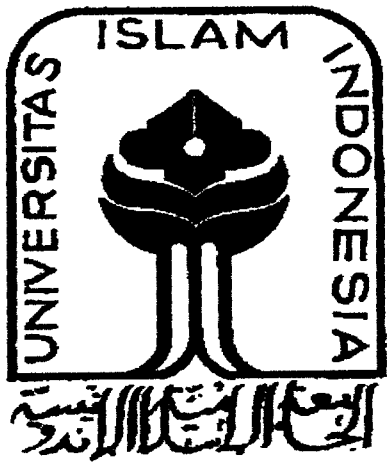


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TUGAS AKHIR

**PERENCANAAN DAN RANCANGAN STADION
DENGAN ATAP LENGKUNG**



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**JURUSAN TEKNIK SIPIL
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
UNIVERSITAS ISLAM INDONESIA
YOGYAKARTA
2005**

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PERENCANAAN DAN RANCANGAN STADION
DENGAN ATAP LENGKUNG

Diajukan kepada Universitas Islam Indonesia
Untuk memenuhi sebagian persyaratan memperoleh
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HALAMAN MOTTO

*“Sesungguhnya shalatku, ibadahku, hidup dan matiku
Hanyalah untuk Allah, penguasa semesta alam tiada sekutu bagi-Nya,
Dan demikian itulah yang diperintahkan kepadaku dan aku adalah orang yang
pertama-tama menyerahkan diri kepada Allah”*

(QS Al An'am : 162-163)

*Landasan iman adalah jiwa yang suci, landasan keikhlasan adalah hati yang jernih
Landasan tekad ialah semangat yang kuat membara, landasan usaha ialah kemauan
yang keras dan landasan pengorbanan ialah akidali yang kokoh.*

(Abdullah Nashih 'Ulwan)

Allah akan mengangkat orang-orang yang beriman diantar kalian

Dan orang-orang yang diberi ilmu

Beberapa derajat lebih tinggi

(Al Mujadillati : 11)

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Dengan segenap hatiku kupersembahkan Tugas Akhir Kepada :

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2. Analisis Portal

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1. Kuda-kuda
2. Pelat
3. Balok
4. Kolom

LAMPIRAN 3 Gambar

DAFTAR NOTASI

1. Perencanaan atap

- a : Jumlah sagrod dalam satu bentang
- A : Luas profil baja
- Ag : Luasan bruto Profil
- Anetto : Luasan bersih profil
- Aeffektif : Luasan netto efektif
- B : Lebar pelat kuda-kuda
- Bf : Lebar sayap
- b : Lebar sayap
- C₁ : Gaya angin tekan
- C₂ : Gaya angin hisap
- Cc : Perbandingan kelangsingan yang menjadi batas antar tekuk elastis dan tekuk melastic
- D : Diameter
- E : Modulus elastisitas baja
- Fa : Tegangan ijin pada luas bruto dalam kondisi beban bekerja
- fa : Tegangan tarik yang terjadi
- fbx : Tegangan lentur arah x
- fby : Tegangan lentur arah y
- fc' : Kuat tekan beton

FS	: Faktor keamanan
Fu	: Kuat tarik baja
fy	: Tegangan leleh baja
Ix	: Inersia arah X
Iy	: Inersia arah Y
K	: Koefisien kelangsingan
I	: Panjang yang ditinjau
L	: Panjang pelat kuda-kuda
Lb	: Jarak antar gording
ML	: Momen tagak lurus sumbu batang
M//	: Momen sejajar sumbu batang
N	: Jumlah baut
p	: Gaya tekan yang bekerja
p//	: Gaya tekan sejajar sumbu batang
q _⊥	: Beban merata tegak lurus sumbu batang
q//	: Beban merata sejajar sumbu batang
r	: Jari-jari inersia = I
Ss	: Jarak beban sagrod
Sx	: Modulus elastis tampang arah sumbu x
Sy	: Modulus elastis tampang arah sumbu y
T	: Gaya tarik yang bekerja
tw	: Tebal badan profil
tp	: Tebal pelat

W	: Berat profil
A	: Sudut kemiringan atap
δ_{\perp}	: Lendutan tegak lurus sumbu batang
$\delta_{//}$: Lendutan sejajar sumbu batang
δ	: Resultante lendutan
μ	: Faktor reduksi luas netto

2. Perencanaan pelat lantai

A_s	: Luas tulangan
a	: Tinggi blok tegangan persegi ekuivalen
b	: Panjang memanjang pelat
c_{lx}	: Koefisien momen lapangan arah x
c_{tx}	: Koefisien momen tumpuan arah x
c_{ly}	: Koefisien momen lapangan arah y
c_{ty}	: Koefisien momen tumpuan arah y
d	: Tinggi efektif pelat
f_c'	: Kuat desak beton
f_y	: Kuat tarik baja
h	: Tinggi pelat
l_y	: Panjang pelat arah panjang
l_x	: Panjang pelat arah pendek
m	: Perbandingan isi dari tulangan memanjang dari bentuk tertutup
M_{ux}	: Momen rencana arah lapangan x

M_{utx}	: Momen rencana arah tumpuan x
M_{uly}	: Momen rencana arah lapangan y
M_{uty}	: Momen rencana arah tumpuan y
M_u	: Momen rencana
M_n	: Momen nominal
q_D	: Beban mati merata
q_L	: Beban hidup merata
q_U	: Beban merata rencana
R_n	: Koefisien tahanan untuk perencanaan kuat
ρ	: Rasio tulangan
ρ_b	: Rasio tulangan pada keadaan seimbang
ϕ	: Koefisien reduksi kekuatan

3. Perencanaan balok

A_s	: Luas tulangan tarik
A_s'	: Luas tulangan desak
b	: Lebar balok
d	: Tinggi efektif tulangan tarik
d'	: Tinggi efektif tulangan tekan
E	: Modulus elastis beton
f_c'	: Kuat tekan beton
f_y	: Kuat tarik baja
h	: Tinggi balok

I	: Momen inersia balok
L	: Panjang penampang
m	: Perbandingan isi dari tulangan memanjang dari bentuk tertutup
M_n	: Momen nominal balok
M_u	: Momen rencana balok
P_D	: Beban mati terpusat
P_L	: Beban hidup terpusat
P_u	: Beban ultimit terpusat
R_n	: Koefisien tahanan untuk perencanaan kuat
V_u	: Gaya geser rencana
V_c	: Kuat geser beton
V_s	: Tegangan geser nominal yang disebabkan oleh tulangan
β_1	: Konstanta yang berdasarkan mutu beton
ρ	: Rasio tulangan tarik
ρ'	: Rasio tulangan tekan
ϕ	: Faktor reduksi kekuatan

4. Perencanaan kolom

a	: Tinggi blok tegangan persegi ekuivalen
A_s	: Luas tulangan tarik
A_s'	: Luas tulangan desak
A_{st}	: Luas tulangan total
A_g	: Luas bruto penampang

- b : lebar penampang kolom
- C_c : Gaya tekan pada beton
- C_s : Gaya pada tulangan tekan
- C_m : Faktor untuk perbesaran momen
- d : Jarak dari sisi tekan terluar ke pusat tulangan tarik
- d' : Jarak dari sisi tekan terluar ke pusat tulangan tekan
- e : Eksentrisitas actual
- eb : Eksentrisitas pada keadaan seimbang
- E_c : Modulus elastisitas beton
- E_g : Modulus elastisitas balok
- E_s : Modulus elastisitas baja tulangan
- F_c' : Kuat desak beton
- f_s : Tegangan tulangan tarik
- f_s' : Tegangan tulangan tekan
- f_y : Tegangan leleh baja yang disyaratkan
- h : Tinggi penampang kolom
- h_n : Panjang bersih kolom
- I_c : Momen inersia kolom
- I_{cr} : Momen inersia balok
- I_g : Momen inersia dari penampang bruto balok
- k : Faktor panjang efektif
- L : Panjang balok
- L_n : Panjang bersih balok

m	: Perbandingan isi dari tulangan memanjang dari bentuk tertutup
M_{1b}	: Momen factor terbesar pada ujung komponen akibat beban tetap
M_{2b}	: Momen factor terbesar pada ujung komponen akibat beban sementara
M_D	: Momen akibat beban mati
M_g	: Momen akibat beban gempa
M_L	: Momen akibat beban hidup
M_n	: Momen nominal
M_{nx}	: Momen nominal yang bekerja pada sb x
M_{ny}	: Momen nominal yang bekerja di sb y
M_s	: Momen akibat beban sementara
M_u	: Momen rencana kolom
$M_{u,kx}$: Momen rencana kolom arah x
$M_{u,ky}$: Momen rencana kolom arah y
P_c	: Beban tekuk euler
P_D	: Gaya tekan akibat beban mati
P_g	: Gaya tekan akibat beban gempa
P_L	: Gaya tekan akibat beban hidup
P_n	: Gaya tekan nominal
$P_{u,k}$: Gaya tekan rencana kolom
r	: Jari-jari girasi penampang
T_s	: Gaya pada tulangan tarik
δ_b	: Faktor terbesar momen untuk rangka yang ditahan terhadap

goyangan kesamping

- δ_s : Faktor pembesaran momen untuk rangka yang tidak ditahan terhadap goyangan kesamping
- ρ : Rasio tulangan kolom
- β_1 : Faktor tinggi blok tekanan ekuivalen
- β_d : Nilai perbandingan momen beban mati terhadap momen total rencana yang besarnya kurang atau sama dengan satu
- Ψ : Faktor kekangan ujung
- ϕ : Faktor reduksi kekuatan
- ΣP_c : Penjumlahan beban tekuk euler pada kolom satu tingkat/lantai
- ΣP_u : Penjumlahan beban tekuk ultimit pada kolom satu tingkat/lantai

5. Perencanaan Gempa

- A_g : Luas bruto penampang
- A_{jh} : Luas tulangan efektif tulangan geser horizontal
- A_{jv} : Luas tulangan geser joint vertikal
- A_{sc} : Luas tulangan longitudinal tarik
- A_{sc}' : Luas tulangan longitudinal tekan
- b_j : Lebar efektif joint
- C : Koefisien gempa dasar
- C_{ki} : Gaya tekan tulangan arah kiri
- F_x : Beban horizontal tiap lantai pada arah x
- f_y : Tegangan leleh baja

- f_c' : Kuat tekan beton
 F_y : Beban horizontal tiap lantai pada arah y
 h_x : Tinggi gedung arah x
 h_k : Tinggi gedung arah y
 h'_k : Tinggi kolom netto
 h_c : Tinggi total penampang kolom dalam arah geser yang ditinjau
 h_w : Tinggi bangunan
 I : Faktor keutamaan struktur
 L_b : Panjang balok
 L_{ki} : Panjang balok bruto sebelah kiri kolom yang ditinjau
 L_{ki}' : Panjang balok netto sebelah kiri kolom yang ditinjau
 L_{ka} : Panjang balok bruto sebelah kanan balok yang ditinjau
 L_{ka}' : Panjang balok netto sebelah kanan balok yang ditinjau
 L_n : Bentang bersih balok
 L_w : Lebar bangunan
 $M_{D,b}$: Momen lentur balok portal akibat beban mati tak berfaktor
 $M_{D,k}$: Momen lentur portal akibat beban mati tak berfaktor
 $M_{E,b}$: Momen lentur balok portal akibat beban gempa tak berfaktor
 $M_{E,k}$: Momen lentur kolom portal akibat beban gempa tak berfaktor
 $M_{L,k}$: Momen lentur kolom portal akibat beban hidup tak berfaktor
 $M_{kap,b}$: Momen kapasitas balok
 $M_{nak,b}$: Kuat momen lentur nominal actual balok
 M_{kap} : Momen kapasitas di sendi plastis pada satu ujung atau bidang

muka kolom

- M_{kap} : Momen kapasitas untuk ujung lainnya
- $M_{u,b}$: Momen rencana balok
- $M_{u,k}$: Momen rencana kolom
- n : Jumlah lantai tingkat di atas kolom yang ditinjau
- $N_{E,k}$: Gaya akibat beban gempa pada pusat kolom
- $N_{g,k}$: Gaya aksial akibat beban gravitasi terfaktor pada pusat joint
- $N_{u,k}$: Gaya aksial rencana kolom
- P_{cs} : Gaya permanen gaya prategang yang terletak di sepertiga bagian
tengah tinggi kolom
- q : Beban terbagi merata
- R_v : Faktor reduksi berdasarkan banyak tingkat
- T : Gaya tarik yang terjadi
- V_b : Gaya gempa dasar
- V_{bx} : Gaya gempa dasar arah x
- V_{by} : Gaya gempa dasar arah y
- V_{ch} : Gaya geser strat beton diagonal yang melewati daerah tekan
ujung joint arah horizontal
- V_{cv} : Gaya geser beton diagonal yang melewati daerah tekan ujung
joint arah vertikal
- V_D : Gaya geser balok akibat beban mati
- $V_{D,k}$: Gaya geser kolom akibat beban mati
- V_E : Gaya geser balok akibat beban gempa

$V_{E,K}$: Gaya geser kolom akibat beban gempa
V_g	: Gaya geser balok akibat berat sendiri dan beban gravitasi
V_{jh}	: Gaya geser horizontal
V_L	: Gaya geser balok akibat beban gempa
$V_{L,K}$: Gaya geser kolom akibat beban gempa
V_{kol}	: Gaya geser kolom
V_{sh}	: Gaya geser pada daerah tarik joint dengan mekanisme panel rangka arah horizontal
V_{sv}	: Gaya geser pada daerah tarik joint dengan mekanisme panel rangka arah vertikal
$V_{u,b}$: Gaya geser rencana balok
$V_{u,k}$: Gaya geser rencana kolom
W_t	: Berat total keseluruhan gedung
W_y	: Berat tiap lantai pada arah y
W_x	: Berat tiap lantai pada arah x
Z_{ka}	: Lengan momen kanan
Z_{ki}	: Lengan momen kiri
ρ	: Rasio tulangan tarik
ρ'	: Rasio tulangan desak
ρ_b	: Rasio tulangan pada keadaan seimbang
ω_d	: Koefisien pembesaran dinamis
α_k	: Faktor distribusi momen dari kolom yang ditinjau

6. Perencanaan Pondasi

- a : Tinggi balok tekan
- bk : Lebar penampang kolom
- bo : Keliling penampang kritis pada pelat dan pondasi
- Bx : Panjang pondasi telapak
- By : Lebar pondasi telapak
- d : Jarak pusat tulangan tarik ke serat tekan beton terluar
- ex : Eksentrisitas gaya terhadap sumbu x
- ey : Eksentrisitas gaya terhadap sumbu y
- f'c : Kuat tekan beton
- fy : Tegangan luluh baja
- h : Tebal pondasi
- hk : Panjang penampang kolom
- Mx : Momen terhadap sumbu x
- My : Momen terhadap sumbu y
- Mu : Momen inersia
- Mn : Momen nominal
- M₁ : Jarak geser dari tepi pondasi terhadap sumbu x
- m : Perbandingan isi dari tulangan memanjang dari bentuk tertutup
- n₁ : Jarak geser dari tepi pondasi terhadap sumbu y
- P : Gaya tekan yang bekerja
- Pb : Selimut beton
- Pn : Gaya tekan nominal

- q_{terjadi} : Tegangan kontak yang terjadi di dasar pondasi
- R_n : Koefisien tahanan untuk perencanaan kuat
- V_c : Kuat beton menahan geser
- x : Panjang bidang geser kritis
- y : Lebar bidang geser kritis
- ρ : Rasio tulangan
- ρ_b : Rasio tulangan dalam keadaan seimbang
- β_1 : Rasio anatar sisi panjang terhadap sisi pendek pondasi
- β_c : Rasio sisi panjang terhadap sisi pendek dari beban terpusat

BAB I

PENDAHULUAN

1.1 Latar Belakang

Sepak bola merupakan cabang olah raga terpopuler diseluruh dunia. Orang memainkan sepak bola dimana saja dari mulai sawah kering, halaman samping, jalan hingga stadion modern dengan fasilitas yang lengkap. Tidak salah bila kejuaraan dunia sepak bola antar Negara empat tahunan yang biasa dikenal dengan *World Cup* disebut-sebut sebagai *The Greatest Show On Earth*.

Perkembangan sepak bola di Indonesia sendiri dapat dibilang cukup menggairahkan. Liga Indonesia yang di putar mulai tahun 1990 memberikan atmosfer yang positif bagi perkembangan olah raga sepak bola di Indonesia. Kompetisi Liga Indonesia diikuti oleh seluruh tim terbaik dari seluruh Indonesia. Salah satunya adalah di Propinsi Jawa Timur yang diwakili oleh salah satu timnya yaitu tim Persik Kediri.

Adapun geliat prestasi yang diperlihatkan oleh tim squad Persik Kediri dalam beberapa tahun terakhir membawa dampak positif. Prestasi tim Persik Kediri dalam kompetisi Liga Indonesia membangkitkan animo masyarakat untuk datang ke Stadion mendukung tim kesayangannya. Kemampuan manajerial tim Persik Kediri yang menarik penonton untuk datang ke stadion membuat pengurus dan pemerintah daerah memutuskan untuk membangun sebuah stadion baru dengan kapasitas yang lebih besar dan fasilitas yang lebih baik yang sama standarnya dengan standart Internasional.

1.2 Tujuan

Perencanaan ini bertujuan untuk mengaplikasikan ilmu keteknik sipil yang telah diperoleh, sehingga dapat dijadikan bekal dalam menghadapi dunia kerja di bidang konstruksi.

1.3 Batasan perencanaan

Batasan masalah dalam penyusunan tugas akhir ini agar terarah dan tidak terlalu meluas, adalah sebagai berikut:

1. Perencanaan meliputi:
 - a. Struktur arap rangka baja
 - b. Struktur pelat lantai
 - c. Struktur rangka beton bertulang
2. Kombinasi pembebanan untuk perencanaan portal diperhitungkan beban gravitasi (mati dan hidup) dengan beban gempa (wilayah 3), Daktilitas penuh dengan factor jenis struktur $K=1$ (beton bertulang), sedang perencanaan rangka atap dihitung beban gravitasi (mati dan hidup) dengan beban angin.
3. Perencanaan atap menggunakan mutu baja profil BJ 37 dengan tegangan leleh (f_y)= 240 Mpa.
4. Perencanaan struktur beton bertulang menggunakan mutu beton dengan kuat desak rencana (f'_c)= 20 Mpa, digunakan baja tulangan Polos (BJTP) untuk diameter ≤ 12 mm dengan tegangan leleh (f_y)= 240 Mpa sedangkan baja tulangan ulir (BJTD) untuk diameter >12 mm dengan tegangan leleh (f_y)= 400 Mpa.

5. Analisa mekanika struktur menggunakan Program SAP 2000 non linier
6. Analisis output menggunakan program aplikasi Microsoft Access dan Microsoft Excel.
7. Perencanaan konstruksi baja berdasarkan metode LRFD (Load Resistance Factor Design) dari AISC.
8. Rancangan Anggaran Biaya tidak diperhitungkan.

1.4 Metode perencanaan

Dalam perencanaan Stadium ini dibagi beberapa langkah yang dilaksanakan sesuai urutan pelaksanaan.

1. Mengumpulkan data
2. Mengumpulkan literature sebagai dasar perencanaan
3. Merencanakan spesifikasi struktur yang direncanakan.
4. menganalisis untuk merencanakan sebuah struktur bangunan gedung.

BAB II

TINJAUAN PUSTAKA

Struktur yang direncanakan dengan peraturan-peraturan pembebanan gempa dapat menahan gaya gempa lebih besar, karena struktur tersebut direncanakan dan didesain dengan baik agar dapat berdeformasi sampai keadaan inelastisnya tanpa menunjukkan keruntuhan (**Gideon HK. 1993**)

Untuk mengendalikan perilaku elastoplastis dalam struktur pada waktu menahan gaya gempa merupakan dasar untuk pencadangan energi yang dipakai dalam perencanaan struktur daktail, dimana perilaku struktur setelah melampaui batas elastis harus tetap terjamin dengan baik, sehingga keruntuhan getas dapat dihindari, dengan menempatkan sendi-sendi plastis pada balok (strong column weak beam) yang memungkinkan pemencaran energi berlangsung di banyak tempat dan memperkecil bahaya ketidakstabilan struktur (**Istimawan Dipohusodo, 1994**).

Ukuran daktilitas suatu struktur adalah factor daktilitas simpangan yang didefinisikan sebagai perbandingan antara defleksi lateral pada akhir batas setelah elastis dan defleksi lateral pada luluh pertama (**Park Paulay, 1975**).

Struktur dengan tingkat daktilitas terbatas mempunyai $d = 2$, dan factor jenis struktur $K_{min} = 2$, sedangkan struktur dengan daktilitas penuh mempunyai $\mu = 4$, dan factor jenis struktur $K_{min} = 1$ (**Bambang Budiono, 1989**)

Perencanaan struktur dengan daktilitas menggunakan metode kekuatan batas dan beban kerja terfaktor sehingga struktur direncanakan pada suatu batas akhir keruntuhan (**SK SNI T-15-1991-03**).

Komponen struktur beton direncanakan sedemikian rupa sehingga tidak terjadi retak yang berlebihan pada penampang sewaktu mendukung beban kerja, dan masih mempunyai cukup keamanan serta cadangan kekuatan untuk menahan beban dan tegangan lebih lanjut tanpa mengalami keruntuhan (**Istimawan Dipohusodo, 1994**).

BAB III

LANDASAN TEORI

3.1. Pendahuluan

Perencanaan Stadion sepakbola ini terdiri dari perencanaan atap berdasarkan Tata Cara Perencanaan Struktur Baja Untuk bangunan Gedung dengan Metode LRFD, dan Perencanaan struktur beton bertulang dengan Duktilitas penuh menurut Tata Cara Perhitungan Struktur Beton untuk bangunan Gedung SK SNI T-15-1991-03.

Stadion diinspirasi dari Stadion Saitama yang ada di Jepang, dengan bentuk atap lengkung. Struktur rangka atap direncanakan Untuk menghasilkan suatu struktur yang stabil, cukup kuat, mampu layan, awet, ekonomis dan mudah untuk dilaksanakan.

Perencanaan Struktur beton bertulang dengan konsep daktilitas menetapkan suatu taraf perencanaan terhadap beban gempa yang menjamin struktur agar tidak rusak karena gempa kecil atau sedang, tetapi saat dilanda gempa kuat yang jarang terjadi struktur tersebut mampu berperilaku daktil dengan memancarkan energi gempa dan sekaligus membatasi beban gempa yang masuk kedalam struktur.

3.2 Beban – beban Bekerja

Perencanaan suatu struktur untuk keadaan – keadaan stabil atas kekuatan batas, dan kemampuan layan batas harus memperhitungkan pengaruh-pengaruh

dari aksi-aksi sebagai pengaruh dari beban-beban berikut ini, menurut pedoman perencanaan pembebanan Untuk Rumah dan Gedung:

1. Beban Mati

Beban mati adalah berat dari semua bagian suatu gedung yang bersifat tetap, termasuk semua Tambahan, Penyelesaian mesin-mesin serta peralatan tetap yang merupakan bagian yang terpisahkan dari gedung tersebut.

2. Beban Hidup

Beban Hidup adalah semua beban yang terjadi akibat pemakaian dan penghunian suatu gedung, termasuk beban pada lantai yang berasal dari barang- barang yang dapat berpindah dan atau beban akibat air hujan pada atap.

3. Beban Gempa

Beban Gempa adalah besarnya getaran yang terjadi didalam struktur rangka bangunan akibat adanya gerakan tanah oleh gempa, dihitung berdasarkan suatu analisa dinamik .

4. Beban Angin

Beban Angin adalah semua beban yang bekerja pada gedung atau bagian gedung yang disebabkan oleh selisih dalam tekanan udara.

3.3 Dasar perencanaan Struktur rangka Baja

Dasar perencanaan struktur rangka baja meliputi peraturan-peraturan dan perencanaan struktur baja.

3.3.1 Peraturan-Peraturan

Peraturan-peraturan yang digunakan dalam perencanaan antara lain sebagai berikut :

1. tata cara Perencanaan Struktur Baja Untuk bangunan Gedung (LRFD 2000)
2. Pedoman Perencanaan Pembebanan Untuk Rumah dan Gedung 1987.

3.3.2 Analisis Struktur

Analisis struktur menggunakan program aplikasi computer SAP 2000 dengan input-input data koordinat-koordinat titik nodal sesuai bentuk dan ukuran struktur rangka atap, luas penampang profil, inersia profil, modulus elastisitas baja $E=200000$ MPa sebagai data-data elemen batang dan beban-beban. Data-data keluaran program berupa reaksi dukungan dan gaya-gaya batang untuk kepentingan perencanaan.

3.3.3 perencanaan Struktur Baja

Perencanaan struktur baja menurut Tata cara Perencanaan Struktur baja Untuk Bangunan Gedung (LRFD 2000), Meliputi Kombinasi Pembebanan, perencanaan akibat gaya tekan, perencanaan akibat gaya tarik dan perencanaan sambungan baut.

1. Kombinasi Pembebanan

Kombinasi pembebanan dalam perencanaan strukturbaja dengan metode LRFD adalah sebagai berikut:

$$1,4 D$$

$$1,2 D + 1,6 L + 0,5 (L_a \text{ atau } H)$$

$$1,2 D + 1,6 (L_a \text{ atau } H) + (\gamma_l L \text{ atau } 0,8 W)$$

$$1,2 D + 1,3 W + \gamma_l L + 0,5 (L_a \text{ atau } H)$$

$$1,2 D + 1,0 E + \gamma_l L$$

$$0,9 D - (1,3 W \text{ atau } 1,0 E)$$

Dengan : D adalah beban mati, L adalah beban hidup, L_a adalah beban hidup diatap selama perawatan atau penggunaan, H adalah beban hujan, W adalah beban Angin dan E adalah beban gempa, dengan $\gamma_l = 0,5$ bila $L < 5 \text{ kN/m}^2$ dan $\gamma_l = 1$ bila $L \geq 5 \text{ kN/m}^2$.

2. Perencanaan Akibat Gaya Tarik Aksial

a Kuat tarik Rencana

Komponen struktur yang memikul gaya tarik aksial terfaktor N_u , harus memenuhi:

$$N_u \leq \phi N_n \quad \dots\dots\dots (3.1)$$

dengan ϕN_n adalah kuat tarik rencana yang besarnya diambil sebagai nilai terendah diantara dua perhitungan menggunakan harga-harga ϕ dan N_n di bawah ini:

$$\phi = 0,9 \text{ untuk } N_n = A_g f_y \quad \dots\dots\dots (3.2)$$

$$\phi = 0,75 \text{ untuk } N_n = A_m \cdot f_u \quad \dots \dots \dots (3.3)$$

dengan N_n adalah kuat tarik nominal (N), N_u adalah kuat tarik perlu yang merupakan gaya aksial tarik akibat beban terfaktor (N). ϕ adalah factor reduksi kekuatan, A_g adalah luas penampang Bruto (mm^2), A_m adalah luas penampang netto (mm^2), f_y adalah tegangan leleh (MPa), f_u adalah tegangan tarik putus (MPa).

b. Syarat angka Perbandingan kelangsingan batang tarik

$$L/r < 240 \quad \dots \dots \dots (3.4)$$

dengan; L adalah panjang batang tarik (m), dan r adalah jari-jari girasi terkecil profil (mm)

3. Perencanaan Akibat gaya tekan aksial

Suatu komponen struktur yang mengalami gaya tekan konsentris akibat beban terfaktor, N_u harus memenuhi persyaratan sebagai berikut:

a. Syarat angka perbandingan kelangsingan batang tekan

$$L_k/r < 200 \quad \dots \dots \dots (3.5)$$

dengan; $L_k = K_c \cdot L$; K_c adalah factor panjang tekuk = 1, L adalah panjang batang tekan (m), r adalah jari-jari girasi terkecil profil (mm)

b. Syarat kuat tekan nominal terfaktor

$$\phi \cdot N_n \geq N_u \quad \dots \dots \dots (3.6)$$

Dengan; $\phi = 0,85$, N_n adalah kuat tekan nominal komponen struktur (N). N_u adalah kuat tekan perlu yang merupakan gaya aksial tekan akibat beban terfaktor (N).

c. Kuat tekan nominal dihitung sebagai berikut :

$$N_n = A_g \cdot f_{cr} = A_g \cdot (f_y \cdot \omega) \quad \dots\dots\dots (3.7)$$

Dengan ketentuan sebagai berikut:

Untuk $\lambda_c \leq 0,25$ maka, $\omega = 1$

Untuk $0,25 < \lambda_c < 1,2$, maka $\omega = 1,43 / (1,6 - 0,67 \lambda_c)$

Untuk $\lambda_c \geq 1,2$, maka $\omega = 1,25 \lambda_c^2$

Keterangan; A_g adalah luas penampang bruto (mm^2), f_{cr} adalah tegangan kritis penampang (MPa), f_y adalah tegangan leleh baja (MPa).

$$f_c = \frac{1}{\pi} \frac{L_k}{r} \sqrt{\frac{f_y}{E}} \quad \dots\dots\dots (3.8)$$

dengan; λ_c adalah parameter kelangsingan batang tekan, $L_k = k_c \cdot L$; k_c adalah faktor panjang tekuk = 1; L adalah panjang batang tekan (mm), r adalah jari-jari giorasi terkecil dari profil (mm), f_y adalah tegangan leleh baja (MPa), E adalah modulus elastisitas baja (MPa).

3.3.4. Perencanaan Sambungan

Untuk perancangan sambungan ini, disini direncanakan dengan menggunakan sambungan las.

a. Pembatasan Ukuran dan Panjang Las.

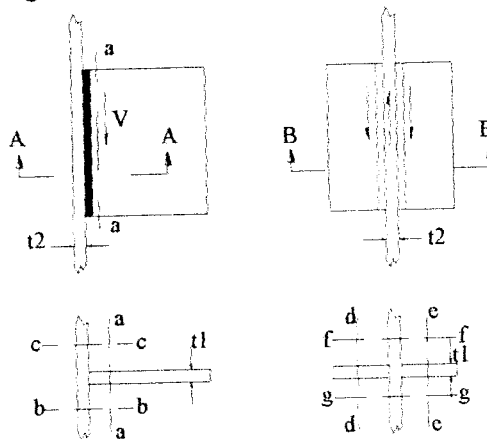
1. Ukuran Las Minimum

Untuk menjamin peleburan dan memperkecil distorsi, AWS (9) dan spesifikasi AISC menentukan ukuran las minimum berdasarkan tebal potongan (yang tertebal) yang akan disambung. Syarat untuk las sudut yang berdasarkan pada dimensi kakinya a dan untuk las tumpul penetrasi parsial yang berdasarkan pada tebal efektif (effective throat, lihat tabel).

2. Ukuran Las Sudut Maksimum Sepanjang Tepi

Pada AISC, ukuran maksimum yang diijinkan adalah :

1. Sepanjang tepi bahan yang tipis dari $\frac{1}{4}$ inci (6,4 mm), ukuran maksimum sama dengan tebal bahan tersebut.
2. Sepanjang tepi bahan yang tebalnya $\frac{1}{4}$ inci (6,4 mm) atau lebih, ukurannya maksimum harus $\frac{1}{26}$ inci (1,6 mm) lebih kecil dari tebal bahan tersebut harus dibuat (berdasarkan gambar kerja) untuk memperoleh tebal efektif penuh.



Gambar. Penampang kritis pada bahan dasar yang mengalami tegangan berlebihan

$$2a(0,707)(0,3F_u) = 0,40 F_y t_1 \dots\dots\dots(3.8.a)$$

$$a_{\text{maks ef}} = \frac{0,40 F_y t_1}{2(0,707)(0,3F_u)} = 0,943 \frac{F_y t_1}{F_u} \dots\dots\dots(3.8.b)$$

dengan : t_y = tebal bahan dasar

F_u = kekuatan tarik bahan elektroda (70 ksi untuk elektroda E70)

F_y = tegangan leleh bahan dasar

Penampang $b-b$ dan $c-c$ tidak kritis karena dua baris las menyalurkan beban melalui dua penampang ukiran las efektif maksimum untuk penyaluran gaya melalui $b-b$ dan $c-c$ ialah :

$$a(0,707)(0,3F_u) = 0,40 F_y t_2 \dots\dots\dots(3.8.c)$$

$$a_{\text{maks ef}} = 1,89 \frac{F_y t_2}{F_u} \dots\dots\dots(3.8.d)$$

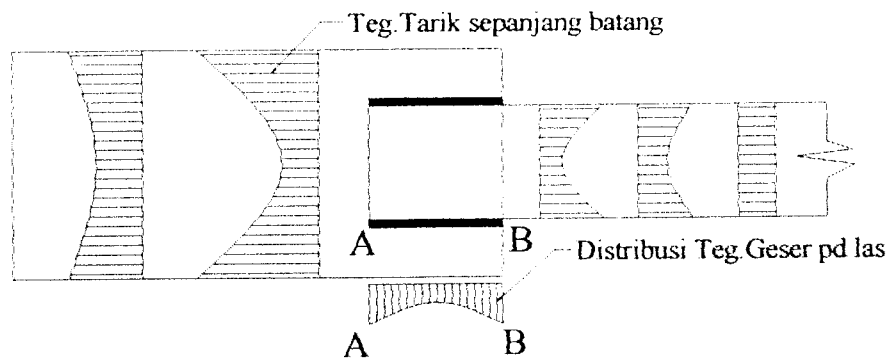
Dengan meninjau 4 las sudut pada gambar, penampang $d-d$ dan $e-e$ sama seperti penampang $a-a$ dan persamaan 3.8.b berlaku. Pada penampang $f-f$ dan $g-g$ beban disalurkan oleh empat las sudut melalui dua penampang :

$$4a(0,707)(0,3F_u) = 2(0,40F_y)t_2$$

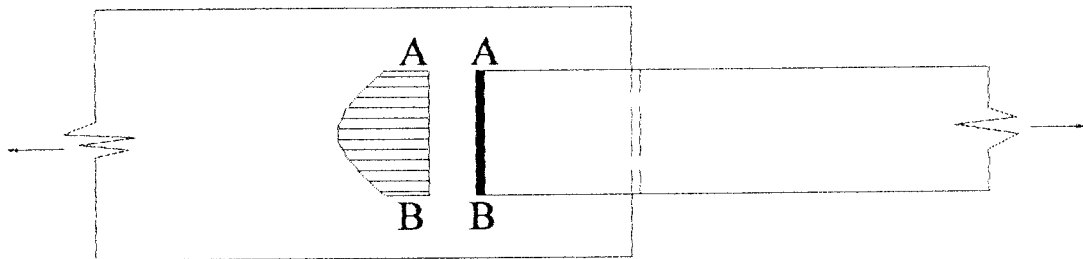
dan hasilnya sama dengan persamaan 3.8.b.

Pada las sudut yang menyambung batang tarik, penyaluran beban dengan las akan berupa penyaluran gaya geser (ke bahan dasar) bila las sudut sejajar dengan arah beban. Pada kasus seperti ini, konsep ukuran las sudut efektif maksimum tetap berlaku (dengan persamaan 3.8.d).

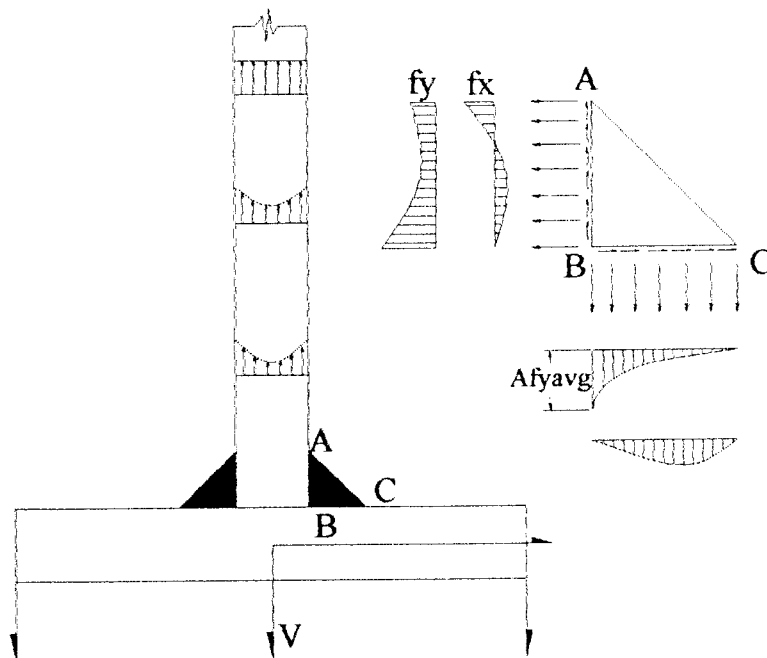
b. Distribusi Tegangan Pada Las Sudut



Gambar. Distribusi tegangan pada sambungan lewatan dengan las sudut longitudinal



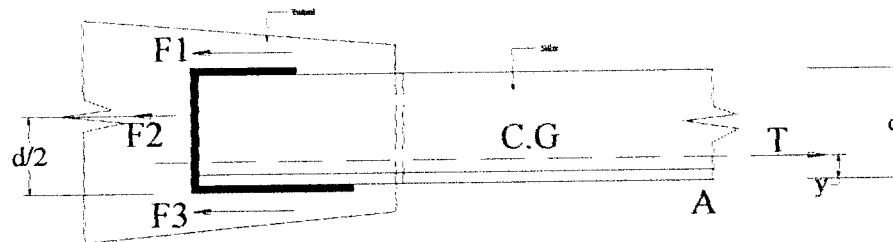
Gambar. Distribusi tegangan geser pada lewatan dengan las sudut transversal



Gambar. Distribusi tegangan geser pada sambungan tegak dengan las sudut transversal

c. Las Sudut

Dalam beberapa hal, batang yang mengalami tegangan aksial langsung bersifat tak simetris sehingga timbul eksentrisitas pada sambungan las, seperti yang terlihat pada gambar dibawah ini :



Gambar. Penyeimbang las pada sambungan tarik

$$\sum M_A = -F_1 d - F_2 d/2 + T y = 0 \dots \dots \dots (3.8.a.i)$$

$$F_1 = T y/d - F_2/2 \dots \dots \dots (3.8.b.i)$$

Gaya F_2 sama dengan gaya tahanan las per inchi kali panjang las

$$F_2 = R_w L_w \dots \dots \dots (3.8.c.i)$$

Keseimbangan gaya mendatar memberikan

$$\sum F_H = T - F_1 - F_2 - F_3 = 0 \dots \dots \dots (3.8.d.i)$$

Penyelesaian persamaan 3.8.a.i dan 3.8.d.i secara simultan menghasilkan

$$F_3 = T \left(1 - \frac{y}{d} \right) - \frac{F_2}{2} \dots \dots \dots (3.8.e.i)$$

Perencanaan sambungan pada gambar diatas yang menghilangkan eksentrisitas akibat las tak simetris disebut *penyeimbang las (balancing the welds)*. Prosedur untuk penyeimbang las dapat diringkas sebagai berikut :

1. Setelah menentukan ukuran las dan elektroda yang sesuai, hitunglah gaya yang ditahan oleh las ujung F_2 (jika ada) dengan persamaan 3.8.c.i.

2. Hitung F_1 dengan persamaan 3.8.b.i.
3. Hitung F_3 dengan persamaan 3.8.e.i atau

$$F_3 = T - F_1 - F_2 \dots\dots\dots(3.8.f.i)$$

4. Hitung panjang las L_{w1} dan L_{w3} dengan

$$L_{w1} = \frac{F_1}{R_w} \dots\dots\dots(3.8.g.i.a)$$

Dan

$$L_w = \frac{F_3}{R_w} \dots\dots\dots(3.8.g.i.b)$$

3.4 Dasar Perencanaan Struktur Beton Bertulang

Dasar perencanaan struktur beton bertulang meliputi, peraturan-peraturan, analisis struktur, perencanaan pelat, perencanaan struktur portal dengan daktilitas penuh, penulangan balok dan penulangan kolom.

3.4.1 peraturan-peraturan

peraturan-peraturan yang dipergunakan antara lain:

1. Tata Cara Perhitungan Struktur Beton Untuk Bangunan Gedung SK SNI T-15-1991-03
2. Petunjuk Perencanaan Beton Bertulang dan Struktur Dinding Bertulang Untuk Rumah dan Gedung 1987
3. Pedoman Perencanaan Pembebanan Untuk Rumah dan Gedung 1987
4. Pedoman Perencanaan Ketahanan Gempa Untuk Rumah dan Gedung 1987
5. Pedoman beton Indonesia 1971.

3.4.2 Pembebanan

Dalam perhitungan struktur bangunan bertingkat, pembebanan merupakan faktor yang sangat penting. Untuk menjamin kekuatan struktur dapat dipertanggung jawabkan, maka pembebanan harus direncanakan sesuai dengan ukuran dan fungsi gedung nantinya.

1. Beban Mati

Data pembebanan gedung menurut Peraturan Pembebanan Indonesia 1987 sebagai berikut ini.

Tabel 3.1 Beban Mati

No	Jenis Material	Beban
1	Beton Bertulang	24 kN/m ³
2	Tegel	24 kN/m ³
3	Spesi	21 kN/m ³
4	Tembok	2,5 kN/m ²

2 Beban hidup.

Beban hidup menurut PPURDG 1987, Untuk Gedung Olah Raga ditetapkan = 5 kN/m^2 dan beban hidup pekerja atap ditetapkan = 1 kN/m^2 .

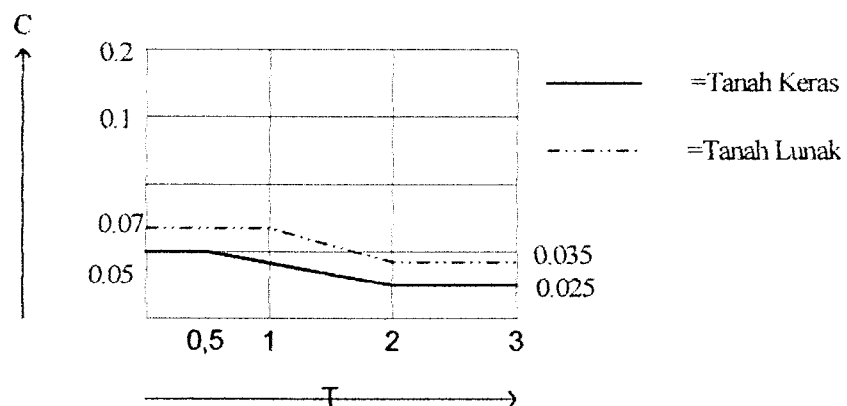
3 Beban Gempa

Pembebanan gempa khusus pada portal, ditentukan berdasarkan persyaratan dan analisis gaya-gaya dalam struktur dalam batas elastis dengan pembebanan gempa menurut PPKGURDG 1987.

$$V_b = C \cdot I \cdot K \cdot W_t \dots \dots \dots (3.9)$$

dengan : V_b adalah gaya geser dasar horizontal total akibat gempa, C adalah koefisien gaya gempa dasar, I adalah faktor keutamaan bangunan = 1,5 (bangunan), K adalah faktor jenis struktur, W_t adalah berat kombinasi beban mati dan beban hidup yang direduksi.

Koefisien Gempa dasar untuk wilayah 3 ditentukan dengan menggunakan waktu getar alami struktur seperti pada gambar berikut:

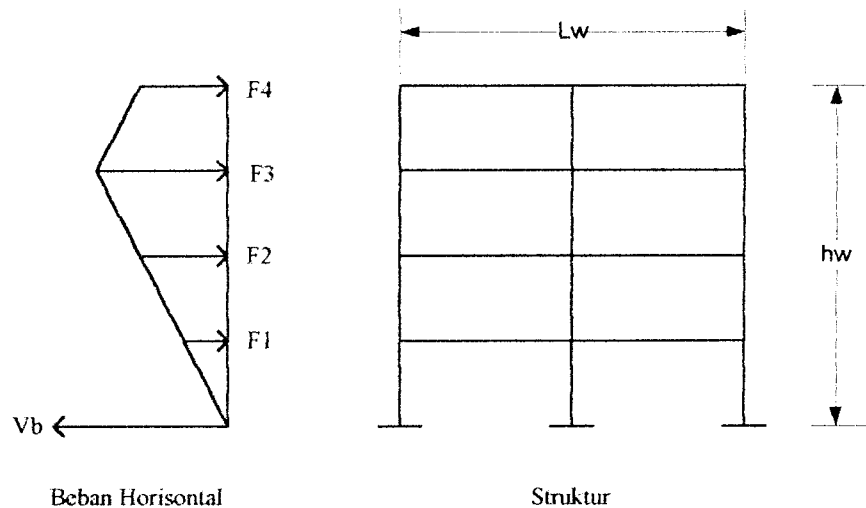


Gambar 3.1 Hubungan koefisien gempa dasar dengan waktu getar struktur (PPKGURDG 1987)

waktu getar alami T untuk portal beton ditentukan dengan persamaan

$$T = 0,06 \cdot H^{3/4} \dots\dots\dots (3.10)$$

dengan H = tinggi struktur



Gambar 3.2 Pembebanan Gempa (PPKGURDG 1987)

$$F_i = \frac{W_i \cdot h_i}{\sum W_i \cdot h_i} \cdot V_b \quad \text{Untuk } \frac{h_w}{l_w} < 3,0 \dots\dots\dots (3.11)$$

$$F_i = 0,9 \frac{W_i \cdot h_i}{\sum W_i \cdot h_i} \cdot V_b + (0,1 \cdot V_b \text{ dipuncak}) \quad \text{Untuk } \frac{h_w}{l_w} \geq 3,0 \dots\dots\dots (3.12)$$

dengan; F_i adalah beban horizontal, W_i adalah beban pada tiap lantai, dan h_i adalah tinggi struktur setiap tingkat dari penjepit lateral.

Distribusi ini mendekati ragam satu dengan suatu penyesuaian apabila ragam kedua atau ragam yang lebih besar mempengaruhi respon dinamis struktur dengan rasio tinggi dan lebar ≥ 3 .

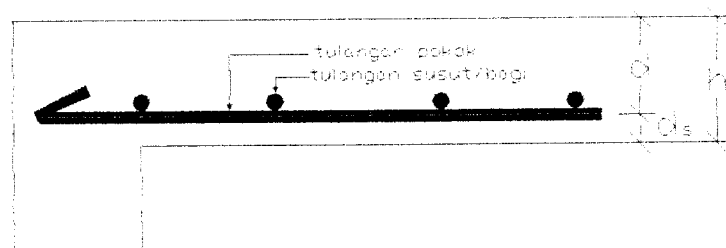
3.4.3 Analisis Struktur

Analisis struktur menggunakan program aplikasi komputer SAP 2000 dengan input-input data koordinat-koordinat titik nodal sesuai bentuk dan ukuran Portal, ukuran penampang balok dan kolom, modulus elastisitas beton $E=4700\sqrt{f_y}$ MPa, sebagai data-data elemen batang dan pembebanan titik dan merata. Data-data keluaran program berupa momen lentur, gaya geser, dan gaya aksial untuk kepentingan perencanaan balok dan kolom.

3.4.4 Perencanaan Pelat

1. Pelat Satu Arah

Pelat satu arah adalah pelat yang hanya ditumpu pada dua sisi yang saling berhadapan, ataupun pelat yang ditumpu pada keempat sisinya tetapi $L_y/L_x > 2$, sehingga hampir seluruh beban dilimpahkan pada sisi pendek. (Kadir Aboe, 2000)



Gambar 3.3 Penulangan Pelat Satu Arah

Analisis / perencanaan pelat satu arah dapat dilakukan sebagaimana balok persegi dengan tinggi balok adalah setebal pelat dan lebar satu satuan (umumnya 1 meter).

Beban merata pelat umumnya mempunyai satuan kN/m^2 , tetapi karena dalam perhitungan ditinjau dengan $b=1\text{m}$, maka satuan beban menjadi kN/m .

Tulangan Pokok pelat satu arah dipasang \perp dukungan. Menurut SK-SNI, untuk pelat satu arah harus dipasang juga tulangan susut/suhu/pembagi dengan arah \perp tulangan pokok.

Menurut SK-SNI, tebal penutup beton:

- Permukaan tidak terbuka / berhubungan langsung dengan cuaca luar dan tidak kontak langsung dengan tanah:

$$\text{Tulangan} \leq D36 \quad \rightarrow \quad p_b \geq 20 \text{ mm}$$

$$\text{Tulangan } D36 - D56 \quad \rightarrow \quad p_b \geq 40 \text{ mm}$$

- Permukaan terbuka atau berhubungan langsung dengan tanah:

$$\text{Tulangan } D19 - D50 \quad \rightarrow \quad p_b \geq 50 \text{ mm}$$

$$\text{Tulangan} \leq D16 \quad \rightarrow \quad p_b \geq 40 \text{ mm}$$

- kontak langsung dengan tanah $\rightarrow p_b \geq 70 \text{ mm}$

tebal pelat (h) terlentur satu arah tergantung besar momen lentur, defleksi dan kuat geser yang dituntut. SK-SNI memberikan tebal minimum pelat satu arah yang dikaitkan dengan bentang pelat, beton normal ($W_c = 23 \text{ kN/m}^3$) dan baja BJTD-40, sebagai berikut:

- $L/20$ \rightarrow dua tumpuan
- $L/24$ \rightarrow satu ujung menerus

- $L/28$ → kedua ujung menerus
- $L/10$ → Kantilever
- Jika mutu baja bukan BJTD-40, dikalikan factor: $\left[0,4 + \frac{f_y}{700}\right]$
- Sedang untuk beton ringan dikalikan factor: $(1,65 - 0,005 \cdot W_c)$

Baja Tulangan dan Luas tulangan

a. luas tulangan pokok A_s harus memenuhi $\rho_{\min} < \rho_{\text{perlu}} < \rho_{\max}$

bila: $\rho_{\text{perlu}} \leq \rho_{\min}$ dan:

$$1,33 \rho_{\text{perlu}} \leq \rho_{\min} \text{ maka digunakan } \rho_{\text{perlu}} = \rho_{\min} \dots\dots\dots (3.13)$$

$$1,33 \rho_{\text{perlu}} > \rho_{\min} \text{ maka digunakan } \rho_{\text{perlu}} = 1,33 \rho_{\min} \dots\dots\dots (3.14)$$

b. selain itu, untuk menjaga terhadap susut harus dipenuhi: $A_s \geq A_{\text{sst}}$, dimana luas tulangan susut minimum:

$$\bullet \text{ BJTD-30} \quad \rightarrow A_{\text{sst}} = 0,002 \text{ b.h} \dots\dots\dots (3.15)$$

$$\bullet \text{ BJTD-40} \quad \rightarrow A_{\text{sst}} = 0,0018 \text{ b.h} \dots\dots\dots (3.16)$$

$$\bullet \text{ BJTD} > 40 \quad \rightarrow A_{\text{sst}} = 0,0018 \text{ b.h} \cdot \frac{400}{f_y} > 0,0014 \text{ b.h} \dots\dots\dots (3.17)$$

c. Jarak tulangan maksimum PkP (pusat ke Pusat)

- Tulangan Pokok : 3h atau 500 mm
- Tulangan susut : 5h atau 500 mm

d. Penulisan tulangan pelat: **Px-s** atau **Dx-s**

Dengan: x adalah diameter tulangan, s adalah jarak tulangan pcp, D adalah baja tulangan deformasian, p adalah baja tulangan polos

$$\text{Jarak tulangan pcp: } s \leq \frac{A_{ID} \cdot 1000}{A_s} \text{ atau } s \leq \frac{A_{IP} \cdot 1000}{A_s}$$

Dimana A_s adalah luas tulangan diperlukan, A_{ID} atau A_{IP} adalah luas satu batang tulangan.

Pelat satu arah umumnya direncanakan dengan rasio tulangan tarik jauh lebih rendah dari $\rho_{\max} = 0,75 \rho_b$. karena disamping penghematan penggunaan baja tulangan, dengan tinggi yang optimal dapat dihindari defleksi yang berlebihan.

2. Pelat Dua Arah

Sistem pelat yang ditumpu pada keempat sisinya dan mempunyai perbandingan antara bentang panjang terhadap bentang pendek tidak lebih atau sama dengan 2 ($L_y/L_x \leq 2$) harus dianalisis sebagai pelat dua arah. Karena akibat beban vertical akan menyebabkan terjadinya aksi dua arah, dimana pelat akan melengkung seperti piring, bukan seperti selinder (pada pelat satu arah), berarti pada sembarang titik pada pelat tersebut akan melengkung pada dua arah utamanya. (Kadir Aboe, 2000)

Metode koefisien momen merupakan salah satu cara perhitungan yang dapat dipergunakan untuk perencanaan pelat dua arah. Metode ini menggunakan besaran koefisien momen yang tergantung perbandingan antara

L_y dengan L_x dan didasarkan pada analisa elastis dengan memperhitungkan pengaruh dari redistribusi yang tidak elastis.

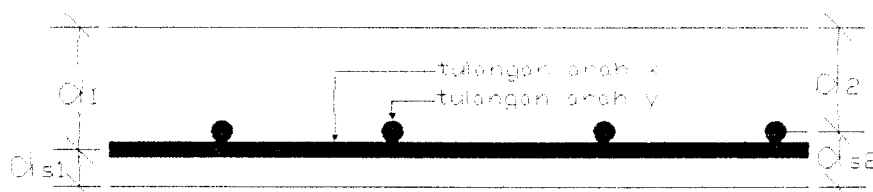
Besar momen yang bekerja pada pelat dua arah dengan berbagai kondisi perletakan dan kontinuitas tepi secara matematis sukar diperoleh secara tepat. Untuk penyederhanaan beberapa peraturan beton menetapkan koefisien momen untuk berbagai kondisi.

Besar momen lentur dalam arah bentang pendek dan bentang panjang:

$$M = 0.001 \cdot x \cdot W_u \cdot L^2 x \quad \dots\dots\dots (3.18)$$

Dengan: W_u adalah beban merata, x adalah koefisien momen yang tergantung kondisi tumpuan dan L_y/L_x .

Pada pelat dua arah, tulangan momen positif untuk kedua arah dipasang saling tegak lurus karena momen positif arah bentang pendek (arah x) lebih besar dari arah bentang panjang (arah y), maka tulangan bentang pendek diletakkan pada lapis bawah agar memberikan d (tinggi manfaat) yang besar.



Gambar 3.4 Tulangan pelat Dua Arah

$$d_{s1} = pb + 0,5D \quad ; \quad d_1 = h - d_{s1}$$

$$d_{s2} = pb + D + 0,5D \quad ; \quad d_2 = h - d_{s2}$$

Menurut SK-SNI, tebal pelat dengan balok yang menghubungkan tumpuan pada semua sisinya adalah:

$$h = \frac{l_n \left(0,8 + \frac{f_y}{1500} \right)}{36 + 5 \cdot \beta \left[\alpha_m - 0,12 \left(1 + \frac{1}{\beta} \right) \right]} \dots\dots\dots (3.19)$$

Tetapi tidak boleh kurang dari :

$$h = \frac{l_n \left[0,8 + \frac{f_y}{1500} \right]}{36 + 9 \cdot \beta} \dots\dots\dots (3.20)$$

dan tidak perlu lebih dari :

$$h = \frac{l_n \left[0,8 + \frac{f_y}{1500} \right]}{36} \dots\dots\dots (3.21)$$

Dalam Segala hal, tebal minimum pelat tidak boleh kurang dari :

- Untuk $\alpha_m = 2,0$ digunakan nilai h minimal 120 mm
- Untuk $\alpha_m = 2,0$ digunakan nilai h minimal 90 mm

Dengan: β adalah rasio bersih L_y terhadap L_x , α_m adalah nilai rata-rata dari a untuk semua balok dari tepi suatu panel, a adalah tinggi blok tekan ($\beta_1 \cdot x$)

3.4.5 Perencanaan Struktur Portal Beton Bertulang dengan Daktilitas Penuh

Struktur beton diproporsikan berdasarkan suatu ketentuan penyelesaian detail khusus yang memungkinkan struktur memberikan respons inelastik terhadap beban siklis yang bekerja dan mampu menjamin pengembangan mekanisme sendi plastis dengan kapasitas energi yang diperlukan tanpa mengalami keruntuhan, $\mu = 4$. Kondisi ini dinamakan juga kondisi daktilitas penuh. Dalam hal ini beban gempa rencana harus diperhitungkan dengan menggunakan nilai faktor K minimum = 1.

Langkah-langkah perencanaan struktur portal beton bertulang dengan daktilitas penuh adalah sebagai berikut:

1. Perencanaan Balok Portal Terhadap Beban lentur.

Kuat lentur perlu balok portal yang dinyatakan dengan $M_{u,b}$ harus ditentukan berdasarkan kombinasi pembebanan tanpa atau dengan beban gempa menurut SK SNI-1991, sebagai berikut:

$$M_{u,b} = 1,2 M_{D,b} + 1,6 M_{L,b} \quad \dots\dots\dots (3.22)$$

$$M_{u,b} = 1,05 (M_{D,b} + M_{L,b R} + M_{E,b}) \quad \dots\dots\dots (3.23)$$

$$M_{u,b} = 0,9 (M_{D,b} + M_{E,b}) \quad \dots\dots\dots (3.24)$$

dengan $M_{D,b}$ adalah momen lentur balok portal akibat beban mati, $M_{L,b}$ adalah momen lentur balok portal akibat beban hidup, $M_{L,b R}$ adalah momen lentur balok portal akibat beban hidup tereduksi (koefisien reduksi beban hidup menurut PPKGURDG 1987, pengguna gedung olahraga = 0,5), dan $M_{E,b}$ adalah momen lentur balok portal akibat beban gempa.

Khusus untuk portal daktilitas penuh perlu dihitung kapasitas lentur sendi plastis balok yang besarnya ditentukan sebagai berikut:

$$M_{Kap,b} = \phi_0 M_{nak,b} \quad \dots\dots\dots (3.25)$$

dengan $M_{Kap,b}$ adalah kapasitas lentur actual balok pada pusat pertemuan balok kolom dengan memperhitungkan luas tulangan yang terpasang, $M_{nak,b}$ adalah kuat lentur nominal balok berdasarkan luas tulangan yang terpasang, ϕ_0 adalah factor penambahan kekuatan yang ditetapkan sebesar 1,25 untuk $f_y < 400$ Mpa, dan 1,4 untuk $f_y > 400$ MPa, f_y adalah kuat leleh tulangan lentur balok.

2. Perencanaan Balok Portal Terhadap Beban Geser

Dengan Konsep desain kapasitas, kuat geser balok portal dihitung dalam kondisi terjadi sendi – sendi plastis pada kedua ujung balok tersebut, dengan tanda yang berlawanan (Positif dan Negatif) menurut persamaan berikut

$$V_{ub} = 1,05V_g + 0,7 \cdot \frac{M_{Kap} + M'_{Kap}}{l_n} \quad \dots\dots\dots (3.26)$$

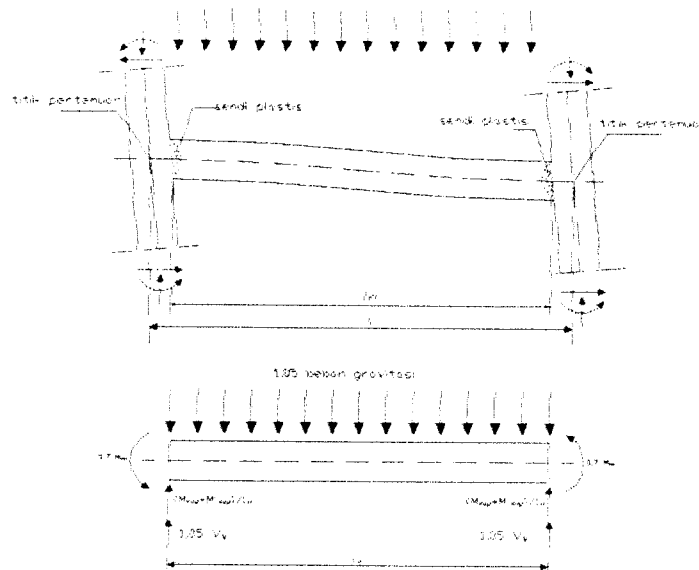
$$V_{ub} = +1,05 \cdot (V_{D,b} + V_{L,b}) \pm 0,7 \cdot \phi \left[\frac{M_{nak-} + M_{nak+}}{l_n} \right] \quad \dots\dots\dots (3.27)$$

tetapi tidak perlu lebih besar dari:

$$V_{u,b} = 1,05 (V_{D,b} + V_{L,b} + 4/K \cdot V_{E,b}) \quad \dots\dots\dots (3.28)$$

dengan: M_{Kap} adalah momen kapasitas balok berdasar tulangan yang sebenarnya terpasang pada salah satu ujung balok atau bidang muka kolom, M'_{Kap} adalah momen kapasitas balok berdasar tulangan yang sebenarnya terpasang pada ujung balok atau bidang muka kolom yang lain, l_n adalah bentang bersih balok, $V_{D,b}$ adalah gaya geser balok akibat beban mati, $V_{L,b}$ adalah gaya geser balok akibat

beban hidup, $V_{E,b}$ adalah gaya geser balok akibat gempa, dan K adalah faktor jenis struktur ($K > 1,0$).



Gambar 3.5 Balok portal dengan sendi plastis pada kedua ujungnya

3. Perencanaan Kolom Portal Terhadap Beban Lentur dan Aksial

Kuat lentur kolom portal dengan daktilitas penuh yang ditentukan pada bidang muka balok $M_{L,K}$ harus dihitung berdasarkan terjadinya kapasitas lentur sendi plastis pada kedua ujung balok yang bertemu dengan kolom tersebut.

$$\sum M_{u,k} = 0,7 \cdot \omega_d \cdot \sum M_{kap,b} \dots \dots \dots (3.29)$$

atau

$$M_{u,k} = 0,7 \cdot \omega_d \cdot \alpha_k \cdot (M_{kap,ki} + M_{kap,ka}) \dots \dots \dots (3.30)$$

etapi dalam segala hal tidak perlu lebih besar dari

$$M_{u,k} = 1,05 \cdot (M_{D,K} + M_{L,K} + \frac{4}{K} M_{E,K}) \dots \dots \dots (3.31)$$

dengan: $M_{D,K}$ adalah momen pada kolom akibat beban mati, $M_{L,K}$ adalah momen pada kolom akibat beban hidup, $M_{E,K}$ adalah momen pada kolom akibat beban gempa, α_k adalah faktor distribusi momen kolom portal yang ditinjau sesuai dengan kekakuan relatif kolom atas dan bawah, $M_{kap,ki}$ adalah momen kapasitas lentur balok disebelah kiri bidang muka kolom, $M_{kap,ka}$ adalah momen kapasitas lentur balok disebelah kanan bidang muka kolom.

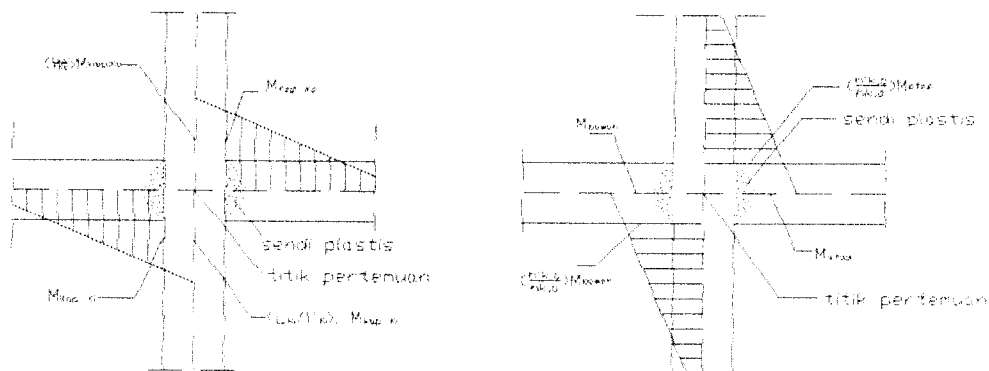
Faktor distribusi momen kolom portaldapat dihitung dengan rumus (Kusuma dan Andriono, 1993)

- untuk faktor distribusi momen kolom atas

$$\alpha_{ka} = \frac{M_{E,k \text{ it}(i+1)atas}}{M_{E,k \text{ it}(i)atas} + M_{E,k \text{ it}(i+1)bawah}} \dots\dots\dots (3.32)$$

- untuk faktor distribusi momen kolom bawah

$$\alpha_{kb} = \frac{M_{E,k \text{ it}(i)bawah}}{M_{E,k \text{ it}(i)bawah} + M_{E,k \text{ it}(i-1)atas}} \dots\dots\dots (3.33)$$



Gambar 3.6 pertemuan balok kolom dengan sendi plastis pada ujung balok disebelah kiri dan kanan

Sedangkan beban aksial rencana, $N_{u,k}$ yang bekerja pada kolom portal dengan daktilitas penuh dihitung dari:

$$N_{u,k} = \frac{0,7 \cdot R_n \cdot \sum M_{kap,b}}{L_b} + 1,05 \cdot N_{g,k} \quad \dots\dots\dots (3.34)$$

Tetapi dalam segala hal tidak perlu lebih besar dari :

$$N_{u,k} \geq 1,05 \cdot (N_{g,k} + \frac{4}{k} \cdot N_{E,K}) \quad \dots\dots\dots (3.35)$$

dengan: R_n adalah faktor reduksi yang ditentukan sebesar

1,0 untuk $1 < n < 4$

$1,1 - 0,025n$ untuk $4 < n < 20$

0,6 untuk $n > 20$

n adalah jumlah lantai diatas kolom yang ditinjau, L_b adalah bentang balok dari pusat kepusat kolom,

$$\sum M_{kap,b} = \sum M_{kap,b \rightarrow ki} + \sum M_{kap,b \rightarrow ka} \quad \dots\dots\dots (3.36)$$

$$\sum M_{kap,b \rightarrow \perp} = \sum M_{kap,b \rightarrow ki \perp} + \sum M_{kap,b \rightarrow ka \perp} \quad \dots\dots\dots (3.37)$$

dengan: $N_{g,k}$ adalah gaya aksial kolom akibat gaya gravitasi, $N_{E,K}$ adalah gaya aksial kolom akibat gaya gempa, $N_{E,K \perp}$ adalah gaya aksial kolom akibat gaya gempa arah tegak lurus portal.

4. Perencanaan Kolom Portal Terhadap Beban Geser

Kuat geser portal dengan daktilitas penuh berdasarkan terjadinya sendi-sendiplastis pada ujung-ujung balok-balok yang bertemu pada kolom tersebut, harus dihitung dengan cermat sebagai berikut:

Untuk kolom lantai atas

$$V_{u,k} = \frac{M_{u,k \text{ atas}} + M_{kap,k \text{ bawah}}}{h'} \dots\dots\dots (3.38)$$

Untuk kolom tiap lantai

$$V_{u,k} = \frac{M_{u,k \text{ atas}} + M_{u,k \text{ bawah}}}{h'_k} \dots\dots\dots (3.39)$$

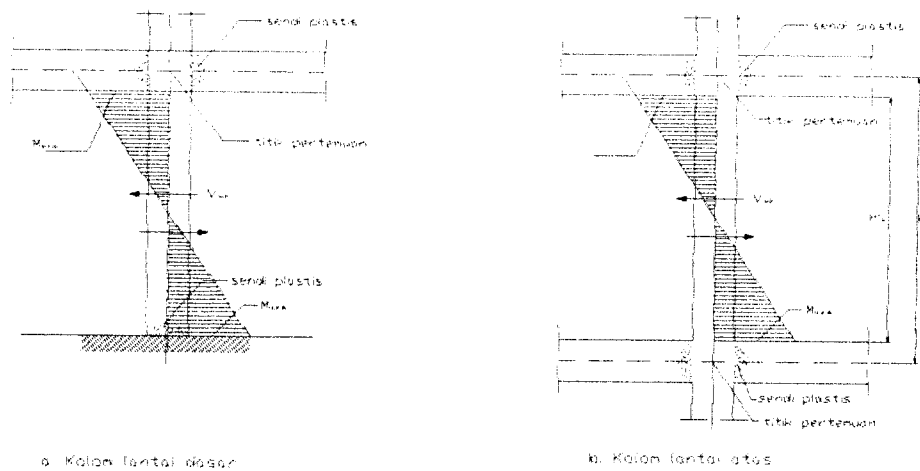
Untuk kolom lantai dasar

$$V_{u,k} = \frac{M_{kap,k}}{h'} \dots\dots\dots (3.40)$$

Dalam segala hal tidak perlu lebih besar dari:

$$V_{u,k} = 1,05 \cdot [M_{D,K} + M_{L,K} + 4K \cdot (V_{E,K} + 0,3V_{E,K^\perp})] \dots\dots\dots (3.41)$$

dengan: $M_{kap,K}$ adalah momen kapasitas kolom, $M_{u,K,atas}$ adalah momen rencana kolom pada ujung atas dihitung pada muka balok menurut persamaan , $M_{u,K,bawah}$ adalah momen rencana kolom pada ujung bawah dihitung pada muka balok menurut persamaan, $M_{kap,K,bawah}$ adalah kapasitas lentur ujung dasar kolom lantai dasar = $\phi_0 M_{nak,K \text{ bawah}}$, $M_{nak,K \text{ bawah}}$ adalah kuat lentur nominal aktual ujung dasar kolom lantai dasar (berdasarkan luas tulangan aktual yang terpasang), h'_k adalah tinggi bersih kolom, $V_{D,K}$ adalah gaya geser kolom akibat beban mati, $V_{L,K}$ adalah gaya geser kolom akibat beban hidup, $V_{E,K}$ adalah gaya geser kolom akibat beban gempa, V_{E,K^\perp} adalah gaya geser kolom akibat beban gempa arah tegak lurus portal.

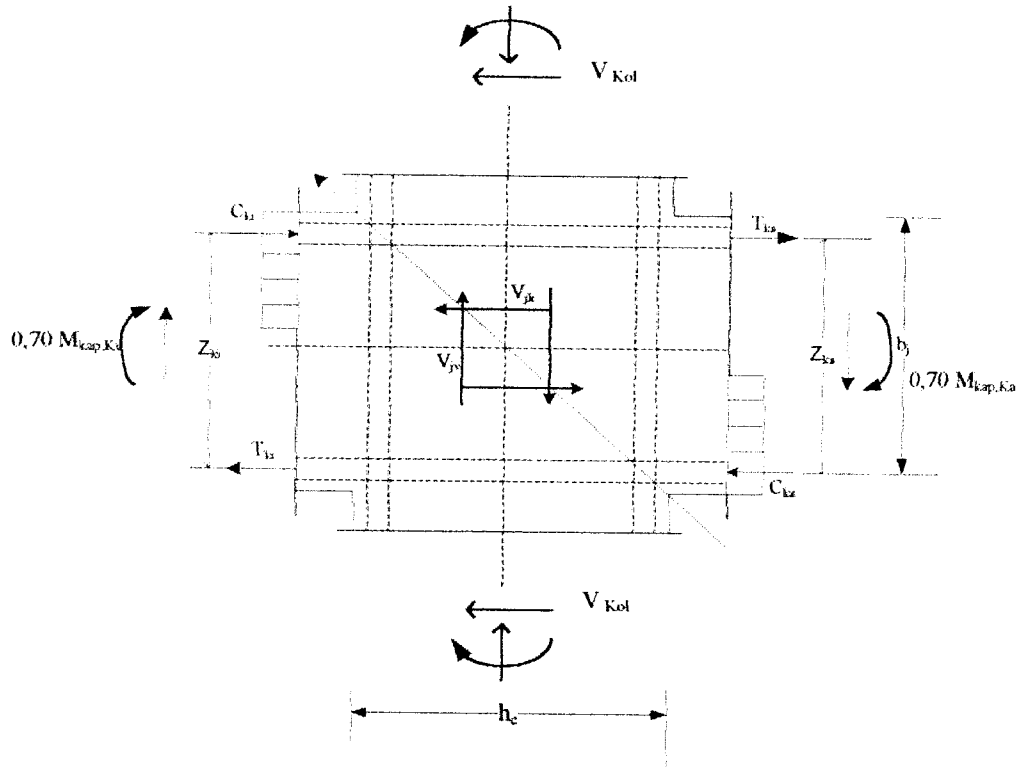


Gambar 3.7 kolom lantai dasar dan kolom lantai atas dengan $M_{u,k}$ yang ditetapkan berdasarkan kapasitas sendi plastis balok.

5. Perencanaan Panel Pertemuan Balok Kolom

Panel pertemuan balok kolom harus diproporsikan sedemikian rupa, sehingga memenuhi persyaratan kuat geser horisontal perlu $V_{U,H}$ dan kuat geser vertikal perlu $V_{U,V}$ yang berkaitan dengann terjadinya momen kapasitas pada sendi plastis pada kedua ujung balok yang bertemu pada kolom itu, seperti ditunjukkan dalam gambar.

Gaya-gaya membentuk keseimbangan pada join rangka adalah seperti yang terlihat pada gambar, dimana gaya geser horisontal.



Gambar 3.8 Panel Pertemuan balok dan Kolom Portal dalam kondisi terjadinya sendi-sendi plastis pada kedua ujung balok

Dimana :

$$V_{jk} = C_{ki} + T_{ka} - V_{kol} \quad \dots\dots\dots (3.42)$$

Dengan :

$$C_{ki} - T_{ki} = 0,70 \frac{M_{kap,ki}}{Z_{ki}} \quad \dots\dots\dots (3.43)$$

$$T_{ka} = C_{ka} = 0,70 \frac{M_{kap,ka}}{Z_{ka}} \quad \dots\dots\dots (3.44)$$

$$V_{kol} = \frac{0,70 \left(\frac{1_{ki}}{1_{ki'}} + \frac{1_{ka}}{1_{ka'}} M_{kap,ka} \right)}{\frac{1}{2} (h_{ka} + h_{ki})} \quad \dots\dots\dots (3.45)$$

Tegangan geser horizontal nominal dalam join adalah sebagai berikut:

$$v_{jH} = \left(\frac{V_{jH}}{b_j \cdot h_c} \right)$$

dengan : b_j adalah lebar efektif join (mm), : h_j adalah tinggi total penampang kolom dalam arah geser yang ditinjau, dan V_{jh} tidak boleh lebih besar dari $1,5 \sqrt{f'c}$ (Mpa).

Gaya geser horizontal V_{jh} ini ditahan oleh dua mekanisme kuat geser join yaitu:

1. strat beton diagonal yang melewati daerah tekan ujung join yang memikul gaya geser V_{ch}
2. mekanisme panel rangka yang terdiri dari sengkang horizontal dan strat beton diagonal daerah tarik join yang memikul gaya geser V_{sh}

besarnya V_{ch} harus diambil sama dengan nol, kecuali bila:

1. tegangan tekan minimal rata-rata pada penampang bruto kolom di atas join, termasuk tegangan prategang. Jika ada dan melebihi nilai $0,1 \cdot f'c$, maka:

$$V_{ch} = \frac{2}{3} \sqrt{\left(\frac{N_{u,t}}{A_g} \right)} - 0,1 \cdot f'c \cdot b_j \cdot h_j \dots\dots\dots (3.46)$$

2. balok diberi gaya prategang yang melewati join, maka:

$$V_{ch} = 0,7 \cdot P_{cs} \dots\dots\dots (3.47)$$

dengan P_{cs} adalah gaya permanent gaya prategang yang terletak di sepertiga bagian tengah tinggi kolom.

3. seluruh balok pada join dirancang sehingga penampang kritis dari sendi plastis terletak pada jarak yang lebih kecil dari tinggi penampang balok diukur dari muka kolom, maka:

$$V_{cb} = 0,5 \cdot \frac{A_s'}{A_s} \cdot V_{jh} \cdot \left(1 + \frac{N_{u,k}}{0,4 \cdot A_g \cdot f'c} \right) \dots \dots \dots (3.48)$$

Dimana Rasio $\frac{A_s'}{A_s}$ tidak boleh lebih besar dari (1).

Bila tegangan rata-rata minimum pada penampang bruto kolom diatas join kurang dari $0,1 \cdot f'c$ ($\rho_c < 0,1 \cdot f'c$) maka :

$$V_{sh} = V_{jh} - \frac{2}{3} \sqrt{\left(\frac{N_{u,k}}{A_g} \right)} - 0,1 \cdot f'c \cdot b_j \cdot h_j \dots \dots \dots (3.49)$$

Pada join rangka dengan melakukan relokasi sendi plastis :

$$V_{sh} = V_{jh} - 0,5 \cdot \frac{A_s'}{A_s} \cdot V_{jh} \cdot \left(1 + \frac{N_{u,k}}{0,4 \cdot A_g \cdot f'c} \right) \dots \dots \dots (3.50)$$

Luas total efektif dari tulangan geser horizontal yang melewati bidang kritis diagonal dengan yang diletakkan didaerah tekan joint efektif (b_j) tidak boleh kurang Dari :

$$A_{jh} = \frac{V_{jh}}{f_y} \dots \dots \dots (3.51)$$

Luas total efektif dari tulangan geser ini harus didistribusikan secara merata diantara tulangan balok longitudinal atas dan bawah.

Geser Joint vertical (V_{jv}) dapat dihitung dengan rumus:

$$V_{jv} = V_{jh} \cdot \frac{h_c}{b_j} \dots \dots \dots (3.52)$$

Tulangan joint geser vertical didapat dari : $V_{sv} = V_{jv} - V_{cv}$

$$\text{Menjadi} = A_{sc} \cdot \frac{V_{sh}}{V_{sc}} \cdot \left(0,6 + \frac{N_{u,k}}{A_g \cdot f'c} \right) \dots \dots \dots (3.53)$$

$$\text{Sehingga luas tulangan joint vertical: } A_{jv} = \frac{V_{sv}}{f_y} \dots \dots \dots (3.54)$$

Tulangan geser joint vertical ini harus terdiri dari tulangan kolom antara (Intermediate bars) yang terletak pada bidang lentur antara ujung tulangan terbesar atau terdiri dari sengkang-sengkang pengikat vertical (syarat-syarat tulangan geser joint vertical dapat dilihat dalam SK SNI T – 15 – 1991-03 pada 3.14.6.6)

3.4.6. Perencanaan Balok

Dalam perencanaan balok digunakan cara perhitungan *Ultimate Strength Design*. Lentur pada balok merupakan akibat dari adanya regangan yang timbul karena adanya beban luar. Bila bebannya bertambah, maka pada balok terjadi deformasi dan regangan tambahan yang mengakibatkan timbulnya retak lentur di sepanjang balok. Oleh karena itu perencanaan harus mendesain penampang elemen balok sedemikian rupa sehingga tidak terjadi retak yang berlebihan pada saat beban bekerjadan masih mempunyai keamanan dan kekuatan cadangan untuk menahan beban dan tegangan tanpa mengalami keruntuhan.

Berdasarkan jenis keruntuhan yang dialami oleh balok, mengenai hancurnya beton yang tertekan atau lelehnya tulangan tarik, maka balok dapat dikelompokkan ke dalam tiga kelompok sebagai berikut ini.

1. Penampang *balance*.

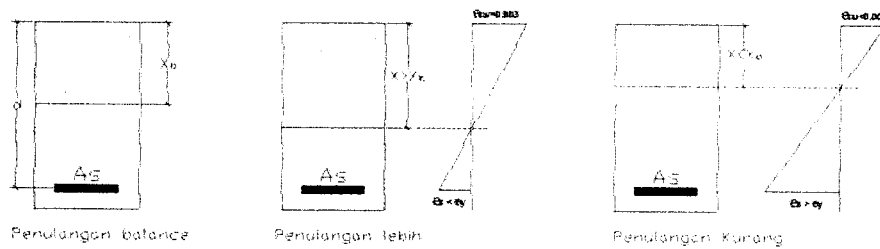
Tulangan tarik mulai leleh tepat pada saat beton mencapai regangan batasnya dan akan hancur karena tekan. Pada awal terjadinya keruntuhan, regangan tekan yang diijinkan pada serat tepi yang tertekan adalah 0,003 in/in. Sedangkan regangan baja sama dengan regangan lelehnya, yaitu $\epsilon_y = f_y/E_c$.

2. Penampang *over reinforced*.

Keruntuhan ditandai dengan hancurnya beton yang tertekan. Pada saat awal keruntuhan, regangan baja (ϵ_s) yang terjadi masih lebih kecil dari regangan leleh (ϵ_y). Dengan demikian tegangan baja (f_s) juga lebih kecil dari tegangan lelehnya (f_y). Kondisi ini terjadi apabila tulangan yang digunakan lebih banyak dari yang diperlukan dalam keadaan *balanced*.

3. Penampang *under reinforced*.

Keruntuhan ditandai dengan terjadinya leleh pada tulangan baja. Tulangan baja ini terus bertambah panjang dengan bertambahnya regangan di atas ϵ_y . Kondisi penampang demikian dapat terjadi apabila tulangan tarik yang dipakai kurang dari yang diperlukan untuk kondisi *balanced*. (Nawy, 1990).



Gambar 3.9 Diagram regangan dan tampang untuk berbagai kondisi penulangan

Balok berperilaku sebagai struktur yang elastik *under reinforced* maka harus memenuhi syarat-syarat sebagai berikut ini.

1. $\rho \leq 0,75 \rho_b$, (SK SNI T-15-1991-03 pasal 3.3.3-3) dimana:

$$\rho = \frac{A_s}{b \cdot d} \dots \dots \dots (3.55)$$

$$\rho_b = \frac{0,85 f_c'}{f_y} \beta_1 \times \frac{600}{600 + f_y} \dots \dots \dots (3.56)$$

2. Agar terjadi keruntuhan yang daktail, diisyaratkan pemakaian tulangan minimum sedemikian, yang menghasilkan kekuatan yang sama dengan beton tanpa tulangan (SK SNI T-15-1991-03 pasal 3.3.5-1).

$$\rho_{min} = 1,4/f_y$$

3. Perencanaan seismik untuk daktilitas penuh, pada penampang suatu komponen struktur lentur, jumlah dari tulangan atas maupun tulangan bawahnya tidak boleh kurang dari $(1,4 b_w d / f_y)$ dan rasio tulangan tidak melampaui $(7 b_w d / f_y)$. Paling tidak harus disediakan dua batang tulangan menerus pada kedua tulangan atas dan bawah. (SK SNI T-15-1991-03 pasal 3.14.3-2).
4. Kuat momen positif pada sisi muka join tidak boleh kurang dari $\frac{1}{2}$ kuat momen negatif yang disediakan pada sisi muka join tersebut. Pada sembarang penampang dari komponen struktur tersebut, kuat momen positif maupun kuat momen negatifnya tidak boleh kurang dari $\frac{1}{4}$ kuat momen maksimum yang terdapat pada kedua ujung join. (SK SNI T-15-1991-03 pasal 3.14.3-2.2).

3.4.6.1 Prosedur Perencanaan Balok

1. Menentukan nilai ρ yang dipakai, dimana $\rho_{\min} < \rho < 0,75 \cdot \rho_b$

$$\rho_{\min} = \frac{1,4}{f_y} \dots\dots\dots(3.57)$$

$$\rho_b = \frac{0,85 \cdot f'_c \cdot \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y} \dots\dots\dots(3.58)$$

Untuk $f'_c \leq 30 \text{ Mpa} \rightarrow \beta_1 = 0.85$

Untuk $f'_c > 30 \text{ Mpa} \rightarrow \beta_1 = 0.85 - 0,008(f'_c - 30) \geq 0,5$

2. menentukan $b \cdot d^2$ yang diperlukan

$$b \cdot d^2_{\text{perlu}} = \frac{M_n_{\text{perlu}}}{R_n} \dots\dots\dots(3.59)$$

$$R_n = \rho \cdot f_y (1 - \frac{1}{2} \rho \cdot m) \text{ dan } m = \frac{f_y}{0,85 \cdot f_c'}$$

$$M_u = \frac{Mu}{\phi} \dots\dots\dots(3.60)$$

3. Pilih satu pasangan b dan d, sehingga $b \cdot d^2 = b \cdot d^2_{\text{perlu}}$
 4. Hitung ρ untuk penampang yang dipilih, dengan menghitung

$$R_n = \frac{M_n}{b \cdot d^2} \dots\dots\dots(3.61)$$

- a. dengan rumus

$$\rho = \frac{1}{m} \left(1 - \sqrt{1 - \frac{2m \cdot R_n}{f_y}} \right) \dots\dots\dots(3.62)$$

- b. dengan pendekatan

cara ini baik bila $R_n \text{ baru} < R_n \text{ lama}$

$$\rho_{\text{baru}} \approx \rho_{\text{lama}} \frac{R_n \text{ baru}}{R_n \text{ lama}} \dots\dots\dots(3.63)$$

5. Hitung Luas tulangan tarik : $A_s = \rho \cdot b \cdot d \dots\dots\dots(3.64)$

6. a. Pilih / tentukan Tulangan

➤ Gunakan Diameter yang kecil (untuk balok $\geq 12 \text{ mm}$), karena untuk memenuhi luas tulangan yang diperlukan akan diperlukan sejumlah tulangan yang lebih banyak dibanding bila digunakan diameter yang lebih besar. Ini akan berakibat luas bidang

singgung antara baja-tulangan dengan beton menjadi lebih besar, sehingga lekatan baja-tulangan ke beton menjadi lebih baik.

- Jumlah tulangan yang digunakan sedemikian, sehingga tulangan tersebut dapat dipasang dalam 1 lapis/baris dan bila terpaksa tidak lebih dari 2 lapis.

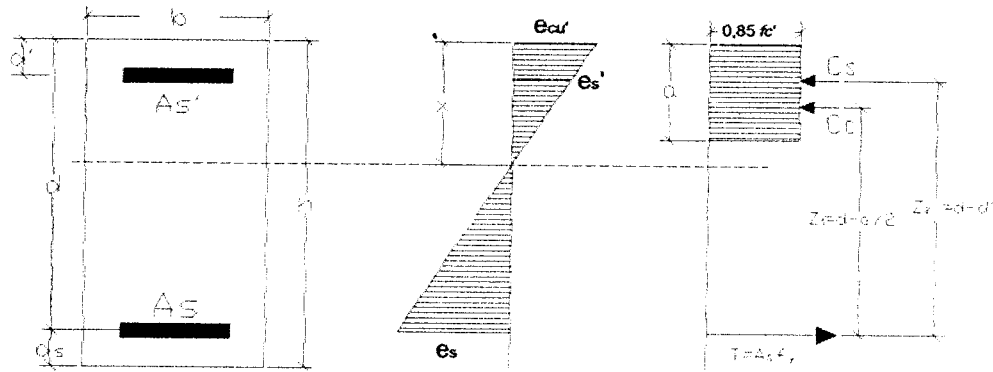
b. Periksa Kekuatan/ Kapasitas penampang.

$$\phi M_n \geq M_u \text{ atau } M_n = \frac{M_u}{\phi} \dots\dots\dots(3.65)$$

3.4.6.2 Balok persegi dengan tulangan rangkap.

Untuk suatu penampang Komponen struktur dimana momen tahanan M_R telah diketahui berdasarkan ρ_{\max} , kemudian dikehendaki penampang tersebut mampu menahan beban yang lebih besar dari kapasitasnya (balok persegi tulangan sebelah), atau karena pertimbangan teknis, maka diperlukan usaha lain untuk memperbesar kemampuan penampang tersebut,

SK-SNI memperbolehkan penambahan tulangan tarik lebih dari batas nilai ρ_{\max} bersamaan dengan pemberian baja tulangan didaerah tekan. Penampang yang demikian disebut Balok dengan bertulangan rangkap.



Gambar 3.10 Balok persegi tulangan rangkap

Untuk menahan Gaya tekan C pada balok dengan tulangan rangkap digunakan dua bahan yang berbeda, yaitu beton dan baja tulangan tekan, sehingga gaya tekan terdiri dari dua komponen yaitu :

- C_c gaya tekan yang ditahan oleh beton tekan
- C_s gaya tekan yang ditahan oleh tulangan baja tekan.

Karena itu dalam analisis momen tahanan dalam, terdiri dari dua bagian yaitu:

- Kopel pasangan beton tekan dengan tulangan baja tarik dan
- Tulangan baja tekan dengan tambahan tulangan baja tarik

$$M_u = M_{n1} + M_{n2} \dots \dots \dots (3.66)$$

$$M_{n1} = C_c \cdot Z_1 \text{ atau } M_{n1} = T_1 \cdot Z_1 \text{ Dengan } Z_1 = d - a/2$$

$$M_{n2} = C_s \cdot Z_2 \text{ atau } M_{n1} = T_2 \cdot Z_2 \text{ Dengan } Z_1 = d - d'$$

Keseimbangan gaya-gaya dalam: $T = C$

$$\text{Dimana: } C = C_c + C_s \text{ dan } T = T_1 + T_2 \dots \dots \dots (3.67)$$

Tegangan yang dipakai pada baja tulangan tekan, sesuai dengan regangan yang terjadi pada tulangan tekan pada saat kekuatan Nominal dicapai.

$$\text{bila } \epsilon_s' < \epsilon_y \text{ maka } f_s' = E_s \cdot \epsilon_s' \dots \dots \dots (3.68)$$

$$\epsilon_s' > \epsilon_y \text{ maka } f_s' = f_y \dots \dots \dots (3.69)$$

Dalam Analisis, bagian beton tekan yang itempati tulangan tekan diperhitungkan (mengurangi luas beton tekan), sehingga ;

$$C_c = 0,85 f_c' a b \quad C_s = A_s' (f_s' - 0,85 f_c')$$

$$T = A_s f_s \dots \dots \dots (3.70)$$

Letak garis Netral dapat ditentukan dengan menggunakan keseimbangan gaya dalam:

$$T = C_c + C_s$$

$$a = \frac{A_s \cdot f_s - A_s' \cdot (f_s' - 0,85 f_c')}{0,85 \cdot f_c' \cdot b} \quad \text{dan } x = \frac{a}{\beta_1} \dots \dots \dots (3.71)$$

Seperti pada bagian tekan yang terdiri dari dua komponen, yaitu beton tekan dan baja tekan, baja tarik dapat diproporsikan menjadi dua bagian, yaitu A_{S1} dan A_{S2} yang memberikan gaya tarik dan T_2 . Dimana T_1 setara dengan C_c dan T_2 setara dengan C_s , sehingga, $A_{S2} = A_s'$ dan $A_{S1} = A_s - A_{S2}$

Untuk menjamin daktilitas SK-SNI menentukan rasio tulangan maksimum :

$$\rho_{\text{mak}} = \frac{A_{s1}}{b \cdot d} \leq 0,75 \rho_b \dots \dots \dots (3.72)$$

a. Kriteria Leleh Untuk Tulangan Tekan

Untuk menjamin regangan tulangan tekan telah mencapai regangan leleh pada saat penampang mencapai kekuatan nominal harus di penuhi.

$$\rho = \rho' \left(1 - \frac{0,85 f_c'}{f_y} \right) > 0,85 \cdot \beta_1 \left(\frac{f_c' \cdot d}{f_y \cdot d} \right) \left(\frac{600}{600 + f_y} \right) \dots \dots \dots (3.73)$$

Karena tulangan baja tekan $\epsilon_s' \geq \epsilon_y$ maka gaya-gaya dalam:

$$\begin{array}{l} T = \rho \cdot b \cdot d \cdot f_y \\ C_c = 0,85 \cdot f_c' \cdot \beta_1 \cdot x \cdot b \\ C_s = (f_y - 0,85 f_c') \cdot \rho' \cdot b \cdot d \end{array} \quad \left| \quad T = C_c + C_s \right.$$

$$\text{Dan } X = \frac{f_y \cdot d}{0,85 \cdot \beta_1 \cdot f_c'} \left[\rho - \rho' \left(1 - \frac{0,85 f_c'}{f_y} \right) \right] \dots \dots \dots (3.74)$$

$$\epsilon_s' = \frac{\epsilon_{cu}}{x} (x - d') > \epsilon_y \dots \dots \dots (3.75)$$

$$\text{atau } \frac{600}{x} (x - d') > \epsilon_y \dots \dots \dots (3.76)$$

$$x \geq \frac{600 d'}{600 - f_y} \dots \dots \dots (3.77)$$

b. Perencanaan Penampang

Bila suatu penampang persegi dengan ukuran yang telah ditetapkan, diinginkan mempunyai kekuatan yang lebih besar dari kekuatan yang tersedia dengan hanya menggunakan tulangan tarik saja, maka diperlukan tambahan tulangan tarik dan tekan.

Prosedur yang logis, untuk perencanaan penampang persegi dengan tulangan rangkap adalah sebagai berikut (Kadir Aboe, 2000)

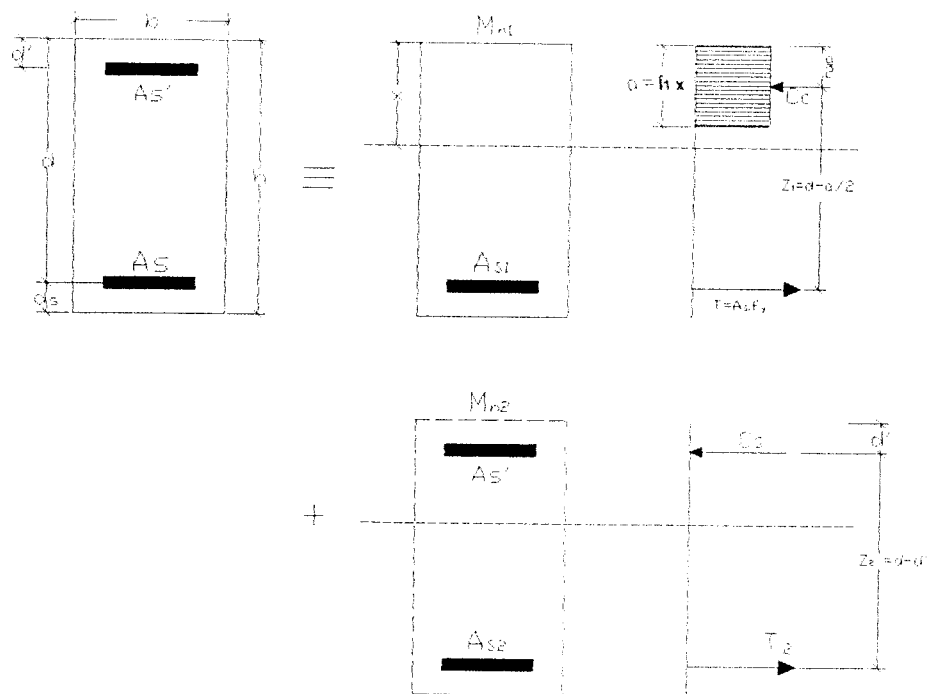
- Menghitung Kapasitas/momen nominal penampang dengan tulangan tarik saja, yaitu dengan menggunakan tulangan tarik maksimum yang diijinkan untuk tampang dengan tulangan sebelah pada kondisi seimbang.

