BAB VI

KESIMPULAN DAN SARAN

6.1. Kesimpulan

Setelah melakukan analisis dan perancangan pada struktur gedung Apartemen Perwira Tinggi Jakarta Selatan yang disesuaikan dengan Tata Cara Perhitungan Struktur Beton Untuk Gedung SNI 03-2847-2002 dan Standar Perencanaan Ketahanan Gempa Untuk Struktur Bangunan Gedung SNI 3-1726-2002, dapat diambil kesimpulan sebagai berikut :

1. Dalam perancangan gedung ini digunakan pelat dua arah. Tebal pelat yang digunakan adalah 120 mm.
2. Dalam perencanaan balok, digunakan 2 dimensi balok yaitu sebesar 400 mm × 700 mm, dan 250 mm × 400 mm. Balok - balok tersebut direncanakan dengan jumlah tulangan lentur dan geser yang berbeda - beda.
3. Dalam perencanaan kolom, dimensi yang digunakan untuk kolom lantai *basement* hingga lantai 1 sebesar 800 mm × 800 mm, dimensi kolom sebesar 700 mm × 700 mm untuk kolom lantai 2 hingga lantai 3, dimensi kolom sebesar 600 mm × 600 mm untuk kolom lantai 4 hingga lantai 5. Sedangkan untuk jumlah tulangan utama serta tulangan geser berbeda - beda.
4. Dalam perencanaan pondasi, dimensi poer yang digunakan adalah 3 m x 3 m, dengan tebal poer 0,7 m. Tulangan yang digunakan untuk bagian poer adalah D19-150 untuk arah memanjang dan arah lebar. Jumlah tiang yang digunakan 4 buah dengan tulangan 8D19 .

5. Dinding penahan tanah menggunakan tulangan utama D19-250 pada bagian dinding dan pelat dasar, dengan lebar dasar pelat 4,5 m , panjang kaki depan 3,1 m. Tebal dasar plat dan dinding digunakan 0,4m.

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. Dalam perancangan elemen-elemen struktur seperti penentuan tulangan pelat, balok serta kolom sebaiknya digunakan ukuran yang hampir seragam untuk mempermudah pelaksanaan pekerjaan di lapangan.
3. Untuk kemudahan dalam melaksanakan analisis struktur terutama dalam pembuatan model struktur gedung akan lebih mudah jika memakai program analisis struktur ETABS beserta dengan program - program bantu lainnya.

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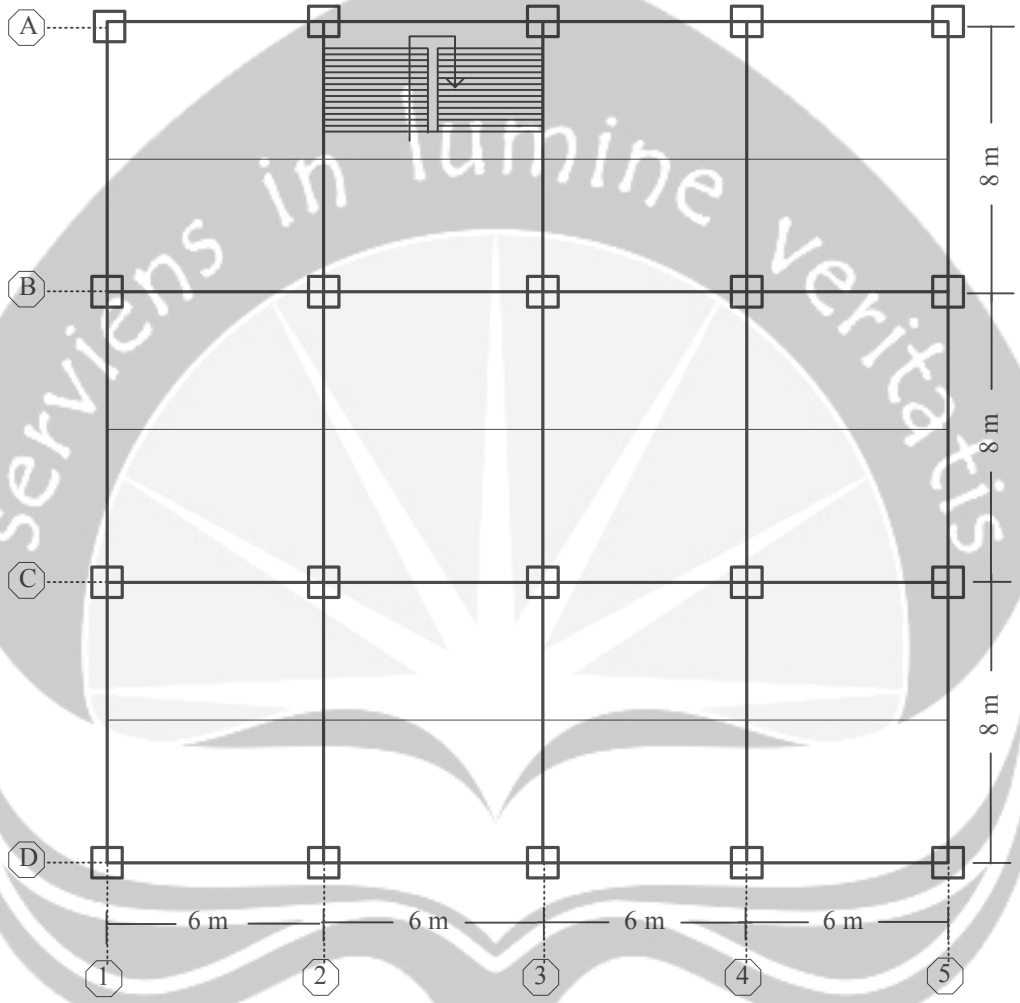
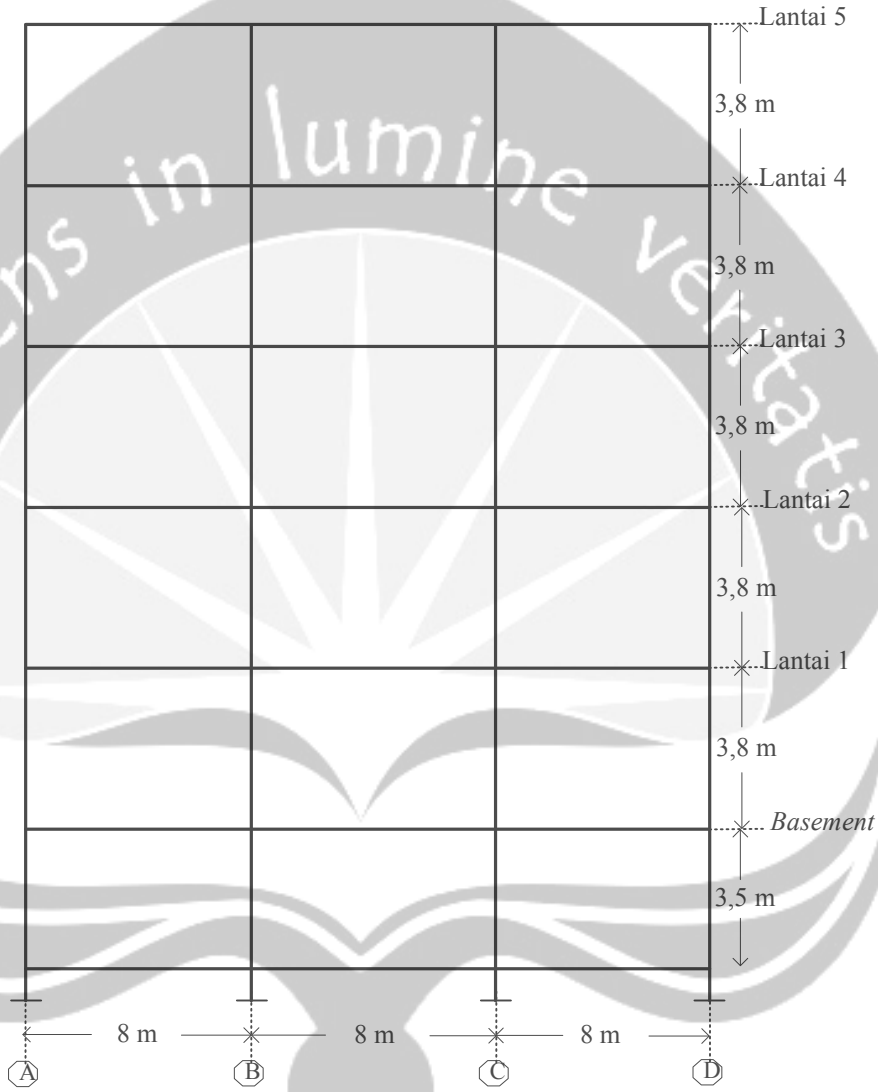
LAMPIRAN

