

LAMPIRAN

Lampiran 1 Perhitungan beban pada denah model L1

Berat seismik lantai 1 (W1)

- Beban mati W1

- Pelat lantai	= 2400 x 0,12 x 800	= 259.200 kg
- Kolom	= 2400 x 0,5 x 0,5 x 4 x 45	= 117.600 kg
- Dinding	= (4 x 30) x 4 x 250	= 120.000 kg
- Tegel	= 24 x 800	= 21.600 kg
- Plafond	= 11 x 800	= 9.900 kg
- Penggantung	= 7 x 800	= 6.300 kg
- Spesi (1cm)	= 21 x 800	= 18.900 kg
- MEP	= 20 x 800	= 18.000 kg

Total beban mati W1 = 464.800 kg

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

Beban hidup W1 = Faktor reduksi x Beban hidup plat lantai x Luas area
= 0,75 x 250 kg/m³ x 800 m²
= 150.000 kg

W1total = beban mati W1 + beban hidup W1
= 464.800 kg + 168.750 kg
= 614.800 kg

Beban mati Lantai 2 (W2)

- Beban mati W2

- Pelat lantai	= 2400 x 0,12 x 800	= 259.200 kg
- Kolom	= 2400 x 0,5 x 0,5 x 4 x 45	= 108.000 kg
- Balok	= 2400 x 0,3 x 0,4 x 5 x 78	= 112.320 kg
- Dinding	= (4 x 30) x 4 x 250	= 120.000 kg
- Tegel	= 24 x 800	= 21.600 kg
- Plafond	= 11 x 800	= 9.900 kg
- Penggantung	= 7 x 800	= 6.300 kg
- Spesi (1cm)	= 21 x 800	= 18.900 kg
- MEP	= 20 x 800	= 18.000 kg

Total beban mati W2 = 577.120 kg

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

Beban hidup W2 = Faktor reduksi x Beban hidup plat lantai x Luas area

$$\begin{aligned}
 &= 0,75 \times 250 \text{ kg/m}^3 \times 800 \text{ m}^2 \\
 &= 168.750 \text{ kg} \\
 \text{W2total} &= \text{beban mati W2} + \text{beban hidup W2} \\
 &= 632.640 \text{ kg} + 168.750 \text{ kg} \\
 &= 727.120 \text{ kg}
 \end{aligned}$$

Beban mati Lantai 3-4 (W3-W4)

- **Beban mati**

- Pelat lantai	= 2400 x 0,12 x 800	= 259.200 kg
- Kolom	= 2400 x 0,4 x 0,4 x 4 x 49	= 75.264 kg
- Balok	= 2400 x 0,3 x 0,4 x 5 x 84	= 120.960 kg
- Dinding	= (4 x 30) x 4 x 250	= 120.000 kg
- Tegel	= 24 x 800	= 21.600 kg
- Plafond	= 11 x 800	= 9.900 kg
- Penggantung	= 7 x 800	= 6.300 kg
- Spesi (1cm)	= 21 x 800	= 18.900 kg
- MEP	= 20 x 800	= 18.000 kg

$$\text{Total beban mati W3-W4} = 590.304 \text{ kg}$$

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

$$\begin{aligned}
 \text{Beban hidup W3-W4} &= \text{Faktor reduksi} \times \text{Beban hidup plat lantai} \times \text{Luas area} \\
 &= 0,75 \times 250 \text{ kg/m}^3 \times 800 \text{ m}^2 \\
 &= 168.750 \text{ kg}
 \end{aligned}$$

$$\begin{aligned}
 \text{(W3-W4)total} &= \text{beban mati (W3-W4)} + \text{beban hidup (W3-W4)} \\
 &= 590.304 \text{ kg} + 168.750 \text{ kg} \\
 &= 688.240 \text{ kg}
 \end{aligned}$$

Beban mati Lantai 5 W5

- **Beban mati**

- Pelat lantai	= 2400 x 0,12 x 800	= 259.200 kg
- Kolom	= 2400 x 0,3 x 0,3 x 4 x 49	= 42.336 kg
- Balok	= 2400 x 0,3 x 0,4 x 5 x 84	= 120.960 kg
- Dinding	= (4 x 30) x 4 x 250	= 120.000 kg
- Tegel	= 24 x 800	= 21.600 kg
- Plafond	= 11 x 800	= 9.900 kg
- Penggantung	= 7 x 800	= 6.300 kg
- Spesi (1cm)	= 21 x 800	= 18.900 kg
- MEP	= 20 x 900	= 18.000 kg

$$\text{Total beban mati W5} = 557.376 \text{ kg}$$

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

$$\begin{aligned} \text{Beban hidup W5} &= \text{Faktor reduksi} \times \text{Beban hidup plat lantai} \times \text{Luas area} \\ &= 0,75 \times 250 \text{ kg/m}^3 \times 800 \text{ m}^2 \\ &= 168.750 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{W5total} &= \text{beban mati W5} + \text{beban hidup W5} \\ &= 557.376 \text{ kg} + 168.750 \text{ kg} \\ &= 658.000 \text{ kg} \end{aligned}$$