Kapasitas Penampang : $M_{n1} < M_n$

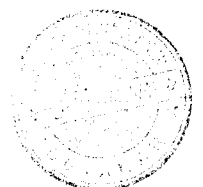
$$\text{Dengan : } M_{n1} = T_1 \cdot \left(d - \frac{a}{2} \right) = A_{s1} \cdot f_y \cdot \left(d - \frac{a}{2} \right) \dots \dots \dots (3.78)$$

Dan luas tulangan yang diperlukan untuk memikul momen sebesar M_{n1}

$$A_{s1} = \rho_{mak} \cdot b \cdot d \dots \dots \dots (3.79)$$



Gambar 3.11 Perencanaan Balok persegi tulangan rangkap



- Kelebihan momen sebesar :

$$M_{n1} = M_n - M_{n1} \dots \dots \dots (3.80)$$

Ditahan oleh tambahan tulangan tarik bersama dengan tulangan tekan, dimana besar gaya tekan yang harus ditahan oleh tulangan tekan:

$$C_s = \frac{M_{n2}}{d - d'} \dots \dots \dots (3.81)$$

$$\text{Luas tulangan tekan : } A_s' = \frac{C_s}{f_s' - 0,85 f_c'} \dots \dots \dots (3.82)$$

$$\text{Dengan: } f_s' = f_y \quad \text{bila } \epsilon_s' > \epsilon_y$$

$$f_s' = E_s \cdot \epsilon_s' \quad \text{bila } \epsilon_s' < \epsilon_y$$

dari keseimbangan gaya dalam $C = T$

$$\text{Karena: } T = T_1 + T_2 \quad \text{dan}$$

$$C = C_c + C_s \quad \text{maka}$$

$$C_c + C_s = T_1 + T_2$$

$$\text{Dimana } C_c = T_1 \quad \text{maka } T_2 = C_s$$

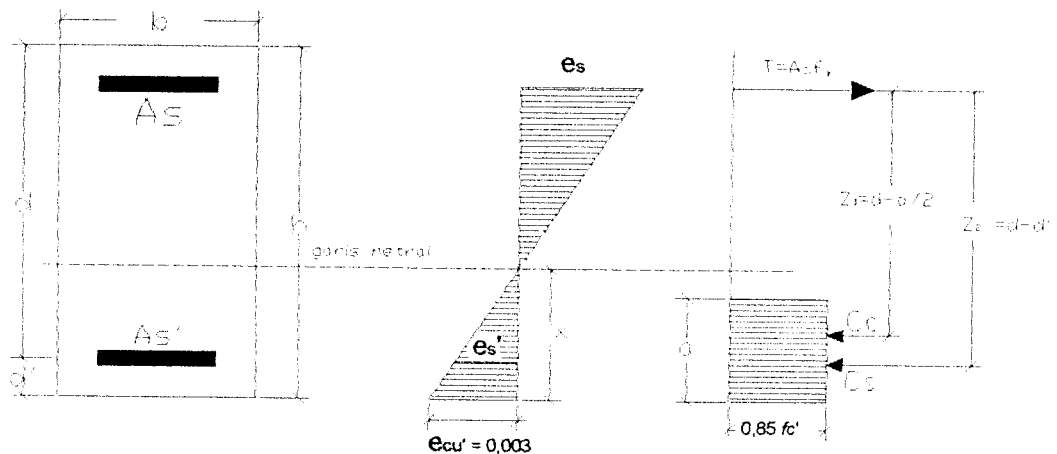
Sehingga tambahan tulangan tarik:

$$A_{s2} = \frac{T_2}{f_y} \quad \text{anggap baja tarik telah leleh}$$

$$\text{Luas tulangan tarik : } A_s = A_{s1} + A_{s2} \dots \dots \dots (3.83)$$

❖ Perencanaan Penulangan lentur tumpuan momen negative

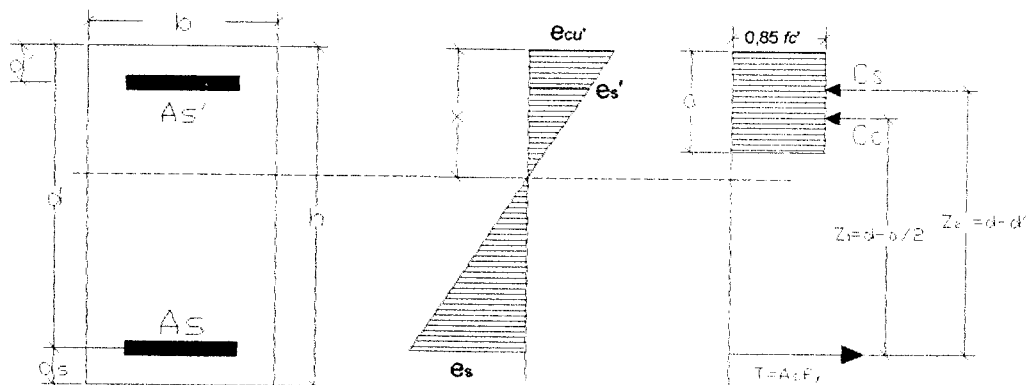
Pada Momen tumpuan negatif maka A_s sebagai tulangan tarik berada di atas, dan A_s' sebagai tulangan tekan berada dibawah pada penampang Balok, perencanaan tulangan rangkap sesuai gambar 3.12



Gambar 3.12 Analisa Balok tulangan rangkap tumpuan momen negatif

❖ Perencanaan Penulangan lentur tumpuan momen Positif

Pada Momen tumpuan Positif maka A_s sebagai tulangan tarik berada di bawah, dan A_s' sebagai tulangan tekan berada diatas pada penampang Balok, perencanaan tulangan rangkap sesuai gambar 3.13



Gambar 3.13 Analisa Balok tulangan rangkap tumpuan momen positif

c. Penulangan Geser Balok

Perencanaan geser pada struktur terlentur didasarkan pada anggapan-anggapan:

- Beton menahan sebagian gaya geser
- Sedang kelebihanannya atau gaya geser diatas kemampuan beton menahan geser, ditahan baja tulangan geser.

Dengan demikian perencanaan penampang akibat geser, harus didasarkan pada:

$$V_u \leq \phi \cdot V_n \quad \text{sedang } V_n = V_c + V_s \quad \text{sehingga}$$

$$V_u \leq \phi V_c + \phi V_s \quad \dots\dots\dots(3.84)$$

Dimana: V_u adalah gaya geser terfaktor, V_n adalah kuat geser nominal, V_c adalah kuat geser nominal beton, V_s adalah kuat geser nominal baja tulangan geser, ϕ adalah faktor reduksi kekuatan = 0,6

Untuk komponen struktur yang menahan gaya geser dan lentur, besarnya kapasitas/ kemampuan beton (tanpa tulangan geser) untuk menahan geser adalah:

Tegangann geser: $v_c = \frac{1}{6} \sqrt{f'c}$ dan $\dots\dots\dots(3.85)$

Kuat geser $V_c = \frac{1}{6} \sqrt{f'c} \cdot b_w \cdot d \quad \dots\dots\dots(3.86)$

Atau bila dihitung dengan lebih rinci:

$$V_c = \frac{1}{7} \left[\sqrt{f'c} + 120 \rho_w \cdot \frac{V_u d}{M_u} \right] \cdot b_w \cdot d \leq 0,30 \sqrt{f'c} \cdot b_w \cdot d \quad \dots\dots\dots (3.87)$$

Dengan: M_u adalah momen terfaktor yang terjadi bersamaan dengan V_u pada penampang yang ditinjau, dan disyaratkan: $\frac{V_u d}{M_u} \leq 1,0$

$$\rho_w = \frac{A_s}{b_w \cdot d}$$

SK-SNI menyatakan meskipun teoritis tidak diperlukan tulangan geser bila $V_u \leq \phi \cdot V_c$, tetapi tetap harus diberikan tulangan geser minimum untuk menjaga apabila beban tak terduga yang dapat mengakibatkan kerusakan (gagal) geser. Karena gagal geser pada struktur beton bertulang terlentur akan terjadi secara tiba-tiba.

Tulangan geser minimal diberikan pada struktur terlentur, kecuali:

- a. plat dan fondasi plat
- b. Struktur balok beton rusuk
- c. Balok dengan tinggi total ≤ 250 mm, atau 2,5 kali tebal flens, atau 1,5 kali lebar badan balok, diambil nilai terbesar.
- d. Titik dimana $V_u = \frac{1}{2} \phi V_c$

Luas tulangan geser minimum:

$$A_v = \frac{1}{3} \cdot \frac{b_w \cdot s}{f_y} \text{ atau } \dots \dots \dots (3.88)$$

$$s_{maks} = \frac{3 \cdot A_v \cdot f_y}{b_w} \dots \dots \dots (3.89)$$

dimana: A_v = luas penampang tulangan geser total dengan jarak spasi antar tulangan s , untuk sengkang tunggal $A_v = 2 \cdot A_{lgs}$; s adalah jarak pusat ke pusat batang tulangan geser (spasi tulangan)

sedang bila $V_u > \phi V_c$ tetapi $V_u = \phi (V_c - V_s)$, diperlukan penyediaan baja tulangan geser untuk menahan gaya tarik arah tegak lurus terhadap retak tarik diagonal, sehingga mampu mencegah bukaan retak lebih lanjut.

SKS-SNI T-15-1991 membatasi spasi tulangan geser sebagai berikut:

- Sengkang vertical : nilai terkecil dari $s \leq d/2$ atau $s \leq 600$ mm
- Untuk sengkang miring dan tulangan longitudinal yang dibengkokkan, spasi sedemikian sehingga setiap garis miring 45° yang ditarik ke arah reaksi dari setengah tinggi komponen $d/2$ ketulangan tarik harus memotong paling sedikit satu batang tulangan geser.
- Bila $V_s > \sqrt{f'_c} \cdot b_w \cdot d$, maka s diatas harus dikalikan 0,5
- Untuk sengkang vertical, V_s dapat dihitung dengan rumus:

$$V_s = \frac{A_v \cdot f_y \cdot d}{s} \text{ atau } A_v = \frac{V_s \cdot s}{f_y \cdot d} \dots\dots\dots (3.90)$$

A_v adalah luas tulangan geser dalam jarak s .

- Bila tulangan geser berupa sengkang miring:

$$V_s = \frac{A_v \cdot f_y (\sin \alpha + \cos \alpha) \cdot d}{s} \dots\dots\dots (3.91)$$

- Jika tulangan geser terdiri dari satu batang tunggal atau grup batang-batang tulangan sejajar dan semua dibengkokkan pada jarak yang sama dari tumpuan, maka:

$$V_s = A_v \cdot f_y \cdot \sin \alpha \leq \frac{1}{4} \sqrt{f'_c} \cdot b_w \cdot d \dots\dots\dots (3.92)$$

- Bila tulangan geser terdiri dari satu seri atau beberapa grup sejajar dari batang yang dibengkokkan pada jarak yang tidak sama dari tumpuan, maka :

$$V_s = \frac{A_v \cdot f_y (\sin \alpha + \cos \alpha) \cdot d}{s} \dots\dots\dots (3.93)$$

- Kuat geser maksimum yang disumbangkan tulangan geser:

$$V_s = \frac{2}{3} \sqrt{f'_c} \cdot b_w \cdot d = 4 V_c \dots\dots\dots (3.94)$$

Tulangan geser yang umumnya digunakan adalah sengkang vertical, karena selain pelaksanaannya lebih mudah, juga ketepatan pemasangan lebih terjamin.

Dalam perencanaan penulangan geser, SK-SNI mengijinkan menggunakan nilai V_c pada titik berjarak d dari tumpuan untuk daerah dekat tumpuan, yang jaraknya $\leq d$ dari muka tumpuan.

Kategori/ Kriteria perencanaan ;

1. Bila $V_u \leq \frac{1}{2} \phi \cdot V_c$, maka tidak diperlukan tulangan geser
2. Bila $\frac{1}{2} \phi V_c < V_u < \phi V_c$ maka diperlukan tulangan geser minimum

dimana $V_c = \frac{1}{6} \sqrt{f'_c} \cdot b_w \cdot d$

Luas tulangan geser minimum (sengkang vertical):

$$A_v = \frac{1}{3} \cdot \frac{b_w \cdot s}{f_y} \text{ atau } s = \frac{3 \cdot A_v \cdot f_y}{b_w} \text{ dan } V_s = \frac{A_v \cdot f_y \cdot d}{s}$$

Spasi sengkang : $s \leq \frac{d}{2}$ atau $s \leq 600$ mm

3. Bila $\phi V_c < V_u < \phi \left(V_c + \frac{1}{3} \sqrt{f'_c} \cdot b_w \cdot d \right)$ atau $\phi V_c < V_u < \phi (3V_c)$

maka diperlukan tulangan geser untuk menahan gaya geser berlebihan :

$$V_{s\text{perlu}} = V_u - \phi V_c, \text{ dengan spasi : } s \leq \frac{d}{2} \text{ atau } s \leq 600 \text{ mm}$$

4. Bila $\phi (3V_c) < V_u < \phi (5V_c)$,

maka diperlukan tulangan geser untuk menahan gaya geser berlebihan :

$$V_{s\text{perlu}} = V_u - \phi V_c, \text{ dengan spasi : } s \leq \frac{d}{4} \text{ atau } s \leq 300 \text{ mm}$$

5. Bila $V_u > \phi (5V_c)$, Pada Kejadian ini balok harus diperbesar.

3.4.7 Penulangan Kolom

a. Analisis Penulangan Lentur dan Aksial Kolom

penulangan lentur dan aksial kolom dianalisis dengan menggunakan diagram interaksi kolom. Tulangan terdistribusi secara simetris dengan memperhatikan keserasian regangan, misalnya : penampang dengan empat lapis tulangan (lihat gambar 3.12) dengan gaya aksial tekan bekerja pada salah satu sumbu utamanya. Jarak masing-masing tulangan terhadap serat beton yang tertekan. d_i dapat ditentukan sebagai berikut (Wahyudi dan Rahim, 1997) :

Untuk lapis pertama $A_{s1}: d_1 = d'$ (3.95)

Kedua $A_{s2}: d_2 = d' + 1.(h-2d')$ (3.96)

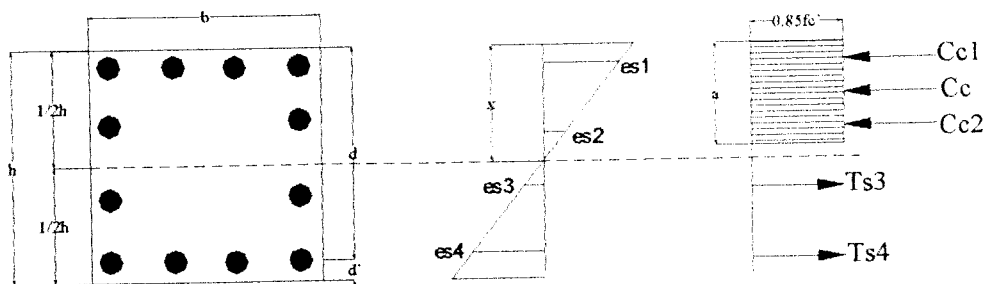
Ketiga $A_{s3}: d_3 = d' + 2.(h-2d')$ (3.97)

Keempat $A_{s4}: d_4 = d' + 3.(h-2d')$ (3.98)

Dengan melihat bentuk persamaan tersebut, dapat dibuat rumus umum untuk jarak tulangan d_i sebagai berikut :

$$d_i = d' + \{(i-1)(h-2d')\} / (N-1) \dots\dots\dots (3.99)$$

dengan : i adalah nomor lapis tulangan, dan N adalah banyaknya garis tulangan,



Gambar 3.14 Penampang dengan tulangan terdistribusi merata pada ke-4 sisinya

Besarnya regangan yang terjadi pada lapis tulangan ke-I, dapat ditetapkan melalui perbandingan segitiga, dengan regangan maksimum pada beton adalah 0,003. dengan demikian untuk tulangan ke-I :

$$\epsilon_{si} = 0,003 \{(x-di)/x\} \dots\dots\dots (3.100)$$

Sebagaimana sebelumnya x adalah jarak sumbu netral terhadap serat terluar. Dengan memperhatikan persamaan tersebut, dapat diketahui bahwa harga ϵ_{si} akan negatif untuk regangan tarik ataupun positif untuk regangan tekan.

Selanjutnya, tegangan pada lapis tulangan ke-I dapat dirumuskan menjadi :

$$f_{si} = \epsilon_{si} \cdot E_s \} \dots\dots\dots (3.101)$$

$$f_{si} = 0,003 \{(x-di)/x\} \cdot 200000 \dots\dots\dots (3.102)$$

Bila :

$$\epsilon_{si} \geq f_y E_s, \text{ maka } f_{si} = f_y \dots\dots\dots (3.103)$$

$$f_y E_s > \epsilon_{si} > -f_y E_s, \text{ maka } f_{si} = \epsilon_{si} E_s \dots\dots\dots (3.104)$$

$$\epsilon_{si} \leq -f_y E_s, \text{ maka } f_{si} = -f_y \dots\dots\dots (3.105)$$

Gaya pada tulangan ke-I, menjadi :

$$C_s = f_{si} \cdot A_{si} \dots\dots\dots (3.106)$$

Untuk gaya desak serat beton :

$$C_c = 0,85 \cdot f_c \cdot a \cdot b \dots\dots\dots (3.107)$$

Dengan mengacu pada Gambar 3.12, dapat disusun persamaan keseimbangan :

$$P_n - C_c - \sum f_{si} \cdot A_{si} = 0 \dots\dots\dots (3.108)$$

$$P_n = 0,85 \cdot f_c \cdot a \cdot b - \sum f_{si} \cdot A_{si} \dots\dots\dots (3.109)$$

Momen terhadap pusat plastisnya adalah :

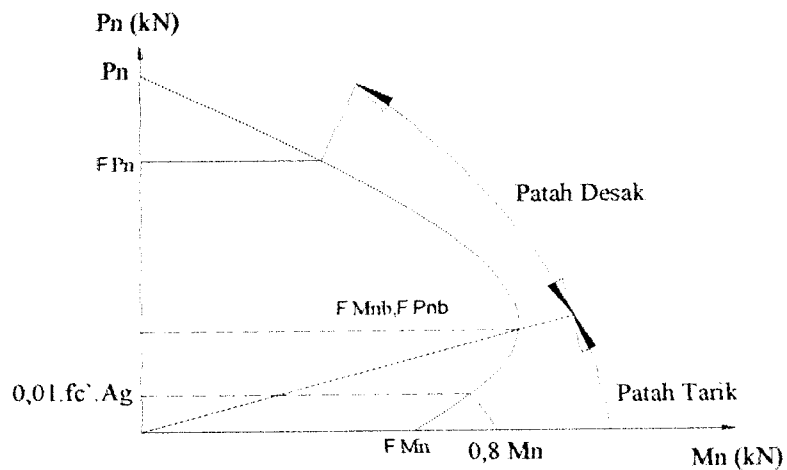
$$M_n^e = C_c \cdot 1/2 \cdot (h-a) + \sum_{i=1}^n f_{si} \cdot A_{si} \cdot (1/2 \cdot h - d_i) \dots\dots\dots (3.110)$$

Perlu diperhatikan bahwa bila :

$$d_i < a, \text{ maka harga } f_{si} = f_{si} - 0,85 \cdot f_c \dots\dots\dots (3.111)$$

$$d_i > a, \text{ maka harga } f_{si} = f_{si} \dots\dots\dots (3.112)$$

Selanjutnya berdasarkan kombinasi antara momen nominal (M_n) yang ada dan gaya aksial nimal (P_n) diwujudkan dalam bentuk diagram, yang dinamakan dengan Diagram Interaksi Kolom seperti gambar dibawah ini :



Gambar 3.15 Diagram Interaksi Pn-Mn

b. Pengaruh Kelangsingan Kolom

Kelangsingan kolom berpengaruh kepada pembesaran momen, syarat menurut SK-SNI-1991, kolom tidak langsing jika :

$$k \cdot l_u / r < 34 - 12 M_{1b} / M_{2b}, \text{ untuk komponen struktur tekan yang ditahan terhadap goyangan ke samping.}$$

$k \cdot l_u / r < 22$, untuk komponen struktur tekan yang tidak ditahan terhadap goyangan ke samping. dengan k adalah factor panjang efektif, l_u adalah panjang bebas kolom tanpa penopang, $r = \sqrt{I_g / A_g}$ adalah jari-jari girasi, M_{1b} dan M_{2b} adalah momen-momen ujung terfaktor pada kolom yang posisinya berlawanan.

Momen M_{2b} adalah momen ujung terfaktor yang lebih besar dan selalu positif, sedangkan momen M_{1b} bernilai negatif apabila komponen kolom terlentur dalam lengkungan ganda, dan positif bila terlentur dalam lengkungan tunggal.

Faktor panjang efektif merupakan fungsi dari factor kekangan ujung Ψ_A dan Ψ_B untuk masing-masing titik ujung atas dan bawah. Kekakuan relative Ψ adalah nilai banding antara jumlah kekakuan kolom dibagi dengan panjang kolom dan jumlah kekakuan balok dibagi dengan panjang balok, yang didefinisikan sebagai (Wang dan Salmon, 1993) :

$$\Psi = \frac{\left(\sum EI_k / i_k\right)}{\left(\sum EI_b / i_b\right)} \dots\dots\dots (3.112)$$

Untuk ujung kolom berupa sendi, nilai $\Psi = \infty$, sedangkan ujung jepit, nilai $\Psi = 0$

Untuk EI_k kekuatan batang kolom boleh ditetapkan sebagai :

$$EI_k = \frac{(E_c \cdot I_g / 2,5)}{(1 + \beta_d)} \dots\dots\dots (3.113)$$

Untuk EI_b kekuatan batang balok boleh ditetapkan sebagai :

$$EI_b = \frac{(E_c \cdot I_g / 5)}{(1 + \beta_d)} \dots\dots\dots (3.114)$$

Dengan : $E_c = 4700 \sqrt{f'_c}$ adalah modulus elastisitas beton, I_g adalah inersia penampang beton, β_d adalah rasio perbandingan momen beban mati terfaktor terhadap momen total terfaktor.

Untuk menetapkan factor panjang efektif kolom k , maka nilai Ψ_A dan Ψ_B diplotkan ke dalam grafik *nomogram* atau *alignment* portal bergoyang.

c. Metode Pembesaran Momen Pada Kolom Langsing

Pada kolom langsing dengan ketentuan $klu < 100$, hitungan kekuatan kolom dilakukan dengan metode pembesaran momen. Perancangan dari kolom tersebut didasarkan atas pembesaran momen yang bekerja sedemikian sehingga kolom tersebut bisa direncanakan sebagai kolom pendek (sudarmoko, 1995)

Pembesaran momen dihitung dengan rumus (SK-SNI, 1991) :

$$M_c = \delta_b M_{2b} + \delta_s M_{2s} \dots\dots\dots (3.115)$$

Dengan : M_c adalah momen berfaktor yang digunakan untuk perencanaan komponen struktur tekan, δ_b adalah factor pembesar untuk momen akibat beban yang tidak menimbulkan goyangan berarti, δ_s adalah factor pembesar untuk momen akibat beban yang menimbulkan goyangan, M_{2b} adalah momen terfaktor akibat beban yang tidak menimbulkan goyangan, dan M_{2s} adalah momen terfaktor akibat beban yang menimbulkan goyangan.

Factor δ_b dan δ_s adalah pembesar momen yang secara empiris dapat ditentukan sebagai berikut :

$$\delta_b = \frac{C_m}{1 - \frac{P_u}{\phi P_c}} \geq 1,0 \dots\dots\dots (3.116)$$

$$\delta_s = \frac{1}{1 - \frac{\sum P_u}{\phi \sum P_c}} \geq 1,0 \dots\dots\dots (3.117)$$

dimana P_c adalah beban tekuk Euler,

$$P_c = \frac{\Pi^2 EI}{(kL_u)^2} \dots\dots\dots (3.118)$$

Dengan : P_u adalah beban rencana aksial rencana terfaktor, $\sum P_u$ dan $\sum P_c$ adalah jumlah untuk semua kolom dalam satu tingkat, C_m adalah factor koreksi seperti ditentukan berikut ini :

Untuk komponen struktur portal ditopang tertahan ke arah samping (berpangku) dan tanpa beban transversal pada dukungan,

$$C_m = 0,60 + 0,40 (M_{1b}/M_{2b}) \geq 0,40 \dots\dots\dots (3.119)$$

Untuk komponen struktur portal tanpa pengaku, $C_m = 1$

d. Kontrol Kapasitas kolom Dengan persamaan Whitney

Dari hasil analisis perhitungan kolom didapat gaya aksial serta momen-momen akibat pembesaran, kemudian hasil-hasil perhitungan diplotkan ke dalam Diagram Interaksi Kolom Pn-Mn.

Bila $e > e_b$,

Maka control kapasitas kolom dengan rumes Whitney kondisi keruntuhan tarik.

Bila $e < e_b$,

Maka control kapasitas kolom dengan rumus Whitney kondisi keruntuhan tekan.

Dengan e adalah eksentrisitas yang terjadi, e_b adalah eksentrisitas pada kondisi seimbang.

Control kapasitas kolom terhadap keruntuhan tarik dengan keseimbangan momen diperhitungkan terhadap titik berat tulangan tarik, dengan demikian eksentrisitas diperhitungkan sebagai :

$$e' = \left[e + \left(d - \frac{h}{2} \right) \right] \dots\dots\dots (3.119)$$

dengan e' adalah eksentrisitas gaya terhadap titik berat tulangan tarik.

Kapasitas kolom terhadap keruntuhan tarik ditentukan dari,

$$\Phi P_n = \Phi \cdot 0,85 \cdot f_c \cdot b \cdot d \cdot \left[\left\{ 1 - \frac{e'}{d} + \sqrt{\left\{ \left(1 - \frac{e'}{d} \right)^2 + 2 \cdot m \cdot \rho \cdot \left(1 - \frac{d'}{d} \right) \right\}} \right\} \right] > P_u \quad (3.120)$$

Sedangkan kapasitas kolom terhadap keruntuhan tekan ditentukan dengan cara,

$$\Phi P_n = \frac{A_s \cdot f_y}{\frac{e}{(d-d')} + 0,5} + \frac{b \cdot h \cdot f_c}{\frac{3 \cdot h \cdot e}{d^2} + 1,18} > P_u \quad \dots\dots\dots (3.121)$$

$$\Phi = 0,65$$

e. Penulangan Geser Kolom

Penulangan geser kolom menurut SK-SNI T-15-1991-03 dibagi dalam dua arah yaitu dalam daerah l_o dan diluar l_o . Daerah yang ditinjau diaman l_o tidak boleh kurang dari :

$$\diamond l_o \geq h, \text{ bila } N_{u,k} \leq 0,3 \cdot A_g \cdot f_c \quad \dots\dots\dots (3.122)$$

$$\diamond l_o \geq 1,5 \cdot h, \text{ bila } N_{u,k} \leq 0,3 \cdot A_g \cdot f_c \quad \dots\dots\dots (3.123)$$

$$\diamond 1/6 \text{ bentang bersih kolom} \quad \dots\dots\dots (3.124)$$

$$\diamond 450 \text{ mm} \quad \dots\dots\dots (3.125)$$

➤ penulangan geser kolom dengan daktilitas penuh

1. Penulangan Geser Kolom dengan Daktilitas Penuh

$$V_{u,k} / \Phi \leq V_{s,k} \dots\dots\dots (3.125)$$

$$V_{s,k} = (A_v f_y d) / s \dots\dots\dots (3.126)$$

Dengan : $V_{u,k}$ adalah gaya geser rencana kolom, $\Phi = 0,6$. A_v adalah luas penampang tulangan sengkang, f_y adalah tegangan ijin leleh baja, d adalah tinggi efektif kolom, dan s adalah jarak tualngan geser.

Tulangan geser kolom harus dipasang pada daerah l_o dengan jarak maksimum (SK-SNI T-15-1991-03).

- ❖ $\frac{1}{4}$ dimensi komponen struktur terkecil
- ❖ 8 kali diameter tulangan longitudinal
- ❖ 100 mm

2. Penulangan Geser daerah diluar l_o

$$V_{u,k} / \Phi \leq V_c + V_{s,k} \dots\dots\dots (3.127)$$

Dengan gaya geser yang ditahan beton :

$$V_c = \left[1 + \frac{N_u}{14A_g} \right] \frac{\sqrt{f_c}}{6} b_u d \dots\dots\dots (3.128)$$

Dengan : N_u adalah gaya aksial yang terjadi pada kolom yang ditinjau, A_g adalah luas penampang kolom, dan b_u adalah lebar kolom terkecil.

Tulangan geser kolom harus dipasang pada daerah di luar l_o dengan jarak maksimum (SK-SNI T-15-1991-03).

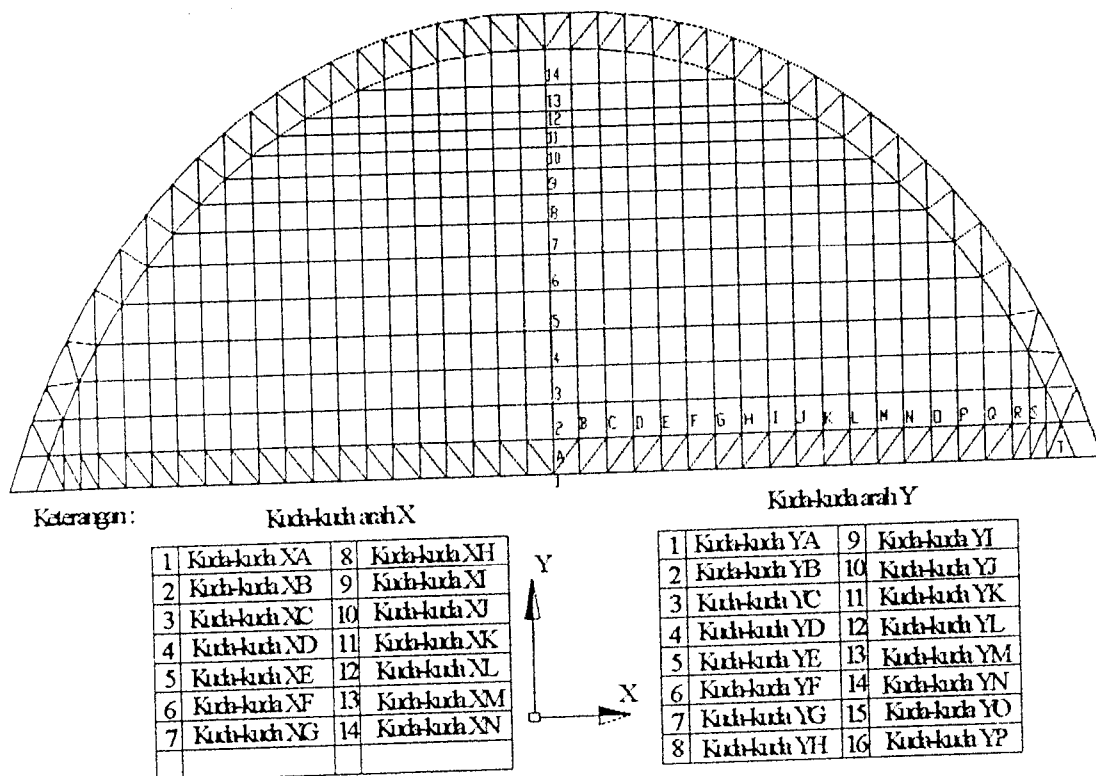
- ❖ 200 mm.

BAB IV

PERENCANAAN STRUKTUR

4.1 Rangka Atap Kuda-kuda Baja

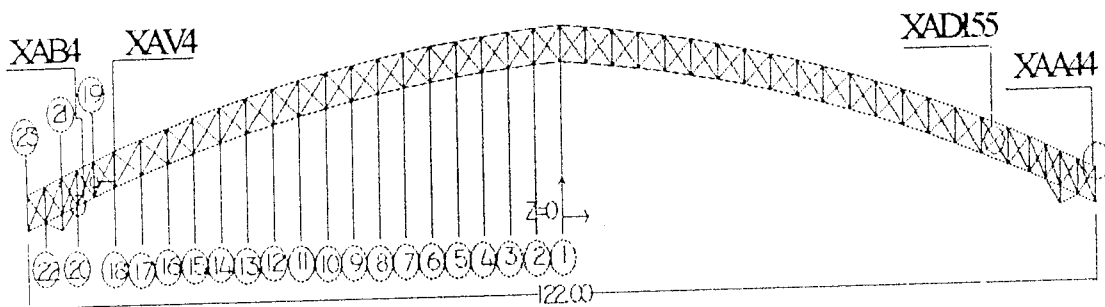
Pada perencanaan struktur atap ini, bentuk dari suatu struktur atap tersebut adalah berbentuk elips atau setengah lingkaran yang terdiri dari beberapa kuda-kuda arah X dan arah Y, dimana fungsi atap itu sendiri adalah untuk menutup suatu konstruksi bangunan stadion di atasnya, sedangkan untuk lebih jelasnya, bentuk dari pada kuda-kuda baja secara keseluruhan dapat dilihat pada Gambar 4.1 yaitu gambar Denah Tampak Atas kuda-kuda, seperti terlihat dibawah ini :



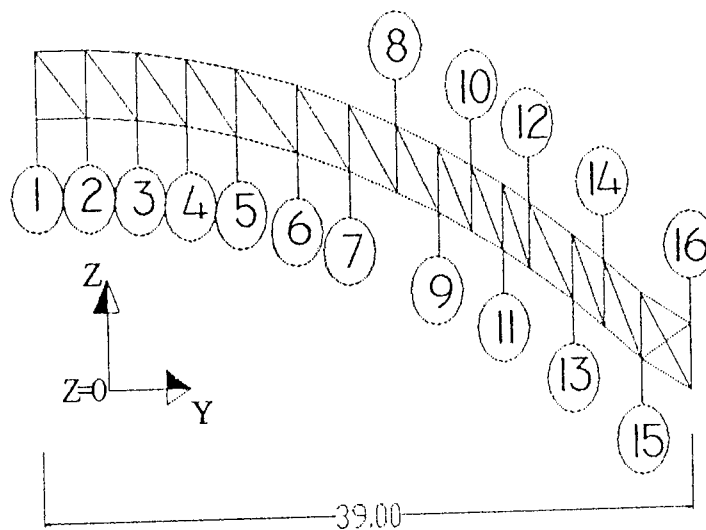
Gambar 4.1 Denah Tampak Atas Kuda-kuda

4.1.1 Data Kontruksi Rangka Atap

Sebagai contoh data untuk perhitungan, disini diambil salah satu contoh kuda-kuda yang mempunyai nilai bentang terbesar yang berdasar dari data SAP 2000, yang mana kuda-kuda tersebut terdiri dari kuda-kuda arah X dan arah Y (**Gambar 4.2.b**), sedangkan untuk contoh perhitungan, disini diambil kuda-kuda arah XA dengan elevasi $Y=0$, seperti yang terlihat pada **Gambar. 4.2.a** Gambar Bentang Memanjang KK1 atau (XA) Arah XA/Y=0.



Gambar 4.2.a Gambar Bentang Memanjang KK1 atau (XA) Arah X/Y=0



Gambar 4.2.b Gambar Bentang memanjang Kuda-kuda Arah Y/YA

Adapun data dari kuda-kuda tersebut (KK1), adalah sebagai berikut:

- Panjang bentang arah x (L_x) = 122 M
- Panjang bentang arah y (L_y) = 39 M

Mutu baja Profil

Tegangan Leleh (F_y) = 36 Ksi \approx 240 Mpa

Kuat tarik (F_u) = 58 Ksi \approx 400 Mpa

4.1.2 Perencanaan Kuda – Kuda

4.1.2.1 Pembebanan Kuda-kuda

- Berat Profil kuda-kuda = 7850 Kg/m³
- Berat penutup atap (Polycarbonat) = 10 Kg/m²
- Beban hidup = 100 Kg/m²

4.1.2.1 Perhitungan Rangka Kuda-kuda

Analisis rangka menggunakan program computer yaitu SAP 2000 yang dapat dilihat pada lampiran 1, dan beban rencana kuda-kuda dapat dilihat dalam tabel.

Adapun asumsi dari profil baja tersebut digunakan :

$$\text{Modulus Elastisitas (Es)} = 2,1 \cdot 10^{10} \text{ Kg/m}^2 = 2,1 \cdot 10^6 \text{ Kg/cm}^2$$

$$\text{dan } f_y = 240 \text{ mpa}$$

sedangkan Asumsi profil digunakan pada KK1 adalah sebagai berikut:

- Batang Atas = P4

$$A_g = 3,17 \text{ In}^2 = 2045,248 \text{ mm}^2$$

$$I_x = I_y = 7,23 \text{ In}^4 = 3.009.726,379 \text{ mm}^4$$

$$r = 1,51 \text{ in} = 38,754 \text{ mm}$$

- Batang Vertikal = PXX5

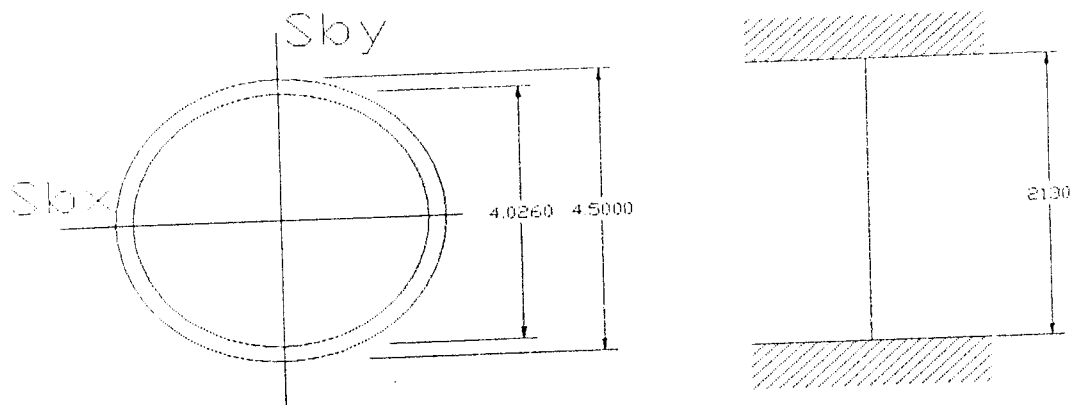
$$A_g = 11,3 \text{ In}^2 = 7290,308 \text{ mm}^2$$

$$I_x = I_y = 33,6 \text{ In}^4 = 13.985.375,27 \text{ mm}^4$$

$$r = 2,06 \text{ in} = 43,799 \text{ mm}$$

- Batang Diagonal = PXX5

$$A_g = 11,3 \text{ In}^2 = 7290,308 \text{ mm}^2$$



Gambar 4.3 Penampang Profil P4

$$\frac{l_k}{r} = \frac{2130}{38,354} = 55,5353 < 200$$

Aman

- Parameter Kelangsingan Batang tekan

$$\lambda_c = \frac{1}{\pi} \frac{l_k}{r} \sqrt{\frac{f_y}{E}}$$

$$= \frac{1}{\pi} \frac{2130}{38,354} \sqrt{\frac{240}{2 \cdot 10^5}} = 0,6124 ; (0,25 < \lambda_c < 1,2)$$

$$\text{maka } \omega = \frac{1,43}{(1,6 - 0,6 \cdot 0,6124)} = 1,084$$

- Kuat Tekan Nominal

$$\phi N_n = \phi \cdot A_g \cdot \left(\frac{f_y}{\omega} \right) \cdot 10^{-3}$$

$$= 0,85 \cdot 2045,284 \cdot \left(\frac{240}{1,084} \right) \cdot 10^{-3} = 384,9058 \text{ kN}$$

$$(\phi N_n = 384,9058 \text{ kN}) > (N_u = 97,928 \text{ kN})$$

Aman

b. Perencanaan Batang tarik (Frame XAA41)

- Gaya tarik Maksimum ; $N_u = 50,486 \text{ KN}$

$$L = 2.06 \text{ m}$$

$$f_y = 240 \text{ MPa} = 240 \cdot 10^3 \text{ KN/m}^2$$

Dicoba Profil : P4

$$A_g = 3,17 \text{ in}^2 = 2045,284 \text{ mm}^2$$

$$I_x = I_y = 7,23 \text{ in}^4 = 3.009.726,379 \text{ mm}^4$$

$$r = 1.51 \text{ in} = 38,354 \text{ mm}$$

- Cek Angka perbandingan Kelangsingan batang Tarik

$$\frac{L}{r} = \frac{2060}{38.354} = 53.7102 < 240$$

Aman

- Kuat tarik Nominal batang tarik

$$\phi N_n = \phi A_g \cdot 240 \cdot 10^{-3}$$

$$= 0.90 \cdot 2045,284 \cdot 240 \cdot 10^{-3} = 441.7813 \text{ kN}$$

$$(\phi N_n = 441.7813 \text{ kN}) > (N_u = 50,486 \text{ kN})$$

Aman

2. Batang Vertikal

Diambil contoh Frame / Batang XAV4, (lihat pada **Gambar 4.2** diatas)

a. Perencanaan Batang Desak

Gaya Desak Maximum, dari data SAP 2000 didapat $N_u = -77,177 \text{ KN}$.

$$L = 3 \text{ m}$$

$$f_y = 240 \text{ MPa} = 240 \cdot 10^3 \text{ KN/m}^2$$

Dicoba Profil : PXX5 (**Gambar 4.4** Penampang profil PXX5)

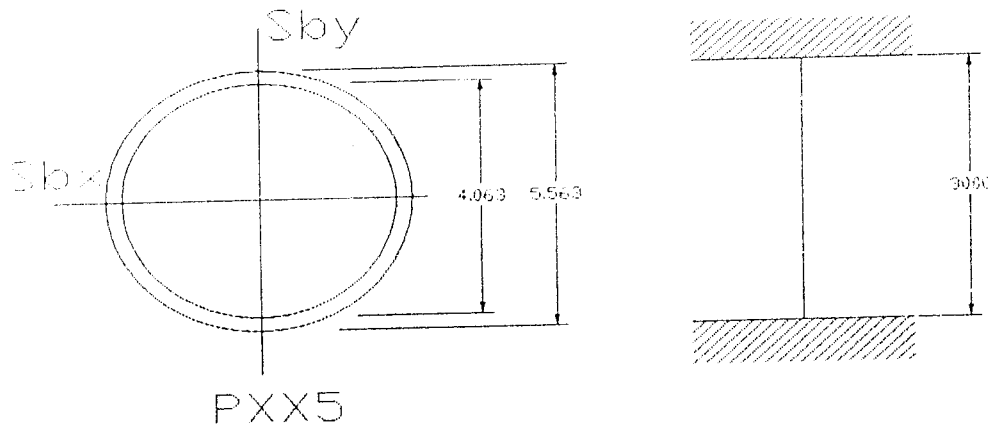
$$A_g = 11.3 \text{ in}^2 = 7290.308 \text{ mm}^2$$

$$I_x = I_y = 33.6 \text{ in}^4 = 13.985.375,27 \text{ mm}^4$$

$$r = 2.06 \text{ in} = 43.799 \text{ mm}$$

- Cek Perbandingan Kelangsingan batang tekan : $\frac{l_k}{r} < 200$

$$L_k = k \cdot L = 1 \cdot 3000 = 3000 \text{ mm}$$



Gambar 4.4 Penampang Profil PXX5

$$\frac{l_k}{r} = \frac{3000}{43.799} = 68.4947 < 200$$

Aman

- Parameter Kelangsingan Batang tekan

$$\lambda_c = \frac{1}{\pi} \frac{l_k}{r} \sqrt{\frac{f_y}{E}}$$

$$= \frac{1}{\pi} \frac{3000}{43.799} \sqrt{\frac{240}{2.10^5}} = 0,7553 ; (0,25 < \lambda_c < 1,2)$$

$$\text{maka } \omega = \frac{1,43}{(1,6 - 0,6 \cdot 0,7553)} = 1,2469$$

- Kuat Tekan Nominal

$$\phi N_n = \phi \cdot A_g \cdot \left(\frac{f_y}{\omega} \right) \cdot 10^{-3}$$

$$= 0.85 \cdot 7.290,308 \cdot \left(\frac{240}{1,2469} \right) \cdot 10^{-3} = 1.192,7346 \text{ kN}$$

$$(\phi N_n = 1752.72 \text{ kN}) > (N_u = 77,177 \text{ kN})$$

Aman

c. Perencanaan Batang tarik (Frame XAA43)

- Gaya tarik Maksimum ; $N_u = 361,80 \text{ kN}$.

$$L = 3 \text{ m}$$

$$f_y = 240 \text{ MPa} = 240 \cdot 10^3 \text{ KN/m}^2$$

Dicoba Profil : PXX5

$$A_g = 11.3 \text{ in}^2 = 7290.308 \text{ mm}^2$$

$$I_x = I_y = 33.6 \text{ in}^4 = 13.985.375,27 \text{ mm}^4$$

$$r = 2.06 \text{ in} = 43.799 \text{ mm}$$

- Cek Angka perbandingan Kelangsingan batang Tarik

$$\frac{L}{r} = \frac{3000}{43.799} = 68.4947 < 240$$

Aman

- Kuat tarik Nominal batang tarik

$$\phi N_n = \phi \cdot A_g \cdot 240 \cdot 10^{-3}$$

$$= 0.90 \cdot 7290,308 \cdot 240 \cdot 10^{-3} = 1574,7065 \text{ kN}$$

$$(\phi N_n = 1574,7065 \text{ kN}) > (N_u = 361,80 \text{ kN})$$

Aman

3. Batang Diagonal

Diambil contoh Frame / batang XAD155, (lihat pada **Gambar 4.1** diatas)

a. Perencanaan Batang Desak

Gaya Desak Maximum, $N_u = -386,386 \text{ KN}$.

$$L = 2.48 \text{ m}$$

$$f_y = 240 \text{ MPa} = 240 \cdot 10^3 \text{ KN/m}^2$$

Dicoba Profil : PXX5 (**Gambar 4.5** Penampang Profil PXX5)

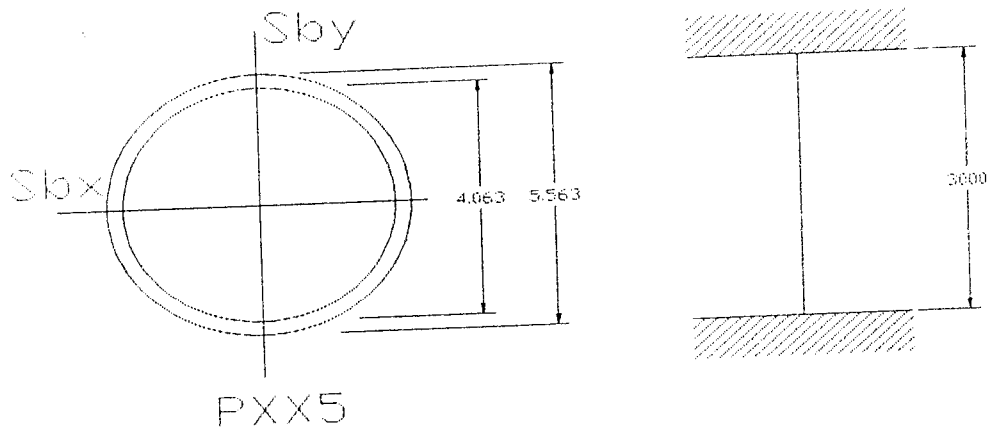
$$A_g = 11.3 \text{ in}^2 = 7290.308 \text{ mm}^2$$

$$I_x = I_y = 33.6 \text{ in}^4 = 13.985.375,27 \text{ mm}^4$$

$$r = 2.06 \text{ in} = 43.799 \text{ mm}$$

- Cek Perbandingan Kelangsingan batang tekan : $\frac{l_k}{r} < 200$

$$L_k = k \cdot L = 1 \cdot 2480 = 2480 \text{ mm}$$



Gambar 4.5 Penampang Profil PXX5

$$\frac{l_k}{r} = \frac{2480}{43.799} = 56,6223 < 200$$

Aman

- Parameter Kelangsingan Batang tekan

$$\lambda_c = \frac{1}{\pi} \frac{l_k}{r} \sqrt{\frac{f_y}{E}}$$

$$= \frac{1}{\pi} \frac{2480}{43.799} \sqrt{\frac{240}{2.10^5}} = 0,6244 ; (0,25 < \lambda_c < 1,2)$$

$$\text{maka } \omega = \frac{1,43}{(1,6 - 0,6 \cdot 0,6244)} = 1,1670$$

- Kuat Tekan Nominal

$$\Phi N_n = \phi \cdot A_g \cdot \left(\frac{f_y}{\omega} \right) \cdot 10^{-3}$$

$$= 0.85 \cdot 7290,308 \cdot \left(\frac{240}{1,1670} \right) \cdot 10^{-3} = 1274,4251 \text{ kN}$$

$$(\phi N_n = 1274,4251 \text{ kN}) > (N_u = 386,386 \text{ kN}) \quad \text{Aman}$$

B. Perencanaan Batang tarik (Frame XAD8)

- Gaya tarik Maksimum ; $N_u = 240,827 \text{ kN}$.

$$L = 2,11 \text{ m}$$

$$f_y = 240 \text{ MPa} = 240 \cdot 10^3 \text{ KN/m}^2$$

Dicoba Profil : PXX5

$$A_g = 11.3 \text{ in}^2 = 7290.308 \text{ mm}^2$$

$$I_x = I_y = 33.6 \text{ in}^4 = 13.985.375,27 \text{ mm}^4$$

$$r = 2.06 \text{ in} = 43.799 \text{ mm}$$

Cek Angka perbandingan Kelangsingan batang Tarik

$$\frac{L}{r} = \frac{2100}{43.799} = 47,9463 < 240$$

Aman

- Kuat tarik Nominal batang tarik

$$\phi N_n = \phi \cdot A_g \cdot 240 \cdot 10^{-3}$$

$$= 0.90 \cdot 7290,308 \cdot 240 \cdot 10^{-3} = 1574,7065 \text{ kN}$$

$$(\phi N_n = 1574,7065 \text{ kN}) > (N_u = 240,827 \text{ kN}) \quad \text{Aman}$$

4. Batang Bawah

Diambil contoh Frame / Batang XAB4, (lihat pada **Gambar 4.1** diatas)

a. Perencanaan Batang Desak

Gaya Desak Maximum, $N_u = -2195,751 \text{ kN}$.

$$L = 2.05 \text{ m}$$

$$f_y = 240 \text{ MPa} = 240 \cdot 10^3 \text{ KN/m}^2$$

Dicoba Profil : PXX8 (**Gambar 4.6** Penampang Profil PXX8)

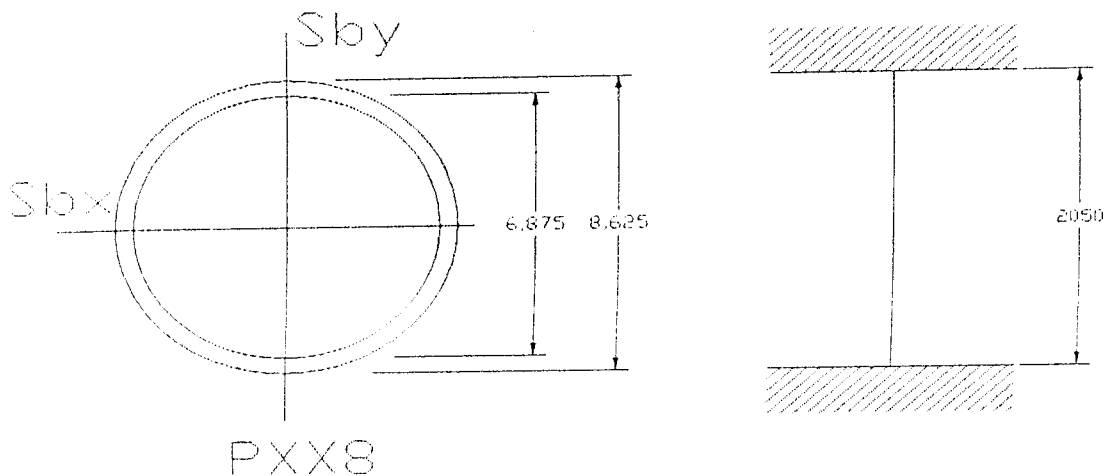
$$A_g = 21,3 \text{ in}^2 = 13741,908 \text{ mm}^2$$

$$I_x = I_y = 162 \text{ in}^4 = 67429490,9 \text{ mm}^4$$

$$r = 2,76 \text{ in} = 70,049 \text{ mm}$$

- Cek Perbandingan Kelangsingan batang tekan : $\frac{l_k}{r} < 200$

$$L_k = k \cdot U = 1 \cdot 2050 = 2050 \text{ mm}$$



Gambar 4.6 Penampang Profil PXX8

$$\frac{l_k}{r} = \frac{2050}{70,049} = 29,2652 < 200$$

Aman

- Parameter Kelangsingan Batang tekan

$$\lambda_c = \frac{1}{\pi} \frac{l_k}{r} \sqrt{\frac{f_y}{E}}$$

$$= \frac{1}{\pi} \frac{2050}{70,049} \sqrt{\frac{240}{2 \cdot 10^5}} = 0,3227 ; (0,25 < \lambda_c < 1,2)$$

$$\text{maka } \phi = \frac{1,43}{(1,6 - 0,6 \cdot 0,3227)} = 1,0168$$

- Kuat Tekan Nominal

$$\begin{aligned}\Phi N_n &= \phi \cdot A_g \cdot \left(\frac{f_y}{\omega} \right) \cdot 10^{-3} \\ &= 0.85 \cdot 13741,908 \cdot \left(\frac{240}{1,0168} \right) \cdot 10^{-3} = 2757,0508 \text{ kN}\end{aligned}$$

$$(\Phi N_n = 2757,0508 \text{ kN}) > (N_u = 2195,751 \text{ kN})$$

Aman

- C. Perencanaan Batang tarik (Frame XAB20)

- Gaya tarik Maksimum ; $N_u = 167,676 \text{ kN}$.

$$L = 3,01 \text{ m}$$

$$f_y = 240 \text{ MPa} = 240 \cdot 10^3 \text{ KN/m}^2$$

Dicoba Profil : PXX8

$$A_g = 21,3 \text{ in}^2 = 13741,908 \text{ mm}^2$$

$$I_x = I_y = 162 \text{ in}^4 = 67429490,9 \text{ mm}^4$$

$$r = 2.76 \text{ in} = 70,049 \text{ mm}$$

Cek Angka perbandingan Kelangsingan batang Tarik

$$\frac{L}{r} = \frac{3010}{70,049} = 42,9699 < 240$$

Aman

- Kuat tarik Nominal batang tarik

$$\begin{aligned}\Phi N_n &= \phi \cdot A_g \cdot 240 \cdot 10^{-3} \\ &= 0.90 \cdot 13741,908 \cdot 240 \cdot 10^{-3} = 2968,2521 \text{ kN}\end{aligned}$$

$$(\Phi N_n = 2968,2521 \text{ kN}) > (N_u = 167,676 \text{ kN})$$

Aman

4.1.4 Perencanaan Sambungan

Untuk perencanaan sambungan konstruksi atap baja direncanakan dengan menggunakan sambungan Las.

Data Perencanaan:

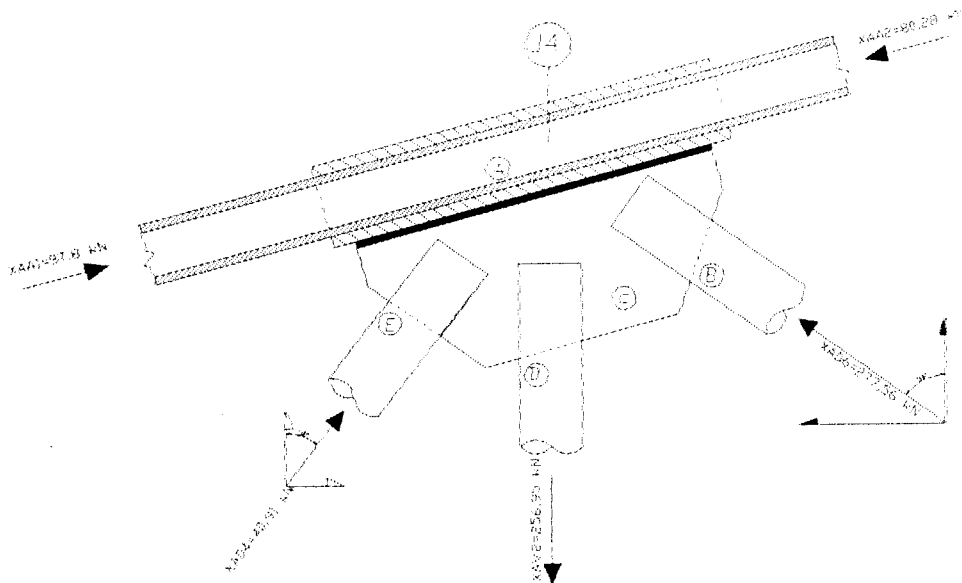
Mutu baja Profil

Tegangan Leleh (F_y) = 36 Ksi \approx 240 Mpa

Kuat tarik (F_u) = 58 Ksi \approx 400 Mpa

Las digunakan Proses SAW (Proses busur nyala terbenam)

berikut contoh perhitungan untuk sambungan Las pada KK1 pada join J4 (join atas)



Sambungan B-C

Dari AISC-1.17.2 dan 1.17.3 diperoleh batasan:

$$\text{Ukuran Maksimum} : \frac{5}{8} - \frac{1}{16} = \frac{9}{16} \text{ inci} = 14,28 \text{ mm}$$

$$\text{Ukuran minimum} : \frac{1}{4} \text{ inci} = 6,35 \text{ mm}$$

Digunakan las sudut $\frac{3}{8}$ " (9,5 mm), dan digunakan proses SAW.

$$\text{Tebal efektif} = 0,707(9,525) = 6,734 \text{ mm}$$

Dari tabel 5.12.1, digunakan kombinasi elektroda fluks F7X-EXXX.

Kapasitas las sudut 9,5 mm pemilimeter panjang adalah

$$\begin{aligned} R_w &= (\text{tebal efektif}) \cdot (\text{Tegangan ijin}) \\ &= 6,734 \text{ mm} \cdot 140 \text{ mpa} = 942,76 \text{ N/mm} \dots\dots\dots (\text{menentukan}) \end{aligned}$$

Plat $\frac{5}{8}$ inci (15,875 mm) tidak dapat dianggap mampu memikul tegangan geser

lebih dari $0,4 F_y$ jadi

$$\begin{aligned} R_{wmak} &= 0,4 F_y t = 0,4 \cdot 240 \cdot 15,875 \text{ mm} \\ &= 1524 \text{ N/mm} \end{aligned}$$

Panjang L_w yang diperlukan adalah

$$L_w = \frac{277,5626 \cdot 10^3 \text{ N}}{942,76} = 294,44 \text{ mm, digunakan las sudut } 9,5 \text{ mm,}$$

panjang 15 cm disetiap sisi panjang .

Sambungan D-C

Dari AISC-1.17.2 dan 1.17.3 diperoleh batasan:

$$\text{Ukuran Maksimum} : \frac{5}{8} - \frac{1}{16} = \frac{9}{16} \text{ inci} = 14,28 \text{ mm}$$

$$\text{Ukuran minimum} : \frac{1}{4} \text{ inci} = 6,35 \text{ mm}$$

Digunakan las sudut $\frac{3}{8}$ " (9,5 mm), dan digunakan proses SAW.

$$\text{Tebal efektif} = 0,707(9,525) = 6,734 \text{ mm}$$

Dari tabel 5.12.1, digunakan kombinasi elektroda fluks F7X-EXXX.

Kapasitas las sudut 9,5 mm pemilimeter panjang adalah

$$\begin{aligned} R_w &= (\text{tebal efektif}) \cdot (\text{Tegangan ijin}) \\ &= 6,734 \text{ mm} \cdot 140 \text{ mpa} = 942,76 \text{ N/mm} \dots\dots\dots(\text{menentukan}) \end{aligned}$$

Plat $\frac{5}{8}$ inci (15,875 mm) tidak dapat dianggap mampu memikul tegangan geser

lebih dari $0,4 F_y$ jadi

$$\begin{aligned} R_{w\text{mak}} &= 0,4 F_y t = 0,4 \cdot 240 \cdot 15,875 \text{ mm} \\ &= 1524 \text{ N/mm} \end{aligned}$$

Panjang L_w yang diperlukan adalah

$$L_w = \frac{256,955 \cdot 10^3 \text{ N}}{942,76} = 272,55 \text{ mm, digunakan las sudut } 9,5 \text{ mm, panjang}$$

15 cm disetiap sisi panjang .

Sambungan E-C

Dari AISC-1.17.2 dan 1.17.3 diperoleh batasan:

$$\text{Ukuran Maksimum} : \frac{5}{8} - \frac{1}{16} = \frac{9}{16} \text{ inci} = 14,28 \text{ mm}$$

$$\text{Ukuran minimum} : \frac{1}{4} \text{ inci} = 6,35 \text{ mm}$$

Digunakan las sudut $\frac{3}{8}$ " (9,5 mm), dan digunakan proses SAW.

$$\text{Tebal efektif} = 0,707(9,525) = 6,734 \text{ mm}$$

Dari tabel 5.12.1, digunakan kombinasi elektroda fluks F7X-EXXX.

Kapasitas las sudut 9,5 mm pemilimeter panjang adalah

$$\begin{aligned} R_w &= (\text{tebal efektif}) \cdot (\text{Tegangan ijin}) \\ &= 6,734 \text{ mm} \cdot 140 \text{ mpa} = 942,76 \text{ N/mm} \dots\dots\dots(\text{menentukan}) \end{aligned}$$

Plat $\frac{5}{8}$ inci (15,875 mm) tidak dapat dianggap mampu memikul tegangan geser

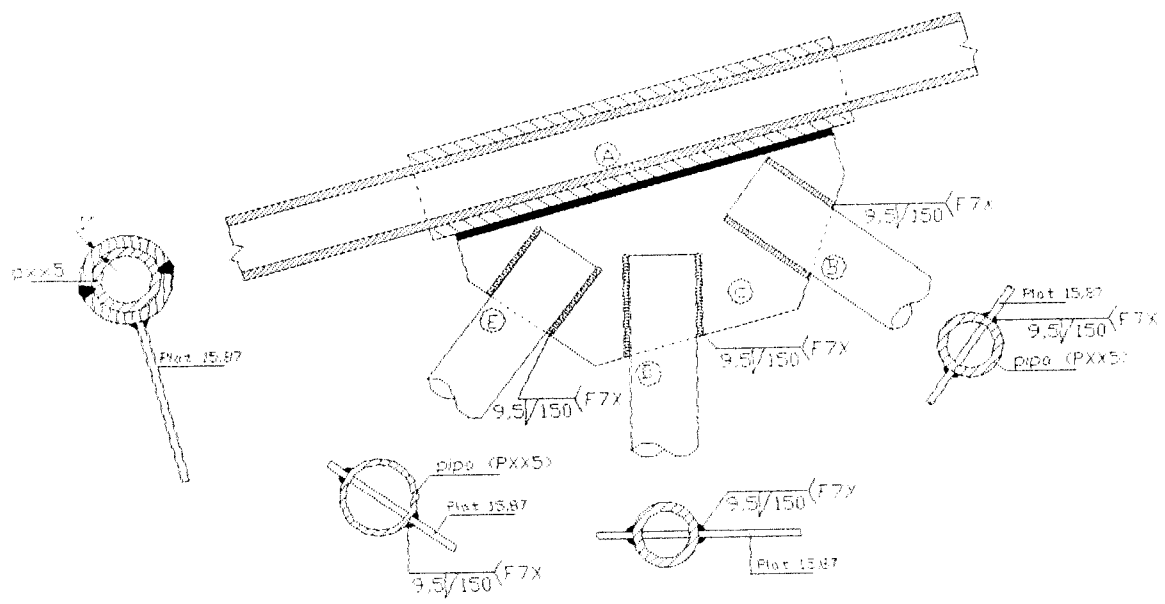
lebih dari $0,4 F_y$ jadi

$$\begin{aligned} R_{w\text{mak}} &= 0,4 F_y t = 0,4 \cdot 240 \cdot 15,875 \text{ mm} \\ &= 1524 \text{ N/mm} \end{aligned}$$

Panjang L_w yang diperlukan adalah

$$L_w = \frac{256,955 \cdot 10^3 \text{ N}}{942,76} = 272,55 \text{ mm, digunakan las sudut 9,5 mm, panjang}$$

15 cm disetiap sisi panjang .

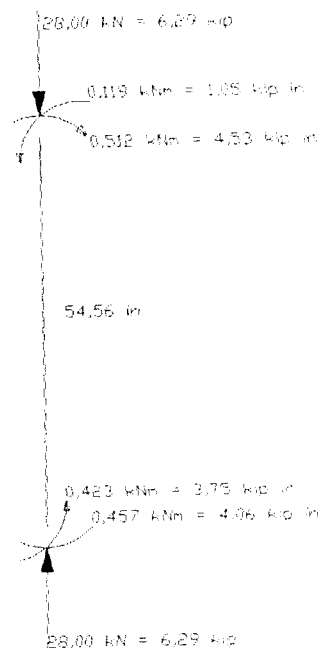


4.1.5 Perhitungan Momen

Dalam perhitungan momen ini, adalah ditujukan untuk atau Profil yang menumpu sebagai tumpuan kuda-kuda, sedangkan Profil yang akan dipilih adalah dicoba Profil P4 dengan batang momen max-nya XCD156.

$$A_{\text{total}} = 20,452 \text{ cm}^2 = 3,17 \text{ in}^2$$

$$S = 52,657 \text{ cm}^3 = 3,213 \text{ in}^3$$



❖ Sebagai Kolom

$$\frac{K_X \cdot L_X}{r_X} = \frac{K_Y \cdot L_Y}{r_Y} = \frac{1 \cdot 54,56}{1,51} = 35,904$$

$$C_c = \sqrt{\frac{2 \cdot \pi^2 \cdot E}{F_y}} = \sqrt{\frac{2 \cdot \pi^2 \cdot 29000}{36}} = 126,099$$

$$\left(\frac{K \cdot L}{r} \right) < C_c \quad (\text{kolom Pendek})$$

$$F_s = \frac{5}{3} + \frac{3}{8} \cdot \frac{(Kl/r)}{C_c} - \frac{1}{8} \cdot \frac{(Kl/r)^3}{C_c^3} = \frac{5}{3} + \frac{3}{8} \cdot \frac{(35,904)}{126,099} - \frac{1}{8} \cdot \frac{(35,904)^3}{126,099^3} = 1,77$$

$$F_a = \frac{F_y}{F_s} \left(1 - 0,5 \left(\frac{Kl/r}{C_c} \right)^2 \right) = \frac{36}{1,77} \left[1 - 0,5 \left(\frac{35,904}{126,099} \right)^2 \right] = 19,4 \text{ Ksi}$$

$$f_a = \frac{P}{A} = \frac{6.2965}{3,213} = 1,95 \text{ Ksi}$$

$$\frac{f_a}{F_a} = \frac{1,95}{19,4} = 0,101 < 1 \dots\dots\dots \text{OK}$$

❖ Sebagai Balok

Menentukan tegangan ijin Lentur (F_b)

$$L_c = \frac{76 \cdot bf}{\sqrt{36}} = \frac{76 \cdot 10.236 \text{ in}}{\sqrt{36}} = 129,658 \text{ in}$$

$$L = 54,56 \text{ in} < L_c = 129,65 \text{ cm} \rightarrow F_b = 0,66 F_y = 23,76 \text{ Ksi} = 1670,46$$

$$F_{bx} = 0,60 F_y = 22 \text{ Ksi}$$

$$F_{by} = 0,75 F_y = 27 \text{ Ksi}$$

Pembesaran Momen x

$$\frac{K_b \cdot L_b}{r_b} = \frac{K_x \cdot L_x}{r_x} = \frac{1 \cdot 54,56}{1,51} = 35,904$$

$$F'_{ex} = \frac{\pi^2 E}{1,92 \cdot \left(\frac{K_b \cdot L_b}{r_b} \right)^2} \rightarrow F'_{ex} = \frac{\pi^2 \cdot 29000}{23 \cdot (35,904)^2} = 9,65 \text{ Ksi}$$

$$f_{bx} = \frac{M}{S_x} = \frac{4,06 \text{ Kip in}}{3,213 \text{ in}^3} = 1,26 \text{ Ksi}$$

$$f_a = \frac{P}{A} = \frac{6.2965}{3,213} = 1,95 \text{ Ksi}$$

$$\frac{fa}{Fa} = \frac{1,95}{19,4} = 0,101 < 1$$

Pembesaran Momen y

$$\frac{K_b \cdot L_b}{r_b} = \frac{K_x \cdot L_x}{r_x} = \frac{1 \cdot 54,56}{1,51} = 35,904$$

$$F'_{ey} = \frac{\pi^2 E}{1,92 \cdot \left(\frac{K_b \cdot L_b}{r_b} \right)^2} \rightarrow F'_{ey} = \frac{\pi^2 \cdot 29000}{23 \cdot (35,904)^2} = 9,65 \text{ Ksi}$$

$$fb_x = \frac{M}{S_x} = \frac{3,75 \text{ Kipin}}{3,213 \text{ in}^3} = 1,167 \text{ ksi}$$

$$\frac{fa}{Fa} + \frac{fb_x}{Fb_x} + \frac{fb_y}{Fb_y} \leq 1$$

$$\frac{1,95}{19,4} + \frac{1,26}{22} + \frac{1,167}{27} = 0,201 \leq 1$$

Untuk selanjutnya, contoh dan perhitungan kuda-kuda yang lain baik kuda-kuda arah X maupun arah Y pada setiap perhitungan Frame atau Profil dapat dilihat pada Lampiran tabel- tabel.

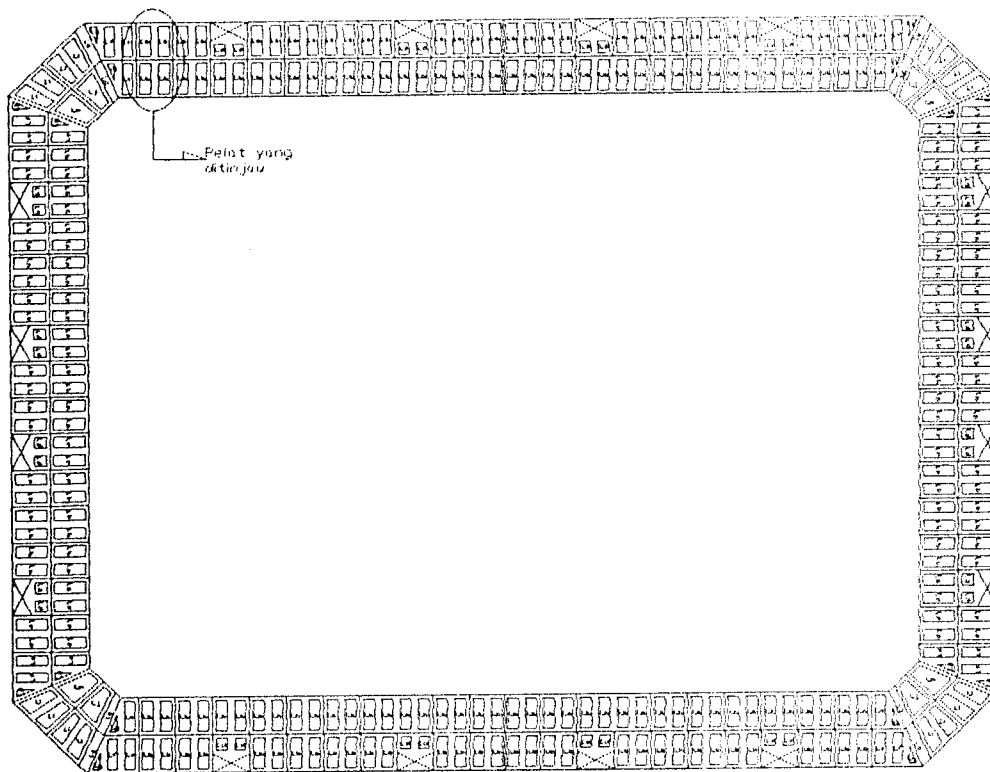
BAB V

PERENCANAAN STRUKTUR NON PORTAL BETON BERTULANG

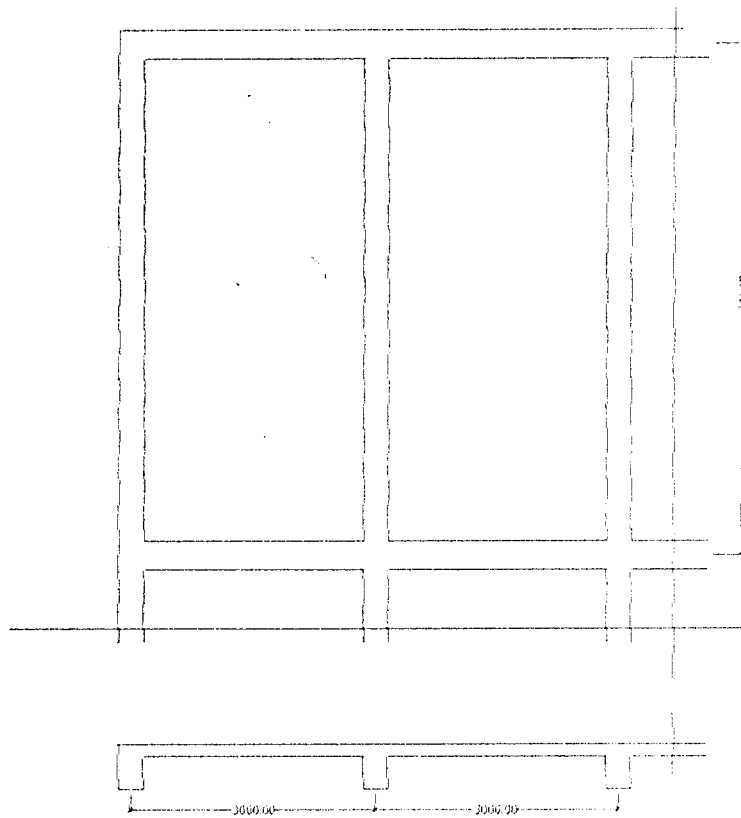
Pada bab ini dibahas mengenai perencanaan struktur non portal beton bertulang yang antara lain meliputi : Perencanaan pelat, Perencanaan balok anak, perencanaan balok anak tribun, perencanaan tangga.

5.1 Perencanaan Pelat

Perencanaan pelat disini meliputi pelat lantai dan pelat tribun, untuk mengetahui lebih lanjut, dibawah ini dilampirkan gambar denah pelat lantai sebagai contoh bahan perhitungan :



Gambar 5.1 Denah Plat lantai



Gambar 5.2 detail pelat ditinjau

$$\text{Beton} : f'_c = 25 \text{ Mpa} \quad \rightarrow \beta_1 = 0,85$$

$$\text{Baja} : f_y = 240 \text{ Mpa} \quad \rightarrow \varepsilon_y = \frac{f_y}{E_s} = \frac{240}{200000} = 0,0012$$

$$\rho_b = \frac{0,85 \cdot 25}{240} \cdot 0,85 \left(\frac{600}{600 - 240} \right) = 0,0538$$

$$\rho_{maks} = 0,75 \cdot \rho_b = 0,0404 \quad \text{dan} \quad \rho_{min} = \frac{1,4}{240} = 0,0058$$

$$m = \frac{f_y}{0,85 \cdot f'_c} = \frac{240}{0,85 \cdot 25} = 11,294$$

Panjang bentang pendek : $L_x = 3000 \text{ mm}$

Panjang bentang panjang : $L_y = 6500 \text{ mm}$

$$\frac{L_y}{L_x} = \frac{6500}{3000} = 2,166 > 2 \quad \rightarrow \text{Pelat satu arah}$$

Tebal Pelat dengan $f_y = 240 \text{ Mpa}$

- Satu Tepi menerus

$$h = \frac{L}{24} \left[0,4 + \frac{f_y}{700} \right] = \frac{3000}{24} \left[0,4 + \frac{240}{700} \right] = 92,85 \text{ mm}$$

- Kedua tepi menerus

$$h = \frac{L}{28} \left[0,4 + \frac{f_y}{700} \right] = \frac{3000}{28} \left[0,4 + \frac{240}{700} \right] = 79,59 \text{ mm}$$

→ dipakai Tebal Pelat lantai $h = 120 \text{ mm}$

Pembebanan Pelat lantai

a. Beban Mati

- Pelat Beton : $0,12 \cdot 24 = 2,880 \text{ kN/m}^2$

- Tegel : $0,02 \cdot 24 = 0,480 \text{ kN/m}^2$

- Spesi : $0,04 \cdot 21 = 0,840 \text{ kN/m}^2$

$$4,200 \text{ kN/m}^2$$

b. Beban hidup

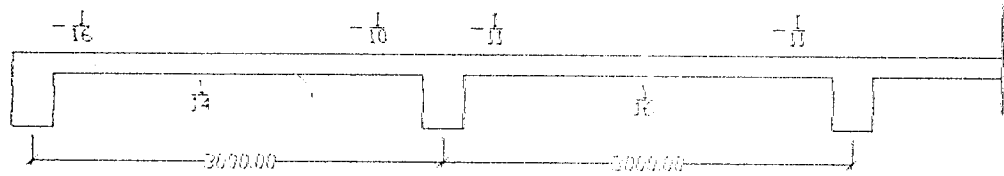
- Gedung Olahraga : $w_L = 400 \text{ kg/m}^2 = 4,000 \text{ kN/m}^2$

c. Beban rencana pelat lantai

$$W_U = 1,2 w_D + 1,6 w_L$$

$$= (1,2 \cdot 4,200) + (1,6 \cdot 4,000) = 11,400 \text{ kN/m}^2$$

ditaksir lebar balok 3000 mm, maka bentang bersih pelat = 2700 mm



$$M_u^- = \frac{1}{16} W_u \cdot L_n^2 = \frac{1}{16} \cdot 11,4 \cdot 2,7^2 = 5,194 \text{ kNm}$$

$$M_u^+ = \frac{1}{14} W_u \cdot L_n^2 = \frac{1}{14} \cdot 11,4 \cdot 2,7^2 = 5,936 \text{ kNm}$$

$$M_u^- = \frac{1}{10} W_u \cdot L_n^2 = \frac{1}{10} \cdot 11,4 \cdot 2,7^2 = 8,310 \text{ kNm}$$

$$M_u^- = \frac{1}{11} W_u \cdot L_n^2 = \frac{1}{11} \cdot 11,4 \cdot 2,7^2 = 7,555 \text{ kNm}$$

$$M_u^+ = \frac{1}{16} W_u \cdot L_n^2 = \frac{1}{16} \cdot 11,4 \cdot 2,7^2 = 5,194 \text{ kNm}$$

$$V_u = 1,15 \cdot \frac{1}{2} \cdot W_u \cdot L_n = 1,15 \cdot \frac{1}{2} \cdot 11,4 \cdot 2,7 = 17,698 \text{ kN}$$

$$V_u = \frac{1}{2} \cdot W_u \cdot L_n = \frac{1}{2} \cdot 11,4 \cdot 2,7 = 15,39 \text{ kN}$$

Diperkirakan tulangan yang dipakai P10, penutup beton 20 mm, maka :

$$d = 120 - 20 - (10/2) = 95 \text{ mm}$$

Periksa Kuat Geser (tanpa tulangan geser) :

$$\Phi V_n = \Phi \left(\frac{1}{6} \sqrt{f_c'} \cdot b_w \cdot d \right) = 0,6 \left(\frac{1}{6} \sqrt{25} \cdot 1000 \cdot 95 \right) = 47500 \text{ N}$$

$$= 47,50 \text{ kN} > 17,698 \text{ kN} \quad \text{--ok-- aman}$$

Perhitungan tulangan lentur :

a. $M_u = 8,31 \text{ kNm}$

$$M_n = \frac{M_u}{\phi} = \frac{8,31}{0,80} = 10,388 \text{ kNm};$$

$$R_n = \frac{M_n}{b.d^2} = \frac{10,388.10^6}{1000.95^2} = 1,151 \text{ MPa}$$

$$\begin{aligned} \text{Maka: } \rho &= \frac{1}{m} \left[1 - \sqrt{1 - \frac{2m.R_n}{f_y}} \right] \\ &= \frac{1}{11,2941} \left[1 - \sqrt{1 - \frac{2.11,2941.0,4795}{240}} \right] = 0,00493 \end{aligned}$$

ternyata $\rho = 0,0049 < \rho_{\min} = 0,0058$ dan $1,33 \cdot \rho = 0,00656 < \rho_{\min} = 0,0058$

dipakai $\rho = 1,33 \cdot \rho = 0,00656$

Luas tulangan pokok :

$$A_s = \rho \cdot b \cdot d = 0,00656 \cdot 1000 \cdot 95 = 623,31 \text{ mm}^2/\text{m}^2$$

Luas tulangan susut :

$$A_{sst} = 0,0018 \cdot b \cdot h = 0,0018 \cdot 1000 \cdot 120 = 216 \text{ mm}^2/\text{m}^2$$

Terlihat bahwa $A_s = 623,31 \text{ mm}^2/\text{m}^2 > A_{sst} = 216 \text{ mm}^2/\text{m}^2$ OK

Tulangan Pokok:

$$\text{Luas 1 batang P10} \rightarrow A_{1p} = 78,50 \text{ mm}^2$$

$$s \leq \frac{A_{1D} \cdot 1000}{A_s} = \frac{78,5 \cdot 1000}{623,31} = 126,06 \text{ mm}$$

Dipakai tulangan : **P10-120**

Jarak tulangan Maks : $3h = 3 \cdot 120 = 360 \text{ mm} < 500 \text{ mm}$

Jarak tulangan dipakai 120mm < 360 mm _____ OK _____

Luas Tulangan dipakai: $A_s = \frac{A_{10} \cdot 1000}{s} = \frac{78,5 \cdot 1000}{120} = 654 \text{ mm}^2 > 623 \text{ mm}^2$

Tulangan Susut

Dipakai tulangan P8 $\rightarrow A_{1p} = 50,30 \text{ mm}^2$

$$s \leq \frac{A_{1p} \cdot 1000}{A_s} = \frac{50,3 \cdot 1000}{216} = 232 \text{ mm}$$

Dipakai tulangan : P8-200

Jarak tulangan Maks : $5h = 5 \cdot 120 = 600 \text{ mm} > 500 \text{ mm}$

Jarak tulangan dipakai 200mm < 500 mm _____ OK _____

b. $M_u^+ = 5,936 \text{ kNm}$

$$M_n = \frac{M_u}{\phi} = \frac{5,936}{0,80} = 7,42 \text{ kNm};$$

$$R_n = \frac{M_n}{b \cdot d^2} = \frac{7,42 \cdot 10^6}{1000 \cdot 95^2} = 0,822 \text{ MPa}$$

$$\begin{aligned} \text{Maka: } \rho &= \frac{1}{m} \left[1 - \sqrt{1 - \frac{2m \cdot R_n}{f_y}} \right] \\ &= \frac{1}{11,2941} \left[1 - \sqrt{1 - \frac{2 \cdot 11,2941 \cdot 0,822}{240}} \right] = 0,00349 \end{aligned}$$

ternyata $\rho = 0,00349 < \rho_{\min} = 0,0058$ dan $1,33 \cdot \rho = 0,0046 < \rho_{\min} = 0,0058$

dipakai $\rho = \rho_{\min} = 0,0058$

Luas tulangan pokok :

$$A_s = \rho \cdot b \cdot d = 0,0058 \cdot 1000 \cdot 95 = 551 \text{ mm}^2/\text{m}'$$

Luas tulangan susut :

$$A_{sv} = 0,0018 \cdot b \cdot h = 0,0018 \cdot 1000 \cdot 120 = 216 \text{ mm}^2/\text{m}'$$

Terlihat bahwa $A_s = 551 \text{ mm}^2/\text{m}' > A_{sv} = 216 \text{ mm}^2/\text{m}'$ OK

Tulangan Pokok:

$$\text{Luas 1 batang P10} \rightarrow A_{1p} = 78,50 \text{ mm}^2$$

$$s \leq \frac{A_{1D} \cdot 1000}{A_s} = \frac{78,5 \cdot 1000}{551} = 142,47 \text{ mm}$$

Dipakai tulangan : **P10-120**

$$\text{Jarak tulangan Maks : } 3h = 3 \cdot 120 = 360 \text{ mm} < 500 \text{ mm}$$

$$\text{Jarak tulangan dipakai } 100 \text{ mm} < 360 \text{ mm} \text{ OK}$$

$$\text{Luas Tulangan dipakai: } A_s = \frac{A_{1D} \cdot 1000}{s} = \frac{78,5 \cdot 1000}{100} = 785 \text{ mm}^2 > 551 \text{ mm}^2$$

Tulangan Susut

$$\text{Dipakai tulangan P8} \rightarrow A_{1p} = 50,30 \text{ mm}^2$$

$$s \leq \frac{A_{1D} \cdot 1000}{A_s} = \frac{50,3 \cdot 1000}{216} = 232,8 \text{ mm}$$

Dipakai tulangan : **P8-200**

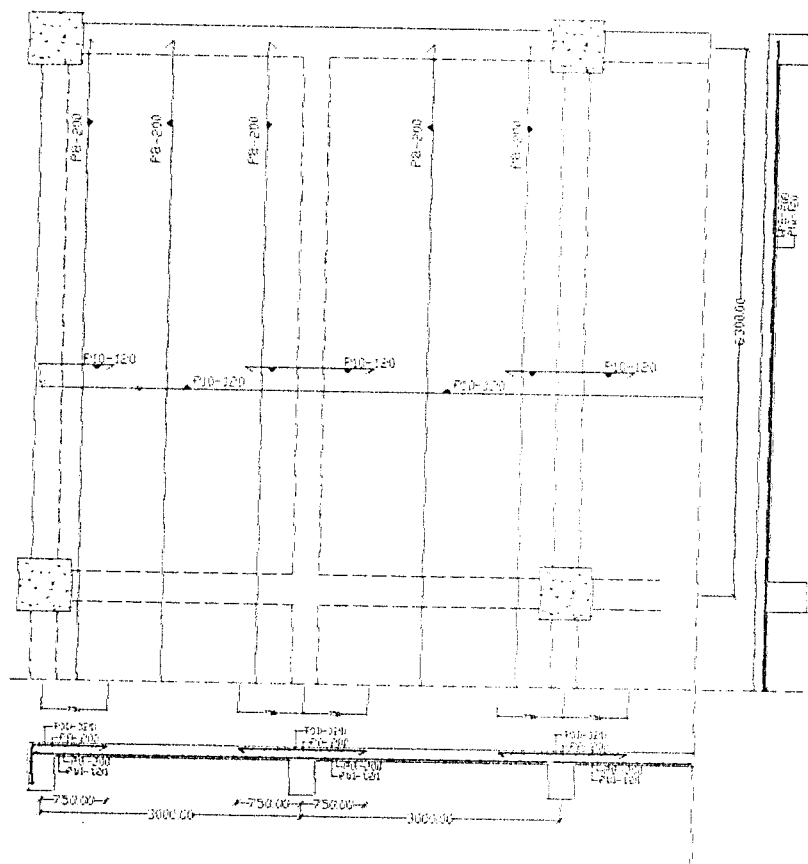
$$\text{Jarak tulangan Maks : } 5h = 5 \cdot 120 = 600 \text{ mm} > 500 \text{ mm}$$

$$\text{Jarak tulangan dipakai } 200 < 500 \text{ mm} \text{ OK}$$

Kebutuhan Tulangan Pelat secara keseluruhan seperti pada tabel kebutuhan tulangan berikut ini.

