

BAB VI

KESIMPULAN DAN SARAN

VI.1 Kesimpulan

Setelah melakukan analisis dan perancangan pada struktur Gedung *Rumah Susun Sederhana Sewa di Jepara*, dapat diambil kesimpulan sebagai berikut:

1. pada pelat tangga lantai 1, digunakan tebal 120 mm dengan tulangan P10-200 pada tumpuan dan P10-100 pada lapangan. Pada pelat bordes digunakan tebal 120 mm dengan tulangan P10-200 pada tumpuan dan P10-200 pada lapangan. Balok bordes digunakan dimensi 200/400 dengan 2D16 untuk tulangan atas dan 2D16 untuk tulangan bawah,
2. pada pelat tangga lantai 2, 3, dan 4, digunakan tebal 120 mm dengan tulangan P10-200 pada tumpuan dan P10-100 pada lapangan. Pada pelat bordes digunakan tebal 120 mm dengan tulangan P10-200 pada tumpuan dan P10-200 pada lapangan. Balok bordes digunakan dimensi 200/400 dengan 2D16 untuk tulangan atas dan 2D16 untuk tulangan bawah,
3. pelat lantai digunakan tebal 110 mm dengan tulangan P10-100 untuk arah X dan Y. Sedangkan pelat atap digunakan tebal 110 cm dengan tulangan P10-100.
4. balok induk untuk lantai 1 s/d 5 digunakan dimensi 400/600 pada daerah tumpuan menggunakan tulangan atas 6D25 dan tulangan bawah 3D25, sedangkan pada daerah lapangan menggunakan tulangan atas 2D25 dan

tulangan bawah 2D25. Tulangan sengkang digunakan 3P10-100 pada daerah sendi plastis dan di luar sendi plastis.

5. Kolom lantai 1 dan 2 adalah 600/600 mm, sedangkan untuk lantai 3, lantai 4, dan lantai 5 adalah 500/500 mm dengan jumlah tulangan lentur 12D25.
6. Dalam perencanaan pondasi, dimensi poer yang digunakan adalah 3 m x 3 m, dengan tebal poer 0,7 m. Tulangan yang digunakan untuk bagian poer adalah D19-150 untuk arah memanjang dan arah lebar. Jumlah tiang yang digunakan 4 buah dengan tulangan 6D19

VI.2 Saran

Saran-saran yang dapat diberikan penulis dari hasil Tugas Akhir yang disusun adalah :

1. Dalam perancangan elemen-elemen struktur sebaiknya dilakukan estimasi awal, sehingga tidak terjadi penentuan elemen struktur berulang-ulang.
2. Dalam perencanaan struktur, hendaknya digunakan tulangan yang seragam untuk mempermudah pelaksanaan pekerjaan di lapangan.

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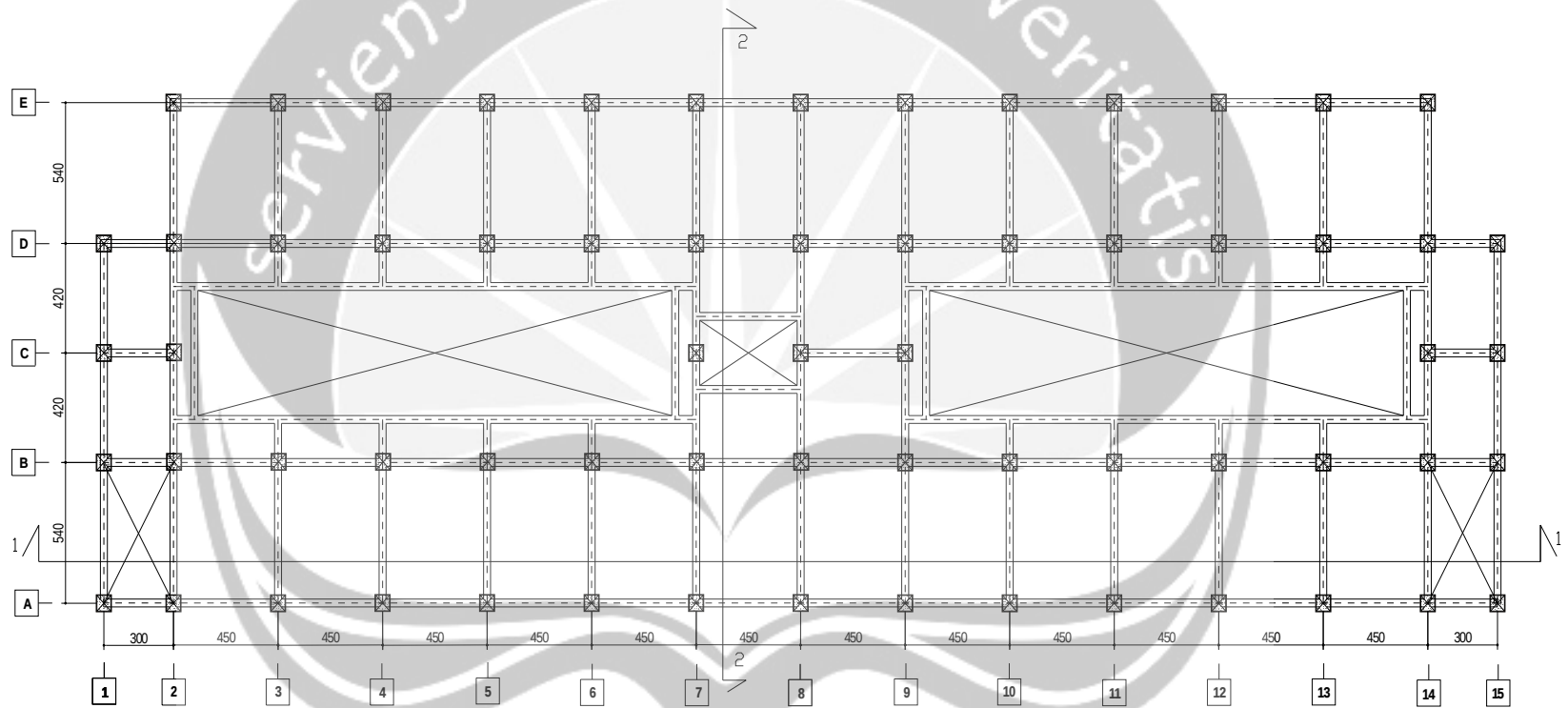
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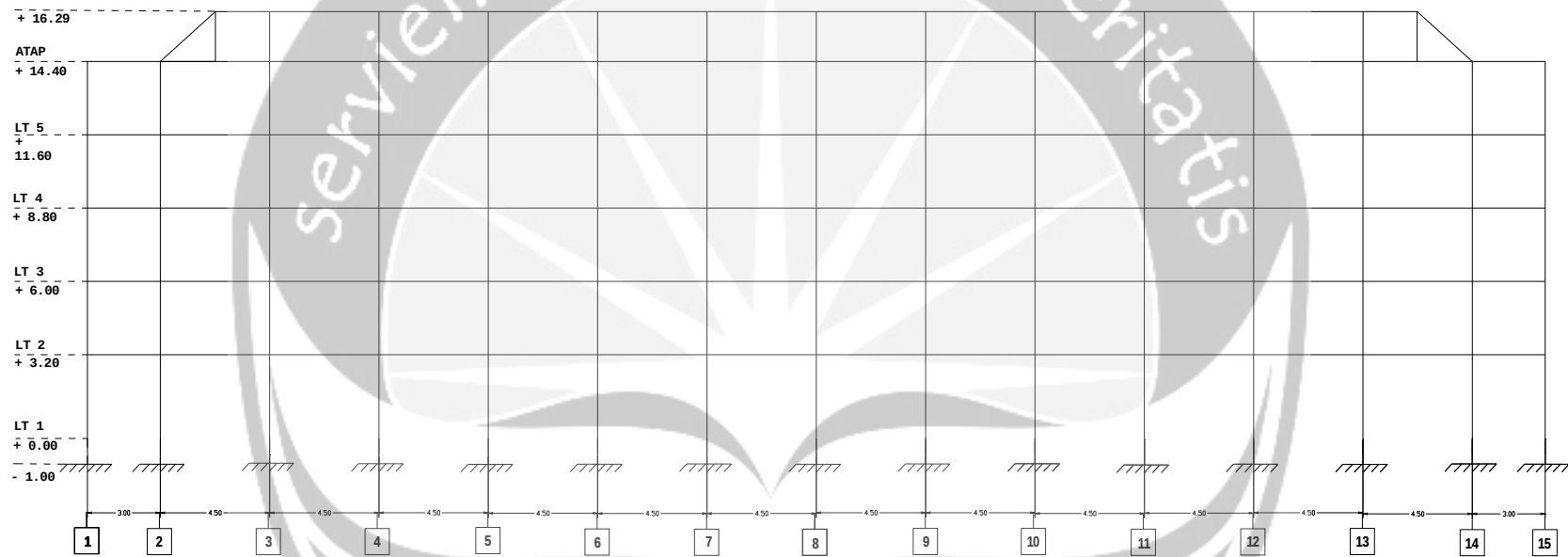
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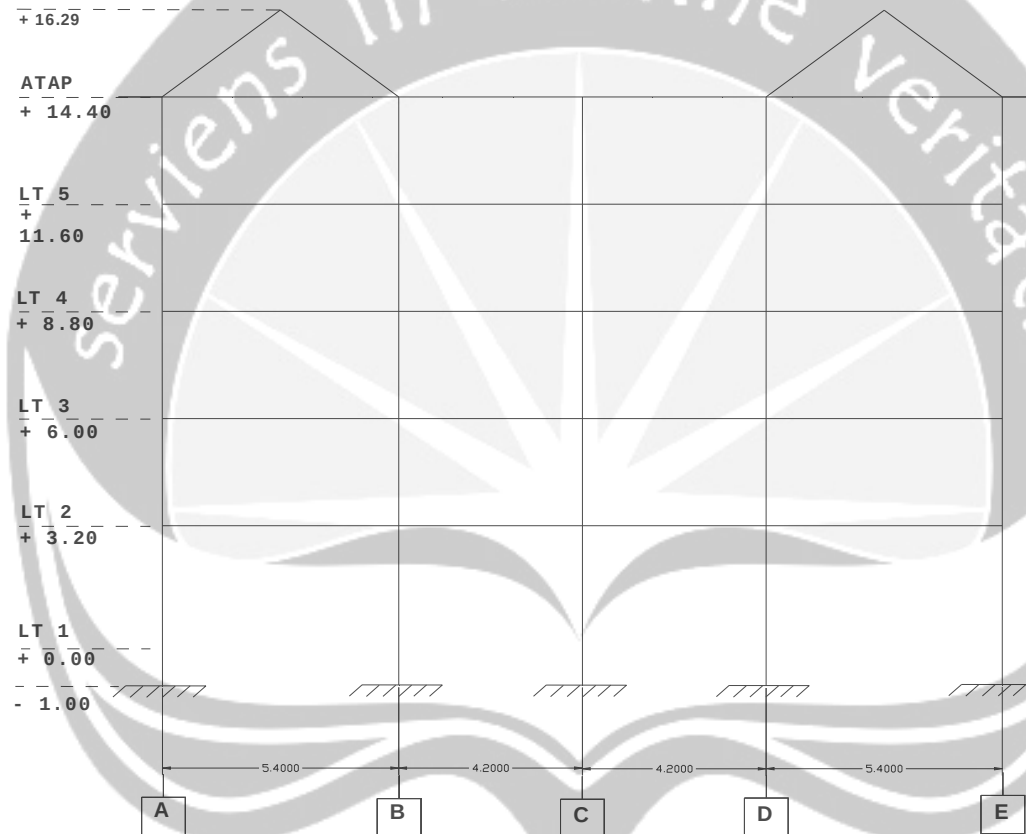




