026	0.000	102.519
			4.0000	0.00	34.40	0.00	54.026	0.000	165.304
			4.0000	0.00	91.12	0.00	9.357	0.000	166.882
			7.4000	0.00	198.80	0.00	9.357	0.000	114.283
MEZZ	B19	ENVE MIN							
			0.6000	0.00	-198.88	0.00	-10.642	0.000	-332.494
			4.0000	0.00	-91.19	0.00	-10.642	0.000	62.697
			4.0000	0.00	-40.21	0.00	-54.517	0.000	61.911
			7.4000	0.00	13.93	0.00	-54.517	0.000	-323.463

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

STORY	COLUMN	LOAD	LOC	P	V2	V3	T	M2	M3
ROOF	C13	ENVE MAX	0.0000	-277.61	42.53	140.92	2.549	151.855	30.050
			2.8000	-250.90	42.53	140.92	2.549	95.221	128.476
ROOF	C13	ENVE MIN	0.0000	-571.65	-48.78	-30.36	-1.236	10.203	-15.840
			2.8000	-522.15	-48.78	-30.36	-1.236	-242.717	-96.758
STORY9	C13	ENVE MAX	0.0000	-610.74	164.15	75.98	3.143	79.303	149.150
			2.8000	-584.03	164.15	75.98	3.143	149.557	177.923
STORY9	C13	ENVE MIN	0.0000	-1298.71	-55.19	-89.01	-1.847	-99.680	23.387
			2.8000	-1249.21	-55.19	-89.01	-1.847	-133.446	-310.480
STORY8	C13	ENVE MAX	0.0000	-947.05	224.35	109.28	4.392	138.490	228.670
			2.8000	-917.38	224.35	109.28	4.392	180.228	271.714
STORY8	C13	ENVE MIN	0.0000	-2034.82	-113.62	-120.83	-2.900	-158.100	-46.430
			2.8000	-1979.82	-113.62	-120.83	-2.900	-167.491	-399.521
STORY7	C13	ENVE MAX	0.0000	-1282.51	251.46	137.83	4.956	193.760	298.286
			2.8000	-1252.83	251.46	137.83	4.956	205.659	285.694
STORY7	C13	ENVE MIN	0.0000	-2772.39	-144.11	-149.83	-3.537	-213.853	-117.821
			2.8000	-2717.39	-144.11	-149.83	-3.537	-192.176	-405.808
STORY6	C13	ENVE MAX	0.0000	-1617.72	273.59	160.23	5.395	238.778	353.441
			2.8000	-1588.05	273.59	160.23	5.395	223.532	288.484
STORY6	C13	ENVE MIN	0.0000	-3511.99	-171.30	-172.10	-4.080	-258.359	-191.162
			2.8000	-3456.99	-171.30	-172.10	-4.080	-209.860	-412.609
STORY5	C13	ENVE MAX	0.0000	-1956.33	309.09	179.78	6.459	278.609	454.844
			2.8000	-1923.69	309.09	179.78	6.459	239.504	272.319
STORY5	C13	ENVE MIN	0.0000	-4260.24	-196.32	-192.50	-5.075	-299.509	-277.373
			2.8000	-4199.74	-196.32	-192.50	-5.075	-224.762	-410.604
STORY4	C13	ENVE MAX	0.0000	-2295.21	315.85	192.31	6.439	308.881	544.446
			2.8000	-2262.57	315.85	192.31	6.439	244.251	212.321
STORY4	C13	ENVE MIN	0.0000	-5010.28	-207.78	-204.99	-5.210	-329.729	-369.456
			2.8000	-4949.78	-207.78	-204.99	-5.210	-229.588	-339.925
STORY3	C13	ENVE MAX	0.0000	-2635.06	313.74	201.06	6.060	334.298	629.583
			2.8000	-2602.42	313.74	201.06	6.060	244.230	115.559
STORY3	C13	ENVE MIN	0.0000	-5762.10	-210.77	-214.47	-5.025	-356.284	-474.585
			2.8000	-5701.60	-210.77	-214.47	-5.025	-228.665	-248.880
STORY2	C13	ENVE MAX	0.0000	-2979.82	331.96	203.69	5.936	354.873	827.549
			2.8000	-2944.21	331.96	203.69	5.936	232.718	-45.062
