

BAB VII

KESIMPULAN DAN SARAN

7.1 Kesimpulan

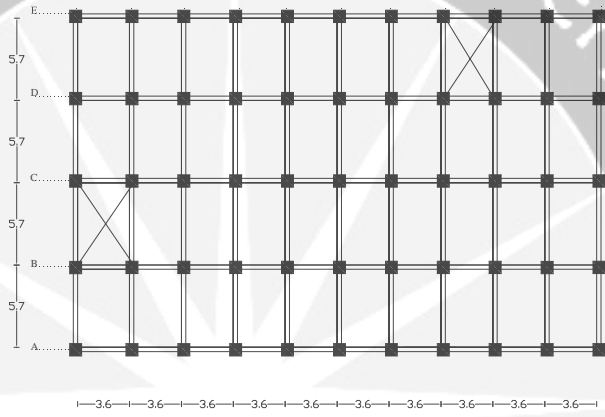
Setelah melakukan analisis dan perancangan pada struktur gedung Perancangan Struktur Wisma Atlit Bontang Kalimantan Timur yang disesuaikan dengan Tata Cara Perhitungan Struktur Beton Untuk Gedung SNI 03-2847-2002 dan Standar Perencanaan Ketahanan Gempa Untuk Struktur Bangunan Gedung SNI 3-1726-2002, 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 dimensi balok yaitu sebesar 300 mm × 500 mm
3. Dalam perencanaan kolom, dimensi yang digunakan untuk kolom lantai *Basement 1* ,*Basement 2* sebesar 700 mm × 700 mm, dimensi kolom sebesar 600 mm × 600 mm untuk kolom lantai 2 hingga lantai 7 . Sedangkan untuk jumlah tulangan utama serta tulangan geser berbeda - beda.

7.2 Saran

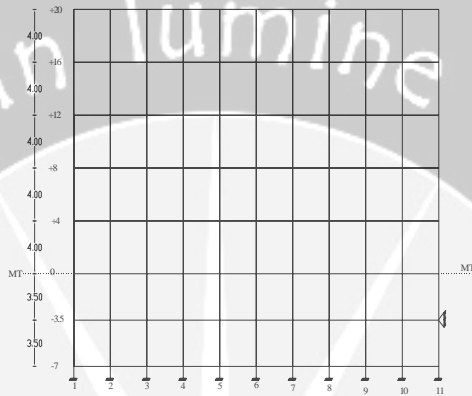
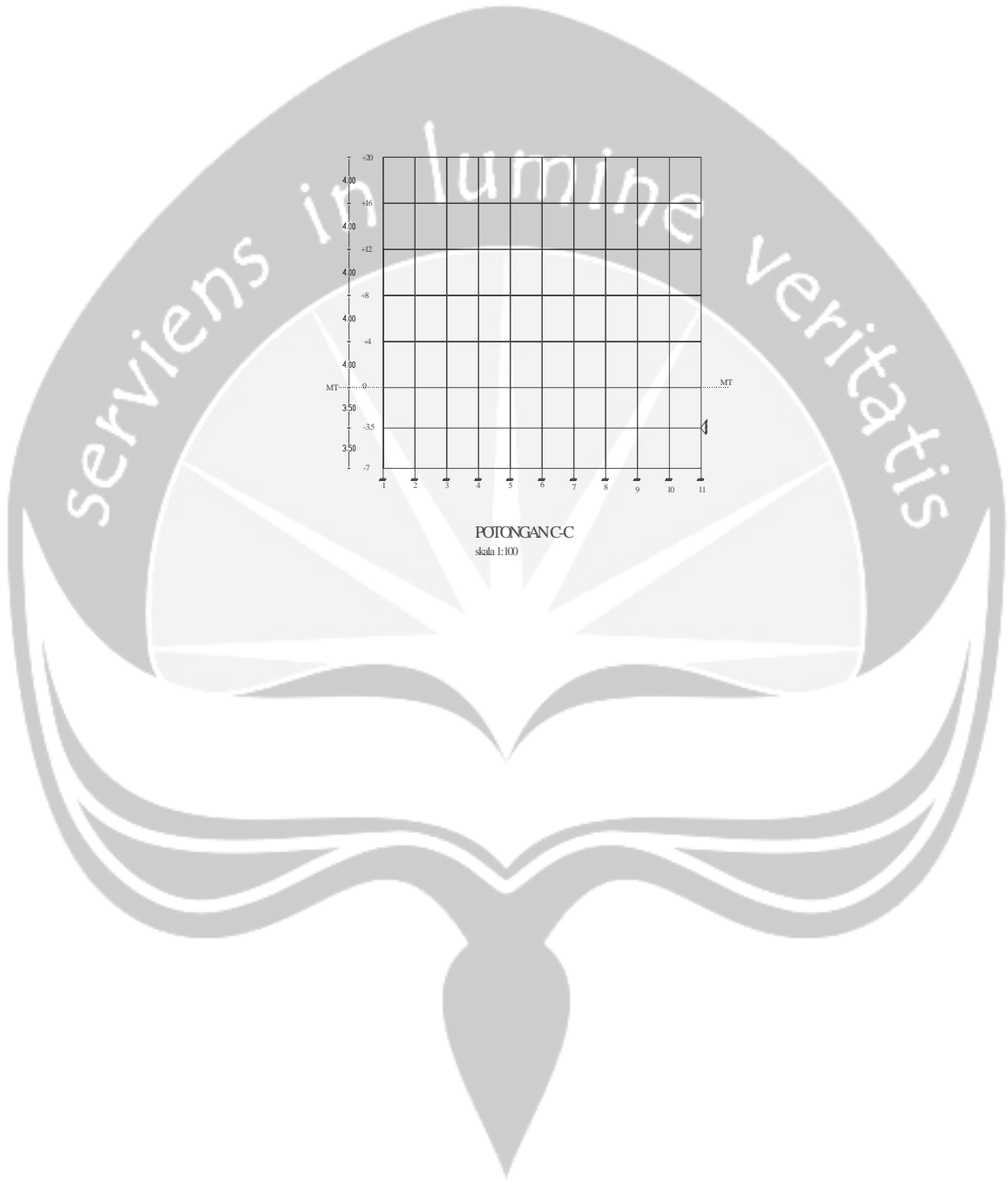
1. Sebelum perencanaan struktur sebaiknya dilakukan estimasi awal pada ukuran elemen struktur, sehingga tidak terjadi penentuan elemen struktur berulang-ulang.
2. Dalam perancangan elemen-elemen struktur seperti penentuan tulangan pelat, balok serta kolom sebaiknya digunakan ukuran yang seragam untuk mempermudah pelaksanaan pekerjaan di lapangan.
3. Untuk kemudahan dalam melaksanakan analisis struktur terutama dalam pembuatan model struktur gedung akan lebih mudah jika di pakai program analisis struktur ETABS beserta dengan program - program bantu lainnya.
4. Dalam melakukan input data pada program ETABS hendaknya dilakukan dengan teliti sesuai dengan asumsi - asumsi yang telah ditetapkan sebelumnya sehingga dapat dihasilkan analisis struktur yang mendekati keadaan sebenarnya.

