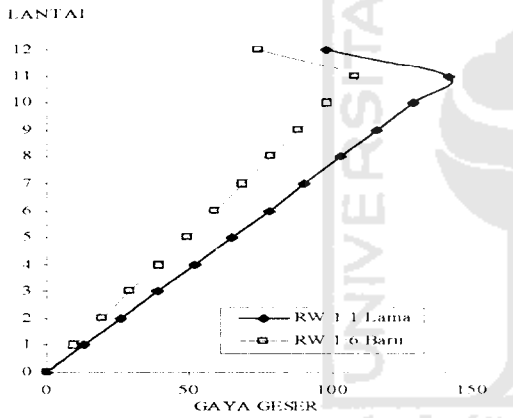
BAB VI

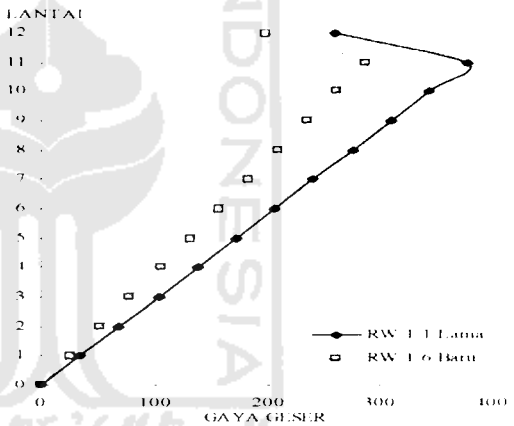
HASIL PERHITUNGAN DAN PEMBAHASAN

6.1 Hasil Penelitian

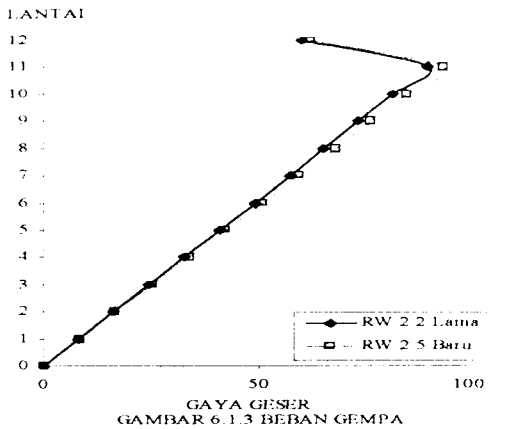
Berdasarkan perhitungan desain struktur dengan menggunakan *code* lama dan *code* baru, didapat hasil sebagai berikut :



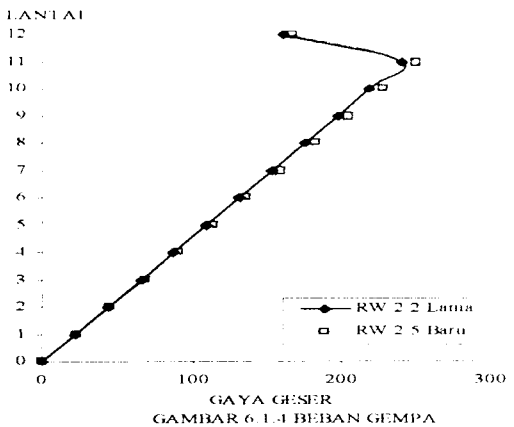
GAMBAR 6.1.1 BEBAN GEMPA
PORTAL E RW 1 1 lama
dan R W 1 6 baru



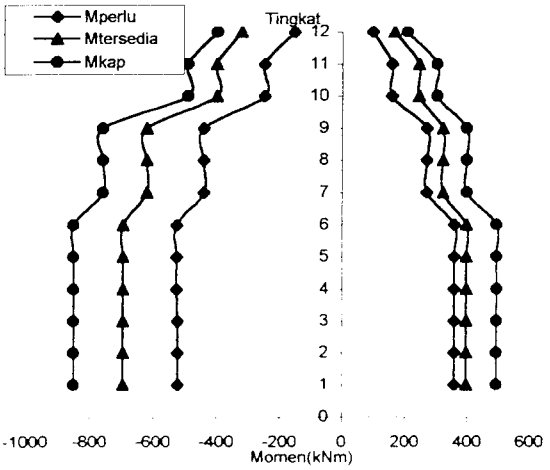
GAMBAR 6.1.2 BEBAN GEMPA
PORTAL 2 R W 1 1 lama
dan R W 1 6 baru



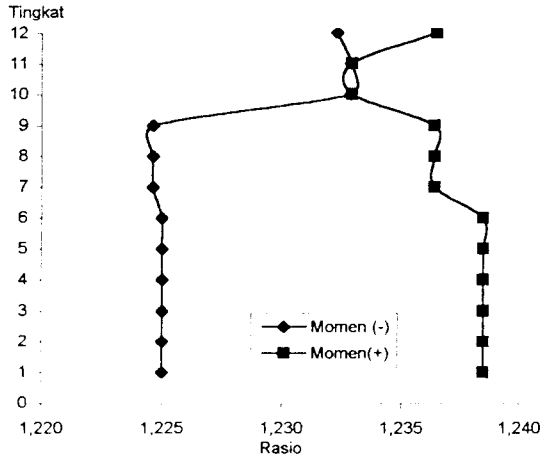
GAYA GESER
GAMBAR 6.1.3 BEBAN GEMPA
PORTAL E R W 2 2lama
dan R W 2/5 baru



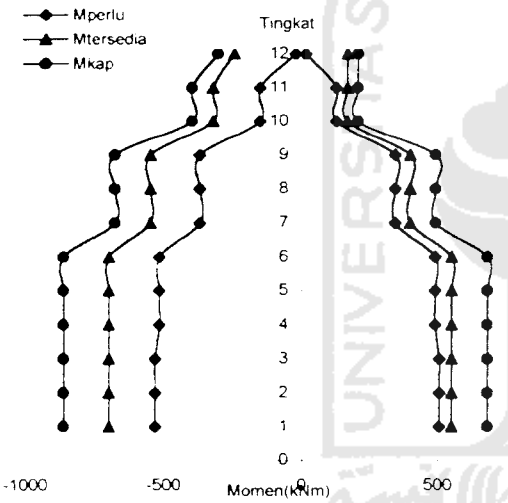
GAMBAR 6.1.4 BEBAN GEMPA
PORTAL 2 R W 2 2 lama
dan R W 2 5 baru



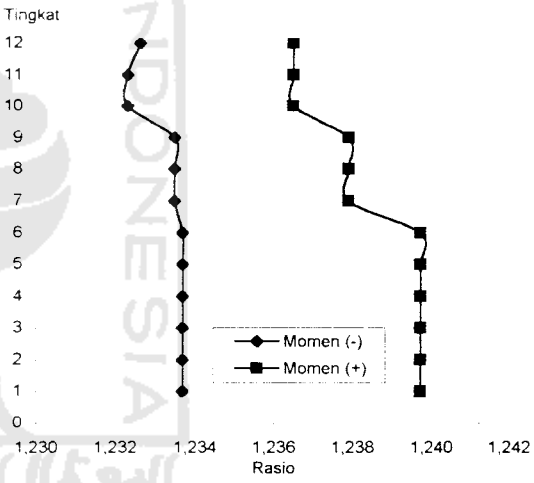
GAMBAR 6.2.1 MOMEN TUMPUAN
PORTAL E (7m) R/W 1/1 Lama



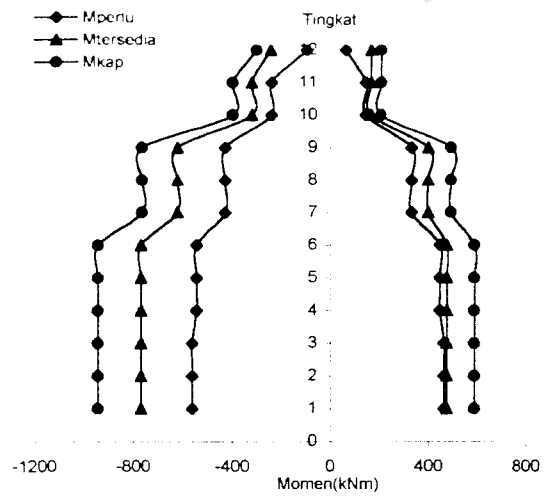
GAMBAR 6.2.2 RASIO MKAP/MTERSEDIA
PORTAL E (7 m) R/W 1/1 Lama



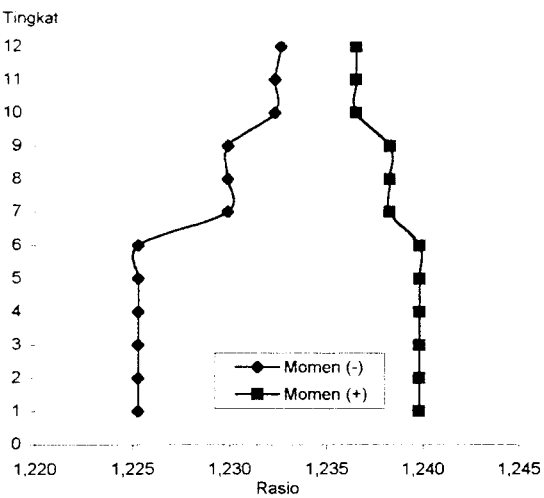
GAMBAR 6.2.3 MOMEN TUMPUAN
PORTAL E (4m) R/W 1/1 Lama



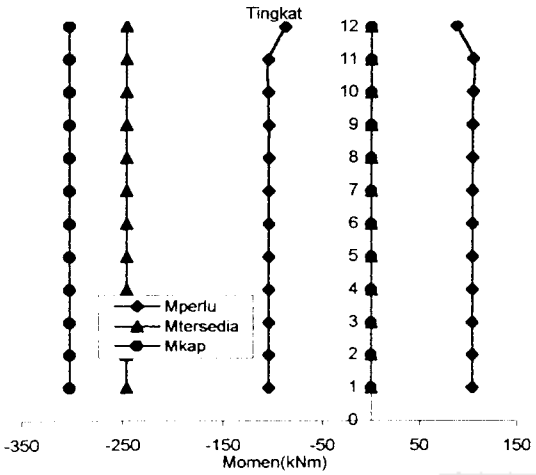
GAMBAR 6.2.4 RASIO MKAP/MTERSEDIA
PORTAL E (4m) R/W 1/1 Lama



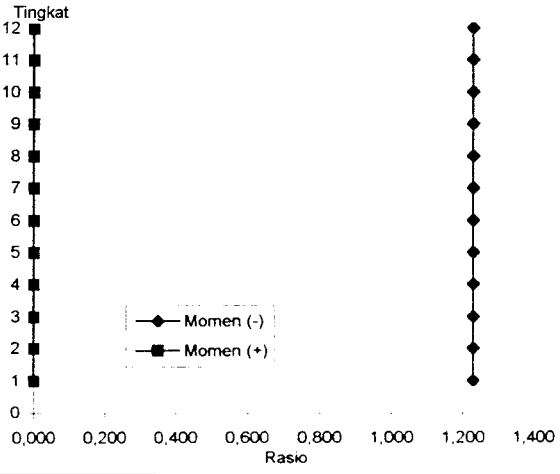
GAMBAR 6.2.5 MOMEN TUMPUAN
PORTAL 2 (5m) R/W 1/1 Lama



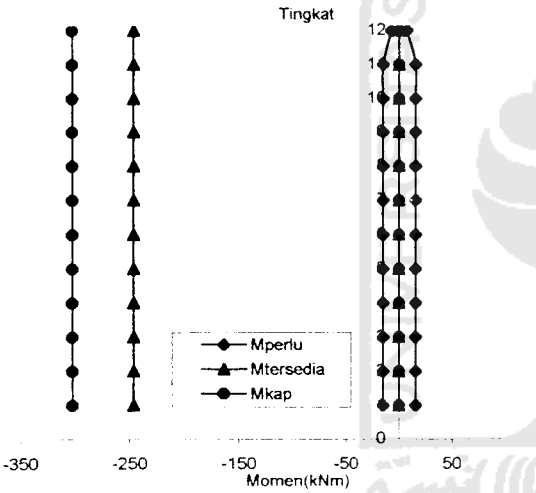
GAMBAR 6.2.6 RASIO MKAP/MTERSEDIA
PORTAL 2 (5m) R/W 1/1 Lama



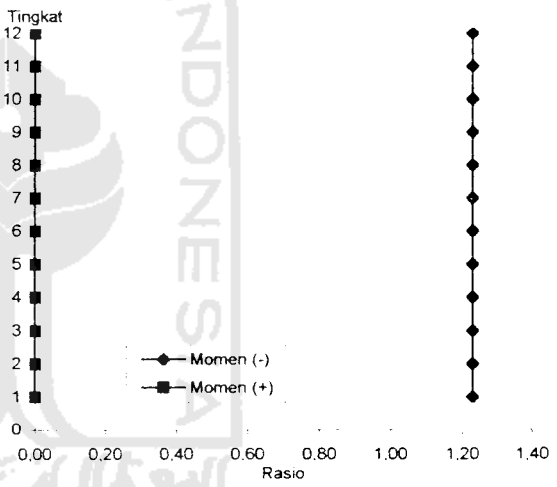
GAMBAR 6.2.7 MOMEN LAPANGAN
PORTAL E (7m) R/W 1/1 Lama



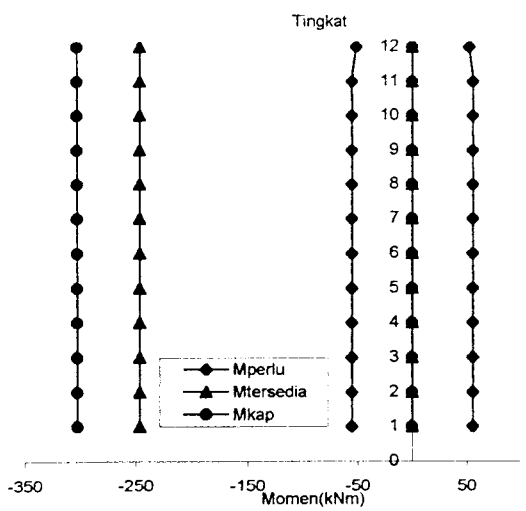
GAMBAR 6.2.8 RASIO MKAP/MTERSEDIA PORTAL E
(7m) R/W 1/1 Lama



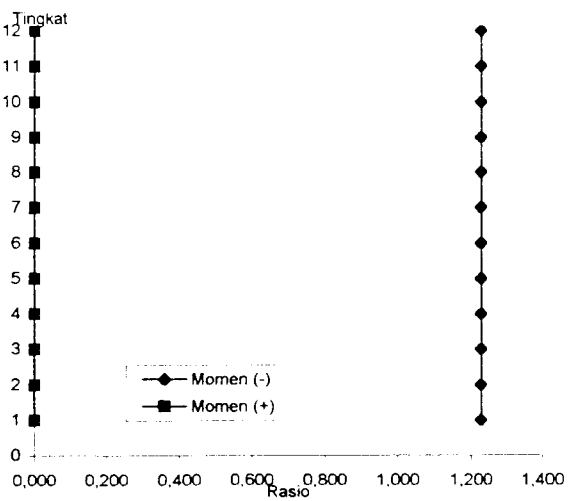
GAMBAR 6.2.9 MOMEN LAPANGAN
PORTAL E (4m) R/W 1/1 Lama



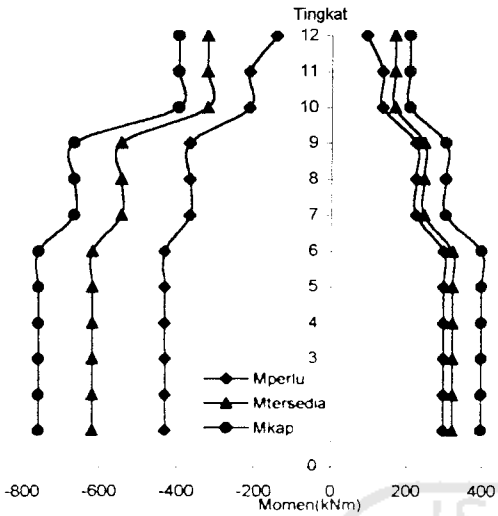
GAMBAR 6.2.10 RASIO MKAP/MTERSEDIA PORTAL E
(4m) R/W 1/1 Lama



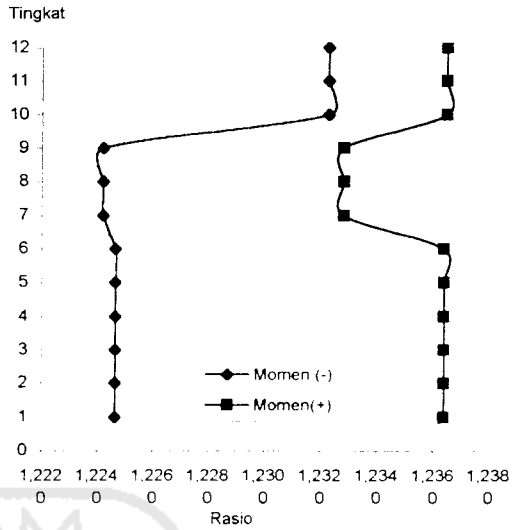
GAMBAR 6.2.11 MOMEN LAPANGAN
PORTAL 2 (5m) R/W 1/1 Lama



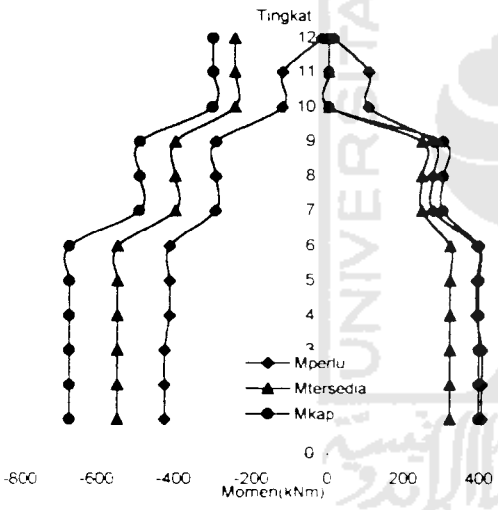
GAMBAR 6.2.12 RASIO MKAP/MTERSEDIA PORTAL 2
(5m) R/W 1/1 Lama



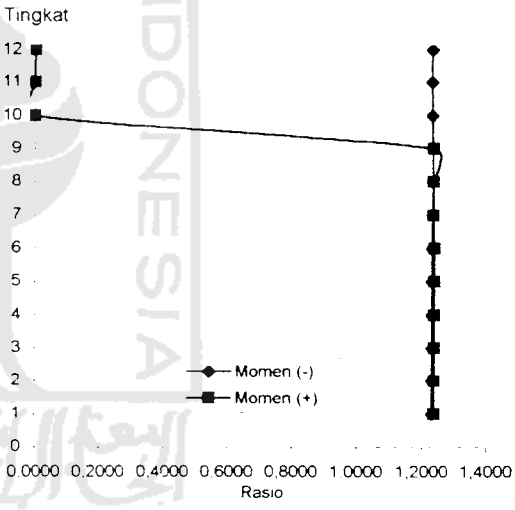
GAMBAR 6 2 13 MOMEN TUMPUAN
PORTAL E (7m) R/W 1/6 Baru



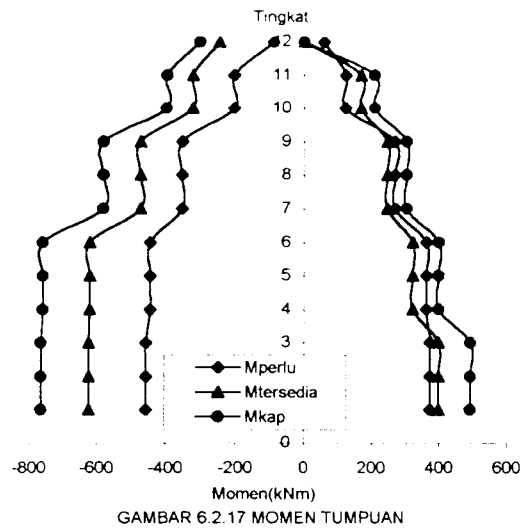
GAMBAR 6.2.14 RASIO MKAP/MTERSEDIA
PORTAL E (7 m) R/W 1/6 Baru



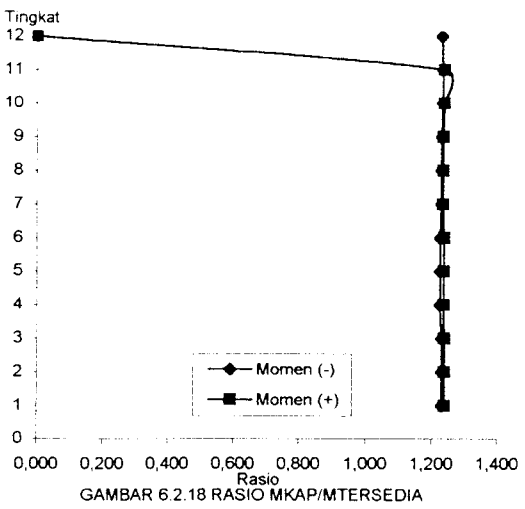
GAMBAR 6 2 15 MOMEN TUMPUAN
PORTAL E (4m) R/W 1/6 Baru



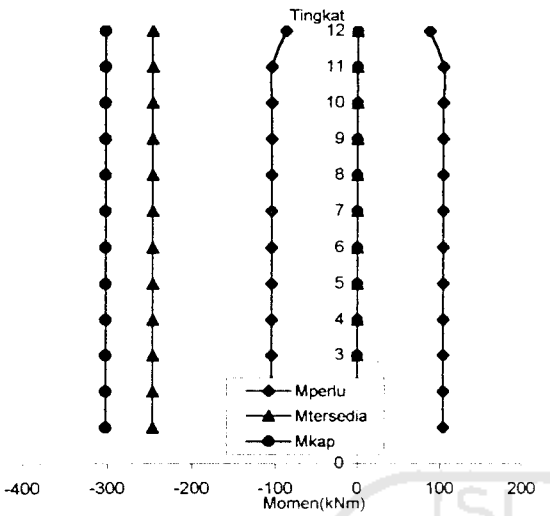
GAMBAR 6 2 16 RASIO MKAP/MTERSEDIA
PORTAL E (4m) R/W 1/6 Baru



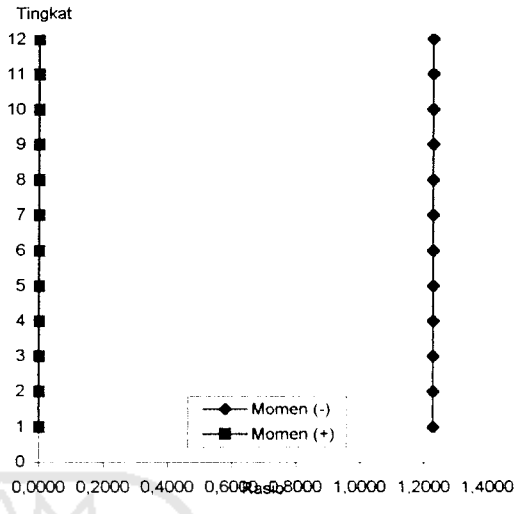
GAMBAR 6.2.17 MOMEN TUMPUAN
PORTAL 2 (5m) R/W 1/6 Baru



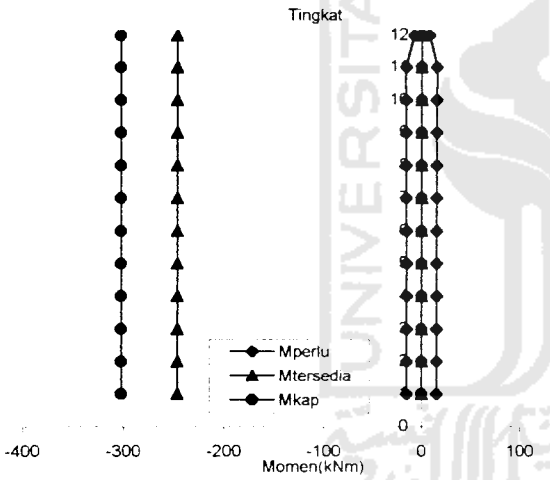
GAMBAR 6.2.18 RASIO MKAP/MTERSEDIA
PORTAL 2 (5m) R/W 1/6 Baru



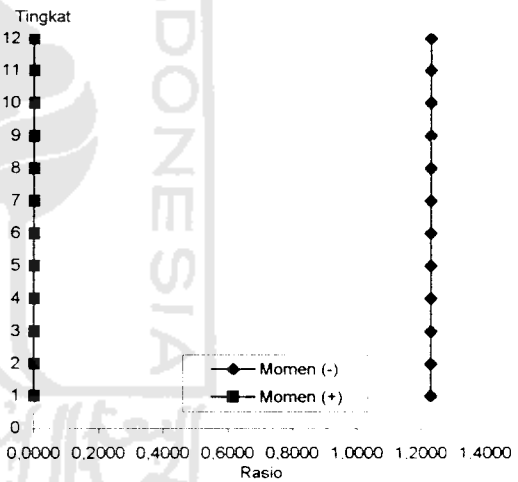
GAMBAR 6.2.19 MOMEN LAPANGAN
PORTAL E (7m) R/W 1/6 Baru



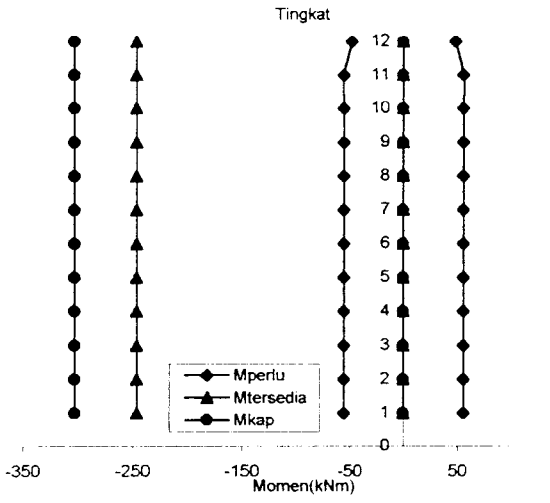
GAMBAR 6.2.20 RASIO MKAP/MTERSEDIA
PORTAL E (7m) R/W 1/6 Baru



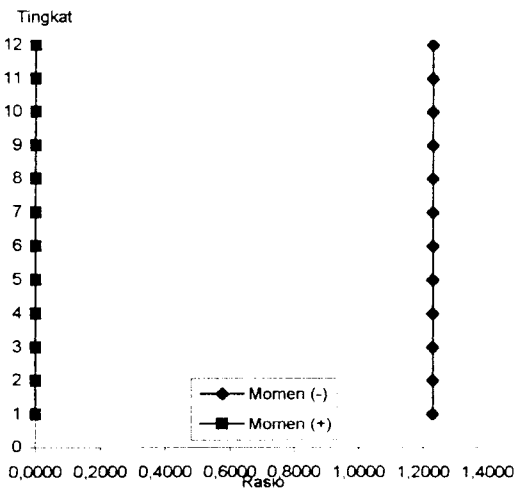
GAMBAR 6.2.21 MOMEN LAPANGAN
PORTAL E (4m) R/W 1/6 Baru



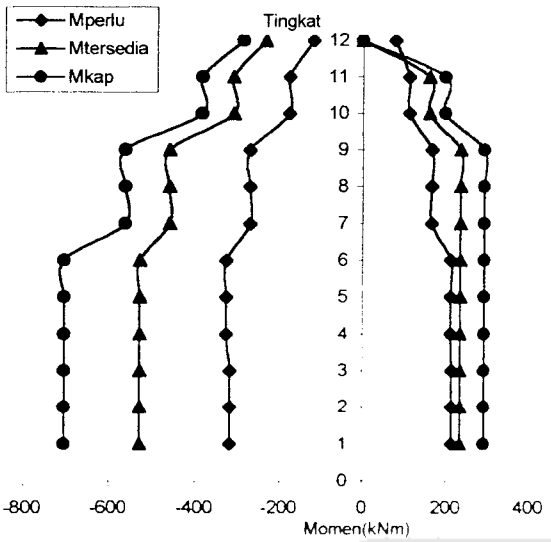
GAMBAR 6.2.22 RASIO MKAP/MTERSEDIA
PORTAL E(4m) R/W 1/6 Baru



