

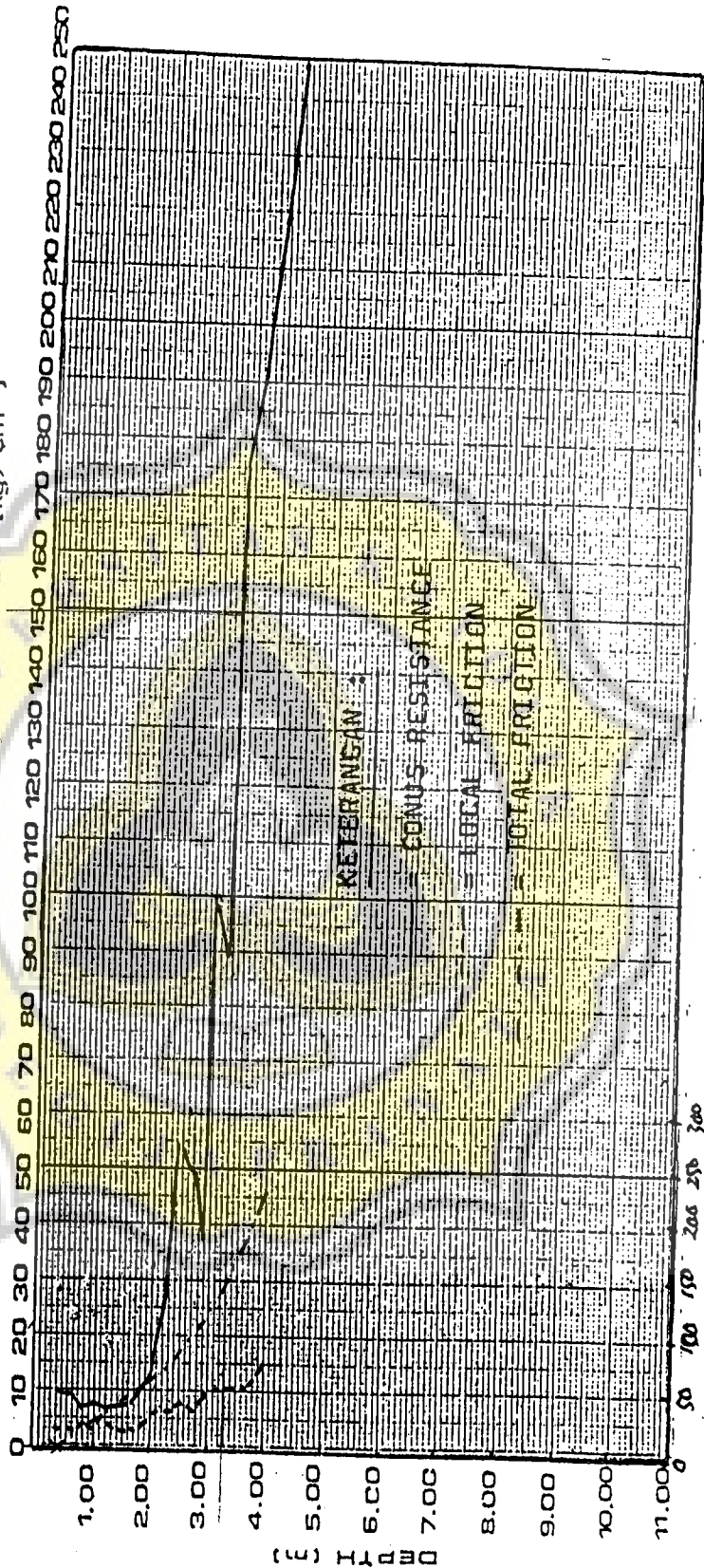
LAMPIRAN



SOUNDING :
 LOCATION : POLITEKNIK KESEHA
 JL. TIRTO AGUNG PEDALANGAN, SI
 DATE : 15/IV/2007.

GRAPH OF SOUNDING
 2.5 TON

CONUS RESISTANCE & LOCAL FRICTION (kg/cm²)



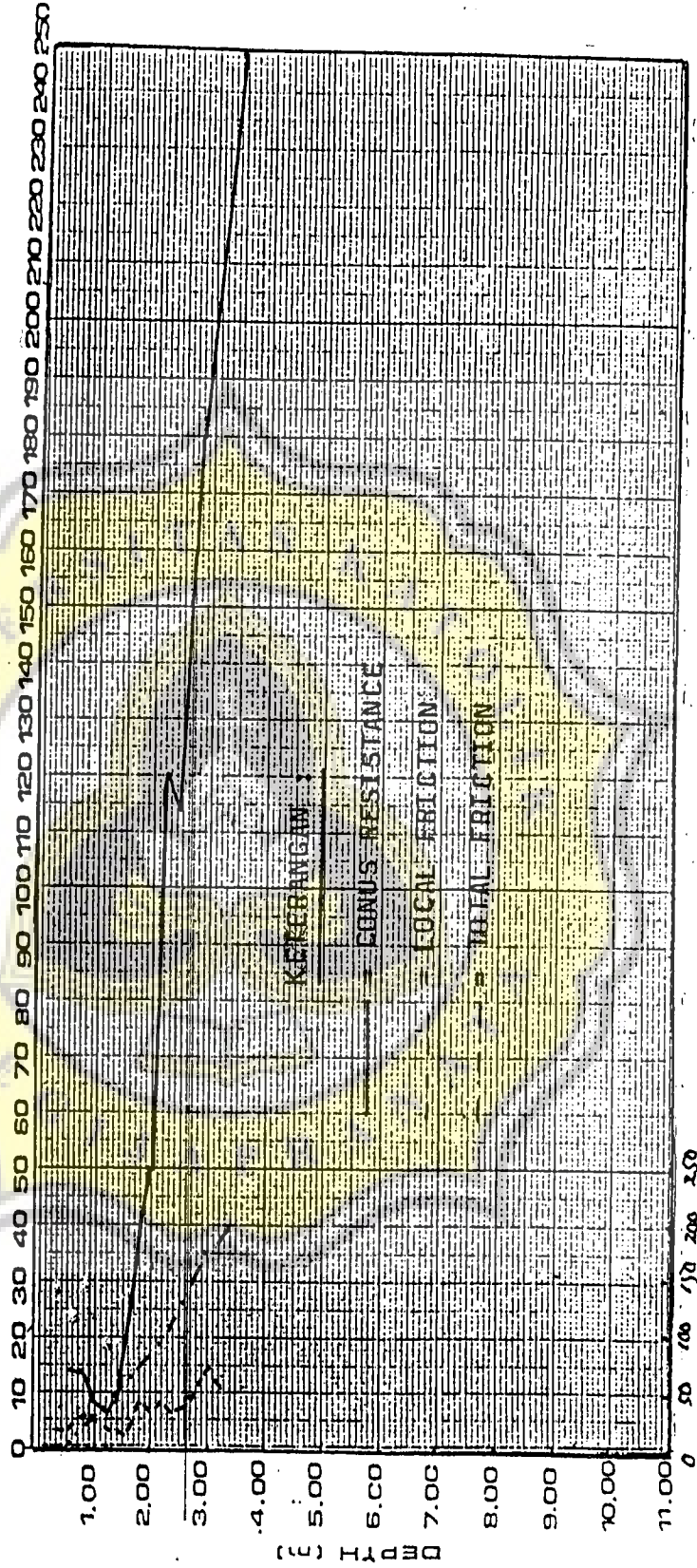
TOTAL FRICTION (kg/m)

SOUNDING :
 LOCATION POLI TEKNIK KESEHATAN
 JL TIRTO AGUNG PEDALANGAN SMG
 DATE : 15/IV/2007,

GRAPH OF SOUNDING

2.5 TON

CONUS RESISTANCE & LOCAL FRICTION (kg/cm²)

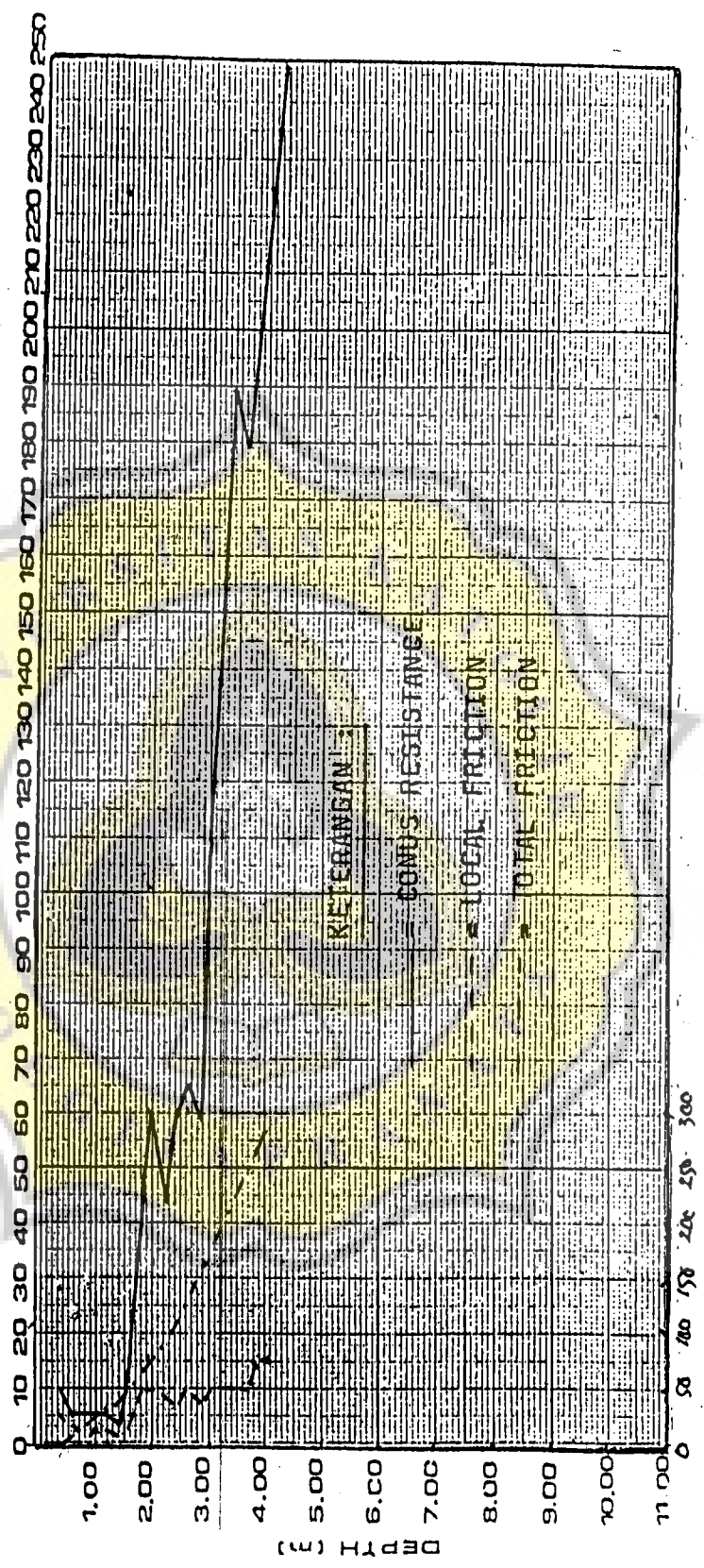


TOTAL FRICTION (kg/m)

SOUNDING :
 LOCATION : POLITEKNIK KESEHATAN
 JL. TIRTO AGUNG PEDALANGAN SMG.
 DATE : 15/IV/2007.

GRAPH OF SOUNDING
 2.5 TON

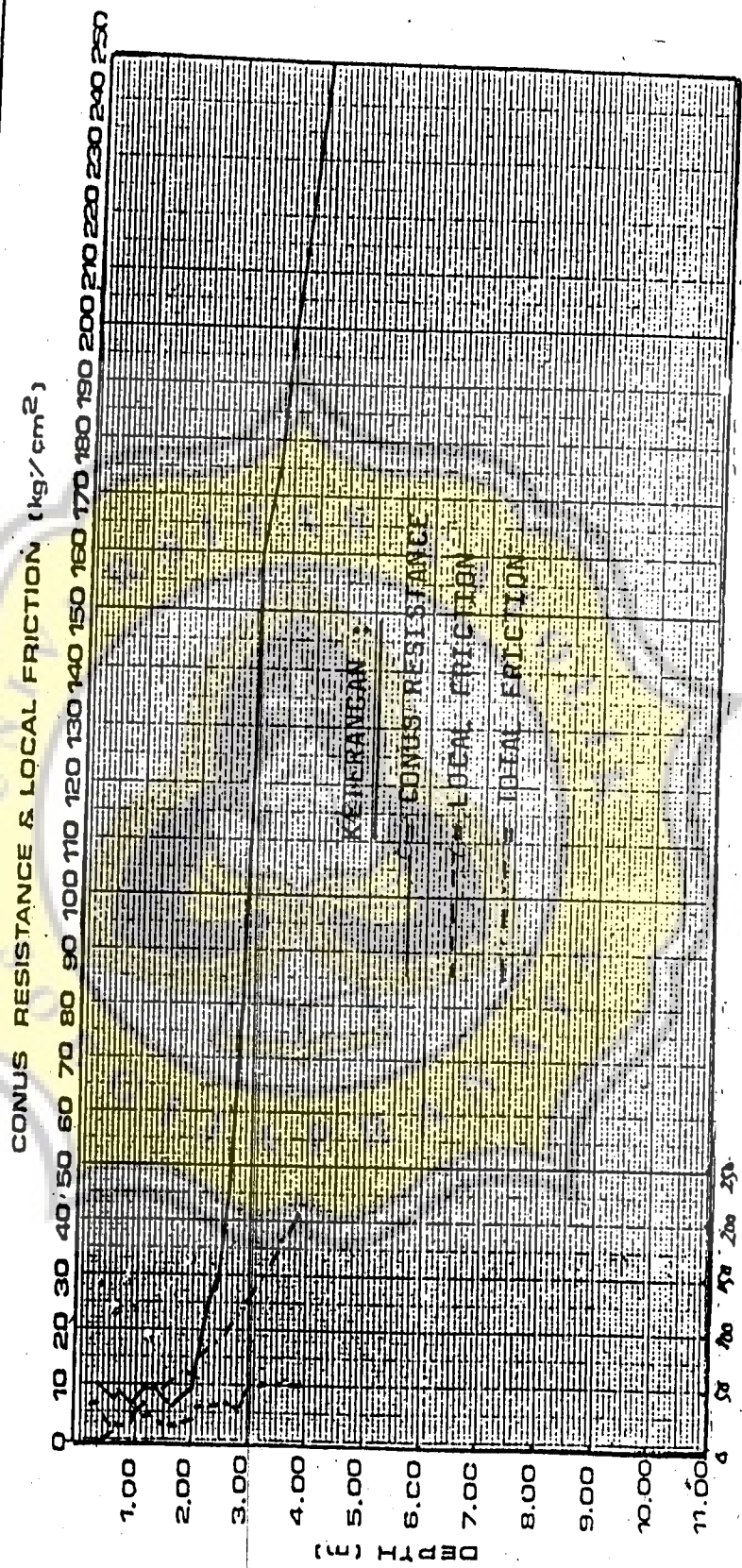
CONUS RESISTANCE & LOCAL FRICTION (kg/cm²)



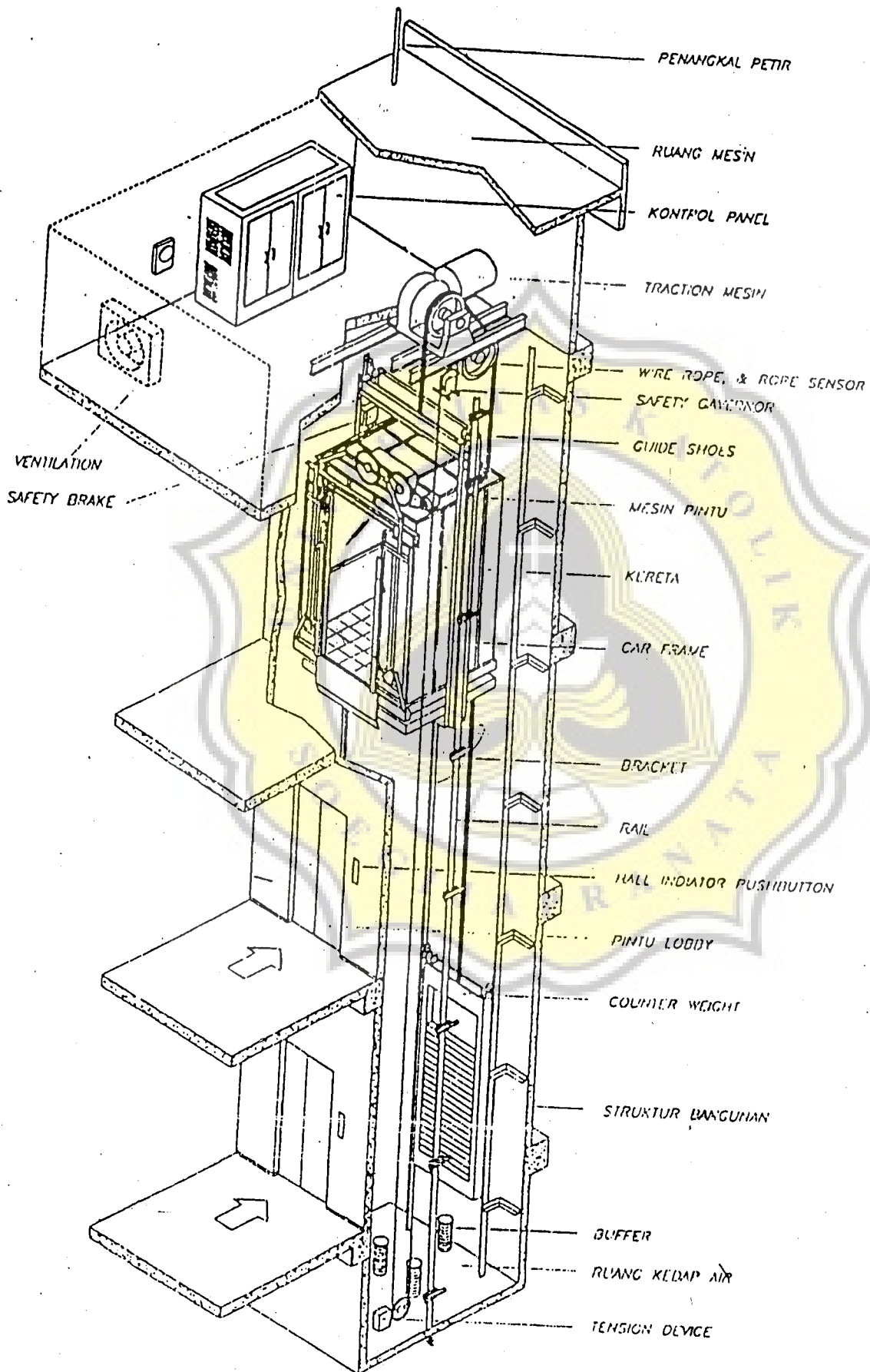
TOTAL FRICTION (kg/m)

SOUNDING :
 LOCATION : POLITEKNIK KESEHATAN
 JL TIRTO AGUNG PEDALANGAN SMG.
 DATE : 15/IV/2007.

GRAPH OF SOUNDING
 2.5 TON



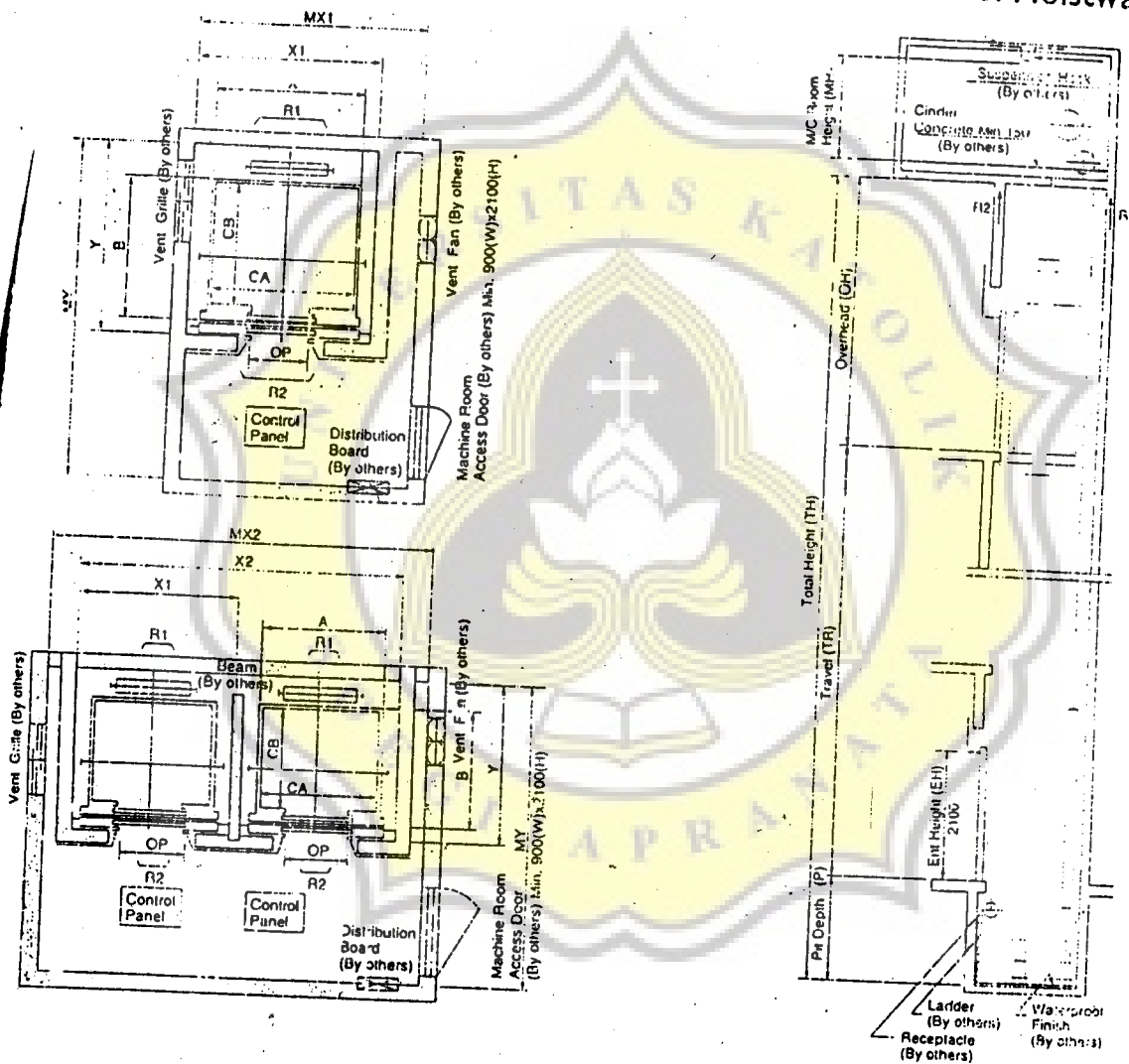
TOTAL FRICTION (kg/m)



Installation Layout Plan & Standard Dimension

Plan of Hoistway & Machine Room

Section of Hoistway



Note:
Machine Room temperature should be maintained below 40 °C with ventilating fan and air conditioner (if necessary) and humidity below 90%.

Heat Emission of M/C Room

$$Kcal/H = F \times L \times S$$

H : Hour

L : Capacity (Kgs)

S : Speed (M/Min)

F : Factor

F : 1/40 : VVVF

(unit : mm)

| Speed (M/Min) | Overhead (OH) | Pit (P) | M/C Room Height (MH) |
|---------------|---------------|---------|----------------------|
| 45 | 4,400 | 1,200 | 2,200 |
| 60 | 4,600 | 1,500 | 2,200 |
| 90 | 4,800 | 1,800 | 2,400 |
| 105 | 5,000 | 2,100 | 2,400 |

Standard Dimensions & Reactions

(Unit : mm)

| Speed (M/Min) | Capacity | | Clear Opening | Car | | Hoistway | | | M/C Room | | | M/C Room Reaction(kgs) | |
|------------------|----------|-------|------------------|---------------|---------------|----------|-------|-------|----------|-------|-------|---------------------------|-------|
| | | | | Internal | External | 1Car | 2Cars | Depth | 1Car | 2Cars | Depth | R1 | R2 |
| | Persons | (kgs) | OP | CA x CB | A x B | X1 | X2 | Y | MX1 | MX2 | MY | | |
| 45 | 6 | 450 | 800 | 1,400 x 850 | 1,460 x 1,005 | 1,800 | 3,700 | 1,480 | 2,000 | 4,000 | 3,200 | 3,600 | 2,000 |
| | 8 | 550 | 800 | 1,400 x 1,030 | 1,460 x 1,185 | 1,800 | 3,700 | 1,660 | 2,000 | 4,000 | 3,400 | 4,050 | 2,250 |
| | 9 | 600 | 800 | 1,400 x 1,100 | 1,460 x 1,255 | 1,800 | 3,700 | 1,730 | 2,000 | 4,000 | 3,500 | 4,100 | 2,450 |
| | | | | 1,400 x 1,150 | 1,460 x 1,305 | 1,800 | 3,700 | 1,780 | 2,000 | 4,000 | 3,550 | | |
| | 10 | 680 | 800 | 1,400 x 1,250 | 1,460 x 1,405 | 1,800 | 3,700 | 1,880 | 2,000 | 4,000 | 3,600 | 4,200 | 2,700 |
| | 11 | 750 | 800 | 1,400 x 1,350 | 1,460 x 1,505 | 1,800 | 3,700 | 2,000 | 2,000 | 4,000 | 3,700 | 4,550 | 2,800 |
| | 13 | 900 | 900 | 1,600 x 1,350 | 1,660 x 1,505 | 2,050 | 4,200 | 2,000 | 2,300 | 4,400 | 3,750 | 5,100 | 3,750 |
| | | | | 1,600 x 1,400 | 1,660 x 1,555 | 2,050 | 4,200 | 2,050 | 2,300 | 4,400 | 3,800 | | |
| | 60 | 1,000 | 900 | 1,600 x 1,500 | 1,660 x 1,655 | 2,050 | 4,200 | 2,150 | 2,300 | 4,400 | 3,850 | 5,450 | 4,300 |
| | | | | 1,600 x 1,550 | 1,660 x 1,705 | 2,050 | 4,200 | 2,200 | 2,300 | 4,400 | 3,900 | | |
| 90 | 1,150 | 1,000 | 1,800 x 1,500 | 1,900 x 1,670 | 2,350 | 4,800 | 2,280 | 2,600 | 4,900 | 3,900 | 6,600 | 5,100 | |
| | | 1,100 | 2,000 x 1,350 | 2,100 x 1,520 | 2,550 | 5,200 | 2,130 | 2,800 | 5,250 | 3,800 | | | |
| 105 | 1,350 | 1,000 | 1,800 x 1,700 | 1,900 x 1,870 | 2,350 | 4,800 | 2,480 | 2,600 | 4,900 | 4,200 | 7,800 | 6,000 | |
| | | | 1,800 x 1,730 | 1,900 x 1,900 | 2,350 | 4,800 | 2,510 | 2,600 | 4,900 | 4,300 | | | |
| | | 1,100 | 2,000 x 1,500 | 2,100 x 1,670 | 2,550 | 5,200 | 2,280 | 2,800 | 5,250 | 4,000 | | | |
| | | 1,100 | 2,000 x 1,550 | 2,100 x 1,720 | 2,550 | 5,200 | 2,330 | 2,800 | 5,250 | 4,100 | | | |
| 24 | 1,600 | 1,100 | 2,000 x 1,750 | 2,100 x 1,920 | 2,550 | 5,200 | 2,530 | 2,900 | 5,400 | 4,300 | 8,500 | 6,800 | |
| | | | 2,000 x 1,800 | 2,100 x 1,970 | 2,550 | 5,200 | 2,580 | 2,900 | 5,400 | 4,400 | | | |
| | | | 2,150 x 1,600 | 2,250 x 1,770 | 2,700 | 5,500 | 2,380 | 3,000 | 5,650 | 4,200 | | | |
| | | | 2,150 x 1,670 | 2,250 x 1,840 | 2,700 | 5,500 | 2,450 | 3,000 | 5,650 | 4,300 | | | |

- Notes :
1. White colored dimensions shall be applied for Malaysia & Singapore market.
 2. Above hoistway dimensions are based on 15-storied buildings. For application to over 16-storied buildings, the hoistway dimensions shall be at least 5% larger considering the sloping of the hoistways.
 3. Above dimensions are based on center opening doors. For applicable dimensions with side opening door, consult Hyundai.
 4. When non-standard capacities and dimensions are required to meet the local code, consult Hyundai.

