

BAB V

KESIMPULAN DAN SARAN

5.1. Kesimpulan

Setelah melakukan analisis dan perancangan pada struktur Gedung kampus Universitas Pelita Harapan Surabaya, penyusun dapat mengambil kesimpulan sebagai berikut:

1. Dalam perencanaan struktur gedung ini digunakan pelat lantai dua arah.
2. Pelat atap menggunakan pelat dua arah tebal 100 mm dengan tulangan utama P8-150 dan tulangan pembagi P6-400 pada daerah tumpuan serta tulangan utama P8-250 dan tulangan susut P8-200 pada daerah lapangan.
3. Pelat lantai sebagai ruang perkuliahan menggunakan pelat dua arah tebal 120 mm dengan tulangan utama P8-100 dan tulangan pembagi P6-250 pada daerah tumpuan serta tulangan utama P8-200 dan tulangan susut P8-150 pada daerah lapangan.
4. Pada perencanaan balok diperoleh dimensi balok induk sebesar 400/700 untuk semua bentang dengan panjang bentang 8 m. Balok induk menggunakan tulangan pokok atas 5D22 dan tulangan pokok bawah 5D22 untuk semua tinjauan portal, kecuali pada bentang ujung yang menggunakan 4D22 sebagai tulangan pokok atas serta 4D22 sebagai tulangan pokok bawah.

5. Pada perencanaan kolom diperoleh dimensi kolom 850/850 untuk lantai 1 sampai dengan lantai 5, digunakan tulangan pokok 24D25.

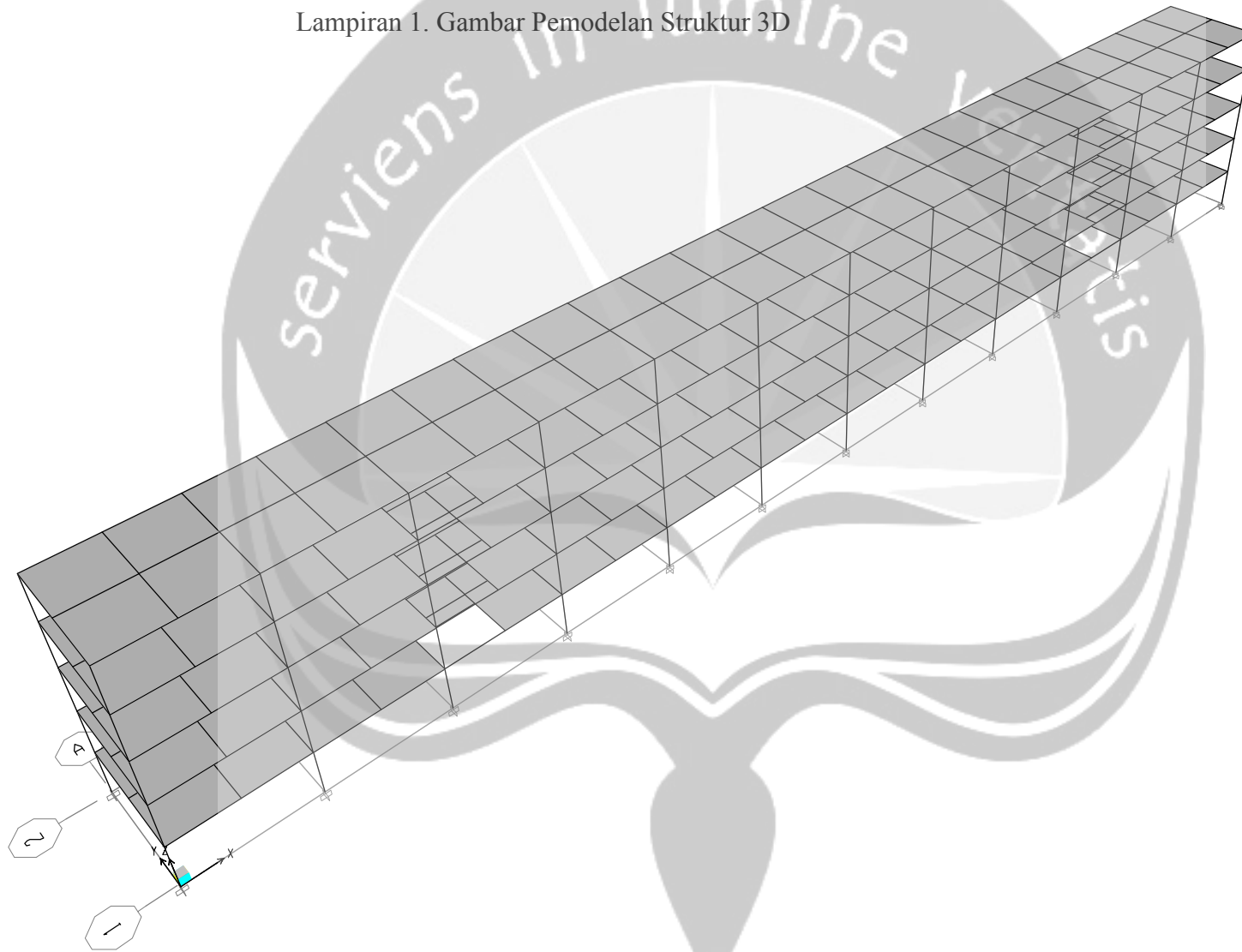
Tulangan sengkang kolom yang digunakan P12 mm.

5.2. Saran

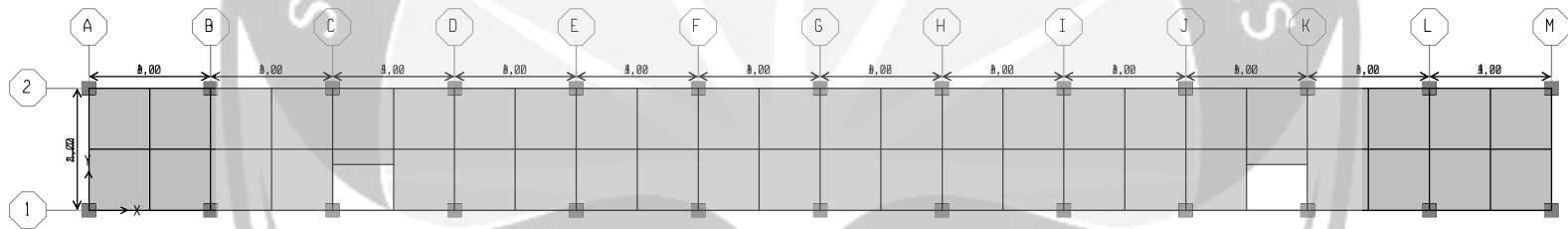
Setelah menyelesaikan penulisan tugas akhir ini, penyusun dapat memberikan beberapa saran sebagai berikut:

1. Penggunaan *software* sebagai program bantu hendaknya dilakukan dengan pemahaman penuh dalam penggunaannya sehingga kesalahan dapat dihindari.
2. Dalam melakukan input data pada program komputer ETABS, hendaknya dilakukan dengan teliti sesuai dengan persyaratan yang berlaku di Indonesia.
3. Khusus untuk perhitungan plat lantai perlu dicari acuan pembanding untuk menentukan luasan minimum tulangan karena SNI 03 – 2847 – 2002 tidak mensyaratkan secara jelas mengenai hal ini.
4. Khusus untuk perencanaan kolom perlu digambarkan diagram interaksi sesuai dengan tulangan yang kemudian terpasang agar hasil yang diperoleh lebih dari sekedar pendekatan.
5. Khusus untuk perencanaan tangga diupayakan kedepannya untuk dimodelkan menyatu dengan struktur utama gedung sehingga menghindari selisih kesalahan maupun untuk mendapatkan pemodelan yang mendekati kemungkinan perilaku struktur sesungguhnya.

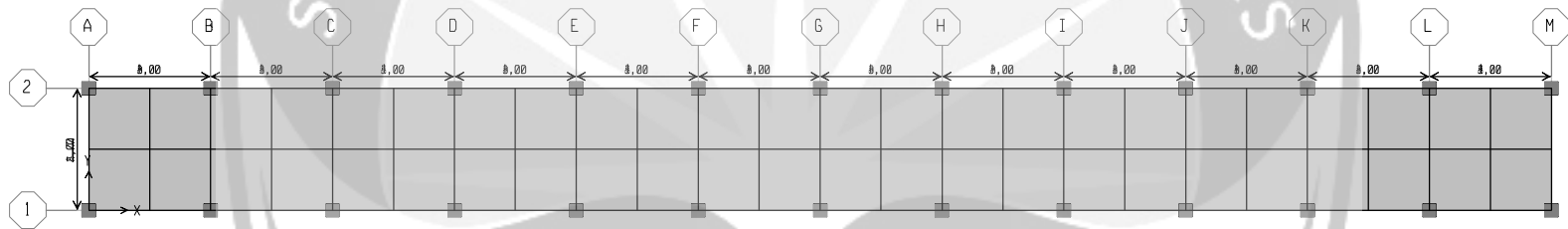
Lampiran 1. Gambar Pemodelan Struktur 3D



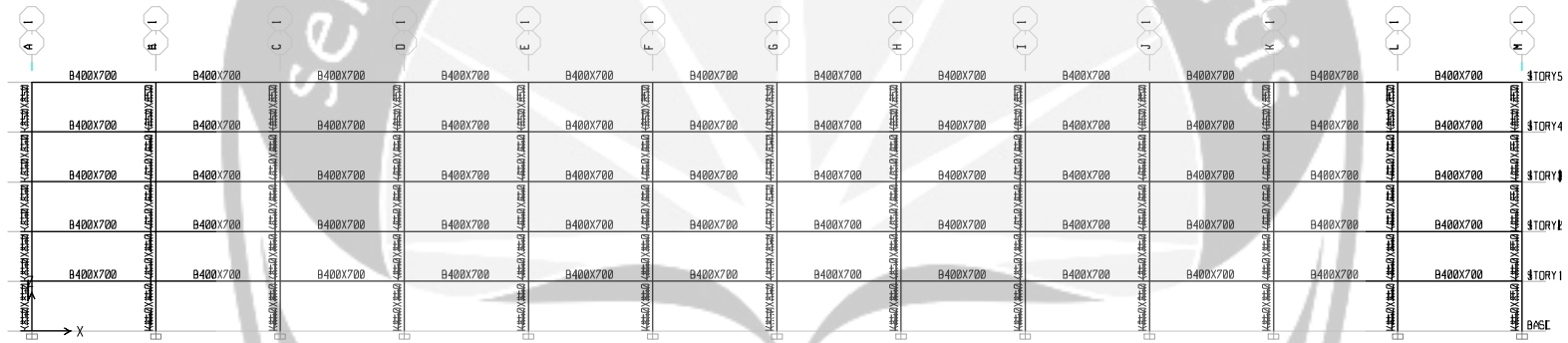
Lampiran 2. Gambar Denah Lantai 1-4



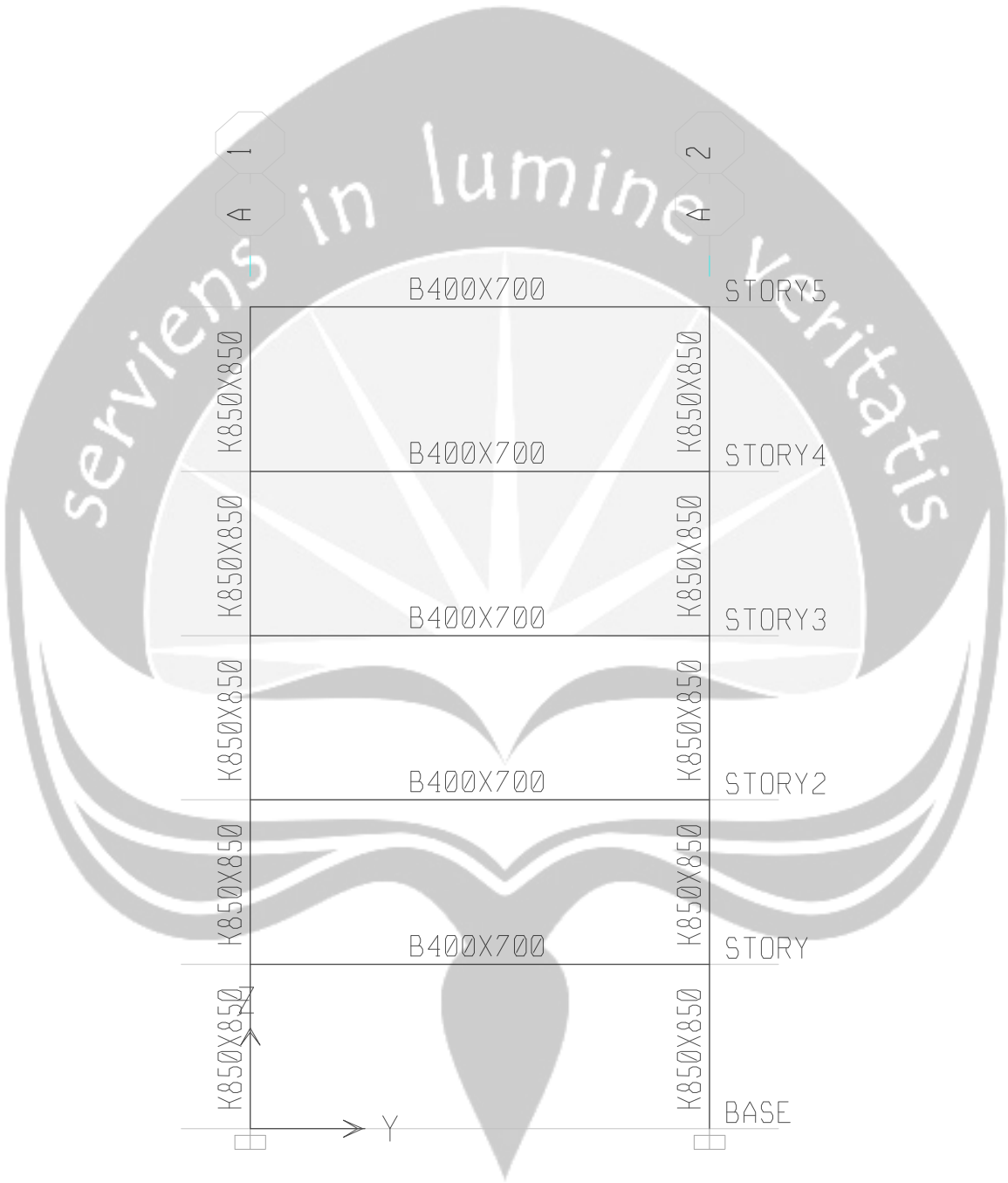
Lampiran 3. Gambar Denah Lantai Atap



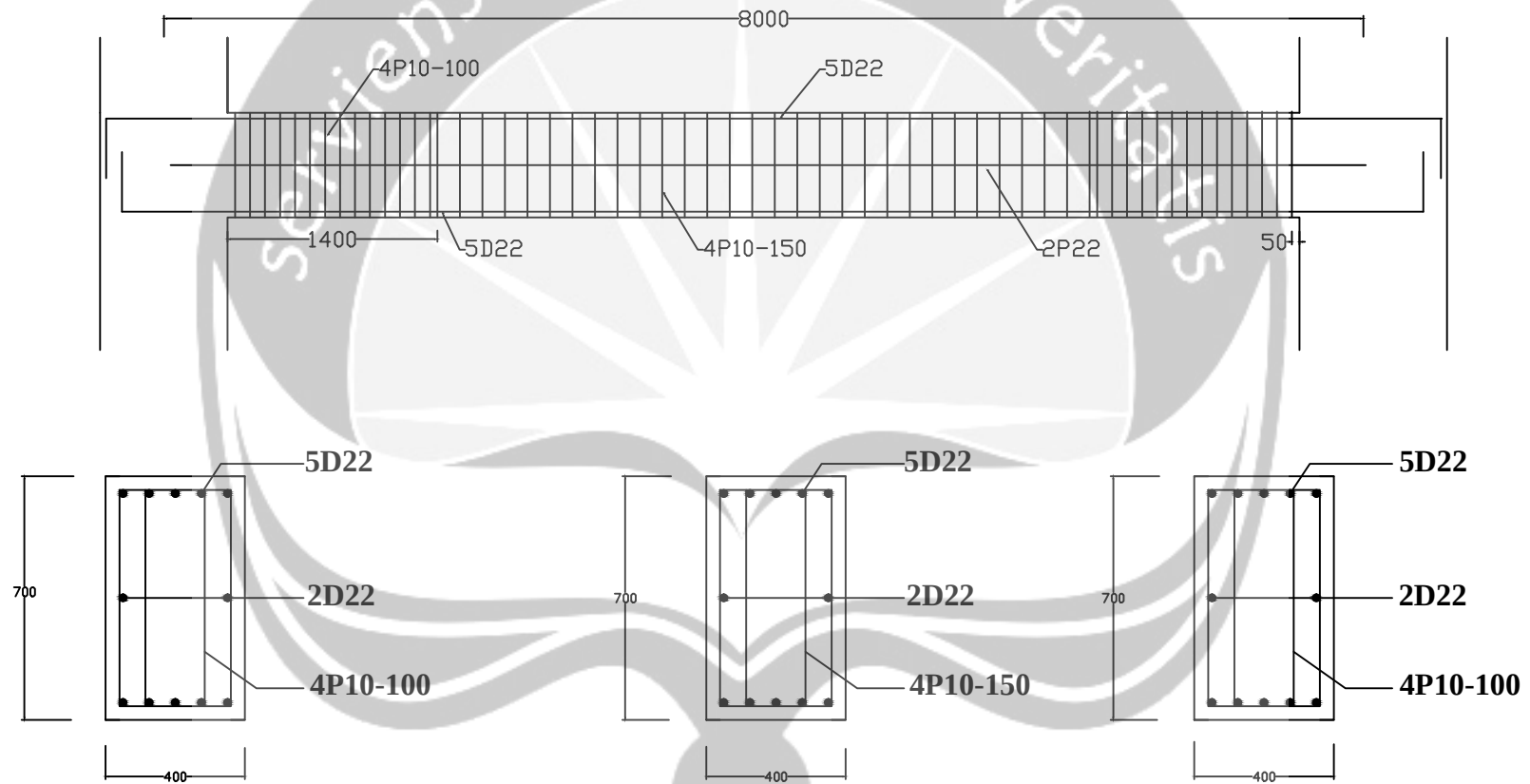
Lampiran 4. Gambar Portal Struktur Arah Sumbu X



Lampiran 5. Gambar Portal Struktur Arah Y



Lampiran 6. Gambar Rencana Balok



Lampiran 7. Momen Rencana Balok Arah Y Elevasi A

Lantai	Balok	Tumpuan	Momen hasil analisis (KNm)					Kombinasi Momen (KNm)					Momen Rencana		
			MD	ML	MR	MEx	MEy	1,2MD+1,6ML+0.5MR	1,2MD+1ML+1Ex+0.3Ey	1,2MD+1ML-1Ex-0.3Ey	1,2MD+1ML+0.3Ex+1Ey	1,2MD+1ML-0.3Ex-1Ey	M+	Mlap	M-
STORY5	B27	Tu,ki	-64,756	-9,527	-3,574	0,52	53,449	-94,7374	-70,6795	-103,7889	-33,6292	-140,8392	70,4196		
		Lap	71,461	10,641	4,418	0,826	0,247	104,9878	97,2943	95,4941	96,889	95,8994		104,9878	
		Tu,ka	-64,771	-9,392	-3,574	0,74	53,449	-94,5394	-70,3425	-103,8919	-33,4462	-140,7882			-140,8392
STORY4	B27	Tu,ki	-90,699	-24,251	-0,098	0,873	72,238	-147,6894	-110,5454	-155,6342	-60,5899	-205,5897	102,79485		
		Lap	89,016	25,981	-0,086	1,285	0,332	148,3458	134,1848	131,4156	133,5177	132,0827		148,3458	
		Tu,ka	-90,614	-24	-0,098	1,164	72,238	-147,1858	-109,9014	-155,5722	-60,1496	-205,324			-205,5897
STORY3	B27	Tu,ki	-90,069	-24,37	0,019	1,254	90,957	-147,0653	-103,9117	-160,9939	-41,1196	-223,786	111,893		
		Lap	89,621	25,909	0,022	1,84	0,418	149,0106	135,4196	131,4888	134,4242	132,4842		149,0106	
		Tu,ka	-89,85	-24,003	0,019	1,6	90,956	-146,2153	-102,9362	-160,7098	-40,387	-223,259			-223,786
STORY2	B27	Tu,ki	-90,375	-24,399	-0,006	1,459	97,31	-147,4914	-102,197	-163,501	-35,1013	-230,5967	115,29835		
		Lap	89,271	25,862	-0,002	2,112	0,447	148,5034	135,2333	130,7411	134,0678	131,9066		148,5034	
		Tu,ka	-90,116	-24,023	-0,006	1,806	97,309	-146,579	-101,1635	-163,1609	-34,3114	-230,013			-230,5967
STORY1	B27	Tu,ki	-89,421	-24,094	0	1,225	76,419	-145,8556	-107,2485	-155,5499	-54,6127	-208,1857	104,09285		
		Lap	90,026	26,065	0,002	1,764	0,351	149,7362	135,9655	132,2269	134,9764	133,216		149,7362	
		Tu,ka	-89,221	-23,827	0	1,482	76,418	-145,1884	-106,4848	-155,2996	-54,0296	-207,7548			-208,1857

Lampiran 8. Penulangan Lentur Balok Arah Y Elevasi A

Lantai	Balok	b (mm)	d (mm)	Mu (KNm)	Rn	ρ	ρ_{min}	ρ_{max}	As (mm ²)	As digunakan	As' digunakan	Tulangan terpasang			
												As		As'	
STORY5	B27	400	639	70,4196	0,5389	0,0014	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	104,9878	0,8035	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	140,8392	1,0779	0,0028	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B27	400	639	102,79485	0,7867	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	148,3458	1,1353	0,0029	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	205,5897	1,5734	0,0041	0,0035	0,0244	1038,5218	1140,86	1140,86	3	D22	3	D22
STORY3	B27	400	639	111,893	0,8563	0,0022	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	149,0106	1,1404	0,0029	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	223,786	1,7127	0,0044	0,0035	0,0244	1133,8656	1140,86	1140,86	3	D22	3	D22
STORY2	B27	400	639	115,29835	0,8824	0,0022	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	148,5034	1,1365	0,0029	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	230,5967	1,7648	0,0046	0,0035	0,0244	1169,7064	1521,14	1140,86	4	D22	3	D22
STORY1	B27	400	639	104,09285	0,7967	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	149,7362	1,1460	0,0029	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	208,1857	1,5933	0,0041	0,0035	0,0244	1052,0876	1140,86	1140,86	3	D22	3	D22