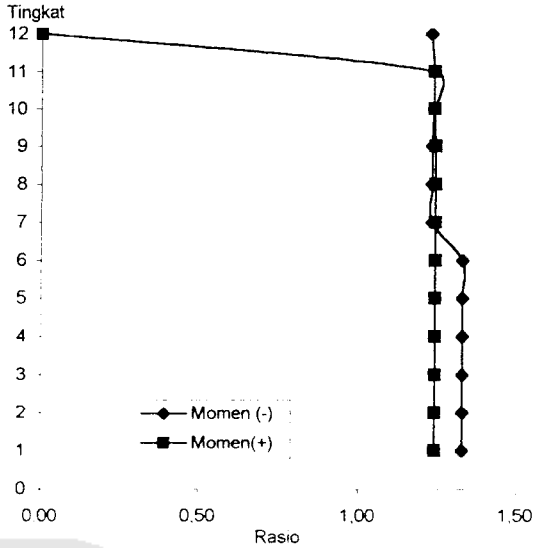
GAMBAR 6.2.23 MOMEN LAPANGAN
PORTAL 2 (5m) R/W 1/6 Baru



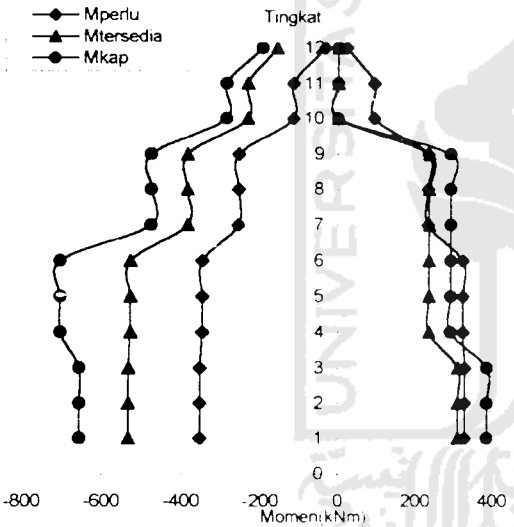
GAMBAR 6.2.24 RASIO MKAP/MTERSEDIA
PORTAL 2(5m) R/W 1/6 Baru



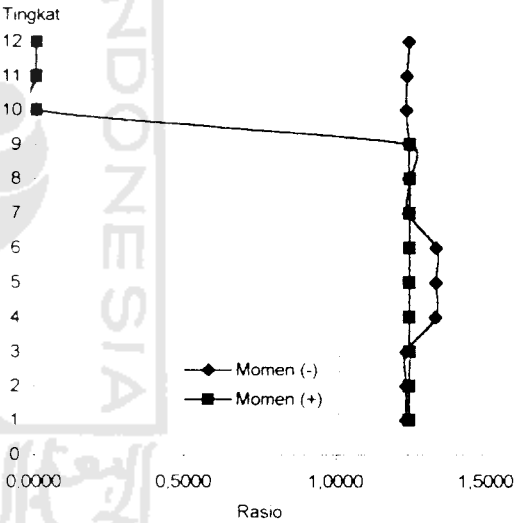
GAMBAR 6.2.25 MOMEN TUMPUAN PORTAL E (7m) R/W 2/2 Lama



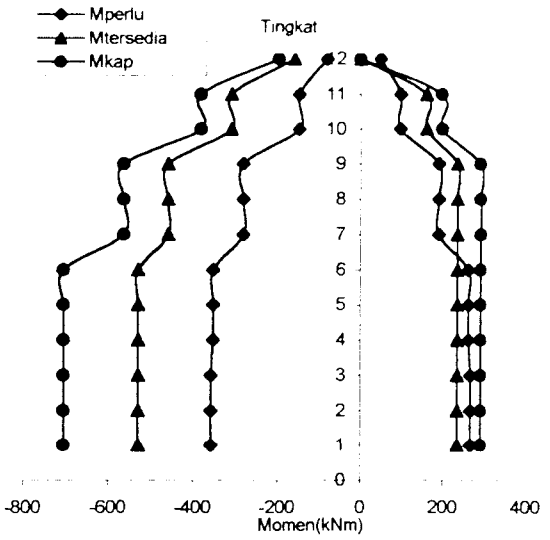
GAMBAR RASIO 6.2.26 MKAP/MTERSEDIA PORTAL E (7 m) R/W 2/2 Lama



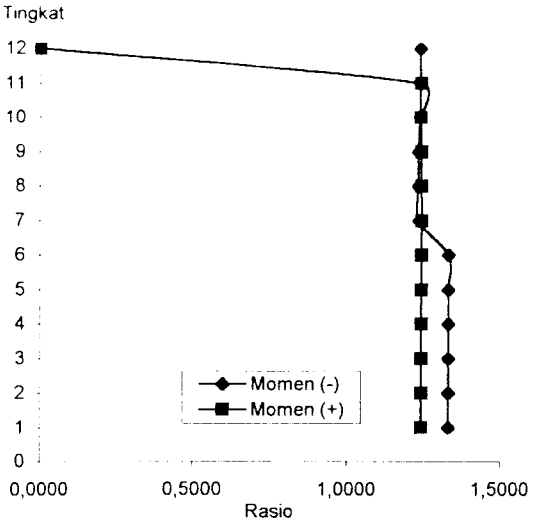
GAMBAR 6 2 27 MOMEN TUMPUAN PORTAL E (4m) R/W 2/2 Lama



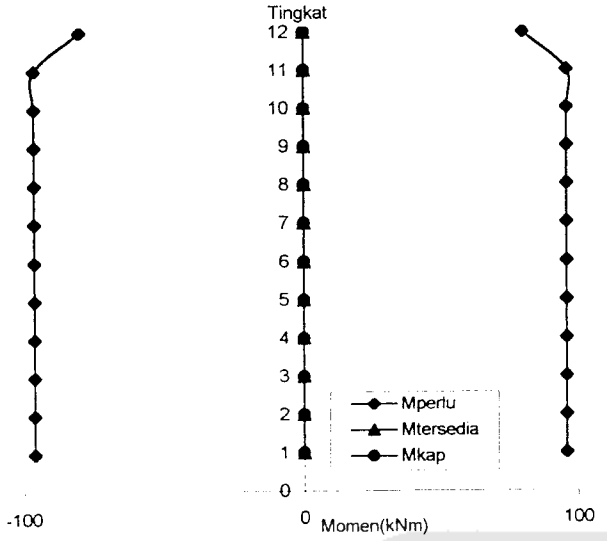
GAMBAR 6 2 28 RASIO MKAP/MTERSEDIA PORTAL E (4m) R/W 2/2 Lama



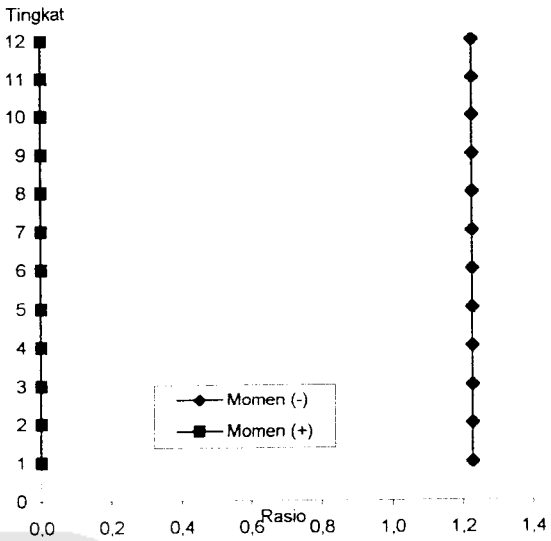
GAMBAR 6.2.29 MOMEN TUMPUAN PORTAL 2 (5m) R/W 2/2 Lama



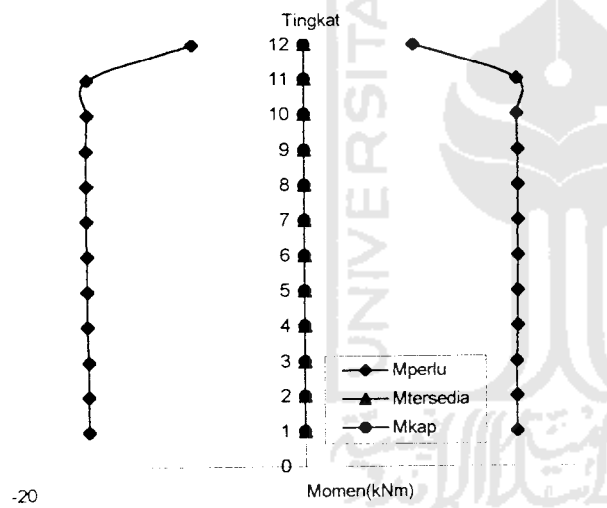
GAMBAR 6.2.30 RASIO MKAP/MTERSEDIA PORTAL 2 (5m) R/W 2/2 Lama



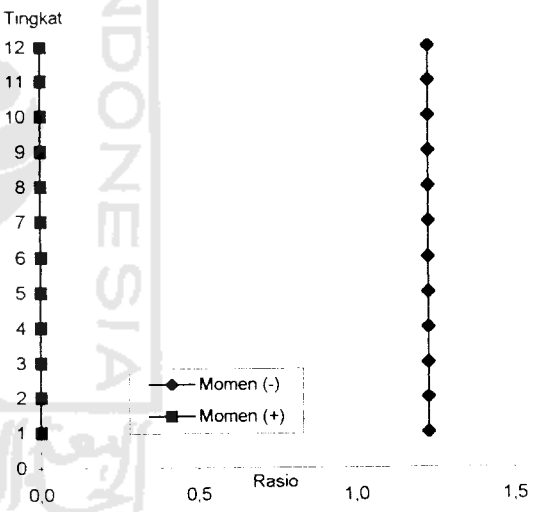
GAMBAR 6.2.31 MOMEN LAPANGAN
PORTALE (7m) R/W 2/2 Lama



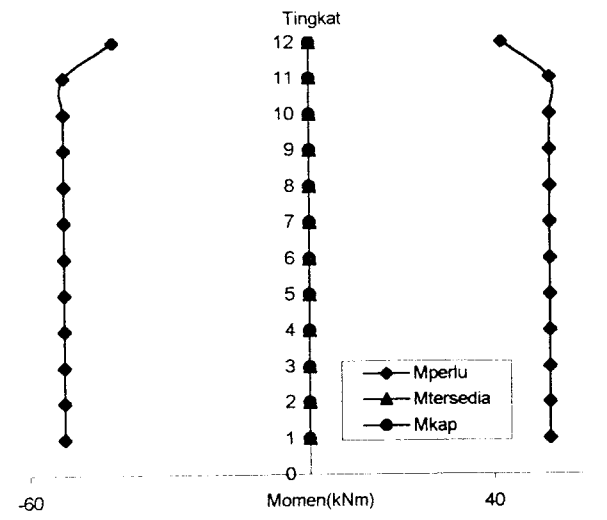
GAMBAR 6.2.32 RASIO MKAP/MTERSEDIA
PORTAL E(7m) R/W 2/2 Lama



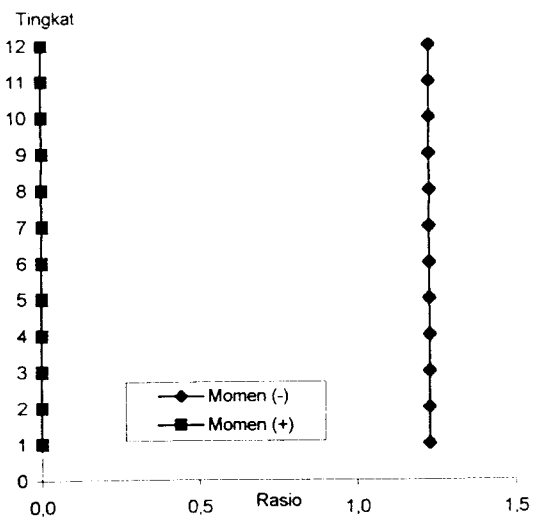
GAMBAR 6.2.33 MOMEN LAPANGAN
PORTALE(4m) R/W 2/2 Lama



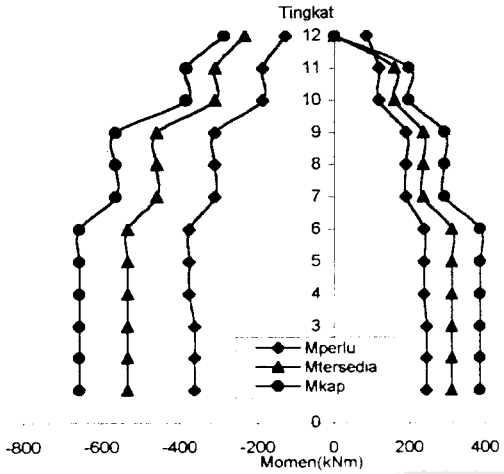
GAMBAR 6.2 34 RASIO MKAP/MTERSEDIA
PORTAL E(4m) R/W 2/2 Lama



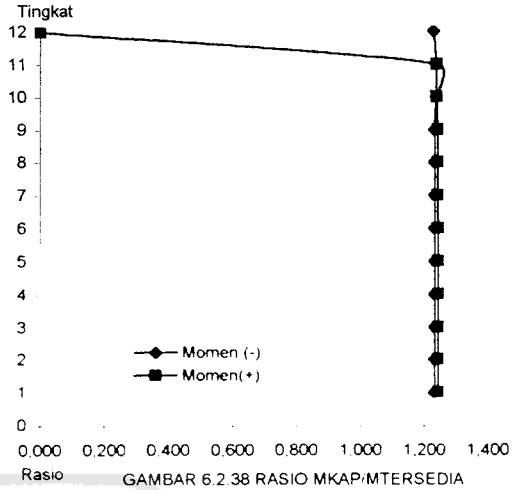
GAMBAR 6.2.35 MOMEN LAPANGAN
PORTAL 2 (5m) R/W 2/2 Lama



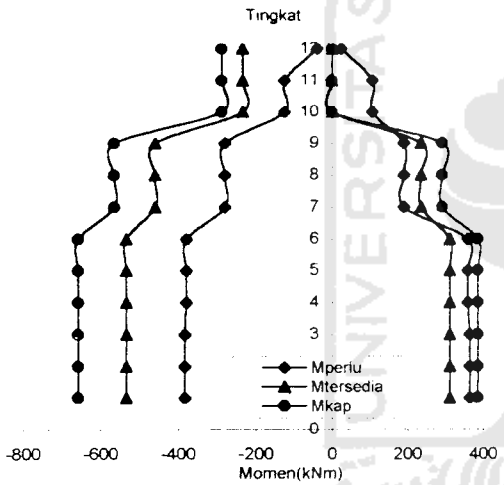
GAMBAR 6.2.36 RASIO MKAP/MTERSEDIA
PORTAL 2(5m) R/W 2/2 Lama



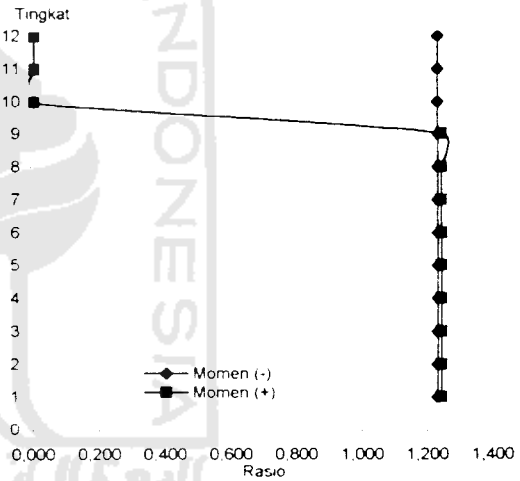
GAMBAR 6.2.37 MOMEN TUMPUAN
PORTAL E (7m) R/W 2/5 Baru



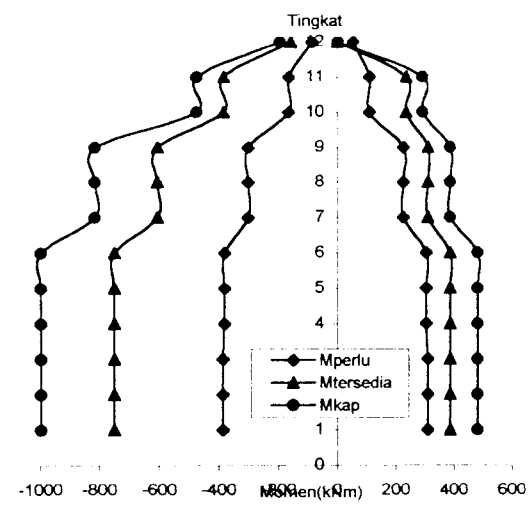
GAMBAR 6.2.38 RASIO MKAP/MTERSEDIA
PORTAL E (7m)R/W 2/5 Baru



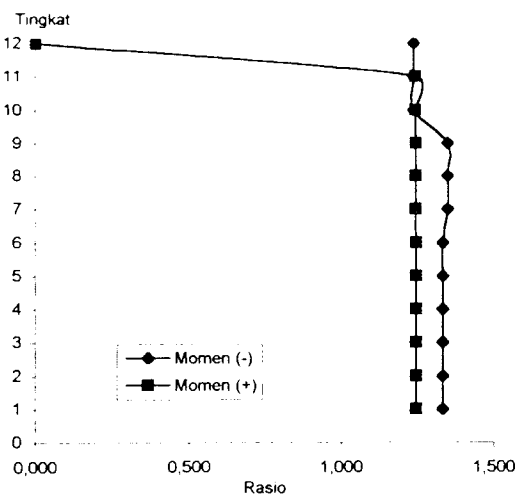
GAMBAR 6.2.39 MOMEN TUMPUAN
PORTAL E (4m) R/W 2/5 Baru



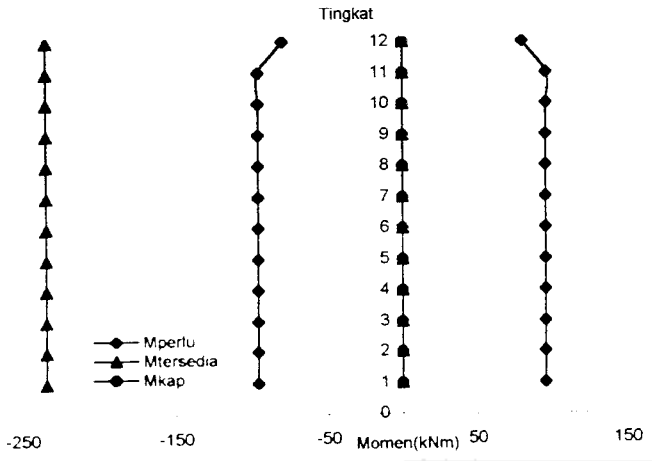
GAMBAR 6.2.40 RASIO MKAP/MTERSEDIA
PORTAL E (4m) R/W 2/5 Baru



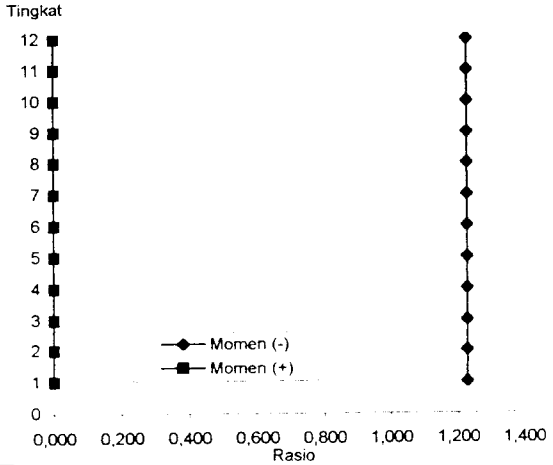
GAMBAR 6.2.41 MOMEN TUMPUAN
PORTAL 2 (5m) R/W 2/5 Baru



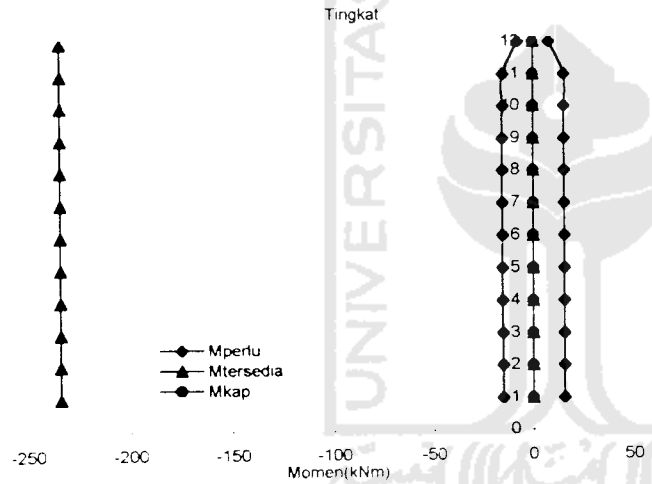
GAMBAR 6.2.42 RASIO MKAP/MTERSEDIA
PORTAL 2 (5m) R/W 2/5 Baru



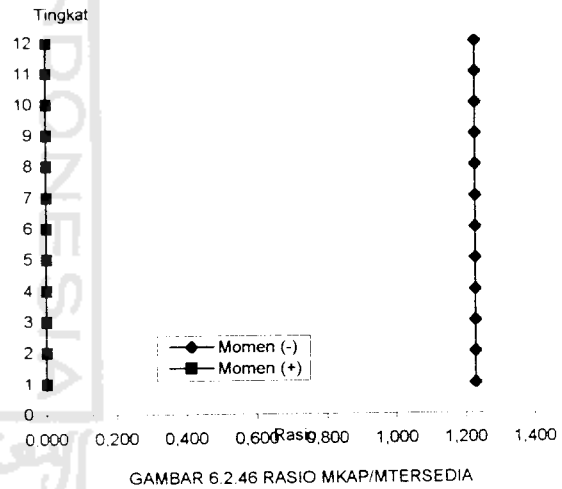
GAMBAR 6.2.43 MOMEN LAPANGAN
PORTAL E (7m) R/W 2/5 Baru



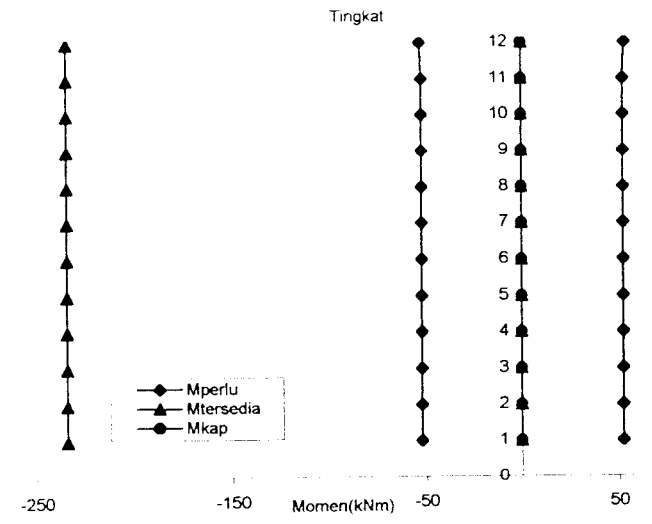
GAMBAR 6.2.44 RASIO MKAP/MTERSEDIA
PORTAL E (7m) R/W 2/5 Baru



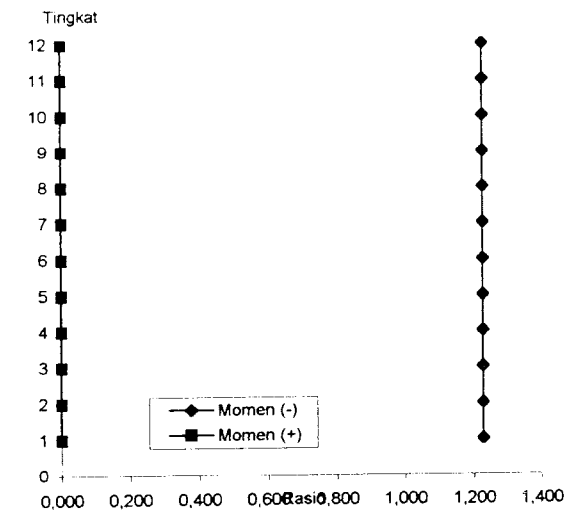
GAMBAR 6.2.45 MOMEN LAPANGAN
PORTAL E (4m) R/W 2/5 Baru



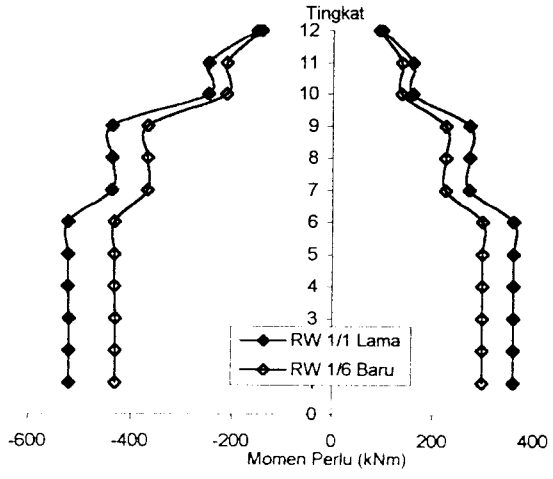
GAMBAR 6.2.46 RASIO MKAP/MTERSEDIA
PORTAL E (4m) R/W 2/5 Baru



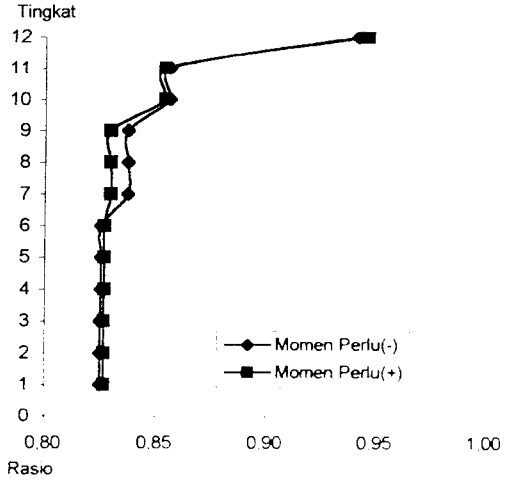
GAMBAR 6.2.47 MOMEN LAPANGAN
PORTAL 2 (5m) R/W 2/5 Baru



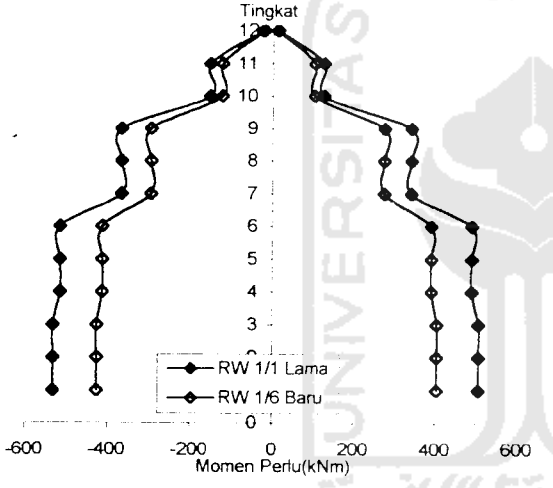
GAMBAR 6.2.48 RASIO MKAP/MTERSEDIA
PORTAL 2 (5m) R/W 2/5 Baru



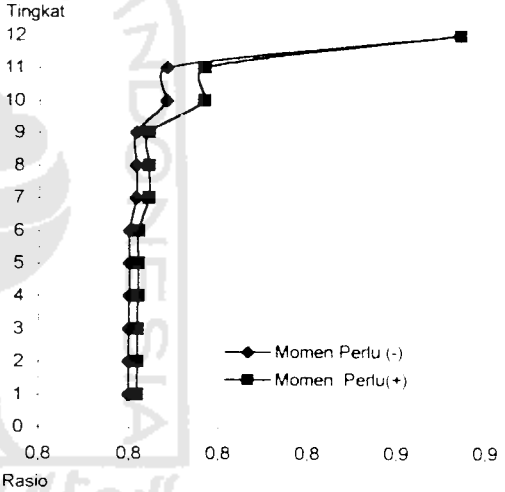
GAMBAR 6.2.49 MOMEN PERLU TUMPUAN PORTAL E (7m)