Tabel Perhitungan pelat lantai (two way slab) arah X
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ MPa}$
 $f_y = 240 \text{ MPa}$
 lebar plat (b) = 1000 mm
 ϕ tul = 10,0 mm

| Type pelat | t (mm) | Lx (m) | Ly (m) | Ly/Lx | Kx | qDL (kg/m ²) | qUL (kg/m ²) | qu (kg/m ²) | Mlx (-Mtn) | Mtn (Nmm) | b (mm) | dx (mm) | a (mm) | As (mm ²) | As _{min1} (mm ²) | As _{min2} (mm ²) | As pakai (mm ²) | Jarak s (mm) | Tul |
|------------|--------|--------|--------|-------|-------|--------------------------|--------------------------|-------------------------|------------|-----------|--------|---------|--------|-----------------------|---------------------------------------|---------------------------------------|-----------------------------|--------------|---------|
| A | 120 | 2,50 | 5,00 | 2,00 | 62,00 | 493 | 250 | 991,6 | 384,245 | 4,80E+06 | 1000 | 95 | 2,911 | 288,69 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| B | 120 | 3,50 | 5,00 | 1,43 | 53,90 | 493 | 250 | 991,6 | 654,729 | 8,18E+06 | 1000 | 95 | 5,017 | 497,51 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| C | 120 | 3,00 | 5,00 | 1,67 | 58,67 | 493 | 250 | 991,6 | 523,595 | 6,54E+06 | 1000 | 95 | 3,990 | 395,66 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| D | 120 | 2,50 | 2,50 | 1,00 | 36,00 | 493 | 250 | 991,6 | 223,110 | 2,79E+06 | 1000 | 95 | 1,679 | 166,53 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| D' | 120 | 2,50 | 2,50 | 1,00 | 56,00 | 441 | 150 | 769,2 | 269,220 | 3,37E+06 | 1000 | 95 | 2,030 | 201,32 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| E | 120 | 2,50 | 3,50 | 1,40 | 53,00 | 493 | 250 | 991,6 | 328,468 | 4,11E+06 | 1000 | 95 | 2,483 | 246,22 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| F | 120 | 2,00 | 2,00 | 1,00 | 36,00 | 493 | 250 | 991,6 | 142,790 | 1,78E+06 | 1000 | 95 | 1,071 | 106,24 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| G | 120 | 2,00 | 4,00 | 2,00 | 62,00 | 493 | 250 | 991,6 | 245,917 | 3,07E+06 | 1000 | 95 | 1,853 | 183,72 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| G' | 120 | 2,00 | 4,00 | 2,00 | 85,00 | 441 | 150 | 769,2 | 261,528 | 3,27E+06 | 1000 | 95 | 1,972 | 195,51 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| H | 120 | 2,00 | 3,00 | 1,50 | 56,00 | 493 | 250 | 991,6 | 222,118 | 2,78E+06 | 1000 | 95 | 1,672 | 165,78 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| H' | 120 | 2,00 | 3,00 | 1,50 | 69,00 | 441 | 150 | 769,2 | 212,299 | 2,65E+06 | 1000 | 95 | 1,597 | 158,39 | 554,17 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| I | 120 | 2,50 | 4,00 | 1,60 | 58,00 | 493 | 250 | 991,6 | 359,455 | 4,49E+06 | 1000 | 95 | 2,721 | 269,79 | 554,1667 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| J | 120 | 2,50 | 6,00 | 2,40 | 63,00 | 493 | 250 | 991,6 | 390,443 | 4,88E+06 | 1000 | 95 | 2,959 | 293,42 | 554,1667 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| J' | 120 | 2,50 | 3,00 | 1,20 | 46,00 | 493 | 250 | 991,6 | 285,085 | 3,56E+06 | 1000 | 95 | 2,151 | 213,32 | 554,1667 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| K | 150 | 1,50 | 2,00 | 1,33 | 50,00 | 553 | 250 | 1063,6 | 121,809 | 1,52E+06 | 1000 | 125 | 0,693 | 68,58 | 729,1667 | 689,00 | 729,17 | 107,657 | Ø10-100 |
| L | 120 | 1,00 | 2,00 | 2,00 | 62,00 | 493 | 250 | 991,6 | 61,479 | 7,68E+05 | 1000 | 95 | 0,400 | 45,59 | 554,1667 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| L' | 120 | 2,00 | 2,50 | 1,25 | 55,50 | 493 | 150 | 831,6 | 184,615 | 2,31E+06 | 1000 | 95 | 1,387 | 137,58 | 554,1667 | 523,64 | 554,17 | 141,654 | Ø10-140 |
| Z | 120 | 2,00 | 2,00 | 1,00 | 38,00 | 441 | 150 | 769,2 | 116,918 | 1,46E+06 | 1000 | 95 | 0,876 | 86,90 | 554,1667 | 523,64 | 554,17 | 141,654 | Ø10-140 |

Tabel Perhitungan pelat lantai (two way slab) arah Y
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ MPa}$
 $f_y = 240 \text{ MPa}$
 lebar plat (b) = 1000 mm
 ϕ tul = 10,0 mm

| Tipe pelat | t (mm) | Lx (m) | Ly (m) | Ly/Lx | Ky | qDL (kg/m ²) | qLL (kg/m ²) | qu (kg/m ²) | Mly (-Mly) (kgm) | Mn (Nmm) | b (mm) | dx (mm) | a (mm) | As (mm ²) | As,min1 (mm ²) | As,min2 (mm ²) | As pakai (mm ²) | Jarak s (mm) | Tul | |
|------------|--------|--------|--------|-------|-------|--------------------------|--------------------------|-------------------------|------------------|----------|--------|---------|--------|-----------------------|----------------------------|----------------------------|-----------------------------|--------------|------|-----|
| | | | | | | | | | | | | | | | | | | | Ø10- | 150 |
| A | 120 | 2,50 | 5,00 | 2,00 | 35,00 | 493 | 250 | 991,6 | 216,913 | 2,71E+06 | 1000 | 85 | 1,828 | 181,30 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| B | 120 | 3,50 | 5,00 | 1,43 | 37,70 | 493 | 250 | 991,6 | 457,946 | 5,72E+06 | 1000 | 85 | 3,908 | 387,56 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| C | 120 | 3,00 | 5,00 | 1,67 | 36,00 | 493 | 250 | 991,6 | 321,278 | 4,02E+06 | 1000 | 85 | 2,722 | 269,97 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| D | 120 | 2,50 | 2,50 | 1,00 | 36,00 | 493 | 250 | 991,6 | 223,110 | 2,79E+06 | 1000 | 85 | 1,881 | 186,54 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| D' | 120 | 2,00 | 2,50 | 1,25 | 49,00 | 441 | 150 | 769,2 | 150,763 | 1,88E+06 | 1000 | 85 | 1,266 | 125,59 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| E | 120 | 2,50 | 3,50 | 1,40 | 38,00 | 493 | 250 | 991,6 | 235,505 | 2,94E+06 | 1000 | 85 | 1,987 | 197,03 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| F | 120 | 2,00 | 2,00 | 1,00 | 36,00 | 493 | 250 | 991,6 | 142,790 | 1,78E+06 | 1000 | 85 | 1,199 | 118,90 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| G | 120 | 2,00 | 4,00 | 2,00 | 35,00 | 493 | 250 | 991,6 | 138,824 | 1,74E+06 | 1000 | 85 | 1,165 | 115,58 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| G' | 120 | 2,00 | 4,00 | 2,00 | 50,00 | 441 | 150 | 769,2 | 153,840 | 1,92E+06 | 1000 | 85 | 1,293 | 128,18 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| H | 120 | 2,00 | 3,00 | 1,50 | 37,00 | 493 | 250 | 991,6 | 146,757 | 1,83E+06 | 1000 | 85 | 1,233 | 122,23 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| H'' | 120 | 2,00 | 3,00 | 1,50 | 51,00 | 441 | 150 | 769,2 | 156,917 | 1,96E+06 | 1000 | 85 | 1,319 | 130,76 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| I | 120 | 2,50 | 4,00 | 1,60 | 36,00 | 493 | 250 | 991,6 | 223,110 | 2,79E+06 | 1000 | 85 | 1,881 | 186,54 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| J | 120 | 2,50 | 6,00 | 2,40 | 34,00 | 493 | 250 | 991,6 | 210,715 | 2,63E+06 | 1000 | 85 | 1,775 | 176,07 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| J' | 120 | 2,50 | 3,00 | 1,20 | 38,00 | 493 | 250 | 991,6 | 235,505 | 2,94E+06 | 1000 | 85 | 1,987 | 197,03 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| K | 150 | 1,50 | 2,00 | 1,33 | 38,00 | 553 | 250 | 1063,6 | 90,938 | 1,14E+06 | 1000 | 115 | 0,562 | 55,71 | 670,83 | 633,88 | 670,83 | 117,019 | Ø10- | 110 |
| M | 120 | 1,00 | 2,00 | 2,00 | 35,00 | 493 | 250 | 991,6 | 34,706 | 4,34E+05 | 1000 | 85 | 0,290 | 28,75 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| 1 | 120 | 2,00 | 2,50 | 1,25 | 49,00 | 441 | 150 | 769,2 | 150,763 | 1,88E+06 | 1000 | 85 | 1,266 | 125,59 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |
| 2 | 120 | 2,00 | 2,00 | 1,00 | 43,00 | 441 | 150 | 769,2 | 132,302 | 1,65E+06 | 1000 | 85 | 1,110 | 110,11 | 495,83 | 468,52 | 495,83 | 158,319 | Ø10- | 150 |

Tabel Perhitungan tulangan lentur kolom akibat M 2 - 2
PERENCANAAN STRUKTUR REKTORAT POLITEKNIK KESEHATAN SEMARANG

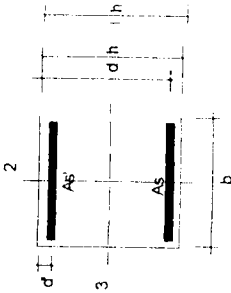
$d' = 50+10+0.5*22 = 71 \text{ mm}$
 $\phi = 0,65$
 $f_c' = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $C_v = 50 \text{ mm}$

Lantai 1

| No klm | b (mm) | h (mm) | d (mm) | P_u (N) | M_u (Nmm) | e (mm) | ρ (%) | Cek p | As = As' (mm ²) | Tul pasang | x_b (mm) | d' (mm) | f_s' pakai | P_{nb} (N) | M_{nb} (Nmm) | e_b (mm) | runtuh | P_n (N) | Cek | Type |
|-----------|-----------|-----------|-----------|--------------|----------------|-----------|---------------|-------|-----------------------------------|---------------|---------------|--------------|-----------------|-----------------|-------------------|---------------|--------|--------------|-----|------|
| C9 | 300 | 300 | 232.00 | 37148.18 | 8819434.94 | 237.41 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669.492 | 146200883 | 193.22 | TARIK | 597073 | OK | K4 |
| C10 | 300 | 300 | 232.00 | 86709.72 | 5197169.64 | 59.94 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669.492 | 146200883 | 193.22 | DESAK | 1698125 | OK | K4 |
| C11 | 300 | 300 | 232.00 | 86788.12 | 4432246.3 | 51.07 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669.492 | 146200883 | 193.22 | DESAK | 1818520 | OK | K4 |
| C12 | 300 | 300 | 232.00 | 36917.37 | 5078732.03 | 137.57 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669.492 | 146200883 | 193.22 | DESAK | 1075302 | OK | K4 |
| C61 | 300 | 300 | 232.00 | 37491.9 | 1744524.97 | 46.53 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669.492 | 146200883 | 193.22 | DESAK | 1887012 | OK | K4 |
| C62 | 300 | 300 | 232.00 | 87092.83 | 4332494.58 | 49.75 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669.492 | 146200883 | 193.22 | DESAK | 1837979 | OK | K4 |
| C63 | 300 | 300 | 232.00 | 87119.64 | 3510586.23 | 40.30 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669.492 | 146200883 | 193.22 | DESAK | 1989975 | OK | K4 |
| C64 | 300 | 300 | 232.00 | 37428.71 | 1570057.68 | 41.95 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669.492 | 146200883 | 193.22 | DESAK | 1961615 | OK | K4 |
| C13 | 600 | 600 | 530.50 | 595153.69 | 33283585.4 | 55.92 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7978359 | OK | K1 |
| C14 | 600 | 600 | 530.50 | 574203.29 | 37023336.6 | 64.48 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7711888 | OK | K1 |
| C15 | 600 | 600 | 530.50 | 575296.24 | 33111502.6 | 57.56 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7926123 | OK | K1 |
| C16 | 600 | 600 | 530.50 | 594110.74 | 43324921.3 | 72.92 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7465724 | OK | K1 |
| C17 | 600 | 600 | 530.50 | 556693.24 | 41585703.9 | 74.70 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7415920 | OK | K1 |
| C18 | 600 | 600 | 530.50 | 561410.93 | 23399227.1 | 41.68 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8465711 | OK | K1 |
| C19 | 600 | 600 | 530.50 | 573937.3 | 20501938.2 | 35.72 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8687743 | OK | K1 |
| C20 | 600 | 600 | 530.50 | 561153.37 | 12862635.8 | 22.92 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9206720 | OK | K1 |
| C21 | 600 | 600 | 530.50 | 1425234.71 | 101299493 | 71.08 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7518236 | OK | K1 |
| C22 | 600 | 600 | 530.50 | 1357742.09 | 46874780.1 | 34.52 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8733791 | OK | K1 |
| C23 | 600 | 600 | 530.50 | 1436750.01 | 57847298 | 40.26 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8517469 | OK | K1 |
| C24 | 600 | 600 | 530.50 | 1349612.62 | 30367486.8 | 22.50 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9224845 | OK | K1 |
| C25 | 600 | 600 | 530.50 | 1596673.4 | 24955733.2 | 15.63 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9531234 | OK | K1 |
| C26 | 600 | 600 | 530.50 | 1435492.85 | 48695530.6 | 33.92 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8757108 | OK | K1 |

| | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|--------|------------|-------------|--------|--------|----|------|---|---|----|--------|-------|-----|------------|------------|--------|-------|---------|----|----|
| C27 | 600 | 600 | 600 | 530.50 | 611780.69 | 73325774.8 | 119.86 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 6341671 | OK | K1 |
| C28 | 600 | 600 | 600 | 530.50 | 607555.66 | 29446881.9 | 48.47 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8226217 | OK | K1 |
| C29 | 600 | 600 | 600 | 530.50 | 910251.48 | 97223400.9 | 106.81 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 6618596 | OK | K1 |
| C30 | 600 | 600 | 600 | 530.50 | 1530173.72 | 109151031.1 | 71.33 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7510896 | OK | K1 |
| C31 | 600 | 600 | 600 | 530.50 | 1394985.91 | 40477821.4 | 29.02 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8952043 | OK | K1 |
| C32 | 600 | 600 | 600 | 530.50 | 1486405.85 | 27370825.9 | 18.41 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9404647 | OK | K1 |
| C33 | 600 | 600 | 600 | 530.50 | 1486345.76 | 33760492.8 | 22.71 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9215670 | OK | K1 |
| C34 | 600 | 600 | 600 | 530.50 | 1491875 | 28886772 | 19.36 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9362286 | OK | K1 |
| C35 | 600 | 600 | 600 | 530.50 | 1487663.18 | 53981328.4 | 36.29 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8666208 | OK | K1 |
| C36 | 600 | 600 | 600 | 530.50 | 899893.34 | 41995850.1 | 46.67 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8288391 | OK | K1 |
| C37 | 600 | 600 | 600 | 530.50 | 909035.95 | 97732489.7 | 107.51 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 6603061 | OK | K1 |
| C38 | 600 | 600 | 600 | 530.50 | 1533231.03 | 108473451 | 70.75 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7527614 | OK | K1 |
| C39 | 600 | 600 | 600 | 530.50 | 1418926.13 | 39383983.5 | 27.76 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9003544 | OK | K1 |
| C40 | 600 | 600 | 600 | 530.50 | 1470071.68 | 22435278.2 | 15.26 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9548244 | OK | K1 |
| C41 | 600 | 600 | 600 | 530.50 | 1469501.53 | 18175852.2 | 12.37 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9683926 | OK | K1 |
| C42 | 600 | 600 | 600 | 530.50 | 1409518.76 | 23219663.9 | 16.47 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9492517 | OK | K1 |
| C43 | 600 | 600 | 600 | 530.50 | 1482904.95 | 53044995.8 | 35.77 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8685853 | OK | K1 |
| C44 | 600 | 600 | 600 | 530.50 | 900683.17 | 41920931.6 | 46.54 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8292712 | OK | K1 |
| C45 | 600 | 600 | 600 | 530.50 | 611731.04 | 73364540.6 | 119.93 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 6340185 | OK | K1 |
| C46 | 600 | 600 | 600 | 530.50 | 609085.82 | 29207305.8 | 47.95 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8243911 | OK | K1 |
| C47 | 600 | 600 | 600 | 530.50 | 1433356.33 | 101665446 | 70.93 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7522456 | OK | K1 |
| C48 | 600 | 600 | 600 | 530.50 | 1404182.95 | 43856051.5 | 31.23 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8862930 | OK | K1 |
| C49 | 600 | 600 | 600 | 530.50 | 1329041.38 | 50277900 | 37.83 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8607834 | OK | K1 |
| C50 | 600 | 600 | 600 | 530.50 | 1330642.62 | 51013380.8 | 38.34 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8588832 | OK | K1 |
| C51 | 600 | 600 | 600 | 530.50 | 1405784.91 | 26913229.8 | 19.14 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9371992 | OK | K1 |
| C52 | 600 | 600 | 600 | 530.50 | 1435312.73 | 51106634.4 | 35.61 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8692142 | OK | K1 |
| C53 | 600 | 600 | 600 | 530.50 | 556228.07 | 10838556.3 | 19.49 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9356818 | OK | K1 |
| C54 | 600 | 600 | 600 | 530.50 | 571435.37 | 20163214.3 | 35.29 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8704466 | OK | K1 |
| C55 | 600 | 600 | 600 | 530.50 | 570689.76 | 16570496.7 | 29.04 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 8951261 | OK | K1 |
| C56 | 600 | 600 | 600 | 530.50 | 554652.61 | 30765793.2 | 55.47 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7993078 | OK | K1 |
| C57 | 600 | 600 | 600 | 530.50 | 595733.11 | 70549372.9 | 118.42 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 6370922 | OK | K1 |
| C58 | 600 | 600 | 600 | 530.50 | 578542.76 | 37999002.6 | 65.68 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7675842 | OK | K1 |
| C59 | 600 | 600 | 600 | 530.50 | 578122.18 | 32697077.5 | 56.56 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7956006 | OK | K1 |
| C60 | 600 | 600 | 600 | 530.50 | 595188.15 | 42847641.9 | 71.99 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 7492164 | OK | K1 |
| C66 | 600 | 600 | 600 | 530.50 | 240156.18 | 2974122.08 | 12.38 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902550.91 | 1045103656 | 267.80 | DESAK | 9683194 | OK | K1 |

Tabel Perhitungan tulangan lentur kolom akrobat M 2 - 2
 PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESHATAN SEMARANG



$d' = 50 + 10 + 0.5 \cdot 19 = 69.5 \text{ mm}$
 $\phi = 0,65$
 $f_c' = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $C_v = 50 \text{ mm}$

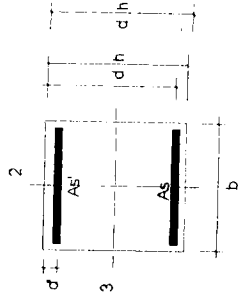
Lantai 2

| No klm | b (mm) | h (mm) | d (mm) | P_u (N) | M_u (Nmm) | e (mm) | ρ (%) | Cek p | $A_s = A_s'$ (mm ²) | Tul pasang | x_b (mm) | d' (mm) | f_s' pakai | P_{nb} (N) | M_{nb} (Nmm) | e_b (mm) | runtuh | P_n (N) | Cek | Type |
|-----------|-----------|-----------|-----------|--------------|----------------|-----------|---------------|-------|------------------------------------|---------------|---------------|--------------|-----------------|-----------------|-------------------|---------------|--------|--------------|-----|------|
| C13 | 500 | 500 | 430.50 | 419947.18 | 40805149 | 97.17 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4565557 | OK | K2 |
| C14 | 500 | 500 | 430.50 | 400277.7 | 31886250 | 79.66 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4909664 | OK | K2 |
| C15 | 500 | 500 | 430.50 | 400248.12 | 32287750 | 80.67 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4888425 | OK | K2 |
| C16 | 500 | 500 | 430.50 | 419076.62 | 33649297 | 80.29 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4896306 | OK | K2 |
| C17 | 500 | 500 | 430.50 | 383441.82 | 19154807 | 49.95 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5630188 | OK | K2 |
| C18 | 500 | 500 | 430.50 | 352962.36 | 11454957 | 32.45 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6163595 | OK | K2 |
| C19 | 500 | 500 | 430.50 | 358277.23 | 10057551 | 28.07 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6313431 | OK | K2 |
| C20 | 500 | 500 | 430.50 | 381649.93 | 27002854 | 70.75 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5105518 | OK | K2 |
| C21 | 500 | 500 | 430.50 | 1078462.6 | 57243361 | 53.08 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5544581 | OK | K2 |
| C22 | 500 | 500 | 430.50 | 1004624.1 | 31305696 | 31.16 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6207032 | OK | K2 |
| C23 | 500 | 500 | 430.50 | 1079974.8 | 58833104 | 54.48 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5507117 | OK | K2 |
| C24 | 500 | 500 | 430.50 | 1079272.4 | 52145402 | 48.32 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5676192 | OK | K2 |
| C25 | 500 | 500 | 430.50 | 1219878.6 | 33169248 | 27.19 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6344458 | OK | K2 |
| C26 | 500 | 500 | 430.50 | 1087160.5 | 29904520 | 27.51 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6333285 | OK | K2 |
| C27 | 500 | 500 | 430.50 | 453013.77 | 41546737 | 91.71 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4667482 | OK | K2 |
| C28 | 500 | 500 | 430.50 | 450031.45 | 16367106 | 36.37 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6035637 | OK | K2 |
| C29 | 500 | 500 | 430.50 | 690446.6 | 62439762 | 90.43 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4692022 | OK | K2 |
| C30 | 500 | 500 | 430.50 | 1163219.5 | 61729357 | 53.07 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5544877 | OK | K2 |
| C31 | 500 | 500 | 430.50 | 1027552.9 | 24881593 | 24.21 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6451535 | OK | K2 |
| C32 | 500 | 500 | 430.50 | 1103387.7 | 19999930 | 18.13 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6682311 | OK | K2 |

| | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|--------|-----------|----------|-------|--------|----|------|---|---|----|--------|-------|-----|---------|-----------|--------|-------|---------|----|----|
| C33 | 500 | 500 | 430.50 | 1159886.7 | 19180485 | 16.54 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6745315 | OK | K2 |
| C34 | 500 | 500 | 430.50 | 1138863.6 | 26117172 | 22.93 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6498777 | OK | K2 |
| C35 | 500 | 500 | 430.50 | 1167502.1 | 39719399 | 34.02 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6111728 | OK | K2 |
| C36 | 500 | 500 | 430.50 | 690460.89 | 31684181 | 45.89 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5745689 | OK | K2 |
| C37 | 500 | 500 | 430.50 | 689717.94 | 42646886 | 61.83 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5318036 | OK | K2 |
| C38 | 500 | 500 | 430.50 | 1165762.8 | 61240491 | 52.53 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5559358 | OK | K2 |
| C39 | 500 | 500 | 430.50 | 1045607.3 | 21420474 | 20.49 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6590907 | OK | K2 |
| C40 | 500 | 500 | 430.50 | 1089575.7 | 13202718 | 12.12 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6926939 | OK | K2 |
| C41 | 500 | 500 | 430.50 | 1086829.3 | 11585236 | 10.66 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6989023 | OK | K2 |
| C42 | 500 | 500 | 430.50 | 1033974.5 | 14425593 | 13.95 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6850371 | OK | K2 |
| C43 | 500 | 500 | 430.50 | 1163744.6 | 39205405 | 33.69 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6122637 | OK | K2 |
| C44 | 500 | 500 | 430.50 | 691106.33 | 32044726 | 46.37 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5731842 | OK | K2 |
| C45 | 500 | 500 | 430.50 | 452648.28 | 41583299 | 91.87 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4664527 | OK | K2 |
| C46 | 500 | 500 | 430.50 | 451441.12 | 17505089 | 38.78 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5959576 | OK | K2 |
| C47 | 500 | 500 | 430.50 | 1085599.6 | 57642839 | 53.10 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5544067 | OK | K2 |
| C48 | 500 | 500 | 430.50 | 1037347.3 | 28120901 | 27.11 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6347365 | OK | K2 |
| C49 | 500 | 500 | 430.50 | 1000653.3 | 58770345 | 58.73 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5396117 | OK | K2 |
| C50 | 500 | 500 | 430.50 | 1002346.9 | 57620890 | 57.49 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5428149 | OK | K2 |
| C51 | 500 | 500 | 430.50 | 1039091.7 | 23078340 | 22.21 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6525716 | OK | K2 |
| C52 | 500 | 500 | 430.50 | 1087837.7 | 24073714 | 22.13 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6528721 | OK | K2 |
| C53 | 500 | 500 | 430.50 | 382753.73 | 10724701 | 28.02 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6315258 | OK | K2 |
| C54 | 500 | 500 | 430.50 | 361961.34 | 9612300 | 26.56 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6366984 | OK | K2 |
| C55 | 500 | 500 | 430.50 | 360922.2 | 9010513 | 24.97 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6424180 | OK | K2 |
| C56 | 500 | 500 | 430.50 | 381506.72 | 28256085 | 74.06 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5030901 | OK | K2 |
| C57 | 500 | 500 | 430.50 | 420351.75 | 40054496 | 95.29 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4600160 | OK | K2 |
| C58 | 500 | 500 | 430.50 | 403840.69 | 32413122 | 80.26 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4600160 | OK | K2 |
| C59 | 500 | 500 | 430.50 | 403458.41 | 32191569 | 79.79 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4896974 | OK | K2 |
| C60 | 500 | 500 | 430.50 | 419976.95 | 33632703 | 80.08 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4906944 | OK | K2 |