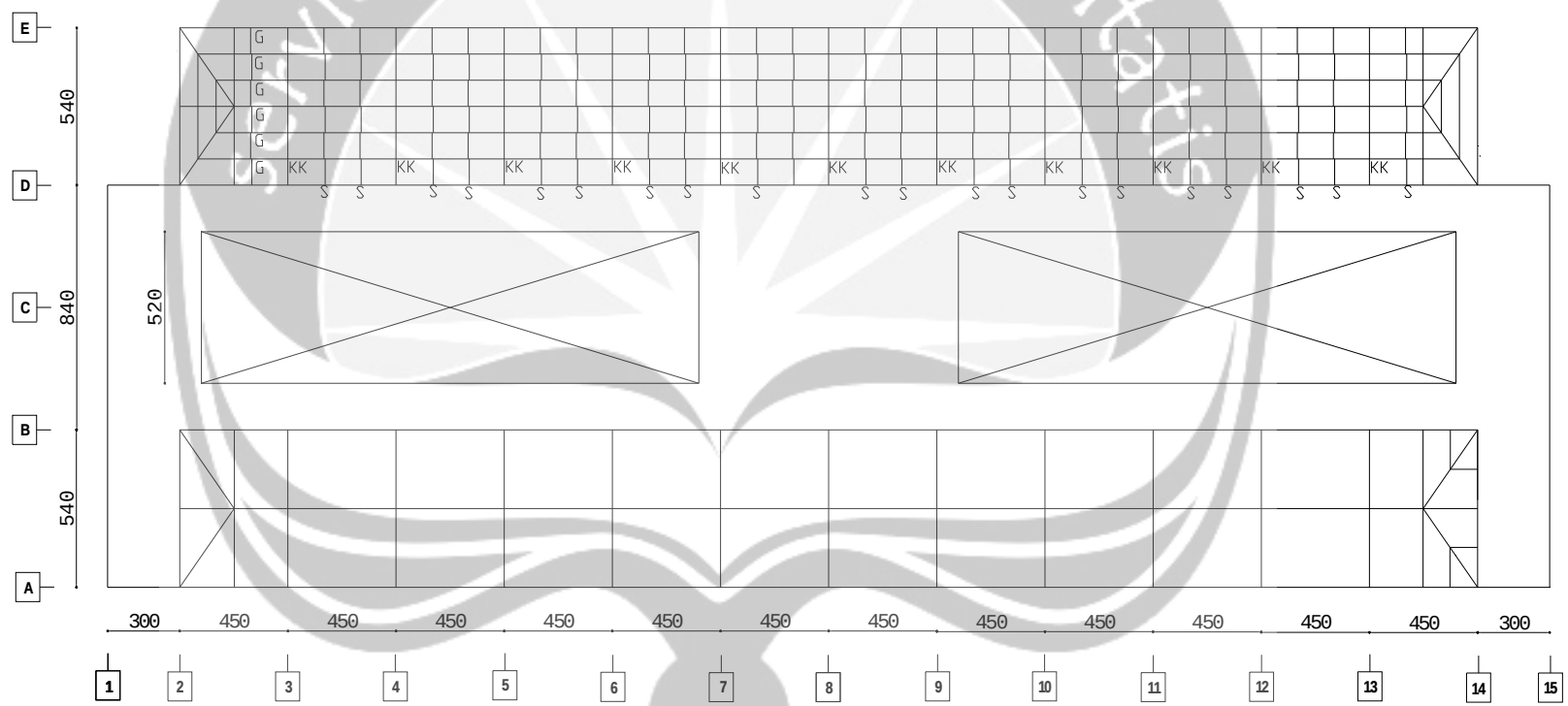
Denah Lantai 2 s/d Lantai 5



Potongan 1-1
PORTAL ARAH PANJANG



Potongan 2-2
PORTAL ARAH PENDEK

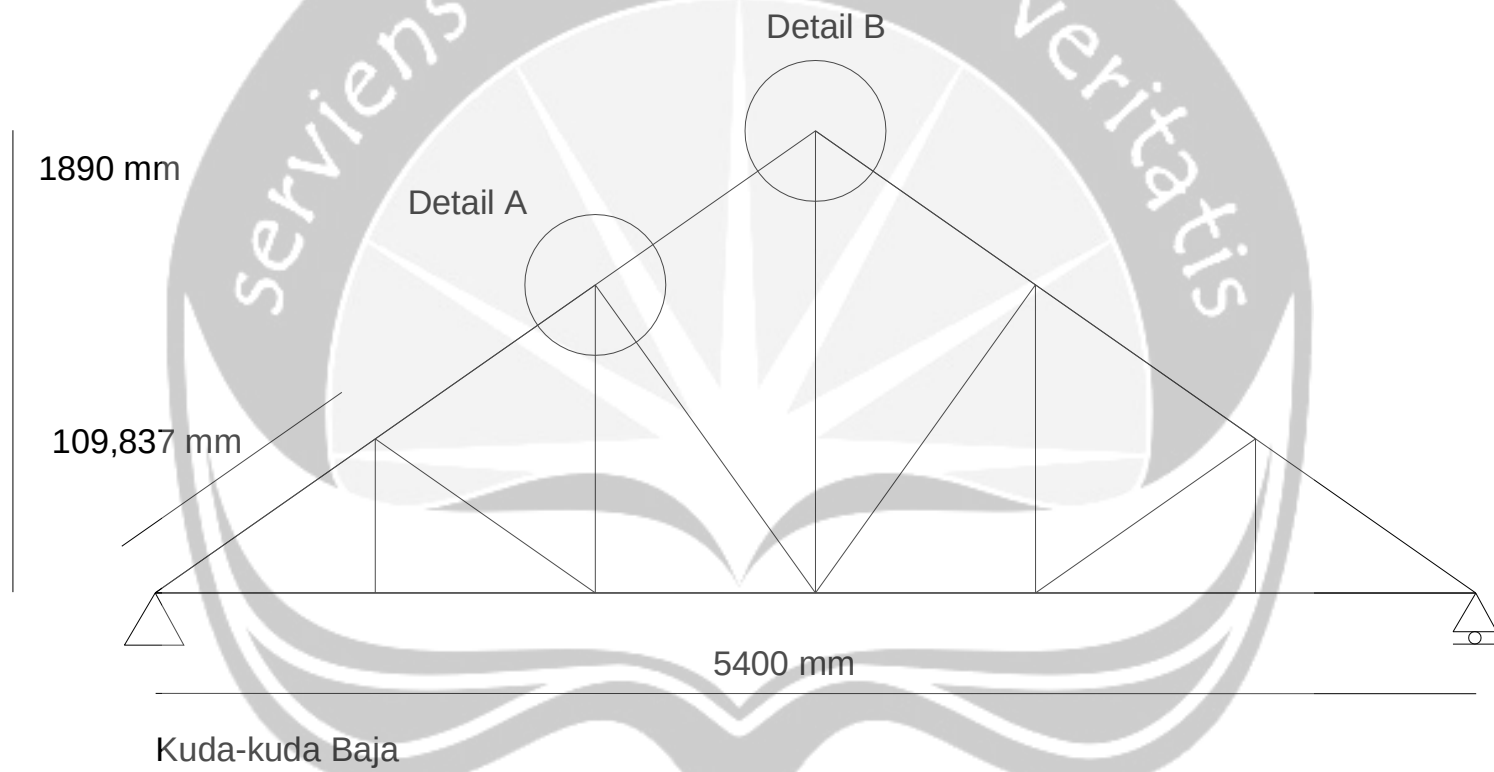


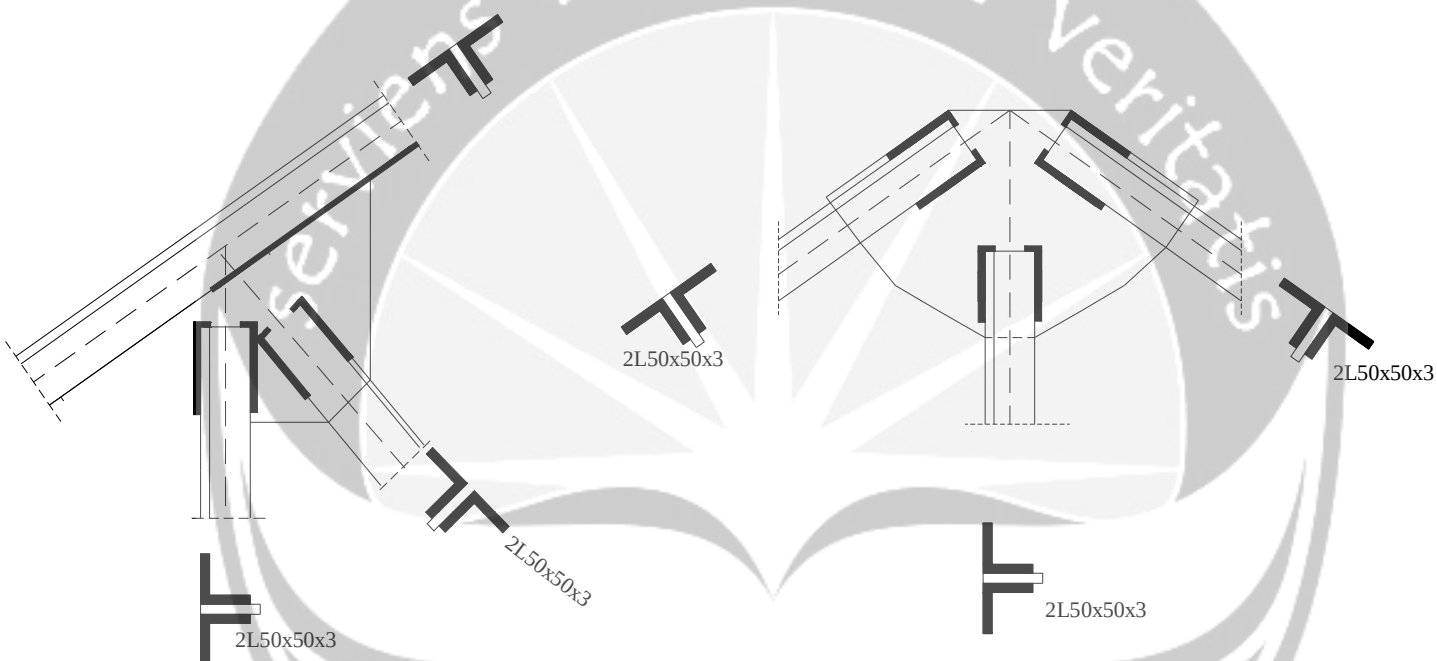
DENAH ATAP



S : Sagrod dengan tulangan ukuran 12 mm

-- : Ikatan Angin dengan tulangan ukuran 16 mm