Tabel 5.1 Tabel Perencanaan pelat

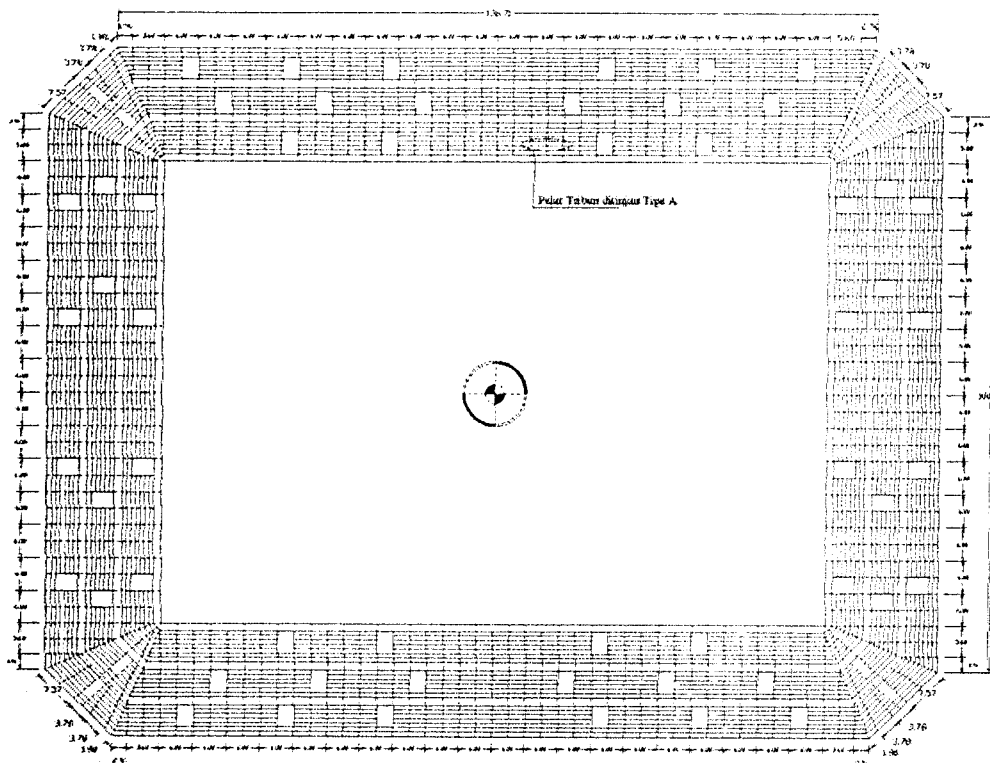
	Mu (kNm)	Mn	R _a	ρ	As (mm ²)	s(mm)	Tul.pokok
- 1/16	5,194	6,49	0,719	0,0058	551,00	142	P10-120
+ 1/14	5,936	7,42	0,822	0,0058	551,00	142	P10-120
- 1/10	8,306	10,38	1,150	0,0066	627,00	125	P10-120
- 1/11	7,555	9,44	1,046	0,0059	560,50	140	P10-120
+ 1/16	5,194	6,49	0,719	0,0058	551,00	142	P10-120



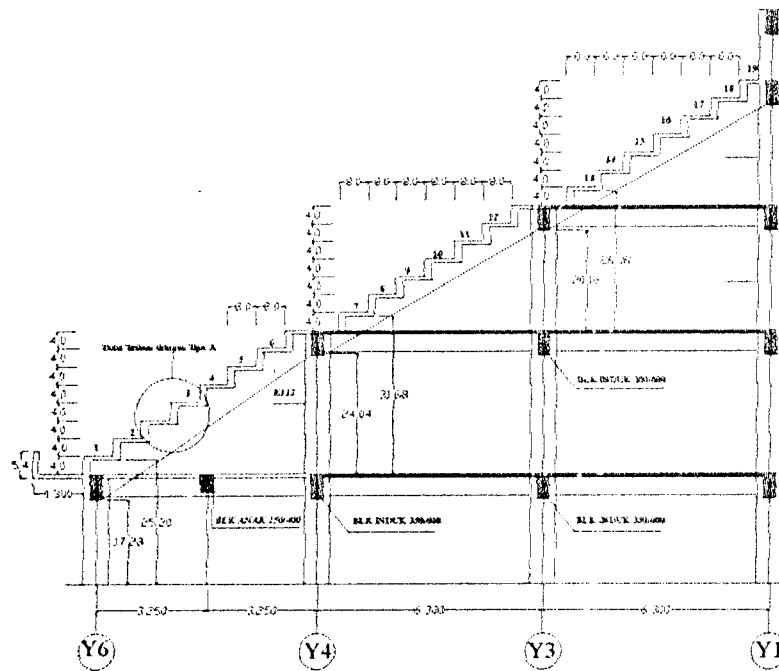
Gambar 5.3 Penulangan pelat lantai

5.1.2 Perencanaan Pelat Tribun

Untuk penulangan pelat tribun, digunakan mutu beton 25 Mpa dengan $f_y=240$ Mpa, berikut adalah gambar denah tribun ditinjau



Gambar 5.4 Denah pelat tribun ditinjau



Gambar 5.5 letak pelat tribun ditinjau

Beton : $f'_c = 25 \text{ Mpa}$ $\rightarrow \beta_1 = 0,85$

Baja : $f_y = 240 \text{ Mpa}$ $\rightarrow \epsilon_y = \frac{f_y}{E_s} = \frac{240}{200000} = 0,0012$

$$\rho_b = \frac{0,85 \cdot 25}{240} \cdot 0,85 \left(\frac{600}{600 - 240} \right) = 0,0538$$

$$\rho_{maks} = 0,75 \cdot \rho_b = 0,0403 \quad \text{dan} \quad \rho_{min} = \frac{1,4}{240} = 0,0058$$

Tebal Pelat dengan $f_y = 240 \text{ Mpa}$

$$h = \frac{L}{20} \left[0,4 + \frac{f_y}{700} \right] = \frac{800}{20} \left[0,4 + \frac{240}{700} \right] = 29,71 \text{ mm}$$

dipakai Tebal Pelat lantai $h = 120 \text{ mm}$

Pembebanan Pelat lantai

a. Beban Mati

$$\text{- Pelat Beton} : 0,10 \cdot 24 = 2,400 \text{ kN/m}^2$$

$$\text{- Finishing} : 0,02 \cdot 24 = 0,480 \text{ kN/m}^2$$

$$= 2,800 \text{ kN/m}^2$$

b. Beban hidup

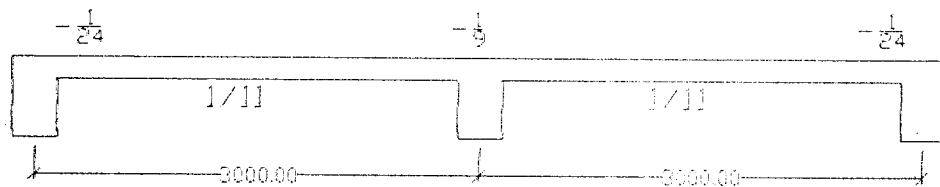
$$\text{- Gedung Olahraga} : w_L = 500 \text{ kg/m}^2 = 4,000 \text{ kN/m}^2$$

c. Beban rencana pelat lantai

$$W_U = 1,2 w_D + 1,6 w_L$$

$$= (1,2 \cdot 2,800) + (1,6 \cdot 5,000) = 11,456 \text{ kN/m}^2$$

ditaksir lebar balok 3000 mm, maka bentang bersih pelat = 2700 mm



$$M_u^- = \frac{1}{24} W_u \cdot L_n^2 = \frac{1}{24} \cdot 11,456 \cdot 2,7^2 = 3,479 \text{ kNm}$$

$$M_u^+ = \frac{1}{11} W_u \cdot L_n^2 = \frac{1}{11} \cdot 11,456 \cdot 2,7^2 = 7,592 \text{ kNm}$$

$$M_u^- = \frac{1}{9} W_u \cdot L_n^2 = \frac{1}{9} \cdot 11,456 \cdot 2,7^2 = 9,279 \text{ kNm}$$

$$V_u = 1,15 \cdot \frac{1}{2} \cdot W_u \cdot L_n = 1,15 \cdot \frac{1}{2} \cdot 11,456 \cdot 2,7 = 17,78 \text{ kN}$$

$$V_u = \frac{1}{2} \cdot W_u \cdot L_n = \frac{1}{2} \cdot 11,456 \cdot 2,7 = 15,465 \text{ kN}$$

Diperkirakan tulangan yang dipakai P10, penutup beton 20 mm, maka :

$$d = 120 - 20 - (10/2) = 95 \text{ mm}$$

Periksa Kuat Geser (tanpa tulangan geser) :

$$\begin{aligned} \Phi V_n &= \Phi \left(\frac{1}{6} \sqrt{f_c'} \cdot b_w \cdot d \right) = 0,6 \left(\frac{1}{6} \sqrt{25} \cdot 1000 \cdot 95 \right) = 47500 \text{ N} \\ &= 47,50 \text{ kN} > 26,4077 \text{ kN} \quad \text{--ok-- aman} \end{aligned}$$

Perhitungan tulangan lentur :

a. $M_u = 3,479 \text{ kNm}$

$$M_n = \frac{M_u}{\phi} = \frac{3,462}{0,80} = 4,348 \text{ kNm} ;$$

$$R_n = \frac{M_n}{b \cdot d^2} = \frac{4,348 \cdot 10^6}{1000 \cdot 95^2} = 0,481 \text{ MPa}$$

$$\begin{aligned} \text{Maka: } \rho &= \frac{1}{m} \left[1 - \sqrt{1 - \frac{2mR_n}{f_y}} \right] \\ &= \frac{1}{11,2941} \left[1 - \sqrt{1 - \frac{2 \cdot 11,2941 \cdot 0,481}{240}} \right] = 0,0021 \end{aligned}$$

ternyata $\rho = 0,0021 < \rho_{\min} = 0,0058$ dan $1,33 \cdot \rho = 0,0027 < \rho_{\min} = 0,0058$

dipakai $\rho = \rho_{\min} = 0,0058$

Luas tulangan pokok :

$$A_s = \rho \cdot b \cdot d = 0,0058 \cdot 1000 \cdot 95 = 551 \text{ mm}^2/\text{m}'$$

Luas tulangan susut :

$$A_{ss} = 0,0018 \cdot b \cdot h = 0,0018 \cdot 1000 \cdot 120 = 216 \text{ mm}^2/\text{m}'$$

Terlihat bahwa $A_s = 551 \text{ mm}^2/\text{m}' > A_{ss} = 216 \text{ mm}^2/\text{m}'$ OK

Tulangan Pokok:

$$\text{Luas 1 batang P10} \rightarrow A_{1p} = 78,50 \text{ mm}^2$$

$$s \leq \frac{A_{1D} \cdot 1000}{A_s} = \frac{78,5 \cdot 1000}{551} = 142,47 \text{ mm}$$

Dipakai tulangan : **P10-11**

$$\text{Jarak tulangan Maks : } 3h = 3 \cdot 120 = 360 \text{ mm} < 500 \text{ mm}$$

$$\text{Jarak tulangan dipakai } 100 \text{ mm} < 360 \text{ mm} \quad \underline{\text{OK}}$$

$$\text{Luas Tulangan dipakai: } A_s = \frac{A_{1D} \cdot 1000}{s} = \frac{78,5 \cdot 1000}{100} = 785 \text{ mm}^2 > 551 \text{ mm}^2$$

Tulangan Susut

$$\text{Dipakai tulangan P8} \rightarrow A_{1p} = 50,30 \text{ mm}^2$$

$$s \leq \frac{A_{1D} \cdot 1000}{A_s} = \frac{50,3 \cdot 1000}{216} = 232,8 \text{ mm}$$

Dipakai tulangan : **P8-200**

$$\text{Jarak tulangan Maks : } 5h = 5 \cdot 120 = 600 \text{ mm} > 500 \text{ mm}$$

$$\text{Jarak tulangan dipakai } 200 < 500 \text{ mm} \quad \underline{\text{OK}}$$

b. $M_u^+ = 7,592 \text{ kNm}$

$$M_n = \frac{M_u}{\phi} = \frac{7,592}{0,80} = 9,49 \text{ kNm};$$

$$R_u = \frac{M_n}{b \cdot d^2} = \frac{9,49 \cdot 10^6}{1000 \cdot 95^2} = 1,05 \text{ MPa}$$

$$\text{Maka: } \rho = \frac{1}{m} \left[1 - \sqrt{1 - \frac{2m \cdot R_u}{f_y}} \right]$$

$$= \frac{1}{11,2941} \left[1 - \sqrt{1 - \frac{2 \cdot 11,2941 \cdot 1,05}{240}} \right] = 0,00449$$

ternyata $\rho = 0,00449 < \rho_{\min} = 0,0058$ dan $1,33 \cdot \rho = 0,0059 > \rho_{\min} = 0,0058$

dipakai $\rho = 0,0059$

Luas tulangan pokok :

$$A_s = \rho \cdot b \cdot d = 0,0059 \cdot 1000 \cdot 95 = 560,50 \text{ mm}^2/\text{m}'$$

Luas tulangan susut :

$$A_{ss} = 0,0018 \cdot b \cdot h = 0,0018 \cdot 1000 \cdot 120 = 216 \text{ mm}^2/\text{m}'$$

Terlihat bahwa $A_s = 560,50 \text{ mm}^2/\text{m}' > A_{ss} = 216 \text{ mm}^2/\text{m}'$ OK

Tulangan Pokok:

$$\text{Luas 1 batang P10} \rightarrow A_{1p} = 78,50 \text{ mm}^2$$

$$s \leq \frac{A_{1D} \cdot 1000}{A_s} = \frac{78,5 \cdot 1000}{560,50} = 140 \text{ mm}$$

Dipakai tulangan : **P10-11**

Jarak tulangan Maks : $3h = 3 \cdot 120 = 360 \text{ mm} < 500 \text{ mm}$

Jarak tulangan dipakai $100 \text{ mm} < 360 \text{ mm}$ OK

$$\text{Luas Tulangan dipakai: } A_s = \frac{A_{1D} \cdot 1000}{s} = \frac{78,5 \cdot 1000}{100} = 785 \text{ mm}^2 > 560,50 \text{ mm}^2$$

Tulangan Susut

$$\text{Dipakai tulangan P8} \rightarrow A_{1p} = 50,30 \text{ mm}^2$$

$$s \leq \frac{A_{1D} \cdot 1000}{A_s} = \frac{50,3 \cdot 1000}{216} = 232,8 \text{ mm}$$

Dipakai tulangan : **P8-200**

Jarak tulangan Maks : $5h = 5 \cdot 120 = 600 \text{ mm} > 500 \text{ mm}$

Jarak tulangan dipakai $200 \text{ mm} < 500 \text{ mm}$ OK

c. $M_u^* = 9,279 \text{ kNm}$

$$M_n = \frac{M_u}{\phi} = \frac{9,279}{0,80} = 11,59 \text{ kNm};$$

$$R_n = \frac{M_n}{b \cdot d^2} = \frac{11,59 \cdot 10^6}{1000 \cdot 95^2} = 1,285 \text{ MPa}$$

$$\begin{aligned} \text{Maka: } \rho &= \frac{1}{m} \left[1 - \sqrt{1 - \frac{2m \cdot R_n}{f_y}} \right] \\ &= \frac{1}{11,2941} \left[1 - \sqrt{1 - \frac{2 \cdot 11,2941 \cdot 1,285}{240}} \right] = 0,0055 \end{aligned}$$

ternyata $\rho = 0,0055 < \rho_{\min} = 0,0058$ dan $1,33 \cdot \rho = 0,00735 > \rho_{\min} = 0,0058$

dipakai $\rho = 0,00735$

Luas tulangan pokok :

$$A_s = \rho \cdot b \cdot d = 0,00735 \cdot 1000 \cdot 95 = 693,5 \text{ mm}^2/\text{m}$$

Luas tulangan susut :

$$A_{sst} = 0,0018 \cdot b \cdot h = 0,0018 \cdot 1000 \cdot 120 = 216 \text{ mm}^2/\text{m}$$

Terlihat bahwa $A_s = 693,5 \text{ mm}^2/\text{m} > A_{sst} = 216 \text{ mm}^2/\text{m}$ OK

Tulangan Pokok:

$$\text{Luas 1 batang P10} \rightarrow A_{1p} = 78,50 \text{ mm}^2$$

$$s \leq \frac{A_{1D} \cdot 1000}{A_s} = \frac{78,5 \cdot 1000}{693,5} = 113,19 \text{ mm}$$

Dipakai tulangan : **P10-110**

Jarak tulangan Maks : $3h = 3 \cdot 120 = 360 \text{ mm} < 500 \text{ mm}$

Jarak tulangan dipakai $100\text{mm} < 360 \text{ mm}$ _____ OK _____

Luas Tulangan dipakai: $A_s = \frac{A_{ld} \cdot 1000}{s} = \frac{78,5 \cdot 1000}{100} = 785 \text{ mm}^2 > 698,25 \text{ mm}^2$

Tulangan Susut

Dipakai tulangan P8 $\rightarrow A_{lp} = 50,30 \text{ mm}^2$

$$s \leq \frac{A_{ld} \cdot 1000}{A_s} = \frac{50,3 \cdot 1000}{216} = 232,8 \text{ mm}$$

Dipakai tulangan : P8-200

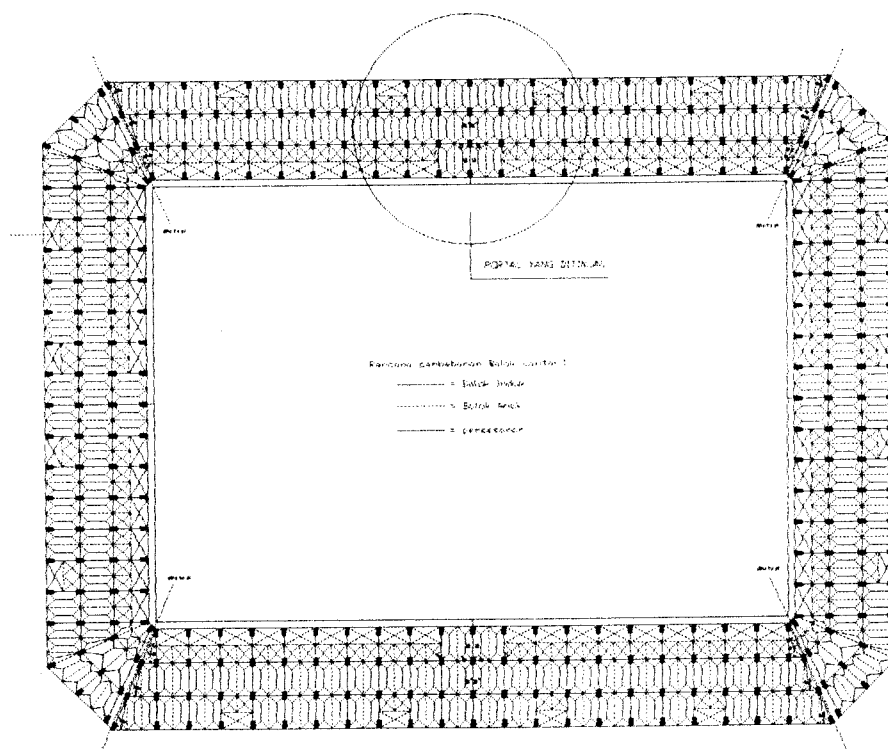
Jarak tulangan Maks : $5h = 5 \cdot 120 = 600 \text{ mm} > 500 \text{ mm}$

Jarak tulangan dipakai $200\text{mm} < 500 \text{ mm}$ _____ OK _____

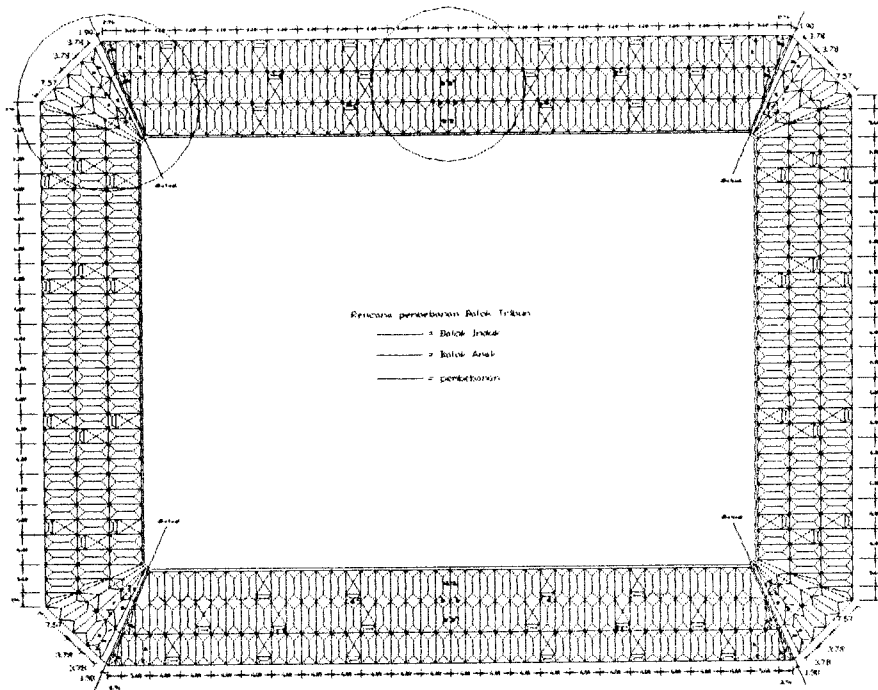
5.2 Distribusi Pembebanan Merata Balok

5.2.1 Balok Lantai

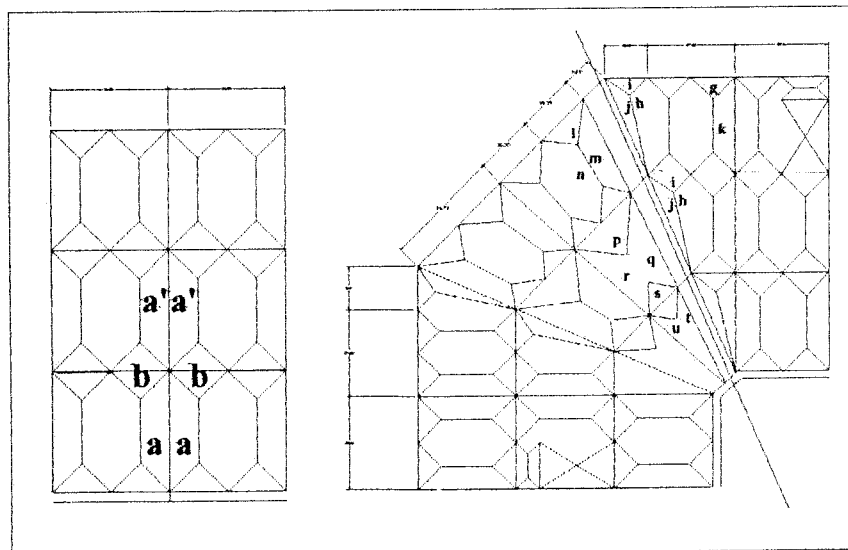
Sebelum berlanjut ke perhitungan, berikut ini adalah gambar denah rencana pembebanan balok yang mana gambar tersebut akan menjelaskan tentang type-type pembebanan. Hal ini dimaksudkan sebagai bahan acuan dalam perhitungan dengan menggunakan program komputer yaitu SAP 2000, seperti yang terlihat dibawah ini : sebagai contoh pembebanan pada lantai 1 dan tribun.



Gambar 5.7 Denah Rencana pembebanan Lantai 1



Gambar 5.8 Denah Rencana Pembebanan Tribun

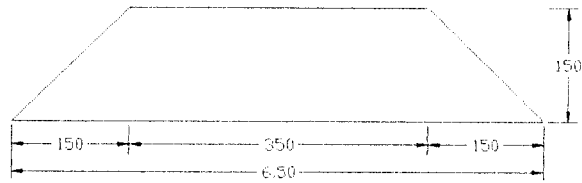


Gambar 5.9 Model Pembebanan

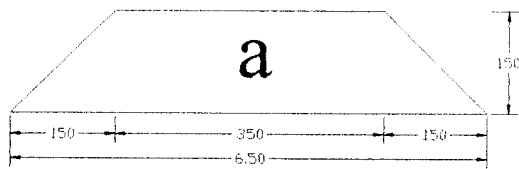
5.2.2 Type-type Pembenanan

5.2.2.1 Balok Lantai

1. Balok lantai



2. Pembebanan type a



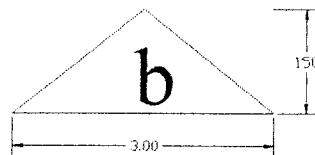
a. Beban mati

✓ Pelat : $1,50 \cdot 4,200 = 6,30 \text{ kN/m}$

b. Beban hidup

✓ $1,50 \cdot 4,000 = 6,00 \text{ kN/m}$

3. Pembebanan type b



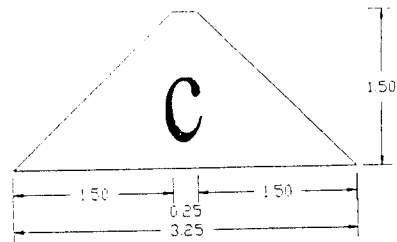
a. Beban mati

✓ Pelat : $1,50 \cdot 4,200 = 6,30 \text{ kN/m}$

b. Beban hidup

✓ $1,50 \cdot 4,000 = 6,00 \text{ kN/m}$

4. Pembebanan type c



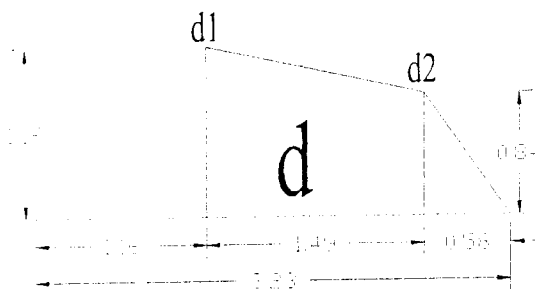
a. beban Mati

$$\checkmark \text{ Pelat : } 1,50 \cdot 4,200 = 6,30 \text{ kN/m}$$

b. Beban Hidup

$$\checkmark 1,50 \cdot 4,000 = 6,00 \text{ kN/m}$$

5. Pembebanan type d



a. beban Mati

$$\checkmark d1 = \text{Pelat : } 1,16 \cdot 4,200 = 4,872 \text{ kN/m}$$

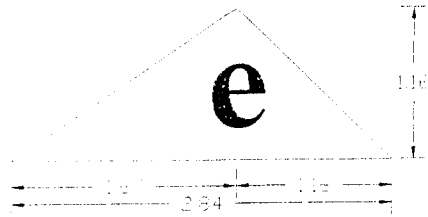
$$\checkmark d2 = \text{Pelat : } 0,84 \cdot 4,200 = 3,528 \text{ kN/m}$$

b. Beban Hidup

$$\checkmark d1 = 1,16 \cdot 4,000 = 4,64 \text{ kN/m}$$

$$\checkmark d2 = 0,84 \cdot 4,000 = 3,36 \text{ kN/m}$$

6. Pembebanan type e



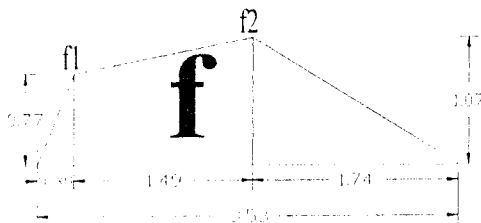
a. beban Mati

$$\checkmark \text{ Pelat : } 1,16 \cdot 4,200 = 4,872 \text{ kN/m}$$

b. Beban Hidup

$$1,16 \cdot 4,000 = 4,64 \text{ kN/m}$$

7. Pembebanan type f



a. beban Mati

$$\checkmark f1 = \text{Pelat : } 0,77 \cdot 4,200 = 3,234 \text{ kN/m}$$

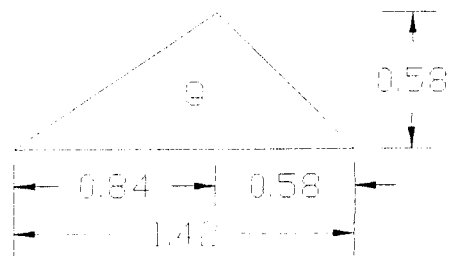
$$\checkmark f2 = \text{Pelat : } 1,07 \cdot 4,200 = 4,494 \text{ kN/m}$$

b. Beban Hidup

$$\checkmark f1 = 0,77 \cdot 4,000 = 3,08 \text{ kN/m}$$

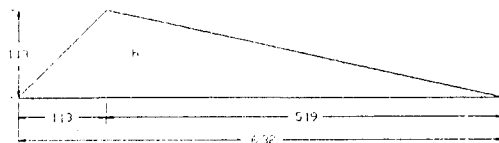
$$\checkmark f2 = 1,07 \cdot 4,000 = 4,28 \text{ kN/m}$$

8. Balok anak lantai type g



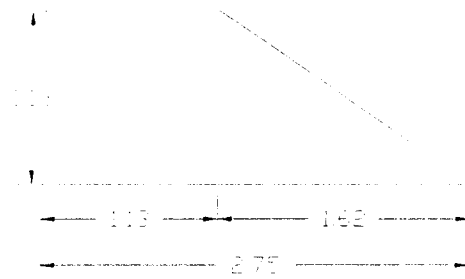
- a. Beban mati
- ✓ Pelat : $0,58 \cdot 4,200 = 2,436 \text{ kN/m}$
- b. Beban hidup
- ✓ $0,58 \cdot 4,000 = 2,320 \text{ kN/m}$

9. Balok anak lantai type h



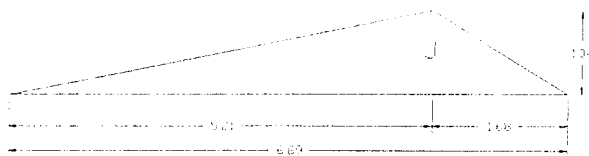
- a. Beban mati
- ✓ Pelat : $1,13 \cdot 4,200 = 4,746 \text{ kN/m}$
- b. Beban hidup
- ✓ Pelat : $1,13 \cdot 4,000 = 4,52 \text{ kN/m}$

10. Balok anak lantai type i



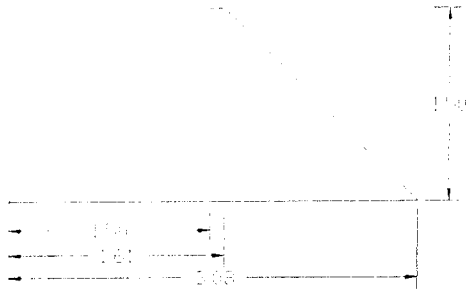
- a. Beban mati
- ✓ Pelat : $1,13 \cdot 4,200 = 4,746 \text{ kN/m}$
- b. Beban hidup
- ✓ $1,13 \cdot 4,000 = 4,52 \text{ kN/m}$

11. Balok anak lantai type j



- a. Beban mati
- ✓ Pelat : $1,04 \cdot 4,200 = 4,368 \text{ kN/m}$
- b. Beban hidup
- ✓ $1,04 \cdot 4,000 = 4,16 \text{ kN/m}$

12. Balok anak lantai type k

**a. beban Mati**

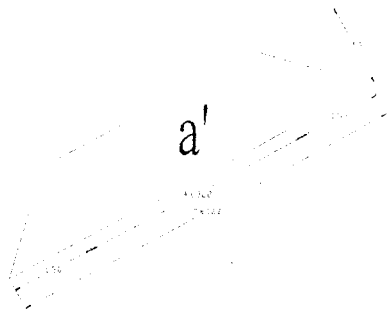
$$\checkmark \text{ Pelat : } 1,50 \cdot 4,200 = 6,30 \text{ kN/m}$$

b. Beban Hidup

$$\checkmark 1,50 \cdot 4,000 = 6,00 \text{ kN/m}$$

5.2.2.2 Balok Anak Tribun

1. Pembebanan type a'



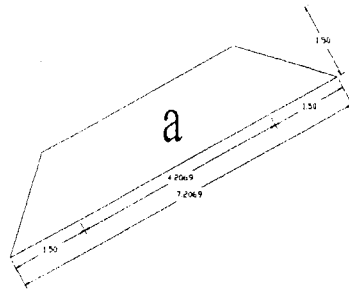
a. beban Mati

✓ Pelat : $1,50 \cdot 4,200 = 6,30 \text{ kN/m}$

b. Beban Hidup

✓ $1,50 \cdot 5,000 = 7,50 \text{ kN/m}$

2. Pembebanan type a



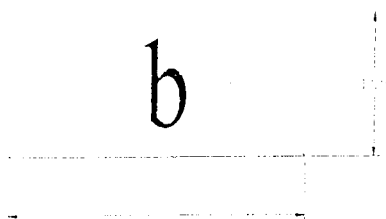
a. beban Mati

✓ Pelat : $1,50 \cdot 4,200 = 6,30 \text{ kN/m}$

b. Beban Hidup

✓ $1,50 \cdot 5,000 = 7,50 \text{ kN/m}$

3. Pembebanan type b



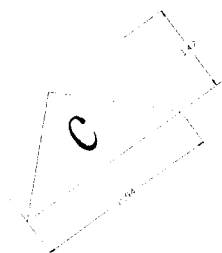
a. beban Mati

$$\checkmark \text{ Pelat : } 1,50 \cdot 2,800 = 4,20 \text{ kN/m}$$

b. Beban Hidup

$$\checkmark 1,50 \cdot 5,000 = 7,50 \text{ kN/m}$$

4. Pembebanan type c

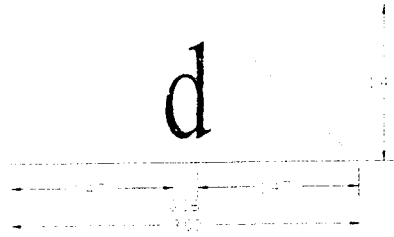


a. beban Mati

$$\checkmark \text{ Pelat : } 1,47 \cdot 2,800 = 4,116 \text{ kN/m}$$

b. Beban Hidup

$$\checkmark 1,47 \cdot 5,000 = 7,35 \text{ kN/m}$$

5. Pembebanan type d**a. beban Mati**

$$\checkmark \text{ Pelat : } 1,47 \cdot 2,800 = 4,116 \text{ kN/m}$$

b. Beban Hidup

$$\checkmark 1,47 \cdot 5,000 = 7,35 \text{ kN/m}$$

6. Pembebanan type e**a. beban Mati**

$$\checkmark \text{ Pelat : } 1,285 \cdot 2,800 = 3,598 \text{ kN/m}$$

b. Beban Hidup

$$\checkmark 1,285 \cdot 5,000 = 6,425 \text{ kN/m}$$

7. Pembebanan type f



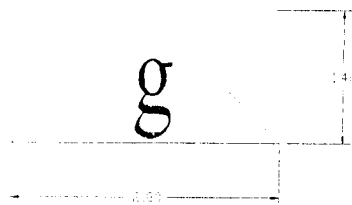
a. beban Mati

$$\checkmark \text{ Pelat : } 1,285 \cdot 2,800 = 3,598 \text{ kN/m}$$

b. Beban Hidup

$$\checkmark 1,285 \cdot 5,000 = 6,425 \text{ kN/m}$$

8. Pembebanan type g



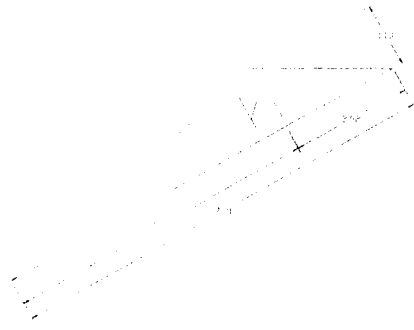
a. beban Mati

$$\checkmark \text{ Pelat : } 1,40 \cdot 2,800 = 3,92 \text{ kN/m}$$

b. Beban Hidup

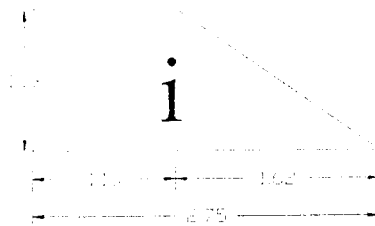
$$\checkmark 1,40 \cdot 5,000 = 7,00 \text{ kN/m}$$

9. Pembebanan type h



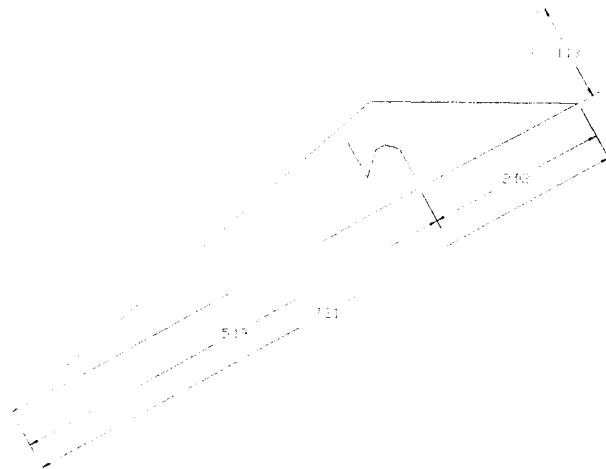
- a. Beban mati
 ✓ Pelat : $1,13 \cdot 2,8 = 3,164 \text{ kN/m}$
- b. Beban hidup
 ✓ $1,13 \cdot 5,000 = 5,65 \text{ kN/m}$

10. Pembebanan type i



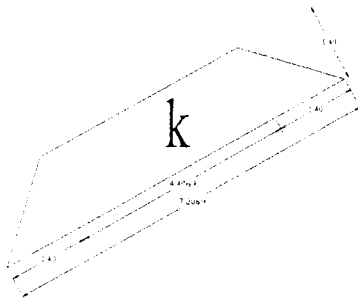
- a. Beban mati
 ✓ Pelat : $1,13 \cdot 2,8 = 3,164 \text{ kN/m}$
- b. Beban hidup
 ✓ $1,13 \cdot 5,000 = 5,65 \text{ kN/m}$

11 Pembebanan type j



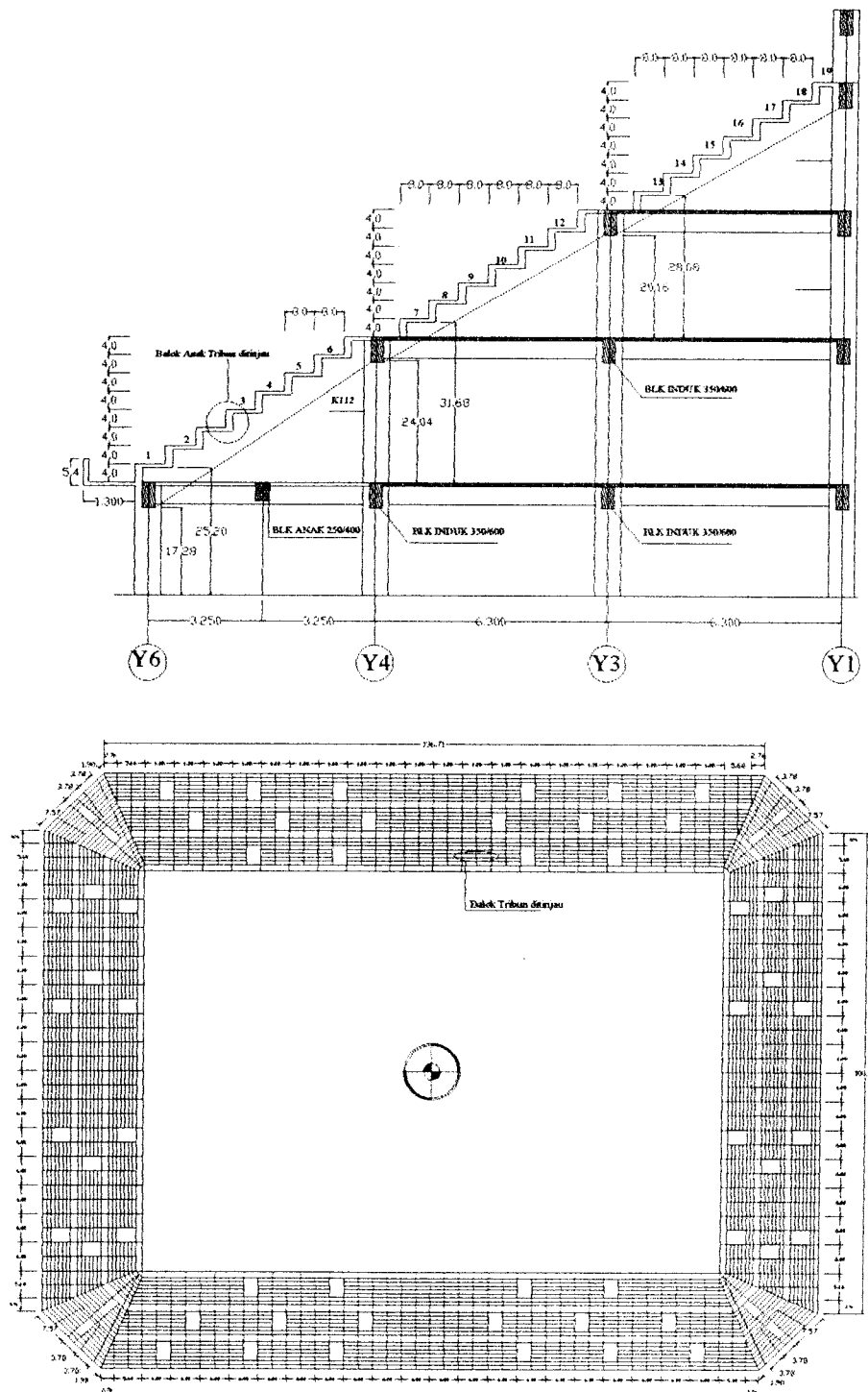
- a. **Beban mati**
 ✓ Pelat : $1,13 \cdot 2,8 = 3,164 \text{ kN/m}$
- b. **Beban hidup**
 ✓ $1,13 \cdot 5,000 = 5,65 \text{ kN/m}$

12. Pembebanan type k



- a. **beban Mati**
 ✓ Pelat : $1,40 \cdot 2,800 = 3,92 \text{ kN/m}$
- b. **Beban Hidup**
 ✓ $1,40 \cdot 5,000 = 7,00 \text{ kN/m}$

5.3 Penulangan Balok Tribun



Gambar 5.10 Denah Balok Tribun ditinjau

Pembebanan Balok Tribun

a. Beban mati (W_D)

$$\text{- Berat pelat beton + finishing} = 0,12 \cdot 0,8 \cdot 24 = 2,300 \text{ kN/m}^2$$

$$\text{- Berat sendiri Balok} = 0,25 \cdot 0,4 \cdot 24 = \underline{2,400 \text{ kN/m}^2}$$

$$W_D = 4,700 \text{ kN/m}^2$$

b. Beban Hidup (W_L)

$$\text{- Beban hidup Gedung Olahraga} = W_L = 0,8 \cdot 5 = 4,000 \text{ kN/m}^2$$

c. Beban rencana balok tribun (W_u)

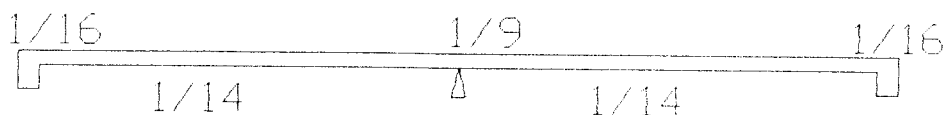
$$W_u = 1,2 w_D + 1,6 w_L$$

$$= (1,2 \cdot 4,700) + (1,6 \cdot 4,000) = 12,000 \text{ kN/m}^2$$

Perhitungan Momen



Momen yang menentukan menurut Tabel 12 Buku Dasar-dasar perencanaan beton bertulang adalah



Tabel 12 Buku Dasar-dasar perencanaan beton bertulang, dapat digunakan bila :

- a. Jumlah bentang minimal dua bentang : terpenuhi
- b. Bentang terpanjang yang bersebelahan disebelah kiri dan kanan perletakan, tidak boleh lebih besar dari 1,2 kali bentang terpendek yang bersebelahan : syarat terpenuhi
- c. Beban mati adalah beban yang terbagi rata : terpenuhi
- d. Beban hidup lebih kecil dari 3 kali beban mati:
 $4 < 3 \times 4,7$: syarat terpenuhi.

$$\begin{aligned} M_u = M_{top AB} = M_{top BC} &= \left(\frac{1}{14} \right) \cdot W_u \cdot L^2 \\ &= \left(\frac{1}{14} \right) \cdot 12,00 \cdot 3^2 = 7,714 \text{ kNm} \end{aligned}$$

$$\begin{aligned} M_u = M_A = M_C &= \left(\frac{1}{16} \right) \cdot W_u \cdot L^2 \\ &= \left(\frac{1}{16} \right) \cdot 12,00 \cdot 3^2 = 6,75 \text{ kNm} \end{aligned}$$

$$\begin{aligned} M_u = M_B &= \left(\frac{1}{9} \right) \cdot W_u \cdot L^2 \\ &= \left(\frac{1}{9} \right) \cdot 12,00 \cdot 3^2 = 12 \text{ kNm} \end{aligned}$$

a. Penulangan untuk momen Lapangan (Momen Positif)

$$M^+ = 7,714 \text{ kNm}$$

$$M_{n \text{ perlu}} = \frac{7,714}{0,8} = 9,642 \text{ kNm}$$

$$f'c = 25 \text{ Mpa} \rightarrow \beta_1 = 0,85$$

$$fy = 400 \text{ Mpa}$$

$$\phi_{tul \text{ Utama}} = 14 \text{ mm}; \phi_{tul \text{ Sengkang}} = 8 \text{ mm}$$

-Menentukan Rasio penulangan

$$\rho_{\min} = \frac{1,4}{f'c} = \frac{1,4}{400} = 0,0035$$

$$\rho_b = \frac{0,85 f'c}{fy} \beta_1 \left(\frac{600}{600 + fy} \right) = \frac{0,85 \cdot 25}{400} \cdot 0,85 \left(\frac{600}{600 + 400} \right) = 0,0271$$

$$\rho_{\max} = 0,75 \cdot \rho_b = 0,75 \cdot 0,0271 = 0,0203$$

$$\rho_{\text{Pakai}} = 0,5 \cdot \rho_{\max} = 0,5 \cdot 0,0203 = 0,0102$$

$$m = \frac{fy}{0,85 \cdot f'c} = \frac{400}{0,85 \cdot 25} = 18,824$$

$$R_n = \rho \cdot fy \cdot \left(1 - \frac{1}{2} \cdot m \right) = 0,0102 \cdot 400 \cdot \left(1 - \frac{1}{2} \cdot 0,0102 \cdot 18,824 \right) \\ = 3,675 \text{ Mpa}$$

$$b \cdot d^2_{\text{Perlu}} = \frac{M_n}{R_n} = \frac{9,642 \cdot 10^6}{3,675} = 2623673,46 \text{ mm}^3$$

Ambil b	250	300	350
$d = \sqrt{\frac{b \cdot d^2}{b}}$	102	94	87

diambil $b = 300 \text{ mm}$

diambil $h = 400 \text{ mm}$

$$d_s = pb + \emptyset_{\text{senggang}} + \text{jarak pusat tul. pokok kesisi dalam senggang}$$

$$= 40 + 10 + 14/2 = 57 \text{ (anggap tulangan satu lapis, } d_s = 50 - 70 \text{ mm)}$$

$$d_{\text{pakai}} = h - d' = 400 - 57 = 343 \text{ mm}$$

$d_{\text{pakai}} > d_{\text{perlu}} \rightarrow$ maka dipakai tulangan sebelah

$$Rn = \frac{Mn}{b \cdot d^2} = \frac{9.642 \cdot 10^6}{300 \cdot 343^2} = 0,3 \text{ Mpa}$$

$$\rho_{\text{pendekatan}} = \frac{Rn_{\text{baru}}}{Rn_{\text{lama}}} \cdot \rho_{\text{lama}} = \frac{0,3}{3,675} \cdot 0,0101$$

$$= 0,00008 < \rho_{\text{max}} = 0,0203$$

$$< \rho_{\text{min}} = 0,0035$$

$$As_{\text{pendekatan}} = \rho \cdot b \cdot d = 0,0035 \cdot 300 \cdot 343 = 360,15 \text{ mm}^2$$

dipakai diameter tulangan = 14 mm, $A_{1\emptyset} = 153 \text{ mm}^2$

$$n = \frac{As}{A_{1\emptyset}} = \frac{360,15}{153} = 2,33 \sim 3 \text{ batang}$$

dipakai 3D 14 = $459 \text{ mm}^2 > 360,15 \text{ mm}^2$

Periksa Kapasitas Penampang

Anggap baja tarik telah leleh pada saat beton tekan mencapai regangan hancur

$$\epsilon_{cu}' = 0,003$$

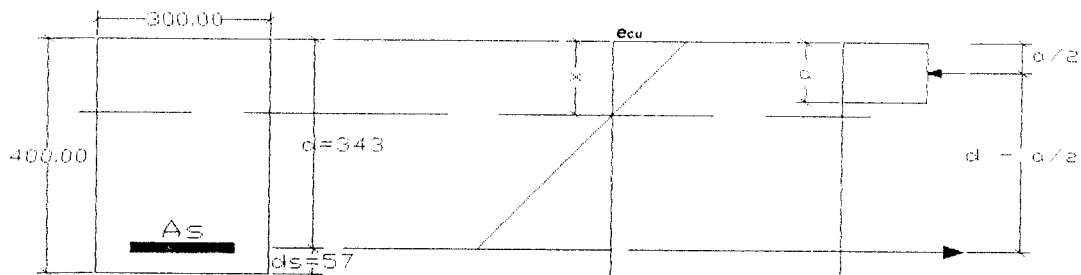
$$\text{Gaya - gaya dalam : } C = 0,85 \cdot f_c' \cdot b \cdot a = 0,85 \cdot 25 \cdot 300 \cdot a = 6375 a$$

$$T = A_s \cdot f_y = 459 \cdot 400 = 183.600 \text{ N}$$

Keseimbangan gaya-gaya dalam $C = T$ memberikan

$$6375 a = 183.600 \text{ N} \rightarrow a = 28,8 \text{ mm dan } x = a/\beta_1 = 28,8/0,85 = 33,88 \text{ mm}$$

Periksa regangan baja tarik



$$\text{- regangan leleh : } \epsilon_y = \frac{f_y}{E_s} = \frac{400}{20000} = 0,002$$

- regangan baja tulangan tarik :

$$\epsilon_s = \frac{d - x}{x} \cdot \epsilon_{cu} = \frac{343 - 33,88}{33,88} \cdot 0,003 = 0,027 > \epsilon_y = 0,002$$

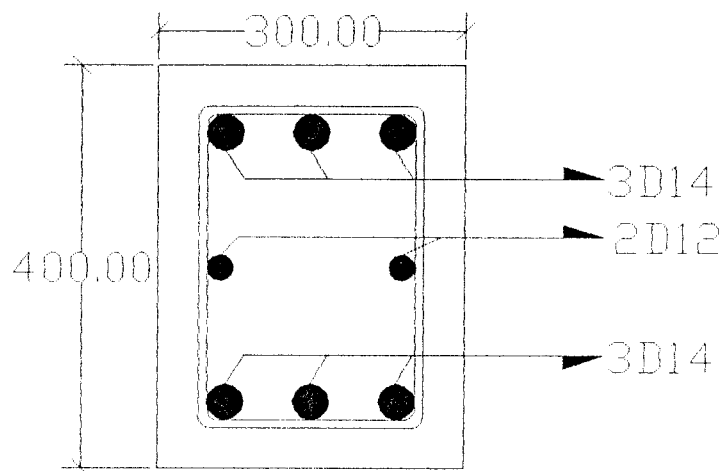
→ baja tulangan tarik telah leleh

Maka momen Nominal :

$$M_n = T \left(d - \frac{a}{2} \right) = 183.600 \left(343 - \frac{28,8}{2} \right) = 60.330.960 = 60,33 \text{ kN-m}$$

$$M_R = \phi M_n = 0,8 \cdot 60,33$$

$$= 48,26 \text{ kN-m} > M_U = 7,714 \text{ kN-m} \quad \underline{\text{Aman}}$$



Gambar 5.11 Penampang Tribun tumpuan lapangan

b. Penampang untuk momen Tumpuan (Momen Negatif) M_B

$$M^+ = 12 \text{ kNm}$$

$$M_{n \text{ perlu}} = \frac{12}{0,8} = 15 \text{ kNm}$$

$$f_c' = 25 \text{ Mpa} \rightarrow \beta_1 = 0,85$$

$$f_y = 400 \text{ Mpa}$$

$$\phi_{nl \text{ Utama}} = 14 \text{ mm}; \phi_{nl \text{ Sengkan}} = 8 \text{ mm}$$

-Menentukan Rasio penulangan

$$\rho_{\min} = \frac{1,4}{f' y} = \frac{1,4}{400} = 0,0035$$

$$\rho_b = \frac{0,85 f' c'}{f_y} \beta_1 \left(\frac{600}{600 + f_y} \right) = \frac{0,85 \cdot 25}{400} \cdot 0,85 \left(\frac{600}{600 + 400} \right) = 0,0271$$

$$\rho_{\max} = 0,75 \cdot \rho_b = 0,75 \cdot 0,0271 = 0,0203$$

$$\rho_{\text{pakai}} = 0,5 \cdot \rho_{\max} = 0,5 \cdot 0,0203 = 0,0102$$

$$m = \frac{f_y}{0,85 \cdot f' c} = \frac{400}{0,85 \cdot 25} = 18,824$$

$$R_n = \rho \cdot f_y \cdot (1 - \frac{1}{2} \cdot m) = 0,0102 \cdot 400 \cdot (1 - \frac{1}{2} \cdot 0,0102 \cdot 18,824) \\ = 3,675 \text{ Mpa}$$

$$b \cdot d^2_{\text{perlu}} = \frac{M_n}{R_n} = \frac{15 \cdot 10^6}{3,675} = 4.081.632,65 \text{ mm}^3$$

Ambil b	250	300	350
$d = \sqrt{\frac{b \cdot d^2}{b}}$	127	117	108

diambil $b = 300 \text{ mm}$

diambil $h = 400 \text{ mm}$

$d_s = pb + \emptyset_{\text{sengkang}} + \text{jarak pusat tul. pokok kesisi dalam sengkang}$

$$= 40 + 10 + 14/2 = 57 \text{ (anggap tulangan satu lapis, } d_s = 50 - 70 \text{ mm)}$$

$$d_{\text{pakai}} = h - d' = 400 - 57 = 343 \text{ mm}$$

$d_{\text{pakai}} > d_{\text{perlu}} \rightarrow$ maka dipakai tulangan sebelah

$$Rn = \frac{Mn}{b \cdot d^2} = \frac{15 \cdot 10^6}{300 \cdot 343^2} = 0,42 \text{ Mpa}$$

$$\begin{aligned} \rho_{\text{pendekatan}} &= \frac{Rn_{\text{baru}}}{Rn_{\text{lama}}} \cdot \rho_{\text{lama}} = \frac{0,42}{3,675} \cdot 0,0101 \\ &= 0,0011 < \rho_{\text{max}} = 0,0203 \\ &< \rho_{\text{min}} = 0,0035 \end{aligned}$$

$$As_{\text{pendekatan}} = \rho \cdot b \cdot d = 0,0035 \cdot 300 \cdot 343 = 360,15 \text{ mm}^2$$

dipakai diameter tulangan = 14 mm, $A_{1\emptyset} = 153 \text{ mm}^2$

$$n = \frac{As}{A_{1\emptyset}} = \frac{360,15}{153} = 2,33 \sim 3 \text{ batang}$$

dipakai 3D 14 = $459 \text{ mm}^2 > 360,15 \text{ mm}^2$

Periksa Kapasitas Penampang

Anggap baja tarik telah leleh pada saat beton tekan mencapai regangan hancur

$$\varepsilon_{cu}' = 0,003$$

$$\text{Gaya - gaya dalam : } C = 0,85 \cdot f_c' \cdot b \cdot a = 0,85 \cdot 25 \cdot 300 \cdot a = 6375 a$$

$$T = As \cdot fy = 459 \cdot 400 = 183.600 \text{ N}$$

Keseimbangan gaya-gaya dalam $C = T$ memberikan

$$6375 a = 183.600 \text{ N} \rightarrow a = 28,8 \text{ mm dan } x = a/\beta_1 = 28,8/0,85 = 33,88 \text{ mm}$$

Periksa regangan baja tarik

$$\text{- regangan leleh : } \varepsilon_y = \frac{fy}{Es} = \frac{400}{20000} = 0,002$$

- regangan baja tulangan tarik :

$$\epsilon_s = \frac{d-x}{x} \cdot \epsilon_{cu} = \frac{343-33,88}{33,88} \cdot 0,003 = 0,027 > \epsilon_y = 0,002$$

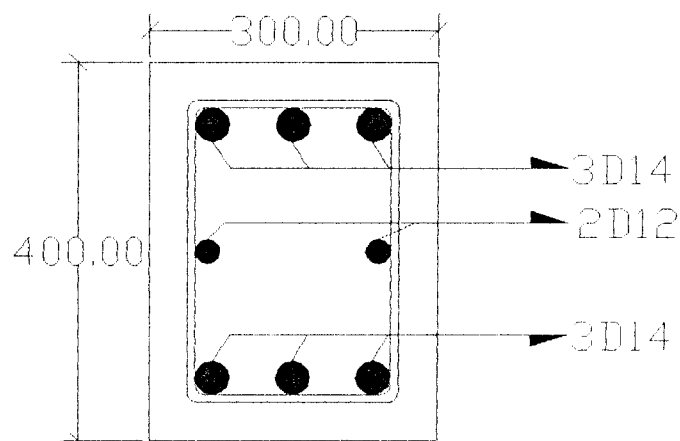
→ baja tulangan tarik telah leleh

Maka momen Nominal :

$$M_n = T \left(d - \frac{a}{2} \right) = 183.600 \left(343 - \frac{28,8}{2} \right) = 60.330.960 = 60,33 \text{ kN-m}$$

$$M_R = \phi M_n = 0,8 \cdot 60,33$$

$$= 48,26 \text{ kN-m} > M_U = 7,714 \text{ kN-m} \quad \underline{\text{Aman}}$$

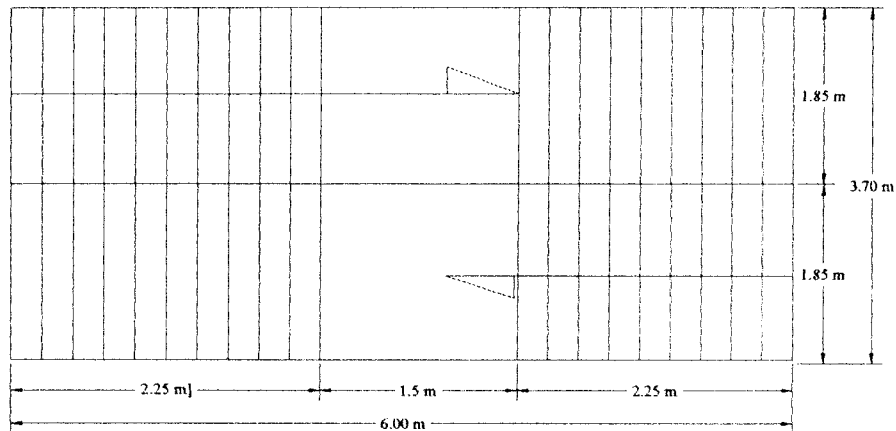


Gambar 5.12 Penampang Tribun tumpuan Mb

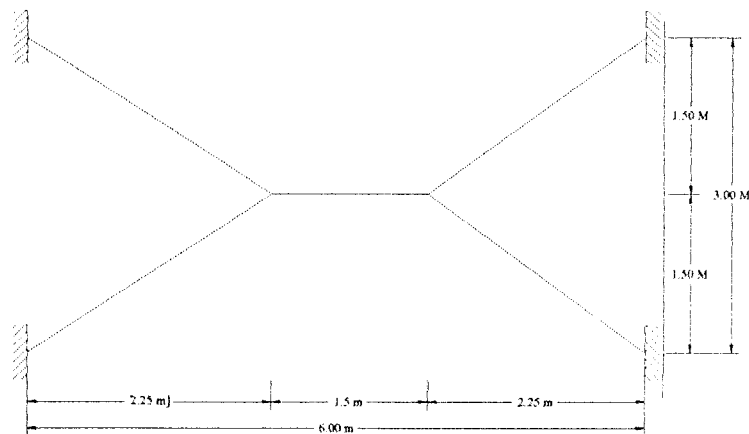
Karena Tinggi balok tribun lebih besar dari 300 mm maka pada tengah balok tribune dipasang tulangan susut **2D12**

5.4. Perencanaan Tangga

Perencanaan tangga meliputi perencanaan oprade dan antrade, pembebanan tangga dan bordes, penulangan pelat tangga dan bordes. Perencanaan tangga disajikan pada **Gambar 5.13** dan **Gambar 5.14**.



Gambar 5.13 Tangga tampak atas



Gambar 5.14 Tangga tampak samping.

5.4.1 Perencanaan Optrade dan Antrade

Langkah-langkah perencanaan optrade dan antrade adalah sebagai berikut :

$$\operatorname{Tg} \alpha^{\circ} = O/A = 1,4/2,25 = 0,622$$

$$\alpha^{\circ} = 31,891^{\circ}$$

$$O = A \cdot 0,622$$

$$2 \cdot O + A = 65$$

$$2 \cdot 0,622 \cdot A + A = 65$$

dari persamaan diatas didapat $A = 28,966$ cm, diambil $A = 29$ cm

$$O = 29 \cdot 0,622 = 18,038$$
 cm, diambil $O = 18$ cm

$$\text{Jumlah Optrade} = 140/18 = 7,778 = 8 \text{ buah}$$

$$\text{Jumlah Antrade} = 8 - 1 = 7 \text{ buah}$$

$$\text{Tinggi injakan, } O = 140/8 = 17,50 \text{ cm}$$

$$\text{Lebar injakan, } A = 225/7 = 32,143 \text{ cm}$$

Tebal pelat tangga

$$ht = 140 \text{ mm}$$

$$hb = (ht / \cos \alpha) + \frac{1}{2} \cdot O$$

$$= (140 / \cos 31,891^{\circ}) + \frac{1}{2} \cdot 175 = 252 \text{ mm}$$

5.4.2 Pembebanan Tangga dan Bordes

Pembebanan tangga dan bordes menurut PPPURDG 1987

a. Beban Mati (per 1m)

$$\checkmark \text{ Berat tangga} : \frac{1}{2} \cdot 0,175 \cdot 1 \cdot 24 = 2,10 \text{ kN/m (tidak termasuk pelat)}$$

$$\checkmark \text{ Tegel} : 0,02 \cdot 1 \cdot 24 = 0,480 \text{ kN/m}$$

$$\checkmark \text{ Spesi} : 0,04 \cdot 1 \cdot 21 = 0,840 \text{ kN/m}$$

$$\checkmark \text{ Sandaran} : 0,08 \cdot 1 \cdot 24 = 1,920 \text{ kN/m}$$

$$w_D = 5,340 \text{ kN/m}$$

b. Beban hidup (per 1m)

$$\checkmark \text{ Tangga} : w_L = 3 \text{ kN/m}$$

5.4.3 Analisis Struktur Tangga dan Bordes

Analisis struktur tangga dihitung menggunakan program aplikasi computer SAP 2000, dengan pemasukan data-data sebagai berikut ini :

1. Nomor joint dan elemen sesuai dengan gambar 5.11,
2. Dukungan pada no joint dianggap jepit,
3. Beban tangga dan bordes terdiri dari beban mati dan beban hidup,
4. Ukuran penampang pelat tangga dan bordes : $b = 1000\text{mm}$, $h = 140 \text{ mm}$, dan
5. Modulus elastisitas beton $E = 4700\sqrt{f_c}$ dengan $f_c = 20 \text{ MPa}$.

$$\text{Jadi } E = 4700\sqrt{20} = 21019,03899 \text{ MPa.}$$

Data input program dan hasil hitungan disajikan dalam lampiran-lampiran.

5.4.4 Penulangan Pelat Tangga dan Bordes

Penulangan pelat tangga dan bordes, dipilih pelat tangga yang memiliki momen yang terbesar untuk mewakili tulangan atas dan bawah, sebagai berikut :

$$M_D = 28,317 \text{ kN/m}$$

$$M_L = 9,834 \text{ kN/m}$$

$$M_U = 1,2 \cdot M_D + 1,6 M_L$$

$$= 1,2 \cdot 28,317 + 1,6 \cdot 9,834 = 49,714 \text{ kN/m}$$

Digunakan tulangan pokok P12

$$h = 140 \text{ mm}$$

$$d' = 15 + \frac{1}{2} \cdot 12 = 21 \text{ mm}$$

$$d = h - d' = 140 - 21 = 119 \text{ mm}$$

$$M_u = 49,714 \text{ kN/m}$$

$$\frac{M_u}{0,8} = \frac{49,714}{0,8} = 62,143 \text{ kNm}$$

$$\frac{M_u}{0,8} = C_c \left[d - \left(\frac{a}{2} \right) \right] = 0,85 \cdot f_c \cdot b \cdot a \left[d - \left(\frac{a}{2} \right) \right]$$

$$62,143 \cdot 10^6 = 0,85 \cdot 20 \cdot 1000 \cdot a \cdot \left[119 - \left(\frac{a}{2} \right) \right]$$

$$62,143 \cdot 10^6 = 2023000a - 8500a^2$$

dari persamaan diatas didapat $a = 36,235 \text{ mm}$

$$0,85 \cdot f_c \cdot b \cdot a = A_{s \text{ perlu}} \cdot f_y$$

$$0,85 \cdot 20 \cdot 1000 \cdot 36,235 = A_{s \text{ perlu}} \cdot 240$$

$$A_{s \text{ perlu}} = 2566,646 \text{ mm}^2$$

$$A_{s \text{ min}} = 0,0025 \cdot b \cdot h = 0,0025 \cdot 1000 \cdot 140 = 350 \text{ mm}^2$$

$A_{s \text{ perlu}} > A_{s \text{ min}}$, maka dipakai $A_{s \text{ perlu}}$

Tersedia tulangan P12 $A_{s \text{ tulangan}} = \frac{1}{4} \cdot \pi \cdot 12^2 = 113,097 \text{ mm}^2$

Jarak antar tulangan perlu, $S_{\text{perlu}} = (113,097 \cdot 1000) / 2566,646 = 44,064 \text{ mm}$

Dipakai P12 – 40

Luas tulangan dipakai $A_{s \text{ dipakai}} = (113,097 \cdot 1000) / 40 = 2827,425 \text{ mm}^2$

$A_{s \text{ pakai}} = 2827,425 \text{ mm}^2 > A_{s \text{ perlu}} = 2566,646 \text{ mm}^2$

❖ Penulangan bagi atau susut

$A_{s \text{ perlu}} = 0,0018 \cdot 1000 \cdot 140 = 252 \text{ mm}^2$

Tersedia tulangan P8, $A_{s \text{ tulangan}} = \frac{1}{4} \cdot \pi \cdot p^2 = \frac{1}{4} \cdot 3,14 \cdot 8^2 = 50,265 \text{ mm}^2$

Jarak antar tulangan perlu, $s_{\text{perlu}} = (50,265 \cdot 1000) / 252 = 199,464 \text{ mm}^2$

Dipakai tulangan bagi P8 – 150

Luas tulangan dipakai $A_{s \text{ dipakai}} = (50,265 \cdot 1000) / 150 = 335,100 \text{ mm}^2$

$A_{s \text{ pakai}} = 335,100 \text{ mm}^2 > A_{s \text{ perlu}} = 252 \text{ mm}^2$ -- aman --

BAB VI

PERENCANAAN STRUKTUR PORTAL BETON BERTULANG

6.1 Pendahuluan

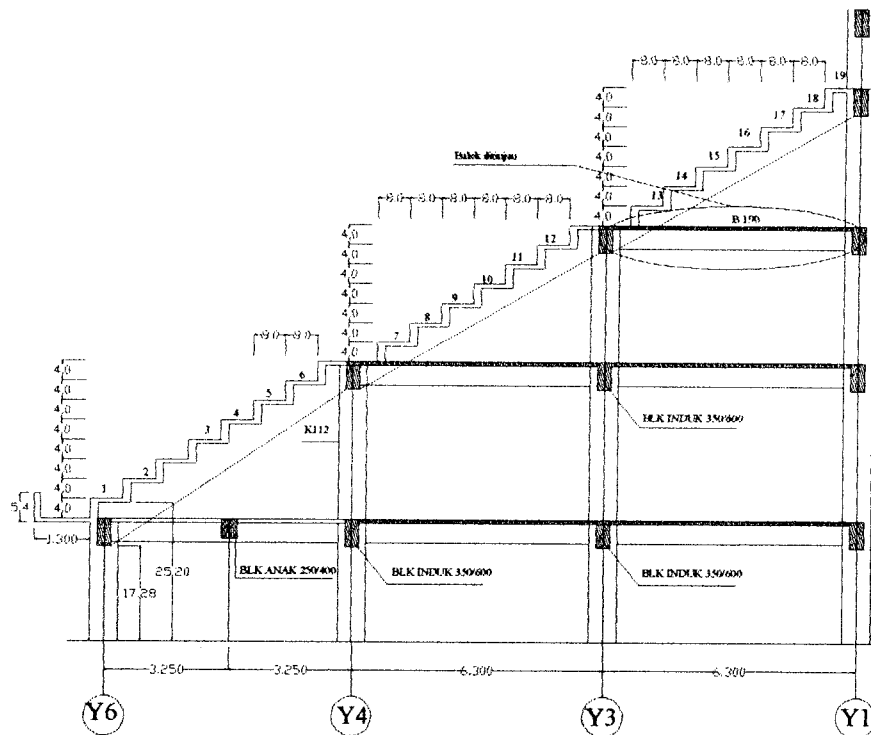
Analisis struktur portal dihitung menggunakan program aplikasi komputer SAP 2000, dengan memasukkan data-data sebagai berikut :

1. Nomor joint dan frame, disesuaikan dengan bentuk dan ukuran portal
2. Dukungan portal dianggap jepit
3. Ukuran penampang balok dan kolom
4. Modulus elastis beton $E = 4700\sqrt{f'_c}$ dengan $f'_c = 25$ MPa
Jadi $E_c = 4700\sqrt{25} = 23500$ MPa
5. Pembebanan portal, meliputi beban mati, beban hidup dan beban gempa
6. Jenis pembebanan, beban merata dan beban terpusat

Data-data input program computer disajikan dalam lampiran-lampiran hasil output dari perhitungan analisis stuktur portal, berupa reaksi dukungan, joint displacement, dan gaya-gaya dalam untuk keperluan perhitungan desain balok dan kolom sebagai elemen portal.

6.2 Perencanaan Lentur Balok

Berikut ini adalah contoh perhitungan balok Tipe 1 : B191 Portal AS A24 yang direncanakan dengan ukuran 300/550, dan direncanakan pula sebagai balok bertulang sebelah.



Gambar 6.1 Balok yang ditinjau

- ▶ f_c = 25 Mpa $\rightarrow \beta_1 = 0,85$
- ▶ f_y = 400 Mpa
- ▶ $\varnothing_{tul\ Utama}$ = 20 mm
- ▶ $\varnothing_{tul\ Sengkang}$ = 10 mm

$$\rho_{min} = \frac{1,4}{f' y} = \frac{1,4}{400} = 0,0035$$

$$\rho_b = \frac{0,85 f'c}{f_y} \beta_1 \left(\frac{600}{600 + f_y} \right) = \frac{0,85 \cdot 25}{400} \cdot 0,85 \left(\frac{600}{600 + 400} \right) = 0,0271$$

$$\rho_{\max} = 0,75 \cdot \rho_b = 0,75 \cdot 0,0271 = 0,0203$$

$$\rho_{\text{pakai}} = 0,5 \cdot \rho_{\max} = 0,5 \cdot 0,0203 = 0,0102$$

$$m = \frac{f_y}{0,85 \cdot f'c} = \frac{400}{0,85 \cdot 25} = 18,824$$

$$\begin{aligned} R_n &= \rho \cdot f_y \cdot (1 - \frac{1}{2} \cdot m) = 0,0102 \cdot 400 \cdot (1 - \frac{1}{2} \cdot 0,0102 \cdot 18,824) \\ &= 3,675 \text{ Mpa} \end{aligned}$$

a. Penulangan untuk momen Tumpuan

$$M- = 93,990 \text{ kNm}$$

$$M_n \text{ perlu} = \frac{93,990}{0,8} = 117,448 \text{ kNm}$$

$$b \cdot d^2 \text{ perlu} = \frac{M_n}{R_n} = \frac{117,448 \cdot 10^3 \cdot 10^3}{3,675} = 31,96 \cdot 10^6 \text{ mm}^3$$

$$\text{diambil } b = 300 \text{ mm}$$

$$d_{\text{perlu}} = \sqrt{\frac{M_n}{R_n \cdot b}} = \sqrt{\frac{117,448}{3,675 \cdot 300}} = 326,423 \text{ mm}$$

$$\text{diambil } h = 550 \text{ mm}$$

$$d_s = pb + \varnothing_{\text{senggang}} + \text{jarak pusat tul. pokok kesisi dalam senggang}$$

$$= 40 + 10 + 20/2$$

$$= 60 \text{ (anggap tulangan satu lapis, } d_s = 50 - 70 \text{ mm)}$$

$$d_{\text{pakai}} = h - d' = 550 - 60$$

$$= 490 \text{ mm}$$

$$d_{\text{pakai}} > d_{\text{perlu}} \rightarrow \text{maka dipakai tulangan sebelah}$$

$$R_n = \frac{Mn}{b.d^2} = \frac{117,488.10^6}{300.490^2} = 1,631 \text{ Mpa} < R_{nlama} = 3,675 \text{ Mpa}$$

$$\begin{aligned} \rho_{pendekatan} &= \frac{Rn_{baru}}{Rn_{lama}} \cdot \rho_{lama} = \frac{1,63}{3,675} \cdot 0,0101 \\ &= 0,0045 < \rho_{max} = 0,0203 \\ &> \rho_{min} = 0,0035 \end{aligned}$$

$$A_{S_{pendekatan}} = \rho \cdot b \cdot d = 0,0045 \cdot 300 \cdot 490 = 662.807 \text{ mm}^2$$

$$\text{dipakai 3D 20} = 942 \text{ mm}^2 > 662.807 \text{ mm}^2$$

Periksa Kapasitas Penampang

Anggap baja tarik telah leleh pada saat beton tekan mencapai regangan hancur

$$\varepsilon_{cu}' = 0,003$$

$$\text{Gaya - gaya dalam : } C = 0,85 \cdot f_c' \cdot b \cdot a = 0,85 \cdot 25 \cdot 300 \cdot a = 6375 a$$

$$T = A_s \cdot f_y = 942 \cdot 400 = 376.800 \text{ N}$$

Keseimbangan gaya-gaya dalam $C = T$ memberikan

$$6375 a = 376.800 \text{ N} \rightarrow a = 59 \text{ mm dan } x = a/\beta_1 = 59/0,85 = 69,4 \text{ mm}$$

Periksa regangan baja tarik

$$\text{- regangan leleh : } \varepsilon_y = \frac{f_y}{E_s} = \frac{400}{200000} = 0,002$$

- regangan baja tulangan tarik :

$$\varepsilon_s = \frac{d-x}{x} \cdot \varepsilon_{cu} = \frac{490-69,4}{69,4} \cdot 0,003 = 0,018 > \varepsilon_y = 0,017$$

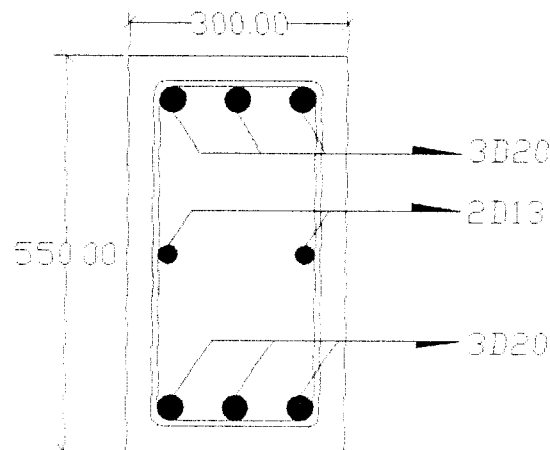
→ baja tulangan tarik telah leleh

Maka momen Nominal :

$$M_n = T \left(d - \frac{a}{2} \right) = 376.800 \left(490 - \frac{59}{2} \right) = 173.516.400 = 173,51 \text{ kN-m}$$

$$M_R = \phi M_n = 0,8 \cdot 173,51$$

$$= 138,813 \text{ kN-m} > M_U = 93,990 \text{ kN-m} \quad \underline{\text{Aman}}$$



Gambar 6.2 Penampang balok tipe 1 tumpuan kiri

b. Penulangan untuk momen Lapangan

$$M^+ = 69,26 \text{ kNm}$$

$$M_n \text{ perlu} = \frac{69,26}{0,8} = 86,575 \text{ kNm}$$

$$b \cdot d^2 \text{ Perlu} = \frac{M_n}{R_n} = \frac{86,575 \cdot 10^6}{3,675} = 23.555.025,22 \text{ mm}^3$$

$$\text{diambil } b = 300 \text{ mm} \quad d_{\text{perlu}} = \sqrt{\frac{M_n}{R_n \cdot b}} = \sqrt{\frac{117,448}{3,675 \cdot 300}} = 326,423 \text{ mm}$$

diambil $h = 550$ mm

$$d_s = pb + \varnothing_{\text{senggang}} + \text{jarak pusat tul. pokok kesisi dalam sengkang}$$

$$= 40 + 10 + 20/2 = 60 \text{ (anggap tulangan satu lapis, } d_s = 50 - 70 \text{ mm)}$$

$$d_{\text{pakai}} = h - d' = 550 - 60 = 490 \text{ mm}$$

$d_{\text{pakai}} > d_{\text{perlu}} \rightarrow$ maka dipakai tulangan sebelah

$$Rn = \frac{Mn}{b \cdot d^2} = \frac{86,575 \cdot 10^6}{300 \cdot 490^2} = 1,202 \text{ Mpa}$$

$$\rho_{\text{pendekatan}} = \frac{Rn_{\text{baru}}}{Rn_{\text{lama}}} \cdot \rho_{\text{lama}} = \frac{1,202}{3,675} \cdot 0,0101$$

$$= 0,0033 < \rho_{\text{max}} = 0,0203$$

$$< \rho_{\text{min}} = 0,0035$$

$$A_{s\text{pendekatan}} = \rho \cdot b \cdot d = 0,0035 \cdot 300 \cdot 490 = 488,414 \text{ mm}^2$$

dipakai diameter tulangan = 20 mm, $A_{1\varnothing} = 314 \text{ mm}^2$

$$n = \frac{A_s}{A_{1\varnothing}} = \frac{488,414}{314} = 1,55 \sim 3 \text{ batang}$$

$$\text{dipakai } 3D 20 = 942 \text{ mm}^2 > 488,414 \text{ mm}^2$$

Periksa Kapasitas Penampang

Anggap baja tarik telah leleh pada saat beton tekan mencapai regangan hancur

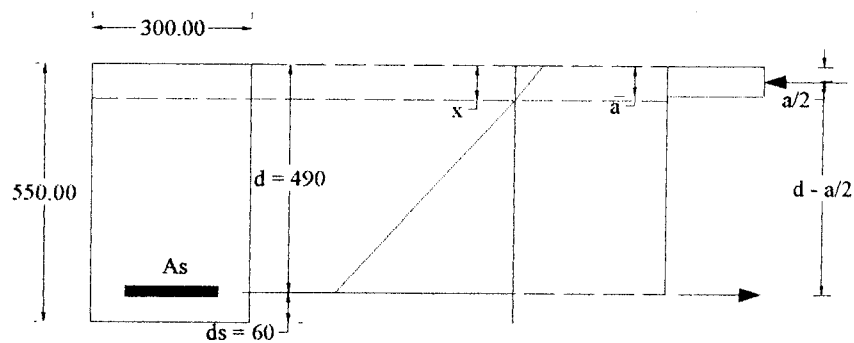
$$\epsilon_{cu}' = 0,003$$

$$\text{Gaya - gaya dalam : } C = 0,85 \cdot f_c' \cdot b \cdot a = 0,85 \cdot 25 \cdot 300 \cdot a = 6375 a$$

$$T = A_s \cdot f_y = 942 \cdot 400 = 376.800 \text{ N}$$

Keseimbangan gaya-gaya dalam $C = T$ memberikan

$$6375 a = 376.800 \text{ N} \rightarrow a = 59 \text{ mm dan } x = a/\beta_1 = 59/0,85 = 69,4 \text{ mm}$$



Periksa regangan baja tarik :

$$\text{❖ Regangan leleh : } \epsilon_y = \frac{f_y}{E_s} = \frac{400}{20000} = 0,002$$

❖ Regangan baja tulangan tarik :

$$\epsilon_y = \frac{d - x}{x} \cdot \epsilon_{cu} = \frac{490 - 69,4}{69,4} \cdot 0,003 = 0,018 > \epsilon_y = 0,002$$

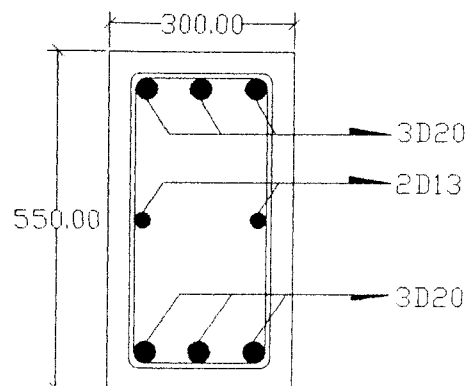
jadi baja tulangan tarik telah leleh

Maka momen nominal :

$$M_n = T \left(d - \frac{a}{2} \right) = 376.800 \left(490 - \frac{59}{2} \right) = 173.516.400 = 173,51 \text{ kN-m}$$

$$M_g = \Phi M_n = 0,8 \cdot 173,51$$

$$= 138,813 \text{ kN-m} > M_u = 69,26 \text{ kN-m} \quad \underline{\text{Aman}}$$



Gambar 6.3 Penampang Balok Tulangan Lapangan

Perencanaan Tulangan Geser Balok

- Gaya geser dukungan

$$V_u \text{ dukungan} = 100,59 \text{ kN}$$

- Gaya geser pada penampang kritis sejauh d dari tumpuan :

$$V_u = \frac{3,37 - (0,49 + 0,3)}{3,37} \cdot 100,59 = 77 \text{ kN}$$

- Kekuatan geser beton (V_c)

$$V_c = \left[\frac{1}{6} \sqrt{f'c} \right] \cdot b_w \cdot d = \left[\frac{1}{6} \sqrt{25} \right] 300 \cdot 490 = 122.500 \text{ N} = 122,5 \text{ kN}$$

- Kekuatan Geser tulangan geser:

$$V_{s1} = \frac{1}{3} \sqrt{f'c} \cdot b_w \cdot d = 2V_c = 245000 \text{ N} = 245 \text{ kN}$$

$$V_{s2} = \frac{2}{3} \sqrt{f'c} \cdot b_w \cdot d = 4V_c = 490000 \text{ N} = 490 \text{ kN}$$

Untuk geser factor reduksi kekuatan $\phi = 0,6$, maka

$$\phi \cdot V_c = 0,6 \cdot 122,5 = 73,5 \text{ kN}$$

$$\phi \cdot V_{s1} = 0,6 \cdot 245 = 147 \text{ kN}$$

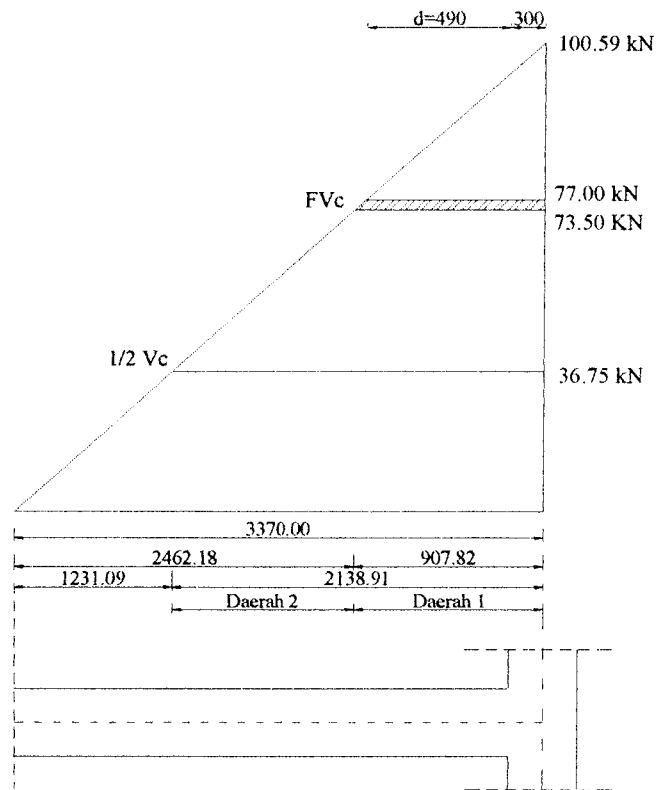
$$\phi \cdot V_{s2} = 0,6 \cdot 490 = 294 \text{ kN}$$

$$\phi \cdot (V_c + V_{s1}) = \phi \cdot 3 V_c = 0,6 \cdot (122,5 + 245) = 220,5 \text{ kN}$$

$$\phi \cdot (V_c + V_{s2}) = \phi \cdot 5 V_c = 0,6 \cdot (122,5 + 490) = 367,5 \text{ kN}$$

Ternyata $\phi \cdot V_c = 73,5 \text{ kN} < V_u = 77 \text{ kN} < \phi \cdot 3 V_c = 220,5 \text{ kN}$

Berarti ukuran penampang dapat dipergunakan tetapi diperlukan tulangan geser.



Gambar 6.4 Diagram Geser Balok Anak

Dicari koordinat titik penting :

Titik dimana gaya geser = $\Phi \cdot V_c = 73,5$ kN

$$\triangleright X_1 = \frac{73,5}{100,59} 3370 = 2462,4 \text{ mm dari tengah bentang}$$

Titik dimana gaya geser = $\frac{1}{2} \cdot \Phi \cdot V_c = 36,75$ kN

$$\triangleright X_2 = \frac{36,75}{100,59} 3370 = 1231,2 \text{ mm dari tengah bentang}$$

$$d/4 = 490 / 4 = 122,5 \text{ mm} < 300 \text{ mm}$$

$$d/2 = 490 / 2 = 245 \text{ mm} < 600 \text{ mm}$$

$$\text{digunakan sengkang dengan D10 mm : } A_s = 2 \cdot \frac{1}{4} \cdot \pi \cdot D^2 = 100,52 \text{ mm}^2$$

- Daerah 1:

$$\phi V_s = V_u - \phi V_c = 77 - 73,5 = 3,5 \text{ kN}$$

$$V_s = 3,5/0,6 = 5,83 \text{ kN}; \text{ jarak sengkang } s = \frac{100,52 \cdot 350 \cdot 492}{5,83 \cdot 10^3} = 461 \text{ mm} >$$

245 mm

Dipakai sengkang **P8-240**

- Daerah 2:

Yaitu daerah tulangan geser minimum:

$$\text{jarak sengkang } s = \frac{3A_v f_y}{b_w} = \frac{3 \cdot 100,53 \cdot 400}{350} = 344,57 \text{ mm} < 245 \text{ mm}$$

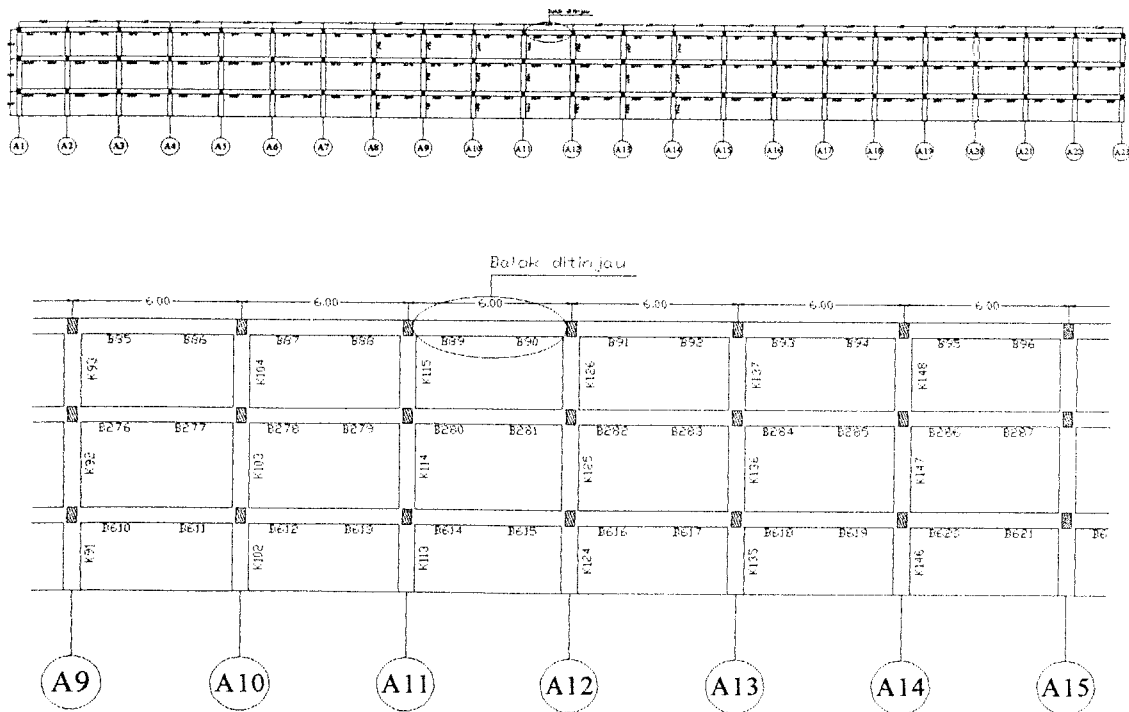
Dipakai sengkang **P8-240**

6.3 Perencanaan Lentur Balok Induk

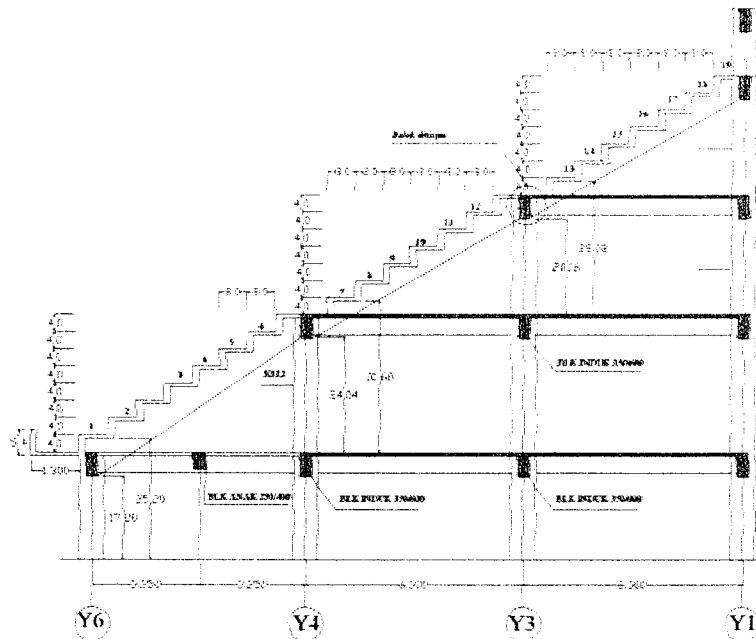
Berikut ini adalah contoh perhitungan balok portal AsY3, Balok Lantai 3 (Balok B89,B90) dengan ukuran Balok $b = 350$ mm dan $h = 600$ mm. Dan direncanakan sebagai balok bertulang rangkap.

Adapun data-data struktur adalah sebagai berikut :

- ▶ $f'c$ = 25 Mpa
- ▶ f_y = 400 Mpa
- ▶ $\phi_{tul\ Utama}$ = 22 mm
- ▶ $\phi_{tul\ Senggang}$ = 10 mm



Gambar 6.5 Portal As Y3



Gambar 6.6 Portal AS A12

a. Penulangan Untuk Momen Lapangan

$$Mu = 343,27 \text{ kNm}$$

$$\text{Beton } f'c = 25 \text{ Mpa} \rightarrow \beta_1 = 0,85$$

$$\text{Baja tulangan; } fy = 400 \text{ Mpa} \rightarrow \epsilon_y = \frac{fy}{E_s} = \frac{400}{200000} = 0,002$$

$$\rho_b = \frac{0,85 f'c}{fy} \beta_1 \left(\frac{600}{600 + fy} \right) = \frac{0,85 \cdot 25}{400} \cdot 0,85 \left(\frac{600}{600 + 400} \right) = 0,0271$$

Untuk Perencanaan digunakan

$$\rho = \rho_{\max} = 0,75 \cdot \rho_b = 0,75 \cdot 0,0271 = 0,0203$$

$$m = \frac{fy}{0,85 \cdot f'c} = \frac{400}{0,85 \cdot 25} = 18,824$$

$$R_n = \rho \cdot f_y \cdot (1 - \frac{1}{2}\rho \cdot m)$$

$$= 0,0203 \cdot 400 \cdot (1 - \frac{1}{2} \cdot 0,0203 \cdot 18,824) = 6,5685 \text{ Mpa}$$

$$M_u = 343,27 \text{ kNm}$$

$$M_n = \frac{343,27}{0,8} = 429,09 \text{ kNm}$$

$$b \cdot d^2 = \frac{M_n}{R_n} = \frac{429,09}{6,5685} = 65,27 \text{ m}^3$$

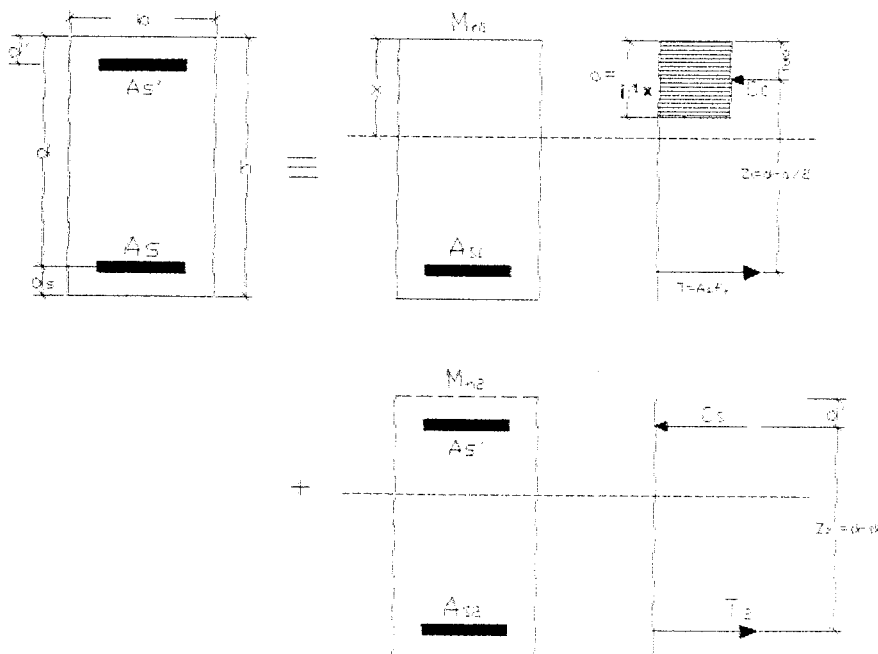
Ambil b	300	350	400
$d = \sqrt{\frac{b \cdot d^2}{b}}$	466	431	403

diambil $b = 300 \text{ mm}$, $h = 550 \text{ mm}$

$$d_s = 100 \text{ mm (Asumsi tulangan tarik 2 lapis, } d_s = 70 - 100)$$

$$d_{pakai} = h - d_s = 550 - 100 = 450 \text{ mm} < d_{pakai} = 466,5 \text{ mm}$$

$d_{pakai} < d_{perlu}$ maka dipakai tulangan rangkap



$$x = \left(\frac{600}{600 + f_y} \right) d = \left(\frac{600}{600 + 400} \right) 450 = 270 \text{ mm}$$

$$a = \beta_1 \cdot x = 0,85 \cdot 270 = 229,5 \text{ mm}$$

Luas Tulangan Tarik (seimbang dengan beton tekan):

$$A_{s1} = \rho_{Maks} \cdot b \cdot d = 0,0203 \cdot 300 \cdot 450 = 2743,24 \text{ mm}^2$$

Anggap tulangan tarik telah leleh

$$T_1 = A_{s1} \cdot f_y$$

$$\begin{aligned} M_{n1} &= T_1 \left(d - \frac{a}{2} \right) = A_{s1} \cdot f_y \cdot \left(d - \frac{a}{2} \right) \\ &= 2743,24 \cdot 400 \cdot \left(450 - \frac{229,5}{2} \right) = 367,87 \text{ kNm} \\ &= 367,87 \text{ kNm} < M_n = 429,09 \text{ kNm} \end{aligned}$$

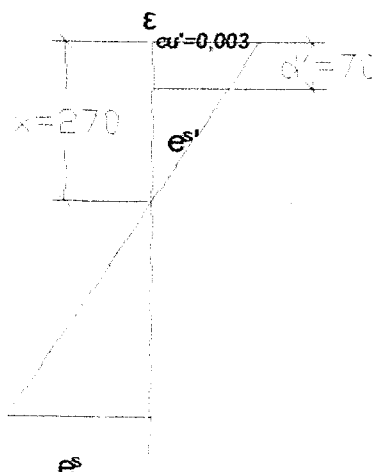
Kelebihan M_n harus ditahan oleh tambahan tulangan tarik dan tulangan tekan:

$$M_{n2} = M_n - M_{n1} = 429,09 - 367,87 = 61,22 \text{ kNm}$$

$$M_{n2} = C_s \cdot (d - d') \text{ atau } M_{n2} = T_2 \cdot (d - d') \text{ sehingga}$$

$$T_2 = C_s = \frac{M_{n2}}{d - d'} = \frac{61,22 \cdot 10^6}{450 - 70} = 161.101,90 \text{ N}$$

Periksa regangan tulangan tekan



$$\varepsilon_s' = \frac{x-d'}{x} \cdot \varepsilon_{cx} = \frac{270-70}{270} \cdot 0,003 = 0,0022$$

$$\varepsilon_y = \frac{f_y}{E_s} = \frac{400}{200000} = 0,002$$

Karena $\varepsilon_s' > \varepsilon_y$ maka baja tekan telah leleh pada saat regangan beton desak mencapai regangan hancur 0,003, dengan demikian: $f_s' = f_y$

Luas tulangan tekan : $A_{s'} = \frac{C_s}{f_s'} = \frac{161.101,90}{400} = 402,75 \text{ mm}^2$

Tambahan luas tulangan tarik: $A_{s2} = \frac{T_2}{f_y} = \frac{161.101,90}{400} = 402,75 \text{ mm}^2$

Luas tulangan tarik : $A_s = A_{s1} + A_{s2} = 2743,24 + 402,75 = 3145,99 \text{ mm}^2$

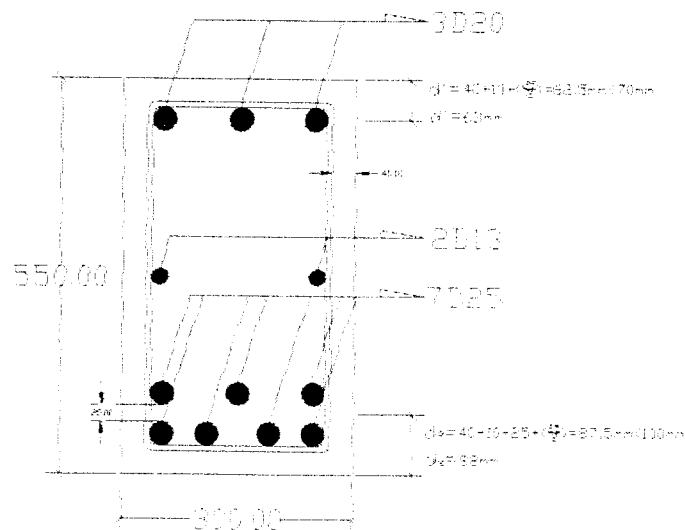
Dipakai Tulangan :

- Tulangan Tarik = 7D25 = 3.437,50 mm² > $A_s = 3145,99 \text{ mm}^2$
- Tulangan Tekan = 3D20 = 942,86 mm² > $A_{s'} = 402,75 \text{ mm}^2$

Periksa rasio Tulangan:

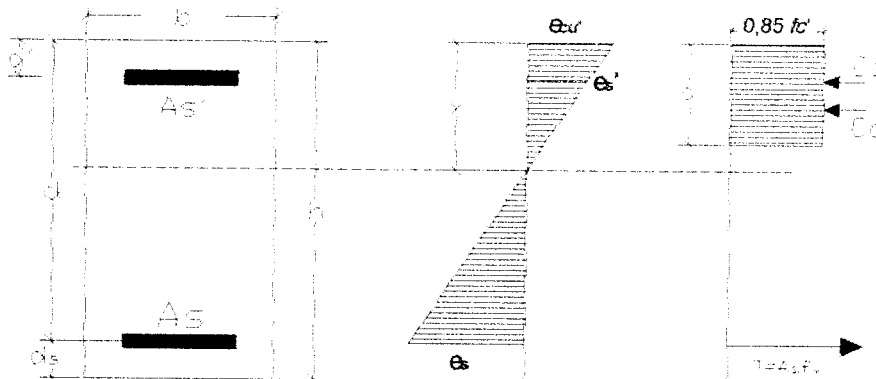
$$A_{s1} = A_s - A_{s'} = 3.437,50 - 402,75 = 2494,64 \text{ mm}^2$$

$$\rho = \frac{A_{s1}}{b \cdot d} = \frac{2494,64}{300 \cdot 450} = 0,0185 < \rho_{mak} = 0,0203 \rightarrow \text{memenuhi syarat}$$



$$Jbd = \frac{300 - (40 + 10) \cdot 2 - 4 \cdot 25}{3} = 33 \text{ mm} > 25 \text{ mm}$$

Periksa kapasitas Penampang



$$A_s = 3.437,5 \text{ mm}^2 ; A_s' = 943,86 \text{ mm}^2 \quad d_s = 88 \text{ mm}; d' = 60 \text{ mm}$$

$$d = 550 - 88 = 462 \text{ mm}$$

Anggap tulangan tarik dan tulangan tekan telah leleh:

$$C_c = 0,85 \cdot f_c' \cdot b \cdot a = 0,85 \cdot 25 \cdot 300 \cdot a = 6375a$$

$$C_s = A_s' \cdot (f_y - 0,85 f_c') = 943,86 \cdot (400 - 0,85 \cdot 25) = 375.107,14 \text{ N}$$

$$T = A_s \cdot f_y = 3437,5 \cdot 400 = 1375000,0 \text{ N}$$

Keseimbangan gaya-gaya dalam :

$$T = C_c + C_s$$

$$1375000,0 = 6375a + 375107,14 \rightarrow a = 159,66 \text{ mm}$$

$$x = \frac{a}{\beta_1} = 187,85 \text{ mm}$$

Periksa regangan-regangan baja yang terjadi:

$$\varepsilon_s' = \frac{(x - d')}{x} \cdot \varepsilon_{cu} = \frac{(187,85 - 60)}{187,85} \cdot 0,003 = 0,00204 > \varepsilon_y = 0,002$$

$$\varepsilon_s = \frac{(d - x)}{d} \cdot \varepsilon_{cu} = \frac{(462 - 187,85)}{462} \cdot 0,003 = 0,0044 > \varepsilon_y = 0,002$$

→ Anggapan benar berarti baja tulangan tarik dan tekan telah leleh pada saat beton tekan mencapai regangan hancur.