Tabel Perhitungan tulangan lentur kolom akibat M 2 - 2
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESHATAN SEMARANG

$d' = 50+10+0.5 \cdot 19 = 69,5 \text{ mm}$
 $f_c' = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $\phi = 0,65$
 $C_v = 50 \text{ mm}$

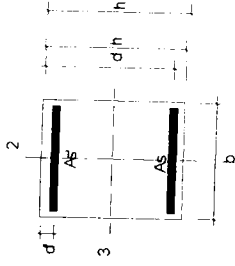


Lantai 3

| No klm | b (mm) | h (mm) | d (mm) | P_u (N) | M_u (Nmm) | e (mm) | p (%) | Cek p | $A_s =$ A_s' (mm ²) | Tul pasang | x_b (mm) | d' (mm) | f_s' pakai | P_{nb} (N) | M_{nb} (Nmm) | e_b (mm) | runtuh | P_n (N) | Cek | Type |
|-----------|-----------|-----------|-----------|--------------|----------------|-----------|----------|-------|---|---------------|---------------|--------------|-----------------|-----------------|-------------------|---------------|--------|--------------|-----|------|
| C13 | 400 | 400 | 330.50 | 256671.81 | 41344369 | 161.08 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2112425 | OK | K3 |
| C14 | 400 | 400 | 330.50 | 239468.74 | 33816600 | 141.22 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2277165 | OK | K3 |
| C15 | 400 | 400 | 330.50 | 239511.14 | 36979754 | 154.40 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2165111 | OK | K3 |
| C16 | 400 | 400 | 330.50 | 256187.46 | 41370688 | 161.49 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2109296 | OK | K3 |
| C17 | 400 | 400 | 330.50 | 245394.05 | 17797741 | 72.53 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3118780 | OK | K3 |
| C18 | 400 | 400 | 330.50 | 221922.22 | 8841133.8 | 39.84 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3785478 | OK | K3 |
| C19 | 400 | 400 | 330.50 | 226724.8 | 8516595.5 | 37.56 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3842698 | OK | K3 |
| C20 | 400 | 400 | 330.50 | 245301.22 | 15165047 | 61.82 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3309590 | OK | K3 |
| C21 | 400 | 400 | 330.50 | 745574.98 | 30197013 | 40.50 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3769130 | OK | K3 |
| C22 | 400 | 400 | 330.50 | 666376.26 | 21010042 | 31.53 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4003231 | OK | K3 |
| C23 | 400 | 400 | 330.50 | 742822.08 | 49925192 | 67.21 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3210713 | OK | K3 |
| C24 | 400 | 400 | 330.50 | 746437.71 | 48007723 | 64.32 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3263080 | OK | K3 |
| C25 | 400 | 400 | 330.50 | 805722.37 | 28998476 | 35.99 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3883282 | OK | K3 |
| C26 | 400 | 400 | 330.50 | 752635.8 | 30317087 | 40.28 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3774552 | OK | K3 |
| C27 | 400 | 400 | 330.50 | 304677.88 | 28105945 | 92.25 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2819456 | OK | K3 |
| C28 | 400 | 400 | 330.50 | 302612.54 | 26516261 | 87.62 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2884346 | OK | K3 |
| C29 | 400 | 400 | 330.50 | 482794.59 | 34781561 | 72.04 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3126947 | OK | K3 |
| C30 | 400 | 400 | 330.50 | 809655.57 | 33792249 | 41.74 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3739046 | OK | K3 |
| C31 | 400 | 400 | 330.50 | 671917.18 | 3248446.6 | 4.83 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4911947 | OK | K3 |
| C32 | 400 | 400 | 330.50 | 730868.9 | 17033691 | 23.31 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4244968 | OK | K3 |

| | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|--------|-----------|-----------|--------|--------|----|------|---|---|----|--------|-------|-----|---------|-----------|--------|-------|---------|----|----|
| C33 | 400 | 400 | 400 | 330.50 | 769524.2 | 18930225 | 24.60 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4205005 | OK | K3 |
| C34 | 400 | 400 | 400 | 330.50 | 748412.94 | 19018629 | 25.41 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4180307 | OK | K3 |
| C35 | 400 | 400 | 400 | 330.50 | 812816.43 | 37184180 | 45.75 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3644578 | OK | K3 |
| C36 | 400 | 400 | 400 | 330.50 | 482678.46 | 31701434 | 65.68 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3238219 | OK | K3 |
| C37 | 400 | 400 | 400 | 330.50 | 482410.64 | 35171653 | 72.91 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3112396 | OK | K3 |
| C38 | 400 | 400 | 400 | 330.50 | 811560.45 | 33766341 | 41.61 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3742187 | OK | K3 |
| C39 | 400 | 400 | 400 | 330.50 | 683591.01 | 14673628 | 21.47 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4303152 | OK | K3 |
| C40 | 400 | 400 | 400 | 330.50 | 720428.67 | 11735814 | 16.29 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4475696 | OK | K3 |
| C41 | 400 | 400 | 400 | 330.50 | 718219.19 | 10874144 | 15.14 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4515928 | OK | K3 |
| C42 | 400 | 400 | 400 | 330.50 | 675655.88 | 11901804 | 17.62 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4430206 | OK | K3 |
| C43 | 400 | 400 | 400 | 330.50 | 809705.86 | 36267905 | 44.79 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3666655 | OK | K3 |
| C44 | 400 | 400 | 400 | 330.50 | 483125.73 | 18888207 | 39.10 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3803975 | OK | K3 |
| C45 | 400 | 400 | 400 | 330.50 | 304189.69 | 28222499 | 92.78 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2812188 | OK | K3 |
| C46 | 400 | 400 | 400 | 330.50 | 303615.24 | 25461863 | 83.86 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2939398 | OK | K3 |
| C47 | 400 | 400 | 400 | 330.50 | 751499.97 | 31025949 | 41.29 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3749982 | OK | K3 |
| C48 | 400 | 400 | 400 | 330.50 | 686794.65 | 19580727 | 28.51 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4088690 | OK | K3 |
| C49 | 400 | 400 | 400 | 330.50 | 691519.75 | 44960383 | 65.02 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3250240 | OK | K3 |
| C50 | 400 | 400 | 400 | 330.50 | 692608.57 | 34048380 | 49.16 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3567898 | OK | K3 |
| C51 | 400 | 400 | 400 | 330.50 | 688126.91 | 16844186 | 24.48 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 4208729 | OK | K3 |
| C52 | 400 | 400 | 400 | 330.50 | 752907.44 | 28771459 | 38.21 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3826170 | OK | K3 |
| C53 | 400 | 400 | 400 | 330.50 | 242621.48 | 11377705 | 46.89 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3618424 | OK | K3 |
| C54 | 400 | 400 | 400 | 330.50 | 229217.63 | 9961292.5 | 43.46 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3697909 | OK | K3 |
| C55 | 400 | 400 | 400 | 330.50 | 228586.2 | 8982824.4 | 39.30 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3798942 | OK | K3 |
| C56 | 400 | 400 | 400 | 330.50 | 241895.41 | 11092987 | 45.86 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 3642025 | OK | K3 |
| C57 | 400 | 400 | 400 | 330.50 | 256898.99 | 41638546 | 162.08 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2104739 | OK | K3 |
| C58 | 400 | 400 | 400 | 330.50 | 242282.61 | 37419050 | 154.44 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2164731 | OK | K3 |
| C59 | 400 | 400 | 400 | 330.50 | 241996.88 | 37252640 | 153.94 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2168821 | OK | K3 |
| C60 | 400 | 400 | 400 | 330.50 | 256700.03 | 41500485 | 161.67 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 1620852 | 359263803 | 221.65 | DESAK | 2107892 | OK | K3 |

Tabel Perhitungan tulangan lentur kolom akibat M 2 - 2
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESHATAN SEMARANG



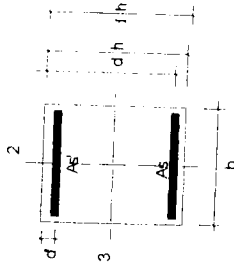
$d' = 50 + 10 + 0.5 \cdot 16 = 68 \text{ mm}$
 $f_c' = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $\phi = 0,65$
 $C_v = 50 \text{ mm}$

Lantai 4

| No kolom | b (mm) | h (mm) | d (mm) | P _u (N) | M _u (Nmm) | e (mm) | ρ (%) | Cek ρ | As = As' (mm ²) | Tul pasang | x _b (mm) | d' (mm) | f _s ' pakai | P _{nb} (N) | M _{nb} (Nmm) | e _b (mm) | runtuh | P _n (N) | Cek | Type |
|-------------|-----------|-----------|-----------|-----------------------|-------------------------|-----------|----------|-------|--------------------------------|---------------|------------------------|------------|---------------------------|------------------------|--------------------------|------------------------|--------|-----------------------|-----|------|
| C13 | 300 | 300 | 232.00 | 107154.91 | 10180381.5 | 95.01 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1345896 | OK | K3 |
| C14 | 300 | 300 | 232.00 | 94191.51 | 10469265.2 | 111.15 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1228627 | OK | K3 |
| C15 | 300 | 300 | 232.00 | 94391.29 | 9762641.9 | 103.43 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1282057 | OK | K3 |
| C16 | 300 | 300 | 232.00 | 106993.51 | 9460123.11 | 88.42 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1400459 | OK | K3 |
| C17 | 300 | 300 | 232.00 | 113333.61 | 15019301 | 132.52 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1101560 | OK | K3 |
| C18 | 300 | 300 | 232.00 | 108288.09 | 10684182.1 | 98.66 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1317398 | OK | K3 |
| C19 | 300 | 300 | 232.00 | 110283.46 | 10008043.5 | 90.75 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1380659 | OK | K3 |
| C20 | 300 | 300 | 232.00 | 113254.65 | 12509187.7 | 110.45 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1233265 | OK | K3 |
| C21 | 300 | 300 | 232.00 | 418075.25 | 16724357.7 | 40.00 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1995090 | OK | K3 |
| C22 | 300 | 300 | 232.00 | 335615.59 | 14607380.5 | 43.52 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1935298 | OK | K3 |
| C23 | 300 | 300 | 232.00 | 416660.99 | 26069953.9 | 62.57 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1665414 | OK | K3 |
| C24 | 300 | 300 | 232.00 | 476127.01 | 23427266 | 54.98 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1763426 | OK | K3 |
| C25 | 300 | 300 | 232.00 | 403800.2 | 18888160 | 46.78 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1883178 | OK | K3 |
| C26 | 300 | 300 | 232.00 | 421764.56 | 16738811.7 | 39.69 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2000632 | OK | K3 |
| C27 | 300 | 300 | 232.00 | 167601.56 | 10833886.8 | 64.64 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1640530 | OK | K3 |
| C28 | 300 | 300 | 232.00 | 166500.28 | 10645931.2 | 63.94 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1648869 | OK | K3 |
| C29 | 300 | 300 | 232.00 | 284688.6 | 24259094.8 | 85.21 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1428635 | OK | K3 |
| C30 | 300 | 300 | 232.00 | 465476.08 | 11444592.3 | 24.59 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2307334 | OK | K3 |
| C31 | 300 | 300 | 232.00 | 326354.15 | 10908178.3 | 33.42 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2117344 | OK | K3 |
| C32 | 300 | 300 | 232.00 | 363493.03 | 12479718.3 | 34.33 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2099577 | OK | K3 |

| | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|--------|-----------|------------|-------|--------|----|------|---|---|----|--------|-------|-----|--------|-----------|--------|-------|---------|----|----|
| C33 | 300 | 300 | 232.00 | 384186.44 | 12815947 | 33.36 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2118640 | OK | K3 |
| C34 | 300 | 300 | 232.00 | 366636.86 | 13908611.5 | 37.94 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2031958 | OK | K3 |
| C35 | 300 | 300 | 232.00 | 468002.21 | 11669409.3 | 24.93 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2299217 | OK | K3 |
| C36 | 300 | 300 | 232.00 | 284369.24 | 24394906.7 | 85.79 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1423512 | OK | K3 |
| C37 | 300 | 300 | 232.00 | 284555.13 | 24505329.1 | 86.12 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1420562 | OK | K3 |
| C38 | 300 | 300 | 232.00 | 466502.26 | 10262864.7 | 22.00 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2369600 | OK | K3 |
| C39 | 300 | 300 | 232.00 | 331798.66 | 6796075.53 | 20.48 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2407704 | OK | K3 |
| C40 | 300 | 300 | 232.00 | 357360.76 | 6298349.8 | 17.62 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2482927 | OK | K3 |
| C41 | 300 | 300 | 232.00 | 355504.07 | 5548035 | 15.61 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2538962 | OK | K3 |
| C42 | 300 | 300 | 232.00 | 327476.13 | 6210114.07 | 18.96 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2447106 | OK | K3 |
| C43 | 300 | 300 | 232.00 | 466072.67 | 1820302.37 | 3.91 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 2921332 | OK | K3 |
| C44 | 300 | 300 | 232.00 | 284582.49 | 24352354.7 | 85.57 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1425418 | OK | K3 |
| C45 | 300 | 300 | 232.00 | 167179.42 | 8573506.22 | 51.28 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1815421 | OK | K3 |
| C46 | 300 | 300 | 232.00 | 167073.77 | 10721156.9 | 64.17 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1646115 | OK | K3 |
| C47 | 300 | 300 | 232.00 | 421719.98 | 18844659.3 | 44.69 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1916360 | OK | K3 |
| C48 | 300 | 300 | 232.00 | 345242.48 | 18433765.5 | 53.39 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1785345 | OK | K3 |
| C49 | 300 | 300 | 232.00 | 391581.75 | 22993178.2 | 58.72 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1713717 | OK | K3 |
| C50 | 300 | 300 | 232.00 | 392100.68 | 22616186.6 | 57.68 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1727240 | OK | K3 |
| C51 | 300 | 300 | 232.00 | 345860.43 | 17051956.5 | 49.30 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1844579 | OK | K3 |
| C52 | 300 | 300 | 232.00 | 421776.52 | 17800140.5 | 42.20 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1957312 | OK | K3 |
| C53 | 300 | 300 | 232.00 | 110572.18 | 8547243.53 | 77.30 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1503312 | OK | K3 |
| C54 | 300 | 300 | 232.00 | 112979.62 | 7386149.3 | 65.38 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1631878 | OK | K3 |
| C55 | 300 | 300 | 232.00 | 112803.83 | 7129656.01 | 63.20 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1657704 | OK | K3 |
| C56 | 300 | 300 | 232.00 | 110346.19 | 8302811.88 | 75.24 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1524021 | OK | K3 |
| C57 | 300 | 300 | 232.00 | 107148.14 | 8449552.41 | 78.86 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1487992 | OK | K3 |
| C58 | 300 | 300 | 232.00 | 96063.02 | 9228248.96 | 96.06 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1337525 | OK | K3 |
| C59 | 300 | 300 | 232.00 | 95939.1 | 8979074.79 | 93.59 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1357251 | OK | K3 |
| C60 | 300 | 300 | 232.00 | 107119.4 | 8376190.84 | 78.19 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1494477 | OK | K3 |

Tabel Perhitungan tulangan lentur kolom akibat M 2 - 2
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESHATAN SEMARANG



$d' = 50 + 10 + 0.5 \cdot 16 = 68 \text{ mm}$

$f_c' = 28 \text{ Mpa}$

$f_y = 390 \text{ Mpa}$

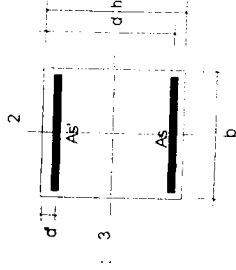
$\phi = 0,65$

$C_v = 50 \text{ mm}$

Lantai 5

| No | b | h | d | P _u | M _u | e | ρ | Cek p | As = As' | Tul pasang | x _b | d' | f _s ' pakai | P _{nb} | M _{nb} | e _b | runtuh | P _n | Cek | Type |
|-----|------|------|--------|----------------|----------------|---------|--------|-------|--------------------|------------|----------------|-------|------------------------|-----------------|-----------------|----------------|--------|----------------|-----|------|
| klm | (mm) | (mm) | (mm) | (N) | (Nmm) | (mm) | (%) | | (mm ²) | | (mm) | (mm) | | (N) | (Nmm) | (mm) | | (N) | | |
| C21 | 300 | 300 | 232.00 | 94552.02 | 25668010.4 | 271.47 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 1653 | OK | K4 |
| C22 | 300 | 300 | 232.00 | 83779.61 | 74729532.2 | 891.98 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 41848 | OK | K4 |
| C23 | 300 | 300 | 232.00 | 93261.98 | 103231594 | 1106.90 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 74190 | OK | K4 |
| C24 | 300 | 300 | 232.00 | 95002.61 | 103054730 | 1084.76 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 70420 | OK | K4 |
| C25 | 300 | 300 | 232.00 | 82156.18 | 75331259.8 | 916.93 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 45116 | OK | K4 |
| C26 | 300 | 300 | 232.00 | 95277.64 | 37006367.7 | 388.41 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 3187 | OK | K4 |
| C47 | 300 | 300 | 232.00 | 93970.13 | 36894977 | 392.62 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 3295 | OK | K4 |
| C48 | 300 | 300 | 232.00 | 83586.46 | 67492957.4 | 807.46 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 31726 | OK | K4 |
| C49 | 300 | 300 | 232.00 | 93986.69 | 102507550 | 1090.66 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 71415 | OK | K4 |
| C50 | 300 | 300 | 232.00 | 93965.49 | 102526579 | 1091.11 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 71491 | OK | K4 |
| C51 | 300 | 300 | 232.00 | 83593.49 | 68465552.3 | 819.03 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 33025 | OK | K4 |
| C52 | 300 | 300 | 232.00 | 93965.35 | 36924867.8 | 392.96 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 3303 | OK | K4 |
| C67 | 300 | 300 | 232.00 | 55389.38 | 15930136.3 | 287.60 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 1698 | OK | K4 |
| C68 | 300 | 300 | 232.00 | 55387.09 | 15840108.2 | 285.99 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 1691 | OK | K4 |
| C69 | 300 | 300 | 232.00 | 29886.93 | 2825257.12 | 94.53 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1349684 | OK | K4 |
| C70 | 300 | 300 | 232.00 | 29791.92 | 2748744.13 | 92.26 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1368074 | OK | K4 |
| C71 | 300 | 300 | 232.00 | 97926.56 | 8173469.83 | 83.47 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1444481 | OK | K4 |
| C72 | 300 | 300 | 232.00 | 97927.68 | 8160583.56 | 83.33 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1445697 | OK | K4 |
| C73 | 300 | 300 | 232.00 | 97938.25 | 8151720.94 | 83.23 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1446611 | OK | K4 |
| C74 | 300 | 300 | 232.00 | 97915.57 | 8204305.31 | 83.79 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1441514 | OK | K4 |
| C75 | 300 | 300 | 232.00 | 29703.38 | 2772602.28 | 93.34 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1359264 | OK | K4 |
| C76 | 300 | 300 | 232.00 | 29705.11 | 2697952.51 | 90.82 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1380021 | OK | K4 |
| C77 | 300 | 300 | 232.00 | 55986.32 | 15915865.9 | 284.28 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 1232 | OK | K4 |
| C78 | 300 | 300 | 232.00 | 56017.22 | 15864489.7 | 283.21 | 5.3589 | OK | 1206 | 6 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 1239 | OK | K4 |

Tabel Perhitungan tulangan lentur kolom akibat M 3 - 3
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG



$d' = 40+10+0.5*25 = 62.5 \text{ mm}$ $\phi = 0.65$
 $f_c' = 28 \text{ Mpa}$ $C_v = 50 \text{ mm}$
 $f_y = 390 \text{ Mpa}$

Lantai 1

| No | b | h | d | P _u | M _u | e | ρ | Cek p | As = As' | Tul pasang | x _b | d' | f' _s pakat | P _{nb} | M _{nb} | e _b | runtuh | P _n | Cek | Tipe |
|-----|------|------|--------|----------------|----------------|--------|--------|-------|--------------------|---------------|----------------|-------|--------------------------|-----------------|-----------------|----------------|--------|----------------|-----|------|
| klm | (mm) | (mm) | (mm) | (N) | (Nmm) | (mm) | (%) | | (mm ²) | | (mm) | (mm) | | (N) | (Nmm) | (mm) | | (N) | | |
| C9 | 300 | 300 | 232.00 | 37148.18 | 11961272 | 321.99 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 387391 | OK | K4 |
| C10 | 300 | 300 | 232.00 | 86709.72 | 13664652 | 157.59 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 982417 | OK | K4 |
| C11 | 300 | 300 | 232.00 | 86788.12 | 13570589 | 156.36 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 987642 | OK | K4 |
| C12 | 300 | 300 | 232.00 | 36917.37 | 11929352 | 323.14 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 385433 | OK | K4 |
| C61 | 300 | 300 | 232.00 | 37491.9 | 6345702 | 169.26 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 935347 | OK | K4 |
| C62 | 300 | 300 | 232.00 | 87092.83 | 7320758 | 84.06 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1439076 | OK | K4 |
| C63 | 300 | 300 | 232.00 | 87119.64 | 7359693 | 84.48 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1435255 | OK | K4 |
| C64 | 300 | 300 | 232.00 | 37428.71 | 6417900 | 171.47 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 926915 | OK | K4 |
| C13 | 600 | 600 | 530.50 | 595153.7 | 29868508 | 50.19 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 8167735 | OK | K1 |
| C14 | 600 | 600 | 530.50 | 574203.3 | 30326552 | 52.82 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 8079868 | OK | K1 |
| C15 | 600 | 600 | 530.50 | 575296.2 | 53245198 | 92.55 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 6950332 | OK | K1 |
| C16 | 600 | 600 | 530.50 | 594110.7 | 52565124 | 88.48 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7051390 | OK | K1 |
| C17 | 600 | 600 | 530.50 | 556693.2 | 47575282 | 85.46 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7128103 | OK | K1 |
| C18 | 600 | 600 | 530.50 | 561410.9 | 42778536 | 76.20 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7374486 | OK | K1 |
| C19 | 600 | 600 | 530.50 | 573937.3 | 43456613 | 75.72 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7387765 | OK | K1 |
| C20 | 600 | 600 | 530.50 | 561153.4 | 52251023 | 93.11 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 6936650 | OK | K1 |
| C21 | 600 | 600 | 530.50 | 1425235 | 41061320 | 28.81 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 8960437 | OK | K1 |
| C22 | 600 | 600 | 530.50 | 1357742 | 36199084 | 26.66 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9048768 | OK | K1 |
| C23 | 600 | 600 | 530.50 | 1436750 | 33010893 | 22.98 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9204386 | OK | K1 |
| C24 | 600 | 600 | 530.50 | 1349613 | 28218492 | 20.91 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9294072 | OK | K1 |
| C25 | 600 | 600 | 530.50 | 1596673 | 33821619 | 21.18 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9282087 | OK | K1 |
| C26 | 600 | 600 | 530.50 | 1435493 | 41128767 | 28.65 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 8966909 | OK | K1 |
| C27 | 600 | 600 | 530.50 | 611780.7 | 36614276 | 59.85 | 2.8490 | OK | 2267 | 8 D 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7853842 | OK | K1 |

| | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|--------|----------|----------|--------|--------|----|------|---|---|----|--------|-------|-----|---------|------------|--------|-------|----------|----|----|
| C28 | 600 | 600 | 530.50 | 607555.7 | 38024993 | 62.59 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7769247 | OK | K1 |
| C29 | 600 | 600 | 530.50 | 910251.5 | 29149854 | 32.02 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 8831527 | OK | K1 |
| C30 | 600 | 600 | 530.50 | 1530174 | 25346470 | 16.56 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9488362 | OK | K1 |
| C31 | 600 | 600 | 530.50 | 1394986 | 13507117 | 9.68 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9813441 | OK | K1 |
| C32 | 600 | 600 | 530.50 | 1486406 | 13160132 | 8.85 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9854116 | OK | K1 |
| C33 | 600 | 600 | 530.50 | 1486346 | 13919669 | 9.37 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9828984 | OK | K1 |
| C34 | 600 | 600 | 530.50 | 1491875 | 14978076 | 10.04 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9796020 | OK | K1 |
| C35 | 600 | 600 | 530.50 | 1487663 | 25182843 | 16.93 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9471799 | OK | K1 |
| C36 | 600 | 600 | 530.50 | 899893.3 | 22164965 | 24.63 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9133856 | OK | K1 |
| C37 | 600 | 600 | 530.50 | 909036 | 28945169 | 31.84 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 8838742 | OK | K1 |
| C38 | 600 | 600 | 530.50 | 1533231 | 27435009 | 17.89 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9428055 | OK | K1 |
| C39 | 600 | 600 | 530.50 | 1418926 | 2495680 | 1.76 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 10216635 | OK | K1 |
| C40 | 600 | 600 | 530.50 | 1470072 | 1278784 | 0.87 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 10263959 | OK | K1 |
| C41 | 600 | 600 | 530.50 | 1469502 | 666525.1 | 0.45 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 10286273 | OK | K1 |
| C42 | 600 | 600 | 530.50 | 1409519 | 742240.6 | 0.53 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 10282352 | OK | K1 |
| C43 | 600 | 600 | 530.50 | 1482905 | 16526873 | 11.14 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9742504 | OK | K1 |
| C44 | 600 | 600 | 530.50 | 900683.2 | 22078111 | 24.51 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9138851 | OK | K1 |
| C45 | 600 | 600 | 530.50 | 611731 | 36498254 | 59.66 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7859618 | OK | K1 |
| C46 | 600 | 600 | 530.50 | 609085.8 | 35365755 | 58.06 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7909993 | OK | K1 |
| C47 | 600 | 600 | 530.50 | 1433356 | 30107636 | 21.00 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9289851 | OK | K1 |
| C48 | 600 | 600 | 530.50 | 1404183 | 12691660 | 9.04 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9845019 | OK | K1 |
| C49 | 600 | 600 | 530.50 | 1329041 | 10775425 | 8.11 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9891012 | OK | K1 |
| C50 | 600 | 600 | 530.50 | 1330643 | 10709455 | 8.05 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9893959 | OK | K1 |
| C51 | 600 | 600 | 530.50 | 1405785 | 9368224 | 6.66 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9963206 | OK | K1 |
| C52 | 600 | 600 | 530.50 | 1435313 | 30748125 | 21.42 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9271611 | OK | K1 |
| C53 | 600 | 600 | 530.50 | 556228.1 | 18412045 | 33.10 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 8789131 | OK | K1 |
| C54 | 600 | 600 | 530.50 | 571435.4 | 13773102 | 24.10 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9156246 | OK | K1 |
| C55 | 600 | 600 | 530.50 | 570689.8 | 11937911 | 20.92 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9293643 | OK | K1 |
| C56 | 600 | 600 | 530.50 | 554652.6 | 17125313 | 30.88 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 8877154 | OK | K1 |
| C57 | 600 | 600 | 530.50 | 595733.1 | 62960335 | 105.69 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 6643591 | OK | K1 |
| C58 | 600 | 600 | 530.50 | 578542.8 | 63617937 | 109.96 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 6549474 | OK | K1 |
| C59 | 600 | 600 | 530.50 | 578122.2 | 48551161 | 83.98 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7166350 | OK | K1 |
| C60 | 600 | 600 | 530.50 | 595188.2 | 48202530 | 80.99 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 7245004 | OK | K1 |
| C66 | 600 | 600 | 530.50 | 240156.2 | 2615336 | 10.89 | 2.8490 | OK | 2267 | 8 | D | 19 | 321.52 | 69.50 | 390 | 3902551 | 1045103656 | 267.80 | DESAK | 9754789 | OK | K1 |