Lampiran 9. Momen Kapasitas Negatif Balok Arah Y Elevasi A

Lantai	No. Elemen	b (mm)	be (mm)	As' (mm ²)	As (mm ²)	d (mm)	d' (mm)	A	B	C1	c (mm)	a (mm)	fs' (MPa)	Mn- (KNm)	Mpr2 (KNm)
STORY5	B27	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B27	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B27	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B27	400	400	1140,86	1521,14	639	61	8670	76057,14	41755371,4	65,1502	55,3777	38,2212	370,5041	463,1301
STORY1	B27	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384

Lampiran 10. Momen Kapasitas Positif Balok Arah Y Elevasi A

Lantai	No. Elemen	b (mm)	be (mm)	As' (mm ²)	As (mm ²)	d (mm)	d' (mm)	A	B	C1	c (mm)	a (mm)	fs' (MPa)	Mn+ (KNm)	Mpr1 (KNm)
STORY5	B27	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,78517	34,66739	297,385	690,7084	863,38545
STORY4	B27	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,78517	34,66739	297,385	690,7084	863,38545
STORY3	B27	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,78517	34,66739	297,385	690,7084	863,38545
STORY2	B27	400	900	1521,14	1140,86	639	61	19507,5	456342,9	55673828,6	42,99143	36,54272	251,3324	741,554	926,94255
STORY1	B27	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,78517	34,66739	297,385	690,7084	863,38545

Lampiran 11. Penulangan Geser Balok Arah Y Elevasi A

Lantai	No. Elemen	Dimensi (mm)		d (mm)	Vu,b terpakai (KN)		Vc (KN)		Vs (KN)		s (mm)		Tulangan geser	
		b	h		pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.
STORY5	B27	400	700	639	185,580	183,754	0	233,32981	247,44051	11,675786	97,36	2063,22	2P10 - 80	2P10 - 300
STORY4	B27	400	700	639	196,106	191,552	0	233,32981	261,47528	22,072793	92,13	1091,38	2P10 - 80	2P10 - 300
STORY3	B27	400	700	639	196,120	191,562	0	233,32981	261,4928	22,085772	92,12	1090,74	2P10 - 80	2P10 - 300
STORY2	B27	400	700	639	212,005	207,446	0	233,32981	282,67288	43,264436	85,22	556,80	2P10 - 80	2P10 - 300
STORY1	B27	400	700	639	196,101	191,548	0	233,32981	261,46761	22,067115	138,20	1091,66	2P10 - 120	2P10 - 300

Lampiran 12. Perhitungan Kebutuhan Senggang Akibat Torsi Balok Arah Y Elevasi A

Balok	Lantai	Tu (KN)	Vu		Pcp (mm ²)	Acp (mm ²)	Reduksi Tu (KN)	Aoh (mm ²)	At/s	Av/s		S gabungan				Av gabungan		Av min1 (mm ²)	Av min2 (mm ²)	Ket.
			SP (KN)	Luar SP (KN)						SP	Luar SP	SP (mm)	Luar SP (mm)	SP (mm ²)	Luar SP (mm ²)					
B27	5	29,97	247,44	11,68	3160	337600	49,39	189100	0,440	1,392	0,066	4P10	120	4P10	120	452,16	157,08	102,70	100,00	OK
B27	4	44,72	261,48	22,07	3160	337600	49,39	189100	0,657	1,471	0,124	4P10	100	4P10	100	452,16	157,08	85,58	83,33	OK
B27	3	44,54	261,49	22,09	3160	337600	49,39	189100	0,654	1,471	0,124	4P10	100	4P10	100	452,16	253,62	85,58	83,33	OK
B27	2	44,42	282,67	43,26	3160	337600	49,39	189100	0,653	1,591	0,243	4P10	100	4P10	100	452,16	253,62	85,58	83,33	OK
B27	1	44,05	261,47	22,07	3160	337600	49,39	189100	0,647	1,471	0,124	4P10	100	4P10	100	452,16	253,62	85,58	83,33	OK

Lampiran 13. Tulangan Tambahan Balok Arah Y Elevasi A Akibat Adanya Torsi

Balok	Lantai	α	At/s	ph	Acp	fy	fys	f'c	Karena lentur						As tamb			As letur		Tulangan Longitudinal							
																				Plastis				Luar plastis			
									Atas	bawah		Atas	bawah		As perlu	As min	Pakai	Atas	Bawah	Atas	Bawah	Kanan	Kiri	Atas	Bawah	Kanan	Kiri
B27	5	45	0,4401698	1840	337600	400	240	30	3	D	22	3	D	22	671,164	1440,21	360,05255	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B27	4	45	0,6568982	1840	337600	400	240	30	3	D	22	3	D	22	1001,63	1200,942	300,23552	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B27	3	45	0,6542247	1840	337600	400	240	30	3	D	22	3	D	22	997,552	1203,894	300,9734	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B27	2	45	0,6525207	1840	337600	400	240	30	4	D	22	3	D	22	994,953	1205,775	301,4437	1520,531	1140,398	5D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B27	1	45	0,6470856	1840	337600	400	240	30	3	D	22	3	D	22	986,666	1211,775	302,94379	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22

Lampiran 14. Momen Nominal Balok Arah Y Elevasi A daerah Plastis Akibat Tulangan Terpasang

Balok	Lantai	d (mm)	d' (mm)	Daerah Plastis																					
				Tarik		Desak		Negatif								Positif									
						As			As	b	A	B	C1	c	fs'	Mn	Mpr	be	A	B	C1	c	fs'	Mn	Mpr
B27	5	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,328	462,9102	900	19508	304106,1689	55651428,9	46,183	192,4999	727,1831	908,9789
B27	4	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,328	462,9102	900	19508	304106,1689	55651428,9	46,183	192,4999	727,1831	908,9789
B27	3	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,328	462,9102	900	19508	304106,1689	55651428,9	46,183	192,4999	727,1831	908,9789
B27	2	639	61	4	D22	1520,531	5	D22	1900,664	400	8670	532185,796	69564286,13	63,995	28,0819	370,301	462,8767	900	19508	152053,0844	55651428,9	49,6565	137,0634	719,0005	898,7507
B27	1	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,328	462,9102	900	19508	304106,1689	55651428,9	46,183	192,4999	727,1831	908,9789

Lampiran 15. Momen Nominal Balok Arah Y Elevasi A daerah diluar Plastis Akibat Tulangan Terpasang

Balok	Lantai	d (mm)	d' (mm)	Luar Daerah Plastis																					
				Tarik			Desak			Negatif						Positif									
B27	5	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,328	462,9102	900	19508	304106,1689	55651428,9	46,183	192,4999	727,1831	908,9789
B27	4	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,328	462,9102	900	19508	304106,1689	55651428,9	46,183	192,4999	727,1831	908,9789
B27	3	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,328	462,9102	900	19508	304106,1689	55651428,9	46,183	192,4999	727,1831	908,9789
B27	2	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,328	462,9102	900	19508	304106,1689	55651428,9	46,183	192,4999	727,1831	908,9789
B27	1	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,328	462,9102	900	19508	304106,1689	55651428,9	46,183	192,4999	727,1831	908,9789

Lampiran 16. Momen Rencana Balok Arah Y Elevasi G

Lantai	Balok	Tumpuan	Momen hasil analisis (KNm)					Kombinasi Momen (KNm)					Momen Rencana		
			MD	ML	MR	MEx	MEy	1,2MD+1,6ML+0.5MR	1,2MD+1ML+1Ex+0.3Ey	1,2MD+1ML-1Ex-0.3Ey	1,2MD+1ML+0.3Ex+1Ey	1,2MD+1ML-0.3Ex-1Ey	M+	Mlap	M-
STORY5	B45	Tu,ki	-115,335	-20,723	-7,85	0	52,975	-175,4838	-143,2325	-175,0175	-106,15	-212,1	106,05		
		Lap	135,998	23,582	9,797	0	0,476	205,8273	186,9224	186,6368	187,2556	186,3036		205,8	
		Tu,ka	-115,35	-20,589	-7,85	0	52,975	-175,2874	-143,1165	-174,9015	-106,034	-211,984			-212,1
STORY4	B45	Tu,ki	-151,73	-52,921	-0,201	0	71,985	-266,8501	-213,4015	-256,5925	-163,012	-306,982	153,49		
		Lap	162,268	57,936	-0,178	0	0,647	287,3302	252,8517	252,4635	253,3046	252,0106		287,3	
		Tu,ka	-151,644	-52,671	-0,201	0	71,985	-266,3469	-213,0483	-256,2393	-162,6588	-306,6288			-306,98
STORY3	B45	Tu,ki	-150,482	-53,127	0,043	0	90,614	-265,5601	-206,5212	-260,8896	-143,0914	-324,3194	162,16		
		Lap	163,431	57,806	0,038	0	0,815	288,6258	254,1677	253,6787	254,7382	253,1082		288,6	
		Tu,ka	-150,264	-52,761	0,043	0	90,614	-264,7129	-205,8936	-260,262	-142,4638	-323,6918			-324,32
STORY2	B45	Tu,ki	-151,08	-53,204	-0,009	0	96,986	-266,4269	-205,4042	-263,5958	-137,514	-331,486	165,74		
		Lap	162,92	57,741	-0,008	0	0,872	287,8856	253,5066	252,9834	254,117	252,373		287,9	
		Tu,ka	-150,822	-52,83	-0,009	0	96,986	-265,5189	-204,7206	-262,9122	-136,8304	-330,8024			-331,49
STORY1	B45	Tu,ki	-149,563	-52,647	0,002	0	76,156	-263,7098	-209,2758	-254,9694	-155,9666	-308,2786	154,14		
		Lap	164,236	58,186	0,002	0	0,685	290,1818	255,4747	255,0637	255,9542	254,5842		290,2	
		Tu,ka	-149,363	-52,381	0,002	0	76,156	-263,0442	-208,7698	-254,4634	-155,4606	-307,7726			-308,28

Lampiran 17. Penulangan Lentur Balok Arah Y Elevasi G

Lantai	Balok	b (mm)	d (mm)	Mu (KNm)	k	ρ	ρ_{min}	ρ_{max}	As (mm ²)	As digunakan	As' digunakan	Tulangan terpasang			
												As		As'	
STORY5	B45	400	639	106,05	0,8116	0,0021	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	205,8273	1,5753	0,0041	0,0035	0,0244	1039,7629	1140,86	1140,86	3	D22	3	D22
		400	639	212,1	1,6233	0,0042	0,0035	0,0244	1072,5654	1140,86	1140,86	3	D22	3	D22
STORY4	B45	400	639	153,491	1,1747	0,0030	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	287,3302	2,1990	0,0058	0,0035	0,0244	1471,6298	1521,14	1140,86	4	D22	3	D22
		400	639	306,982	2,3494	0,0062	0,0035	0,0244	1577,6568	1901,43	1140,86	5	D22	3	D22
STORY3	B45	400	639	162,1597	1,2411	0,0032	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	288,6258	2,2089	0,0058	0,0035	0,0244	1478,5966	1521,14	1140,86	4	D22	3	D22
		400	639	324,3194	2,4821	0,0065	0,0035	0,0244	1671,8352	1901,43	1140,86	5	D22	3	D22
STORY2	B45	400	639	165,743	1,2685	0,0033	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	287,8856	2,2033	0,0058	0,0035	0,0244	1474,6160	1521,14	1140,86	4	D22	3	D22
		400	639	331,486	2,5370	0,0067	0,0035	0,0244	1710,9425	1901,43	1140,86	5	D22	3	D22
STORY1	B45	400	639	154,1393	1,1797	0,0030	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	290,1818	2,2208	0,0058	0,0035	0,0244	1486,9679	1521,14	1140,86	4	D22	3	D22
		400	639	308,2786	2,3593	0,0062	0,0035	0,0244	1584,6792	1901,43	1140,86	5	D22	3	D22

Lampiran 18. Momen Kapasitas Negatif Balok Arah Y Elevasi G

Lantai	No. Elemen	b (mm)	be (mm)	As' (mm ²)	As (mm ²)	d (mm)	d' (mm)	A	B	C1	c (mm)	a (mm)	fs' (MPa)	Mn- (KNm)	Mpr2 (KNm)
STORY5	B45	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B45	400	400	1140,86	1901,43	639	61	8670	-76057,14	41755371,4	73,9226	62,8343	104,8879	458,5702	573,2128
STORY3	B45	400	400	1140,86	1901,43	639	61	8670	-76057,14	41755371,4	73,9226	62,8343	104,8879	458,5702	573,2128
STORY2	B45	400	400	1140,86	1901,43	639	61	8670	-76057,14	41755371,4	73,9226	62,8343	104,8879	458,5702	573,2128
STORY1	B45	400	400	1140,86	1901,43	639	61	8670	-76057,14	41755371,4	73,9226	62,8343	104,8879	458,5702	573,2128

Lampiran 19. Momen Kapasitas Positif Balok Arah Y Elevasi G

Lantai	No. Elemen	b (mm)	be (mm)	As' (mm ²)	As (mm ²)	d (mm)	d' (mm)	A	B	C1	c (mm)	a (mm)	fs' (MPa)	Mn+ (KNm)	Mpr1 (KNm)
STORY5	B45	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385025	690,708358	863,385447
STORY4	B45	400	900	1901,43	1140,86	639	61	19507,5	684514,3	69592285,7	44,7069	38,00086	218,665583	781,033024	976,29128
STORY3	B45	400	900	1901,43	1140,86	639	61	19507,5	684514,3	69592285,7	44,7069	38,00086	218,665583	781,033024	976,29128
STORY2	B45	400	900	1901,43	1140,86	639	61	19507,5	684514,3	69592285,7	44,7069	38,00086	218,665583	781,033024	976,29128
STORY1	B45	400	900	1901,43	1140,86	639	61	19507,5	684514,3	69592285,7	44,7069	38,00086	218,665583	781,033024	976,29128

Lampiran 20. Penulangan Geser Balok Arah Y Elevasi G

Lantai	No. Elemen	Dimensi (mm)		d (mm)	Vu,b terpakai (KN)		Vc (KN)		Vs (KN)		s (mm)		Tulangan geser	
		b	h		pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.
STORY5	B45	400	700	639	233,172	219,010	0	233,32981	310,89534	58,683366	77,49	410,50	2P10 - 50	2P10 - 300
STORY4	B45	400	700	639	293,148	273,336	0	233,32981	390,86345	131,11853	61,63	183,72	2P10 - 50	2P10 - 150
STORY3	B45	400	700	639	293,146	273,335	0	233,32981	390,86126	131,11691	61,63	183,73	2P10 - 50	2P10 - 150
STORY2	B45	400	700	639	293,156	273,342	0	233,32981	390,8744	131,12664	61,63	183,71	2P10 - 50	2P10 - 150
STORY1	B45	400	700	639	293,114	273,311	0	233,32981	390,81855	131,08527	92,46	183,77	2P10 - 50	2P10 - 150

Lampiran 21. Perhitungan Kebutuhan Sengkok Balok Arah Y Elevasi G Akibat Torsi

Balok	Lantai	Tu (KN)	Vu		Pcp (mm ²)	Acp (mm ²)	Reduksi Tu (KN)	Aoh (mm ²)	At/s	Av/s		S gabungan				Av gabungan		Av min1 (mm ²)	Av min2 (mm ²)	Ket.
			SP (KN)	Luar SP (KN)						SP	Luar SP	SP (mm)		Luar SP (mm)		SP (mm ²)	Luar SP (mm ²)			
B45	5	2,40	310,9	58,68	3160	337600	49,39	189100	0,035	1,749	0,330	2P10	50	2P10	150	90,9932	60,11	42,79	41,67	OK
B45	4	3,87	390,86	131,12	3160	337600	49,39	189100	0,057	2,199	0,738	2P10	50	2P10	150	115,644	127,70	42,79	41,67	OK
B45	3	5,43	390,86	131,12	3160	337600	49,39	189100	0,080	2,199	0,738	2P10	50	2P10	150	117,948	134,61	42,79	41,67	OK
B45	2	6,21	390,87	131,13	3160	337600	49,39	189100	0,091	2,199	0,738	2P10	50	2P10	150	119,096	138,05	42,79	41,67	OK
B45	1	5,15	390,82	131,09	3160	337600	49,39	189100	0,076	2,199	0,738	2P10	50	2P10	150	117,513	133,32	42,79	41,67	OK

Lampiran 22. Tulangan Tambahan Balok Arah Y Elevasi G Akibat Adanya Torsi

Balok	Lantai	α	At/s	ph	Acp	fy	fys	f'c	Karena lentur				As tamb			As letur		Tulangan Longitudinal									
																		Plastis				Luar plastis					
									Atas		bawah		As perlu	As min	Pakai	Atas	Bawah	Atas	Bawah	Kanan	Kiri	Atas	Bawah	Kanan	Kiri		
B45	5	45	0,0352547	1840	337600	400	240	30	3	D	22	3	D	22	53,7558	1887,236	471,80911	1140,398	1140,398	5D22	5D22	2D22	2D22	5D22	5D22	2D22	2D22
B45	4	45	0,0567748	1840	337600	400	240	30	5	D	22	3	D	22	86,5693	1863,478	465,86958	1900,664	1140,398	7D22	5D22	2D22	2D22	6D22	5D22	2D22	2D22
B45	3	45	0,0798226	1840	337600	400	240	30	5	D	22	3	D	22	121,712	1838,034	459,50839	1900,664	1140,398	7D22	5D22	2D22	2D22	6D22	5D22	2D22	2D22
B45	2	45	0,0912656	1840	337600	400	240	30	5	D	22	3	D	22	139,16	1825,4	456,3501	1900,664	1140,398	7D22	5D22	2D22	2D22	6D22	5D22	2D22	2D22
B45	1	45	0,075592	1840	337600	400	240	30	5	D	22	3	D	22	115,261	1842,704	460,67603	1900,664	1140,398	7D22	5D22	2D22	2D22	6D22	5D22	2D22	2D22

Lampiran 23. Momen Nominal Balok Arah Y Elevasi G daerah Plastis Akibat Tulangan Terpasang

Balok	Lantai	d (mm)	d' (mm)	Daerah Plastis																			
				Tarik		Desak		Negatif								Positif							
					As		As	b	A	B	C1	c	fs'	Mn	Mpr	be	A	B	C1	c	fs'	Mn	Mpr
B45	5	639	61	5	D22 1900,664	5	D22 1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,403	573,0032	900	19508	380132,7111	69564286,13	50,7626	121,0031	744,339	930,4238
B45	4	639	61	7	D22 2660,929	5	D22 1900,664	400	8670	76026,5422	69564286,13	85,297	170,912	633,509	791,8864	900	19508	836291,9644	97390000,58	52,4019	98,44835	781,854	977,3175
B45	3	639	61	7	D22 2660,929	5	D22 1900,664	400	8670	76026,5422	69564286,13	85,297	170,912	633,509	791,8864	900	19508	836291,9644	97390000,58	52,4019	98,44835	781,854	977,3175
B45	2	639	61	7	D22 2660,929	5	D22 1900,664	400	8670	76026,5422	69564286,13	85,297	170,912	633,509	791,8864	900	19508	836291,9644	97390000,58	52,4019	98,44835	781,854	977,3175
B45	1	639	61	7	D22 2660,929	5	D22 1900,664	400	8670	76026,5422	69564286,13	85,297	170,912	633,509	791,8864	900	19508	836291,9644	97390000,58	52,4019	98,44835	781,854	977,3175

Lampiran 24. Momen Nominal Balok Arah Y Elevasi G daerah diluar Plastis Akibat Tulangan Terpasang

Balok	Lantai	d (mm)	d' (mm)	Luar Daerah Plastis																			
				Tarik		Desak		Negatif								Positif							
					As		As	b	A	B	C1	c	fs'	Mn	Mpr	be	A	B	C1	c	fs'	Mn	Mpr
B45	5	639	61	5	D22 1900,664	5	D22 1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,403	573,0032	900	19508	380132,7111	69564286,13	50,7626	121,0031	744,339	930,4238
B45	4	639	61	6	D22 2280,796	5	D22 1900,664	400	8670	228079,627	69564286,13	77,382	127,019	546,181	682,7262	900	19508	608212,3377	83477143,35	51,6585	108,4987	764,848	956,0599
B45	3	639	61	6	D22 2280,796	5	D22 1900,664	400	8670	228079,627	69564286,13	77,382	127,019	546,181	682,7262	900	19508	608212,3377	83477143,35	51,6585	108,4987	764,848	956,0599
B45	2	639	61	6	D22 2280,796	5	D22 1900,664	400	8670	228079,627	69564286,13	77,382	127,019	546,181	682,7262	900	19508	608212,3377	83477143,35	51,6585	108,4987	764,848	956,0599
B45	1	639	61	6	D22 2280,796	5	D22 1900,664	400	8670	228079,627	69564286,13	77,382	127,019	546,181	682,7262	900	19508	608212,3377	83477143,35	51,6585	108,4987	764,848	956,0599