Hitung momen nominal :

$$C_c = 6375a = 6375 \cdot 159,66 = 1017892,85 \text{ N}$$

$$M_n = C_c \left(d - \frac{a}{2} \right) + C_s (d - d') =$$

$$= 1017892,8 \left(462 - \frac{159,66}{2} \right) + 375 \cdot 107,14 (462 - 60) = 532,56 \text{ kNm}$$

$$= 532,56 \text{ kNm} > 429,09 \text{ kNm}$$

Aman

b. Penulangan Untuk Momen Tumpuan

$$Mu = 368,32 \text{ kNm} \rightarrow M_n = \frac{368,32}{0,8} = 460,40 \text{ kNm}$$

$$\text{Beton } f'_c = 25 \text{ Mpa} \rightarrow \beta_1 = 0,85$$

$$\text{Baja tulangan; } f_y = 400 \text{ Mpa} \rightarrow \epsilon_y = \frac{f_y}{E_s} = \frac{400}{20000} = 0,002$$

$$\rho_b = \frac{0,85 f'_c}{f_y} \beta_1 \left(\frac{600}{600 + f_y} \right) = \frac{0,85 \cdot 25}{400} \cdot 0,85 \left(\frac{600}{600 + 400} \right) = 0,0271$$

Untuk Perencanaan digunakan

$$\rho = \rho_{\max} = 0,75 \cdot \rho_b = 0,75 \cdot 0,0271 = 0,0203$$

$$m = \frac{f_y}{0,85 \cdot f'_c} = \frac{400}{0,85 \cdot 25} = 18,824$$

$$R_n = \rho \cdot f_y \cdot (1 - \frac{1}{2} \rho \cdot m) = 0,0203 \cdot 400 \cdot (1 - \frac{1}{2} \cdot 0,0203 \cdot 18,824) = 6,5685 \text{ Mpa}$$

$$b \cdot d^2 = \frac{M_n}{R_n} = \frac{460,40}{6,5685} = 70,04 \text{ m}^3$$

$$d_{\text{Perlu}} = \sqrt{\frac{M_n}{R_n \cdot b}}$$

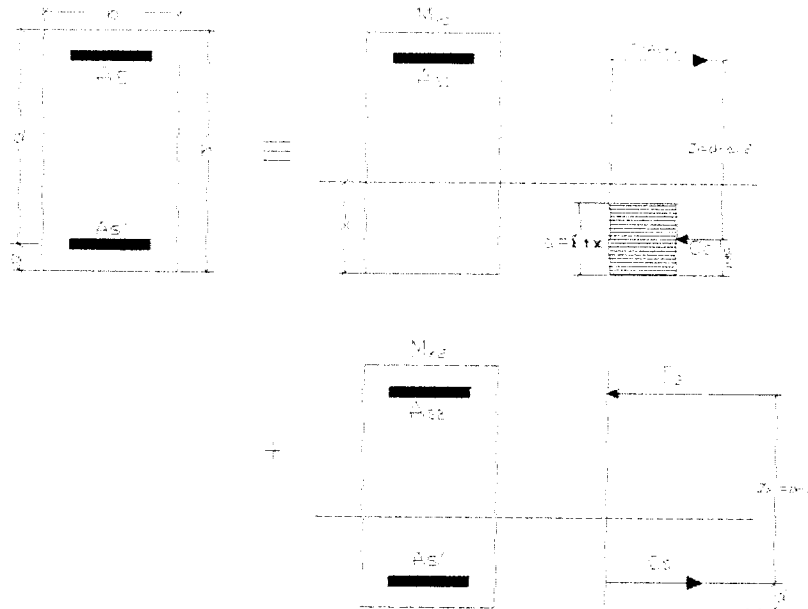
Ambil b	300	350	400
$d = \sqrt{\frac{b \cdot d^2}{b}}$	483	447	418,4

diambil $b = 300 \text{ mm}$, $h = 550 \text{ mm}$

$$d_s = 100 \text{ mm (Asumsi tulangan tarik 2 lapis, } ds = 70 - 100)$$

$$d_{\text{pakai}} = h - ds = 550 - 100 = 450 \text{ mm} < d_{\text{pakai}} = 469 \text{ mm}$$

$d_{pakai} < d_{perlu}$ maka dipakai tulangan rangkap



$$x = \left(\frac{600}{600 + f_y} \right) d = \left(\frac{600}{600 + 400} \right) 450 = 270 \text{ mm}$$

$$a = \beta_1 \cdot x = 0,85 \cdot 270 = 229,5 \text{ mm}$$

Luas Tulangan Tarik (seimbang dengan beton tekan):

$$A_{s1} = \rho_{maks} \cdot b \cdot d = 0,0203 \cdot 300 \cdot 450 = 2743,24 \text{ mm}^2$$

Anggap tulangan tarik telah leleh

$$T_1 = A_{s1} \cdot f_y$$

$$M_{nt} = T_1 \left(d - \frac{a}{2} \right) = A_{s1} \cdot f_y \cdot \left(d - \frac{a}{2} \right)$$

$$= 2743,24 \cdot 400 \cdot \left(450 - \frac{229,5}{2} \right) = 367,87 \text{ kNm}$$

$$= 367,87 \text{ kNm} < M_u = 429,09 \text{ kNm}$$

Kelebihan M_n harus ditahan oleh tambahan tulangan tarik dan tulangan tekan:

$$M_{n2} = M_n - M_{nj} = 429,09 - 367,87 = 61,22 \text{ kNm}$$

$$M_{n2} = C_s \cdot (d-d') \text{ atau } M_{n2} = T_2 \cdot (d-d') \text{ sehingga}$$

$$T_2 = C_s = \frac{M_{n2}}{d-d'} = \frac{61,22 \cdot 10^6}{450-70} = 161.101,90 \text{ N}$$

Periksa regangan tulangan tekan

$$\varepsilon_s' = \frac{x-d'}{x} \cdot \varepsilon_{cu} = \frac{270-70}{270} \cdot 0,003 = 0,0022$$

$$\varepsilon_y = \frac{f_y}{E_s} = \frac{400}{200000} = 0,002$$

Karena $\varepsilon_s' > \varepsilon_y$ maka baja tekan telah leleh pada saat regangan beton desak mencapai regangan hancur 0,003, dengan demikian: $f_s' = f_y$

$$\text{Luas tulangan tekan : } A_s' = \frac{C_s}{f_s'} = \frac{161.101,90}{400} = 402,75 \text{ mm}^2$$

$$\text{Tambahan luas tulangan tarik : } A_{s2} = \frac{T_2}{f_y} = \frac{161.101,90}{400} = 402,75 \text{ mm}^2$$

$$\text{Luas tulangan tarik : } A_s = A_{s1} + A_{s2} = 2743,24 + 402,75 = 3145,99 \text{ mm}^2$$

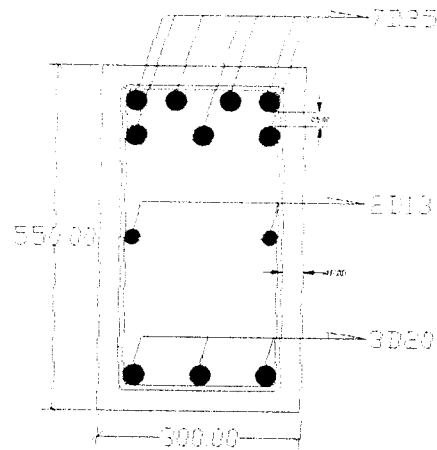
Dipakai Tulangan :

- Tulangan Tarik = 7D25 = 3.437,50 mm² > $A_s = 3145,99 \text{ mm}^2$
- Tulangan Tekan = 3D20 = 942,86 mm² > $A_s' = 402,75 \text{ mm}^2$

Periksa rasio Tulangan:

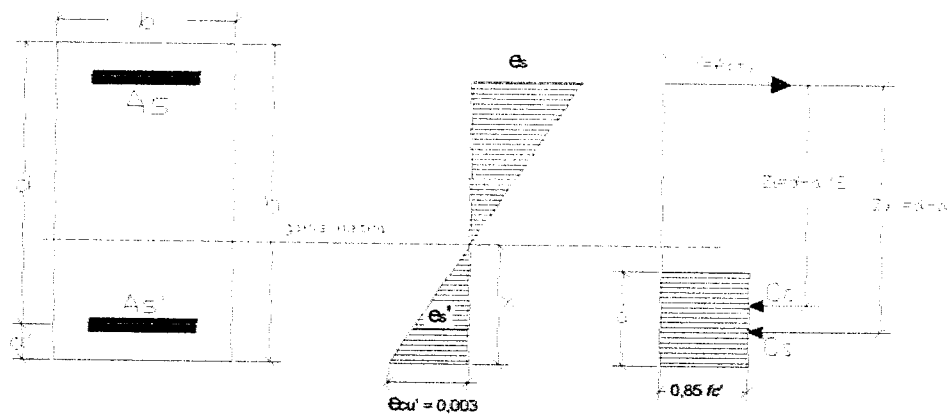
$$A_{s1} = A_s - A_s' = 3.437,50 - 402,75 = 2494,64 \text{ mm}^2$$

$$\rho = \frac{A_{s1}}{b \cdot d} = \frac{2494,64}{300 \cdot 450} = 0,0185 < \rho_{\max} = 0,0203 \rightarrow \text{memenuhi syarat}$$



$$J_{bd} = \frac{300 - (40 + 10) \cdot 2 - 4 \cdot 25}{3} = 33 \text{ mm} > 25 \text{ mm}$$

Periksa kapasitas Penampang



$$A_s = 3.437,5 \text{ mm}^2 ; A_s' = 943,86 \text{ mm}^2 \quad d_s = 88 \text{ mm}; d' = 60 \text{ mm}$$

$$d = 550 - 88 = 462 \text{ mm}$$

Anggap tulangan tarik dan tulangan tekan telah leleh:

$$C_c = 0,85 \cdot f_c \cdot b \cdot a = 0,85 \cdot 25 \cdot 300 \cdot a = 6375a$$

$$C_s = A_s' \cdot (f_y - 0,85 f_c') = 943,86 \cdot (400 - 0,85 \cdot 25) = 375.107,14 \text{ N}$$

$$T = A_s \cdot f_y = 3437,5 \cdot 400 = 1375000,0 \text{ N}$$

Keseimbangan gaya-gaya dalam :

$$T = C_c + C_s$$

$$1375000,0 = 6375a + 375107,14 \rightarrow a = 159,66 \text{ mm}$$

$$x = \frac{a}{\beta_1} = 187,85 \text{ mm}$$

Periksa regangan-regangan baja yang terjadi:

$$\varepsilon_s = \frac{(x - d')}{x} \cdot \varepsilon_{cu} = \frac{(187,85 - 60)}{187,85} \cdot 0,003 = 0,00204 > \varepsilon_y = 0,002$$

$$\varepsilon_s = \frac{(d - x)}{d} \cdot \varepsilon_{cu} = \frac{(462 - 187,85)}{462} \cdot 0,003 = 0,0044 > \varepsilon_y = 0,002$$

→ Anggapan benar berarti baja tulangan tarik dan tekan telah leleh pada saat beton tekan mencapai regangan hancur.

Hitung momen nominal :

$$C_c = 6375a = 6375 \cdot 159,66 = 1017892,85 \text{ N}$$

$$M_n = C_c \left(d - \frac{a}{2} \right) + C_s (d - d') =$$

$$= 1017892,8 \left(462 - \frac{159,66}{2} \right) + 375 \cdot 107,14 (462 - 60) = 532,56 \text{ kNm}$$

$$= 532,56 \text{ kNm} > 429,09 \text{ kNm}$$

Aman

Kontrol Kapasitas momen nominal tumpuan positif

$$\rho_{\text{aktual}} = \frac{A_{\text{Sada}}}{b \cdot d} = \frac{3437,5}{300 \cdot 462} = 0,0248$$

$$R_{\text{aktual}} = \rho_{\text{aktual}} \cdot f_y \cdot (1 - \frac{1}{2} \cdot \rho_{\text{aktual}} \cdot m) = 0,0248 \cdot 400 \cdot (1 - \frac{1}{2} \cdot 0,0248 \cdot 18,824) \\ = 7,60$$

$$M_{\text{nak}}^+ = R_{\text{aktual}} \cdot b \cdot d^2 = 7,60 \cdot 300 \cdot 450^2 \cdot 10^{-6} = 486,97 \text{ kNm}$$

Tabel Perencanaan Balok Persegi Tulangan Rangkap

	B90	
	Tul. Tumpuan	Tul. Lapangan
M_u	368.32 kNm	343.27 kNm
ϕ	0.80	0.80
$M_n = M_u / \phi$	460.40 kNm	429.09 kNm
f'_c	25.00 Mpa	25.00 Mpa
F_y	400.00 Mpa	400.00 Mpa
$\phi_{Tul\ Tekan}$	25.00 mm	25.00 mm
$\phi_{Tul\ Tarik}$	10.00 mm	10.00 mm
β_1	0.85	0.85
ρ_b	0.0271	0.0271
$\rho_{maks} = 0.75 \cdot \rho_b$	0.0203	0.0203
m	18.82	18.82
R_n	6.57 Mpa	6.57 Mpa
$h d^2$	70.04 mm ³	65.27 mm ³
ambil b	300.00 mm	300.00 mm
d_{perlu}	483.17 mm	466.46 mm
ambil h	550.00 mm	550.00 mm
d_s	100.000 mm	100.000 mm
d_{pakai}	450.00 mm	450.00 mm
$d_{pakai} < d_{perlu}$	T Rangkap	T Rangkap
x	270.00 mm	270.00 mm
a	229.50 mm	229.50 mm
As_1	2,743.24 mm ²	2,743.24 mm ²
M_{n1}	367.87 kNm	367.87 kNm
M_{n2}	92.53 kNm	61.22 kNm
$T_2 = C_s$	243,490.06 N	161,101.90 N
ϵ_s'	0.00222	0.00222
ϵ_r	0.00200	0.00200
f_s'	400.00 mpa	400.00 mpa
As'	608.73 mm ²	402.75 mm ²
As_2	608.73 mm ²	402.75 mm ²
As	3,351.97 mm ²	3,146.00 mm ²
Tul. Tarik	7 D 25	7 D 25
As_{aktual}	3,437.50 mm ²	3,437.50 mm ²
Tul. Tekan	3 D 20	3 D 20
As'_{aktual}	942.86 mm ²	942.86 mm ²
As_1	2,494.64 mm ²	2,494.64 mm ²
ρ	0.0185	0.0185
	$\rho < \rho_{maks}$	$\rho < \rho_{maks}$
d'	60.00 mm	60.00 mm
d_s	88.00 mm	88.00 mm
d_{aktual}	462.00 mm	462.00 mm
C_c	6375 a	6375 a
C_s	357,107.14 N	357,107.14 N
T	1,375,000.00 N	1,375,000.00 N
a	159.67 mm	159.67 mm
x	187.85 mm	187.85 mm
ϵ_s'	0.00204	0.00204
ϵ_s	0.00438	0.00438
	Tul. Tekan telah leleh	Tul. Tekan telah leleh
	Tul. Tarik telah leleh	Tul. Tarik telah leleh
C_c	1,017,892.86 N	1,017,892.86 N
M_n	532.56 kN	532.56 kN
	aman	aman

Tabel Perencanaan Balok

	Portal AS Y1			
	Lantai 4 = B25		Lantai 5 = B1	
	Tul. Tumpuan	Tul. Lapangan	Tul. Tumpuan	Tul. Lapangan
M_w	280,74 kNm	169,20 kNm	33,71 kNm	21,40 kNm
ϕ	0,80	0,80	0,80	0,80
$M_{ax} = M_w / \phi$	350,93 kNm	211,50 kNm	42,14 kNm	26,75 kNm
f'_c	25,00 Mpa	25,00 Mpa	25,00 Mpa	25,00 Mpa
F_y	400,00 Mpa	400,00 Mpa	400,00 Mpa	400,00 Mpa
$\phi_{Tul\ Pokok}$	25,00 mm	25,00 mm	20,00 mm	20,00 mm
$\phi_{Tul\ Sengkang}$	12,00 mm	12,00 mm	10,00 mm	10,00 mm
β_1	0,85	0,85	0,85	0,85
ρ_b	0,0271	0,0271	0,0271	0,0271
$\rho_{min} = 1,4/F_y$	0,0035	0,0035	0,0035	0,0035
$\rho_{max} = 0,75 \cdot \rho_b$	0,0203	0,0203	0,0203	0,0203
$\rho = 0,5 \cdot \rho_{max}$	0,0102	0,0102	0,0102	0,0102
m	18,82	18,82	18,82	18,82
R_n	3,68	3,68	3,68	3,68
$b d^2$	95,48	57,54	11,46	7,28
ambil b	300,00 mm	300,00 mm	300,00 mm	300,00 mm
d_{perlu}	564,15 mm	437,97 mm	195,49 mm	155,76 mm
ambil h	700,00 mm	700,00 mm	400,00 mm	400,00 mm
d_s	64,500 mm	64,500 mm	60,000 mm	60,000 mm
d_{pakai}	635,50 mm	635,50 mm	340,00 mm	340,00 mm
$d_{pakai} > d_{perlu}$	T Sebelah	T Sebelah	T Sebelah	T Sebelah
R_{nbars}	2,90	1,75	1,22	0,77
$\rho_{Pendekatan}$	0,0080	0,0048	0,0034	0,0021
	$\rho_{min} < \rho < \rho_{mak}$	$\rho_{min} < \rho < \rho_{mak}$	$\rho < \rho_{min}$	$\rho < \rho_{min}$
ρ_{Pakai}	0,0080	0,0048	0,0035	0,0035
$A_s_{pendekatan}$	1.526,5 mm ²	920,0 mm ²	357,0 mm ²	357,0 mm ²
Jumlah tul.	4,00	3,00	3,00	3,00
Tul Dipasang	4 D 25	3 D 25	3 D 20	3 D 20
A_s	1.964,3 mm ²	1.473,2 mm ²	942,9 mm ²	942,9 mm ²
Periksaan Kapasitas Penampang				
C	6375 a	6375 a	6375 a	6375 a
T	785,71 kN	589,29 kN	377,14 kN	377,14 kN
a	123,25 mm	92,44 mm	59,16 mm	59,16 mm
x	145,00 mm	108,75 mm	69,60 mm	69,60 mm
Pemeriksaan regangan baja tarik				
ϵ_y	0,0020	0,0020	0,0020	0,0020
ϵ_s	0,0101	0,0145	0,0117	0,0117
	Tul. telah leleh	Tul. telah leleh	Tul. telah leleh	Tul. telah leleh
M_n	450,90 kNm	347,26 kNm	117,07 kNm	117,07 kNm
M_R	360,72 kNm	277,80 kNm	93,66 kNm	93,66 kNm
	Aman	Aman	Aman	Aman

Tabel Perencanaan Balok

	Portal AS Y3			
	Lantai 1 = B648		Lantai 2 = B314	
	Tul. Tumpuan	Tul. Lapangan	Tul. Tumpuan	Tul. Lapangan
M_u	226,56 kNm	185,56 kNm	238,48 kNm	197,15 kNm
ϕ	0,80	0,80	0,80	0,80
$M_n = M_u / \phi$	283,20 kNm	231,95 kNm	298,10 kNm	246,44 kNm
f'_c	25,00 Mpa	25,00 Mpa	25,00 Mpa	25,00 Mpa
F_y	400,00 Mpa	400,00 Mpa	400,00 Mpa	400,00 Mpa
$\phi_{Tul Pokok}$	25,00 mm	25,00 mm	25,00 mm	25,00 mm
$\phi_{Tul Sengkan}$	12,00 mm	12,00 mm	12,00 mm	12,00 mm
β_1	0,85	0,85	0,85	0,85
ρ_b	0,0271	0,0271	0,0271	0,0271
$\rho_{min} = 1,4 / F_y$	0,0035	0,0035	0,0035	0,0035
$\rho_{max} = 0,75 \cdot \rho_b$	0,0203	0,0203	0,0203	0,0203
$\rho = 0,5 \cdot \rho_{mak}$	0,0102	0,0102	0,0102	0,0102
m	18,82	18,82	18,82	18,82
R_n	3,68	3,68	3,68	3,68
$b d^2$	77,05	63,11	81,11	67,05
ambil b	300,00 mm	300,00 mm	300,00 mm	300,00 mm
d_{perlu}	506,79 mm	458,65 mm	519,96 mm	472,75 mm
ambil h	750,00 mm	750,00 mm	750,00 mm	750,00 mm
d_s	64,500 mm	64,500 mm	64,500 mm	64,500 mm
d_{pakai}	685,50 mm	685,50 mm	685,50 mm	685,50 mm
$d_{pakai} > d_{perlu}$	T Sebelah	T Sebelah	T Sebelah	T Sebelah
R_{nbaru}	2,01	1,65	2,11	1,75
$\rho_{Pendekatan}$	0,0056	0,0045	0,0058	0,0048
	$\rho_{min} < \rho < \rho_{mak}$	$\rho_{min} < \rho < \rho_{mak}$	$\rho_{min} < \rho < \rho_{mak}$	$\rho_{min} < \rho < \rho_{mak}$
ρ_{Pakai}	0,0056	0,0045	0,0058	0,0048
$A_s_{pendekatan}$	1.142,0 mm ²	935,4 mm ²	1.202,1 mm ²	993,8 mm ²
Jumlah tul.	4,00	3,00	• 4,00	3,00
Tul Dipasang	4 D 25	3 D 25	4 D 25	3 D 25
A_s	1.964,3 mm ²	1.473,2 mm ²	1.964,3 mm ²	1.473,2 mm ²
Periksaan Kapasitas Penampang				
C	6375 a	6375 a	6375 a	6375 a
T	785,71 kN	589,29 kN	785,71 kN	589,29 kN
a	123,25 mm	92,44 mm	123,25 mm	92,44 mm
x	145,00 mm	108,75 mm	145,00 mm	108,75 mm
Pemeriksaan regangan baja tarik				
ϵ_y	0,0020	0,0020	0,0020	0,0020
ϵ_s	0,0112	0,0159	0,0112	0,0159
	Tul. telah leleh	Tul. telah leleh	Tul. telah leleh	Tul. telah leleh
M_n	490,19 kNm	376,72 kNm	490,19 kNm	376,72 kNm
M_R	392,15 kNm	301,38 kNm	392,15 kNm	301,38 kNm
	Aman	Aman	Aman	Aman

6.3. Perencanaan dan Penulangan Balok Terhadap Beban Geser

Selain balok direncanakan terhadap beban lentur yang bekerja, balok juga harus direncanakan terhadap gaya geser akibat lentur yang bekerja pada balok tersebut.

Pada tempat yang berpotensi terjadi sendi plastis, spasi maksimum tulangan geser direncanakan tidak boleh melebihi nilai yang didapat dibawah ini.

- $d/4 = 462/4 = 115,5 \text{ mm}$
- $8 \times \text{diameter tulangan longitudinal terkecil} = 8 \times 25 = 200 \text{ mm}$
- $24 \text{ kali diameter batang sengkang} = 24 \times 10 = 240 \text{ mm}$
- 200 mm

Pada daerah di luar sendi plastis, spasi maksimum tulangan geser tidak boleh melebihi nilai di bawah ini.

- $d/2 = 462/2 = 231 \text{ mm}$
- 600 mm

Pada perhitungan ini digunakan balok B90 sebagai contoh dalam perhitungan, berikut adalah langkah-langkahnya :

Dari data Sap2000 didapat data:

$$V_{D,b} = 115,25 \text{ kN} \quad V_{E,b} = 1,5 \text{ kN}$$

$$V_{L,b} = 63,83 \text{ kN} \quad V_G = 179,08 \text{ kN}$$

$$ln = 6 - 0,6 = 5,4 \text{ m}$$

Dari perhitungan balok terhadap lentur didapat:

$$M_{nak,b} = 606,466 \text{ kNm} \quad M_{nak,b'} = 606,466 \text{ kNm}$$

- Gaya Geser rencana (akibat beban kombinasi)

$$V_{ub} = 1,25 \cdot 0,7 \cdot \frac{M_{nak-} + M_{nak+}}{l_n} + 1,05V_g$$

$$\begin{aligned} V_{ub} &= 1,25 \cdot 0,7 \cdot \frac{606,466 + 606,466}{5,4} + (1,05 \cdot 179,08) \\ &= 384,48 \text{ kN} \end{aligned}$$

- tetapi tidak perlu lebih besar dari

$$\begin{aligned} V_{u,b} &= 1,05 (V_{DL} + V_{LL} + 4/K \cdot V_E) \\ &= 1,05 (115,25 + 63,83 + 4/1 \cdot 1,5) \\ &= 194,334 \text{ kN} \end{aligned}$$

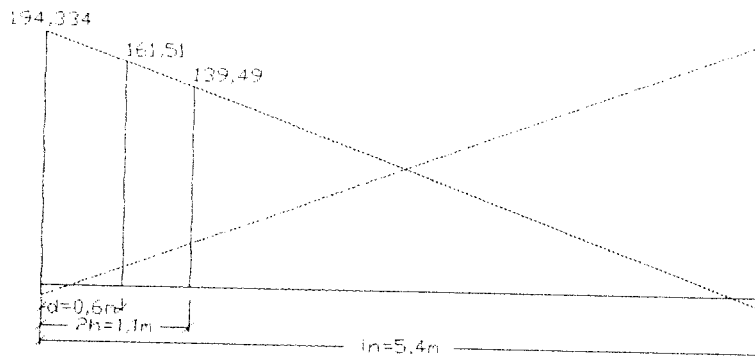
$V_{u,b}$ Pada daerah sejauh d :

$$\left[1,05V_g - 0,7 \cdot 1,25 \left(\frac{M_{nak,b} + M_{nak,b}'}{l_n} \right) \right] + \frac{l_n - d}{l_n} \left[V_{u,b}' - \left[1,05V_g - 0,7 \cdot 1,25 \left(\frac{M_{nak,b} + M_{nak,b}'}{l_n} \right) \right] \right]$$

$$[1,05 \cdot 179,08 - 196,53] + \frac{5,4 - 0,46}{5,4} [194,334 - 8,49] = 161,51 \text{ kN}$$

$V_{u,b}$ Pada daerah sejauh $2h$:

$$[1,05 \cdot 179,08 - 196,53] + \frac{5,4 - 1,1}{5,4} [194,334 - 8,49] = 139,49 \text{ kN}$$



a. Pada sendi plastis (0 - 2h = 0 - 110)

$$V_{u,b} = 161,51 \text{ kN}; V_c = 0$$

$$V_s = \frac{V_{u,b}}{\phi} - V_c = \frac{161,51}{0,6} - 0 = 269,18 \text{ kN}$$

Digunakan sengkang 2 kaki P10, $f_y = 240 \text{ MPa}$

$$A_v = 2 \cdot \frac{1}{4} \cdot \pi \cdot d^2 = 2 \cdot \frac{1}{4} \cdot \pi \cdot 10^2 = 157 \text{ mm}^2$$

$$S = (A_v \cdot f_y \cdot d) / V_s = (157 \cdot 240 \cdot 100) / 269,18 \cdot 10^3 = 141,6 \text{ mm} < d/4 = 115,5 \text{ mm}$$

dipakai sengkang 2P10 - 60 mm

b. Di luar sendi plastis (2h = 120)

$$V_{u,b} = 139,49 \text{ kN}; V_c = \frac{\sqrt{f'_c}}{6} \cdot b \cdot w \cdot d = \frac{\sqrt{25}}{6} \cdot 350 \cdot 100 = 115500 \text{ N} = 115,5 \text{ kN}$$

$$V_s = \frac{V_{u,b}}{\phi} - V_c = \frac{139,49}{0,6} - 115,5 = 116,98 \text{ kN}$$

Digunakan sengkang 2 kaki P 10, $f_y = 240 \text{ MPa}$

$$A_v = 2 \cdot \frac{1}{4} \cdot \pi \cdot d^2 = 2 \cdot \frac{1}{4} \cdot \pi \cdot 10^2 = 157 \text{ mm}^2$$

$$S = (A_v \cdot f_y \cdot d) / V_s = (157 \cdot 240 \cdot 100) / 116,98 \cdot 10^3$$

$$= 148,8 \text{ mm} < d/2 = 231 \text{ mm}$$

dipakai sengkang 2P10 -140

6.5. Perencanaan Kolom

6.5.1 Perhitungan Diagram Interaksi Kolom

Sebagai contoh perhitungan diagram interaksi kolom 600x600mm ditinjau pada $\rho_g = 0,0164$, diketahui :

Tulangan yang dianalisis 12 D25 (Terdistribusi merata pada tiap sisi)

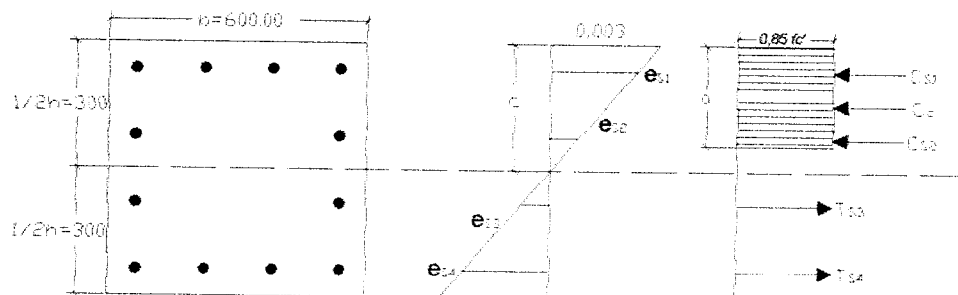
$$A_s = (1/4) \cdot \pi \cdot 25^2 \cdot 12 = 5890,48 \text{ mm}^2$$

$$\rho = A_s / A_g = 5890,48 / 360.000 = 0,0218$$

$$f'_c = 25 \text{ Mpa}, f_y = 400 \text{ Mpa}$$

$$b = 600 \text{ mm}, h = 600 \text{ mm}, A_g = 600 \times 600 \text{ mm} = 360.000 \text{ mm}^2$$

$$d' = 60 \text{ mm}, d = 600 - 70 \text{ mm} = 530 \text{ mm}$$



Pada contoh perhitungan ini digunakan dalam kondisi balance (seimbang),

$$c_b = 600 / (600 + 400) \cdot 540 = 324 \text{ mm}$$

jarak masing-masing tulangan pada serat beton yang tertekan ditentukan sebagai berikut:

$$\text{Lapis 1 } A_{s1} = (1/4) \cdot \pi \cdot 25^2 \cdot 4 = 1964,29 \text{ mm}^2$$

$$d_1 = d' = 60 \text{ mm}$$

$$\epsilon_{s1} = 0,003 \cdot ((324 - 60) / 324) = 0,0024$$

$$f_{s1} = 600 \cdot ((324 - 60) / 324) = 488,88 \text{ Mpa} > f_y \text{ maka}$$

$$C_{s1} = A_s \cdot (f_s - 0,85 \cdot f_c) = 1964,29 \cdot (400 - 0,85 \cdot 25) = 743973,2 \text{ N}$$

$$\text{Lapis 2 } A_{s2} = (1/4) \cdot \pi \cdot 25^2 \cdot 2 = 981,25 \text{ mm}^2$$

$$D_2 = 60 + ((600 - 2 \cdot 60) / 3) = 220 \text{ mm}$$

$$\varepsilon_{s2} = 0,003 \cdot ((324 - 220) / 324)$$

$$f_{s2} = 600 \cdot ((324 - 220) / 324) = 192,6 \text{ Mpa} < f_y \text{ maka}$$

$$C_{s2} = A_s \cdot (f_s - 0,85 \cdot f_c) = 981,25 \cdot (192,6 - 0,85 \cdot 25) = 168282,9 \text{ N}$$

$$\text{Lapis 3 } A_{s3} = (1/4) \cdot \pi \cdot 25^2 \cdot 2 = 981,25 \text{ mm}^2$$

$$D_3 = 60 + 3 \cdot ((600 - 2 \cdot 60) / 4) = 380 \text{ mm}$$

$$\varepsilon_{s3} = 0,003 \cdot ((324 - 380) / 324)$$

$$f_{s3} = 600 \cdot ((324 - 380) / 324) = -103,7 \text{ Mpa} < -f_y \text{ maka}$$

$$C_{s3} = A_s \cdot (f_s - 0,85 \cdot f_c) = 981,25 \cdot (-103,7) = -101851,9 \text{ N}$$

$$\text{Lapis 4 } A_{s4} = (1/4) \cdot \pi \cdot 25^2 \cdot 4 = 1964,29 \text{ mm}^2$$

$$D_4 = 60 + 4 \cdot ((600 - 2 \cdot 60) / 4) = 540 \text{ mm}$$

$$\varepsilon_{s4} = 0,003 \cdot ((324 - 540) / 324)$$

$$f_{s4} = 600 \cdot ((324 - 540) / 324) = -400 \text{ Mpa} = -f_y \text{ maka}$$

$$C_{s4} = A_s \cdot (f_s - 0,85 \cdot f_c) = 1964,29 \cdot (-400) = -785714,3 \text{ N}$$

Untuk gaya desak serat beton:

$$C_c = 0,85 \cdot f_c \cdot a \cdot b = 0,85 \cdot 25 \cdot (0,85 \cdot 324) \cdot 600 = 3511350 \text{ N}$$

Dengan demikian,

$$0,65P_n = 0,65(C_c + C_{s1} + C_{s2} + C_{s3} + C_{s4})$$

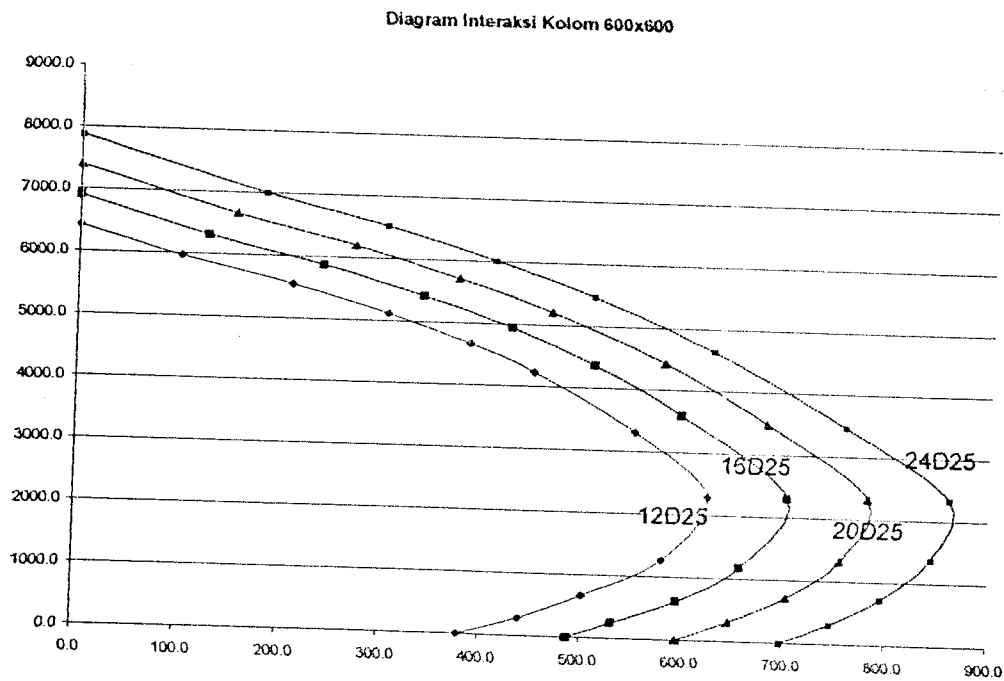
$$= 0,65(3511350 + 743973,2 + 168282,9 + (-101851,9) + (-785714,3)) \cdot 10^{-3}$$

$$= 2298,4 \text{ kN}$$

Perhitungan momennya adalah sebagai berikut,

$$\begin{aligned}
 0,65M_u &= 0,65[C_c \cdot \frac{1}{2} \cdot (h - a) + \sum C_{s_i} \cdot (a - d_i)] \\
 &= 0,65[3511350 \cdot \frac{1}{2} \cdot (300 - 275,4) + 743973,2 \cdot (275,4 - 60) + 168282,9 \cdot (275,4 - 220) + (-101851,9) \cdot (275,4 - 380) + (-785714,3) \cdot (275,4 - 540)] \cdot 10^{-6} \\
 &= 623,1 \text{ kNm}
 \end{aligned}$$

Dengan cara yang sama dihitung pula untuk kondisi x yang lain, sehingga dapat digambar diagram interaksi kolom. Dihitung juga dengan jumlah tulangan yang berbeda.



6.5.2 Perencanaan kolom terhadap beban lentur dan aksial

Langkah perhitungan dan sebagian rumus- rumus perencanaan kolom telah dijelaskan pada bab sebelumnya. Berikut ini proses perhitungan perencanaan penulangan kolom berdasarkan rumus dan peraturan SKSNI.

Momen rencana kolom

Momen rencana kolom diperoleh dari rumus:

$$\sum M_{u,k} \geq 0,7 \cdot \omega_d \cdot \sum M_{kap,b} \dots \dots \dots (6.4-1)$$

atau

$$\sum M_{u,k} \geq 0,7 \cdot \omega_d \cdot (M_{kap,ki} + M_{kap,ka}) \dots \dots \dots (6.4-2)$$

momen rencana kolom juga dapat ditulis:

$$M_{u,k} \geq \frac{h_k}{h_k} \cdot 0,7 \cdot \omega_d \cdot \phi_0 \cdot \alpha_k \cdot \left[\frac{I_{ka}}{I'_{ka}} M_{kap,ki} + \frac{I_{ka}}{I'_{ka}} M_{kap,ka} \right] \dots \dots \dots (6.4-3)$$

tetapi dalam segala hal tidak perlu lebih besar dari

$$\sum M_{u,k} > 1,05 \cdot (M_{D,K} + M_{L,K} + \frac{4}{K} M_{E,K}) \dots \dots \dots (6.4-4)$$

dengan; $M_{D,K}$ = momen kolom akibat beban mati tak terfaktor, $M_{L,K}$ = momen kolom akibat beban hidup tak terfaktor, $M_{E,K}$ = momen kolom akibat beban gempa tak terfaktor, α_k = faktor distribusi momen kolom portal yang ditinjau sesuai, yang nilainya sebanding dengan kekakuan relatif kolom atas dan bawah, $M_{kap,ki}$ = momen kapasitas balok disebelah kiri bidang muka kolom, $M_{kap,ka}$ = momen kapasitas balok disebelah kanan bidang muka kolom, h_k = tinggi kolom dari titik pertemuan ke titik pertemuan, h_k = tinggi bersih kolom, $\omega_d = 1,3$ kecuali pada lantai 1 dan lantai paling atas, $\omega_d = 1$ karena pada lantai tersebut diperbolehkan terjadinya sendi plastis pada kolom.

lantai 1 dan lantai paling atas, $\omega_d = 1$ karena pada lantai tersebut diperbolehkan terjadinya sendi plastis pada kolom.

Menurut buku Pedoman Perencanaan Gempa untuk rumah dan gedung momen rencana kolom harus diperhitungkan terhadap 30 % momen arah tegak lurus nya, maka apabila menghitung momen rencana arah x harus dijumlahkan antara 100% momen arah x dan 30% momen arah y, demikian pula sebaliknya.

Sebagai contoh perhitungan kolom portal terhadap beban lentur dan gaya aksial adalah kolom no 24.

Portal X : $M_{kap,ki^-} = 606,456 \text{ kNm}$ (balok 531,532)

$M_{kap,ki^+} = 606,456 \text{ kNm}$ (balok 529,530)

Portal Y : $M_{kap,ki^-} = -$

$M_{kap,ki^+} = 173,51 \text{ kNm}$ (balok 8)

$$\alpha_{ka} = \frac{M_{E,k \text{ lt}(i+1)\text{atas}}}{M_{E,k \text{ lt}(i)\text{atas}} + M_{E,k \text{ lt}(i+1)\text{bawah}}}$$

$$\alpha_{ka} = \frac{102,934}{102,934 + 29,253} = 0,71$$

$$\alpha_{kb} = \frac{M_{E,k \text{ lt}(i)\text{bawah}}}{M_{E,k \text{ lt}(i)\text{bawah}} + M_{E,k \text{ lt}(i-1)\text{atas}}}$$

$$\alpha_{kb} = \frac{50,876}{50,876 + 133,007} = 0,64$$

Momen Kolom

Momen Rencana Kolom

Portal X (memanjang)

$$\left[\left(\frac{L_{ki}}{L_{ki}} M_{kap,ki} + \frac{L_{ka}}{L_{ka}} M_{kap,ka} \right)_x + 0,3 \left(\frac{L_{ky}}{L_{ky}} M_{kap,ky} + \frac{L_{ka}}{L_{ka}} M_{kap,ka} \right)_y \right]$$

$$\left[\left(\frac{6}{5,4} \cdot 459,1813 + \frac{6}{5,4} \cdot 348,9813 \right)_x + 0,3 \left(0 + \frac{6,3}{5,7} \cdot 1247,2674 \right)_y \right] = 1287,115 \text{ kNm}$$

$M_{u,katasX}$

$$= \frac{h_k'}{h_k} \cdot 0,7 \cdot \omega_D \cdot \alpha_k \cdot \left[\left(\frac{L_{ki}}{L_{ki}'} M_{kap,ki} + \frac{L_{ka}}{L_{ka}'} M_{kap,ka} \right)_x + 0,3 \left(\frac{L_{ki}}{L_{ki}'} M_{kap,ki} + \frac{L_{ka}}{L_{ka}'} M_{kap,ka} \right)_y \right]$$

$$= \frac{3,45}{4} \cdot 0,7 \cdot 1,3 \cdot 0,779 \cdot 1287,115 = 302,435 \text{ kNm}$$

$M_{u,kbawah X}$

$$= \frac{h_k'}{h_k} \cdot 0,7 \cdot \omega_D \cdot \alpha_k \cdot \left[\left(\frac{L_{ki}}{L_{ki}'} M_{kap,ki} + \frac{L_{ka}}{L_{ka}'} M_{kap,ka} \right)_x + 0,3 \left(\frac{L_{ki}}{L_{ki}'} M_{kap,ki} + \frac{L_{ka}}{L_{ka}'} M_{kap,ka} \right)_y \right]$$

$$= \frac{3,45}{4} \cdot 0,7 \cdot 1,3 \cdot 0,277 \cdot 1287,115 = 828,805 \text{ kNm}$$

Portal Y (melintang)

$$\left[\left(\frac{L_{ki}}{L_{ki}'} M_{kap,ki} + \frac{L_{ka}}{L_{ka}'} M_{kap,ka} \right)_y + 0,3 \left(\frac{L_{ki}}{L_{ki}'} M_{kap,ki} + \frac{L_{ka}}{L_{ka}'} M_{kap,ka} \right)_x \right]$$

$$\left[\left(0 + \frac{6,3}{5,7} \cdot 1247,2674 \right) + 0,3 \left(\frac{6}{5,4} \cdot 459,1813 + \frac{6}{5,4} \cdot 348,9813 \right) \right] = 1573,939 \text{ kNm}$$

$M_{u,katasY}$

$$= \frac{h_k'}{h_k} \cdot 0,7 \cdot \omega_D \cdot \alpha_k \cdot \left[\left(\frac{L_{ki}}{L_{ki}'} M_{kap,ki} + \frac{L_{ka}}{L_{ka}'} M_{kap,ka} \right)_y + 0,3 \left(\frac{L_{ki}}{L_{ki}'} M_{kap,ki} + \frac{L_{ka}}{L_{ka}'} M_{kap,ka} \right)_x \right]$$

$$= \frac{3,45}{4} \cdot 0,7 \cdot 1,3 \cdot 0,779 \cdot 1573,939 = 280,8335 \text{ kNm}$$

$M_{u,kbawah Y}$

$$= \frac{h_k'}{h_k} \cdot 0,7 \cdot \omega_D \cdot \alpha_k \cdot \left[\left(\frac{L_{ki}}{L_{ki}}, M_{kap,ki} + \frac{L_{ka}}{L_{ka}}, M_{kap,ka} \right)_y + 0,3 \left(\frac{L_{ki}}{L_{ki}}, M_{kap,ki} + \frac{L_{ka}}{L_{ka}}, M_{kap,ka} \right)_x \right]$$

$$= \frac{3,45}{4} \cdot 0,7 \cdot 1,3 \cdot 0,277 \cdot 1573,939 = 352,094 \text{ kNm}$$

Tetapi tidak perlu lebih besar dari

Momen Maksimum Kolom

Portal X (memanjang):

$$M_{u,k \text{ atas maks}} = 1,05 \left\{ M_{DL} + M_{LL} + \frac{4}{K} (M_{EX} + 0,3M_{EY}) \right\}$$

$$= 1,05 (3,557 + 1,887 + 4/1,4(-102,934+0,3(-36,749)))$$

$$= 136,314 \text{ kNm}$$

$$M_{u,k \text{ bawah maks}} = 1,05 \left\{ M_{DL} + M_{LL} + \frac{4}{K} (M_{EX} + 0,3M_{EY}) \right\}$$

$$= 1,05 (-2,772 - 1,588 + 4/1,4(50,876+0,3(20,922)))$$

$$= 196,43 \text{ kNm}$$

Portal Y (melintang):

$$M_{u,k \text{ atas maks}} = 1,05 \left\{ M_{DL} + M_{LL} + \frac{4}{K} (M_{EX} + 0,3M_{EY}) \right\}$$

$$= 1,05 (146,283 + 6,745 + 4/1,4(-36,749+0,3(-102,934)))$$

$$= 845,21 \text{ kNm}$$

$$M_{u,k \text{ bawah maks}} = 1,05 \left\{ M_{DL} + M_{LL} + \frac{4}{K} (M_{EX} + 0,3M_{EY}) \right\}$$

$$= 1,05 (-113,589 - 4,001 + 4/1,4(20,922+0,3(50,876)))$$

$$= 93,771 \text{ kNm}$$

Momen Terpakai Kolom

Momen terpakai kolom di dapat dari nilai terbesar antara momen rencana kolom dengan momen maksimum kolom, tetapi tidak boleh lebih dari momen maksimum kolom yang terbesar.

Portal X (memanjang)

$$M_{u,k \text{ atas } X} = 828,805 \text{ kNm}$$

$$M_{u,k \text{ bawah } X} = 302,432 \text{ kNm}$$

$$M_{u,k \text{ atas } X \text{ maks}} = 136,314 \text{ kNm}$$

$$M_{u,k \text{ bawah } X \text{ maks}} = 196,43 \text{ kNm}$$

Sehingga momen terpakai: 196,43 kNm

Portal Y (melintang)

$$M_{u,k \text{ atas } Y} = 352,09 \text{ kNm}$$

$$M_{u,k \text{ bawah } Y} = 280,83 \text{ kNm}$$

$$M_{u,k \text{ atas } Y \text{ maks}} = 85,21 \text{ kNm}$$

$$M_{u,k \text{ bawah } Y \text{ maks}} = 93,77 \text{ kNm}$$

Sehingga momen terpakai: 93,771 kNm

Gaya Aksial Kolom

Gaya aksial rencana kolom dapat dihitung dengan rumus:

$$N_{u,k} = (0,7.Rv.\sum M_{kap,b})/L_b + 1,05.N_{g,k} \dots\dots\dots(6.4-5)$$

atau

$$N_{u,k} = 0,7.Rv.\sum \left(\frac{M_{kap,k} + M_{kap,k}'}{L_{ka}'} + \frac{M_{kap,ka} + M_{kap,ka}'}{L_{ka}'} \right) + 1,05.N_{g,k} \dots\dots\dots(6.4-6)$$

gaya aksial kolom tidak perlu lebih besar dari:

$$N_{u,k} \geq 1,05 \cdot (N_{DL,K} + N_{LL,K} + 4/K \cdot N_{E,K}) \dots \dots \dots (6.4-7)$$

Gaya Aksial Maksimum Kolom

Portal X (memanjang):

$$\begin{aligned} N_{u,k \text{ atas maks}} &= 1,05 (N_{DL} + N_{LL} + 4/K(N_{EX} + 0,3N_{EY})) \\ &= 1,05 (931,830 + 103,348 + 4/1,4(-1,237 + 0,3 \cdot 0,861)) \\ &= 1301,96 \text{ kN} \end{aligned}$$

$$\begin{aligned} N_{u,k \text{ bawah maks}} &= 1,05 (N_{DL} + N_{LL} + 4/K(N_{EX} + 0,3N_{EY})) \\ &= 1,05 (969,280 + 103,348 + 4/1,4(-1,237 + 0,3 \cdot 0,861)) \\ &= 1159,6 \text{ kN} \end{aligned}$$

Portal Y (melintang):

$$\begin{aligned} N_{u,k \text{ atas maks}} &= 1,05 (N_{DL} + N_{LL} + 4/K(N_{EX} + 0,3N_{EY})) \\ &= 1,05 (931,830 + 103,348 + 4/1,4(0,861 + 0,3 \cdot -1,237)) \\ &= 1293, \text{ kN} \end{aligned}$$

$$\begin{aligned} N_{u,k \text{ bawah maks}} &= 1,05 (N_{DL} + N_{LL} + 4/K(N_{EX} + 0,3N_{EY})) \\ &= 1,05 (969,280 + 103,348 + 4/1,4(0,861 + 0,3 \cdot -1,237)) \\ &= 1127,729 \text{ kN} \end{aligned}$$

Gaya Aksial Rencana Kolom

Rumus:

$$N_{u,kX} = 1,05 N_{G,k} + 0,7 \cdot Rv \left[\left(\frac{M_{kap,ki} + M_{kap,ka}}{L_{ki}'} \right)_x + 0,3 \left(\frac{M_{kap,ki} + M_{kap,ka}}{L_{ka}'} \right)_y \right]$$

$$N_{u,kY} = 1,05 N_{G,k} + 0,7 \cdot Rv \left[\left(\frac{M_{kap,ki} + M_{kap,ka}}{L_{ki}'} \right)_y + 0,3 \left(\frac{M_{kap,ki} + M_{kap,ka}}{L_{ka}'} \right)_x \right]$$

Gaya Aksial Terpakai Kolom

Gaya aksial terpakai kolom di dapat dari nilai terbesar antara gaya aksial rencana kolom dengan gaya aksial maksimum kolom, tetapi tidak boleh lebih dari gaya aksial maksimum kolom yang terbesar.

Portal X (memanjang):

$$N_{u,k \text{ atas}X} : 1301,96 \text{ kN}$$

$$N_{u,k \text{ bawah}X} : 1159,59 \text{ kN}$$

$$N_{u,k \text{ atas}X \text{ maks}} : 1378,35 \text{ kN}$$

$$N_{u,k \text{ bawah}X \text{ maks}} : 1350,76 \text{ kN}$$

Sehingga: gaya aksial maksimum terpakai = 1301,96 kN

Portal Y (melintang):

$$N_{u,k \text{ atas}Y} : 1109,871 \text{ kN}$$

$$N_{u,k \text{ bawah}Y} : 1149,194 \text{ kN}$$

$$N_{u,k \text{ atas}Y \text{ maks}} : 1293,47 \text{ kN}$$

$$N_{u,k \text{ bawah}Y \text{ maks}} : 1127,729 \text{ kN}$$

Sehingga: gaya aksial maksimum terpakai = 1109,87 kN

Penulangan Kolom

Penulangan Kolom arah x

Tulangan kolom direncanakan pada keempat sisi kolom.

Ditetapkan: p = tebal selimut beton = 40 mm

$$\phi_{\text{senggang}} = 10 \text{ mm}$$

$$\phi_{\text{pokok}} = 25 \text{ mm}$$

$$f_{y\text{senggang}} = 240 \text{ MPa}$$

$$f_{y\text{pokok}} = 400 \text{ MPa}$$

$$d' = p + \phi_{\text{senggang}} + (\frac{1}{2}\phi_{\text{pokok}}) = 40 + 10 + 12,5 = 62,5 \text{ mm}$$

$$\frac{d'}{h} = \frac{62,5}{600} = 0,10 \quad \text{untuk } h = 600 \text{ mm}$$

$$N_{u,kX} \text{ maks} : 1301,96 \text{ kN}$$

$$M_{u,kX} : 196,43 \text{ kNm}$$

$$e = \frac{M_{u,k}}{N_{u,k}} = \frac{196,43}{1301,96} = 0,15 \text{ m} = 150,24 \text{ mm}$$

$$N_u' = \frac{N_u}{\phi_0 \cdot A_g \cdot 0,85 \cdot f_c'} = \frac{1123,323 \cdot 10^3}{0,85 \cdot 600^2 \cdot 0,85 \cdot 25} = 0,02$$

$$M_u' = \frac{M_u}{\phi_0 \cdot A_g \cdot 0,85 \cdot f_c' \cdot h} \cdot e = \frac{336,143 \cdot 10^3}{0,85 \cdot 600^2 \cdot 0,85 \cdot 25} \cdot \frac{299,24}{600} = 0,05$$

Dari grafik gideon kusuma seri beton 4 diperoleh.

$$r = 0,01$$

$$\rho = r \cdot \beta = 0,01 \cdot 1 = 0,01$$

$$A_{s \text{ perlu}} = \rho \cdot A_g = 0,01 \cdot 600 \cdot 600 = 3600 \text{ mm}^2$$

Dipasang tulangan kolom 16D25

$$A_s = 7854 \text{ mm}^2 > A_{s \text{ perlu}} = 3600 \text{ mm}^2 \dots\dots\dots \text{OK.}$$

Dalam SK SNI T-15-1991-03, nilai $\rho_{\text{min}} = 0,01$ dan $\rho_{\text{maks}} = 0,06$ untuk kolom

$$\rho_{\text{terpasang}} = \frac{A_{s \text{ terpasang}}}{A_g} = \frac{7854}{600 \times 600} = 0,021$$

Cek: $0,01 < 0,021 < 0,06 \dots\dots\dots \text{OK.}$

Penulangan Kolom arah y

$$d' = p + \emptyset_{\text{senggang}} + (1/2 \emptyset_{\text{pokok}}) = 40 + 10 + 12,5 = 62,5 \text{ mm}$$

$$\frac{d'}{h} = \frac{62,5}{600} = 0,10 \quad \text{untuk } h = 600 \text{ mm}$$

$$N_{u,k \text{ maks}} : 1123,323 \text{ kN}$$

$$M_{u,k \text{ X}} : 42,198 \text{ kNm}$$

$$e = \frac{M_{u,k}}{N_{u,k}} = \frac{42,198}{1123,32} = 0,038 \text{ m} = 38,28 \text{ mm}$$

$$N_u' = \frac{N_u}{\phi \cdot A_g \cdot 0,85 \cdot f_c'} = \frac{1123,323 \cdot 10^3}{0,85 \cdot 600^2 \cdot 0,85 \cdot 25} = 0,17$$

$$M_u' = \frac{M_u}{\phi \cdot A_g \cdot 0,85 \cdot f_c' \cdot h} \cdot e = \frac{42,19 \cdot 10^3}{0,85 \cdot 600^2 \cdot 0,85 \cdot 25} \cdot \frac{38,28}{600} = 0,004$$

Dari grafik gideon kusuma seri beton 4 diperoleh.

$$r = 0,01$$

$$\rho = r \cdot \beta = 0,01 \cdot 1 = 0,01$$

$$A_{s \text{ perlu}} = \rho \cdot A_g = 0,01 \cdot 600 \cdot 600 = 3600 \text{ mm}^2$$

Dipasang tulangan kolom 16D25

$$A_s = 7854 \text{ mm}^2 > A_{s \text{ perlu}} = 3600 \text{ mm}^2 \dots \text{OK.}$$

Dalam SK SNI T-15-1991-03, nilai $\rho_{\min} = 0,01$ dan $\rho_{\max} = 0,06$ untuk kolom

$$\rho_{\text{terpasang}} = \frac{A_{s \text{ terpasang}}}{A_g} = \frac{7854}{600 \times 600} = 0,012$$

Cek: $0,01 < 0,012 < 0,06 \dots \text{OK.}$

6.5.2. Perencanaan gaya geser dan tulangan geser

Gaya geser rencana dari kolom diperoleh dari :

$$V_{u,k} = (M_{u,k \text{ atas}} + M_{u,k \text{ bawah}}) / l_n$$

Tetapi tidak perlu lebih besar dari

$$V_{u,k} \geq 1,05 \cdot (V_{D,K} + V_{L,K} + 4/K \cdot V_{E,K})$$

Tulangan geser kolom harus dipasang pada seluruh tinggi kolom dengan jarak maksimum

- $\frac{1}{4}$ dimensi komponen struktur terkecil = $\frac{1}{2} \cdot 700 = 350 \text{ mm}$
- 8 kali diameter tulangan longitudinal = $8 \cdot 25 = 200 \text{ mm}$
- 100 mm

Gaya Geser Kolom

Gaya Geser Maksimum Kolom

Portal X (memanjang):

$$\begin{aligned} V_{u,kY \text{ maks}} &= 1,05 (V_{DL} + V_{LL} + 4/K (V_{EX} + 0,3 V_{EY})) \\ &= 1,05 (-1,947 - 1,069 + 4/1,4(47,326 + 0,3 \cdot 17,745)) \\ &= 154,774 \text{ kN} \end{aligned}$$

Portal Y (melintang):

$$\begin{aligned}
 V_{u,kf} \text{ maks} &= 1,05 (V_{DL} + V_{LL} + 4/K (V_{EX} + 0,3 V_{EY})) \\
 &= 1,05 (-79,961 - 3,307 + 4/1,4(17,745+0,3 \cdot 47,326)) \\
 &= 8,392 \text{ kN}
 \end{aligned}$$

Gaya Geser Rencana Kolom

$$V_{u,k} = \frac{M_{u,k \text{ atas}} + M_{u,k \text{ bawah}}}{h_n}$$

dengan: $M_{u,k \text{ atas}}$ = momen rencana kolom atas

$M_{u,k \text{ bawah}}$ = momen rencana kolom bawah

h_n = tinggi bersih kolom

Portal X (memanjang)

$$V_{u,k} = \frac{604,676 + 214,844}{3,25 - 0,9} = 348,732 \text{ kN}$$

Portal Y (melintang)

$$V_{u,k} = \frac{623,721 + 221,611}{3,25 - 0,9} = 359,716 \text{ kN}$$

Gaya Geser Terpakai

Gaya geser terpakai kolom di dapat dari nilai terkecil antara gaya geser rencana kolom dengan gaya geser maksimum kolom.

Portal X (memanjang):

$$V_{u,kx} \text{ maks} = 154,774 \text{ kN}$$

$$V_{u,kx} = 348,732 \text{ kN}$$

Sehingga: gaya geser terpakai = 154,774 kN

Portal Y (melintang):

$$V_{u,ky maks} = 8,392 \text{ kN}$$

$$V_{u,ky} = 359,716 \text{ kN}$$

Sehingga: gaya geser terpakai = 8,392 kN

Perencanaan Tulangan Geser Kolom

Untuk menentukan tulangan geser kolom dengan menggunakan $V_{u,k}$ terpakai dan nilai $N_{u,k}$ dari kedua portal yang ada.

$$N_{u,kx} = 1123,323 \text{ kN}$$

$$N_{u,ky} = 1127,729 \text{ kN}$$

$$V_{u,kx} = 154,774 \text{ kN}$$

$$V_{u,ky} = 8,392 \text{ kN}$$

Sehingga digunakan: $N_{u,k} = 1127,729 \text{ kN}$

$$V_{u,k} = 154,774 \text{ kN}$$

Besarnya gaya geser yang disumbangkan oleh beton:

$$V_c = \left(1 + \frac{N_u}{14.A_g} \right) \frac{\sqrt{f_c'}}{6} . b_w . d$$

dengan:

N_u = gaya aksial terkecil pada kolom

A_g = luas tampang bruto kolom

f_c' = kuat tekan beton

b_w = lebar penampang kolom

d = lebar efektif penampang kolom

Sehingga:

$$d = h - d' = 800 - 62,5 = 737,5 \text{ mm}$$

$$V_c = \left(1 + \frac{1127,729}{14.800^2}\right) \frac{\sqrt{25}}{6} \cdot 800 \cdot 737,5 \cdot 10^{-3} = 491,532 \text{ kN}$$

Besarnya gaya geser yang harus ditahan oleh tulangan baja:

$$V_s = \frac{V_{u,k}}{\phi} - V_c \quad \text{dengan } \phi = 0,60 \text{ untuk geser}$$

Sehingga:

$$V_s = \frac{154,774}{0,6} - 491,532 = -233,575 \text{ kN}$$

Jarak antar sengkang (S):

$$S = \frac{A_v \cdot f_y \cdot d}{V_s}$$

Digunakan tulangan geser berupa sengkang dengan 3 kaki D10, $f_y=240$

MPa.

$$\Phi_{\text{sengkang}} = 10 \text{ mm}$$

$$A_v = 3 \cdot \left(\frac{1}{4} \cdot \pi \cdot \Phi_{\text{sengkang}}^2\right) = 235,619449 \text{ mm}^2$$

$$d = h - d' = 800 - 62,5 = 737,5 \text{ mm}$$

$$S = \frac{157,0796 \cdot 240 \cdot 737,5}{233,575 \cdot 1000} = 178,549 \text{ mm}$$

Dipasang tulangan geser kolom 2D10-100

6.6. Pertemuan Balok Kolom Luar

Berikut ini adalah cara perencanaan pertemuan balok kolom luar pada kolom 600, join *jm9*. Dari hasil perhitungan analisis struktur diperoleh

$$M_{nak,b-ka} = 486,97 \text{ kNm}$$

$$M_{nak,b-ki} = 0$$

$$V_{kol} = \frac{0,7 \cdot \left(\frac{I_{ki}}{I_{nki}} M_{kap,b-ki} + \frac{I_{ka}}{I_{nka}} M_{kap,b-ka} \right)}{1/2 \cdot (h_{k,a} + h_{k,b})}$$

Dengan:

I_{ki} dan I_{ka} = bentang as balok kanan dan kiri join

I_{ki}' dan I_{ka}' = bentang bersih balok kanan dan kiri join

h_{ka} dan h_{kb} = bentang as ke as kolom di atas dan di bawah join

$$V_{kol} = \frac{0,7 \cdot \left(\frac{6,3}{6} \cdot 608,71 \right)}{1/2 \cdot (3 + 4)} = 127,82 \text{ kN}$$

$$T = \frac{0,7 M_{kap,b-ka}}{z}$$

$$z = 732 \text{ mm} = 0,732 \text{ m}$$

$$T = \frac{0,7 \cdot 608,71}{0,732} = 582,1 \text{ kN}$$

$$V_{j,h} = T - V_{kol}$$

$$= 582,1 - 127,82 = 454,2 \text{ kN}$$

$$\begin{aligned}
 V_{jv} &= hc/bc \cdot V_{jh} \\
 &= (0,6/0,6) \cdot 454,2 \\
 &= 454,2 \text{ kN}
 \end{aligned}$$

a. Kontrol tegangan geser horizontal minimal

Lebar efektif join (b_j) diambil sebagai berikut:

$$bc = 600 \text{ mm}$$

$$bb = 600 \text{ mm}$$

$$b_j = bc = 600 \text{ mm}$$

$$b_j = 600 + 0,5 \cdot 600 = 900 \text{ mm}$$

dipakai $b_j = 900 \text{ mm}$

$$V_{j,h} = \frac{V_{j,h}}{b_j \cdot hc} = \frac{454,2 \cdot 10^3}{600 \cdot 600} = 1,27 \text{ N/mm}^2 < 1,5 \sqrt{f'_c} = 1,5 \cdot \sqrt{25} = 7,5 \text{ N/mm}^2$$

b. Penulangan geser horizontal

$$N_u = 987,63 \text{ kN}$$

$$\frac{N_u}{A_g} = \frac{987,63 \cdot 10^3}{600 \cdot 600} = 1,26 \text{ N/mm}^2 < 0,1 \cdot f'_c = 0,1 \cdot 25 = 2,5 \text{ N/mm}^2$$

$$V_{c,h} = 0$$

$$V_{s,h} = V_{j,h} - V_{c,h} = 454,2 - 0 = 454,2 \text{ kN}$$

$$A_{j,h} = \frac{V_{s,h}}{f_y} = \frac{454,2 \cdot 10^3}{400} = 1135,5 \text{ mm}^2$$

$$\text{Digunakan sengkang } 2P10 = 2 \cdot 1/4 \cdot \pi \cdot 10 = 157,0796 \text{ mm}^2$$

$$\text{Jumlah lapis sengkang} = \frac{1135,5}{157,0796} = 7,1 \approx 8 \text{ lapis}$$

c. Penulangan geser vertikal

$$\begin{aligned}
 V_{c,v} &= \left(\frac{A_s'}{A_s} \right) V_{j,h} \left[0,6 + \left(\frac{Nu}{A_g, f_c'} \right) \right] \\
 &= 911,6048 \cdot 10^3 \left[0,6 + \left(\frac{987,63}{600 \cdot 600 \cdot 25} \right) \right] = 547038,1709 \text{ N} = 547,0382 \text{ kN}
 \end{aligned}$$

$$V_{s,v} = V_{j,v} - V_{c,v} = 1025,5554 - 547,0382 = 478,5172 \text{ kN}$$

$$A_{j,v} = \frac{V_{s,v}}{f_y} = \frac{478,5172 \cdot 10^3}{400} = 1196,293 \text{ mm}^2$$

Dipasang tulangan geser kolom P10-50

Tabel Momen Rencana Kolom

Lantai	Kolom	h_k (m)	h'_k (m)	α_{ba_x}	α_{ab_x}	α_{ba_y}	α_{ab_y}	I_{h1}	I_{h2}	I_{k1}	I_{k2}	I_{k3}	Mnak,b-x		Mnak,b-y		Muk-x		Muk-y		
													kiri	kanan	kiri	kanan	Bawah	Atas	Bawah	Atas	
1	k127	3	2.4	0.36	1.00	0.80	1.00	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	0	302.435	828.805	280.835	352.094
2	k128	4	3.4	0.61	0.64	0.71	0.20	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	0	536.126	559.268	265.781	75.713
3	k129	3.5	2.9	0.67	0.39	0.20	0.29	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	0	574.668	335.795	72.908	105.588
4	k130	3.5	2.9	0.88	0.33	0.14	0.80	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	0	753.452	283.737	49.506	291.760
5	k131	2	1.4	1.00	0.12	1.00	0.86	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	0	725.204	88.667	308.082	266.258

Lantai	Kolom	h_k	h'_k	α_{ka_x}	α_{kb_x}	α_{ka_y}	α_{kb_y}	I_{k1}	I_{k2}	I_{k3}	I_{k4}	I_{k5}	Mnak,b-x		Mnak,b-y		Muk-x		Muk-y		
													kiri	kanan	kiri	kanan	Bawah	Atas	Bawah	Atas	
1	k124	3	2.4	0.31	1.00	0.92	1.00	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	173.51	265.844	862.910	429.368	465.777
2	k125	4	3.4	0.70	0.69	0.84	0.08	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	173.51	642.481	634.383	416.384	38.685
3	k126	3.5	2.9	1.00	0.30	1.00	0.16	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	173.51	893.728	267.444	482.412	76.526

Lantai	Kolom	h_k	h'_k	α_{ka_x}	α_{kb_x}	α_{ka_y}	α_{kb_y}	I_{k1}	I_{k2}	I_{k3}	I_{k4}	I_{k5}	Mnak,b-x		Mnak,b-y		Muk-x		Muk-y		
													kiri	kanan	kiri	kanan	Bawah	Atas	Bawah	Atas	
1	k122	3	2.4	0.35	1.00	0.84	1.00	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	173.51	303.432	862.910	390.666	465.777
2	k123	4	3.4	1.00	0.65	1.00	0.16	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	173.51	916.842	594.445	494.889	79.806
1	k121	3	2.4	1.00	1.00	1.00	1.00	6	5.4	6	5.4	6	5.4	606.456	606.456	173.51	173.51	862.910	862.910	465.777	465.777

Tabel Momen Maksimum Kolom

Lantai	kolom	M _{l₁}		M _{l₂}		M _{l₃}		M _{l₄}		M _{l₅}			
		bawah	atas	bawah	atas	bawah	atas	bawah	atas	bawah	atas		
1	K 127	29.494	-35.972	17.910	-24.326	34.918	-17.381	-1.84E-14	9.85E-15	196.430	136.314	93.771	85.214
2	K 128	39.904	-37.004	27.140	-25.263	-4.416	-5.366	2.15E-15	3.39E-15	88.942	87.920	75.960	72.142
3	K 129	39.362	-42.666	27.756	-32.050	-2.161	-1.703	3.46E-15	-2.16E-15	79.550	85.606	73.196	80.598
4	K 130	48.222	-111.070	28.666	-65.160	-1.486	6.816	3.91E-17	7.53E-17	86.972	213.667	82.604	193.629
5	K 131	0.075	-0.025	0.038	-0.021	9.423	0.005	-9.25E-18	1.47E-16	39.693	0.067	11.991	0.054

Lantai	kolom	M _{l₁}		M _{l₂}		M _{l₃}		M _{l₄}		M _{l₅}			
		bawah	atas	bawah	atas	bawah	atas	bawah	atas	bawah	atas		
1	k124	14.35518	-1.49435	7.262319	-0.38876	39.19988	-24.282	-2.03E-14	1.30E-14	187.338	103.962	72.090	32.573
2	k125	6.121464	-13.0651	3.801543	-8.44352	-2.05905	-6.38932	1.13E-15	3.97E-15	19.067	49.419	13.014	30.635
3	k126	-5.85723	33.52448	-3.53667	21.06206	-1.20464	-1.4269	2.03E-15	-1.20E-15	14.923	63.309	11.381	59.114

Lantai	kolom	M _{l₁}		M _{l₂}		M _{l₃}		M _{l₄}		M _{l₅}			
		bawah	atas	bawah	atas	bawah	atas	bawah	atas	bawah	atas		
1	k122	25.6461	-23.5536	13.99616	-13.9365	43.42237	-28.1481	-2.20E-14	1.45E-14	223.998	157.586	96.337	74.831
2	k123	5.088709	12.72293	1.986613	10.5195	-5.41192	-4.87762	3.19E-15	2.59E-15	30.159	44.891	14.248	30.550
1	k121	-27.8707	102.0179	-17.8573	60.48507	44.83269	-21.4894	-2.24E-14	1.06E-14	236.312	260.884	104.504	197.705

Tabel Gaya Aksial Kolom

Lt	kolom	N_{dik} kNm	N_{llk} kNm	$N_{el,ex}$ kNm	$N_{el,by}$ kNm	$N_{g,k}$ kNm	I_{ki}	$I_{ki'}$	I_{ka}	$I_{ka'}$	$N_{U,k maks}$ bawah	$N_{U,k min}$ bawah	Mkap,b-x		Mnak,b-y		$N_{U,x}$ kNm	$N_{U,y}$ kNm	$N_{U,terpakai}$ kNm
													kiri	kanan	kiri	kanan			
1	K127	883.30	288.87	16.95	4.7E-14	1172.17	6	5	6	5	1301.96	1159.59	606.46	606.46	173.51	0	1378.35	1293.47	1301.96
2	K128	672.19	216.20	13.05	7E-15	888.39	6	5	6	5	987.63	877.99	606.46	606.46	173.51	0	1080.39	995.50	987.63
3	K129	461.18	143.70	12.09	2.7E-15	604.88	6	5	6	5	685.89	584.36	606.46	606.46	173.51	0	782.70	697.82	685.89
4	K130	244.56	65.49	11.97	4.1E-14	310.05	6	5	6	5	375.84	275.27	606.46	606.46	173.51	0	473.13	388.25	375.84
5	K131	36.78	0.01	0.00	2.2E-14	36.78	6	5	6	5	38.62	38.62	606.46	606.46	173.51	0	186.20	101.32	38.62

Lt	kolom	N_{dik} kNm	N_{llk} kNm	$N_{el,ex}$ kNm	$N_{el,by}$ kNm	$N_{g,k}$ kNm	I_{ki}	$I_{ki'}$	I_{ka}	$I_{ka'}$	$N_{U,k maks}$ bawah	$N_{U,k min}$ bawah	Mkap,b-x		Mnak,b-y		$N_{U,x}$ kNm	$N_{U,y}$ kNm	$N_{U,terpakai}$ kNm
													kiri	kanan	kiri	kanan			
1	K124	1078.16	574.69	11.74	1.7E-14	1652.84	6	5	6	5	1784.80	1686.17	606.46	606.46	173.51	173.51	1889.14	1818.42	1784.80
2	K125	804.42	421.72	12.14	3.4E-14	1226.15	6	5	6	5	1338.46	1236.45	606.46	606.46	173.51	173.51	1441.11	1370.39	1338.46
3	K126	513.90	264.10	12.31	1.1E-14	778.00	6	5	6	5	868.61	765.18	606.46	606.46	173.51	173.51	970.55	899.83	868.61

Lt	kolom	N_{dik} kNm	N_{llk} kNm	$N_{el,ex}$ kNm	$N_{el,by}$ kNm	$N_{g,k}$ kNm	I_{ki}	$I_{ki'}$	I_{ka}	$I_{ka'}$	$N_{U,k maks}$ bawah	$N_{U,k min}$ bawah	Mkap,b-x		Mnak,b-y		$N_{U,x}$ kNm	$N_{U,y}$ kNm	$N_{U,terpakai}$ kNm
													kiri	kanan	kiri	kanan			
1	K122	786.19	418.82	19.51	7.2E-15	1205.00	6	5	6	5	1347.20	1183.31	606.46	606.46	173.51	173.51	1418.91	1348.19	1347.20
2	K123	488.47	251.39	18.95	3.4E-15	739.86	6	5	6	5	856.45	697.25	606.46	606.46	173.51	173.51	930.50	859.79	856.45
1	K121	334.28	176.43	48.29	2.1E-14	510.71	6	5	6	5	739.06	333.43	606.46	606.46	173.51	173.51	689.90	619.19	689.90

Tabel Penulangan Kolom

Lantai	Kolom	Arah	dimensi kolom		M_U Tepakai (kNm)	N_U Tepakai (kN)	e_b m	e m	$M_{U'}^1$	$N_{U'}^1$	r pada grafik (%)	ρ	Digunakan		Ket	
			b (mm)	h (mm)									Tul	A_s (mm ²)		
1	k127	sb x	600	600	196.420	1301.96	0.2711	0.151	0.050	0.020	0.01	0.01	12 D	25	5887.5	Patah Desak
		sb y														
2	k128	sb x	600	600	88.942	987.63	0.2711	0.090	0.023	0.015	0.01	0.01	12 D	25	5887.5	Patah Desak
		sb y														
3	k129	sb x	600	600	85.606	685.89	0.2711	0.125	0.022	0.011	0.01	0.01	12 D	25	5887.5	Patah Desak
		sb y														
4	k130	sb x	500	500	213.667	375.84	0.2667	0.569	0.095	0.008	0.01	0.01	12 D	25	5887.5	Patah Tarik
		sb y														
5	k131	sb x	500	500	39.693	38.62	0.2667	1.028	0.018	0.001	0.01	0.01	12 D	25	5887.5	Patah Tarik
		sb y														

Lantai	Kolom	Arah	dimensi kolom		M_U Tepakai (kNm)	N_U Tepakai (kN)	e_b m	e m	$M_{U'}^1$	$N_{U'}^1$	r pada grafik (%)	ρ	Digunakan		Ket	
			b (mm)	h (mm)									Tul	A_s (mm ²)		
1	k124	sb x	600	600	187.338	1784.80	324	0.105	0.048	0.027	0.01	0.01	12 D	25	5887.5	Patah Desak
		sb y														
2	k125	sb x	600	600	49.419	1338.46	324	0.037	0.013	0.021	0.01	0.01	12 D	25	5887.5	Patah Desak
		sb y														
3	k126	sb x	600	600	63.309	868.61	324	0.073	0.016	0.013	0.01	0.01	12 D	25	5887.5	Patah Desak
		sb y														

Lantai	Kolom	Arah	dimensi kolom		M_U Tepakai (kNm)	N_U Tepakai (kN)	e_b m	e m	$M_{U'}^1$	$N_{U'}^1$	r pada grafik (%)	ρ	Digunakan		Ket	
			b (mm)	h (mm)									Tul	A_s (mm ²)		
1	k122	sb x	600	600	223.998	1347.20	324	0.166	0.057	0.021	0.01	0.01	12 D	25	5887.5	Patah Desak
		sb y														
2	k123	sb x	600	600	44.891	856.45	324	0.052	0.012	0.013	0.01	0.01	12 D	25	5887.5	Patah Desak
		sb y														
1	k121	sb x	600	600	260.884	689.90	324	0.378	0.067	0.011	0.01	0.01	12 D	25	5887.5	Patah Desak
		sb y														

Penulangan Geser Kolom

t	KL	b mm	h mm	d mm	hk (m)	V _D kN	V _L kN	V _{ex} kN	V _{ev} kN	M _{u,ex} (kNm)		V _{u,k maks} (kN)		V _{u,terpakai} kN	N _{u,k} kN	V _C kN	V _S kN	Spasi mm	s mak mm	digunakan
										Bawah	Atas	V _{u,kv}	V _{u,ks}							
1	K127	600	600	538	2.4	21.82	14.08	-9.431E-15	17.43	302.43	828.81	59.66	110.91	110.91	1.301.96	338.2	153.3	198	100	3 Ø 10-100
2	K128	600	600	538	3.4	19.23	13.10	-3.102E-16	0.24	536.13	559.27	34.24	34.94	34.94	987.63	321.4	263.2	116	100	3 Ø 10-100
3	K129	600	600	538	2.9	23.44	17.09	1.6057E-15	-0.13	574.67	335.79	42.39	42.00	42.39	685.89	305.3	234.7	130	100	3 Ø 10-100
4	K130	500	500	438	2.9	45.51	26.81	-1.036E-17	-2.37	753.45	283.74	72.95	65.97	72.95	375.84	201.9	80.3	308	100	3 Ø 10-100
5	K131	500	500	438	1.4	0.05	0.03	-7.808E-17	4.71	725.20	88.67	6.02	19.86	19.86	38.62	184.3	151.2	164	100	3 Ø 10-100

t	kolom	b mm	h mm	d mm	hk (m)	V _D kN	V _L kN	V _{ex} kN	V _{ev} kN	M _{u,ex} (kNm)		V _{u,k maks} (kN)		V _{u,terpakai} kN	N _{u,k} kN	V _C kN	V _S kN	Spasi mm	s mak mm	digunakan
										Bawah	Atas	V _{u,kv}	V _{u,ks}							
1	k124	600	600	538	2.4	5.28	2.55	-1.11E-14	2.16	265.844	862.9102	34.888	97.10	97.0999	1784.80	363.9	202.1	150	100	3 Ø 10-100
2	k125	600	600	538	3.4	4.80	3.06	-7.101E-16	1.08	642.481	634.3826	9.6148	12.80	12.7976	1338.46	340.1	318.8	95	95	3 Ø 10-95
3	k126	600	600	538	2.9	-11.25	-7.03	9.2157E-16	0.06	893.728	267.4441	-19.114	18.93	18.9274	868.61	315.1	283.5	107	100	3 Ø 10-100

t	kolom	b mm	h mm	d mm	hk (m)	V _D kN	V _L kN	V _{ex} kN	V _{ev} kN	M _{u,ex} (kNm)		V _{u,k maks} (kN)		V _{u,terpakai} kN	N _{u,k} kN	V _C kN	V _S kN	Spasi mm	s mak mm	digunakan
										Bawah	Atas	V _{u,kv}	V _{u,ks}							
1	k122	600	600	538	2.4	16.40	9.31	-1.217E-14	23.86	303.432	862.9102	57.056	127.19	127.195	1347.20	340.6	128.6	236	100	3 Ø 10-100
2	k123	600	600	538	3.4	-1.91	-2.13	1.4936E-16	-0.13	916.842	594.4453	-4.4122	4.80	4.80488	856.45	314.4	306.4	99	99	3 Ø 10-99
1	k121	600	600	538	2.4	-43.30	-26.11	-1.102E-14	22.11	862.91	862.9102	-45.026	19.97	19.9701	689.90	305.5	272.3	112	100	3 Ø 10-100

BAB VII

PEMBAHASAN

7.1 Umum

Perencanaan struktur suatu bangunan adalah bertujuan untuk menghasilkan suatu struktur yang stabil, cukup kuat, mampu layan, awet, ekonomis dan mudah dilaksanakan. Struktur dikatakan stabil apabila tidak mudah terguling atau tergeser selama umur bangunan yang direncanakan, cukup kuat dan mampu layan apabila kemungkinan terjadi kegagalan struktur dan kehilangan kemampuan layan selama umur bangunan yang direncanakan adalah kecil dan dalam batas yang direncanakan.

Struktur Gedung Olah Raga dalam tugas akhir ini direncanakan dengan menggunakan daktilitas penuh, sehingga struktur tersebut diharapkan mampu memberikan respon inelastic terhadap beban siklis yang bekerja dan mampu menjamin pengembangan mekanisme terbentuknya sendi-sendi plastis dengan kapasitas perencanaan energi yang diperlukan tanpa mengalami keruntuhan

Sedangkan untuk analisis mekanika struktur pada Tugas Akhir ini menggunakan program SAP 2000 non linier versi 8 dan analisis output menggunakan program aplikasi Microsoft Office Acces dan Microsoft Office Excel.

7.2 Atap

Perencanaan ini menggunakan atap dengan rangka baja jenis Pipa (Pipe) sebagai kuda-kudanya. Terdapat dua tipe kuda-kuda yang direncanakan yaitu kuda-kuda arah X dan arah Y, yang mana dari kedua tipe tersebut terdapat beberapa kuda-kuda arah melintang (X) dan horizontal (Y), yang direncanakan dengan menggunakan *Load Resistance Factor Design (LRFD)* dari AISC. Profil yang digunakan yaitu Profil P4 (Pipe P4 diameter 4 inc), Profil PXX5 (Pipe Extra Extra Strong diameter 5 inc), dan Profil PXX8 (Pipe Extra Extra Strong diameter 8 inc) dengan mutu baja Kuat Tarik 4077 Kg/cm^2 dan Tegangan Leleh 2531 Kg/cm^2 . Sebagai sambungan digunakan Las dengan proses SAW (proses busur nyala terbenam) dengan digunakan Las sudut $\frac{3}{8}$ " (9,5 mm) dan elektroda fluks F70.

7.3 Pelat

Pada bangunan ini terdiri dari pelat lantai dan pelat tribun. Perencanaan tipe pelat berdasarkan perbandingan panjang sisi-sisinya dan dukungan pada pelat. Perhitungan beban perencanaan pelat mengacu pada ketentuan PPPURDG 1987. Tebal pelat lantai direncanakan 120 mm dan pelat tribun 120 mm. Mutu baja yang digunakan pada pelat lantai dan pelat tribun adalah $f_y = 240 \text{ Mpa}$ dan Mutu betonnya $f_c' = 25 \text{ Mpa}$. Dalam Contoh perhitungan pelat lantai dianalisa sebagai pelat satu arah ($L_y/L_x > 2$) dengan tulangan pokok P10-100 dan tulangan susut P8-150. Pelat tribun dianalisa sebagai pelat satu arah dengan tulangan pokok P10-100 dan tulangan susut P8-150.

7.4 Balok tribun

Balok tribun adalah balok yang berfungsi untuk menyangga pelat tribun. Perhitungan momen pada balok tribun ini menggunakan cara pendekatan berdasar SK SNI-15-1991-03, yaitu dengan menggunakan koefisien momen. Spesifikasi bahan yang digunakan adalah $f_c = 25$ Mpa, dan $f_y = 400$ Mpa. Untuk tulangan ulir dan $f_y = 240$ Mpa untuk tulangan polos. Tulang pokok menggunakan $\emptyset 10$ mm dan tulangan sengkang menggunakan $\emptyset 8$ mm dengan penutup beton menurut tabel 3 adalah $p = 40$ mm. Ukuran Balok tribun 300x400 mm, pada momen tumpuan digunakan 3 $\emptyset 14$ dengan sengkang $\emptyset 8$, sedang pada momen lapangan digunakan 3 $\emptyset 14$ dengan sengkang $\emptyset 8$, dikarenakan tinggi balok tribun lebih besar dari 300 mm digunakan tulangan susut 2 $\emptyset 12$.

7.5 Balok

Balok dibagi menjadi 3 dan direncanakan berdasar analisis struktur portal. Spesifikasi bahan yang digunakan adalah $f_c = 25$ Mpa dan $f_y = 400$ Mpa untuk tulangan ulir dan $f_y = 240$ Mpa untuk tulangan polos.

Balok Tipe 1 adalah balok yang memanjang dalam arah y digunakan ukuran balok 300x550 mm dianalisis sebagai balok bertulangan sebelah dengan tulangan untuk momen tumpuan 3 $\emptyset 20$ dan tulangan untuk momen lapangan 3 $\emptyset 20$ dengan digunakan sengkang $\emptyset 8$ -240 dan tulangan susut 2 $\emptyset 13$.

Balok Tipe 2 adalah balok yang memanjang dalam arah x digunakan ukuran balok 300x550 mm dianalisis sebagai balok bertulangan rangkap dengan tulangan untuk Tulangan Tarik 7 $\emptyset 25$ dan tulangan tekan 3 $\emptyset 20$ dengan

digunakan sengkang 2Ø10-60 untuk daerah sendi plastis dan 2Ø10-140 untuk daerah diluar sendi plastis dan tulangan susut 2Ø13.

Balok Tipe 3 adalah balok yang memanjang dalam arah x digunakan ukuran balok 300x750 mm dianalisis sebagai balok bertulangan sebelah dengan tulangan untuk momen tumpuan 4Ø25 dan tulangan untuk momen lapangan 3Ø25 dengan digunakan sengkang 2Ø10-60 untuk daerah sendi plastis dan 2Ø10-140 untuk daerah diluar sendi plastis dan tulangan susut 2Ø13.

7.6 Kolom

Kolom juga merupakan struktur yang direncanakan berdasarkan analisis portal. Penentuan lebar kolom disesuaikan dengan lebar balok agar mempermudah penulangan di lapangan. Lebar kolom direncanakan lebih besar dari lebar balok untuk memberikan kekuatan yang baik. Spesifikasi bahan yang digunakan adalah $f_c = 25$ Mpa dan $f_y = 400$ Mpa untuk tulangan ulir, $f_y = 240$ untuk tulangan polos. Digunakan dimensi kolom 600x600mm Tulangan pokok 12D25 digunakan sengkang 3Ø10-100.

7.7 Tangga

Perencanaan tangga meliputi perencanaan optrade and antrade, pembebanan tangga dan bordes, penulangan pelat tangga dan bordes, penulangan balok bordes. Perencanaan tangga menggunakan tulangan pokok θ 12 mm dan tualangan bagi θ 8 mm. Spesifikasi bahan yang dipergunakan $f_c = 20$ Mpa, dan $f_y = 240$ Mpa.

BAB VIII

KESIMPULAN DAN SARAN

8.1 Kesimpulan

Berdasarkan hasil perhitungan pada bab-bab sebelumnya dapat disimpulkan sebagai berikut :

1. Gedung Olah raga yang didesain dan direncanakan menggunakan analisis 3-D dengan menggunakan Program Aplikasi SAP 2000 terhadap berat sendiri, beban kerja dan beban gempa yang bekerja adalah yang terjadi di wilayah Jawa Timur (wilayah gempa 3).
2. Pada suatu konstruksi struktur bangunan gedung biasanya dibagi menjadi dua yaitu struktur atas (*Upper Structure*) dan struktur bawah (*Sub Structure*). Struktur atas merupakan elemen bangunan yang berada di atas permukaan tanah begitu juga pada struktur bawah adalah merupakan suatu elemen bangunan yang terletak di bawah permukaan tanah, akan tetapi pada Tugas Akhir ini, penulis tidak memperhitungkan struktur bawah (*Sub Structure*), seperti halnya perhitungan pondasi, yang mana hal ini tidak termasuk dalam tema Tugas Akhir tersebut.
3. Dalam perencanaan ini menggunakan metode kekuatan batas yaitu beban kerja dinaikkan dengan memberikan factor beban, sehingga diperoleh suatu beban yang dipakai untuk perencanaan.
4. Perencanaan konstruksi meliputi :
 - ✓ Perencanaan rangka atap dengan menggunakan metode *Load Resistance Factor Design* dari AISC.

- ✓ Perencanaan pelat dengan menggunakan metode koefisien momen dengan menganggap bahwa tumpuan tepi jepit elastis sehingga didapat koefisien momen dari ketentuan PPPURDG 1987.
- ✓ Perencanaan balok tribun menggunakan cara pendekatan berdasarkan SK-SNI T-15-1991-03, yaitu dengan menggunakan koefisien momen.
- ✓ Balok anak dianalisis dengan menggunakan program Aplikasi Komputer SAP 2000, dan direncanakan berdasarkan SK-SNI T-15-1991-03.

8.2 Saran

Dengan memperhatikan hal-hal tersebut di atas, maka dapat diberikan beberapa saran antara lain :

1. Perlu adanya perhitungan sampai tahap akhir (RAB) juga perhitungan pondasi pada tugas akhir ini, sehingga penghematan dari biaya dapat diketahui.
2. perlu adanya re-desain untuk Tugas Akhir ini dengan peningkatan spesifikasi bahan yang lain, sehingga diketahui sejauh mana efisien bahan yang dipergunakan.

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2.	Eri Maghfur Hidayat	97 511 094	Teknik Sipil

JUDUL TUGAS AKHIR

Perencanaan Stadion Dengan Atap Lengkung

PERIODE KE : II (Des 04 - Mei 05)

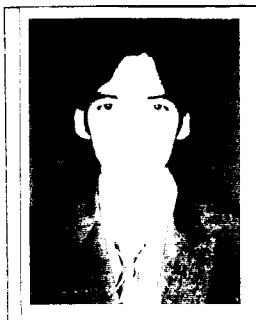
TAHUN : 2004 - 2005

Berlaku mulai Tgl : 25-Jan-05 – Sampai Akhir Mei 05

No.	Kegiatan	Bulan Ke :					
		Des.	Jan.	Peb.	Mar.	Apr.	Mei.
1	Pendaftaran						
2	Penentuan Dosen Pembimbing						
3	Pembuatan Proposal						
4	Seminar Proposal						
5	Konsultasi Penyusunan TA.						
6	Sidang - Sidang						
7	Pendadaran						

Dosen Pembimbing I : Fatkhurrohman N,Ir,MT

Dosen Pembimbing II : Suharyatmo,Ir,H,MT



Jogjakarta ,25-Jan-05
 a.n. Dekan

(Signature)
 Ir.H.Munadhir, MS

Catatan :

Seminar : _____

Sidang : _____

Pendadaran : _____

KARTU PESERTA TUGAS AKHIR

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JUDUL TUGAS AKHIR :

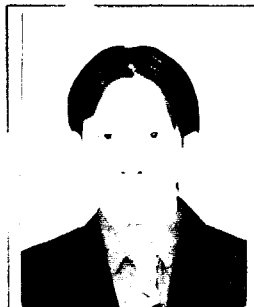
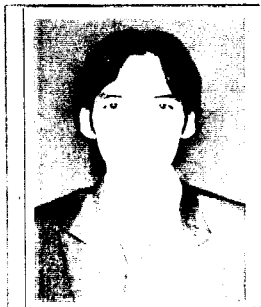
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PERIODE I : SEPTEMBER - PEBRUARI

TAHUN : 2003 - 2004

No.	Kegiatan	Bulan Ke :					
		Sep.	Okt.	Nop.	Des.	Jan.	Peb.
1.	Pendaftaran	■					
2.	Penentuan Dosen Pembimbing	■					
3.	Pembuatan Proposal		■				
4.	Seminar Proposal		■	■			
5.	Konsultasi Penyusunan TA.			■	■	■	
6.	Sidang-Sidang						■
7.	Pendadaran.						■

DOSEN PEMBIMBING I : Fatkhurrohman N,Ir,MT
 DOSEN PEMBIMBING II : Suharyatmo,Ir,H,MT



Yogyakarta, 08-Sep-03
 a.n. Dekan,

 Ir H Munadhir, MT
 (.....)

Catatan.