Tabel Perhitungan tulangan lentur kolom akibat M 3-3
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESHATAN SEMARANG

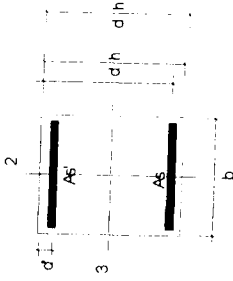
$$d' = 50+10+0.5 \times 19 = 69.5 \text{ mm}$$

$$f_c' = 28 \text{ Mpa}$$

$$f_y = 390 \text{ Mpa}$$

$$\phi = 0.65$$

$$C_v = 50 \text{ mm}$$



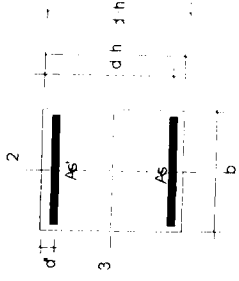
Lantai 2

| No kolom | b (mm) | h (mm) | d (mm) | P _u (N) | M _u (Nmm) | e (mm) | ρ (%) | Cek ρ | As = As' (mm ²) | Tul pasang | x _b (mm) | d' (mm) | f _s pakai | P _{nb} (N) | M _{nb} (Nmm) | e _b (mm) | runtuh | P _n (N) | Cek | Tipe |
|-------------|-----------|-----------|-----------|-----------------------|-------------------------|-----------|----------|-------|-----------------------------------|---------------|------------------------|------------|-------------------------|------------------------|--------------------------|------------------------|--------|-----------------------|-----|------|
| C13 | 500 | 500 | 430.50 | 419947.18 | 25194156 | 59.99 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5364067 | OK | K2 |
| C14 | 500 | 500 | 430.50 | 400277.7 | 25492819 | 63.69 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5272382 | OK | K2 |
| C15 | 500 | 500 | 430.50 | 400248.12 | 34351371 | 85.83 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4782710 | OK | K2 |
| C16 | 500 | 500 | 430.50 | 419076.62 | 34409153 | 82.11 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4858477 | OK | K2 |
| C17 | 500 | 500 | 430.50 | 383441.82 | 23919092 | 62.38 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5304479 | OK | K2 |
| C18 | 500 | 500 | 430.50 | 352962.36 | 21854749 | 61.92 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5315909 | OK | K2 |
| C19 | 500 | 500 | 430.50 | 358277.23 | 22299866 | 62.24 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5307890 | OK | K2 |
| C20 | 500 | 500 | 430.50 | 381649.93 | 26736966 | 70.06 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5121500 | OK | K2 |
| C21 | 500 | 500 | 430.50 | 1078462.57 | 32667323 | 30.29 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6236659 | OK | K2 |
| C22 | 500 | 500 | 430.50 | 1004624.13 | 25962413 | 25.84 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6392499 | OK | K2 |
| C23 | 500 | 500 | 430.50 | 1079974.76 | 19899682 | 18.43 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6670547 | OK | K2 |
| C24 | 500 | 500 | 430.50 | 1079272.37 | 17745485 | 16.44 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6749096 | OK | K2 |
| C25 | 500 | 500 | 430.50 | 1219878.6 | 25336878 | 20.77 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6580083 | OK | K2 |
| C26 | 500 | 500 | 430.50 | 1087160.45 | 34206496 | 31.46 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6196809 | OK | K2 |
| C27 | 500 | 500 | 430.50 | 453013.77 | 36545218 | 80.67 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4888383 | OK | K2 |
| C28 | 500 | 500 | 430.50 | 450031.45 | 35446891 | 78.77 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4928659 | OK | K2 |
| C29 | 500 | 500 | 430.50 | 690446.6 | 34088197 | 49.37 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5646479 | OK | K2 |
| C30 | 500 | 500 | 430.50 | 1163219.45 | 33129627 | 28.48 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6299136 | OK | K2 |
| C31 | 500 | 500 | 430.50 | 1027552.94 | 8010450.3 | 7.80 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7114327 | OK | K2 |
| C32 | 500 | 500 | 430.50 | 1103387.66 | 7164895 | 6.49 | 3.6863 | OK | 1984 | 7 D 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7172804 | OK | K2 |

| | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|--------|------------|-----------|-------|--------|----|------|---|---|----|--------|-------|-----|---------|-----------|--------|-------|---------|----|----|
| C33 | 500 | 500 | 430.50 | 1159886.69 | 8121676.6 | 7.00 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7149849 | OK | K2 |
| C34 | 500 | 500 | 430.50 | 1138863.56 | 8727236.1 | 7.66 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7120236 | OK | K2 |
| C35 | 500 | 500 | 430.50 | 1167502.12 | 23866757 | 20.44 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6592572 | OK | K2 |
| C36 | 500 | 500 | 430.50 | 690460.89 | 30542592 | 44.24 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5794023 | OK | K2 |
| C37 | 500 | 500 | 430.50 | 689717.94 | 34072923 | 49.40 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5645639 | OK | K2 |
| C38 | 500 | 500 | 430.50 | 1165762.82 | 33074528 | 28.37 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6302953 | OK | K2 |
| C39 | 500 | 500 | 430.50 | 1045607.25 | 2258575.8 | 2.16 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7374580 | OK | K2 |
| C40 | 500 | 500 | 430.50 | 1089575.73 | 955351.6 | 0.88 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7436542 | OK | K2 |
| C41 | 500 | 500 | 430.50 | 1086829.25 | 735682.36 | 0.68 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7446289 | OK | K2 |
| C42 | 500 | 500 | 430.50 | 1033974.52 | 1661353.7 | 1.61 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7401168 | OK | K2 |
| C43 | 500 | 500 | 430.50 | 1163744.55 | 24123707 | 20.73 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6581630 | OK | K2 |
| C44 | 500 | 500 | 430.50 | 691106.33 | 30672948 | 44.38 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5789683 | OK | K2 |
| C45 | 500 | 500 | 430.50 | 452648.28 | 36271156 | 80.13 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4899734 | OK | K2 |
| C46 | 500 | 500 | 430.50 | 451441.12 | 35841203 | 79.39 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4915325 | OK | K2 |
| C47 | 500 | 500 | 430.50 | 1085599.55 | 33107745 | 30.50 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6229607 | OK | K2 |
| C48 | 500 | 500 | 430.50 | 1037347.27 | 9154261.4 | 8.82 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7068789 | OK | K2 |
| C49 | 500 | 500 | 430.50 | 1000653.26 | 7826975.3 | 7.82 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7113160 | OK | K2 |
| C50 | 500 | 500 | 430.50 | 1002346.9 | 7438480.3 | 7.42 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7131051 | OK | K2 |
| C51 | 500 | 500 | 430.50 | 1039091.66 | 8201731.7 | 7.89 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 7109986 | OK | K2 |
| C52 | 500 | 500 | 430.50 | 1087837.69 | 33423156 | 30.72 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 6221869 | OK | K2 |
| C53 | 500 | 500 | 430.50 | 382753.73 | 22234089 | 58.09 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5412578 | OK | K2 |
| C54 | 500 | 500 | 430.50 | 361961.34 | 19299977 | 53.32 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5538061 | OK | K2 |
| C55 | 500 | 500 | 430.50 | 360922.2 | 18831480 | 52.18 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5569049 | OK | K2 |
| C56 | 500 | 500 | 430.50 | 381506.72 | 21133544 | 55.39 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5482771 | OK | K2 |
| C57 | 500 | 500 | 430.50 | 420351.75 | 37313914 | 88.77 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4724396 | OK | K2 |
| C58 | 500 | 500 | 430.50 | 403840.69 | 37958915 | 93.99 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 4624280 | OK | K2 |
| C59 | 500 | 500 | 430.50 | 403458.41 | 27207643 | 67.44 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5182517 | OK | K2 |
| C60 | 500 | 500 | 430.50 | 419976.95 | 26717897 | 63.62 | 3.6863 | OK | 1984 | 7 | D | 19 | 260.91 | 69.50 | 390 | 2639095 | 646418584 | 244.94 | DESAK | 5274098 | OK | K2 |

Tabel Perhitungan tulangan lentur kolom akrobat M 3-3
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESHATAN SEMARANG

$d' = 50+10+0.5 \cdot 19 = 69.5 \text{ mm}$
 $\phi = 0.65$
 $f_c' = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $C_v = 50 \text{ mm}$

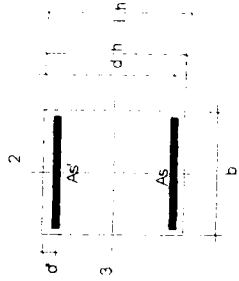


Lantai 3

| No klm | b (mm) | h (mm) | d (mm) | P _u (N) | M _u (Nmm) | e (mm) | p (%) | Cek p | As = As' (mm ²) | Tul pasang | x _b (mm) | d' (mm) | f _s pakai | P _{nb} (N) | M _{nb} (Nmm) | e _b (mm) | runtuh | P _n (N) | Cek | Type |
|-----------|-----------|-----------|-----------|-----------------------|-------------------------|-----------|----------|----------|-----------------------------------|---------------|------------------------|------------|-------------------------|------------------------|--------------------------|------------------------|--------|-----------------------|-----|------|
| C13 | 400 | 400 | 330.50 | 256671.81 | 28117863 | 109.55 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2600597 | OK | K3 |
| C14 | 400 | 400 | 330.50 | 239468.74 | 27996978 | 116.91 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2517423 | OK | K3 |
| C15 | 400 | 400 | 330.50 | 239511.14 | 22994393 | 96.01 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2768839 | OK | K3 |
| C16 | 400 | 400 | 330.50 | 256187.46 | 21586581 | 84.26 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2933466 | OK | K3 |
| C17 | 400 | 400 | 330.50 | 245394.05 | 16341443 | 66.59 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3221743 | OK | K3 |
| C18 | 400 | 400 | 330.50 | 221922.22 | 11126175 | 50.14 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3546561 | OK | K3 |
| C19 | 400 | 400 | 330.50 | 226724.8 | 11355758 | 50.09 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3547635 | OK | K3 |
| C20 | 400 | 400 | 330.50 | 245301.22 | 17792693 | 72.53 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3118665 | OK | K3 |
| C21 | 400 | 400 | 330.50 | 745574.98 | 25283693 | 33.91 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3938261 | OK | K3 |
| C22 | 400 | 400 | 330.50 | 666376.26 | 17307828 | 25.97 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4163411 | OK | K3 |
| C23 | 400 | 400 | 330.50 | 742822.08 | 11299056 | 15.21 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4513438 | OK | K3 |
| C24 | 400 | 400 | 330.50 | 746437.71 | 7364365 | 9.87 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4710237 | OK | K3 |
| C25 | 400 | 400 | 330.50 | 805722.37 | 16072940 | 19.95 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4352327 | OK | K3 |
| C26 | 400 | 400 | 330.50 | 752635.8 | 25166302 | 33.44 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3951019 | OK | K3 |
| C27 | 400 | 400 | 330.50 | 304677.88 | 36976741 | 121.36 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2469697 | OK | K3 |
| C28 | 400 | 400 | 330.50 | 302612.54 | 35699900 | 117.97 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2505895 | OK | K3 |
| C29 | 400 | 400 | 330.50 | 482794.59 | 29684667 | 61.49 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3315978 | OK | K3 |
| C30 | 400 | 400 | 330.50 | 809655.57 | 22026790 | 27.21 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4126787 | OK | K3 |
| C31 | 400 | 400 | 330.50 | 671917.18 | 1948214 | 2.90 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4994231 | OK | K3 |
| C32 | 400 | 400 | 330.50 | 730868.9 | 2007853 | 2.75 | 5.1447 | OK | 1700 | 6 D 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 500824 | OK | K3 |

| | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|--------|-----------|----------|--------|--------|----|------|---|---|----|--------|-------|-----|---------|-----------|--------|-------|---------|----|----|
| C33 | 400 | 400 | 330.50 | 769524.2 | 2402895 | 3.12 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4984604 | OK | K3 |
| C34 | 400 | 400 | 330.50 | 748412.94 | 2825007 | 3.77 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4956676 | OK | K3 |
| C35 | 400 | 400 | 330.50 | 812816.43 | 17888307 | 22.01 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4285843 | OK | K3 |
| C36 | 400 | 400 | 330.50 | 482678.46 | 27438011 | 56.85 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3406507 | OK | K3 |
| C37 | 400 | 400 | 330.50 | 482410.64 | 29618523 | 61.40 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3317654 | OK | K3 |
| C38 | 400 | 400 | 330.50 | 811560.45 | 21919578 | 27.01 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4132569 | OK | K3 |
| C39 | 400 | 400 | 330.50 | 683591.01 | 1560532 | 2.28 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 5021038 | OK | K3 |
| C40 | 400 | 400 | 330.50 | 720428.67 | 844142.5 | 1.17 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 5070080 | OK | K3 |
| C41 | 400 | 400 | 330.50 | 718219.19 | 327348.8 | 0.46 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 5102194 | OK | K3 |
| C42 | 400 | 400 | 330.50 | 675655.88 | 1060898 | 1.57 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 5052383 | OK | K3 |
| C43 | 400 | 400 | 330.50 | 809705.86 | 18360404 | 22.68 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4264726 | OK | K3 |
| C44 | 400 | 400 | 330.50 | 483125.73 | 27585183 | 57.10 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3401463 | OK | K3 |
| C45 | 400 | 400 | 330.50 | 304189.69 | 36689096 | 120.61 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2477622 | OK | K3 |
| C46 | 400 | 400 | 330.50 | 303615.24 | 36162862 | 119.11 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2493660 | OK | K3 |
| C47 | 400 | 400 | 330.50 | 751499.97 | 25250505 | 33.60 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3946634 | OK | K3 |
| C48 | 400 | 400 | 330.50 | 686794.65 | 5415133 | 7.88 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4787649 | OK | K3 |
| C49 | 400 | 400 | 330.50 | 691519.75 | 4150740 | 6.00 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4863598 | OK | K3 |
| C50 | 400 | 400 | 330.50 | 692608.57 | 3970910 | 5.73 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4874653 | OK | K3 |
| C51 | 400 | 400 | 330.50 | 688126.91 | 5291602 | 7.69 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 4795397 | OK | K3 |
| C52 | 400 | 400 | 330.50 | 752907.44 | 25489770 | 33.86 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3939778 | OK | K3 |
| C53 | 400 | 400 | 330.50 | 242621.48 | 16867853 | 69.52 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3170058 | OK | K3 |
| C54 | 400 | 400 | 330.50 | 229217.63 | 10482895 | 45.73 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3644898 | OK | K3 |
| C55 | 400 | 400 | 330.50 | 228586.2 | 10360053 | 45.32 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3654361 | OK | K3 |
| C56 | 400 | 400 | 330.50 | 241895.41 | 17064770 | 70.55 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 3152411 | OK | K3 |
| C57 | 400 | 400 | 330.50 | 256898.99 | 30625206 | 119.21 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2492550 | OK | K3 |
| C58 | 400 | 400 | 330.50 | 242282.61 | 31367213 | 129.47 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2387312 | OK | K3 |
| C59 | 400 | 400 | 330.50 | 241996.88 | 27626166 | 114.16 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2547890 | OK | K3 |
| C60 | 400 | 400 | 330.50 | 256700.03 | 21825638 | 85.02 | 5.1447 | OK | 1700 | 6 | D | 19 | 200.30 | 69.50 | 390 | 2205855 | 359263803 | 162.87 | DESAK | 2922176 | OK | K3 |

Tabel Perhitungan tulangan lentur kolom akibat M 3 - 3
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESHATAN SEMARANG



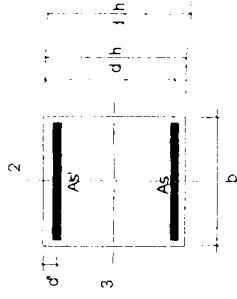
$d' = 50+10+0.5 \cdot 16 = 68 \text{ mm}$
 $\phi = 0,65$
 $f_c' = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $C_v = 50 \text{ mm}$

Lantai 4

| No Klm | b (mm) | h (mm) | d (mm) | P_u (N) | M_u (Nmm) | e (mm) | ρ (%) | Cek p | $A_s =$ A_s' (mm ²) | Tul pasang | x_b (mm) | d' (mm) | f_s' pakai | P_{nb} (N) | M_{nb} (Nmm) | e_b (mm) | runtuh | P_n (N) | Cek | Type |
|-----------|-----------|-----------|-----------|--------------|----------------|-----------|---------------|-------|---|---------------|---------------|--------------|-----------------|-----------------|-------------------|---------------|--------|--------------|-----|------|
| C13 | 300 | 300 | 232.00 | 107154.91 | 35458892 | 330.91 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 372625 | OK | K3 |
| C14 | 300 | 300 | 232.00 | 94191.51 | 35503828.2 | 376.93 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 319211 | OK | K3 |
| C15 | 300 | 300 | 232.00 | 94391.29 | 33215928.2 | 351.90 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 344344 | OK | K3 |
| C16 | 300 | 300 | 232.00 | 106993.51 | 33185443.1 | 310.16 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 430095 | | K3 |
| C17 | 300 | 300 | 232.00 | 113333.61 | 7086711.56 | 62.53 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 541600 | OK | K3 |
| C18 | 300 | 300 | 232.00 | 108288.09 | 6043758.81 | 55.81 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 568570 | OK | K3 |
| C19 | 300 | 300 | 232.00 | 110283.46 | 5759776.83 | 52.23 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 584128 | OK | K3 |
| C20 | 300 | 300 | 232.00 | 113254.65 | 7835553.95 | 69.19 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 517342 | OK | K3 |
| C21 | 300 | 300 | 232.00 | 418075.25 | 25455001.6 | 60.89 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 547952 | OK | K3 |
| C22 | 300 | 300 | 232.00 | 335615.59 | 9936806.71 | 29.61 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 707829 | OK | K3 |
| C23 | 300 | 300 | 232.00 | 416660.99 | 7400220.1 | 17.76 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 800968 | OK | K3 |
| C24 | 300 | 300 | 232.00 | 426127.01 | 5205011.53 | 12.21 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 858911 | OK | K3 |
| C25 | 300 | 300 | 232.00 | 403800.2 | 8556895.34 | 21.19 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 770803 | OK | K3 |
| C26 | 300 | 300 | 232.00 | 421764.56 | 24521811.2 | 58.14 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 558911 | OK | K3 |
| C27 | 300 | 300 | 232.00 | 167601.56 | 35221636 | 210.15 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 704519 | OK | K3 |
| C28 | 300 | 300 | 232.00 | 166500.28 | 34606872.1 | 207.85 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 714838 | OK | K3 |
| C29 | 300 | 300 | 232.00 | 284688.6 | 32082635.9 | 112.69 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 400560 | OK | K3 |
| C30 | 300 | 300 | 232.00 | 465476.08 | 27842339.6 | 59.81 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 552176 | OK | K3 |
| C31 | 300 | 300 | 232.00 | 326354.15 | 4693193.14 | 14.38 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 834535 | OK | K3 |
| C32 | 300 | 300 | 232.00 | 363493.03 | 1091838.88 | 3.00 | 6.9297 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1062357 | OK | K3 |

| | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|--------|-----------|------------|--------|--------|----|------|---|---|----|--------|-------|-----|--------|-----------|--------|-------|---------|----|----|
| C33 | 300 | 300 | 232.00 | 384186.44 | 1525583.57 | 3.97 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1016485 | OK | K3 |
| C34 | 300 | 300 | 232.00 | 366636.86 | 4966762.16 | 13.55 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 843598 | OK | K3 |
| C35 | 300 | 300 | 232.00 | 468002.21 | 26879849.3 | 57.44 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 561802 | OK | K3 |
| C36 | 300 | 300 | 232.00 | 284369.24 | 31681774.4 | 111.41 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 403239 | OK | K3 |
| C37 | 300 | 300 | 232.00 | 284555.13 | 32025735.8 | 112.55 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 400865 | OK | K3 |
| C38 | 300 | 300 | 232.00 | 466502.26 | 27690110.7 | 59.36 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 554002 | OK | K3 |
| C39 | 300 | 300 | 232.00 | 331798.66 | 4441133.08 | 13.39 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 845400 | OK | K3 |
| C40 | 300 | 300 | 232.00 | 357360.76 | 1104320.13 | 3.09 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1057402 | OK | K3 |
| C41 | 300 | 300 | 232.00 | 355504.07 | 1282831.77 | 3.61 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1031546 | OK | K3 |
| C42 | 300 | 300 | 232.00 | 327476.13 | 4390592.13 | 13.41 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 845150 | OK | K3 |
| C43 | 300 | 300 | 232.00 | 466072.67 | 27414290.2 | 58.82 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 556160 | OK | K3 |
| C44 | 300 | 300 | 232.00 | 284582.49 | 31816147.1 | 111.80 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 402423 | OK | K3 |
| C45 | 300 | 300 | 232.00 | 167179.42 | 34962705.5 | 209.13 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 738362 | OK | K3 |
| C46 | 300 | 300 | 232.00 | 167073.77 | 34862891.2 | 208.67 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 711142 | OK | K3 |
| C47 | 300 | 300 | 232.00 | 421719.98 | 24489612.1 | 58.07 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 559198 | OK | K3 |
| C48 | 300 | 300 | 232.00 | 345242.48 | 2259835.7 | 6.55 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 945052 | OK | K3 |
| C49 | 300 | 300 | 232.00 | 391581.75 | 2424803.63 | 6.19 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 952614 | OK | K3 |
| C50 | 300 | 300 | 232.00 | 392100.68 | 2316937.44 | 5.91 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 959035 | OK | K3 |
| C51 | 300 | 300 | 232.00 | 345860.43 | 2152212.95 | 6.22 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 951944 | OK | K3 |
| C52 | 300 | 300 | 232.00 | 421776.52 | 24600994.7 | 58.33 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 558154 | OK | K3 |
| C53 | 300 | 300 | 232.00 | 110572.18 | 7415920.94 | 67.07 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 524812 | OK | K3 |
| C54 | 300 | 300 | 232.00 | 112979.62 | 6432474.46 | 56.93 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 563870 | OK | K3 |
| C55 | 300 | 300 | 232.00 | 112803.83 | 6372969.25 | 56.50 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 565697 | OK | K3 |
| C56 | 300 | 300 | 232.00 | 110346.19 | 7516058.36 | 68.11 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 521097 | OK | K3 |
| C57 | 300 | 300 | 232.00 | 107148.14 | 25011349.8 | 233.43 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 611110 | OK | K3 |
| C58 | 300 | 300 | 232.00 | 96063.02 | 23686336.2 | 246.57 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 566243 | OK | K3 |
| C59 | 300 | 300 | 232.00 | 95939.1 | 23032372.1 | 240.07 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 587775 | OK | K3 |
| C60 | 300 | 300 | 232.00 | 107119.4 | 24413585.4 | 227.91 | 6.9297 | OK | 1206 | 6 | D | 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 31554 | OK | K3 |

Tabel Perhitungan tulangan lentur kolom akibat M 3 - 3
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESHATAN SEMARANG