Lampiran 25. Momen Rencana Balok Arah X Elevasi 1

Lantai	Balok	Tumpuan	Momen hasil analisis (KNm)					Kombinasi Momen (KNm)					Momen Rencana		
			MD	ML	MR	ME _x	ME _y	1,2MD+1,6ML+0.5MR	1,2MD+1ML+1Ex+0.3Ey	1,2MD+1ML-1Ex-0.3Ey	1,2MD+1ML+0.3Ex+1Ey	1,2MD+1ML-0.3Ex-1Ey	M+	Mlap	M-
STORY5	B1	Tu,ki	-66,934	-10,768	-3,407	27,087	1,282	-99,2531	-63,6172	-118,5604	-81,6807	-100,4969	59,2802		
		Lap	68,29	10,263	4,184	0,899	1,763	100,4608	93,6389	90,7831	94,2437	90,1783		100,461	
		Tu,ka	-66,878	-8,456	-4,12	25,887	1,35	-95,8432	-62,4176	-115,0016	-79,5935	-97,8257			-118,56
STORY4	B1	Tu,ki	-94,158	-25,126	-0,251	41,903	1,837	-153,3167	-95,6615	-180,5697	-123,7077	-152,5235	90,28485		
		Lap	86,745	25,275	-0,047	0,78	2,357	144,5105	130,8561	127,8819	131,96	126,778		144,511	
		Tu,ka	-87,726	-23,575	0,162	41,353	1,804	-142,9102	-86,952	-170,7404	-114,6363	-143,0561			-180,57
STORY3	B1	Tu,ki	-92,209	-24,986	-0,049	59,944	2,262	-150,6529	-75,0142	-196,2594	-115,3916	-155,882	98,1297		
		Lap	87,085	25,245	0,011	1,249	2,974	144,8995	131,8882	127,6058	133,0957	126,3983		144,9	
		Tu,ka	-89,03	-23,766	0,067	58,846	2,306	-144,8281	-71,0642	-190,1398	-110,6422	-150,5618			-196,259
STORY2	B1	Tu,ki	-91,358	-24,655	-0,059	68,782	2,405	-149,1071	-64,7811	-204,467	-111,245	-157,3242	-204,467		
		Lap	86,907	25,221	-0,002	1,409	3,181	144,641	131,8727	127,1461	133,1131	125,9057		144,641	
		Tu,ka	-90,181	-24,133	-0,002	67,563	2,485	-146,831	-64,0417	-201,827	-109,5963	-155,1041			-201,827
STORY1	B1	Tu,ki	-88,141	-23,721	0,055	57,451	1,869	-143,6953	-71,4785	-187,5019	-110,3859	-148,5945	96,39075		
		Lap	87,323	25,329	-0,025	1,251	2,501	145,3015	132,1179	128,1153	132,9929	127,2403		145,302	
		Tu,ka	-92,57	-24,846	0,001	56,262	1,965	-150,8371	-79,0785	-192,7815	-117,0864	-154,7736			-192,782
STORY5	B2	Tu,ki	-66,697	-8,693	0,026	25,648	1,357	-93,9322	-62,6743	-114,7845	-79,678	-97,7808	60,0555		
		Lap	63,004	9,45	-3,892	0,165	1,716	88,7788	85,7346	84,375	86,8203	83,2893		88,7788	
		Tu,ka	-69,481	-10,648	3,786	25,682	1,346	-98,521	-67,9394	-120,111	-84,9746	-103,0758			-120,111
STORY4	B2	Tu,ki	-88,749	-23,482	-3,836	41,352	1,829	-145,988	-88,0801	-171,8815	-115,7462	-144,2154	86,879		
		Lap	82,051	23,767	0,027	0,319	2,319	136,5019	123,2429	121,2135	124,6429	119,8135		136,502	
		Tu,ka	-89,812	-24,024	0	41,413	1,822	-146,2128	-89,8388	-173,758	-117,5525	-146,0443			-173,758
STORY3	B2	Tu,ki	-88,907	-23,477	-0,006	58,194	2,303	-144,2546	-71,2805	-189,0503	-110,4042	-149,9266	95,5278		
		Lap	81,982	23,717	0	0,427	2,919	136,3256	123,3981	120,7927	125,1425	119,0483		136,326	
		Tu,ka	-89,942	-24,125	0,002	58,312	2,294	-146,5294	-73,0552	-191,0556	-112,2678	-151,843			-191,056
STORY2	B2	Tu,ki	-89,137	-23,64	-0,004	66,572	2,464	-144,7904	-63,2932	-197,9156	-108,1688	-153,04	99,48415		
		Lap	81,958	23,709	0,004	0,286	3,124	136,286	123,2818	120,8354	125,2684	118,8488		136,286	
		Tu,ka	-89,651	-23,949	0,001	66,701	2,457	-145,8991	-64,0921	-198,9683	-109,0629	-153,9975			-198,968
STORY1	B2	Tu,ki	-89,784	-23,981	-0,003	55,155	1,935	-146,1119	-75,9863	-187,4573	-113,2403	-150,2033	93,72865		
		Lap	81,99	23,733	0,001	0,244	2,453	136,3613	123,1009	121,1411	124,6472	119,5948		136,361	
		Tu,ka	-89,047	-23,576	0,001	55,268	1,93	-144,5775	-74,5854	-186,2794	-111,922	-148,9428			-187,457
STORY5	B3	Tu,ki	-68,542	-9,985	-0,001	25,637	1,345	-98,2269	-66,1949	-118,2759	-83,1993	-101,2715	59,13795		
		Lap	63,379	9,598	-3,854	0,136	1,717	89,4846	86,3039	85,0017	87,4106	83,895		89,4846	
		Tu,ka	-67,187	-9,066	3,811	25,633	1,357	-93,2245	-63,6503	-115,7305	-80,6435	-98,7373			-118,276
STORY4	B3	Tu,ki	-69,56	-12,975	-3,858	41,162	1,612	-106,161	-54,8014	-138,0926	-82,4864	-110,4076	73,86875		
		Lap	66,703	14,383	0,004	0,504	2,185	103,0584	95,5861	93,2671	96,7628	92,0904		103,058	
		Tu,ka	-75,259	-15,434	-0,007	41,483	1,699	-115,0087	-63,7521	-147,7375	-91,6009	-119,8887			-147,738
STORY3	B3	Tu,ki	-69,348	-12,801	0,006	58,019	2,033	-103,6962	-37,3897	-154,6475	-76,5799	-115,4573	82,4162		
		Lap	66,886	14,466	-0,001	0,713	2,751	103,4083	96,2675	93,1909	97,6941	91,7643		103,408	
		Tu,ka	-75,256	-15,42	0,002	58,465	2,134	-114,9782	-46,622	-164,8324	-86,0537	-125,4007			-164,832
STORY2	B3	Tu,ki	-69,194	-12,703	-0,001	66,391	2,178	-103,3581	-28,6914	-162,7802	-73,6405	-117,8311	86,7884		
		Lap	66,865	14,463	0	0,816	2,945	103,3788	96,4005	93,0015	97,8908	91,5112		103,379	
		Tu,ka	-75,391	-15,521	0	66,902	2,282	-115,3028	-38,4036	-173,5768	-83,6376	-128,3428			-173,577
STORY1	B3	Tu,ki	-69,115	-12,639	0	55,034	1,711	-103,1604	-40,0297	-151,1243	-77,3558	-113,7982	81,30305		
		Lap	66,837	14,427	0	0,675	2,312	103,2876	96	93,2628	97,1459	92,1169		103,288	
		Tu,ka	-75,734	-15,728	0	55,46	1,791	-116,0456	-50,6115	-162,6061	-88,1798	-125,0378			-162,606
STORY5	B4	Tu,ki	-68,624	-9,991	0	25,66	1,358	-98,3344	-66,2724	-118,4072	-83,2838	-101,3958	59,2036		
		Lap	63,147	9,46	-3,857	0,146	1,716	88,9839	85,8972	84,5756	86,9962	83,4766		88,9839	
		Tu,ka	-67,569	-9,346	3,809	25,659	1,347	-94,1319	-64,3657	-116,4919	-81,3841	-99,4735			-118,407

Momen Rencana Balok Arah X Elevasi 1 (lanjutan)

Lantai	Balok	Tumpuan	Momen hasil analisis (KNm)					Kombinasi Momen (KNm)					Momen Rencana		
			MD	ML	MR	ME _x	ME _y	1,2MD+1,6ML+0,5MR	1,2MD+1ML+1Ex+0,3Ey	1,2MD+1ML-1Ex-0,3Ey	1,2MD+1ML+0,3Ex+1Ey	1,2MD+1ML-0,3Ex-1Ey	M+	Mlap	M-
STORY4	B4	Tu,ki	-89,498	-23,833	-3,857	41,369	1,833	-147,4589	-89,3117	-173,1495	-116,9869	-145,4743	87,00045		
		Lap	82,567	23,983	0,005	0,238	2,336	137,4557	124,0022	122,1246	125,4708	120,656		137,456	
		Tu,ka	-89,984	-24,101	-0,006	41,368	1,837	-146,5454	-90,1627	-174,0009	-117,8344	-146,3292			-174,001
STORY3	B4	Tu,ki	-89,72	-23,941	0,005	58,279	2,308	-145,9671	-72,6336	-190,5764	-111,8133	-151,3967	95,50925		
		Lap	82,503	23,938	-0,001	0,335	2,939	137,3039	124,1583	121,7249	125,9811	119,9021		137,304	
		Tu,ka	-89,978	-24,075	0,001	58,276	2,313	-146,4931	-73,0787	-191,0185	-112,2528	-151,8444			-191,019
STORY2	B4	Tu,ki	-89,621	-23,886	-0,001	66,679	2,469	-145,7633	-64,0115	-198,8509	-108,9585	-153,9039	99,79355		
		Lap	82,487	23,937	0	0,384	3,146	137,2836	124,2492	121,5936	126,1826	119,6602		137,284	
		Tu,ka	-90,04	-24,121	0	66,675	2,477	-146,6416	-64,7509	-199,5871	-109,6895	-154,6485			-199,587
STORY1	B4	Tu,ki	-89,392	-23,735	0	55,27	1,938	-145,2464	-75,154	-186,8568	-112,4864	-149,5244	94,1931		
		Lap	82,576	23,976	0	0,319	2,471	137,4528	124,1275	122,0069	125,6339	120,5005		137,453	
		Tu,ka	-90,247	-24,238	0	55,268	1,946	-147,0772	-76,6826	-188,3862	-114,008	-151,0608			-188,386
STORY5	B5	Tu,ki	-67,948	-9,578	0	25,643	1,351	-96,8624	-65,0673	-117,1639	-82,0717	-100,1595	58,6667		
		Lap	63,223	9,504	-3,857	0,142	1,717	89,1455	86,0287	84,7145	87,1312	83,612		89,1455	
		Tu,ka	-68,039	-9,636	3,81	25,645	1,352	-95,1594	-65,2322	-117,3334	-82,2373	-100,3283			-117,333
STORY4	B5	Tu,ki	-89,868	-24,018	-3,857	41,363	1,837	-148,1989	-89,9455	-173,7737	-117,6137	-146,1055	86,88685		
		Lap	82,078	23,681	0,005	0,232	2,332	136,3857	123,1062	121,243	124,5762	119,773		136,386	
		Tu,ka	-89,848	-24,006	-0,006	41,365	1,837	-146,2302	-89,9075	-173,7397	-117,5771	-146,0701			-173,774
STORY3	B5	Tu,ki	-89,883	-24,003	0,005	58,274	2,312	-146,2619	-72,895	-190,8302	-112,0684	-151,6568	95,4233		
		Lap	82,129	23,682	-0,001	0,322	2,936	136,4455	123,4396	121,034	125,2694	119,2042		136,446	
		Tu,ka	-89,89	-24,008	0,001	58,277	2,312	-146,2803	-72,9054	-190,8466	-112,0809	-151,6711			-190,847
STORY2	B5	Tu,ki	-89,876	-24,006	-0,001	66,678	2,475	-146,2613	-64,4367	-199,2777	-109,3788	-154,3356	99,63885		
		Lap	82,109	23,678	0	0,368	3,142	136,4156	123,5194	120,8982	125,4612	118,9564		136,416	
		Tu,ka	-89,872	-24,004	0	66,681	2,475	-146,2528	-64,4269	-199,2739	-109,3711	-154,3297			-199,278
STORY1	B5	Tu,ki	-89,928	-24,027	0	55,273	1,943	-146,3568	-76,0847	-187,7965	-113,4157	-150,4655	93,89825		
		Lap	82,152	23,69	0	0,305	2,467	136,4864	123,3175	121,2273	124,8309	119,7139		136,486	
		Tu,ka	-89,902	-24,01	0	55,275	1,943	-146,2984	-76,0345	-187,7503	-113,3669	-150,4179			-187,797
STORY5	B6	Tu,ki	-68,014	-9,62	0	25,645	1,352	-97,0088	-65,1862	-117,2874	-82,1913	-100,2823	58,6437		
		Lap	63,203	9,492	-3,857	0,142	1,716	89,1023	85,9924	84,6788	87,0942	83,577		89,1023	
		Tu,ka	-68,008	-9,616	3,81	25,646	1,352	-95,0902	-65,174	-117,2772	-82,1798	-100,2714			-117,287
STORY4	B6	Tu,ki	-89,858	-24,013	-3,857	41,364	1,837	-148,1789	-89,9275	-173,7577	-117,5964	-146,0888	86,88055		
		Lap	82,097	23,694	0,005	0,23	2,332	136,4293	123,14	121,2808	124,6114	119,8094		136,429	
		Tu,ka	-89,86	-24,014	-0,006	41,364	1,837	-146,2574	-89,9309	-173,7611	-117,5998	-146,0922			-173,761
STORY3	B6	Tu,ki	-89,895	-24,011	0,005	58,276	2,312	-146,2891	-72,9154	-190,8546	-112,0902	-151,6798	95,4273		
		Lap	82,141	23,691	-0,001	0,324	2,936	136,4743	123,465	121,0554	125,2934	119,227		136,474	
		Tu,ka	-89,894	-24,011	0,001	58,276	2,312	-146,2899	-72,9142	-190,8534	-112,089	-151,6786			-190,855
STORY2	B6	Tu,ki	-89,88	-24,009	-0,001	66,679	2,475	-146,2709	-64,4435	-199,2865	-109,3863	-154,3437	99,64375		
		Lap	82,123	23,689	0	0,371	3,142	136,45	123,5502	120,923	125,4899	118,9833		136,45	
		Tu,ka	-89,88	-24,01	0	66,679	2,475	-146,272	-64,4445	-199,2875	-109,3873	-154,3447			-199,288
STORY1	B6	Tu,ki	-89,916	-24,02	0	55,274	1,943	-146,3312	-76,0623	-187,7761	-113,394	-150,4444	93,88975		
		Lap	82,17	23,703	0	0,308	2,467	136,5288	123,3551	121,2589	124,8664	119,7476		136,529	
		Tu,ka	-89,918	-24,021	0	55,274	1,943	-146,3352	-76,0657	-187,7795	-113,3974	-150,4478			-187,78
STORY5	B7	Tu,ki	-68,008	-9,616	0	25,646	1,352	-96,9952	-65,174	-117,2772	-82,1798	-100,2714	58,6437		
		Lap	63,203	9,492	-3,857	0,142	1,716	89,1023	85,9924	84,6788	87,0942	83,577		89,1023	
		Tu,ka	-68,014	-9,62	3,81	25,645	1,352	-95,1038	-65,1862	-117,2874	-82,1913	-100,2823			-117,287
STORY4	B7	Tu,ki	-89,86	-24,014	-3,857	41,364	1,837	-148,1829	-89,9309	-173,7611	-117,5998	-146,0922	86,88055		
		Lap	82,097	23,694	0,005	0,23	2,332	136,4293	123,14	121,2808	124,6114	119,8094		136,429	
		Tu,ka	-89,858	-24,013	-0,006	41,364	1,837	-146,2534	-89,9275	-173,7577	-117,5964	-146,0888			-173,761

Momen Rencana Balok Arah X Elevasi 1 (lanjutan)

Lantai	Balok	Tumpuan	Momen hasil analisis (KNm)					Kombinasi Momen (KNm)					Momen Rencana		
			MD	ML	MR	ME _x	ME _y	1,2MD+1,6ML+0.5MR	1,2MD+1ML+1Ex+0.3Ey	1,2MD+1ML-1Ex-0.3Ey	1,2MD+1ML+0.3Ex+1Ey	1,2MD+1ML-0.3Ex-1Ey	M+	Mlap	M-
STORY3	B7	Tu,ki	-89,894	-24,011	0,005	58,276	2,312	-146,2879	-72,9142	-190,8534	-112,089	-151,6786	95,4273		
		Lap	82,141	23,691	-0,001	0,324	2,936	136,4743	123,465	121,0554	125,2934	119,227		136,474	
		Tu,ka	-89,895	-24,011	0,001	58,276	2,312	-146,2911	-72,9154	-190,8546	-112,0902	-151,6798			-190,855
STORY2	B7	Tu,ki	-89,88	-24,01	-0,001	66,679	2,475	-146,2725	-64,4445	-199,2875	-109,3873	-154,3447	99,64375		
		Lap	82,123	23,689	0	0,371	3,142	136,45	123,5502	120,923	125,4899	118,9833		136,45	
		Tu,ka	-89,88	-24,009	0	66,679	2,475	-146,2704	-64,4435	-199,2865	-109,3863	-154,3437			-199,288
STORY1	B7	Tu,ki	-89,918	-24,021	0	55,274	1,943	-146,3352	-76,0657	-187,7795	-113,3974	-150,4478	93,88975		
		Lap	82,17	23,703	0	0,308	2,467	136,5288	123,3551	121,2589	124,8664	119,7476		136,529	
		Tu,ka	-89,916	-24,02	0	55,274	1,943	-146,3312	-76,0623	-187,7761	-113,394	-150,4444			-187,78
STORY5	B8	Tu,ki	-68,039	-9,636	0	25,645	1,352	-97,0644	-65,2322	-117,3334	-82,2373	-100,3283	58,6667		
		Lap	63,223	9,504	-3,857	0,142	1,717	89,1455	86,0287	84,7145	87,1312	83,612		89,1455	
		Tu,ka	-67,948	-9,578	3,81	25,643	1,351	-94,9574	-65,0673	-117,1639	-82,0717	-100,1595			-117,333
STORY4	B8	Tu,ki	-89,848	-24,006	-3,857	41,365	1,837	-148,1557	-89,9075	-173,7397	-117,5771	-146,0701	86,88685		
		Lap	82,078	23,681	0,005	0,232	2,332	136,3857	123,1062	121,243	124,5762	119,773		136,386	
		Tu,ka	-89,868	-24,018	-0,006	41,363	1,837	-146,2734	-89,9455	-173,7737	-117,6137	-146,1055			-173,774
STORY3	B8	Tu,ki	-89,89	-24,008	0,005	58,277	2,312	-146,2783	-72,9054	-190,8466	-112,0809	-151,6711	95,4233		
		Lap	82,129	23,682	-0,001	0,322	2,936	136,4455	123,4396	121,034	125,2694	119,2042		136,446	
		Tu,ka	-89,883	-24,003	0,001	58,274	2,312	-146,2639	-72,895	-190,8302	-112,0684	-151,6568			-190,847
STORY2	B8	Tu,ki	-89,872	-24,004	-0,001	66,681	2,475	-146,2533	-64,4269	-199,2739	-109,3711	-154,3297	99,63885		
		Lap	82,109	23,678	0	0,368	3,142	136,4156	123,5194	120,8982	125,4612	118,9564		136,416	
		Tu,ka	-89,876	-24,006	0	66,678	2,475	-146,2608	-64,4367	-199,2777	-109,3788	-154,3356			-199,278
STORY1	B8	Tu,ki	-89,902	-24,01	0	55,275	1,943	-146,2984	-76,0345	-187,7503	-113,3669	-150,4179	93,89825		
		Lap	82,152	23,69	0	0,305	2,467	136,4864	123,3175	121,2273	124,8309	119,7139		136,486	
		Tu,ka	-89,928	-24,027	0	55,273	1,943	-146,3568	-76,0847	-187,7965	-113,4157	-150,4655			-187,797
STORY5	B9	Tu,ki	-67,569	-9,346	0	25,659	1,347	-96,0364	-64,3657	-116,4919	-81,3841	-99,4735	59,2036		
		Lap	63,147	9,46	-3,857	0,146	1,716	88,9839	85,8972	84,5756	86,9962	83,4766		88,9839	
		Tu,ka	-68,624	-9,991	3,809	25,66	1,358	-96,4299	-66,2724	-118,4072	-83,2838	-101,3958			-118,407
STORY4	B9	Tu,ki	-89,984	-24,101	-3,857	41,368	1,837	-148,4709	-90,1627	-174,0009	-117,8344	-146,3292	87,00045		
		Lap	82,567	23,983	0,005	0,238	2,336	137,4557	124,0022	122,1246	125,4708	120,656		137,456	
		Tu,ka	-89,498	-23,833	-0,006	41,369	1,833	-145,5334	-89,3117	-173,1495	-116,9869	-145,4743			-174,001
STORY3	B9	Tu,ki	-89,978	-24,075	0,005	58,276	2,313	-146,4911	-73,0787	-191,0185	-112,2528	-151,8444	95,50925		
		Lap	82,503	23,938	-0,001	0,335	2,939	137,3039	124,1583	121,7249	125,9811	119,9021		137,304	
		Tu,ka	-89,72	-23,941	0,001	58,279	2,308	-145,9691	-72,6336	-190,5764	-111,8133	-151,3967			-191,019
STORY2	B9	Tu,ki	-90,04	-24,121	-0,001	66,675	2,477	-146,6421	-64,7509	-199,5871	-109,6895	-154,6485	99,79355		
		Lap	82,487	23,937	0	0,384	3,146	137,2836	124,2492	121,5936	126,1826	119,6602		137,284	
		Tu,ka	-89,621	-23,886	0	66,679	2,469	-145,7628	-64,0115	-198,8509	-108,9585	-153,9039			-199,587
STORY1	B9	Tu,ki	-90,247	-24,238	0	55,268	1,946	-147,0772	-76,6826	-188,3862	-114,008	-151,0608	94,1931		
		Lap	82,576	23,976	0	0,319	2,471	137,4528	124,1275	122,0069	125,6339	120,5005		#REF!	
		Tu,ka	-89,392	-23,735	0	55,27	1,937	-145,2464	-75,1543	-186,8565	-112,4874	-149,5234			-188,386
STORY5	B10	Tu,ki	-67,187	-9,066	0	25,633	1,357	-95,13	-63,6503	-115,7305	-80,6435	-98,7373	59,13795		
		Lap	63,379	9,598	-3,858	0,136	1,717	89,4826	86,3039	85,0017	87,4106	83,895		89,4826	
		Tu,ka	-68,542	-9,985	3,811	25,637	1,345	-96,3209	-66,1949	-118,2759	-83,1993	-101,2715			-118,276
STORY4	B10	Tu,ki	-75,259	-15,434	-3,854	41,483	1,699	-116,9322	-63,7521	-147,7375	-91,6009	-119,8887	73,86875		
		Lap	66,703	14,383	0,006	0,504	2,185	103,0594	95,5861	93,2671	96,7628	92,0904		103,059	
		Tu,ka	-69,56	-12,975	-0,007	41,162	1,612	-104,2355	-54,8014	-138,0926	-82,4864	-110,4076			-147,738
STORY3	B10	Tu,ki	-75,256	-15,42	0,004	58,465	2,134	-114,9772	-46,622	-164,8324	-86,0537	-125,4007	82,4162		
		Lap	66,886	14,466	-0,001	0,713	2,751	103,4083	96,2675	93,1909	97,6941	91,7643		103,408	
		Tu,ka	-69,348	-12,801	0,002	58,019	2,033	-103,6982	-37,3897	-154,6475	-76,5799	-115,4573			-164,832