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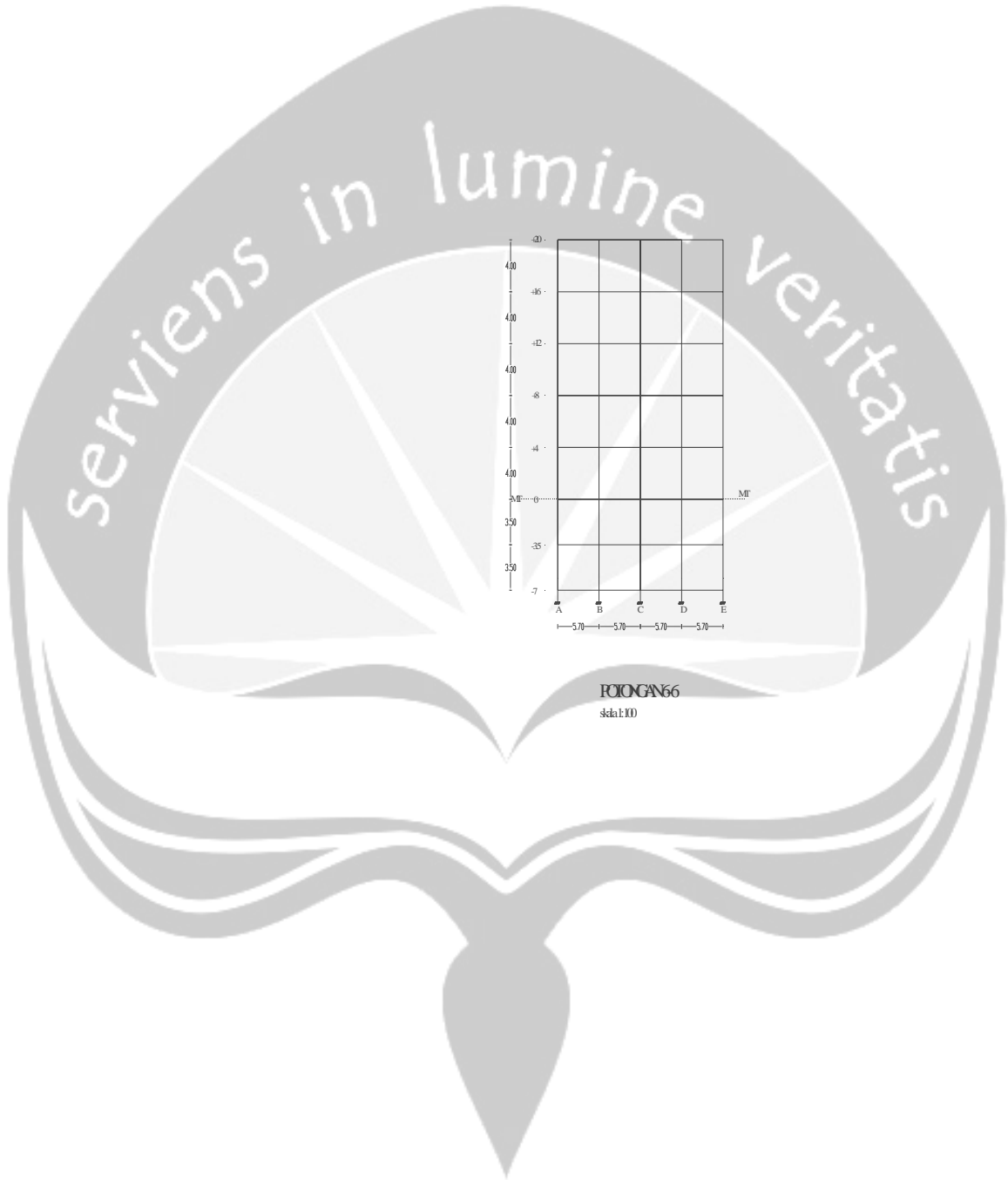