STORY2	C13	ENVE MIN	0.0000	-6522.06	-214.12	-215.26	-5.004	-370.020	-645.077
			2.8000	-6456.05	-214.12	-215.26	-5.004	-215.466	-102.403
STORY1	C13	ENVE MAX	0.0000	-3321.18	259.44	225.39	4.800	459.665	889.397
			2.8000	-3285.58	259.44	225.39	4.800	187.605	214.867
STORY1	C13	ENVE MIN	0.0000	-7272.36	-185.56	-238.31	-4.120	-479.674	-819.892
			2.8000	-7206.36	-185.56	-238.31	-4.120	-171.430	-352.239
MEZZ	C13	ENVE MAX	0.0000	-3639.02	183.70	213.44	2.303	664.374	1266.142
			2.8000	-3603.41	183.70	213.44	2.303	72.567	763.023
MEZZ	C13	ENVE MIN	0.0000	-7771.41	-168.76	-222.47	-2.029	-678.976	-1288.669
			2.8000	-7705.41	-168.76	-222.47	-2.029	-61.882	-827.376

B E A M F O R C E S

STORY	BEAM	LOAD	LOC	P	V2	V3	T	M2	M3
ROOF	B22	ENVE MAX	0.4500	0.00	-47.59	0.00	5.665	0.000	1.747
			4.0000	0.00	-10.74	0.00	5.665	0.000	204.035
			4.0000	0.00	85.56	0.00	7.074	0.000	207.629
			4.0750	0.00	86.18	0.00	7.074	0.000	201.189
			6.0000	0.00	113.56	0.00	7.074	0.000	100.635
			6.0000	0.00	150.42	0.00	7.074	0.000	100.635
			7.7000	0.00	175.51	0.00	7.074	0.000	7.794
ROOF	B22	ENVE MIN	0.4500	0.00	-179.91	0.00	-4.987	0.000	-302.378
			4.0000	0.00	-104.12	0.00	-4.987	0.000	90.408
			4.0000	0.00	0.87	0.00	-7.330	0.000	87.579
			4.0750	0.00	1.20	0.00	-7.330	0.000	87.501
			6.0000	0.00	14.94	0.00	-7.330	0.000	-20.351
			6.0000	0.00	31.72	0.00	-7.330	0.000	-20.351
			7.7000	0.00	44.26	0.00	-7.330	0.000	-267.219
STORY9	B22	ENVE MAX	0.4500	0.00	-52.27	0.00	11.069	0.000	21.737
			4.0000	0.00	-4.63	0.00	11.069	0.000	258.160
			4.0000	0.00	122.90	0.00	9.711	0.000	264.874
			6.0000	0.00	160.98	0.00	9.711	0.000	146.076
			6.0000	0.00	222.51	0.00	9.711	0.000	146.076
			7.5500	0.00	249.79	0.00	9.711	0.000	45.850
STORY9	B22	ENVE MIN	0.4500	0.00	-245.49	0.00	-10.805	0.000	-420.182
			4.0000	0.00	-142.22	0.00	-10.805	0.000	115.794
			4.0000	0.00	-9.13	0.00	-11.333	0.000	111.413
			6.0000	0.00	9.35	0.00	-11.333	0.000	-53.892
			6.0000	0.00	36.32	0.00	-11.333	0.000	-53.892
			7.5500	0.00	49.18	0.00	-11.333	0.000	-382.833
STORY8	B22	ENVE MAX	0.5000	0.00	-35.79	0.00	16.932	0.000	81.517
			4.0000	0.00	11.39	0.00	16.932	0.000	258.854
			4.0000	0.00	140.51	0.00	15.858	0.000	267.634
			6.0000	0.00	178.59	0.00	15.858	0.000	174.497
			6.0000	0.00	240.12	0.00	15.858	0.000	174.497
			7.5000	0.00	266.61	0.00	15.858	0.000	102.591
STORY8	B22	ENVE MIN	0.5000	0.00	-259.68	0.00	-16.597	0.000	-462.745
			4.0000	0.00	-157.34	0.00	-16.597	0.000	114.303
			4.0000	0.00	-25.61	0.00	-17.292	0.000	108.016
			6.0000	0.00	-7.14	0.00	-17.292	0.000	-85.208
			6.0000	0.00	19.84	0.00	-17.292	0.000	-85.208
			7.5000	0.00	32.32	0.00	-17.292	0.000	-429.242