Momen Rencana Balok Arah X Elevasi 1 (lanjutan)

Lantai	Balok	Tumpuan	Momen hasil analisis (KNm)					Kombinasi Momen (KNm)					Momen Rencana		
			MD	ML	MR	ME _x	ME _y	1,2MD+1,6ML+0,5MR	1,2MD+1ML+1Ex+0,3Ey	1,2MD+1ML-1Ex-0,3Ey	1,2MD+1ML+0,3Ex+1Ey	1,2MD+1ML-0,3Ex-1Ey	M+	Mlap	M-
STORY2	B10	Tu,ki	-75,391	-15,521	-0,001	66,902	2,282	-115,3033	-38,4036	-173,5768	-83,6376	-128,3428	86,7884		
		Lap	66,865	14,463	0	0,816	2,945	103,3788	96,4005	93,0015	97,8908	91,5112		103,379	
		Tu,ka	-69,194	-12,703	0	66,391	2,178	-103,3576	-28,6914	-162,7802	-73,6405	-117,8311			-173,577
STORY1	B10	Tu,ki	-75,734	-15,728	0	55,46	1,791	-116,0456	-50,6115	-162,6061	-88,1798	-125,0378	81,30305		
		Lap	66,837	14,427	0	0,675	2,312	103,2876	96	93,2628	97,1459	92,1169		103,288	
		Tu,ka	-69,115	-12,639	0	55,034	1,711	-103,1604	-40,0297	-151,1243	-77,3558	-113,7982			-162,606
STORY5	B11	Tu,ki	-69,481	-10,648	0	25,682	1,346	-100,414	-67,9394	-120,111	-84,9746	-103,0758	60,0555		
		Lap	63,004	9,45	-3,836	0,165	1,716	88,8068	85,7346	84,375	86,8203	83,2893		88,8068	
		Tu,ka	-66,697	-8,693	3,786	25,648	1,357	-92,0522	-62,6743	-114,7845	-79,678	-97,7808			-120,111
STORY4	B11	Tu,ki	-89,812	-24,024	-3,892	41,413	1,822	-148,1588	-89,8388	-173,758	-117,5525	-146,0443	86,879		
		Lap	82,051	23,767	-0,006	0,319	2,319	136,4854	123,2429	121,2135	124,6429	119,8135		136,485	
		Tu,ka	-88,749	-23,482	0	41,352	1,829	-144,07	-88,0801	-171,8815	-115,7462	-144,2154			-173,758
STORY3	B11	Tu,ki	-89,942	-24,125	0,027	58,312	2,294	-146,5169	-73,0552	-191,0556	-112,2678	-151,843	95,5278		
		Lap	81,982	23,717	-0,004	0,427	2,919	136,3236	123,3981	120,7927	125,1425	119,0483		136,324	
		Tu,ka	-88,907	-23,477	0,002	58,194	2,303	-144,2506	-71,2805	-189,0503	-110,4042	-149,9266			-191,056
STORY2	B11	Tu,ki	-89,651	-23,949	0	66,701	2,457	-145,8996	-64,0921	-198,9683	-109,0629	-153,9975	99,48415		
		Lap	81,958	23,709	-0,003	0,286	3,124	136,2825	123,2818	120,8354	125,2684	118,8488		136,283	
		Tu,ka	-89,137	-23,64	0,001	66,572	2,464	-144,7879	-63,2932	-197,9156	-108,1688	-153,04			-198,968
STORY1	B11	Tu,ki	-89,047	-23,576	0,004	55,268	1,93	-144,576	-74,5854	-186,2794	-111,922	-148,9428	93,72865		
		Lap	81,99	23,733	-0,001	0,244	2,453	136,3603	123,1009	121,1411	124,6472	119,5948		136,36	
		Tu,ka	-89,784	-23,981	0,001	55,155	1,935	-146,1099	-75,9863	-187,4573	-113,2403	-150,2033			-187,457
STORY5	B12	Tu,ki	-66,878	-8,456	0,001	25,887	1,35	-93,7827	-62,4176	-115,0016	-79,5935	-97,8257	59,2802		
		Lap	68,29	10,263	-4,12	0,899	1,763	96,3088	93,6389	90,7831	94,2437	90,1783		96,3088	
		Tu,ka	-66,934	-10,768	4,184	27,087	1,282	-95,4576	-63,6172	-118,5604	-81,6807	-100,4969			-118,56
STORY4	B12	Tu,ki	-87,726	-23,575	-3,407	41,353	1,804	-144,6947	-86,952	-170,7404	-114,6363	-143,0561	90,28485		
		Lap	86,745	25,275	0,162	0,78	2,357	144,615	130,8561	127,8819	131,96	126,778		144,615	
		Tu,ka	-94,158	-25,126	-0,047	41,903	1,837	-153,2147	-95,6615	-180,5697	-123,7077	-152,5235			-180,57
STORY3	B12	Tu,ki	-89,03	-23,766	-0,251	58,846	2,306	-144,9871	-71,0642	-190,1398	-110,6422	-150,5618	98,1297		
		Lap	87,085	25,245	0,067	1,249	2,974	144,9275	131,8882	127,6058	133,0957	126,3983		144,928	
		Tu,ka	-92,209	-24,986	0,011	59,944	2,262	-150,6229	-75,0142	-196,2594	-115,3916	-155,882			-196,259
STORY2	B12	Tu,ki	-90,181	-24,133	-0,049	67,563	2,485	-146,8545	-64,0417	-200,6587	-109,5963	-155,1041	101,8942		
		Lap	86,907	25,221	0,055	1,409	3,181	144,6695	131,8727	127,1461	133,1131	125,9057		144,67	
		Tu,ka	-91,358	-24,655	-0,002	68,782	2,406	-149,0786	-64,7808	-203,7884	-111,244	-157,3252			-203,788
STORY1	B12	Tu,ki	-92,57	-24,846	-0,059	56,262	1,965	-150,8671	-79,0785	-192,7815	-117,0864	-154,7736	96,39075		
		Lap	87,323	25,329	0,026	1,251	2,501	145,327	132,1179	128,1153	132,9929	127,2403		145,327	
		Tu,ka	-88,141	-23,721	0,001	57,451	1,869	-143,7223	-71,4785	-187,5019	-110,3859	-148,5945			-192,782

Lampiran 26. Penulangan Lentur Balok Arah X Elevasi 1

Lantai	Balok	b (mm)	d (mm)	Mu (KNm)	Rn	ρ	ρ_{min}	ρ_{max}	As (mm ²)	As digunakan	As' digunakan	Tulangan terpasang			
												As		As'	
STORY5	B1	400	639	59,2802	0,4537	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	100,4608	0,7689	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	118,5604	0,9074	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B1	400	639	90,28485	0,6910	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	144,5105	1,1060	0,0028	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	180,5697	1,3820	0,0036	0,0035	0,0244	908,3883	1140,86	1140,86	3	D22	3	D22
STORY3	B1	400	639	98,1297	0,7510	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	144,8995	1,1090	0,0028	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	196,2594	1,5020	0,0039	0,0035	0,0244	989,8638	1140,86	1140,86	3	D22	3	D22
STORY2	B1	400	639	204,467	1,5648	0,0040	0,0035	0,0244	1032,6586	1140,86	1140,86	3	D22	3	D22
		400	639	144,641	1,1070	0,0028	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	201,827	1,5446	0,0040	0,0035	0,0244	1018,8805	1140,86	1140,86	3	D22	3	D22
STORY1	B1	400	639	96,39075	0,7377	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	145,3015	1,1120	0,0028	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	192,7815	1,4754	0,0038	0,0035	0,0244	971,7660	1140,86	1140,86	3	D22	3	D22
STORY5	B2	400	639	60,0555	0,4596	0,0012	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	88,7788	0,6795	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	120,111	0,9192	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B2	400	639	86,879	0,6649	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,5019	1,0447	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	173,758	1,3298	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B2	400	639	95,5278	0,7311	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,3256	1,0433	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	191,0556	1,4622	0,0038	0,0035	0,0244	962,7929	1140,86	1140,86	3	D22	3	D22
STORY2	B2	400	639	99,48415	0,7614	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,286	1,0430	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	198,9683	1,5228	0,0039	0,0035	0,0244	1003,9749	1140,86	1140,86	3	D22	3	D22
STORY1	B2	400	639	93,72865	0,7173	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,3613	1,0436	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	187,4573	1,4347	0,0037	0,0035	0,0244	944,1019	1140,86	1140,86	3	D22	3	D22

Penulangan Lentur Balok Arah X Elevasi 1 (lanjutan)

Lantai	Balok	b (mm)	d (mm)	Mu (KNm)	Rn	ρ	ρ_{min}	ρ_{max}	As (mm ²)	As digunakan	As' digunakan	Tulangan terpasang			
												As		As'	
STORY5	B3	400	639	59,13795	0,4526	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	89,4846	0,6849	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	118,2759	0,9052	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B3	400	639	73,86875	0,5653	0,0014	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	103,0584	0,7887	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	147,7375	1,1307	0,0029	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B3	400	639	82,4162	0,6308	0,0016	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	103,4083	0,7914	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	164,8324	1,2615	0,0032	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY2	B3	400	639	86,7884	0,6642	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	103,3788	0,7912	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	173,5768	1,3284	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY1	B3	400	639	81,30305	0,6222	0,0016	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	103,2876	0,7905	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	162,6061	1,2445	0,0032	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY5	B4	400	639	59,2036	0,4531	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	88,9839	0,6810	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	118,4072	0,9062	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B4	400	639	87,00045	0,6658	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	137,4557	1,0520	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	174,0009	1,3317	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B4	400	639	95,50925	0,7310	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	137,3039	1,0508	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	191,0185	1,4619	0,0038	0,0035	0,0244	962,6000	1140,86	1140,86	3	D22	3	D22
STORY2	B4	400	639	99,79355	0,7637	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	137,2836	1,0507	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	199,5871	1,5275	0,0039	0,0035	0,0244	1007,2002	1140,86	1140,86	3	D22	3	D22
STORY1	B4	400	639	94,1931	0,7209	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	137,4528	1,0520	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	188,3862	1,4418	0,0037	0,0035	0,0244	948,9248	1140,86	1140,86	3	D22	3	D22

Penulangan Lentur Balok Arah X Elevasi 1 (lanjutan)

Lantai	Balok	b (mm)	d (mm)	Mu (KNm)	Rn	ρ	ρ_{min}	ρ_{max}	As (mm ²)	As digunakan	As' digunakan	Tulangan terpasang			
												As		As'	
STORY5	B5	400	639	58,6667	0,4490	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	89,1455	0,6823	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	117,3334	0,8980	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B5	400	639	86,88685	0,6650	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,3857	1,0438	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	173,7737	1,3299	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B5	400	639	95,4233	0,7303	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4455	1,0443	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	190,8466	1,4606	0,0038	0,0035	0,0244	961,7066	1140,86	1140,86	3	D22	3	D22
STORY2	B5	400	639	99,63885	0,7626	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4156	1,0440	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	199,2777	1,5251	0,0039	0,0035	0,0244	1005,5875	1140,86	1140,86	3	D22	3	D22
STORY1	B5	400	639	93,89825	0,7186	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4864	1,0446	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	187,7965	1,4373	0,0037	0,0035	0,0244	945,8628	1140,86	1140,86	3	D22	3	D22
STORY5	B6	400	639	58,6437	0,4488	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	89,1023	0,6819	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	117,2874	0,8976	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B6	400	639	86,88055	0,6649	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4293	1,0441	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	173,7611	1,3298	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B6	400	639	95,4273	0,7303	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4743	1,0445	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	190,8546	1,4607	0,0038	0,0035	0,0244	961,7482	1140,86	1140,86	3	D22	3	D22
STORY2	B6	400	639	99,64375	0,7626	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,45	1,0443	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	199,2875	1,5252	0,0039	0,0035	0,0244	1005,6385	1140,86	1140,86	3	D22	3	D22
STORY1	B6	400	639	93,88975	0,7186	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,5288	1,0449	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	187,7795	1,4371	0,0037	0,0035	0,0244	945,7746	1140,86	1140,86	3	D22	3	D22

Penulangan Lentur Balok Arah X Elevasi 1 (lanjutan)

Lantai	Balok	b (mm)	d (mm)	Mu (KNm)	Rn	ρ	ρ_{min}	ρ_{max}	As (mm ²)	As digunakan	As' digunakan	Tulangan terpasang			
												As		As'	
STORY5	B7	400	639	58,6437	0,4488	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	89,1023	0,6819	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	117,2874	0,8976	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B7	400	639	86,88055	0,6649	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4293	1,0441	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	173,7611	1,3298	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B7	400	639	95,4273	0,7303	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4743	1,0445	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	190,8546	1,4607	0,0038	0,0035	0,0244	961,7482	1140,86	1140,86	3	D22	3	D22
STORY2	B7	400	639	99,64375	0,7626	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,45	1,0443	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	199,2875	1,5252	0,0039	0,0035	0,0244	1005,6385	1140,86	1140,86	3	D22	3	D22
STORY1	B7	400	639	93,88975	0,7186	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,5288	1,0449	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	187,7795	1,4371	0,0037	0,0035	0,0244	945,7746	1140,86	1140,86	3	D22	3	D22
STORY5	B8	400	639	58,6667	0,4490	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	89,1455	0,6823	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	117,3334	0,8980	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B8	400	639	86,88685	0,6650	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,3857	1,0438	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	173,7737	1,3299	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B8	400	639	95,4233	0,7303	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4455	1,0443	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	190,8466	1,4606	0,0038	0,0035	0,0244	961,7066	1140,86	1140,86	3	D22	3	D22
STORY2	B8	400	639	99,63885	0,7626	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4156	1,0440	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	199,2777	1,5251	0,0039	0,0035	0,0244	1005,5875	1140,86	1140,86	3	D22	3	D22
STORY1	B8	400	639	93,89825	0,7186	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4864	1,0446	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	187,7965	1,4373	0,0037	0,0035	0,0244	945,8628	1140,86	1140,86	3	D22	3	D22

Penulangan Lentur Balok Arah X Elevasi 1 (lanjutan)

Lantai	Balok	b (mm)	d (mm)	Mu (KNm)	Rn	ρ	ρ_{min}	ρ_{max}	As (mm ²)	As digunakan	As' digunakan	Tulangan terpasang			
												As		As'	
STORY5	B9	400	639	59,2036	0,4531	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	88,9839	0,6810	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	118,4072	0,9062	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B9	400	639	87,00045	0,6658	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	137,4557	1,0520	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	174,0009	1,3317	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B9	400	639	95,50925	0,7310	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	137,3039	1,0508	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	191,0185	1,4619	0,0038	0,0035	0,0244	962,6000	1140,86	1140,86	3	D22	3	D22
STORY2	B9	400	639	99,79355	0,7637	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	137,2836	1,0507	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	199,5871	1,5275	0,0039	0,0035	0,0244	1007,2002	1140,86	1140,86	3	D22	3	D22
STORY1	B9	400	639	94,1931	0,7209	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	137,4528	1,0520	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	188,3862	1,4418	0,0037	0,0035	0,0244	948,9248	1140,86	1140,86	3	D22	3	D22
STORY5	B10	400	639	59,13795	0,4526	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	89,4826	0,6848	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	118,2759	0,9052	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B10	400	639	73,86875	0,5653	0,0014	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	103,0594	0,7887	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	147,7375	1,1307	0,0029	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B10	400	639	82,4162	0,6308	0,0016	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	103,4083	0,7914	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	164,8324	1,2615	0,0032	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY2	B10	400	639	86,7884	0,6642	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	103,3788	0,7912	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	173,5768	1,3284	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY1	B10	400	639	81,30305	0,6222	0,0016	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	103,2876	0,7905	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	162,6061	1,2445	0,0032	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22

Penulangan Lentur Balok Arah X Elevasi 1 (lanjutan)

Lantai	Balok	b (mm)	d (mm)	Mu (KNm)	Rn	ρ	ρ_{min}	ρ_{max}	As (mm ²)	As digunakan	As' digunakan	Tulangan terpasang			
												As		As'	
STORY5	B11	400	639	60,0555	0,4596	0,0012	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	88,8068	0,6797	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	120,111	0,9192	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B11	400	639	86,879	0,6649	0,0017	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,4854	1,0446	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	173,758	1,3298	0,0034	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY3	B11	400	639	95,5278	0,7311	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,3236	1,0433	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	191,0556	1,4622	0,0038	0,0035	0,0244	962,7929	1140,86	1140,86	3	D22	3	D22
STORY2	B11	400	639	99,48415	0,7614	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,2825	1,0430	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	198,9683	1,5228	0,0039	0,0035	0,0244	1003,9749	1140,86	1140,86	3	D22	3	D22
STORY1	B11	400	639	93,72865	0,7173	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	136,3603	1,0436	0,0027	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	187,4573	1,4347	0,0037	0,0035	0,0244	944,1019	1140,86	1140,86	3	D22	3	D22
STORY5	B12	400	639	59,2802	0,4537	0,0011	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	96,3088	0,7371	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	118,5604	0,9074	0,0023	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
STORY4	B12	400	639	90,28485	0,6910	0,0018	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	144,615	1,1068	0,0028	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	180,5697	1,3820	0,0036	0,0035	0,0244	908,3883	1140,86	1140,86	3	D22	3	D22
STORY3	B12	400	639	98,1297	0,7510	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	144,9275	1,1092	0,0028	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	196,2594	1,5020	0,0039	0,0035	0,0244	989,8638	1140,86	1140,86	3	D22	3	D22
STORY2	B12	400	639	101,8942	0,7798	0,0020	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	144,6695	1,1072	0,0028	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	203,7884	1,5597	0,0040	0,0035	0,0244	1029,1158	1140,86	1140,86	3	D22	3	D22
STORY1	B12	400	639	96,39075	0,7377	0,0019	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	145,327	1,1122	0,0028	0,0035	0,0244	894,6000	1140,86	1140,86	3	D22	3	D22
		400	639	192,7815	1,4754	0,0038	0,0035	0,0244	971,7660	1140,86	1140,86	3	D22	3	D22

Lampiran 27. Momen Kapasitas Negatif Balok Arah X Elevasi 1

Lantai	No. Elemen	b (mm)	be (mm)	As (mm ²)	As (mm ²)	d (mm)	d' (mm)	A	B	C1	c (mm)	a (mm)	fs' (MPa)	Mn- (KNm)	Mpr2 (KNm)
STORY5	B1	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B1	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B1	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B1	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B1	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B2	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B2	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B2	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B2	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B2	400	400	1140,86	1140,86	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B3	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B3	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B3	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B3	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B3	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B4	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B4	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B4	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B4	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B4	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B5	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B5	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B5	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B5	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B5	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B6	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B6	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B6	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B6	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B6	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B7	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B7	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B7	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384

Momen Kapasitas Negatif Balok Arah X Elevasi 1 (lanjutan)

Lantai	No. Elemen	b (mm)	be (mm)	As' (mm ²)	As (mm ²)	d (mm)	d' (mm)	A	B	C1	c (mm)	a (mm)	fs' (MPa)	Mn- (KNm)	Mpr2 (KNm)
STORY2	B7	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B7	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B8	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B8	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B8	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B8	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B8	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B9	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B9	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B9	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B9	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B9	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B10	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B10	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B10	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B10	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B10	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B11	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B11	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B11	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B11	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B11	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY5	B12	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY4	B12	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY3	B12	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY2	B12	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384
STORY1	B12	400	400	1140,857	1140,8571	639	61	8670	228171,4	41755371,4	57,4758	48,8544	36,7900	330,5107	413,1384

Lampiran 28. Momen Kapasitas Positif Balok Arah X Elevasi 1

Lantai	No. Elemen	b (mm)	be (mm)	As' (mm ²)	As (mm ²)	d (mm)	d' (mm)	A	B	C1	c (mm)	a (mm)	fs' (MPa)	Mn+ (KNm)	Mprl (KNm)
STORY5	B1	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385	690,708358	863,385447
STORY4	B1	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385	690,708358	863,385447
STORY3	B1	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385	690,708358	863,385447
STORY2	B1	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385	690,708358	863,385447
STORY1	B1	400	900	1140,86	1140,86	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385	690,708358	863,385447
STORY5	B2	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B2	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B2	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY2	B2	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B2	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B3	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B3	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B3	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY2	B3	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B3	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B4	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B4	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B4	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY2	B4	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B4	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B5	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B5	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B5	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY2	B5	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B5	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B6	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B6	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B6	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY2	B6	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B6	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B7	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B7	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B7	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894

Momen Kapasitas Positif Balok Arah X Elevasi 1 (lanjutan)