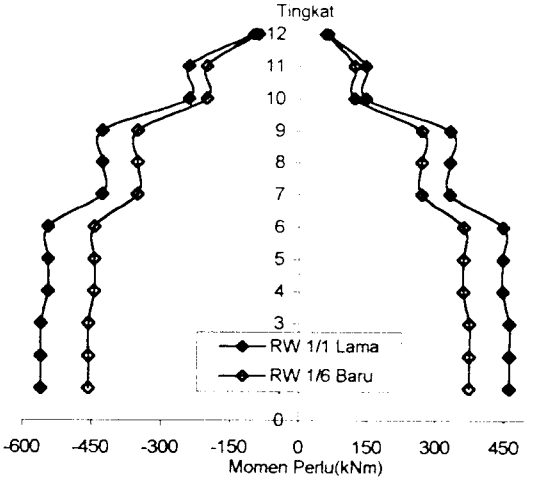
GAMBAR 6.2.50 RASIO MPERLU RW 1/1 LAMA dan RW 1/6 BARU TUMPUAN PORTAL E (7m)



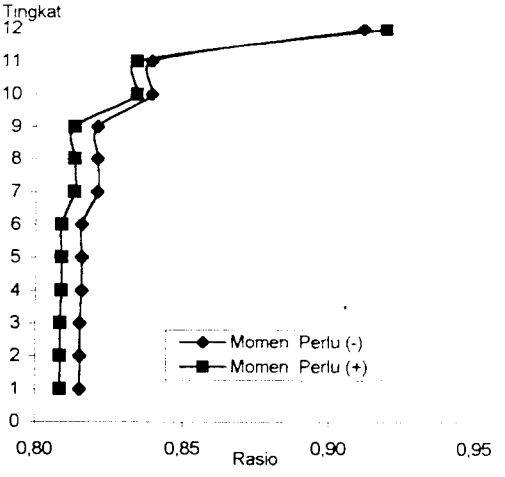
GAMBAR 6.2.51 MOMEN PERLU TUMPUAN PORTAL E (4m)



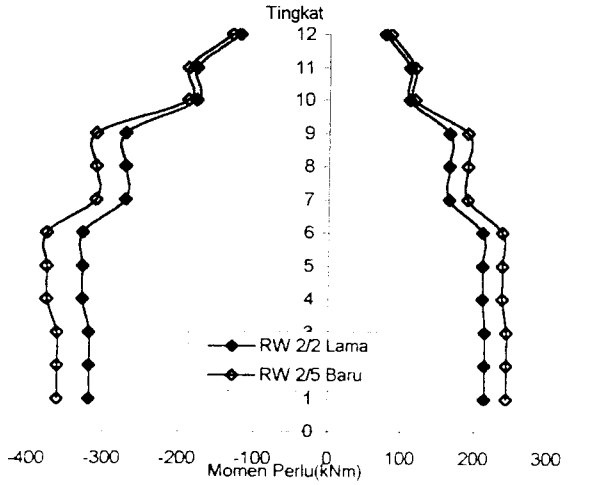
GAMBAR 6.2.52 RASIO MPERLU RW 1/1 LAMA dan RW 1/6 BARU TUMPUAN PORTAL E (4m)



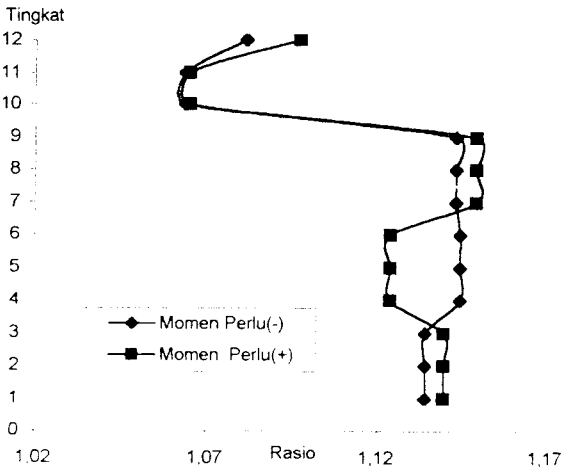
GAMBAR 6.2.53 MOMEN PERLU TUMPUAN PORTAL 2 (5m)



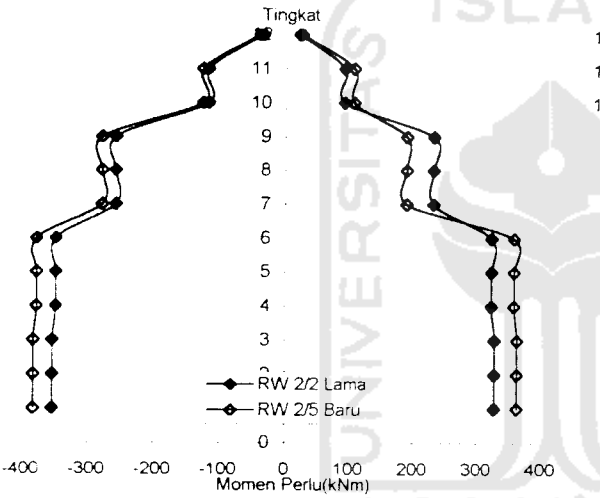
GAMBAR 6.2.54 RASIO MPERLU RW 1/1 LAMA dan RW 1/6 BARU TUMPUAN PORTAL 2 (5m)



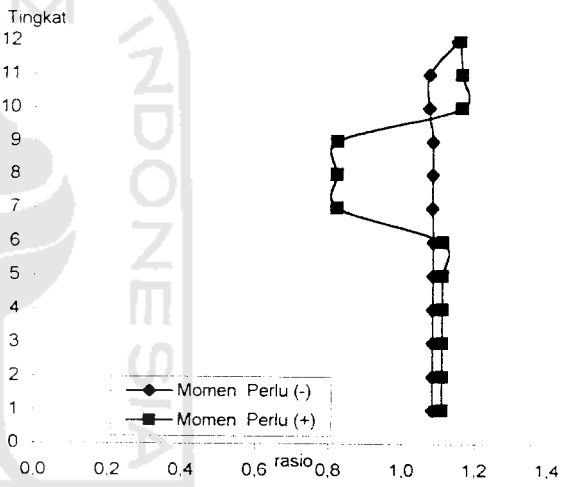
GAMBAR 6.2.55 MOMEN PERLU TUMPUAN PORTAL E (7m)



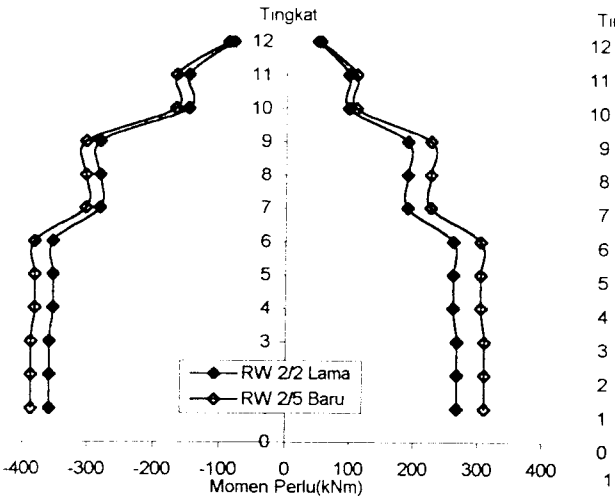
GAMBAR 6.2.56 RASIO MPERLU RW 2/2 LAMA dan RW 2/5 BARU TUMPUAN PORTAL E (7m)



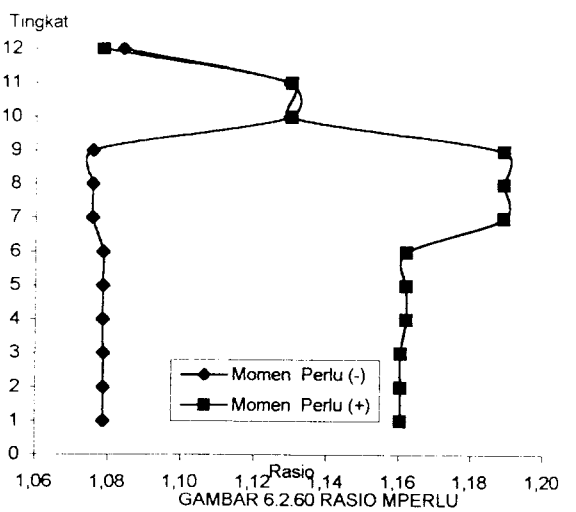
GAMBAR 6.2.57 MOMEN PERLU TUMPUAN PORTAL E (4m)



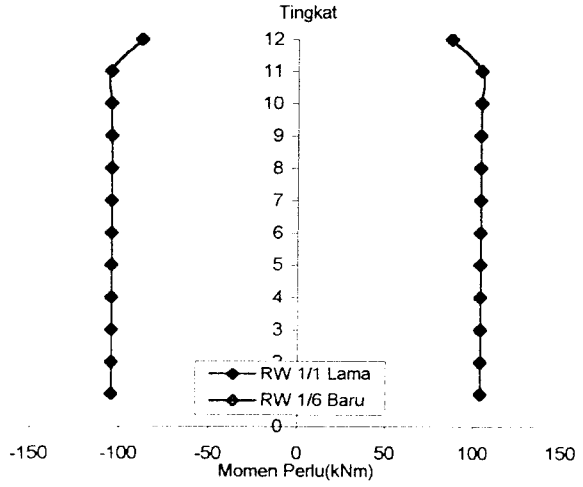
GAMBAR 6.2.58 RASIO MPERLU RW 2/2 LAMA dan RW 2/5 BARU TUMPUAN PORTAL E (4m)



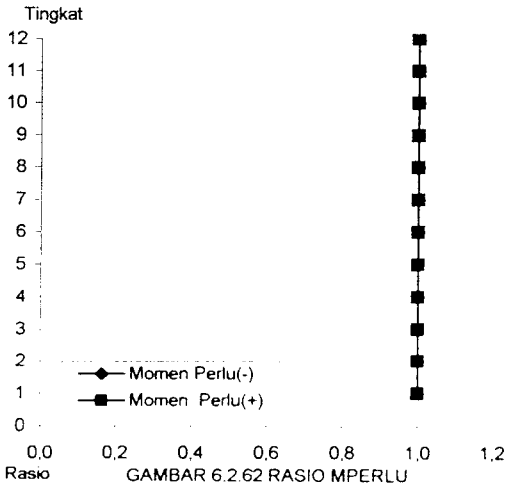
GAMBAR 6.2.59 MOMEN PERLU TUMPUAN PORTAL 2 (5m)



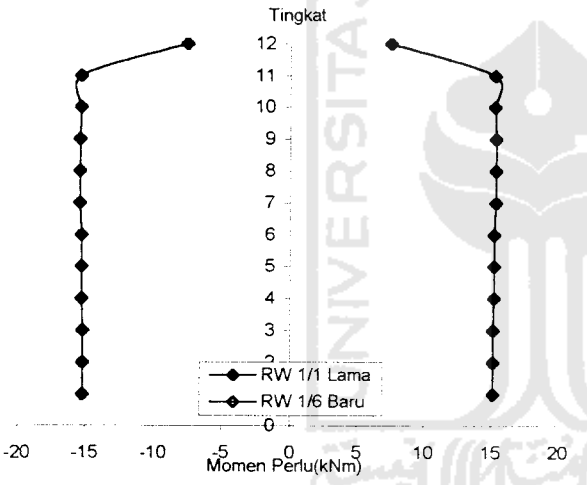
GAMBAR 6.2.60 RASIO MPERLU RW 2/2 LAMA dan RW 2/5 BARU TUMPUAN PORTAL 2 (5m)



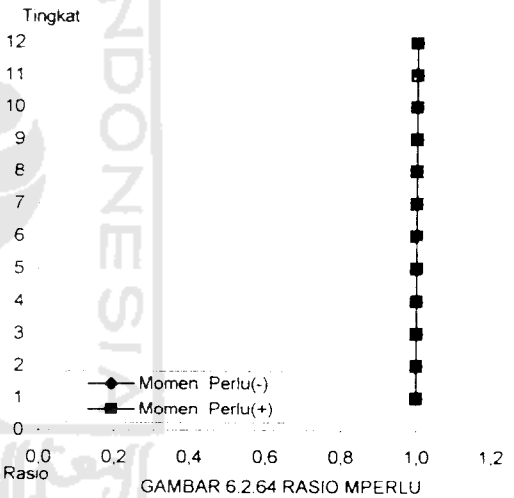
GAMBAR 6.2.61 MOMEN PERLU LAPANGAN PORTAL E (7m)



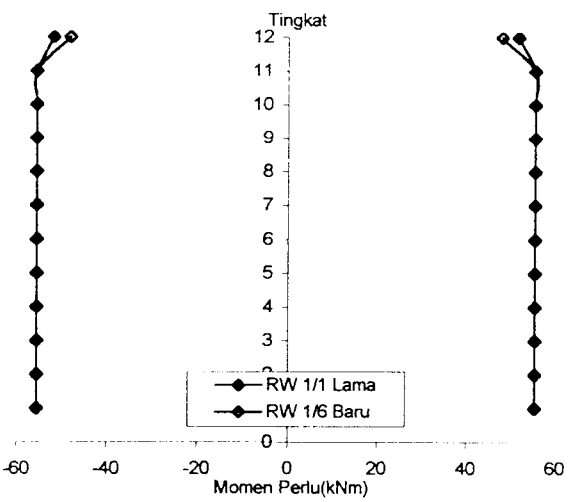
GAMBAR 6.2.62 RASIO MPERLU RW 1/1 LAMA dan RW 1/6 BARU LAPANGAN PORTAL E (7m)



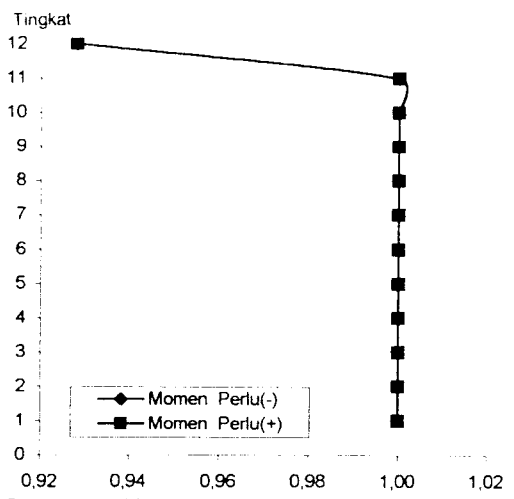
GAMBAR 6.2.63 MOMEN PERLU LAPANGAN PORTAL E (4m)



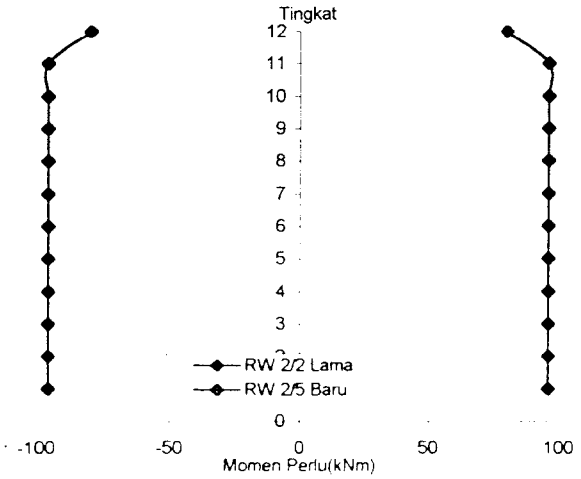
GAMBAR 6.2.64 RASIO MPERLU RW 1/1 LAMA dan RW 1/6 BARU LAPANGAN PORTAL E (4m)



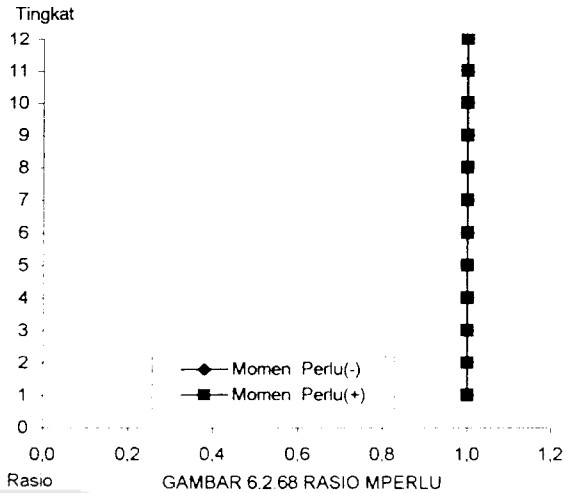
GAMBAR 6.2.65 MOMEN PERLU LAPANGAN PORTAL 2 (5m)



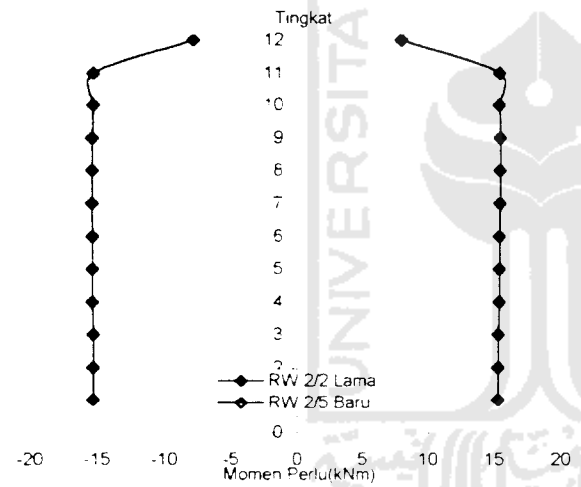
GAMBAR 6.2.66 RASIO MPERLU RW 1/1 LAMA dan RW 1/6 BARU LAPANGAN PORTAL 2 (5m)



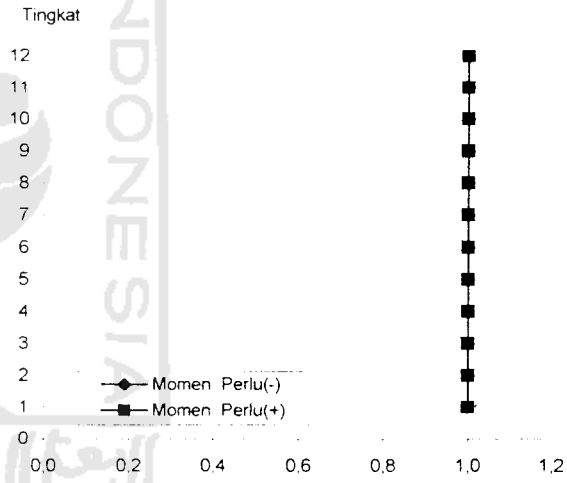
GAMBAR 6.2.67 MOMEN PERLU
LAPANGAN PORTAL E (7m)



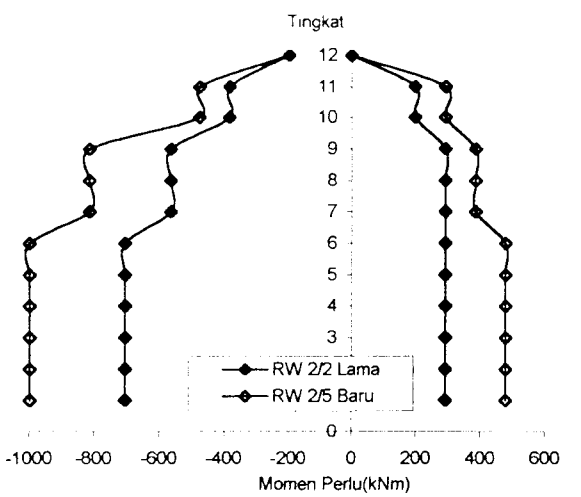
GAMBAR 6.2.68 RASIO MPERLU
RW 2/2 LAMA dan RW 2/5 BARU
LAPANGAN PORTAL E (7m)



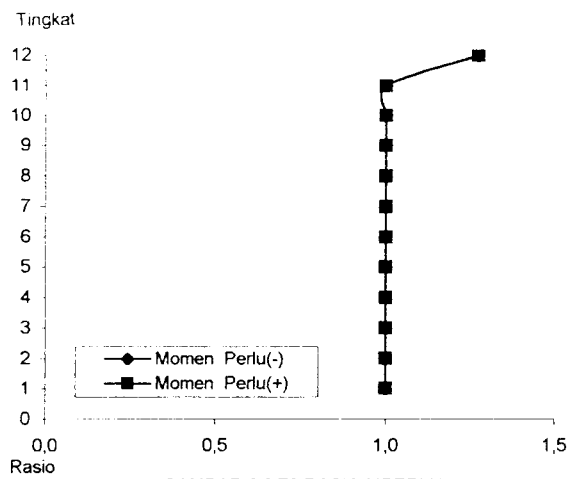
GAMBAR 6.2.69 MOMEN PERLU
LAPANGAN PORTAL E (4m)



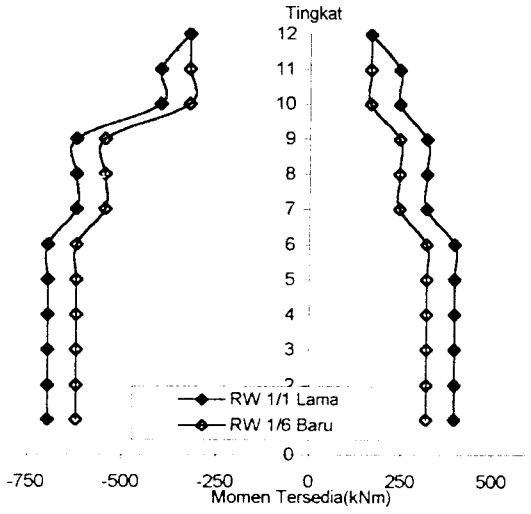
GAMBAR 6.2.70 RASIO MPERLU
RW 2/2 LAMA dan RW 2/5 BARU
LAPANGAN PORTAL E (4m)



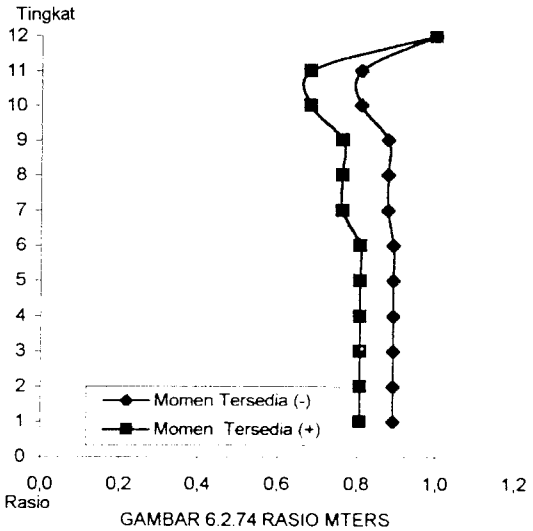
GAMBAR 6.2.71 MOMEN PERLU
LAPANGAN PORTAL 2 (5m)



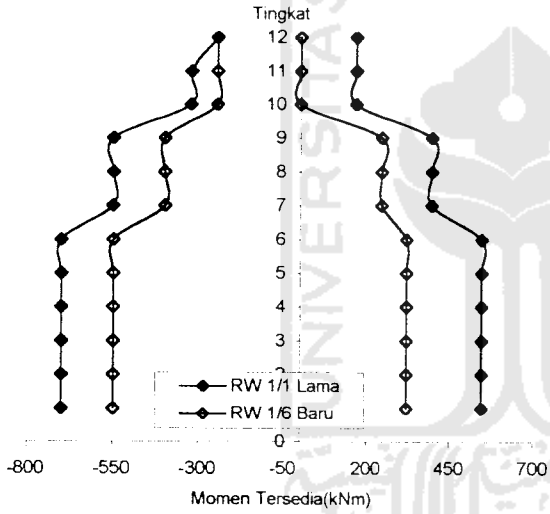
GAMBAR 6.2.72 RASIO MPERLU
RW 2/2 LAMA danRW 2/5 BARU
LAPANGAN PORTAL 2(5m)



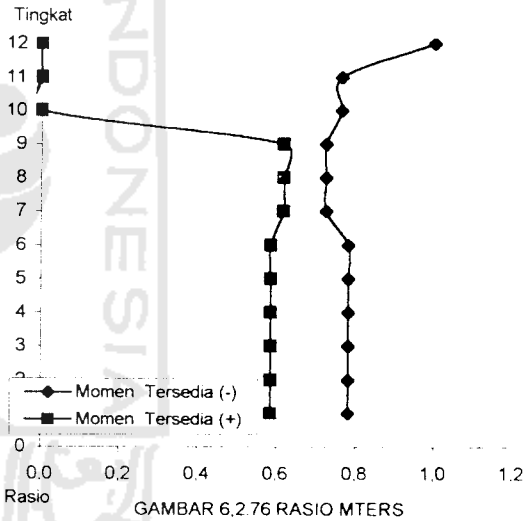
GAMBAR 6.2.73 MOMEN TERSEDIA TUMPUAN
PORTAL E (7m)



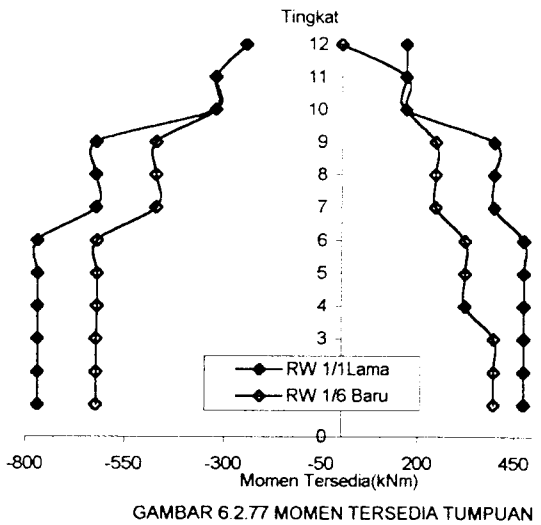
GAMBAR 6.2.74 RASIO MTERS
RW 1/1 LAMA dan RW 1/6 BARU TUMPUAN
PORTAL E (7m)



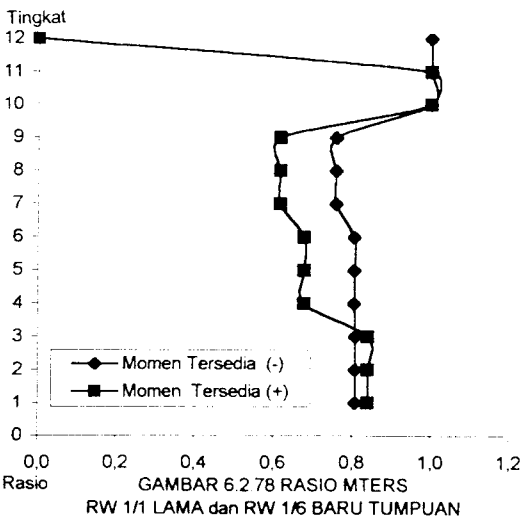
GAMBAR 6.2.75 MOMEN TERSEDIA TUMPUAN
PORTAL E (4m)



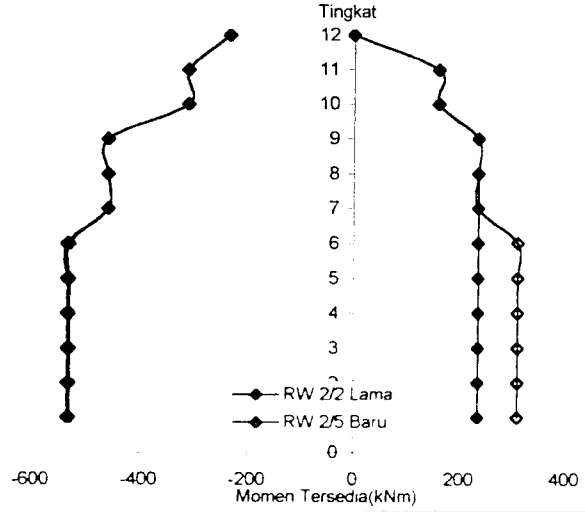
GAMBAR 6.2.76 RASIO MTERS
RW 1/1 LAMA dan RW 1/6 BARU TUMPUAN
PORTAL E (4m)