$d' = 50+10+0.5 \cdot 16 = 68 \text{ mm}$
 $\phi = 0.65$
 $f_c' = 28 \text{ Mpa}$
 $C_v = 50 \text{ mm}$
 $f_y = 390 \text{ Mpa}$

Lantai 5

| No kolom | b (mm) | h (mm) | d (mm) | P_u (N) | M_u (Nmm) | e (mm) | ρ (%) | Cek ρ | $A_s = A_s'$ (mm ²) | Tul pasang | x_b (mm) | d' (mm) | f_s' pakai | P_{nb} (N) | M_{nb} (Nmm) | e_b (mm) | runtuh | P_n (N) | Cek | Type |
|-------------|-----------|-----------|-----------|--------------|----------------|-----------|---------------|------------|------------------------------------|---------------|---------------|--------------|-----------------|-----------------|-------------------|---------------|--------|--------------|-----|------|
| C21 | 300 | 300 | 232.00 | 94552.02 | 25668010.4 | 271.47 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 264 | OK | K4 |
| C22 | 300 | 300 | 232.00 | 83779.61 | 74729532.2 | 891.98 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 205 | OK | K4 |
| C23 | 300 | 300 | 232.00 | 93261.98 | 103231594 | 1106.90 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 210 | OK | K4 |
| C24 | 300 | 300 | 232.00 | 95002.61 | 103054730 | 1084.76 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 256 | OK | K4 |
| C25 | 300 | 300 | 232.00 | 82156.18 | 75331259.8 | 916.93 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 775 | OK | K4 |
| C26 | 300 | 300 | 232.00 | 95277.64 | 37006367.7 | 388.41 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 763 | OK | K4 |
| C47 | 300 | 300 | 232.00 | 93970.13 | 36894977 | 392.62 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 297 | OK | K4 |
| C48 | 300 | 300 | 232.00 | 83586.46 | 67492957.4 | 807.46 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 209 | OK | K4 |
| C49 | 300 | 300 | 232.00 | 93986.69 | 102507550 | 1090.66 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 209 | OK | K4 |
| C50 | 300 | 300 | 232.00 | 93965.49 | 102526579 | 1091.11 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 292 | OK | K4 |
| C51 | 300 | 300 | 232.00 | 83593.49 | 68465552.3 | 819.03 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 762 | OK | K4 |
| C52 | 300 | 300 | 232.00 | 93965.35 | 36924867.8 | 392.96 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 1211 | OK | K4 |
| C67 | 300 | 300 | 232.00 | 55389.38 | 15930136.3 | 287.60 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 1221 | OK | K4 |
| C68 | 300 | 300 | 232.00 | 55387.09 | 15840108.2 | 285.99 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 4657 | OK | K4 |
| C69 | 300 | 300 | 232.00 | 29886.93 | 2825257.12 | 94.53 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1349684 | OK | K4 |
| C70 | 300 | 300 | 232.00 | 29791.92 | 2748744.13 | 92.26 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1368074 | OK | K4 |
| C71 | 300 | 300 | 232.00 | 97926.56 | 8173469.83 | 83.47 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1444481 | OK | K4 |
| C72 | 300 | 300 | 232.00 | 97927.68 | 8160583.56 | 83.33 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1445697 | OK | K4 |
| C73 | 300 | 300 | 232.00 | 97938.25 | 8151720.94 | 83.23 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1446611 | OK | K4 |
| C74 | 300 | 300 | 232.00 | 97915.57 | 8204305.31 | 83.79 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1441514 | OK | K4 |
| C75 | 300 | 300 | 232.00 | 29703.38 | 2772602.28 | 93.34 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1359264 | OK | K4 |
| C76 | 300 | 300 | 232.00 | 29705.11 | 2697952.51 | 90.82 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | DESAK | 1380021 | OK | K4 |
| C77 | 300 | 300 | 232.00 | 55986.32 | 15915865.9 | 284.28 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 1239 | OK | K4 |
| C78 | 300 | 300 | 232.00 | 56017.22 | 15864489.7 | 283.21 | 5.3589 | OK | 1206 | 6 D 16 | 140.61 | 68.00 | 310 | 756669 | 146200883 | 193.22 | TARIK | 8275 | OK | K4 |

Tabel Perhitungan tulangan sengkang kolom
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$$f_c' = 28 \text{ MPa}$$

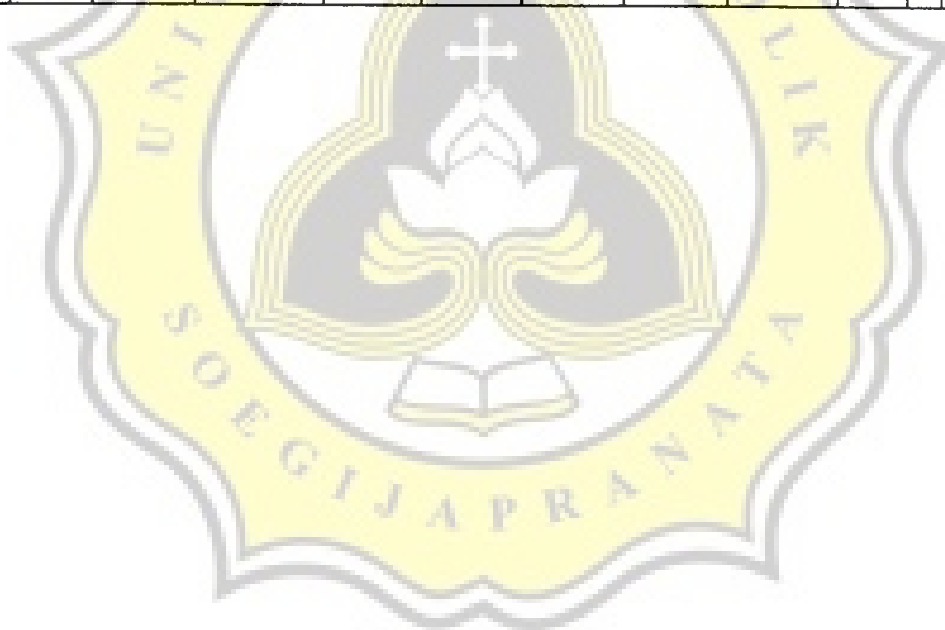
$$f_y = 240 \text{ MPa}$$

$$\phi = 0.6$$

Lantai 1

| Klm | b (mm) | h (mm) | d (mm) | P_u (N) | V_u (N) | V_c (N) | V_s (N) | $0.5\phi V_c$ | ϕV_c | Cek | S (mm) | Tulangan sengkang | | | |
|-----|-----------|-----------|-----------|--------------|--------------|--------------|--------------|---------------|------------|-----------|-----------|----------------------|----|---|-----|
| C9 | 300 | 300 | 232.00 | 37148.18 | 3322.58 | 63185 | -57647 | 18956 | 37911 | prlu gser | 377 | Ø | 10 | - | 200 |
| C10 | 300 | 300 | 232.00 | 86709.72 | 3795.74 | 65599 | -59273 | 19680 | 39360 | prlu gser | 377 | Ø | 10 | - | 200 |
| C11 | 300 | 300 | 232.00 | 86788.12 | 3769.61 | 65603 | -59320 | 19681 | 39362 | prlu gser | 377 | Ø | 10 | - | 200 |
| C12 | 300 | 300 | 232.00 | 36917.37 | 3313.71 | 63174 | -57651 | 18952 | 37904 | prlu gser | 377 | Ø | 10 | - | 200 |
| C61 | 300 | 300 | 232.00 | 37491.9 | 37491.9 | 63202 | -715 | 18961 | 37921 | prlu gser | 377 | Ø | 10 | - | 200 |
| C62 | 300 | 300 | 232.00 | 87092.83 | 87092.83 | 65618 | 79537 | 19685 | 39371 | gser min | 377 | Ø | 10 | - | 200 |
| C63 | 300 | 300 | 232.00 | 87119.64 | 87119.64 | 65619 | 79580 | 19686 | 39372 | gser min | 377 | Ø | 10 | - | 200 |
| C64 | 300 | 300 | 232.00 | 37428.71 | 37428.71 | 63199 | -818 | 18960 | 37919 | prlu gser | 377 | Ø | 10 | - | 200 |
| C13 | 600 | 600 | 530.50 | 595153.7 | 595153.69 | 313833 | 678090 | 94150 | 188300 | gser min | 188 | Ø | 10 | - | 200 |
| C14 | 600 | 600 | 530.50 | 574203.3 | 574203.29 | 312666 | 644339 | 93800 | 187600 | gser min | 188 | Ø | 10 | - | 200 |
| C15 | 600 | 600 | 530.50 | 575296.2 | 575296.24 | 312727 | 646100 | 93818 | 187636 | gser min | 188 | Ø | 10 | - | 200 |
| C16 | 600 | 600 | 530.50 | 594110.7 | 594110.74 | 313775 | 676410 | 94132 | 188265 | gser min | 188 | Ø | 10 | - | 200 |
| C17 | 600 | 600 | 530.50 | 556693.2 | 556693.24 | 311691 | 616131 | 93507 | 187015 | gser min | 188 | Ø | 10 | - | 200 |
| C18 | 600 | 600 | 530.50 | 561410.9 | 561410.93 | 311954 | 623731 | 93586 | 187172 | gser min | 188 | Ø | 10 | - | 200 |
| C19 | 600 | 600 | 530.50 | 573937.3 | 573937.3 | 312651 | 643911 | 93795 | 187591 | gser min | 188 | Ø | 10 | - | 200 |
| C20 | 600 | 600 | 530.50 | 561153.4 | 561153.37 | 311939 | 623316 | 93582 | 187164 | gser min | 188 | Ø | 10 | - | 200 |
| C21 | 600 | 600 | 530.50 | 1425235 | 1425234.71 | 360062 | 2015329 | 108019 | 216037 | gser min | 188 | Ø | 10 | - | 200 |
| C22 | 600 | 600 | 530.50 | 1357742 | 1357742.09 | 356303 | 1906601 | 106891 | 213782 | gser min | 188 | Ø | 10 | - | 200 |
| C23 | 600 | 600 | 530.50 | 1436750 | 1436750.01 | 360703 | 2033880 | 108211 | 216422 | gser min | 188 | Ø | 10 | - | 200 |
| C24 | 600 | 600 | 530.50 | 1349613 | 1349612.62 | 355850 | 1893504 | 106755 | 213510 | gser min | 188 | Ø | 10 | - | 200 |
| C25 | 600 | 600 | 530.50 | 1596673 | 1596673.4 | 369609 | 2291513 | 110883 | 221766 | gser min | 188 | Ø | 10 | - | 200 |
| C26 | 600 | 600 | 530.50 | 1435493 | 1435492.85 | 360633 | 2031855 | 108190 | 216380 | gser min | 188 | Ø | 10 | - | 200 |
| C27 | 600 | 600 | 530.50 | 611780.7 | 611780.69 | 314759 | 704876 | 94428 | 188855 | gser min | 188 | Ø | 10 | - | 200 |
| C28 | 600 | 600 | 530.50 | 607555.7 | 607555.66 | 314524 | 698069 | 94357 | 188714 | gser min | 188 | Ø | 10 | - | 200 |
| C29 | 600 | 600 | 530.50 | 910251.5 | 910251.48 | 331381 | 1185705 | 99414 | 198829 | gser min | 188 | Ø | 10 | - | 200 |
| C30 | 600 | 600 | 530.50 | 1530174 | 1530173.72 | 365906 | 2184384 | 109772 | 219544 | gser min | 188 | Ø | 10 | - | 200 |
| C31 | 600 | 600 | 530.50 | 1394986 | 1394985.91 | 358377 | 1966599 | 107513 | 215026 | gser min | 188 | Ø | 10 | - | 200 |
| C32 | 600 | 600 | 530.50 | 1486406 | 1486405.85 | 363468 | 2113875 | 109041 | 218081 | gser min | 188 | Ø | 10 | - | 200 |
| C33 | 600 | 600 | 530.50 | 1486346 | 1486345.76 | 363465 | 2113778 | 109040 | 218079 | gser min | 188 | Ø | 10 | - | 200 |
| C34 | 600 | 600 | 530.50 | 1491875 | 1491875 | 363773 | 2122685 | 109132 | 218264 | gser min | 188 | Ø | 10 | - | 200 |
| C35 | 600 | 600 | 530.50 | 1487663 | 1487663.18 | 363538 | 2115900 | 109062 | 218123 | gser min | 188 | Ø | 10 | - | 200 |
| C36 | 600 | 600 | 530.50 | 899893.3 | 899893.34 | 330804 | 1169018 | 99241 | 198483 | gser min | 188 | Ø | 10 | - | 200 |
| C37 | 600 | 600 | 530.50 | 909036 | 909035.95 | 331314 | 1183746 | 99394 | 198788 | gser min | 188 | Ø | 10 | - | 200 |
| C38 | 600 | 600 | 530.50 | 1533231 | 1533231.03 | 366076 | 2189309 | 109823 | 219646 | gser min | 188 | Ø | 10 | - | 200 |
| C39 | 600 | 600 | 530.50 | 1418926 | 1418926.13 | 359710 | 2005167 | 107913 | 215826 | gser min | 188 | Ø | 10 | - | 200 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|--------|----------|------------|--------|---------|--------|--------|----------|-----|---|----|---|-----|
| C40 | 600 | 600 | 530.50 | 1470072 | 1470071.68 | 362559 | 2087561 | 108768 | 217535 | gser min | 188 | Ø | 10 | - | 200 |
| C41 | 600 | 600 | 530.50 | 1469502 | 1469501.53 | 362527 | 2086642 | 108758 | 217516 | gser min | 188 | Ø | 10 | - | 200 |
| C42 | 600 | 600 | 530.50 | 1409519 | 1409518.76 | 359186 | 1990012 | 107756 | 215512 | gser min | 188 | Ø | 10 | - | 200 |
| C43 | 600 | 600 | 530.50 | 1482905 | 1482904.95 | 363273 | 2108235 | 108982 | 217964 | gser min | 188 | Ø | 10 | - | 200 |
| C44 | 600 | 600 | 530.50 | 900683.2 | 900683.17 | 330848 | 1170290 | 99255 | 198509 | gser min | 188 | Ø | 10 | - | 200 |
| C45 | 600 | 600 | 530.50 | 611731 | 611731.04 | 314756 | 704796 | 94427 | 188854 | gser min | 188 | Ø | 10 | - | 200 |
| C46 | 600 | 600 | 530.50 | 609085.8 | 609085.82 | 314609 | 700534 | 94383 | 188765 | gser min | 188 | Ø | 10 | - | 200 |
| C47 | 600 | 600 | 530.50 | 1433356 | 1433356.33 | 360514 | 2028413 | 108154 | 216308 | gser min | 188 | Ø | 10 | - | 200 |
| C48 | 600 | 600 | 530.50 | 1404183 | 1404182.95 | 358889 | 1981416 | 107667 | 215334 | gser min | 188 | Ø | 10 | - | 200 |
| C49 | 600 | 600 | 530.50 | 1329041 | 1329041.38 | 354704 | 1860364 | 106411 | 212823 | gser min | 188 | Ø | 10 | - | 200 |
| C50 | 600 | 600 | 530.50 | 1330643 | 1330642.62 | 354794 | 1862944 | 106438 | 212876 | gser min | 188 | Ø | 10 | - | 200 |
| C51 | 600 | 600 | 530.50 | 1405785 | 1405784.91 | 358978 | 1983996 | 107694 | 215387 | gser min | 188 | Ø | 10 | - | 200 |
| C52 | 600 | 600 | 530.50 | 1435313 | 1435312.73 | 360623 | 2031565 | 108187 | 216374 | gser min | 188 | Ø | 10 | - | 200 |
| C53 | 600 | 600 | 530.50 | 556228.1 | 556228.07 | 311665 | 615382 | 93499 | 186999 | gser min | 188 | Ø | 10 | - | 200 |
| C54 | 600 | 600 | 530.50 | 571435.4 | 571435.37 | 312512 | 639880 | 93754 | 187507 | gser min | 188 | Ø | 10 | - | 200 |
| C55 | 600 | 600 | 530.50 | 570689.8 | 570689.76 | 312470 | 638679 | 93741 | 187482 | gser min | 188 | Ø | 10 | - | 200 |
| C56 | 600 | 600 | 530.50 | 554652.6 | 554652.61 | 311577 | 612844 | 93473 | 186946 | gser min | 188 | Ø | 10 | - | 200 |
| C57 | 600 | 600 | 530.50 | 595733.1 | 595733.11 | 313865 | 679023 | 94160 | 188319 | gser min | 188 | Ø | 10 | - | 200 |
| C58 | 600 | 600 | 530.50 | 578542.8 | 578542.76 | 312908 | 651330 | 93872 | 187745 | gser min | 188 | Ø | 10 | - | 200 |
| C59 | 600 | 600 | 530.50 | 578122.2 | 578122.18 | 312884 | 650653 | 93865 | 187731 | gser min | 188 | Ø | 10 | - | 200 |
| C60 | 600 | 600 | 530.50 | 595188.2 | 595188.15 | 313835 | 678145 | 94150 | 188301 | gser min | 188 | Ø | 10 | - | 200 |
| C66 | 600 | 600 | 530.50 | 240156.2 | 240156.18 | 294062 | 106198 | 88219 | 176437 | gser min | 188 | Ø | 10 | - | 200 |



Tabel Perhitungan tulangan sengkang kolom
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c' = 28$ MPa
 $f_y = 240$ MPa
 $\phi = 0.6$

Lantai 2

| Klm | b (mm) | h (mm) | d (mm) | P_u (N) | V_u (N) | V_c (N) | V_s (N) | $0.5\phi V_c$ | ϕV_c | Cek | S (mm) | Tulangan sengkang |
|-----|-----------|-----------|-----------|--------------|--------------|--------------|--------------|---------------|------------|-----------|-----------|----------------------|
| C13 | 500 | 500 | 430.50 | 419947.18 | 8664.86 | 212549 | -198108 | 63765 | 127530 | prlu gser | 226 | ∅ 10 - 200 |
| C14 | 500 | 500 | 430.50 | 400277.7 | 8676.58 | 211483 | -197022 | 63445 | 126890 | prlu gser | 226 | ∅ 10 - 200 |
| C15 | 500 | 500 | 430.50 | 400248.12 | 11373.99 | 211481 | -192525 | 63444 | 126889 | prlu gser | 226 | ∅ 10 - 200 |
| C16 | 500 | 500 | 430.50 | 419076.62 | 11340.8 | 212502 | -193601 | 63751 | 127501 | prlu gser | 226 | ∅ 10 - 200 |
| C17 | 500 | 500 | 430.50 | 383441.82 | 10672.38 | 210570 | -192783 | 63171 | 126342 | prlu gser | 226 | ∅ 10 - 200 |
| C18 | 500 | 500 | 430.50 | 352962.36 | 9739.38 | 208917 | -192685 | 62675 | 125350 | prlu gser | 226 | ∅ 10 - 200 |
| C19 | 500 | 500 | 430.50 | 358277.23 | 9955.59 | 209205 | -192613 | 62762 | 125523 | prlu gser | 226 | ∅ 10 - 200 |
| C20 | 500 | 500 | 430.50 | 381649.93 | 12278.77 | 210473 | -190008 | 63142 | 126284 | prlu gser | 226 | ∅ 10 - 200 |
| C21 | 500 | 500 | 430.50 | 1078462.57 | 17524.7 | 248256 | -219048 | 74477 | 148953 | prlu gser | 226 | ∅ 10 - 200 |
| C22 | 500 | 500 | 430.50 | 1004624.13 | 11695.83 | 244252 | -224759 | 73276 | 146551 | prlu gser | 226 | ∅ 10 - 200 |
| C23 | 500 | 500 | 430.50 | 1079974.76 | 9458.32 | 248338 | -232574 | 74501 | 149003 | prlu gser | 226 | ∅ 10 - 200 |
| C24 | 500 | 500 | 430.50 | 1079272.37 | 7250.82 | 248300 | -236215 | 74490 | 148980 | prlu gser | 226 | ∅ 10 - 200 |
| C25 | 500 | 500 | 430.50 | 1219878.6 | 12049.23 | 255924 | -235842 | 76777 | 153554 | prlu gser | 226 | ∅ 10 - 200 |
| C26 | 500 | 500 | 430.50 | 1087160.45 | 18136.12 | 248727 | -218500 | 74618 | 149236 | prlu gser | 226 | ∅ 10 - 200 |
| C27 | 500 | 500 | 430.50 | 453013.77 | 20257.23 | 214342 | -180580 | 64303 | 128605 | prlu gser | 226 | ∅ 10 - 200 |
| C28 | 500 | 500 | 430.50 | 450031.45 | 19559.82 | 214181 | -181581 | 64254 | 128508 | prlu gser | 226 | ∅ 10 - 200 |
| C29 | 500 | 500 | 430.50 | 690446.6 | 18557.52 | 227216 | -196287 | 68165 | 136330 | prlu gser | 226 | ∅ 10 - 200 |
| C30 | 500 | 500 | 430.50 | 1163219.45 | 17510.21 | 252851 | -223668 | 75855 | 151711 | prlu gser | 226 | ∅ 10 - 200 |
| C31 | 500 | 500 | 430.50 | 1027552.94 | 3223.54 | 245495 | -240123 | 73649 | 147297 | prlu gser | 226 | ∅ 10 - 200 |
| C32 | 500 | 500 | 430.50 | 1103387.66 | 2653.36 | 249607 | -245185 | 74882 | 149764 | prlu gser | 226 | ∅ 10 - 200 |
| C33 | 500 | 500 | 430.50 | 1159886.69 | 2987.79 | 252671 | -247691 | 75801 | 151602 | prlu gser | 226 | ∅ 10 - 200 |
| C34 | 500 | 500 | 430.50 | 1138863.56 | 3234.03 | 251531 | -246141 | 75459 | 150918 | prlu gser | 226 | ∅ 10 - 200 |
| C35 | 500 | 500 | 430.50 | 1167502.12 | 13512.04 | 253084 | -230564 | 75925 | 151850 | prlu gser | 226 | ∅ 10 - 200 |
| C36 | 500 | 500 | 430.50 | 690460.89 | 16385.94 | 227217 | -199907 | 68165 | 136330 | prlu gser | 226 | ∅ 10 - 200 |
| C37 | 500 | 500 | 430.50 | 689717.94 | 18524.63 | 227177 | -196303 | 68153 | 136306 | prlu gser | 226 | ∅ 10 - 200 |
| C38 | 500 | 500 | 430.50 | 1165762.82 | 17495.54 | 252989 | -223830 | 75897 | 151794 | prlu gser | 226 | ∅ 10 - 200 |
| C39 | 500 | 500 | 430.50 | 1045607.25 | 1254.41 | 246474 | -244384 | 73942 | 147885 | prlu gser | 226 | ∅ 10 - 200 |
| C40 | 500 | 500 | 430.50 | 1089575.73 | 498.45 | 248858 | -248028 | 74657 | 149315 | prlu gser | 226 | ∅ 10 - 200 |
| C41 | 500 | 500 | 430.50 | 1086829.25 | 394.77 | 248709 | -248051 | 74613 | 149226 | prlu gser | 226 | ∅ 10 - 200 |
| C42 | 500 | 500 | 430.50 | 1033974.52 | 822.24 | 245843 | -244473 | 73753 | 147506 | prlu gser | 226 | ∅ 10 - 200 |
| C43 | 500 | 500 | 430.50 | 1163744.55 | 13667.72 | 252880 | -230100 | 75864 | 151728 | prlu gser | 226 | ∅ 10 - 200 |
| C44 | 500 | 500 | 430.50 | 691106.33 | 16426.99 | 227252 | -199874 | 68176 | 136351 | prlu gser | 226 | ∅ 10 - 200 |
| C45 | 500 | 500 | 430.50 | 452648.28 | 20075.77 | 214322 | -180863 | 64297 | 128593 | prlu gser | 226 | ∅ 10 - 200 |
| C46 | 500 | 500 | 430.50 | 451441.12 | 19741.47 | 214257 | -181355 | 64277 | 128554 | prlu gser | 226 | ∅ 10 - 200 |
| C47 | 500 | 500 | 430.50 | 1085599.55 | 17714.95 | 248643 | -219118 | 74593 | 149186 | prlu gser | 226 | ∅ 10 - 200 |
| C48 | 500 | 500 | 430.50 | 1037347.27 | 4804.73 | 246026 | -238018 | 73808 | 147616 | prlu gser | 226 | ∅ 10 - 200 |
| C49 | 500 | 500 | 430.50 | 1000653.26 | 3860.01 | 244037 | -237603 | 73211 | 146422 | prlu gser | 226 | ∅ 10 - 200 |
| C50 | 500 | 500 | 430.50 | 1002346.9 | 3874.88 | 244129 | -237670 | 73239 | 146477 | prlu gser | 226 | ∅ 10 - 200 |
| C51 | 500 | 500 | 430.50 | 1039091.66 | 4306.22 | 246121 | -238944 | 73836 | 147673 | prlu gser | 226 | ∅ 10 - 200 |
| C52 | 500 | 500 | 430.50 | 1087837.69 | 17898.71 | 248764 | -218933 | 74629 | 149258 | prlu gser | 226 | ∅ 10 - 200 |
| C53 | 500 | 500 | 430.50 | 382753.73 | 12191.35 | 210533 | -190214 | 63160 | 126320 | prlu gser | 226 | ∅ 10 - 200 |
| C54 | 500 | 500 | 430.50 | 361961.34 | 10533.8 | 209405 | -191849 | 62822 | 125643 | prlu gser | 226 | ∅ 10 - 200 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|--------|-----------|----------|--------|---------|-------|--------|-----------|-----|---|----|-----|
| C55 | 500 | 500 | 430.50 | 360922.2 | 10298.91 | 209349 | -192184 | 62805 | 125609 | prlu gser | 226 | Ø | 10 | 200 |
| C56 | 500 | 500 | 430.50 | 381506.72 | 11667.69 | 210465 | -191019 | 63139 | 126279 | prlu gser | 226 | Ø | 10 | 200 |
| C57 | 500 | 500 | 430.50 | 420351.75 | 14618.91 | 212571 | -188206 | 63771 | 127543 | prlu gser | 226 | Ø | 10 | 200 |
| C58 | 500 | 500 | 430.50 | 403840.69 | 15087.04 | 211676 | -186531 | 63503 | 127006 | prlu gser | 226 | Ø | 10 | 200 |
| C59 | 500 | 500 | 430.50 | 403458.41 | 11807.83 | 211655 | -191976 | 63497 | 126993 | prlu gser | 226 | Ø | 10 | 200 |
| C60 | 500 | 500 | 430.50 | 419976.95 | 11452.43 | 212551 | -193464 | 63765 | 127531 | prlu gser | 226 | Ø | 10 | 200 |