Lantai	No. Elemen	b (mm)	be (mm)	As' (mm ²)	As (mm ²)	d (mm)	d' (mm)	A	B	C1	c (mm)	a (mm)	fs' (MPa)	Mn+ (KNm)	Mpr1 (KNm)
STORY2	B7	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B7	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B8	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B8	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B8	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY2	B8	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B8	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B9	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B9	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B9	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY2	B9	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B9	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B10	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B10	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B10	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY2	B10	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B10	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B11	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY4	B11	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY3	B11	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY2	B11	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY1	B11	400	2000	1140,857	1140,8571	639	61	43350	228171,4	41755371,4	28,515352	24,23805	683,5191	1038,67915	1298,34894
STORY5	B12	400	900	1140,857	1140,8571	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385	690,708358	863,385447
STORY4	B12	400	900	1140,857	1140,8571	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385	690,708358	863,385447
STORY3	B12	400	900	1140,857	1140,8571	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385	690,708358	863,385447
STORY2	B12	400	900	1140,857	1140,8571	639	61	19507,5	228171,4	41755371,4	40,785169	34,66739	297,385	690,708358	863,385447

Lampiran 29. Penulangan Geser Balok Arah X Elevasi 1

Lantai	No. Elemen	Dimensi (mm)		d (mm)	Vu,b terpakai (KN)		Vc (KN)		Vs (KN)		s (mm)		Tulangan geser	
		b	h		pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.
STORY5	B1	400	700	639	210,003	201,847	0	233,329809	280,00397	35,7989188	86,03	672,92	2P10 - 80	2P10 - 200
STORY4	B1	400	700	639	224,630	212,683	0	233,329809	299,50722	50,2470028	80,43	479,43	2P10 - 80	2P10 - 200
STORY3	B1	400	700	639	224,388	212,503	0	233,329809	299,18419	50,0077021	80,52	481,72	2P10 - 80	2P10 - 200
STORY2	B1	400	700	639	224,204	212,367	0	233,329809	298,93891	49,8259958	80,58	483,48	2P10 - 80	2P10 - 200
STORY1	B1	400	700	639	223,725	212,012	0	233,329809	298,30052	49,3530727	80,76	488,11	2P10 - 80	2P10 - 200
STORY5	B2	400	700	639	269,73162	261,8617058	0	233,329809	359,64216	115,819132	66,98	207,99	2P10 - 50	2P10 - 200
STORY4	B2	400	700	639	283,70862	272,2159226	0	233,329809	378,27816	129,624754	63,68	185,84	2P10 - 50	2P10 - 180
STORY3	B2	400	700	639	283,7193	272,2238317	0	233,329809	378,29239	129,635299	63,68	185,83	2P10 - 50	2P10 - 180
STORY2	B2	400	700	639	283,76529	272,2579016	0	233,329809	378,35371	129,680726	63,67	185,76	2P10 - 50	2P10 - 180
STORY1	B2	400	700	639	283,90408	272,3607198	0	233,329809	378,53877	129,817817	63,64	185,57	2P10 - 80	2P10 - 180
STORY5	B3	400	700	639	270,21041	262,2163981	0	233,329809	360,28055	116,292055	66,86	207,15	2P10 - 50	2P10 - 200
STORY4	B3	400	700	639	268,87258	261,2253282	0	233,329809	358,49677	114,970628	67,20	209,53	2P10 - 50	2P10 - 200
STORY3	B3	400	700	639	268,86437	261,2192442	0	233,329809	358,48582	114,962516	67,20	209,54	2P10 - 50	2P10 - 200
STORY2	B3	400	700	639	268,82741	261,1918666	0	233,329809	358,43655	114,926013	67,21	209,61	2P10 - 50	2P10 - 200
STORY1	B3	400	700	639	268,80031	261,1717897	0	233,329809	358,40041	114,899243	67,21	209,66	2P10 - 80	2P10 - 200
STORY5	B4	400	700	639	270,17428	262,1896289	0	233,329809	360,23237	116,256362	66,87	207,21	2P10 - 50	2P10 - 200
STORY4	B4	400	700	639	283,95171	272,3960065	0	233,329809	378,60228	129,864866	63,63	185,50	2P10 - 50	2P10 - 180
STORY3	B4	400	700	639	283,98456	272,4203421	0	233,329809	378,64608	129,897313	63,62	185,45	2P10 - 50	2P10 - 180
STORY2	B4	400	700	639	283,96157	272,4033072	0	233,329809	378,61542	129,8746	63,63	185,48	2P10 - 50	2P10 - 180
STORY1	B4	400	700	639	283,92954	272,3795799	0	233,329809	378,57272	129,842964	63,63	185,53	2P10 - 80	2P10 - 180
STORY5	B5	400	700	639	270,05437	262,1008037	0	233,329809	360,07249	116,137929	66,90	207,42	2P10 - 50	2P10 - 200
STORY4	B5	400	700	639	283,91558	272,3692372	0	233,329809	378,5541	129,829173	63,64	185,55	2P10 - 50	2P10 - 180
STORY3	B5	400	700	639	283,92543	272,3765379	0	233,329809	378,56724	129,838908	63,63	185,54	2P10 - 50	2P10 - 180
STORY2	B5	400	700	639	283,92543	272,3765379	0	233,329809	378,56724	129,838908	63,63	185,54	2P10 - 50	2P10 - 180
STORY1	B5	400	700	639	283,93939	272,3868806	0	233,329809	378,58586	129,852698	63,63	185,52	2P10 - 80	2P10 - 180
STORY5	B6	400	700	639	270,06341	262,107496	0	233,329809	360,08454	116,146852	66,90	207,41	2P10 - 50	2P10 - 200
STORY4	B6	400	700	639	283,9205	272,3728876	0	233,329809	378,56067	129,834041	63,64	185,54	2P10 - 50	2P10 - 180
STORY3	B6	400	700	639	283,93036	272,3801883	0	233,329809	378,57381	129,843775	63,63	185,53	2P10 - 50	2P10 - 180
STORY2	B6	400	700	639	283,92543	272,3765379	0	233,329809	378,56724	129,838908	63,63	185,54	2P10 - 50	2P10 - 180
STORY1	B6	400	700	639	283,93939	272,3868806	0	233,329809	378,58586	129,852698	63,63	185,52	2P10 - 80	2P10 - 180
STORY5	B7	400	700	639	270,06341	262,107496	0	233,329809	360,08454	116,146852	66,90	207,41	2P10 - 50	2P10 - 200
STORY4	B7	400	700	639	283,9205	272,3728876	0	233,329809	378,56067	129,834041	63,64	185,54	2P10 - 50	2P10 - 180
STORY3	B7	400	700	639	283,93036	272,3801883	0	233,329809	378,57381	129,843775	63,63	185,53	2P10 - 50	2P10 - 180
STORY2	B7	400	700	639	283,92543	272,3765379	0	233,329809	378,56724	129,838908	63,63	185,54	2P10 - 50	2P10 - 180

Penulangan Geser Balok Arah X Elevasi 1 (lanjutan)

Lantai	No. Elemen	Dimensi (mm)		d (mm)	Vu,b terpakai (KN)		Vc (KN)		Vs (KN)		s (mm)		Tulangan geser	
		b	h		pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.	pada s.p.	di luar s.p.
STORY1	B7	400	700	639	283,93939	272,3868806	0	233,329809	378,58586	129,852698	63,63	185,52	2P10 - 80	2P10 - 180
STORY5	B8	400	700	639	270,07244	262,1141883	0	233,329809	360,09659	116,155775	66,90	207,39	2P10 - 50	2P10 - 200
STORY4	B8	400	700	639	283,91558	272,3692372	0	233,329809	378,5541	129,829173	63,64	185,55	2P10 - 50	2P10 - 180
STORY3	B8	400	700	639	283,93036	272,3801883	0	233,329809	378,57381	129,843775	63,63	185,53	2P10 - 50	2P10 - 180
STORY2	B8	400	700	639	283,92543	272,3765379	0	233,329809	378,56724	129,838908	63,63	185,54	2P10 - 50	2P10 - 180
STORY1	B8	400	700	639	283,93529	272,3838386	0	233,329809	378,58038	129,848642	63,63	185,52	2P10 - 80	2P10 - 180
STORY5	B9	400	700	639	269,95254	262,0253631	0	233,329809	359,93671	116,037341	66,93	207,60	2P10 - 50	2P10 - 200
STORY4	B9	400	700	639	284,03959	272,4611044	0	233,329809	378,71945	129,951663	63,61	185,37	2P10 - 50	2P10 - 180
STORY3	B9	400	700	639	284,02645	272,4513701	0	233,329809	378,70193	129,938684	63,61	185,39	2P10 - 50	2P10 - 180
STORY2	B9	400	700	639	284,04041	272,4617128	0	233,329809	378,72054	129,952474	63,61	185,37	2P10 - 50	2P10 - 180
STORY1	B9	400	700	639	284,10036	272,5061254	0	233,329809	378,80048	130,011691	63,59	185,29	2P10 - 80	2P10 - 180
STORY5	B10	400	700	639	269,9164	261,9985939	0	233,329809	359,88853	116,001649	66,94	207,67	2P10 - 50	2P10 - 200
STORY4	B10	400	700	639	277,73314	267,7892652	0	233,329809	370,31085	123,722544	65,05	194,71	2P10 - 50	2P10 - 180
STORY3	B10	400	700	639	277,76599	267,8136009	0	233,329809	370,35465	123,754992	65,05	194,66	2P10 - 50	2P10 - 180
STORY2	B10	400	700	639	277,79309	267,8336778	0	233,329809	370,39079	123,781761	65,04	194,61	2P10 - 50	2P10 - 180
STORY1	B10	400	700	639	277,85387	267,8786988	0	233,329809	370,47182	123,841789	65,02	194,52	2P10 - 80	2P10 - 180
STORY5	B11	400	700	639	270,35085	262,320433	0	233,329809	360,46779	116,430768	66,83	206,90	2P10 - 50	2P10 - 200
STORY4	B11	400	700	639	283,91311	272,3674121	0	233,329809	378,55082	129,82674	63,64	185,55	2P10 - 50	2P10 - 180
STORY3	B11	400	700	639	283,92707	272,3777547	0	233,329809	378,56943	129,84053	63,63	185,53	2P10 - 50	2P10 - 180
STORY2	B11	400	700	639	283,86219	272,3296918	0	233,329809	378,48293	129,776446	63,65	185,62	2P10 - 50	2P10 - 180
STORY1	B11	400	700	639	283,74229	272,2408666	0	233,329809	378,32305	129,658013	63,68	185,79	2P10 - 50	2P10 - 180
STORY5	B12	400	700	639	209,69747	201,6202246	0	233,329809	279,59662	35,4971566	86,16	678,64	2P10 - 80	2P10 - 200
STORY4	B12	400	700	639	223,49051	211,8381616	0	233,329809	297,98734	49,1210727	80,84	490,42	2P10 - 80	2P10 - 200
STORY3	B12	400	700	639	223,73853	212,0218959	0	233,329809	298,31804	49,3660517	80,75	487,98	2P10 - 80	2P10 - 200
STORY2	B12	400	700	639	223,91264	212,1508749	0	233,329809	298,55018	49,5380237	80,69	486,29	2P10 - 80	2P10 - 200
STORY1	B12	400	700	639	224,40128	212,5128679	0	233,329809	299,20171	50,0206811	80,51	481,60	2P10 - 80	2P10 - 200

Lampiran 30. Kebutuhan Senggang Akibat Torsi Balok Arah X Elevasi 1

Balok	Lantai	Tu (KN)	Vs		Pcp (mm ²)	Acp (mm ²)	Reduksi Tu (KN)	Aoh (mm ²)	At/s	Av/s		S gabungan				Av gabungan		Av min1 (mm ²)	Av min2 (mm ²)	Ket.
			SP (KN)	Luar SP (KN)						SP	Luar SP	SP (mm)	Luar SP (mm)	SP (mm ²)	Luar SP (mm ²)					
B1	5	31,74	280	35,80	3160	337600	49,39	189100	0,466	1,576	0,201	4P10	100	4P10	200	250,808	226,80	85,58	83,33	OK
B1	4	44,92	299,51	50,25	3160	337600	49,39	189100	0,660	1,685	0,283	4P10	100	4P10	150	300,498	240,36	85,58	83,33	OK
B1	3	46,75	299,18	50,01	3160	337600	49,39	189100	0,687	1,683	0,281	4P10	100	4P10	150	305,698	248,24	85,58	83,33	OK
B1	2	47,42	298,94	49,83	3160	337600	49,39	189100	0,697	1,682	0,280	4P10	100	4P10	150	307,532	251,04	85,58	83,33	OK
B1	1	45,53	298,3	49,35	3160	337600	49,39	189100	0,669	1,678	0,278	4P10	100	4P10	150	301,596	242,28	85,58	83,33	OK
B2	5	27,99	359,64	115,82	4920	419200	48,91	189100	0,411	2,024	0,652	4P10	100	4P10	200	284,593	294,80	85,58	83,33	OK
B2	4	40,08	378,28	129,62	4920	419200	48,91	189100	0,589	2,129	0,729	4P10	80	4P10	150	264,472	286,01	68,47	66,67	OK
B2	3	41,70	378,29	129,64	4920	419200	48,91	189100	0,613	2,129	0,729	4P10	80	4P10	150	268,304	293,20	68,47	66,67	OK
B2	2	42,38	378,35	129,68	4920	419200	48,91	189100	0,622	2,129	0,730	4P10	80	4P10	150	269,911	296,20	68,47	66,67	OK
B2	1	40,33	378,54	129,82	4920	419200	48,91	189100	0,592	2,130	0,730	4P10	80	4P10	150	265,179	287,28	68,47	66,67	OK
B3	5	27,84	360,28	116,29	4920	419200	48,91	189100	0,409	2,027	0,654	4P10	100	4P10	200	284,518	294,46	85,58	83,33	OK
B3	4	34,25	358,5	114,97	4920	419200	48,91	189100	0,503	2,017	0,647	4P10	100	4P10	150	302,331	247,95	85,58	83,33	OK
B3	3	35,72	358,49	114,96	4920	419200	48,91	189100	0,525	2,017	0,647	4P10	100	4P10	150	306,647	254,43	85,58	83,33	OK
B3	2	36,36	358,44	114,93	4920	419200	48,91	189100	0,534	2,017	0,647	4P10	100	4P10	150	308,517	257,25	85,58	83,33	OK
B3	1	34,48	358,4	114,90	4920	419200	48,91	189100	0,507	2,017	0,647	4P10	100	4P10	150	302,976	248,94	85,58	83,33	OK
B4	5	27,66	360,23	116,26	4920	419200	48,91	189100	0,406	2,027	0,654	4P10	100	4P10	200	283,956	293,35	85,58	83,33	OK
B4	4	40,38	378,6	129,86	4920	419200	48,91	189100	0,593	2,130	0,731	4P10	80	4P10	150	265,339	287,57	68,47	66,67	OK
B4	3	41,83	378,65	129,90	4920	419200	48,91	189100	0,614	2,131	0,731	4P10	80	4P10	150	268,748	293,95	68,47	66,67	OK
B4	2	42,45	378,62	129,87	4920	419200	48,91	189100	0,624	2,130	0,731	4P10	80	4P10	150	270,194	296,67	68,47	66,67	OK
B4	1	40,60	378,57	129,84	4920	419200	48,91	189100	0,596	2,130	0,731	4P10	80	4P10	150	265,831	288,50	68,47	66,67	OK
B5	5	27,49	360,07	116,14	4920	419200	48,91	189100	0,404	2,026	0,653	4P10	100	4P10	200	283,369	292,22	85,58	83,33	OK
B5	4	39,78	378,55	129,83	4920	419200	48,91	189100	0,584	2,130	0,731	4P10	80	4P10	150	263,907	284,90	68,47	66,67	OK
B5	3	41,17	378,57	129,84	4920	419200	48,91	189100	0,605	2,130	0,731	4P10	80	4P10	150	267,166	291,00	68,47	66,67	OK
B5	2	41,75	378,57	129,84	4920	419200	48,91	189100	0,613	2,130	0,731	4P10	80	4P10	150	268,543	293,59	68,47	66,67	OK
B5	1	39,97	378,59	129,85	4920	419200	48,91	189100	0,587	2,130	0,731	4P10	80	4P10	150	264,363	285,74	68,47	66,67	OK
B6	5	27,31	360,08	116,15	4920	419200	48,91	189100	0,401	2,026	0,654	4P10	100	4P10	200	282,853	291,19	85,58	83,33	OK
B6	4	39,56	378,56	129,83	4920	419200	48,91	189100	0,581	2,130	0,731	4P10	80	4P10	150	263,386	283,92	68,47	66,67	OK
B6	3	40,87	378,57	129,84	4920	419200	48,91	189100	0,600	2,130	0,731	4P10	80	4P10	150	266,469	289,69	68,47	66,67	OK
B6	2	41,42	378,57	129,84	4920	419200	48,91	189100	0,608	2,130	0,731	4P10	80	4P10	150	267,756	292,11	68,47	66,67	OK
B6	1	39,71	378,59	129,85	4920	419200	48,91	189100	0,583	2,130	0,731	4P10	80	4P10	150	263,738	284,57	68,47	66,67	OK
B7	5	27,14	360,08	116,15	4920	419200	48,91	189100	0,399	2,026	0,654	4P10	100	4P10	200	282,339	290,16	85,58	83,33	OK
B7	4	39,32	378,56	129,83	4920	419200	48,91	189100	0,578	2,130	0,731	4P10	80	4P10	150	262,815	282,85	68,47	66,67	OK
B7	3	40,55	378,57	129,84	4920	419200	48,91	189100	0,596	2,130	0,731	4P10	80	4P10	150	265,721	288,29	68,47	66,67	OK

Kebutuhan Senggang Akibat Torsi Balok Arah X Elevasi 1 (lanjutan)

Balok	Lantai	Tu (KN)	Vs		Pcp (mm ²)	Acp (mm ²)	Reduksi Tu (KN)	Aoh (mm ²)	At/s	Av/s		S gabungan				Av gabungan		Av min1 (mm ²)	Av min2 (mm ²)	Ket.
			SP (KN)	Luar SP (KN)						SP	Luar SP	SP (mm)	Luar SP (mm)	SP (mm ²)	Luar SP (mm ²)					
B7	2	41,06	378,57	129,84	4920	419200	48,91	189100	0,603	2,130	0,731	4P10	80	4P10	150	266,922	290,55	68,47	66,67	OK
B7	1	39,42	378,59	129,85	4920	419200	48,91	189100	0,579	2,130	0,731	4P10	80	4P10	150	225,865	217,60	68,47	66,67	OK
B8	5	27,13	360,1	116,16	4920	419200	48,91	189100	0,399	2,026	0,654	4P10	100	4P10	200	282,331	290,14	85,58	83,33	OK
B8	4	39,31	378,55	129,83	4920	419200	48,91	189100	0,577	2,130	0,731	4P10	80	4P10	150	262,784	282,79	68,47	66,67	OK
B8	3	40,55	378,57	129,84	4920	419200	48,91	189100	0,596	2,130	0,731	4P10	80	4P10	150	265,707	288,27	68,47	66,67	OK
B8	2	41,06	378,57	129,84	4920	419200	48,91	189100	0,603	2,130	0,731	4P10	80	4P10	150	266,924	290,55	68,47	66,67	OK
B8	1	39,42	378,58	129,85	4920	419200	48,91	189100	0,579	2,130	0,731	4P10	80	4P10	150	263,066	283,31	68,47	66,67	OK
B9	5	27,36	359,94	116,04	4920	419200	48,91	189100	0,402	2,025	0,653	4P10	100	4P10	200	282,911	291,35	85,58	83,33	OK
B9	4	39,79	378,72	129,95	4920	419200	48,91	189100	0,584	2,131	0,731	4P10	80	4P10	150	263,993	285,02	68,47	66,67	OK
B9	3	41,12	378,7	129,94	4920	419200	48,91	189100	0,604	2,131	0,731	4P10	80	4P10	150	267,123	290,89	68,47	66,67	OK
B9	2	41,67	378,72	129,95	4920	419200	48,91	189100	0,612	2,131	0,731	4P10	80	4P10	150	268,422	293,32	68,47	66,67	OK
B9	1	39,94	378,8	130,01	4920	419200	48,91	189100	0,587	2,131	0,732	4P10	80	4P10	150	264,385	285,74	68,47	66,67	OK
B10	5	27,55	359,89	116,00	4920	419200	48,91	189100	0,405	2,025	0,653	4P10	100	4P10	200	283,433	292,40	85,58	83,33	OK
B10	4	33,67	370,31	123,72	4920	419200	48,91	189100	0,495	2,084	0,696	4P10	100	4P10	150	307,275	252,79	85,58	83,33	OK
B10	3	35,03	370,35	123,75	4920	419200	48,91	189100	0,515	2,084	0,696	4P10	100	4P10	150	311,295	258,81	85,58	83,33	OK
B10	2	35,60	370,39	123,78	4920	419200	48,91	189100	0,523	2,084	0,696	4P10	100	4P10	150	313,002	261,36	85,58	83,33	OK
B10	1	33,83	370,47	123,84	4920	419200	48,91	189100	0,497	2,085	0,697	4P10	100	4P10	150	307,856	253,62	85,58	83,33	OK
B11	5	27,58	360,47	116,43	4920	419200	48,91	189100	0,405	2,028	0,655	4P10	100	4P10	200	283,856	293,08	85,58	83,33	OK
B11	4	39,84	378,55	129,83	4920	419200	48,91	189100	0,585	2,130	0,731	4P10	80	4P10	150	264,044	285,15	68,47	66,67	OK
B11	3	41,27	378,57	129,84	4920	419200	48,91	189100	0,606	2,130	0,731	4P10	80	4P10	150	267,404	291,45	68,47	66,67	OK
B11	2	41,88	378,48	129,78	4920	419200	48,91	189100	0,615	2,130	0,730	4P10	80	4P10	150	268,804	294,09	68,47	66,67	OK
B11	1	40,03	378,32	129,66	4920	419200	48,91	189100	0,588	2,129	0,730	4P10	80	4P10	150	264,377	285,83	68,47	66,67	OK
B12	5	29,25	279,6	35,50	3160	3E+05	49,39	189100	0,430	1,573	0,200	4P10	100	4P10	200	243,261	211,82	85,58	83,33	OK
B12	4	43,33	297,99	49,12	3160	3E+05	49,39	189100	0,636	1,677	0,276	4P10	100	4P10	200	294,965	309,87	85,58	83,33	OK
B12	3	44,77	298,32	49,37	3160	3E+05	49,39	189100	0,658	1,679	0,278	4P10	100	4P10	150	299,376	238,94	85,58	83,33	OK
B12	2	45,48	298,55	49,54	3160	3E+05	49,39	189100	0,668	1,680	0,279	4P10	100	4P10	150	301,599	242,23	85,58	83,33	OK
B12	1	43,39	299,2	50,02	3160	3E+05	49,39	189100	0,637	1,684	0,281	4P10	100	4P10	200	339,12	311,23	85,58	83,33	OK