Seminar :
 Sidang :
 Pendadaran :

*Secara administrasi sudah selesai,
 Mhs harus mendaftarkan TA dari awal lagi!*

18/05/01

LAMPIRAN 1

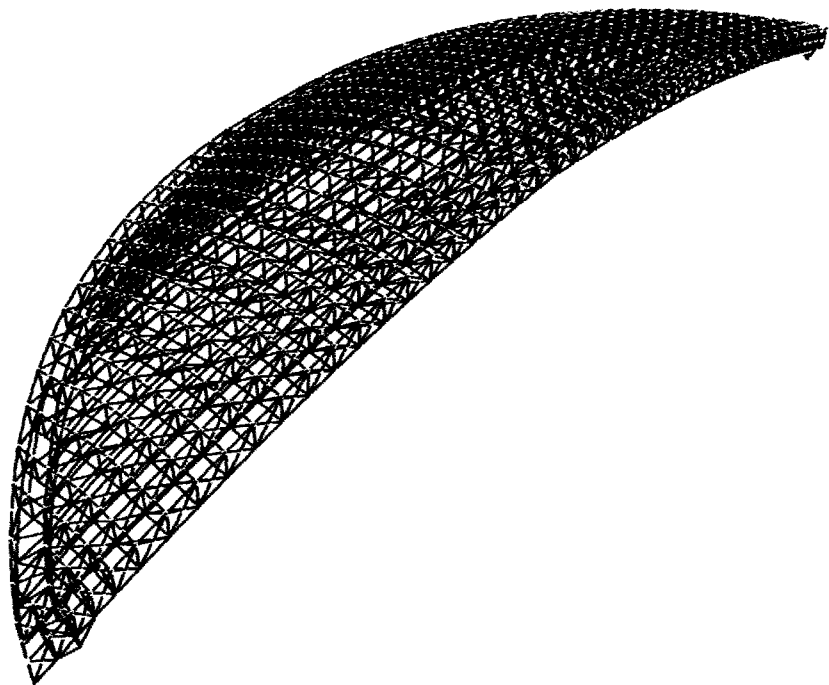
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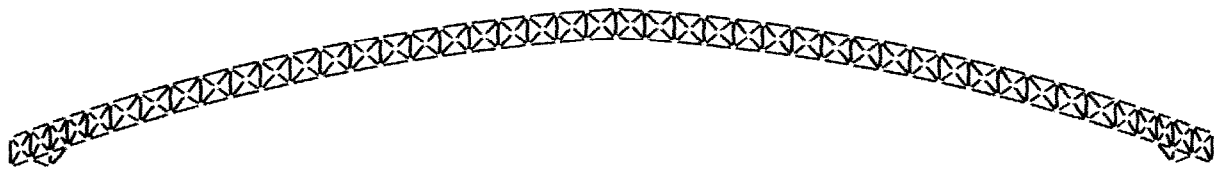
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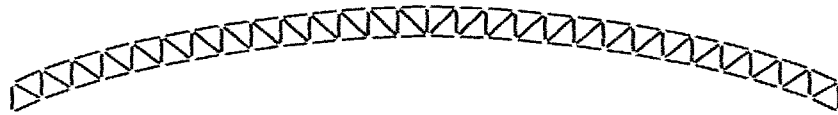
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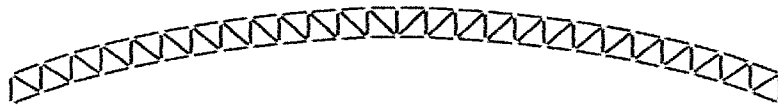
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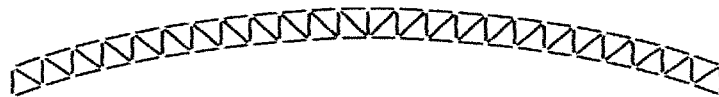
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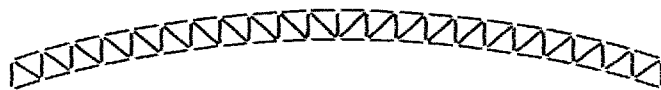


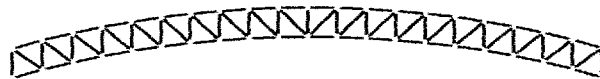


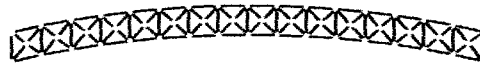


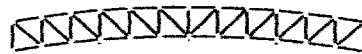


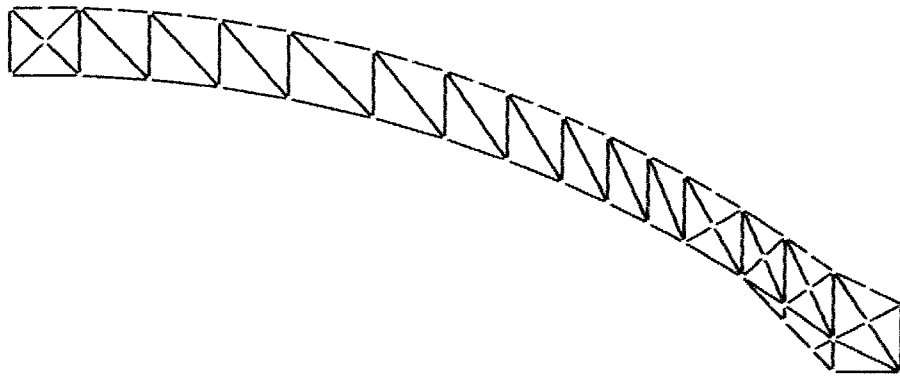


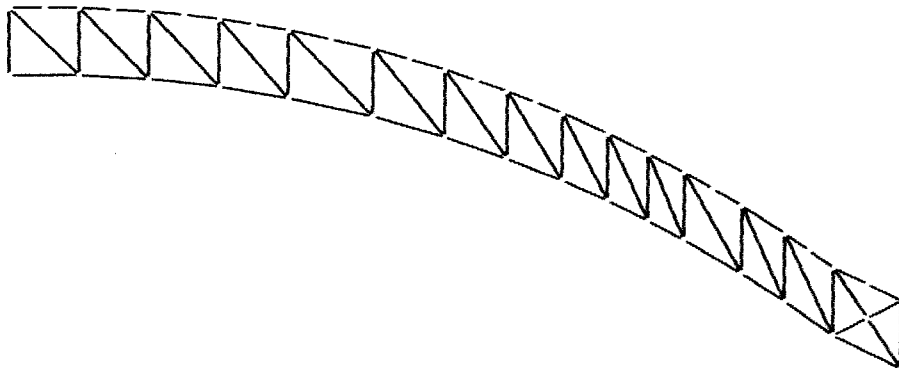


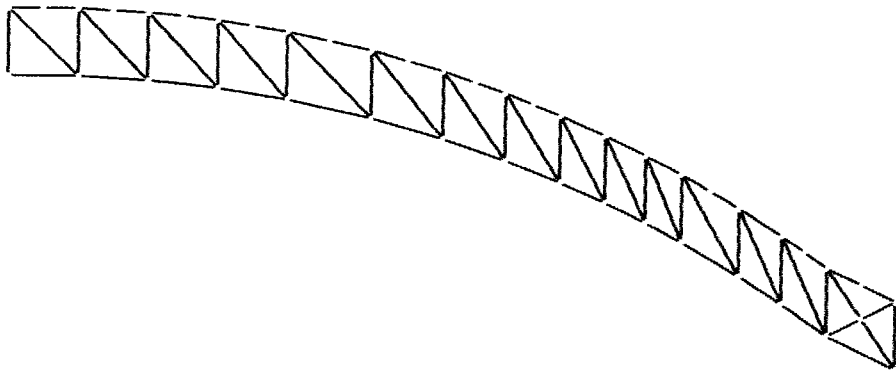


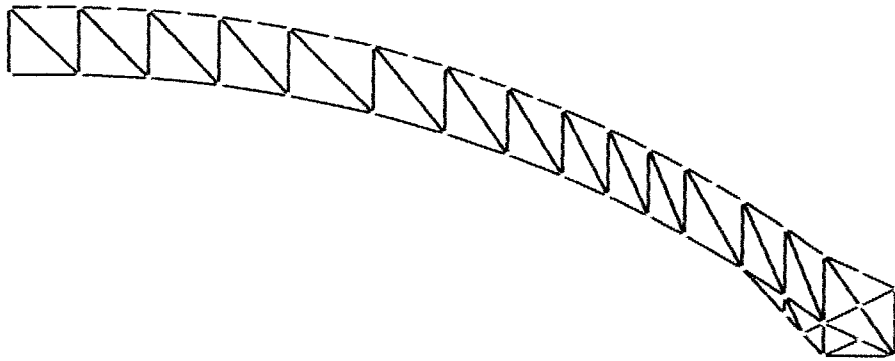


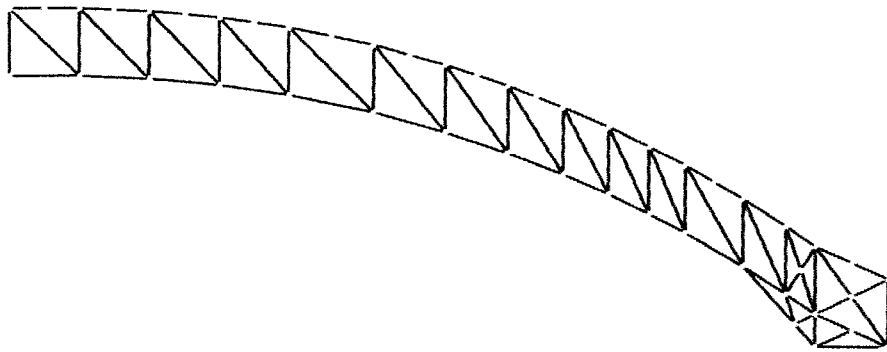


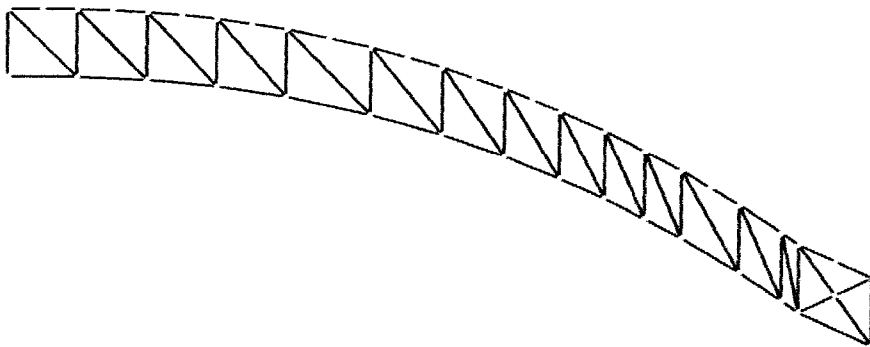


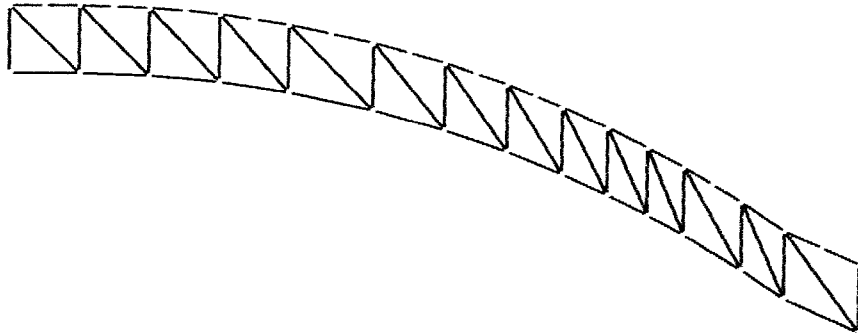


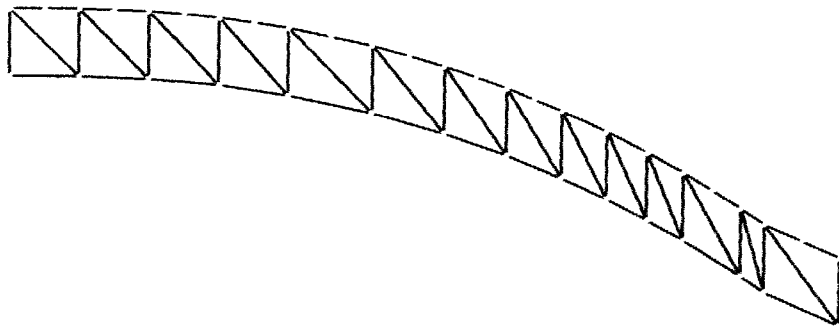


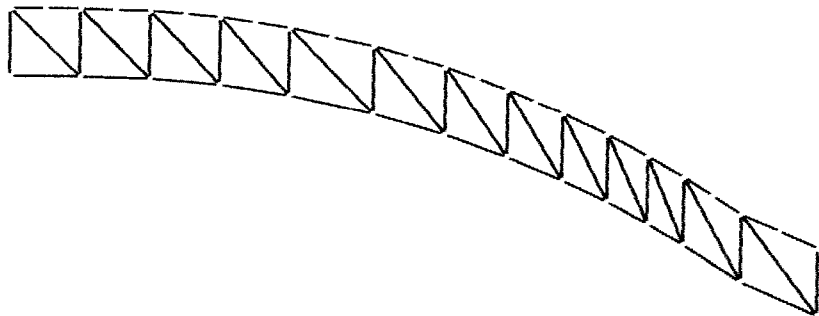


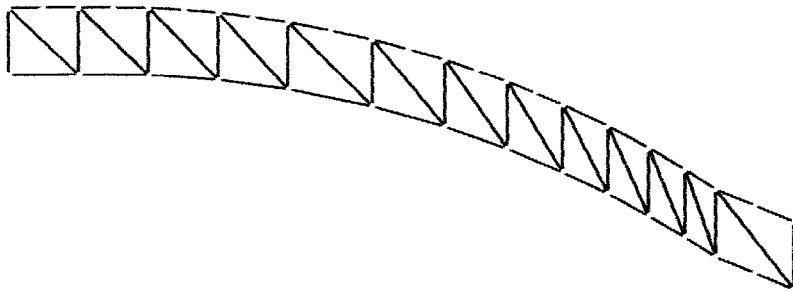


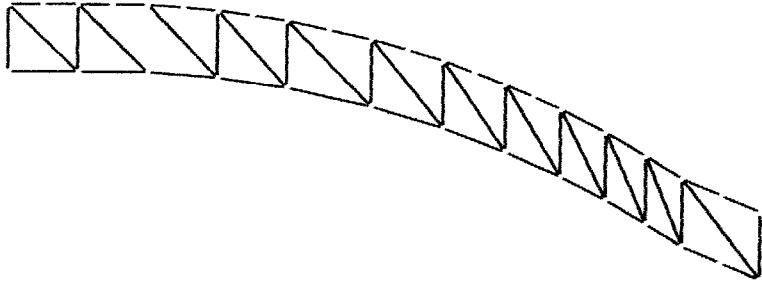


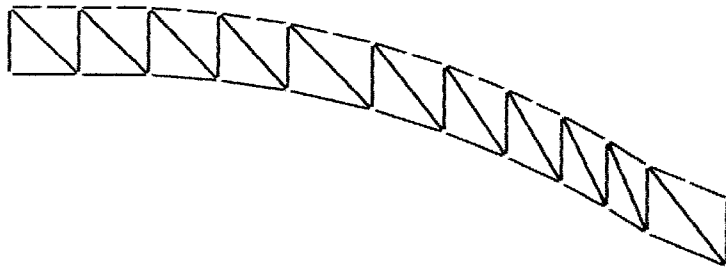


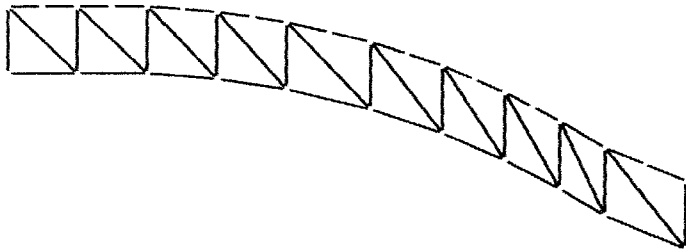


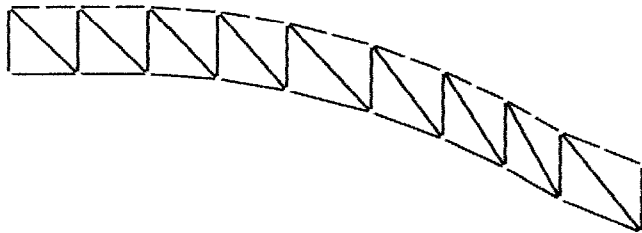


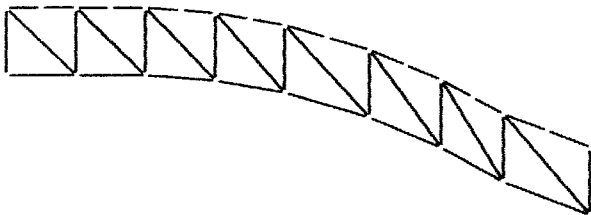


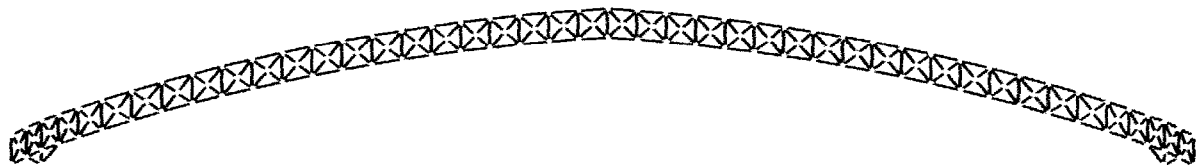


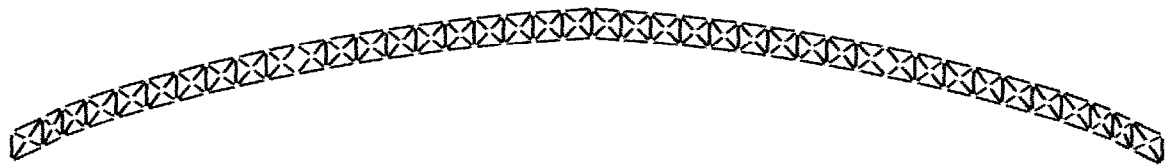




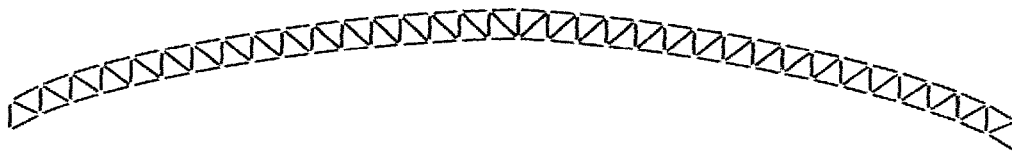


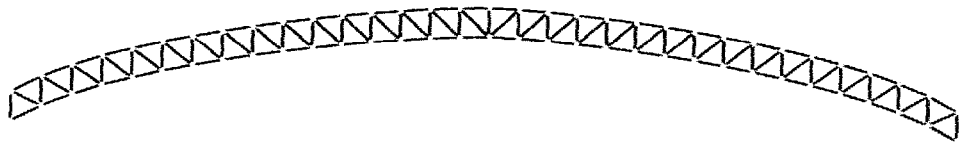


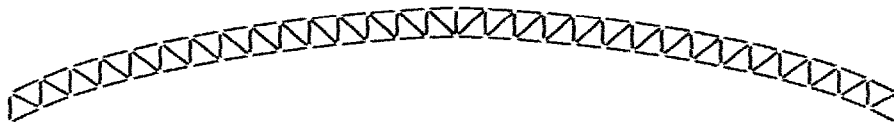








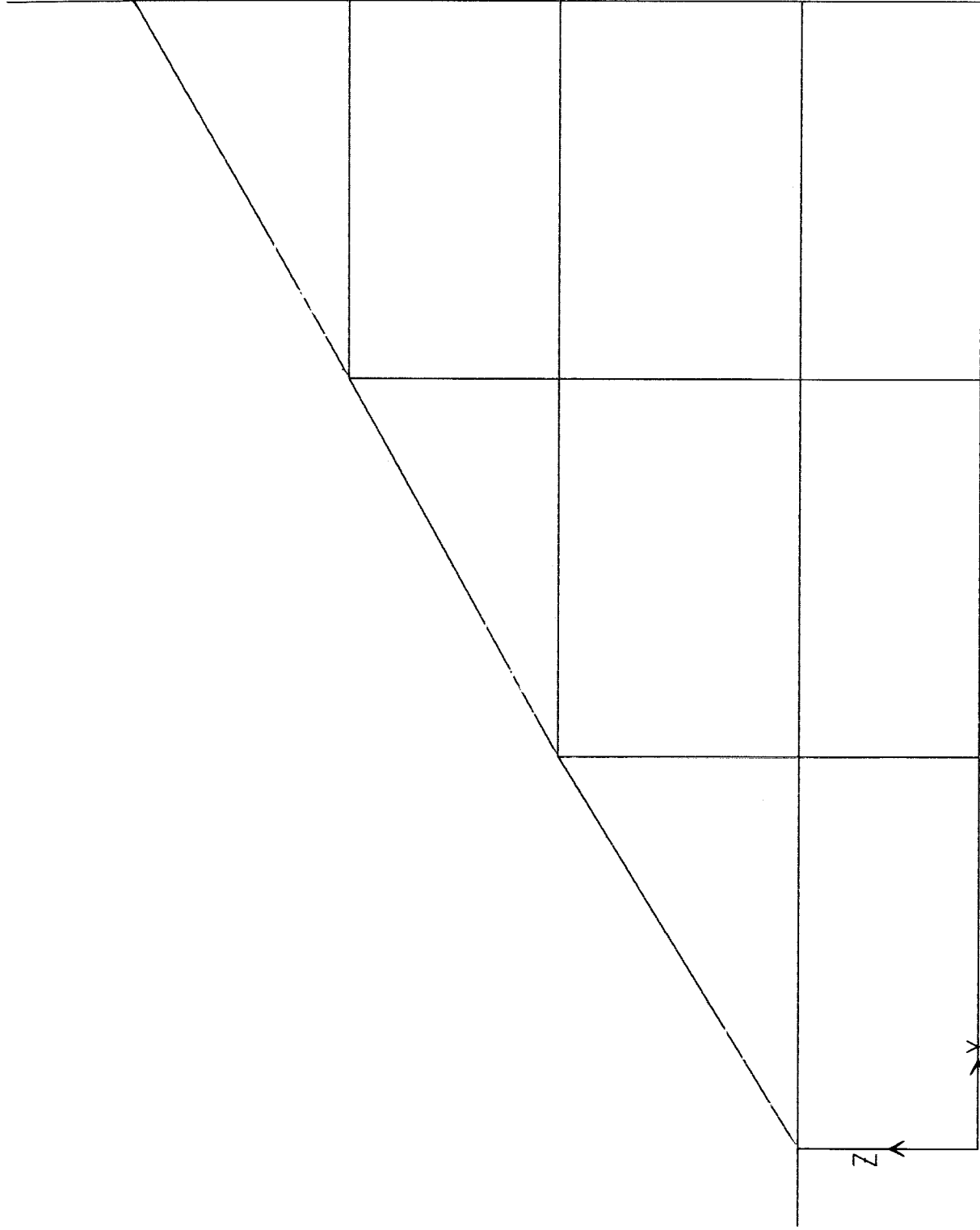


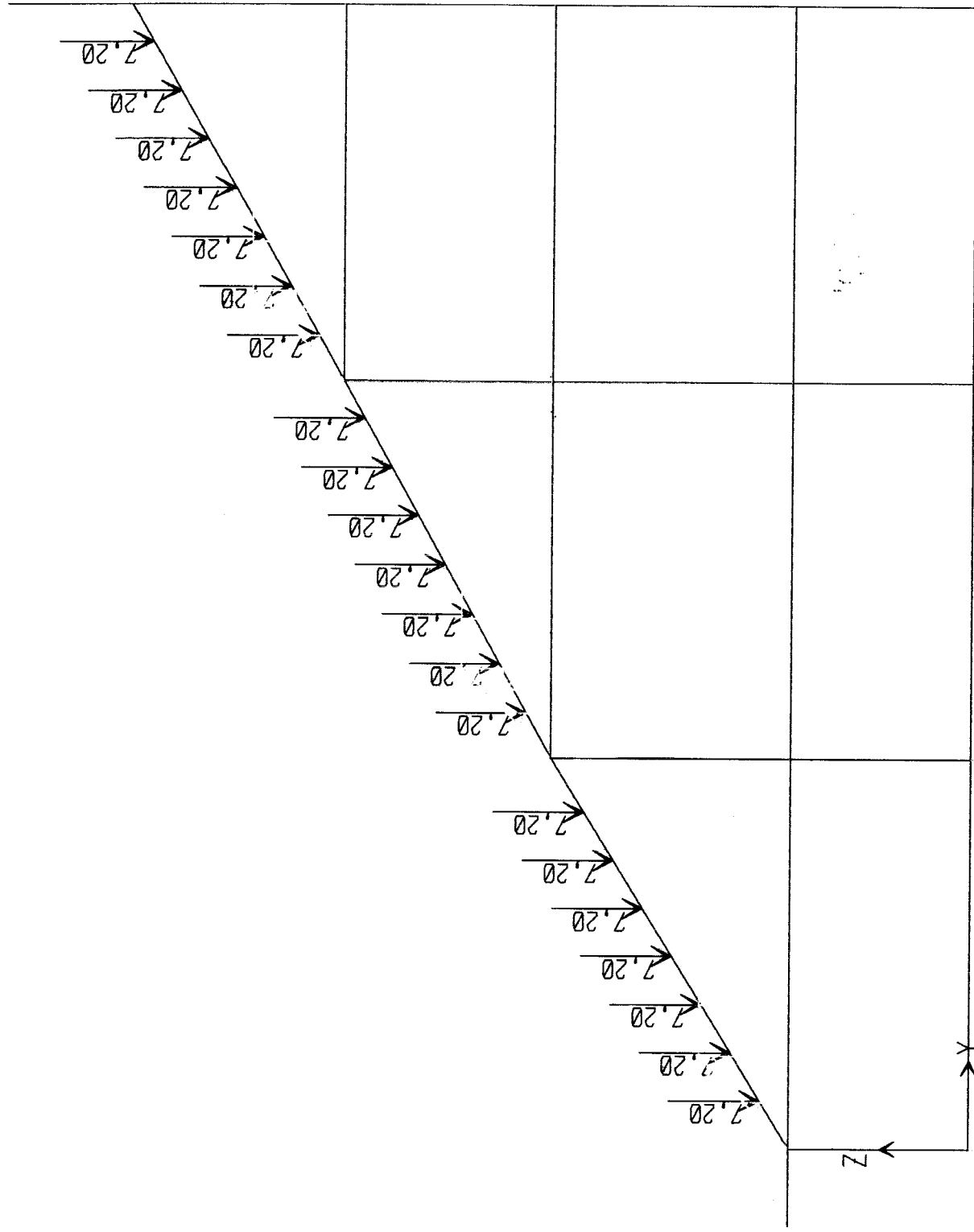


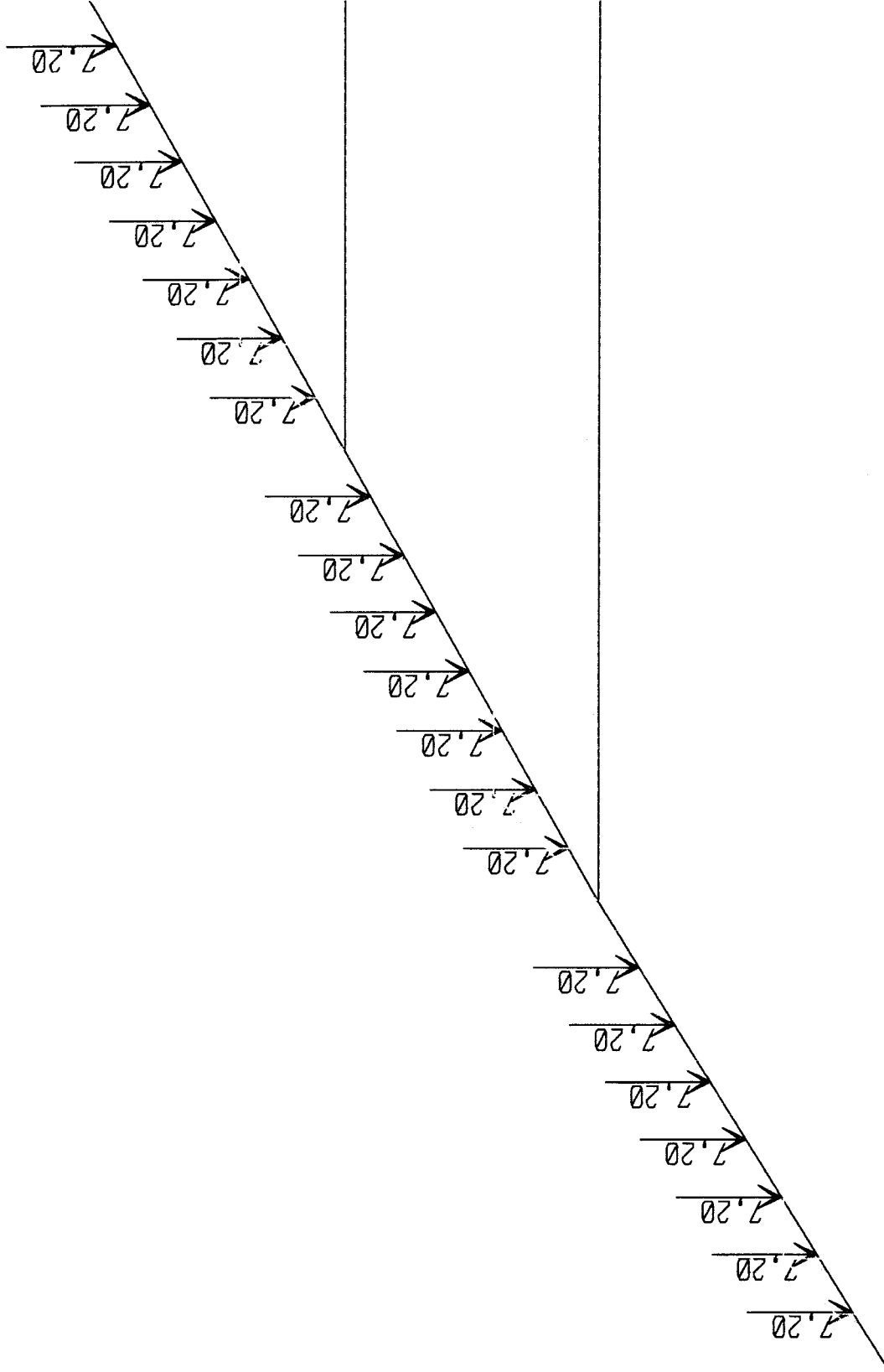
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STRUKTUR

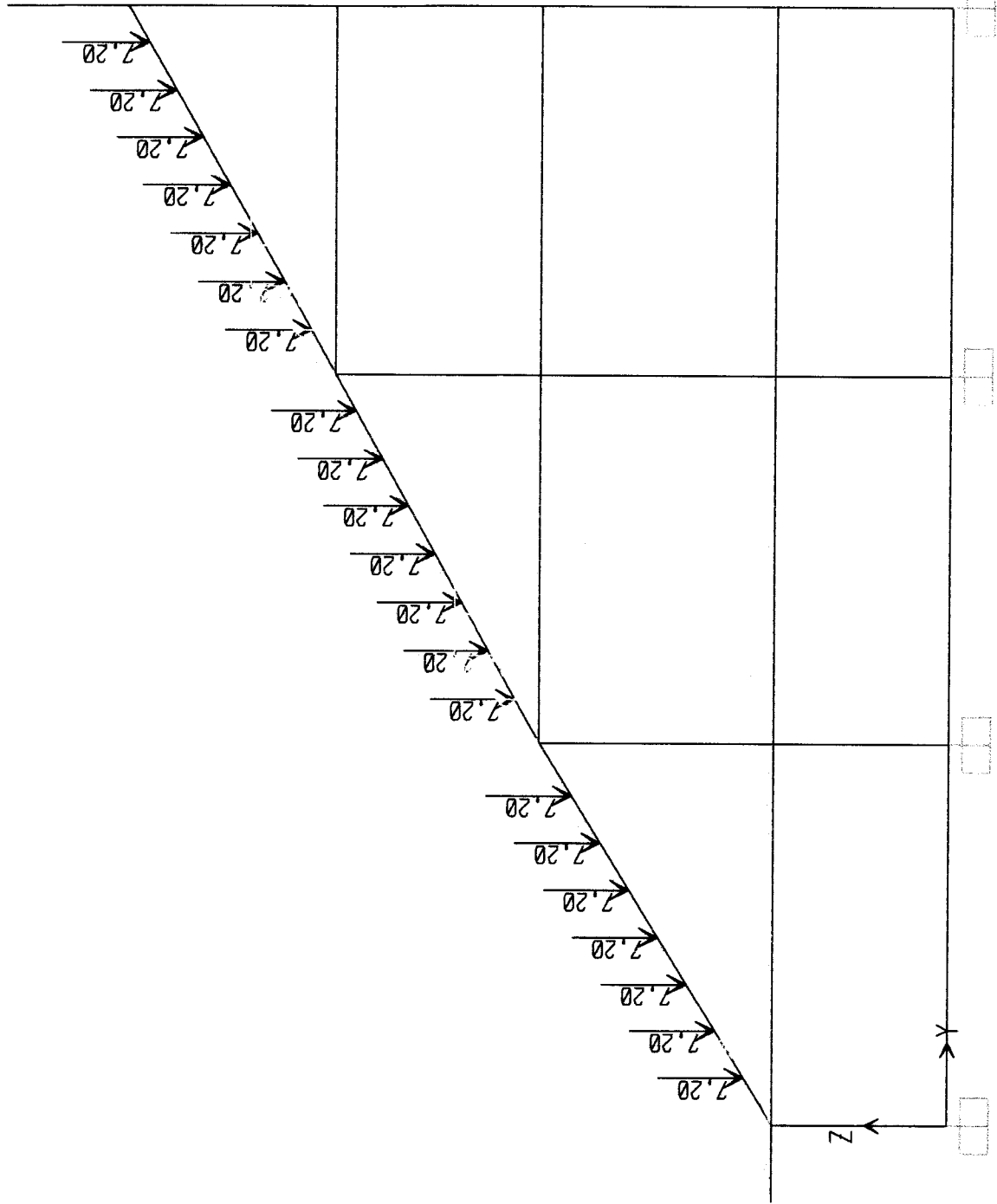
BETON BERTULANG

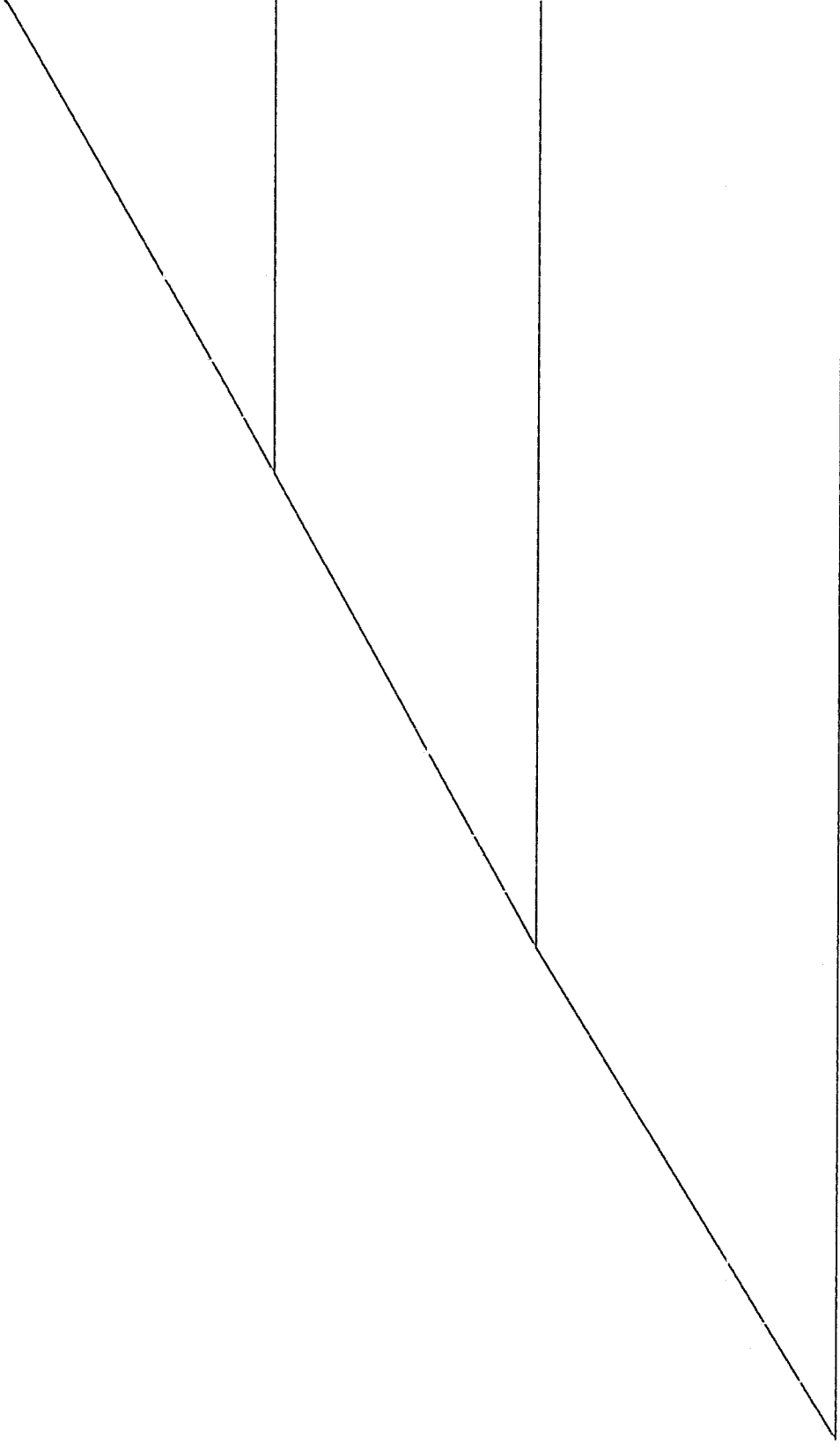




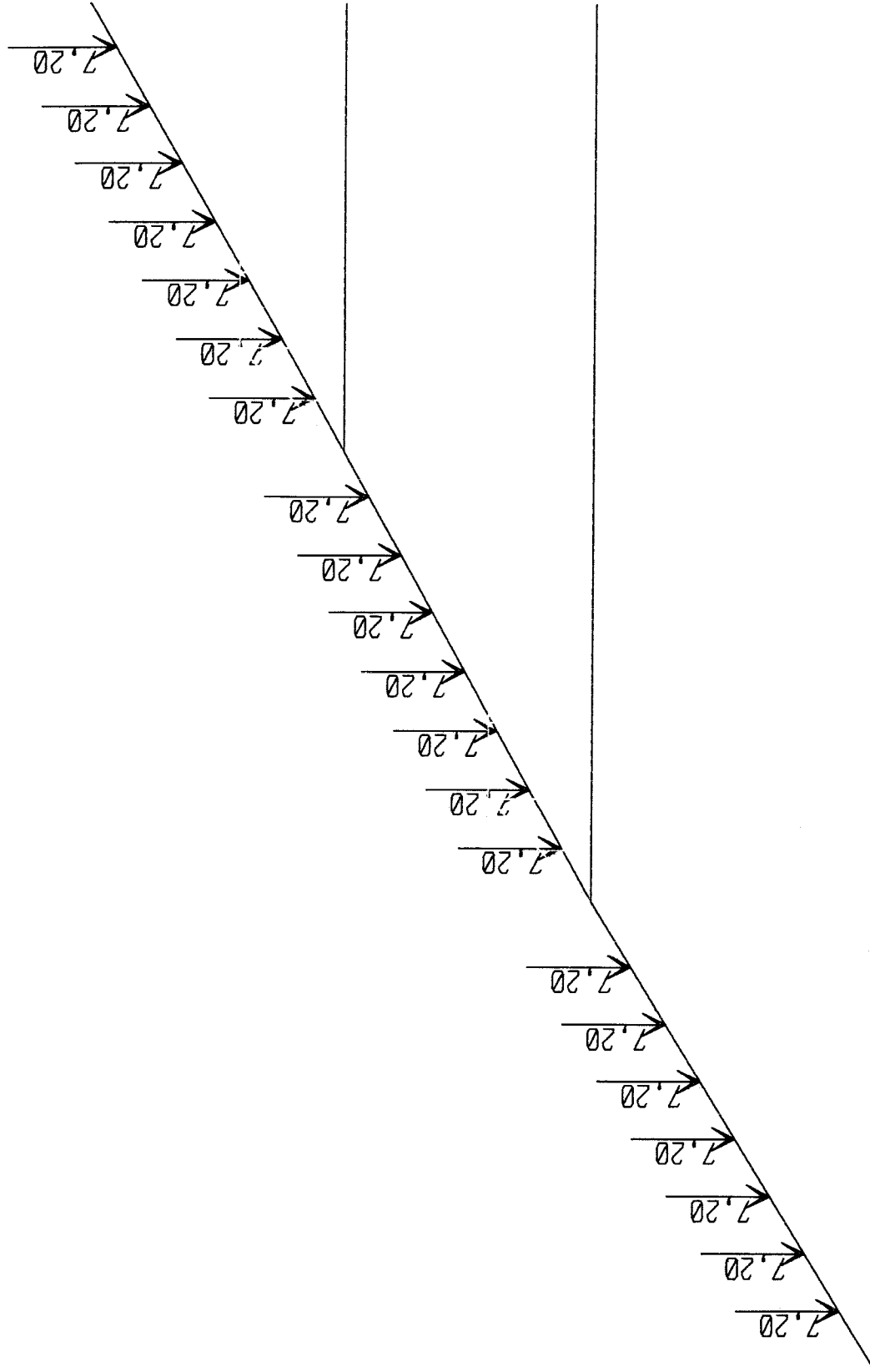


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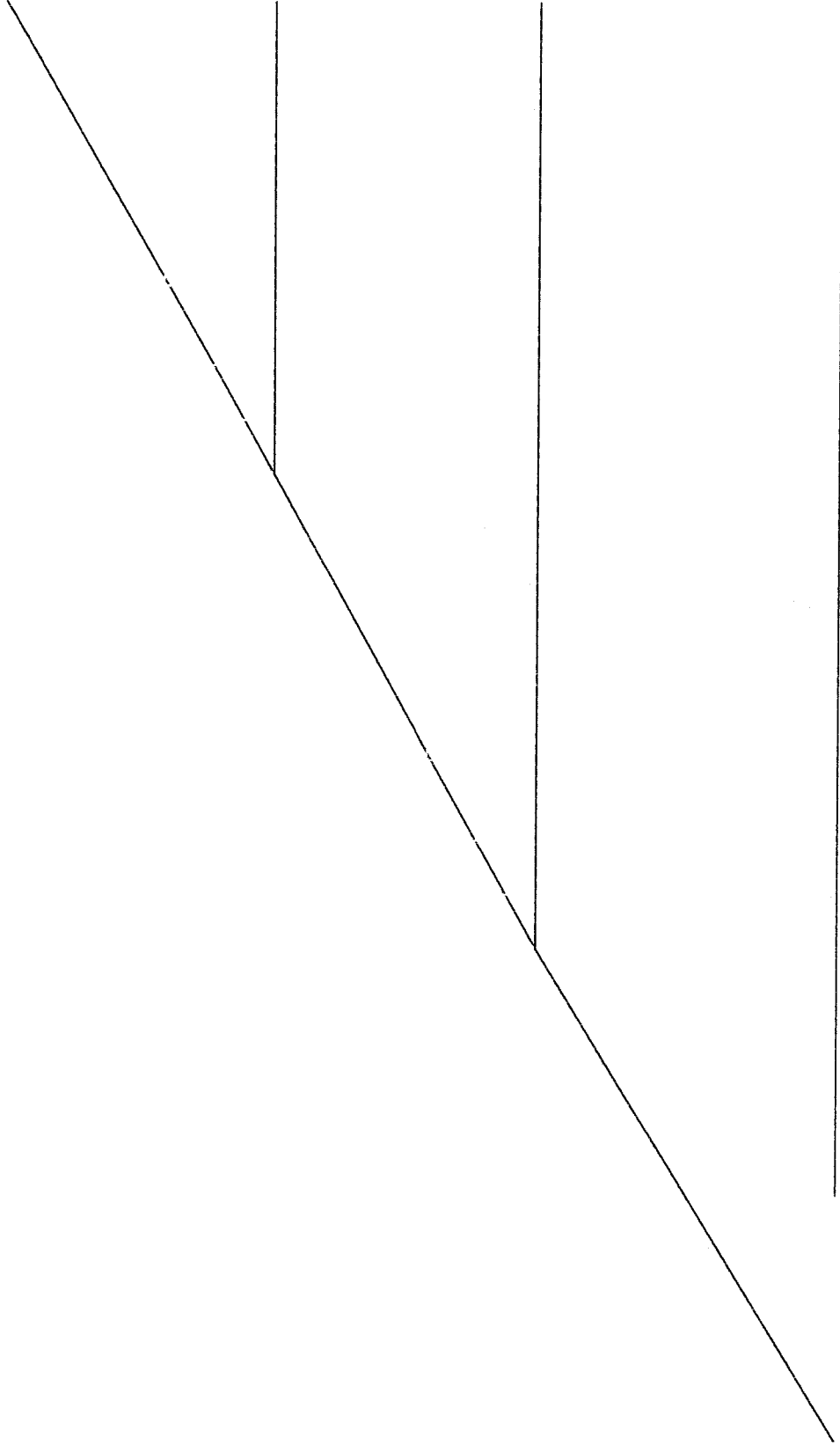




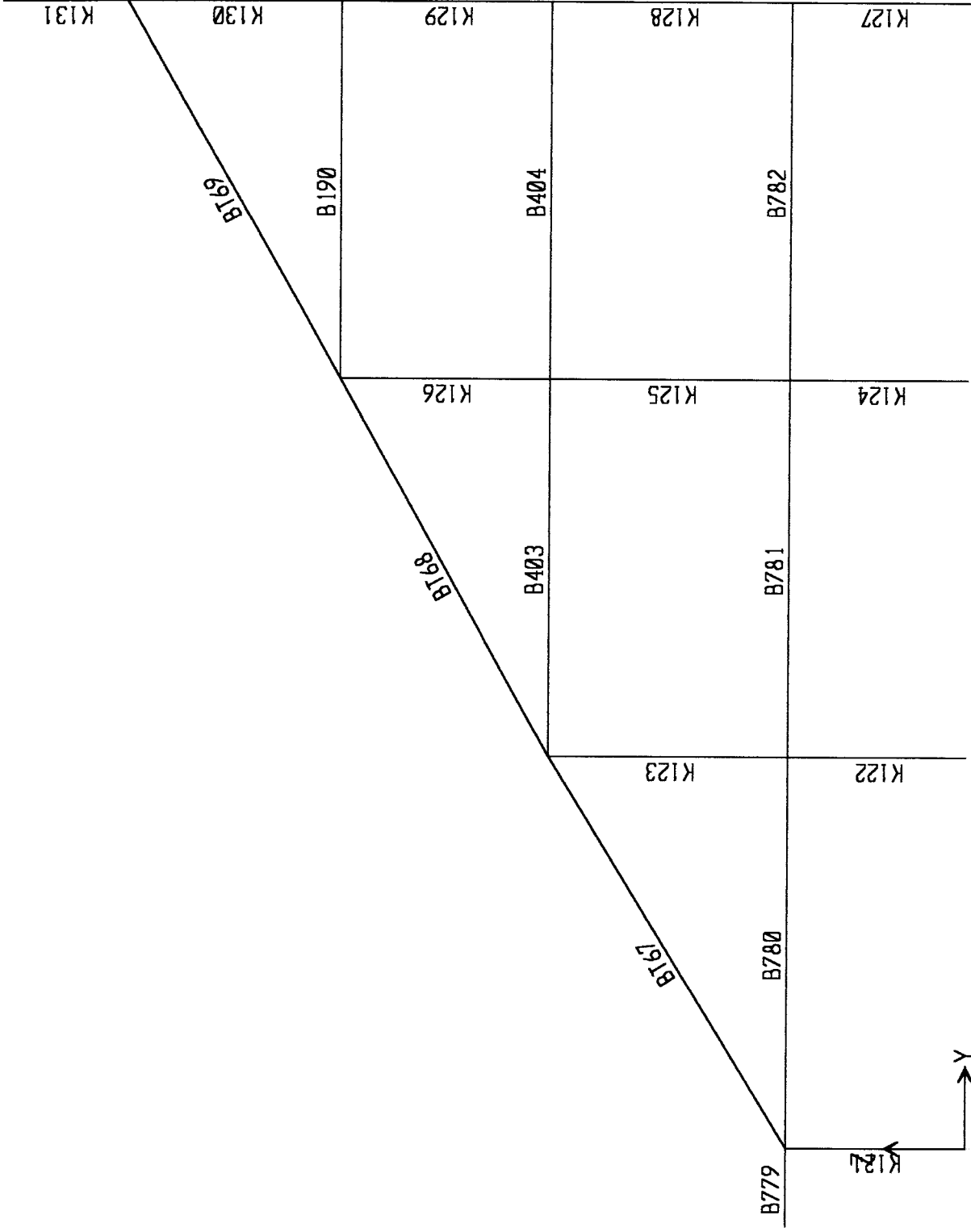
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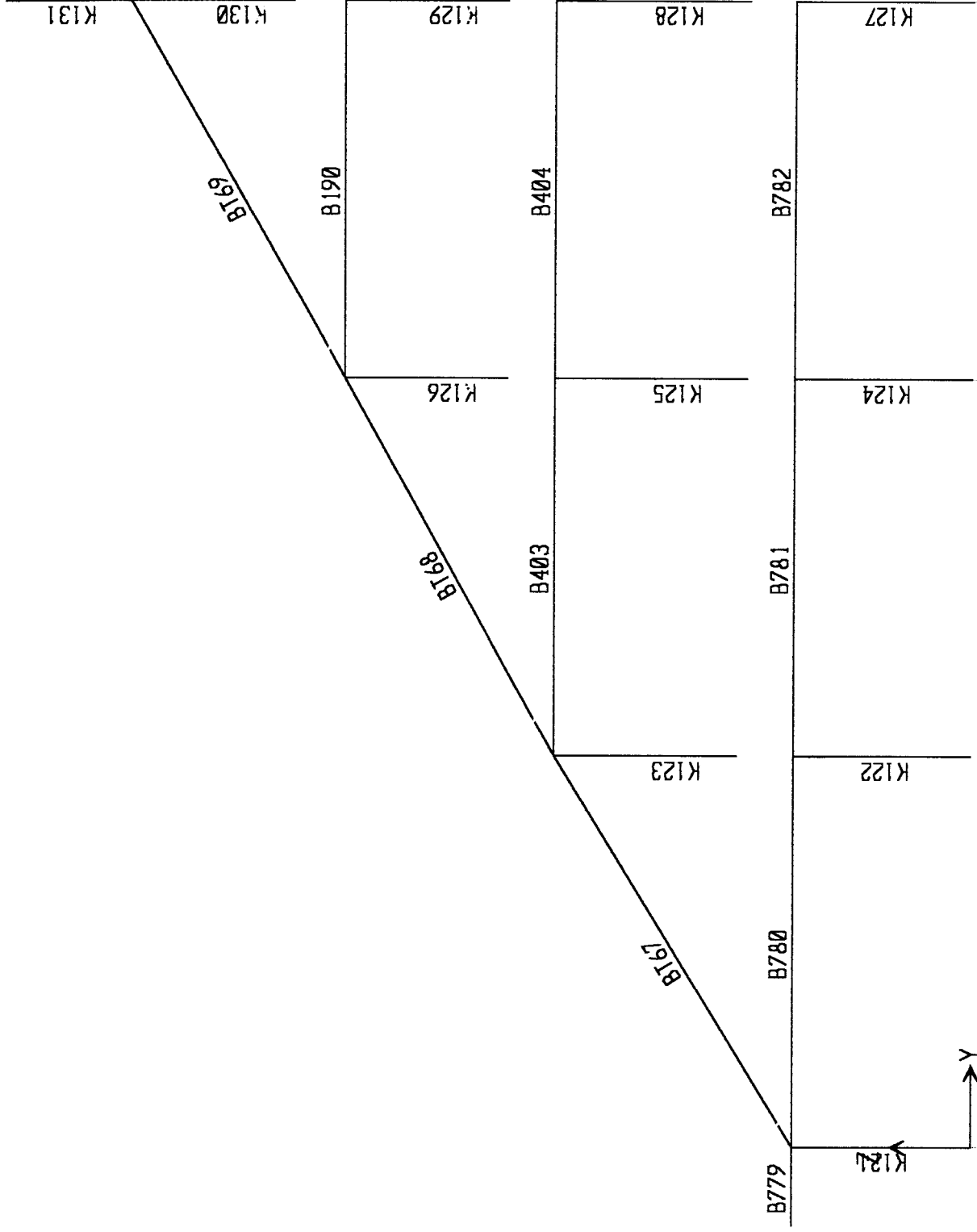


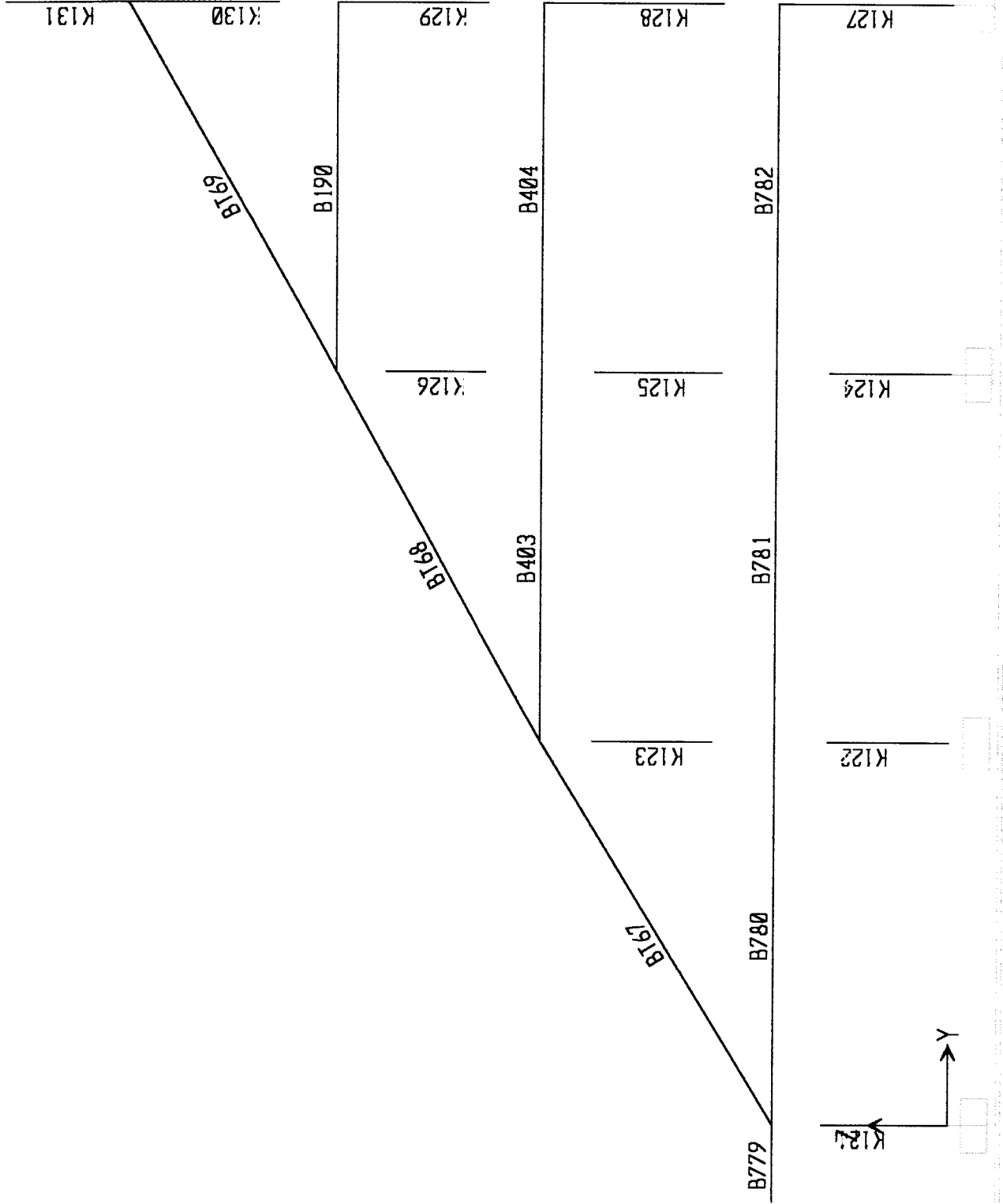
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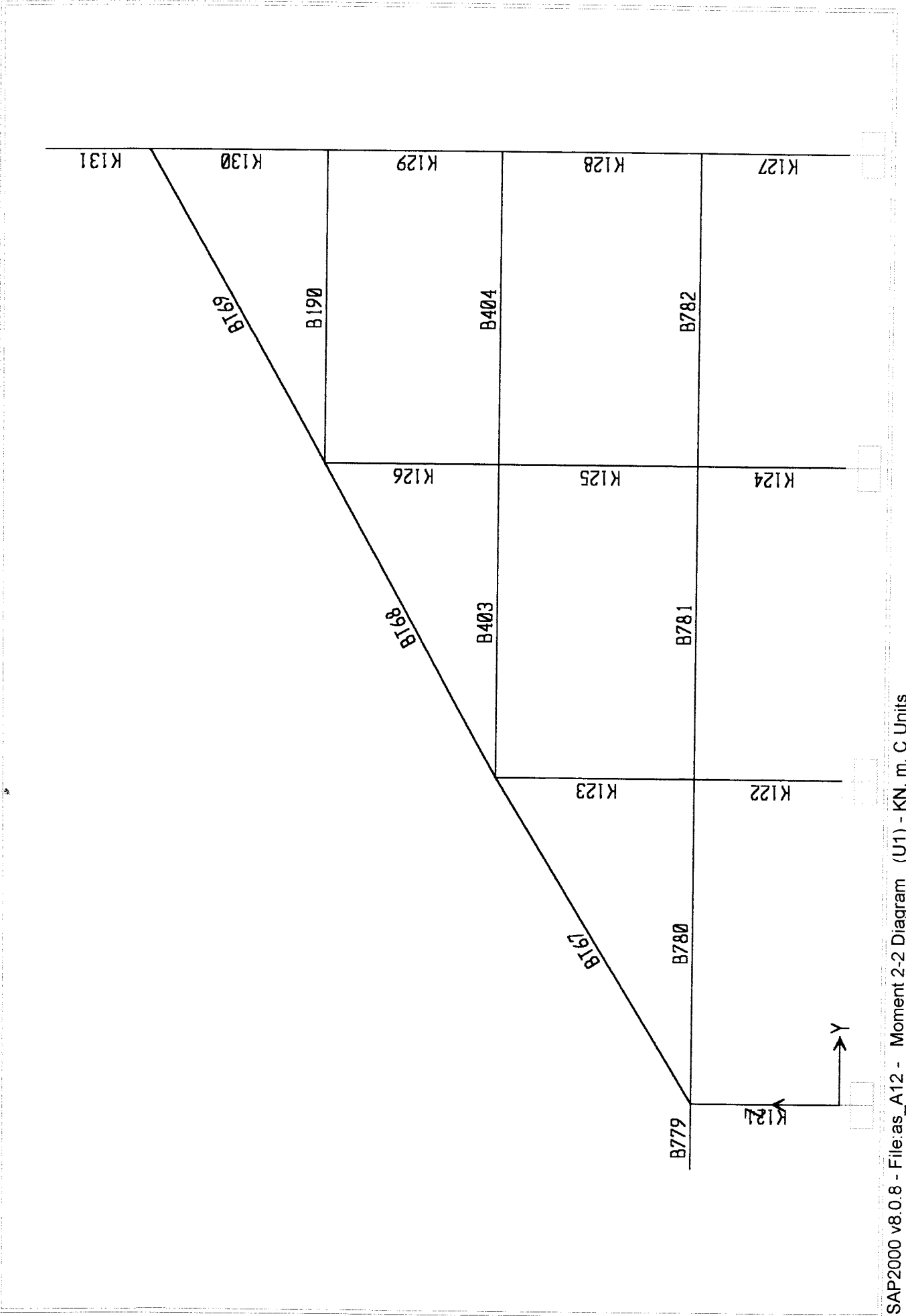


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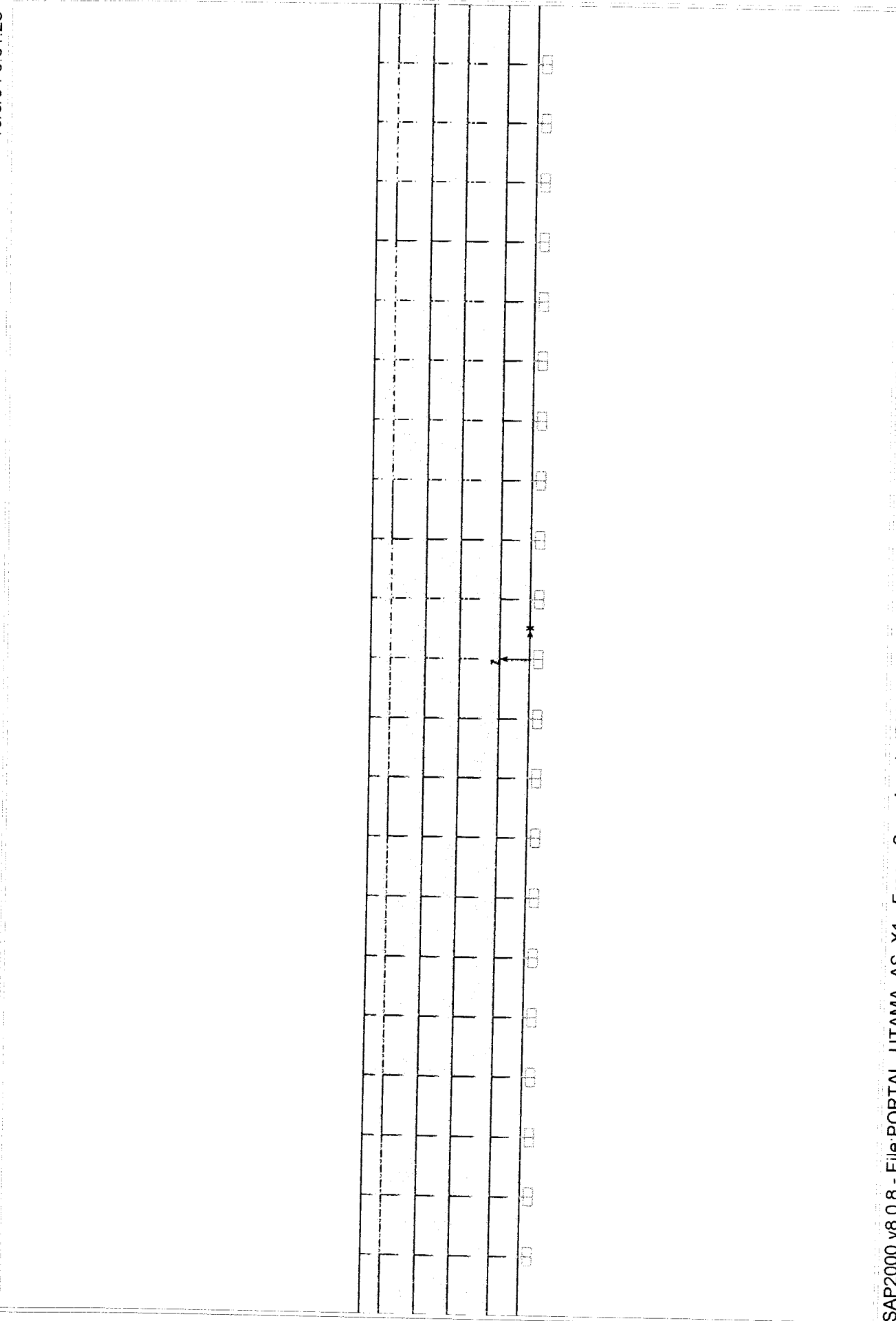






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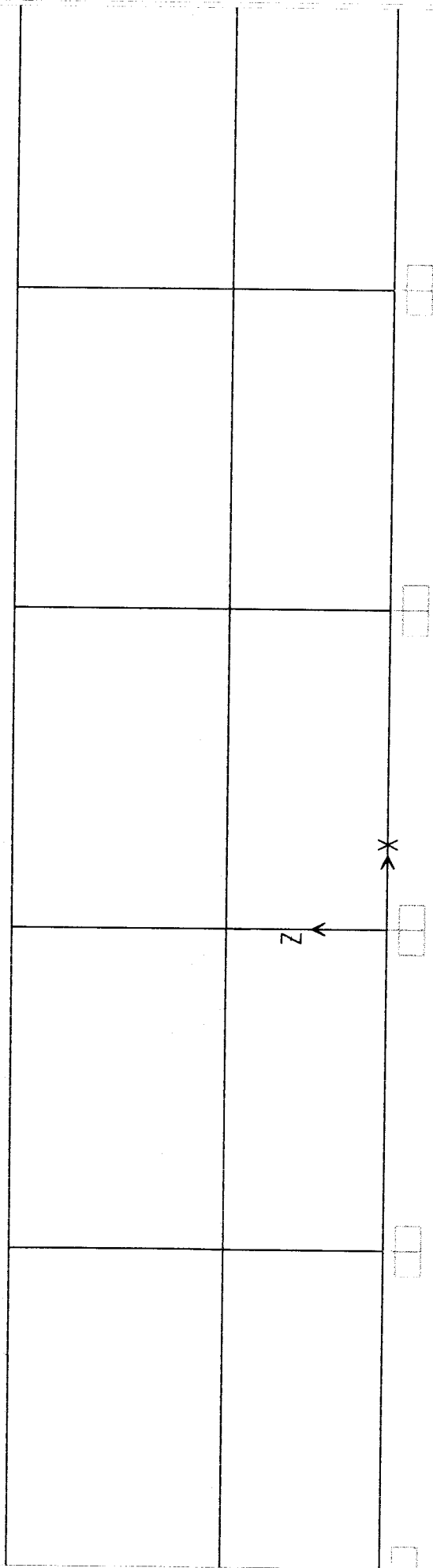




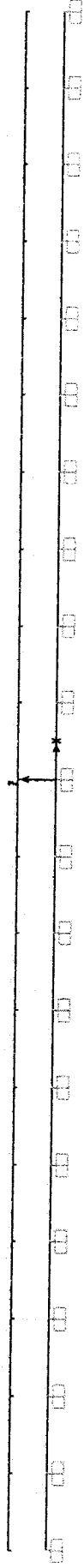
The diagram displays a grid representing a structural frame span load. A coordinate system is shown with a vertical Z-axis, a horizontal X-axis, and a diagonal Y-axis. The grid consists of 10 columns and 4 rows. To the right of the grid, there are several small square icons, likely representing control or status indicators for each cell. The grid is enclosed in a rectangular border.

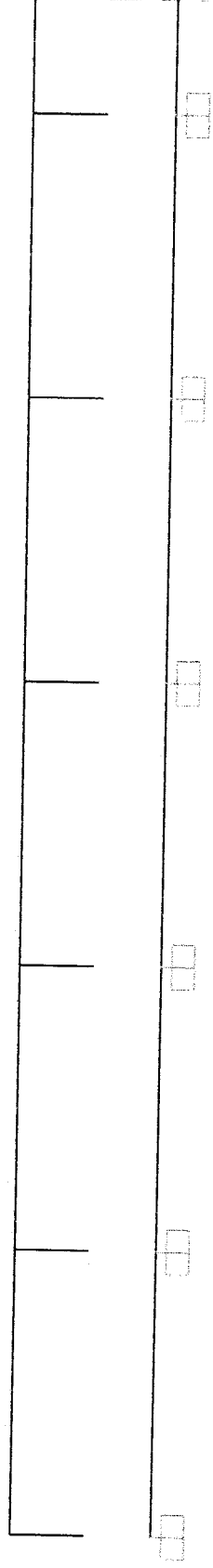
																		*	*					

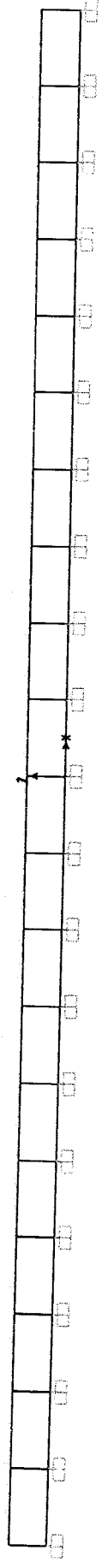
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000



Node	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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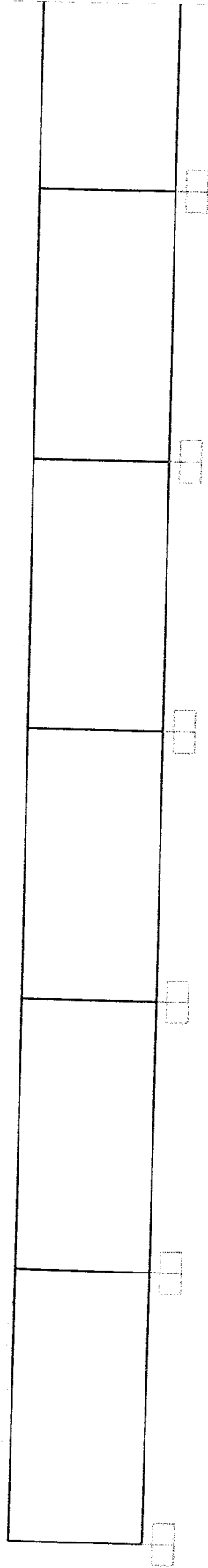


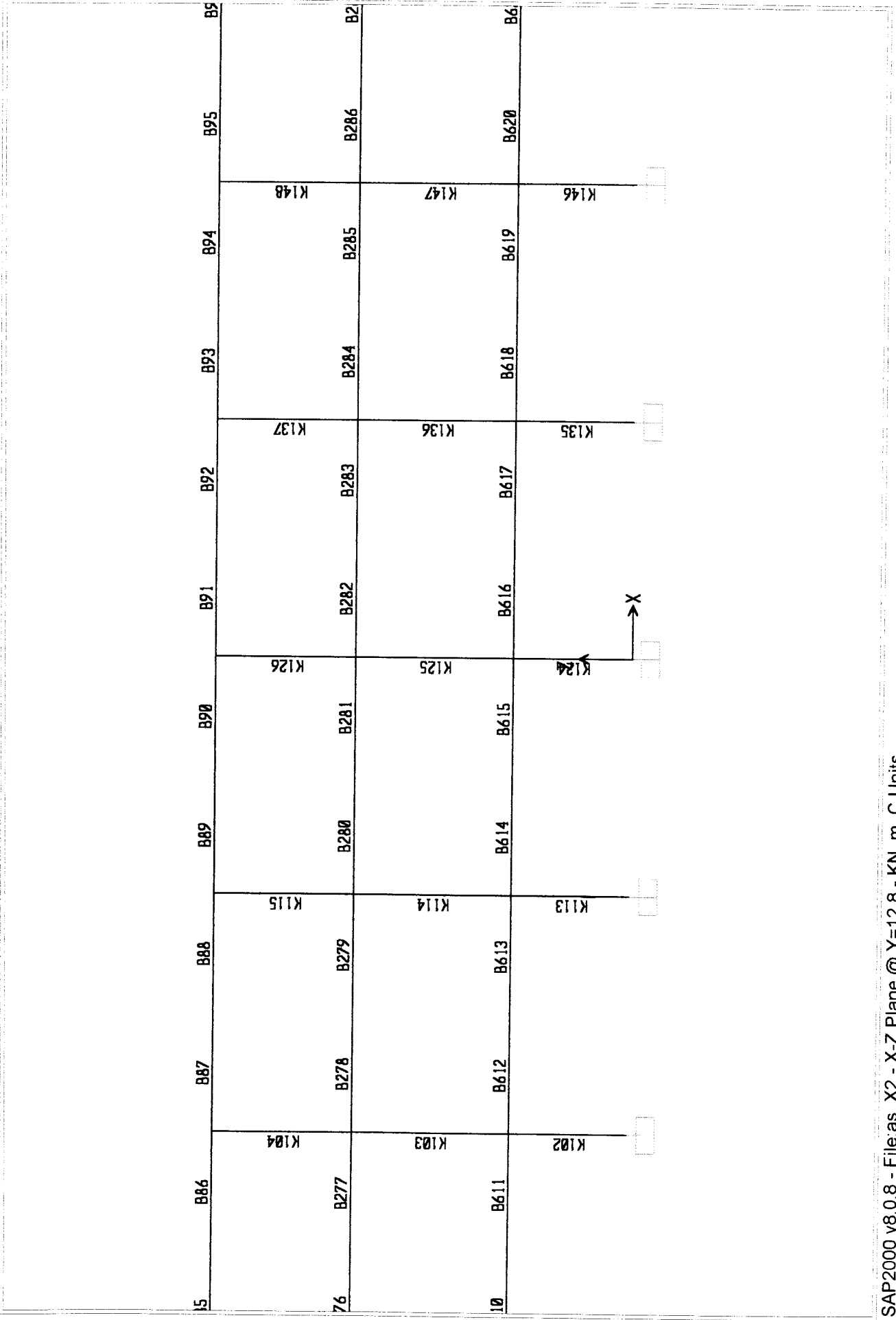


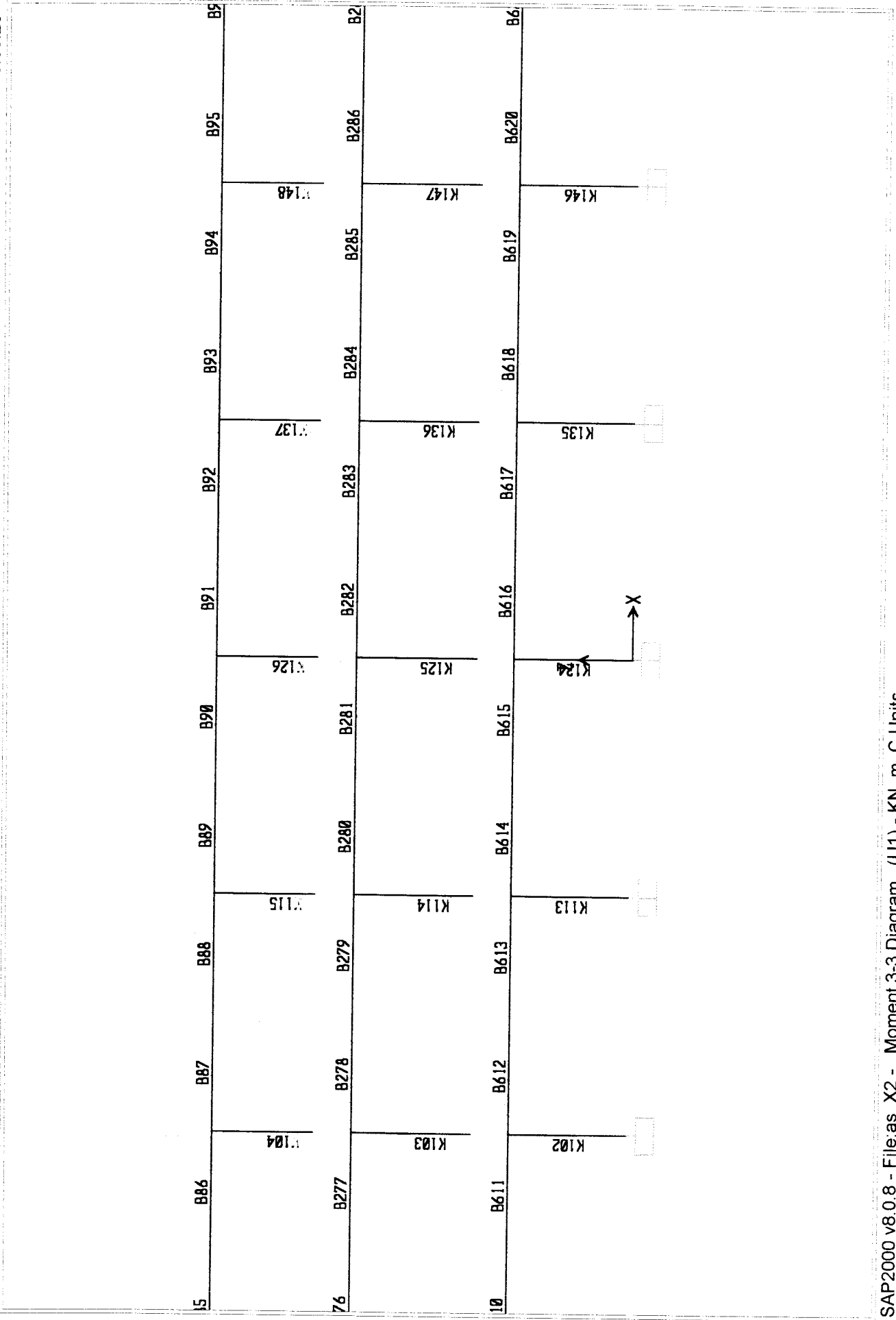


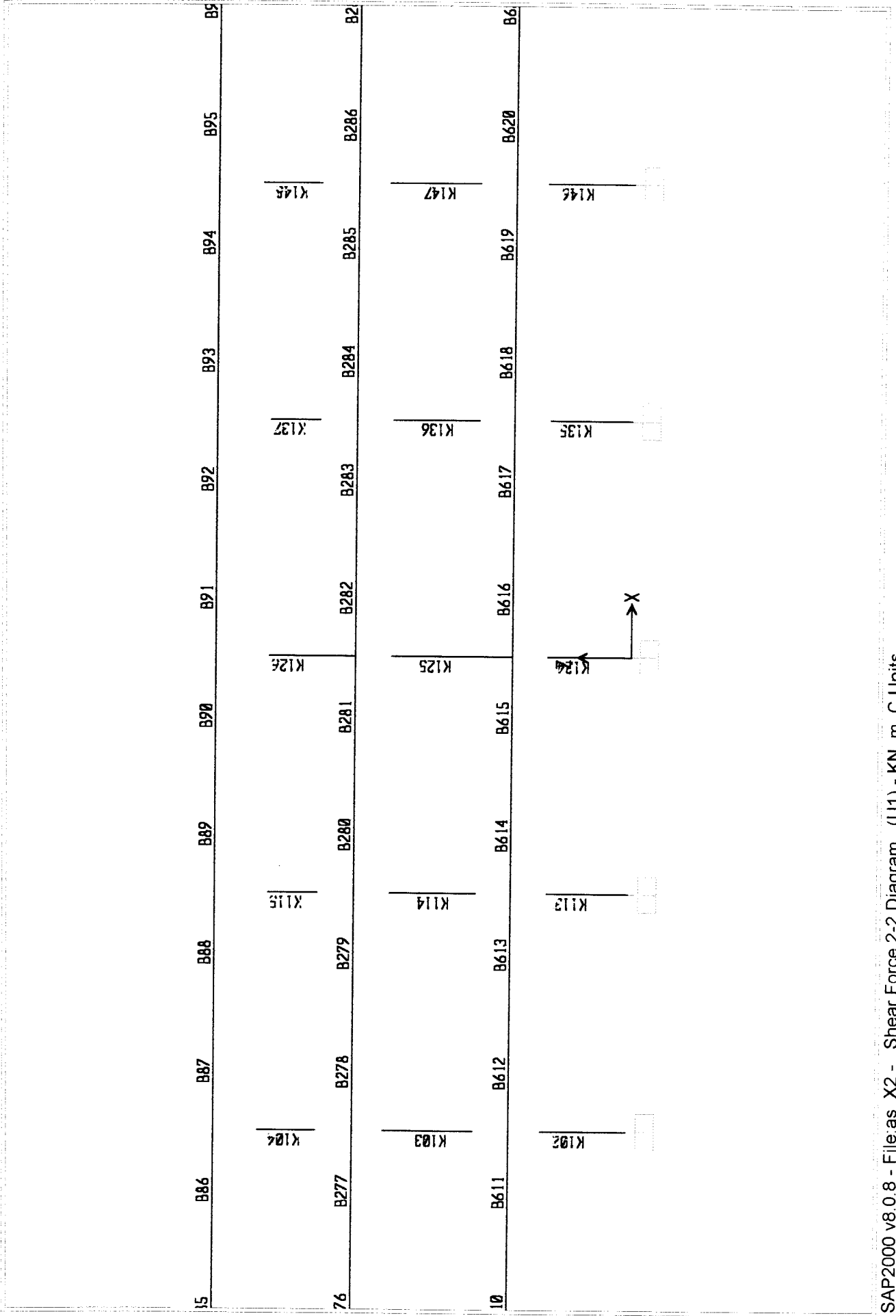
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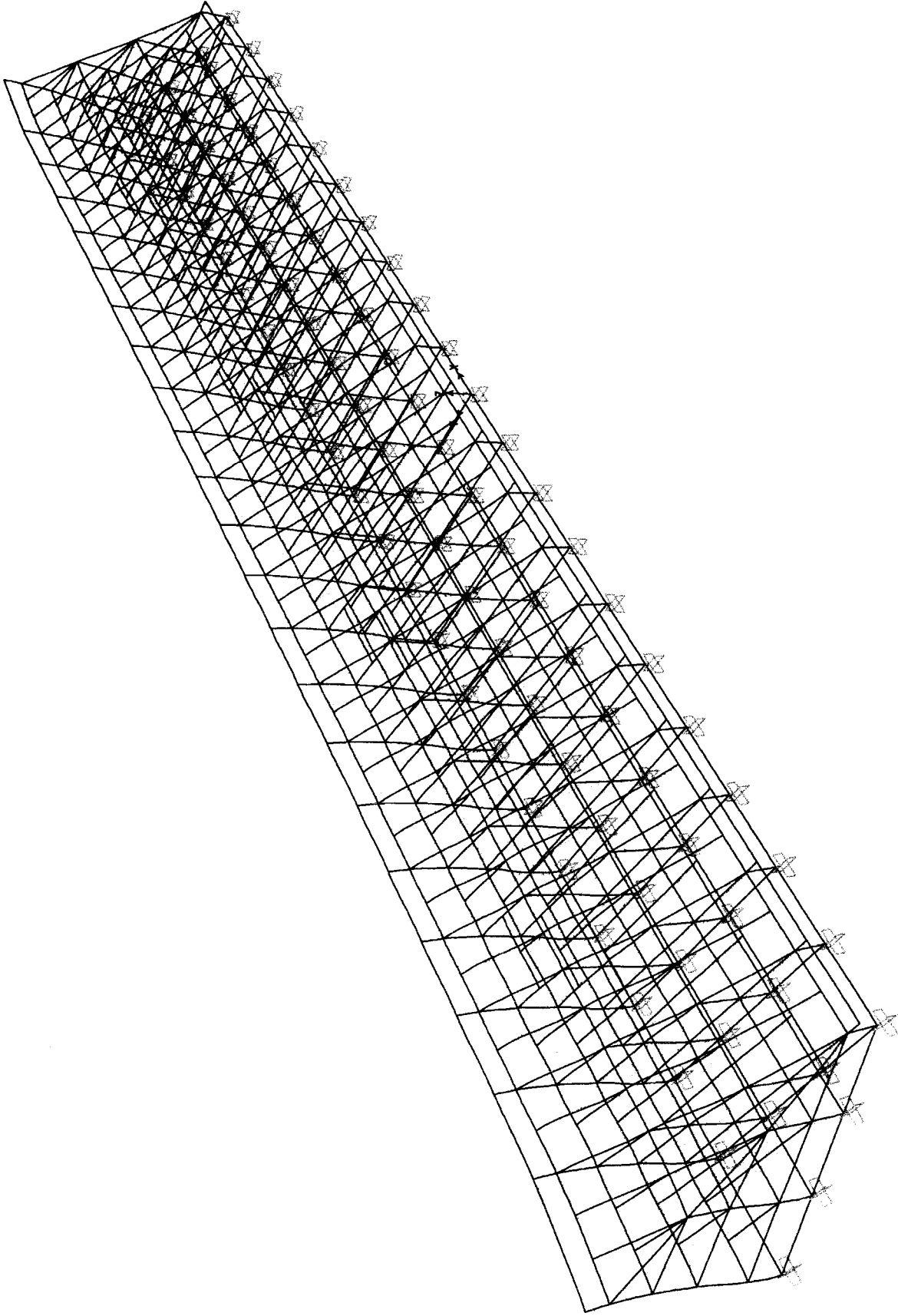
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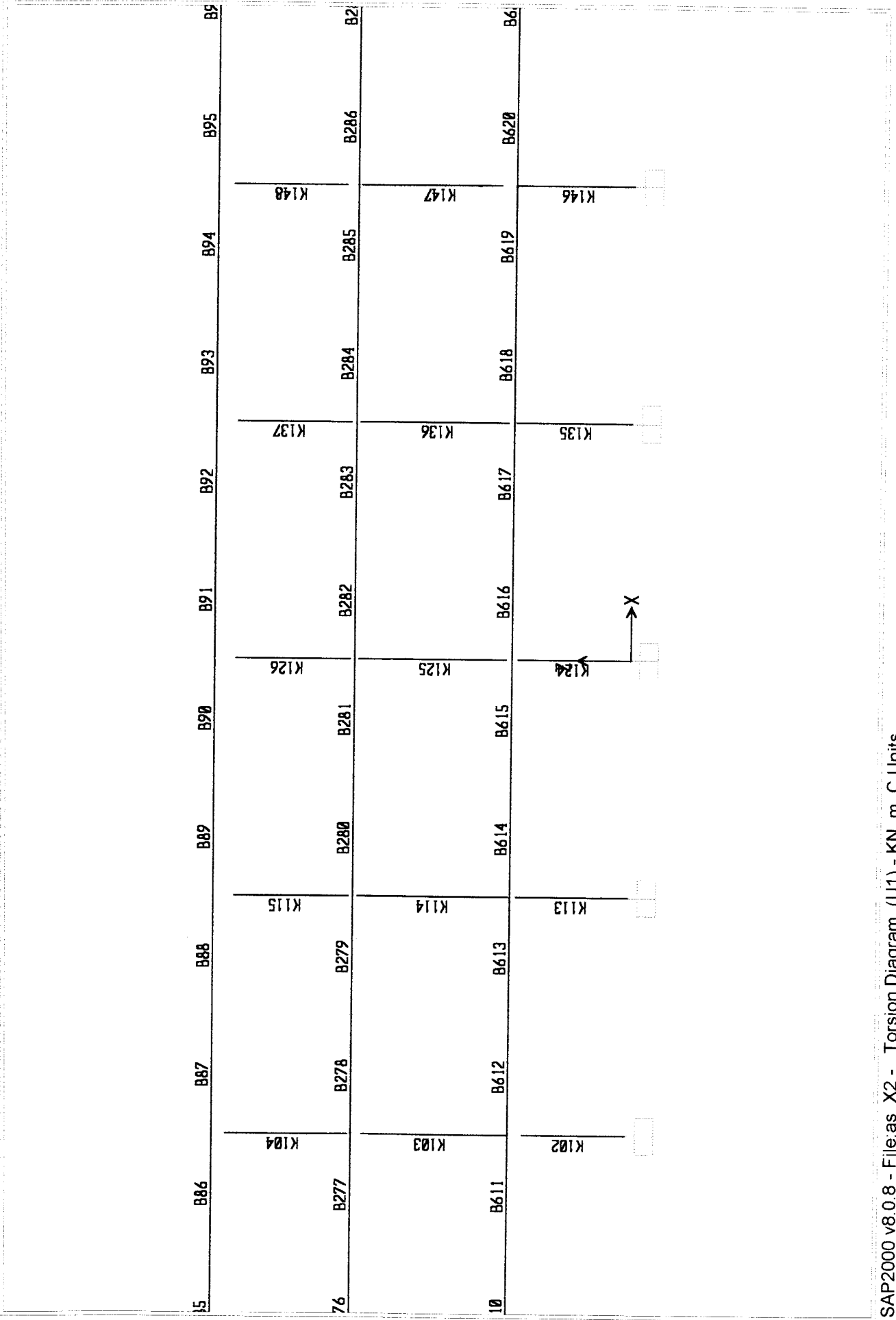


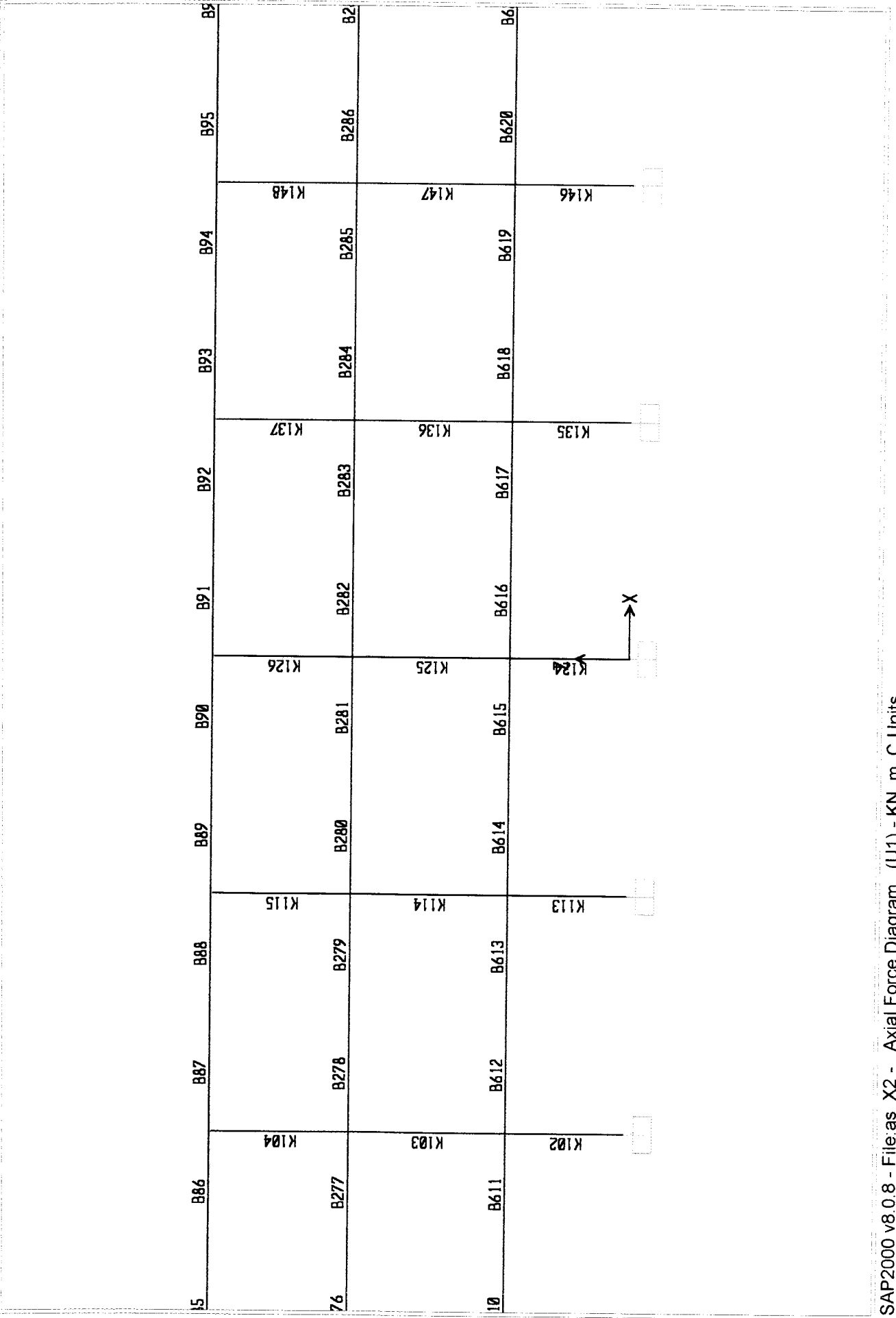






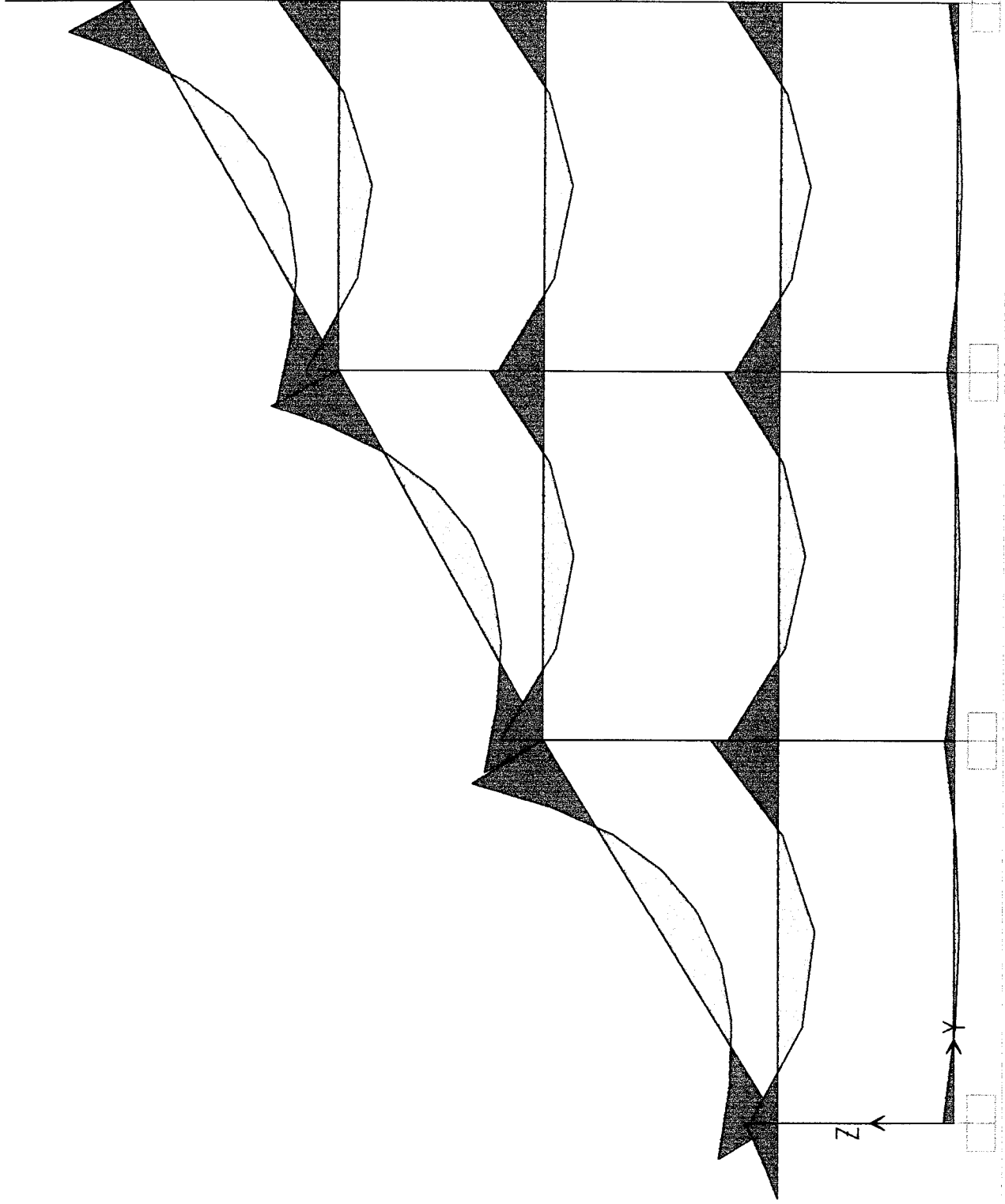




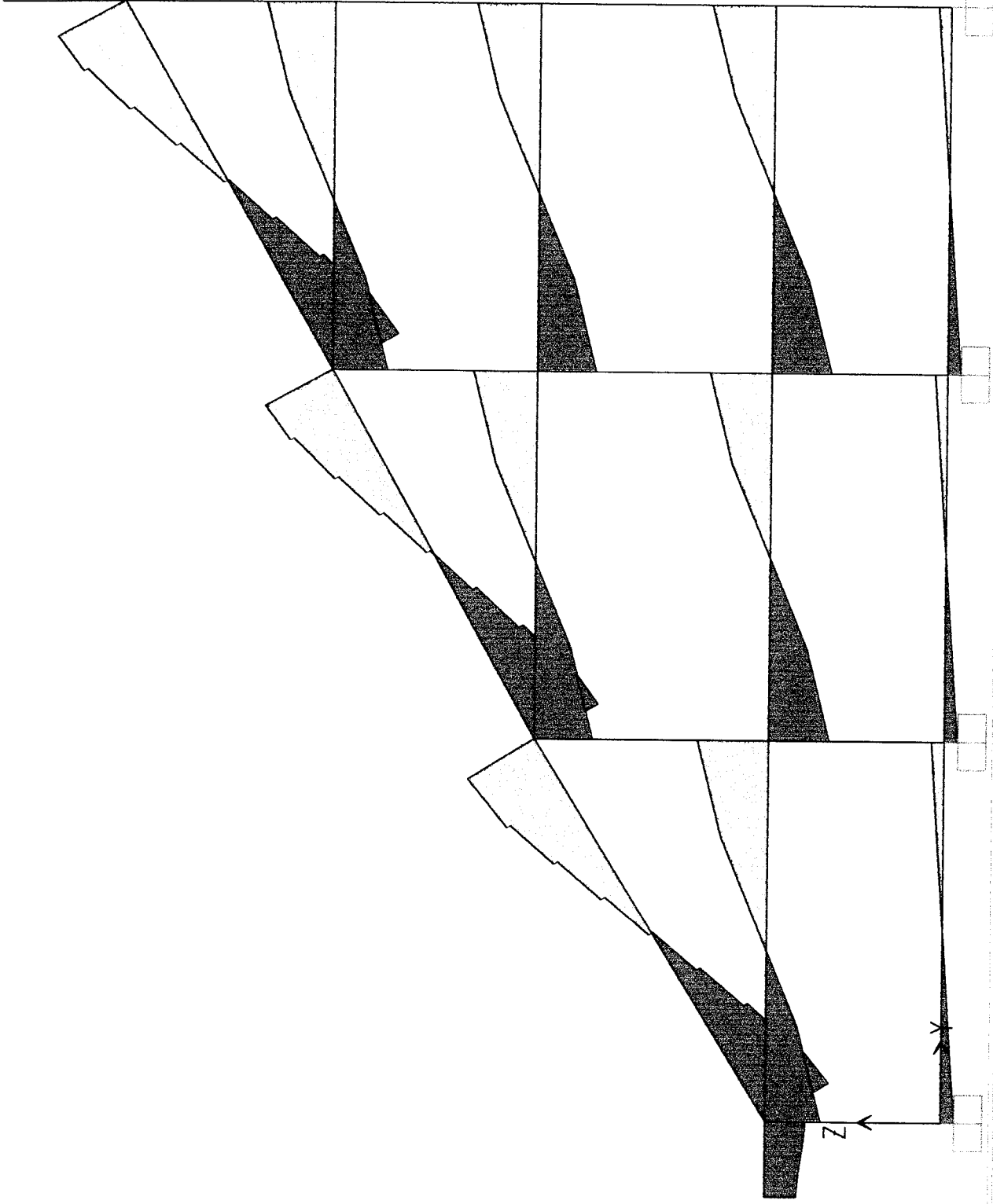


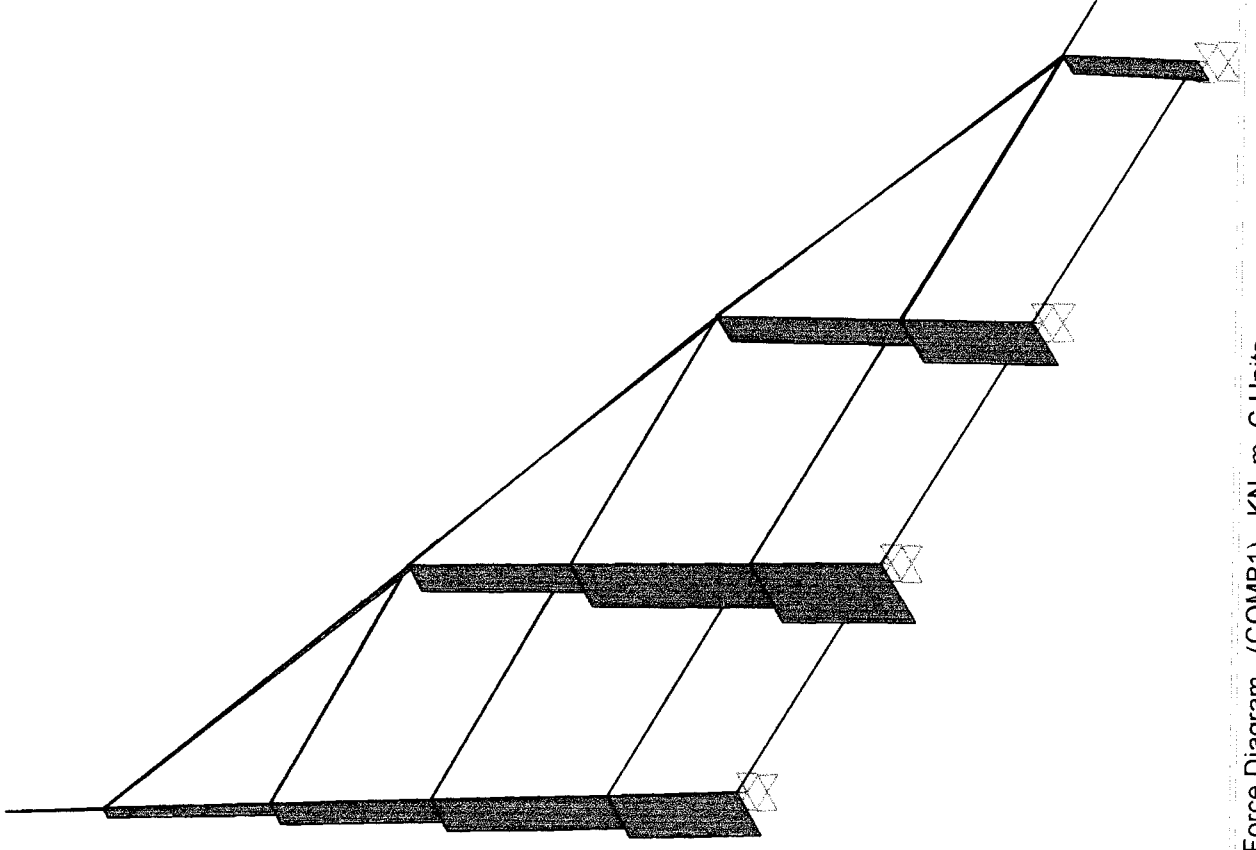
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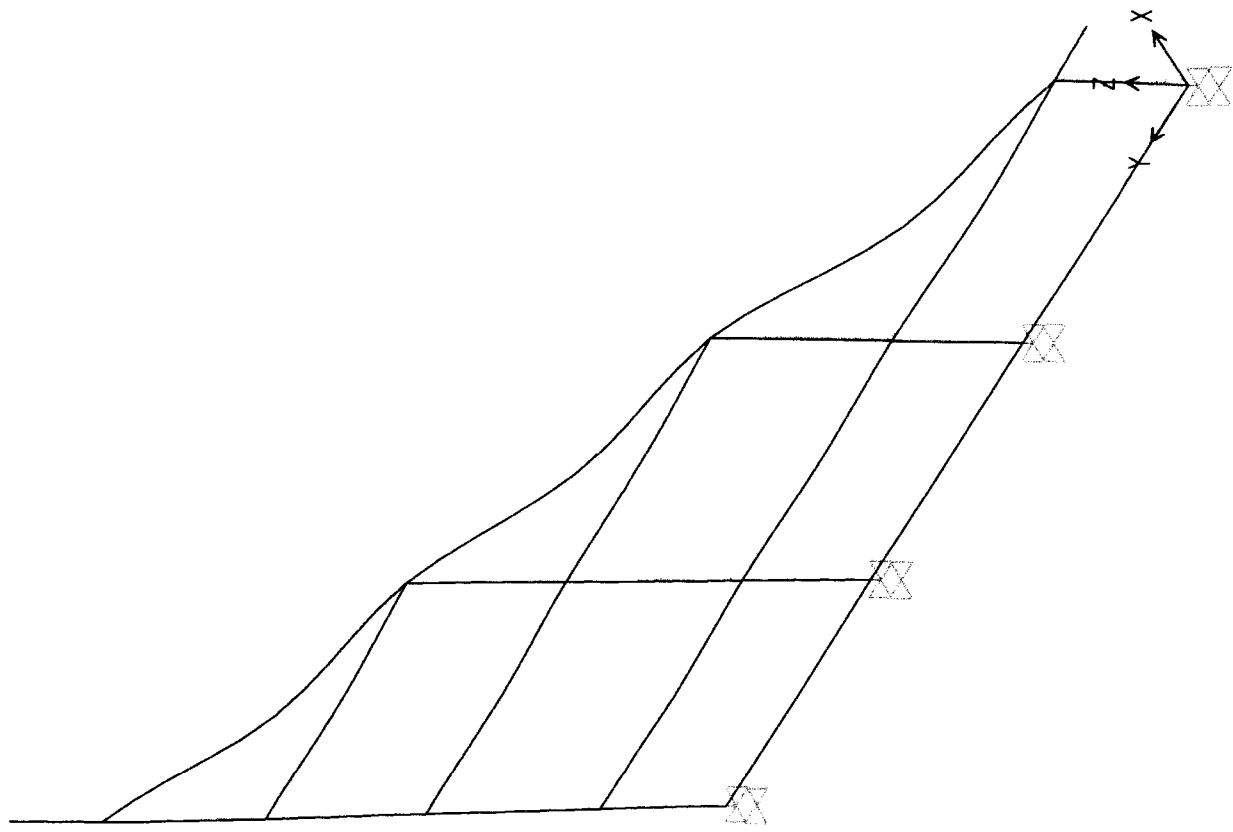
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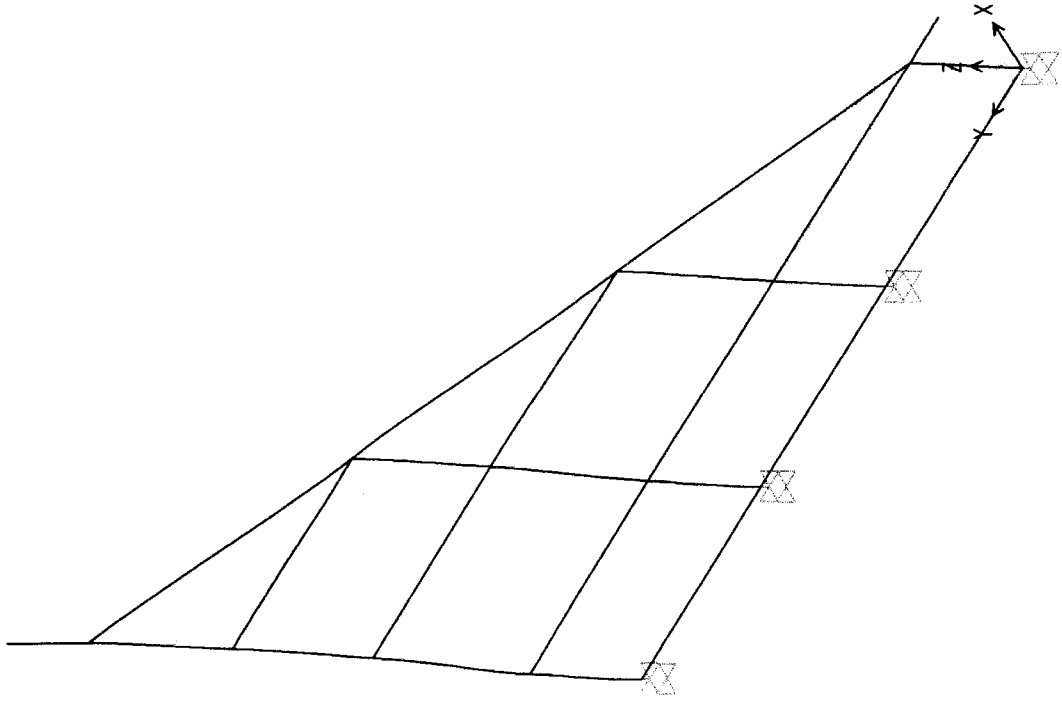