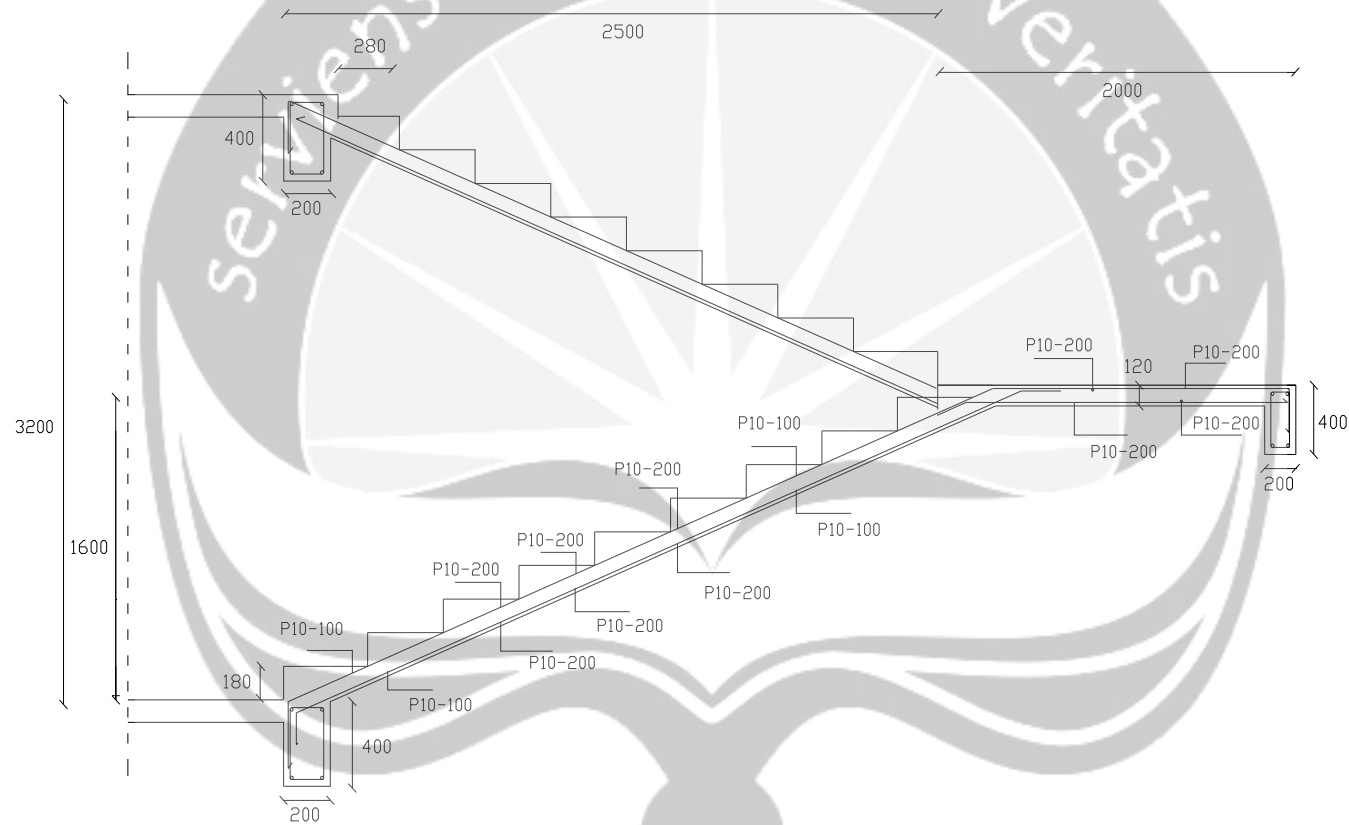
DETAIL A
SKALA 1:70

DETAIL B
SKALA 1:70

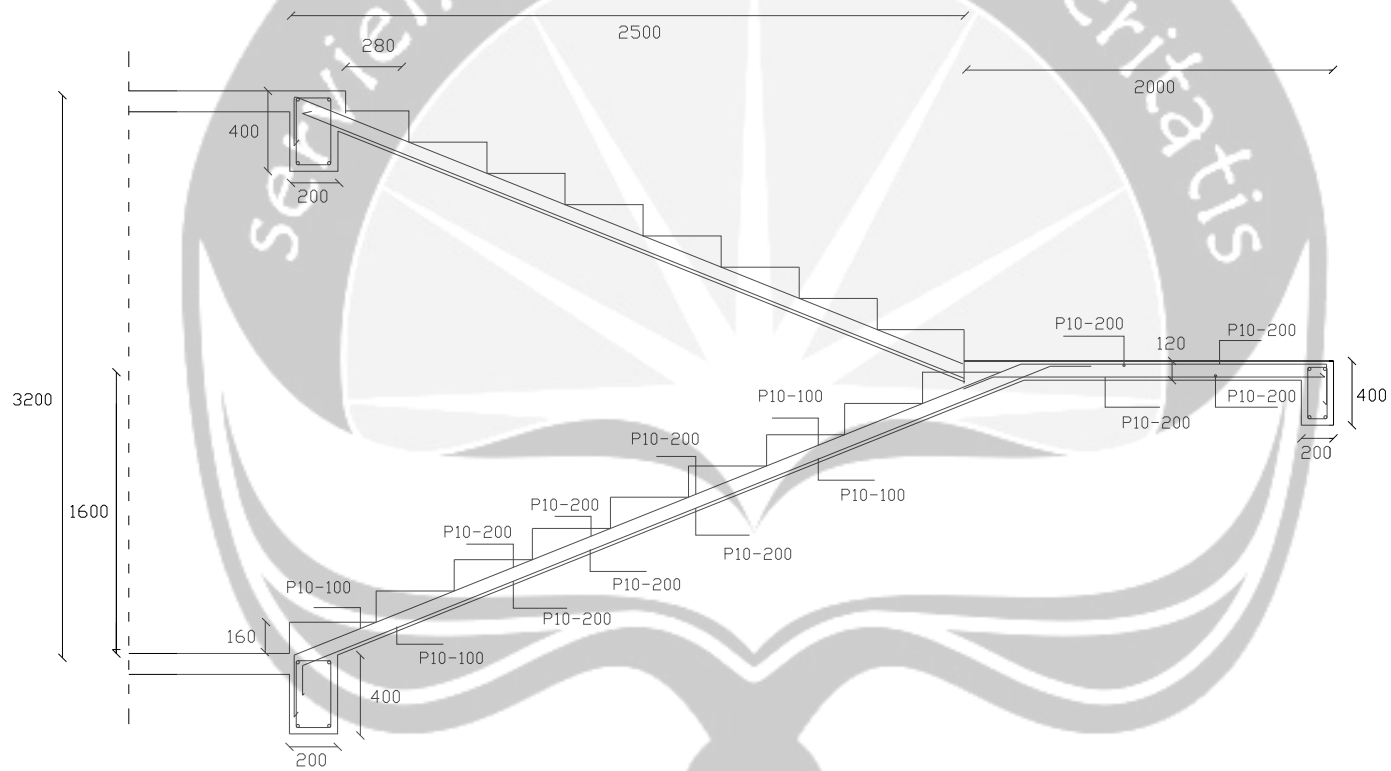
DETAIL SAMBUNGAN KUDA-KUDA BAJA

LAS TIPE SUDUT SMAW
MUTU LAS E 70xx

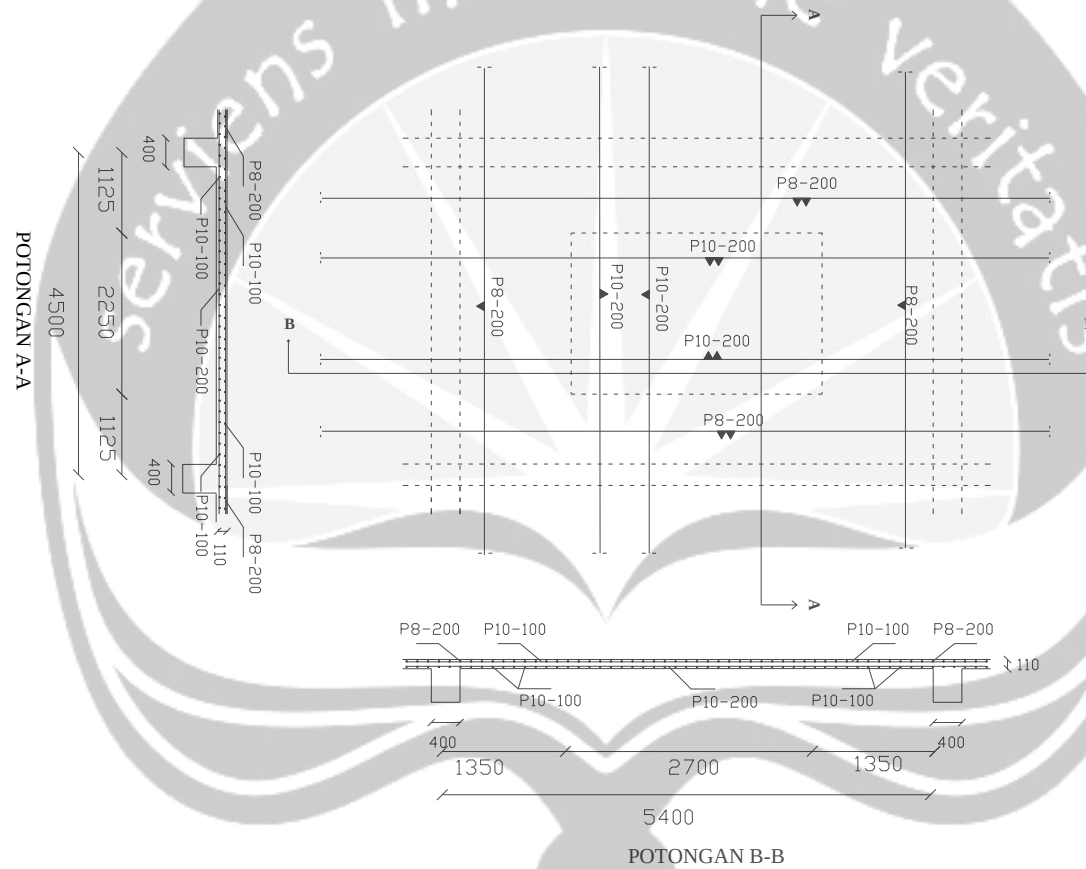
- TEBAL PLAT BUHUL : 8 mm
- PANJANG LAS : 30 mm
- TEBAL LAS : 4 mm