Beban mati Lantai 6 (W6)

- **Beban mati**

- Pelat Atap	= 2400 x 0,12 x 800	= 259.200 kg
- Kolom	= 2400 x 0,3 x 0,3 x 4 x 49	= 42.336 kg
- Balok	= 2400 x 0,3 x 0,4 x 5 x 84	= 120.960 kg
- Dinding	= (4 x 30) x 4 x 250	= 120.000 kg
- Plafond	= 11 x 800	= 9.900 kg
- Penggantung	= 7 x 800	= 6.300 kg
- Spesi (1cm)	= 21 x 800	= 18.900 kg
- MEP	= 20 x 800	= 18.000 kg

$$\text{Total beban mati W6} = 535.776 \text{ kg}$$

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

$$\begin{aligned} \text{Beban hidup W6} &= \text{Faktor reduksi} \times \text{Beban hidup plat lantai} \times \text{Luas area} \\ &= 0,75 \times 100 \text{ kg/m}^3 \times 800 \text{ m}^2 \\ &= 67.500 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{W6total} &= \text{beban mati W6} + \text{beban hidup W6} \\ &= 535.776 \text{ kg} + 67.500 \text{ kg} \\ &= 548.800 \text{ kg} \end{aligned}$$

Lantai ke-	W(kg)	Tinggi (m)
6	548.800	24
5	658.000	20
4	688.240	16
3	688.240	12
2	727.120	8
1	614.800	4
Total	3.525.200	

$$V = C_s \times \sum W = 0,06 \times 3.525.200 = 211.512 \text{ kg}$$

Lampiran 2 Perhitungan beban pada denah model L2

Berat seismik lantai 1 (W1)

- Beban mati W1

- Pelat lantai	= 2400 x 0,12 x 500	= 259.200 kg
- Kolom	= 2400 x 0,5 x 0,5 x 4 x 33	= 117.600 kg
- Dinding	= (4 x 30) x 4 x 250	= 120.000 kg
- Tegel	= 24 x 500	= 21.600 kg
- Plafond	= 11 x 500	= 9.900 kg
- Penggantung	= 7 x 500	= 6.300 kg
- Spesi (1cm)	= 21 x 500	= 18.900 kg
- MEP	= 20 x 500	= 18.000 kg

Total beban mati W1 = 324.700 kg

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

Beban hidup W1 = Faktor reduksi x Beban hidup plat lantai x Luas area
= 0,75 x 250 kg/m² x 500 m²
= 93.750 kg

W1total = beban mati W1 + beban hidup W1
= 324.700 kg + 93.750 kg
= 418.450 kg

Beban mati Lantai 2 (W2)

- Beban mati W2

- Pelat lantai	= 2400 x 0,12 x 500	= 259.200 kg
- Kolom	= 2400 x 0,5 x 0,5 x 4 x 33	= 117.600 kg
- Balok	= 2400 x 0,3 x 0,4 x 5 x 52	= 120.960 kg
- Dinding	= (4 x 30) x 4 x 250	= 120.000 kg
- Tegel	= 24 x 500	= 21.600 kg
- Plafond	= 11 x 500	= 9.900 kg
- Penggantung	= 7 x 500	= 6.300 kg
- Spesi (1cm)	= 21 x 500	= 18.900 kg
- MEP	= 20 x 500	= 18.000 kg

Total beban mati W2 = 399.580 kg

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

$$\begin{aligned} \text{Beban hidup W2} &= \text{Faktor reduksi} \times \text{Beban hidup plat lantai} \times \text{Luas area} \\ &= 0,75 \times 250 \text{ kg/m}^3 \times 500 \text{ m}^2 \\ &= 93.750 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{W2total} &= \text{beban mati W2} + \text{beban hidup W2} \\ &= 399.580 \text{ kg} + 168.750 \text{ kg} \\ &= 493.330 \text{ kg} \end{aligned}$$