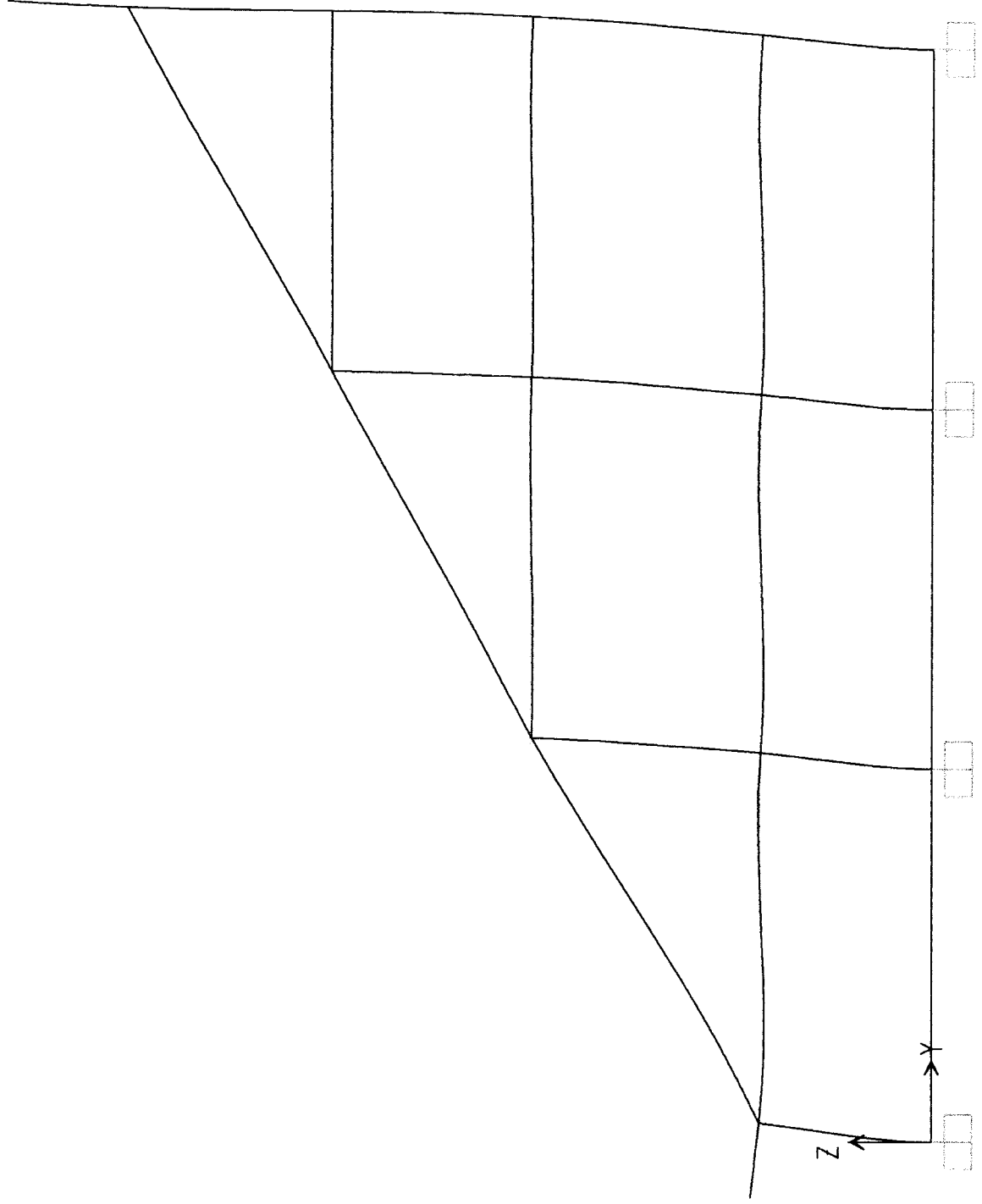
SAP2000 v8.0.8 - File:PORTAL_UTAMA - Moment 3-3 Diagram (COMB1) - KN, cm, C Units











LAMPIRAN 2

TABEL PERHITUNGAN STRUKTUR

TABEL PERHITUNGAN
STRUKTUR
ATAP BAJA

Tabel 4.1
Tabel Gaya Batang KK XA

I. Batang Atas

NO	Batang	Profil	L (m)	N _D (KN)	N _I (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XAA1	P4	2.1274	-40.52393	-29.6602	-1.9035	8.6106	-97.1800	-75.0667	-62.4497	-97.1800	
2	XAA2	P4	2.1274	-33.59558	-26.18514	-1.7182	7.3880	-80.2878	-62.1752	-51.2478	-80.2878	
3	XAA3	P4	1.7995	6.366785	2.258813	0.5841	-0.5201	17.1165	13.5382	12.2132	17.1165	
4	XAA4	P4	2.0587	17.49958	11.06131	1.4714	-2.6866	43.6630	34.5129	29.5233	43.6630	
5	XAA5	P4	2.4729	3.246631	1.859731	0.0443	-0.7125	8.4735	6.4083	5.5002	8.4735	
6	XAA6	P4	3.1408	0.7106091	1.848405	-0.2761	-1.2176	6.2719	4.3726	3.2428	6.2719	
7	XAA7	P4	3.1321	-6.512345	-3.073368	-0.7646	-0.5760	-5.8954	-5.2118	-4.9855	-5.8954	
8	XAA8	P4	3.1127	-12.6085	-6.929861	-1.5416	0.2095	-22.3709	-18.5108	-16.4094	-22.3709	
9	XAA9	P4	3.1023	-15.93804	-8.259975	-1.4813	0.6091	-28.0864	-22.7307	-20.2222	-28.0864	
10	XAA10	P4	3.0875	-17.06882	-8.465215	-1.9437	0.9457	-36.6272	-29.6996	-26.2323	-36.6272	
11	XAA11	P4	3.0806	-20.05137	-9.862162	-2.1616	1.2449	-43.2017	-34.8962	-30.8084	-43.2017	
12	XAA12	P4	3.0696	-25.03185	-12.35077	-2.7471	1.4832	-53.1967	-43.1021	-38.0258	-53.1967	
13	XAA13	P4	3.0614	-22.91442	-11.04414	-1.8979	1.5774	-45.4176	-36.2544	-32.0841	-45.4176	
14	XAA14	P4	3.0482	-21.67595	-10.16056	-2.0365	1.5297	-46.2925	-37.0869	-32.8074	-46.2925	
15	XAA15	P4	3.0447	-20.61809	-9.742798	-2.1033	1.3883	-44.6824	-35.9622	-31.7724	-44.6824	
16	XAA16	P4	3.0351	-21.37099	-10.09224	-2.0440	1.5678	-46.0678	-36.9386	-32.6044	-46.0678	
17	XAA17	P4	3.0293	-22.15491	-10.58744	-2.1949	1.6827	-48.7093	-39.1065	-34.4534	-48.7093	
18	XAA18	P4	3.0227	-23.03999	-11.2331	-2.3549	1.7447	-50.7886	-40.8650	-35.9455	-50.7886	
19	XAA19	P4	3.0192	-27.95507	-14.08271	-2.5818	2.4494	-61.0411	-48.8309	-42.7935	-61.0411	
20	XAA20	P4	3.0150	-30.09556	-15.46588	-2.7394	2.8174	-66.5026	-53.1218	-46.4537	-66.5026	
21	XAA21	P4	3.0096	-33.89479	-17.88016	-3.0897	3.1951	-74.1252	-59.2677	-51.7259	-74.1252	
22	XAA22	P4	3.0067	-31.38724	-18.19746	-3.3579	3.0628	-70.3443	-56.8160	-49.1111	-70.3443	
23	XAA23	P4	3.0067	-30.94428	-17.92609	-2.9858	3.3296	-69.2910	-55.5795	-48.0011	-69.2910	
24	XAA24	P4	3.0096	-31.19425	-16.51536	-2.9320	2.9073	-68.7694	-55.0615	-48.0544	-68.7694	
25	XAA25	P4	3.0150	-30.89883	-16.28036	-2.9779	2.8471	-68.6857	-55.0454	-48.0544	-68.6857	
26	XAA26	P4	3.0192	-30.51389	-16.01383	-2.8733	2.8484	-67.6189	-54.1141	-47.2480	-67.6189	
27	XAA27	F4	3.0227	-30.03014	-15.67065	-2.6699	2.9406	-66.6088	-53.1082	-46.3756	-66.6088	
28	XAA28	P4	3.0293	-28.26128	-14.53926	-2.5410	2.7037	-62.9094	-50.1719	-43.8782	-62.9094	
29	XAA29	P4	3.0351	-26.99246	-13.70662	-2.3648	2.4993	-59.1255	-47.1169	-41.2799	-59.1255	
30	XAA30	P4	3.0447	-26.25301	-13.25246	-2.1466	2.5223	-57.2100	-45.4099	-39.8072	-57.2100	
31	XAA31	P4	3.0482	-23.30236	-11.40855	-1.8190	2.1786	-50.3209	-39.8471	-35.0500	-50.3209	
32	XAA32	P4	3.0614	-24.41598	-12.3939	-1.6218	1.9999	-45.2471	-35.7952	-31.5692	-45.2471	

Tabel 4.1 lanjutan

NO	Batang	Profil	L (m)	N _D (kN)	N _L (kN)	N _{WKA} (kN)	N _{WKT} (kN)	N _{U1} (kN)	N _{U2} (kN)	N _{U3} (kN)	N _{UMAKS} (kN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XAA33	P4	3,0696	-20,04925	-9,323925	-1,2048	2,5640	-47,3113	-36,8373	-32,3147	-47,3113	
34	XAA34	P4	3,0806	-18,62332	-9,08329	-1,0879	2,0640	-40,0844	-31,2699	-27,4875	-40,0844	
35	XAA35	P4	3,0875	-15,81324	-7,707581	-0,8483	1,8818	-34,7428	-26,9718	-23,6957	-34,7428	
36	XAA36	P4	3,1023	-15,39597	-7,931578	-0,5608	1,4444	-27,1703	-20,9390	-18,5327	-27,1703	
37	XAA37	P4	3,1127	-12,24597	-6,645081	-0,1966	1,5182	-22,1873	-16,7590	-14,7014	-22,1873	
38	XAA38	P4	3,1321	-6,168848	-2,728995	0,3011	0,8810	-10,0300	-7,0338	-6,3380	-10,0300	
39	XAA39	P4	3,1408	1,391353	2,462536	1,5965	-0,0402	11,8657	10,8151	8,8511	11,8657	
40	XAA40	P4	2,4729	4,842024	3,152372	1,3069	-0,2981	15,4124	13,1276	11,2016	15,4124	
41	XAA41	P4	2,0587	17,65391	11,4529	3,3433	-1,6228	50,4858	41,8764	35,9170	50,4858	
42	XAA42	P4	1,7995	5,9194	2,39415	0,8265	-0,6507	20,4814	16,3528	14,5802	20,4814	
43	XAA43	P4	2,1274	-35,05428	-26,81557	-7,4715	1,6952	-80,6445	-69,3466	-58,3466	-80,6445	
44	XAA44	P4	2,1274	-41,31386	-30,03352	-8,7678	1,8152	-97,9279	-83,8647	-71,1651		

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKT} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{U1} = 1,2N_D + 1,6N_L
- [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKT}
- [12] N_{UMAKS} = gaya aksial batang maksimum (kN)
- [13] Keterangan

Tabel 4.1 lanjutan

NO	Batang	Profil	L (m)	N _D (kN)	N _L (kN)	N _{WKA} (kN)	N _{WKI} (kN)	N _{U1} (kN)	N _{U2} (kN)	N _{U3} (kN)	N _{UMAKS} (kN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XAA33	P4	3.0696	-20.04925	-9.323925	-1.2048	2.5640	-47.3113	-36.8373	-32.3147	-47.3113	
34	XAA34	P4	3.0806	-18.62332	-9.08329	-1.0879	2.0640	-40.0844	-31.2699	-27.4875	-40.0844	
35	XAA35	P4	3.0875	-15.81324	-7.707581	-0.8483	1.8818	-34.7428	-26.9718	-23.6957	-34.7428	
36	XAA36	P4	3.1023	-15.39597	-7.931578	-0.5608	1.4444	-27.1703	-20.9390	-18.5327	-27.1703	
37	XAA37	P4	3.1127	-12.24597	-6.645081	-0.1966	1.5182	-22.1873	-16.7590	-14.7014	-22.1873	
38	XAA38	P4	3.1321	-6.168848	-2.728995	0.3011	0.8810	-10.0300	-7.0338	-6.3380	-10.0300	
39	XAA39	P4	3.1408	1.391353	2.462536	1.5965	-0.0402	11.8057	10.8151	8.8511	11.8657	
40	XAA40	P4	2.4729	4.842024	3.152372	1.3069	-0.2981	15.4124	13.1276	11.2016	15.4124	
41	XAA41	P4	2.0587	17.65391	11.4529	3.3433	-1.6228	50.4858	41.8764	35.9170	50.4858	
42	XAA42	P4	1.7995	5.9194	2.39415	0.8265	-0.6507	20.4814	16.3528	14.5802	20.4814	
43	XAA43	P4	2.1274	-35.05428	-26.81557	-7.4715	1.6952	-80.6445	-69.3466	-58.3466	-80.6445	
44	XAA44	P4	2.1274	-41.31386	-30.03352	-8.7678	1.8152	-97.9279	-83.8647	-71.1651	-80.6445	

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKI} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{U1} = 1,2N_D + 1,6N_L
- [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKI}
- [12] N_{UMAKS} = gaya aksial batang maksimum (kN)
- [13] Keterangan

Tabel 4.1 lanjutan

NO	Batang	Profil	L (m)	N _D (kN)	N _L (kN)	N _{WKA} (kN)	N _{WKT} (kN)	N _{U1} (kN)	N _{U2} (kN)	N _{U3} (kN)	N _{UD} (kN)	N _{UMAKS} (kN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	
33	XAA33	P4	3.0696	-20.04925	-9.323925	-1.2048	2.5640	-47.3113	-36.8373	-32.3147	-47.3113		
34	XAA34	P4	3.0806	-18.62332	-9.08329	-1.0879	2.0640	-40.0844	-31.2699	-27.4875	-40.0844		
35	XAA35	P4	3.0875	-15.81324	-7.707581	-0.8483	1.8818	-34.7428	-26.9718	-23.6957	-34.7428		
36	XAA36	P4	3.1023	-15.39597	-7.931578	-0.5608	1.4444	-27.1703	-20.9390	-18.5327	-27.1703		
37	XAA37	P4	3.1127	-12.24597	-6.645081	-0.1966	1.5182	-22.1873	-16.7590	-14.7014	-22.1873		
38	XAA38	P4	3.1321	-6.168848	-2.728995	0.3011	0.8810	-10.0300	-7.0338	-6.3380	-10.0300		
39	XAA39	P4	3.1408	1.391353	2.462536	1.5965	-0.0402	11.8657	10.8151	8.8511	11.8657		
40	XAA40	P4	2.4729	-4.842024	3.152372	1.3069	-0.2981	15.4124	13.1276	11.2016	15.4124		
41	XAA41	P4	2.0587	17.65391	11.4529	3.3433	-1.6228	50.4858	41.8764	35.9170	50.4858		
42	XAA42	P4	1.7995	5.9194	2.39415	0.8265	-0.6507	20.4814	16.3528	14.5802	20.4814		
43	XAA43	P4	2.1274	-35.05428	-26.81557	-7.4715	1.6952	-80.6445	-69.3466	-58.3466	-80.6445		
44	XAA44	P4	2.1274	-41.31386	-30.03352	-8.7678	1.8152	-97.9279	-83.8647	-71.1651	-83.8647		

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKT} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{U1} = 1,2N_D + 1,6N_L
- [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKT}
- [12] N_{UMAKS} = gaya aksial batang maksimum (kN)
- [13] Keterangan

Tabel 4.2
Tabel Gaya Batang KK XA

1. Batang Vertikal		Profil	L (m)	N _b (KN)	N _i (KN)	N _{wka} (KN)	N _{wkt} (KN)	N _{u1} (KN)	N _{u2} (KN)	N _{u3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XAV1	PXX5	3.00	18.8766	11.3862	0.2850	-3.7815	40.8697	30.9943	26.1145	40.8697	
2	XAV2	PXX5	3.00	111.6293	76.8751	6.1667	-21.2887	256.9554	200.1166	167.1701	256.9554	
3	XAV3	PXX5	3.00	126.9983	95.6751	13.1086	-21.0611	305.4782	244.8390	203.8353	305.4782	
4	XAV4	PXX5	3.00	-37.4658	-20.1364	0.7577	7.9493	-77.1771	-56.9736	-48.3437	-77.1771	
5	XAV5	PXX5	3.00	37.9682	31.8964	3.8845	-7.5071	96.5960	77.1084	63.4385	96.5960	
6	XAV6	PXX5	3.00	38.1953	30.2761	6.5105	-4.3024	94.2762	78.5198	65.5143	94.2762	
7	XAV7	PXX5	3.00	30.9949	23.8363	6.9555	-1.5574	75.3319	64.8456	54.6300	75.3319	
8	XAV8	PX5	3.00	24.0874	15.5081	6.2725	0.7339	53.7179	47.8154	41.1690	53.7179	
9	XAV9	PX5	3.00	20.9567	13.3363	6.9541	2.1911	46.4861	43.2095	37.4939	46.4861	
10	XAV10	PX5	3.00	24.6262	14.5455	8.0220	2.8272	52.8242	49.2446	43.0108	52.8242	
11	XAV11	PX5	3.00	22.7161	10.3248	7.8412	4.1538	43.7790	42.2437	37.8188	43.7790	
12	XAV12	PX5	3.00	15.6747	4.7136	7.0619	5.3785	26.3514	28.2379	26.2178	26.3514	
13	XAV13	P5	3.00	13.8594	2.0787	8.1150	7.3726	19.9572	24.7059	23.8150	19.9572	
14	XAV14	P5	3.00	17.3358	3.1197	9.9732	8.8590	25.7944	31.3136	29.9766	25.7944	
15	XAV15	P5	3.00	5.2462	-5.1789	8.8224	10.6721	-1.9908	9.0938	11.3133	-1.9908	
16	XAV16	P5	3.00	1.4541	-8.9027	7.5107	10.6902	-12.4995	-0.3618	3.4537	-12.4995	
17	XAV17	P5	3.00	2.5474	-9.6647	7.2835	10.7352	-12.4067	-0.5648	3.5772	-12.4067	
18	XAV18	P5	3.00	-1.1069	-13.0392	5.4516	10.1084	-22.1910	-10.1013	-4.5131	-22.1910	
19	XAV19	P5	3.00	1.7802	-12.5526	4.4627	8.9458	-17.9479	-8.1057	-2.7260	-17.9479	
20	XAV20	P5	3.00	8.7293	-10.0155	3.7794	7.3563	-5.5497	0.3730	4.6653	-5.5497	
21	XAV21	P5	3.00	13.0621	-8.1934	1.9920	4.9182	2.5650	4.3141	7.8256	2.5650	
22	XAV22	P5	3.00	15.7754	-7.7020	-0.0048	2.7459	6.6072	4.9496	8.2505	6.6072	
23	XAV23	P5	3.00	20.1631	0.2625	0.0610	-0.0328	24.6158	18.5350	18.4225	24.6158	
24	XAV24	P5	3.00	14.6829	-7.7714	-2.6960	0.0795	5.1853	0.6538	3.9844	5.1853	
25	XAV25	P5	3.00	13.7880	-7.5681	-4.7204	-2.0175	4.4367	-2.3370	0.9065	4.4367	
26	XAV26	P5	3.00	12.5293	-8.2648	-6.9246	-3.9729	1.8114	-6.9509	-3.4089	1.8114	
27	XAV27	P5	3.00	8.7089	-9.4782	-8.2265	-4.8414	-4.7145	-13.4076	-9.3455	-4.7145	
28	XAV28	P5	3.00	7.9414	-9.1210	-9.2173	-5.9598	-5.0640	-14.8588	-10.9497	-5.0640	
29	XAV29	P5	3.00	11.5651	-5.9737	-9.8772	-7.7437	4.3201	-8.6126	-6.0524	4.3201	
30	XAV30	P5	3.00	9.4817	-5.8233	-9.9738	-7.8941	2.0608	-10.4230	-7.9273	2.0608	
31	XAV31	P5	3.00	11.5207	-2.9569	-10.1631	-9.1071	9.0939	-5.3753	-4.1081	9.0939	
32	XAV32	P5	3.00	20.0573	3.7151	-8.7155	-10.0423	30.0129	12.0511	10.4589	30.0129	

Tabel 4.2 Lanjutan

NO	Batang	Profil	L (m)	N _D (kN)	N _L (kN)	N _{WKA} (kN)	N _{WKI} (kN)	N _{U1} (kN)	N _{U2} (kN)	N _{U3} (kN)	N _{UMAKS} (kN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XAV33	P5	3.00	14.3894	2.1122	-7.3493	-8.1037	20.6468	6.6659	5.7606	20.6468	
34	XAV34	PX5	3.00	13.7496	3.3691	-5.7098	-6.9131	21.8901	9.5658	8.1219	21.8901	
35	XAV35	PX5	3.00	22.7926	10.3279	-4.1499	-7.8384	43.8758	27.9270	23.5007	43.8758	
36	XAV36	PX5	3.00	23.3088	13.3877	-3.1511	-7.9324	49.3909	33.2619	27.5243	49.3909	
37	XAV37	PX5	3.00	22.4222	13.9560	-1.1746	-6.1589	49.2363	35.5176	29.5365	49.2363	
38	XAV38	PX5	3.00	21.7595	13.6493	-2.1288	-7.0035	47.9502	33.4081	27.5584	47.9502	
39	XAV39	PXX5	3.00	40.9302	30.5218	2.9377	-7.9430	97.9511	77.0125	63.9317	97.9511	
40	XAV40	PXX5	3.00	55.9111	42.7695	6.9188	-8.3560	135.5245	109.9459	91.6162	135.5245	
41	XAV41	PXX5	3.00	60.7331	48.2571	11.4613	-5.7734	150.0911	126.3218	105.6402	150.0911	
42	XAV42	PXX5	3.00	-27.0868	-12.6115	-5.8427	-1.3386	-52.6826	-46.5232	-41.1183	-52.6826	
43	XAV43	PXX5	3.00	150.0411	113.5939	26.0063	-14.5629	361.7996	302.5573	253.8741	361.7996	tarik Max
44	XAV44	PXX5	3.00	113.0347	77.7580	21.3403	-6.4304	260.0545	220.6492	187.3244	260.0545	
45	XAV45	PXX5	3.00	26.1427	15.8596	5.2328	-0.4314	56.7467	48.8394	42.0424	56.7467	

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKI} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{U1} = 1,2N_D + 1,6N_L
- [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKI}
- [12] N_{UMAKS} = gaya aksial batang maksimum (kN)

Tabel 4.3
Tabel Gaya Batang KK XA

1. Batang Diagonal

NO	Batang	Profil	L (m)	N _b (KN)	N _f (KN)	N _{wka} (KN)	N _{wkt} (KN)	N ₀₁ (KN)	N ₀₂ (KN)	N ₀₃ (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XAD1	PXX5	2.1140	-18.3534	-14.6180	-0.3291	4.8916	-45.4129	-34.4546	-28.1898	-45.4129	
2	XAD2	PXX5	1.5146	89.0109	63.7762	3.5778	-19.1994	208.8549	160.9346	133.6019	208.8549	
3	XAD3	PXX5	1.5146	88.6245	64.2384	3.6023	-19.3400	209.1309	161.1710	133.6402	209.1309	
4	XAD4	PXX5	2.1140	-15.6848	-13.8399	-0.2886	4.6543	-40.9656	-31.0705	-25.1391	-40.9656	
5	XAD5	PXX5	2.1140	101.1583	69.8084	8.6066	-16.3250	233.0835	185.1405	155.2226	233.0835	
6	XAD6	PXX5	1.5146	-121.1493	-82.6146	-7.6700	21.8352	-277.5627	-217.3760	-181.9698	-277.5627	
7	XAD7	PXX5	1.5146	-121.6591	-82.1943	-7.5843	21.7708	-277.5018	-217.2276	-182.0014	-277.5018	
8	XAD8	PXX5	2.1140	105.1116	71.6834	8.8729	-16.7284	240.8273	191.2679	160.5465	240.8273	
9	XAD9	PXX5	1.9861	85.2475	67.9271	11.6720	-12.5877	210.9804	172.2416	143.1300	210.9804	
10	XAD10	PXX5	1.4746	-155.0264	-115.5623	-13.4883	27.7839	-370.9313	-294.3845	-244.8578	-370.9313	
11	XAD11	PXX5	1.4746	-156.5923	-116.1038	-13.5960	27.8697	-373.6769	-296.5728	-246.8140	-373.6769	
12	XAD12	PXX5	1.9861	85.4843	67.1329	11.5841	-12.3919	209.9938	171.3963	142.6250	209.9938	
13	XAD13	PXX5	2.0735	-123.9911	-74.5797	-2.1909	24.4447	-268.1168	-203.7166	-171.7539	-268.1168	
14	XAD14	PXX5	1.5230	28.5035	5.2092	-5.3401	-7.2006	42.5390	25.4961	23.2636	42.5390	
15	XAD15	PXX5	1.5230	29.5897	6.6291	-5.2464	-7.6140	46.1143	28.2900	25.4490	46.1143	
16	XAD16	PXX5	2.0735	-118.9281	-72.1164	-2.0195	23.7364	-258.0999	-195.9983	-165.0912	-258.0999	
17	XAD17	PXX5	2.2175	-127.5958	-78.5762	-5.5185	22.5445	-278.8368	-215.7497	-182.0742	-278.8368	
18	XAD18	PXX5	1.6206	57.5802	24.3154	-2.3232	-11.0073	108.0008	78.2128	67.7919	108.0008	
19	XAD19	PXX5	1.6260	56.3452	24.2241	-2.3540	-10.9855	106.3728	76.9788	66.5970	106.3728	
20	XAD20	PXX5	2.2249	-124.1098	-77.3163	-5.3711	22.2419	-272.6378	-210.9237	-177.7881	-272.6378	
21	XAD21	PXX5	2.4802	-151.2733	-96.4573	-8.5951	25.8540	-335.8596	-262.2087	-220.8699	-335.8596	
22	XAD22	PXX5	1.8255	65.7745	30.7203	-2.5883	-13.5598	128.0818	92.9554	79.7896	128.0818	
23	XAD23	PXX5	1.8194	63.7365	30.2985	-2.6428	-13.4637	124.9613	90.5496	77.5645	124.9613	
24	XAD24	PXX5	2.4719	-147.3071	-95.0920	-8.4415	25.5199	-328.9156	-256.8166	-216.0629	-328.9156	
25	XAD25	PXX5	2.4602	-141.1271	-91.6875	-9.7149	23.0306	-316.0525	-248.6973	-209.4027	-316.0525	
26	XAD26	PXX5	1.8310	72.5217	39.5004	-1.2127	-15.3200	150.2267	111.2147	94.2860	150.2267	
27	XAD27	PXX5	1.8310	70.7376	39.1895	-1.2615	-15.2577	147.5883	109.1774	92.3819	147.5883	
28	XAD28	PXX5	2.4602	-137.9048	-90.7977	-9.5829	22.8448	-310.7621	-244.5711	-205.6578	-310.7621	
29	XAD29	PX5	2.4325	-140.8917	-91.4489	-11.2607	21.3996	-315.3883	-250.0541	-210.8617	-315.3883	
30	XAD30	PX5	1.8513	91.6848	53.1238	1.4514	-17.5214	195.0198	148.0066	125.2392	195.0198	
31	XAD31	PX5	1.8513	90.0026	52.9274	1.4165	-17.4862	192.6869	146.2149	123.5318	192.6869	
32	XAD32	PX5	2.4325	-137.9112	-90.7436	-11.1384	21.2700	-310.6831	-246.3784	-207.4883	-310.6831	

Tabel 4.3 Lanjutan

NO	Batang	Profil	L (m)	N _b (KN)	N _i (KN)	N _{wka} (KN)	N _{wk1} (KN)	N _{u1} (KN)	N _{u2} (KN)	N _{u3} (KN)	N _{uMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XAD33	PX5	2.4168	-151.2066	-97.9489	-14.7264	20.2554	-338.1662	-271.2963	-229.3182	-338.1662	
34	XAD34	PX5	1.8631	71.5221	41.6482	-0.7300	-15.6043	152.4635	113.4717	95.6225	152.4635	
35	XAD35	PX5	1.8631	69.7786	41.3723	-0.7969	-15.5728	149.9301	111.4912	93.7602	149.9301	
36	XAD36	PX5	2.4168	-148.2178	-97.1637	-14.5494	20.1520	-333.3233	-267.4517	-225.8101	-333.3233	
37	XAD37	PX5	2.3934	-130.4888	-83.9976	-13.8929	16.1063	-290.9828	-234.9085	-198.9095	-290.9828	
38	XAD38	PX5	1.8810	68.5010	42.9522	0.0778	-15.2623	150.9248	113.2869	94.8788	150.9248	
39	XAD39	PX5	1.8810	66.9261	42.8035	0.0215	-15.2655	148.7969	111.6234	93.2791	148.7969	
40	XAD40	PX5	2.3934	-127.8398	-83.4928	-13.7474	16.0715	-287.0203	-231.7621	-195.9795	-287.0203	
41	XAD41	PX5	2.3817	-116.1564	-73.8483	-13.6361	12.7383	-257.5449	-209.5219	-177.8727	-257.5449	
42	XAD42	PX5	1.8901	73.7025	46.5702	1.2287	-15.4035	162.9552	123.6908	103.7322	162.9552	
43	XAD43	PX5	1.8901	72.2092	46.4959	1.1800	-15.4257	161.0445	122.1993	102.2725	161.0445	
44	XAD44	PX5	2.3817	-113.8781	-73.5509	-13.5186	12.7496	-254.3351	-206.9737	-175.4519	-254.3351	
45	XAD45	PX5	2.3623	-111.0865	-69.1226	-14.1885	10.4982	-243.8999	-199.9511	-170.3271	-243.8999	
46	XAD46	PX5	1.9054	67.3971	45.0156	1.9586	-14.1184	152.9015	117.0265	97.7341	152.9015	
47	XAD47	PX5	1.9054	65.9973	45.0065	1.9202	-14.1536	151.2072	115.7096	96.4211	151.2072	
48	XAD48	PX5	2.3623	-109.0415	-68.9762	-14.0764	10.5580	-241.2118	-197.8005	-168.2393	-241.2118	
49	XAD49	P5	2.3469	-98.1928	-61.0634	-16.4479	5.3604	-215.5329	-181.3872	-155.2171	-215.5329	
50	XAD50	P5	1.9178	54.7325	38.5952	-0.0469	-13.8309	127.4314	95.5173	78.9765	127.4314	
51	XAD51	P5	1.9178	53.3832	38.6193	-0.1063	-13.8989	125.8507	94.2605	77.7094	125.8507	
52	XAD52	P5	2.3469	-96.0668	-60.8893	-16.2822	5.4640	-212.7030	-179.0659	-152.9704	-212.7030	
53	XAD53	P5	2.3201	-87.0427	-53.6433	-17.4020	1.7563	-190.2805	-163.5927	-140.6028	-190.2805	
54	XAD54	P5	1.9398	63.9082	45.0346	3.0438	-13.0400	148.7452	115.2114	95.9109	148.7452	
55	XAD55	P5	1.9398	62.5625	45.0915	2.9793	-13.1248	147.2215	113.9913	94.6663	147.2215	
56	XAD56	P5	2.3201	-85.1869	-53.6413	-17.2578	1.8998	-188.0503	-161.7471	-138.7579	-188.0503	
57	XAD57	P5	2.3125	-75.5774	-46.1879	-18.0451	-1.5494	-164.5935	-145.0992	-125.3044	-164.5935	
58	XAD58	P5	1.9462	56.4492	42.0665	3.8091	-11.2146	135.0453	105.8549	87.8265	135.0453	
59	XAD59	P5	1.9462	55.1659	42.1841	3.7444	-11.3214	133.6937	104.7635	86.6846	133.6937	
60	XAD60	P5	2.3125	-73.8173	-46.2639	-17.9128	-1.3899	-162.6030	-143.4475	-123.6202	-162.6030	
61	XAD61	P5	2.2897	-59.8485	-35.9045	-17.4833	-4.6603	-129.2655	-117.9291	-102.5414	-129.2655	
62	XAD62	P5	1.9654	45.0063	36.4455	4.2187	-8.7975	112.3203	89.3027	73.6832	112.3203	
63	XAD63	P5	1.9654	43.7879	36.6084	4.1734	-8.9010	111.1190	88.3474	72.6580	111.1190	
64	XAD64	P5	2.2897	-58.1416	-36.0205	-17.3606	-4.4961	-127.4027	-116.3847	-100.9474	-127.4027	
65	XAD65	P5	2.2747	-46.2394	-26.8812	-16.9018	-7.3014	-98.4972	-94.1551	-82.6346	-98.4972	
66	XAD66	P5	1.9784	73.0309	36.2453	6.6682	-6.2765	109.6296	90.2241	74.6904	109.6296	

Tabel 4.3 Lanjutan

NO	Batang	Profil	L (m)	N _b (KN)	N _i (KN)	N _{wka} (KN)	N _{wk1} (KN)	N _{u1} (KN)	N _{u2} (KN)	N _{u3} (KN)	N _{uMaks} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
67	XAD67	P5	1.9784	41.8732	36.4827	6.6313	-6.3982	108.6200	89.4226	73.7872	108.6200	
68	XAD68	P5	2.2747	-44.7402	-27.1451	-16.8123	-7.1176	-97.1204	-93.0151	-81.3815	-97.1204	
69	XAD69	P5	2.2559	-37.4288	-20.6227	-16.8127	-9.4475	-77.9108	-78.6084	-69.7701	-77.9108	
70	XAD70	P5	1.9948	31.3295	29.9281	7.1492	-3.5394	85.4803	72.6893	59.8630	85.4803	
71	XAD71	P5	1.9948	30.1330	30.1469	7.1191	-3.6477	84.3946	71.8388	58.9187	84.3946	
72	XAD72	P5	2.2559	-35.9252	-20.8732	-16.7409	-9.2862	-76.5073	-77.4696	-68.5240	-76.5073	
73	XAD73	P5	2.2448	-27.9313	-13.9011	-15.2863	-10.3216	-55.7593	-60.1630	-54.2054	-55.7593	
74	XAD74	P5	2.0047	14.9377	21.4136	7.0264	-0.6213	52.1871	47.5720	38.3947	52.1871	
75	XAD75	P5	2.0047	13.8654	21.7392	7.0265	-0.7375	51.4212	46.9977	37.6809	51.4212	
76	XAD76	P5	2.2448	-26.5445	-14.2527	-15.2379	-10.1476	-54.6578	-59.2788	-53.1705	-54.6578	
77	XAD77	P5	2.2299	-19.67257	-7.5263	-13.9385	-11.2148	-35.8092	-43.5831	-40.3147	-35.8092	
78	XAD78	P5	2.0180	7.3408	17.5167	9.1662	2.9103	36.8356	38.6261	31.1190	36.8356	
79	XAD79	P5	2.0180	6.1451	17.7576	9.1649	2.8229	35.7862	37.8376	30.2274	35.7862	
80	XAD80	P5	2.2299	-18.2945	-7.9581	-13.9163	-11.0742	-34.6863	-42.7143	-39.3057	-34.6863	
81	XAD81	P5	2.2078	-17.2300	-5.0891	-13.3645	-11.5470	-28.8186	-37.6514	-35.4703	-28.8186	
82	XAD82	P5	2.0382	-6.2010	10.9188	10.0323	6.1327	10.0289	19.5604	14.8810	10.0289	
83	XAD83	P5	2.0382	-7.2847	11.2923	10.0672	6.0343	9.3260	19.0751	14.2356	9.3260	
84	XAD84	P5	2.2078	-16.0240	-5.5886	-13.3996	-11.4037	-28.1705	-37.2074	-34.8123	-28.1705	
85	XAD85	P5	2.1932	-7.2489	0.8978	-10.8318	-11.1525	-7.2622	-18.4448	-18.8296	-7.2622	
86	XAD86	P5	2.0518	-18.1801	6.9449	11.1184	8.6381	-10.7042	5.3140	2.3376	-10.7042	
87	XAD87	P5	2.0518	-19.3577	7.2974	11.1840	8.5778	-11.5535	4.7557	1.6283	-11.5535	
88	XAD88	P5	2.1932	-5.8748	0.6201	-10.8540	-11.0755	-6.0577	-17.5680	-17.8338	-6.0577	
89	XAD89	P5	2.0518	-15.2317	7.1778	-8.6839	-11.2474	-6.7935	-15.5158	-18.5920	-6.7935	
90	XAD90	P5	2.1932	-10.0403	0.4741	10.9910	10.8217	-11.2898	4.7219	4.5187	-11.2898	
91	XAD91	P5	2.1932	-11.4174	0.7620	11.0700	10.7979	-12.4817	3.9228	3.5962	-12.4817	
92	XAD92	P5	2.0518	-14.0466	6.8306	-8.7419	-11.1814	-5.9270	-14.9355	-17.8629	-5.9270	
93	XAD93	P5	2.0382	-1.9912	11.4897	-6.0394	-10.1429	15.9942	4.7483	-0.1759	15.9942	
94	XAD94	P5	2.2078	-19.9981	-5.2354	11.4202	13.2900	-32.3744	-10.5766	-8.3328	-32.3744	
95	XAD95	P5	2.2078	-21.2851	-4.7794	11.5531	13.2600	-33.1893	-11.0283	-8.9800	-33.1893	
96	XAD96	P5	2.0382	-0.8427	11.1537	-6.1284	-10.1119	16.8348	5.2720	0.4919	16.8348	
97	XAD97	P5	2.0180	8.5683	16.5361	-3.1257	-9.0314	36.7396	23.8039	16.7170	36.7396	
98	XAD98	P5	2.2299	-24.9353	-9.0212	10.8056	14.0274	-44.3562	-20.3005	-16.4342	-44.3562	
99	XAD99	P5	2.2299	-26.3079	-8.6646	10.9530	14.0475	-45.4328	-20.9311	-17.2177	-45.4328	
100	XAD100	P5	2.0180	9.7700	16.2873	-3.2142	-9.0310	37.7836	24.4807	17.5004	37.7836	

Tabel 4.3 Lanjutan

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMARS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
106	XAD106	P5	2.2559	-46.6706	-24.3984	8.4983	17.2120	-95.0422	-61.0837	-50.6273	-95.0422	
107	XAD107	P5	2.2559	-48.1100	-24.0957	8.6702	17.2758	-96.2850	-61.8095	-51.4828	-96.2850	
108	XAD108	P5	1.9948	28.5007	27.2436	2.9130	-6.8168	77.7906	61.8386	50.1628	77.7906	
109	XAD109	P5	1.9784	38.6269	34.1646	5.8571	-6.3446	101.0155	82.7901	68.1481	101.0155	
110	XAD110	P5	2.2747	-53.6535	-30.2283	6.4108	17.2066	-112.7495	-76.8691	-63.9141	-112.7495	
111	XAD111	P5	2.2747	-55.1434	-29.9435	6.5998	17.2939	-114.0817	-77.6416	-64.8086	-114.0817	
112	XAD112	P5	1.9784	39.7841	33.9174	5.7334	-6.3800	102.0088	83.3866	68.8506	102.0088	
113	XAD113	P5	1.9654	39.0955	34.2559	8.3444	-3.8899	101.7241	86.3064	71.6253	101.7241	
114	XAD114	P5	2.2897	-65.4426	-38.7428	3.8778	17.7145	-140.5195	-100.7362	-84.1322	-140.5195	
115	XAD115	P5	2.2897	-67.1176	-38.5883	4.0506	17.8322	-142.2823	-101.8509	-85.3131	-142.2823	
116	XAD116	P5	1.9654	40.2937	34.0689	8.2362	-3.9313	102.8627	87.0304	72.4295	102.8627	
117	XAD117	P5	1.9462	50.2180	40.2727	10.8635	-3.5196	124.6979	106.5596	89.2999	124.6979	
118	XAD118	P5	2.3125	-80.0283	-48.9388	0.7825	18.2606	-174.3361	-129.8131	-108.8393	-174.3361	
119	XAD119	P5	2.3125	-81.7747	-48.8459	0.9462	18.3912	-176.2832	-131.0769	-110.1430	-176.2832	
120	XAD120	P5	1.9462	51.4894	40.1417	10.7537	-3.5826	126.0139	107.4149	90.2113	126.0139	
121	XAD121	P5	1.9398	59.3485	44.3682	12.9543	-2.8915	142.2073	122.2007	103.1857	142.2073	
122	XAD122	P5	2.3201	-86.9325	-54.6643	-2.1380	17.3850	-191.7819	-146.4019	-122.9744	-191.7819	
123	XAD123	P5	2.3201	-88.7931	-54.6519	-1.9925	17.5260	-193.9948	-147.8871	-124.4648	-193.9948	
124	XAD124	P5	1.9398	60.6830	44.2922	12.8654	-2.9532	143.6870	123.2038	104.2214	143.6870	
125	XAD125	P5	1.9178	50.9427	38.5958	13.8888	0.1046	122.8845	108.8300	92.2889	122.8845	
126	XAD126	P5	2.3469	-96.0120	-61.4440	-5.5862	16.3581	-213.5248	-166.8471	-140.5139	-213.5248	
127	XAD127	P5	2.3469	-98.2018	-61.6484	-5.4889	16.5284	-216.4796	-168.9464	-142.5257	-216.4796	
128	XAD128	P5	1.9178	52.3174	38.5811	13.8218	0.0428	124.5106	109.9691	93.4343	124.5106	
129	XAD129	PX5	1.9054	65.2145	45.4064	14.2208	-1.9958	150.9077	130.2457	110.7858	150.9077	
130	XAD130	PX5	2.3623	-105.6732	-68.0792	-10.3387	13.9753	-235.7346	-189.2074	-160.0306	-235.7346	
131	XAD131	PX5	2.3623	-107.7723	-68.2397	-10.2815	14.0898	-238.5103	-191.2206	-161.9750	-238.5103	
132	XAD132	PX5	1.9054	66.6209	45.4057	14.1832	-2.6331	152.5941	131.4654	112.0058	152.5941	
133	XAD133	PX5	1.8901	71.9612	47.4846	15.6716	-1.2872	162.3288	140.5525	120.2020	162.3288	
134	XAD134	PX5	2.3817	-112.4049	-73.7063	-12.7743	13.5494	-252.8160	-204.9411	-173.3527	-252.8160	
135	XAD135	PX5	2.3817	-114.7267	-74.0292	-12.7691	13.6699	-256.1187	-207.4119	-175.6851	-256.1187	
136	XAD136	PX5	1.8901	73.4894	47.5802	15.6544	-1.3385	164.3155	142.0220	121.6305	164.3155	
137	XAD137	PX5	1.8810	65.6791	42.9193	15.2803	-0.0481	147.4858	128.9507	110.5567	147.4858	
138	XAD138	PX5	2.3934	-125.7806	-83.2073	-15.9632	13.7537	-284.0685	-232.2072	-196.5469	-284.0685	
139	XAD139	PX5	2.3934	-128.4029	-83.7126	-15.9979	13.8995	-288.0236	-235.2151	-199.3383	-288.0236	

Tabel 4.3 Lanjutan

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{ut} (KN)	N _{u2} (KN)	N _{u3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
145	XAD145	PX5	1.8513	88.0419	52.8200	17.4499	-1.4144	190.1623	163.5615	140.9244	190.1623	
146	XAD146	PX5	2.4325	-135.9502	-90.3491	-21.1680	11.1709	-308.0188	-256.4157	-217.6090	-308.0188	
147	XAD147	PX5	2.4325	-138.8723	-91.2233	-21.2891	11.2906	-312.6039	-259.9998	-220.9042	-312.6039	
148	XAD148	PX5	1.8513	89.6720	52.9792	17.4751	-1.4460	192.3730	165.2499	142.5446	192.3730	
149	XAD149	PXX5	1.8310	71.5114	41.0447	15.7422	1.0834	151.4853	132.5046	114.9140	151.4853	
150	XAD150	PXX5	2.4602	-136.4399	-90.9379	-22.8945	9.5833	-309.2285	-259.3948	-220.4214	-309.2285	
151	XAD151	PXX5	2.4602	-139.6376	-91.8308	-23.0827	9.7140	-314.4945	-263.5701	-224.2140	-314.4945	
152	XAD152	PXX5	1.8310	73.3458	41.3997	15.8102	1.0246	154.2544	134.6630	116.9203	154.2544	
153	XAD153	PXX5	1.8194	50.3426	21.8928	11.7783	3.9394	95.4396	85.7136	76.3310	95.4396	
154	XAD154	PXX5	2.4719	-166.8723	-109.8507	-28.9208	10.3116	-376.0079	-316.7108	-269.6320	-376.0079	
155	XAD155	PXX5	2.4802	-172.6519	-112.0021	-29.4133	10.5874	-386.3856	-325.0851	-277.0843	-386.3856	
156	XAD156	PXX5	1.8255	53.1900	22.5303	11.9114	3.8649	99.8765	89.2010	79.5452	99.8765	
157	XAD157	PXX5	1.6260	49.7321	19.4561	10.1462	3.1976	90.8084	80.2817	71.9434	90.8084	
158	XAD158	PXX5	2.2249	-144.0512	-91.8506	-25.7911	7.0127	-319.8225	-270.8162	-231.4516	-319.8225	
159	XAD159	PXX5	2.2175	-150.3022	-94.5936	-26.4570	7.3264	-331.7124	-280.5327	-239.9926	-331.7124	
160	XAD160	PXX5	1.6206	51.8209	19.8688	10.2481	3.1521	93.9752	82.7791	74.2639	93.9752	
161	XAD161	PXX5	1.5230	18.8633	-1.6674	5.4753	6.0708	19.9681	21.5464	22.2610	19.9681	
162	XAD162	PXX5	1.0368	129.7771	-79.8593	-25.7031	2.8181	-283.5074	-243.4743	-209.2488	-283.5074	
163	XAD163	PXX5	2.0735	-138.3652	-84.3616	-26.9657	3.1635	-301.0168	-258.1214	-221.9665	-301.0168	
164	XAD164	PXX5	1.0368	16.7007	-4.0836	4.7819	6.2403	13.5071	15.8686	17.6187	13.5071	
165	XAD165	PXX5	1.4746	-151.8411	-114.3031	-27.1708	13.6517	-365.0942	-306.4257	-257.4386	-365.0942	
166	XAD166	PXX5	1.9861	83.3312	66.1642	12.1969	-11.4331	205.8602	169.0314	140.6754	205.8602	
167	XAD167	PXX5	1.9861	83.6811	67.8036	12.6056	-11.6100	208.9031	171.8040	142.7453	208.9031	
168	XAD168	PXX5	1.4746	-148.8849	-112.9479	-26.9017	13.4369	-359.3784	-301.8158	-253.4096	-359.3784	
169	XAD169	PXX5	1.5146	-132.4824	-89.3637	-24.1129	7.8027	-301.9608	-255.4060	-217.1073	-301.9608	
170	XAD170	PXX5	2.1140	97.86643	65.8409	15.2115	-8.3031	222.7852	185.3427	157.1252	222.7852	
171	XAD171	PXX5	2.1140	91.1780	62.3571	14.4095	-7.8609	209.1848	174.1800	147.4556	209.1848	
172	XAD172	PXX5	1.5146	-131.8819	-90.0482	-24.2370	7.9231	-302.3355	-255.8360	-217.2439	-302.3355	
173	XAD173	PXX5	1.5146	89.2024	65.0076	19.7310	-3.4860	211.0552	181.9686	154.1082	211.0552	
174	XAD174	PXX5	2.1140	-25.3498	-21.1322	-6.9870	0.5603	-64.2313	-56.5578	-47.5012	-64.2313	
175	XAD175	PXX5	2.1140	-27.9314	-21.4491	-7.1000	0.5604	-67.8362	-59.3971	-50.2046	-67.8362	
176	XAD176	PXX5	1.5146	89.5493	64.2249	19.5007	-3.4368	210.2190	181.0651	153.5401	210.2190	

Tabel 4.4
Tabel Gaya Batang KK XA

1. Batang Bawah

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{wKA} (KN)	N _{wKI} (KN)	N ₀₁ (KN)	N ₀₂ (KN)	N ₀₃ (KN)	N _{UMARKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XAB1	PXX8	2.13	7.542	5.638	0.026	-1.987	18.071	13.585	11.169	18.071	
2	XAB2	PXX8	2.13	-368.282	-263.693	-24.788	69.388	-864.765	-677.631	-564.620	-864.765	
3	XAB3	PXX8	1.80	-535.543	-382.782	-38.339	98.369	-1255.851	-987.335	-823.285	-1255.851	
4	XAB4	PXX8	2.06	-946.532	-661.922	-66.414	169.987	-2195.751	-1725.883	-1442.202	-2195.751	
5	XAB5	PXX8	2.47	-824.403	-584.044	-70.091	138.496	-1924.717	-1526.925	-1276.621	-1924.717	
6	XAB6	PXX8	3.14	-668.573	-481.517	-67.807	104.164	-1573.906	-1260.904	-1054.540	-1573.906	
7	XAB7	PXX8	3.13	-536.105	-387.560	-65.811	72.603	-1264.562	-1026.540	-860.443	-1264.562	
8	XAB8	PX8	3.11	-401.759	-295.611	-60.547	45.029	-956.140	-788.972	-662.282	-956.140	
9	XAB9	PX8	3.10	-284.268	-206.339	-51.383	22.309	-671.866	-565.108	-476.677	-671.866	
10	XAB10	PX8	3.09	-211.441	-149.827	-46.660	6.850	-494.008	-426.081	-361.870	-494.008	
11	XAB11	PX8	3.08	-136.947	-97.873	-41.999	-7.045	-321.466	-291.099	-249.154	-321.466	
12	XAB12	PX8	3.07	-98.256	-66.236	-39.867	-16.212	-224.380	-215.755	-187.368	-224.380	
13	XAB13	P8	3.06	-64.704	-39.432	-36.571	-22.488	-141.040	-149.436	-132.537	-141.040	
14	XAB14	P8	3.05	-23.160	-10.198	-34.363	-30.721	-44.378	-74.317	-69.947	-44.378	
15	XAB15	P8	3.04	-2.669	7.957	-32.464	-35.305	9.528	-31.811	-35.220	9.528	
16	XAB16	P8	3.04	17.011	24.968	-29.581	-38.498	60.361	9.774	-0.926	60.361	
17	XAB17	P8	3.03	44.155	46.153	-23.297	-39.780	126.831	67.167	47.387	126.831	
18	XAB18	P8	3.02	48.619	53.691	-19.567	-38.742	144.248	84.706	61.696	144.248	
19	XAB19	P8	3.02	49.902	59.041	-15.082	-36.168	154.347	97.662	72.358	154.347	
20	XAB20	P8	3.01	52.461	65.452	-7.433	-30.808	167.676	116.838	88.787	167.676	
21	XAB21	P8	3.01	42.967	64.974	-0.988	-24.193	155.519	115.454	87.608	155.519	
22	XAB22	P8	3.01	28.681	64.207	7.143	-15.788	137.147	111.433	83.915	137.147	
23	XAB23	P8	3.01	27.332	63.091	15.248	-7.284	133.744	118.606	91.567	133.744	
24	XAB24	P8	3.01	36.658	62.083	23.331	1.158	143.323	135.489	108.882	143.323	
25	XAB25	P8	3.01	43.732	62.351	29.935	7.666	152.241	150.103	123.380	152.241	
26	XAB26	P8	3.02	37.798	55.767	35.284	15.367	134.585	143.280	119.379	134.585	
27	XAB27	P8	3.02	35.522	50.529	37.911	19.865	123.473	138.098	116.443	123.473	
28	XAB28	P8	3.03	29.762	42.651	38.911	23.679	103.956	124.661	106.382	103.956	
29	XAB29	P8	3.04	2.884	21.819	37.730	29.938	38.371	74.035	64.704	38.371	
30	XAB30	P8	3.04	-13.635	5.963	34.834	32.705	-7.081	36.685	34.129	-7.081	
31	XAB31	P8	3.05	-31.898	-11.658	30.402	34.565	-57.201	-6.216	-1.220	-57.201	
32	XAB32	P8	3.06	-70.614	-40.554	22.256	36.749	-149.975	-85.545	-68.165	-149.975	

Tabel 4.4 Lanjutan

NO	Batang	Profil	L	N ₅	N _L	N _{WKA}	N _{WKT}	N _{U1}	N _{U2}	N _{U3}	N _{UMAKS}	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XAB33	P8	3.07	-101.989	-66.957	16.121	40.034	-230.013	-152.793	-124.098	-230.013	
34	XAB34	PX8	3.08	-138.076	-98.060	7.111	42.133	-323.121	-233.408	-191.382	-323.121	
35	XAB35	PX8	3.09	-210.497	-149.436	-6.586	46.784	-492.249	-376.673	-312.629	-492.249	
36	XAB36	PX8	3.10	-281.727	-205.412	-21.819	51.542	-667.333	-526.232	-438.198	-667.333	
37	XAB37	PX8	3.11	-396.497	-293.496	-44.074	60.746	-946.441	-761.931	-636.147	-946.441	
38	XAB38	PX8	3.13	-528.142	-384.897	-71.396	66.067	-1250.746	-1022.880	-857.924	-1250.746	
39	XAB39	PXX8	3.14	-649.466	-471.695	-101.508	66.954	-1535.261	-1272.362	-1070.207	-1535.261	
40	XAB40	PXX8	2.47	-813.634	-579.654	-137.294	69.726	-1904.770	-1592.607	-1344.184	-1904.770	
41	XAB41	PXX8	2.06	-940.510	-660.332	-169.337	66.496	-2185.980	-1842.062	-1559.062	-2185.980	
42	XAB42	PXX8	1.80	-533.628	-382.110	-98.727	37.740	-1251.729	-1057.270	-893.508	-1251.729	
43	XAB43	PXX8	2.13	-347.577	-249.758	-65.407	23.793	-816.825	-691.107	-584.068	-816.825	
44	XAB44	PXX8	2.13	12.324	8.961	3.075	-0.125	29.127	25.536	21.695	29.127	
Tumpuan												
1	XAP1	PXX8	2.127352	585.5699	277.8764	22.93286	-76.30871	907.2861	707.9841	588.8942	907.286	
2	XAP2	PXX8	1.45	106.4338	98.10284	25.09747	-9.939254	284.6851	243.6308	201.5867	284.685	
3	XAP3	PXX8	2.655485	-567.8636	-374.0332	-18.58141	115.0019	-1282.474	-982.2148	-821.9149	-1282.474	
4	XAP4	PXX8	2.655485	-571.2211	-378.2778	-114.3781	20.72111	-1293.294	-1105.286	-943.1671	-1293.294	
5	XAP5	PXX8	1.45	102.2352	97.69597	9.038041	-25.85337	278.9957	220.0924	178.2227	278.996	
6	XAP6	PXX8	2.127352	376.0655	272.1312	74.79776	-22.39195	886.6885	754.7737	638.146	886.689	

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_I = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKT} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{U1} = 1,2N_D + 1,6N_I
- [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKT}
- [12] N_{UMAKS} = gaya aksial batang maksimum (kN)

Tabel Gaya Batang KK XB

2. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XBV1	PXX5	3.00	18.8766	11.3862	0.2850	-3.7815	40.8697	30.9943	26.1145	40.8697	
2	XBV2	PXX5	3.00	111.6293	76.8751	6.1667	-21.2887	256.9554	200.1166	167.1701	256.9554	
3	XBV3	PXX5	3.00	126.9983	95.6751	13.1086	-21.0611	305.4782	244.8390	203.8353	305.4782	
4	XBV4	PXX5	3.00	-37.4658	-20.1364	0.7577	7.9493	-77.1771	-56.9736	-48.3437	-77.1771	
5	XBV5	PXX5	3.00	37.9682	31.8964	3.8845	-7.5071	96.5960	77.1084	63.4385	96.5960	
6	XBV6	PXX5	3.00	38.1953	30.2761	6.5103	-4.3024	94.2762	78.5198	65.5443	94.2762	
7	XBV7	PXX5	3.00	30.9949	23.8363	6.9555	-1.5574	75.3319	64.8456	54.6300	75.3319	
8	XBV8	PX5	3.00	24.0874	15.5081	6.2725	0.7339	53.7179	47.8154	41.1690	53.7179	
9	XBV9	PX5	3.00	20.9567	13.3363	6.9541	2.1911	46.4861	43.2095	37.4939	46.4861	
10	XBV10	PX5	3.00	24.6262	14.5455	8.0220	2.8272	52.8242	49.2446	43.0108	52.8242	
11	XBV11	PX5	3.00	22.7161	10.3248	7.8412	4.1538	43.7790	42.2437	37.8188	43.7790	
12	XBV12	PX5	3.00	15.6747	4.7136	7.0619	5.3785	26.3514	28.2379	26.2178	26.3514	
13	XBV13	P5	3.00	13.8594	2.0787	8.1150	7.3726	19.9572	24.7059	23.8150	19.9572	
14	XBV14	P5	3.00	17.3358	3.1197	9.9732	8.8590	25.7944	31.3136	29.9766	25.7944	
15	XBV15	P5	3.00	5.2462	-5.1789	8.8224	10.6721	-1.9908	9.0938	11.3133	-1.9908	
16	XBV16	P5	3.00	1.4541	-8.9027	7.5107	10.6902	-12.4995	-0.3618	3.4537	-12.4995	
17	XBV17	P5	3.00	2.5474	-9.6647	7.2835	10.7352	-12.4067	-0.5648	3.5772	-12.4067	
18	XBV18	P5	3.00	-1.1069	-13.0392	5.4516	10.1084	-22.1910	-10.1013	-4.5131	-22.1910	
19	XBV19	P5	3.00	1.7802	-12.5526	4.4627	8.9458	-17.9479	-8.1057	-2.7260	-17.9479	
20	XBV20	P5	3.00	8.7293	-10.0155	3.7794	7.3563	-5.5497	0.3730	4.6653	-5.5497	
21	XBV21	P5	3.00	13.0621	-8.1934	1.9920	4.9182	2.5650	4.3141	7.8256	2.5650	
22	XBV22	P5	3.00	15.7754	-7.7020	-0.0048	2.7459	6.6072	4.9496	8.2505	6.6072	
23	XBV23	P5	3.00	20.1631	0.2625	0.0610	-0.0328	24.6158	18.5350	18.4225	24.6158	
24	XBV24	P5	3.00	14.6829	-7.7714	-2.6960	0.0795	5.1853	0.6538	3.9844	5.1853	
25	XBV25	P5	3.00	13.7880	-7.5681	-4.7204	-2.0175	4.4367	-2.3370	0.9065	4.4367	
26	XBV26	P5	3.00	12.5293	-8.2648	-6.9246	-3.9729	1.8114	-6.9509	-3.4089	1.8114	
27	XBV27	P5	3.00	8.7089	-9.4782	-8.2265	-4.8414	-4.7145	-13.4076	-9.3455	-4.7145	
28	XBV28	P5	3.00	7.9414	-9.1210	-9.2173	-5.9598	-5.0640	-14.8588	-10.9497	-5.0640	
29	XBV29	P5	3.00	11.5651	-5.9737	-9.8772	-7.7437	4.3201	-8.6126	-6.0524	4.3201	
30	XBV30	P5	3.00	9.4817	-5.8233	-9.9738	-7.8941	2.0608	-10.4230	-7.9273	2.0608	
31	XBV31	P5	3.00	11.5207	-2.9569	-10.1631	-9.1071	9.0939	-5.3753	-4.1081	9.0939	
32	XBV32	P5	3.00	20.0573	3.7151	-8.7155	-10.0423	30.0129	12.0511	10.4589	30.0129	

Lanjutan

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XBV33	P5	3.00	14.3894	2.1122	-7.3493	-8.1037	20.6468	6.6659	5.7606	20.6468	
34	XBV34	PX5	3.00	13.7496	3.3691	-5.7098	-6.9131	21.8901	9.5658	8.1219	21.8901	
35	XBV35	PX5	3.00	22.7926	10.3279	-4.1499	-7.8384	43.8758	27.9270	23.5007	43.8758	
36	XBV36	PX5	3.00	23.3088	13.3877	-3.1511	-7.9324	49.3909	33.2619	27.5243	49.3909	
37	XBV37	PX5	3.00	22.4222	13.9560	-1.1746	-6.1589	49.2363	35.5176	29.5365	49.2363	
38	XBV38	PX5	3.00	21.7595	13.6493	-2.1288	-7.0035	47.9502	33.4081	27.5584	47.9502	
39	XBV39	PXX5	3.00	40.9302	30.5218	2.9577	-7.9430	97.9511	77.0125	63.9317	97.9511	
40	XBV40	PXX5	3.00	55.9111	42.7695	6.9188	-8.3560	135.5245	109.9459	91.6162	135.5245	
41	XBV41	PXX5	3.00	60.7331	48.2571	11.4613	-5.7734	150.0911	126.3218	105.6402	150.0911	
42	XBV42	PXX5	3.00	-27.0868	-12.6115	-5.8427	-1.3386	-52.6826	-46.5232	-41.1183	-52.6826	
43	XBV43	PXX5	3.00	150.0411	113.5939	26.0063	-14.5629	361.7296	302.5573	253.8741	361.7296	
44	XBV44	PXX5	3.00	113.0347	77.7580	21.3403	-6.4304	260.0545	220.6492	187.3244	260.0545	
45	XBV45	PXX5	3.00	26.1427	15.8596	5.2328	-0.4314	56.7467	48.8394	42.0424	56.7467	

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKI} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{UI} = 1,2N_D + 1,6N_L
- [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKI}
- [12] N_{UMAKS} = gaya aksial batang maksimum (kN)

Tabel Gaya Batang KK XB

3. Batang Diagonal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XBD1	PXX5	2.1140	-18.3534	-14.6180	-0.3291	4.8916	-45.4129	-34.4546	-28.1898	-45.4129	
2	XBD2	PXX5	1.5146	89.0109	63.7762	3.5778	-19.1994	208.8549	160.9346	133.6019	208.8549	
3	XBD3	PXX5	1.5146	88.6245	64.2384	3.6023	-19.3400	209.1309	161.1710	133.6402	209.1309	
4	XBD4	PXX5	2.1140	-15.6848	-13.8399	-0.2886	4.6543	-40.9656	-31.0705	-25.1391	-40.9656	
5	XBD5	PXX5	2.1140	101.1583	69.8084	8.6066	-16.3250	233.0835	185.1405	155.2226	233.0835	
6	XBD6	PXX5	1.5146	-121.1493	-82.6146	-7.6700	21.8352	-277.5627	-217.3760	-181.9698	-277.5627	
7	XBD7	PXX5	1.5146	-121.6591	-82.1943	-7.5843	21.7708	-277.5018	-217.2276	-182.0014	-277.5018	
8	XBD8	PXX5	2.1140	105.1116	71.6834	8.8729	-16.7284	240.8273	191.2679	160.5465	240.8273	
9	XBD9	PXX5	1.9861	85.2475	67.9271	11.6720	-12.5877	210.9804	174.2416	143.1300	210.9804	
10	XBD10	PXX5	1.4746	-155.0264	-115.5623	-13.4883	27.7839	-370.9313	-294.3845	-244.8578	-370.9313	
11	XBD11	PXX5	1.4746	-156.5923	-116.1038	-13.5960	27.8697	-373.6769	-296.5728	-246.8140	-373.6769	
12	XBD12	PXX5	1.9861	85.4843	67.1329	11.5841	-12.3919	209.9938	171.3963	142.6250	209.9938	
13	XBD13	PXX5	2.0735	-123.9911	-74.5797	-2.1909	24.4447	-268.1168	-203.7166	-171.7539	-268.1168	
14	XBD14	PXX5	1.5230	28.5035	5.2092	-5.3401	-7.2006	42.5390	25.4961	23.2636	42.5390	
15	XBD15	PXX5	1.5230	29.5897	6.6291	-5.2464	-7.6140	46.1143	28.2900	25.4490	46.1143	
16	XBD16	PXX5	2.0735	-118.9281	-72.1164	-2.0195	23.7364	-258.0999	-195.9983	-165.0912	-258.0999	
17	XBD17	PXX5	2.2175	-127.5958	-78.5762	-5.5185	22.5445	-278.8368	-215.7497	-182.0742	-278.8368	
18	XBD18	PXX5	1.6206	57.5802	24.3154	-2.3232	-11.0073	108.0008	78.2128	67.7919	108.0008	
19	XBD19	PXX5	1.6206	56.3452	24.2241	-2.3340	-10.9855	106.3728	76.9788	66.5970	106.3728	
20	XBD20	PXX5	2.2249	-124.1098	-77.3163	-5.3711	22.2419	-272.6378	-210.9237	-177.7881	-272.6378	
21	XBD21	PXX5	2.4802	-151.2733	-96.4573	-8.5951	25.8540	-335.8596	-262.2087	-220.8699	-335.8596	
22	XBD22	PXX5	1.8255	65.7745	30.7203	-2.5883	-13.5598	128.0818	92.9554	79.7896	128.0818	
23	XBD23	PXX5	1.8194	63.7365	30.2985	-2.6428	-13.4637	124.9613	90.5496	77.5645	124.9613	
24	XBD24	PXX5	2.4719	-147.3071	-95.0920	-8.4415	25.5199	-328.9156	-256.8166	-216.0629	-328.9156	
25	XBD25	PXX5	2.4602	-141.1271	-91.6875	-9.7149	23.0306	-316.0525	-248.6973	-209.4027	-316.0525	
26	XBD26	PXX5	1.8310	72.5217	39.5004	-1.2127	-15.3200	150.2267	111.2147	94.2860	150.2267	
27	XBD27	PXX5	1.8310	70.7376	39.1895	-1.2615	-15.2577	147.5883	109.1774	92.3819	147.5883	
28	XBD28	PXX5	2.4602	-137.9048	-90.7977	-9.5829	22.8448	-310.7621	-244.5711	-205.6578	-310.7621	
29	XBD29	PX5	2.4325	-140.8917	-91.4489	-11.2607	21.3996	-315.3883	-250.0541	-210.8617	-315.3883	
30	XBD30	PX5	1.8513	91.6848	53.1238	1.4514	-17.5214	195.0198	148.0066	125.2392	195.0198	
31	XBD31	PX5	1.8513	90.0026	52.9274	1.4165	-17.4862	192.6869	146.2149	123.5318	192.6869	
32	XBD32	PX5	2.4325	-137.9112	-90.7436	-11.1384	21.2700	-310.6831	-246.3784	-207.4883	-310.6831	

Lanjutan

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XBD33	PX5	2.4168	-151.2066	-97.9489	-14.7264	20.2554	-338.1662	-271.2963	-229.3182	-338.1662	
34	XBD34	PX5	1.8631	71.5221	41.6482	-0.7300	-15.6043	152.4635	113.4717	95.6225	152.4635	
35	XBD35	PX5	1.8631	69.7786	41.3723	-0.7969	-15.5728	149.9301	111.4912	93.7602	149.9301	
36	XBD36	PX5	2.4168	-148.2178	-97.1637	-14.5494	20.1520	-333.3233	-267.4517	-225.8101	-333.3233	
37	XBD37	PX5	2.3934	-130.4888	-83.9976	-13.8929	16.1063	-290.9828	-234.9085	-198.9095	-290.9828	
38	XBD38	PX5	1.8810	68.5010	42.9522	0.0778	-15.2623	150.9248	113.2869	94.8788	150.9248	
39	XBD39	PX5	1.8810	66.9261	42.8035	0.0215	-15.2655	148.7969	111.6234	93.2791	148.7969	
40	XBD40	PX5	2.3934	-127.8598	-83.4928	-13.7474	16.0715	-287.0203	-231.7621	-195.9795	-287.0203	
41	XBD41	PX5	2.3817	-116.1564	-73.8483	-13.6361	12.7383	-257.5449	-209.5219	-177.8727	-257.5449	
42	XBD42	PX5	1.8901	73.7025	46.5702	1.2287	-15.4035	162.9552	123.6908	103.7322	162.9552	
43	XBD43	PX5	1.8901	72.2092	46.4959	1.1800	-15.4257	161.0445	122.1993	102.2725	161.0445	
44	XBD44	PX5	2.3817	-113.8781	-73.5509	-13.5186	12.7496	-254.3351	-206.9737	-175.4519	-254.3351	
45	XBD45	PX5	2.3623	-111.0865	-69.1226	-14.1885	10.4982	-243.8999	-199.9511	-170.3271	-243.8999	
46	XBD46	PX5	1.9054	67.3971	45.0156	1.9586	-14.1184	152.9015	117.0265	97.7341	152.9015	
47	XBD47	PX5	1.9054	65.9973	45.0065	1.9202	-14.1536	151.2072	115.7096	96.4211	151.2072	
48	XBD48	PX5	2.3623	-109.0415	-68.9762	-14.0764	10.5580	-241.2118	-197.8005	-168.2393	-241.2118	
49	XBD49	P5	2.3469	-98.1928	-61.0634	-16.4479	5.3604	-215.5329	-181.3872	-155.2171	-215.5329	
50	XBD50	P5	1.9178	54.7325	38.5952	-0.0469	-13.8309	127.4314	95.5173	78.9765	127.4314	
51	XBD51	P5	1.9178	53.3832	38.6193	-0.1063	-13.8989	125.8507	94.2605	77.7094	125.8507	
52	XBD52	P5	2.3469	-96.0668	-60.8893	-16.2822	5.4640	-212.7030	-179.0659	-152.9704	-212.7030	
53	XBD53	P5	2.3201	-87.0427	-53.6433	-17.4020	1.7563	-190.2805	-163.5927	-140.6028	-190.2805	
54	XBD54	P5	1.9398	63.9082	45.0346	3.0438	-13.0400	148.7452	115.2114	95.9109	148.7452	
55	XBD55	P5	1.9398	62.5625	45.0915	2.9793	-13.1248	147.2215	113.9913	94.6663	147.2215	
56	XBD56	P5	2.3201	-85.1869	-53.6413	-17.2578	1.8998	-188.0503	-161.7471	-138.7579	-188.0503	
57	XBD57	P5	2.3125	-75.5774	-46.1879	-18.0451	-1.5494	-164.5935	-145.0992	-125.3044	-164.5935	
58	XBD58	P5	1.9462	56.4492	42.0665	3.8091	-11.2146	135.0453	105.8549	87.8265	135.0453	
59	XBD59	P5	1.9462	55.1659	42.1841	3.7444	-11.3214	133.6937	104.7635	86.6846	133.6937	
60	XBD60	P5	2.3125	-73.8173	-46.2639	-17.9128	-1.3899	-162.6030	-143.4475	-123.6202	-162.6030	
61	XBD61	P5	2.2897	-59.8485	-35.9045	-17.4833	-4.6603	-129.2655	-117.9291	-102.5414	-129.2655	
62	XBD62	P5	1.9654	45.0063	36.4455	4.2187	-8.7975	112.3203	89.3027	73.6832	112.3203	
63	XBD63	P5	1.9654	43.7879	36.6084	4.1734	-8.9010	111.1190	88.3474	72.6580	111.1190	
64	XBD64	P5	2.2897	-58.1416	-36.0205	-17.3606	-4.4961	-127.4027	-116.3847	-100.9474	-127.4027	
65	XBD65	P5	2.2747	-46.2394	-26.8812	-16.9018	-7.3014	-98.4972	-94.1551	-82.6346	-98.4972	
66	XBD66	P5	1.9784	43.0309	36.2453	6.6682	-6.2765	109.6296	90.2241	74.6904	109.6296	

Lanjutan

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{UI} (KN)	N _{UI2} (KN)	N _{UI3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
67	XBD67	P5	1.9784	41.8732	36.4827	6.6313	-6.3982	108.6200	89.4226	73.7872	108.6200	
68	XBD68	P5	2.2747	-44.7402	-27.1451	-16.8123	-7.1176	-97.1204	-93.0151	-81.3815	-97.1204	
69	XBD69	P5	2.2559	-37.4288	-20.6227	-16.8127	-9.4475	-77.9108	-78.6084	-69.7701	-77.9108	
70	XBD70	P5	1.9948	31.3295	29.9281	7.1492	-3.5394	85.4803	72.6893	59.8630	85.4803	
71	XBD71	P5	1.9948	30.1330	30.1469	7.1191	-3.6477	84.3946	71.8388	58.9187	84.3946	
72	XBD72	P5	2.2559	-35.9252	-20.8732	-16.7409	-9.2862	-76.5073	-77.4696	-68.5240	-76.5073	
73	XBD73	P5	2.2448	-27.9313	-13.9011	-15.2863	-10.3216	-55.7593	-60.1630	-54.2054	-55.7593	
74	XBD74	P5	2.0047	14.9377	21.4136	7.0264	-0.6213	52.1871	47.5720	38.3947	52.1871	
75	XBD75	P5	2.0047	13.8654	21.7392	7.0265	-0.7375	51.4212	46.9977	37.6809	51.4212	
76	XBD76	P5	2.2448	-26.5445	-14.2527	-15.2379	-10.1476	-54.6578	-59.2788	-53.1705	-54.6578	
77	XBD77	P5	2.2299	-19.67257	-7.6263	-13.9385	-11.2148	-35.8092	-43.5831	-40.3147	-35.8092	
78	XBD78	P5	2.0180	7.3408	17.5167	9.1662	2.9103	36.8356	38.6261	31.1190	36.8356	
79	XBD79	P5	2.0180	6.1451	17.7576	9.1649	2.8229	35.7862	37.8376	30.2272	35.7862	
80	XBD80	P5	2.2299	-18.2945	-7.9581	-13.9163	-11.0742	-34.6863	-42.7143	-39.3037	-34.6863	
81	XBD81	P5	2.2078	-17.2300	-5.0891	-13.3645	-11.5470	-28.8186	-37.6514	-35.4703	-28.8186	
82	XBD82	P5	2.0382	-6.2010	10.9188	10.0323	6.1327	10.0289	19.5604	14.8810	10.0289	
83	XBD83	P5	2.0382	-7.2847	11.2923	10.0672	6.0343	9.3260	19.0751	14.2356	9.3260	
84	XBD84	P5	2.2078	-16.0240	-5.5886	-13.3996	-11.4037	-28.1705	-37.2074	-34.8123	-28.1705	
85	XBD85	P5	2.1932	-7.2489	0.8978	-10.8318	-11.1525	-7.2622	-18.4448	-18.8296	-7.2622	
86	XBD86	P5	2.0518	-18.1801	6.9449	11.1184	8.6381	-10.7042	5.3140	2.3376	-10.7042	
87	XBD87	P5	2.0518	-19.3577	7.2974	11.1840	8.5778	-11.5535	4.7557	1.6283	-11.5535	
88	XBD88	P5	2.1932	-5.8748	0.6201	-10.8540	-11.0755	-6.0577	-17.5680	-17.8338	-6.0577	
89	XBD89	P5	2.0518	-15.2317	7.1778	-8.6839	-11.2474	-6.7935	-15.5158	-18.5920	-6.7935	
90	XBD90	P5	2.1932	-10.0403	0.4741	10.9910	10.8217	-11.7898	4.7219	4.5187	-11.2898	
91	XBD91	P5	2.1932	-11.4174	0.7620	11.0700	10.7979	-12.4817	3.9228	3.5962	-12.4817	
92	XBD92	P5	2.0518	-14.0466	6.8306	-8.7419	-11.1814	-5.9270	-14.9355	-17.8629	-5.9270	
93	XBD93	P5	2.0382	-1.9912	11.4897	-6.0394	-10.1429	15.9942	4.7483	-0.1759	15.9942	
94	XBD94	P5	2.2078	-19.9981	-5.2354	11.4202	13.2900	-32.3744	-10.5766	-8.3328	-32.3744	
95	XBD95	P5	2.2078	-21.2851	-4.7794	11.5531	13.2600	-33.1893	-11.0283	-8.9800	-33.1893	
96	XBD96	P5	2.0382	-0.8427	11.1537	-6.1284	-10.1119	16.8348	5.2720	0.4919	16.8348	
97	XBD97	P5	2.0180	8.5683	16.5361	-3.1257	-9.0314	36.7396	23.8039	16.7170	36.7396	
98	XBD98	P5	2.2299	-24.9353	-9.0212	10.8056	14.0274	-44.3562	-20.3005	-16.4342	-44.3562	
99	XBD99	P5	2.2299	-26.3079	-8.6646	10.9530	14.0475	-45.4328	-20.9311	-17.2177	-45.4328	
100	XBD100	P5	2.0180	9.7700	16.2873	-3.2142	-9.0310	37.7836	24.4807	17.5004	37.7836	

Lanjutan

NO	Batang	Profil	L	N _D	N _L	N _{WKA}	N _{WKT}	N _{UI}	N _{U2}	N _{U3}	N _{UMAKS}	KET
[1]	[2]	[3]	(m)	(KN)	(KN)	(KN)	(KN)	(KN)	(KN)	(KN)	(KN)	[13]
106	XBD106	P5	2.2559	-46.6706	-24.3984	8.4983	17.2120	-95.0422	-61.0837	-50.6273	-95.0422	[11]
107	XBD107	P5	2.2559	-48.1100	-24.0957	8.6702	17.2758	-96.2850	-61.8095	-51.4828	-96.2850	[12]
108	XBD108	P5	1.9948	28.5007	27.2436	2.9130	-6.8168	77.7906	61.8386	50.1628	77.7906	[13]
109	XBD109	P5	1.9784	38.6269	34.1646	5.8571	-6.3446	101.0155	82.7901	68.1481	101.0155	
110	XBD110	P5	2.2747	-53.6535	-30.2283	6.4108	17.2066	-112.7495	-76.8691	-63.9141	-112.7495	
111	XBD111	P5	2.2747	-55.1434	-29.9435	6.5998	17.2939	-114.0817	-77.6416	-64.8086	-114.0817	
112	XBD112	P5	1.9784	39.7841	33.9174	5.7334	-6.3800	102.0088	83.3866	68.8506	102.0088	
113	XBD113	P5	1.9654	39.0955	34.2559	8.3444	-3.8899	101.7241	86.3064	71.6253	101.7241	
114	XBD114	P5	2.2897	-65.4426	-38.7428	3.8778	17.7145	-140.5195	-100.7362	-84.1322	-140.5195	
115	XBD115	P5	2.2897	-67.1176	-38.5883	4.0506	17.8322	-142.2823	-101.8509	-85.3131	-142.2823	
116	XBD116	P5	1.9654	40.2937	34.0689	8.2362	-3.9313	102.8627	87.0304	72.4295	102.8627	
117	XBD117	P5	1.9462	50.2180	40.2727	10.8635	-3.5196	124.6979	106.5596	89.2999	124.6979	
118	XBD118	P5	2.3125	-80.0283	-48.9388	0.7825	18.2606	-174.3361	-129.8131	-108.8393	-174.3361	
119	XBD119	P5	2.3125	-81.7747	-48.8459	0.9462	18.3912	-176.2832	-131.0769	-110.1430	-176.2832	
120	XBD120	P5	1.9462	51.4894	40.1417	10.7537	-3.3826	126.0139	107.4149	90.2113	126.0139	
121	XBD121	P5	1.9398	59.3485	44.3682	12.9543	-2.8915	142.2073	122.2007	103.1857	142.2073	
122	XBD122	P5	2.3201	-86.9325	-54.6643	-2.1380	17.3850	-191.7819	-146.4019	-122.9744	-191.7819	
123	XBD123	P5	2.3201	-88.7931	-54.6519	-1.9925	17.5260	-193.9948	-147.8871	-124.4648	-193.9948	
124	XBD124	P5	1.9398	60.6830	44.2922	12.8654	-2.9532	143.6870	123.2038	104.2214	143.6870	
125	XBD125	P5	1.9178	50.9427	38.5958	13.8888	0.1046	122.8845	108.8300	92.2889	122.8845	
126	XBD126	P5	2.3469	-96.0120	-61.4440	-5.5862	16.3581	-213.5248	-166.8471	-140.5139	-213.5248	
127	XBD127	P5	2.3469	-98.2018	-61.6484	-5.4889	16.5284	-216.4796	-168.9464	-142.5257	-216.4796	
128	XBD128	P5	1.9178	52.3174	38.5811	13.8218	0.0428	124.5106	109.9691	93.4343	124.5106	
129	XBD129	PX5	1.9054	65.2145	45.4064	14.2208	-1.9958	150.9077	130.2457	110.7858	150.9077	
130	XBD130	PX5	2.3623	-105.6732	-68.0792	-10.3387	13.9753	-235.7346	-189.2074	-160.0306	-235.7346	
131	XBD131	PX5	2.3623	-107.7723	-68.2397	-10.2815	14.0898	-238.5103	-191.2206	-161.9750	-238.5103	
132	XBD132	PX5	1.9054	66.6209	45.4057	14.1832	-2.0331	152.5941	131.4654	112.0058	152.5941	
133	XBD133	PX5	1.8901	71.9612	47.4846	15.6716	-1.2872	162.3288	140.5525	120.2020	162.3288	
134	XBD134	PX5	2.3817	-112.4049	-73.7063	-12.7743	13.5494	-252.8160	-204.9411	-173.3527	-252.8160	
135	XBD135	PX5	2.3817	-114.7267	-74.0292	-12.7691	13.6699	-256.1187	-207.4119	-175.6851	-256.1187	
136	XBD136	PX5	1.8901	73.4894	47.5802	15.6544	-1.3385	164.3155	142.0220	121.6305	164.3155	
137	XBD137	PX5	1.8810	65.6791	42.9193	15.2803	-0.0481	147.4858	128.9507	110.5567	147.4858	
138	XBD138	PX5	2.3934	-125.7806	-83.2073	-15.9632	13.7537	-284.0685	-232.2072	-196.5469	-284.0685	
139	XBD139	PX5	2.3934	-128.4029	-83.7126	-15.9979	13.8995	-288.0236	-235.2151	-199.3383	-288.0236	

1. Batang Bawah

Tabel Gaya Batang KK XB

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{Ut} (KN)	N _{uz} (KN)	N _{Us} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	X3B1	PXX8	2.13	7.542	5.638	0.026	-1.987	18.071	13.585	11.169	18.071	
2	XBB2	PXX8	2.13	-368.282	-263.693	-24.788	69.388	-864.765	-677.631	-564.620	-864.765	
3	XBB3	PXX8	1.80	-535.543	-382.782	-38.339	98.369	-1255.851	-987.335	-823.285	-1255.851	
4	XBB4	PXX8	2.06	-946.532	-661.922	-66.414	169.987	-2195.751	-1725.883	-1442.202	-2195.751	
5	XBB5	PXX8	2.47	-824.403	-584.044	-70.091	138.496	-1924.717	-1526.925	-1276.621	-1924.717	
6	XBB6	PXX8	3.14	-668.573	-481.517	-67.807	104.164	-1573.906	-1260.904	-1054.540	-1573.906	
7	XBB7	PXX8	3.13	-536.105	-387.560	-65.811	72.603	-1264.562	-1026.540	-860.443	-1264.562	
8	XBB8	PX8	3.11	-401.759	-295.611	-60.547	45.029	-956.140	-788.972	-662.282	-956.140	
9	XBB9	PX8	3.10	-284.268	-206.339	-51.383	22.309	-671.866	-565.108	-476.677	-671.866	
10	XBB10	PX8	3.09	-211.441	-149.827	-46.660	6.850	-494.008	-426.081	-361.870	-494.008	
11	XBB11	PX8	3.08	-136.947	-97.873	-41.999	-7.045	-321.466	-291.099	-249.154	-321.466	
12	X3B12	PX8	3.07	-98.256	-66.236	-39.867	-16.212	-224.380	-215.755	-187.368	-224.380	
13	XBB13	P8	3.06	-64.704	-39.432	-36.571	-22.488	-141.040	-149.436	-132.537	-141.040	
14	XBB14	P8	3.05	-23.160	-10.198	-34.363	-30.721	-44.378	-74.317	-69.947	-44.378	
15	XBB15	P8	3.04	-2.669	7.957	-32.464	-35.305	9.528	-31.811	-35.220	9.528	
16	XBB16	P8	3.04	17.011	24.968	-29.581	-38.498	60.361	9.774	-0.926	60.361	
17	XBB17	P8	3.03	44.155	46.153	-23.297	-39.780	126.831	67.167	47.387	126.831	
18	XBB18	P8	3.02	48.619	53.691	-19.567	-38.742	144.248	84.706	61.696	144.248	
19	XBB19	P8	3.02	49.902	59.041	-15.082	-36.168	154.347	97.662	72.358	154.347	
20	XBB20	P8	3.01	52.461	65.452	-7.433	-30.808	167.676	116.838	88.787	167.676	
21	XBB21	P8	3.01	42.967	64.974	-0.988	-24.193	155.519	115.454	87.608	155.519	
22	XBB22	P8	3.01	28.681	64.207	7.143	-15.788	137.147	111.433	83.915	137.147	
23	XBB23	P8	3.01	27.332	63.091	15.248	-7.284	133.744	118.606	91.567	133.744	
24	XBB24	P8	3.01	36.658	62.083	23.331	1.158	143.323	135.489	108.882	143.323	
25	XBB25	P8	3.01	43.732	62.351	29.935	7.666	152.241	150.103	123.380	152.241	
26	XBB26	P8	3.02	37.798	55.767	35.284	15.367	134.585	143.280	119.379	134.585	
27	XBB27	P8	3.02	35.522	50.529	37.911	19.865	123.473	138.098	116.443	123.473	
28	XBB28	P8	3.03	29.762	42.651	38.911	23.679	103.956	124.661	106.382	103.956	
29	XBB29	P8	3.04	2.884	21.819	37.730	29.938	38.371	74.055	64.704	38.371	
30	XBB30	P8	3.04	-13.635	5.963	34.834	32.705	-7.081	36.685	34.129	38.371	
31	XBB31	P8	3.05	-31.898	-11.658	30.402	34.565	-57.201	-6.216	-1.220	-57.201	
32	XBB32	P8	3.06	-70.654	-40.554	22.256	36.740	-149.975	-85.545	-68.165	-149.975	

Tabel 4.4 Lanjutan

NO	Batang	Profil	L (m)	N _D (kN)	N _L (kN)	N _{WKA} (kN)	N _{WKI} (kN)	N _{UI} (kN)	N _{UI2} (kN)	N _{UI3} (kN)	N _{UMAKS} (kN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XBB33	P8	3.07	-101.989	-36.957	16.121	40.034	-230.013	-152.793	-124.098	-230.013	
34	XBB34	PX8	3.08	-138.076	-98.060	7.111	42.133	-323.121	-233.408	-191.382	-323.121	
35	XBB35	PX8	3.09	-210.497	-149.436	-6.586	46.784	-492.249	-376.673	-312.629	-492.249	
36	XBB36	PX8	3.10	-281.727	-205.412	-21.819	51.542	-667.333	-526.232	-438.198	-667.333	
37	XBB37	PX8	3.11	-396.497	-293.496	-44.074	60.746	-946.441	-761.931	-636.147	-946.441	
38	XBB38	PX8	3.13	-528.142	-384.897	-71.396	66.067	-1250.746	-1022.880	-857.924	-1250.746	
39	XBB39	PXX8	3.14	-649.466	-471.695	-101.508	66.954	-1535.261	-1272.362	-1070.207	-1535.261	
40	XBB40	PXX8	2.47	-813.634	-579.654	-137.294	69.726	-1904.770	-1592.607	-1344.184	-1904.770	
41	XBB41	PXX8	2.06	-940.510	-660.332	-169.337	66.496	-2185.980	-1842.062	-1559.062	-2185.980	
42	XBB42	PXX8	1.80	-533.628	-382.110	-98.727	37.740	-1251.729	-1037.270	-893.508	-1251.729	
43	XBB43	PXX8	2.13	-347.677	-249.758	-65.407	23.793	-816.825	-691.107	-584.068	-816.825	
44	XBB44	PXX8	2.13	12.324	8.961	3.075	-0.125	29.127	25.536	21.695	29.127	
Tumpuan												
1	XBP1	PXX8	2.127352	385.5699	277.8764	22.93286	-76.30871	907.2861	707.9841	588.8942	907.286	
2	XBP2	PXX8	1.45	106.4338	98.10284	25.09747	-9.939254	284.6851	243.6308	201.5867	284.685	
3	XBP3	PXX8	2.655485	-567.8636	-374.0332	-18.58141	115.0019	-1282.474	-982.2148	-821.9149	-1282.474	
4	XBP4	PXX8	2.655485	-571.2211	-378.2778	-114.3781	20.72111	-1293.294	-1105.286	-943.1671	-1293.294	
5	XBP5	PXX8	1.45	102.2352	97.69597	9.038041	-25.85337	278.9957	220.0924	178.2227	278.996	
6	XBP6	PXX8	2.127352	376.0655	272.1312	74.79776	-22.39195	886.6885	754.7737	638.146	886.689	
Keterangan												
[1]	Nomer											
[2]	Nama Batang											
[3]	Jenis Profil Yang dipakai											
[4]	Panjang batang L (m)											
[5]	N _D = gaya Aksial Akibat Beban Mati (kN)											
[6]	N _L = gaya Aksial Akibat Beban Hidup (kN)											
[7]	N _{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)											
[8]	N _{WKI} = gaya Aksial Akibat Beban Angin Kiri (kN)											
[9]	N _{UI} = 1,2N _D + 1,6N _L											
[10]	N _{UI2} = 0,9N _D + 1,2 N _L + 1,2 N _{WKA}											
[11]	N _{UI3} = 0,9N _D + 1,2 N _L + 1,2 N _{WKI}											
[12]	N _{UMAKS} = gaya aksial batang maksimum (kN)											

Tabel 4.11
Tabel Gaya Batang KK_XC

1. Batang Atas

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XCA1	P3	3,4677	9,0789	7,1000	0,9019	-1,6338	22,2546	17,7733	14,7304	22,2546	
2	XCA2	P3	2,2053	8,9611	7,3654	1,5965	-1,0340	22,5381	18,8193	15,6627	22,5381	
3	XCA3	P3	2,5200	5,8561	5,3334	1,7831	-0,1217	15,5608	13,8104	11,5246	15,5608	
4	XCA4	P3	3,1623	1,3927	1,8503	1,3764	0,7156	4,6317	5,1254	4,3325	4,6317	
5	XCA5	P3	3,1321	-3,3234	-1,1770	1,1041	1,5245	-5,9905	-3,0784	-2,5740	-5,9905	
6	XCA6	P3	3,1127	-5,8387	-2,9172	0,9050	1,9469	-11,7839	-7,6694	-6,4192	-11,7839	
7	XCA7	P3	3,1023	-7,8957	-4,2764	0,7458	2,2730	-16,4218	-11,3429	-9,5102	-16,4218	
8	XCA8	P3	3,0875	-10,4544	-5,9047	0,5154	2,6242	-22,0895	-15,8761	-13,3455	-22,0895	
9	XCA9	P3	3,0783	-12,0238	-7,0233	0,3901	2,8985	-25,7573	-18,7812	-15,7712	-25,7573	
10	XCA10	P3	3,0675	-13,1881	-7,7329	0,3471	3,1088	-28,2831	-20,7322	-17,4181	-28,2831	
11	XCA11	P3	3,0575	-14,9681	-8,8780	0,1725	3,3432	-32,2446	-23,9179	-20,1130	-32,2446	
12	XCA12	P3	3,0447	-15,6397	-9,6431	0,0595	3,5035	-34,2655	-25,5760	-21,4433	-34,2655	
13	XCA13	P3	3,0430	-16,5391	-10,2534	-0,0563	3,6056	-36,3200	-27,2569	-22,8625	-36,3200	
14	XCA14	P3	3,0321	-17,5036	-11,0387	-0,3260	3,6164	-38,7246	-29,3909	-24,6601	-38,7246	
15	XCA15	P3	3,0279	-18,0997	-11,5621	-0,5167	3,6126	-40,2734	-30,7844	-25,8292	-40,2734	
16	XCA16	P3	3,0203	-18,8779	-12,1641	-0,7609	3,5834	-42,1623	-32,5001	-27,2869	-42,1623	
17	XCA17	P3	3,0181	-19,5958	-12,7875	-1,1297	3,4373	-44,0187	-34,3368	-28,8565	-44,0187	
18	XCA18	P3	3,0130	-19,9083	-13,1004	-1,4362	3,2425	-44,8878	-35,3614	-29,7470	-44,8878	
19	XCA19	P3	3,0088	-19,8983	-13,1433	-1,7622	2,9318	-44,9378	-35,7951	-30,1623	-44,9378	
20	XCA20	P3	3,0054	-19,5414	-12,7589	-2,0805	2,4762	-43,8878	-35,3947	-29,9265	-43,8878	
21	XCA21	P3	3,0054	-19,6151	-12,8041	-2,4863	2,0866	-44,0485	-36,0020	-30,5146	-44,0485	
22	XCA22	P3	3,0088	-20,1982	-13,3827	-2,9818	1,7977	-45,6806	-37,8158	-32,0803	-45,6806	
23	XCA23	P3	3,0130	-20,4260	-13,4850	-3,3235	1,4925	-46,1243	-38,5536	-32,7744	-46,1243	
24	XCA24	P3	3,0181	-20,5895	-13,4505	-3,5810	1,2227	-46,2719	-38,9683	-33,2039	-46,2719	
25	XCA25	P3	3,0203	-20,0682	-12,9791	-3,7603	0,8751	-44,8948	-38,1487	-32,5862	-44,8948	
26	XCA26	P3	3,0279	-19,5963	-12,5323	-3,8259	0,6499	-43,6215	-37,2664	-31,8955	-43,6215	
27	XCA27	P3	3,0321	-18,9537	-11,9810	-3,8253	0,4537	-41,9724	-36,0259	-30,8911	-41,9724	
28	XCA28	P3	3,0430	-17,5761	-10,9903	-3,7689	0,1562	-38,7434	-33,5296	-28,8195	-38,7434	
29	XCA29	P3	3,0447	-16,3900	-10,1825	-3,6238	0,0128	-36,0289	-31,3186	-26,9547	-36,0289	
30	XCA30	P3	3,0575	-15,2285	-9,1556	-3,4051	-0,1353	-33,0012	-28,7785	-24,8546	-33,0012	
31	XCA31	P3	3,0675	12,9097	-7,5232	-3,0489	-0,3620	-27,6136	-24,3052	-21,0810	-27,6136	
32	XCA32	P3	3,0783	-12,4981	-7,6694	-3,0656	-0,3265	-27,3603	-24,1304	-20,8434	-27,3603	

lanjutan

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XCA33	P3	3,0875	-10,1088	-5,6815	-2,5697	-0,5405	-21,3178	-18,9994	-16,5644	-21,3178	
34	XCA34	P3	3,1023	-7,8185	-4,2663	-2,2732	-0,7495	-16,3130	-14,8841	-13,0557	-16,3130	
35	XCA35	P3	3,1127	-5,6924	-2,7874	-1,9154	-0,9199	-11,4007	-10,7665	-9,5719	-11,4007	
36	XCA36	P3	3,1321	-3,1810	-1,0402	-1,4931	-1,1216	-5,6008	-5,9028	-5,4570	-5,6008	
37	XCA37	P3	3,1623	1,3479	1,9005	-0,7065	-1,3852	4,6583	2,6459	1,8315	4,6583	
38	XCA38	P3	2,5200	5,6625	5,2560	0,0601	-1,8170	15,2047	11,4757	9,2231	15,2047	
39	XCA39	P3	2,2053	8,9384	7,3910	0,9962	-1,6435	22,5518	18,1092	14,9417	22,5518	
40	XCA40	P3	3,4677	9,1678	7,1990	1,6423	-0,9288	22,5198	18,8605	15,7752	22,5198	