STORY7	B22	ENVE MAX	0.5000	0.00	-22.54	0.00	22.241	0.000	127.802
			4.0000	0.00	24.64	0.00	22.241	0.000	258.488
			4.0000	0.00	154.93	0.00	20.973	0.000	268.938
			6.0000	0.00	193.01	0.00	20.973	0.000	200.721
			6.0000	0.00	254.54	0.00	20.973	0.000	200.721
			7.5000	0.00	281.02	0.00	20.973	0.000	150.656
STORY7	B22	ENVE MIN	0.5000	0.00	-272.85	0.00	-21.900	0.000	-509.571
			4.0000	0.00	-170.52	0.00	-21.900	0.000	113.864
			4.0000	0.00	-39.95	0.00	-22.406	0.000	105.893
			6.0000	0.00	-21.48	0.00	-22.406	0.000	-112.406
			6.0000	0.00	5.50	0.00	-22.406	0.000	-112.406
			7.5000	0.00	17.98	0.00	-22.406	0.000	-478.399
STORY6	B22	ENVE MAX	0.5000	0.00	-10.50	0.00	26.722	0.000	170.508
			4.0000	0.00	36.68	0.00	26.722	0.000	259.092
			4.0000	0.00	168.04	0.00	25.387	0.000	271.055
			6.0000	0.00	206.12	0.00	25.387	0.000	223.652
			6.0000	0.00	267.65	0.00	25.387	0.000	223.652
			7.5000	0.00	294.13	0.00	25.387	0.000	192.842
STORY6	B22	ENVE MIN	0.5000	0.00	-284.22	0.00	-26.384	0.000	-549.864
			4.0000	0.00	-181.89	0.00	-26.384	0.000	113.340
			4.0000	0.00	-52.57	0.00	-26.797	0.000	103.885
			6.0000	0.00	-34.10	0.00	-26.797	0.000	-136.192
			6.0000	0.00	-7.13	0.00	-26.797	0.000	-136.192
			7.5000	0.00	5.35	0.00	-26.797	0.000	-522.162
STORY5	B22	ENVE MAX	0.5500	0.00	-0.33	0.00	30.475	0.000	204.378
			4.0000	0.00	46.38	0.00	30.475	0.000	258.689
			4.0000	0.00	178.80	0.00	29.062	0.000	271.889
			6.0000	0.00	216.88	0.00	29.062	0.000	241.345

B E A M F O R C E S

STORY	BEAM	LOAD	LOC	P	V2	V3	T	M2	M3
STORY5	B22	ENVE MAX	(Continued)						
			6.0000	0.00	278.41	0.00	29.062	0.000	241.345
			7.4500	0.00	304.06	0.00	29.062	0.000	226.153
STORY5	B22	ENVE MIN							
			0.5500	0.00	-292.18	0.00	-30.130	0.000	-567.158
			4.0000	0.00	-190.81	0.00	-30.130	0.000	112.952
			4.0000	0.00	-62.61	0.00	-30.416	0.000	102.312
			6.0000	0.00	-44.14	0.00	-30.416	0.000	-156.079
			6.0000	0.00	-17.16	0.00	-30.416	0.000	-156.079
			7.4500	0.00	-5.08	0.00	-30.416	0.000	-543.779
STORY4	B22	ENVE MAX							
			0.5500	0.00	4.27	0.00	33.226	0.000	220.018
			4.0000	0.00	50.98	0.00	33.226	0.000	258.206
			4.0000	0.00	184.05	0.00	31.756	0.000	271.995
			6.0000	0.00	222.13	0.00	31.756	0.000	248.776
			6.0000	0.00	283.65	0.00	31.756	0.000	248.776
			7.4500	0.00	309.31	0.00	31.756	0.000	240.876
STORY4	B22	ENVE MIN							
			0.5500	0.00	-295.92	0.00	-32.880	0.000	-580.514
			4.0000	0.00	-194.55	0.00	-32.880	0.000	112.761
			4.0000	0.00	-67.09	0.00	-33.049	0.000	101.584
			6.0000	0.00	-48.62	0.00	-33.049	0.000	-165.662
			6.0000	0.00	-21.64	0.00	-33.049	0.000	-165.662
			7.4500	0.00	-9.56	0.00	-33.049	0.000	-561.762
STORY3	B22	ENVE MAX							
			0.5500	0.00	4.28	0.00	34.962	0.000	220.076