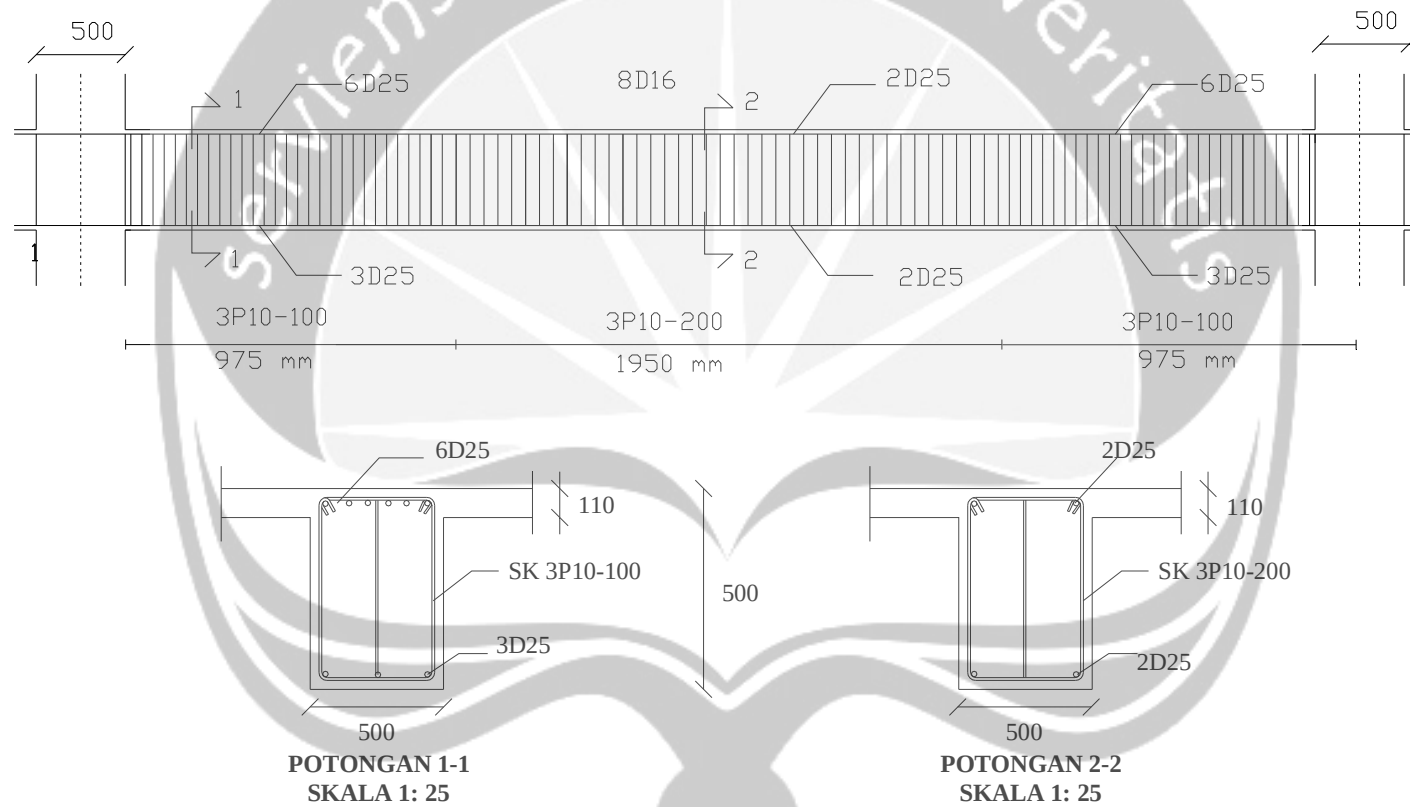
Penulangan Tangga Lantai 1



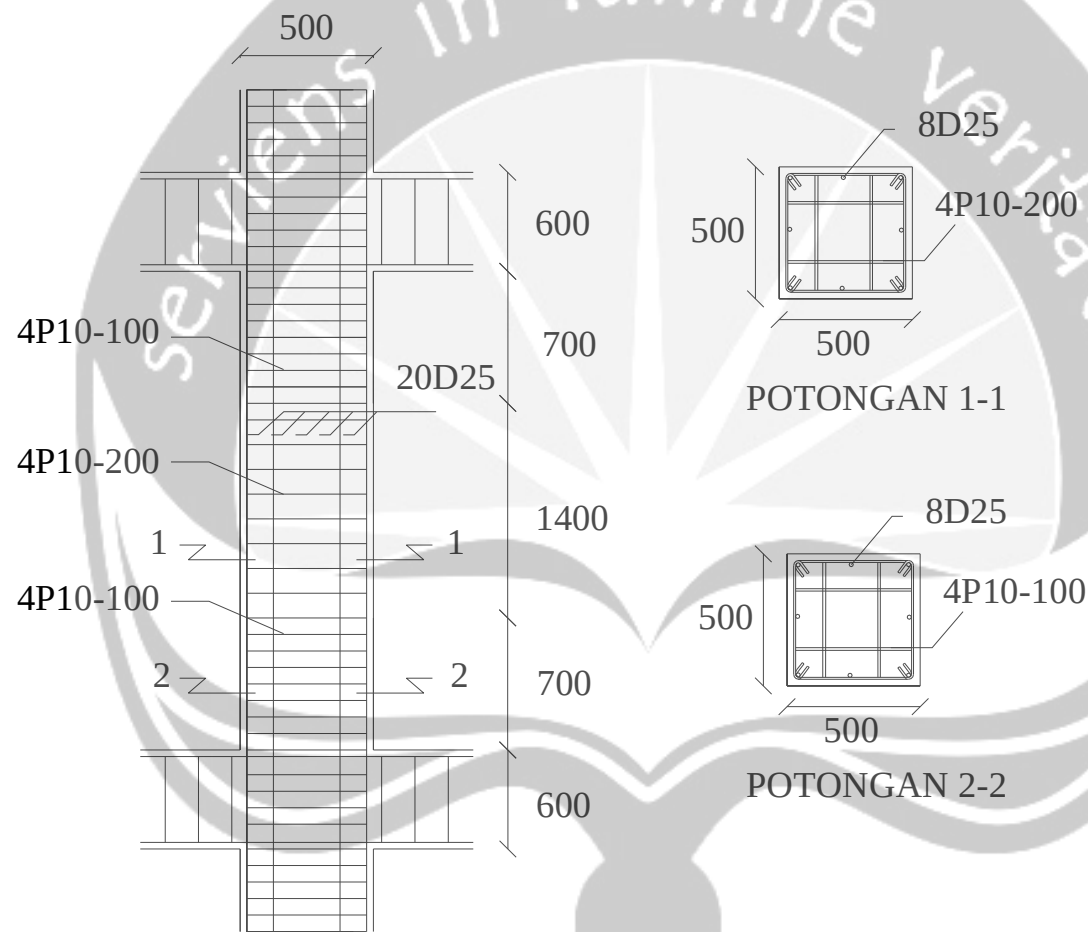
Penulangan Tangga Lantai 2, 3, dan 4



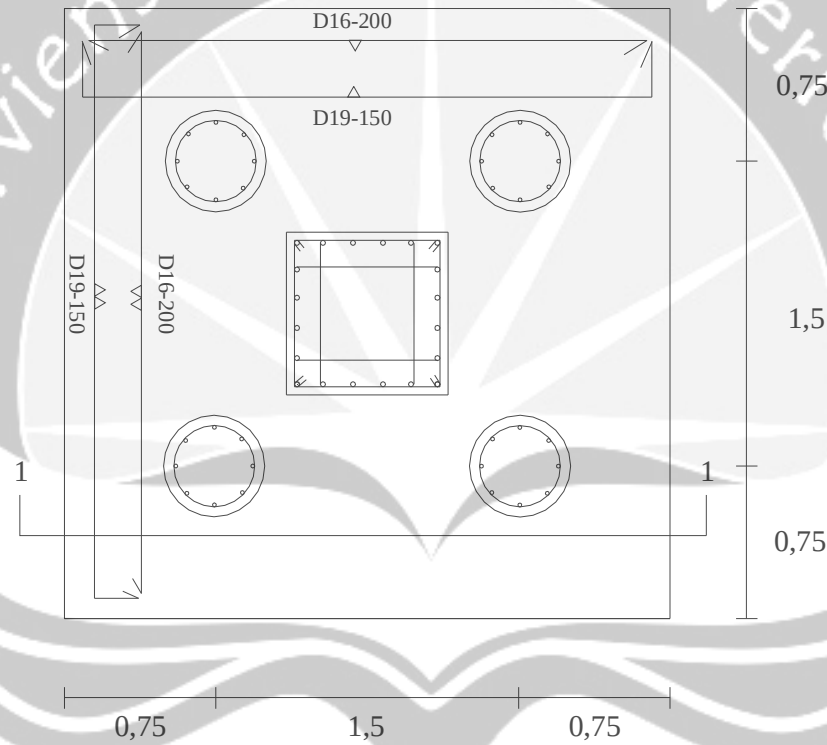
GAMBAR PENULANGAN PELAT LANTAI DAN PELAT ATAP
SKALA 1 : 70



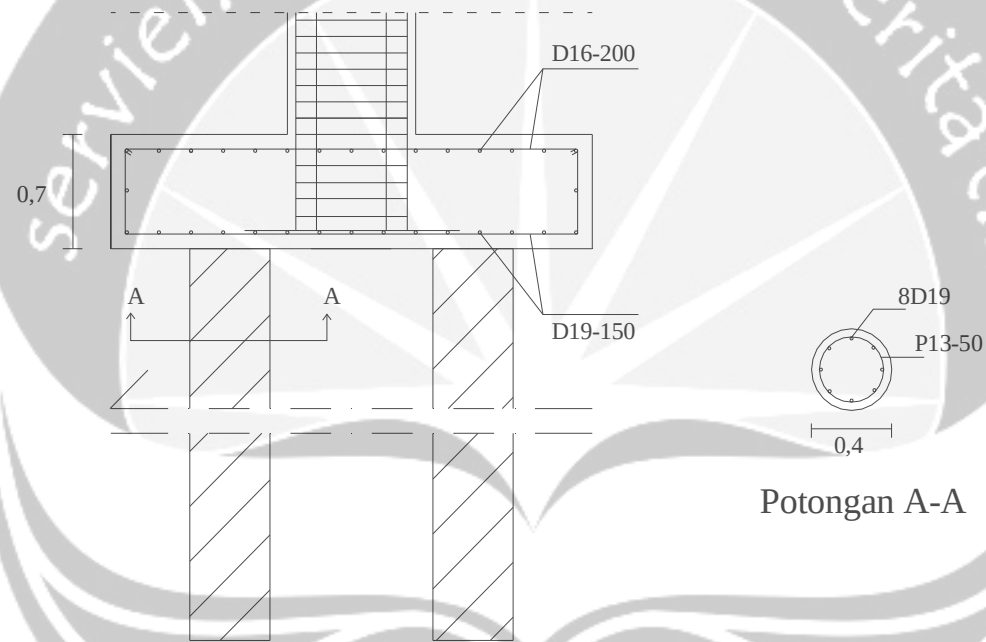
Gambar Penulangan Balok



Gambar Penulangan Kolom

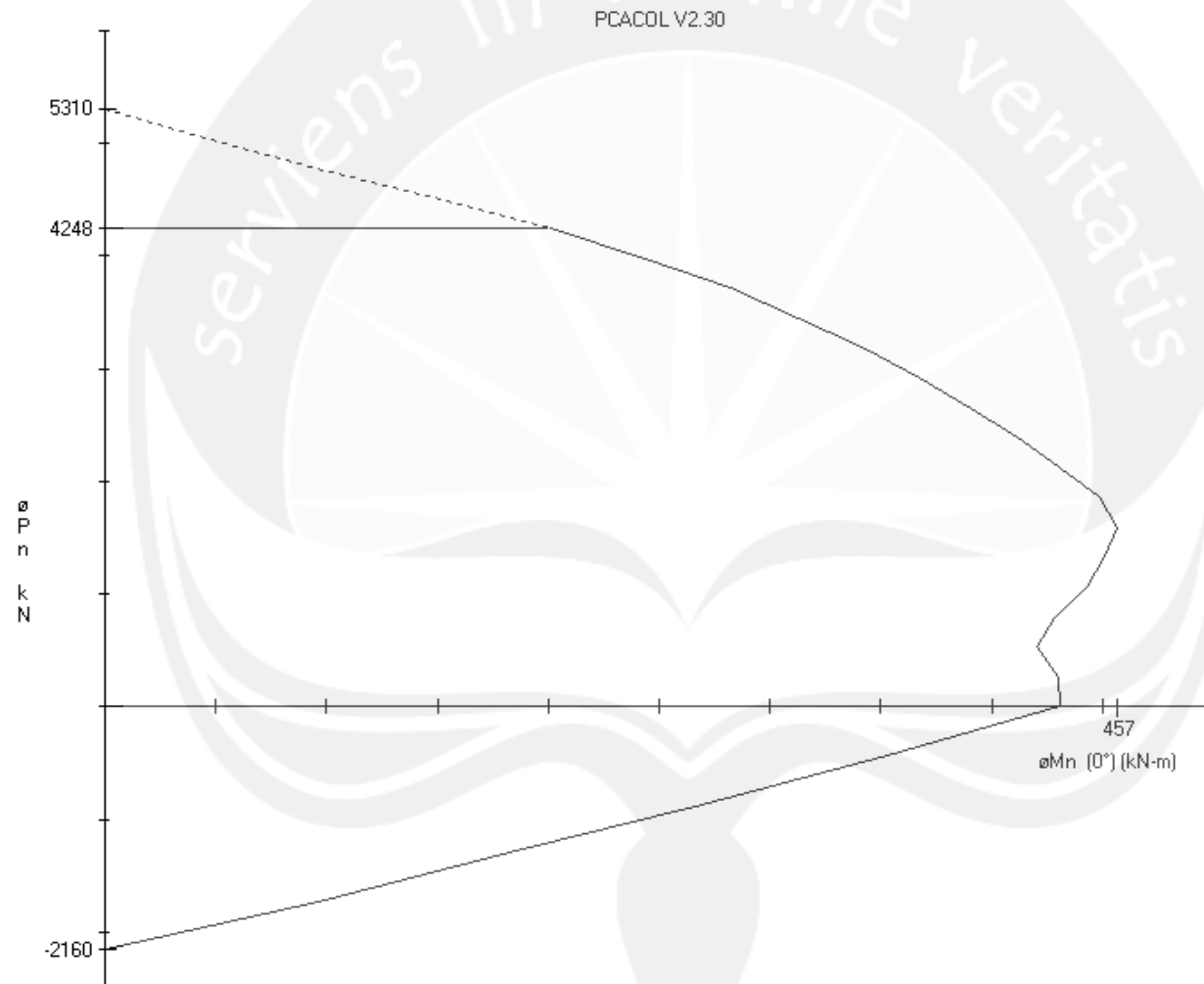


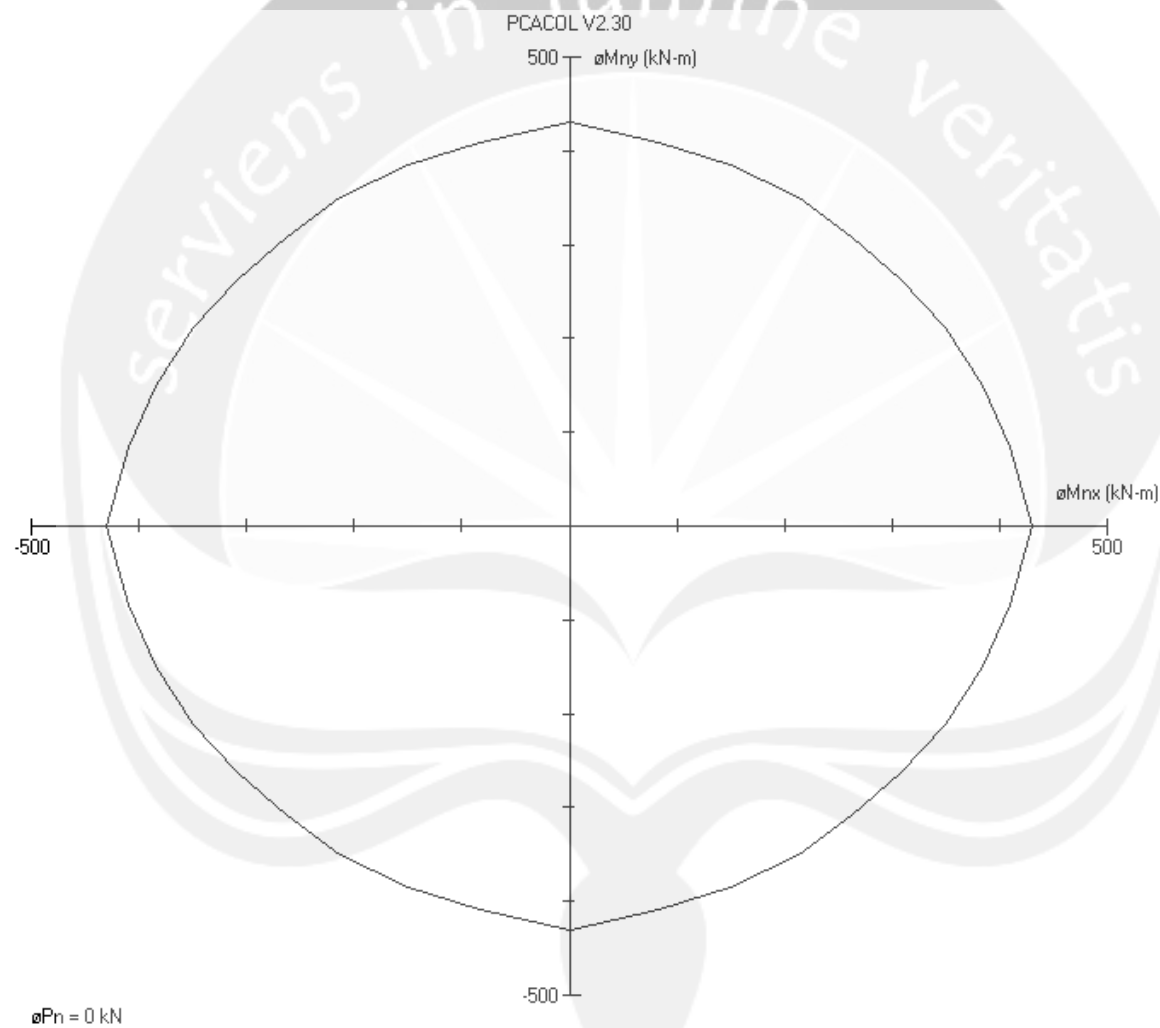
Gambar Denah Fondasi



Gambar Potongan 1-1

GAMBAR DETAIL PONDASI





Penulangan Lentur Balok																						
Lt	Balok	Posisi	f'_c	f_y	Φ	β_1	b (mm)	h (mm)	Tul. Lentur (mm)	Sengkang (mm)	Selimut (mm)	ρ_{maks}	ρ_{min}	M_u (kNm)	Mu pakai	R_n	ρ	ρ yg dipakai	A_s (mm ²)	Dipakai	A_s yg dipakai (mm ²)	Tul. D25 Atas Bawah
5	B30	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	223.319	223.32	2.4156	0.0064	0.0064	1381.9709	3	1472.6216	3
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	333.741	333.74	3.6100	0.0100	0.0100	2141.0209	5	2454.3693	5
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	81.326	81.326	0.7220	0.0018	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	23.236	44.664	0.4831	0.0012	0.0035	752.5000	2	981.7477	2
5	B31	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	240.394	240.39	2.6003	0.0070	0.0070	1495.5514	4	1963.4954	4
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	229.631	229.63	2.4838	0.0066	0.0066	1423.8071	3	1472.6216	3
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	56.858	56.858	0.4968	0.0013	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	24.447	48.079	0.5201	0.0013	0.0035	752.5000	2	981.7477	2
5	B32	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	240.535	240.54	2.6018	0.0070	0.0070	1496.4947	4	1963.4954	4
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	299.84	299.84	3.2433	0.0088	0.0088	1901.5426	4	1963.4954	4
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	56.79	59.968	0.6487	0.0016	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	24.524	48.107	0.5204	0.0013	0.0035	752.5000	2	981.7477	2
5	B33	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	223.505	223.51	2.4176	0.0064	0.0064	1383.2012	3	1472.6216	3
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	333.529	333.53	3.6077	0.0100	0.0100	2139.5042	5	2454.3693	5
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	81.434	81.434	0.7215	0.0018	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	23.319	44.701	0.4835	0.0012	0.0035	752.5000	2	981.7477	2
5	B77	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	186.205	186.21	2.0141	0.0053	0.0053	1139.4202	3	1472.6216	3
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	213.147	213.15	2.3055	0.0061	0.0061	1314.9149	3	1472.6216	3
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	55.219	55.219	0.4611	0.0012	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	56.416	56.416	0.4028	0.0010	0.0035	752.5000	2	981.7477	2
5	B78	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	198.534	198.53	2.1475	0.0057	0.0057	1219.3542	3	1472.6216	3