Tabel Perhitungan tulangan sengkang kolom
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$$f_c' = 28 \text{ MPa}$$

$$f_y = 240 \text{ MPa}$$

$$\phi = 0.6$$

Lantai 3

| Klm | b (mm) | h (mm) | d (mm) | P_u (N) | V_u (N) | V_c (N) | V_s (N) | $0.5\phi V_c$ | ϕV_c | Cek | S (mm) | Tulangan sengkang | | | |
|-----|-----------|-----------|-----------|--------------|--------------|--------------|--------------|---------------|------------|-----------|-----------|----------------------|----|---|-----|
| C13 | 400 | 400 | 330.50 | 419947.18 | 10697.21 | 138434 | -120605 | 41530 | 83060 | prlu gser | 283 | Ø | 10 | - | 200 |
| C14 | 400 | 400 | 330.50 | 400277.7 | 10993.15 | 137410 | -119088 | 41223 | 82446 | prlu gser | 283 | Ø | 10 | - | 200 |
| C15 | 400 | 400 | 330.50 | 400248.12 | 10254.11 | 137409 | -120319 | 41223 | 82445 | prlu gser | 283 | Ø | 10 | - | 200 |
| C16 | 400 | 400 | 330.50 | 419076.62 | 10536.31 | 138389 | -120828 | 41517 | 83033 | prlu gser | 283 | Ø | 10 | - | 200 |
| C17 | 400 | 400 | 330.50 | 383441.82 | 8520.69 | 136534 | -122333 | 40960 | 81921 | prlu gser | 283 | Ø | 10 | - | 200 |
| C18 | 400 | 400 | 330.50 | 352962.36 | 5378.79 | 134948 | -125983 | 40484 | 80969 | prlu gser | 283 | Ø | 10 | - | 200 |
| C19 | 400 | 400 | 330.50 | 358277.23 | 5361.99 | 135225 | -126288 | 40567 | 81135 | prlu gser | 283 | Ø | 10 | - | 200 |
| C20 | 400 | 400 | 330.50 | 381649.93 | 9297.78 | 136441 | -120945 | 40932 | 81865 | prlu gser | 283 | Ø | 10 | - | 200 |
| C21 | 400 | 400 | 330.50 | 1078462.57 | 14431.29 | 172706 | -148654 | 51812 | 103623 | prlu gser | 283 | Ø | 10 | - | 200 |
| C22 | 400 | 400 | 330.50 | 1004624.13 | 9560.69 | 168863 | -152928 | 50659 | 101318 | prlu gser | 283 | Ø | 10 | - | 200 |
| C23 | 400 | 400 | 330.50 | 1079974.76 | 6381.24 | 172784 | -162149 | 51835 | 103671 | prlu gser | 283 | Ø | 10 | - | 200 |
| C24 | 400 | 400 | 330.50 | 1079272.37 | 4061.71 | 172748 | -165978 | 51824 | 103649 | prlu gser | 283 | Ø | 10 | - | 200 |
| C25 | 400 | 400 | 330.50 | 1219878.6 | 9023.34 | 180066 | -165027 | 54020 | 108039 | prlu gser | 283 | Ø | 10 | - | 200 |
| C26 | 400 | 400 | 330.50 | 1087160.45 | 14312.14 | 173158 | -149305 | 51948 | 103895 | prlu gser | 283 | Ø | 10 | - | 200 |
| C27 | 400 | 400 | 330.50 | 453013.77 | 19672.28 | 140155 | -107368 | 42046 | 84093 | prlu gser | 283 | Ø | 10 | - | 200 |
| C28 | 400 | 400 | 330.50 | 450031.45 | 19063.73 | 140000 | -108227 | 42000 | 84000 | prlu gser | 283 | Ø | 10 | - | 200 |
| C29 | 400 | 400 | 330.50 | 690446.6 | 15825.93 | 152512 | -126135 | 45754 | 91507 | prlu gser | 283 | Ø | 10 | - | 200 |
| C30 | 400 | 400 | 330.50 | 1163219.45 | 12217.25 | 177117 | -156755 | 53135 | 106270 | prlu gser | 283 | Ø | 10 | - | 200 |
| C31 | 400 | 400 | 330.50 | 1027552.94 | 1096.53 | 170056 | -168229 | 51017 | 102034 | prlu gser | 283 | Ø | 10 | - | 200 |
| C32 | 400 | 400 | 330.50 | 1103387.66 | 569.17 | 174003 | -173054 | 52201 | 104402 | prlu gser | 283 | Ø | 10 | - | 200 |
| C33 | 400 | 400 | 330.50 | 1159886.69 | 895.89 | 176943 | -175450 | 53083 | 106166 | prlu gser | 283 | Ø | 10 | - | 200 |
| C34 | 400 | 400 | 330.50 | 1138863.56 | 1184.27 | 175849 | -173876 | 52755 | 105510 | prlu gser | 283 | Ø | 10 | - | 200 |
| C35 | 400 | 400 | 330.50 | 1167502.12 | 9595.88 | 177340 | -161347 | 53202 | 106404 | prlu gser | 283 | Ø | 10 | - | 200 |
| C36 | 400 | 400 | 330.50 | 690460.89 | 14862.59 | 152513 | -127742 | 45754 | 91508 | prlu gser | 283 | Ø | 10 | - | 200 |
| C37 | 400 | 400 | 330.50 | 689717.94 | 15797.33 | 152474 | -126145 | 45742 | 91484 | prlu gser | 283 | Ø | 10 | - | 200 |
| C38 | 400 | 400 | 330.50 | 1165762.82 | 12154.26 | 177249 | -156992 | 53175 | 106350 | prlu gser | 283 | Ø | 10 | - | 200 |
| C39 | 400 | 400 | 330.50 | 1045607.25 | 888.33 | 170996 | -169515 | 51299 | 102598 | prlu gser | 283 | Ø | 10 | - | 200 |
| C40 | 400 | 400 | 330.50 | 1089575.73 | 362.44 | 173284 | -172680 | 51985 | 103970 | prlu gser | 283 | Ø | 10 | - | 200 |
| C41 | 400 | 400 | 330.50 | 1086829.25 | 97.77 | 173141 | -172978 | 51942 | 103885 | prlu gser | 283 | Ø | 10 | - | 200 |
| C42 | 400 | 400 | 330.50 | 1033974.52 | 539.26 | 170390 | -169492 | 51117 | 102234 | prlu gser | 283 | Ø | 10 | - | 200 |
| C43 | 400 | 400 | 330.50 | 1163744.55 | 9886.58 | 177144 | -160667 | 53143 | 106287 | prlu gser | 283 | Ø | 10 | - | 200 |
| C44 | 400 | 400 | 330.50 | 691106.33 | 14932.92 | 152546 | -127658 | 45764 | 91528 | prlu gser | 283 | Ø | 10 | - | 200 |
| C45 | 400 | 400 | 330.50 | 452648.28 | 19536.81 | 140136 | -107575 | 42041 | 84082 | prlu gser | 283 | Ø | 10 | - | 200 |
| C46 | 400 | 400 | 330.50 | 451441.12 | 19293.95 | 140073 | -107917 | 42022 | 84044 | prlu gser | 283 | Ø | 10 | - | 200 |
| C47 | 400 | 400 | 330.50 | 1085599.55 | 14343.84 | 173077 | -149171 | 51923 | 103846 | prlu gser | 283 | Ø | 10 | - | 200 |
| C48 | 400 | 400 | 330.50 | 1037347.27 | 2895.37 | 170566 | -165740 | 51170 | 102340 | prlu gser | 283 | Ø | 10 | - | 200 |
| C49 | 400 | 400 | 330.50 | 1000653.26 | 2356.96 | 168656 | -164728 | 50597 | 101194 | prlu gser | 283 | Ø | 10 | - | 200 |
| C50 | 400 | 400 | 330.50 | 1002346.9 | 2255.91 | 168744 | -164985 | 50623 | 101247 | prlu gser | 283 | Ø | 10 | - | 200 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|--------|------------|----------|--------|---------|-------|--------|-----------|-----|---|----|---|-----|
| C51 | 400 | 400 | 330.50 | 1039091.66 | 2827.03 | 170657 | -165945 | 51197 | 102394 | prlu gser | 283 | Ø | 10 | - | 200 |
| C52 | 400 | 400 | 330.50 | 1087837.69 | 14493.88 | 173194 | -149037 | 51958 | 103916 | prlu gser | 283 | Ø | 10 | - | 200 |
| C53 | 400 | 400 | 330.50 | 382753.73 | 8047.77 | 136498 | -123085 | 40950 | 81899 | prlu gser | 283 | Ø | 10 | - | 200 |
| C54 | 400 | 400 | 330.50 | 361961.34 | 5513 | 135416 | -126228 | 40625 | 81250 | prlu gser | 283 | Ø | 10 | - | 200 |
| C55 | 400 | 400 | 330.50 | 360922.2 | 5445.45 | 135362 | -126286 | 40609 | 81217 | prlu gser | 283 | Ø | 10 | - | 200 |
| C56 | 400 | 400 | 330.50 | 381506.72 | 8916.09 | 136433 | -121573 | 40930 | 81860 | prlu gser | 283 | Ø | 10 | - | 200 |
| C57 | 400 | 400 | 330.50 | 420351.75 | 15732.02 | 138455 | -112235 | 41537 | 83073 | prlu gser | 283 | Ø | 10 | - | 200 |
| C58 | 400 | 400 | 330.50 | 403840.69 | 16118.97 | 137596 | -110731 | 41279 | 82557 | prlu gser | 283 | Ø | 10 | - | 200 |
| C59 | 400 | 400 | 330.50 | 403458.41 | 15317.13 | 137576 | -112047 | 41273 | 82546 | prlu gser | 283 | Ø | 10 | - | 200 |
| C60 | 400 | 400 | 330.50 | 419976.95 | 14941.86 | 138436 | -113533 | 41531 | 83061 | prlu gser | 283 | Ø | 10 | - | 200 |



Tabel Perhitungan tulangan sengkang kolom
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$$f_c' = 28 \text{ MPa}$$

$$f_y = 240 \text{ MPa}$$

$$\phi = 0.6$$

Lantai 4

| Klm | b (mm) | h (mm) | d (mm) | P_u (N) | V_u (N) | V_c (N) | V_s (N) | $0.5\phi V_c$ | ϕV_c | Cek | S (mm) | Tulangan sengkang | | | |
|-----|-----------|-----------|-----------|--------------|--------------|--------------|--------------|---------------|------------|-----------|-----------|----------------------|----|---|-----|
| C13 | 300 | 300 | 232.00 | 107154.91 | 17774.09 | 66595 | -36972 | 19979 | 39957 | prlu gser | 377 | Ø | 10 | - | 200 |
| C14 | 300 | 300 | 232.00 | 94191.51 | 17799.4 | 65964 | -36298 | 19789 | 39578 | prlu gser | 377 | Ø | 10 | - | 200 |
| C15 | 300 | 300 | 232.00 | 94391.29 | 16456.28 | 65973 | -38546 | 19792 | 39584 | prlu gser | 377 | Ø | 10 | - | 200 |
| C16 | 300 | 300 | 232.00 | 106993.51 | 16610.6 | 66587 | -38903 | 19976 | 39952 | prlu gser | 377 | Ø | 10 | - | 200 |
| C17 | 300 | 300 | 232.00 | 113333.61 | 3277.7 | 66896 | -61433 | 20069 | 40138 | prlu gser | 377 | Ø | 10 | - | 200 |
| C18 | 300 | 300 | 232.00 | 108288.09 | 3326.21 | 66650 | -61107 | 19995 | 39990 | prlu gser | 377 | Ø | 10 | - | 200 |
| C19 | 300 | 300 | 232.00 | 110283.46 | 3176.81 | 66748 | -61453 | 20024 | 40049 | prlu gser | 377 | Ø | 10 | - | 200 |
| C20 | 300 | 300 | 232.00 | 113254.65 | 3704.53 | 66892 | -60718 | 20068 | 40135 | prlu gser | 377 | Ø | 10 | - | 200 |
| C21 | 300 | 300 | 232.00 | 418075.25 | 13632.98 | 81740 | -59019 | 24522 | 49044 | prlu gser | 377 | Ø | 10 | - | 200 |
| C22 | 300 | 300 | 232.00 | 335615.59 | 5439.38 | 77724 | -68658 | 23317 | 46634 | prlu gser | 377 | Ø | 10 | - | 200 |
| C23 | 300 | 300 | 232.00 | 416660.99 | 4130.99 | 81671 | -74787 | 24501 | 49003 | prlu gser | 377 | Ø | 10 | - | 200 |
| C24 | 300 | 300 | 232.00 | 426127.01 | 2901.37 | 82133 | -77297 | 24640 | 49280 | prlu gser | 377 | Ø | 10 | - | 200 |
| C25 | 300 | 300 | 232.00 | 403800.2 | 4534.16 | 81045 | -73488 | 24314 | 48627 | prlu gser | 377 | Ø | 10 | - | 200 |
| C26 | 300 | 300 | 232.00 | 421764.56 | 13129.12 | 81920 | -60038 | 24576 | 49152 | prlu gser | 377 | Ø | 10 | - | 200 |
| C27 | 300 | 300 | 232.00 | 167601.56 | 17801.97 | 69540 | -39870 | 20862 | 41724 | prlu gser | 377 | Ø | 10 | - | 200 |
| C28 | 300 | 300 | 232.00 | 166500.28 | 17511.63 | 69486 | -40300 | 20846 | 41692 | prlu gser | 377 | Ø | 10 | - | 200 |
| C29 | 300 | 300 | 232.00 | 284688.6 | 16097.29 | 75243 | -48414 | 22573 | 45146 | prlu gser | 377 | Ø | 10 | - | 200 |
| C30 | 300 | 300 | 232.00 | 465476.08 | 14415.78 | 84049 | -60023 | 25215 | 50430 | prlu gser | 377 | Ø | 10 | - | 200 |
| C31 | 300 | 300 | 232.00 | 326354.15 | 2249.73 | 77273 | -73523 | 23182 | 46364 | prlu gser | 377 | Ø | 10 | - | 200 |
| C32 | 300 | 300 | 232.00 | 363493.03 | 586.54 | 79082 | -78104 | 23724 | 47449 | prlu gser | 377 | Ø | 10 | - | 200 |
| C33 | 300 | 300 | 232.00 | 384186.44 | 754.38 | 80090 | -78832 | 24027 | 48054 | prlu gser | 377 | Ø | 10 | - | 200 |
| C34 | 300 | 300 | 232.00 | 366636.86 | 2413.14 | 79235 | -75213 | 23770 | 47541 | prlu gser | 377 | Ø | 10 | - | 200 |
| C35 | 300 | 300 | 232.00 | 468002.21 | 13467.43 | 84172 | -61727 | 25252 | 50503 | prlu gser | 377 | Ø | 10 | - | 200 |
| C36 | 300 | 300 | 232.00 | 284369.24 | 15810.84 | 75227 | -48876 | 22568 | 45136 | prlu gser | 377 | Ø | 10 | - | 200 |
| C37 | 300 | 300 | 232.00 | 284555.13 | 16074.54 | 75237 | -48446 | 22571 | 45142 | prlu gser | 377 | Ø | 10 | - | 200 |
| C38 | 300 | 300 | 232.00 | 466502.26 | 14328.69 | 84099 | -60218 | 25230 | 50460 | prlu gser | 377 | Ø | 10 | - | 200 |
| C39 | 300 | 300 | 232.00 | 331798.66 | 2110.82 | 77538 | -74020 | 23261 | 46523 | prlu gser | 377 | Ø | 10 | - | 200 |
| C40 | 300 | 300 | 232.00 | 357360.76 | 607.96 | 78783 | -77770 | 23635 | 47270 | prlu gser | 377 | Ø | 10 | - | 200 |
| C41 | 300 | 300 | 232.00 | 355504.07 | 715.09 | 78692 | -77501 | 23608 | 47215 | prlu gser | 377 | Ø | 10 | - | 200 |
| C42 | 300 | 300 | 232.00 | 327476.13 | 2084.37 | 77327 | -73853 | 23198 | 46396 | prlu gser | 377 | Ø | 10 | - | 200 |
| C43 | 300 | 300 | 232.00 | 466072.67 | 13767.73 | 84078 | -61132 | 25224 | 50447 | prlu gser | 377 | Ø | 10 | - | 200 |
| C44 | 300 | 300 | 232.00 | 284582.49 | 15871.64 | 75238 | -48785 | 22571 | 45143 | prlu gser | 377 | Ø | 10 | - | 200 |
| C45 | 300 | 300 | 232.00 | 167179.42 | 17684.72 | 69519 | -40045 | 20856 | 41711 | prlu gser | 377 | Ø | 10 | - | 200 |
| C46 | 300 | 300 | 232.00 | 167073.77 | 17621.19 | 69514 | -40145 | 20854 | 41708 | prlu gser | 377 | Ø | 10 | - | 200 |
| C47 | 300 | 300 | 232.00 | 421719.98 | 13101.96 | 81918 | -60081 | 24575 | 49151 | prlu gser | 377 | Ø | 10 | - | 200 |
| C48 | 300 | 300 | 232.00 | 345242.48 | 1075.84 | 78193 | -76400 | 23458 | 46916 | prlu gser | 377 | Ø | 10 | - | 200 |
| C49 | 300 | 300 | 232.00 | 391581.75 | 1324.16 | 80450 | -78243 | 24135 | 48270 | prlu gser | 377 | Ø | 10 | - | 200 |
| C50 | 300 | 300 | 232.00 | 392100.68 | 1265.69 | 80475 | -78366 | 24143 | 48285 | prlu gser | 377 | Ø | 10 | - | 200 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|--------|-----------|----------|-------|--------|-------|-------|-----------|-----|---|----|---|-----|
| C51 | 300 | 300 | 232.00 | 345860.43 | 1018.37 | 78223 | -76525 | 23467 | 46934 | prlu gser | 377 | Ø | 10 | - | 200 |
| C52 | 300 | 300 | 232.00 | 421776.52 | 13186.24 | 81921 | -59944 | 24576 | 49152 | prlu gser | 377 | Ø | 10 | - | 200 |
| C53 | 300 | 300 | 232.00 | 110572.18 | 3481.08 | 66762 | -60960 | 20028 | 40057 | prlu gser | 377 | Ø | 10 | - | 200 |
| C54 | 300 | 300 | 232.00 | 112979.62 | 3570.07 | 66879 | -60929 | 20064 | 40127 | prlu gser | 377 | Ø | 10 | - | 200 |
| C55 | 300 | 300 | 232.00 | 112803.83 | 3537.74 | 66870 | -60974 | 20061 | 40122 | prlu gser | 377 | Ø | 10 | - | 200 |
| C56 | 300 | 300 | 232.00 | 110346.19 | 3535.28 | 66751 | -60859 | 20025 | 40050 | prlu gser | 377 | Ø | 10 | - | 200 |
| C57 | 300 | 300 | 232.00 | 107148.14 | 12149.76 | 66595 | -46345 | 19978 | 39957 | prlu gser | 377 | Ø | 10 | - | 200 |
| C58 | 300 | 300 | 232.00 | 96063.02 | 11981.46 | 66055 | -46086 | 19816 | 39633 | prlu gser | 377 | Ø | 10 | - | 200 |
| C59 | 300 | 300 | 232.00 | 95939.1 | 11805.02 | 66049 | -46374 | 19815 | 39629 | prlu gser | 377 | Ø | 10 | - | 200 |
| C60 | 300 | 300 | 232.00 | 107119.4 | 12004.14 | 66593 | -46587 | 19978 | 39956 | prlu gser | 377 | Ø | 10 | - | 200 |



Tabel Perhitungan tulangan sengkang kolom
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f'_c = 28$ MPa
 $f_y = 240$ MPa
 $\phi = 0.6$

Lantai 5

| Klim | b (mm) | h (mm) | d (mm) | P_u (N) | V_u (N) | V_c (N) | V_s (N) | $0.5\phi V_c$ | ϕV_c | Cek | S (mm) | Tulangan sengkang |
|------|--------|--------|--------|-----------|-----------|----------------|-----------------|-----------------|----------------|-----------|--------|-------------------|
| C21 | 300 | 300 | 233.00 | 94552.02 | 8816.29 | 37467004533374 | -37467004518680 | 11240101360012 | 22480202720024 | prlu gser | 678 | Ø 10 - 200 |
| C22 | 300 | 300 | 233.00 | 83779.61 | 3288.29 | 33198349737407 | -33198349731927 | 9959504921222 | 19919009842444 | prlu gser | 678 | Ø 10 - 200 |
| C23 | 300 | 300 | 233.00 | 93261.98 | 1035.57 | 36955815724835 | -36955815723109 | 110*6744717451 | 22173489434901 | prlu gser | 678 | Ø 10 - 200 |
| C24 | 300 | 300 | 233.00 | 95002.61 | 988.78 | 37645554473871 | -37645554472223 | 112936686342161 | 22587332684323 | prlu gser | 678 | Ø 10 - 200 |
| C25 | 300 | 300 | 233.00 | 82156.18 | 2833.18 | 32555052438828 | -32555052433806 | 9766515731558 | 19533031463117 | prlu gser | 678 | Ø 10 - 200 |
| C26 | 300 | 300 | 233.00 | 95277.64 | 8474.29 | 37754537341079 | -37754537326955 | 11326361202324 | 22652722404647 | prlu gser | 678 | Ø 10 - 200 |
| C47 | 300 | 300 | 233.00 | 93970.13 | 8612.27 | 37236425903408 | -37236425889055 | 11170927771023 | 22341855542045 | prlu gser | 678 | Ø 10 - 200 |
| C48 | 300 | 300 | 233.00 | 83586.46 | 1892.53 | 33121812484012 | -33121812480858 | 9936543745204 | 19873087490407 | prlu gser | 678 | Ø 10 - 200 |
| C49 | 300 | 300 | 233.00 | 93986.69 | 347.21 | 37242987937663 | -37242987937084 | 11172896381299 | 22345792762598 | prlu gser | 678 | Ø 10 - 200 |
| C50 | 300 | 300 | 233.00 | 93965.49 | 335.79 | 37234587265791 | -37234587265232 | 11170376179737 | 22340752359475 | prlu gser | 678 | Ø 10 - 200 |
| C51 | 300 | 300 | 233.00 | 83593.49 | 1890.57 | 33124598178506 | -33124598175355 | 9937379453552 | 19874758907103 | prlu gser | 678 | Ø 10 - 200 |
| C52 | 300 | 300 | 233.00 | 93965.35 | 8611.89 | 37234531775303 | -37234531775303 | 11170359536897 | 22340719073794 | prlu gser | 678 | Ø 10 - 200 |
| C67 | 300 | 300 | 233.00 | 55389.38 | 19430.2 | 21948490936257 | -21948490903873 | 6584547280877 | 13169094561754 | prlu gser | 678 | Ø 10 - 200 |
| C68 | 300 | 300 | 233.00 | 55387.09 | 19335.69 | 21947583505191 | -21947583472965 | 6584275051557 | 13168550103115 | prlu gser | 678 | Ø 10 - 200 |
| C69 | 300 | 300 | 233.00 | 29886.93 | 10616.55 | 11842938371751 | -11842938354057 | 3552881511525 | 71057630230051 | prlu gser | 678 | Ø 10 - 200 |
| C70 | 300 | 300 | 233.00 | 29791.92 | 10640.23 | 1180528988992 | -11805289871258 | 3541586966697 | 7083173933395 | prlu gser | 678 | Ø 10 - 200 |
| C71 | 300 | 300 | 233.00 | 97926.56 | 20822.09 | 38804193366252 | -38804193331548 | 11641258009876 | 23282516019751 | prlu gser | 678 | Ø 10 - 200 |
| C72 | 300 | 300 | 233.00 | 97927.68 | 20847.45 | 38804637175332 | -38804637140586 | 11641391152600 | 23282782305199 | prlu gser | 678 | Ø 10 - 200 |
| C73 | 300 | 300 | 233.00 | 97938.25 | 20183.59 | 38808825623524 | -38808825589885 | 11642647687057 | 23285295374114 | prlu gser | 678 | Ø 10 - 200 |
| C74 | 300 | 300 | 233.00 | 97915.57 | 20306.89 | 38799838489654 | -38799838455809 | 11639951546896 | 23279903093792 | prlu gser | 678 | Ø 10 - 200 |
| C75 | 300 | 300 | 233.00 | 29703.38 | 10648.91 | 11770205196185 | -11770205178437 | 3531061558856 | 7062123117711 | prlu gser | 678 | Ø 10 - 200 |
| C76 | 300 | 300 | 233.00 | 29705.11 | 10638.39 | 11770890722711 | -11770890704980 | 3531267216813 | 7062534433626 | prlu gser | 678 | Ø 10 - 200 |
| C77 | 300 | 300 | 233.00 | 55986.32 | 19365.11 | 22185033250734 | -22185033218459 | 6655509975220 | 13311019950441 | prlu gser | 678 | Ø 10 - 200 |
| C78 | 300 | 300 | 233.00 | 56017.22 | 19372.52 | 22197277626245 | -22197277593958 | 6659183287874 | 13318366575747 | prlu gser | 678 | Ø 10 - 200 |

Perhitungan Balok Tulangan Rangkap Lantai 2
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c' = 28 \text{ MPa}$
 $f_y = 390 \text{ MPa}$