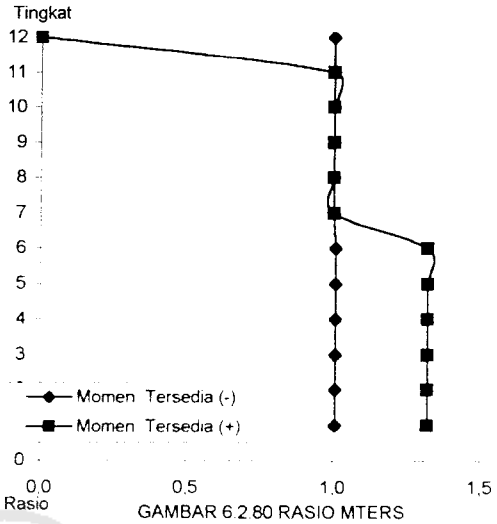
GAMBAR 6.2.77 MOMEN TERSEDIA TUMPUAN
PORTAL 2 (5m)



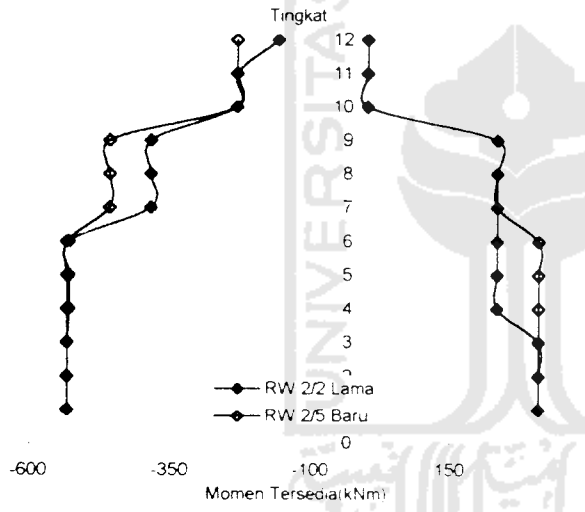
GAMBAR 6.2.78 RASIO MTERS
RW 1/1 LAMA dan RW 1/6 BARU TUMPUAN
PORTAL 2 (5m)



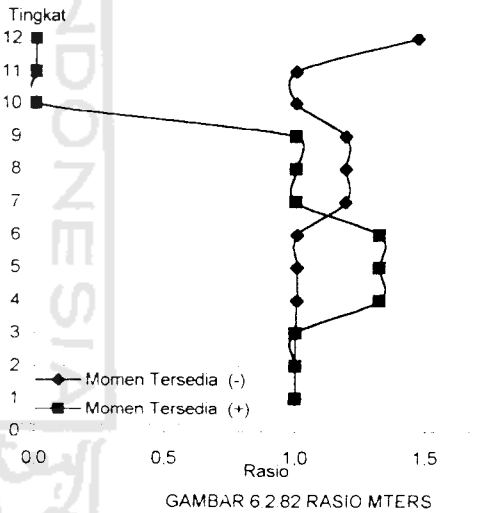
GAMBAR 6 2 79 MOMEN TERSEDIA TUMPUAN PORTAL E (7m)



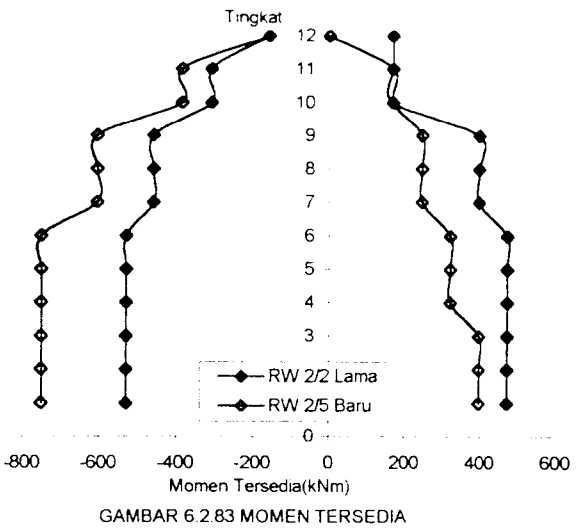
GAMBAR 6 2 80 RASIO MTERS RW 2/2 LAMA dan RW 2/6 BARU TUMPUAN PORTAL E (7m)



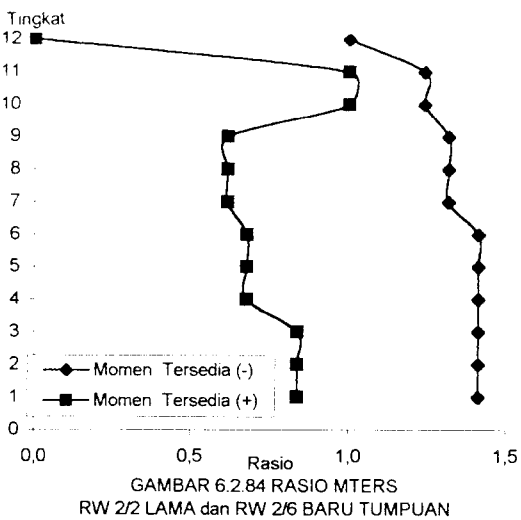
GAMBAR 6 2 81 MOMEN TERSEDIA TUMPUAN PORTAL E (4m)



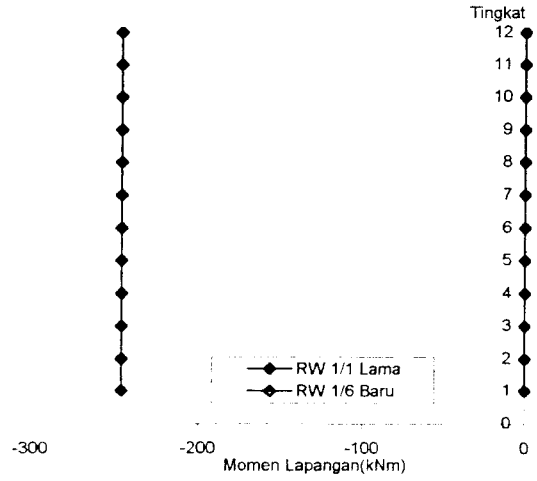
GAMBAR 6 2 82 RASIO MTERS RW 2/2 LAMA dan RW 2/6 BARU TUMPUAN PORTAL E (4m)



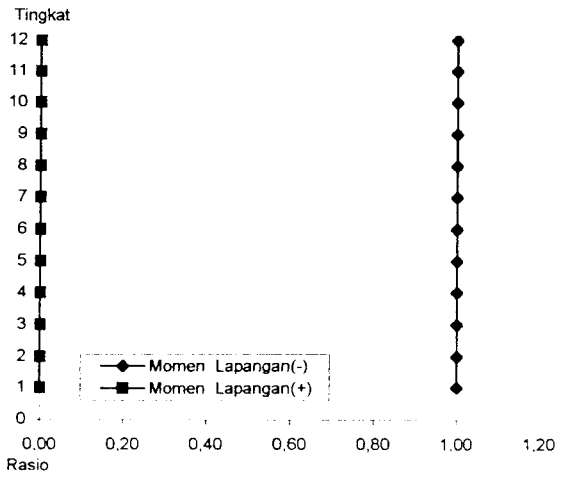
GAMBAR 6.2.83 MOMEN TERSEDIA TUMPUAN PORTAL 2 (5m)



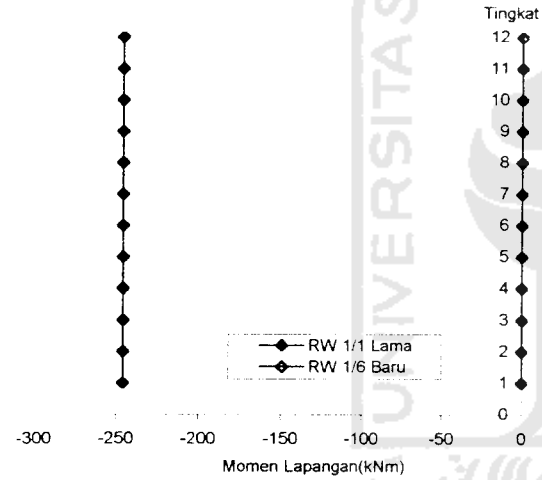
GAMBAR 6.2.84 RASIO MTERS RW 2/2 LAMA dan RW 2/6 BARU TUMPUAN PORTAL 2 (5m)



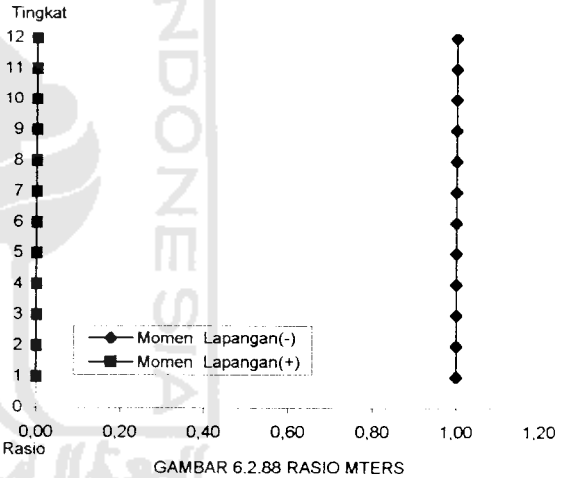
GAMBAR 6.2.85 MOMEN TERSEDIA LAPANGAN PORTAL E (7m)



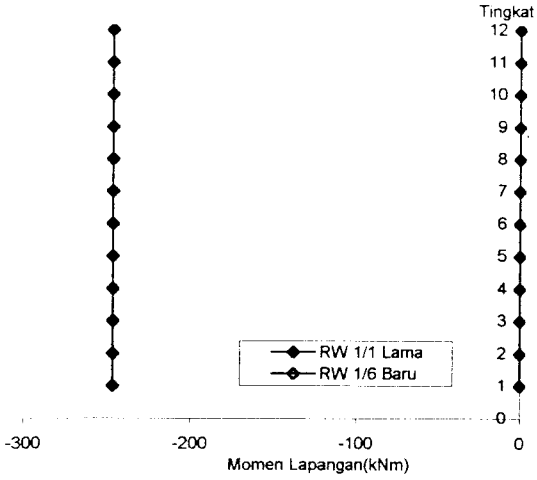
GAMBAR 6.2.86 RASIO MTERS RW 1/1 LAMA dan RW 1/6 BARU LAPANGAN PORTAL E (7m)



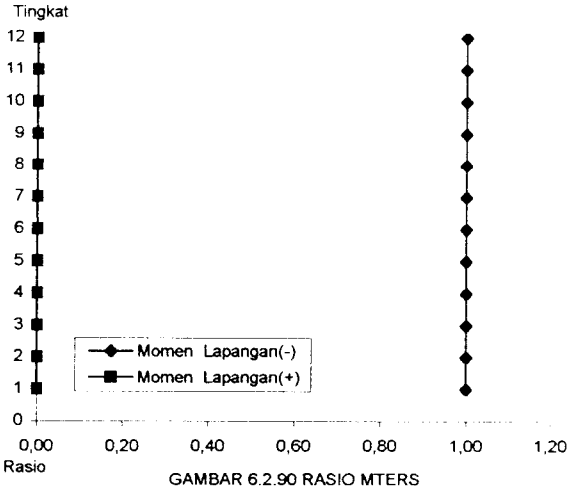
GAMBAR 6.2.87 MOMEN TERSEDIA LAPANGAN PORTAL E (4m)



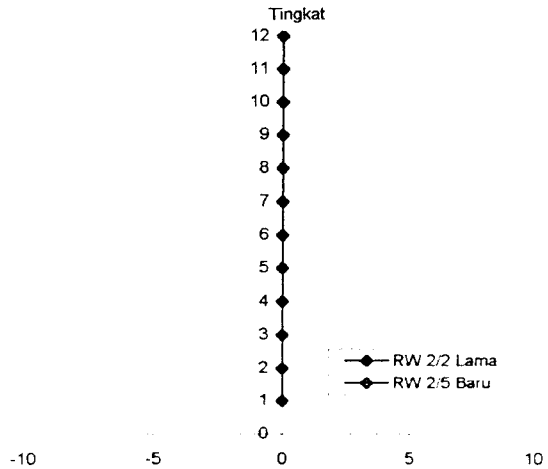
GAMBAR 6.2.88 RASIO MTERS RW 1/1 LAMA dan RW 1/6 BARU LAPANGAN PORTAL E (4m)



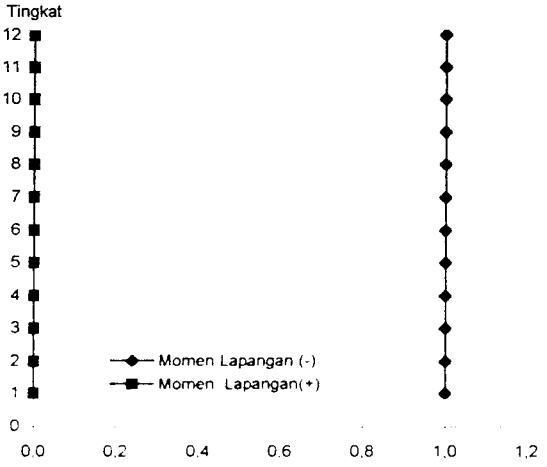
GAMBAR 6.2.89 MOMEN TERSEDIA LAPANGAN PORTAL 2 (5m)



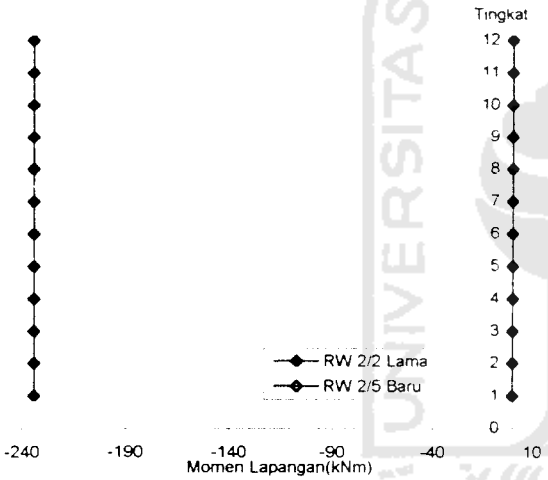
GAMBAR 6.2.90 RASIO MTERS RW 1/1 LAMA dan RW 1/6 BARU LAPANGAN PORTAL 2 (5m)



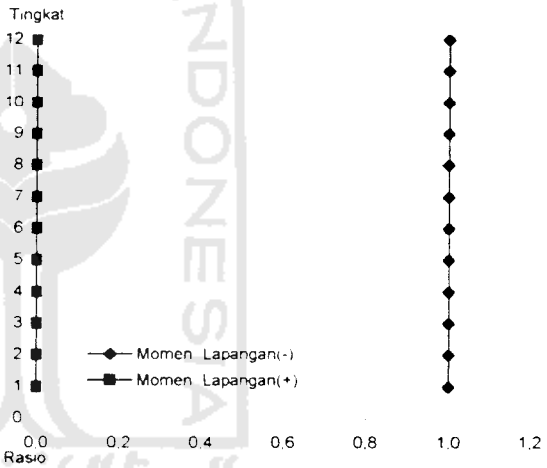
GAMBAR 6.2.91 MOMEN TERSEDIA LAPANGAN PORTAL E (7m)



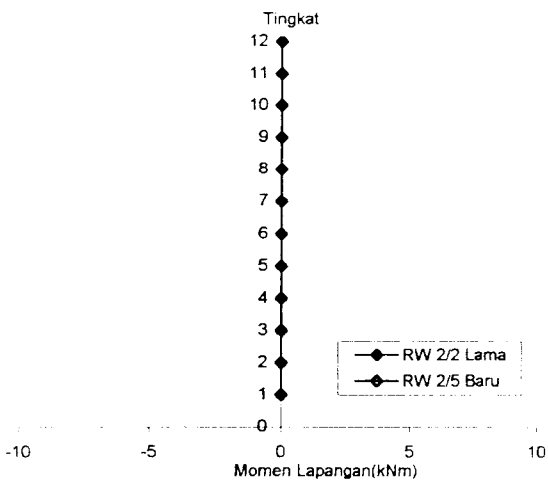
GAMBAR 6.2.92 RASIO MTERS RW 2/2 LAMA dan RW 2/5 BARU LAPANGAN PORTAL E (7m)



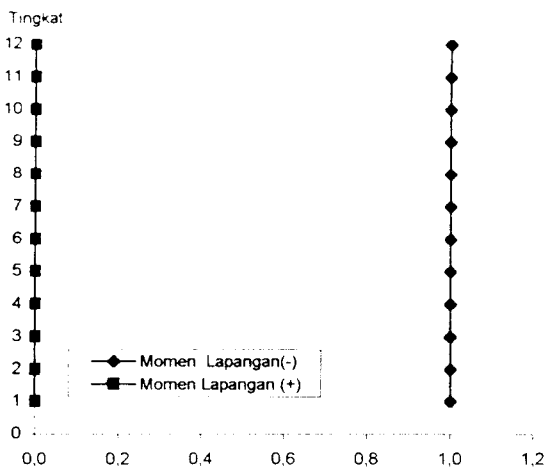
GAMBAR 6.2.93 MOMEN TERSEDIA LAPANGAN PORTAL E (4m)



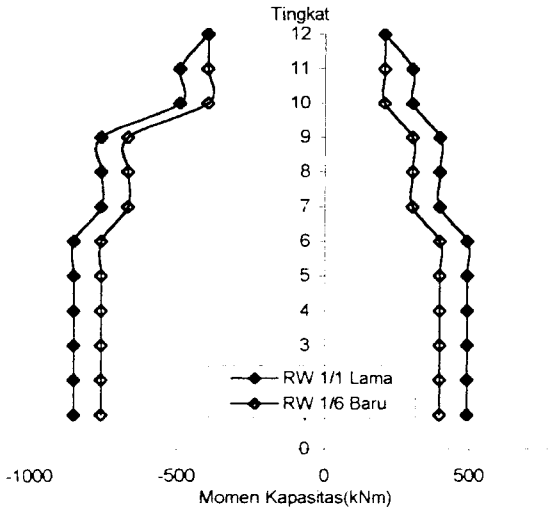
GAMBAR 6.2.94 RASIO MTERS RW 2/2 LAMA dan RW 2/5 BARU LAPANGAN PORTAL E (4m)



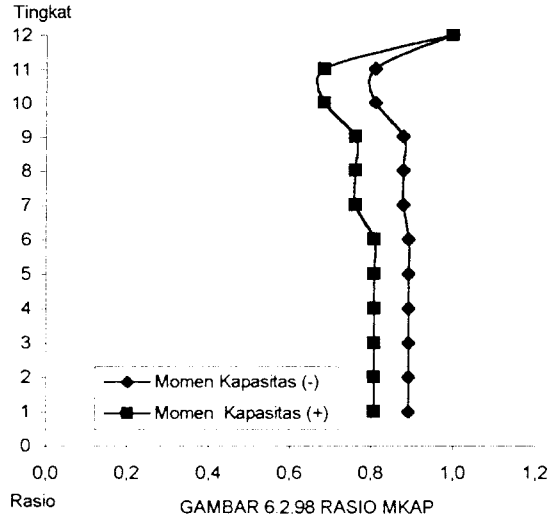
GAMBAR 6.2.95 MOMEN TERSEDIA LAPANGAN PORTAL 2 (5m)



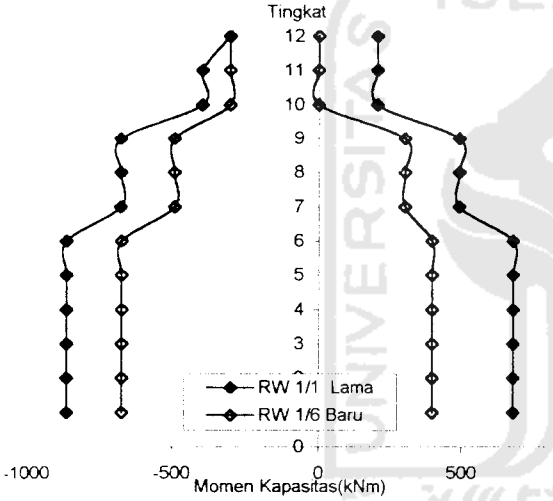
GAMBAR 6.2.96 RASIO MTERS RW 2/2 LAMA dan RW 2/5 BARU LAPANGAN PORTAL 2 (5m)



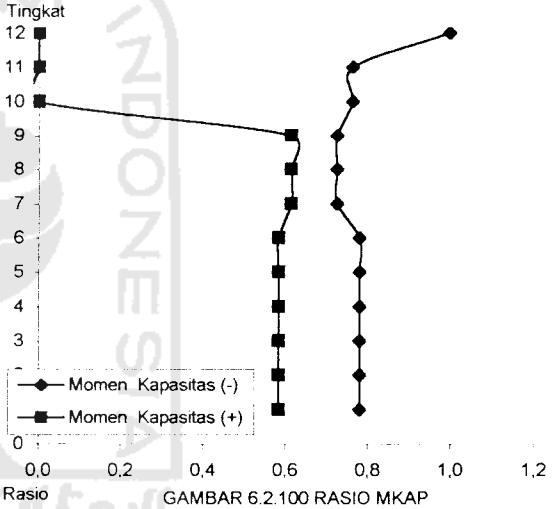
GAMBAR 6.2.97 MOMEN KAPASITAS TUMPUAN PORTAL E (7m)



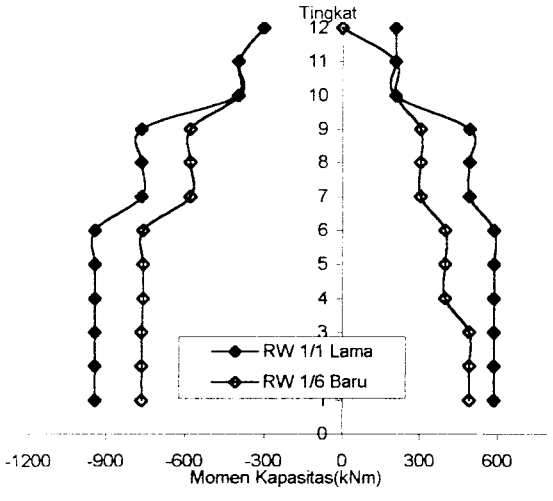
GAMBAR 6.2.98 RASIO MKAP RW 1/1 LAMA dan RW 1/6 BARU TUMPUAN PORTAL E (7m)



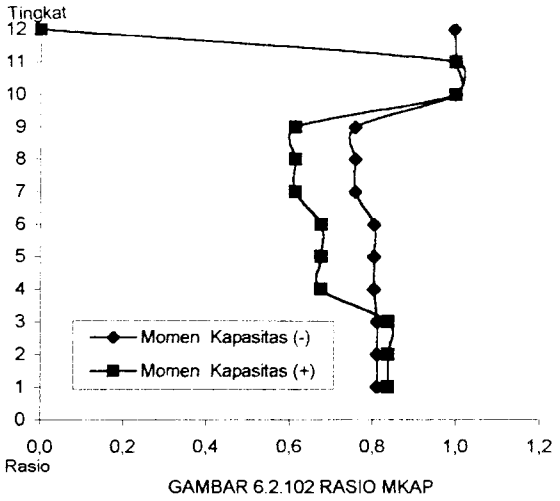
GAMBAR 6.2.99 MOMEN KAPASITAS TUMPUAN PORTAL E (4m)



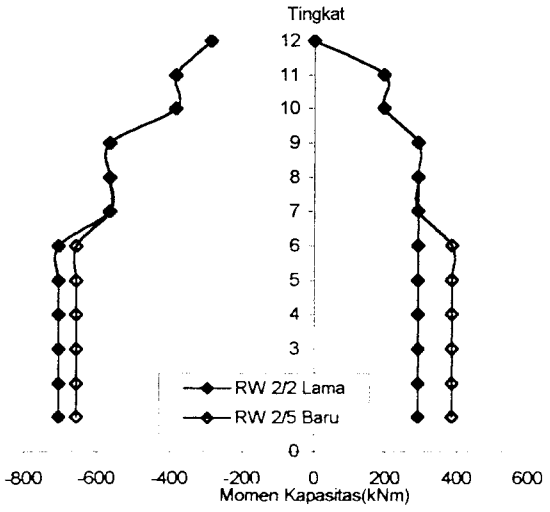
GAMBAR 6.2.100 RASIO MKAP RW 1/1 LAMA dan RW 1/6 BARU TUMPUAN PORTAL E (4m)



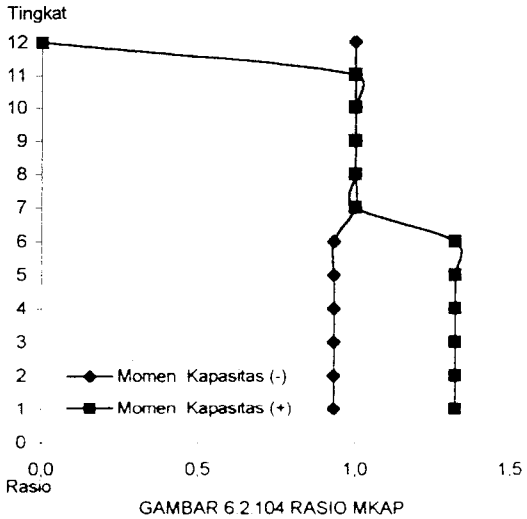
GAMBAR 6.2.101 MOMEN KAPASITAS TUMPUAN PORTAL 2 (5m)



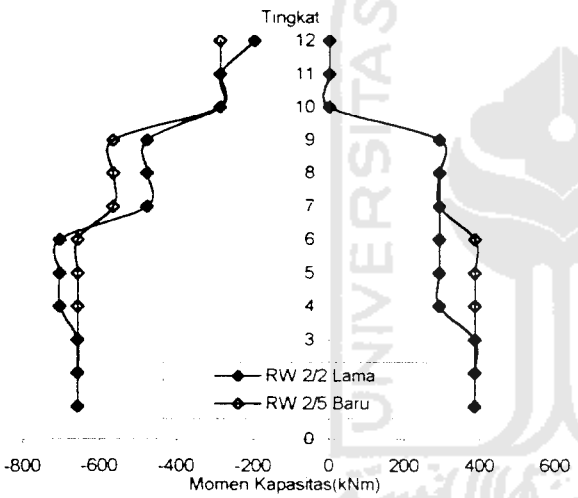
GAMBAR 6.2.102 RASIO MKAP RW 1/1 LAMA dan RW 1/6 BARU TUMPUAN PORTAL 2 (5m)



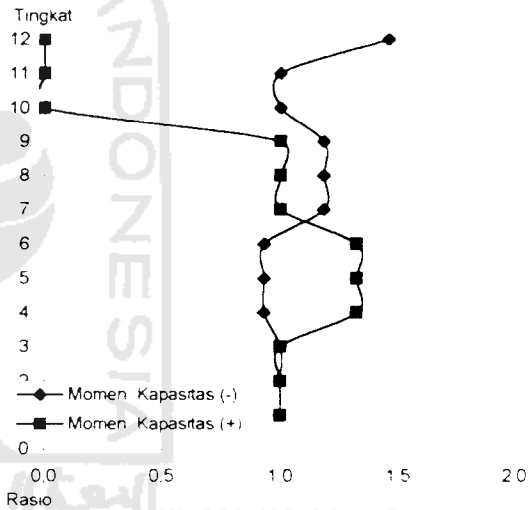
GAMBAR 6.2.103 MOMEN KAPASITAS TUMPUAN
PORTAL E (7m)