Lampiran 31. Kebutuhan Tulangan Tambahan Balok Arah X Elevasi 1 Akibat Adanya Torsi

Balok	Lantai	α	At/s	ph	Acp	fy	fys	f'c	Karena Lentur				As Tamb			As letur		Tulangan Longitudinal									
																		Plastis				Luar plastis					
									Atas	bawah	As perlu	As min	Pakai	Atas	Bawah	Atas	Bawah	Kanan	Kiri	Atas	Bawah	Kanan	Kiri				
B1	5	45	0,466273	1840	337600	400	240	30	3	D	22	3	D	22	710,966	1411,392	352,84807	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B1	4	45	0,6598508	1840	337600	400	240	30	3	D	22	3	D	22	1006,13	1197,682	299,42061	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B1	3	45	0,6867619	1840	337600	400	240	30	3	D	22	3	D	22	1047,16	1167,973	291,99314	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B1	2	45	0,6966185	1840	337600	400	240	30	3	D	22	3	D	22	1062,19	1157,091	289,27271	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B1	1	45	0,6687379	1840	337600	400	240	30	3	D	22	3	D	22	1019,68	1187,871	296,96776	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B2	5	45	0,4111434	1840	419200	400	240	30	3	D	22	3	D	22	626,905	1937,819	484,45487	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B2	4	45	0,588695	1840	419200	400	240	30	3	D	22	3	D	22	897,633	1741,803	435,45064	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B2	3	45	0,6126094	1840	419200	400	240	30	3	D	22	3	D	22	934,097	1715,401	428,85025	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B2	2	45	0,6224808	1840	419200	400	240	30	3	D	22	3	D	22	949,149	1704,503	426,12577	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B2	1	45	0,592382	1840	419200	400	240	30	3	D	22	3	D	22	903,255	1737,732	434,43301	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B3	5	45	0,4089694	1840	419200	400	240	30	3	D	22	3	D	22	623,59	1940,22	485,05491	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B3	4	45	0,5030554	1840	419200	400	240	30	3	D	22	3	D	22	767,051	1836,349	459,08717	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B3	3	45	0,5246636	1840	419200	400	240	30	3	D	22	3	D	22	799,999	1812,493	453,1233	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B3	2	45	0,534153	1840	419200	400	240	30	3	D	22	3	D	22	814,468	1802,017	450,50423	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B3	1	45	0,5065515	1840	419200	400	240	30	3	D	22	3	D	22	772,382	1832,489	458,12224	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B4	5	45	0,4062959	1840	419200	400	240	30	3	D	22	3	D	22	619,514	1943,171	485,79279	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B4	4	45	0,5932047	1840	419200	400	240	30	3	D	22	3	D	22	904,509	1736,824	434,20597	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B4	3	45	0,6143869	1840	419200	400	240	30	3	D	22	3	D	22	936,807	1713,439	428,35968	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B4	2	45	0,623509	1840	419200	400	240	30	3	D	22	3	D	22	950,717	1703,368	425,84197	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B4	1	45	0,5963629	1840	419200	400	240	30	3	D	22	3	D	22	909,325	1733,337	433,3343	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B5	5	45	0,4038134	1840	419200	400	240	30	3	D	22	3	D	22	615,728	1945,912	486,47796	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B5	4	45	0,584391	1840	419200	400	240	30	3	D	22	3	D	22	891,07	1746,554	436,63855	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B5	3	45	0,6047212	1840	419200	400	240	30	3	D	22	3	D	22	922,069	1724,11	431,02741	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B5	2	45	0,6133292	1840	419200	400	240	30	3	D	22	3	D	22	935,195	1714,606	428,65159	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B5	1	45	0,5871526	1840	419200	400	240	30	3	D	22	3	D	22	895,281	1743,505	435,87634	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B6	5	45	0,4011987	1840	419200	400	240	30	3	D	22	3	D	22	611,741	1948,799	487,19963	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B6	4	45	0,5811152	1840	419200	400	240	30	3	D	22	3	D	22	886,075	1750,171	437,54266	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B6	3	45	0,6003437	1840	419200	400	240	30	3	D	22	3	D	22	915,395	1728,942	432,23559	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B6	2	45	0,6084082	1840	419200	400	240	30	3	D	22	3	D	22	927,691	1720,039	430,00978	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B6	1	45	0,5832452	1840	419200	400	240	30	3	D	22	3	D	22	889,323	1747,819	436,95478	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B7	5	45	0,398628	1840	419200	400	240	30	3	D	22	3	D	22	607,822	1951,637	487,90913	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B7	4	45	0,5775457	1840	419200	400	240	30	3	D	22	3	D	22	880,633	1754,111	438,52785	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B7	3	45	0,5956725	1840	419200	400	240	30	3	D	22	3	D	22	908,272	1734,099	433,52485	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B7	2	45	0,6031935	1840	419200	400	240	30	3	D	22	3	D	22	919,74	1725,796	431,44906	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B7	1	45	0,579044	1840	419200	400	240	30	3	D	22	3	D	22	882,917	1752,457	438,11431	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B8	5	45	0,3985546	1840	419200	400	240	30	3	D	22	3	D	22	607,71	1951,718	487,9294	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B8	4	45	0,5773694	1840	419200	400	240	30	3	D	22	3	D	22	880,364	1754,306	438,5765	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B8	3	45	0,5955843	1840	419200	400	240	30	3	D	22	3	D	22	908,138	1734,197	433,54918	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22

Kebutuhan Tulangan Tambahan Balok Arah X Elevasi 1 Akibat Adanya Torsi (lanjutan)

Balok	Lantai	α	At/s	ph	Acp	fy	fys	f'c	Karena lentur				As tamb			As letur		Tulangan Longitudinal									
																		Plastis				Luar plastis					
									Atas		bawah		As perlu	As min	Pakai	Atas	Bawah	Atas	Bawah	Kanan	Kiri	Atas	Bawah	Kanan	Kiri		
B8	2	45	0,6032082	1840	419200	400	240	30	3	D	22	3	D	22	919,762	1725,78	431,445	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B8	1	45	0,5790587	1840	419200	400	240	30	3	D	22	3	D	22	882,94	1752,441	438,11026	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B9	5	45	0,4019038	1840	419200	400	240	30	3	D	22	3	D	22	612,817	1948,02	487,00502	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B9	4	45	0,5844644	1840	419200	400	240	30	3	D	22	3	D	22	891,182	1746,473	436,61828	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B9	3	45	0,6040749	1840	419200	400	240	30	3	D	22	3	D	22	921,084	1724,823	431,2058	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B9	2	45	0,6121394	1840	419200	400	240	30	3	D	22	3	D	22	933,381	1715,92	428,97999	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B9	1	45	0,5866825	1840	419200	400	240	30	3	D	22	3	D	22	894,564	1744,024	436,00608	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B10	5	45	0,4046507	1840	419200	400	240	30	3	D	22	3	D	22	617,005	1944,987	486,24687	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B10	4	45	0,4945355	1840	419200	400	240	30	3	D	22	3	D	22	754,06	1845,755	461,43866	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B10	3	45	0,5145132	1840	419200	400	240	30	3	D	22	3	D	22	784,522	1823,699	455,92482	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B10	2	45	0,5229449	1840	419200	400	240	30	3	D	22	3	D	22	797,378	1814,391	453,59765	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B10	1	45	0,4969887	1840	419200	400	240	30	3	D	22	3	D	22	757,801	1843,046	460,76159	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B11	5	45	0,4051354	1840	419200	400	240	30	3	D	22	3	D	22	617,744	1944,452	486,11308	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B11	4	45	0,5852577	1840	419200	400	240	30	3	D	22	3	D	22	892,392	1745,597	436,39935	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B11	3	45	0,6062048	1840	419200	400	240	30	3	D	22	3	D	22	924,332	1722,472	430,61793	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B11	2	45	0,6151948	1840	419200	400	240	30	3	D	22	3	D	22	938,039	1712,547	428,1367	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B11	1	45	0,5879752	1840	419200	400	240	30	3	D	22	3	D	22	896,535	1742,597	435,6493	1140,398	1140,398	5D22	5D22	1D22	1D22	5D22	5D22	1D22	1D22
B12	5	45	0,4296815	1840	337600	400	240	30	3	D	22	3	D	22	655,172	1451,789	362,94731	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B12	4	45	0,6364651	1840	337600	400	240	30	3	D	22	3	D	22	970,472	1223,5	305,87504	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B12	3	45	0,6575886	1840	337600	400	240	30	3	D	22	3	D	22	1002,68	1200,18	300,04497	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B12	2	45	0,6680475	1840	337600	400	240	30	3	D	22	3	D	22	1018,63	1188,633	297,15831	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22
B12	1	45	0,6373465	1840	337600	400	240	30	3	D	22	3	D	22	971,816	1222,527	305,63178	1140,398	1140,398	4D22	4D22	1D22	1D22	4D22	4D22	1D22	1D22

Lampiran 32. Momen Nominal Balok Arah X Elevasi 1 pada Daerah Plastis Akibat Tulangan Terpasang

Balok	Lantai	d (mm)	d' (mm)	Daerah Plastis																					
				Tarik		Desak		Negatif								Positif									
					As (mm²)		As (mm²)	b	A	B	C1	c	fs'	Mn (KNm)	Mpr (KNm)	be	A	B	C1	c	fs'	Mn (KNm)	Mpr (KNm)		
B1	5	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854
B1	4	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854
B1	3	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854
B1	2	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854
B1	1	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854
B2	5	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B2	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B2	3	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B2	2	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B2	1	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B3	5	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B3	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B3	3	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B3	2	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B3	1	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B4	5	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B4	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B4	3	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B4	2	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B4	1	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B5	5	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B5	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B5	3	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B5	2	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B5	1	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B6	5	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B6	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B6	3	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B6	2	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B6	1	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B7	5	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B7	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B7	3	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B7	2	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B7	1	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B8	5	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B8	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B8	3	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B8	2	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B8	1	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B9	5	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B9	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B9	3	639	61	5	D22	1900,664	5	D22																	

Momen Nominal Balok Arah X Elevasi 1 pada Daerah Plastis Akibat Tulangan Terpasang (Lanjutan)

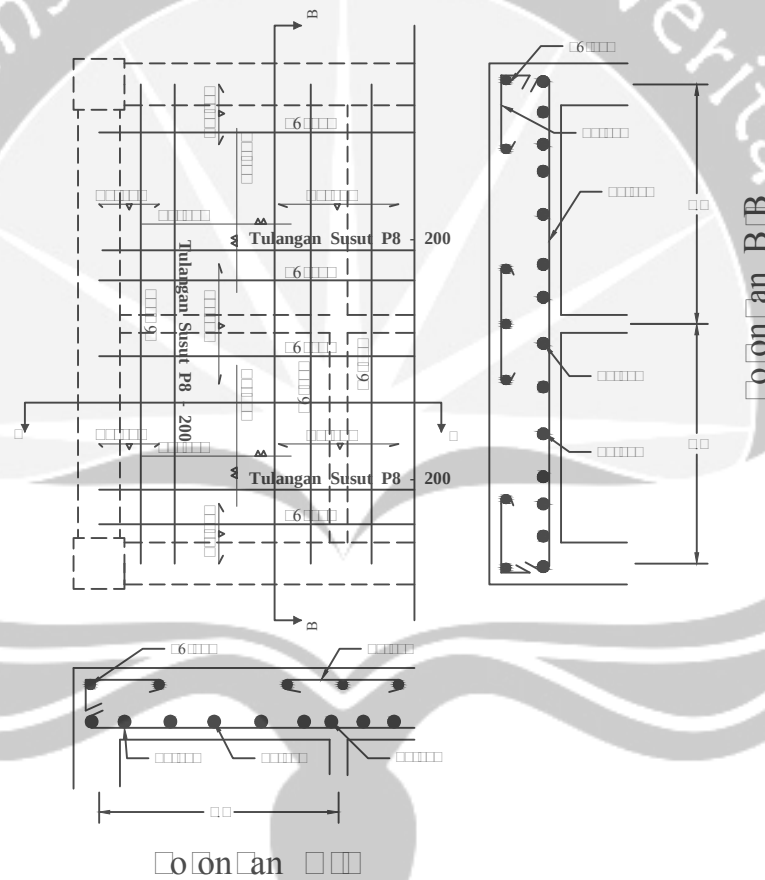
Balok	Lantai	d (mm)	d' (mm)	Daerah Plastis																					
				Tarik		Desak		Negatif							Positif										
					As (mm ²)		As (mm ²)	b	A	B	C1	c	fs'	Mn (KNm)	Mpr (KNm)	be	A	B	C1	c	fs'	Mn (KNm)	Mpr (KNm)		
B10	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B10	3	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B10	2	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B10	1	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B11	5	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B11	4	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B11	3	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B11	2	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B11	1	639	61	5	D22	1900,664	5	D22	1900,664	400	8670	380132,711	69564286,13	70,296	79,3419	458,40256	573,003202	2000	43350	380132,7111	69564286,13	35,9136	419,1117	1431,4974	1789,37169
B12	5	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854
B12	4	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854
B12	3	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854
B12	2	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854
B12	1	639	61	4	D22	1520,531	4	D22	1520,531	400	8670	304106,169	55651428,9	64,477	32,3553	370,32813	462,910161	900	19508	304106,1689	55651428,9	46,183	192,4999	727,18308	908,978854

Balok	Lantai	d (mm)	d' (mm)	Luar Daerah Plastis																					
				Tarik		Desak		Negatif								Positif									
				As (mm ²)		As (mm ²)		b	A	B	C1	c	fs'	Mn (KNm)	Mpr (KNm)	be	A	B	C1	c	fs'	Mn (KNm)	Mpr (KNm)		
B1	5	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854
B1	4	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854
B1	3	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854
B1	2	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854
B1	1	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854
B2	5	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B2	4	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B2	3	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B2	2	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B2	1	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B3	5	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B3	4	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B3	3	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B3	2	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B3	1	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169
B4	5	639	61	5	D22	1901	5	D																	

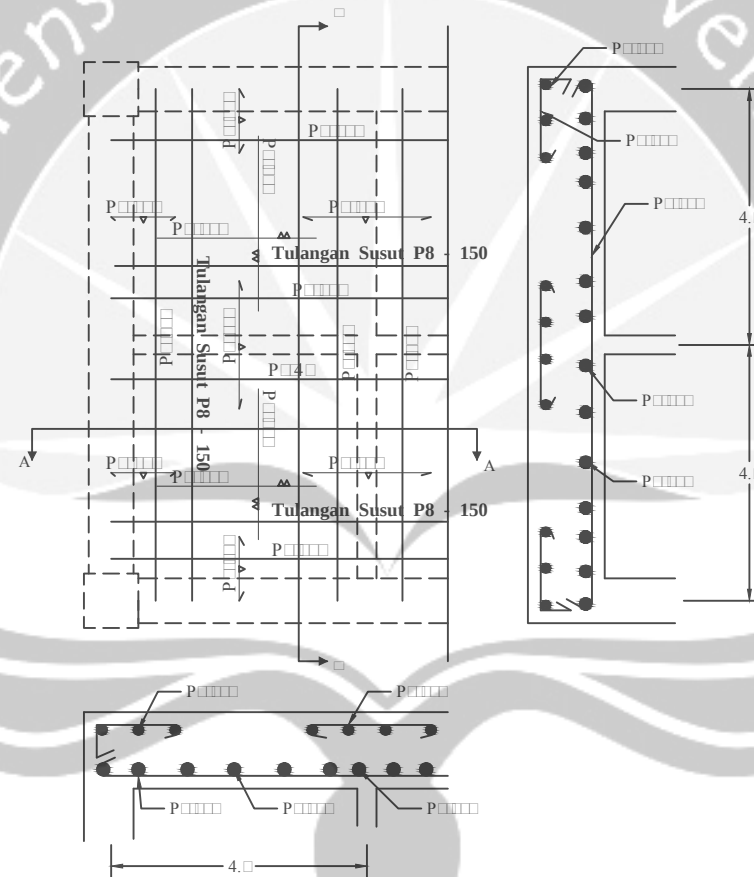
Momen Nominal Balok Arah X Elevasi 1 pada Daerah Luar Plastis Akibat Tulangan Terpasang (lanjutan)

Balok	Lantai	d (mm)	d' (mm)	Luar Daerah Plastis																							
				Tarik		Desak		Negatif												Positif							
				As (mm ²)		As (mm ²)		b	A	B	C1	c	fs'	Mn (KNm)	Mpr (KNm)	be	A	B	C1	c	fs'	Mn (KNm)	Mpr (KNm)				
B9	5	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B9	4	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B9	3	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B9	2	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B9	1	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B10	5	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B10	4	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B10	3	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B10	2	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B10	1	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B11	5	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B11	4	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B11	3	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B11	2	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B11	1	639	61	5	D22	1901	5	D22	1901	400	8670	380133	69564286	70,3	79,3	458,40256	573,003202	2000	43350	380133	69564286	35,9	419	1431,4974	1789,37169		
B12	5	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854		
B12	4	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854		
B12	3	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854		
B12	2	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854		
B12	1	639	61	4	D22	1521	4	D22	1521	400	8670	304106	55651429	64,5	32,4	370,32813	462,910161	900	19507,5	304106	55651429	46,2	192	727,18308	908,978854		

Lampiran 34. Gambar Rencana Pelat Atap

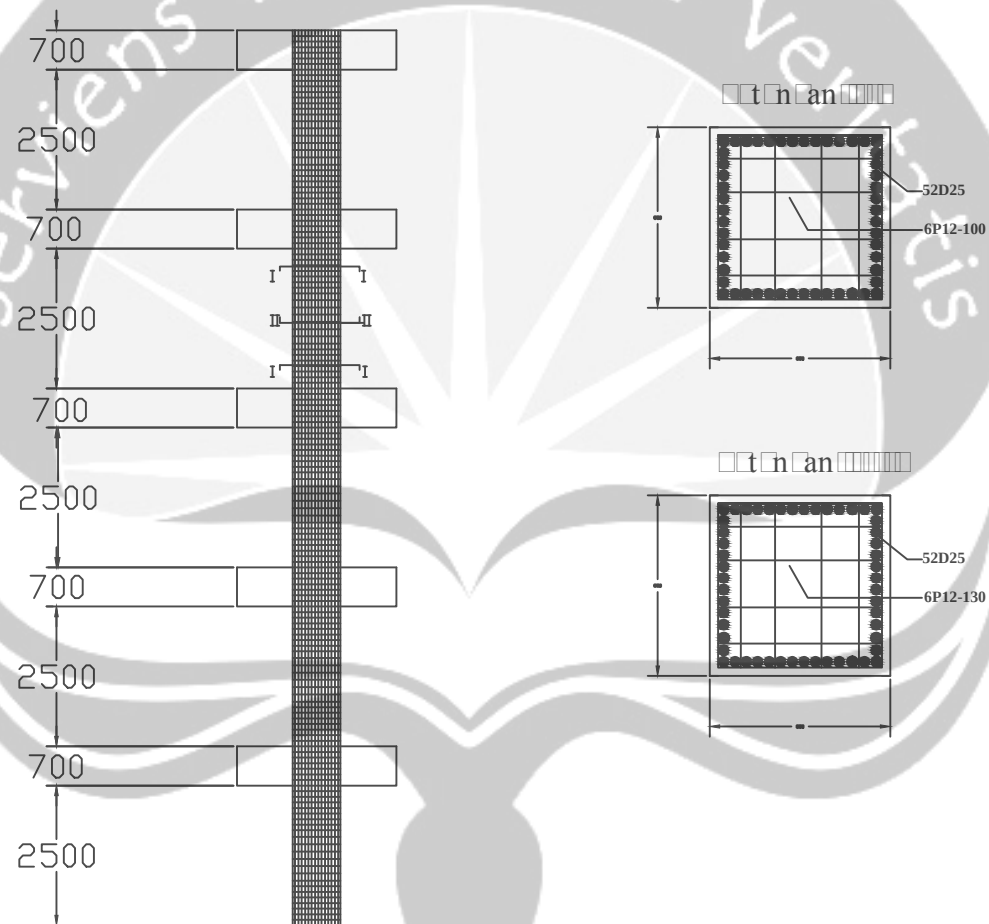


Lantai 5 a a n ana at Lantai

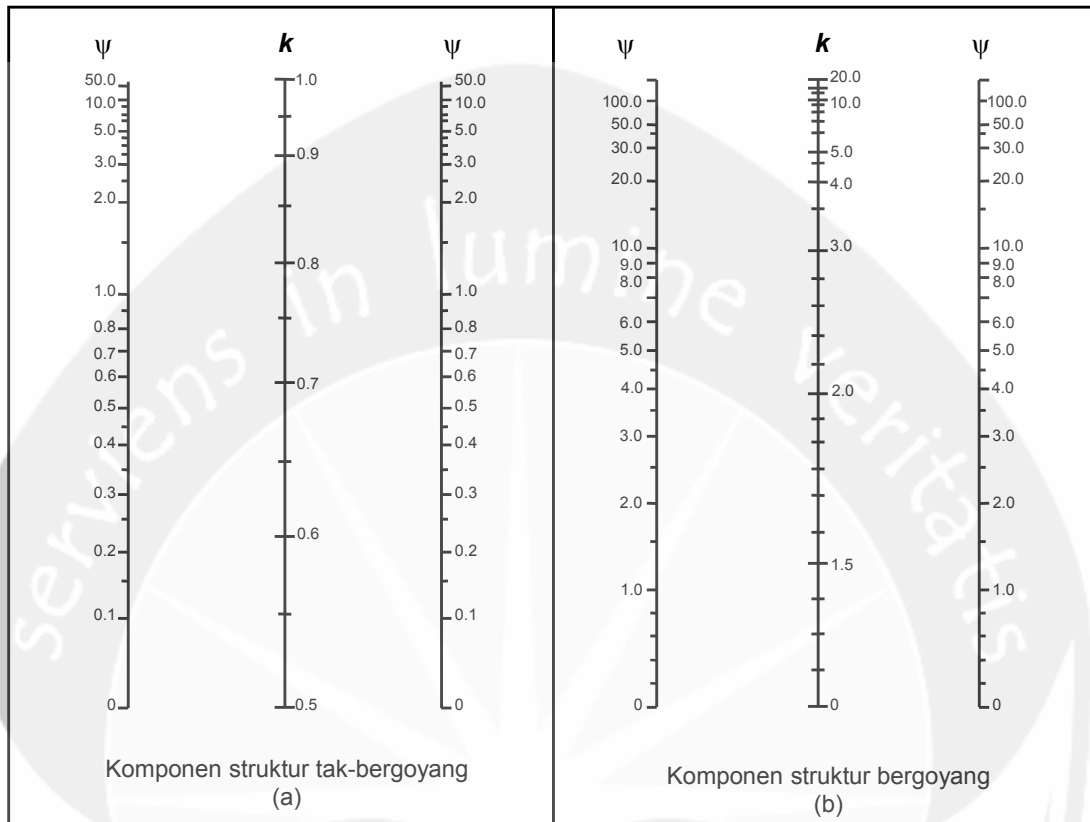


P t n an A A

Lampiran 36. Gambar Rencana Kolom



Lampiran 37. Nomogram Faktor Panjang Efektif



Faktor panjang efektif, k

CATATAN:

Ψ = rasio $\Sigma(EI/l)$ dari komponen struktur tekan terhadap $\Sigma(EI/l)$ dari komponen struktur lentur pada salah satu ujung komponen struktur tekan yang dihitung dalam bidang rangka yang ditinjau.

l = panjang bentang dari komponen struktur lentur yang diukur dari pusat ke pusat *joint*.