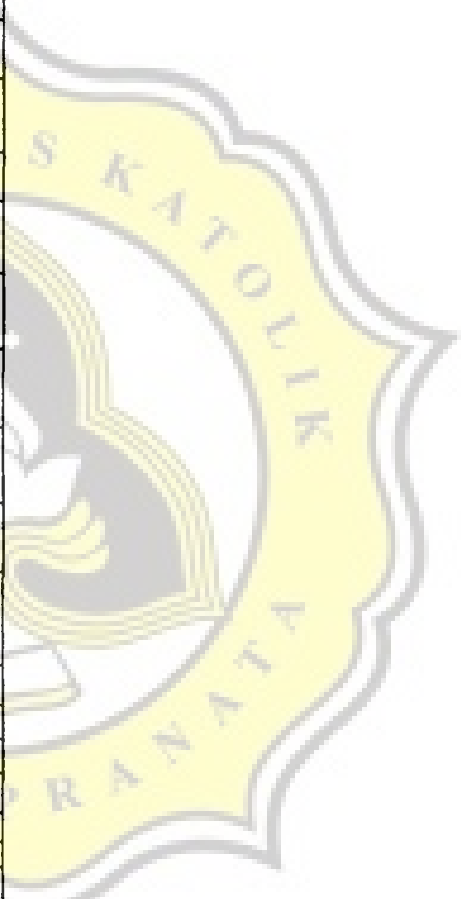
| A | B | C | D | E | G | H | I | J | K | L | M | N | O | P | Q | S | T | U | V | W | X | Y | Z | AA | AB | AC | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|-----|-----|-------|------|-----|-------|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|----------|---------|--------|-----------|-----------|-----------|------------|-----------|-------------|----------|-------------|-------------|-------------|--------|--------|------------------------------------|--------------------------|---------------------------|---|----------------|---------------|-----------|--------------|-----------|-------------|-------------|-------------------|-----|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | Blk | b (mm) | h (mm) | d (mm) | d' (mm) | Jns Mu | Mu (Nmm) | Tulangan | | | | | | As2 = As' (mm ²) | As (mm ²) | As1 (mm ²) | p | p - p' (mm) | 0,75pb cek | x (mm) | cek luluh | a (mm) | M1 (Nmm) | M2 (Nmm) | Mu total (Nmm) | cek |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | lapis1 | lapis2 | lapis1 | lapis2 | lapis1 | lapis2 | | | | | | | | | | | | | |
| B1 | 250 | 500 | 450,0 | 50,0 | Mtp | 1E+08 | 3 | D | 22 | 2 | D | 22 | 0 | D | 22 | 2 | D | 22 | 0 | D | 22 | 2 | D | 22 | 1899,7 | 759,88 | -1.140 | 0,007 | -0,010 | 0,024 | OK | 87,9 | blm | 74,7 | 5620881,337 | 296.353.200 | 256.677.969 | OK | | | | | | | | | | | | | | |
| | 250 | 500 | 450,0 | 50,0 | Mlp | 7E+07 | 2 | D | 22 | 0 | D | 22 | 2 | D | 22 | 3 | D | 22 | 3 | D | 22 | 3 | D | 22 | 759,88 | 1899,7 | 1.140 | 0,017 | 0,010 | 0,024 | OK | 87,9 | sdh | 74,7 | 5620881,337 | 118.541.280 | 105.537.837 | OK | | | | | | | | | | | | | | |
| B2 | 200 | 400 | 350,0 | 50,0 | Mtp | 4E+07 | 3 | D | 22 | 2 | D | 22 | 0 | D | 22 | 2 | D | 22 | 2 | D | 22 | 2 | D | 22 | 1899,7 | 759,88 | -1.140 | 0,011 | -0,016 | 0,024 | OK | 109,9 | sdh | 93,4 | 1469479,171 | 222.264.900 | 190.174.222 | OK | | | | | | | | | | | | | | |
| | 200 | 400 | 350,0 | 50,0 | Mlp | 5E+07 | 2 | D | 22 | 0 | D | 22 | 2 | D | 22 | 3 | D | 22 | 3 | D | 22 | 3 | D | 22 | 759,88 | 1899,7 | 1.140 | 0,027 | 0,016 | 0,024 | OK | 109,9 | sdh | 93,4 | 1466948,34 | 88.905.960 | 76.816.972 | OK | | | | | | | | | | | | | | |
| B3 | 150 | 200 | 150,0 | 50,0 | Mtp | 8E+06 | 3 | D | 19 | 2 | D | 19 | 0 | D | 19 | 2 | D | 19 | 2 | D | 19 | 2 | D | 19 | 1415,925 | 566,77 | -850 | 0,025 | -0,038 | 0,024 | OK | 109,3 | sdh | 92,9 | 1181337,345 | 55.260.075 | 47.975.200 | OK | | | | | | | | | | | | | | |
| | 150 | 200 | 150,0 | 50,0 | Mlp | 1E+06 | 2 | D | 19 | 0 | D | 19 | 0 | D | 19 | 3 | D | 19 | 3 | D | 19 | 3 | D | 19 | 565,77 | 850,155 | 283 | 0,038 | 0,013 | 0,024 | OK | 109,3 | sdh | 92,9 | 392346,5325 | 22.104.030 | 19.121.920 | OK | | | | | | | | | | | | | | |
| BT | 200 | 200 | 150,0 | 50,0 | Mtp | 3E+07 | 3 | D | 22 | 0 | D | 22 | 0 | D | 22 | 2 | D | 22 | 2 | D | 22 | 2 | D | 22 | 1139,82 | 759,88 | -380 | 0,025 | -0,013 | 0,024 | OK | 36,6 | sdh | 31,1 | 5102495,463 | 44.452.980 | 42.122.154 | OK | | | | | | | | | | | | | | |
| | 200 | 200 | 150,0 | 50,0 | Mlp | 2E+07 | 2 | D | 22 | 0 | D | 22 | 0 | D | 22 | 3 | D | 22 | 3 | D | 22 | 3 | D | 22 | 759,88 | 1139,82 | 380 | 0,038 | 0,013 | 0,024 | OK | 36,6 | sdh | 31,1 | 5104683,87 | 29.635.320 | 29.529.003 | OK | | | | | | | | | | | | | | |

Perhitungan Balok Tulangan Rangkap Lantai 3
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c' = 28 \text{ MPa}$

$f_s = 390 \text{ MPa}$

| Blok | b (mm) | h (mm) | d (mm) | d' (mm) | Jns Mu | Mu (Nmm) | Tulangan | | | As2 = As' (mm ²) | As (mm ²) | As1 (mm ²) | p | p - p' | 0.75pb cek | x (mm) | cek luluh | a (mm) | M1 (Nmm) | M2 (Nmm) | Mu total (Nmm) | cek | | | | | | |
|------|--------|--------|--------|---------|--------|-----------|--------------|--------|--------|------------------------------|-----------------------|------------------------|---|--------|------------|--------|-----------|--------|----------|----------|----------------|-------|-----|------|------------|-------------|-------------|----|
| | | | | | | | Tulangan As' | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | lapis1 | lapis2 | lapis2 | | | | | | | | | | | | | | | | | | | |
| B1 | 250 | 500 | 450,0 | 50,0 | Mtp | 79225645 | 3 | D 22 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 1899,7 | 759,88 | -1.140 | 0,007 | -0,010 | 0,024 | OK | 87,9 | sdh | 74,7 | 5620881,34 | 296.353.200 | 256.677.969 | OK |
| | 250 | 500 | 450,0 | 50,0 | Mlp | 16927504 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 3 | D 22 | 759,88 | 1899,7 | 1.140 | 0,017 | 0,010 | 0,024 | OK | 87,9 | sdh | 74,7 | 5620881,34 | 118.541.280 | 105.537.837 | OK |
| B2 | 200 | 400 | 350,0 | 50,0 | Mtp | 39245824 | 3 | D 22 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 1899,7 | 759,88 | -1.140 | 0,011 | -0,016 | 0,024 | OK | 109,9 | sdh | 93,4 | 1469479,17 | 222.254.900 | 190.174.222 | OK |
| | 200 | 400 | 350,0 | 50,0 | Mlp | 37617961 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 3 | D 22 | 759,88 | 1899,7 | 1.140 | 0,027 | 0,016 | 0,024 | OK | 109,9 | sdh | 93,4 | 1466948,34 | 88.905.960 | 76.816.972 | OK |
| B3 | 150 | 200 | 150,0 | 50,0 | Mtp | 8833324,5 | 3 | D 19 | 2 | D 19 | 0 | D 19 | 2 | D 19 | 1416,925 | 566,77 | -850 | 0,025 | -0,038 | 0,024 | OK | 109,3 | sdh | 92,9 | 1181337,35 | 55.260.075 | 47.975.200 | OK |
| | 150 | 200 | 150,0 | 50,0 | Mlp | 3209437 | 2 | D 19 | 0 | D 19 | 0 | D 19 | 3 | D 19 | 566,77 | 850,16 | 283 | 0,038 | 0,013 | 0,024 | OK | 109,3 | sdh | 92,9 | 392346,533 | 22.104.030 | 19.121.920 | OK |
| BT | 200 | 200 | 150,0 | 50,0 | Mtp | 31781521 | 3 | D 22 | 0 | D 22 | 0 | D 22 | 2 | D 22 | 1139,82 | 759,88 | -380 | 0,025 | -0,013 | 0,024 | OK | 36,6 | sdh | 31,1 | 5102495,46 | 44.452.980 | 42.122.154 | OK |
| | 200 | 200 | 150,0 | 50,0 | Mlp | 14694754 | 2 | D 22 | 0 | D 22 | 0 | D 22 | 3 | D 22 | 759,88 | 1139,8 | 380 | 0,038 | 0,013 | 0,024 | OK | 36,6 | sdh | 31,1 | 5104683,87 | 29.635.320 | 29.529.003 | OK |



Perhitungan Balok Tulangan Rangka Lantai 4

PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ MPa}$

$f_s = 390 \text{ MPa}$

| Balok | A | | B | | C | | D | | E | | G | | H | | I | | J | | K | | L | | M | | N | | O | | P | | Q | | S | | T | | U | | V | | W | | X | | Y | | Z | | AA | | AB | | AC | |
|-------|--------|--------|--------|---------|--------------|--------------|----------|----------|--------------|--------|--------|--------|--------|-------------|------------------------------|-----------------------|------------------------|-------|--------|--------|----|-----------|--------|----------|-------------|----------------|-------------|----|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|----|--|----|--|----|--|
| | b (mm) | h (mm) | d (mm) | d' (mm) | Jns Mu (Nmm) | Jms Mu (Nmm) | Mu (Nmm) | Tulangan | Tulangan As' | lapis1 | lapis2 | lapis1 | lapis2 | Tulangan As | As2 = As' (mm ²) | As (mm ²) | As1 (mm ²) | p | p - p' | 0.75pb | x | cek luluh | a (mm) | M1 (Nmm) | M2 (Nmm) | Mu total (Nmm) | cek | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B1 | 250 | 500 | 450,0 | 50,0 | Mtp | 67505747 | 3 | D 22 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 2 | D 22 | 1.140 | 0,007 | -0,010 | 0,024 | OK | 87,9 | sdh | 74,7 | 5620881,337 | 296.353.200 | 256.677.969 | OK | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | 500 | 450,0 | 50,0 | Mlp | 15934052 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 3 | D 22 | 2 | D 22 | 1.140 | 0,017 | 0,010 | 0,024 | OK | 87,9 | sdh | 74,7 | 5620881,337 | 118.541.280 | 105.537.837 | OK | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B2 | 200 | 400 | 350,0 | 50,0 | Mtp | 48406174 | 3 | D 22 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 2 | D 22 | 1.140 | 0,011 | -0,016 | 0,024 | OK | 109,9 | sdh | 93,4 | 1469479,171 | 222.264.900 | 190.174.222 | OK | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | 400 | 350,0 | 50,0 | Mlp | 2537085,3 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 3 | D 22 | 2 | D 22 | 1.140 | 0,027 | 0,016 | 0,024 | OK | 109,9 | sdh | 93,4 | 1466948,34 | 88.905.960 | 76.816.972 | OK | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B3 | 150 | 200 | 150,0 | 50,0 | Mtp | 6795207,6 | 3 | D 19 | 2 | D 19 | 0 | D 19 | 2 | D 19 | 2 | D 19 | 850 | 0,025 | -0,038 | 0,024 | OK | 109,3 | sdh | 92,9 | 1181337,345 | 55.260.075 | 47.975.200 | OK | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 150 | 200 | 150,0 | 50,0 | Mlp | 2690985,3 | 2 | D 19 | 0 | D 19 | 0 | D 19 | 3 | D 19 | 2 | D 19 | 850 | 0,038 | 0,013 | 0,024 | OK | 109,3 | sdh | 92,9 | 392346,5325 | 22.104.030 | 19.121.920 | OK | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B7 | 200 | 200 | 150,0 | 50,0 | Mtp | 29729129 | 3 | D 22 | 0 | D 22 | 0 | D 22 | 2 | D 22 | 2 | D 22 | 1139,8 | 0,025 | -0,013 | 0,024 | OK | 36,6 | sdh | 31,1 | 5102495,463 | 44.452.980 | 42.122.154 | OK | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | 200 | 150,0 | 50,0 | Mlp | 11537015 | 2 | D 22 | 0 | D 22 | 0 | D 22 | 3 | D 22 | 2 | D 22 | 759,88 | 0,038 | 0,013 | 0,024 | OK | 36,6 | sdh | 31,1 | 5104683,87 | 29.635.320 | 29.529.003 | OK | | | | | | | | | | | | | | | | | | | | | | | | | | |

Perhitungan Balok Tulangan Rangkap Lantai 5
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 25 \text{ MPa}$
 $f_y = 390 \text{ MPa}$

| Balok | b (mm) | h (mm) | d (mm) | d' (mm) | Jns Mu | Mu (Nmm) | Tulangan | | | As2 = As' (mm ²) | As (mm ²) | As1 (mm ²) | p | p - p' | 0.75ob cek | x (mm) | cek tuluh | a (mm) | M1 (Nmm) | M2 (Nmm) | Mu total (Nmm) | cek | | | | |
|-------|--------|--------|--------|---------|--------|-----------|----------|--------|--------|------------------------------|-----------------------|------------------------|---|--------|------------|--------|-----------|--------|----------|----------|----------------|------|-------------|-------------|-------------|----|
| | | | | | | | lapis1 | lapis2 | lapis2 | | | | | | | | | | | | | | | | | |
| B1 | 250 | 500 | 450.0 | 50.0 | M1p | 81667114 | 3 | D 22 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 0 | 0,007 | -0,010 | 0,024 | OK | 87,9 | sdh | 74,7 | 5620881,337 | 296.353.200 | 256.677.969 | OK |
| | 250 | 500 | 450.0 | 50.0 | M1p | 1488057,3 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 3 | D 22 | 0 | 0,017 | 0,010 | 0,024 | OK | 87,9 | sdh | 74,7 | 5620881,337 | 118.541.280 | 105.537.837 | OK |
| B2 | 200 | 400 | 350.0 | 50.0 | M1p | 55812930 | 3 | D 22 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 0 | 0,011 | -0,016 | 0,024 | OK | 109,9 | sdh | 93,4 | 1469479,171 | 227.264.900 | 190.174.222 | OK |
| | 200 | 400 | 350.0 | 50.0 | M1p | 66967400 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 3 | D 22 | 0 | 0,027 | 0,016 | 0,024 | OK | 109,9 | sdh | 93,4 | 1466948,34 | 88.905.960 | 76.816.972 | OK |
| B3 | 150 | 200 | 150.0 | 50.0 | M1p | 8108999,5 | 3 | D 19 | 2 | D 19 | 0 | D 19 | 2 | D 19 | 0 | 0,025 | -0,038 | 0,024 | OK | 109,3 | sdh | 92,9 | 1181337,345 | 55.260.075 | 47.975.200 | OK |
| | 150 | 200 | 150.0 | 50.0 | M1p | 3678746,8 | 2 | D 19 | 0 | D 19 | 0 | D 19 | 3 | D 19 | 0 | 0,038 | 0,013 | 0,024 | OK | 109,3 | sdh | 92,9 | 392346,5325 | 22.104.030 | 19.121.920 | OK |
| B4 | 200 | 200 | 150.0 | 50.0 | M1p | 28715271 | 3 | D 22 | 0 | D 22 | 0 | D 22 | 2 | D 22 | 0 | 0,025 | -0,013 | 0,024 | OK | 36,6 | sdh | 31,1 | 5102495,463 | 44.452.980 | 42.122.154 | OK |
| | 200 | 200 | 150.0 | 50.0 | M1p | 12403732 | 2 | D 22 | 0 | D 22 | 0 | D 22 | 3 | D 22 | 0 | 0,038 | 0,013 | 0,024 | OK | 36,6 | sdh | 31,1 | 5104683,87 | 29.635.320 | 29.529.003 | OK |
| B4 | 250 | 250 | 200.0 | 50.0 | M1p | 22793165 | 3 | D 22 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 0 | 0,015 | -0,023 | 0,024 | OK | 87,9 | sdh | 74,7 | 5620881,337 | 111.132.450 | 99.240.332 | OK |
| | 250 | 250 | 200.0 | 50.0 | M1p | 12923654 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 3 | D 22 | 0 | 0,038 | 0,023 | 0,024 | OK | 36,6 | sdh | 31,1 | 15314051,61 | 44.452.980 | 50.801.977 | OK |

Perhitungan Balok Tulangan Rangkap Lantai 6

PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ MPa}$

$f_y = 390 \text{ MPa}$

| Balok | b (mm) | h (mm) | d (mm) | d' (mm) | Jns Mu | Mu (Nmm) | Tulangan | | As2 = As' (mm ²) | As (mm ²) | As1 (mm ²) | p | p - p' | 0.75pb | x (mm) | cek tuluh | a (mm) | M1 (Nmm) | M2 (Nmm) | Mu total (Nmm) | cek | | |
|-------|--------|--------|--------|---------|--------|----------|--------------|-------------|------------------------------|-----------------------|------------------------|------|--------|--------|--------|-----------|--------|----------|----------|----------------|-------------|-------------|----|
| | | | | | | | Tulangan As' | Tulangan As | | | | | | | | | | | | | | | |
| RB | 250 | 350 | 300,0 | 50,0 | Mtp | 23973282 | 3 | D 22 | 2 | D 22 | 2 | D 22 | 0,010 | -0,015 | 0,024 | OK | 87,9 | blm | 74,7 | 5620881,34 | 185.220.750 | 162.215.387 | OK |
| | 250 | 350 | 300,0 | 50,0 | Mlp | 11378177 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 0,025 | 0,015 | 0,024 | OK | 87,9 | blm | 74,7 | 5620881,34 | 74.088.300 | 67.752.804 | OK |
| | 250 | 250 | 200,0 | 50,0 | Mtp | 27652445 | 3 | D 22 | 2 | D 22 | 0 | D 22 | 0,015 | -0,023 | 0,024 | OK | 87,9 | blm | 74,7 | 5620881,34 | 111.132.450 | 99.240.332 | OK |
| RB4 | 250 | 250 | 200,0 | 50,0 | Mlp | 20034342 | 2 | D 22 | 0 | D 22 | 2 | D 22 | 0,038 | 0,023 | 0,024 | OK | 109,9 | blm | 93,4 | 1466948,34 | 44.452.980 | 39.031.939 | OK |



Tabel Perhitungan Tulangan Sengkang Balok Lantai 2
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f'_c = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $\phi = 0,6$

| Tipe balok | Ditul | b (mm) | h (mm) | d' = ds (mm) | d (mm) | jns Vu | Vu (N) | Vc (N) | Vs (N) | Vs maks (N) | Cek pnp. | Vs min | ϕV_c | $0,5\phi V_c$ | $\phi V_c + \phi V_{s \text{ min}}$ | Cek | Vs pakai | s (mm) | Smaks | | | Tulangan sengkang pasang |
|------------|-------|--------|--------|--------------|--------|--------|----------|--------|----------|-------------|----------|----------|------------|---------------|-------------------------------------|----------|----------|--------|----------|-------------|--------------|--------------------------|
| | | | | | | | | | | | | | | | | | | | d/4 (mm) | 10Dtul (mm) | 24Æ gsr (mm) | |
| | 22 | 250 | 500 | 50,0 | 450,0 | lap | 75099,65 | 99216 | 25950,41 | 396862,70 | ckp | 37500,00 | 59529,40 | 29764,70 | 97029,40 | gsr min | 37500,00 | 531 | 113 | 220 | 240 | $\phi 10 - 110$ |
| B1 | 22 | 250 | 500 | 50,0 | 450,0 | tump | 71600,99 | 99216 | 20119,31 | 396862,70 | ckp | 37500,00 | 59529,40 | 29764,70 | 97029,40 | gsr min | 37500,00 | 685 | 113 | 220 | 240 | $\phi 10 - 110$ |
| | 22 | 200 | 400 | 50,0 | 350,0 | lap | 78762,61 | 61734 | 69536,82 | 246936,79 | ckp | 23333,33 | 37040,52 | 18520,26 | 60373,85 | prlu gsr | 69536,82 | 154 | 88 | 220 | 240 | $\phi 10 - 100$ |
| B2 | 22 | 200 | 400 | 50,0 | 350,0 | tump | 51944,39 | 61734 | 24839,79 | 246936,79 | ckp | 23333,33 | 37040,52 | 18520,26 | 60373,85 | gsr min | 24839,79 | 431 | 88 | 220 | 240 | $\phi 10 - 100$ |
| | 19 | 150 | 200 | 50,0 | 150,0 | lap | 36729,51 | 19843 | 41372,72 | 79372,54 | ckp | 7500,00 | 11905,88 | 5952,94 | 19405,88 | prlu gsr | 41372,72 | 111 | 38 | 250 | 240 | $\phi 10 - 100$ |
| B3 | 19 | 150 | 200 | 50,0 | 150,0 | tump | 25233,59 | 19843 | 2212,85 | 79372,54 | ckp | 7500,00 | 11905,88 | 5952,94 | 19405,88 | prlu gsr | 2212,85 | 207 | 38 | 250 | 240 | $\phi 10 - 100$ |
| | 22 | 200 | 200 | 50,0 | 150,0 | lap | 60808,12 | 26458 | 74889,35 | 105830,05 | ckp | 10000,00 | 15874,51 | 7937,25 | 25874,51 | prlu gsr | 74889,35 | 61 | 38 | 250 | 240 | $\phi 10 - 100$ |
| B4 | 22 | 200 | 200 | 50,0 | 150,0 | tump | 23668,23 | 26458 | 12989,54 | 105830,05 | ckp | 10000,00 | 15874,51 | 7937,25 | 25874,51 | gsr min | 12989,54 | 354 | 38 | 250 | 240 | $\phi 10 - 100$ |

Tabel Perhitungan Tulangan Sengkang Balok Lantai 3
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $\phi = 0,6$

| Tipe balok | Dtul | b (mm) | h (mm) | d' _s (mm) | d (mm) | jns Vu | Vu (N) | Vc (N) | Vs (N) | Vs maks (N) | Cek pnp. | Vs min | ϕVc | 0.5ϕVc | ϕVc+ ϕVs,min | Cek | Vs pakai | s (mm) | S maks | | | Tulangan sengkang pasang |
|------------|------|--------|--------|----------------------|--------|--------|----------|--------|----------|-------------|----------|----------|----------|----------|-----------------|-----------|----------|--------|----------|-------------|---------------|--------------------------|
| | | | | | | | | | | | | | | | | | | | d/4 (mm) | 10Dtul (mm) | 24 ϕ gsr (mm) | |
| B1 | 22 | 250 | 500 | 50,0 | 450,0 | lap | 70059,40 | 99216 | 17549,99 | 396862,70 | ckp | 37500,00 | 59529,40 | 29764,70 | 97029,40 | gser min | 37500,00 | 785 | 113 | 220 | 240 | ∅ 10 - 110 |
| | 22 | 250 | 500 | 50,0 | 450,0 | tump | 65288,59 | 99216 | 9598,64 | 396862,70 | ckp | 37500,00 | 59529,40 | 29764,70 | 97029,40 | gser min | 37500,00 | 1.435 | 113 | 220 | 240 | ∅ 10 - 110 |
| B2 | 22 | 200 | 400 | 50,0 | 350,0 | lap | 79198,64 | 61734 | 70263,54 | 246936,79 | ckp | 23333,33 | 37040,52 | 18520,26 | 60373,85 | prlu gser | 70263,54 | 153 | 88 | 220 | 240 | ∅ 10 - 100 |
| | 22 | 200 | 400 | 50,0 | 350,0 | tump | 67927,12 | 61734 | 51477,67 | 246936,79 | ckp | 23333,33 | 37040,52 | 18520,26 | 60373,85 | prlu gser | 51477,67 | 208 | 88 | 220 | 240 | ∅ 10 - 100 |
| B3 | 19 | 150 | 200 | 50,0 | 150,0 | lap | 19402,20 | 19843 | 12493,87 | 79372,54 | ckp | 7500,00 | 11905,88 | 5952,94 | 19405,88 | gser min | 12493,87 | 368 | 38 | 250 | 240 | ∅ 10 - 100 |
| | 19 | 150 | 200 | 50,0 | 150,0 | tump | 14683,85 | 19843 | 4629,95 | 79372,54 | ckp | 7500,00 | 11905,88 | 5952,94 | 19405,88 | gser min | 7500,00 | 992 | 38 | 250 | 240 | ∅ 10 - 100 |
| B4 | 22 | 200 | 200 | 50,0 | 150,0 | lap | 60378,00 | 26458 | 74172,49 | 105830,05 | ckp | 10000,00 | 15874,51 | 7937,25 | 25874,51 | prlu gser | 74172,49 | 62 | 38 | 250 | 240 | ∅ 10 - 100 |
| | 22 | 200 | 200 | 50,0 | 150,0 | tump | 45231,70 | 26458 | 48928,65 | 105830,05 | ckp | 10000,00 | 15874,51 | 7937,25 | 25874,51 | prlu gser | 48928,65 | 94 | 38 | 250 | 240 | ∅ 10 - 100 |