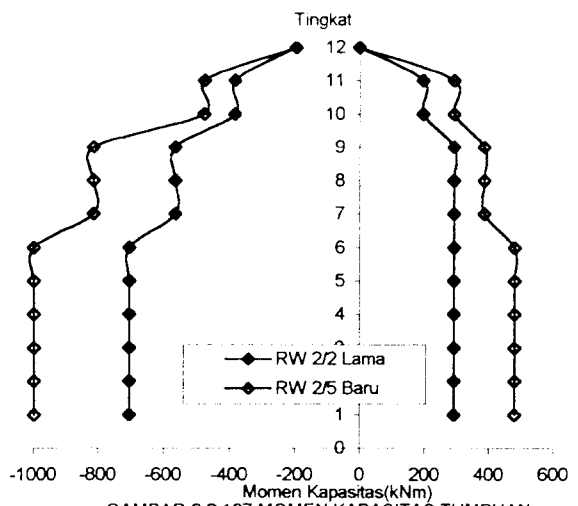
GAMBAR 6.2.104 RASIO MKAP
RW 2/2 LAMA dan RW 2/6 BARU TUMPUAN
PORTAL E (7m)



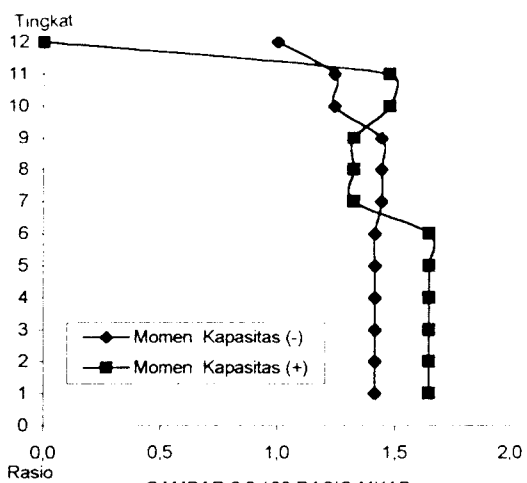
GAMBAR 6.2.105 MOMEN KAPASITAS TUMPUAN
PORTAL E (4m)



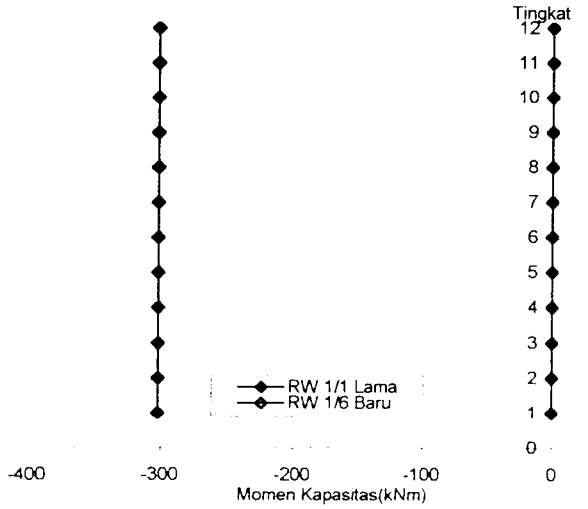
GAMBAR 6.2.106 RASIO MKAP
RW 2/2 LAMA dan RW 2/6 BARU TUMPUAN
PORTAL E (4m)



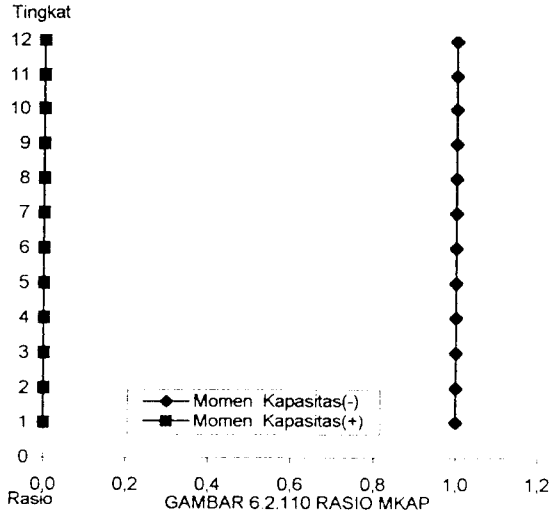
GAMBAR 6.2.107 MOMEN KAPASITAS TUMPUAN
PORTAL 2 (5m)



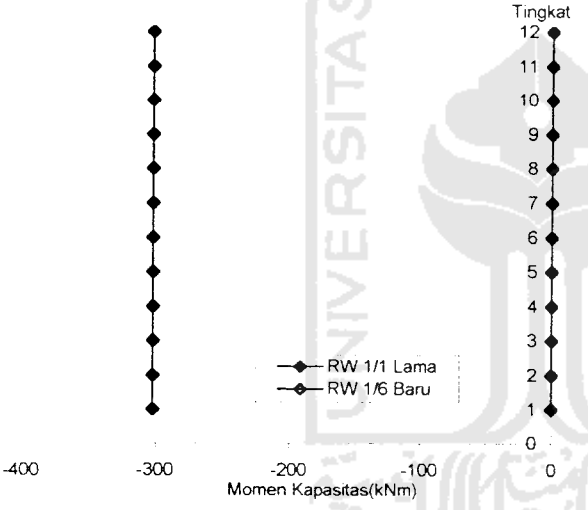
GAMBAR 6.2.108 RASIO MKAP
RW 2/2 LAMA dan RW 2/6 BARU TUMPUAN
PORTAL 2 (5m)



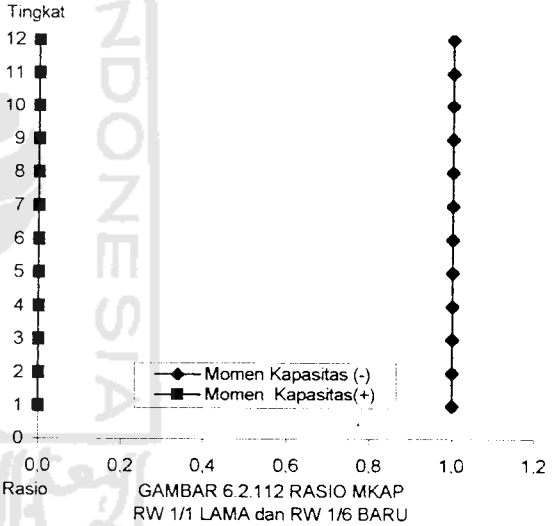
GAMBAR 6.2.109 MOMEN KAPASITAS LAPANGAN PORTAL E (7m)



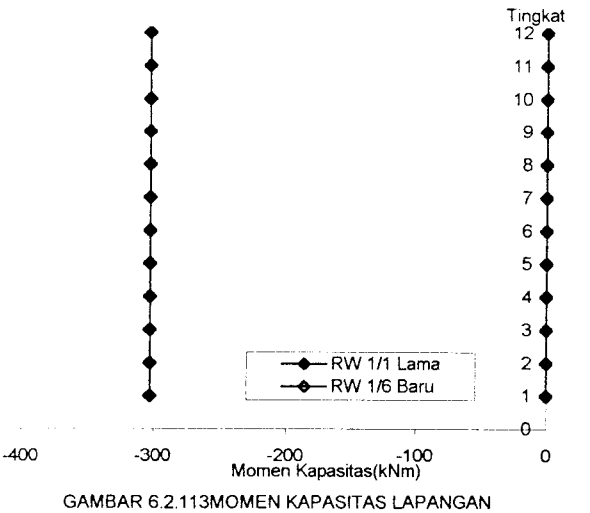
GAMBAR 6.2.110 RASIO MKAP RW 1/1 LAMA dan RW 1/6 BARU LAPANGAN PORTAL E (7m)



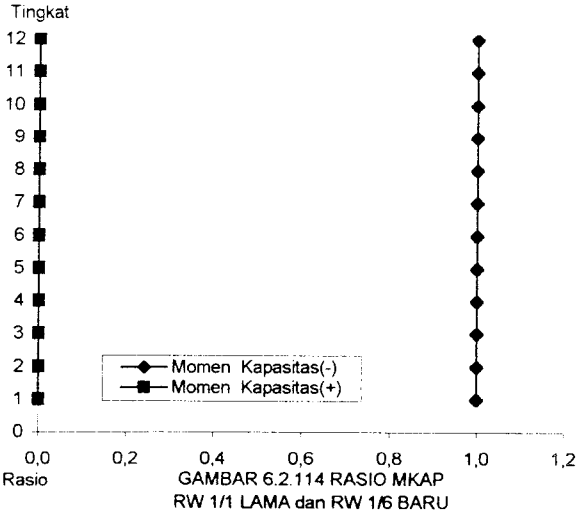
GAMBAR 6.2.111 MOMEN KAPASITAS LAPANGAN PORTAL E (4m)



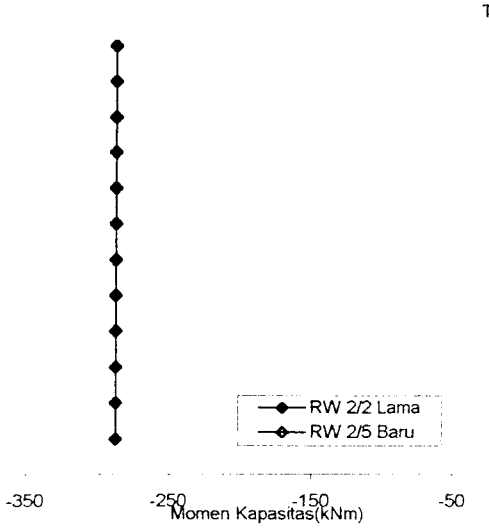
GAMBAR 6.2.112 RASIO MKAP RW 1/1 LAMA dan RW 1/6 BARU LAPANGAN PORTAL E (4m)



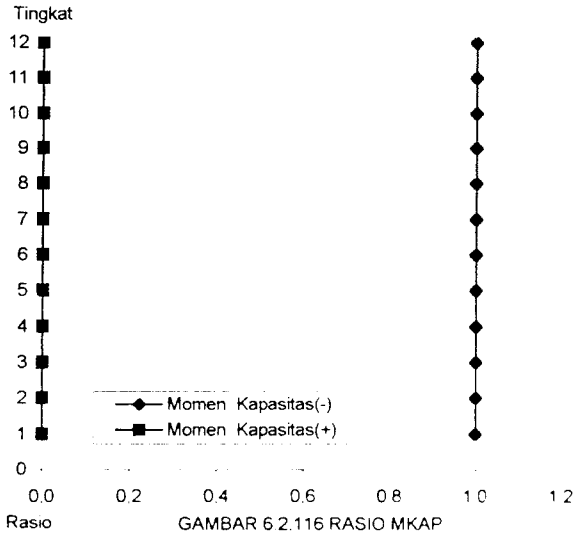
GAMBAR 6.2.113MOMEN KAPASITAS LAPANGAN PORTAL 2 (5m)



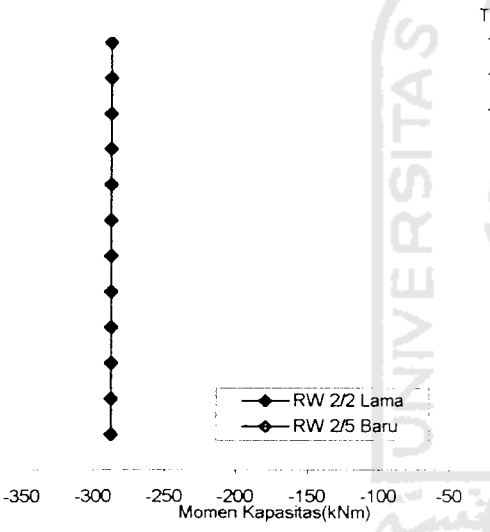
GAMBAR 6.2.114 RASIO MKAP RW 1/1 LAMA dan RW 1/6 BARU LAPANGAN PORTAL 2 (5m)



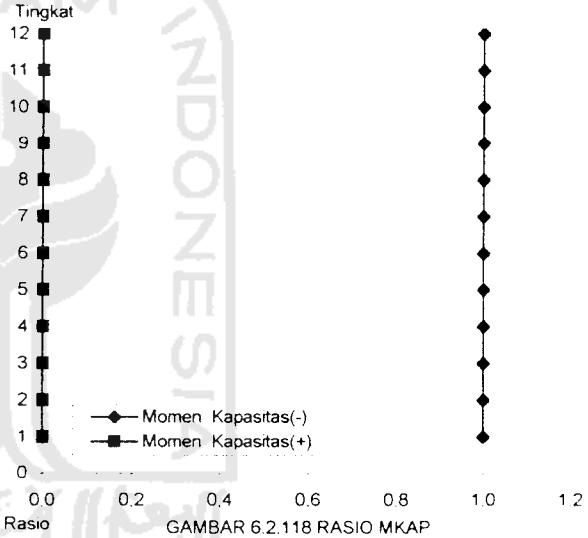
GAMBAR 6.2.115 MOMEN KAPASITAS
LAPANGAN PORTAL E (7m)



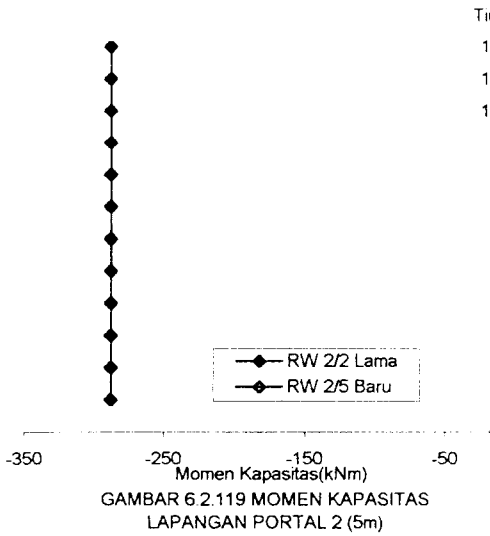
GAMBAR 6.2.116 RASIO MKAP
RW 2/2 LAMA dan RW 2/5 BARU
LAPANGAN PORTAL E (7m)



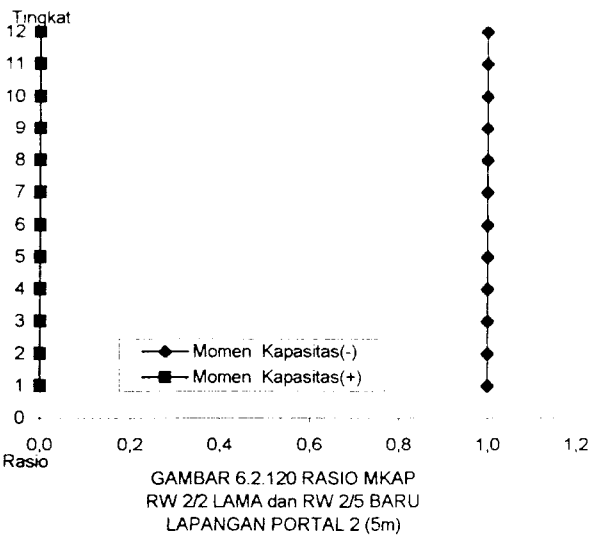
GAMBAR 6.2.117 MOMEN KAPASITAS
LAPANGAN PORTAL E (4m)



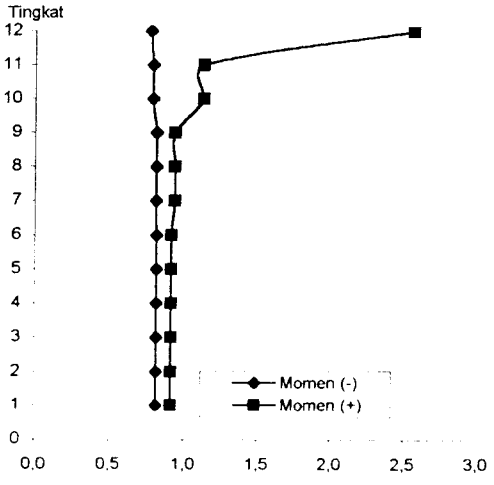
GAMBAR 6.2.118 RASIO MKAP
RW 2/2 LAMA dan RW 2/5 BARU
LAPANGAN PORTAL E (4m)



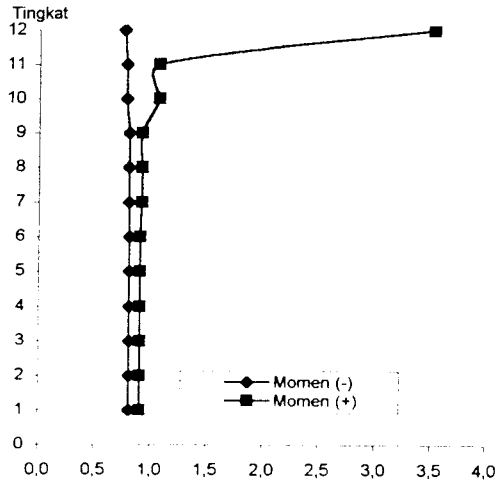
GAMBAR 6.2.119 MOMEN KAPASITAS
LAPANGAN PORTAL 2 (5m)



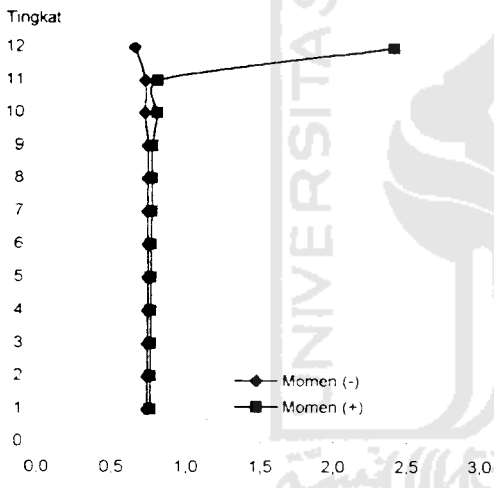
GAMBAR 6.2.120 RASIO MKAP
RW 2/2 LAMA dan RW 2/5 BARU
LAPANGAN PORTAL 2 (5m)



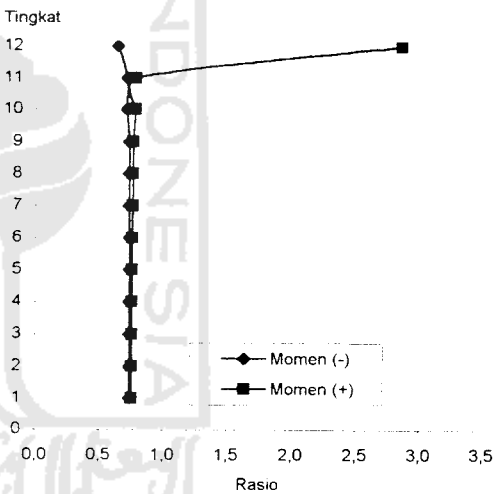
GAMBAR 6.2.121 RASIO MOMEN TEPI-AS RW 1/1 LAMA PORTAL E (7m)



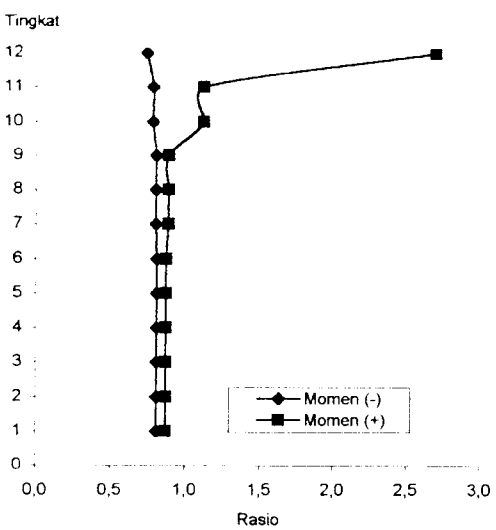
GAMBAR 6.2.122 RASIO MOMEN TEPI-AS RW 1/6 BARU PORTAL E (7m)



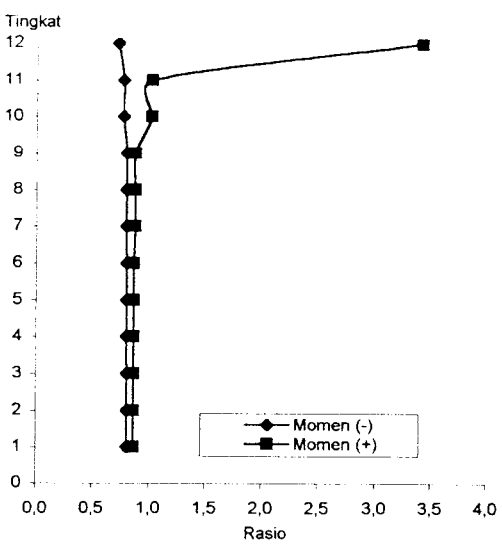
GAMBAR 6.2.123 RASIO MOMEN TEPI-AS RW 1/1 LAMA PORTAL E (4m)



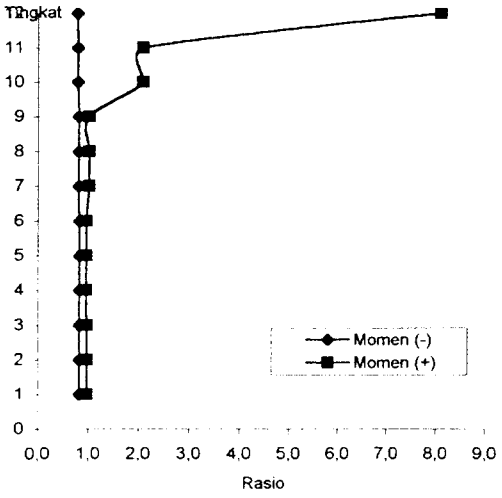
GAMBAR 6.2.124 RASIO MOMEN TEPI-AS RW 1/6 BARU PORTAL E (4m)



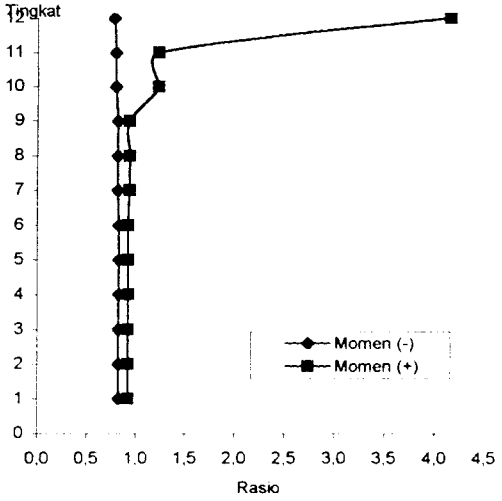
GAMBAR 6.2.125 RASIO MOMEN TEPI-AS RW 1/1 LAMA PORTAL 2 (5m)



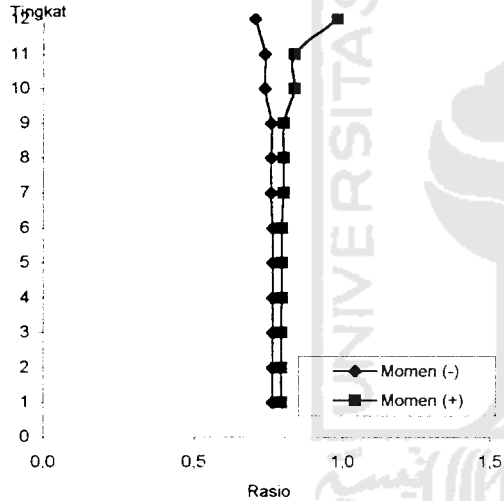
GAMBAR 6.2.126 RASIO MOMEN TEPI-AS RW 1/6 BARU PORTAL 2 (5m)



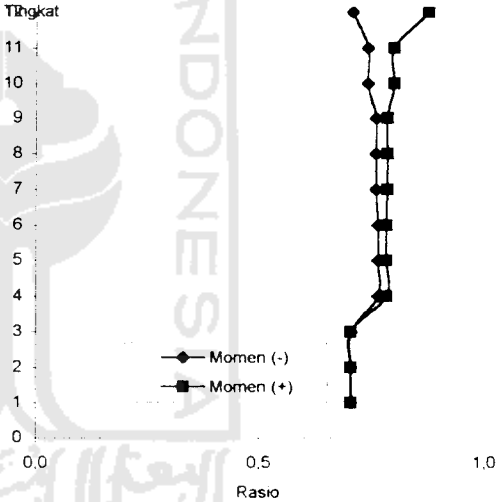
GAMBAR 6.2.127 RASIO MOMEN TEPI-AS RW
2/2 LAMA PORTAL E (7m)



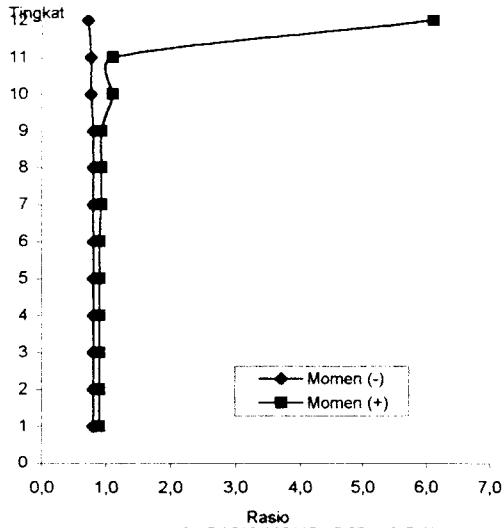
GAMBAR 6.2.128 RASIO MOMEN TEPI-AS RW
2/5 BARU PORTAL E (7m)



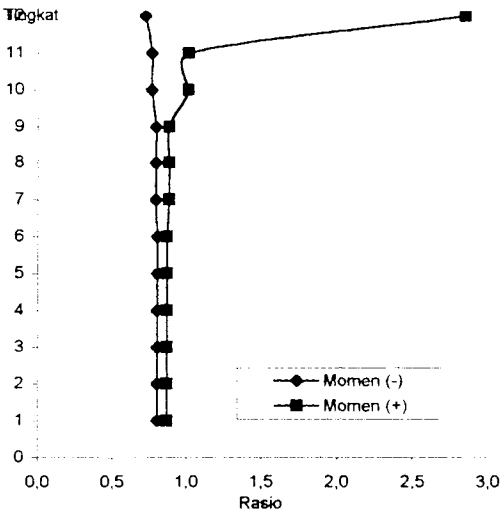
GAMBAR 6.2.129 RASIO MOMEN TEPI-AS RW
2/2 LAMA PORTAL E (4m)



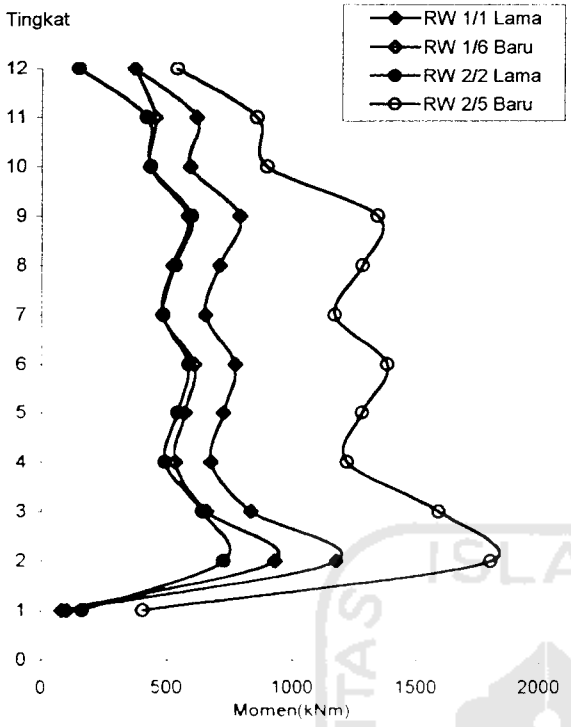
GAMBAR 6.2.130 RASIO MOMEN TEPI-AS RW
2/5 BARU PORTAL E (4m)