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	267.583	267.58	2.8944	0.0078	0.0078	1679.1412	4	1963.4954	4
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	38.583	53.517	0.5789	0.0015	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	14.674	39.707	0.4295	0.0011	0.0035	752.5000	2	981.7477	2
5	B79	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	172.303	172.3	1.8637	0.0049	0.0049	1050.0267	3	1472.6216	3
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	235.947	235.95	2.5522	0.0068	0.0068	1465.8458	3	1472.6216	3
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	34.152	47.189	0.5104	0.0013	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	17.605	34.461	0.3727	0.0009	0.0035	752.5000	2	981.7477	2
5	B80	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	170.785	170.79	1.8473	0.0048	0.0048	1040.3122	3	1472.6216	3
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	233.438	233.44	2.5250	0.0067	0.0067	1449.1249	3	1472.6216	3
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	73.377	73.377	0.5050	0.0013	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	17.864	34.157	0.3695	0.0009	0.0035	752.5000	2	981.7477	2
5	B81	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	171.343	171.34	1.8534	0.0049	0.0049	1043.8821	3	1472.6216	3
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	233.886	233.89	2.5299	0.0068	0.0068	1452.1085	3	1472.6216	3
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	32.884	46.777	0.5060	0.0013	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	15.74	34.269	0.3707	0.0009	0.0035	752.5000	2	981.7477	2
5	B82	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	173.623	173.62	1.8780	0.0049	0.0049	1058.4815	3	1472.6216	3
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	240.094	240.09	2.5970	0.0069	0.0069	1493.5446	4	1963.4954	4
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	32.368	48.019	0.5194	0.0013	0.0035	752.5000	2	981.7477	2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	17.658	34.725	0.3756	0.0009	0.0035	752.5000	2	981.7477	2

Penulangan Lentur Balok (lanjutan)

Lt	Balok	Posisi	f'_c	f_y	Φ	β_1	b (mm)	h (mm)	Tul. Lentur (mm)	Sengkang (mm)	Selimut (mm)	ρ_{maks}	ρ_{min}	M_u (kNm)	M_u pakai	R_n	ρ	ρ yg dipakai	A_s (mm ²)	Dipakai	A_s yg dipakai (mm ²)	Tul. D25	
																						Atas	Bawah
5	B83	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	168.867	168.87	1.8266	0.0048	0.0048	1028.0509	3	1472.6216	3	
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	237.519	237.52	2.5692	0.0069	0.0069	1476.3365	4	1963.4954		4
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	36.488	47.504	0.5138	0.0013	0.0035	752.5000	2	981.7477		2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	17.39	33.773	0.3653	0.0009	0.0035	752.5000	2	981.7477	2	
5	B84	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	169.414	169.41	1.8325	0.0048	0.0048	1031.5462	3	1472.6216	3	
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	243.1	243.1	2.6295	0.0070	0.0070	1513.6708	4	1963.4954		4