Lampiran 40. Penulangan Lentur Kolom

Lantai	Kolom	Dimensi		Mx (KNm)	My (KNm)	Pu (KN)	Mnox (KNm)	Mnoy (KNm)	Mn Terpakai (KNm)	Mod	Nod	ρ	As Perlu (mm ²)	Terpasang	
		b (mm)	h (mm)											Dipakai	As (mm ²)
5	C1	850	850	140,134	142,167	247,01	333,362	334,806	334,806	0,01817	0,01753	0,03500	23338,88	52 D 25	25512,50
	C2	850	850	237,585	47,662	388,54	404,999	270,142	404,999	0,02198	0,02758	0,03500	23338,88	52 D 25	25512,50
	C3	850	850	224,013	47,843	388,71	384,269	259,178	384,269	0,02086	0,02759	0,03500	23338,88	52 D 25	25512,50
	C4	850	850	228,904	46,733	386,91	390,874	261,522	390,874	0,02122	0,02746	0,03500	23338,88	52 D 25	25512,50
	C5	850	850	234,01	46,698	386,51	398,700	265,698	398,700	0,02164	0,02743	0,03500	23338,88	52 D 25	25512,50
	C6	850	850	233,762	46,108	386,91	397,830	264,584	397,830	0,02159	0,02746	0,03500	23338,88	52 D 25	25512,50
	C7	850	850	233,775	46,065	386,87	397,814	264,529	397,814	0,02159	0,02746	0,03500	23338,88	52 D 25	25512,50
	C8	850	850	233,762	46,108	386,91	397,830	264,584	397,830	0,02159	0,02746	0,03500	23338,88	52 D 25	25512,50
	C9	850	850	234,01	46,698	386,51	398,700	265,698	398,700	0,02164	0,02743	0,03500	23338,88	52 D 25	25512,50
	C10	850	850	228,904	46,733	386,91	390,874	261,522	390,874	0,02122	0,02746	0,03500	23338,88	52 D 25	25512,50
	C11	850	850	224,013	47,843	388,71	384,269	259,178	384,269	0,02086	0,02759	0,03500	23338,88	52 D 25	25512,50
	C12	850	850	237,585	47,662	388,54	404,999	270,142	404,999	0,02198	0,02758	0,03500	23338,88	52 D 25	25512,50
	C13	850	850	140,134	142,167	247,01	333,362	334,806	334,806	0,01817	0,01753	0,03500	23338,88	52 D 25	25512,50
4	C1	850	850	150,3	123,634	572,57	333,649	314,715	333,649	0,01811	0,04064	0,03500	23338,88	52 D 25	25512,50
	C2	850	850	235,252	66,073	924,93	416,661	296,534	416,661	0,02262	0,06565	0,03500	23338,88	52 D 25	25512,50
	C3	850	850	221,318	80,263	858,26	406,979	306,822	406,979	0,02209	0,06092	0,03500	23338,88	52 D 25	25512,50
	C4	850	850	226,382	78,048	899,03	412,935	307,609	412,935	0,02241	0,06381	0,03500	23338,88	52 D 25	25512,50
	C5	850	850	232,26	66,304	920,58	412,249	294,411	412,249	0,02238	0,06534	0,03500	23338,88	52 D 25	25512,50
	C6	850	850	231,971	66,02	920,42	411,570	293,735	411,570	0,02234	0,06533	0,03500	23338,88	52 D 25	25512,50
	C7	850	850	231,976	65,998	920,42	411,559	293,705	411,559	0,02234	0,06533	0,03500	23338,88	52 D 25	25512,50
	C8	850	850	231,971	66,02	920,42	411,570	293,735	411,570	0,02234	0,06533	0,03500	23338,88	52 D 25	25512,50
	C9	850	850	232,26	66,304	920,58	412,249	294,411	412,249	0,02238	0,06534	0,03500	23338,88	52 D 25	25512,50
	C10	850	850	226,383	78,047	899,03	412,936	307,609	412,936	0,02241	0,06381	0,03500	23338,88	52 D 25	25512,50
	C11	850	850	221,319	80,263	858,26	406,981	306,823	406,981	0,02209	0,06092	0,03500	23338,88	52 D 25	25512,50
	C12	850	850	235,253	66,073	924,93	416,663	296,535	416,663	0,02262	0,06565	0,03500	23338,88	52 D 25	25512,50
	C13	850	850	150,3	123,634	572,57	333,649	314,715	333,649	0,01811	0,04064	0,03500	23338,88	52 D 25	25512,50
3	C1	850	850	179,545	145,141	905,51	396,458	372,029	396,458	0,02152	0,06427	0,03500	23338,88	52 D 25	25512,50
	C2	850	850	265,01	75,458	1462,04	470,217	335,624	470,217	0,02552	0,10377	0,03500	23338,88	52 D 25	25512,50
	C3	850	850	252,006	93,114	1327,67	464,837	352,015	464,837	0,02523	0,09424	0,03500	23338,88	52 D 25	25512,50
	C4	850	850	256,616	89,907	1411,32	469,273	350,900	469,273	0,02547	0,10017	0,03500	23338,88	52 D 25	25512,50
	C5	850	850	261,98	73,3	1454,63	463,768	329,794	463,768	0,02517	0,10325	0,03500	23338,88	52 D 25	25512,50
	C6	850	850	261,709	73,098	1454	463,184	329,259	463,184	0,02514	0,10320	0,03500	23338,88	52 D 25	25512,50
	C7	850	850	261,707	73,087	1454,02	463,172	329,240	463,172	0,02514	0,10320	0,03500	23338,88	52 D 25	25512,50
	C8	850	850	261,709	73,098	1454	463,184	329,259	463,184	0,02514	0,10320	0,03500	23338,88	52 D 25	25512,50
	C9	850	850	261,98	73,3	1454,63	463,768	329,794	463,768	0,02517	0,10325	0,03500	23338,88	52 D 25	25512,50

Penulangan Lentur Kolom (Lanjutan)

Lantai	Kolom	Dimensi		Mx (KNm)	My (KNm)	Pu (KN)	Mnox (KNm)	Mnoy (KNm)	Mn Terpakai (KNm)	Mod	Nod	ρ	As Perlu (mm ²)	Terpasang	
		b (mm)	h (mm)											Dipakai	As (mm ²)
	C10	850	850	256,616	89,907	1411,32	469,273	350,900	469,273	0,02547	0,10017	0,03500	23338,88	52 D 25	25512,50
	C11	850	850	252,006	93,114	1327,67	464,837	352,015	464,837	0,02523	0,09424	0,03500	23338,88	52 D 25	25512,50
	C12	850	850	265,01	75,458	1462,04	470,217	335,624	470,217	0,02552	0,10377	0,03500	23338,88	52 D 25	25512,50
	C13	850	850	179,545	145,141	905,51	396,458	372,029	396,458	0,02152	0,06427	0,03500	23338,88	52 D 25	25512,50
2	C1	850	850	256,959	211,669	1240,21	570,669	538,510	570,669	0,03097	0,08803	0,03500	23338,88	52 D 25	25512,50
	C2	850	850	356,155	128,348	1999,89	654,255	492,498	654,255	0,03551	0,14195	0,03500	23338,88	52 D 25	25512,50
	C3	850	850	340,222	146,627	1796,68	644,885	507,421	644,885	0,03500	0,12753	0,03500	23338,88	52 D 25	25512,50
	C4	850	850	346,072	142,82	1923,63	650,731	506,410	650,731	0,03532	0,13654	0,03500	23338,88	52 D 25	25512,50
	C5	850	850	352,56	124,075	1988,74	645,184	482,946	645,184	0,03502	0,14116	0,03500	23338,88	52 D 25	25512,50
	C6	850	850	352,234	123,615	1987,59	644,301	481,968	644,301	0,03497	0,14108	0,03500	23338,88	52 D 25	25512,50
	C7	850	850	352,225	123,59	1987,63	644,267	481,922	644,267	0,03497	0,14108	0,03500	23338,88	52 D 25	25512,50
	C8	850	850	352,234	123,615	1987,59	644,301	481,968	644,301	0,03497	0,14108	0,03500	23338,88	52 D 25	25512,50
	C9	850	850	352,559	124,075	1988,74	645,182	482,945	645,182	0,03502	0,14116	0,03500	23338,88	52 D 25	25512,50
	C10	850	850	346,071	142,82	1923,63	650,729	506,409	650,729	0,03532	0,13654	0,03500	23338,88	52 D 25	25512,50
	C11	850	850	340,221	146,627	1796,68	644,883	507,420	644,883	0,03500	0,12753	0,03500	23338,88	52 D 25	25512,50
	C12	850	850	356,155	128,348	1999,89	654,255	492,498	654,255	0,03551	0,14195	0,03500	23338,88	52 D 25	25512,50
	C13	850	850	256,958	211,669	1240,21	570,667	538,509	570,667	0,03097	0,08803	0,03500	23338,88	52 D 25	25512,50
1	C1	850	850	281,681	234,258	1566,3	627,415	593,742	627,415	0,03405	0,11117	0,03500	23338,88	52 D 25	25512,50
	C2	850	850	313,396	207,015	2539,5	653,639	578,103	653,639	0,03548	0,18025	0,03500	23338,88	52 D 25	25512,50
	C3	850	850	308,217	212,553	2264,91	650,259	582,332	650,259	0,03529	0,16076	0,03500	23338,88	52 D 25	25512,50
	C4	850	850	310,083	211,35	2435,86	652,134	582,027	652,134	0,03540	0,17289	0,03500	23338,88	52 D 25	25512,50
	C5	850	850	312,122	205,462	2522,96	650,393	574,658	650,393	0,03530	0,17908	0,03500	23338,88	52 D 25	25512,50
	C6	850	850	311,977	205,297	2521,13	650,033	574,284	650,033	0,03528	0,17895	0,03500	23338,88	52 D 25	25512,50
	C7	850	850	311,932	205,288	2521,2	649,956	574,233	649,956	0,03528	0,17895	0,03500	23338,88	52 D 25	25512,50
	C8	850	850	311,977	205,297	2521,13	650,033	574,284	650,033	0,03528	0,17895	0,03500	23338,88	52 D 25	25512,50
	C9	850	850	312,123	205,463	2522,96	650,395	574,660	650,395	0,03530	0,17908	0,03500	23338,88	52 D 25	25512,50
	C10	850	850	310,084	211,35	2435,86	652,135	582,028	652,135	0,03540	0,17289	0,03500	23338,88	52 D 25	25512,50
	C11	850	850	308,217	212,553	2264,91	650,259	582,332	650,259	0,03529	0,16076	0,03500	23338,88	52 D 25	25512,50
	C12	850	850	313,397	207,015	2539,5	653,641	578,103	653,641	0,03548	0,18025	0,03500	23338,88	52 D 25	25512,50
	C13	850	850	281,682	234,258	1566,3	627,417	593,743	627,417	0,03405	0,11117	0,03500	23338,88	52 D 25	25512,50

Tabel 41. Perhitungan Gaya Geser Kolom

Lantai	Kolom	Tinggi Lantai (mm)	Tinggi Bersih (mm)	Dimensi		Ppr (KN)	Nod	ρ	Mod	Mpr (KNm)	Ve1 (KN)	Mpr ujung bawah		Mpr ujung atas		Ve2 (KN)	V (KN)	Ve3 (KN)	Ve Terpakai (KN)
				b (mm)	h (mm)							B.Kiri (KNm)	B.Kanan (KNm)	B.Kiri (KNm)	B.Kanan (KNm)				
5	C1	3200	2500	850	850	247,01	0,01	0,035	0,130	4605,94	1842,38	0	908,97885	0	908,97885	363,59	93,83	187,66	363,59
	C2	3200	2500	850	850	388,54	0,02	0,035	0,130	4605,94	1842,38	462,91016	1789,3717	462,91016	1789,3717	900,91	19,15	38,30	900,91
	C3	3200	2500	850	850	388,71	0,02	0,035	0,130	4605,94	1842,38	573,0032	1789,3717	573,0032	1789,3717	944,95	17,09	34,18	944,95
	C4	3200	2500	850	850	386,91	0,02	0,035	0,130	4605,94	1842,38	573,0032	1789,3717	573,0032	1789,3717	944,95	24,90	49,80	944,95
	C5	3200	2500	850	850	386,51	0,02	0,035	0,130	4605,94	1842,38	573,0032	1789,3717	573,0032	1789,3717	944,95	19,82	39,64	944,95
	C6	3200	2500	850	850	386,91	0,02	0,035	0,130	4605,94	1842,38	573,0032	1789,3717	573,0032	1789,3717	944,95	19,57	39,14	944,95
	C7	3200	2500	850	850	386,87	0,02	0,035	0,130	4605,94	1842,38	573,0032	1789,3717	573,0032	1789,3717	944,95	19,58	39,16	944,95
	C8	3200	2500	850	850	386,91	0,02	0,035	0,130	4605,94	1842,38	573,0032	1789,3717	573,0032	1789,3717	944,95	19,59	39,18	944,95
	C9	3200	2500	850	850	386,51	0,02	0,035	0,130	4605,94	1842,38	573,0032	1789,3717	573,0032	1789,3717	944,95	19,46	38,92	944,95
	C10	3200	2500	850	850	386,91	0,02	0,035	0,130	4605,94	1842,38	573,0032	1789,3717	573,0032	1789,3717	944,95	16,98	33,96	944,95
	C11	3200	2500	850	850	388,71	0,02	0,035	0,130	4605,94	1842,38	573,0032	1789,3717	573,0032	1789,3717	944,95	25,18	50,36	944,95
	C12	3200	2500	850	850	388,54	0,02	0,035	0,130	4605,94	1842,38	573,0032	908,97885	573,0032	908,97885	592,79	20,55	41,10	592,79
4	C13	3200	2500	850	850	247,01	0,01	0,035	0,130	4605,94	1842,38	462,91016	0	462,91016	0	185,16	50,92	101,84	185,16
	C1	3200	2500	850	850	572,57	0,03	0,035	0,130	4605,94	3684,75	0	908,97885	0	908,97885	363,59	90,07	180,14	363,59
	C2	3200	2500	850	850	924,93	0,04	0,035	0,130	4605,94	3684,75	462,91016	1789,3717	462,91016	1789,3717	900,91	39,18	78,36	900,91
	C3	3200	2500	850	850	858,26	0,04	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	33,07	66,14	944,95
	C4	3200	2500	850	850	899,03	0,04	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	51,49	102,98	944,95
	C5	3200	2500	850	850	920,58	0,04	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	39,21	78,42	944,95
	C6	3200	2500	850	850	920,42	0,04	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	39,34	78,68	944,95
	C7	3200	2500	850	850	920,42	0,04	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	39,32	78,64	944,95
	C8	3200	2500	850	850	920,42	0,04	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	39,32	78,64	944,95
	C9	3200	2500	850	850	920,58	0,04	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	39,55	79,10	944,95
	C10	3200	2500	850	850	899,03	0,04	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	33,43	66,86	944,95
	C11	3200	2500	850	850	858,26	0,04	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	53,70	107,40	944,95
3	C12	3200	2500	850	850	924,93	0,04	0,035	0,130	4605,94	3684,75	573,0032	908,97885	573,0032	908,97885	592,79	39,97	79,94	592,79
	C13	3200	2500	850	850	572,57	0,03	0,035	0,130	4605,94	3684,75	462,91016	0	462,91016	0	185,16	17,21	34,42	185,16
	C1	3200	2500	850	850	905,51	0,04	0,035	0,130	4605,94	3684,75	0	908,97885	0	908,97885	363,59	101,99	203,98	363,59
	C2	3200	2500	850	850	1462,04	0,07	0,035	0,130	4605,94	3684,75	462,91016	1789,3717	462,91016	1789,3717	900,91	54,83	109,66	900,91
	C3	3200	2500	850	850	1327,67	0,06	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	49,97	99,94	944,95
	C4	3200	2500	850	850	1411,32	0,07	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	65,68	131,36	944,95
	C5	3200	2500	850	850	1454,63	0,07	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	55,13	110,26	944,95
	C6	3200	2500	850	850	1454	0,07	0,035	0,130	4605,94	3684,75	573,0032	1789,3717	573,0032	1789,3717	944,95	55,19	110,38	944,95
	C7	3200	2500	850	850	1454,02	0,07	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	55,18	110,36	944,95
	C8	3200	2500	850	850	1454	0,07	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	55,18	110,36	944,95
	C9	3200	2500	850	850	1454,63	0,07	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	55,30	110,60	944,95
	C10	3200	2500	850	850	1411,32	0,07	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	50,16	100,32	944,95
	C11	3200	2500	850	850	1327,67	0,06	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	67,64	135,28	944,95
	C12	3200	2500	850	850	1462,04	0,07	0,035	0,130	4605,94	3684,75	573,0032	908,9789	573,0032	908,9789	592,79	56,66	113,32	592,79

Perhitungan Gaya Geser Kolom (Lanjutan)

Lantai	Kolom	Tinggi Lantai (mm)	Tinggi Bersih (mm)	Dimensi		Ppr (KN)	Nod	ρ	Mod	Mpr (KNm)	Ve1 (KN)	Mpr ujung bawah		Mpr ujung atas		Ve2 (KN)	V (KN)	Ve3 (KN)	Ve Terpakai (KN)
				b (mm)	h (mm)							B.Kiri (KNm)	B.Kanan (KNm)	B.Kiri (KNm)	B.Kanan (KNm)				
	C13	3200	2500	850	850	905,51	0,04	0,035	0,130	4605,94	3684,75	462,9102	0	462,9102	0	185,16	8,97	17,94	185,16
2	C1	3200	2500	850	850	1240,21	0,06	0,035	0,130	4605,94	3684,75	0	908,9789	0	908,9789	363,59	115,77	231,54	363,59
	C2	3200	2500	850	850	1999,89	0,09	0,035	0,130	4605,94	3684,75	462,9102	1789,372	462,9102	1789,372	900,91	63,47	126,94	900,91
	C3	3200	2500	850	850	1796,68	0,08	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	58,47	116,94	944,95
	C4	3200	2500	850	850	1923,63	0,09	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	75,94	151,88	944,95
	C5	3200	2500	850	850	1988,74	0,09	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	64,21	128,42	944,95
	C6	3200	2500	850	850	1987,59	0,09	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	64,36	128,72	944,95
	C7	3200	2500	850	850	1987,63	0,09	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	64,34	128,68	944,95
	C8	3200	2500	850	850	1987,59	0,09	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	64,34	128,68	944,95
	C9	3200	2500	850	850	1988,74	0,09	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	64,61	129,22	944,95
	C10	3200	2500	850	850	1923,63	0,09	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	58,77	117,54	944,95
	C11	3200	2500	850	850	1796,68	0,08	0,035	0,130	4605,94	3684,75	573,0032	1789,372	573,0032	1789,372	944,95	78,23	156,46	944,95
	C12	3200	2500	850	850	1999,89	0,09	0,035	0,130	4605,94	3684,75	573,0032	908,9789	573,0032	908,9789	592,79	66,89	133,78	592,79
	C13	3200	2500	850	850	1240,21	0,06	0,035	0,130	4605,94	3684,75	462,9102	0	462,9102	0	185,16	3,11	6,22	185,16
1	C1	3200	2500	850	850	1566,3	0,07	0,035	0,130	4605,94	1842,38	0	908,9789	0	908,9789	363,59	96,02	192,04	363,59
	C2	3200	2500	850	850	2539,5	0,12	0,035	0,130	4605,94	1842,38	462,9102	1789,372	462,9102	1789,372	900,91	65,07	130,14	900,91
	C3	3200	2500	850	850	2264,91	0,10	0,035	0,130	4605,94	1842,38	573,0032	1789,372	573,0032	1789,372	944,95	62,53	125,06	944,95
	C4	3200	2500	850	850	2435,86	0,11	0,035	0,130	4605,94	1842,38	573,0032	1789,372	573,0032	1789,372	944,95	72,11	144,22	944,95
	C5	3200	2500	850	850	2522,96	0,12	0,035	0,130	4605,94	1842,38	573,0032	1789,372	573,0032	1789,372	944,95	65,69	131,38	944,95
	C6	3200	2500	850	850	2521,13	0,12	0,035	0,130	4605,94	1842,38	573,0032	1789,372	573,0032	1789,372	944,95	65,80	131,60	944,95
	C7	3200	2500	850	850	2521,2	0,12	0,035	0,130	4605,94	1842,38	573,0032	1789,372	573,0032	1789,372	944,95	65,79	131,58	944,95
	C8	3200	2500	850	850	2521,13	0,12	0,035	0,130	4605,94	1842,38	573,0032	1789,372	573,0032	1789,372	944,95	65,78	131,56	944,95
	C9	3200	2500	850	850	2522,96	0,12	0,035	0,130	4605,94	1842,38	573,0032	1789,372	573,0032	1789,372	944,95	65,97	131,94	944,95
	C10	3200	2500	850	850	2435,86	0,11	0,035	0,130	4605,94	1842,38	573,0032	1789,372	573,0032	1789,372	944,95	62,73	125,46	944,95
	C11	3200	2500	850	850	2264,91	0,10	0,035	0,130	4605,94	1842,38	573,0032	1789,372	573,0032	1789,372	944,95	73,37	146,74	944,95
	C12	3200	2500	850	850	2539,5	0,12	0,035	0,130	4605,94	1842,38	573,0032	908,9789	573,0032	908,9789	592,79	67,59	135,18	592,79
	C13	3200	2500	850	850	1566,3	0,07	0,035	0,130	4605,94	1842,38	462,9102	0	462,9102	0	185,16	29,96	59,92	185,16