Lampiran 1	
Denah	152



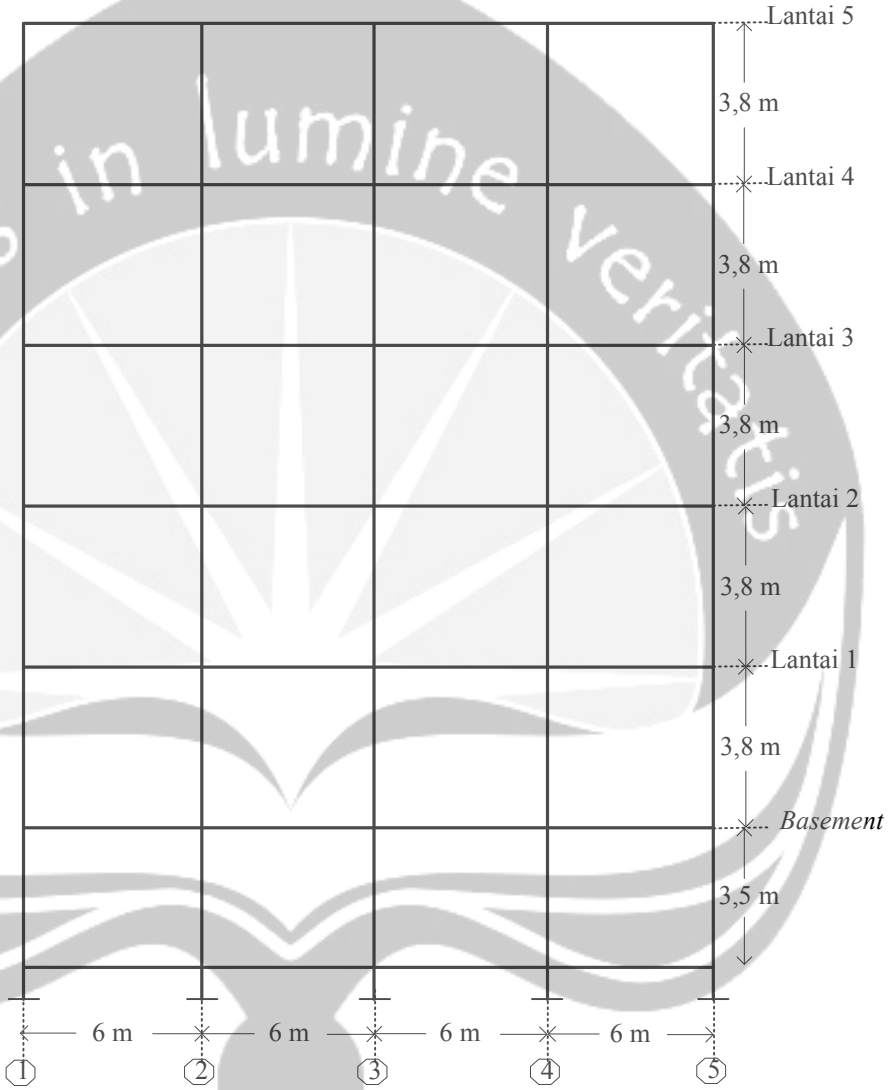
Denah Balok Kolom Lantai Basement – Lt.5

Lampiran 2	
Portal 4	153



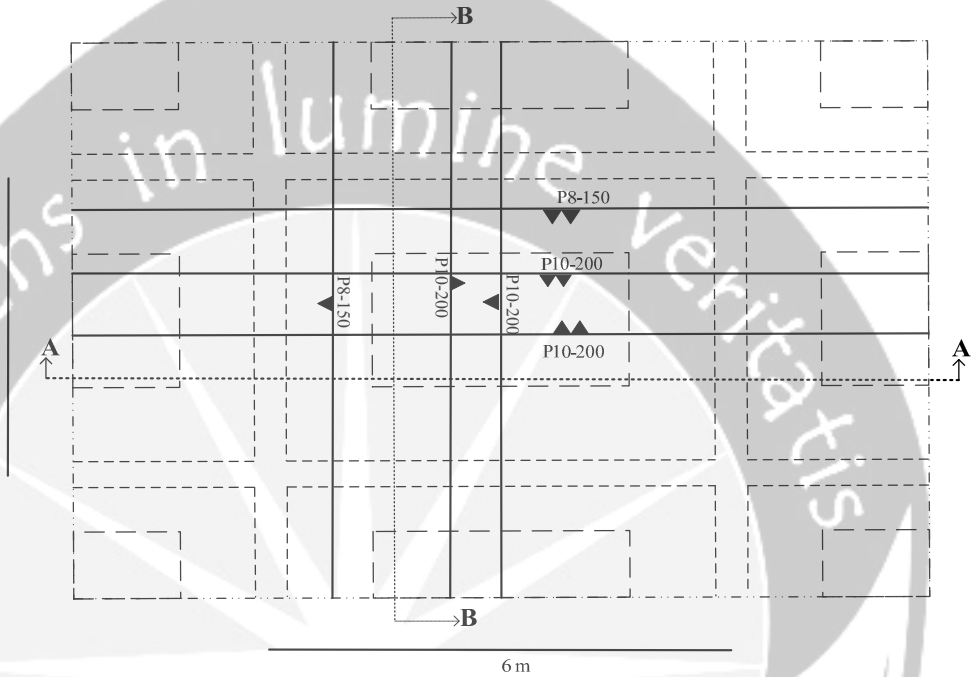
Denah Portal 4

Lampiran 3	
Portal B	154



Denah Portal B

Lampiran 4	
Pelat atap	155



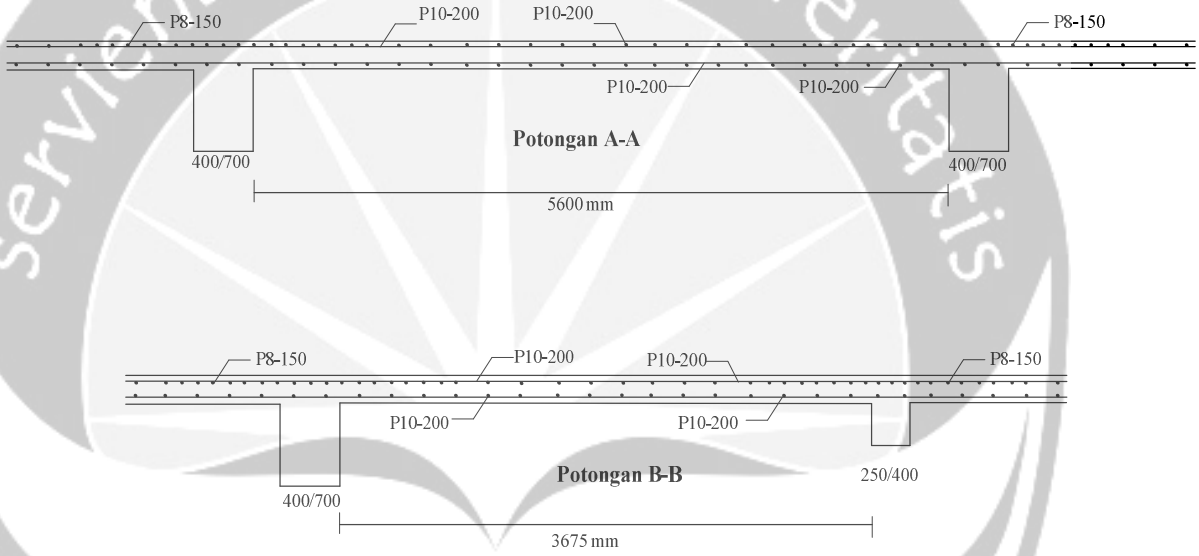
Penulangan Pelat Atap

Keterangan:

▲ : Lapisan Terluar

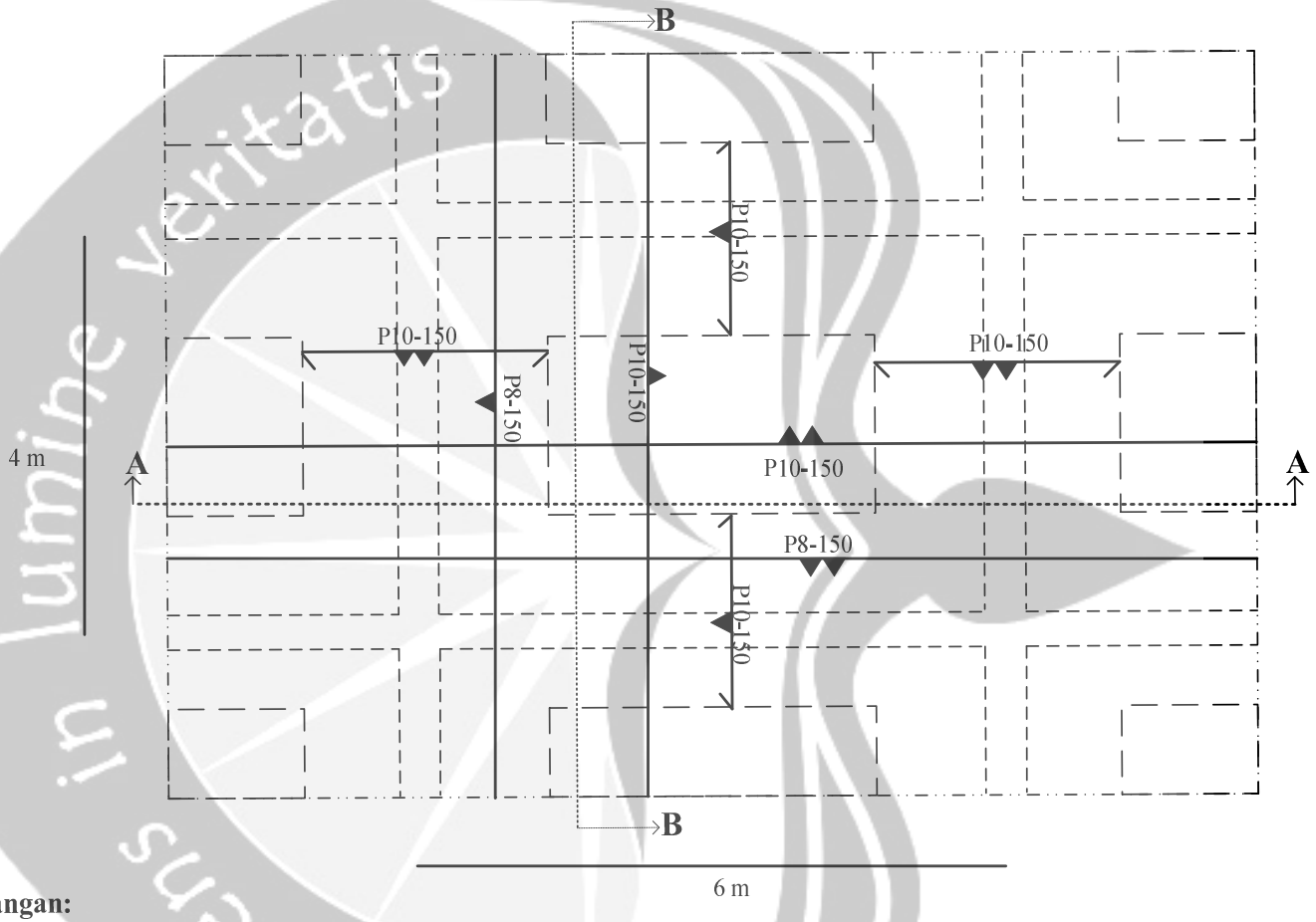
▲▲ : Lapisan Kedua dari luar

Lampiran 5	
Pot.pelat atap	156



Detail Penulangan Pelat Atap

Lampiran 6	157
Pelat lantai	



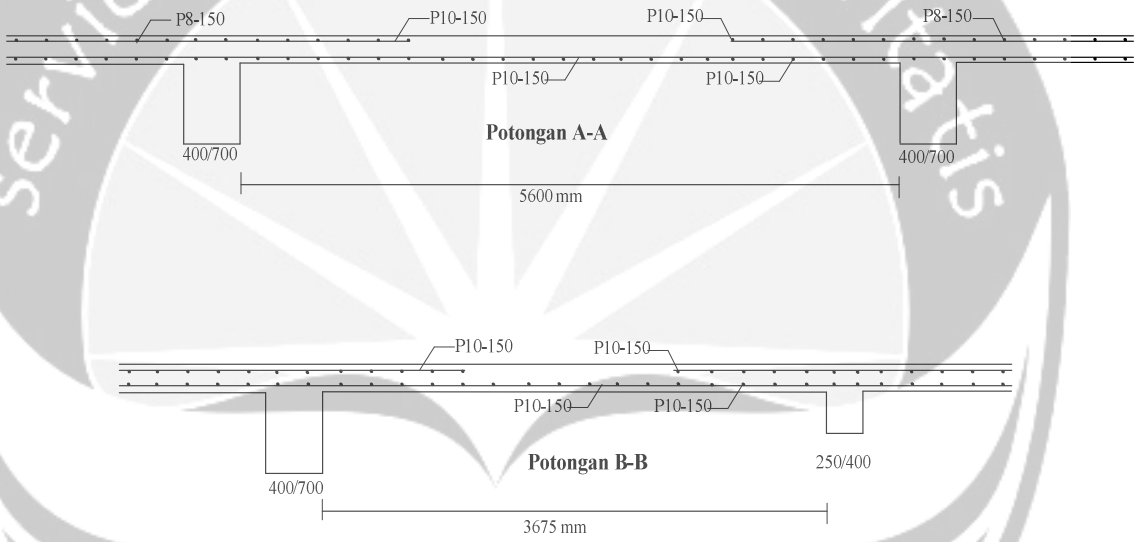
Keterangan:

▲ : Lapisan Terluar

▲▲ : Lapisan Kedua dari luar

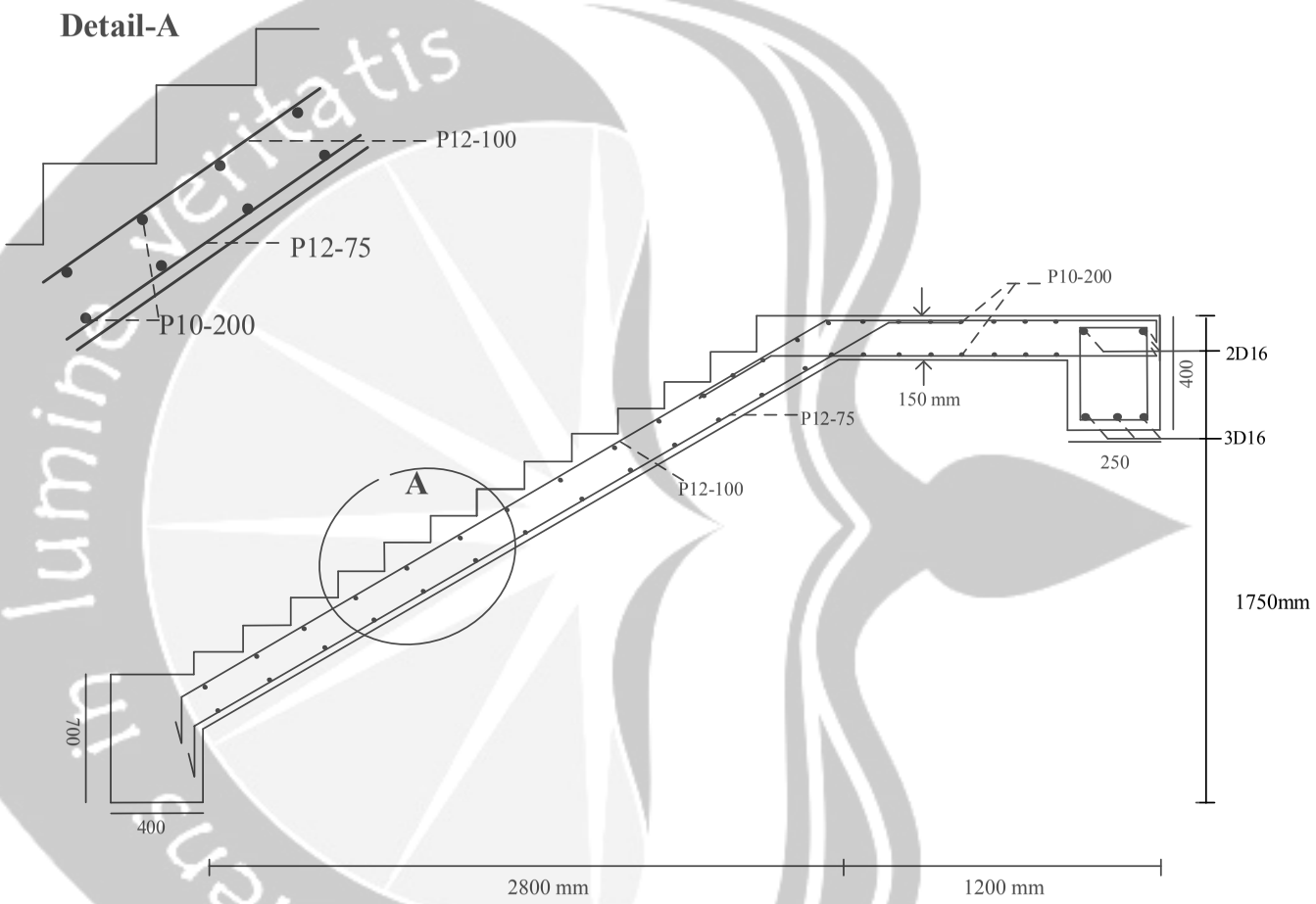
Penulangan Pelat Lantai

Lampiran 7	
Pot. pelat lantai	158



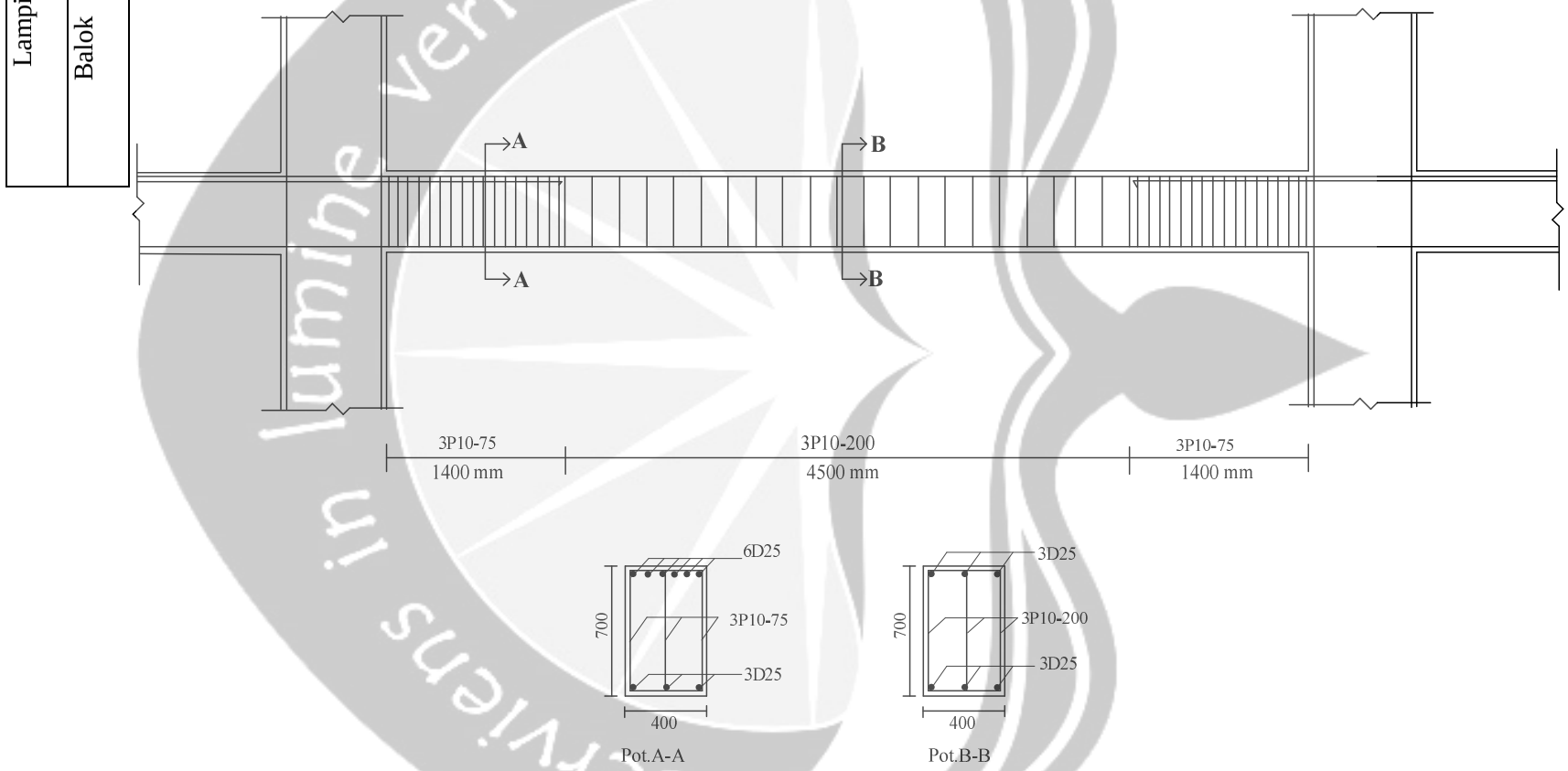
Detail Penulangan Pelat Lantai

Lampiran 8	159
Tangga	



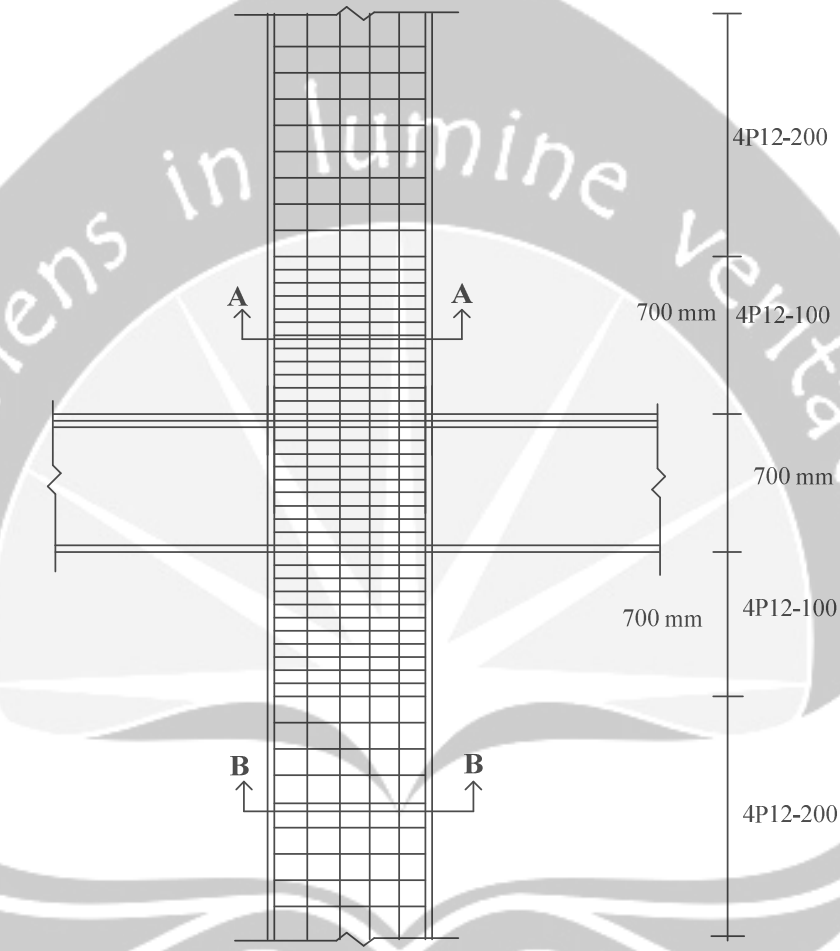
Penulangan Tangga

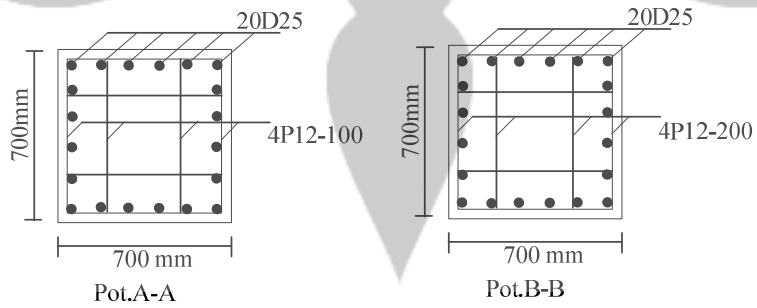
Lampiran 9	160
	Balok



DETAIL PENULANGAN BALOK B-31

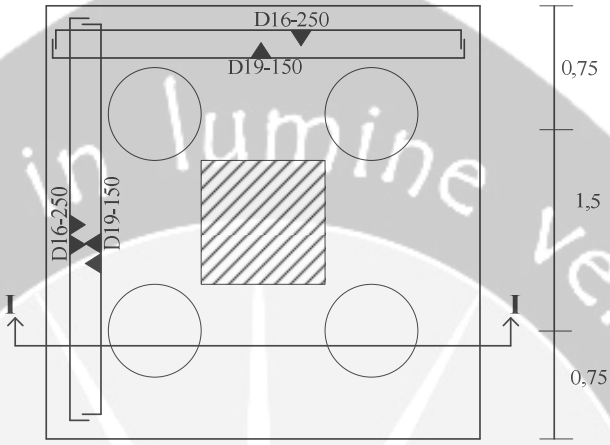
Lampiran 10	
Kolom	161



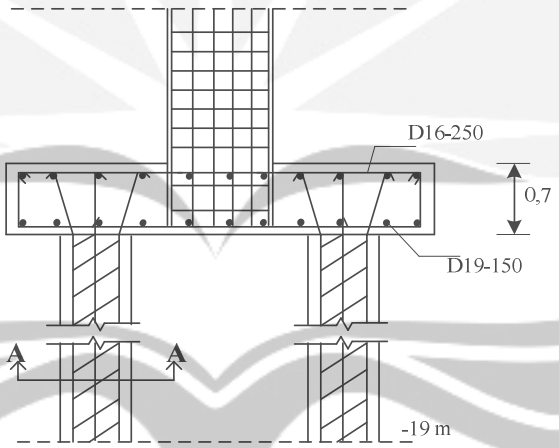


DETAIL PENULANGAN KOLOM LANTAI-2

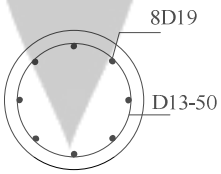
Lampiran 11	
Pondasi	162



DENAH PONDASI

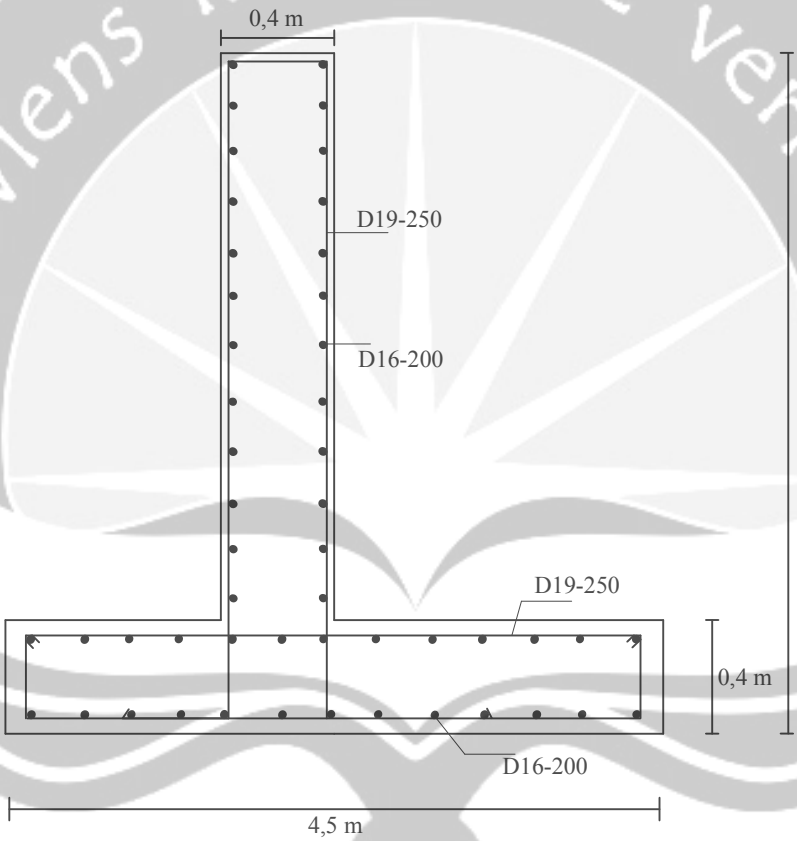


POTONGAN I-I



POT.A-A

Lampiran 12	
Dinding penahan	163



PENULANGAN DINDING PENAHAN TANAH

Penulangan Lentur Lantai 1 Balok 400/700

Balok	Posisi	f'_c	f_y	*b* (mm)	*h* (mm)	Tul. Lentur (mm)	Sengkang (mm)	Selimut (mm)	*d*	ρ_{maks}	ρ_{min}	M_u (kNm)	R_n	ρ	ρ yg dipakai	$A_{s\ (mm2)}$	Pembultn	A_s yg dipakai (mm^2)	Tul. D25	
																			Atas	Bawah
B15	Tump. +	30	400	400	700	25	10	40	638	0.0244	0.0035	256.585	1.9730	0.0051	0.0051	1310.6	3	1472.62		3
	Tump. -	30	400	400	700	25	10	40	638	0.0244	0.0035	322.19	2.4774	0.0065	0.0065	1664.6	4	1963.494	4	
	Lapg. +	30	400	400	700	25	10	40	638	0.0244	0.0035	79.366	0.6103	0.0015	0.0035	892.5	3	1472.62		3
	lapg.-	30	400	400	700	25	10	40	638	0.0244	0.0035	15.8732	0.1221	0.0003	0.0035	892.5	3	1472.62	3	
B16	Tump. +	30	400	400	700	25	10	40	638	0.0244	0.0035	246.573	1.8960	0.0049	0.0049	1257.3	3	1472.62		3
	Tump. -	30	400	400	700	25	10	40	638	0.0244	0.0035	332.564	2.5572	0.0068	0.0068	1721.4	4	1963.494	4	
	Lapg. +	30	400	400	700	25	10	40	638	0.0244	0.0035	69.797	0.5367	0.0014	0.0035	892.5	3	1472.62		3
	lapg.-	30	400	400	700	25	10	40	638	0.0244	0.0035	13.9594	0.1073	0.0003	0.0035	892.5	3	1472.62	3	