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	39.247	48.62	0.5259	0.0013	0.0035	752.5000	2	981.7477		2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	18.287	33.883	0.3665	0.0009	0.0035	752.5000	2	981.7477	2	
5	B85	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	174.994	174.99	1.8929	0.0050	0.0050	1067.2703	3	1472.6216	3	
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	240.507	240.51	2.6015	0.0070	0.0070	1496.3074	4	1963.4954		4
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	32.579	48.101	0.5203	0.0013	0.0035	752.5000	2	981.7477		2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	16.971	34.999	0.3786	0.0010	0.0035	752.5000	2	981.7477	2	
5	B86	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	172.106	172.11	1.8616	0.0049	0.0049	1048.7655	3	1472.6216	3	
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	234.588	234.59	2.5375	0.0068	0.0068	1456.7854	3	1472.6216		3
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	32.801	46.918	0.5075	0.0013	0.0035	752.5000	2	981.7477		2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	15.695	34.421	0.3723	0.0009	0.0035	752.5000	2	981.7477	2	
5	B87	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	170.75	170.75	1.8469	0.0048	0.0048	1040.0883	3	1472.6216	3	
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	233.391	233.39	2.5245	0.0067	0.0067	1448.8120	3	1472.6216		3
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	32.522	46.678	0.5049	0.0013	0.0035	752.5000	2	981.7477		2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	17.874	34.15	0.3694	0.0009	0.0035	752.5000	2	981.7477	2	
5	B88	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	172.245	172.25	1.8631	0.0049	0.0049	1049.6554	3	1472.6216	3	
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	235.857	235.86	2.5512	0.0068	0.0068	1465.2455	3	1472.6216		3
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	34.153	47.171	0.5102	0.0013	0.0035	752.5000	2	981.7477		2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	17.594	34.449	0.3726	0.0009	0.0035	752.5000	2	981.7477	2	
5	B89	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	196.59	196.59	2.1264	0.0056	0.0056	1206.7089	3	1472.6216	3	
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	267.651	267.65	2.8951	0.0078	0.0078	1679.6047	4	1963.4954		4
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	38.634	53.53	0.5790	0.0015	0.0035	752.5000	2	981.7477		2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	14.621	39.318	0.4253	0.0011	0.0035	752.5000	2	981.7477	2	
5	B90	Tump -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	186.863	186.86	2.0212	0.0053	0.0053	1143.6706	3	1472.6216	3	
		Tump +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	291.987	291.99	3.1583	0.0086	0.0086	1846.9230	4	1963.4954		4
		Lap +	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	55.325	58.397	0.6317	0.0016	0.0035	752.5000	2	981.7477		2
		Lap -	25	400	0.8	0.9	400	600	25	10	40	0.0203	0.0035	56.573	56.573	0.4042	0.0010	0.0035	752.5000	2	981.7477	2	