DENAH LANTAI BASEMENT 1, 2 DAN LANTAI 1-5

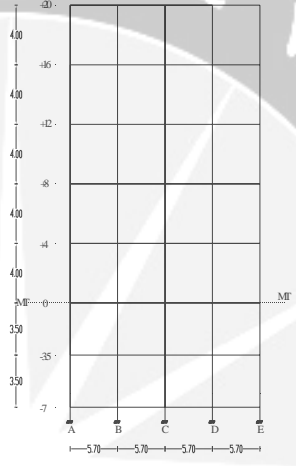
Skala 1:100



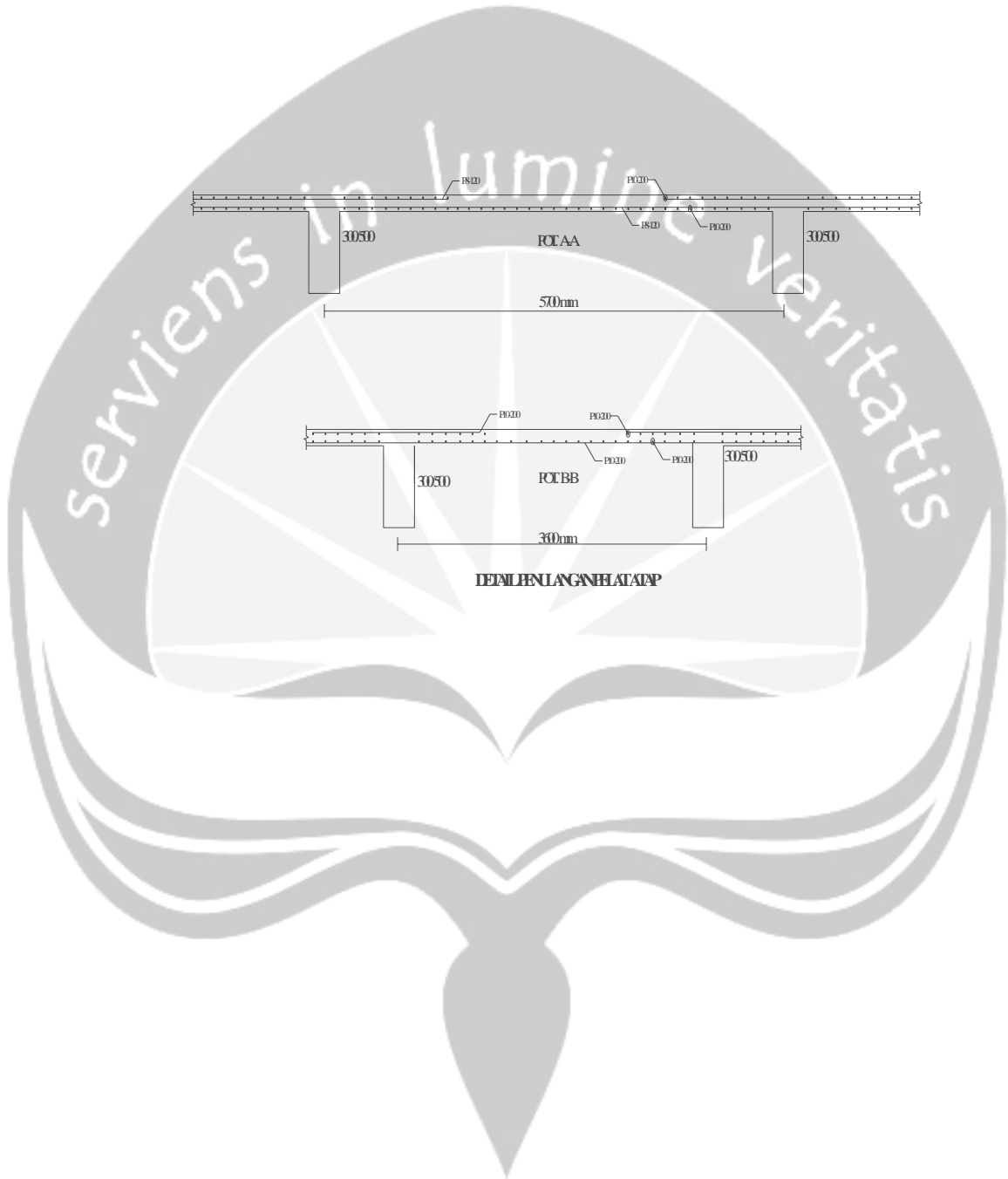
POTONGAN-C
skala 1:100

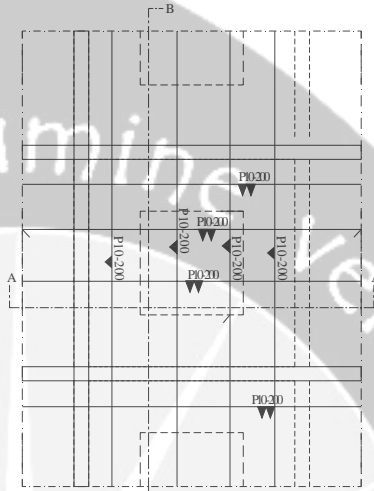
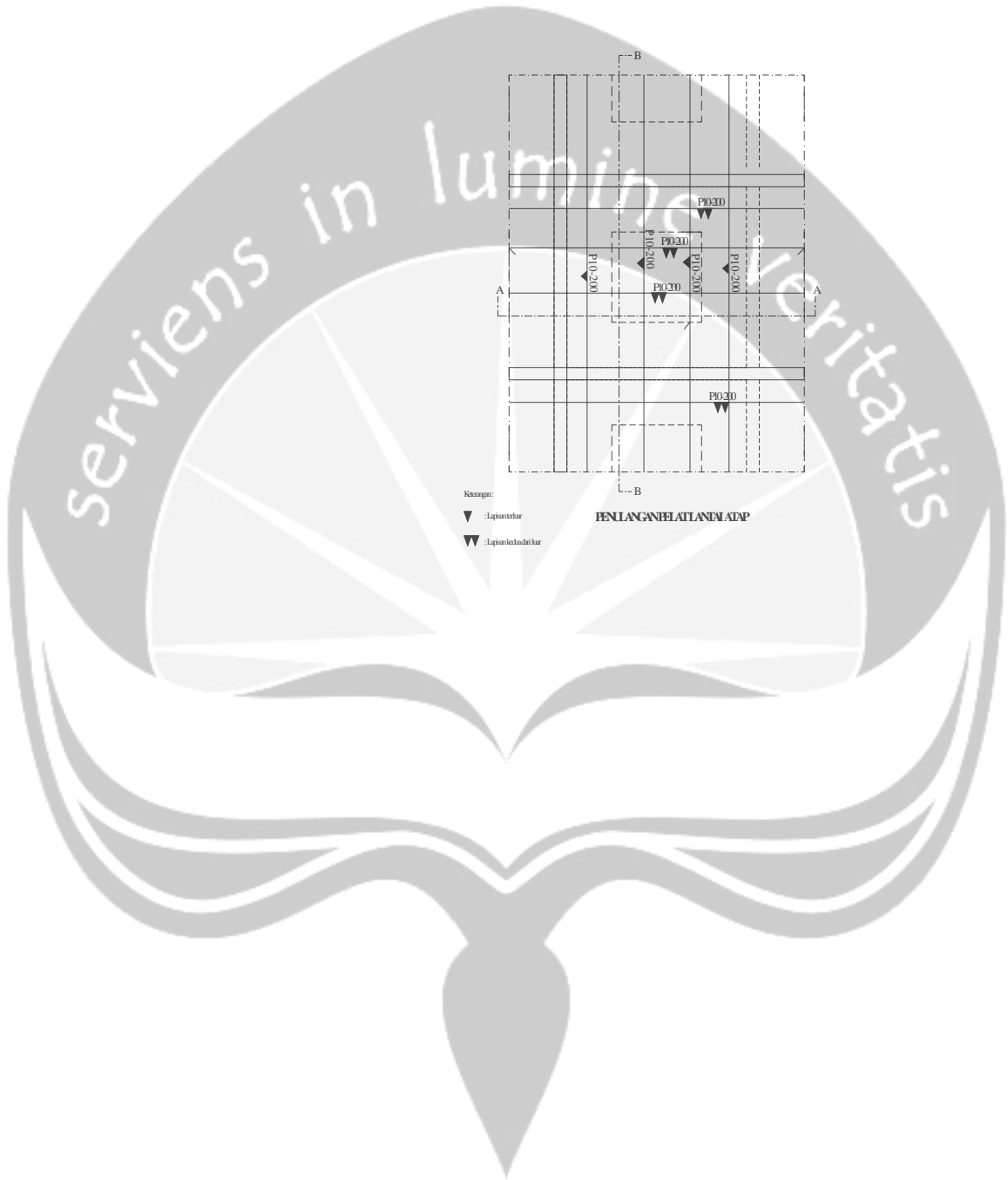


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sda1.100



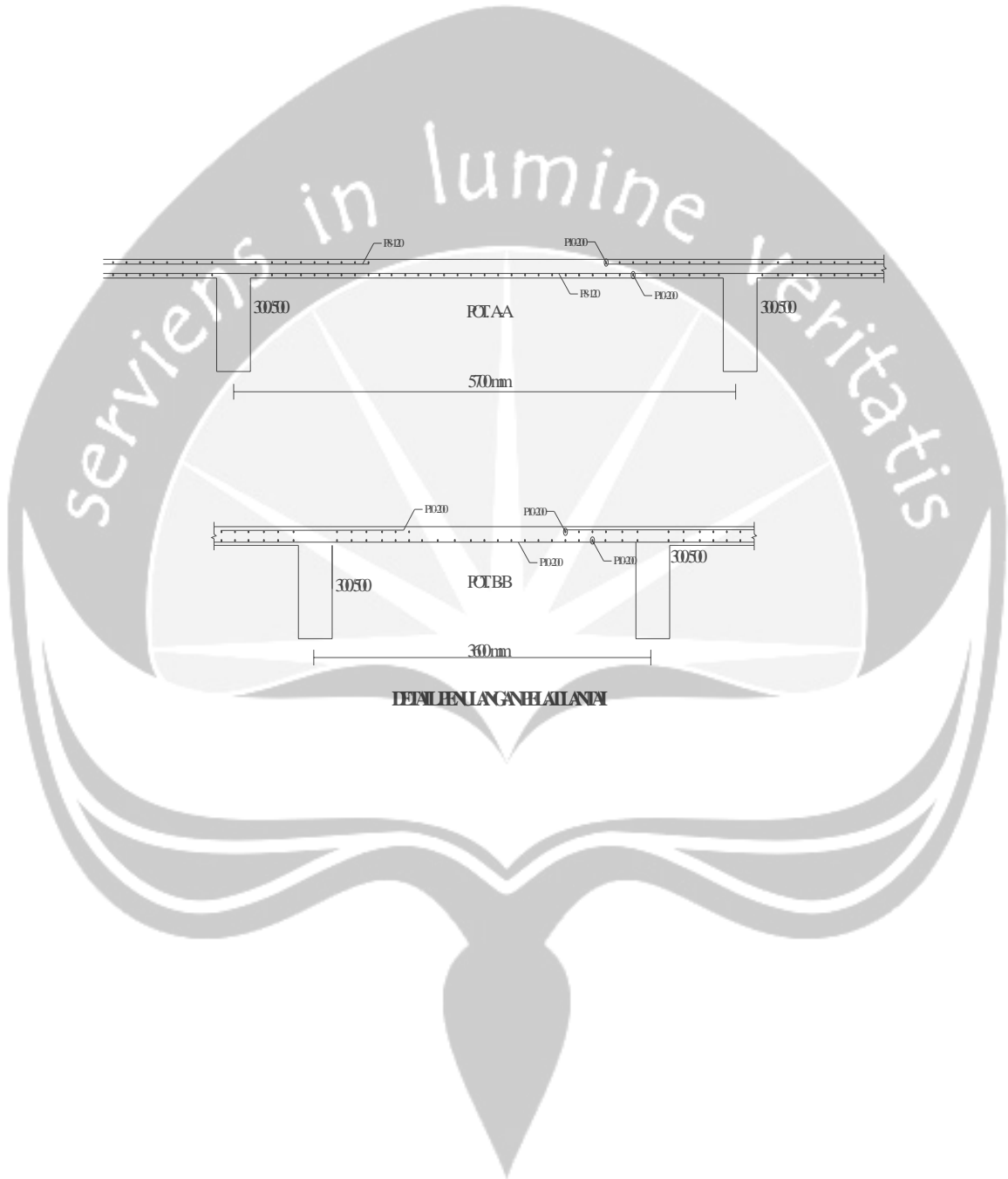


Keterangan:

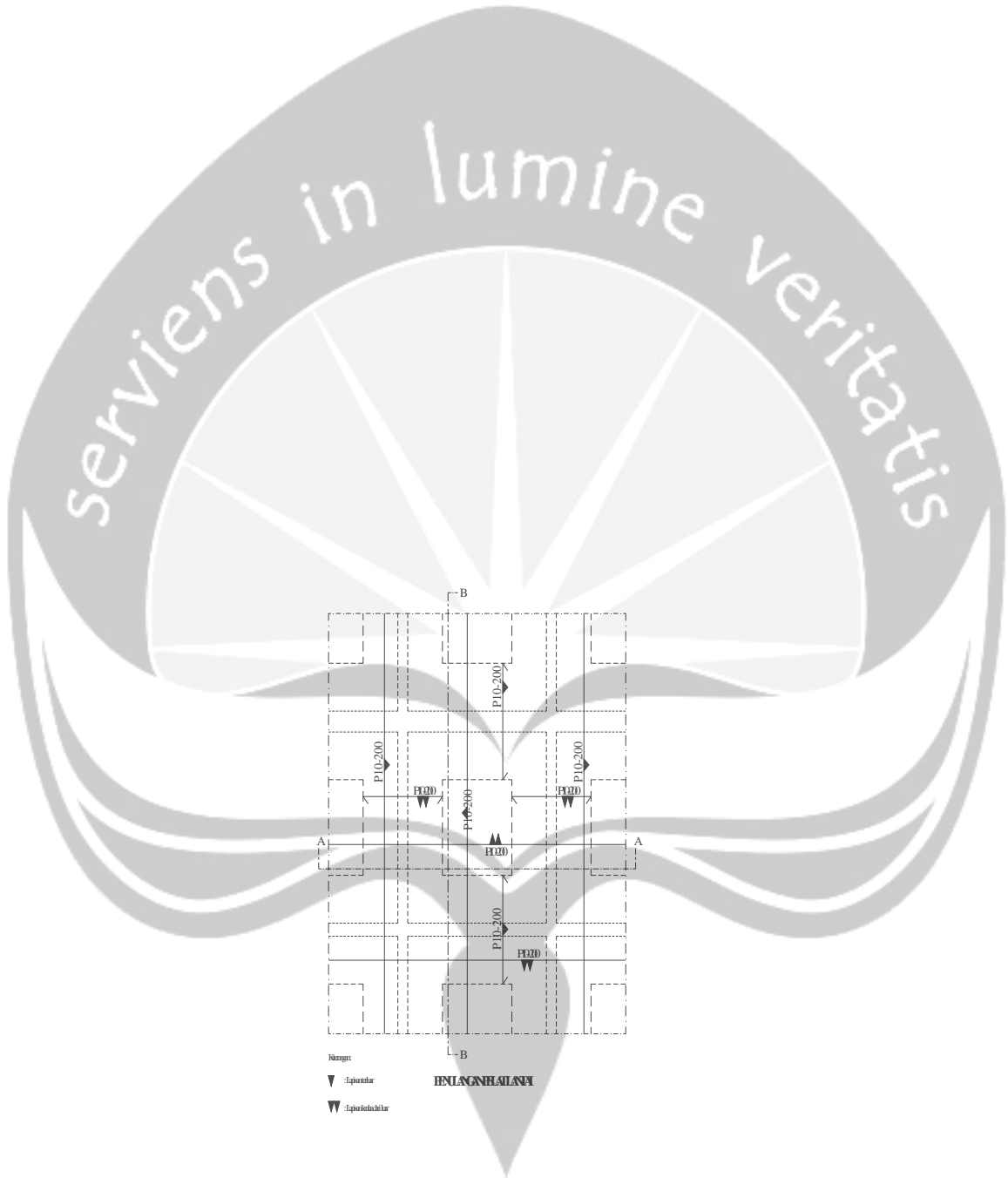
▼ : Lapisan atas

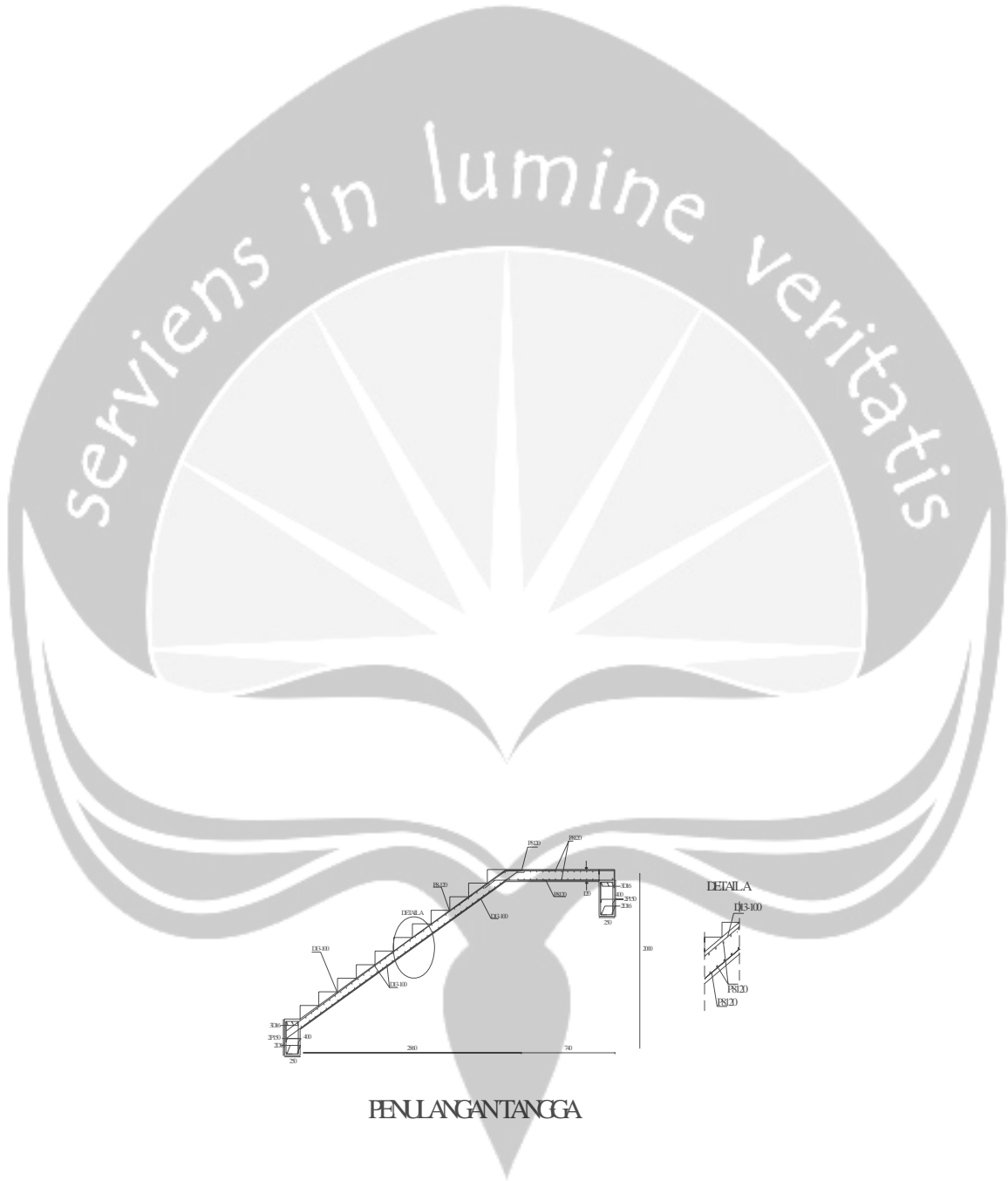
▼▼ : Lapisan bawah

BENLANGAN PELATNAN A&P

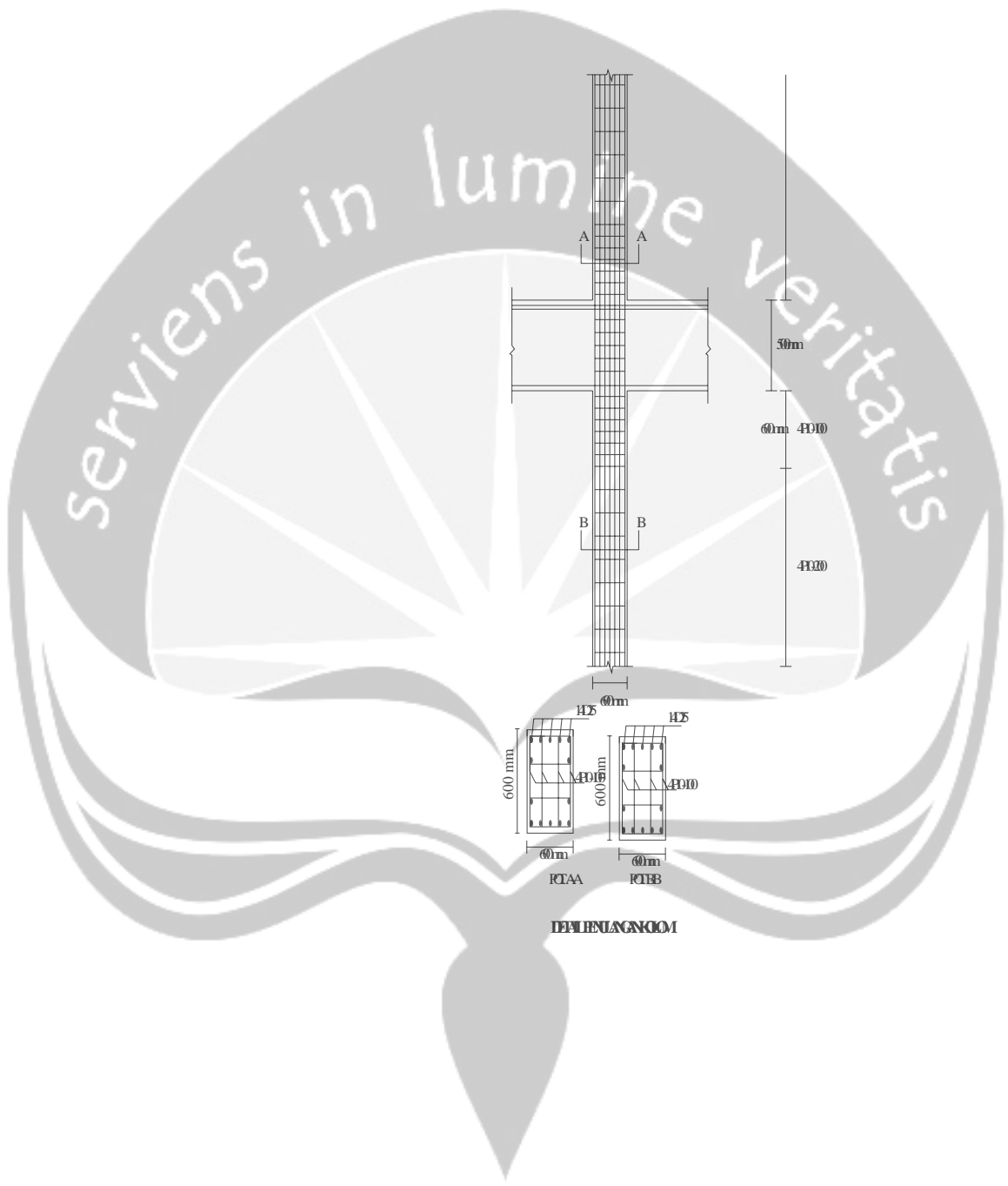


DETAILED PLAN

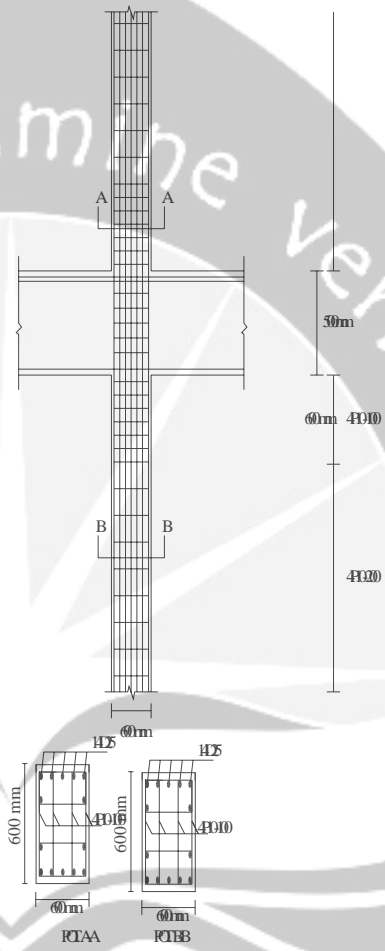




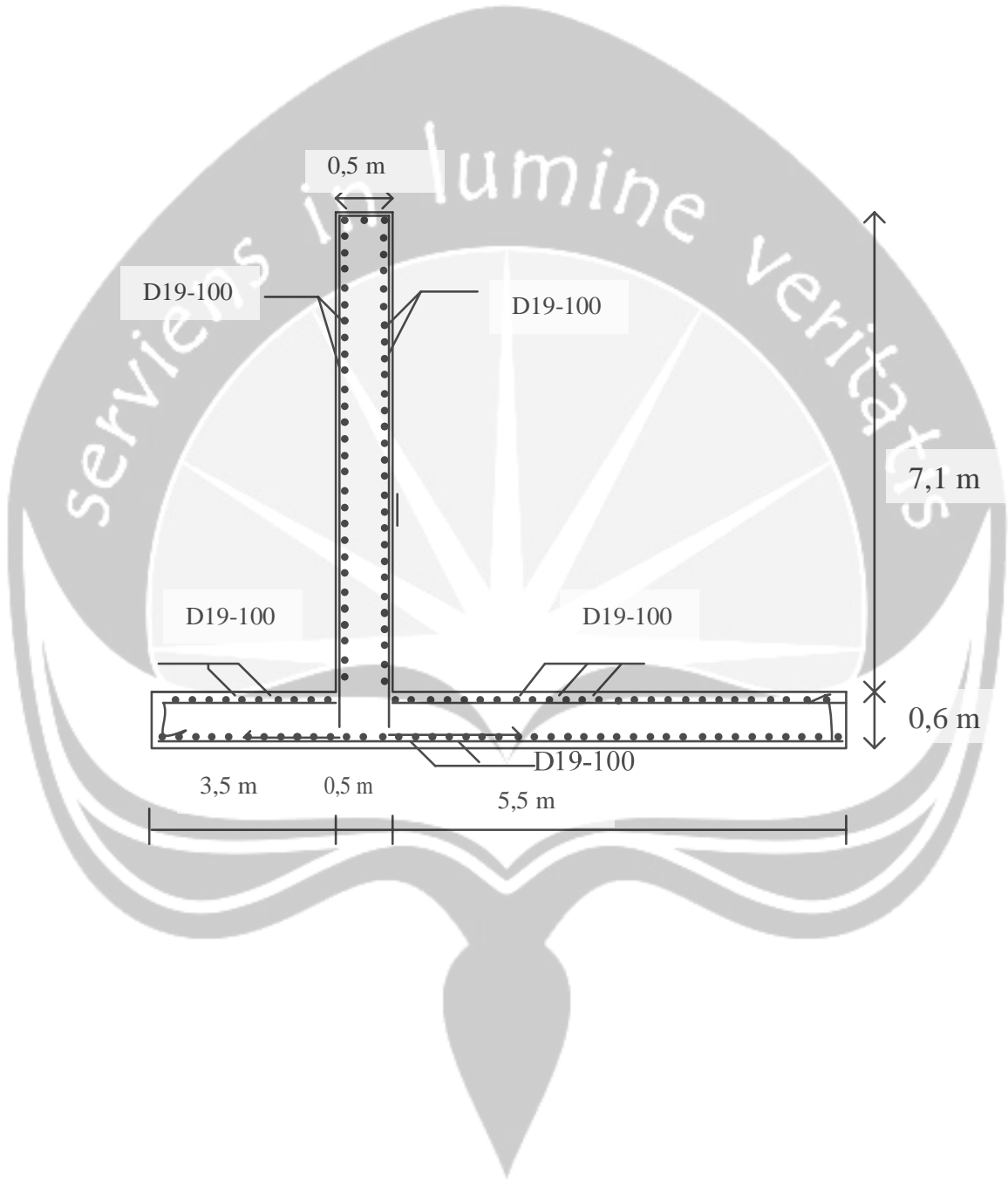
PENLANGANTANGGA



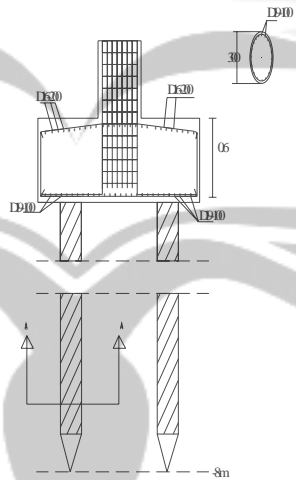
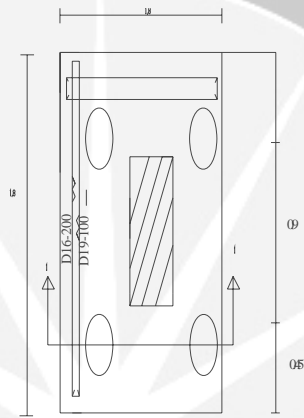
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DPAENIANGKUM



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Potongan



Penulangan Lentur Balok 300/500

Lantai	Balok	Posisi	Fc'	fy	b	h	Tul. Lentur (mm)	Sengkang (mm)	Seli mut (mm)	D (mm)	ρ_{maks}	ρ_{min}	M_u (kNm)	R_n	P Pakai	ρ	A_s (mm ²)	Di pakai	Tul. D216		
																			A_s yg dipakai (mm ²)	Atas	Bawah
5	B94	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	115.505	2.4635	0.0066	0.0066	870.4104	5	1005.3096	5	
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	74.34	1.5855	0.0041	0.0041	546.8171	3	603.1858		3
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	21.056	0.4927	0.0012	0.0035	464.1000	3	603.1858		3
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	8.972	0.1914	0.0005	0.0035	464.1000	3	603.1858	3	
5	B95	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	112.126	2.3914	0.0064	0.0064	843.2123	5	1005.3096	5	
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	80.249	1.7115	0.0045	0.0045	592.2694	3	603.1858		3
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	19.378	0.4783	0.0012	0.0035	464.1000	3	603.1858		3
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	8.993	0.1918	0.0005	0.0035	464.1000	3	603.1858	3	
5	B96	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	103.017	2.1971	0.0058	0.0058	770.4799	4	804.2477	4	
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	79.941	1.7050	0.0044	0.0044	589.8924	3	603.1858		3
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	10.591	0.4394	0.0011	0.0035	464.1000	3	603.1858		3
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	5.26	0.1122	0.0003	0.0035	464.1000	3	603.1858	3	
5	B97	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	103.363	2.2045	0.0058	0.0058	773.2272	4	804.2477	4	
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	74.068	1.5797	0.0041	0.0041	544.7326	3	603.1858		3
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	18.649	0.4409	0.0011	0.0035	464.1000	3	603.1858		3
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	8.712	0.1858	0.0005	0.0035	464.1000	3	603.1858	3	