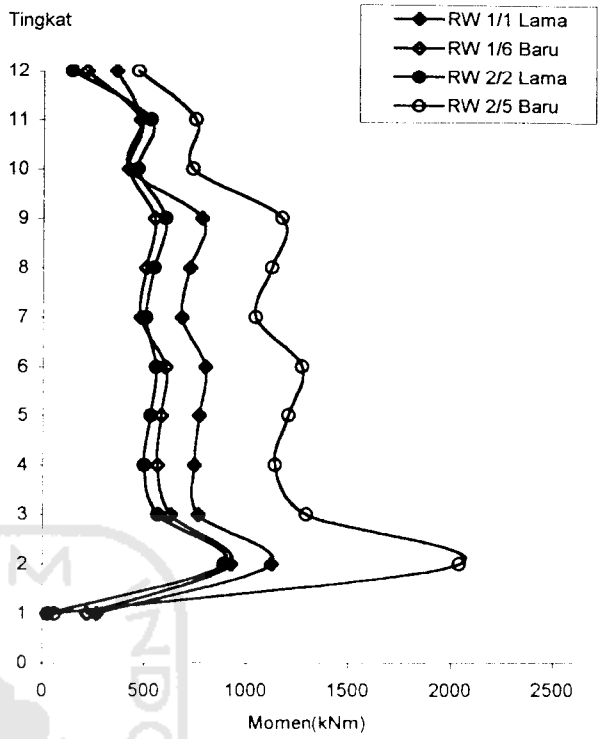
GAMBAR 6.2.131 RASIO MOMEN TEPI-AS RW
2/2 LAMA PORTAL 2 (5m)



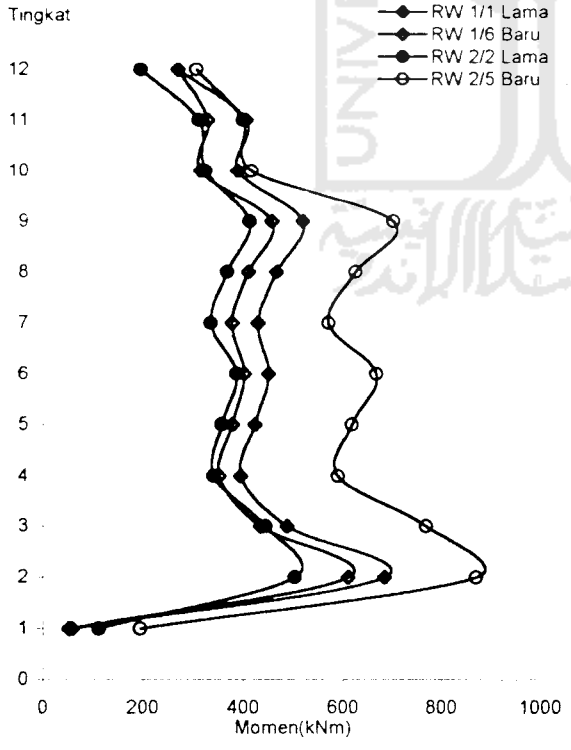
GAMBAR 6.2.132 RASIO MOMEN TEPI-AS RW
2/5 BARU PORTAL 2 (5m)



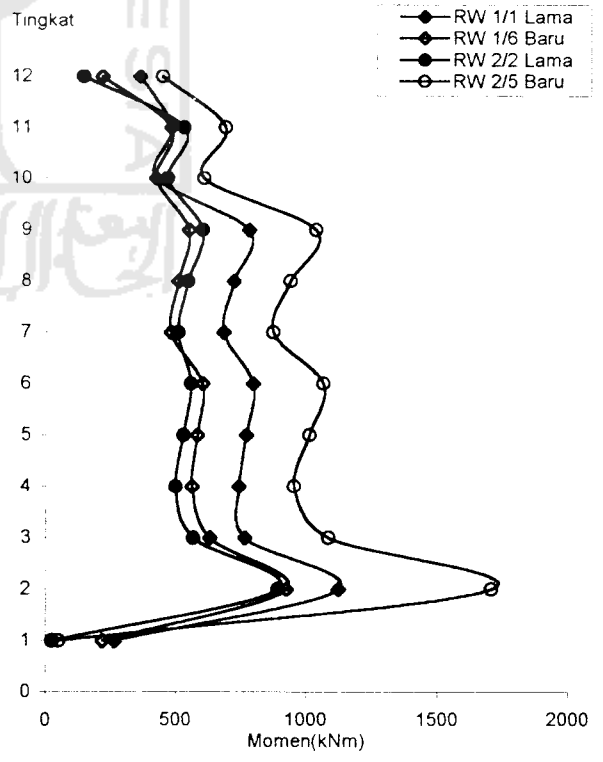
GAMBAR 6 2 133 MOMEN KAPASITAS ARAH X
KOLOM A



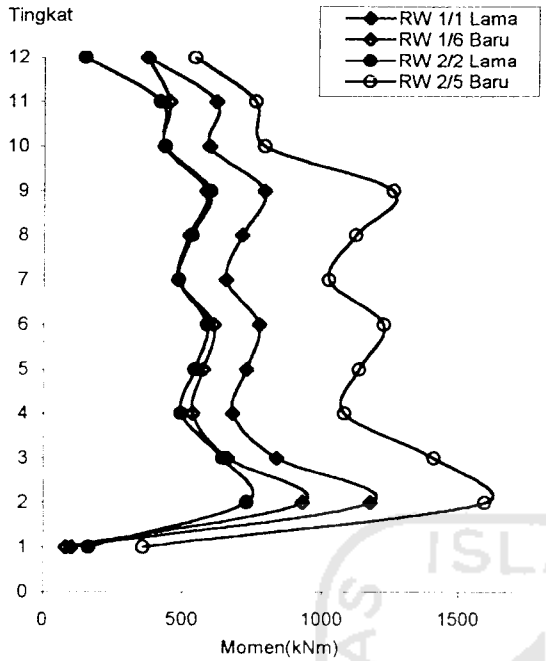
GAMBAR 6.2.134 MOMEN KAPASITAS ARAH Y
KOLOM A



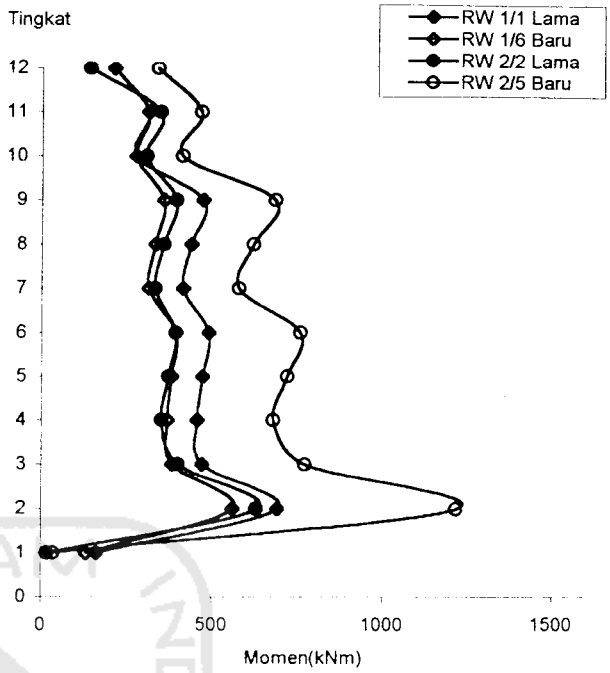
GAMBAR 6.2.135 MOMEN KAPASITAS ARAH X
KOLOM B



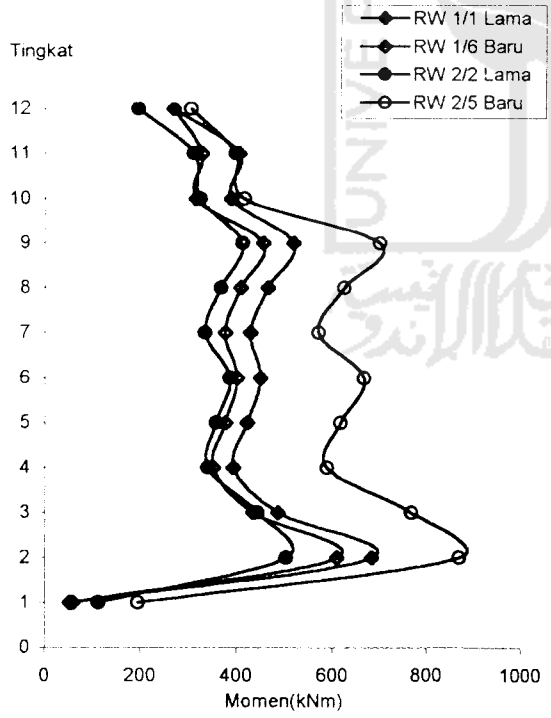
GAMBAR 6.2.136 MOMEN KAPASITAS ARAH Y
KOLOM B



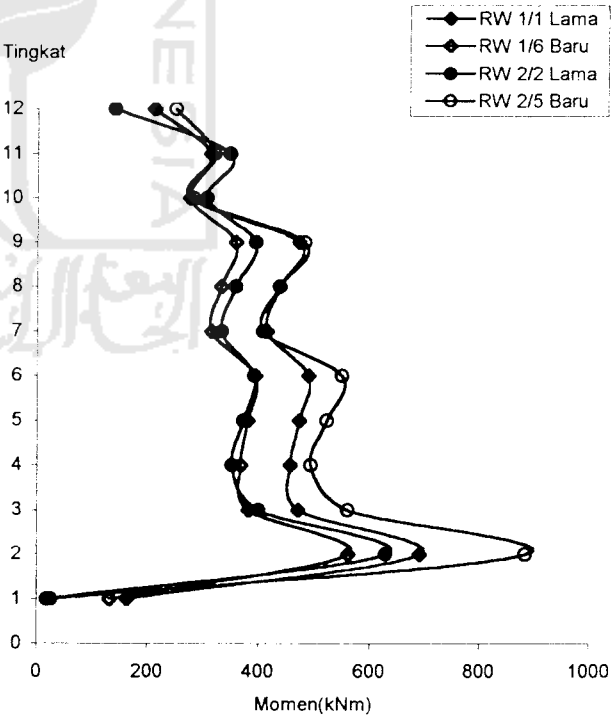
GAMBAR 6.2.137 MOMEN KAPASITAS ARAH X
KOLOM C



GAMBAR 6.2.138 MOMEN KAPASITAS ARAH Y
KOLOM C



GAMBAR 6.2.139 MOMEN KAPASITAS ARAH X
KOLOM D



GAMBAR 6.2.140 MOMEN KAPASITAS ARAH Y
KOLOM D

Berdasarkan hasil perhitungan desain struktur pada R/W 1/1 lama dan R/W 1/6 baru, serta rangking 2 pada R/W 2/2 lama dan R/W 2/5 baru, didapatkan hasil sebagai berikut ini dari Tabel 6.1 sampai Tabel 6.10.

Tabel 6.1 Kebutuhan Tulangan Balok R/W 1/1

PORTAL E							
Lantai	Tulangan Longitudinal				Tulangan Geser		
	Tumpuan		Lapangan		Dalam Sendi Plastis	Luar Sendi Plastis	Sengkang Praktis
	Tarik	Tekan	Tarik	Tekan			
1	D22- 9	D22- 5	D22- 3	D22- 0	ø10 - 60	ø10 - 150	ø10 - 250
2	D22- 9	D22- 5	D22- 3	D22- 0	ø10 - 60	ø10 - 150	ø10 - 250
3	D22- 9	D22- 5	D22- 3	D22- 0	ø10 - 60	ø10 - 150	ø10 - 250
4	D22- 9	D22- 5	D22- 3	D22- 0	ø10 - 60	ø10 - 150	ø10 - 250
5	D22- 9	D22- 5	D22- 3	D22- 0	ø10 - 60	ø10 - 150	ø10 - 250
6	D22- 9	D22- 5	D22- 3	D22- 0	ø10 - 60	ø10 - 150	ø10 - 250
7	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 65	ø10 - 180	ø10 - 250
8	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 65	ø10 - 180	ø10 - 250
9	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 65	ø10 - 180	ø10 - 250
10	D22- 5	D22- 3	D22- 3	D22- 0	ø10 - 80	ø10 - 250	ø10 - 250
11	D22- 5	D22- 3	D22- 3	D22- 0	ø10 - 80	ø10 - 250	ø10 - 250
12	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 110	ø10 - 250	ø10 - 250
1	D22- 9	D22- 7	D22- 3	D22- 0	ø10 - 50	ø10 - 250	ø10 - 250
2	D22- 9	D22- 7	D22- 3	D22- 0	ø10 - 50	ø10 - 250	ø10 - 250
3	D22- 9	D22- 7	D22- 3	D22- 0	ø10 - 50	ø10 - 250	ø10 - 250
4	D22- 9	D22- 7	D22- 3	D22- 0	ø10 - 50	ø10 - 250	ø10 - 250
5	D22- 9	D22- 7	D22- 3	D22- 0	ø10 - 50	ø10 - 250	ø10 - 250
6	D22- 9	D22- 7	D22- 3	D22- 0	ø10 - 50	ø10 - 250	ø10 - 250
7	D22- 7	D22- 5	D22- 3	D22- 0	ø10 - 65	ø10 - 250	ø10 - 250
8	D22- 7	D22- 5	D22- 3	D22- 0	ø10 - 65	ø10 - 250	ø10 - 250
9	D22- 7	D22- 5	D22- 3	D22- 0	ø10 - 65	ø10 - 250	ø10 - 250
10	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 110	ø10 - 250	ø10 - 250
11	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 110	ø10 - 250	ø10 - 250
12	D22- 3	D22- 2	D22- 3	D22- 0	ø10 - 140	ø10 - 250	ø10 - 250

PORTAL 2							
Lantai	Tulangan Longitudinal				Tulangan Geser		
	Tumpuan		Lapangan		Dalam Sendi Plastis	Luar Sendi Plastis	Sengkang Praktis
	Tarik	Tekan	Tarik	Tekan			
1	D22- 10	D22- 6	D22- 3	D22- 0	ø10 - 45	ø10 - 140	ø10 - 250
2	D22- 10	D22- 6	D22- 3	D22- 0	ø10 - 45	ø10 - 140	ø10 - 250
3	D22- 10	D22- 6	D22- 3	D22- 0	ø10 - 45	ø10 - 140	ø10 - 250
4	D22- 10	D22- 6	D22- 3	D22- 0	ø10 - 45	ø10 - 140	ø10 - 250
5	D22- 10	D22- 6	D22- 3	D22- 0	ø10 - 45	ø10 - 140	ø10 - 250
6	D22- 10	D22- 6	D22- 3	D22- 0	ø10 - 45	ø10 - 140	ø10 - 250
7	D22- 8	D22- 5	D22- 3	D22- 0	ø10 - 55	ø10 - 180	ø10 - 250
8	D22- 8	D22- 5	D22- 3	D22- 0	ø10 - 55	ø10 - 180	ø10 - 250
9	D22- 8	D22- 5	D22- 3	D22- 0	ø10 - 55	ø10 - 180	ø10 - 250
10	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 80	ø10 - 250	ø10 - 250
11	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 80	ø10 - 250	ø10 - 250
12	D22- 3	D22- 2	D22- 3	D22- 0	ø10 - 100	ø10 - 250	ø10 - 250

Tabel 6.2 Kebutuhan Tulangan Balok R/W 1/6

PORTAL E							
Lantai	Tulangan Longitudinal				Tulangan Geser		
	Tumpuan		Lapangan		Dalam Sendi Plastis	Luar Sendi Plastis	Sengkang Praktis
	Tarik	Tekan	Tarik	Tekan			
1	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 65	ø10 - 150	ø10 - 250
2	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 65	ø10 - 150	ø10 - 250
3	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 65	ø10 - 150	ø10 - 250
4	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 65	ø10 - 150	ø10 - 250
5	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 65	ø10 - 150	ø10 - 250
6	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 65	ø10 - 150	ø10 - 250
7	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 75	ø10 - 180	ø10 - 250
8	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 75	ø10 - 180	ø10 - 250
9	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 75	ø10 - 180	ø10 - 250
10	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 95	ø10 - 250	ø10 - 250
11	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 95	ø10 - 250	ø10 - 250
12	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 110	ø10 - 250	ø10 - 250
1	D22- 7	D22- 4	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
2	D22- 7	D22- 4	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
3	D22- 7	D22- 4	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
4	D22- 7	D22- 4	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
5	D22- 7	D22- 4	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
6	D22- 7	D22- 4	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
7	D22- 5	D22- 3	D22- 3	D22- 0	ø10 - 90	ø10 - 250	ø10 - 250
8	D22- 5	D22- 3	D22- 3	D22- 0	ø10 - 90	ø10 - 250	ø10 - 250
9	D22- 5	D22- 3	D22- 3	D22- 0	ø10 - 90	ø10 - 250	ø10 - 250
10	D22- 3	D22- 0	D22- 3	D22- 0	ø10 - 150	ø10 - 250	ø10 - 250
11	D22- 3	D22- 0	D22- 3	D22- 0	ø10 - 150	ø10 - 250	ø10 - 250
12	D22- 3	D22- 0	D22- 3	D22- 0	ø10 - 150	ø10 - 250	ø10 - 250

PORTAL 2							
Lantai	Tulangan Longitudinal				Tulangan Geser		
	Tumpuan		Lapangan		Dalam Sendi Plastis	Luar Sendi Plastis	Sengkang Praktis
	Tarik	Tekan	Tarik	Tekan			
1	D22- 8	D22- 5	D22- 3	D22- 0	ø10 - 55	ø10 - 150	ø10 - 250
2	D22- 8	D22- 5	D22- 3	D22- 0	ø10 - 55	ø10 - 150	ø10 - 250
3	D22- 8	D22- 5	D22- 3	D22- 0	ø10 - 55	ø10 - 150	ø10 - 250
4	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 60	ø10 - 150	ø10 - 250
5	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 60	ø10 - 150	ø10 - 250
6	D22- 8	D22- 4	D22- 3	D22- 0	ø10 - 60	ø10 - 150	ø10 - 250
7	D22- 6	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 150	ø10 - 250
8	D22- 6	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 150	ø10 - 250
9	D22- 6	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 150	ø10 - 250
10	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 85	ø10 - 150	ø10 - 250
11	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 85	ø10 - 150	ø10 - 250
12	D22- 3	D22- 0	D22- 3	D22- 0	ø10 - 100	ø10 - 150	ø10 - 250

Tabel 6.3 Kebutuhan Tulangan Balok R/W 2/2

PORTAL E							
Lantai	Tulangan Longitudinal				Tulangan Geser		
	Tumpuan		Lapangan		Dalam Sendi Plastis	Luar Sendi Plastis	Sengkang Praktis
	Tarik	Tekan	Tarik	Tekan			
1	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 200	ø10 - 250
2	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 200	ø10 - 250
3	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 200	ø10 - 250
4	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 200	ø10 - 250
5	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 200	ø10 - 250
6	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 200	ø10 - 250
7	D22- 6	D22- 3	D22- 3	D22- 0	ø10 - 75	ø10 - 200	ø10 - 250
8	D22- 6	D22- 3	D22- 3	D22- 0	ø10 - 75	ø10 - 200	ø10 - 250
9	D22- 6	D22- 3	D22- 3	D22- 0	ø10 - 75	ø10 - 200	ø10 - 250
10	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 90	ø10 - 250	ø10 - 250
11	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 90	ø10 - 250	ø10 - 250
12	D22- 3	D22- 0	D22- 3	D22- 0	ø10 - 140	ø10 - 250	ø10 - 250
1	D22- 7	D22- 4	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
2	D22- 7	D22- 4	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
3	D22- 7	D22- 4	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
4	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
5	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
6	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 70	ø10 - 250	ø10 - 250
7	D22- 5	D22- 3	D22- 3	D22- 0	ø10 - 85	ø10 - 250	ø10 - 250
8	D22- 5	D22- 3	D22- 3	D22- 0	ø10 - 85	ø10 - 250	ø10 - 250
9	D22- 5	D22- 3	D22- 3	D22- 0	ø10 - 85	ø10 - 250	ø10 - 250
10	D22- 3	D22- 0	D22- 3	D22- 0	ø10 - 150	ø10 - 250	ø10 - 250
11	D22- 3	D22- 0	D22- 3	D22- 0	ø10 - 150	ø10 - 250	ø10 - 250
12	D22- 2	D22- 0	D22- 3	D22- 0	ø10 - 150	ø10 - 250	ø10 - 250

PORTAL 2							
Lantai	Tulangan Longitudinal				Tulangan Geser		
	Tumpuan		Lapangan		Dalam Sendi Plastis	Luar Sendi Plastis	Sengkang Praktis
	Tarik	Tekan	Tarik	Tekan			
1	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 60	ø10 - 190	ø10 - 250
2	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 60	ø10 - 190	ø10 - 250
3	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 60	ø10 - 190	ø10 - 250
4	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 60	ø10 - 190	ø10 - 250
5	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 60	ø10 - 190	ø10 - 250
6	D22- 7	D22- 3	D22- 3	D22- 0	ø10 - 60	ø10 - 190	ø10 - 250
7	D22- 6	D22- 3	D22- 3	D22- 0	ø10 - 65	ø10 - 190	ø10 - 250
8	D22- 6	D22- 3	D22- 3	D22- 0	ø10 - 65	ø10 - 190	ø10 - 250
9	D22- 6	D22- 3	D22- 3	D22- 0	ø10 - 65	ø10 - 190	ø10 - 250
10	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 80	ø10 - 250	ø10 - 250
11	D22- 4	D22- 2	D22- 3	D22- 0	ø10 - 80	ø10 - 250	ø10 - 250
12	D22- 2	D22- 0	D22- 3	D22- 0	ø10 - 140	ø10 - 250	ø10 - 250

Tabel 6.4 Kebutuhan Tulangan Balok R/W 2/5

PORTAL E							
Lantai	Tulangan Longitudinal				Tulangan Geser		
	Tumpuan		Lapangan		Dalam Sendi Plastis	Luar Sendi Plastis	Sengkang Praktis
	Tarik	Tekan	Tarik	Tekan			
1	D22- 7	D22- 5	D22- 2	D22- 2	ø10 - 60	ø10 - 150	ø10 - 250
2	D22- 7	D22- 5	D22- 2	D22- 2	ø10 - 60	ø10 - 150	ø10 - 250
3	D22- 7	D22- 5	D22- 2	D22- 2	ø10 - 60	ø10 - 150	ø10 - 250
4	D22- 7	D22- 5	D22- 2	D22- 2	ø10 - 60	ø10 - 150	ø10 - 250
5	D22- 7	D22- 5	D22- 2	D22- 2	ø10 - 60	ø10 - 150	ø10 - 250
6	D22- 7	D22- 5	D22- 2	D22- 2	ø10 - 60	ø10 - 150	ø10 - 250
7	D22- 6	D22- 4	D22- 2	D22- 2	ø10 - 70	ø10 - 200	ø10 - 250
8	D22- 6	D22- 4	D22- 2	D22- 2	ø10 - 70	ø10 - 200	ø10 - 250
9	D22- 6	D22- 4	D22- 2	D22- 2	ø10 - 70	ø10 - 200	ø10 - 250
10	D22- 4	D22- 2	D22- 2	D22- 2	ø10 - 90	ø10 - 200	ø10 - 250
11	D22- 4	D22- 2	D22- 2	D22- 2	ø10 - 90	ø10 - 200	ø10 - 250
12	D22- 3	D22- 2	D22- 2	D22- 2	ø10 - 100	ø10 - 200	ø10 - 250
1	D22- 7	D22- 7	D22- 2	D22- 2	ø10 - 50	ø10 - 200	ø10 - 250
2	D22- 7	D22- 7	D22- 2	D22- 2	ø10 - 50	ø10 - 200	ø10 - 250
3	D22- 7	D22- 7	D22- 2	D22- 2	ø10 - 50	ø10 - 200	ø10 - 250
4	D22- 7	D22- 7	D22- 2	D22- 2	ø10 - 50	ø10 - 200	ø10 - 250
5	D22- 7	D22- 7	D22- 2	D22- 2	ø10 - 50	ø10 - 200	ø10 - 250
6	D22- 7	D22- 7	D22- 2	D22- 2	ø10 - 50	ø10 - 200	ø10 - 250
7	D22- 5	D22- 5	D22- 2	D22- 2	ø10 - 70	ø10 - 200	ø10 - 250
8	D22- 5	D22- 5	D22- 2	D22- 2	ø10 - 70	ø10 - 200	ø10 - 250
9	D22- 5	D22- 5	D22- 2	D22- 2	ø10 - 70	ø10 - 200	ø10 - 250
10	D22- 2	D22- 2	D22- 2	D22- 2	ø10 - 100	ø10 - 200	ø10 - 250
11	D22- 2	D22- 2	D22- 2	D22- 2	ø10 - 100	ø10 - 200	ø10 - 250
12	D22- 2	D22- 2	D22- 2	D22- 2	ø10 - 100	ø10 - 200	ø10 - 250

PORTAL 2							
Lantai	Tulangan Longitudinal				Tulangan Geser		
	Tumpuan		Lapangan		Dalam Sendi Plastis	Luar Sendi Plastis	Sengkang Praktis
	Tarik	Tekan	Tarik	Tekan			
1	D22- 7	D22- 6	D22- 2	D22- 2	ø10 - 50	ø10 - 150	ø10 - 250
2	D22- 7	D22- 6	D22- 2	D22- 2	ø10 - 50	ø10 - 150	ø10 - 250
3	D22- 7	D22- 6	D22- 2	D22- 2	ø10 - 50	ø10 - 150	ø10 - 250
4	D22- 7	D22- 6	D22- 2	D22- 2	ø10 - 50	ø10 - 150	ø10 - 250
5	D22- 7	D22- 6	D22- 2	D22- 2	ø10 - 50	ø10 - 150	ø10 - 250
6	D22- 7	D22- 6	D22- 2	D22- 2	ø10 - 50	ø10 - 150	ø10 - 250
7	D22- 6	D22- 4	D22- 2	D22- 2	ø10 - 60	ø10 - 200	ø10 - 250
8	D22- 6	D22- 4	D22- 2	D22- 2	ø10 - 60	ø10 - 200	ø10 - 250
9	D22- 6	D22- 4	D22- 2	D22- 2	ø10 - 60	ø10 - 200	ø10 - 250
10	D22- 3	D22- 2	D22- 2	D22- 2	ø10 - 90	ø10 - 200	ø10 - 250
11	D22- 3	D22- 2	D22- 2	D22- 2	ø10 - 90	ø10 - 200	ø10 - 250
12	D22- 2	D22- 2	D22- 2	D22- 2	ø10 - 100	ø10 - 200	ø10 - 250

Tabel 6.5 Kebutuhan Tulangan Kolom

Lantai	Klm	Tulangan Terpasang							
		RW 1/1 Lama		RW 1/6 Baru		RW 2/2 Lama		RW 2/5 Baru	
		Arah x	Arah y	Arah x	Arah y	Arah x	Arah y	Arah x	Arah y
1	A	ø25 - 18	ø25 - 28	ø25 - 20	ø25 - 28	ø25 - 18	ø25 - 24	ø25 - 18	ø25 - 24
2		ø25 - 18	ø25 - 28	ø25 - 20	ø25 - 28	ø25 - 18	ø25 - 24	ø25 - 18	ø25 - 24
3		ø25 - 18	ø25 - 28	ø25 - 20	ø25 - 28	ø25 - 18	ø25 - 24	ø25 - 18	ø25 - 24
4		ø25 - 18	ø25 - 22	ø25 - 20	ø25 - 22	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20
5		ø25 - 18	ø25 - 22	ø25 - 20	ø25 - 22	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20
6		ø25 - 18	ø25 - 22	ø25 - 20	ø25 - 22	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20
7		ø25 - 18	ø25 - 22	ø25 - 20	ø25 - 22	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20
8		ø25 - 18	ø25 - 22	ø25 - 20	ø25 - 22	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20
9		ø25 - 18	ø25 - 22	ø25 - 20	ø25 - 22	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20
10		ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 16	ø25 - 18	ø25 - 16	ø25 - 18
11		ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 16	ø25 - 18	ø25 - 16	ø25 - 18
12		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
1	B	ø25 - 18	ø25 - 28	ø25 - 18	ø25 - 28	ø25 - 16	ø25 - 24	ø25 - 16	ø25 - 24
2		ø25 - 18	ø25 - 28	ø25 - 18	ø25 - 28	ø25 - 16	ø25 - 24	ø25 - 16	ø25 - 24
3		ø25 - 18	ø25 - 28	ø25 - 18	ø25 - 28	ø25 - 16	ø25 - 24	ø25 - 16	ø25 - 24
4		ø25 - 18	ø25 - 22	ø25 - 18	ø25 - 22	ø25 - 16	ø25 - 20	ø25 - 16	ø25 - 20
5		ø25 - 18	ø25 - 22	ø25 - 18	ø25 - 22	ø25 - 16	ø25 - 20	ø25 - 16	ø25 - 20
6		ø25 - 18	ø25 - 22	ø25 - 18	ø25 - 22	ø25 - 16	ø25 - 20	ø25 - 16	ø25 - 20
7		ø25 - 18	ø25 - 22	ø25 - 18	ø25 - 22	ø25 - 16	ø25 - 20	ø25 - 16	ø25 - 20
8		ø25 - 18	ø25 - 22	ø25 - 18	ø25 - 22	ø25 - 16	ø25 - 20	ø25 - 16	ø25 - 20
9		ø25 - 18	ø25 - 22	ø25 - 18	ø25 - 22	ø25 - 16	ø25 - 20	ø25 - 16	ø25 - 20
10		ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 16	ø25 - 18	ø25 - 16	ø25 - 18
11		ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 16	ø25 - 18	ø25 - 16	ø25 - 18
12		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
1	C	ø25 - 22	ø25 - 18	ø25 - 22	ø25 - 18	ø25 - 20	ø25 - 16	ø25 - 20	ø25 - 16
2		ø25 - 22	ø25 - 18	ø25 - 22	ø25 - 18	ø25 - 20	ø25 - 16	ø25 - 20	ø25 - 16
3		ø25 - 22	ø25 - 18	ø25 - 22	ø25 - 18	ø25 - 20	ø25 - 16	ø25 - 20	ø25 - 16
4		ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 18	ø25 - 16
5		ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 18	ø25 - 16
6		ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 18	ø25 - 16
7		ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 18	ø25 - 16
8		ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 18	ø25 - 16
9		ø25 - 20	ø25 - 18	ø25 - 20	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 18	ø25 - 16
10		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
11		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
12		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
1	D	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
2		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
3		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
4		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
5		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
6		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
7		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
8		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
9		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
10		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
11		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16
12		ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 18	ø25 - 16	ø25 - 16	ø25 - 16	ø25 - 16