Momen Nominal Positif Tumpuan Balok

Lt	Balok	$\frac{1}{4} l_n$ balok	$(b_v + 16 h_f)$	$b_v + l_{penit}$	A_s flens	A_s flens	Tul. Lentur	Senggang	b	h	b_e	As'	A_s	$A_s' + A_s$ flens konversi	A_s'	f's	c	a	M_n
					(mm ²)	konversi	(mm)	(mm)	(mm)	(mm)	(mm)	(mm ²)	(mm ²)	(mm ²)	(mm ²)	(MPa)	(mm)	(mm)	(kNm)
5	B30	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	2454.3693	981.7477	3019.8559	3019.8559	503.4	19.86	16.88	208.868
5	B31	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1472.6216	981.7477	2038.1082	2038.1082	527.6	15.76	13.39	208.354
5	B32	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1963.4954	981.7477	2528.9821	2528.9821	527.6	15.74	13.38	208.353
5	B33	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	2454.3693	981.7477	3019.8559	3019.8559	503.4	19.86	16.88	208.868
5	B77	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1472.6216	981.7477	2038.1082	2038.1082	503.4	19.53	16.60	208.836
5	B78	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1963.4954	981.7477	2528.9821	2528.9821	503.4	19.72	16.76	208.854
5	B79	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1472.6216	981.7477	2038.1082	2038.1082	503.4	19.53	16.60	208.836
5	B80	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1472.6216	981.7477	2038.1082	2038.1082	503.4	19.53	16.60	208.836
5	B81	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1472.6216	981.7477	2038.1082	2038.1082	503.4	19.53	16.60	208.836
5	B82	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1963.4954	981.7477	2528.9821	2528.9821	503.4	19.72	16.76	208.854
5	B83	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1963.4954	981.7477	2528.9821	2528.9821	503.4	19.72	16.76	208.854
5	B84	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1963.4954	981.7477	2528.9821	2528.9821	503.4	19.72	16.76	208.854
5	B85	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1963.4954	981.7477	2528.9821	2528.9821	503.4	19.72	16.76	208.854
5	B86	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1472.6216	981.7477	2038.1082	2038.1082	503.4	19.53	16.60	208.836
5	B87	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	1472.6216	981.7477	2038.1082	2038.1082	503.4	19.53	16.60	208.836
5	B88	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809
5	B89	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809
5	B90	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809

Momen Nominal Positif Lapangan Balok

Lt	Balok	$\frac{1}{4} l_n$ balok	$(b_v + 16 h_f)$	$b_v + l_{penit}$	A_s flens	A_s flens	Tul. Lentur	Senggang	b	h	b_e	As'	A_s	$A_s' + A_s$ flens konversi	A_s'	f's	c	a	M_n
					(mm ²)	konversi	(mm)	(mm)	(mm)	(mm)	(mm)	(mm ²)	(mm ²)	(mm ²)	(mm ²)	(MPa)	(mm)	(mm)	(kNm)
5	B30	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B31	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B32	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B33	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B77	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B78	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B79	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B80	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B81	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B82	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B83	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	455.1	25.26	21.47	211.380
5	B84	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809
5	B85	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809
5	B86	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809
5	B87	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809
5	B88	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809
5	B89	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809
5	B90	1343.75	1445.48668	5365.4867	942.4778	565.4867	25	10	400	600	1343.75	981.7477	981.7477	1547.2344	1547.2344	503.4	19.27	16.38	208.809

Penulangan Geser Daerah Sendi Plastik Balok																						
Lt	Balok	Jenis	Nilai	b (mm)	h (mm)	V _e (kN)	V _{g-ki} (kN)	V _{g-ka} (kN)	Gaya Gempa ki		Gaya Gempa ka		V _u terpakai (kN)	V _n (N)	V _c (N)	Dipakai Tul. Geser	Av (mm ²)	Spasi (mm)	S (mm)	Senggang		
									V _{u kiri}	V _{u kanan}	V _{u kiri}	V _{u kanan}										
5	B30	Mn ⁻	296.35	400	600	103.1051	73.64	70.22	29.4651	173.33	176.75	32.8851	176.7451	235660.0940	0	3	kaki	10	235.6194	128.9778	100	3 P 10 - 100
		Mn ⁺	208.87																			
5	B31	Mn ⁻	389.62	400	600	122.0357	48.04	56.79	73.9957	178.83	170.08	65.2457	178.8257	238434.2434	0	3	kaki	10	235.6194	127.4771	100	3 P 10 - 100
		Mn ⁺	208.35																			
5	B32	Mn ⁻	389.62	400	600	122.0355	56.88	47.95	65.1555	169.99	178.92	74.0855	178.9155	238553.9387	0	3	kaki	10	235.6194	127.4132	100	3 P 10 - 100
		Mn ⁺	208.35																			
5	B33	Mn ⁻	296.35	400	600	103.1051	70.24	73.61	32.8651	176.72	173.35	29.4951	176.7151	235620.0940	0	3	kaki	10	235.6194	128.9996	100	3 P 10 - 100
		Mn ⁺	208.87																			
5	B77	Mn ⁻	296.35	400	600	103.0985	20.55	13.85	82.5485	116.95	123.65	89.2485	123.6485	164864.7107	0	3	kaki	10	235.6194	184.3627	100	3 P 10 - 100
		Mn ⁺	208.84																			
5	B78	Mn ⁻	296.35	400	600	103.1023	50.03	40	53.0723	143.10	153.13	63.1023	153.1323	204176.4321	0	3	kaki	10	235.6194	148.8659	100	3 P 10 - 100
		Mn ⁺	208.85																			
5	B79	Mn ⁻	296.35	400	600	103.0985	44.03	46	59.0685	149.10	147.13	57.0985	149.0985	198798.0440	0	3	kaki	10	235.6194	152.8934	100	3 P 10 - 100
		Mn ⁺	208.84																			
5	B80	Mn ⁻	296.35	400	600	103.0985	45.07	44.96	58.0285	148.06	148.17	58.1385	148.1685	197558.0440	0	3	kaki	10	235.6194	153.8531	100	3 P 10 - 100
		Mn ⁺	208.84																			
5	B81	Mn ⁻	296.35	400	600	103.0985	44.99	45.04	58.1085	148.14	148.09	58.0585	148.1385	197518.0440	0	3	kaki	10	235.6194	153.8842	100	3 P 10 - 100
		Mn ⁺	208.84																			
5	B82	Mn ⁻	296.35	400	600	103.1023	44.1	45.93	59.0023	149.03	147.20	57.1723	149.0323	198709.7654	0	3	kaki	10	235.6194	152.9613	100	3 P 10 - 100
		Mn ⁺	208.85																			
5	B83	Mn ⁻	296.35	400	600	103.1023	50.98	49.29	52.1223	152.39	154.08	53.8123	154.0823	205443.0987	0	3	kaki	10	235.6194	147.9481	100	3 P 10 - 100
		Mn ⁺	208.85																			
5	B84	Mn ⁻	296.35	400	600	103.1023	52.01	53.74	51.0923	156.84	155.11	49.3623	156.8423	209123.0987	0	3	kaki	10	235.6194	145.3446	100	3 P 10 - 100
		Mn ⁺	208.85																			
5	B85	Mn ⁻	299.43	400	600	103.7309	45.74	44.3	57.9909	148.03	149.47	59.4309	149.4709	199294.4986	0	3	kaki	10	235.6194	152.5125	100	3 P 10 - 100
		Mn ⁺	208.85																			
5	B86	Mn ⁻	299.43	400	600	103.7271	45	45.04	58.7271	148.77	148.73	58.6871	148.7671	198356.1105	0	3	kaki	10	235.6194	153.2340	100	3 P 10 - 100
		Mn ⁺	208.84																			
5	B87	Mn ⁻	299.43	400	600	103.7271	44.93	45.1	58.7971	148.83	148.66	58.6271	148.8271	198436.1105	0	3	kaki	10	235.6194	153.1723	100	3 P 10 - 100
		Mn ⁺	208.84																			
5	B88	Mn ⁻	299.43	400	600	103.7215	45.97	44.07	57.7515	147.79	149.69	59.6515	149.6915	199588.6812	0	3	kaki	10	235.6194	152.2877	100	3 P 10 - 100
		Mn ⁺	208.81																			
5	B89	Mn ⁻	299.43	400	600	103.7215	39.98	50.07	63.7415	153.79	143.70	53.6515	153.7915	205055.3478	0	3	kaki	10	235.6194	148.2278	100	3 P 10 - 100
		Mn ⁺	208.81																			
5	B90	Mn ⁻	299.43	400	600	103.7215	13.8	20.6	89.9215	124.32	117.52	83.1215	124.3215	165762.0145	0	3	kaki	10	235.6194	183.3647	100	3 P 10 - 100
		Mn ⁺	208.81																			