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKI} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{U1} = 1,2N_D + 1,6N_L
- [10] N_{U2} = 0,9N_D + 1,2N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2N_L + 1,2 N_{WKI}
- [12] N_{UMAKS} = gaya aksial batang maksimum (kN)
- [13] Keterangan

Tabel 4.12
Tabel Gaya Batang KK_XC

1. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKL} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XCA1	P3	3,000	29,1731	26,8395	7,9666	-1,6189	77,3854	68,0232	56,5205	77,3854	
2	XCA2	P3	3,000	-87,7347	-61,5325	-1,1113	20,8646	-203,1681	-154,1339	-127,7628	-203,1681	
3	XCA3	P3	3,000	-13,9703	-11,4163	-0,5644	3,5128	-34,4648	-26,9501	-22,0574	-34,4648	
4	XCA4	P3	3,000	-13,0015	-13,0576	-0,3229	4,3406	-35,9284	-27,7580	-22,1618	-35,9284	
5	XCA5	P3	3,000	-10,2384	-9,7076	-0,4650	3,0020	-27,2527	-21,4217	-17,2613	-27,2527	
6	XCA6	P3	3,000	8,1265	-1,4285	0,0281	0,5382	8,0318	5,6333	6,2455	8,0318	
7	XCA7	P3	3,000	8,6204	-0,1253	0,4427	0,4874	10,7095	8,1391	8,1929	10,7095	
8	XCA8	P3	3,000	1,0424	-3,2755	0,0300	1,1999	-3,4244	-2,9565	-1,5527	-3,4244	
9	XCA9	P3	3,000	16,5533	3,7198	1,0518	-0,2767	25,2501	20,6239	19,0297	25,2501	
10	XCA10	P3	3,000	13,3629	3,1359	1,2719	0,1519	20,4873	17,3160	15,9720	20,4873	
11	XCA11	P3	3,000	15,6020	3,8996	1,4922	0,0995	25,5272	20,5118	18,8406	25,5272	
12	XCA12	P3	3,000	9,2054	0,7383	1,4865	1,2228	12,7933	10,9546	10,6382	12,7933	
13	XCA13	P3	3,000	2,5152	-3,6660	-0,0670	1,2423	-2,2818	-2,2159	-0,6447	-2,2818	
14	XCA14	P3	3,000	11,7748	1,5088	1,7996	1,2607	17,1094	14,5674	13,9208	17,1094	
15	XCA15	P3	3,000	9,1273	0,3939	1,4728	1,3321	12,1487	10,4547	10,2858	12,1487	
16	XCA16	P3	3,000	3,8012	-2,7859	0,1066	1,1016	0,6697	0,2060	1,4000	0,6697	
17	XCA17	P3	3,000	12,4288	2,2054	2,0066	1,2190	19,0089	16,2404	15,2952	19,0089	
18	XCA18	P3	3,000	10,3266	1,7347	1,4671	0,8476	15,7354	13,1379	12,3945	15,7354	
19	XCA19	P3	3,000	11,8444	2,4279	0,5732	-0,2939	17,5323	14,2612	13,2207	17,5323	
20	XCA20	P3	3,000	23,2219	9,3138	1,6615	-1,6648	42,2027	34,0701	30,0784	42,2027	
21	XCA21	P3	3,000	11,5253	2,7456	0,3667	-0,6139	17,6577	14,1075	12,9308	17,6577	
22	XCA22	P3	3,000	10,5153	1,9293	-0,7836	-1,4726	16,2707	10,8386	10,0117	16,2707	
23	XCA23	P3	3,000	13,0112	2,6886	-1,0894	-2,0497	20,4809	13,6292	12,4769	20,4809	
24	XCA24	P3	3,000	4,8525	-1,7591	-0,8742	-0,2460	3,5740	1,2072	1,9611	3,5740	
25	XCA25	P3	3,000	10,3357	1,2458	-1,1348	-1,5798	14,9617	9,4353	8,9014	14,9617	
26	XCA26	P3	3,000	13,2516	2,4667	-1,0428	-1,9238	20,4142	13,6351	12,5779	20,4142	
27	XCA27	P3	3,000	3,4443	-2,7584	-1,0632	-0,0761	0,2854	-1,4860	-0,3038	0,2854	
28	XCA28	P3	3,000	10,0426	1,2913	-1,0860	-1,5472	14,6828	9,2847	8,7312	14,6828	
29	XCA29	P3	3,000	16,2852	4,5871	0,0386	-1,5997	27,4472	20,2075	18,2416	27,4472	
30	XCA30	P3	3,000	10,4215	0,2973	-0,8751	-0,9812	12,4158	8,6860	8,5586	12,4158	
31	XCA31	P3	3,000	11,8040	-0,8166	-0,8935	-0,6018	12,2926	8,5715	8,9215	12,2926	
32	XCA32	P3	3,000	1,1839	-2,9583	-1,1196	-0,0630	-2,7471	-3,8280	-2,5601	-2,7471	

1. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XCA33	P3	3,0000	8,3394	-0,2572	-0,5054	-0,4136	10,1614	6,5903	6,7005	10,1614	
34	XCA34	P3	3,0000	7,2876	-1,7913	-0,6230	0,0168	6,4446	3,6617	4,4294	6,4446	
35	XCA35	P3	3,0000	-8,7826	-8,8988	-2,7924	0,3857	-24,2116	-21,9338	-18,1200	-24,2116	
36	XCA36	P3	3,0000	-13,3622	-13,0838	-4,3095	0,3632	-36,4030	-32,8979	-27,2905	-36,4030	
37	XCA37	P3	3,0000	-13,4773	-10,9677	-3,4122	0,5048	-33,1555	-29,3854	-24,6850	-33,1555	
38	XCA38	P3	3,0000	-85,4302	-59,4767	-20,1493	1,0924	-197,1134	-172,4384	-146,9484	-197,1134	
39	XCA39	P3	3,0000	26,2039	24,9546	0,9792	-7,9331	70,8065	54,7041	44,0093	70,8065	

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKT} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{UI} = 1,2N_D + 1,6N_L
- [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKT}
- [12] N_{UMAKS} = gaya aksial batang maksimum (kN)
- [13] Keterangan

Tabel Gaya Batang KK_XC

4. Batang Bawah

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XCB1	P4	3.4677	-12875.84	-5,623,859	-7,439,737	661,991	-24449.18	-19229.65	-17542.5	-24449.18	
2	XCB2	P4	3.1623	-32938.36	-11904.04	-8,514,755	2,124,534	-58572.5	-44951.14	-41379.93	-58572.5	
3	XCB3	P4	3.1321	-32039.42	-11458.62	-1,052,295	1,812,359	-56781.09	-43848.57	-40410.99	-56781.09	
4	XCB4	P4	3.1127	-25887.39	-9,219,632	-1,135,601	1,169,307	-45816.29	-35724.93	-32959.05	-45816.29	
5	XCB5	P4	3.1023	-23458.15	-8,698,504	-1,086,128	1,088,498	-42067.39	-32853.89	-30244.34	-42067.39	
6	XCB6	P4	3.0875	-22238.63	-7723.5	-1,204,085	7,267,903	-39043.96	-30727.87	-28410.82	-39043.96	
7	XCB7	P4	3.0783	-18273.34	-6,274,858	-1,235,871	3,328,432	-31967.79	-25458.88	-23576.43	-31967.79	
8	XCB8	P4	3.0675	-10445.91	-3,933,286	-1,001,214	-1,789,232	-18828.35	-15322.72	-14142.73	-18828.35	
9	XCB9	P4	3.0575	-17084.43	-5,958,148	-1,324,488	1,650,489	-30034.35	-24115.15	-22327.7	-30034.35	
10	XCB10	P4	3.0447	-10884.82	-3653.39	-1,236,933	-3,236,059	-18907.2	-15664.75	-14568.73	-18907.2	
11	XCB11	P4	3.0430	-2,944,237	-1,267,831	-9,271,661	-6,102,084	-5,561,613	-5,283,809	-4903.46	-5561.613	
12	XCB12	P4	3.0321	-7,036,267	-2,309,316	-1,182,045	-6,047,161	-12138.43	-1052227	-9,829,479	-12138.43	
13	XCB13	P4	3.0279	-3,850,381	-1,206,539	-1,087,258	-7,856,232	-6550.92	-6217.9	-5,855,938	-6550.92	
14	XCB14	P4	3.0203	2732.73	824,152	-7,437,674	-9,498,054	4,597,919	2,555,518	2,308,673	4597,919	
15	XCB15	P4	3.0181	-1958.08	-5,787,854	-9,749,777	-8,302,813	-3,275,752	-3,626,787	-3,453,152	-3275,752	
16	XCB16	P4	3.0130	-6,793,392	-1,495,409	-8,086,645	-7,712,792	-1,054,472	-1,761,252	-1,716,389	-1054,472	
17	XCB17	P4	3.0088	2,684,298	8,768,289	-5,549,712	-7,741,784	4,624,084	2,802,098	2,539,049	4624,084	
18	XCB18	P4	3.0054	-1,494,788	-4,758,674	-6,575,253	-5,385,585	-2,555,134	-2,705,381	-2,562,62	-2555,134	
19	XCB19	P4	3.0054	-2,103,458	-7,111,317	-4,035,912	-2,258,082	-3661.96	-3,230,779	-3017.44	-3661.96	
20	XCB20	P4	3.0088	-3,749,329	-1,343,977	-2,986,099	373,844	-6,649,558	-5345.5	-4,942,307	-6649,558	
21	XCB21	P4	3.0130	-3,753,786	-1,347,303	-3,564,206	3,011,836	-6,660,227	-5,037,941	-4633.75	-6660,227	
22	XCB22	P4	3.0181	-2,112,912	-7,147,075	2,272,232	4,059,001	-3,679,027	-2,486,602	-2272.19	-3679,027	
23	XCB23	P4	3.0203	-1,505,727	-4,801,603	5,392,492	6,592,893	-2,575,129	-1,284,248	-1,140,199	-2575,129	
24	XCB24	P4	3.0279	2,664,647	8,688,121	7,740,397	5,568,367	4,587,676	4,369,604	4,108,961	4587,676	
25	XCB25	P4	3.0321	-6,976,046	-1,561,359	7,714,457	8,104,796	-1,086,943	1,105,276	1,573,683	-1086,943	
26	XCB26	P4	3.0430	-1,971,354	-5,841,712	8,302,697	9,763,125	-3,300,299	-1478.9	-1,303,649	-3300,299	
27	XCB27	P4	3.0447	2709.62	8,152,314	9,492,121	7,454,042	4,555,915	4555.99	4,311,421	4555,915	
28	XCB28	P4	3.0575	-3,867,456	-1,212,845	7,853,792	1,088,591	-6581.5	-3993.67	-3,629,816	-6581.5	
29	XCB29	P4	3.0675	-7,050,406	-2,315,614	6,042,026	1,183,106	-12165.47	-8,399,059	-7,704,375	-12165,47	
30	XCB30	P4	3.0783	-2,955,784	-1,272,029	610,353	9,283,602	-5,582,187	-3,454,217	-3,072,608	-5582,187	

Lanjutan Batang Bawah

NO	Batang	Profil	L (m)	N _D (kN)	N _L (kN)	N _{WKA} (kN)	N _{WKT} (kN)	N _{U1} (kN)	N _{U2} (kN)	N _{U3} (kN)	N _{UMAKS} (kN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
31	XCB31	P4	3.0875	-10915.2	-3.665,755	3.218,856	1.238,324	-18963.44	-13836.32	-12736.59	-18963.44	
32	XCB32	P4	3.1023	-17076.08	-5,956,186	-1,639,907	1.325,056	-30021.2	-22712.69	-20925.83	-30021.2	
33	XCB33	P4	3.1127	-10461.82	-3,939,373	1,715,032	1.001,994	-18857.19	-14122.31	-12940.5	-18857.19	
34	XCB34	P4	3.1321	-18285.8	-6,281,249	-3,337,636	1.236,549	-31992.96	-24395.24	-22510.87	-31992.96	
35	XCB35	P4	3.1623	-22255.48	-7,733,927	-7,295,134	1.203,968	-39080.86	-30186.06	-27865.88	-39080.86	
36	XCB36	P4	3.4677	-23476.25	-8,707,523	-1,090,669	1.086,212	-42103.54	-32886.46	-30274.2	-42103.54	
37	XCB37	P4	3.1623	-25939.45	-9,243,771	-1,177,983	1132.96	-45917.37	-35851.61	-33078.47	-45917.37	
38	XCB38	P4	2.5200	-32144.86	-11503.5	-1,825,351	1.050,524	-56979.43	-44925	-41473.95	-56979.43	
39	XCB39	P4	2.2053	-33110.14	-11972.24	-2,147,659	8.454,025	-58887.77	-46743.01	-43151.34	-58887.77	
40	XCB40	P4	3.4677	-12949.37	-5,650,481	-6,705,455	7.420,748	-24580.01	-19239.66	-17544.52	-24580.01	

Keterangan

- [1] Nomer
 [2] Nama Batang
 [3] Jenis Profil Yang dipakai
 [4] Panjang batang L (m)
 [5] N_D = gaya Aksial Akibat Beban Mati (kN)
 [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
 [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
 [8] N_{WKT} = gaya Aksial Akibat Beban Angin Kiri (kN)
 [9] N_{U1} = 1,2N_D + 1,6N_L
 [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
 [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKT}
 [12] N_{UMAKS} = gaya aksial batang maksimum (kN)

Tabel Gaya Batang KK_XD

1. Batang Atas

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XDA1	P3	2.675986	-1120.647	-340.2635	427.8881	512.954	-1889.198	-903.4329	-801.3539	-1889.198	
2	XDA2	P3	3.253859	-2621.497	-889.7437	477.0524	699.4883	-4569.386	-2854.576	-2587.653	-4569.386	
3	XDA3	P3	3.168659	-4103.346	-1433.742	425.2284	783.6638	-7218.002	-4903.228	-4473.105	-7218.002	
4	XDA4	P3	3.126404	-5961.047	-2153.762	420.1494	958.59	-10599.28	-7445.278	-6799.149	-10599.28	
5	XDA5	P3	3.107427	-7593.201	-2780.547	401.1803	1096.317	-13560.72	-9689.121	-8854.957	-13560.72	
6	XDA6	P3	3.085191	-9288.715	-3444.911	355.9031	1217.131	-16658.31	-12066.65	-11033.18	-16658.31	
7	XDA7	P3	3.078327	-11079.11	-4135.135	305.7374	1339.521	-19911.14	-14566.47	-13325.93	-19911.14	
8	XDA8	P3	3.065436	-12290.44	-4583.762	264.1368	1410.077	-22082.54	-16244.94	-14869.81	-22082.54	
9	XDA9	P3	3.055552	-13364.88	-5001.494	208.8083	1459.182	-24040.24	-17779.61	-16279.16	-24040.24	
10	XDA10	P3	3.044733	-14499.94	-5426.706	140.9544	1497.631	-26082.66	-19392.85	-17764.84	-26082.66	
11	XDA11	P3	3.041381	-15108.87	-5644.798	77.75373	1488.953	-27162.32	-20278.43	-18584.99	-27162.32	
12	XDA12	P3	3.032095	-15583.07	-5839.269	5.116069	1464.933	-28042.51	-21025.74	-19273.96	-28042.51	
13	XDA13	P3	3.025244	-15829.74	-5944.974	-84.78004	1401.463	-28507.64	-21482.47	-19698.98	-28507.64	
14	XDA14	P3	3.019205	-15869.4	-5954.233	-181.3677	1307.191	-28570.06	-21645.18	-19858.91	-28570.06	
15	XDA15	P3	3.015974	-15623.54	-5880.337	-269.5138	1200.571	-28156.79	-21441.01	-19676.91	-28156.79	
16	XDA16	P3	3.012125	-15298.65	-5758.041	-380.1026	1059.408	-27571.24	-21134.55	-19407.14	-27571.24	
17	XDA17	P3	3.007341	-14891.92	-5582.912	-504.4339	891.2941	-26802.96	-20707.54	-19032.67	-26802.96	
18	XDA18	P3	3.004813	-13940.48	-5180.671	-617.842	677.3257	-25017.64	-19504.64	-17950.44	-25017.64	
19	XDA19	P3	3.004813	-13945.49	-5178.17	-677.0376	617.5048	-25019.66	-19577.19	-18023.74	-25019.66	
20	XDA20	P3	3.007341	-14884.19	-5581.509	-891.142	504.2354	-26791.44	-21162.95	-19488.5	-26791.44	
21	XDA21	P3	3.012125	-15291.49	-5756.792	-1058.94	380.2581	-27560.66	-21941.22	-20214.18	-27560.66	
22	XDA22	P3	3.015974	-15615.09	-5877.996	-1199.772	269.7268	-28142.9	-22546.91	-20783.51	-28142.9	
23	XDA23	P3	3.019205	-15852.99	-5950.247	-1306.31	181.2513	-28543.98	-22975.56	-21190.49	-28543.98	
24	XDA24	P3	3.025244	-15818.7	-5942.615	-1400.559	85.09442	-28490.62	-23048.63	-21265.85	-28490.62	
25	XDA25	P3	3.032095	-15569.8	-5836.377	-1463.907	-4.813097	-28021.96	-22773.16	-21022.24	-28021.96	
26	XDA26	P3	3.041381	-15089.58	-5639.449	-1487.641	-77.7785	-27130.62	-22133.13	-20441.3	-27130.62	
27	XDA27	P3	3.044733	-14486.85	-5422.895	-1496.169	-140.4452	-26060.85	-21341.04	-19714.17	-26060.85	
28	XDA28	P3	3.055552	-13349.37	-4997.328	-1457.892	-208.5604	-24014.97	-19760.7	-18261.5	-24014.97	
29	XDA29	P3	3.065436	-12271.24	-4579.094	-1408.628	-263.8551	-22052.04	-18229.38	-16855.65	-22052.04	
30	XDA30	P3	3.078327	-11065.21	-4131.024	-1338.063	-305.3066	-19887.89	-16521.6	-15282.29	-19887.89	

lanjutan tabel gaya batang KK-XD

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
31	XDA31	P3	3.085191	-9274.184	-3442.208	-1215.975	-355.4229	-16636.55	-13936.58	-12903.92	-16636.55	
32	XDA32	P3	3.107427	-7577.617	-2779.249	-1095.606	-400.7936	-13539.94	-11469.68	-10635.91	-13539.94	
33	XDA33	P3	3.126404	-5955.104	-2155.558	-958.2158	-419.3264	-10595.02	-9096.122	-8449.455	-10595.02	
34	XDA34	P3	3.168659	-4076.485	-1432.739	-782.059	-423.8743	-7184.165	-6326.594	-5896.772	-7184.165	
35	XDA35	P3	3.253859	-2600.738	-891.8407	-698.3766	-475.4164	-4547.831	-4248.925	-3981.373	-4547.831	
36	XDA36	P3	2.675986	-1078.251	-323.5237	-506.9575	-426.0766	-1811.539	-1967.003	-1869.946	-1811.539	

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKI} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{U1} = 1,2N_D + 1,6N_L
- [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKI}
- [12] N_{UMAKS} = gaya aksial batang maksimum (kN)
- [13] Keterangan

Tabel 4.2
Tabel Gaya Batang KK X₀D

1. Batang Vertikal

NO	Batang	Profil	L	N _D	N _L	N _{WKA}	N _{WKI}	N _{U1}	N _{U2}	N _{U3}	N _{UMAKS}	KET
[1]	[2]	[3]	(m) [4]	(KN) [5]	(KN) [6]	(KN) [7]	(KN) [8]	(KN) [9]	(KN) [10]	(KN) [11]	(KN) [12]	[13]
1	XDV1	P4	3.00	-26456.08	-9279.754	-18.98634	2300.952	-46594.9	-34968.96	-32185.03	-46594.9	
2	XDV2	P4	3.00	-10717.76	-4202.524	-36.15405	1014.477	-19585.35	-14732.4	-13471.64	-19585.35	
3	XDV3	P4	3.00	-6047.677	-2446.882	-84.94024	526.7802	-11172.22	-8481.096	-7747.031	-11172.22	
4	XDV4	P4	3.00	-2480.228	-1642.532	-76.50977	334.1232	-5604.324	-4295.055	-3802.295	-5604.324	
5	XDV5	P4	3.00	-1555.844	-1125.872	-21.5002	259.9679	-3668.408	-2777.106	-2439.344	-3668.408	
6	XDV6	P4	3.00	-3779.521	-1686.205	-139.0014	282.5499	-7233.354	-5591.817	-5085.955	-7233.354	
7	XDV7	P4	3.00	1416.995	-455.2999	39.95716	161.2821	923.9144	740.8845	886.4744	923.9144	
8	XDV8	P4	3.00	-642.1105	-838.946	-26.06301	183.6735	-2112.846	-1615.91	-1364.226	-2112.846	
9	XDV9	P4	3.00	-3732.038	-1677.505	-171.3772	247.9989	-7162.453	-5577.493	-5074.241	-7162.453	
10	XDV10	P4	3.00	3091.116	157.5479	107.9596	68.5726	3961.416	3100.614	3053.349	3961.416	
11	XDV11	P4	3.00	1.499955	-593.6895	-12.39691	136.0255	-948.1033	-725.9537	-547.8469	-948.1033	
12	XDV12	P4	3.00	-2458.72	-1278.055	-201.0408	118.473	-4995.353	-3987.763	-3604.347	-4995.353	
13	XDV13	P4	3.00	4047.871	594.1935	154.1238	5.575467	5808.155	4541.065	4362.807	5808.155	
14	XDV14	P4	3.00	1429.539	-62.5979	-34.73089	10.98142	1615.29	1169.79	1188.57	1615.29	
15	XDV15	P4	3.00	512.5676	-296.7709	-150.229	-76.03627	140.2477	-75.08903	13.94226	140.2477	
16	XDV16	P4	3.00	5189.067	1080.314	158.8571	-111.2215	7955.384	6157.167	5833.072	7955.384	
17	XDV17	P4	3.00	3297.295	637.6294	-28.89421	-188.3016	4976.961	3698.048	3506.759	4976.961	
18	XDV18	P4	3.00	3005.241	536.0479	-152.8423	-286.8542	4463.966	3164.564	3003.75	4463.966	
19	XDV19	P4	3.00	6295.263	1506.306	188.1806	-188.3959	9964.405	7699.12	7247.229	9964.405	
20	XDV20	P4	3.00	3008.342	538.0062	286.2819	151.7803	4470.82	3696.653	3535.251	4470.82	
21	XDV21	P4	3.00	3292.622	635.471	187.8417	28.97399	4967.9	3951.335	3760.694	4967.9	
22	XDV22	P4	3.00	5169.187	1076.153	111.161	-157.8774	7924.869	6077.045	5754.199	7924.869	
23	XDV23	P4	3.00	525.5342	-292.6446	76.03606	149.1972	162.4096	213.0505	300.8439	162.4096	
24	XDV24	P4	3.00	1425.527	-62.48378	18.97832	34.59927	1610.658	1230.767	1249.513	1610.658	
25	XDV25	P4	3.00	4031.777	591.0841	-5.314567	-153.0856	5783.867	4331.522	4154.197	5783.867	
26	XDV26	P4	3.00	-2444.483	-1272.997	-118.6713	199.378	-4970.176	-3870.037	-3488.138	-4970.176	
27	XDV27	P4	3.00	8.105349	-590.5097	-134.8832	12.74424	-935.0891	-863.1766	-686.0237	-935.0891	
28	XDV28	P4	3.00	3067.311	152.8439	-69.72427	-107.9352	3925.323	2860.323	2814.47	3925.323	
29	XDV29	P4	3.00	-3701.803	-1668.042	-246.3171	170.6934	-7111.031	-5628.854	-5128.441	-7111.031	
30	XDV30	P4	3.00	-670.6805	-848.7835	-186.4288	25.76707	-2162.87	-1845.867	-1591.232	-2162.87	
31	XDV31	P4	3.00	1426.799	-478.0695	-159.0872	-39.56986	947.2479	519.5313	662.9521	947.2479	

1. lanjutan tabel gaya batang KK XA

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKL} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
32	XDV32	P4	3.00	-3787.255	-1691.207	-285.8094	136.9924	-7250.637	-5780.949	-5273.587	-7250.637	
33	XDV33	P4	3.00	-1551.337	-1125.251	-259.0252	22.28764	-3662.007	-3057.335	-2719.76	-3662.007	
34	XDV34	P4	3.00	-2520.517	-1653.948	-339.436	74.05109	-5670.938	-4660.526	-4164.342	-5670.938	
35	XDV35	P4	3.00	-6018.979	-2438.038	-525.1897	84.31966	-11123.64	-8972.954	-8241.543	-11123.64	
36	XDV36	P4	3.00	-10772.75	-4216.939	-1020.365	33.87018	-19674.41	-15980.24	-14715.16	-19674.41	
37	XDV37	P4	3.00	-26333.66	-9231.608	-2284.101	23.8007	-46370.97	-37519.15	-34749.67	-46370.97	

Tabel Gaya Batang KK_XD

1. Batang Diagonal

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{wka} (KN)	N _{wki} (KN)	N _{ui} (KN)	N _{u2} (KN)	N _{u3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XDD1	P4	2.912199	2311.341	1114.97	-127.2973	-406.0399	4557.561	3265.414	2930.923	4557.561	
2	XDD2	P4	3.468083	390.2281	350.1105	-125.686	-213.2136	1028.451	620.5148	515.4816	1028.451	
3	XDD3	P4	3.594496	142.1511	118.9253	-71.73608	-101.4674	360.8619	184.5631	148.8855	360.8619	
4	XDD4	P4	3.673472	308.8198	135.5023	-121.3064	-155.182	587.3875	294.9729	254.3222	587.3875	
5	XDD5	P4	3.71431	290.3102	74.89439	-103.0121	-121.7357	468.2032	227.5379	205.0695	468.2032	
6	XDD6	P4	3.768076	1401.076	454.3301	-57.36297	-170.9455	2408.219	1737.328	1601.03	2408.219	
7	XDD7	P4	3.786304	2083.121	705.8047	-38.81356	-215.2647	3629.033	2675.198	2463.457	3629.033	
8	XDD8	P4	3.823205	1004.175	238.0271	-64.68311	-124.1899	1585.853	1111.77	1040.362	1585.853	
9	XDD9	P4	3.8544	1294.842	369.9876	-22.76229	-115.2592	2145.791	1582.028	1471.032	2145.791	
10	XDD10	P4	3.892351	1237.92	323.891	-15.254	-96.22675	2003.729	1484.492	1387.325	2003.729	
11	XDD11	P4	3.905125	71.86641	-133.1361	-27.2366	6.047421	-126.7781	-127.7675	-87.82664	-126.7781	
12	XDD12	P4	3.943805	129.4124	-68.68365	-2.828881	14.34203	45.40108	30.65616	51.26125	45.40108	
13	XDD13	P4	3.976443	-444.5539	-293.1544	23.64741	96.93599	-1002.512	-723.5068	-635.5605	-1002.512	
14	XDD14	P4	2.004719	-974.5258	-504.1758	26.08252	152.1265	-1976.112	-1450.785	-1299.532	-1976.112	
15	XDD15	P4	2.014702	-1745.139	-745.5202	14.71488	201.0949	-3286.999	-2447.591	-2223.935	-3286.999	
16	XDD16	P4	2.028109	-2228.451	-969.2454	65.9623	308.2737	-4224.935	-3089.546	-2798.772	-4224.935	
17	XDD17	P4	2.04842	-2598.957	-1144.128	105.2687	391.3007	-4949.353	-3585.692	-3242.454	-4949.353	
18	XDD18	P4	2.062092	-3580.494	-1500.718	104.0936	479.273	-6697.741	-4898.393	-4448.178	-6697.741	
19	XDD19	P4	2.062092	-3566.374	-1494.497	-478.2397	-104.6153	-6670.845	-5577.021	-5128.672	-6670.845	
20	XDD20	P4	2.04842	-2603.16	-1145.496	-390.2211	-103.8471	-4956.585	-4185.704	-3842.055	-4956.585	
21	XDD21	P4	2.028109	-2228.101	-967.6122	-307.3819	-65.47882	-4221.9	-3535.283	-3245	-4221.9	
22	XDD22	P4	2.014702	-1721.331	-739.3271	-200.6638	-15.83206	-3248.521	-2677.187	-2455.389	-3248.521	
23	XDD23	P4	2.004719	-992.7148	-508.7	-151.8691	-24.69407	-2005.178	-1686.126	-1533.516	-2005.178	
24	XDD24	P4	3.976443	-442.7921	-292.5507	-96.40863	-23.27096	-999.4317	-865.2641	-777.4989	-999.4317	
25	XDD25	P4	3.943805	149.9168	-63.09221	-14.26046	1.512587	78.95266	42.10194	61.0296	78.95266	
26	XDD26	P4	3.905125	54.50882	-137.7104	-5.416203	29.01139	-154.926	-122.6939	-81.38082	-154.926	
27	XDD27	P4	3.892351	1232.049	322.7806	95.46428	14.76912	1994.908	1610.738	1513.904	1994.9	
28	XDD28	P4	3.8544	1320.598	376.5253	116.7341	22.60278	2187.157	1780.449	1667.491	2187.157	
29	XDD29	P4	3.823205	973.4986	230.0399	122.8802	65.37019	1536.262	1299.653	1230.641	1536.262	

lanjutan tabel gaya batang KK XD

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
30	XDD30	P4	3.786304	2094.579	710.213	216.8883	39.33501	3649.836	2997.643	2784.579	3649.836	
31	XDD31	P4	3.768076	1410.145	456.0788	170.3082	56.28845	2421.9	2020.795	1883.971	2421.9	
32	XDD32	P4	3.71431	295.7521	79.65002	124.8232	104.9107	482.3426	511.5448	487.6498	482.3426	
33	XDD33	P4	3.673472	307.1382	137.1878	154.2598	119.9629	588.0663	626.1615	585.0052	588.0663	
34	XDD34	P4	3.594496	191.4736	134.2027	107.0098	73.45911	444.4927	461.7813	421.5204	444.4927	
35	XDD35	P4	3.468083	327.3724	328.4962	207.6355	125.5114	918.4407	937.9931	839.4443	918.4407	
36	XDD36	P4	2.912199	2333.332	1117.365	407.0463	127.705	4587.783	3929.292	3594.083	4587.783	

Tabel Gaya Batang KK_XD

1. Batang Bawah

NO	Batang	Profil	L (m)	N _d (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XDB1	P4	2.675986	-23471.71	-8864.136	-708.1666	1507.867	-42348.66	-32611.3	-29952.06	-42348.66	
2	XDB2	P4	3.253859	-20299.41	-7436.773	-784.3616	1074.832	-36258.13	-28134.83	-25903.8	-36258.13	
3	XDB3	P4	3.168659	-16635	-6343.223	-795.9391	789.8666	-30111.16	-23538.5	-21635.53	-30111.16	
4	XDB4	P4	3.126404	-16286.55	-5683.665	-819.6705	601.2458	-28637.73	-22461.9	-20756.8	-28637.73	
5	XDB5	P4	3.107427	-15936.83	-5513.692	-916.0332	462.3897	-27946.1	-22058.81	-20404.71	-27946.1	
6	XDB6	P4	3.085191	-9705.995	-3747.945	-794.8688	142.1174	-17643.91	-14186.77	-13062.39	-17643.91	
7	XDB7	P4	3.078327	-12415.58	-4231.291	-953.492	104.3308	-21668.76	-17395.76	-16126.37	-21668.76	
8	XDB8	P4	3.065436	-10694.42	-3620.836	-979.7213	-74.51222	-18626.64	-15145.64	-14059.39	-18626.64	
9	XDB9	P4	3.055552	-2900.367	-1263.46	-729.3337	-413.4687	-5501.978	-5001.684	-4622.646	-5501.978	
10	XDB10	P4	3.044733	-6613.816	-2195.712	-932.694	-383.766	-11449.72	-9706.521	-9047.809	-11449.72	
11	XDB11	P4	3.041381	-5659.428	-1917.866	-941.9517	-462.4853	-9859.898	-8525.266	-7949.906	-9859.898	
12	XDB12	P4	3.032095	404.6059	-72.13651	-625.6169	-607.5828	370.1086	-473.1589	-451.5179	370.1086	
13	XDB13	P4	3.025244	-3772.556	-1294.979	-851.5725	-527.8276	-6599.037	-5971.165	-5582.671	-6599.037	
14	XDB14	P4	3.019205	-4136.96	-1496.676	-830.2322	-456.0633	-7359.033	-6515.554	-6066.551	-7359.033	
15	XDB15	P4	3.015974	-1180.859	-652.0616	-533.5408	-370.5254	-2460.229	-2485.496	-2289.877	-2460.329	
16	XDB16	P4	3.012125	-5256.25	-1979.735	-726.1133	-231.1796	-9475.075	-7977.643	-7383.722	-9475.075	
17	XDB17	P4	3.007341	-6893.418	-2687.4	-674.8519	-3.001805	-12571.94	-10238.78	-9432.56	-12571.94	
18	XDB18	P4	3.004813	-8095.848	-3302.055	-502.0981	323.4157	-14998.31	-11851.25	-10860.63	-14998.31	
19	XDB19	P4	3.004813	-8104.364	-3306.319	-321.7012	504.8786	-15015.35	-11647.55	-10655.66	-15015.35	
20	XDB20	P4	3.007341	-6898.743	-2689.78	4.164893	676.6099	-12582.14	-9431.606	-8624.673	-12582.14	
21	XDB21	P4	3.012125	-5261.862	-1983.478	231.6687	727.5381	-9487.8	-6837.847	-6242.804	-9487.8	
22	XDB22	P4	3.015974	-1202.287	-659.9456	370.7158	535.7022	-2498.657	-1429.134	-1231.15	-2498.657	
23	XDB23	P4	3.019205	-4145.654	-1501.018	456.1828	831.4372	-7376.414	-4984.891	-4534.585	-7376.414	
24	XDB24	P4	3.025244	-3782.29	-1299.807	527.5531	852.5049	-6618.439	-4330.766	-3940.823	-6618.439	
25	XDB25	P4	3.032095	381.9733	-80.27004	607.3658	627.4333	329.9359	976.291	1000.372	329.9359	
26	XDB26	P4	3.041381	-5670.031	-1922.772	461.8603	942.5532	-9880.473	-6856.122	-6279.291	-9880.473	
27	XDB27	P4	3.044733	-6620.179	-2200.007	383.6895	933.6913	-11464.23	-8137.742	-7477.74	-11464.23	
28	XDB28	P4	3.055552	-2924.202	-1271.74	412.468	730.403	-5543.826	-3662.908	-3281.386	-5543.826	
29	XDB29	P4	3.065436	-10695.35	-3623.479	74.49689	980.3668	-18631.99	-13884.6	-12797.55	-18631.99	

lari lanjutan tabel batang bawah KK XD

NO	Batang	Profil	L (m)	N _d (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
30	XDB30	P4	3.078327	-12426.28	-4237.873	-105.7318	953.7363	-21692.13	-16395.98	-15124.62	-21692.13	
31	XDB31	P4	3.085191	-9717.715	-3753.024	-142.3393	795.9168	-17666.1	-13420.38	-12294.47	-17666.1	
32	XDB32	P4	3.107427	-15957.04	-5525.409	-465.7287	915.6236	-27989.1	-21550.7	-19893.07	-27989.1	
33	XDB33	P4	3.126404	-16307.46	-5697.707	-604.0666	820.3601	-28685.28	-22238.84	-20529.53	-28685.28	
34	XDB34	P4	3.168659	-16690.7	-6366.192	-796.2852	795.2629	-30214.75	-23616.6	-21706.75	-30214.75	
35	XDB35	P4	3.253859	-20329.13	-7453.89	-1079.758	783.7148	-36321.18	-28536.6	-26300.43	-36321.18	
36	XDB36	P4	2.675986	-23522.13	-8884.094	-1513.84	707.1832	-42441.11	-33647.44	-30982.21	-42441.11	

Tabel. 4.18
Tabel Gaya Batang KK_XE

1. Batang Atas		NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKL} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]		
1	XEA1	P3	3.443269	-5433.258	-2051.352	197.9088	710.7468	-9802.073	-7114.064	-6498.659	-9802.073	-9802.073		
2	XEA2	P3	3.23858	-7212.143	-2655.44	292.0983	955.9584	-12903.28	-9326.938	-8530.307	-12903.28	-12903.28		
3	XEA3	P3	3.15913	-7459.088	-2768.122	325.0058	1017.036	-13379.9	-9644.918	-8814.482	-13379.9	-13379.9		
4	XEA4	P3	3.123604	-8396.291	-3184.284	342.214	1138.285	-15170.4	-10967.15	-10011.86	-15170.4	-15170.4		
5	XEA5	P3	3.092329	-9701.981	-3702.993	321.3244	1247.073	-17567.17	-12789.79	-11678.89	-17567.17	-17567.17		
6	XEA6	P3	3.080584	-10889.96	-4192.152	289.7428	1337.781	-19775.4	-14483.86	-13226.21	-19775.4	-19775.4		
7	XEA7	P3	3.069609	-11729.68	-4531.396	256.3648	1589.214	-21325.85	-15686.75	-14327.33	-21325.85	-21325.85		
8	XEA8	P3	3.055552	-12587.51	-4872.114	205.6687	1423.697	-22900.39	-16928.49	-15466.86	-22900.39	-22900.39		
9	XEA9	P3	3.044733	-13370.71	-5197.697	143.8251	1443.249	-24361.16	-18098.28	-16538.97	-24361.16	-24361.16		
10	XEA10	P3	3.041381	-13555.59	-5284.701	87.41998	1408.595	-24722.23	-18436.77	-16851.36	-24722.23	-24722.23		
11	XEA11	P3	3.03066	-13808.85	-5401.621	17.69717	1368.102	-25213.21	-18888.67	-17268.18	-25213.21	-25213.21		
12	XEA12	P3	3.025244	-13722.35	-5404.57	-65.63655	1285.506	-25114.13	-18914.36	-17292.99	-25114.13	-25114.13		
13	XEA13	P3	3.018095	-13449.17	-5318.776	-152.7652	1176.929	-24649.05	-18670.11	-17074.47	-24649.05	-24649.05		
14	XEA14	P3	3.014963	-13081.12	-5195.141	-233.9859	1064.799	-24009.57	-18287.96	-16729.42	-24009.57	-24009.57		
15	XEA15	P3	3.011245	-12680.82	-5044.794	-332.6522	928.5463	-23288.65	-17865.67	-16352.23	-23288.65	-23288.65		
16	XEA16	P3	3.006011	-12327.68	-4890.154	-443.2794	779.2591	-22617.46	-17495.03	-16027.98	-22617.46	-22617.46		
17	XEA17	P3	3.003748	-11575.98	-4545.637	-541.5873	594.822	-21164.19	-16523.05	-15159.36	-21164.19	-21164.19		
18	XEA18	P3	3.003748	-11578.89	-4542.333	-594.3979	541.1854	-21162.4	-16585.08	-15222.38	-21162.4	-21162.4		
19	XEA19	P3	3.006011	-12320.55	-4889.49	-779.3225	443.0499	-22607.85	-17891.07	-16424.22	-22607.85	-22607.85		
20	XEA20	P3	3.011245	-12674.84	-5044.284	-928.1573	332.9136	-23280.66	-18574.29	-17061	-23280.66	-23280.66		
21	XEA21	P3	3.014963	-13072.48	-5192.359	-1063.897	234.1927	-23994.75	-19272.74	-17715.03	-23994.75	-23994.75		
22	XEA22	P3	3.018095	-13432.83	-5314.969	-1176.139	152.6036	-24623.35	-19878.88	-18284.39	-24623.35	-24623.35		
23	XEA23	P3	3.025244	-13712	-5402.312	-1284.635	65.94249	-25098.1	-20365.14	-18744.45	-25098.1	-25098.1		
24	XEA24	P3	3.03066	-13793.5	-5398.003	-1367.04	-17.53975	-25189	-20532.2	-18912.8	-25189	-25189		
25	XEA25	P3	3.041381	-13536.41	-5279.171	-1407.258	-87.46526	-24690.37	-20206.49	-18622.74	-24690.37	-24690.37		
26	XEA26	P3	3.044733	-13354.9	-5192.014	-1441.539	-143.5351	-24333.1	-19979.67	-18422.07	-24333.1	-24333.1		
27	XEA27	P3	3.055552	-12571.79	-4868.469	-1422.603	-205.486	-22875.71	-18863.9	-17403.36	-22875.71	-22875.71		
28	XEA28	P3	3.069609	-11707.66	-4525.269	-1387.609	-256.2918	-21289.62	-17632.34	-16274.76	-21289.62	-21289.62		
29	XEA29	P3	3.080584	-10873.95	-4186.083	-1335.873	-289.3517	-19746.47	-16412.9	-15157.08	-19746.47	-19746.47		

lanjutan tabel gaya batang KK XE

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKL} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
30	XEA30	P3	3.092329	-9683.315	-3698.745	-1245.758	-321.0721	-17537.97	-14648.39	-13538.76	-17537.97	
31	XEA31	P3	3.123604	-8382.225	-3184.452	-1137.946	-341.8334	-15153.79	-12730.88	-11775.54	-15153.79	
32	XEA32	P3	3.15913	-7438.218	-2772.976	-1017.416	-324.1717	-13362.62	-11242.87	-10410.97	-13362.62	
33	XEA33	P3	3.23858	-7254.288	-2685.686	-964.5449	-293.1234	-13002.24	-10909.14	-10103.43	-13002.24	
34	XEA34	P3	3.443269	-5443.959	-2057.105	-711.8374	-197.5612	-9824.118	-8222.294	-7605.162	-9824.118	

Tabel Gaya Batang KK_XE

1. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XEV1	P4	3.00	-20467.82	-7429.904	-141.5299	1715.946	-36449.23	-27317.09	-25088.12	-36449.23	
2	XEV2	P4	3.00	-6735.841	-2651.089	-4.583624	658.1887	-12324.75	-9059.396	-8264.068	-12324.75	
3	XEV3	P4	3.00	-1630.553	-1122.002	6.377871	286.8783	-3751.867	-2616.577	-2279.977	-3751.867	
4	XEV4	P4	3.00	-495.5893	-574.6273	13.68842	157.3452	-1514.111	-929.4878	-757.0996	-1514.111	
5	XEV5	P4	3.00	-2289.993	-973.8019	-78.4502	165.0003	-4306.074	-3134.027	-2841.886	-4306.074	
6	XEV6	P4	3.00	2536.385	99.94138	52.31502	27.32967	3203.569	2465.454	2435.472	3203.569	
7	XEV7	P4	3.00	257.968	-428.2275	-5.722569	101.3343	-375.6024	-288.5688	-160.1006	-375.6024	
8	XEV8	P4	3.00	-2841.903	-1237.449	-150.6646	158.6977	-5390.202	-4223.449	-3852.214	-5390.202	
9	XEV9	P4	3.00	3585.245	467.6647	110.3028	-6.613358	5050.558	3920.282	3779.982	5050.558	
10	XEV10	P4	3.00	765.6375	-222.8171	-3.432143	52.27213	562.2577	417.5747	484.4198	562.2577	
11	XEV11	P4	3.00	-1355.44	-760.8731	-177.9644	12.25383	-2843.925	-2346.501	-2118.239	-2843.925	
12	XEV12	P4	3.00	4506.164	860.8057	162.6246	-52.57688	6784.686	5283.664	5025.422	6784.686	
13	XEV13	P4	3.00	2506.667	427.3989	-10.64509	-117.4948	3691.838	2756.104	2627.885	3691.838	
14	XEV14	P4	3.00	1532.443	182.7726	-142.6402	-188.3333	2131.368	1427.358	1372.526	2131.368	
15	XEV15	P4	3.00	5961.166	1468.156	189.2205	-177.8185	9502.448	7353.901	6913.454	9502.448	
16	XEV16	P4	3.00	3563.026	906.5539	-9.047703	-235.6862	5726.118	4283.731	4011.765	5726.118	
17	XEV17	P4	3.00	3250.719	741.6071	-161.592	-346.9938	5087.434	3621.665	3399.183	5087.434	
18	XEV18	P4	3.00	6528.202	1723.593	215.7679	-215.1303	10591.59	8202.614	7685.536	10591.59	
19	XEV19	P4	3.00	3251.777	741.9718	345.8925	160.3996	5089.288	4232.037	4009.445	5089.288	
20	XEV20	P4	3.00	3555.659	903.4408	235.0187	9.158515	5712.296	4566.244	4295.212	5712.296	
21	XEV21	P4	3.00	5943.875	1463.268	177.5787	-188.2383	9473.879	7318.504	6879.523	9473.879	
22	XEV22	P4	3.00	1540.645	184.8352	187.9126	141.7038	2144.51	1833.878	1778.427	2144.51	
23	XEV23	P4	3.00	2496.17	423.9071	116.9063	10.9295	3673.656	2895.529	2768.357	3673.656	
24	XEV24	P4	3.00	4498.567	859.9598	52.76347	-162.2265	6774.216	5143.978	4885.99	6774.216	
25	XEV25	P4	3.00	-1351.822	-761.3781	-12.90647	177.4381	-2840.392	-2145.781	-1917.368	-2840.392	
26	XEV26	P4	3.00	766.9396	-221.9703	-52.20242	3.290151	565.175	361.2384	427.8295	565.175	
27	XEV27	P4	3.00	3571.372	463.9843	6.233865	-109.7622	5028.021	3778.497	3639.302	5028.021	
28	XEV28	P4	3.00	-2834.067	-1237.058	-159.7281	149.5363	-5380.172	-4226.803	-3855.686	-5380.172	
29	XEV29	P4	3.00	256.7035	-429.2585	-101.1119	6.202724	-378.7694	-405.4113	-276.6338	-378.7694	
30	XEV30	P4	3.00	2297.387	90.77	-30.34103	-53.03354	3154.988	2329.832	2302.601	3154.988	

lanjutan tabel gaya batang KK XE

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
31	XEV31	P4	3.00	-2272.994	-972.5684	-164.7473	78.39482	-4283.702	-3220.804	-2929.034	-4283.702	
32	XEV32	P4	3.00	-547.1185	-593.7244	-162.7833	-14.35225	-1606.501	-1210.547	-1032.429	-1606.501	
33	XEV33	P4	3.00	-1588.294	-1110.166	-284.1349	-6.593327	-3682.219	-2912.957	-2579.907	-3682.219	
34	XEV34	P4	3.00	-6795.928	-2666.305	-662.9557	3.620528	-12421.2	-9921.779	-9121.888	-12421.2	
35	XEV35	P4	3.00	-20306.84	-7371.448	-1699.36	143.5024	-36162.52	-28971.46	-26760.02	-36162.52	

Tabel Gaya Batang KK_XE

1. Batang Diagonal

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XED1	P4	2.912199	4935.346	2194.759	-125.1172	-673.8069	9434.03	69.25.382	6266.954	9434.03	
2	XED2	P4	3.468083	1371.21	651.3825	-96.23933	-259.085	2687.664	1900.261	1704.846	2687.664	
3	XED3	P4	3.594496	391.9071	276.9247	-110.7829	-180.0141	913.368	552.0865	469.0092	913.368	
4	XED4	P4	3.673472	72.48074	77.69878	-97.06097	-116.4857	211.2949	41.99804	18.6884	211.2949	
5	XED5	P4	3.71431	1371.664	458.5551	-47.37694	-162.0157	2379.685	1727.911	1590.345	2379.685	
6	XED6	P4	3.768076	1139.838	415.2888	-50.22025	-154.0424	2032.267	1463.936	1339.35	2032.267	
7	XED7	P4	3.786304	1095.275	305.7921	-46.66386	-123.1119	1803.598	1296.702	1204.964	1803.598	
8	XED8	P4	3.823205	1385.542	404.1914	-17.54838	-118.5962	2309.357	1710.96	1589.702	2309.357	
9	XED9	P4	3.8544	899.7078	252.479	-19.29727	-82.41702	1483.616	1089.555	1013.811	1483.616	
10	XED10	P4	3.044733	-156.128	-197.0934	-26.80021	22.47315	-502.7031	-409.1875	-350.0595	-502.7031	
11	XED11	P4	3.041381	47.60076	-101.7774	-9.404435	16.0399	-105.7228	-90.57746	-60.04425	-105.7228	
12	XED12	P4	3.032095	-1069.602	-484.9131	-2.800581	118.4277	-2059.384	-1547.898	-1402.424	-2059.384	
13	XED13	P4	3.025244	-1380.323	-632.3141	5.614086	164.6926	-2668.09	-1993.131	-1803.437	-2668.09	
14	XED14	P4	3.019205	-1891.405	-823.4639	-11.80361	194.0624	-3587.229	-2704.586	-2457.547	-3587.229	
15	XED15	P4	3.015974	-2276.397	-971.6906	33.36604	276.2887	-4286.382	-3174.747	-2883.24	-4286.382	
16	XED16	P4	3.012125	-2164.184	-983.8553	97.19795	343.1618	-4171.189	-3011.755	-2716.598	-4171.189	
17	XED17	P4	3.007341	-2939.977	-1270.651	102.3824	420.045	-5561.013	-4047.901	-3666.706	-5561.013	
18	XED18	P4	3.004813	-2927.77	-1265.439	-419.7652	-103.4054	-5538.026	-4657.238	-4277.606	-5538.026	
19	XED19	P4	3.004813	-2172.299	-986.1684	-341.8068	-95.26468	-4184.628	-3548.639	-3252.789	-4184.628	
20	XED20	P4	3.007341	-2271.939	-969.1951	-275.5068	-33.20799	-4277.039	-3538.387	-3247.629	-4277.039	
21	XED21	P4	3.012125	-1868.813	-817.6357	-193.8386	10.57032	-3550.793	-2895.701	-2650.41	-3550.793	
22	XED22	P4	3.015974	-1401.424	-637.8731	-164.327	-4.858691	-2702.305	-2223.921	-2032.559	-2702.305	
23	XED23	P4	3.019205	-1059.996	-481.7804	-117.7826	2.662535	-2042.844	-1673.472	-1528.938	-2042.844	
24	XED24	P4	3.025244	59.02077	-99.98093	-16.31008	8.685155	-89.14455	-86.4305	-56.43623	-89.14455	
25	XED25	P4	3.032095	-170.1691	-199.4495	-21.79528	28.0671	-523.3221	-418.6459	-358.8111	-523.3221	
26	XED26	P4	3.041381	895.8636	251.0515	82.02632	19.26344	1476.719	1205.971	1130.655	1476.719	
27	XED27	P4	3.044733	1404.114	409.2895	119.1884	16.86604	2339.8	1897.876	1775.089	2339.8	
28	XED28	P4	3.065436	1072.624	301.0476	123.3841	48.1222	1768.825	1474.679	1384.365	1768.825	
29	XED29	P4	3.078327	1144.424	417.8178	154.0204	49.56591	2041.817	1716.187	1590.842	2041.817	
30	XED30	P4	3.085191	1394.01	465.7568	164.2544	47.81516	2418.022	2010.622	1870.895	2418.022	

lanjutan

NO	Batang	Profil	L (m)	N _D (KN)	S _E (KN)	N _{WKA} (KN)	N _{WKT} (KN)	S _{WT} (KN)	S _{WT} (KN)	N _{U3} (KN)	N _{U3} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
31	XED31	P4	3.107427	42.88574	72.13774	115.3853	97.3509	166.8833	263.6248	241.9835	166.8833	
32	XED32	P4	3.126404	436.3735	292.5677	183.7162	110.5742	991.7565	964.2768	876.5065	991.7565	
33	XED33	P4	3.168659	1306.315	631.7933	253.8322	95.88385	2578.447	2238.434	2048.896	2578.447	
34	XED34	P4	3.253859	4971.699	2200.255	675.2142	125.1505	9486.447	7925.092	7265.016	9486.447	

Tabel Gaya Batang KK_XE

1. Batang Bawah

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XEB1	P4	3.443269	-19752.79	-7588.159	-506.4652	1390.574	-35844.41	-27491.06	-25214.62	-35844.41	
2	XEB2	P4	3.23858	-13815.23	-5454.866	-629.42	734.2964	-25306.06	-19734.85	-18098.39	-25306.06	
3	XEB3	P4	3.15913	-12897.16	-4643.109	-601.1588	559.6185	-22905.57	-17900.57	-16507.64	-22905.57	
4	XEB4	P4	3.123604	-12453.34	-4345.317	-689.9129	396.4164	-21896.52	-17250.29	-15946.69	-21896.52	
5	XEB5	P4	3.092329	-8455.438	-3344.245	-650.2181	185.8432	-15497.32	-12403.25	-11399.98	-15497.32	
6	XEB6	P4	3.080584	-10270.45	-3493.175	-745.4267	127.867	-17913.62	-14329.73	-13281.77	-17913.62	
7	XEB7	P4	3.069609	-9314.322	-3123.06	-782.1135	-1.348.79	-16174.08	-13069.1	-12132.18	-16174.08	
8	XEB8	P4	3.055552	-3678.689	-1591.225	-625.5367	-227.7303	-6960.388	-5970.935	-5493.567	-6960.388	
9	XEB9	P4	3.044733	-6425.092	-2149.976	-776.3989	-238.9049	-11150.07	-9294.232	-8649.239	-11150.07	
10	XEB10	P4	3.041381	-5720.358	-1927.14	-788.5756	-306.7905	-9947.854	-8407.182	-7829.04	-9947.854	
11	XEB11	P4	3.03066	-1600.052	-864.8295	-578.2914	-362.084	-3303.789	-3171.792	-2912.343	-3303.789	
12	XEB12	P4	3.025244	-5079.978	-1800.77	-773.5242	-323.3318	-8977.204	-7661.132	-7120.901	-8977.204	
13	XEB13	P4	3.018095	-5904.252	-2146.718	-771.7729	-235.0933	-10519.85	-8816.017	-8172.001	-10519.85	
14	XEB14	P4	3.014963	-4125.03	-1823.857	-558.7358	-102.7715	-7868.208	-6571.639	-6024.482	-7868.208	
15	XEB15	P4	3.011245	-7937.859	-3015.338	-769.5242	-15.68973	-14349.97	-11685.91	-10781.31	-14349.97	
16	XEB16	P4	3.006011	-9597.486	-3722.541	-742.3263	188.309	-17473.05	-13995.58	-12878.82	-17473.05	
17	XEB17	P4	3.003748	-10389.69	-4216.209	-519.8026	534.2497	-19213.57	-15033.94	-13769.08	-19213.57	
18	XEB18	P4	3.003748	-10395.82	-4219.4	-532.551	522.2992	-19226.03	-15058.58	-13792.76	-19226.03	
19	XEB19	P4	3.006011	-9598.731	-3724.216	-187.4693	743.5847	-17477.22	-13332.88	-12215.62	-17477.22	
20	XEB20	P4	3.011245	-7942.329	-3018.964	15.94577	770.6868	-14361.14	-10751.72	-9846.029	-14361.14	
21	XEB21	P4	3.014963	-4144.253	-1831.522	102.9294	560.7598	-7903.218	-5803.898	-5254.502	-7903.218	
22	XEB22	P4	3.018095	-5909.184	-2150.54	234.9684	772.6034	-10531.88	-7616.952	-6971.79	-10531.88	
23	XEB23	P4	3.025244	-5091.733	-1806.909	322.7409	774.468	-9001.134	-6363.561	-5821.488	-9001.134	
24	XEB24	P4	3.03066	-1617.792	-871.1071	361.9311	579.7079	-3335.121	-2067.024	-1805.691	-3335.121	
25	XEB25	P4	3.041381	-5729.996	-1932.811	305.9583	789.1612	-9968.493	-7109.22	-6529.376	-9968.493	
26	XEB26	P4	3.044733	-6431.717	-2154.602	238.37	777.0205	-11165.42	-8088.024	-7441.644	-11165.42	
27	XEB27	P4	3.055552	-3695.814	-1597.184	227.337	626.633	-6990.471	-4970.049	-4490.894	-6990.471	
28	XEB28	P4	3.069609	-9316.438	-3126.723	0.42725	782.108	-16182.48	-12136.35	-11198.33	-16182.48	
29	XEB29	P4	3.080584	-10276.51	-3499.07	-128.8042	745.9634	-17930.33	-13602.31	-12552.59	-17930.33	

lanjutan

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{UB} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
30	XEB30	P4	3.092329	-8476.488	-3352.16	-187.766	650.2741	-15535.24	-11876.75	-10871.1	-15535.24	
31	XEB31	P4	3.123604	-12457.44	-4352.31	-398.2947	689.7828	-21912.62	-16912.42	-15606.73	-21912.62	
32	XEB32	P4	3.15913	-12940.35	-4663.906	-564.7868	601.1896	-22990.66	-17920.74	-16521.57	-22990.66	
33	XEB33	P4	3.23858	-13795.89	-5454.698	-733.7881	629.8865	-25282.58	-19842.48	-18206.07	-25282.58	
34	XEB34	P4	3.443269	-19780.91	-7599.226	-1393.089	506.7179	-35895.85	-28593.6	-26313.83	-35895.85	

Tabel 4.22
Tabel Gaya Batang KK_XF

1. Batang Atas

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKL} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XFA1	P3	3.404717	-8255.935	-3029.453	164.2045	921.5677	-14754.25	-10868.64	-9959.804	-14754.25	
2	XFA2	P3	3.234826	-8619.916	-3228.003	187.4371	994.4379	-15508.7	-11406.6	-10438.2	-15508.7	
3	XFA3	P3	3.162278	-8462.76	-3246.166	207.3234	1018.865	-15349.18	-11263.09	-10289.25	-15349.18	
4	XFA4	P3	3.1127	-9372.085	-3650.738	217.265	1129.949	-17087.68	-12555.04	-11459.82	-17087.68	
5	XFA5	P3	3.092329	-10257.95	-4052.14	208.052	1221.087	-18792.96	-13845.06	-12629.42	-18792.96	
6	XFA6	P3	3.073906	-10761.93	-4291.338	189.5929	1262.427	-19780.45	-14607.83	-13320.43	-19780.45	
7	XFA7	P3	3.061388	-11067.44	-4451.951	162.4218	1275.41	-20404.05	-15108.13	-13772.54	-20404.05	
8	XFA8	P3	3.048213	-11408.56	-4630.019	114.3644	1271.869	-21098.3	-15686.49	-14297.48	-21098.3	
9	XFA9	P3	3.041381	-11290.97	-4620.138	65.61106	1220.646	-20941.39	-15627.31	-14241.26	-20941.39	
10	XFA10	P3	3.029257	-11055.38	-4581.96	17.95647	1163.447	-20597.6	-15426.65	-14052.06	-20597.6	
11	XFA11	P3	3.025244	-10346.54	-4445.971	-50.85632	1060.636	-19769.4	-14888.08	-13554.29	-19769.4	
12	XFA12	P3	3.018095	-9906.756	-4235.892	-123.1602	935.8127	-18665.53	-14146.94	-12876.17	-18665.53	
13	XFA13	P3	3.013984	-9293.23	-4025.242	-180.8803	825.4302	-17592.26	-13411.25	-12203.68	-17592.26	
14	XFA14	P3	3.009585	-8995.42	-3916.665	-260.6709	718.4953	-17061.17	-13108.68	-11933.68	-17061.17	
15	XFA15	P3	3.005395	-8861.474	-3841.665	-352.6557	607.7605	-16780.43	-13008.51	-11656.01	-16780.43	
16	XFA16	P3	3.002815	-8290.932	-3358.333	-427.2986	462.2849	-15642.45	-12244.6	-11177.1	-15642.45	
17	XFA17	P3	3.002815	-8291.935	-3554.95	-461.7443	426.9933	-15638.24	-12282.77	-11216.29	-15638.24	
18	XFA18	P3	3.005395	-8856.834	-3841.503	-607.8854	352.4904	-16774.61	-13310.42	-12157.97	-16774.61	
19	XFA19	P3	3.009585	-8990.35	-3916.579	-718.1396	261.0052	-17054.95	-13652.98	-12478	-17054.95	
20	XFA20	P3	3.013984	-9286.199	-4023.699	-824.8171	181.1077	-17581.36	-14175.8	-12968.69	-17581.36	
21	XFA21	P3	3.018095	-9891.111	-4232.685	-935.2214	122.9497	-18641.63	-15103.49	-13833.68	-18641.63	
22	XFA22	P3	3.025244	-10537.33	-4443.787	-1059.846	51.10106	-19754.86	-16087.96	-14754.82	-19754.86	
23	XFA23	P3	3.029257	-11040.61	-4579.065	-1162.585	-17.8189	-20575.23	-16826.53	-15452.81	-20575.23	
24	XFA24	P3	3.041381	-11273.44	-4617.268	-1220.081	-65.76386	-20915.76	-17150.92	-15765.74	-20915.76	
25	XFA25	P3	3.048213	-11394.16	-4626.985	-1270.881	-114.1351	-21076.16	-17332.18	-15944.08	-21076.16	
26	XFA26	P3	3.061388	-11053.85	-4450.495	-1274.964	-162.3403	-20385.41	-16819.02	-15483.87	-20385.41	
27	XFA27	P3	3.073906	-10743.48	-4288.885	-1261.815	-189.5936	-19754.39	-16329.97	-15043.31	-19754.39	
28	XFA28	P3	3.092329	-10249.89	-4053.311	-1221.143	-207.8156	-18785.17	-15554.25	-14338.26	-18785.17	
29	XFA29	P3	3.1127	-9367.496	-3657.163	-1131.42	-217.1292	-17092.46	-14177.05	-13079.9	-17092.46	
30	XFA30	P3	3.162278	-8457.262	-3258.787	-1021.676	-206.9792	-15362.77	-12748.09	-11770.46	-15362.77	
31	XFA31	P3	3.234826	-8661.516	-3259.109	-1002.323	-187.5452	-15608.39	-12909.08	-11931.35	-15608.39	
32	XFA32	P3	3.404717	-8255.024	-3028.963	-920.6277	-163.3869	-14752.37	-12169.03	-11260.34	-14752.37	

Tabel 4.23
Tabel Gaya Batang KK_XF

1. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XFV1	P4	3.00	-13792.58	-5386.604	-210.3096	1136.341	-25169.66	-19129.62	-17513.64	-25169.66	
2	XFV2	P4	3.00	-3185.364	-1723.671	-32.3669	398.5507	-6580.309	-4974.072	-4456.971	-6580.309	
3	XFV3	P4	3.00	-48.94312	-449.7492	9.512145	121.9494	-778.3304	-572.3333	-437.4085	-778.3304	
4	XFV4	P4	3.00	-1519.527	-649.8229	-44.84416	117.6116	-2863.15	-2201.175	-2006.228	-2863.15	
5	XFV5	P4	3.00	2921.315	502.7244	59.11078	-66.57032	4309.937	3303.386	3152.568	4309.937	
6	XFV6	P4	3.00	565.4758	-88.68475	3.352791	25.52398	536.6754	406.5299	433.1353	536.6754	
7	XFV7	P4	3.00	-2084.094	-786.5411	-118.5983	78.03694	-3759.379	-2961.852	-2725.89	-3759.379	
8	XFV8	P4	3.00	3655.02	773.655	104.8309	-88.5829	5623.872	4343.701	4111.604	5623.872	
9	XFV9	P4	3.00	1350.241	223.6188	-0.2108039	-56.11551	1978.08	1483.307	1416.221	1978.08	
10	XFV10	P4	3.00	-678.3901	-299.2612	-163.6594	-88.84414	-1292.886	-1166.056	-1076.277	-1292.886	
11	XFV11	P4	3.00	4726.195	1183.33	168.483	-127.3496	7564.763	5875.752	5520.753	7564.763	
12	XFV12	P4	3.00	3253.625	905.3964	4.516459	-221.8326	5352.984	4020.158	3748.539	5352.984	
13	XFV13	P4	3.00	2493.579	742.865	-138.2695	-323.9857	4180.878	2969.735	2746.876	4180.878	
14	XFV14	P4	3.00	6245.172	1810.113	200.6237	-251.9044	10390.39	8033.539	7490.505	10390.39	
15	XFV15	P4	3.00	3569.189	1112.702	13.67413	-264.5014	6063.351	4563.922	4230.111	6063.351	
16	XFV16	P4	3.00	3182.238	940.4911	-167.9034	-403.0262	5323.472	3791.12	3508.972	5323.472	
17	XFV17	P4	3.00	6414.945	1917.792	240.0432	-239.4048	10766.4	8362.853	7787.515	10766.4	
18	XFV18	P4	3.00	3179.437	939.7077	401.6824	166.7554	5318.856	4471.161	4189.249	5318.856	
19	XFV19	P4	3.00	3564.385	1111.138	264.2724	-13.51205	6055.082	4858.438	4525.097	6055.082	
20	XFV20	P4	3.00	6221.235	1803.667	251.5349	-199.3819	10351.35	8065.354	7524.253	10351.35	
21	XFV21	P4	3.00	2502.038	745.4096	323.6837	137.3313	4195.101	3534.746	3311.123	4195.101	
22	XFV22	P4	3.00	3240.81	901.9004	221.0331	-4.441976	5332.013	4264.249	3993.679	5332.013	
23	XFV23	P4	3.00	4717.02	1182.601	128.1912	-167.4592	7552.586	5818.269	5463.489	7552.586	
24	XFV24	P4	3.00	-674.9707	-299.045	87.86756	162.6288	-1288.437	-860.8865	-771.173	-1288.437	
25	XFV25	P4	3.00	1356.205	226.6953	57.09654	0.422717	1990.159	1561.135	1493.126	1990.159	
26	XFV26	P4	3.00	3627.106	766.5718	87.13797	-194.505	5579.042	4288.847	4058.876	5579.042	
27	XFV27	P4	3.00	-2056.908	-778.9021	-76.81452	117.911	-3714.533	-2878.078	-2644.407	-3714.533	
28	XFV28	P4	3.00	543.2034	-94.34792	-26.95777	-3.370793	500.8874	343.3162	371.6206	500.8874	
29	XFV29	P4	3.00	2928.938	507.2732	67.69389	-59.12442	4326.363	3326.005	3173.823	4326.363	
30	XFV30	P4	3.00	-1543.671	-656.4648	-119.5499	44.56627	-2902.749	-2320.521	-2123.582	-2902.749	
31	XFV31	P4	3.00	14.71368	-42.4177	-116.3131	-9.958651	-663.0119	-636.8346	-509.2093	-663.0119	
32	XFV32	P4	3.00	-3255.7	-1740.612	-402.4735	32.67954	-6691.819	-5501.833	-4979.649	-6691.819	
33	XFV33	P4	3.00	-13687.45	-5351.369	-1127.082	210.7602	-24987.13	-20092.85	-18487.44	-24987.13	

Tabel 4.24
Tabel Gaya Batang KK_XF

1. Batang Diagonal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XF1D1	P4	3.306373	3732.858	1801.051	-13.83864	-464.1013	7361.11	5504.226	4963.911	7361.11	
2	XF1D2	P4	3.493437	1096.146	786.9146	-40.25123	-236.9799	2574.438	1882.527	1646.453	2574.438	
3	XF1D3	P4	3.605551	885.935	522.1931	-53.4405	-183.9888	1898.631	1359.845	1203.187	1898.631	
4	XF1D4	P4	3.702553	1189.147	489.7514	-34.43574	-156.8736	2210.579	1616.611	1469.686	2210.579	
5	XF1D5	P4	3.75	1298.898	538.2237	-29.23184	-163.7878	2419.836	1779.799	1618.332	2419.836	
6	XF1D6	P4	3.798539	1111.12	376.4661	-25.22637	-119.3429	1935.69	1421.496	1308.556	1935.69	
7	XF1D7	P4	3.835635	1032.053	305.3194	-13.40624	-89.73608	1726.975	1279.144	1187.548	1726.975	
8	XF1D8	P4	3.879639	600.0679	179.6664	-3.775864	-48.69247	1007.548	751.1298	697.2299	1007.548	
9	XF1D9	P4	3.905125	-215.2857	-186.3849	-10.46593	36.1303	-556.5587	-429.9781	-374.0627	-556.5587	
10	XF1D10	P4	3.956817	-415.6162	-238.4987	-20.64337	38.98131	-880.3375	-685.0251	-613.4755	-880.3375	
11	XF1D11	P4	3.976443	-1503.938	-622.2614	-0.5209917	155.0443	-2800.344	-2100.884	-1914.205	-2800.344	
12	XF1D12	P4	2.00804	-1838.908	-766.2844	3.121666	194.6928	-3432.745	-2570.813	-2340.927	-3432.745	
13	XF1D13	P4	2.021392	-1877.367	-807.5098	-22.59756	179.2799	-3544.856	-2685.759	-2443.506	-3544.856	
14	XF1D14	P4	2.038234	-1603.014	-703.264	32.30075	208.1168	-3048.839	-2247.869	-2036.889	-3048.839	
15	XF1D15	P4	2.058665	-1388.081	-680.7033	91.71128	264.1596	-2769.367	-1966.972	-1760.033	-2769.367	
16	XF1D16	P4	2.075867	-2260.611	-1028.945	90.15659	347.3928	-4359.045	-3161.096	-2852.413	-4359.045	
17	XF1D17	P4	2.075867	-2254.751	-1025.447	-347.386	-91.02419	-4346.417	-3676.676	-3369.042	-4346.417	
18	XF1D18	P4	2.058665	-1393.207	-690.2751	-262.2721	-89.70336	-2776.288	-2396.943	-2189.86	-2776.288	
19	XF1D19	P4	2.038234	-1602.473	-702.0905	-207.7388	-32.21616	-3046.312	-2534.021	-2323.393	-3046.312	
20	XF1D20	P4	2.021392	-1850.806	-799.624	-178.7473	21.15875	-3500.366	-2839.771	-2599.884	-3500.366	
21	XF1D21	P4	2.00804	-1859.087	-771.1824	-194.2799	-1.484273	-3464.796	-2831.733	-2600.378	-3464.796	
22	XF1D22	P4	3.976443	-1491.658	-617.9783	-153.901	0.593566	-2778.755	-2268.748	-2083.354	-2778.755	
23	XF1D23	P4	3.956817	-407.1234	-237.3003	-39.917	19.40807	-868.2285	-699.9718	-627.8817	-868.2285	
24	XF1D24	P4	3.905125	-225.5351	-187.5485	-34.96601	11.92111	-570.7197	-469.999	-413.7345	-570.7197	
25	XF1D25	P4	3.879639	588.5157	175.4964	47.41973	3.545634	987.0131	797.1635	744.5145	987.0131	
26	XF1D26	P4	3.835635	1062.471	314.2493	91.39156	12.82923	1777.764	1442.993	1348.718	1777.764	
27	XF1D27	P4	3.798539	1070.493	365.2124	117.4768	26.17376	1868.932	1542.671	1433.107	1868.932	
28	XF1D28	P4	3.75	1319.547	543.8716	164.8801	28.91225	2453.65	2038.094	1874.933	2453.65	
29	XF1D29	P4	3.702553	1172.185	483.0146	155.1431	34.38948	2179.446	1820.756	1675.852	2179.446	
30	XF1D30	P4	3.605551	901.5829	525.3309	184.7779	53.44515	1922.429	1663.555	1505.956	1922.429	
31	XF1D31	P4	3.493437	1017.608	758.1876	230.1875	40.64057	2434.229	2101.897	1874.441	2434.229	
32	XF1D32	P4	3.306373	3812.522	1822.158	469.0699	13.53035	7490.48	6180.744	5634.097	7490.48	

Tabel 4.25
Tabel Gaya Batang KK_XF

1. Batang Bawah

NO	Batang	Profil	L (m)	N _d (KN)	N _i (KN)	N _{wka} (KN)	N _{wki} (KN)	N _{u1} (KN)	N _{u2} (KN)	N _{u3} (KN)	N _{u1+2+3} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XFB1	P4	3.404717	-15242.02	-6454.231	-517.8719	1095.686	-28617.19	-22084.34	-20148.07	-28617.19	
2	XFB2	P4	3.234826	-10928.26	-4383.951	-504.9171	591.0707	-20128.23	-15702.07	-14386.89	-20128.23	
3	XFB3	P4	3.162278	-9744.301	-3566.92	-529.4039	362.3262	-17400.23	-13685.46	-12615.38	-17400.23	
4	XFB4	P4	3.1127	-5946.966	-2504.715	-507.7965	118.3823	-11143.9	-8967.283	-8715.869	-11143.9	
5	XFB5	P4	3.092329	-8716.995	-2974.603	-591.678	151.9726	-15219.76	-12124.83	-11232.45	-15219.76	
6	XFB6	P4	3.073906	-7676.189	-2515.961	-612.5321	16.45815	-13236.96	-10662.76	-9907.974	-13236.96	
7	XFB7	P4	3.061388	-2985.68	-1295.56	-490.3173	-166.4274	-5655.711	-4830.164	-4441.496	-5655.711	
8	XFB8	P4	3.048213	-6189.177	-2036.475	-649.7338	-140.6149	-10685.37	-8793.711	-8182.768	-10685.37	
9	XFB9	P4	3.041381	-5788.092	-1892.061	-652.3917	-179.3764	-9973.008	-8262.626	-7695.008	-9973.008	
10	XFB10	P4	3.029257	-2527.134	-1152.099	-468.4599	-180.4352	-4875.919	-4219.091	-3873.461	-4875.919	
11	XFB11	P4	3.025244	-6456.093	-2253.838	-701.5535	-138.0941	-11353.45	-9356.953	-8680.802	-11353.45	
12	XFB12	P4	3.018095	-7662.335	-2720.498	-701.9957	-21.87118	-13547.6	-11003.09	-10186.94	-13547.6	
13	XFB13	P4	3.013984	-6621.439	-2700.937	-495.966	179.2682	-12267.23	-9795.578	-8985.297	-12267.23	
14	XFB14	P4	3.009585	-10837.96	-4047.234	781.819	229.9896	-19481.13	-15549.03	-14334.86	-19481.13	
15	XFB15	P4	3.005395	-12016.11	-4560.648	-759.0157	381.1464	-21716.37	-17198.1	-15829.9	-21716.37	
16	XFB16	P4	3.002815	-12590.11	-5048.493	-495.0613	767.0618	-23185.71	-17983.36	-16468.81	-23185.71	
17	XFB17	P4	3.002815	-12591.58	-5049.916	-765.1235	497.3554	-23189.76	-18310.47	-16795.5	-23189.76	
18	XFB18	P4	3.005395	-12015.87	-4562.214	-380.6192	759.9343	-21718.59	-16745.69	-15377.02	-21718.59	
19	XFB19	P4	3.009585	-10838.21	-4049.808	-229.7552	782.6967	-19485.55	-14889.87	-13674.92	-19485.55	
20	XFB20	P4	3.013984	-6638.967	-2708.535	-179.381	497.7527	-12300.42	-9440.569	-8628.009	-12300.42	
21	XFB21	P4	3.018095	-7666.275	-2724.879	21.41047	702.6301	-13559.34	-10143.81	-9326.346	-13559.34	
22	XFB22	P4	3.025244	-6468.756	-2261.397	136.7943	702.1436	-11380.74	-8371.403	-7592.984	-11380.74	
23	XFB23	P4	3.029257	-2543.476	-1159.442	179.9295	469.7899	-4907.277	-3464.543	-3116.71	-4907.277	
24	XFB24	P4	3.041381	-5798.912	-1899.874	177.7214	652.6898	-9998.492	-7285.604	-6715.642	-9998.492	
25	XFB25	P4	3.048213	-6191.146	-2041.204	139.9215	650.2225	-10695.3	-7853.371	-7241.21	-10695.3	
26	XFB26	P4	3.061388	-3010.085	-1306.294	164.5121	491.0855	-5702.172	-4079.215	-3687.326	-5702.172	
27	XFB27	P4	3.073906	-7672.378	-2520.691	-17.56295	612.6098	-13239.96	-9951.045	-9194.838	-13239.96	
28	XFB28	P4	3.092329	-8730.367	-2984.257	-154.0396	592.0248	-15251.25	-11623.29	-10728.01	-15251.25	
29	XFB29	P4	3.1127	-5951.225	-2510.346	-119.5996	507.9868	-11158.02	-8512.037	-7758.934	-11158.02	
30	XFB30	P4	3.162278	-9766.651	-3579.893	-365.2829	529.6904	-17447.81	-13524.2	-12450.23	-17447.81	
31	XFB31	P4	3.234826	-10878.76	-4370.853	-587.8468	504.8663	-20047.88	-15741.33	-14430.07	-20047.88	
32	XFB32	P4	3.404717	-15272.89	-6462.536	-1097.53	518.1035	-28667.53	-22817.68	-20878.92	-28667.53	

Tabel 4.22
Tabel Gaya Batang KK_XG

1. Batang Atas

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XGA1	P3	3.404717	-8255.935	-3029.453	164.2045	921.5677	-14754.25	-10868.64	-9959.804	-14754.25	
2	XGA2	P3	3.234826	-8619.916	-3228.003	187.4371	994.4379	-15508.7	-11406.6	-10438.2	-15508.7	
3	XGA3	P3	3.162278	-8462.76	-3246.166	207.3234	1018.865	-15349.18	-11263.09	-10289.25	-15349.18	
4	XGA4	P3	3.1127	-9372.085	-3650.738	217.265	1129.949	-17087.68	-12555.04	-11459.82	-17087.68	
5	XGA5	P3	3.092329	-10257.95	-4052.14	208.052	1221.087	-18792.96	-13845.06	-12629.42	-18792.96	
6	XGA6	P3	3.073906	-10761.93	-4291.338	189.5929	1262.427	-19780.45	-14607.83	-13320.43	-19780.45	
7	XGA7	P3	3.061388	-11067.44	-4451.951	162.4218	1275.41	-20404.05	-15108.13	-13772.54	-20404.05	
8	XGA8	P3	3.048213	-11408.56	-4630.019	114.3644	1271.869	-21098.3	-15686.49	-14297.48	-21098.3	
9	XGA9	P3	3.041381	-11290.97	-4620.138	65.61106	1220.646	-20941.39	-15627.31	-14241.26	-20941.39	
10	XGA10	P3	3.029257	-11055.38	-4581.96	17.95647	1163.447	-20597.6	-15426.65	-14052.06	-20597.6	
11	XGA11	P3	3.025244	-10546.54	-4445.971	-50.85632	1060.636	-19769.4	-14888.08	-13554.29	-19769.4	
12	XGA12	P3	3.018095	-9906.756	-4235.892	-123.1602	935.8127	-18665.53	-14146.94	-12876.17	-18665.53	
13	XGA13	P3	3.013984	-9292.23	-4025.242	-180.8803	825.4302	-17592.26	-13411.25	-12203.68	-17592.26	
14	XGA14	P3	3.009585	-8995.42	-3916.665	-260.6709	718.4953	-17061.17	-13108.68	-11933.68	-17061.17	
15	XGA15	P3	3.005395	-8861.474	-3841.665	-352.6557	607.7695	-15780.43	-13008.51	-11856.01	-16780.43	
16	XGA16	P3	3.002815	-8290.932	-3558.333	-427.2986	462.2849	-15642.45	-12244.6	-11177.1	-15642.45	
17	XGA17	P3	3.002815	-8291.935	-3554.95	-461.7443	426.9933	-15638.24	-12282.77	-11216.29	-15638.24	
18	XGA18	P3	3.005395	-8856.834	-3841.503	-607.8854	352.4904	-16774.61	-13310.42	-12157.97	-16774.61	
19	XGA19	P3	3.009585	-8990.35	-3916.579	-718.1396	261.0052	-17054.95	-13652.98	-12478	-17054.95	
20	XGA20	P3	3.013984	-9286.199	-4023.699	-824.8171	181.1077	-17581.36	-14175.8	-12968.69	-17581.36	
21	XGA21	P3	3.018095	-9891.111	-4232.685	-935.2214	122.9497	-18641.63	-15103.49	-13833.68	-18641.63	
22	XGA22	P3	3.025244	-10537.33	-4443.787	-1059.846	51.10106	-19754.86	-16087.96	-14754.82	-19754.86	
23	XGA23	P3	3.029257	-11040.61	-4579.065	-1162.585	-17.8189	-20575.23	-16826.53	-15452.81	-20575.23	
24	XGA24	P3	3.041381	-11273.44	-4617.268	-1220.081	-65.76386	-20915.76	-17150.92	-15765.74	-20915.76	
25	XGA25	P3	3.048213	-11394.16	-4626.985	-1270.881	-114.1351	-21076.16	-17332.18	-15944.08	-21076.16	
26	XGA26	P3	3.061388	-11053.85	-4450.495	-1274.964	-162.3403	-20385.41	-16819.02	-15483.87	-20385.41	
27	XGA27	P3	3.073906	-10743.48	-4288.885	-1261.815	-189.5936	-19754.39	-16329.97	-15043.31	-19754.39	
28	XGA28	P3	3.092329	-10249.89	-4053.311	-1221.143	-207.8156	-18785.17	-15554.25	-14338.26	-18785.17	
29	XGA29	P3	3.1127	-9367.496	-3657.163	-1131.42	-217.1292	-17092.46	-14177.05	-13079.9	-17092.46	
30	XGA30	P3	3.162278	-8457.262	-3258.787	-1021.676	-206.9792	-15362.77	-12748.09	-11770.46	-15362.77	
31	XGA31	P3	3.234826	-8661.516	-3259.109	-1002.323	-187.5452	-15608.39	-12909.08	-11931.35	-15608.39	
32	XGA32	P3	3.404717	-8255.024	-3028.963	-920.6277	-163.3869	-14752.37	-12169.03	-11260.34	-14752.37	

Tabel Gaya Batang KK_XG

2. Batang Vertikal

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XGV1	P4	3.00	-13792.58	-5386.604	-210.3096	1136.341	-25169.66	-19129.62	-17513.64	-25169.66	
2	XGV2	P4	3.00	-3185.364	-1723.671	-32.3669	398.5507	-6580.309	-4974.072	-4456.971	-6580.309	
3	XGV3	P4	3.00	-48.94312	-449.7492	9.512145	121.9494	-778.3304	-572.3333	-437.4085	-778.3304	
4	XGV4	P4	3.00	-1519.527	-649.8229	-44.84416	117.6116	-2863.15	-2201.175	-2006.228	-2863.15	
5	XGV5	P4	3.00	2921.315	502.7244	59.11078	-66.57032	4309.937	3303.386	3152.568	4309.937	
6	XGV6	P4	3.00	565.4758	-88.68475	3.352791	25.52398	536.6754	406.5299	433.1353	536.6754	
7	XGV7	P4	3.00	-2084.094	-786.5411	-118.5983	78.03694	-3759.379	-2961.852	-2725.89	-3759.379	
8	XGV8	P4	3.00	3655.02	773.655	104.8309	-88.5829	5623.872	4343.701	4111.604	5623.872	
9	XGV9	P4	3.00	1350.241	223.6188	-0.2108039	-56.11551	1978.08	1483.307	1416.221	1978.08	
10	XGV10	P4	3.00	-678.3901	-299.2612	-163.6594	-88.84414	-1292.886	-1166.056	-1076.277	-1292.886	
11	XGV11	P4	3.00	4726.195	1183.33	168.483	-127.3496	7564.763	5875.752	5520.753	7564.763	
12	XGV12	P4	3.00	3253.625	905.3964	4.516459	-221.8326	5352.984	4020.158	3748.539	5352.984	
13	XGV13	P4	3.00	2493.579	742.865	-138.2695	-323.9857	4180.878	2969.735	2746.876	4180.878	
14	XGV14	P4	3.00	6245.172	1810.113	200.6237	-251.9044	10390.39	8033.539	7490.505	10390.39	
15	XGV15	P4	3.00	3569.189	1112.702	13.67413	-264.5014	6063.351	4563.922	4230.111	6063.351	
16	XGV16	P4	3.00	3182.238	940.4911	-167.9034	-403.0262	5323.472	3791.12	3508.972	5323.472	
17	XGV17	P4	3.00	6414.945	1917.792	240.0432	-239.4048	10766.4	8362.853	7787.515	10766.4	
18	XGV18	P4	3.00	3179.437	939.7077	401.6824	166.7554	5318.856	4471.161	4189.249	5318.856	
19	XGV19	P4	3.00	3564.385	1111.138	264.2724	-13.51205	6055.082	4858.438	4525.097	6055.082	
20	XGV20	P4	3.00	6221.235	1803.667	251.5349	-199.3819	10351.35	8065.354	7524.253	10351.35	
21	XGV21	P4	3.00	2502.038	745.4096	323.6837	137.3313	4195.101	3534.746	3311.123	4195.101	
22	XGV22	P4	3.00	3240.81	901.9004	221.0331	-4.441976	5332.013	4264.249	3993.679	5332.013	
23	XGV23	P4	3.00	4717.02	1182.601	128.1912	-167.4592	7552.586	5818.269	5463.489	7552.586	
24	XGV24	P4	3.00	-674.9707	-299.045	87.86756	162.6288	-1288.437	-860.8865	-771.173	-1288.437	
25	XGV25	P4	3.00	1356.205	226.6953	57.09654	0.422717	1990.159	1561.135	1493.126	1990.159	
26	XGV26	P4	3.00	3627.106	766.5718	87.13797	-104.505	5579.042	4288.847	4058.876	5579.042	
27	XGV27	P4	3.00	-2056.908	-778.9021	-76.81452	117.911	-3714.533	-2878.078	-2644.407	-3714.533	
28	XGV28	P4	3.00	543.2034	-94.34792	-26.95777	-3.370793	500.8874	343.3162	371.6206	500.8874	
29	XGV29	P4	3.00	2928.938	507.2732	67.69389	-59.12442	4326.363	3326.005	3173.823	4326.363	
30	XGV30	P4	3.00	-1543.671	-656.4648	-119.5499	44.56627	-2902.749	-2320.521	-2123.582	-2902.749	
31	XGV31	P4	3.00	14.71368	-425.4177	-116.3131	-9.958651	-663.0119	-636.8346	-509.2093	-663.0119	
32	XGV32	P4	3.00	-3255.7	-1740.612	-402.4735	32.67954	-6691.819	-5501.833	-4979.649	-6691.819	
33	XGV33	P4	3.00	-13687.45	-5351.369	-1127.082	210.7602	-24987.13	-20092.85	-18487.44	-24987.13	

Tabel Gaya Batang KK_XG

1. Batang Diagonal

NO	Batang	Profil	L (m)	N _D (KN)	N _I (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XGD1	P4	3.306373	3732.858	1801.051	-13.83864	-464.1013	7361.11	5504.226	4963.911	7361.11	
2	XGD2	P4	3.493437	1096.146	786.9146	-40.25123	-236.9799	2574.438	1882.527	1646.453	2574.438	
3	XGD3	P4	3.605551	885.935	522.1931	-53.4405	-183.9888	1898.631	1359.845	1203.187	1898.631	
4	XGD4	P4	3.702553	1189.147	489.7514	-34.43574	-156.8736	2210.579	1616.611	1469.686	2210.579	
5	XGD5	P4	3.75	1298.898	538.2237	-29.23184	-163.7878	2419.836	1779.799	1618.332	2419.836	
6	XGD6	P4	3.798539	1111.12	376.4661	-25.22637	-119.3429	1935.69	1421.496	1308.536	1935.69	
7	XGD7	P4	3.835635	1032.053	305.3194	-13.40624	-89.73608	1726.975	1279.144	1187.548	1726.975	
8	XGD8	P4	3.879639	600.0679	179.6664	-3.775864	-48.69247	1007.548	751.1298	697.2299	1007.548	
9	XGD9	P4	3.905125	-215.2857	-186.3849	-10.46593	36.1303	-556.5587	-429.9781	-374.0627	-556.5587	
10	XGD10	P4	3.956817	-415.6162	-238.4987	-20.64337	38.98131	-880.3375	-685.0251	-613.4755	-880.3375	
11	XGD11	P4	3.976443	-1503.938	-622.2614	-0.5209917	155.0443	-2800.344	-2100.884	-1914.205	-2800.344	
12	XGD12	P4	2.00804	-1838.908	-766.2844	3.121666	194.6928	-3432.745	-2570.813	-2340.927	-3432.745	
13	XGD13	P4	2.021392	-1877.367	-807.5098	-22.59756	179.2799	-3544.856	-2685.759	-2443.506	-3544.856	
14	XGD14	P4	2.038234	-1603.014	-703.264	32.30075	208.1168	-3048.839	-2247.869	-2036.889	-3048.839	
15	XGD15	P4	2.058665	-1388.081	-689.7933	91.71128	264.1596	-2769.367	1966.972	-1760.033	-2769.367	
16	XGD16	P4	2.075867	-2260.611	-1028.945	90.15659	347.3928	-4359.045	-3161.096	-2852.413	-4359.045	
17	XGD17	P4	2.075867	-2254.751	-1025.447	-347.386	-91.02419	-4346.417	-3676.676	-3369.042	-4346.417	
18	XGD18	P4	2.058665	-1393.207	-690.2751	-262.2721	-89.70336	-2776.288	-2396.943	-2189.86	-2776.288	
19	XGD19	P4	2.038234	-1602.473	-702.0905	-207.7388	-32.21616	-3046.312	-2534.021	-2323.393	-3046.312	
20	XGD20	P4	2.021392	-1850.806	-799.624	-178.7473	21.15875	-3500.366	-2839.771	-2599.884	-3500.366	
21	XGD21	P4	2.00804	-1859.087	-771.1824	-194.2799	-1.484273	-3464.796	-2831.733	-2600.378	-3464.796	
22	XGD22	P4	3.976443	-1491.658	-617.9783	-153.901	0.593566	-2778.755	-2268.748	-2083.354	-2778.755	
23	XGD23	P4	3.956817	-407.1234	-237.3003	-39.917	19.40807	-868.2285	-699.0718	-627.8817	-868.2285	
24	XGD24	P4	3.905125	-225.5351	-187.5485	-34.96601	11.9211	-570.7197	-469.999	-413.7345	-570.7197	
25	XGD25	P4	3.879639	588.5157	175.4964	47.41973	3.545634	987.0131	797.1635	744.5145	987.0131	
26	XGD26	P4	3.835635	1062.471	314.2493	91.39156	12.82923	1777.764	1442.993	1348.718	1777.764	
27	XGD27	P4	3.798539	1070.493	365.2124	117.4768	26.17376	1868.932	1542.671	1433.107	1868.932	
28	XGD28	P4	3.75	1319.547	543.8716	164.8801	28.91225	2453.65	2038.094	1874.933	2453.65	
29	XGD29	P4	3.702553	1172.185	483.0146	155.1431	34.38948	2179.446	1820.756	1675.852	2179.446	
30	XGD30	P4	3.605551	901.5829	525.3309	184.7779	53.44515	1922.429	1663.555	1505.956	1922.429	
31	XGD31	P4	3.493437	1017.608	758.1876	230.1875	40.64057	2434.229	2101.897	1874.441	2434.229	
32	XGD32	P4	3.306373	3812.522	1822.158	469.0699	13.53035	7490.48	6180.744	5634.097	7490.48	

Tabel 4.25
Tabel Gaya Batang KK_XG

1. Batang Bawah

NO	Batang	Profil	L (m)	N _d (KN)	N _i (KN)	N _{wKA} (KN)	N _{wKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XGB1	P4	3.404717	-15242.02	-6454.231	-517.8719	1095.686	-28617.19	-22084.34	-20148.07	-28617.19	
2	XGB2	P4	3.234826	-10928.26	-4383.951	-304.9171	591.0707	-20128.23	-15702.07	-14386.89	-20128.23	
3	XGB3	P4	3.162278	-9744.301	-3566.92	-529.4039	362.3262	-17400.23	-13685.46	-12615.38	-17400.23	
4	XGB4	P4	3.1127	-5946.966	-2504.715	-507.7965	118.3823	-11143.9	-8967.283	-8215.869	-11143.9	
5	XGB5	P4	3.092329	-8716.995	-2974.603	-591.678	151.9726	-15219.76	-12124.83	-11232.45	-15219.76	
6	XGB6	P4	3.073906	-7676.189	-2515.961	-612.5321	16.45815	-13236.96	-10662.76	-9907.974	-13236.96	
7	XGB7	P4	3.061388	-2985.68	-1295.56	-450.3173	-166.4274	-5655.711	-4830.164	-4441.496	-5655.711	
8	XGB8	P4	3.048213	-6189.177	-2036.475	-649.7338	-140.6149	-10685.37	-8793.711	-8182.768	-10685.37	
9	XGB9	P4	3.041381	-5788.092	-1892.061	-652.3917	-179.3764	-9973.008	-8262.626	-7695.008	-9973.008	
10	XGB10	P4	3.029257	-2527.134	-1152.099	-468.4599	-180.4352	-4875.919	-4219.091	-3873.461	-4875.919	
11	XGB11	P4	3.025244	-6456.093	-2253.838	-701.5535	-138.0941	-11353.45	-9356.953	-8680.802	-11353.45	
12	XGB12	P4	3.018095	-7662.335	-2720.498	-701.9957	-21.87118	-13547.6	-11003.09	-10186.94	-13547.6	
13	XGB13	P4	3.013984	-6621.439	-2700.937	-495.966	179.2882	-12267.23	-9795.578	-8985.297	-12267.23	
14	XGB14	P4	3.009585	-10837.96	-4047.234	-781.819	229.9896	-1931.13	-15549.03	-14334.86	-19481.13	
15	XGB15	P4	3.005395	-12016.11	-4560.648	-759.0157	381.1464	-21716.37	-17198.1	-15829.9	-21716.37	
16	XGB16	P4	3.002815	-12590.11	-5048.493	-495.0613	767.0618	-23185.71	-17983.36	-16468.81	-23185.71	
17	XGB17	P4	3.002815	-12591.58	-5049.916	-765.1235	497.3554	-23189.76	-18310.47	-16795.5	-23189.76	
18	XGB18	P4	3.005395	-12015.87	-4562.214	-380.6192	759.9343	-21718.59	-16745.69	-15377.02	-21718.59	
19	XGB19	P4	3.009585	-10838.21	-4049.808	-229.7552	782.6967	-19485.55	-14889.87	-13674.92	-19485.55	
20	XGB20	P4	3.013984	-6638.967	-2708.535	-179.381	497.7527	-12300.42	-9440.569	-8628.009	-12300.42	
21	XGB21	P4	3.018095	-7666.275	-2724.879	21.41047	702.6301	-13559.34	-10143.81	-9326.346	-13559.34	
22	XGB22	P4	3.025244	-6468.756	-2261.397	136.7943	702.1436	-11380.74	-8371.403	-7692.984	-11380.74	
23	XGB23	P4	3.029257	-2543.476	-1159.442	179.9295	469.7899	-4907.277	-3464.543	-3116.71	-4907.277	
24	XGB24	P4	3.041381	-5798.912	-1899.874	177.7214	652.6898	-9998.492	-7285.604	-6715.642	-9998.492	
25	XGB25	P4	3.048213	-6191.146	-2041.204	139.9215	650.2225	-10695.3	-7853.571	-7241.21	-10695.3	
26	XGB26	P4	3.061388	-3010.085	-1306.294	164.5121	491.0855	-5702.172	-4079.215	-3687.326	-5702.172	
27	XGB27	P4	3.073906	-7672.378	-2520.691	-17.56295	612.6098	-13239.96	-9951.045	-9194.838	-13239.96	
28	XGB28	P4	3.092329	-8730.367	-2984.257	-154.0396	592.0248	-15251.25	-11623.29	-10728.01	-15251.25	
29	XGB29	P4	3.1127	-5951.225	-2510.346	-119.5996	507.9868	-11158.02	-8512.037	-7758.934	-11158.02	
30	XGB30	P4	3.162278	-9766.651	-3579.893	-365.2829	529.6904	-17447.81	-13524.2	-12450.23	-17447.81	
31	XGB31	P4	3.234826	-10878.76	-4370.853	-587.8468	504.8663	-20047.88	-15741.33	-14430.07	-20047.88	
32	XGB32	P4	3.404717	-13272.89	-6462.536	-1097.53	518.1035	-28667.53	-22817.68	-20878.92	-28667.53	