Tabel Perhitungan Tulangan Sengkang Balok Lantai 4
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28$ Mpa
 $f_y = 390$ Mpa
 $\phi = 0,6$

| Tipe balok | Dtul (mm) | b (mm) | h (mm) | d' = ds (mm) | d (mm) | l ins Vu (mm) | Vu (N) | Vc (N) | Vs (N) | Vs maks (N) | Cek pnp min | Vs min | Vs pakai | Cek gser min | Vs | Smaks | | | Tulangan sengkang pasang | |
|------------|-----------|--------|--------|--------------|--------|---------------|----------|--------|----------|-------------|-------------|----------|----------|--------------|----------|------------|-------------|--------------|--------------------------|------------|
| | | | | | | | | | | | | | | | | d / 4 (mm) | 10Dtul (mm) | 24Æ gsr (mm) | | |
| | 22 | 250 | 500 | 50,0 | 450,0 | lap | 72902,08 | 99216 | 22287,79 | 396862,70 | ckp | 37500,00 | 37500,00 | gser min | 37500,00 | 618 | 113 | 220 | 240 | Ø 10 - 110 |
| B1 | 22 | 250 | 500 | 50,0 | 450,0 | tump | 68025,16 | 99216 | 14159,59 | 396862,70 | ckp | 37500,00 | 37500,00 | gser min | 37500,00 | 973 | 113 | 220 | 240 | Ø 10 - 110 |
| | 22 | 200 | 400 | 50,0 | 350,0 | lap | 59476,34 | 61734 | 37393,04 | 246936,79 | ckp | 23333,33 | 37393,04 | gser min | 37393,04 | 287 | 88 | 220 | 240 | Ø 10 - 100 |
| B2 | 22 | 200 | 400 | 50,0 | 350,0 | tump | 46568,98 | 61734 | 15880,77 | 246936,79 | ckp | 23333,33 | 37040,52 | gser min | 23333,33 | 675 | 88 | 220 | 240 | Ø 10 - 100 |
| | 19 | 150 | 200 | 50,0 | 150,0 | lap | 26845,60 | 19843 | 24899,53 | 79372,54 | ckp | 7500,00 | 24899,53 | prlu gser | 24899,53 | 184 | 38 | 250 | 240 | Ø 10 - 100 |
| B3 | 19 | 150 | 200 | 50,0 | 150,0 | tump | 22126,78 | 19843 | 17034,83 | 79372,54 | ckp | 7500,00 | 17034,83 | prlu gser | 17034,83 | 270 | 38 | 250 | 240 | Ø 10 - 100 |
| | 22 | 200 | 200 | 50,0 | 150,0 | lap | 59836,10 | 26458 | 73269,32 | 105830,05 | ckp | 10000,00 | 73269,32 | prlu gser | 73269,32 | 63 | 38 | 250 | 240 | Ø 10 - 100 |
| BT | 22 | 200 | 200 | 50,0 | 150,0 | tump | 22696,20 | 26458 | 11369,49 | 105830,05 | ckp | 10000,00 | 11369,49 | gser min | 11369,49 | 404 | 38 | 250 | 240 | Ø 10 - 100 |

Tabel Perhitungan Tulangan Sengkang Balok Lantai 5
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $\phi = 0,6$

| Tipe balok | Ditul (mm) | b (mm) | h (mm) | d ₁ (mm) | d _s (mm) | d (mm) | Jns Nu | V _c (N) | V _s (N) | V _s maks (N) | Cek pp.p. min | V _s min | øV _c | 0.5øV _c | øV _c + øV _s min | Cek | V _s pakai | S maks | | | Tulangan sengkang pasang | |
|------------|------------|--------|--------|---------------------|---------------------|--------|----------|--------------------|--------------------|-------------------------|---------------|--------------------|-----------------|--------------------|---------------------------------------|-----------|----------------------|----------|-------------|---------------|--------------------------|------------|
| | | | | | | | | | | | | | | | | | | d/4 (mm) | 10Dtul (mm) | 24.Æ gsr (mm) | | |
| | 22 | 250 | 500 | 50,0 | 450,0 | 99216 | 79997,31 | 99216 | 34113,18 | 396862,70 | ckp | 37500,00 | 59529,40 | 29764,70 | 97029,40 | gser min | 37500,00 | 404 | 113 | 220 | 240 | ø 10 - 110 |
| B1 | 22 | 250 | 500 | 50,0 | 450,0 | 99216 | 74691,36 | 99216 | 25269,93 | 396862,70 | ckp | 37500,00 | 59529,40 | 29764,70 | 97029,40 | gser min | 37500,00 | 545 | 113 | 220 | 240 | ø 10 - 110 |
| | 22 | 200 | 400 | 50,0 | 350,0 | 61734 | 90059,4 | 61734 | 88364,80 | 246936,79 | ckp | 23333,33 | 37040,52 | 18520,26 | 60373,85 | prlu gser | 88364,80 | 121 | 88 | 220 | 240 | ø 10 - 100 |
| B2 | 22 | 200 | 400 | 50,0 | 350,0 | 61734 | 86921,20 | 61734 | 83134,47 | 246936,79 | ckp | 23333,33 | 37040,52 | 18520,26 | 60373,85 | prlu gser | 83134,47 | 129 | 88 | 220 | 240 | ø 10 - 100 |
| | 19 | 150 | 200 | 50,0 | 150,0 | 19843 | 29147,20 | 19843 | 28735,53 | 79372,54 | ckp | 7500,00 | 11905,88 | 5952,94 | 19405,88 | prlu gser | 28735,53 | 160 | 38 | 250 | 240 | ø 10 - 100 |
| B3 | 19 | 150 | 200 | 50,0 | 150,0 | 19843 | 19668,99 | 19843 | 12938,52 | 79372,54 | ckp | 7500,00 | 11905,88 | 5952,94 | 19405,88 | prlu gser | 12938,52 | 355 | 38 | 250 | 240 | ø 10 - 100 |
| | 22 | 200 | 200 | 50,0 | 150,0 | 26458 | 59689,00 | 26458 | 73024,15 | 105830,05 | ckp | 10000,00 | 15874,51 | 7937,25 | 25874,51 | prlu gser | 73024,15 | 63 | 38 | 250 | 240 | ø 10 - 100 |
| BT | 22 | 200 | 200 | 50,0 | 150,0 | 26458 | 22549,10 | 26458 | 11124,32 | 105830,05 | ckp | 10000,00 | 15874,51 | 7937,25 | 25874,51 | gser min | 11124,32 | 413 | 38 | 250 | 240 | ø 10 - 100 |
| | 22 | 250 | 250 | 50,0 | 200,0 | 44096 | 41329,97 | 44096 | 24787,43 | 176383,42 | ckp | 16666,67 | 26457,51 | 13228,76 | 43124,18 | gser min | 24787,43 | 247 | 50 | 250 | 240 | ø 10 - 100 |
| B4 | 22 | 250 | 250 | 50,0 | 200,0 | 44096 | 29668,99 | 44096 | 5352,46 | 176383,42 | ckp | 16666,67 | 26457,51 | 13228,76 | 43124,18 | gser min | 16666,67 | 1.144 | 50 | 250 | 240 | ø 10 - 100 |

Tabel Perhitungan Tulangan Sengkang Balok Lantai 6
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f'_c = 28 \text{ Mpa}$
 $f_y = 390 \text{ Mpa}$
 $\phi = 0,6$

| Tipe balok | D tul (mm) | b (mm) | h (mm) | d' = ds (mm) | d (mm) | jns Vu | Vu (N) | Vc (N) | Vs (N) | Vs maks (N) | Cek ppip. min | Vs min | φVc | 0.5φVc | φVc + φVs min | Cek | Vs pakai | s (mm) | S maks | | | Tulangan sengkang pasang |
|------------|------------|--------|--------|--------------|--------|--------|----------|--------|----------|-------------|---------------|----------|----------|----------|---------------|-----------|----------|--------|----------|-------------|--------------|--------------------------|
| | | | | | | | | | | | | | | | | | | | d/4 (mm) | 10Dtul (mm) | 24Ægser (mm) | |
| | 22 | 250 | 350 | 50,0 | 300,0 | lap | 70809,50 | 66144 | 51872,05 | 264575,13 | ckp | 25000,00 | 39586,27 | 19843,13 | 64686,27 | prlu gser | 51872,05 | 177 | 75 | 220 | 240 | Ø 10 - 110 |
| RB | 22 | 250 | 350 | 50,0 | 300,0 | tump | 58076,09 | 66144 | 30649,70 | 264575,13 | ckp | 25000,00 | 39586,27 | 19843,13 | 64686,27 | gser mth | 30649,70 | 300 | 75 | 220 | 240 | Ø 10 - 110 |
| | 22 | 250 | 250 | 50,0 | 200,0 | lap | 46666,09 | 44096 | 33680,96 | 176383,42 | ckp | 16666,67 | 26457,51 | 13228,76 | 43124,18 | prlu gser | 33680,96 | 182 | 50 | 220 | 240 | Ø 10 - 100 |
| B4 | 22 | 250 | 250 | 50,0 | 200,0 | tump | 35837,81 | 44096 | 15633,83 | 176383,42 | ckp | 16666,67 | 26457,51 | 13228,76 | 43124,18 | gser min | 16666,67 | 392 | 50 | 220 | 240 | Ø 10 - 100 |

Tabel Perhitungan Tulangan Sengkang Torsi Balok Lantai 2
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ MPa}$
 $f_y = 240 \text{ MPa}$ (Tul. Sengkang Torsi)
 $f_y = 390 \text{ MPa}$ (Tul. Pokok &
 $\phi = 0,6$

| Tipe balok | E sengkang | b (mm) | h (mm) | b1 (mm) | h1 (mm) | Tu (N mm) | Tc (N mm) | fTc (N mm) | Cek (N mm) | ØTs (N mm) | ATc (N mm) | Cek dimensi balok | at torsi | At torsi | Pasang Tul. Torsi (tiap sisi) | E Seng. torsi | At sengkang (mm) | S (mm) | Smak (mm) | Cek S minimum | | ØTs pakai (N mm) | Ts (N mm) | Tn (N mm) | Cek | Tulangan Sengkang Torsi | |
|------------|------------|--------|--------|---------|---------|-----------|-----------|------------|------------|------------|------------|-------------------|----------|----------|-------------------------------|---------------|------------------|--------|-----------|---------------|--------------|------------------|-----------|-----------|-----------|-------------------------|-----------|
| | | | | | | | | | | | | | | | | | | | | ZAt | b.s/3fy (mm) | | | | | | |
| B1 | 10 | 250 | 500 | 140 | 390 | 2.232E+07 | 1.102E+07 | 1.128E+07 | prlu | 1.102E+07 | 4.410E+07 | OK | 0,79 | 1890,1 | 1 | Æ 19 | 78,5 | 44,0 | 187,5 | 157 | 15,3 | 50 | 9.706E+06 | 1.618E+07 | 2.720E+07 | OK | Æ 10 - 50 |
| B2 | 10 | 200 | 400 | 90 | 290 | 9.781E+06 | 5.644E+06 | 3.387E+06 | prlu | 6.394E+06 | 2.258E+07 | OK | 0,77 | 1678,9 | 1 | Æ 19 | 78,5 | 35,5 | 150,0 | 157 | 9,9 | 50 | 4.544E+06 | 7.574E+06 | 1.322E+07 | OK | Æ 10 - 50 |
| B3 | 10 | 150 | 200 | 40 | 90 | 3.381E+06 | 1.587E+06 | 9.525E+05 | prlu | 2.429E+06 | 6.350E+06 | OK | 0,81 | 1494,8 | 1 | Æ 19 | 78,5 | 13,7 | 87,5 | 157 | 2,8 | 30 | 1.103E+06 | 1.842E+06 | 3.430E+06 | OK | Æ 10 - 30 |
| BT | 10 | 200 | 200 | 90 | 90 | 4.349E+06 | 2.822E+06 | 1.693E+06 | prlu | 2.656E+06 | 1.129E+07 | OK | 1,00 | 819,7 | 1 | Æ 19 | 78,5 | 34,5 | 100,0 | 157 | 9,6 | 50 | 1.831E+06 | 3.052E+06 | 5.874E+06 | OK | Æ 10 - 50 |

Tabel Perhitungan Tulangan Sengkang Torsi Balok Lantai 3
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ MPa}$
 $f_y = 240 \text{ MPa}$ (Tul. Sengkang Torsi)
 $f_y = 390 \text{ MPa}$ (Tul. Pokok &
 $\phi = 0,6$

| Tipe balok | PERHITUNGAN SENGGANG TORSI | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|----------------------------|--------|--------|---------|---------|-----------|-----------|------------|------------|------------|------------|-------------------|------|----------|-------------------------------|---------------|------------------|--------|-----------|-------------------|---------|--------------|------------|-----------|-----------|-----------------------------|
| | Æ sengkang (mm) | b (mm) | h (mm) | b1 (mm) | h1 (mm) | Tu (N mm) | Tc (N mm) | fTc (N mm) | Cek (N mm) | ØTc (N mm) | ATc (N mm) | Cek dimensi balok | a t | At torsi | Pasang Tul. Torsi (tiap sisi) | Æ Seng. torsi | At sengkang (mm) | s (mm) | Smax (mm) | Cek S minimum 2At | b.s/βfy | S pakai (mm) | ØTc (N mm) | Ts (N mm) | Tn (N mm) | Cek Tulangan Sengkang Torsi |
| B1 | 10 | 250 | 500 | 140 | 390 | 2.203E+07 | 1.102E+07 | 1.100E+07 | prlu | 1.102E+07 | 4.410E+07 | OK | 0,79 | 1890,1 | 1 Æ 19 | 10 | 78,5 | 44,0 | 187,5 | 157 | 15,3 | 50 | 9,706E+06 | 1,618E+07 | 2,720E+07 | OK Æ 10 - 50 |
| B2 | 10 | 200 | 400 | 90 | 290 | 1.239E+07 | 5,640E+06 | 3,387E+06 | prlu | 9,000E+06 | 2,258E+07 | OK | 0,77 | 2363,2 | 1 Æ 19 | 10 | 78,5 | 25,2 | 150,0 | 157 | 7,0 | 50 | 4,544E+06 | 7,574E+06 | 1,322E+07 | OK Æ 10 - 50 |
| B3 | 10 | 150 | 200 | 40 | 90 | 2,583E+06 | 1,587E+06 | 9,525E+05 | prlu | 1,630E+06 | 6,350E+06 | OK | 0,81 | 1003,5 | 1 Æ 19 | 10 | 78,5 | 20,3 | 87,5 | 157 | 4,2 | 30 | 1,105E+06 | 1,842E+06 | 3,430E+06 | OK Æ 10 - 30 |
| B4 | 10 | 200 | 200 | 90 | 90 | 4,310E+06 | 2,822E+06 | 1,693E+06 | prlu | 2,617E+06 | 1,129E+07 | OK | 1,00 | 807,7 | 1 Æ 19 | 10 | 78,5 | 35,0 | 100,0 | 157 | 9,7 | 50 | 1,831E+06 | 3,052E+06 | 5,874E+06 | OK Æ 10 - 50 |

Tabel Perhitungan Tulangan Sengkang Balok Lantai 4
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ MPa}$
 $f_y = 240 \text{ MPa}$ (Tul.Sengkang Torsi)
 $f_y = 390 \text{ MPa}$ (Tul.Pokok &
 $\phi = 0,6$

| PERHITUNGAN SENGKANG TORSI | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|---------------|--------|--------|---------|-----------|-----------|------------|------------|------------|------------|-------------------|----------|----------|-------------------------------|---------------|------------------|--------|-----------|---------------|---------|--------------|------------|-----------|-----------|-----------|-------------------------|------|
| Tipe balok | Tipe sengkang | b (mm) | h (mm) | h1 (mm) | Tu (N mm) | Tc (N mm) | fTc (N mm) | Cek (N mm) | OTs (N mm) | 4Tc (N mm) | Cek dimensi balok | At torsi | At torsi | Pasang Tul. Torsi (tiap sisi) | € Seng. torsi | At sengkang (mm) | S (mm) | Smax (mm) | Cek S minimum | | S pakai (mm) | OTs (N mm) | Ts (N mm) | Th (N mm) | Cek | Tulangan Sengkang Torsi | |
| | | | | | | | | | | | | | | | | | | | 2At | b.s/3fy | | | | | | | |
| B1 | 10 | 250 | 500 | 390 | 2.592E+07 | 1.102E+07 | 1.490E+07 | prlu | 1.102E+07 | 4.410E+07 | OK | 0,79 | 1890,1 | 1 | € 19 | 10 | 78,5 | 44,0 | 187,5 | 15,3 | 15,3 | 50 | 9,706E+06 | 1,618E+07 | 2,720E+07 | OK | € 10 |
| B2 | 10 | 200 | 400 | 290 | 1.230E+07 | 5.644E+06 | 3.387E+06 | prlu | 8.917E+06 | 2.258E+07 | OK | 0,77 | 2341,4 | 1 | € 19 | 10 | 78,5 | 25,5 | 150,0 | 7,1 | 7,1 | 50 | 4,544E+06 | 7,574E+06 | 1,322E+07 | OK | € 10 |
| B3 | 10 | 150 | 200 | 40 | 1.777E+06 | 1.587E+06 | 9.525E+05 | prlu | 8.246E+05 | 6.350E+06 | OK | 0,81 | 507,6 | 1 | € 19 | 10 | 78,5 | 40,2 | 87,5 | 8,4 | 8,4 | 30 | 1,105E+06 | 1,842E+06 | 3,430E+06 | OK | € 10 |
| B4 | 10 | 200 | 200 | 90 | 4.560E+06 | 2.822E+06 | 1.693E+06 | prlu | 2.867E+06 | 1.129E+07 | OK | 1,00 | 884,7 | 1 | € 19 | 10 | 78,5 | 31,9 | 100,0 | 8,9 | 8,9 | 50 | 1,831E+06 | 3,052E+06 | 5,874E+06 | OK | € 10 |

Tabel Perhitungan Tulangan Sengkang Torsi Balok Lantai 5
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ MPa}$
 $f_y = 240 \text{ MPa}$ (Tul. Sengkang Torsi)
 $f_y = 390 \text{ MPa}$ (Tul. Pokok & T)
 $\phi = 0,6$

| Tipe balok | Æ sengkang | b (mm) | h (mm) | b1 (mm) | h1 (mm) | Tu (N mm) | Tc (N mm) | fTc (N mm) | Cek (N mm) | ØTs (N mm) | 4Tc (N mm) | Cek dimensi balok | At torsi | At torsi | Pasang Tul. Torsi (tiap sisi) | Æ Seng. torsi | At sengkang (mm) | S (mm) | Smax (mm) | Cek S minimum | | S pakai (mm) | ØTs (N mm) | Ts (N mm) | Th (N mm) | Cek | Tulangan Sengkang Torsi | |
|------------|------------|--------|--------|---------|---------|-----------|-----------|------------|------------|------------|------------|-------------------|----------|----------|-------------------------------|---------------|------------------|--------|-----------|---------------|---------|--------------|------------|-----------|-----------|-----------|-------------------------|-----------|
| | | | | | | | | | | | | | | | | | | | | ZAt | b.s/3fy | | | | | | | |
| B1 | 10 | 250 | 500 | 140 | 390 | 2.302E+07 | 1.102E+07 | 1.200E+07 | prlu | 1.102E+07 | 4.410E+07 | OK | 0,79 | 1890,1 | 1 | Æ 19 | 10 | 78,5 | 44,0 | 187,5 | 15,3 | 15,3 | 50 | 9.706E+06 | 1.618E+07 | 2.720E+07 | OK | Æ 10 - 50 |
| B2 | 10 | 200 | 400 | 90 | 290 | 1.113E+07 | 5.644E+06 | 3.387E+06 | prlu | 7.747E+06 | 2.258E+07 | OK | 0,77 | 2034,2 | 1 | Æ 19 | 10 | 78,5 | 29,3 | 150,0 | 8,1 | 8,1 | 50 | 4.544E+06 | 7.574E+06 | 1.322E+07 | OK | Æ 10 - 50 |
| B3 | 10 | 150 | 200 | 40 | 90 | 4.277E+06 | 1.587E+06 | 9.525E+05 | prlu | 3.324E+06 | 6.350E+06 | OK | 0,81 | 2046,3 | 1 | Æ 19 | 10 | 78,5 | 10,0 | 87,5 | 2,1 | 2,1 | 30 | 1.105E+06 | 1.842E+06 | 3.430E+06 | OK | Æ 10 - 30 |
| B4 | 10 | 200 | 200 | 90 | 90 | 2.732E+06 | 2.822E+06 | 1.693E+06 | prlu | 1.038E+06 | 1.129E+07 | OK | 1,00 | 320,5 | 1 | Æ 19 | 10 | 78,5 | 88,2 | 100,0 | 15,7 | 24,5 | 50 | 1.831E+06 | 3.052E+06 | 5.874E+06 | OK | Æ 10 - 50 |
| B4 | 10 | 250 | 250 | 140 | 140 | 1.149E+07 | 5.512E+06 | 3.307E+06 | prlu | 8.184E+06 | 2.205E+07 | OK | 1,00 | 1623,8 | 1 | Æ 19 | 10 | 78,5 | 27,1 | 125,0 | 9,4 | 9,4 | 50 | 4.431E+06 | 7.385E+06 | 1.290E+07 | OK | Æ 10 - 50 |

Tabel Perhitungan Tulangan Sengkang Torsi Balok Lantai 6
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

$f_c = 28 \text{ MPa}$
 $f_y = 240 \text{ MPa}$ (Tul.Sengkang Torsi)
 $f_y = 390 \text{ MPa}$ (Tul.Pokok & T)
 $\phi = 0,6$

| PERHITUNGAN SENGKANG TORSI | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|--------|--------|---------|---------|-----------|-----------|------------|-----------------------|-------------------|------------|-------------------|----------------------|-------------------------------|-------------------|------|-----------|---------------|---------|--------------|-------------------|-----------------------|-----------------------|-----------------------------|
| Tipe balok | b (mm) | h (mm) | b1 (mm) | h1 (mm) | Tu (N mm) | Tc (N mm) | fTc (N mm) | Cek ϕT_s (N mm) | ϕT_s (N mm) | 4Tc (N mm) | Cek dimensi balok | At torsi (tiap sisi) | Pasang Tul. Torsi (tiap sisi) | At sengkang torsi | s | Smax (mm) | Cek S minimum | | S pakai (mm) | ϕT_s (N mm) | T _s (N mm) | T _n (N mm) | Cek Tulangan Sengkang Torsi |
| | | | | | | | | | | | | | | | | | ZAt | b.s/3fy | | | | | |
| RB | 250 | 350 | 140 | 240 | 1.769E+07 | 7.717E+06 | 9.969E+06 | 7.717E+06 | 7.717E+06 | 3.087E+07 | OK | 1.407,6 | 1 | 19 | 78,5 | 42,4 | 150,0 | 157 | 14,7 | 6.541E+06 | 1.090E+07 | 1.862E+07 | OK |
| BA | 250 | 250 | 140 | 140 | 7.002E+06 | 5.512E+06 | 3.307E+06 | 3.695E+06 | 2.205E+07 | OK | 1,00 | 733,1 | 1 | 19 | 78,5 | 125,0 | 157 | 20,8 | 4.431E+06 | 7.385E+06 | 1.290E+07 | OK | |

REKAP TIPE PONDASI
PERENCANAAN STRUKTUR GEDUNG REKTORAT POLITEKNIK KESEHATAN SEMARANG

| Poer | P _u (kg) | Tipe pondasi | D (m) | h (m) |
|------|------------------------|--------------|----------|----------|
| 1 | 6517,46 | P1 | 1,30 | 3,00 |
| 2 | 9437,33 | P1 | 1,30 | 3,00 |
| 3 | 9221,22 | P1 | 1,30 | 3,00 |
| 4 | 4473,1 | P1 | 1,30 | 3,00 |
| 5 | 60610,38 | P2 | 1,30 | 3,00 |
| 6 | 58642,95 | P2 | 1,30 | 3,00 |
| 7 | 58588,01 | P2 | 1,30 | 3,00 |
| 8 | 60637,38 | P2 | 1,30 | 3,00 |
| 9 | 57482,98 | P2 | 1,30 | 3,00 |
| 10 | 74987,78 | P2 | 1,30 | 3,00 |
| 11 | 144715,86 | P4 | 1,80 | 3,00 |
| 12 | 138475,28 | P4 | 1,80 | 3,00 |
| 13 | 146315,98 | P4 | 1,80 | 3,00 |
| 14 | 137364,52 | P4 | 1,80 | 3,00 |
| 15 | 162948,66 | P4 | 1,80 | 3,00 |
| 16 | 145780,91 | P4 | 1,80 | 3,00 |
| 17 | 63302,88 | P3 | 1,40 | 3,00 |
| 18 | 62062 | P3 | 1,40 | 3,00 |
| 19 | 92718,9 | P3 | 1,40 | 3,00 |
| 20 | 155894,15 | P4 | 1,80 | 3,00 |
| 21 | 142229,92 | P4 | 1,80 | 3,00 |
| 22 | 151542,15 | P4 | 1,80 | 3,00 |
| 23 | 151535,9 | P4 | 1,80 | 3,00 |
| 24 | 152106,19 | P4 | 1,80 | 3,00 |
| 25 | 151514,34 | P4 | 1,80 | 3,00 |
| 26 | 91840,49 | P3 | 1,40 | 3,00 |
| 27 | 92690,41 | P3 | 1,40 | 3,00 |
| 28 | 156200,93 | P4 | 1,80 | 3,00 |
| 29 | 144671,52 | P4 | 1,80 | 3,00 |

| Poer | P _u (kg) | Tipe pondasi | D (m) | h (m) |
|------|------------------------|--------------|----------|----------|
| 30 | 149878,72 | P4 | 1,80 | 3,00 |
| 31 | 149821,58 | P4 | 1,80 | 3,00 |
| 32 | 143706,21 | P4 | 1,80 | 3,00 |
| 33 | 151040,51 | P4 | 1,80 | 3,00 |
| 34 | 91815,56 | P3 | 1,40 | 3,00 |
| 35 | 62410,26 | P3 | 1,40 | 3,00 |
| 36 | 64409,37 | P3 | 1,40 | 3,00 |
| 37 | 145550,36 | P4 | 1,80 | 3,00 |
| 38 | 143250 | P4 | 1,80 | 3,00 |
| 39 | 135319,92 | P4 | 1,80 | 3,00 |
| 40 | 135438,27 | P4 | 1,80 | 3,00 |
| 41 | 143389,62 | P4 | 1,80 | 3,00 |
| 42 | 145774,07 | P4 | 1,80 | 3,00 |
| 43 | 67793,27 | P2 | 1,30 | 3,00 |
| 44 | 58231,51 | P2 | 1,30 | 3,00 |
| 45 | 60720,13 | P2 | 1,30 | 3,00 |
| 46 | 58976,15 | P2 | 1,30 | 3,00 |
| 47 | 58986,43 | P2 | 1,30 | 3,00 |
| 48 | 60697,69 | P2 | 1,30 | 3,00 |
| 49 | 5116,84 | P1 | 1,30 | 3,00 |
| 50 | 8877,48 | P1 | 1,30 | 3,00 |
| 51 | 8885,38 | P1 | 1,30 | 3,00 |
| 52 | 5942,44 | P1 | 1,30 | 3,00 |
| 53 | 24484,85 | P2 | 1,30 | 3,00 |
| 54 | 56537,43 | P2 | 1,30 | 3,00 |
| 55 | 57480,65 | P2 | 1,30 | 3,00 |
| 56 | 56747,55 | P2 | 1,30 | 3,00 |
| 57 | 59413,93 | P2 | 1,30 | 3,00 |