B17	Tump. +	30	400	400	700	25	10	40	638	0.0244	0.0035	247.453	1.9028	0.0049	0.0049	1262	3	1472.62		3
	Tump. -	30	400	400	700	25	10	40	638	0.0244	0.0035	330.444	2.5409	0.0067	0.0067	1709.7	4	1963.494	4	
	Lapg. +	30	400	400	700	25	10	40	638	0.0244	0.0035	112.648	0.8662	0.0022	0.0035	892.5	3	1472.62		3
	lapg.-	30	400	400	700	25	10	40	638	0.0244	0.0035	22.5296	0.1732	0.0004	0.0035	892.5	3	1472.62	3	
B18	Tump. +	30	400	400	700	25	10	40	638	0.0244	0.0035	263.612	2.0270	0.0053	0.0053	1348.1	3	1472.62		3
	Tump. -	30	400	400	700	25	10	40	638	0.0244	0.0035	354.722	2.7276	0.0072	0.0072	1843.3	4	1963.494	4	
	Lapg. +	30	400	400	700	25	10	40	638	0.0244	0.0035	111.488	0.8573	0.0022	0.0035	892.5	3	1472.62		3
	lapg.-	30	400	400	700	25	10	40	638	0.0244	0.0035	22.2976	0.1715	0.0004	0.0035	892.5	3	1472.62	3	
B29	Tump. +	30	400	400	700	25	10	40	638	0.0244	0.0035	224.104	1.7232	0.0045	0.0045	1138.4	3	1472.62		3
	Tump. -	30	400	400	700	25	10	40	638	0.0244	0.0035	474.897	3.6516	0.0099	0.0099	2523.8	6	2945.241	6	
	Lapg. +	30	400	400	700	25	10	40	638	0.0244	0.0035	197.49	1.5186	0.0039	0.0039	998.77	3	1472.62		3
	lapg.-	30	400	400	700	25	10	40	638	0.0244	0.0035	39.498	0.3037	0.0008	0.0035	892.5	3	1472.62	3	
B30	Tump. +	30	400	400	700	25	10	40	638	0.0244	0.0035	203.861	1.5676	0.0040	0.0040	1032.1	3	1472.62		3
	Tump. -	30	400	400	700	25	10	40	638	0.0244	0.0035	460.841	3.5436	0.0096	0.0096	2442.5	6	2945.241	6	

	Lapg. +	30	400	400	700	25	10	40	638	0.0244	0.0035	193.047	1.4844	0.0038	0.0038	975.58	3	1472.62		3
	lapg.-	30	400	400	700	25	10	40	638	0.0244	0.0035	38.6094	0.2969	0.0007	0.0035	892.5	3	1472.62	3	
B31	Tump. +	30	400	400	700	25	10	40	638	0.0244	0.0035	211.699	1.6278	0.0042	0.0042	1073.2	3	1472.62		3
	Tump. -	30	400	400	700	25	10	40	638	0.0244	0.0035	474.917	3.6518	0.0099	0.0099	2524	6	2945.241	6	
	Lapg. +	30	400	400	700	25	10	40	638	0.0244	0.0035	197.478	1.5185	0.0039	0.0039	998.71	3	1472.62		3
	lapg.-	30	400	400	700	25	10	40	638	0.0244	0.0035	39.4956	0.3037	0.0008	0.0035	892.5	3	1472.62	3	

Momen Nominal Negatif Tumpuan Balok 400/700

Balok	*f'c*	*fy*	*be*	*b* (mm)	*h* (mm)	Sengkang (mm)	tul lentur (mm)	selimut (mm)	*As* ($mm^{2)}$	*A's* ($mm^{2)}$	*c*	*a*	*f's* (Mpa)	*Mn* (kNm)
B15	30	400	1300	400	700	10	25	40	1963.4954	1472.6216	74.3478	63.1956	95.61375	471.5234
B16	30	400	1300	400	700	10	25	40	1963.4954	1472.6216	74.3478	63.1956	95.61375	471.5234
B17	30	400	1300	400	700	10	25	40	1963.4954	1472.6216	74.3478	63.1956	95.61375	471.5234
B18	30	400	1300	400	700	10	25	40	1963.4954	1472.6216	74.3478	63.1956	95.61375	471.5234
B29	30	400	1360	400	700	10	25	40	2945.2431	1472.6216	98.5816	83.7944	219.6046	695.0152
B30	30	400	1360	400	700	10	25	40	2945.2431	1472.6216	98.5816	83.7944	219.6046	695.0152
B31	30	400	1360	400	700	10	25	40	2945.2431	1472.6216	98.5816	83.7944	219.6046	695.0152

Momen Nominal Positif Tumpuan Balok 400/700

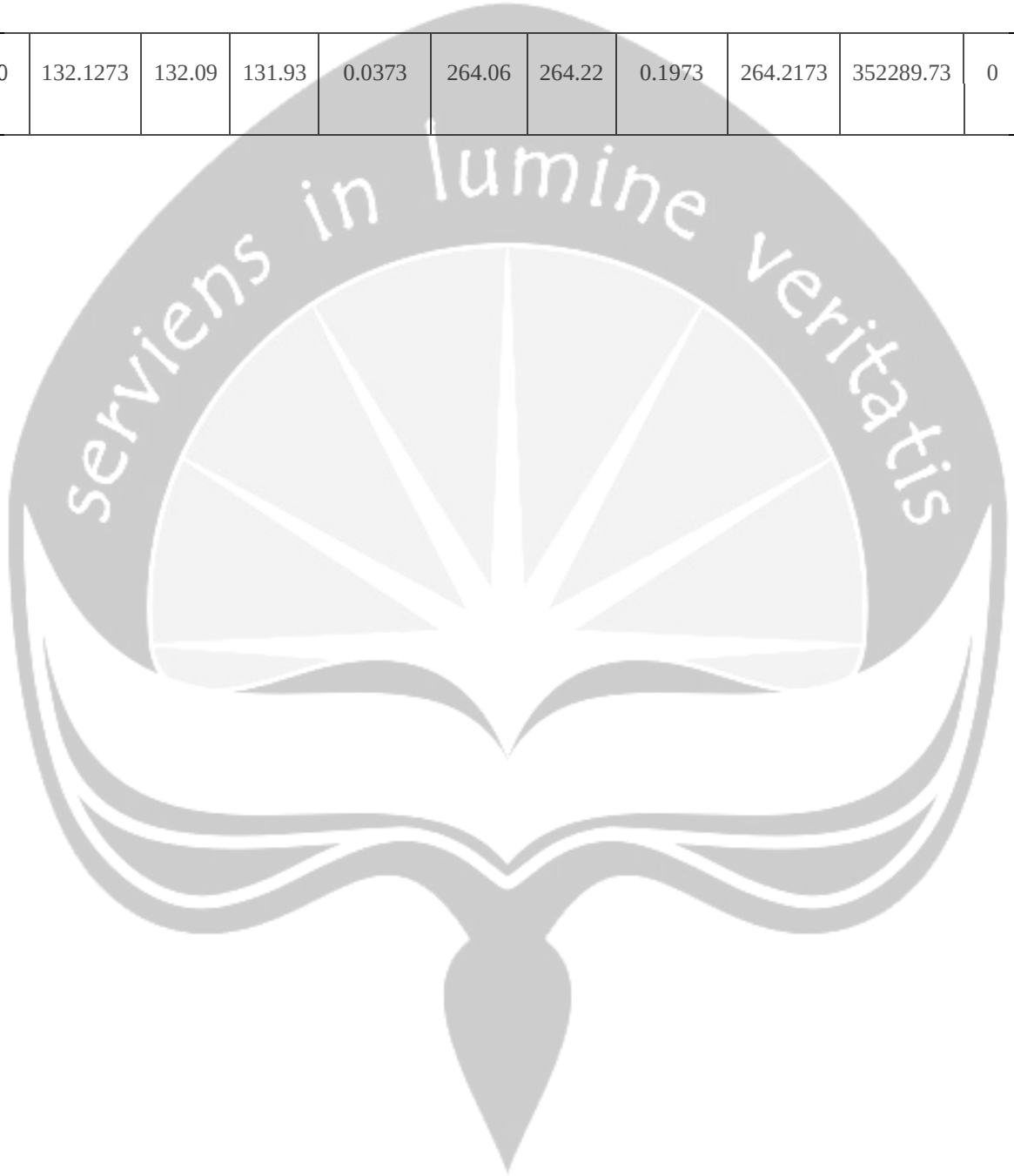
Balok	*f'c*	*fy*	*be*	*b* (mm)	*h* (mm)	Sengkang (mm)	tul lentur (mm)	selimut (mm)	*As* ($mm^{2)}$	*A's* ($mm^{2)}$	*c*	*a*	*f's* (Mpa)	*Mn* (kNm)
B15	30	400	1300	400	700	10	25	40	2528.9821	1472.6216	43.1615	36.6872	-247.979	392.348