Lantai	Balok	Posisi	Fc'	Fy	b	h	Tul. Lentur (mm)	Sengkang (mm)	Seli mut (mm)	d (mm)	ρ_{maks}	ρ_{min}	M_u (kNm)	R_n	P Pakai	ρ	A_s (mm ²)	Di pakai	A_s yg dipakai		Tul. D216	
																			(mm ²)	Atas	Bawah	
5	B98	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	107.974	2.3028	0.0061	0.0061	809.9547	5	1005.3096	5		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	74.443	1.5877	0.0041	0.0041	547.6067	3	603.1858		3	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	18.605	0.4606	0.0012	0.0035	464.1000	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	8.693	0.1854	0.0005	0.0035	464.1000	3	603.1858	3		
5	B99	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	108.407	2.3121	0.0061	0.0061	813.4148	5	1005.3096	5		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	74.506	1.5890	0.0041	0.0041	548.0897	3	603.1858		3	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	18.402	0.4624	0.0012	0.0035	464.1000	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	8.606	0.1835	0.0005	0.0035	464.1000	3	603.1858	3		
5	B100	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	108.416	2.3123	0.0061	0.0061	813.4867	5	1005.3096	5		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	74.496	1.5888	0.0041	0.0041	548.0130	3	603.1858		3	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	18.391	0.4625	0.0012	0.0035	464.1000	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	8.601	0.1834	0.0005	0.0035	464.1000	3	603.1858	3		
5	B101	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	108.416	2.3123	0.0061	0.0061	813.4867	5	1005.3096	5		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	74.557	1.5901	0.0041	0.0041	548.4807	3	603.1858		3	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	18.441	0.4625	0.0012	0.0035	464.1000	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	8.662	0.1847	0.0005	0.0035	464.1000	3	603.1858	3		
5	B102	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	108.818	2.3208	0.0062	0.0062	816.7008	5	1005.3096	5		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	75.528	1.6108	0.0042	0.0042	555.9297	3	603.1858		3	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	19.158	0.4642	0.0012	0.0035	464.1000	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	8.883	0.1895	0.0005	0.0035	464.1000	3	603.1858	3		

Lantai	Balok	Posisi	Fc'	fy	b	h	Tul. Lentur (mm)	Sengkang (mm)	Seli mut (mm)	d (mm)	ρ_{maks}	ρ_{min}	M_u (kNm)	R_n	Pakai	ρ	A_s (mm ²)	Dipakai	A_s yg dipakai		Tul. D216	
																			(mm ²)	Atas	Bawah	
5	B103	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	121.874	2.5993	0.0070	0.0070	922.0040	5	1005.3096	5		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	83.46	1.7800	0.0047	0.0047	617.1034	4	804.2477		4	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	21.323	0.5199	0.0013	0.0035	464.1000	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	9.044	0.1929	0.0005	0.0035	464.1000	3	603.1858	3		
5	B114	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	172.636	3.6819	0.0102	0.0102	1349.8992	7	1407.4335	7		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	59.503	1.2691	0.0033	0.0035	464.1000	3	603.1858		3	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	61.887	1.3199	0.0034	0.0035	464.1000	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	21.973	0.4686	0.0012	0.0035	464.1000	3	603.1858	3		
5	B115	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	177.777	3.7916	0.0105	0.0105	1395.0420	7	1407.4335	7		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	55.008	1.1732	0.0030	0.0035	464.1000	3	603.1858		3	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	70.761	1.5092	0.0039	0.0039	519.4413	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	24.779	0.5285	0.0013	0.0035	464.1000	3	603.1858	3		
5	B116	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	177.519	3.7861	0.0105	0.0105	1392.7679	7	1407.4335	7		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	55.211	1.1775	0.0030	0.0035	464.1000	3	603.1858		3	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	60.374	1.2876	0.0033	0.0035	464.1000	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	23.456	0.5003	0.0013	0.0035	464.1000	3	603.1858	3		
5	B117	Tump -	25	400	300	500	16	10	40	442	0.02	0.0035	186.112	3.9693	0.0111	0.0111	1469.0078	8	1608.4954	8		
		Tump +	25	400	300	500	16	10	40	442	0.02	0.0035	54.918	1.1713	0.0030	0.0035	464.1000	3	603.1858		3	
		Lap +	25	400	300	500	16	10	40	442	0.02	0.0035	62.942	1.3424	0.0035	0.0035	464.1000	3	603.1858		3	
		Lap -	25	400	300	500	16	10	40	442	0.02	0.0035	25.902	0.5524	0.0014	0.0035	464.1000	3	603.1858	3		

Momen Nominal Negatif Tumpuan Balok 300/500

Lantai	Balok	Tul. Lentur	Sengkang	Selimut	b	h	b_e	A_s	A_s'	c	a	f_s'	M_n
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm ²)	(mm ²)	(mm)	(mm)	(Mpa)	(kNm)
5	B94	16	10	40	300	500	750	1005.3096	603.1858	66.06	56.15	73.21	165.127
5	B95	16	10	40	300	500	750	1005.3096	603.1858	66.06	56.15	73.21	165.127
5	B96	16	10	40	300	500	750	804.2477	603.1858	58.64	49.84	6.54	134.043
5	B97	16	10	40	300	500	750	804.2477	603.1858	58.64	49.84	6.54	134.043
5	B98	16	10	40	300	500	750	1005.3096	603.1858	66.06	56.15	73.21	165.127
5	B99	16	10	40	300	500	750	1005.3096	603.1858	66.06	56.15	73.21	165.127
5	B100	16	10	40	300	500	750	1005.3096	603.1858	66.06	56.15	73.21	165.127
5	B101	16	10	40	300	500	750	1005.3096	603.1858	66.06	56.15	73.21	165.127
5	B102	16	10	40	300	500	750	1005.3096	603.1858	66.06	56.15	73.21	165.127
5	B103	16	10	40	300	500	750	1005.3096	804.2477	64.83	55.10	63.20	165.112
5	B114	16	10	40	300	500	1260	1407.4335	603.1858	83.50	70.97	183.22	218.969
5	B115	16	10	40	300	500	1260	1407.4335	603.1858	83.50	70.97	183.22	218.969
5	B116	16	10	40	300	500	1260	1407.4335	603.1858	83.50	70.97	183.22	218.969
5	B117	16	10	40	300	500	1260	1608.4954	603.1858	93.41	79.40	227.47	245.229

Momen Nominal Negatif Lapangan Balok 300/500

Lantai	Balok	Tul. Lentur	Sengkang	Selimut	b	h	b_e	A_s	A_s'	c	a	f_s'	M_n
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm ²)	(mm ²)	(mm)	(mm)	(Mpa)	(kNm)
5	B94	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B95	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B96	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B97	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B98	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B99	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B100	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B101	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B102	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B103	16	10	40	300	500	750	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B114	16	10	40	300	500	1260	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B115	16	10	40	300	500	1260	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B116	16	10	40	300	500	1260	603.1858	603.1858	52.10	44.28	-68.00	102.772
5	B117	16	10	40	300	500	1260	603.1858	603.1858	52.10	44.28	-68.00	102.772

Momen Nominal Positif Tumpuan Balok 300/500

Lantai	Balok	Tul. Lentur	Sengkang	Selimut	b	h	b_e	$A_{s'}$	A_s	c	a	f_s'	M_n
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm ²)	(mm ²)	(mm)	(mm)	(Mpa)	(kNm)
5	B94	16	10	40	300	500	750	603.1858	1005.3096	46.54	39.56	-147.74	178.513
5	B95	16	10	40	300	500	750	603.1858	1005.3096	46.54	39.56	-147.74	178.513
5	B96	16	10	40	300	500	750	603.1858	804.2477	44.51	37.83	-181.93	147.097
5	B97	16	10	40	300	500	750	603.1858	804.2477	44.51	37.83	-181.93	147.097
5	B98	16	10	40	300	500	750	603.1858	1005.3096	46.54	39.56	-147.74	178.513
5	B99	16	10	40	300	500	750	603.1858	1005.3096	46.54	39.56	-147.74	178.513
5	B100	16	10	40	300	500	750	603.1858	1005.3096	46.54	39.56	-147.74	178.513
5	B101	16	10	40	300	500	750	603.1858	1005.3096	46.54	39.56	-147.74	178.513
5	B102	16	10	40	300	500	750	603.1858	1005.3096	46.54	39.56	-147.74	178.513
5	B103	16	10	40	300	500	750	804.2477	1005.3096	47.26	40.17	-136.33	178.690
5	B114	16	10	40	300	500	1260	603.1858	1407.4335	41.26	35.07	-243.35	246.782
5	B115	16	10	40	300	500	1260	603.1858	1407.4335	41.26	35.07	-243.35	246.782
5	B116	16	10	40	300	500	1260	603.1858	1407.4335	41.26	35.07	-243.35	246.782
5	B117	16	10	40	300	500	1260	603.1858	1608.4954	42.77	36.36	-213.57	274.732