Tabel 42. Penulangan Geser Kolom

Lantai	Kolom	Dimensi		Ve Terpakai (KN)	Nu (KN)	Vc		Vs		Spasi		Terpasang			
		b (mm)	h (mm)			SP (KN)	Luar SP (KN)	SP (KN)	Luar SP (KN)	SP (mm)	Luar SP (mm)	SP		Luar SP	
5	C1	850	850	363,5915	101,57	0	619,15	484,78872	363,591542	100	130	6	P	12	6
	C2	850	850	900,9127	192,57	0	624,66	1201,217	900,91274	100	130	6	P	12	6
	C3	850	850	944,95	191,94	0	624,62	1259,9333	944,949957	100	130	6	P	12	6
	C4	850	850	944,95	191,26	0	624,58	1259,9333	944,949957	100	130	6	P	12	6
	C5	850	850	944,95	191,09	0	624,57	1259,9333	944,949957	100	130	6	P	12	6
	C6	850	850	944,95	191,26	0	624,58	1259,9333	944,949957	100	130	6	P	12	6
	C7	850	850	944,95	191,24	0	624,58	1259,9333	944,949957	100	130	6	P	12	6
	C8	850	850	944,95	191,26	0	624,58	1259,9333	944,949957	100	130	6	P	12	6
	C9	850	850	944,95	191,09	0	624,57	1259,9333	944,949957	100	130	6	P	12	6
	C10	850	850	944,95	191,26	0	624,58	1259,9333	944,949957	100	130	6	P	12	6
	C11	850	850	944,95	191,94	0	624,62	1259,9333	944,949957	100	130	6	P	12	6
	C12	850	850	592,7928	192,57	0	624,66	790,39043	592,792822	100	130	6	P	12	6
4	C13	850	850	185,1641	101,57	0	619,15	246,88542	185,164064	100	130	6	P	12	6
	C1	850	850	363,5915	273,13	0	629,55	484,78872	363,591542	100	130	6	P	12	6
	C2	850	850	900,9127	475,3	0	641,80	1201,217	900,91274	100	130	6	P	12	6
	C3	850	850	944,95	447,9	0	640,14	1259,9333	944,949957	100	130	6	P	12	6
	C4	850	850	944,95	464	0	641,11	1259,9333	944,949957	100	130	6	P	12	6
	C5	850	850	944,95	472,77	0	641,64	1259,9333	944,949957	100	130	6	P	12	6
	C6	850	850	944,95	472,73	0	641,64	1259,9333	944,949957	100	130	6	P	12	6
	C7	850	850	944,95	472,73	0	641,64	1259,9333	944,949957	100	130	6	P	12	6
	C8	850	850	944,95	472,73	0	641,64	1259,9333	944,949957	100	130	6	P	12	6
	C9	850	850	944,95	472,77	0	641,64	1259,9333	944,949957	100	130	6	P	12	6
	C10	850	850	944,95	464	0	641,11	1259,9333	944,949957	100	130	6	P	12	6
	C11	850	850	944,95	447,9	0	640,14	1259,9333	944,949957	100	130	6	P	12	6
3	C12	850	850	592,7928	475,3	0	641,80	790,39043	592,792822	100	130	6	P	12	6
	C13	850	850	185,1641	273,13	0	629,55	246,88542	185,164064	100	130	6	P	12	6
	C1	850	850	363,5915	437,39	0	639,50	484,78872	363,591542	100	130	6	P	12	6
	C2	850	850	900,9127	752,78	0	658,61	1201,217	900,91274	100	130	6	P	12	6
	C3	850	850	944,95	698,09	0	655,30	1259,9333	944,949957	100	130	6	P	12	6
	C4	850	850	944,95	731,19	0	657,30	1259,9333	944,949957	100	130	6	P	12	6
	C5	850	850	944,95	748,83	0	658,37	1259,9333	944,949957	100	130	6	P	12	6

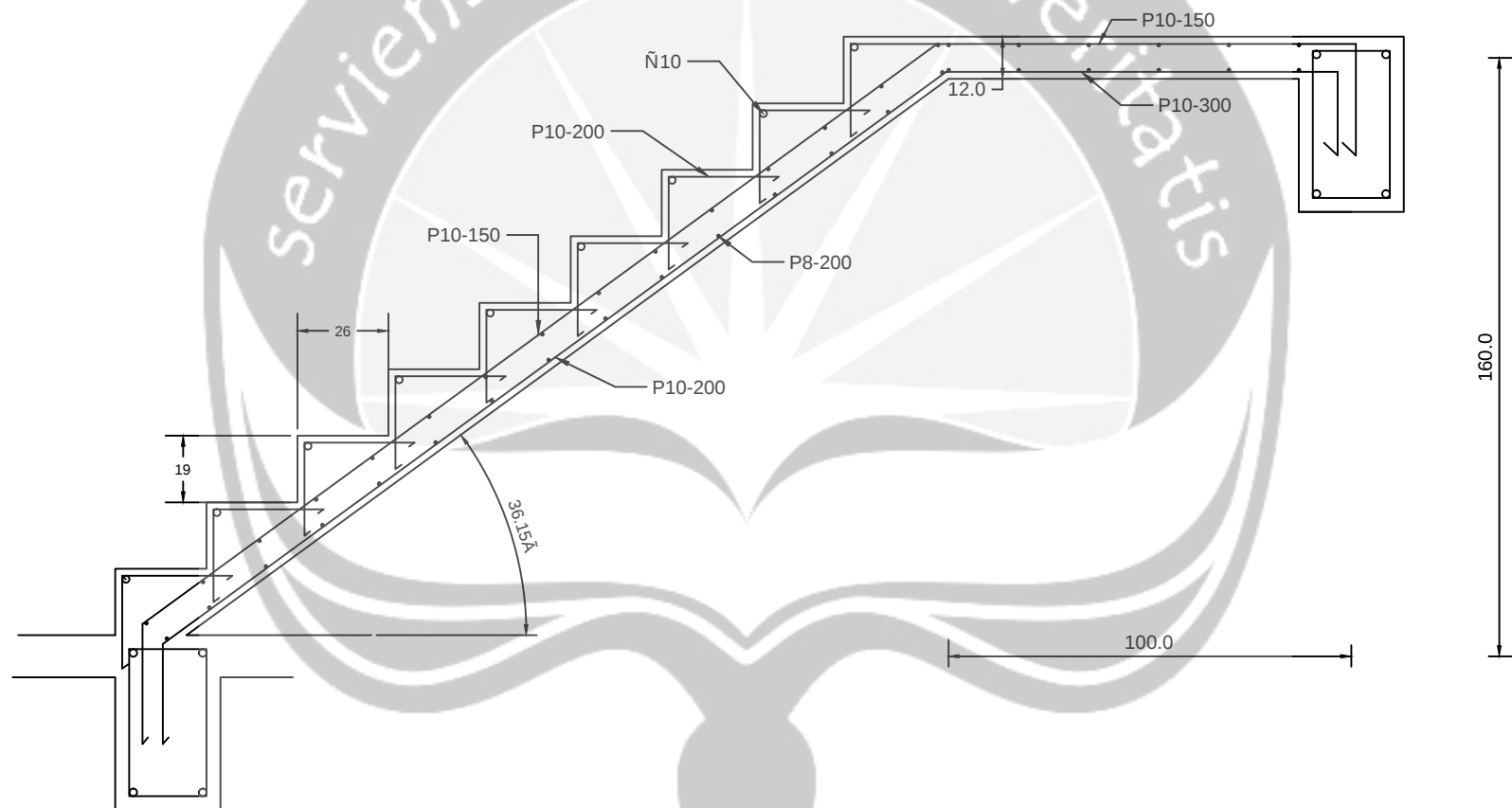
Penulangan Geser Kolom (Lanjutan)

Lantai	Kolom	Dimensi		Ve Terpakai (KN)	Nu (KN)	Vc		Vs		Spasi		Terpasang			
		b (mm)	h (mm)			SP (KN)	Luar SP (KN)	SP (KN)	Luar SP (KN)	SP (mm)	Luar SP (mm)	SP		Luar SP	
	C6	850	850	944,95	748,62	0	658,36	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C7	850	850	944,95	748,64	0	658,36	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C8	850	850	944,95	748,62	0	658,36	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C9	850	850	944,95	748,83	0	658,37	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C10	850	850	944,95	731,19	0	657,30	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C11	850	850	944,95	698,09	0	655,30	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C12	850	850	592,793	752,78	0	658,61	790,39043	592,792822	100	130	6	P 12	6	P 12
	C13	850	850	185,164	437,39	0	639,50	246,88542	185,164064	100	130	6	P 12	6	P 12
2	C1	850	850	363,592	599,18	0	649,30	484,78872	363,591542	100	130	6	P 12	6	P 12
	C2	850	850	900,913	1029,03	0	675,35	1201,217	900,91274	100	130	6	P 12	6	P 12
	C3	850	850	944,95	946,56	0	670,36	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C4	850	850	944,95	996,85	0	673,40	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C5	850	850	944,95	1023,39	0	675,01	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C6	850	850	944,95	1022,98	0	674,99	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C7	850	850	944,95	1023,01	0	674,99	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C8	850	850	944,95	1022,98	0	674,99	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C9	850	850	944,95	1023,39	0	675,01	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C10	850	850	944,95	996,85	0	673,40	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C11	850	850	944,95	946,56	0	670,36	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C12	850	850	592,793	1029,03	0	675,35	790,39043	592,792822	100	130	6	P 12	6	P 12
	C13	850	850	185,164	599,18	0	649,30	246,88542	185,164064	100	130	6	P 12	6	P 12
1	C1	850	850	363,592	767,54	0	659,51	484,78872	363,591542	100	130	6	P 12	6	P 12
	C2	850	850	900,913	1312,88	0	692,56	1201,217	900,91274	100	130	6	P 12	6	P 12
	C3	850	850	944,95	1201,45	0	685,80	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C4	850	850	944,95	1269,16	0	689,91	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C5	850	850	944,95	1304,68	0	692,06	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C6	850	850	944,95	1304,01	0	692,02	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C7	850	850	944,95	1304,07	0	692,02	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C8	850	850	944,95	1304,01	0	692,02	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C9	850	850	944,95	1304,68	0	692,06	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C10	850	850	944,95	1269,16	0	689,91	1259,9333	944,949957	100	130	6	P 12	6	P 12

Penulangan Geser Kolom (Lanjutan)

Lantai	Kolom	Dimensi		Ve Terpakai (KN)	Nu (KN)	Vc		Vs		Spasi		Terpasang			
		b (mm)	h (mm)			SP (KN)	Luar SP (KN)	SP (KN)	Luar SP (KN)	SP (mm)	Luar SP (mm)	SP		Luar SP	
	C11	850	850	944,95	1201,45	0	685,80	1259,9333	944,949957	100	130	6	P 12	6	P 12
	C12	850	850	592,793	1312,88	0	692,56	790,39043	592,792822	100	130	6	P 12	6	P 12
	C13	850	850	185,164	767,54	0	659,51	246,88542	185,164064	100	130	6	P 12	6	P 12

Lampiran 43. Gambar Rencana Tangga



Tabel 44. Peninjauan Kolom Terhadap Gempa Arah X

Lantai	Kolom	Dimensi		Me Bawah						Me Atas						Mn		Syarat $\sum Me \geq 6/5 \sum Mg$		
		b (mm)	h (mm)	Pu (KN)	Pn (KN)	Nod	ρ	Mod	Mu (KNm)	Pu (KN)	Pn (KN)	Nod	ρ	Mod	Mu (KNm)	B.Kiri (KNm)	B.Kanan (KNm)			
5	C1	850	850	572,57	880,87692	0,041	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	0	727,1830831	2395,09	>	872,62
	C2	850	850	924,93	1422,9692	0,066	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	370,32813	1431,497352	2395,09	>	2162,19
	C3	850	850	858,26	1320,4	0,061	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	1431,497352	2395,09	>	2267,88
	C4	850	850	899,03	1383,1231	0,064	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	1431,497352	2395,09	>	2267,88
	C5	850	850	920,58	1416,2769	0,065	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	1431,497352	2395,09	>	2267,88
	C6	850	850	920,42	1416,0308	0,065	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	1431,497352	2395,09	>	2267,88
	C7	850	850	920,42	1416,0308	0,065	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	1431,497352	2395,09	>	2267,88
	C8	850	850	920,42	1416,0308	0,065	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	1431,497352	2395,09	>	2267,88
	C9	850	850	920,58	1416,2769	0,065	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	1431,497352	2395,09	>	2267,88
	C10	850	850	899,03	1383,1231	0,064	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	1431,497352	2395,09	>	2267,88
	C11	850	850	858,26	1320,4	0,061	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	1431,497352	2395,09	>	2267,88
	C12	850	850	924,93	1422,9692	0,066	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	458,40256	727,1830831	2395,09	>	1422,70
	C13	850	850	572,57	880,87692	0,041	0,035	0,13	2395,0875	0	0	0,000	0,035	0	0	370,32813	0	2395,09	>	444,39
4	C1	850	850	905,51	1393,0923	0,064	0,035	0,13	2395,0875	247,01	380,01538	0,018	0,035	0,13	2395,0875	0	727,1830831	4790,18	>	872,62
	C2	850	850	1462,04	2249,2923	0,104	0,035	0,13	2395,0875	388,54	597,75385	0,028	0,035	0,13	2395,0875	370,32813	1431,497352	4790,18	>	2162,19
	C3	850	850	1327,67	2042,5692	0,094	0,035	0,13	2395,0875	388,71	598,01538	0,028	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C4	850	850	1411,32	2171,2615	0,100	0,035	0,13	2395,0875	386,91	595,24615	0,027	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C5	850	850	1454,63	2237,8923	0,103	0,035	0,13	2395,0875	386,51	594,63077	0,027	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C6	850	850	1454	2236,9231	0,103	0,035	0,13	2395,0875	386,91	595,24615	0,027	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C7	850	850	1454,02	2236,9538	0,103	0,035	0,13	2395,0875	386,87	595,18462	0,027	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C8	850	850	1454	2236,9231	0,103	0,035	0,13	2395,0875	386,91	595,24615	0,027	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C9	850	850	1454,63	2237,8923	0,103	0,035	0,13	2395,0875	386,51	594,63077	0,027	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C10	850	850	1411,32	2171,2615	0,100	0,035	0,13	2395,0875	386,91	595,24615	0,027	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C11	850	850	1327,67	2042,5692	0,094	0,035	0,13	2395,0875	388,71	598,01538	0,028	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C12	850	850	1462,04	2249,2923	0,104	0,035	0,13	2395,0875	388,54	597,75385	0,028	0,035	0,13	2395,0875	458,40256	727,1830831	4790,18	>	1422,70
	C13	850	850	905,51	1393,0923	0,064	0,035	0,13	2395,0875	247,01	380,01538	0,018	0,035	0,13	2395,0875	370,32813	0	4790,18	>	444,39
3	C1	850	850	1240,21	1908,0154	0,088	0,035	0,13	2395,0875	572,57	880,87692	0,041	0,035	0,13	2395,0875	0	727,1830831	4790,18	>	872,62
	C2	850	850	1999,89	3076,7538	0,142	0,035	0,13	2395,0875	924,93	1422,9692	0,066	0,035	0,13	2395,0875	370,32813	1431,497352	4790,18	>	2162,19
	C3	850	850	1796,68	2764,1231	0,128	0,035	0,13	2395,0875	858,26	1320,4	0,061	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C4	850	850	1923,63	2959,4308	0,137	0,035	0,13	2395,0875	899,03	1383,1231	0,064	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C5	850	850	1988,74	3059,6	0,141	0,035	0,13	2395,0875	920,58	1416,2769	0,065	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C6	850	850	1987,59	3057,8308	0,141	0,035	0,13	2395,0875	920,42	1416,0308	0,065	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C7	850	850	1987,63	3057,8923	0,141	0,035	0,13	2395,0875	920,42	1416,0308	0,065	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C8	850	850	1987,59	3057,8308	0,141	0,035	0,13	2395,0875	920,42	1416,0308	0,065	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C9	850	850	1988,74	3059,6	0,141	0,035	0,13	2395,0875	920,58	1416,2769	0,065	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C10	850	850	1923,63	2959,4308	0,137	0,035	0,13	2395,0875	899,03	1383,1231	0,064	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C11	850	850	1796,68	2764,1231	0,128	0,035	0,13	2395,0875	858,26	1320,4	0,061	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C12	850	850	1999,89	3076,7538	0,142	0,035	0,13	2395,0875	924,93	1422,9692	0,066	0,035	0,13	2395,0875	458,40256	727,1830831	4790,18	>	1422,70
	C13	850	850	1240,21	1908,0154	0,088	0,035	0,13	2395,0875	572,57	880,87692	0,041	0,035	0,13	2395,0875	370,32813	0	4790,18	>	444,39
2	C1	850	850	1566,3	2409,6923	0,111	0,035	0,13	2395,0875	905,51	1393,0923	0,064	0,035	0,13	2395,0875	0	727,1830831	4790,18	>	872,62

Peninjauan Kolom Terhadap Gempa Arah X (Lanjutan)

Lantai	Kolom	Dimensi		Me Bawah						Me Atas						Mn		Syarat $\sum Me \geq 6/5 \sum Mg$		
		b (mm)	h (mm)	Pu (KN)	Pn (KN)	Nod	ρ	Mod	Mu (KNm)	Pu (KN)	Pn (KN)	Nod	ρ	Mod	Mu (KNm)	B.Kiri (KNm)	B.Kanan (KNm)			
	C2	850	850	2539,5	3906,9231	0,180	0,035	0,13	2395,0875	1462,04	2249,2923	0,104	0,035	0,13	2395,0875	370,32813	1431,497352	4790,18	>	2162,19
	C3	850	850	2264,91	3484,4769	0,161	0,035	0,13	2395,0875	1327,67	2042,5692	0,094	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C4	850	850	2435,86	3747,4769	0,173	0,035	0,13	2395,0875	1411,32	2171,2615	0,100	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C5	850	850	2522,96	3881,4769	0,179	0,035	0,13	2395,0875	1454,63	2237,8923	0,103	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C6	850	850	2521,13	3878,6615	0,179	0,035	0,13	2395,0875	1454	2236,9231	0,103	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C7	850	850	2521,2	3878,7692	0,179	0,035	0,13	2395,0875	1454,02	2236,9538	0,103	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C8	850	850	2521,13	3878,6615	0,179	0,035	0,13	2395,0875	1454	2236,9231	0,103	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C9	850	850	2522,96	3881,4769	0,179	0,035	0,13	2395,0875	1454,63	2237,8923	0,103	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C10	850	850	2435,86	3747,4769	0,173	0,035	0,13	2395,0875	1411,32	2171,2615	0,100	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C11	850	850	2264,91	3484,4769	0,161	0,035	0,13	2395,0875	1327,67	2042,5692	0,094	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C12	850	850	2539,5	3906,9231	0,180	0,035	0,13	2395,0875	1462,04	2249,2923	0,104	0,035	0,13	2395,0875	458,40256	727,1830831	4790,18	>	1422,70
	C13	850	850	1566,3	2409,6923	0,111	0,035	0,13	2395,0875	905,51	1393,0923	0,064	0,035	0,13	2395,0875	370,32813	0	4790,18	>	444,39
1	C1	850	850	0	0	0,000	0,035	0,13	2395,0875	1240,21	1908,0154	0,088	0,035	0,13	2395,0875	0	727,1830831	4790,18	>	872,62
	C2	850	850	0	0	0,000	0,035	0,13	2395,0875	1999,89	3076,7538	0,142	0,035	0,13	2395,0875	370,32813	1431,497352	4790,18	>	2162,19
	C3	850	850	0	0	0,000	0,035	0,13	2395,0875	1796,68	2764,1231	0,128	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C4	850	850	0	0	0,000	0,035	0,13	2395,0875	1923,63	2959,4308	0,137	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C5	850	850	0	0	0,000	0,035	0,13	2395,0875	1988,74	3059,6	0,141	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C6	850	850	0	0	0,000	0,035	0,13	2395,0875	1987,59	3057,8308	0,141	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C7	850	850	0	0	0,000	0,035	0,13	2395,0875	1987,63	3057,8923	0,141	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C8	850	850	0	0	0,000	0,035	0,13	2395,0875	1987,59	3057,8308	0,141	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C9	850	850	0	0	0,000	0,035	0,13	2395,0875	1988,74	3059,6	0,141	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C10	850	850	0	0	0,000	0,035	0,13	2395,0875	1923,63	2959,4308	0,137	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C11	850	850	0	0	0,000	0,035	0,13	2395,0875	1796,68	2764,1231	0,128	0,035	0,13	2395,0875	458,40256	1431,497352	4790,18	>	2267,88
	C12	850	850	0	0	0,000	0,035	0,13	2395,0875	1999,89	3076,7538	0,142	0,035	0,13	2395,0875	458,40256	727,1830831	4790,18	>	1422,70
	C13	850	850	0	0	0,000	0,035	0,13	2395,0875	1240,21	1908,0154	0,088	0,035	0,13	2395,0875	370,32813	0	4790,18	>	444,39