B16	30	400	1300	400	700	10	25	40	2528.9821	1472.6216	43.1615	36.6872	-247.979	392.348
B17	30	400	1300	400	700	10	25	40	2528.9821	1472.6216	43.1615	36.6872	-247.979	392.348
B18	30	400	1300	400	700	10	25	40	2528.9821	1472.6216	43.1615	36.6872	-247.979	392.348
B29	30	400	1360	400	700	10	25	40	3699.2254	1472.6216	45.5412	38.7100	-203.668	396.377
B30	30	400	1360	400	700	10	25	40	3699.2254	1472.6216	45.5412	38.7100	-203.668	396.377
B31	30	400	1360	400	700	10	25	40	3699.2254	1472.6216	45.5412	38.7100	-203.668	396.377

Penulangan Geser Daerah Sendi Plastis Balok 400/700

Balok	Jenis	Nilai	b (mm)	h (mm)	V_e (kN)	$V_{g\text{-}ki}$ (kN)	$V_{g\text{-}ka}$ (kN)	Gaya Gempa Kiri		Gaya Gempa Kanan		V_u terpakai (kN)	V_n (N)	V_c (N)	V_s (N)	Sengkang
								$V_{u\ kiri}$	$V_{u\ kanan}$	$V_{u\ kiri}$	$V_{u\ kanan}$					
B15	Mn^-	458.41	400	700	165.7437	64.01	71.31	101.7337	237.05	229.75	94.4337	237.0537	316071.59	0	316071.585	3 P 10 - 100
	Mn^+	403.46														
B16	Mn^-	458.41	400	700	165.7437	68.6	66.72	97.1437	232.46	234.34	99.0237	234.3437	312458.25	0	312458.252	3 P 10 - 100
	Mn^+	403.46														
B17	Mn^-	458.41	400	700	165.7437	67.59	67.73	98.1537	233.47	233.33	98.0137	233.4737	311298.25	0	311298.252	3 P 10 - 100
	Mn^+	403.46														
B18	Mn^-	458.41	400	700	165.7437	70.45	64.87	95.2937	230.61	236.19	100.8737	236.1937	314924.92	0	314924.919	3 P 10 - 100
	Mn^+	403.46														
B29	Mn^-	632.25	400	700	132.1273	131.93	132.1	0.1973	264.23	264.06	0.0273	264.2273	352303.07	0	352303.067	3 P 10 - 100
	Mn^+	318.16														
B30	Mn^-	632.25	400	700	132.1273	132.03	132	0.0973	264.13	264.16	0.1273	264.1573	352209.73	0	352209.733	3 P 10 - 100
	Mn^+	318.16														

B31	Mn^-	632.25	400	700	132.1273	132.09	131.93	0.0373	264.06	264.22	0.1973	264.2173	352289.73	0	352289.733	3 P 10 - 100
	Mn^+	318.16														



Penulangan Geser Luar Sendi Plastis Balok 400/700

Balok	Jenis	Nilai	b (mm)	h (mm)	V_e (kN)	$V_{g\text{-}ki}$ (kN)	$V_{g\text{-}ka}$ (kN)	Gaya Gempa Kiri		Gaya Gempa Kanan		V_u terpakai (kN)	V_n (N)	V_c (N)	Sengkang
								$V_{u\ kiri}$	$V_{u\ kanan}$	$V_{u\ kiri}$	$V_{u\ kanan}$				
B15	Mn^-	471.52	400	700	166.1291	45.09	52.39	121.0391	218.5191	211.2191	113.7391	218.5191	291358.821	232782.087	3 P 10 - 200
	Mn^+	392.35													
B16	Mn^-	471.52	400	700	166.1291	49.68	47.8	116.4491	213.9291	215.8091	118.3291	215.8091	287745.487	232782.087	3 P 10 - 200
	Mn^+	392.35													
B17	Mn^-	471.52	400	700	166.1291	48.67	48.81	117.4591	214.9391	214.7991	117.3191	214.9391	286585.487	232782.087	3 P 10 - 200
	Mn^+	392.35													
B18	Mn^-	471.52	400	700	166.1291	51.53	45.95	114.5991	212.0791	217.6591	120.1791	217.6591	290212.154	232782.087	3 P 10 - 200
	Mn^+	392.35													
B29	Mn^-	695.02	400	700	151.5823	112.94	113.1	38.6423	264.6823	264.5223	38.4823	264.6823	352909.667	232782.087	3 P 10 - 200
	Mn^+	396.38													

B30	Mn^-	695.02	400	700	151.5823	113.03	113.01	38.5523	264.5923	264.6123	38.5723	264.6123	352816.333	232782.087	3 P 10 - 200
	Mn^+	396.38													
B31	Mn^-	695.02	400	700	151.5823	113.1	112.94	38.4823	264.5223	264.6823	38.6423	264.6823	352909.667	232782.087	3 P 10 - 200
	Mn^+	396.38													

Penulangan Longitudinal Kolom C-9

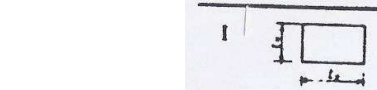
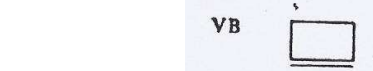
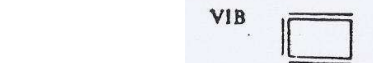
Lantai	Kolom	*b*	*h*	pembesaran Moment				*Pu*	Σpu	*Pc*	*ΣPc*	δs	*M1*	*M2*	*As*	Tul.lentur	n tul yg di gunakan
				Mn1s	*Mn2s*	*M1s*	*M2s*										
		(mm)	(mm)	(kNm)	(kNm)	(kNm)	(kNm)	(kN)	(kN)	(kN)	(kN)		(kNm)	(kNm)	(mm)	(mm)	
5	C9	600	600	2.825	14.345	68.85	67.562	526.09	7223.64	18318.087	366361.7	1.027	73.534	83.731	7200	25	16
4	C9	600	600	4.207	10.401	133.83	131.803	1284	17231.5	18318.087	366361.7	1.067	146.99	151.02	7200	25	16
3	C9	700	700	5.135	12.857	208.35	198.226	2055.35	27523.8	36161.284	723225.7	1.053	224.62	221.68	9800	25	20
2	C9	700	700	2.967	7.606	259.17	243.652	2828.26	37816.6	36161.284	723225.7	1.075	281.56	269.52	9800	25	20
1	C9	800	800	1.929	4.799	361.22	325.169	3621.66	48437.3	65870.735	1317415	1.052	381.77	346.73	12800	25	28
basement	C9	800	800	0.919	1.298	484.26	426.552	4415.75	59012.2	81321.895	1626438	1.051	509.79	449.53	12800	25	28

Penulangan Geser Kolom C-9

Lantai	Kolom	*b*	*h*	*hn*	HBK		*Vu*	*d*	*Vc*	*ØVC*	*Vs*	*Av*	*S*	Sengkang
					Mnats	Mnbwh								
		(mm)	(mm)	(mm)	(kNm)	(kNm)	(kN)	(mm)	(kN)	(kN)	(N)	(mm)	(mm)	
5	C9	600	600	3.8	1310.769	1310.769	689.8785	535.5	306.5106	229.8829	919531.55	530.9292	74.20628	4 D 12 - 70
4	C9	600	600	3.8	1309.231	1309.231	689.0688	535.5	320.5811	240.4358	918437.85	530.9292	74.29465	4 D 12 - 70
3	C9	700	700	3.8	1026.154	1026.154	574.4169	635.5	448.1477	336.1107	765441.05	530.9292	105.7917	4 D 12 - 100
2	C9	700	700	3.8	1029.231	1029.231	574.4169	635.5	462.9682	347.2261	765426.23	530.9292	105.7938	4 D 12 - 100
1	C9	800	800	3.8	1521.538	1521.538	800.8097	735.5	609.9963	457.4973	1067136.29	530.9292	87.82347	4 D 12 - 75
basement	C9	800	800	3.5	1553.846	1553.846	887.9121	735.5	626.1121	469.5841	1183256.67	530.9292	79.20481	4 D 12 - 75

Tabel 13.3.2

Momen di dalam pelat persegi yang menumpu pada keempat tepinya akibat beban terbagi rata