Momen Nominal Positif Lapangan Balok 300/500

Lantai	Balok	Tul. Lentur (mm)	Sengkang (mm)	Selimut (mm)	b (mm)	h (mm)	b_e (mm)	A_s' (mm ²)	A_s (mm ²)	c (mm)	a (mm)	f_s' (Mpa)	M_n (kNm)
5	B94	16	10	40	300	500	750	603.1858	1005.3096	44.34	37.69	-184.81	177.936
5	B95	16	10	40	300	500	750	1005.3096	1005.3096	46.27	39.33	-152.15	178.444
5	B96	16	10	40	300	500	750	603.1858	804.2477	41.95	35.66	-229.53	146.362
5	B97	16	10	40	300	500	750	603.1858	804.2477	41.95	35.66	-229.53	146.362
5	B98	16	10	40	300	500	750	603.1858	1005.3096	44.34	37.69	-184.81	177.936
5	B99	16	10	40	300	500	750	804.2477	1005.3096	45.39	38.58	-166.77	178.216
5	B100	16	10	40	300	500	750	603.1858	1005.3096	44.34	37.69	-184.81	177.936
5	B101	16	10	40	300	500	750	603.1858	1005.3096	44.34	37.69	-184.81	177.936
5	B102	16	10	40	300	500	750	603.1858	1005.3096	44.34	37.69	-184.81	177.936
5	B103	16	10	40	300	500	750	804.2477	1005.3096	45.39	38.58	-166.77	178.216
5	B114	16	10	40	300	500	1260	603.1858	1407.4335	38.78	32.96	-297.42	252.824
5	B115	16	10	40	300	500	1260	603.1858	1407.4335	38.78	32.96	-297.42	252.824
5	B116	16	10	40	300	500	1260	603.1858	1407.4335	38.78	32.96	-297.42	252.824
5	B117	16	10	40	300	500	1260	1005.3096	1407.4335	40.95	34.81	-249.87	254.015

Penulangan Geser Daerah Sendi Plastis Balok 300/500

Lantai	Balok	Jenis	Nilai	b	h	V_e	V_{g-ki}	V_{g-ka}	Gaya Gempa Kiri		Gaya Gempa Kanan		V_u terpakai (kN)	V_n (N)	V_c (N)	V_s (N)	Sengkang
				(mm)	(mm)	(kN)	(kN)	(kN)	V_u kiri	V_u kanan	V_u kiri	V_u kanan					
5	B94	Mn ⁻	165.13	300	500	114.5467	18.22	32.36	96.3267	146.91	132.77	82.1867	146.9067	195875.5556	0	195875.5556	3P10-100
		Mn ⁺	178.51														
5	B95	Mn ⁻	165.13	300	500	114.5467	27.38	23.1	87.1667	137.65	141.93	91.4467	141.9267	189235.5556	0	189235.5556	3P10-100
		Mn ⁺	178.51														
5	B96	Mn ⁻	134.04	300	500	93.7133	15.75	15.98	77.9633	109.69	109.46	77.7333	109.6933	146257.7778	0	146257.7778	3P10-100
		Mn ⁺	147.10														
5	B97	Mn ⁻	134.04	300	500	93.7133	22.55	27.93	71.1633	121.64	116.26	65.7833	121.6433	162191.1111	0	162191.1111	3P10-100
		Mn ⁺	147.10														
5	B98	Mn ⁻	165.13	300	500	114.5467	25.01	25.47	89.5367	140.02	139.56	89.0767	140.0167	186688.8889	0	186688.8889	3P10-100
		Mn ⁺	178.51														
5	B99	Mn ⁻	165.13	300	500	114.5467	25.12	25.36	89.4267	139.91	139.67	89.1867	139.9067	186542.2222	0	186542.2222	3P10-100
		Mn ⁺	178.51														
5	B100	Mn ⁻	165.13	300	500	114.5467	25.12	25.36	89.4267	139.91	139.67	89.1867	139.9067	186542.2222	0	186542.2222	3P10-100
		Mn ⁺	178.51														
5	B101	Mn ⁻	162.13	300	500	113.5467	25.13	25.35	88.4167	138.90	138.68	88.1967	138.8967	185195.5556	0	185195.5556	3P10-100
		Mn ⁺	178.51														
5	B102	Mn ⁻	165.13	300	500	114.5467	25.49	24.99	89.0567	139.54	140.04	89.5567	140.0367	186715.5556	0	186715.5556	3P10-100
		Mn ⁺	178.51														
5	B103	Mn ⁻	165.11	300	500	114.6007	32.16	18.32	82.4407	132.92	146.76	96.2807	146.7607	195680.8889	0	195680.8889	3P10-100
		Mn ⁺	178.69														
5	B114	Mn ⁻	218.97	300	500	91.3237	53.94	50.64	37.3837	141.96	145.26	40.6837	145.2637	193684.9673	0	193684.9673	3P10-100
		Mn ⁺	246.78														

Lantai	Balok	Jenis	Nilai	b	h	V_e	V_{g-ki}	V_{g-ka}	Gaya Gempa Kiri		Gaya Gempa Kanan		V_u terpakai	V_n	V_c	V_s	Sengkang
				(mm)	(mm)	(kN)	(kN)	(kN)	V_u kiri	V_u kanan	V_u kiri	V_u kanan	(kN)	(N)	(N)	(N)	
5	B115	Mn ⁻	218.97	300	500	91.3237	52.24	52.35	39.0837	143.67	143.56	38.9737	143.6737	191564.9673	0	191564.9673	3P10-100
		Mn ⁺	246.78														
5	B116	Mn ⁻	218.97	300	500	91.3237	52.31	52.27	39.0137	143.59	143.63	39.0537	143.6337	191511.6340	0	191511.6340	3P10-100
		Mn ⁺	246.78														
5	B117	Mn ⁻	245.23	300	500	101.9531	50.6	53.98	51.3531	155.93	152.55	47.9731	155.9331	207910.8497	0	207910.8497	3P10-100
		Mn ⁺	274.73														

Penulangan Geser Luar Sendi Plastis Balok 300/500

Lantai	Balok	Jenis	Nilai	b (mm)	h (mm)	V _e (kN)	V _{g-ki} (kN)	V _{g-ka} (kN)	Gaya Gempa Kiri		Gaya Gempa Kanan		V _u terpakai (kN)	V _n (N)	V _c (N)	V _s (N)	Senggang
									V _{u kiri}	V _{u kanan}	V _{u kiri}	V _{u kanan}					
5	B94	Mn ⁻	165.13	300	500	114.5467	18.22	32.36	96.3267	146.9067	132.7667	82.1867	146.9067	195875.5556	110500	85375.5556	3P10-200
		Mn ⁺	178.51														
5	B95	Mn ⁻	165.13	300	500	114.5467	27.38	23.1	87.1667	137.6467	141.9267	91.4467	141.9267	189235.5556	110500	78735.5556	3P10-200
		Mn ⁺	178.51														
5	B96	Mn ⁻	134.04	300	500	93.7133	15.75	15.98	77.9633	109.6933	109.4633	77.7333	109.6933	146257.7778	110500	35757.7778	3P10-200
		Mn ⁺	147.10														
5	B97	Mn ⁻	134.04	300	500	93.7133	22.55	27.93	71.1633	121.6433	116.2633	65.7833	121.6433	162191.1111	110500	51691.1111	3P10-200
		Mn ⁺	147.10														
5	B98	Mn ⁻	165.13	300	500	114.5467	25.01	25.47	89.5367	140.0167	139.5567	89.0767	140.0167	186688.8889	110500	76188.8889	3P10-200
		Mn ⁺	178.51														
5	B99	Mn ⁻	165.13	300	500	114.5467	25.12	25.36	89.4267	139.9067	139.6667	89.1867	139.9067	186542.2222	110500	76042.2222	3P10-200
		Mn ⁺	178.51														
5	B100	Mn ⁻	165.13	300	500	114.5467	25.12	25.36	89.4267	139.9067	139.6667	89.1867	139.9067	186542.2222	110500	76042.2222	3P10-200
		Mn ⁺	178.51														
5	B101	Mn ⁻	162.13	300	500	113.5467	25.13	25.35	88.4167	138.8967	138.6767	88.1967	138.8967	185195.5556	110500	74695.5556	3P10-200
		Mn ⁺	178.51														
5	B102	Mn ⁻	165.13	300	500	114.5467	25.49	24.99	89.0567	139.5367	140.0367	89.5567	140.0367	186715.5556	110500	76215.5556	3P10-200
		Mn ⁺	178.51														
5	B103	Mn ⁻	165.11	300	500	114.6007	32.16	18.32	82.4407	132.9207	146.7607	96.2807	146.7607	195680.8889	110500	85180.8889	3P10-200
		Mn ⁺	178.69														
5	B114	Mn ⁻	218.97	300	500	91.3237	53.94	50.64	37.3837	141.9637	145.2637	40.6837	145.2637	193684.9673	110500	83184.9673	3P10-200
		Mn ⁺	246.78														
5	B115	Mn ⁻	218.97	300	500	91.3237	52.24	52.35	39.0837	143.6737	143.5637	38.9737	143.6737	191564.9673	110500	81064.9673	3P10-200
		Mn ⁺	246.78														