Tabel 6.6 Kebutuhan Tulangan Geser Kolom

Lantai	Klm	Tulangan Terpasang							
		RW 1/1 Lama		RW 1/6 Baru		RW 2/2 Lama		RW 2/5 Baru	
		S. Plastis	Luar S. P	S. Plastis	Luar S. P	S. Plastis	Luar S. P	S. Plastis	Luar S. P
1	A	ø12 - 80	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 70	ø12 - 100
2		ø12 - 80	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 70	ø12 - 100
3		ø12 - 80	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 70	ø12 - 100
4		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 80	ø12 - 100
5		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 80	ø12 - 100
6		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 80	ø12 - 100
7		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
8		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
9		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
10		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
11		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
12		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
1	B	ø12 - 80	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 80	ø12 - 100
2		ø12 - 80	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 80	ø12 - 100
3		ø12 - 80	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 80	ø12 - 100
4		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
5		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
6		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
7		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
8		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
9		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
10		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
11		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
12		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
1	C	ø12 - 90	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 90	ø12 - 100
2		ø12 - 90	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 90	ø12 - 100
3		ø12 - 90	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 90	ø12 - 100
4		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 90	ø12 - 100
5		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 90	ø12 - 100
6		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 90	ø12 - 100
7		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
8		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
9		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
10		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
11		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
12		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
1	D	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
2		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
3		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
4		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
5		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
6		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
7		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
8		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
9		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
10		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
11		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100
12		ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100	ø12 - 100

Tabel 6.7 Kebutuhan Tulangan Pondasi

Arah	Tulangan Terpasang			
	RW 1/1	RW 1/6	RW 2/2	RW 2/5
x	D22- 260	D22- 260	D22- 300	D22- 300
y	D22- 290	D22- 290	D22- 300	D22- 300

Tabel 6.8 Perbandingan Gaya Germpa

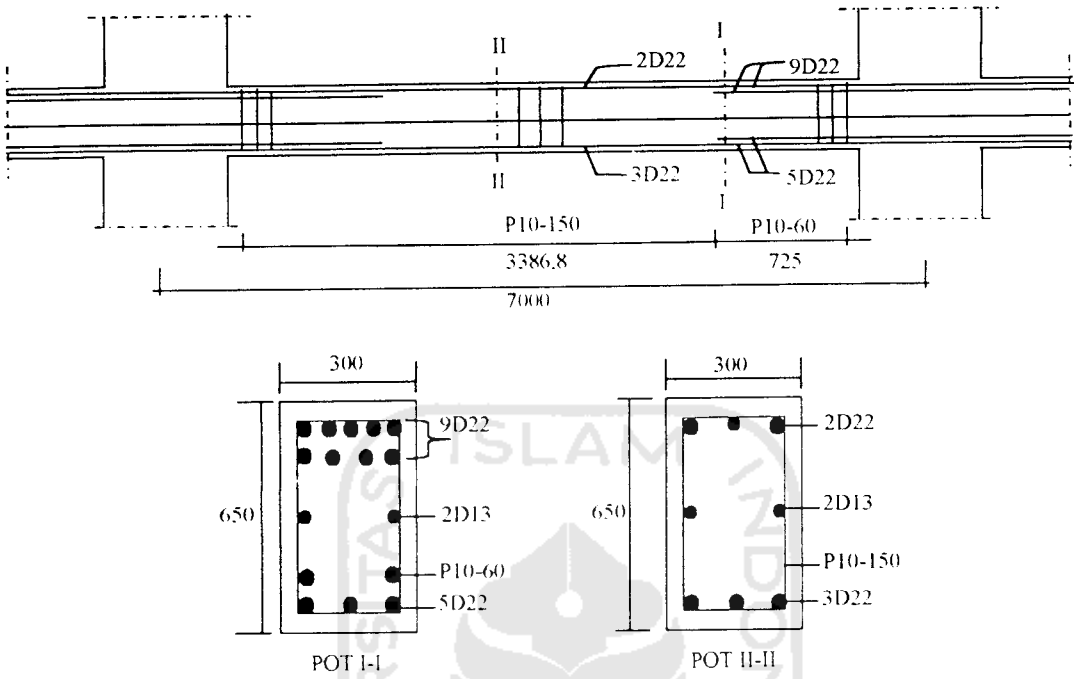
Lantai	Gaya Gempa (kN)			Gaya Gempa (kN)		
	RW 1/1 Lama	RW 1/6 Baru	%	RW 2/2 Lama	RW 2/5 Baru	%
Arah X	947,4925	720,6088	131,49%	600,8901	625,2399	103,89%
Arah Y	2526,6467	1921,6234	131,49%	1602,3737	1667,3065	103,89%

Tabel 6.9 Perbandingan R/W 1/1 Lama dan R/W 1/6 Baru

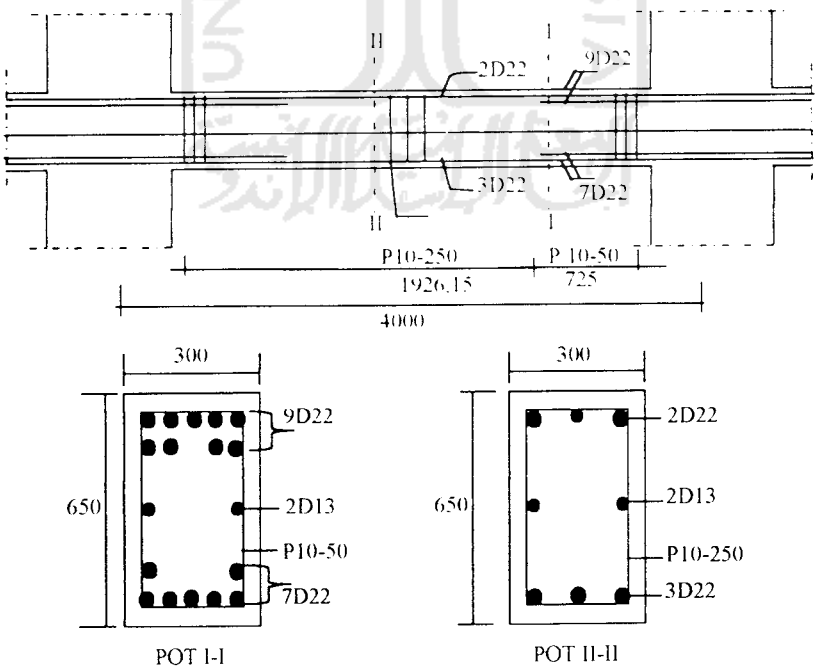
Balok	Tulangan Longitudinal (AS+AS')			Tulangan Geser		
	RW 1/1 Lama	RW 1/6 Baru	%	RW 1/1 Lama	RW 1/6 Baru	%
7m	47706,6806	40611,4211	117,47%	29090,7446	30248,5715	103,83%
4m	49600,7218	42073,3804	117,89%	23013,9526	23848,3163	103,50%
5m	53720,7126	39181,5254	137,11%	32427,0159	31989,2963	101,37%
Σ	151028,1150	121866,3268	123,93%	84531,7130	86086,1840	101,81%
Kolom	Tulangan Longitudinal (AS+AS')			Tulangan Geser		
	RW 1/1 Lama	RW 1/6 Baru	%	RW 1/1 Lama	RW 1/6 Baru	%
A	120888,0000	110376,0000	109,52%	58498,2000	56972,1600	102,68%
B	96912,0000	89352,0000	108,46%	58498,2000	56972,1600	102,68%
C	82872,0000	77184,0000	107,37%	57650,4000	56972,1600	101,19%
D	44712,0000	39960,0000	111,89%	56972,1600	56972,1600	100,00%
Σ	345384,0000	316872,0000	109,00%	231618,9600	227888,6400	101,64%

Tabel 6.10 Perbandingan R/W 2/2 Lama dan R/W 2/5 Baru

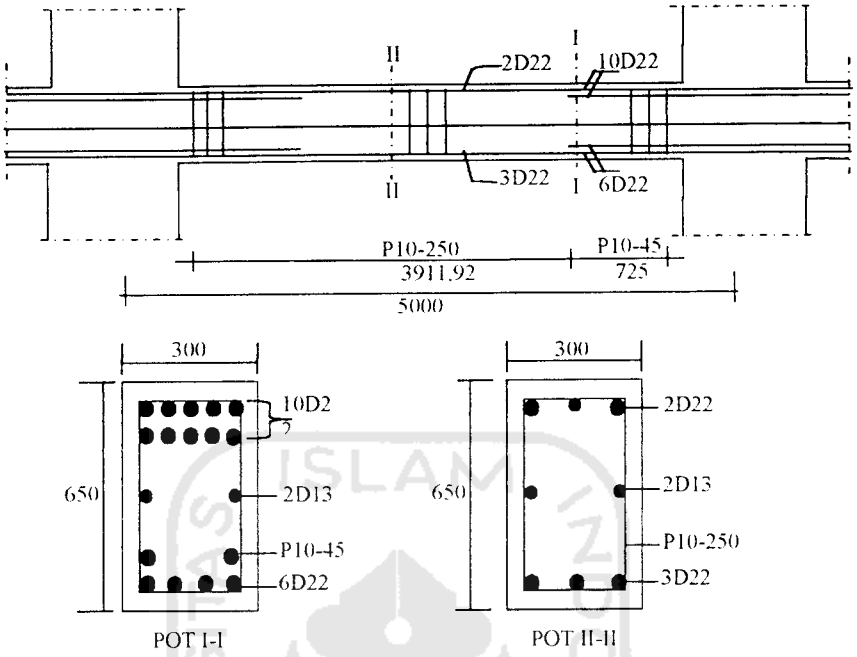
Balok	Tulangan Longitudinal (AS+AS')			Tulangan Geser		
	RW 2/2 Lama	RW 2/5 Baru	%	RW 2/2 Lama	RW 2/5 Baru	%
7m	32538,0428	36843,5599	111,69%	32621,2485	32141,3110	101,47%
4m	38356,7629	42516,2428	109,78%	24290,6158	23603,4538	102,83%
5m	35933,8181	60156,7377	140,27%	32324,1982	32281,2079	100,13%
Σ	106828,6237	139516,5404	123,43%	89236,0624	88025,9727	101,36%
Kolom	Tulangan Longitudinal (AS+AS')			Tulangan Geser		
	RW 2/2 Lama	RW 2/5 Baru	%	RW 2/2 Lama	RW 2/5 Baru	%
A	102592,0000	107456,0000	104,53%	56972,1600	57575,0400	101,05%
B	79744,0000	86144,0000	107,43%	56972,1600	57575,0400	101,05%
C	66880,0000	73664,0000	109,21%	56972,1600	56972,1600	100,00%
D	34707,2000	39744,0000	112,67%	56972,1600	56972,1600	100,00%
Σ	283923,2000	307008,0000	107,52%	227888,6400	229094,4000	100,53%



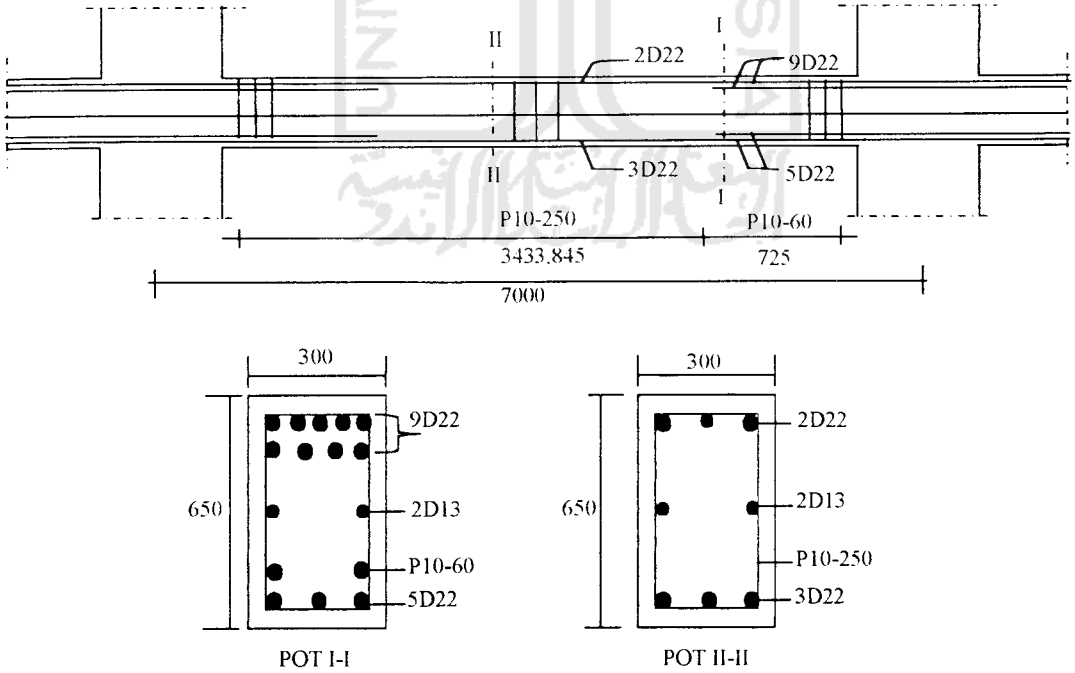
Gambar 6.3.1 Balok Portal E Bentang 7m Lantai 3



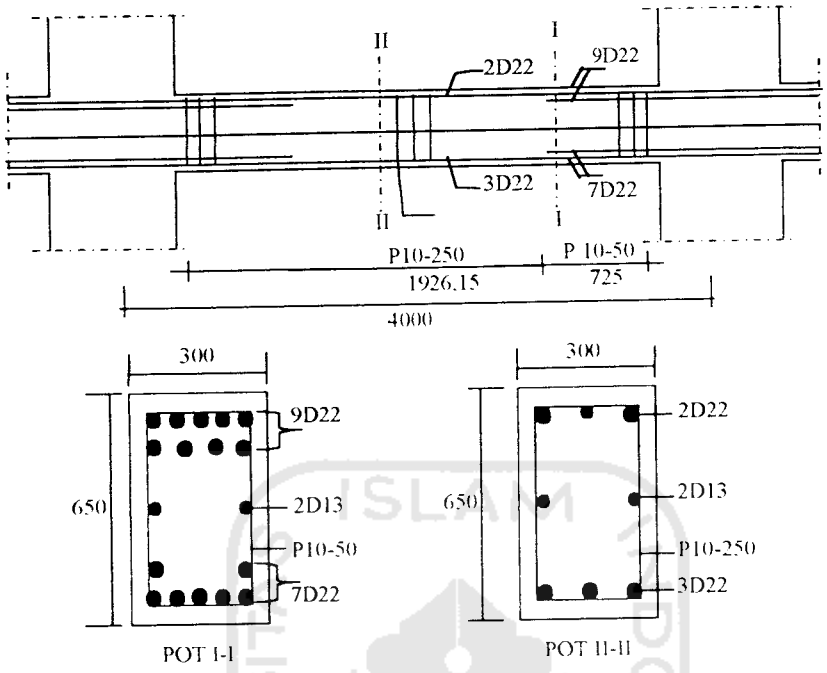
Gambar 6.3.2 Balok Portal E Bentang 4 m Lantai 3



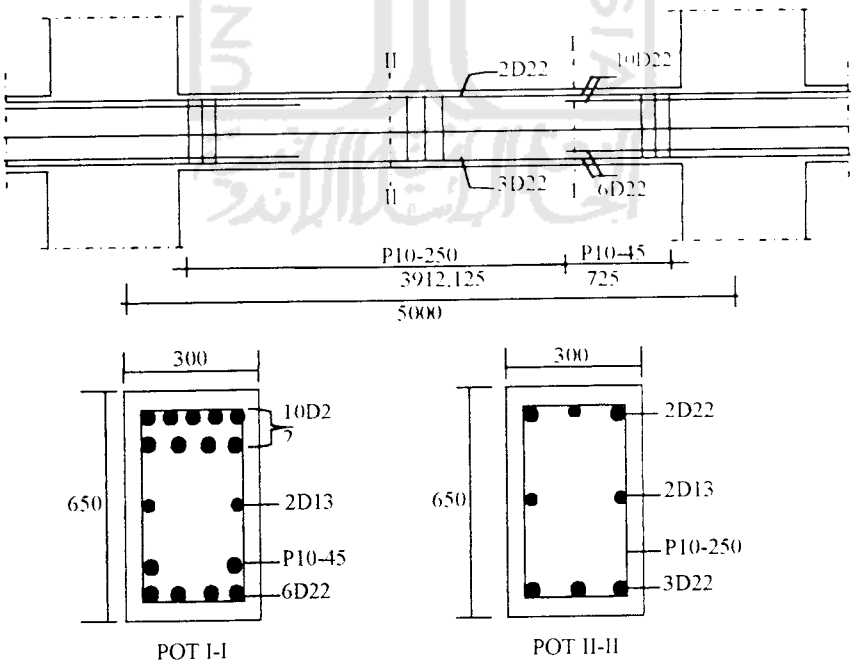
Gambar 6.3.3 Balok Portal 2 Lantai 3



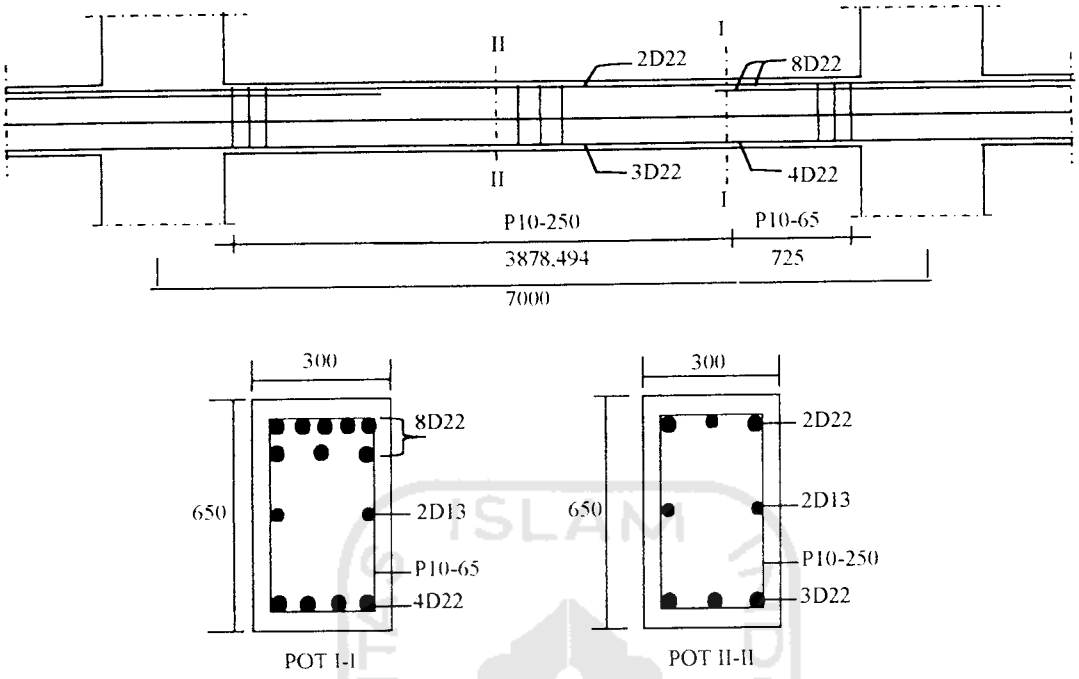
Gambar 6.3.4 Balok Portal E Bentang 7 m Lantai 4



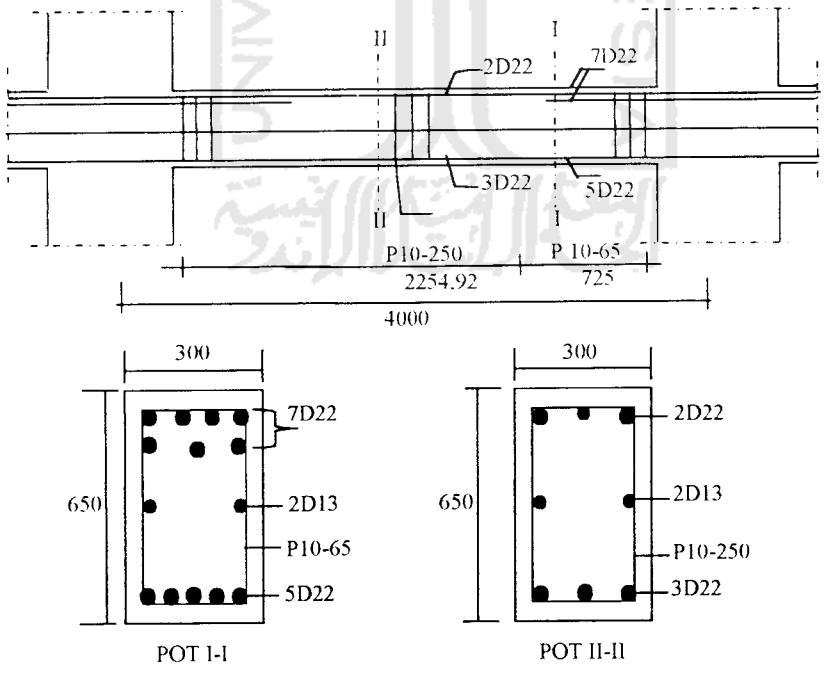
Gambar 6.3.5 Balok Portal E Bentang 4 m Lantai 4



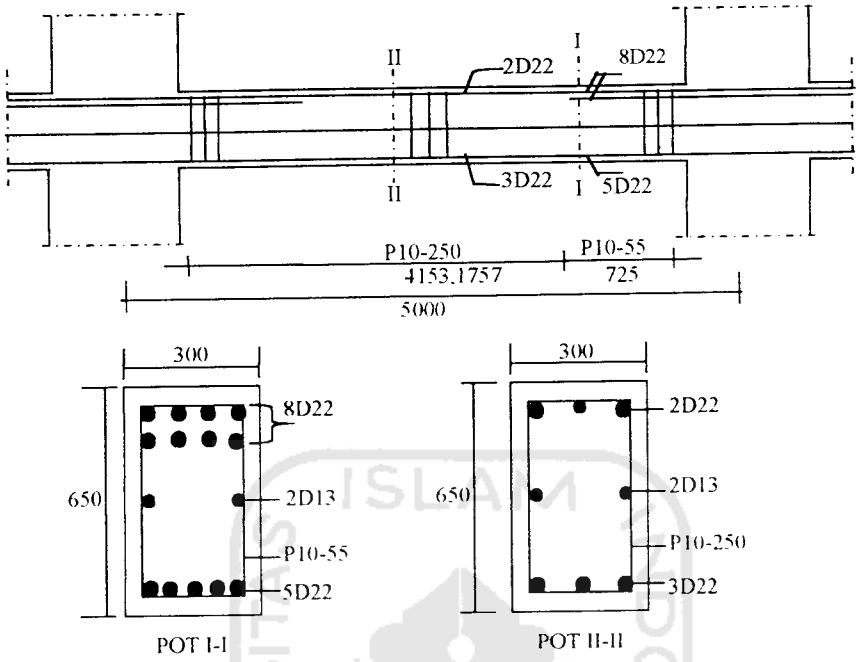
Gambar 6.3.6 Balok Portal 2 Lantai 4



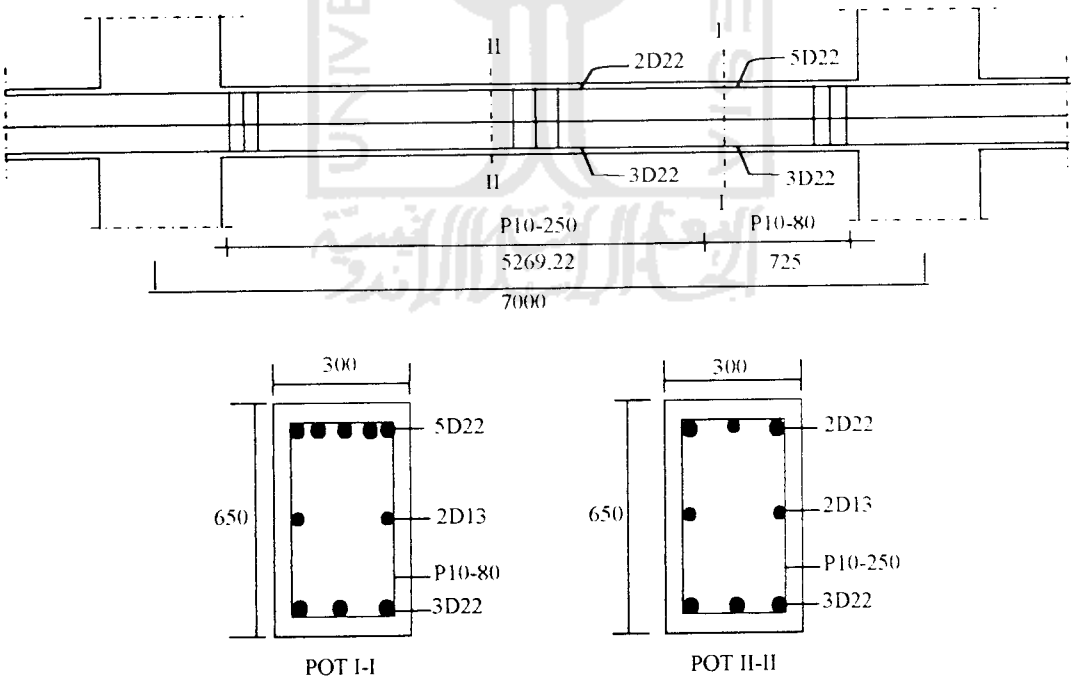
Gambar 6.3.7 Balok Portal E Bentang 7m Lantai 7