		ly/lx	1,0	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	2,0	2,1	2,2	2,3	2,4	2,5	>2,5
I		(Mlx) = 0,001 qlx² X	44	52	59	66	73	78	84	88	93	97	100	103	106	108	110	112	125
		(Mly) = 0,001 qlx² X	44	45	45	44	44	43	41	40	39	38	37	36	35	34	32	32	25
II		(Mlx) = – (Mtx) = 0,001 qlx² X	36	42	46	50	53	56	58	59	60	61	62	62	62	63	63	63	63
		(Mly) = 0,001 qlx² X	36	37	38	38	38	37	36	36	35	35	35	34	34	34	34	34	13
		– (Mty) = 0,001 qlx² X	36	37	38	38	38	37	36	36	35	35	35	34	34	34	34	34	38
III		(Mlx) = – (Mtx) = 0,001 qlx² X	48	55	61	67	71	76	79	82	84	86	88	89	90	91	92	92	94
		(Mly) = 0,001 qlx² X	48	50	51	51	51	51	51	50	50	49	49	49	48	48	47	47	19
		– (Mty) = 0,001 qlx² X	48	50	51	51	51	51	51	50	50	49	49	49	48	48	47	47	56
IVA		(Mlx) = 0,001 qlx² X	22	28	34	41	48	55	62	68	74	80	85	89	93	97	100	103	125
		(Mly) = 0,001 qlx² X	51	57	62	67	70	73	75	77	78	79	79	79	79	79	79	79	25
		– (Mty) = 0,001 qlx² X	51	57	62	67	70	73	75	77	78	79	79	79	79	79	79	79	75
IVB		(Mlx) = – (Mtx) = 0,001 qlx² X	51	54	57	59	60	61	62	62	63	63	63	63	63	63	63	63	63
		(Mly) = 0,001 qlx² X	22	20	18	17	15	14	13	12	11	10	10	10	9	9	9	9	13
VA		(Mlx) = 0,001 qlx² X	31	38	45	53	59	66	72	78	83	88	92	96	99	102	105	108	125
		(Mly) = 0,001 qlx² X	60	65	69	73	75	77	78	79	79	80	80	80	79	79	79	79	25
		– (Mty) = 0,001 qlx² X	60	65	69	73	75	77	78	79	79	80	80	80	79	79	79	79	75
VB		(Mlx) = – (Mlx) = 0,001 qlx² X	60	66	71	76	79	82	85	87	88	89	90	91	91	92	92	93	94
		(Mly) = 0,001 qlx² X	31	30	28	27	25	24	22	21	20	19	18	17	17	16	16	15	12
VIA		(Mlx) = – (Mtx) = 0,001 qlx² X	38	46	53	59	65	69	73	77	80	83	85	86	87	88	89	90	54
		(Mly) = 0,001 qlx² X	43	46	48	50	51	51	51	51	50	50	50	49	49	48	48	48	19
		– (Mty) = 0,001 qlx² X	43	46	48	50	51	51	51	51	50	50	50	49	49	48	48	48	56
VIB		(Mlx) = – (Mtx) = 0,001 qlx² X	13	48	51	55	57	58	60	61	62	62	62	63	63	63	63	63	63
		(Mly) = 0,001 qlx² X	38	39	38	38	37	36	36	35	35	34	34	34	33	33	33	33	13
		(Mty) = 0,001 qlx² X	38	39	38	38	37	36	36	35	35	34	34	34	33	33	33	33	38

= Terletak bebas

= Menerus atau terjepit elastis

L O A D I N G C O M B I N A T I O N S

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
COMB19	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

B E A M F O R C E S

Story	Beam	Load	Loc	P	V2	V3	T	M2	M3
LT 1	B15	COMB19 MAX	0.4	0	76.22	0	0.141	0	256.585
			0.873	0	80.64	0	0.141	0	219.556
			1.345	0	86.21	0	0.141	0	184.926
			1.818	0	92.95	0	0.141	0	151.84
			2.291	0	100.62	0	0.141	0	112.161
			2.764	0	108.38	0	0.141	0	65.367
			3.236	0	121.6	0	0.141	0	79.366
			3.709	0	136.67	0	0.141	0	122.706
			4.182	0	151.55	0	0.141	0	158.932
			4.655	0	164.27	0	0.141	0	189.75
			5.127	0	174.33	0	0.141	0	227.387
			5.6	0	181.72	0	0.141	0	262.661
LT 1	B15	COMB19 MIN	0.4	0	-174.42	0	-0.161	0	-322.19
			0.873	0	-167.02	0	-0.161	0	-241.381
			1.345	0	-156.96	0	-0.161	0	-169.459
			1.818	0	-144.24	0	-0.161	0	-107.375
			2.291	0	-129.37	0	-0.161	0	-48.728
			2.764	0	-114.29	0	-0.161	0	6.257
			3.236	0	-104.67	0	-0.161	0	-10.346

			3.709	0	-96.91	0	-0.161	0	-67.085
			4.182	0	-89.24	0	-0.161	0	-127.487
			4.655	0	-82.5	0	-0.161	0	-192.51
			5.127	0	-76.92	0	-0.161	0	-272.646
			5.6	0	-72.51	0	-0.161	0	-356.908
LT 1	B16	COMB19 MAX	0.4	0	69.63	0	0.148	0	246.573
			0.873	0	74.05	0	0.148	0	212.658
			1.345	0	79.63	0	0.148	0	176.522
			1.818	0	86.36	0	0.148	0	147.647
			2.291	0	94.04	0	0.148	0	112.179
			2.764	0	101.8	0	0.148	0	69.597
			3.236	0	112.69	0	0.148	0	69.797
			3.709	0	127.76	0	0.148	0	113.271
			4.182	0	142.64	0	0.148	0	149.631
			4.655	0	155.36	0	0.148	0	179.398
			5.127	0	165.42	0	0.148	0	214.194
			5.6	0	172.81	0	0.148	0	248.505
LT 1	B16	COMB19 MIN	0.4	0	-174.7	0	-0.152	0	-332.564
			0.873	0	-167.3	0	-0.152	0	-251.621
			1.345	0	-157.25	0	-0.152	0	-174.946
			1.818	0	-144.53	0	-0.152	0	-113.825
			2.291	0	-129.65	0	-0.152	0	-56.141
			2.764	0	-114.58	0	-0.152	0	-2.12
			3.236	0	-102.63	0	-0.152	0	-1.676
			3.709	0	-94.87	0	-0.152	0	-55.301

			4.182	0	-87.2	0	-0.152	0	-112.589
			4.655	0	-80.46	0	-0.152	0	-173.314
			5.127	0	-74.89	0	-0.152	0	-247.362
			5.6	0	-70.47	0	-0.152	0	-327.412
LT 1	B17	COMB19 MAX	0.4	0	70.09	0	0.151	0	247.453
			0.873	0	74.51	0	0.151	0	213.321
			1.345	0	80.08	0	0.151	0	177.806
			1.818	0	86.82	0	0.151	0	148.451
			2.291	0	94.49	0	0.151	0	112.503
			2.764	0	102.25	0	0.151	0	69.441
			3.236	0	113.7	0	0.151	0	69.654
			3.709	0	128.78	0	0.151	0	112.648
			4.182	0	143.66	0	0.151	0	148.529
			4.655	0	156.38	0	0.151	0	177.817
			5.127	0	166.43	0	0.151	0	213.401
			5.6	0	173.83	0	0.151	0	247.495
LT 1	B17	COMB19 MIN	0.4	0	-173.69	0	-0.149	0	-329.83
			0.873	0	-166.29	0	-0.149	0	-249.367
			1.345	0	-156.23	0	-0.149	0	-174.007
			1.818	0	-143.51	0	-0.149	0	-113.103
			2.291	0	-128.64	0	-0.149	0	-55.636
			2.764	0	-113.56	0	-0.149	0	-1.831
			3.236	0	-102.18	0	-0.149	0	-2.096
			3.709	0	-94.42	0	-0.149	0	-55.937
			4.182	0	-86.74	0	-0.149	0	-113.441

			4.655	0	-80.01	0	-0.149	0	-174.383
			5.127	0	-74.43	0	-0.149	0	-249.914
			5.6	0	-70.01	0	-0.149	0	-330.444
LT 1	B18	COMB19 MAX	0.4	0	72.88	0	0.16	0	263.612
			0.873	0	77.3	0	0.16	0	228.16
			1.345	0	82.88	0	0.16	0	190.346
			1.818	0	89.61	0	0.16	0	159.893
			2.291	0	97.29	0	0.16	0	123.259
			2.764	0	105.05	0	0.16	0	79.51
			3.236	0	115.16	0	0.16	0	65.103
			3.709	0	130.23	0	0.16	0	111.488
			4.182	0	145.11	0	0.16	0	150.759
			4.655	0	157.83	0	0.16	0	183.436
			5.127	0	167.89	0	0.16	0	218.731
			5.6	0	175.28	0	0.16	0	255.582
LT 1	B18	COMB19 MIN	0.4	0	-180.86	0	-0.142	0	-354.722
			0.873	0	-173.46	0	-0.142	0	-270.869
			1.345	0	-163.4	0	-0.142	0	-191.141
			1.818	0	-150.69	0	-0.142	0	-127.069
			2.291	0	-135.81	0	-0.142	0	-66.844
			2.764	0	-120.73	0	-0.142	0	-10.284
			3.236	0	-108.01	0	-0.142	0	6.142
			3.709	0	-100.25	0	-0.142	0	-49.02
			4.182	0	-92.57	0	-0.142	0	-107.845
			4.655	0	-85.84	0	-0.142	0	-170.107

			5.127	0	-80.26	0	-0.142	0	-243.279
			5.6	0	-75.84	0	-0.142	0	-324.496
LT 1	B29	COMB19 MAX	0.4	0	15.06	0	0.131	0	224.104
			0.85	0	19.24	0	0.131	0	216.428
			1.3	0	24.46	0	0.131	0	206.634
			1.75	0	30.74	0	0.131	0	194.252
			2.2	0	37.87	0	0.131	0	197.869
			2.65	0	44.26	0	0.131	0	197.619
			3.1	0	49.61	0	0.131	0	192.48
			3.55	0	53.9	0	0.131	0	183.537
			4	0	57.15	0	0.131	0	197.49
			4	0	140.71	0	0.131	0	197.49
			4.45	0	145.54	0	0.131	0	171.263
			4.9	0	152.79	0	0.131	0	180.133
			5.35	0	162.45	0	0.131	0	185.198
			5.8	0	174.52	0	0.131	0	185.374
			6.25	0	188.26	0	0.131	0	181.924
			6.7	0	200.06	0	0.131	0	194.281
			7.15	0	209.45	0	0.131	0	204.048
			7.6	0	216.43	0	0.131	0	211.698
LT 1	B29	COMB19 MIN	0.4	0	-216.27	0	-0.157	0	-474.897
			0.85	0	-209.29	0	-0.157	0	-379.056
			1.3	0	-199.9	0	-0.157	0	-286.899
			1.75	0	-188.09	0	-0.157	0	-199.51
			2.2	0	-174.36	0	-0.157	0	-136.992