			4.0000	0.00	50.99	0.00	34.962	0.000	258.205
			4.0000	0.00	184.28	0.00	33.586	0.000	271.991
			6.0000	0.00	222.36	0.00	33.586	0.000	246.700
			6.0000	0.00	283.89	0.00	33.586	0.000	246.700
			7.4500	0.00	309.54	0.00	33.586	0.000	238.507
STORY3	B22	ENVE MIN							
			0.5500	0.00	-294.75	0.00	-34.629	0.000	-576.609
			4.0000	0.00	-193.39	0.00	-34.629	0.000	112.673
			4.0000	0.00	-66.41	0.00	-34.822	0.000	101.555
			6.0000	0.00	-47.94	0.00	-34.822	0.000	-165.439
			6.0000	0.00	-20.96	0.00	-34.822	0.000	-165.439
			7.4500	0.00	-8.88	0.00	-34.822	0.000	-562.566
STORY2	B22	ENVE MAX							
			0.6000	0.00	-1.80	0.00	36.048	0.000	196.909
			4.0000	0.00	44.42	0.00	36.048	0.000	257.262
			4.0000	0.00	177.58	0.00	34.305	0.000	270.229
			6.0000	0.00	215.65	0.00	34.305	0.000	230.824
			6.0000	0.00	277.18	0.00	34.305	0.000	230.824
			7.4000	0.00	301.96	0.00	34.305	0.000	212.318
STORY2	B22	ENVE MIN							
			0.6000	0.00	-285.89	0.00	-35.755	0.000	-535.413
			4.0000	0.00	-185.54	0.00	-35.755	0.000	112.797
			4.0000	0.00	-58.54	0.00	-35.483	0.000	102.574
			6.0000	0.00	-40.07	0.00	-35.483	0.000	-152.635
			6.0000	0.00	-13.09	0.00	-35.483	0.000	-152.635
			7.4000	0.00	-1.43	0.00	-35.483	0.000	-526.079
STORY1	B22	ENVE MAX							
			0.6000	0.00	-13.16	0.00	33.379	0.000	154.005
			4.0000	0.00	33.06	0.00	33.379	0.000	249.835
			4.0000	0.00	160.40	0.00	34.147	0.000	261.511
			6.0000	0.00	198.48	0.00	34.147	0.000	201.557
			6.0000	0.00	260.01	0.00	34.147	0.000	201.557
			7.4000	0.00	284.79	0.00	34.147	0.000	165.073
STORY1	B22	ENVE MIN							
			0.6000	0.00	-267.52	0.00	-33.364	0.000	-479.307
			4.0000	0.00	-167.18	0.00	-33.364	0.000	109.622
			4.0000	0.00	-45.00	0.00	-34.704	0.000	101.361
			6.0000	0.00	-26.53	0.00	-34.704	0.000	-126.036
			6.0000	0.00	0.45	0.00	-34.704	0.000	-126.036
			7.4000	0.00	12.11	0.00	-34.704	0.000	-476.417

S U P P O R T R E A C T I O N S

STORY	POINT	LOAD	FX	FY	FZ	MX	MY	MZ
BASE	1	ENVE Max	234.50	209.16	4773.53	1345.075	680.587	2.029
BASE	1	ENVE Min	-142.08	-182.51	903.01	-1419.797	-584.524	-2.303
BASE	16	ENVE Max	231.95	215.76	5677.79	1396.739	682.606	2.029
BASE	16	ENVE Min	-149.68	-249.45	1624.74	-1415.337	-598.382	-2.303
BASE	17	ENVE Max	250.78	224.59	5714.29	1358.778	711.039	2.029
BASE	17	ENVE Min	-146.98	-197.24	1142.54	-1434.152	-604.635	-2.303
BASE	18	ENVE Max	165.07	216.81	8451.94	1340.613	618.001	2.029
BASE	18	ENVE Min	-223.41	-205.06	2556.93	-1396.969	-687.109	-2.303
BASE	15	ENVE Max	224.89	220.73	8284.88	1378.499	676.926	2.029
BASE	15	ENVE Min	-226.92	-257.99	3736.23	-1389.277	-683.954	-2.303
BASE	2	ENVE Max	188.35	207.94	5534.63	1312.550	612.322	1.999