V_{g-ka}	Gaya Gempa Ki	Gaya Gempa Ka	V_u t
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Lt	Balok	Jenis	Nilai	b (mm)	h (mm)	V _e (kN)	V _{g-ki} (kN)	V _{g-ka} (kN)	Gaya Gempa Ki		Gaya Gempa Ka		V _u terpakai (kN)	V _n (N)	V _e (N)	V _s (N)	Senggang
									V _{u kiri}	V _{u kanan}	V _{u kiri}	V _{u kanan}					
5	B30	Mn ⁺	296.35	400	700	68.2723	59.75	56.25	8.5223	124.52	128.02	12.0223	128.0223	170696.3686	212500	-41803.6314	3 P 10 - 100
		Mn ⁻	208.87														
5	B31	Mn ⁺	389.62	400	700	80.8074	57.41	58.59	23.3974	139.40	138.22	22.2174	139.3974	185863.2152	212500	-26636.7848	3 P 10 - 100
		Mn ⁻	208.35														
5	B32	Mn ⁺	389.62	400	700	80.8073	47.92	50.82	32.8873	131.63	128.73	29.9873	131.6273	175503.0135	212500	-36996.9865	3 P 10 - 100
		Mn ⁻	208.35														
5	B33	Mn ⁺	296.35	400	700	68.2723	58.14	57.87	10.1323	126.14	126.41	10.4023	126.4123	168549.7019	212500	-43950.2981	3 P 10 - 100
		Mn ⁻	208.87														
5	B77	Mn ⁺	296.35	400	700	68.2679	56.37	59.64	11.8979	127.91	124.64	8.6279	127.9079	170543.9300	212500	-41956.0700	3 P 10 -100
		Mn ⁻	208.84														
5	B78	Mn ⁺	296.35	400	600	114.8185	27.54	13.51	87.2785	128.33	142.36	101.3085	142.3585	189811.3297	179167	10644.6630	3 P 10 - 100
		Mn ⁻	208.85														
5	B79	Mn ⁺	296.35	400	600	114.8143	20.76	20.3	94.0543	135.11	135.57	94.5143	135.5743	180765.7005	179167	1599.0338	3 P 10 - 100
		Mn ⁻	208.84														
5	B80	Mn ⁺	296.35	400	600	114.8143	21.3	19.76	93.5143	134.57	136.11	95.0543	136.1143	181485.7005	179167	2319.0338	3 P 10 - 100
		Mn ⁻	208.84														
5	B81	Mn ⁺	296.35	400	600	114.8143	20.54	20.52	94.2743	135.33	135.35	94.2943	135.3543	180472.3672	179167	1305.7005	3 P 10 - 100
		Mn ⁻	208.84														
5	B82	Mn ⁺	296.35	400	600	114.8185	13.06	27.99	101.7585	142.81	127.88	86.8285	142.8085	190411.3297	179167	11244.6630	3 P 10 - 100
		Mn ⁻	208.85														
5	B83	Mn ⁺	296.35	400	600	114.8185	14.06	28.99	100.7585	143.81	128.88	85.8285	143.8085	191744.6630	179167	12577.9963	3 P 10 - 100
		Mn ⁻	208.85														
5	B84	Mn ⁺	296.35	400	600	114.8185	15.06	29.99	99.7585	144.81	129.88	84.8285	144.8085	193077.9963	179167	13911.3297	3 P 10 - 100
		Mn ⁻	208.85														
5	B85	Mn ⁺	299.43	400	600	115.5185	16.06	30.99	99.4585	146.51	131.58	84.5285	146.5085	195344.6310	179167	16177.9644	3 P 10 - 100
		Mn ⁻	208.85														
5	B86	Mn ⁺	299.43	400	600	115.5143	17.06	31.99	98.4543	147.50	132.57	83.5243	147.5043	196672.3352	179167	17505.6686	3 P 10 - 100
		Mn ⁻	208.84														
5	B87	Mn ⁺	299.43	400	600	115.5143	18.06	32.99	97.4543	148.50	133.57	82.5243	148.5043	198005.6686	179167	18839.0019	3 P 10 - 100
		Mn ⁻	208.84														
5	B88	Mn ⁺	299.43	400	600	115.5080	19.06	33.99	96.4480	149.50	134.57	81.5180	149.4980	199330.7283	179167	20164.0616	3 P 10 - 100
		Mn ⁻	208.81														
5	B89	Mn ⁺	299.43	400	600	115.5080	20.06	34.99	95.4480	150.50	135.57	80.5180	150.4980	200664.0616	179167	21497.3949	3 P 10 - 100
		Mn ⁻	208.81														
5	B90	Mn ⁺	299.43	400	600	115.5080	21.06	35.99	94.4480	151.50	136.57	79.5180	151.4980	201997.3949	179167	22830.7283	3 P 10 - 100
		Mn ⁻	208.81														

Kelangsingan Kolom

lt	kolom	h (mm)	AKIBAT BEBAN GRAVITASI		AKIBAT GAYA GOYANGAN		Pu	Pc	ΣPc	δs	M1	M2	Mny	Mnx	Pn	ρ	As	Jumlah tul	Jum Tul Pakai
			M2	M3	M2	M3													
5	C34	2800	14.287	0.179	299.52	377.37	418.77	59069687	2126508.73	1.0003	313.8837	377.6441	482.90	580.99	3455.57	0.035	8750	17.825	20
5	C35	2800	0.189	27.884	202.11	365.94	468.11	59069687	2126508.73	1.0003	202.3593	393.9334	311.32	606.05	3455.57	0.035	8750	17.825	20
5	C36	2800	1.272	28.394	298.10	336.33	470.52	59069687	2126508.73	1.0003	299.4630	364.8253	460.71	561.27	3455.57	0.035	8750	17.825	20
5	C37	2800	1.164	56.334	292.50	187.71	344.39	59069687	2126508.73	1.0002	293.7302	244.0865	451.89	375.52	3455.57	0.035	8750	17.825	20
5	C2	2800	11.247	0.996	163.69	344.95	218.42	59069687	2126508.73	1.0001	174.9564	345.9892	269.16	532.29	3455.57	0.035	8750	17.825	20
5	C7	2800	33.343	16.968	272.87	383.91	301.59	59069687	2126508.73	1.0002	306.2686	400.9546	471.18	616.85	3455.57	0.035	8750	17.825	20
5	C13	2800	7.961	2.138	305.10	168.94	486.8	59069687	2126508.73	1.0003	313.1582	171.1336	481.78	263.28	3455.57	0.035	8750	17.825	20
5	C17	2800	0.538	3.436	301.12	179.87	492.32	59069687	2126508.73	1.0003	301.7520	183.3595	464.23	282.09	3455.57	0.035	8750	17.825	20
5	C21	2800	0.08	3.698	300.26	183.63	490.93	59069687	2126508.73	1.0003	300.4335	187.3885	462.21	288.29	3455.57	0.035	8750	17.825	20
5	C25	2800	1.831	4.63	301.14	187.16	485.11	59069687	2126508.73	1.0003	303.0636	191.8429	466.25	295.14	3455.57	0.035	8750	17.825	20
5	C29	2800	0.224	29.404	299.44	371.13	456.98	59069687	2126508.73	1.0003	299.7478	400.6414	461.15	616.37	3455.57	0.035	8750	17.825	20
5	C39	2800	0.878	28.75	289.83	373.75	461.51	59069687	2126508.73	1.0003	290.7959	402.6082	447.38	619.40	3455.57	0.035	8750	17.825	20
5	C44	2800	1.212	4.117	303.01	189.567	486.54	59069687	2126508.73	1.0003	304.3185	193.7418	468.18	298.06	3455.57	0.035	8750	17.825	20
5	C48	2800	0.043	3.598	300.44	183.599	490.93	59069687	2126508.73	1.0003	300.5725	187.2535	462.42	288.08	3455.57	0.035	8750	17.825	20
5	C52	2800	0.432	3.439	300.33	184.385	4992.3	59069687	2126508.73	1.0031	301.7081	188.4030	464.17	289.85	3455.57	0.035	8750	17.825	20
5	C56	2800	5.108	2.997	316.97	191.32	486.82	59069687	2126508.73	1.0003	322.1698	194.3754	495.65	299.04	3455.57	0.035	8750	17.825	20
5	C61	2800	19.474	16.895	322.05	397.967	301.47	59069687	2126508.73	1.0002	341.5799	414.9372	525.51	638.36	3455.57	0.035	8750	17.825	20
5	C67	2800	6.259	5.859	163.02	358.903	218.54	59069687	2126508.73	1.0001	169.3043	364.8112	260.47	561.25	3455.57	0.035	8750	17.825	20

Penulangan Geser

Lt	kolom	h(mm)				Mn atas	Mn bawah	Vu	Mn-	Mn+	Vu	2E	Vu pakai	Vc	ϕVc	KET	Vs	Sengkan	
			b	h	Diagram													Luar Lo	500
5	C34	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	431.3	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C35	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	446.1	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C36	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	431.3	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C37	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	231.1	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C2	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	424.2	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C7	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	472	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C13	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	195.6	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C17	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	207.1	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C21	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	232.8	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C25	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	250.2	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C29	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	424.4	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C39	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	427.1	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C44	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	424.4	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C48	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	427.1	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C52	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	252.9	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C56	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	237.8	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C61	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	489	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150
5	C67	2.8	500	500	577	887.692	887.692	634.066	578.805	529.965	791.978	441.5	791.98	241555.7	181.17	perlu	814415.6	8P10-75	8P10-150

Hubungan Balok Kolom

Lt	kolom	h	Mn-	Mn+	tul atas	tul bawah	As1	As2	As1fy	As2fy	Mu	Vh	Vy-y	ϕVc
5	C34	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C35	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C36	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C37	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C2	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C7	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C13	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C17	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C21	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C25	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C29	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C39	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C44	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C48	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C52	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C56	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C61	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636
5	C67	2.8	578.805	529.965	3	3	1472.6216	1472.6216	589.0486225	589.04862	554.38492	395.98923	782.10802	1848.5636