			2.65	0	-162.28	0	-0.157	0	-79.606
			3.1	0	-152.62	0	-0.157	0	-24.862
			3.55	0	-145.38	0	-0.157	0	27.712
			4	0	-140.54	0	-0.157	0	78.589
			4	0	-57.09	0	-0.157	0	78.589
			4.45	0	-53.85	0	-0.157	0	39.885
			4.9	0	-49.55	0	-0.157	0	-12.715
			5.35	0	-44.2	0	-0.157	0	-67.485
			5.8	0	-37.81	0	-0.157	0	-124.896
			6.25	0	-30.69	0	-0.157	0	-187.682
			6.7	0	-24.41	0	-0.157	0	-275.145
			7.15	0	-19.18	0	-0.157	0	-367.376
			7.6	0	-15	0	-0.157	0	-463.291
LT 1	B30	COMB19 MAX	0.4	0	11.67	0	0.139	0	203.861
			0.85	0	15.85	0	0.139	0	197.708
			1.3	0	21.08	0	0.139	0	189.439
			1.75	0	27.36	0	0.139	0	178.579
			2.2	0	34.48	0	0.139	0	181.809
			2.65	0	40.88	0	0.139	0	183.111
			3.1	0	46.22	0	0.139	0	179.522
			3.55	0	50.52	0	0.139	0	172.13
			4	0	53.76	0	0.139	0	193.047
			4	0	137.26	0	0.139	0	193.047
			4.45	0	142.1	0	0.139	0	172.143
			4.9	0	149.34	0	0.139	0	179.549

			5.35	0	159	0	0.139	0	183.15
			5.8	0	171.07	0	0.139	0	181.862
			6.25	0	184.81	0	0.139	0	178.608
			6.7	0	196.62	0	0.139	0	189.473
			7.15	0	206.01	0	0.139	0	197.748
			7.6	0	212.99	0	0.139	0	203.907
LT 1	B30	COMB19 MIN	0.4	0	-213.01	0	-0.145	0	-460.841
			0.85	0	-206.04	0	-0.145	0	-366.464
			1.3	0	-196.64	0	-0.145	0	-275.77
			1.75	0	-184.84	0	-0.145	0	-189.846
			2.2	0	-171.1	0	-0.145	0	-126.881
			2.65	0	-159.03	0	-0.145	0	-70.987
			3.1	0	-149.37	0	-0.145	0	-17.735
			3.55	0	-142.12	0	-0.145	0	33.347
			4	0	-137.29	0	-0.145	0	82.733
			4	0	-53.78	0	-0.145	0	82.733
			4.45	0	-50.53	0	-0.145	0	33.353
			4.9	0	-46.23	0	-0.145	0	-17.724
			5.35	0	-40.89	0	-0.145	0	-70.97
			5.8	0	-34.49	0	-0.145	0	-126.858
			6.25	0	-27.37	0	-0.145	0	-189.78
			6.7	0	-21.09	0	-0.145	0	-275.692
			7.15	0	-15.86	0	-0.145	0	-366.372
			7.6	0	-11.68	0	-0.145	0	-460.736
LT 1	B31	COMB19 MAX	0.4	0	15	0	0.18	0	211.699

			0.85	0	19.18	0	0.18	0	204.048
			1.3	0	24.41	0	0.18	0	194.28
			1.75	0	30.69	0	0.18	0	181.922
			2.2	0	37.81	0	0.18	0	185.369
			2.65	0	44.21	0	0.18	0	185.192
			3.1	0	49.55	0	0.18	0	180.126
			3.55	0	53.85	0	0.18	0	171.255
			4	0	57.09	0	0.18	0	197.478
			4	0	140.55	0	0.18	0	197.478
			4.45	0	145.38	0	0.18	0	183.526
			4.9	0	152.63	0	0.18	0	192.468
			5.35	0	162.29	0	0.18	0	197.606
			5.8	0	174.36	0	0.18	0	197.855
			6.25	0	188.1	0	0.18	0	194.245
			6.7	0	199.9	0	0.18	0	206.627
			7.15	0	209.29	0	0.18	0	216.42
			7.6	0	216.27	0	0.18	0	224.095
LT 1	B31	COMB19 MIN	0.4	0	-216.43	0	-0.121	0	-463.291
			0.85	0	-209.45	0	-0.121	0	-367.377
			1.3	0	-200.06	0	-0.121	0	-275.147
			1.75	0	-188.26	0	-0.121	0	-187.685
			2.2	0	-174.52	0	-0.121	0	-124.898
			2.65	0	-162.45	0	-0.121	0	-67.487
			3.1	0	-152.79	0	-0.121	0	-12.718
			3.55	0	-145.54	0	-0.121	0	39.881

4	0	-140.7	0	-0.121	0	78.585
4	0	-57.15	0	-0.121	0	78.585
4.45	0	-53.9	0	-0.121	0	27.707
4.9	0	-49.61	0	-0.121	0	-24.868
5.35	0	-44.26	0	-0.121	0	-79.612
5.8	0	-37.86	0	-0.121	0	-136.998
6.25	0	-30.74	0	-0.121	0	-199.526
6.7	0	-24.46	0	-0.121	0	-286.916
7.15	0	-19.23	0	-0.121	0	-379.074
7.6	0	-15.05	0	-0.121	0	-474.917

L O A D I N G C O M B I N A T I O N S

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
COMB19	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

C O L U M N F O R C E

Story	Column	Load	Loc	P	V2	V3	T	M2	M3
LT 5	C9	COMB19 MAX	0	-251.02	62.57	62.71	0.056	91.022	96.93
			1.55	-238.97	62.57	62.71	0.056	9.11	2.841
			3.1	-226.91	62.57	62.71	0.056	106.842	87.677
LT 5	C9	COMB19 MIN	0	-416.68	-55.05	-63.14	-0.039	-88.879	-82.965
			1.55	-400.6	-55.05	-63.14	-0.039	-6.301	-0.532
			3.1	-384.53	-55.05	-63.14	-0.039	-103.368	-97.024
LT 4	C9	COMB19 MAX	0	-492.79	105.85	109.92	0.197	176.95	178.101
			1.55	-480.74	105.85	109.92	0.197	6.572	14.037
			3.1	-468.69	105.85	109.92	0.197	159.247	142.022
LT 4	C9	COMB19 MIN	0	-934.07	-99.89	-106.9	-0.193	-172.151	-167.642
			1.55	-918	-99.89	-106.9	-0.193	-6.452	-12.81
			3.1	-901.93	-99.89	-106.9	-0.193	-163.807	-150.028
LT 3	C9	COMB19 MAX	0	-743.27	154.3	162.71	0.532	274.039	265.831
			1.55	-726.87	154.3	162.71	0.532	21.842	26.663
			3.1	-710.46	154.3	162.71	0.532	226.989	203.01
LT 3	C9	COMB19 MIN	0	-1465.88	-147.21	-160.04	-0.523	-269.148	-253.352
			1.55	-1444.01	-147.21	-160.04	-0.523	-21.08	-25.171
			3.1	-1422.14	-147.21	-160.04	-0.523	-230.355	-212.505
LT 2	C9	COMB19 MAX	0	-993.63	175.21	183.42	0.662	338.828	321.575
			1.55	-977.22	175.21	183.42	0.662	54.534	50.003
			3.1	-960.82	175.21	183.42	0.662	227.068	215.374
LT 2	C9	COMB19 MIN	0	-1998.93	-170.82	-181.59	-0.656	-335.868	-314.178
			1.55	-1977.06	-170.82	-181.59	-0.656	-54.4	-49.402

			3.1	-1955.18	-170.82	-181.59	-0.656	-229.759	-221.568
LT 1	C9	COMB19 MAX	0	-1258.29	198.82	207.72	1.011	469.611	425.829
			1.55	-1236.86	198.82	207.72	1.011	147.924	117.735
			3.1	-1215.44	198.82	207.72	1.011	172.531	185.267
LT 1	C9	COMB19 MIN	0	-2551.56	-195.59	-207.13	-1.009	-469.568	-421.077
			1.55	-2522.99	-195.59	-207.13	-1.009	-148.8	-117.98
			3.1	-2494.42	-195.59	-207.13	-1.009	-174.326	-190.509
BASEMENT	C9	COMB19 MAX	0	-1522.98	186.89	191.6	0.541	629.377	555.063
			1.4	-1503.62	186.89	191.6	0.541	361.188	293.489
			2.8	-1484.27	186.89	191.6	0.541	93.144	32.174
BASEMENT	C9	COMB19 MIN	0	-3103.26	-186.12	-192.06	-0.541	-629.837	-554.232
			1.4	-3077.45	-186.12	-192.06	-0.541	-361.017	-293.739
			2.8	-3051.65	-186.12	-192.06	-0.541	-92.341	-33.505

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Gaya-gaya Pada Pondasi

Story	Point	Load	FX	FY	FZ	MX	MY	MZ
BASE	15	DEAD	-0.3	0.17	1732.15	-0.175	-0.318	0
BASE	15	LIVE	-0.15	0.09	635.95	-0.093	-0.163	0
BASE	15	SD	-0.14	0.1	1099.7	-0.045	-0.16	0.007
BASE	15	EX	-143.38	-147.51	-27.66	484.257	-426.552	-0.416
BASE	15	EY	-143.38	-147.51	-27.66	484.257	-426.552	-0.416
BASE	15	RAIN	-0.01	-0.01	14.31	0.006	-0.009	0
Summation	0, 0, Base	DEAD	-0.3	0.17	1732.15	27714.26	-31179.1	7.796
Summation	0, 0, Base	LIVE	-0.15	0.09	635.95	10175.11	-11447.3	4.103
Summation	0, 0, Base	SD	-0.14	0.1	1099.7	17595.22	-19794.8	4.034
Summation	0, 0, Base	EX	-143.38	-147.51	-27.66	41.681	71.346	-361.517
Summation	0, 0, Base	EY	-143.38	-147.51	-27.66	41.681	71.346	-361.517
Summation	0, 0, Base	RAIN	-0.01	-0.01	14.31	228.962	-257.585	0.029