BASE	2	ENVE Min	-227.14	-174.89	1550.89	-1388.713	-674.955	-2.306
BASE	3	ENVE Max	282.39	215.90	6216.34	1280.945	732.228	2.029
BASE	3	ENVE Min	-216.57	-168.25	1306.48	-1366.189	-664.961	-2.303
BASE	14	ENVE Max	218.42	177.93	8059.31	1295.354	669.925	2.029
BASE	14	ENVE Min	-227.47	-184.80	3612.27	-1329.883	-684.549	-2.303
BASE	19	ENVE Max	103.99	133.41	7878.98	1280.753	554.355	2.029
BASE	19	ENVE Min	-106.53	-183.75	2447.22	-1274.857	-563.058	-2.303
BASE	20	ENVE Max	103.22	129.31	7834.73	1252.170	553.559	2.029
BASE	20	ENVE Min	-105.61	-180.19	2460.58	-1241.273	-562.101	-2.303
BASE	13	ENVE Max	213.44	168.76	7771.41	1266.142	664.374	2.029
BASE	13	ENVE Min	-222.47	-183.70	3639.02	-1288.669	-678.976	-2.303
BASE	4	ENVE Max	207.89	220.76	7058.98	1253.437	654.131	2.029
BASE	4	ENVE Min	-220.21	-166.03	2122.43	-1340.761	-671.446	-2.303
BASE	5	ENVE Max	214.25	220.55	7094.41	1238.449	659.558	2.029
BASE	5	ENVE Min	-211.95	-164.38	2160.54	-1322.608	-661.051	-2.303
BASE	12	ENVE Max	216.77	167.00	7858.33	1252.701	667.114	2.029
BASE	12	ENVE Min	-216.83	-184.56	3681.93	-1268.287	-672.002	-2.303
BASE	21	ENVE Max	102.98	128.49	7825.18	1240.611	553.306	2.029
BASE	21	ENVE Min	-106.47	-180.26	2480.00	-1224.376	-563.031	-2.303
BASE	22	ENVE Max	103.53	128.72	7789.92	1235.716	553.899	2.029
BASE	22	ENVE Min	-104.88	-181.47	2478.18	-1214.061	-561.313	-2.303
BASE	11	ENVE Max	215.67	164.99	8057.75	1243.920	666.947	2.029
BASE	11	ENVE Min	-218.93	-183.51	3671.59	-1254.103	-675.305	-2.303
BASE	6	ENVE Max	212.78	218.80	7109.38	1229.256	659.419	2.029
BASE	6	ENVE Min	-213.83	-162.93	2241.89	-1308.620	-664.536	-2.303
BASE	7	ENVE Max	159.27	199.12	5459.11	1225.916	586.863	1.992
BASE	7	ENVE Min	-209.37	-167.78	1524.51	-1277.966	-660.793	-2.309
BASE	10	ENVE Max	181.52	175.04	6044.97	1232.385	629.983	2.029
BASE	10	ENVE Min	-228.05	-174.74	2650.85	-1255.575	-685.178	-2.303
BASE	23	ENVE Max	119.73	134.62	5796.40	1221.374	569.119	2.029
BASE	23	ENVE Min	-107.33	-172.52	1634.62	-1209.033	-561.655	-2.303
BASE	24	ENVE Max	127.62	208.48	3613.09	1235.752	579.980	2.029
BASE	24	ENVE Min	-130.98	-182.05	366.17	-1281.268	-589.561	-2.303
BASE	9	ENVE Max	150.45	204.15	3969.77	1259.788	596.352	2.029
BASE	9	ENVE Min	-167.66	-207.89	720.68	-1277.239	-619.810	-2.303
BASE	8	ENVE Max	142.46	176.43	3269.65	1230.711	572.266	1.992
BASE	8	ENVE Min	-199.97	-179.37	382.58	-1248.909	-620.221	-2.309
BASE	84	ENVE Max	197.54	182.56	5058.84	1300.836	635.617	1.999
BASE	84	ENVE Min	-238.12	-174.68	865.41	-1351.688	-665.495	-2.306
Summation	0, 0, Base	ENVE MAX	4569.46	4650.01	162203.63	1221297.026	-5222291.79	117486.040
Summation	0, 0, Base	ENVE MIN	-4569.46	-4650.01	51961.31	552882.353	-1898810.651	-115166.936