Lantai	Balok	Jenis	Nilai	b	h	V_e	V_{g-ki}	V_{g-ka}	Gaya Gempa Kiri		Gaya Gempa Kanan		V_u terpakai	V_n	V_c	V_s	Sengkang
				(mm)	(mm)	(kN)	(kN)	(kN)	$V_{u\ kiri}$	$V_{u\ kanan}$	$V_{u\ kiri}$	$V_{u\ kanan}$	(kN)	(N)	(N)	(N)	
5	B116	Mn ⁻	218.97	300	500	91.3237	52.31	52.27	39.0137	143.5937	143.6337	39.0537	143.6337	191511.6340	110500	81011.6340	3P10-200
		Mn ⁺	246.78														
5	B117	Mn ⁻	245.23	300	500	101.9531	50.6	53.98	51.3531	155.9331	152.5531	47.9731	155.9331	207910.8497	110500	97410.8497	3P10-200
		Mn ⁺	246.78														

KELANGSINGAN KOLOM

lantai	kolom	H (mm)	dimensi kolom	AKIBAT BEBAN GRAVITASI		AKIBAT GAYA GOYANGAN		Pu	ΣPc	Mny	Mnx	BRLM	ket	Jumlah tul	Jum Tul Pakai
				M2	M3	M2	M3								
5	C6	4000	600	118.8	1.646	18.60	42.18	22525.35	904632.05	212.32	69.66	2145.97	tidak ok	7.334	14
5	C12	4000	600	1.601	45.048	43.61	18.08	22525.35	1210697.49	71.27	97.82	4587.33	ok	7.334	14
5	C13	4000	600	5.676	20.017	44.22	42.12	22525.35	1210697.49	78.49	97.24	4681.21	ok	7.334	14
5	C14	4000	600	9.189	0.951	44.74	43.45	22525.35	1210697.49	84.72	70.00	4708.29	ok	7.334	14
5	C15	4000	600	9.674	0.873	45.26	43.50	22525.35	1210697.49	86.29	69.96	4708.29	ok	7.334	14
5	C16	4000	600	9.692	0.965	45.78	43.50	22525.35	1210697.49	87.13	70.10	4708.29	ok	7.334	14
5	C17	4000	600	9.713	1.597	46.30	43.49	22525.35	904632.05	88.62	71.67	4774.33	ok	7.334	14
5	C18	4000	600	10.61	11.043	46.82	43.50	22525.35	1210697.49	90.18	85.61	4587.33	ok	7.334	14

KELANGSINGAN KOLOM

lantai	kolom	H (mm)	dimensi kolom	AKIBAT BEBAN GRAVITASI		AKIBAT GAYA GOYANGAN		Pu	ΣP_c	Mny	Mnx	BRLM	ket	Jumlah tul	Jum Tul Pakai
				M2	M3	M2	M3								
5	C19	4000	600	61.44	24.455	47.34	43.50	22525.35	1210697.49	169.21	106.24	4708.29	ok	7.334	14
5	C20	4000	600	61.44	15.998	47.86	43.45	22525.35	1210697.49	170.03	93.15	4774.33	ok	7.334	14
5	C21	4000	600	10.01	15.989	48.86	42.12	22525.35	1210697.49	92.49	91.04	4650.00	ok	7.334	14
5	C22	4000	600	5.493	57.056	48.99	18.08	22525.35	1210697.49	85.74	116.30	4988.74	ok	7.334	14
5	C28	4000	600	0.165	0.996	46.31	44.76	22525.35	904632.05	73.95	72.76	4840.07	ok	7.334	14
5	C39	4000	600	8.177	0.947	46.30	45.99	22525.35	904632.05	86.26	74.64	4774.33	ok	7.334	14
5	C50	4000	600	92.89	0.943	18.60	47.30	22525.35	904632.05	172.49	76.72	4905.49	ok	7.334	14

PENULANGAN GESER

Lantai	kolom	Tinggi (mm)	Mn atas	Mn bawah	Mn-	Mn+	2E	Vu pakai	Nu	Vc	φVc	Vs	s	S pakai	Senggang	
															Luar Lo	600
5	C6	4	980	980	218.969	246.782	30.85	490	327.87	286233	214.7	367100.186	110.4	220.793	4P10-100	4P10-200
5	C12	4	976.92308	976.92308	165.112	246.782	54.21	488.462	275.94	283464	212.6	367817.9888	110.18	220.362	4P10-100	4P10-200
5	C13	4	976.92308	976.92308	218.969	246.782	54.95	488.462	470.99	293865	220.4	357417.2571	113.39	226.774	4P10-100	4P10-200
5	C14	4	976.92308	976.92308	165.127	246.782	55.62	488.462	487.06	294722	221	356560.3499	113.66	227.319	4P10-100	4P10-200
5	C15	4	980	980	165.127	178.513	56.29	490	487.83	294763	221.1	358570.5729	113.02	226.045	4P10-100	4P10-200
5	C16	4	976.92308	976.92308	165.127	178.513	56.95	488.462	487.84	294763	221.1	356518.7576	113.67	227.346	4P10-100	4P10-200
5	C17	4	980	980	218.969	246.782	57.61	490	487.67	294754	221.1	358579.1047	113.02	226.04	4P10-100	4P10-200
5	C18	4	976.92308	976.92308	165.127	178.513	58.28	488.462	504	295625	221.7	355657.0513	113.95	227.897	4P10-100	4P10-200

PENULANGAN GESER

Lantai	kolom	Tinggi (mm)	Mn atas	Mn bawah	Mn-	Mn+	2E	Vu pakai	Nu	Vc	φVc	Vs	s	S pakai	Sengkang	
															Luar Lo	600
5	C19	4	980	980	165.127	178.513	58.94	490	453.14	292913	219.7	360420.3621	112.44	224.885	4P10-100	4P10-200
5	C20	4	976.92308	976.92308	165.127	178.513	59.61	488.462	452.62	292885	219.7	358396.8082	113.08	226.155	4P10-100	4P10-200
5	C21	4	976.92308	976.92308	165.127	178.513	60.27	488.462	467.23	293664	220.2	357617.7532	113.32	226.647	4P10-100	4P10-200
5	C22	4	980	980	165.127	178.513	61.02	490	354.13	287633	215.7	365699.9132	110.82	221.638	4P10-100	4P10-200
5		4	976.92308	976.92308	218.969	246.782	57.65	488.462	491.89	294979	221.2	356302.7978	113.74	227.484	4P10-100	4P10-200
5		4	976.92308	976.92308	245.229	246.782	57.61	488.462	487.84	294763	221.1	356518.7576	113.67	227.346	4P10-100	4P10-200
5		4	980	980	245.229	274.732	30.85	490	267.4	283009	212.3	370324.6528	109.44	218.87	4P10-100	4P10-200

HUBUNGAN BALOK KOLOM

lantai	kolom	h	Mn-	Mn+	tul atas	tul bawah	As1	As2	As1fy	As2fy	Mu	Vh	Vy-y	ϕVc
5	C6	4	218.969	246.782	7	3	1407.43	603.186	562.9734	241.274	232.875	116.438	6.83497	1687.5
5	C12	4	165.112	246.782	5	4	1005.31	804.248	402.12386	321.699	205.947	102.973	5.90512	1687.5
5	C13	4	218.969	246.782	5	4	1005.31	804.248	402.12386	321.699	232.875	116.438	5.45355	1687.5
5	C14	4	165.127	246.782	5	3	1005.31	603.186	402.12386	241.274	205.955	102.977	5.90497	1687.5
5	C15	4	165.127	178.513	5	3	1005.31	603.186	402.12386	241.274	171.82	85.91	6.68076	1687.5
5	C16	4	165.127	178.513	5	3	1005.31	603.186	402.12386	241.274	171.82	85.91	6.68076	1687.5
5	C17	4	218.969	246.782	7	3	1407.43	603.186	562.9734	241.274	232.875	116.438	6.83497	1687.5
5	C18	4	165.127	178.513	5	3	1005.31	603.186	402.12386	241.274	171.82	85.91	6.68076	1687.5
5	C19	4	165.127	178.513	4	3	804.248	603.186	321.69909	241.274	171.82	85.91	5.74461	1687.5
5	C20	4	165.127	178.513	5	3	1005.31	603.186	402.12386	241.274	171.82	85.91	6.68076	1687.5
5	C21	4	165.127	178.513	5	3	1005.31	603.186	402.12386	241.274	171.82	85.91	6.68076	1687.5
5	C22	4	165.127	178.513	5	3	1005.31	603.186	402.12386	241.274	171.82	85.91	6.68076	1687.5
5	C28	4	218.969	246.782	7	3	1407.43	603.186	562.9734	241.274	232.875	116.438	6.83497	1687.5
5	C39	4	245.229	246.782	8	3	1608.5	603.186	643.39818	241.274	246.005	123.003	7.23076	1687.5
5	C50	4	245.229	274.732	8	3	1608.5	603.186	643.39818	241.274	259.98	129.99	6.94959	1687.5

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