Beban mati Lantai 3-4 (W3-W4)

- **Beban mati**

- Pelat lantai	= 2400 x 0,12 x 900	= 259.200 kg
- Kolom	= 2400 x 0,4 x 0,4 x 4 x 49	= 75.264 kg
- Balok	= 2400 x 0,3 x 0,4 x 5 x 84	= 120.960 kg
- Dinding	= (4 x 30) x 4 x 250	= 120.000 kg
- Tegel	= 24 x 500	= 21.600 kg
- Plafond	= 11 x 500	= 9.900 kg
- Penggantung	= 7 x 500	= 6.300 kg
- Spesi (1cm)	= 21 x 500	= 18.900 kg
- MEP	= 20 x 500	= 18.000 kg

$$\text{Total beban mati W3-W4} = 298.588 \text{ kg}$$

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

$$\begin{aligned} \text{Beban hidup W3-W4} &= \text{Faktor reduksi} \times \text{Beban hidup plat lantai} \times \text{Luas area} \\ &= 0,75 \times 250 \text{ kg/m}^3 \times 500 \text{ m}^2 \\ &= 168.750 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{(W3-W4)total} &= \text{beban mati (W3-W4)} + \text{beban hidup (W3-W4)} \\ &= 298.588 \text{ kg} + 168.750 \text{ kg} \\ &= 392.338 \text{ kg} \end{aligned}$$

Beban mati Lantai 5 W5

- **Beban mati**

- Pelat lantai	= 2400 x 0,12 x 900	= 259.200 kg
- Kolom	= 2400 x 0,3 x 0,3 x 4 x 49	= 42.336 kg
- Balok	= 2400 x 0,3 x 0,4 x 5 x 84	= 120.960 kg
- Dinding	= (4 x 30) x 4 x 250	= 120.000 kg
- Tegel	= 24 x 500	= 21.600 kg
- Plafond	= 11 x 500	= 9.900 kg
- Penggantung	= 7 x 500	= 6.300 kg
- Spesi (1cm)	= 21 x 500	= 18.900 kg
- MEP	= 20 x 500	= 18.000 kg

$$\text{Total beban mati W5} = 557.376 \text{ kg}$$

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

$$\begin{aligned} \text{Beban hidup W5} &= \text{Faktor reduksi} \times \text{Beban hidup plat lantai} \times \text{Luas area} \\ &= 0,75 \times 250 \text{ kg/m}^3 \times 500 \text{ m}^2 \\ &= 168.750 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{W5total} &= \text{beban mati W5} + \text{beban hidup W5} \\ &= 557.376 \text{ kg} + 168.750 \text{ kg} \\ &= 370.162 \text{ kg} \end{aligned}$$

Beban mati Lantai 6 (W6)

- **Beban mati**

- Pelat Atap = 2400 x 0,12 x 900 = 259.200 kg
- Kolom = 2400 x 0,3 x 0,3 x 4 x 49 = 42.336 kg
- Balok = 2400 x 0,3 x 0,4 x 5 x 84 = 120.960 kg
- Dinding = (4 x 30) x 4 x 250 = 120.000 kg
- Plafond = 11 x 900 = 9.900 kg
- Penggantung = 7 x 900 = 6.300 kg
- Spesi (1cm) = 21 x 900 = 18.900 kg
- MEP = 20 x 900 = 18.000 kg

$$\text{Total beban mati W6} = 535.776 \text{ kg}$$

Faktor reduksi diambil dari peraturan PPIUG 1983 Tabel 3.3 yakni bangunan hunian memiliki factor reduksi sebesar 0,75

$$\begin{aligned} \text{Beban hidup W6} &= \text{Faktor reduksi} \times \text{Beban hidup plat lantai} \times \text{Luas area} \\ &= 0,75 \times 100 \text{ kg/m}^3 \times 500 \text{ m}^2 \\ &= 67.500 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{W6total} &= \text{beban mati W6} + \text{beban hidup W6} \\ &= 535.776 \text{ kg} + 67.500 \text{ kg} \\ &= 358.162 \text{ kg} \end{aligned}$$

Lantai ke-	W(kg)	Tinggi (m)
6	358.162	24
5	370.162	20
4	392.338	16
3	392.338	12
2	493.330	8
1	418.450	4
Total	2.424.780	

$$V = C_s \times \sum W = 0,06 \times 2.424.780 = 145.486,8 \text{ kg} = 1.454,87 \text{ Kn}$$