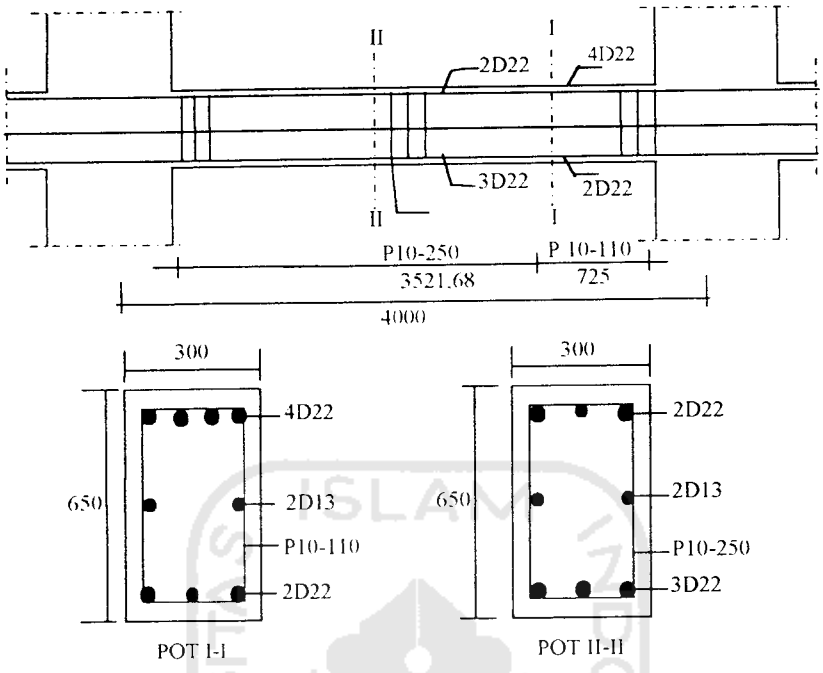
Gambar 6.3.8 Balok Portal E Bentang 4 m Lantai 7



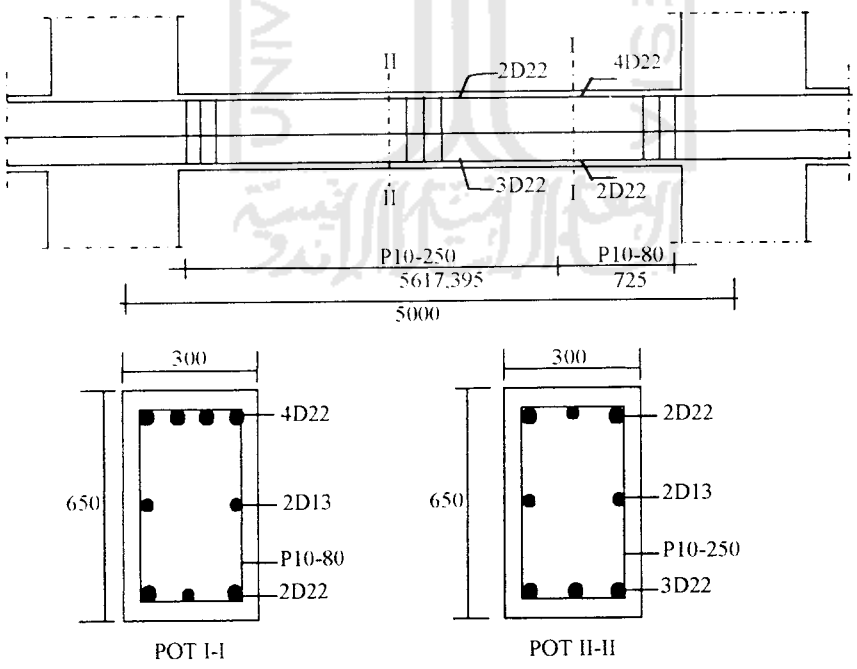
Gambar 6.3.9 Balok Portal 2 Lantai 7



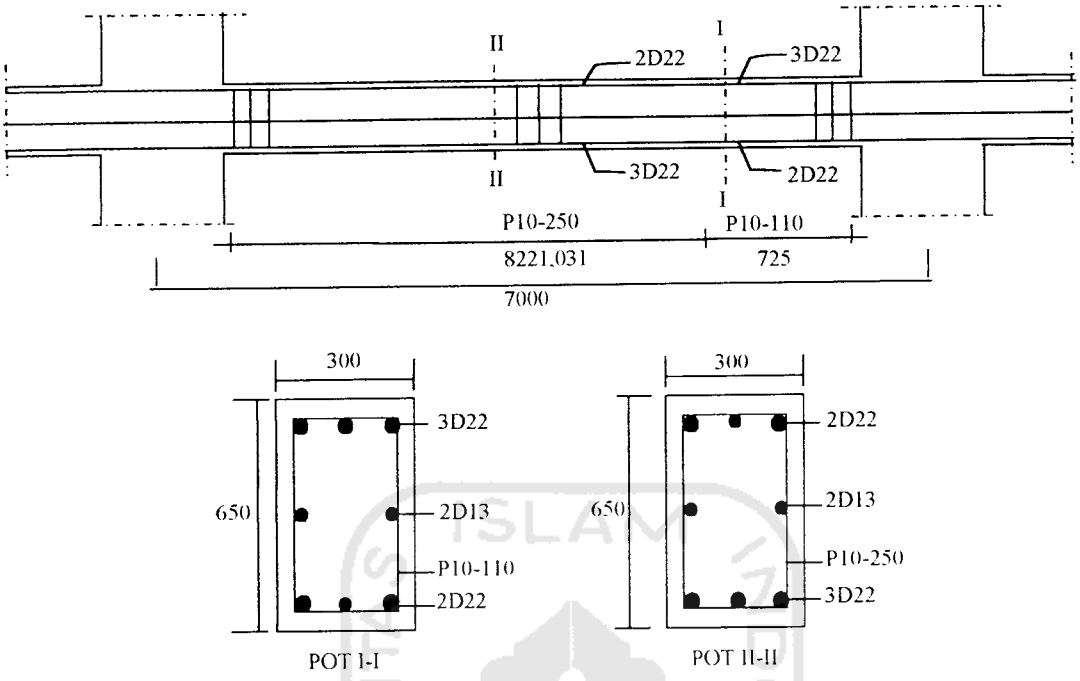
Gambar 6.3.10 Balok Portal E Bentang 7m Lantai 10



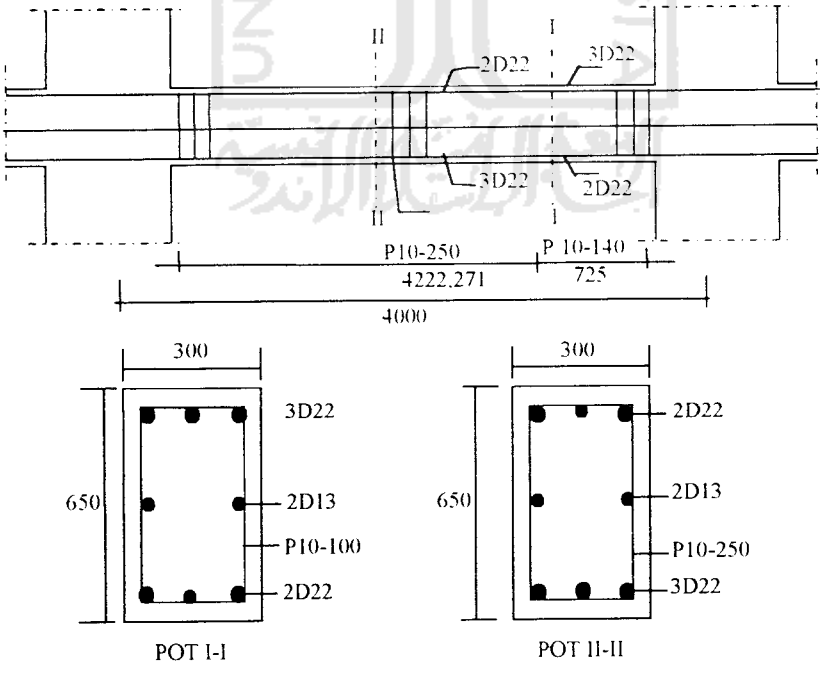
Gambar 6.3.11 Balok Portal E Bentang 4 m Lantai 10



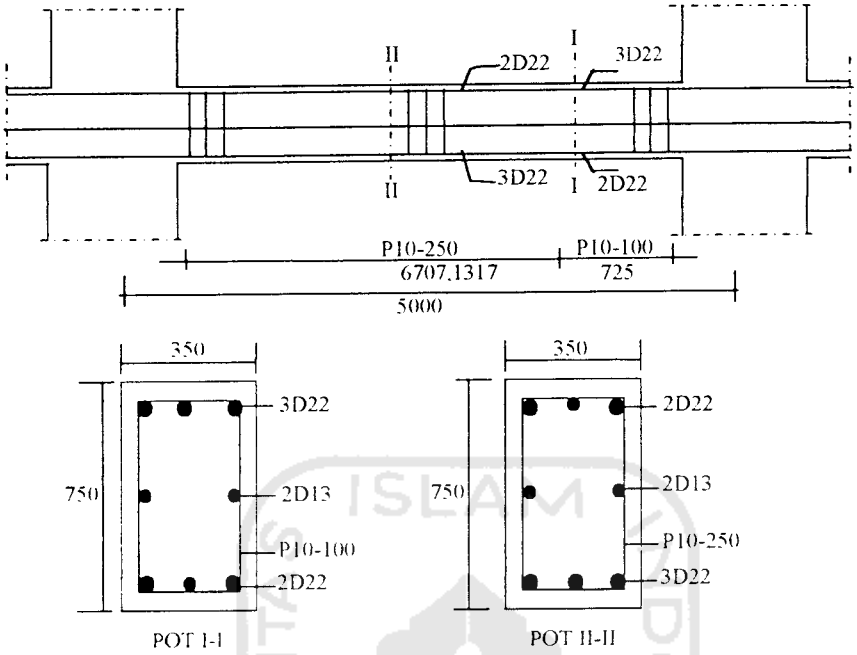
Gambar 6.3.12 Balok Portal 2 Lantai 10



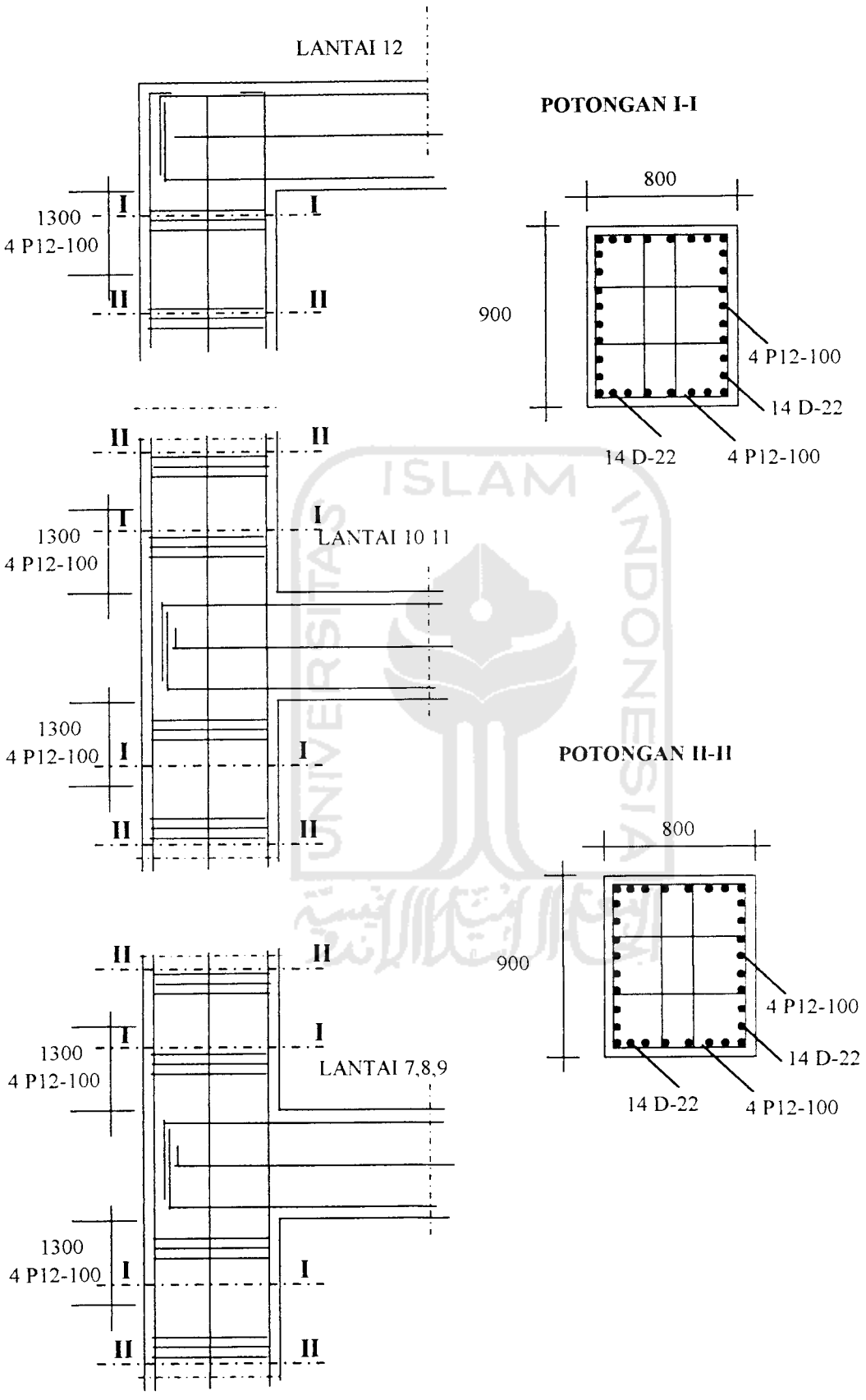
Gambar 6.3.13 Balok Portal E Bentang 7m Lantai 12



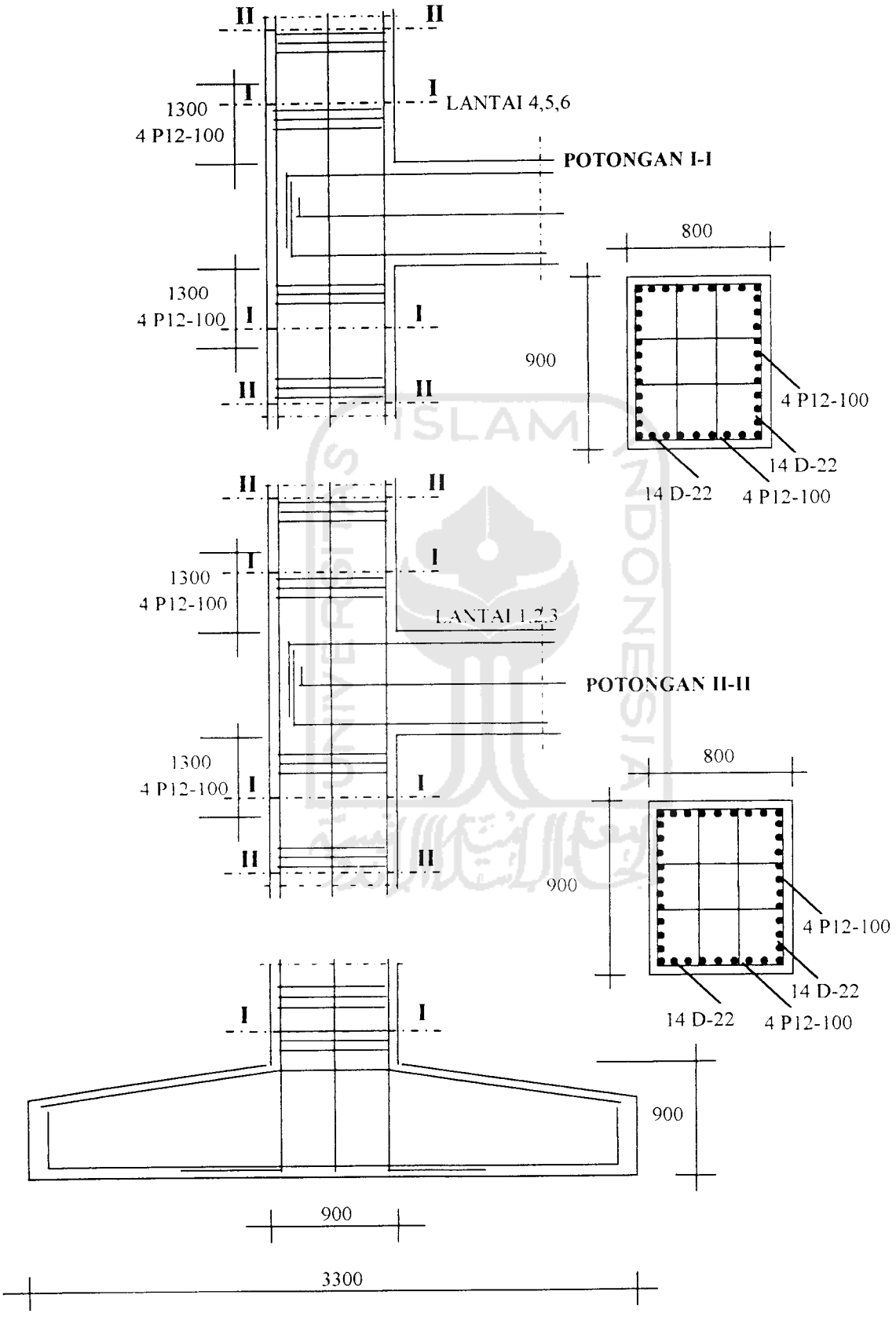
Gambar 6.3.14 Balok Portal E Bentang 4 m Lantai 12



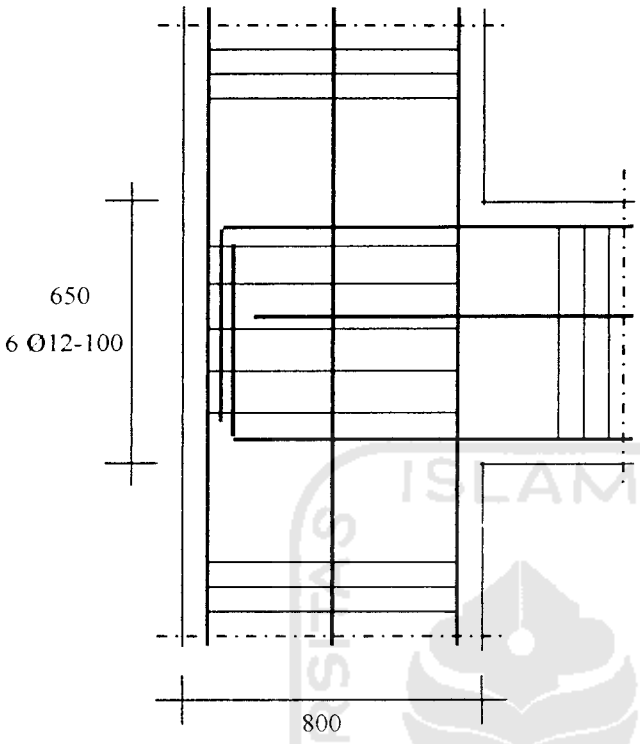
Gambar 6.3.15 Balok Portal 2 Lantai 12



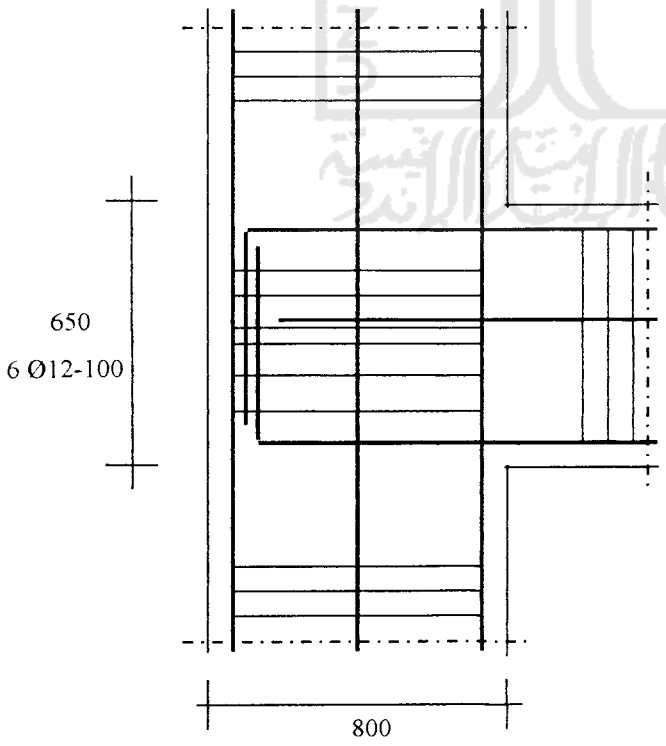
Gambar 6.3.16 Kolom D



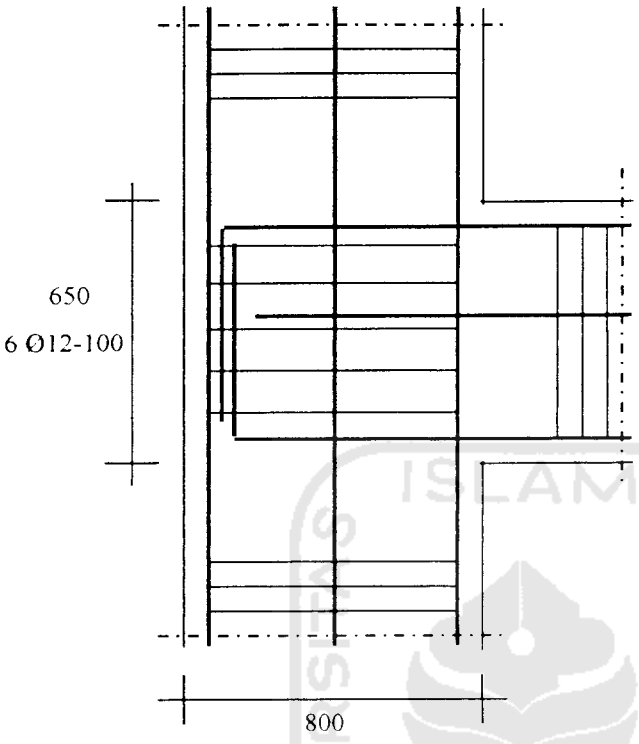
Gambar 6.3.17 Kolom D dan Pondasi



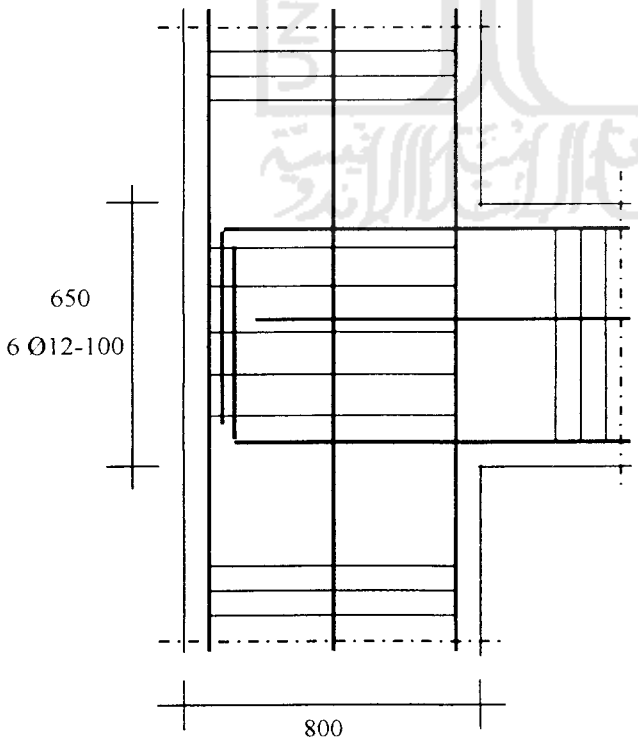
Gambar 6.3.18 Detail join Balok Kolom D Lantai 12



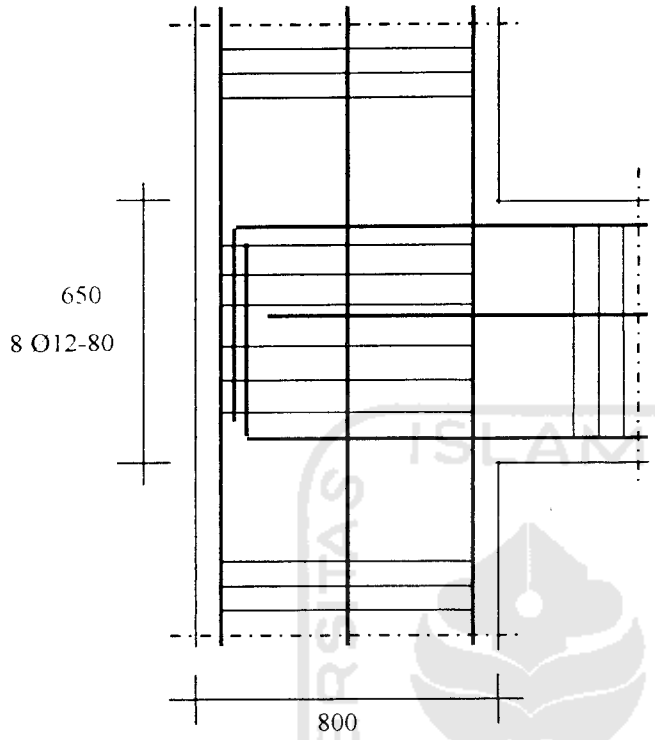
Gambar 6.3.19 Detail join Balok Kolom D Lantai 10 dan 11



Gambar 6.3.20 Detail join Balok Kolom D Lantai 7, 8 dan 9



Gambar 6.3.21 Detail join Balok Kolom D Lantai 4, 5 dan 6



Gambar 6.3.22 Detail join Balok Kolom D Lantai 1, 2 dan 3

6.2 Pembahasan

Berdasarkan dari hasil perhitungan desain struktur pada rangking wilayah gempa 1 (R/W 1/1 lama dan R/W 1/6 baru) dan rangking wilayah gempa 2 (R/W 2/2 lama dan R/W 2/5 baru) dengan menggunakan *code* lama dan *code* baru didapat hasil sebagai berikut:

6.2.1 Perbandingan Beban Gempa

Dari grafik 6.1 pada rangking gempa 1 (R/W 1/1 lama dan R/W 1/6 baru) gaya geser dasar V pada *code* lama menunjukkan hasil yang lebih besar dari *code* baru. Namun pada rangking gempa 2 (R/W 2/2 lama dan R/W 2/5 baru) gaya geser dasar V pada *code* lama menunjukkan hasil yang lebih kecil dari *code* baru. Untuk R/W 1/1 lama lebih besar 131,49 % dari R/W 1/6 baru, sedangkan untuk R/W 2/2 baru lebih kecil 103,89 % dari R/W 2/5 baru.

Akibat perbedaan gaya geser dasar gempa, berakibat perbedaan pada momen perlu, momen tersedia, dan momen kapasitas pada balok dan perbedaan momen pada kolom.

6.2.2 Kebutuhan Tulangan Balok

Struktur yang berada pada R/W 1/1 lama, luas tulangan longitudinal lebih besar 123,93 %, sedangkan luas tulangan geser lebih besar 101,81 % dari R/W 1/6 baru. Pada R/W 2/2 lama, luas tulangan longitudinal lebih kecil 123,43 % sedangkan luas tulangan geser lebih kecil 101,36 % dari R/W 2/5 baru.

6.2.3 Kebutuhan Tulangan Kolom

Secara umum struktur yang berada pada R/W 1/1 lama, luas tulangan longitudinal lebih besar 109,00 %, tulangan geser lebih besar 101,64 % dari R/W 1/6 baru. Sedangkan pada R/W 2/2 lama, luas tulangan longitudinal lebih kecil 107,52 % dan tulangan geser lebih kecil 100,53 % dari R/W 2/5 baru.

6.2.4 Kebutuhan Tulangan Pondasi

Kebutuhan tulangan *poer* pondasi tiang pancang pada R/W 1/1 lama, gaya aksial dan momen yang terjadi lebih besar dari R/W 1/6 baru. Sehingga kebutuhan tulangan pada *code* lama lebih besar dari *code* baru, tulangan terpasang disamakan karena perbedaan kebutuhan tulangan relatif kecil. Struktur pada R/W 2/2 lama, gaya aksial dan momen yang terjadi lebih kecil dari R/W 2/5 baru. Kebutuhan tulangan pada *code* lama lebih kecil dari *code* baru, tulangan terpasang disamakan karena perbedaan kebutuhan tulangan relatif kecil.