Tabel Gaya Batang KK_XH

1. Batang ATAS

NO	Batang	Profil	L (m)	N _D (KN)	N _I (KN)	N _{WKA} (KN)	N _{KI} (KN)	N _{UI} (KN)	N _{I2} (KN)	N _{U2} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XHA1	P3	3.306373	-6339.494	-2396.531	55.59965	654.7324	-11441.84	-8514.662	-7795.703	-11441.84	
2	XHA2	P3	3.175153	-6793.639	-2669.683	53.53749	720.9583	-12423.86	-9253.65	-8452.745	-12423.86	
3	XHA3	P3	3.132092	-6828.512	-2796.489	60.83782	759.96	-12668.6	-9428.441	-8589.495	-12668.6	
4	XHA4	P3	3.099742	-6939.15	-2947.476	70.46816	807.3372	-13042.94	-9697.646	-8813.402	-13042.94	
5	XHA5	P3	3.076102	-6961.26	-3006.093	65.4754	816.9985	-13163.26	-9793.875	-8892.047	-13163.26	
6	XHA6	P3	3.057466	-6692.903	-2986.298	45.55101	792.1256	-12809.56	-9552.51	-8656.62	-12809.56	
7	XHA7	P3	3.046457	-5878.442	-2756.949	30.3301	719.5675	-11465.25	-8562.541	-7735.456	-11465.25	
8	XHA8	P3	3.033562	-5068.235	-2516.788	3.692038	632.889	-10108.74	-7577.126	-6822.09	-10108.74	
9	XHA9	P3	3.026549	-3890.624	-2148.212	-32.22487	504.8281	-8105.888	-6118.085	-5473.622	-8105.888	
10	XHA10	P3	3.017018	-2652.493	-1743.742	-57.85635	378.079	-5972.979	-4549.162	-4026.039	-5972.979	
11	XHA11	P3	3.015984	-1986.428	-1498.228	-87.03205	287.5251	-4780.879	-3690.098	-3240.629	-4780.879	
12	XHA12	P3	3.008056	-2222.47	-1560.524	-126.0706	264.0603	-5163.802	-4024.136	-3555.979	-5163.802	
13	XHA13	P3	3.003748	-2689.996	-1689.874	-159.6227	262.8458	-5931.794	-4640.393	-4133.431	-5931.794	
14	XHA14	P3	3.001666	-2766.56	-1657.914	-198.539	215.9396	-5972.536	-4717.648	-4220.274	-5972.536	
15	XHA15	P3	3.001666	-2766.327	-1656.268	-215.7913	198.2757	-5969.621	-4736.165	-4239.285	-5969.621	
16	XHA16	P3	3.003748	-2687.583	-1690.002	-263.1433	159.3572	-5929.104	-4762.6	-4255.599	-5929.104	
17	XHA17	P3	3.008056	-2219.52	-1560.414	-263.7998	126.3037	-5160.086	-4186.625	-3718.5	-5160.086	
18	XHA18	P3	3.013984	-1981.533	-1496.956	-287.2523	86.98655	-4772.968	-3924.429	-3475.242	-4772.968	
19	XHA19	P3	3.017018	-2639.579	-1740.475	-377.3875	57.73138	-5952.255	-4917.057	-4394.914	-5952.255	
20	XHA20	P3	3.026549	-3884.031	-2147.338	-504.4919	32.34251	-8096.577	-6677.823	-6033.622	-8096.577	
21	XHA21	P3	3.033562	-5057.07	-2514.661	-632.2719	-3.606599	-10091.94	-8327.683	-7573.284	-10091.94	
22	XHA22	P3	3.046457	-5864.723	-2754.558	-719.1914	-30.55181	-11444.96	-9446.751	-8620.383	-11444.96	
23	XHA23	P3	3.057466	-6682.725	-2984.867	-791.6204	-45.40356	-12795.06	-10546.24	-9650.777	-12795.06	
24	XHA24	P3	3.076102	-6949.133	-3005.464	-816.8785	-65.51256	-13147.7	-10841.03	-9939.392	-13147.7	
25	XHA25	P3	3.099742	-6929.282	-2947.783	-807.4618	-70.51589	-13031.59	-10742.65	-9858.313	-13031.59	
26	XHA26	P3	3.132092	-6818.637	-2798.154	-760.2333	-60.69482	-12659.41	-10406.84	-9567.393	-12659.41	
27	XHA27	P3	3.175153	-6795.913	-2676.833	-722.6829	-53.47469	-12438.03	-10195.74	-9392.691	-12438.03	
28	XHA28	P3	3.306373	-6326.063	-2393.439	-653.4899	-55.13029	-11420.78	-9349.771	-8631.739	-11420.78	

Tabel Gaya Batang KK_XH

1. Batang Vertikal

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
1	XHV1	P4	3.00	-5249.726	-2112.572	-195.3662	332.7768	-9679.786	-7494.279	-6860.508	-9679.786	
2	XHV2	P5	3.00	-1816.305	-770.7209	-34.84227	157.838	-3412.72	-2601.351	-2370.134	-3412.72	
3	XHV3	P6	3.00	1180.783	145.1559	38.07476	1.785797	1649.189	1282.582	1239.035	1649.189	
4	XHV4	P7	3.00	905.7786	299.6735	27.4677	-47.45068	1566.412	1207.77	1117.868	1566.412	
5	XHV5	P8	3.00	-912.2824	-152.4916	-74.33545	-36.21256	-1338.725	-1093.247	-1047.499	-1338.725	
6	XHV6	P9	3.00	3767.947	1246.731	110.5865	-201.0963	6516.306	5019.933	4645.914	6516.306	
7	XHV7	P10	3.00	2507.585	955.3203	31.73645	-207.0936	4537.615	3441.295	3154.699	4537.615	
8	XHV8	P11	3.00	983.1934	602.0413	-121.7735	-272.2838	2143.098	1461.195	1280.583	2143.098	
9	XHV9	P12	3.00	5938.215	2050.691	191.8389	-320.8339	10406.96	8035.43	7420.223	10406.96	
10	XHV10	P13	3.00	5511.889	2069.872	79.60779	-437.8603	9926.063	7540.076	6919.115	9926.063	
11	XHV11	P14	3.00	5458.198	2105.733	-62.14759	-588.5807	9919.01	7364.681	6732.961	9919.01	
12	XHV12	P15	3.00	7862.004	2831.412	264.1393	-443.7137	13964.66	10790.46	9941.041	13964.66	
13	XHV13	P16	3.00	4217.189	1708.441	113.7663	-313.344	7794.132	5982.119	5169.586	7794.132	
14	XHV14	P17	3.00	3106.727	1239.417	-109.6188	-419.4732	5711.14	4151.812	3779.987	5711.14	
15	XHV15	P18	3.00	6109.245	2125.026	265.8824	-265.374	10731.13	8367.41	7729.902	10731.13	
16	XHV16	P19	3.00	3104.187	1238.256	418.0836	108.5196	5706.234	4781.376	4409.899	5706.234	
17	XHV17	P20	3.00	4213.559	1706.956	313.3663	-113.3727	7787.401	6216.59	5704.503	7787.401	
18	XHV18	P21	3.00	7844.082	2826.39	442.4119	-264.1856	13935.12	10982.24	10134.32	13935.12	
19	XHV19	P22	3.00	5461.933	2106.782	588.4328	61.73735	9925.17	8149.997	7517.962	9925.17	
20	XHV20	P23	3.00	5500.762	2067.088	437.1009	-79.67109	9908.255	7955.712	7335.586	9908.255	
21	XHV21	P24	3.00	5932.55	2049.818	321.3294	-191.125	10398.77	8184.671	7569.726	10398.77	
22	XHV22	P25	3.00	990.8025	604.0186	271.9907	120.986	2155.393	1942.933	1761.728	2155.393	
23	XHV23	P26	3.00	2512.437	958.2955	208.1379	-31.43593	4548.197	3660.913	3373.424	4548.197	
24	XHV24	P27	3.00	3756.226	1242.655	200.2341	-110.4296	6495.719	5112.07	4739.274	6495.719	
25	XHV25	P28	3.00	-889.4828	-144.4178	37.70145	73.80589	-1298.448	-928.5941	-885.2688	-1298.448	
26	XHV26	P29	3.00	889.8914	295.5442	46.96159	-26.92446	1540.74	1211.909	1123.246	1540.74	
27	XHV27	P30	3.00	1211.419	154.6919	-0.2048991	-38.87787	1701.209	1275.661	1229.254	1701.209	
28	XHV28	P31	3.00	-1849.317	-775.7546	-158.2637	35.67489	-3460.388	-2785.208	-2552.481	-3460.388	
29	XHV29	P32	3.00	-5212.814	-2103.86	-330.6742	195.2908	-9621.554	-7612.974	-6981.816	-9621.554	

Tabel Gaya Batang KK_XH

3. Batang Diagonal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKE} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XHD1	P4	3.404717	795.5746	797.6274	-16.16959	-215.5764	2230.894	1653.767	1414.478	2230.894	
2	XHD2	P4	3.383518	2378.982	1170.694	12.09745	-280.576	4727.888	3560.433	3209.225	4727.888	
3	XHD3	P4	3.661967	863.1885	544.7665	-16.07197	-152.2636	1907.453	1411.303	1247.873	1907.453	
4	XHD4	P4	3.732077	128.8783	196.4388	-27.94652	-77.05624	468.9561	318.1812	259.2496	468.9561	
5	XHD5	P4	3.792413	373.6995	121.9895	-5.985683	-36.48307	643.6227	475.3342	438.9373	643.6227	
6	XHD6	P4	3.84813	-833.6553	-240.0765	-20.51996	39.49915	-1384.509	-1063.005	-990.9826	-1384.509	
7	XHD7	P4	3.885988	-1654.261	-627.8135	-37.38258	119.5708	-2989.615	-2287.071	-2098.726	-2989.615	
8	XHD8	P4	3.937321	-1997.822	-780.7398	-33.64344	161.5415	-3646.57	-2775.3	-2541.078	-3646.57	
9	XHD9	P4	3.969887	-3407.153	-1255.757	-64.68639	249.2528	-6097.794	-4650.97	-4274.243	-6097.794	
10	XHD10	P4	2.011368	-3501.179	-1287.636	-82.16471	239.7443	-6261.633	-4794.822	-4408.531	-6261.633	
11	XHD11	P4	2.021392	-2076.684	-861.3051	-65.37251	149.9538	-3870.109	-2981.029	-2722.637	-3870.109	
12	XHD12	P4	2.045018	-504.7298	-283.5004	-38.1274	32.74771	-1059.276	-840.2102	-755.1601	-1059.276	
13	XHD13	P4	2.068967	95.78681	-114.9921	-6.794296	21.95372	-69.04314	-59.93551	-25.43789	-69.04314	
14	XHD14	P4	2.086265	-511.2265	-341.2112	41.01679	126.3196	-1159.41	-820.3371	-717.9738	-1159.41	
15	XHD15	P4	2.086265	-508.3334	-338.7435	-126.4423	-41.75637	-1151.99	-1015.723	-914.0999	-1151.99	
16	XHD16	P4	2.068967	93.93819	-114.858	-20.25275	8.461743	-71.0229	-77.57047	-43.11308	-71.0229	
17	XHD17	P4	2.045018	-504.8678	-282.7816	-33.25043	37.44498	-1058.292	-833.6195	-748.785	-1058.292	
18	XHD18	P4	2.021392	-2054.196	-854.2117	-148.3453	65.2076	-3831.774	-3051.845	-2795.581	-3831.774	
19	XHD19	P4	2.011368	-3517.386	-1292.167	-239.8422	83.19955	-6288.33	-5004.058	-4616.408	-6288.33	
20	XHD20	P4	3.969887	-3395.45	-1252.526	-248.2484	64.88321	-6078.583	-4856.835	-4481.077	-6078.583	
21	XHD21	P4	3.937321	-1990.724	-779.1641	-162.1638	32.62718	-3635.531	-2921.245	-2687.496	-3635.531	
22	XHD22	P4	3.885988	-1667.92	-631.418	-119.1778	38.67669	-3011.773	-2401.843	-2212.418	-3011.773	
23	XHD23	P4	3.84813	-838.7252	-243.6244	-40.728	20.17809	-1396.269	-1096.075	-1022.988	-1396.269	
24	XHD24	P4	3.792413	383.9533	126.0291	37.11981	5.612529	662.3905	541.3367	503.5279	662.3905	
25	XHD25	P4	3.732077	101.9813	186.5589	75.50346	28.86372	420.8719	406.2581	350.2904	420.8719	
26	XHD26	P4	3.661967	878.7758	548.437	152.4826	15.37333	1932.03	1632.002	1467.47	1932.03	
27	XHD27	P4	3.583518	2346.71	1161.35	279.2402	-11.0973	4674.212	3840.748	3492.343	4674.212	
28	XHD28	P4	3.404717	840.2932	805.9492	216.9346	15.4473	2297.87	1983.724	1741.94	2297.87	

Tabel Gaya Batang KK_XH

4. Batang Bawah

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XHB1	P4	3.306373	-7589.958	-3334.426	-415.5348	418.0718	-14443.03	-11330.92	-10330.59	-14443.03	
2	XHB2	P4	3.175153	-1673.709	-964.9943	-332.3143	-91.06576	-3552.442	-3063.108	-2773.61	-3552.442	
3	XHB3	P4	3.132092	-5615.322	-2008.003	-418.149	83.85181	-9951.192	-7965.173	-7362.772	-9951.192	
4	XHB4	P4	3.099742	-4885.437	-1523.016	-427.7644	-47.01032	-8299.351	-6737.831	-6280.925	-8299.351	
5	XHB5	P4	3.076102	-745.0324	-233.3254	-285.0044	-226.673	-1267.359	-1292.525	-1222.527	-1267.359	
6	XHB6	P4	3.057466	-4249.321	-1222.06	-456.5482	-151.0333	-7054.481	-5838.719	-5472.101	-7054.481	
7	XHB7	P4	3.046457	-4981.208	-1412.773	-472.8643	-119.6709	-8237.887	-6745.853	-6322.021	-8237.887	
8	XHB8	P4	3.033562	-2900.137	-941.7678	-262.9745	-27.53252	-4986.993	-4055.814	-3773.284	-4986.993	
9	XHB9	P4	3.026549	-7804.72	-2504.345	-554.727	71.35931	-13372.62	-10695.13	-9943.831	-13372.62	
10	XHB10	P4	3.017018	-10449.33	-3452.569	-605.3506	257.7917	-18063.3	-14273.9	-13238.13	-18063.3	
11	XHB11	P4	3.013984	-9846.39	-3464.761	-347.8317	518.3585	-17359.29	-13436.86	-12397.43	-17359.29	
12	XHB12	P4	3.008056	-13107.79	-4639.796	-567.7691	592.1799	-23153.02	-18046.09	-16654.15	-23153.02	
13	XHB13	P4	3.003748	-13472.02	-4842.789	-598.7197	611.9775	-23914.89	-18654.63	-17201.79	-23914.89	
14	XHB14	P4	3.001666	-12166.21	-4552.188	-197.6592	940.3878	-21882.96	-16649.41	-15283.75	-21882.96	
15	XHB15	P4	3.001666	-12161.1	-4551.202	-938.7448	199.0558	-21875.25	-17332.93	-16167.57	-21875.25	
16	XHB16	P4	3.003748	-13468.99	-4843.871	-611.7151	599.2526	-23912.98	-18668.79	-17215.63	-23912.98	
17	XHB17	P4	3.008056	-13104.4	-4641.423	-591.5409	568.815	-23151.56	-18073.52	-16681.09	-23151.56	
18	XHB18	P4	3.013984	-9859.015	-3471.306	-518.9351	348.8914	-17384.91	-13661.4	-12620.01	-17384.91	
19	XHB19	P4	3.017018	-10452.67	-3457.337	-258.3854	605.9488	-18074.94	-13866.27	-12829.07	-18074.94	
20	XHB20	P4	3.026549	-7815.853	-2511.324	-72.65727	555.1737	-13397.14	-10135.04	-9381.647	-13397.14	
21	XHB21	P4	3.033562	-2913.332	-948.6277	26.62159	263.7785	-5013.803	-3728.406	-3443.818	-5013.803	
22	XHB22	P4	3.046457	-4986.703	-1418.555	118.3389	472.9777	-8253.732	-6048.292	-5622.726	-8253.732	
23	XHB23	P4	3.057466	-4250.884	-1225.253	150.6262	456.9393	-7061.465	-5115.348	-4747.772	-7061.465	
24	XHB24	P4	3.076102	-756.9371	-240.1968	225.3658	285.415	-1292.639	-699.0405	-626.9814	-1292.639	
25	XHB25	P4	3.099742	-4875.37	-1522.832	46.97519	427.6831	-8286.975	-6158.861	-5702.011	-8286.975	
26	XHB26	P4	3.132092	-5619.097	-2011.233	-84.14118	418.6671	-9960.89	-7571.636	-6968.267	-9960.89	
27	XHB27	P4	3.175153	-1650.576	-960.9888	91.57284	331.82	-3518.273	-2528.818	-2240.521	-3518.273	
28	XHB28	P4	3.306373	-7601.168	-3336.263	-418.2299	415.8358	-14459.42	-11346.44	-10345.56	-14459.42	

TABEL 4.50

Tabel Gaya Batang KK_XI

1. Batang Atas

NO	Batang	Profil	l (m)	N_D (KN)	N_L (KN)	N_{WKA} (KN)	N_{WKI} (KN)	N_{U1} (KN)	N_{U2} (KN)	N_{U3} (KN)	N_{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XIA1	P3	3.223725	-4784.253	-1809.82	22.1346	474.5895	-8636.815	-6451.05	-5908.104	-8636.815	
2	XIA2	P3	3.162278	-4222.406	-1809.412	23.23869	475.5916	-7961.946	-5943.573	-5400.75	-7961.946	
3	XIA3	P3	3.118092	-4545.875	-2026.971	39.22094	545.9637	-8698.204	-6476.588	-5868.497	-8698.204	
4	XIA4	P3	3.085191	-4531.956	-2087.011	42.048	563.8009	-8777.565	-6532.717	-5906.613	-8777.565	
5	XIA5	P3	3.065436	-4090.229	-2009.154	32.74375	535.0323	-8122.921	-6052.898	-5450.152	-8122.921	
6	XIA6	P3	3.05	-2908.099	-1667.159	33.24659	450.0363	-6157.173	-4577.983	-4077.836	-6157.173	
7	XIA7	P3	3.036593	-1734.973	-1304.359	15.76577	341.8555	-4168.941	-3107.787	-2716.48	-4168.941	
8	XIA8	P3	3.027887	-373.3112	-869.8407	-12.72327	204.7369	-1839.719	-1395.057	-1134.105	-1839.719	
9	XIA9	P3	3.018095	1007.209	-410.5877	-33.36318	69.28374	551.7104	373.747	496.9233	551.7104	
10	XIA10	P3	3.013038	1533.728	-199.0319	-48.30922	1.448743	1522.023	1083.546	1143.256	1522.023	
11	XIA11	P3	3.007341	534.8386	-513.237	-80.23067	48.07839	-179.3729	-230.8067	-76.83562	-179.3729	
12	XIA12	P3	3.003748	-569.4845	-858.6208	-94.91872	119.7365	-2057.175	-1656.783	-1399.197	-2057.175	
13	XIA13	P3	3.001066	-1026.695	-966.0627	-117.364	124.1516	-2777.734	-2224.137	-1934.319	-2777.734	
14	XIA14	P3	3.001066	-1026.514	-965.4678	-124.2369	117.13	-2776.566	-2231.509	-1941.858	-2776.566	
15	XIA15	P3	3.003748	-569.4213	-858.6874	-120.0765	94.59532	-2057.205	-1686.996	-1429.39	-2057.205	
16	XIA16	P3	3.007341	536.0034	-513.1192	-47.89288	80.38691	-177.7867	-190.8115	-36.87573	-177.7867	
17	XIA17	P3	3.013038	1540.358	-196.6989	-0.8875771	48.28715	1533.711	1149.218	1208.228	1533.711	
18	XIA18	P3	3.018095	1016.659	-408.7766	-68.99273	33.20142	565.9484	341.67	464.3029	565.9484	
19	XIA19	P3	3.027887	-366.4343	-868.4008	-204.3194	12.78077	-1829.162	-1617.055	-1356.535	-1829.162	
20	XIA20	P3	3.036593	-1725.771	-1302.987	-341.5416	-15.79491	-4155.704	-3526.628	-3135.732	-4155.704	
21	XIA21	P3	3.05	-2895.265	-1664.667	-449.6491	-33.48247	-6137.784	-5142.917	-4643.517	-6137.784	
22	XIA22	P3	3.065436	-4080.976	-2008.203	-534.7024	-32.65169	-8110.295	-6724.365	-6121.904	-8110.295	
23	XIA23	P3	3.085191	-4521.299	-2086.193	-563.5698	-42.02152	-8763.468	-7248.885	-6623.027	-8763.468	
24	XIA24	P3	3.118092	-4537.685	-2027.339	-546.1894	-39.35463	-8688.964	-7172.15	-6563.948	-8688.964	
25	XIA25	P3	3.162278	-4221.605	-1811.794	-476.1256	-23.17719	-7964.796	-6544.947	-6001.409	-7964.796	
26	XIA26	P3	3.223725	-4765.712	-1805.3	-473.1397	-21.81478	-8607.334	-7023.268	-6481.678	-8607.334	

TABEL 4.51
Tabel Gaya Batang KK_XI

2. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{T2} (KN)	N _{T3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XIV1	P4	3.00	-167.4985	-514.7056	-171.5858	-42.9094	-1024.527	-974.2983	-819.8867	-1024.527	
2	XIV2	P4	3.00	1611.225	377.5913	28.43215	-65.96567	2537.617	1937.331	1824.054	2537.617	
3	XIV3	P4	3.00	1795.383	527.1521	26.2289	-105.5591	2997.904	2279.902	2121.757	2997.904	
4	XIV4	P4	3.00	-46.39809	151.6954	-71.80492	-109.7288	187.035	54.11036	8.601732	187.035	
5	XIV5	P4	3.00	3707.46	1256.363	88.67332	-225.4173	6459.132	4950.757	4573.848	6459.132	
6	XIV6	P4	3.00	2941.411	1174.895	20.06415	-273.6596	5409.526	4081.221	3728.753	5409.526	
7	XIV7	P4	3.00	2038.931	982.031	-117.5001	-363.0078	4017.967	2872.475	2577.866	4017.967	
8	XIV8	P4	3.00	6202.508	2261.674	154.6177	-410.8009	11061.69	8481.808	7803.306	11061.69	
9	XIV9	P4	3.00	6423.006	2482.402	60.54367	-560.0568	11679.45	8832.24	8087.52	11679.45	
10	XIV10	P4	3.00	7107.092	2807.898	-64.07669	-766.0511	13021.15	9688.969	8846.6	13021.15	
11	XIV11	P4	3.00	8857.961	3321.646	259.64	-570.7714	15944.19	12269.71	11273.21	15944.19	
12	XIV12	P4	3.00	4343.409	1844.698	122.2848	-338.8897	8163.607	6269.447	5716.038	8163.607	
13	XIV13	P4	3.00	2682.522	1173.098	-92.82052	-386.0951	5095.983	3710.603	3358.673	5095.983	
14	XIV14	P4	3.00	5732.463	2071.688	259.0458	-258.8763	10193.66	7956.098	7334.592	10193.66	
15	XIV15	P4	3.00	2678.041	1172.803	385.1509	91.9502	5090.133	4279.781	3927.94	5090.133	
16	XIV16	P4	3.00	4331.172	1840.521	338.2377	-121.8927	8142.241	6512.566	5960.41	8142.241	
17	XIV17	P4	3.00	8845.209	3321.268	571.0631	-259.254	15928.28	12631.49	11635.11	15928.28	
18	XIV18	P4	3.00	7103.457	2806.858	765.3107	63.59628	13015.12	10679.71	9837.655	13015.12	
19	XIV19	P4	3.00	6411.695	2481.725	559.9327	-60.49841	11664.79	9420.515	8675.997	11664.79	
20	XIV20	P4	3.00	6199.611	2261.587	411.1758	-154.2209	11058.07	8786.966	8108.489	11058.07	
21	XIV21	P4	3.00	2049.424	987.4159	363.7336	116.8796	4039.174	3465.861	3169.636	4039.174	
22	XIV22	P4	3.00	2944.211	1176.099	274.0049	-20.01986	5414.812	4389.915	4037.085	5414.812	
23	XIV23	P4	3.00	3701.984	1258.569	226.1749	-88.46729	6456.091	5113.479	4735.908	6456.091	
24	XIV24	P4	3.00	-26.46217	157.9697	111.2531	71.76065	220.9968	299.2513	251.8604	220.9968	
25	XIV25	P4	3.00	1784.703	525.4296	104.4216	-26.93578	2982.331	2362.054	2204.426	2982.331	
26	XIV26	P4	3.00	1613.09	383.485	68.38159	-27.48967	2549.285	1994.021	1878.976	2549.285	
27	XIV27	P4	3.00	-141.6183	-506.9469	44.44094	171.1777	-981.0571	-682.4637	-530.3796	-981.0571	

TABEL 4.52
Tabel Gaya Batang KK_XI

3. Batang Diagonal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UM,KS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XID1	P4	3.354102	1035.248	762.855	-3.988831	-194.7026	4941.264	1842.363	2462.866	4941.264	
2	XID2	P4	3.5141	-520.8735	261.9556	-17.04527	-82.53416	2121.61	-48.44758	-37.32434	-15710.17	
3	XID3	P4	3.644846	-709.6879	-8.806627	-15.21652	-13.01487	3736.77	-531.6173	-684.4766	-7490.991	
4	XID4	P4	3.71431	-252.8397	56.28225	8.282657	-5.787905	2070.73	-5.929276	-21.15795	-12500.79	
5	XID5	P4	3.762034	-1617.281	-431.3908	-10.23189	97.61581	1215.793	-1835.661	-2431.177	-10799.8	
6	XID6	P4	3.823205	-2509.948	-821.1193	-28.61683	176.663	1111.586	-3123.74	-4119.2	-3428.927	
7	XID7	P4	3.860687	-2674.438	-947.7802	-3.623732	233.3213	-195.7742	-3388.725	-4512.501	-9226.869	
8	XID8	P4	3.898731	-5958.3	-1384.608	-37.47981	308.6722	-1793.881	-5105.228	-6747.003	-9452.8	
9	XID9	P4	3.950304	-3810.798	-1374.502	-39.33039	304.2952	-2060.178	-5041.915	-6659.624	-5153.221	
10	XID10	P4	3.969887	-1570.611	-665.9953	-38.85767	127.6412	-4485.521	-2173.39	-2835.681	-12440.96	
11	XID11	P4	4.022736	1051.341	260.5165	-9.066608	-74.19574	-4390.344	1247.947	1678.436	-15896.86	
12	XID12	P4	4.049494	1408.41	365.9502	-10.19223	-101.6798	-3208.777	1694.479	2275.612	-14632.69	
13	XID13	P4	4.083246	461.3398	42.92534	46.61797	35.88663	-1989.663	522.6578	622.2883	-22458.64	
14	XID14	P4	4.124185	456.3868	44.70089	-35.89019	-47.06541	-1464.483	421.321	619.1856	-23987.3	
15	XID15	P4	4.158654	1402.169	364.4119	102.9012	11.79823	-2732.345	1822.728	2265.662	-23566.13	
16	XID16	P4	4.158654	1056.942	264.9777	74.90108	8.656674	-2726.825	1359.102	1692.294	-23562.24	
17	XID17	P4	4.124185	-1554.614	-662.3596	-127.068	38.52188	-1466.032	-2260.482	-2810.667	-23986.63	
18	XID18	P4	4.083246	-3819.696	-1375.86	-303.7552	40.20987	-1985.046	-5368.863	-6672.475	-22461.83	
19	XID19	P4	4.049494	-3946.425	-1382.737	-308.1811	37.50302	-3163.274	-5417.136	-6729.758	-14662.96	
20	XID20	P4	4.022736	-2666.762	-944.6604	-233.394	2.771143	-4422.932	-3653.796	-4498.298	-15906.4	
21	XID21	P4	3.969887	-2522.816	-826.3442	-176.9352	29.65082	-4460.27	-3319.573	-4143.001	-12468.4	
22	XID22	P4	3.950304	-1619.427	-431.3752	-97.74886	10.09493	-2045.449	-1942.595	-2433.728	-5185.229	
23	XID23	P4	3.898731	-243.0312	56.82035	5.596195	-8.608893	-1822.342	0.3203934	-8.526721	-9467.63	
24	XID24	P4	3.860687	-733.3477	-15.56737	11.49098	15.38282	-190.3874	-528.975	-723.6855	-9246.364	
25	XID25	P4	3.823205	-499.8691	268.6553	84.94114	17.77733	1116.741	100.8797	-1.399622	-3451.058	
26	XID26	P4	3.762034	1039.659	759.4763	193.0394	3.170331	1200.686	2078.712	2462.753	-10814.26	

TABEL 4.53
Tabel Gaya Batang KK_XI

4. Batang Bawah

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{H1} (KN)	N _{H2} (KN)	N _{H3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XIB1	P4	3.22373	-2204.726	-1350.95	-328.4383	9.29914	-4807.19	-3999.519	-3594.234	-4807.19	
2	XIB2	P4	3.16228	-1422.255	-684.8677	-328.4902	-157.2733	-2802.494	-2496.059	-2290.599	-2802.494	
3	XIB3	P4	3.11809	-1842.271	-464.9343	-339.9029	-223.6693	-2954.62	-2623.848	-2484.368	-2954.62	
4	XIB4	P4	3.08519	1375.5	620.071	-181.1063	-336.1241	2642.714	1764.708	1578.687	2642.714	
5	XIB5	P4	3.06544	-2688.403	-587.6253	-364.1752	-217.2688	-4166.284	-3561.723	-3385.436	-4166.284	
6	XIB6	P4	3.05	-3935.746	-940.2358	-373.6288	-138.5698	-6227.272	-5118.809	-4836.738	-6227.272	
7	XIB7	P4	3.03559	-2532.537	-618.3522	-130.7932	23.79482	-4028.407	-3178.258	-2992.752	-4028.407	
8	XIB8	P4	3.02789	-7479.175	-2257.375	-406.7668	157.577	-12586.81	-9928.228	-9251.016	-12586.81	
9	XIB9	P4	3.0181	-10397.56	-3303.527	-438.3689	387.5128	-17762.72	-13848.08	-12857.02	-17762.72	
10	XIB10	P4	3.01304	-11439.53	-3787.383	-301.5981	645.2476	-19787.25	-15202.35	-14066.14	-19787.25	
11	XIB11	P4	3.00734	-14624.61	-4970.993	-523.0908	719.6573	-25503.12	-19755.05	-18263.75	-25503.12	
12	XIB12	P4	3.00375	-13863.22	-4781.909	-535.9794	659.4979	-24286.92	-18858.37	-17423.79	-24286.92	
13	XIB13	P4	3.00107	-11287.54	-4009.117	-55.44052	946.8389	-19959.64	-15036.26	-13833.52	-19959.64	
14	XIB14	P4	3.00107	-11278.3	-4006.801	-945.0538	56.64644	-19944.85	-16092.7	-14890.66	-19944.85	
15	XIB15	P4	3.00375	-13856.06	-4781.167	-658.7581	536.5335	-24277.13	-18998.36	-17564.01	-24277.13	
16	XIB16	P4	3.00734	-14621.88	-4973.696	-719.4565	523.9675	-25504.16	-19991.47	-18499.36	-25504.16	
17	XIB17	P4	3.01304	-11448.56	-3792.618	-645.5692	302.5852	-19806.46	-15629.53	-14491.74	-19806.46	
18	XIB18	P4	3.0181	-10399.83	-3308.016	-388.1928	438.8112	-17772.62	-13795.3	-12802.89	-17772.62	
19	XIB19	P4	3.02789	-7489.176	-2263.06	-158.5851	407.1799	-12607.91	-9646.232	-8967.314	-12607.91	
20	XIB20	P4	3.03659	-2542.976	-624.6832	-24.84837	131.3224	-4051.064	-3068.116	-2880.711	-4051.064	
21	XIB21	P4	3.05	-3938.978	-944.0163	137.7652	373.7693	-6237.2	-4512.582	-4229.377	-6237.2	
22	XIB22	P4	3.06544	-2689.414	-591.3851	216.5848	364.4311	-4173.513	-2870.233	-2692.818	-4173.513	
23	XIB23	P4	3.08519	1367.452	616.4979	335.3258	181.2013	2627.339	2372.895	2187.946	2627.339	
24	XIB24	P4	3.11809	-1828.492	-462.6127	224.4765	340.1297	-2934.371	-1931.406	-1792.623	-2934.371	
25	XIB25	P4	3.16228	-1426.668	-688.5805	155.9423	328.0874	-2813.73	-1923.167	-1716.593	-2813.73	
26	XIB26	P4	3.22373	-2213.713	-1351.943	-9.218051	328.7677	-4819.564	-3625.735	-3220.152	-4819.564	

Tabel Gaya Batang KK_XJ

1. Batang Atas

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XJA1	P3	3.195309	-2461.059	-1057.193	1.846953	266.1451	-4644.779	-3481.368	-3164.21	-4644.779	
2	XJA2	P3	3.137897	-2506.082	-1218.852	25.73587	330.4489	-4957.462	-3687.213	-3321.558	-4957.462	
3	XJA3	P3	3.097241	-2452.369	-1266.129	31.65209	348.1844	-4968.89	-3688.685	-3308.846	-4968.89	
4	XJA4	P3	3.071742	-1777.5	-1135.228	34.75749	318.5645	-3949.365	-2920.315	-2579.747	-3949.365	
5	XJA5	P3	3.055552	-226.8032	-675.6248	47.06215	215.9684	-1353.164	-958.3981	-755.7106	-1353.164	
6	XJA6	P3	3.036593	1235.001	-216.6082	34.08055	88.2326	1135.428	892.468	957.4505	1135.428	
7	XJA7	P3	3.032095	3164.072	417.9076	13.0076	-91.46929	4465.539	3364.763	3239.391	4465.539	
8	XJA8	P3	3.018095	4749.055	957.9279	2.956382	-236.5256	7231.55	5427.21	5139.832	7231.55	
9	XJA9	P3	3.013038	4622.724	961.793	-21.58481	-262.0331	7086.137	5288.701	5000.163	7086.137	
10	XJA10	P3	3.007341	2793.586	371.1974	-49.99968	-142.799	3946.219	2899.665	2788.305	3946.219	
11	XJA11	P3	3.002815	644.6769	-323.4587	-55.10703	27.75766	256.0783	128.3303	225.368	256.0783	
12	XJA12	P3	3.001066	-318.849	-604.5009	-74.55623	76.56898	-1349.82	-1101.833	-920.4823	-1349.82	
13	XJA13	P3	3.002815	643.1204	-604.8721	-76.93436	74.28367	-1349.593	-1104.516	-923.0542	-1349.593	
14	XJA14	P3	3.007341	2796.83	372.3845	-28.10607	52.86666	253.519	156.412	253.5793	253.519	
15	XJA15	P3	3.002815	4628.325	-323.8909	143.1107	50.01456	3952.011	3135.741	3024.026	3952.011	
16	XJA16	P3	3.013038	4764.84	963.3909	262.4012	21.55346	7095.416	5636.443	5347.426	7095.416	
17	XJA17	P3	3.018095	3169.729	963.424	237.5756	-3.280409	7259.287	5729.556	5440.529	7259.287	
18	XJA18	P3	3.032095	1242.224	419.2034	91.64091	-13.15993	4474.4	3465.77	3340.009	4474.4	
19	XJA19	P3	3.036593	-219.4386	-214.9758	-88.00126	-34.25732	1146.708	754.4295	818.9222	1146.708	
20	XJA20	P3	3.055552	-1767.564	-674.3707	-215.8445	-47.25179	-1342.319	-1265.753	-1063.442	-1342.319	
21	XJA21	P3	3.071742	-2446.05	-1133.269	-318.0041	-34.68687	-3934.307	-3332.335	-2992.355	-3934.307	
22	XJA22	P3	3.097241	-2502.048	-1265.817	-348.1462	-31.69203	-4960.567	-4138.2	-3758.456	-4960.567	
23	XJA23	P3	3.137897	-2455.87	-1218.247	-330.1904	-25.6285	-4951.653	-4109.968	-3744.494	-4951.653	
24	XJA24	P3	3.195309	-2455.87	-1057.059	-265.9417	-1.67678	-4638.339	-3797.884	-3480.766	-4638.339	

Tabel Gaya Batang KK_XJ

2. Batang Vertikal

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMIAMS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XJV1	P4	3.00	1478.754	44.01488	-174.7604	-185.7641	1844.929	1173.984	1160.78	1844.929	
2	XJV2	P4	3.00	1711.378	532.1059	-1.419081	-134.4456	2905.023	2177.065	2017.433	2905.023	
3	XJV3	P4	3.00	539.8055	177.7298	-71.57194	-116.0044	932.1343	613.2144	559.8955	932.1343	
4	XJV4	P4	3.00	3895.057	1357.562	46.3397	-293.0507	6846.167	5190.233	4782.964	6846.167	
5	XJV5	P4	3.00	3373.416	1283.731	9.671896	-311.2609	6102.068	4588.158	4203.039	6102.068	
6	XJV6	P4	3.00	2980.098	1294.165	-106.176	-429.7173	5646.782	4107.675	3719.426	5646.782	
7	XJV7	P4	3.00	6757.608	2463.296	116.5157	-499.3082	12050.4	9177.621	8438.633	12050.4	
8	XJV8	P4	3.00	7684.138	2987.088	54.57963	-692.1924	14000.31	10565.73	9669.599	14000.31	
9	XJV9	P4	3.00	8938.368	3491.661	-70.55796	-943.4733	16312.7	12149.86	11102.36	16312.7	
10	XJV10	P4	3.00	9229.798	3530.538	204.5359	-678.0987	16724.62	12788.91	11729.75	16724.62	
11	XJV11	P4	3.00	4382.102	1926.788	97.45533	-384.2416	8341.383	6372.983	5794.947	8341.383	
12	XJV12	P4	3.00	1783.115	889.9675	-94.18443	-316.6763	5363.686	2559.743	2292.753	5363.686	
13	XJV13	P4	3.00	4217.549	1581.359	197.6143	-197.7255	7591.234	5930.563	5456.155	7591.234	
14	XJV14	P4	3.00	1779.723	886.5992	315.4344	93.78464	3554.226	3044.191	2778.211	3554.226	
15	XJV15	P4	3.00	4387.191	1927.765	384.2451	-97.6963	8349.055	6722.885	6144.555	8349.055	
16	XJV16	P4	3.00	9212.392	3522.399	675.9415	-204.6583	16690.71	13329.16	12272.44	16690.71	
17	XJV17	P4	3.00	8959.914	3497.895	944.1945	69.72063	16348.53	13394.43	12345.06	16348.53	
18	XJV18	P4	3.00	7678.257	2985.675	691.3924	-55.02627	13990.99	11322.91	10427.21	13990.99	
19	XJV19	P4	3.00	6772.454	2469.051	500.3514	-116.9112	12077.43	9658.491	8917.776	12077.43	
20	XJV20	P4	3.00	2970.15	1290.462	428.3801	105.7645	5628.92	4735.746	4348.607	5628.92	
21	XJV21	P4	3.00	3390.427	1292.918	313.6258	-9.603788	6137.182	4979.237	4591.362	6137.182	
22	XJV22	P4	3.00	3893.587	1350.488	291.2258	-46.39626	6833.086	5474.285	5069.139	6833.086	
23	XJV23	P4	3.00	528.5002	182.0348	116.066	70.55727	925.456	833.3712	778.7607	925.456	
24	XJV24	P4	3.00	1711.419	528.5962	135.084	2.934962	2899.457	2336.693	2178.115	2899.457	
25	XJV25	P4	3.00	1451.526	29.96404	181.8775	174.3865	1789.773	1560.583	1551.594	1789.773	

Tabel Gaya Batang KK_XJ

3. Batang Diagonal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _U (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XJD1	P4	3.551056	274.4119	478.7658	1.332054	-118.3594	1095.32	823.0881	679.4584	1095.32	
2	XJD2	P4	3.650534	-557.3126	155.109	-1.00965	-39.7869	-420.6007	-316.6621	-363.1948	-420.6007	
3	XJD3	P4	3.738034	-485.7365	-45.80166	36.77172	48.22213	-656.1664	-447.9987	-434.2582	-656.1664	
4	XJD4	P4	3.804681	-172.1189	-456.2396	-1.850894	112.209	-2795.411	-2098.779	-1961.907	-2795.411	
5	XJD5	P4	3.8544	-2826.633	-962.9489	-18.42814	222.3091	-4932.678	-3721.622	-3432.737	-4932.678	
6	XJD6	P4	3.924398	-2976.208	-1086.769	29.73544	391.4277	-5310.279	-3947.027	-3620.996	-5310.279	
7	XJD7	P4	3.943805	-4299.926	-1583.389	-15.89794	379.9493	-7693.333	-5789.078	-5314.061	-7693.333	
8	XJD8	P4	2.00804	-3600.008	-1349.33	5.49268	342.8253	-6478.938	-4852.613	-4447.813	-6478.938	
9	XJD9	P4	2.024747	-14.81998	-178.4549	38.43674	83.05047	-303.3118	-181.3598	-127.8233	-303.3118	
10	XJD10	P4	2.04842	2569.664	808.9727	37.2768	-164.9604	4377.954	3328.197	3085.505	4377.954	
11	XJD11	P4	2.075867	3481.365	1110.551	29.65332	-247.9293	5954.167	4501.209	4168.11	5954.167	
12	XJD12	P4	2.093227	1560.065	467.5898	92.63426	-24.2632	2620.221	2076.327	1936.05	2620.221	
13	XJD13	P4	2.093227	1561.375	469.2119	24.39125	-92.91174	2624.389	1997.561	1856.798	2624.389	
14	XJD14	P4	2.075867	3490.286	1114.323	249.5698	-29.01089	5971.259	4777.928	4443.631	5971.259	
15	XJD15	P4	2.04842	2574.955	810.332	164.7677	-37.81527	4386.477	3487.579	3244.479	4386.477	
16	XJD16	P4	2.024747	19.37095	-166.6745	-80.76654	-39.09793	-243.434	-279.4953	-229.493	-243.434	
17	XJD17	P4	2.00804	-3614.987	-1353.21	-343.2314	-4.92885	-6503.121	-5289.218	-4883.255	-6503.121	
18	XJD18	P4	3.943805	-4282.728	-1578.844	-378.9223	15.78865	-7665.423	-6203.774	-5730.121	-7665.423	
19	XJD19	P4	3.924398	-2985.203	-1089.712	-302.3665	-29.93853	-5325.783	-4357.177	-4030.263	-5325.783	
20	XJD20	P4	3.8544	-2817.887	-959.8134	-220.7123	19.24105	-4917.166	-3952.729	-3664.785	-4917.166	
21	XJD21	P4	3.804681	-1735.446	-465.9352	-114.7939	1.689866	-2828.031	-2258.776	-2118.996	-2828.031	
22	XJD22	P4	3.738034	-492.0347	-42.06247	-47.46708	-36.95147	-657.7416	-550.2667	-537.648	-657.7416	
23	XJD23	P4	3.650534	-557.1364	145.7612	39.11014	2.669834	-435.3456	-279.5771	-323.3055	-435.3456	
24	XJD24	P4	3.551056	274.5145	478.3471	117.0437	-2.543129	1094.773	961.532	818.0278	1094.773	

4. Batang Bawah

Tabel Gaya Batang KK_XJ

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{UI} (KN)	N _C (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XJB1	P4	3.195309	-893.2841	-593.421	-309.0116	-160.6563	-2021.415	-1886.875	-1708.848	-2021.415	
2	XJB2	P4	3.137897	-748.9531	-185.8743	-304.049	-257.5805	-1196.143	-1261.966	-1206.203	-1196.143	
3	XJB3	P4	3.097241	2645.619	1197.195	-110.0362	-409.335	5090.255	3685.648	3326.489	5090.255	
4	XJB4	P4	3.071742	-1516.74	-147.1319	-283.8017	-247.0187	-2055.499	-1882.187	-1838.047	-2055.499	
5	XJB5	P4	3.055552	-2964.059	-517.1812	-284.5788	-155.2835	-4384.361	-3629.765	-3474.611	-4384.361	
6	XJB6	P4	3.036593	-2285.277	-365.8259	-25.85985	65.59663	-3327.653	-2526.772	-2417.024	-3327.653	
7	XJB7	P4	3.032095	-7165.99	-1986.67	-284.8686	211.7989	-11777.86	-9175.237	-8579.236	-11777.86	
8	XJB8	P4	3.018095	-10453.68	-3177.893	-295.5128	498.9606	-17629.04	-13576.4	-12623.03	-17629.04	
9	XJB9	P4	3.013038	-10964.71	-3465.926	-99.28754	767.1939	-18703.13	-14146.49	-13106.71	-18703.13	
10	XJB10	P4	3.007341	-16525.63	-5470.741	-531.8774	835.8077	-28583.94	-22076.21	-20434.99	-28583.94	
11	XJB11	P4	3.002815	-14532.69	-4839.044	-503.5173	706.2437	-25181.7	-19490.5	-18038.78	-25181.7	
12	XJB12	P4	3.001066	-10098.19	-3372.56	69.76	912.9	-17513.92	-13051.73	-12039.96	-17513.92	
13	XJB13	P4	3.001066	-10078.74	-3365.758	-910.801	-69.36147	-17479.7	-14202.74	-13193.01	-17479.7	
14	XJB14	P4	3.002815	-14524.68	-4838.71	-705.4988	504.1788	-25171.55	-19725.26	-18273.65	-25171.55	
15	XJB15	P4	3.007341	-16521.82	-5471.704	-834.9949	532.931	-28580.91	-22437.68	-20796.17	-28580.91	
16	XJB16	P4	3.013038	-10977.38	-3471.849	-768.0054	99.95689	-18727.81	-14967.46	-13925.91	-18727.81	
17	XJB17	P4	3.018095	-10454.04	-3180.841	-499.3461	295.8642	-17634.2	-13824.86	-12870.61	-17634.2	
18	XJB18	P4	3.032095	-7178.311	-1992.915	-212.9391	285.2897	-11802.64	-9107.505	-8509.63	-11802.64	
19	XJB19	P4	3.036593	-2287.006	-368.8365	-66.26003	25.94911	-3334.545	-2580.421	-2469.77	-3334.545	
20	XJB20	P4	3.055552	-2977.797	-524.8561	153.3526	284.5667	-4413.126	-3125.822	-2968.365	-4413.126	
21	XJB21	P4	3.071742	-1519.014	-147.4184	247.0671	283.9218	-2058.687	-1247.534	-1203.309	-2058.687	
22	XJB22	P4	3.097241	2646.341	1191.871	408.3365	110.3688	5082.603	4301.956	3944.395	5082.603	
23	XJB23	P4	3.137897	-749.3505	-184.5919	257.2701	303.4181	-1194.568	-587.2015	-531.824	-1194.568	
24	XJB24	P4	3.195309	-894.5128	-592.5136	161.3468	309.4753	-2021.437	-1322.462	-1144.708	-2021.437	

Tabel Gaya Batang KK_XK

1. Batang Atas

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKL} (KN)	N _{UL} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XKA1	P3	3.15913	7.599316	-7.881804	5.735748	7.706199	-3.491707	4.264117	6.628659	-3.491707	
2	XKA2	P3	3.1127	-63.53713	-77.36333	4.75116	24.09199	-200.0259	-144.318	-121.109	-200.0259	
3	XKA3	P3	3.078327	50.48773	-57.93902	7.535654	22.02041	-32.11716	-15.04509	2.336619	-32.11716	
4	XKA4	P3	3.061388	358.959	31.6101	12.98857	5.086043	481.327	376.5815	367.0985	481.327	
5	XKA5	P3	3.041381	661.9871	131.5026	6.981217	-23.89444	1004.789	761.969	722.5182	1004.789	
6	XKA6	P3	3.032095	1073.997	267.8819	5.605396	-61.36509	1717.408	1294.782	1214.418	1717.408	
7	XKA7	P3	3.020348	1553.486	433.6721	9.455378	-98.96266	2558.058	1929.89	1799.789	2558.058	
8	XKA8	P3	3.012125	1520.625	438.2104	2.737167	-106.8154	2525.887	1897.7	1766.236	2525.887	
9	XKA9	P3	3.008056	715.6569	163.4042	-5.523072	-46.37411	1120.235	833.5485	784.5273	1120.235	
10	XKA10	P3	3.002399	53.59351	-56.68977	-6.207047	7.965396	-26.39142	-27.24203	-10.23509	-26.39142	
11	XKA11	P3	3.0006	-53.38387	-72.7044	-12.289	5.887098	-180.3877	-150.0376	-128.2262	-180.3877	
12	XKA12	P3	3.0006	-53.75861	-72.76678	-5.935184	12.25651	-180.9372	-142.8251	-120.9951	-180.9372	
13	XKA13	P3	3.002399	51.21592	-57.71861	-8.26802	6.161633	-30.89067	-33.08963	-15.77405	-30.89067	
14	XKA14	P3	3.008056	713.5477	162.5321	46.31083	5.677789	1115.309	892.8044	844.0148	1116.309	
15	XKA15	P3	3.012125	1526.807	440.9227	107.3643	-2.866359	2537.645	2032.071	1899.794	2537.645	
16	XKA16	P3	3.020348	1555.297	433.9387	98.96735	-9.517319	2560.658	2039.254	1909.073	2560.658	
17	XKA17	P3	3.032095	1073.54	267.7828	61.37145	-5.574247	1716.701	1361.172	1280.837	1716.701	
18	XKA18	P3	3.041381	662.7609	131.3717	25.82318	-7.019746	1005.508	785.1187	745.7072	1005.508	
19	XKA19	P3	3.061388	360.2757	32.00582	-5.052635	-13.05409	483.5402	356.592	346.9902	483.5402	
20	XKA20	P3	3.078327	51.0461	-57.9738	-22.00891	-7.515464	-31.50276	-50.03777	-32.64563	-31.50276	
21	XKA21	P3	3.1127	-60.59894	-76.09507	-23.76073	-4.73696	-194.4708	-174.366	-151.5375	-194.4708	
22	XKA22	P3	3.15913	9.949251	-7.443511	-7.562031	-5.701153	0.0294838	-9.052324	-6.819271	0.0294838	

Tabel Gaya Batang KK_XK

2. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (kN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XKV1	P4	3	4248.772	677.7529	-207.2806	-376.7188	6182.931	4388.461	4185.136	6182.931	
2	XKV2	P4	3	1779.057	600.4606	-59.08232	-209.1975	3095.605	2250.805	2070.667	3095.605	
3	XKV3	P4	3	3663.935	1074.952	3.029618	-265.7083	6116.645	4591.119	4268.634	6116.645	
4	XKV4	P4	3	4146.431	1466.762	-10.72601	-377.4166	7322.537	5479.031	5039.002	7322.537	
5	XKV5	P4	3	4303.067	1619.945	-99.20866	-504.1949	7755.593	5697.644	5211.661	7755.593	
6	XKV6	P4	3	7493.708	2713.886	52.85125	-625.6203	13334.67	10064.42	9250.256	13334.67	
7	XKV7	P4	3	9562.915	3586.198	63.67743	-832.8721	17213.41	12986.47	11910.61	17213.41	
8	XKV8	P4	3	12457.82	4698.992	-17.97342	-1192.721	22467.77	16829.26	15419.56	22467.77	
9	XKV9	P4	3	12077.94	4578.04	161.0717	-983.4384	21818.4	16557.08	15183.67	21818.4	
10	XKV10	P4	3	2373.311	1194.458	24.37935	-274.2353	4759.106	3598.585	3240.248	4759.106	
11	XKV11	P4	3	-706.9194	-11.31709	-150.5379	-147.7086	-866.4106	-830.4534	-827.0583	-866.4106	
12	XKV12	P4	3	2174.858	893.5757	111.6873	-111.7067	4039.551	3163.688	2895.615	4039.551	
13	XKV13	P4	3	-743.6654	-25.17683	143.6019	149.8961	-932.6814	-527.1887	-519.6357	-932.6814	
14	XKV14	P4	3	2305.97	1165.434	268.7937	-22.56479	4631.859	3796.447	3446.817	4631.859	
15	XKV15	P4	3	12060.86	4580.166	984.85	-160.1914	21801.29	17532.79	16158.74	21801.29	
16	XKV16	P4	3	12500.82	4712.735	1194.978	16.79330	22541.37	18340	16926.18	22541.37	
17	XKV17	P4	3	9522.557	3573.9	831.1432	-62.33172	17145.31	13856.35	12784.18	17145.31	
18	XKV18	P4	3	7492.039	2710.504	625.5212	-52.10481	13327.25	10746.07	9932.914	13327.25	
19	XKV19	P4	3	4318.109	1624.958	505.8503	99.61092	7781.664	6443.268	5955.781	7781.664	
20	XKV20	P4	3	4128.32	1453.265	374.2239	10.90765	7279.208	5908.475	5472.496	7279.208	
21	XKV21	P4	3	3655.456	1084.607	267.6717	-3.480077	6121.918	4912.645	4587.263	6121.918	
22	XKV22	P4	3	1825.199	606.6492	212.0687	60.40636	3160.877	2625.141	2443.146	3160.877	
23	XKV23	P4	3	4227.694	679.598	374.8988	204.9993	6160.59	5070.321	4866.441	6160.59	

Tabel Gaya Batang KK_XK

3. Batang Diagonal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{H1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XKD1	P4	3.611108	-834.2764	-32.94564	-9.505252	-1.26884	-1053.845	-801.7898	-791.9061	-1053.845	
2	XKD2	P4	3.702553	-854.9724	51.0414	61.31979	48.55944	-944.3007	-634.6417	-649.9542	-944.3007	
3	XKD3	P4	3.786304	-2691.797	-726.5654	16.61718	198.2585	-4392.661	-3274.555	-3056.585	-4392.661	
4	XKD4	P4	3.835635	-3636.15	-1138.613	7.698221	292.3516	-6185.161	-4629.633	-4288.049	-6185.161	
5	XKD5	P4	3.905125	-3812.976	-1314.925	84.88206	413.6133	-6679.451	-4907.73	-4513.252	-6679.451	
6	XKD6	P4	3.943805	-5323.06	-1866.899	-11.08029	455.6444	-9374.709	-7044.329	-6484.259	-9374.709	
7	XKD7	P4	4.002811	-5116.632	-1879.095	-17.45676	452.3169	-9146.511	-6880.831	-6317.103	-9146.511	
8	XKD8	P4	4.056218	557.2928	-52.43251	114.1915	127.2996	584.8594	575.6743	591.4041	584.8594	
9	XKD9	P4	4.090037	6675.853	2269.914	136.8464	-430.6321	11642.89	8896.38	8215.406	11642.89	
10	XKD10	P4	4.158654	6088.277	2020.381	120.7405	-384.3547	10538.54	8048.795	7442.681	10538.54	
11	XKD11	P4	4.200428	2543.882	767.1191	214.0853	22.3055	4280.049	3466.939	3236.803	4280.049	
12	XKD12	P4	4.200428	2503.382	754.2913	-24.74321	-213.316	4210.924	3128.501	2902.214	4210.924	
13	XKD13	P4	4.158654	6083.984	2019.56	385.6134	-119.2767	10532.08	8361.794	7755.926	10532.08	
14	XKD14	P4	4.090037	6726.451	2295.796	436.0264	-137.9227	11745.01	9331.992	8643.254	11745.01	
15	XKD15	P4	4.056218	604.4302	-40.58526	-125.2921	-115.1458	660.3799	344.9344	357.1099	660.3799	
16	XKD16	P4	4.002811	-5180.841	-1900.266	-455.2172	19.84926	-9257.435	-7489.336	-6919.257	-9257.435	
17	XKD17	P4	3.943805	-5292.992	-1860.518	-454.0946	11.03491	-9328.419	-7541.228	-6983.073	-9328.419	
18	XKD18	P4	3.905125	-3809.982	-1313.739	-413.2425	-84.8026	-6673.994	-5501.386	-5107.258	-6673.994	
19	XKD19	P4	3.835635	-3647.433	-1145.664	-293.8495	-7.433549	-6209.982	-5010.106	-4666.407	-6209.982	
20	XKD20	P4	3.786304	-2679.017	-714.6889	-195.37	-16.69779	-4358.323	-3503.186	-3288.779	-4358.323	
21	XKD21	P4	3.702553	-826.5015	49.02473	-48.43828	-60.69447	-913.3622	-743.1476	-757.855	-913.3622	
22	XKD22	P4	3.611108	-866.0826	-38.06859	-1.715227	7.80192	-1100.209	-827.2149	-815.7943	-1100.209	

Tabel Gaya Batang KK_XK

1. Batang Bawah

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMARS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XKB1	P4	3.15913	878.3174	331.5533	-253.0259	-335.9143	1584.466	884.7185	785.2525	1384.466	
2	XKB2	P4	3.1127	3854.583	1576.251	-53.70999	-447.7727	7147.501	5296.174	4823.299	7147.501	
3	XKB3	P4	3.078327	233.308	496.5263	-200.0153	-324.1469	1074.412	565.7904	416.8325	1074.412	
4	XKB4	P4	3.061388	-1914.528	-104.2305	-191.1445	-165.0869	-2464.203	-2077.526	-2046.257	-2464.203	
5	XKB5	P4	3.041381	-2210.282	-230.4566	90.46994	148.0841	-3021.069	-2157.238	-2088.101	-3021.069	
6	XKB6	P4	3.032095	-7898.372	-2058.794	-240.7305	273.968	-12772.12	-9867.964	-9250.325	-12772.12	
7	XKB7	P4	3.020348	-11828.56	-3467.575	-264.7382	602.1556	-19742.39	-15124.48	-14084.21	-19742.39	
8	XKB8	P4	3.012125	-9940.786	-2977.097	167.6758	911.9501	-16692.3	-12318.01	-11424.88	-16692.3	
9	XKB9	P4	3.008056	-18237.09	-5945.979	-500.5629	985.9319	-31398.08	-24149.23	-22365.44	-31398.08	
10	XKB10	P4	3.002399	-13635.12	-4365.634	-419.2216	672.1868	-23347.16	-18013.43	-16703.74	-23347.16	
11	XKB11	P4	3.0006	-8036.68	-2483.384	223.8623	844.7084	-13617.43	-9944.438	-9199.423	-13617.43	
12	XKB12	P4	3.0006	-7982.006	-2462.56	-840.4268	-224.7869	-13518.5	-11147.39	-10408.62	-13518.5	
13	XKB13	P4	3.002399	-13595.69	-4351.548	-668.8931	418.9938	-23277.31	-18260.65	-16955.19	-23277.31	
14	XKB14	P4	3.008056	-18232.79	-5949.924	-986.3197	501.1613	-31399.23	-24733.01	-22946.03	-31399.23	
15	XKB15	P4	3.012125	-9969.023	-2988.338	-913.8322	-166.7478	-16744.17	-13654.72	-12758.22	-16744.17	
16	XKB16	P4	3.020348	-11818.3	-3467.178	-601.995	264.7994	-19729.45	-15519.48	-14479.33	-19729.45	
17	XKB17	P4	3.032095	-7908.706	-2062.854	-274.8536	240.8599	-12791.01	-9923.085	-9304.229	-12791.01	
18	XKB18	P4	3.041381	-2213.765	-232.6893	-149.0016	-90.82932	-3028.821	-2450.418	-2380.611	-3028.821	
19	XKB19	P4	3.061388	-1911.324	-102.0571	165.5217	191.0359	-2456.88	-1644.034	-1613.417	-2456.88	
20	XKB20	P4	3.078327	225.5891	488.9132	322.2159	199.9876	1052.968	1176.385	1029.711	1052.968	
21	XKB21	P4	3.1127	3832.608	1571.454	445.7973	52.93384	7113.456	5870.049	5398.613	7113.456	
22	XKB22	P4	3.15913	885.3129	332.1336	336.6742	253.6408	1593.789	1599.351	1499.711	1593.789	

Tabel Gaya Batang KK_XL

1. Batang Atas

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XL/A1	P3	3.123604	603.3564	174.0295	7.681822	-35.82555	1002.475	761.0743	708.8655	1002.475	
2	XL/A2	P3	3.089919	402.4711	73.51263	8.82891	-9.549247	600.5855	461.0338	438.98	600.5855	
3	XL/A3	P3	3.067507	754.2748	172.2208	16.30349	-26.75172	1180.683	905.0765	853.4103	1180.683	
4	XL/A4	P3	3.044733	988.7744	256.1062	11.13112	-52.89544	1596.299	1210.582	1133.75	1596.299	
5	XL/A5	P3	3.033562	1525.109	435.9928	6.748891	-102.2493	2527.719	1903.888	1773.09	2527.719	
6	XL/A6	P3	3.020348	2167.342	654.2417	12.00331	-151.5571	3647.597	2750.101	2553.829	3647.597	
7	XL/A7	P3	3.013038	2120.114	674.0942	16.83494	-151.6886	3622.687	2737.217	2534.989	3622.687	
8	XL/A8	P3	3.007341	625.4472	133.4521	-11.04177	-44.4048	964.0601	709.7949	669.7593	964.0601	
9	XL/A9	P3	3.002399	91.92528	-29.30751	-8.864682	-1.537804	63.41832	36.92612	45.71837	63.41832	
10	XL/A10	P3	3.000417	8.103141	-16.57233	-9.194012	-5.050929	-16.79196	-23.62678	-18.65508	-16.79196	
11	XL/A11	P3	3.000417	9.224185	-16.41838	4.917036	9.021632	-15.20039	-5.499852	-0.5743363	-15.20039	
12	XL/A12	P3	3.002399	89.08744	-30.53319	1.492948	9.126245	58.05183	45.33041	54.49036	58.05183	
13	XL/A13	P3	3.007341	631.8025	136.0087	44.75342	10.75124	975.777	785.5368	744.7342	975.777	
14	XL/A14	P3	3.013038	2111.046	670.412	150.8267	-16.77631	3605.914	2883.427	2684.304	3605.914	
15	XL/A15	P3	3.020348	2175.527	657.4425	152.2109	-12.14972	3662.541	2929.559	2732.326	3662.541	
16	XL/A16	P3	3.033562	1526.007	436.2775	102.2409	-6.82848	2529.252	2019.628	1888.745	2529.252	
17	XL/A17	P3	3.044733	987.8303	255.5379	52.53753	-11.34694	1594.257	1258.738	1182.076	1594.257	
18	XL/A18	P3	3.067507	750.201	170.6213	26.33722	-16.3181	1173.235	911.5312	860.3448	1173.235	
19	XL/A19	P3	3.089919	406.5984	74.96376	9.89512	-8.84582	607.86	467.7692	445.2801	607.86	
20	XL/A20	P3	3.123604	605.6209	174.3493	35.94018	-7.647148	1005.704	797.4063	745.1014	1005.704	

Tabel Gaya Batang KK_XL

2. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKJ} (KN)	N _{C1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XLV1	P4	3.00	9383.481	2698.551	-146.8236	-821.4612	15577.86	11507.21	10697.64	15577.86	
2	XLV2	P4	3.00	4322.834	1478.385	-32.04277	-401.6391	7552.817	5626.162	5182.646	7552.817	
3	XLV3	P4	3.00	4720.295	1470.293	-79.28305	-446.8563	8016.823	5917.478	5476.39	8016.823	
4	XLV4	P4	3.00	5080.868	1720.8	-178.152	-608.3521	8850.321	6423.958	5907.719	8850.321	
5	XLV5	P4	3.00	8260.151	2893.371	-73.76468	-797.1074	14541.57	10817.66	9949.652	14541.57	
6	XLV6	P4	3.00	11493.36	4137.534	-106.8567	-1141.24	20412.08	15180.83	13939.58	20412.08	
7	XLV7	P4	3.00	16400.5	5894.446	-102.1215	-1575.733	29111.71	21711.24	19942.91	29111.71	
8	XLV8	P4	3.00	10615.99	4216.763	51.40654	-1002.784	19486	14676.19	13411.16	19486	
9	XLV9	P4	3.00	-5319.732	-1842.704	-285.7584	174.9176	-9332.006	-7341.915	-6789.103	-9332.006	
10	XLV10	P4	3.00	-5190.955	-1806.117	-345.8557	105.6735	-9118.933	-7254.227	-6712.392	-9118.933	
11	XLV11	P4	3.00	396.8027	27.9412	2.374238	-4.611063	520.8691	393.501	385.1186	520.8691	
12	XLV12	P4	3.00	-5206.294	-1815.351	-104.712	349.1257	-9152.114	-6989.74	-6445.135	-9152.114	
13	XLV13	P4	3.00	-5207.703	-1798.17	-167.9143	281.6282	-9126.315	-7046.233	-6506.782	-9126.315	
14	XLV14	P4	3.00	10345.83	4102.445	975.7843	-49.827	18978.91	15405.12	14174.39	18978.91	
15	XLV15	P4	5.00	16334.09	5871.937	1569.331	101.5469	28996.01	23630.2	21868.62	28996.01	
16	XLV16	P4	3.00	11507.4	4140.107	1139.704	104.6771	20433.05	16692.44	15450.4	20433.05	
17	XLV17	P4	3.00	8259.974	2894.147	793.2811	69.74441	14542.6	11858.89	10990.65	14542.6	
18	XLV18	P4	3.00	5006.106	1697.887	601.0086	176.5369	8723.945	7264.169	6754.804	8723.945	
19	XLV19	P4	3.00	4684.448	1464.55	444.3577	78.22021	7964.617	6506.692	6067.327	7964.617	
20	XLV20	P4	3.00	4372.296	1483.484	401.9432	31.07218	7620.331	6197.58	5752.535	7620.331	
21	XLV21	P4	3.00	9309.673	2674.413	815.0255	146.4223	15450.67	12556.03	11763.71	15450.67	

3. Batang Diagonal

Tabel Gaya Batang KK_XL

NO	Batang	Profil	L (m)	N _d (KN)	N _l (KN)	N _{wka} (KN)	N _{wkt} (KN)	N _{ut} (KN)	N _{u2} (KN)	N _{ub} (KN)	N _{uMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XLD1	P4	3.679253	-915.8799	-83.31353	73.78584	94.61421	-1232.358	-835.7251	-810.7311	-1232.358	
2	XLD2	P4	3.756009	-2869.25	-623.449	115.0286	270.8909	-4440.618	-3192.429	-3005.395	-4440.618	
3	XLD3	P4	3.817014	-4160.644	-1271.563	135.9078	453.7986	-7027.274	-5107.366	-4725.897	-7027.274	
4	XLD4	P4	3.892351	-4984.346	-1722.334	227.4503	658.0837	-8737.51	-6280.192	-5763.432	-8737.51	
5	XLD5	P4	3.937321	-6218.672	-2298.439	231.7624	806.3721	-11139.91	-8076.816	-7387.285	-11139.91	
6	XLD6	P4	4.002811	-6045.19	-2273.105	178.9306	747.207	-10891.2	-7953.681	-7271.75	-10891.2	
7	XLD7	P4	4.049494	4675.075	1254.058	272.0248	-41.48973	7616.583	6038.868	5662.65	7616.583	
8	XLD8	P4	4.09684	18690.59	6719.777	582.6456	-1097.299	33180.35	25584.44	23568.51	33180.35	
9	XLD9	P4	4.158654	11247.31	3803.833	406.2595	-544.6986	19582.91	15174.69	14033.54	19582.91	
10	XLD10	P4	4.207434	3481.832	866.3741	257.1867	40.59313	5564.396	4481.921	4222.009	5564.396	
11	XLD11	P4	4.207434	3482.589	867.5286	-37.94051	-254.8227	5567.152	4129.835	3869.577	5567.152	
12	XLD12	P4	4.158654	11302.32	3827.295	545.903	-410.9209	19686.46	15419.93	14271.74	19686.46	
13	XLD13	P4	4.09684	18508.8	6645.702	1080.164	-581.2616	32843.68	25928.96	23935.25	32843.68	
14	XLD14	P4	4.049494	4822.517	1315.349	53.83431	-275.0028	7891.572	5983.28	5588.675	7891.572	
15	XLD15	P4	4.002811	-6034.427	-2270.349	-747.9766	-180.3893	-10873.87	-9052.975	-8371.87	-10873.87	
16	XLD16	P4	3.937321	-6232.991	-2301.813	-809.6135	-234.1601	-11162.49	-9343.404	-8652.86	-11162.49	
17	XLD17	P4	3.892351	-5026.69	-1734.844	-660.477	-226.7659	-8807.779	-7398.407	-6877.953	-8807.779	
18	XLD18	P4	3.817014	-4120.919	-1259.497	-451.0226	-136.1483	-6960.299	-5761.451	-5383.602	-6960.299	
19	XLD19	P4	3.756009	-2817.789	-614.9857	-269.0612	-115.3147	-4365.324	-3596.866	-3412.37	-4365.324	
20	XLD20	P4	3.679253	-980.438	-102.043	-99.35555	-73.8448	-1339.794	-1124.073	-1093.46	-1339.794	

Tabel Gaya Batang KK_XL

4. Batang Bawah

NO	Batang	Profil	L (m)	N _D (KN)	N _C (KN)	N _{WKA} (KN)	N _{WKJ} (KN)	N _{UH} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XLB1	P4	3.123604	4775.514	1800.596	13.67184	-436.4772	8611.57	6475.084	5934.905	8611.57	
2	XLB2	P4	3.089919	4024.111	1712.379	76.5124	-351.5824	7568.74	5768.37	5254.656	7568.74	
3	XLB3	P4	3.067507	473.7282	847.441	-44.97	-256.8303	1924.379	1389.321	1135.088	1924.379	
4	XLB4	P4	3.044733	-2241.573	-66.26399	111.3699	127.9359	-2795.91	-1963.288	-1943.409	-2795.91	
5	XLB5	P4	3.033562	-7731.361	-1956.422	214.7942	703.8998	-12407.91	-9048.179	-8461.252	-12407.91	
6	XLB6	P4	3.020348	-11988.86	-3204.645	-153.9146	647.2466	-19514.06	-14820.24	-13858.85	-19514.06	
7	XLB7	P4	3.013038	-7381.182	-1776.659	-130.1179	314.0468	-11700.07	-8931.195	-8398.198	-11700.07	
8	XLB8	P4	3.007341	-12643.8	-3871.624	45.46534	1013.371	-21367.15	-15970.81	-14809.32	-21367.15	
9	XLB9	P4	3.002399	-18715.24	-6086.448	-497.1278	1024.484	-32196.61	-24744.01	-22918.07	-32196.61	
10	XLB10	P4	3.000417	-12023.7	-3819.66	-382.783	572.1319	-20539.89	-15864.26	-14718.36	-20539.89	
11	XLB11	P4	3.000417	-12016.41	-3817.839	-573.3171	381.1427	-20528.23	-16084.16	-14938.8	-20528.23	
12	XLB12	P4	3.002399	-18724.99	-6093.948	-1025.929	497.5579	-32220.31	-25396.35	-23568.16	-32220.31	
13	XLB13	P4	3.007341	-12536.9	-3830.897	-1004.364	-46.63922	-21173.72	-17085.33	-15936.26	-21173.72	
14	XLB14	P4	3.013038	-7379.48	-1778.508	-314.3315	130.2954	-11700.99	-9152.939	-8619.388	-11700.99	
15	XLB15	P4	3.020348	-12011.69	-3213.828	-649.0208	154.4361	-19556.15	-15445.94	-14481.79	-19556.15	
16	XLB16	P4	3.033562	-7749.762	-1963.152	-705.5527	-214.7646	-12440.76	-10117.23	-9588.285	-12440.76	
17	XLB17	P4	3.044733	-2232.826	-65.39433	-128.5199	-112.1713	-2784.022	-2242.24	-2222.622	-2784.022	
18	XLB18	P4	3.067507	465.9027	842.1561	255.1334	44.5944	1906.533	1736.06	1483.413	1906.533	
19	XLB19	P4	3.089919	3983.42	1701.055	348.2799	-76.98383	7501.792	6044.28	5533.964	7501.792	
20	XLB20	P4	3.123604	4789.488	1804.559	437.0134	-14.12627	8634.679	7000.425	6459.058	8634.679	

Tabel Gaya Batang KK_XM

1. Batang Atas

NO	Batang	Profil	L (m)	N _d (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XMA1	P3	3.080584	2722.867	733.4265	46.58369	-136.7729	4440.923	3386.593	3166.565	4440.923	
2	XMA2	P3	3.05	7533.225	2242.342	51.03114	-509.5544	12627.62	9531.95	8859.247	12627.62	
3	XMA3	P3	3.038157	11130.59	3397.864	101.8782	-747.5877	18793.29	14217.22	13197.86	18793.29	
4	XMA4	P3	3.022731	16467.42	5218.872	86.80388	-1217.914	28111.1	21187.49	19621.83	28111.1	
5	XMA5	P3	3.013984	14947.53	4782.989	111.6906	-1084.057	25589.82	19326.4	17891.5	25589.82	
6	XMA6	P3	3.006659	7128.459	2258.243	102.4678	-462.0929	12167.34	9248.467	8570.993	12167.34	
7	XMA7	P3	3.002399	2576.683	833.7026	38.11439	-170.3112	4425.943	3365.195	3115.084	4425.943	
8	XMA8	P3	2.250113	-684.0616	-151.1549	-38.44423	-0.6555055	-1062.722	-843.1744	-797.8279	-1062.722	
9	XMA9	P3	3.00015	-680.5422	-149.6574	0.8009616	38.21531	-1056.102	-791.1157	-746.2184	-1056.102	
10	XMA10	P3	2.250113	2567.215	832.2233	169.4889	-38.56695	4412.216	3512.548	3262.881	4412.216	
11	XMA11	P3	3.00015	7101.236	2247.838	459.4006	-102.5589	12118.02	9639.799	8965.447	12118.02	
12	XMA12	P3	3.002399	14934.63	4776.753	1082.342	-111.8466	25564.37	20472.08	19039.06	25564.37	
13	XMA13	P3	3.006659	16456.31	5213.106	1216.852	-86.42464	28088.54	22526.63	20962.69	28088.54	
14	XMA14	P3	3.013984	11134.88	3397.752	747.2142	-102.2238	18798.26	14995.35	13976.03	18798.26	
15	XMA15	P3	3.022731	7583.458	2255.902	513.1684	-50.80712	12709.59	10148	9471.227	12709.59	
16	XMA16	P3	3.038157	2725.042	734.0897	136.6153	-46.90716	4444.594	3497.384	3277.157	4444.594	

TABEL 4.35
Tabel Gaya Batang KK_XI

2. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _i (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XMV1	P4	3.00	8136.712	2193.332	-17.40514	-565.7382	13273.39	9934.153	9276.153	13273.39	
2	XMV2	P4	3.00	3607.516	1077.91	-38.44905	-307.9265	6053.675	4494.118	4170.745	6053.675	
3	XMV3	P4	3.00	2636.27	589.9016	75.41887	-72.03653	4107.366	3171.027	2994.057	4107.366	
4	XMV4	P4	3.00	8238.816	2565.632	10.71703	-630.6909	13991.59	10506.55	9736.864	13991.59	
5	XMV5	P4	3.00	1489.783	120.1016	-9.345648	-39.37106	1979.902	1473.712	1437.681	1979.902	
6	XMV6	P4	3.00	10914.24	3688.612	394.5458	-527.6071	18998.86	14722.6	13616.02	18998.86	
7	XMV7	P4	3.00	-591.1606	-370.8362	-7.340226	85.36884	-1302.731	-985.8563	-874.6055	-1302.731	
8	XMV8	P4	3.00	-3192.062	-1346.421	-210.6264	125.979	-5984.748	-4741.313	-4337.386	-5984.748	
9	XMV9	P4	3.00	704.5052	-31.5969	-4.597648	3.301576	794.8513	590.6213	600.1003	794.8513	
10	XMV10	P4	3.00	-3187.265	-1343.261	-126.0274	209.7878	-5973.935	-4631.684	-4228.706	-5973.935	
11	XMV11	P4	3.00	-624.1896	-376.0635	-87.85492	6.160954	-1350.729	-1118.473	-1005.654	-1350.729	
12	XMV12	P4	3.00	10822.02	3654.402	525.5656	-388.0351	18833.47	14755.78	13659.46	18833.47	
13	XMV13	P4	3.00	1460.53	110.4	37.38835	9.788256	1929.276	1491.823	1458.703	1929.276	
14	XMV14	P4	3.00	8084.721	2508.433	619.0315	-8.076655	13715.16	11029.21	10276.68	13715.16	
15	XMV15	P4	3.00	2702.858	614.4716	80.08631	-73.55159	4226.584	3266.042	3081.7	4226.584	
16	XMV16	P4	3.00	3713.633	1106.636	317.4558	40.7967	6226.978	5051.18	4719.189	6226.978	
17	XMV17	P4	3.00	8150.23	2195.304	568.0024	19.17628	13292.76	10651.17	9992.584	13292.76	

Tabel Gaya Batang KK_XM

3. Batang Diagonal

NO	Batang	Profil	L (m)	N _b (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKJ} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XMD1	P4	2.381701	15952.9	5265.963	3.259021	-1313.232	27569.03	20680.68	19100.89	27569.03	
2	XMD4	P4	2.381701	16046.92	5219.048	4.929711	-1299.832	27606.78	20711	19145.28	27606.78	
3	XMD5	P4	2.323925	10569.94	3635.648	126.3038	-782.6082	18500.96	14027.29	12936.59	18500.96	
4	XMD8	P4	2.323925	10787.22	3624.854	127.0528	-779.1606	18744.43	14210.79	13123.33	18744.43	
5	XMD9	P4	2.297303	14300.39	5029.758	191.1802	-1066.259	25208.08	19135.48	17626.55	25208.08	
6	XMD12	P4	2.297303	14455.6	5000.184	190.69	-1059.356	25347.02	19239.09	17739.04	25347.02	
7	XMD13	P4	2.255931	14723.33	5241.488	367.1036	-943.2682	26054.38	19981.31	18408.86	26054.38	
8	XMD16	P4	2.255931	14950.15	5241.981	370.2386	-940.2567	26327.35	20189.8	18617.21	26327.35	
9	XMD17	P4	2.226213	-4750.589	-1180.284	338.3441	633.4151	-7589.162	4370.813	4107.737	-7589.162	
10	XMD18	P4	2.021392	4115.258	876.9193	-321.0187	-540.2486	6341.38	4370.813	4107.737	6341.38	
11	XMD19	P4	2.021392	3860.493	864.9529	-318.2667	-534.5049	6016.517	4130.467	3870.981	6016.517	
12	XMD20	P4	2.226213	-4499.28	-1172.199	339.0052	632.0548	-7274.654	-5049.185	-4697.525	-7274.654	
13	XMD21	P4	2.193171	-9936.471	-3311.632	-132.9706	694.9374	-17222.38	-13076.35	-12082.86	-17222.38	
14	XMD22	P4	2.051828	11746	4046.947	52.67913	-959.0577	20570.31	15490.95	14276.87	20570.31	
15	XMD23	P4	2.051828	11431.6	4011.813	51.74644	-951.2069	20136.82	15164.71	13961.17	20136.82	
16	XMD24	P4	2.193171	-9712.686	-3311.937	-132.7363	695.2479	-16954.32	-12875.02	-11881.44	-16954.32	
17	XMD25	P4	2.164163	-7082.391	-2274.466	-97.21526	471.4012	-12138.01	-9220.169	-8537.829	-12138.01	
18	XMD26	P4	2.079327	8092.073	2714.01	223.619	-454.8836	14052.9	10808.02	9993.817	14052.9	
19	XMD27	P4	2.079327	7870.495	2708.958	224.6	-452.6394	13778.93	10603.71	9791.027	13778.93	
20	XMD28	P4	2.164163	-6862.706	-2269.09	-97.13403	470.1385	-11865.79	-9015.904	-8335.178	-11865.79	
21	XMD29	P4	2.131953	-2764.054	-731.338	-62.74185	120.0927	-4487.005	-3440.544	-3221.143	-4487.005	
22	XMD30	P4	2.11074	4782.395	1437.588	282.9792	-76.41765	8039.014	6368.835	5937.56	8039.014	
23	XMD31	P4	2.11074	4574.961	1442.153	285.964	-74.57432	7797.398	6191.206	5758.56	7797.398	
24	XMD32	P4	2.131953	-2534.469	-727.0411	-62.75579	119.0045	-4204.629	-3228.779	-3010.666	-4204.629	
25	XMD33	P4	2.11074	4573.195	1445.21	73.4655	-287.8369	7800.169	5938.286	5504.723	7800.169	
26	XMD34	P4	2.131953	-2526.936	-727.3301	-118.9685	62.86404	-4196.051	-3289.801	-3071.602	-4196.051	
27	XMD35	P4	2.131953	-2755.679	-731.3763	-119.9825	119.9825	-4477.017	-3501.741	-3282.328	-4477.017	
28	XMD36	P4	2.11074	4779.377	1440.076	75.24167	-284.7772	8039.373	6119.82	5687.797	8039.373	
29	XMD37	P4	2.079327	7832.865	2699.674	449.5304	-225.3882	13718.92	10828.62	10018.72	13718.92	

3. Lanjutan Batang Diagonal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKL} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
30	XMD38	P4	2.164163	-6838.867	-2261.834	-468.689	96.7746	-11825.61	-9431.633	-8753.076	-11825.61	
31	XMD39	P4	2.164163	-7059.683	-2267.653	-470.002	96.90395	-12099.86	-9638.909	-8958.613	-12099.86	
32	XMD40	P4	2.079327	8055.246	2704.983	451.8371	-224.4088	13994.27	11037.91	10226.41	13994.27	
33	XMD41	P4	2.051828	11372.97	3984.629	948.388	-47.76934	20022.97	16155.3	14959.91	20022.97	
34	XMD42	P4	2.193171	-9720.009	-3308.528	-695.7089	131.4232	-16957.66	-13553.09	-12560.53	-16957.66	
35	XMD43	P4	2.193171	-9946.29	-3309.001	-695.5509	131.6994	-17229.95	-13757.12	-12764.42	-17229.95	
36	XMD44	P4	2.051828	11686.75	4019.532	956.243	-48.64002	20455.35	16489	15283.14	20455.35	
37	XMD45	P4	2.021392	3849.173	862.3996	534.5706	318.9706	5998.847	5140.62	4881.899	5998.847	
38	XMD46	P4	2.226213	-4512.266	-1180.234	-632.0396	-336.981	-7303.094	-6235.768	-5881.697	-7303.094	
39	XMD47	P4	2.226213	-4761.92	-1187.817	-633.3211	-336.3669	-7614.811	-6471.093	-6114.749	-7614.811	
40	XMD48	P4	2.021392	4101.474	873.6577	540.1432	321.7289	6319.621	5387.887	5125.79	6319.621	
41	XMD50	P4	2.255931	14901.77	5226.764	936.3819	-370.3092	26244.95	20807.37	19239.34	26244.95	
42	XMD51	P4	2.255931	14678.92	5227.459	939.6295	-367.2354	25978.64	20611.53	19043.29	25978.64	
43	XMD54	P4	2.297303	14303.76	4948.056	1046.455	-190.5594	25081.4	20066.79	18582.38	25081.4	
44	XMD55	P4	2.297303	14144.77	4975.801	1052.932	-191.0178	24935.01	19964.78	18472.04	24935.01	
45	XMD58	P4	2.323925	10784.11	3625.272	779.4595	-126.8586	18741.37	14991.38	13903.79	18741.37	
46	XMD59	P4	2.323925	10571.21	3637.27	783.2028	-126.1146	18505.08	14818.65	13727.47	18505.08	
47	XMD62	P4	2.381701	16105.29	5232.842	1304.806	-3.404259	27698.9	22339.94	20770.09	27698.9	
48	XMD63	P4	2.381701	16007.49	5277.754	1317.704	-1.734856	27653.39	22321.29	20737.96	27653.39	

Tabel Gaya Batang KK_XM

4. Batang Bawah

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XMB1	P4	3.0806	10221.5	4169.224	-41.81685	-1084.123	18936.56	14152.24	12901.47	18936.56	
2	XMB2	P4	3.0500	-2068.867	193.4772	-91.54476	-139.9141	-2173.077	-1739.661	-1797.704	-2173.077	
3	XMB3	P4	3.0382	-7943.703	-1589.249	-240.6926	156.6198	-12075.24	-9345.263	-8868.488	-12075.24	
4	XMB4	P4	3.0227	-26984.32	-8233.56	139.8057	2198.196	-45554.88	-33998.30	-31528.32	-45554.88	
5	XMB5	P4	3.0140	-29905.41	-9556.35	-329.3406	2059.747	-51176.65	-38777.7	-35910.79	-51176.65	
6	XMB6	P4	3.0067	-16699.7	-5103.813	-673.4509	602.3021	-28205.74	-21962.45	-20431.3	-28205.74	
7	XMB7	P4	3.0024	2038.799	1361.497	407.5092	67.13488	4624.955	3957.777	3549.278	4624.955	
8	XMB8	P4	3.0002	6872.702	2906.949	690.1264	-36.61082	12898.36	10501.92	9629.837	12898.36	
9	XMB9	P4	3.0002	6875.716	2907.449	35.69554	-691.1668	12902.78	9719.919	8847.684	12902.78	
10	XMB10	P4	3.0024	2053.398	1362.075	-66.73417	-407.2528	4643.397	3402.467	2993.844	4643.397	
11	XMB11	P4	3.0067	-16675.82	-5098.572	-601.6927	672.9504	-28168.71	-21848.56	-20318.99	-28168.71	
12	XMB12	P4	3.0140	-29821.29	-9528.827	-2053.961	328.2457	-51031.66	-40738.5	-37879.86	-51031.66	
13	XMB13	P4	3.0227	-26907.01	-8208.3	-2192.188	-140.1133	-45421.7	-36696.89	-34234.41	-45421.7	
14	XMB14	P4	3.0382	-7980.87	-1602.364	-160.6183	239.9728	-12140.83	-9298.362	-8817.653	-12140.83	
15	XMB15	P4	3.0500	-2163.125	162.0551	131.5411	91.0273	-2336.462	-1594.497	-1643.114	-2336.462	
16	XMB16	P4	3.0806	10178.92	4153.5	1080.163	41.78831	18860.3	15441.42	14195.38	18860.3	

Tabel Gaya Batang KK_XN

1. Batang Atas

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{Ut} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XNA1	P3	3.043041	1562.692	485.4197	25.24441	-96.11053	2651.902	2019.219	1873.594	2651.902	
2	XNA2	P3	3.023971	4048.528	1292.689	55.02888	-268.1433	6926.536	5260.937	4873.13	6926.536	
3	XNA3	P3	3.014963	1665.091	515.2106	-4.613842	-133.4165	2822.446	2111.298	1956.735	2822.446	
4	XNA4	P3	3.006659	534.3188	174.3385	-16.24825	-59.83287	920.1241	670.5952	618.2936	920.1241	
5	XNA5	P3	3.002016	139.8781	89.96288	-3.92117	-26.41189	311.7944	229.1404	202.1515	311.7944	
6	XNA6	P3	3.000017	-93.10163	11.62703	-8.462715	-11.36947	-93.11871	-79.99429	-83.4824	-93.11871	
7	XNA7	P3	3.000017	-96.20988	10.80782	11.19999	8.498033	-98.15935	-60.17933	-63.42188	-98.15935	
8	XNA8	P3	3.002016	142.1256	90.18481	26.35594	3.809739	314.8465	267.762	240.7065	314.8465	
9	XNA9	P3	3.006659	536.0361	174.6968	59.83326	16.17906	922.7582	763.8925	711.4835	922.7582	
10	XNA10	P3	3.014963	1663.812	514.5575	133.3994	4.760004	2819.866	2274.979	2120.612	2819.866	
11	XNA11	P3	3.023971	4039.216	1289.891	267.1172	-55.35553	6910.885	5503.704	5116.737	6910.885	
12	XNA12	P3	3.043041	1572.761	488.4832	96.83883	-25.28196	2668.886	2117.871	1971.326	2668.886	

Tabel Gaya Batang KK_XN

2. Batang Vertikal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKT} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XNV1	P4	3.00	24618.96	7371.687	-131.9977	-1974.919	41337.45	30844.69	28633.18	41337.45	
2	XNV2	P4	3.00	10593.21	3384.293	-48.51614	-894.5894	18126.72	13536.82	12521.53	18126.72	
3	XNV3	P4	3.00	-9152.424	-3212.08	-379.457	423.563	-16122.24	-12547.03	-11583.4	-16122.24	
4	XNV4	P4	3.00	-1250.122	-907.5623	-681.0549	-454.1643	-2952.246	-3031.45	-2759.182	-2952.246	
5	XNV5	P4	3.00	-9336.015	-3291.909	-594.0269	228.9503	-16470.27	-13065.54	-12077.96	-16470.27	
6	XNV6	P4	3.00	-4952.093	-1841.994	-411.4441	49.05452	-8889.703	-7161.01	-6608.412	-8889.703	
7	XNV7	P4	3.00	1298.213	203.024	27.77884	-22.97716	1882.694	1445.355	1384.448	1882.694	
8	XNV8	P4	3.00	-4921.078	-1839.25	-47.86255	411.9499	-8848.094	-693.505	-6141.73	-8848.094	
9	XNV9	P4	3.00	-9294.129	-3282.152	-228.1022	592.4359	-16404.4	-12577.02	-11592.38	-16404.4	
10	XNV10	P4	3.00	-1166.258	-880.6015	464.3516	684.502	-2808.472	-1549.133	-1284.952	-2808.472	
11	XNV11	P4	3.00	-9429.063	-3291.371	-459.9642	362.8786	-16581.07	-12987.76	-12000.35	-16581.07	
12	XNV12	P4	3.00	10675.15	3415.41	899.9977	46.14524	18274.84	14786.12	13761.5	18274.84	
13	XNV13	P4	3.00	24421.78	7310.018	1958.69	131.1852	41002.16	33102.05	30909.04	41002.16	

Tabel Gaya Batang KK_XN

3. Batang Diagonal

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKI} (KN)	N _{UI} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XND1	P4	3.898731	-11229.76	-3538.948	96.86948	981.6064	-19138.03	-14237.28	-13175.6	-19138.03	
2	XND2	P4	3.983014	-28690.96	-9349.107	132.7171	2469.994	-49387.72	-36881.53	-34076.8	-49387.72	
3	XND3	P4	4.036087	11095.56	3711.813	966.1285	38.17534	19253.57	15599.53	14485.99	19253.57	
4	XND4	P4	4.103657	14647.65	5041.002	893.9595	-366.291	25642.78	20304.83	18792.53	25642.78	
5	XND5	P4	4.165585	6571.779	2203.13	527.5459	-23.2366	11411.14	9191.412	8530.474	11411.14	
6	XND6	P4	4.235576	2456.014	846.9391	347.3256	135.5908	4302.319	3643.53	3389.449	4302.319	
7	XND7	P4	4.235576	2515.888	860.4139	-134.0309	-349.1344	4395.728	3135.958	2877.834	4395.728	
8	XND8	P4	4.165585	6581.47	2207.89	23.26197	-528.7105	11430.39	8600.705	7938.338	11430.39	
9	XND9	P4	4.103657	14657.1	5043.295	368.2774	-892.546+	25657.79	19685.28	18172.29	25657.79	
10	XND10	P4	4.036087	10922.96	3661.893	-59.76875	-975.2419	18966.59	14153.22	13054.65	18966.59	
11	XND11	P4	3.983014	-28509.01	-9291.301	-2455.831	-133.0053	-49076.89	-39754.66	-36967.27	-49076.89	
12	XND12	P4	3.898731	-11411.07	-3596.749	-998.0522	-98.86493	-19448.08	-15783.72	-14704.7	-19448.08	

Tabel Gaya Batang KK_XN

4. Batang Bawah

NO	Batang	Profil	L (m)	N _D (KN)	N _L (KN)	N _{WKA} (KN)	N _{WKJ} (KN)	N _{U1} (KN)	N _{U2} (KN)	N _{U3} (KN)	N _{UMAKS} (KN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	XNB1	P4	3.043041	-5350.033	-564.8795	422.7288	563.9487	-7323.847	-4985.611	-4816.147	-7323.847	
2	XNB2	P4	3.023971	-13004.34	-2974.119	554.9423	1298.472	-20363.8	-14606.92	-13714.68	-20363.8	
3	XNB3	P4	3.014963	-18003.16	-4264.992	1870.93	2937.177	-28427.78	-19075.72	-17796.22	-28427.78	
4	XNB4	P4	3.006659	-15613.4	-5151.985	-1832.995	-544.9993	-26979.26	-22434.04	-20888.44	-26979.26	
5	XNB5	P4	3.002016	-4867.628	-1416.141	-1119.108	-765.0731	-8106.979	-7423.164	-6998.322	-8106.979	
6	XNB6	P4	3.000017	1247.747	788.2596	-236.6608	-433.7257	2758.511	1784.891	1548.413	2758.511	
7	XNB7	P4	3.000017	1226.54	785.2076	432.1461	235.8442	2728.18	2564.71	2329.148	2728.18	
8	XNB8	P4	3.002016	-4898.896	-1425.706	762.6433	1119.07	-8159.804	-5204.681	-4776.969	-8159.804	
9	XNB9	P4	3.006659	-15652.64	-5163.571	541.0494	1831.942	-27044.88	-19634.4	-18085.33	-27044.88	
10	XNB10	P4	3.014963	-17925.5	-4242.638	-2932.632	-1871.972	-28298.82	-24743.27	-23470.48	-28298.82	
11	XNB11	P4	3.023971	-13106.85	-3008.802	-1308.293	-556.0929	-20542.3	-16976.68	-16074.04	-20542.3	
12	XNB12	P4	3.043041	-5314.806	-556.6854	-561.7468	-422.5755	-7268.463	-6125.444	-5958.438	-7268.463	

1	XPD1	P4	0.8099173	5072.034	2056.829	618.5682	104.3609	9377.366	7775.307	7158.258	9377.366	
2	XPD2	P4	0.735679	1630.721	447.22	56.06179	-55.74321	2672.417	2071.587	1937.421	2672.417	
3	XPD3	P4	0.8099173	5143.267	2081.572	-100.0824	-620.4754	9502.437	7006.728	6382.257	9502.437	

Tabel 4.1 lanjutan

NO	Batang	Profil	L (m)	N _D (kN)	N _L (kN)	N _{WKA} (kN)	N _{WKI} (kN)	N _{U1} (kN)	N _{U2} (kN)	N _{U3} (kN)	N _{U(MAKS)} (kN)	KET
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
33	XBA33	P4	3,0696	-20,04925	-9,323925	-1,2048	2,5640	-47,3113	-36,8373	-32,3147	-47,3113	
34	XBA34	P4	3,0806	-18,62332	-9,08329	-1,0879	2,0640	-40,0844	-51,2699	-27,4875	-40,0844	
35	XBA35	P4	3,0875	-15,81324	-7,707581	-0,8483	1,8818	-34,7428	-26,9718	-23,6957	-34,7428	
36	XBA36	P4	3,1023	-15,39597	-7,931578	-0,5608	1,4444	-27,1703	-20,9390	-18,5327	-27,1703	
37	XBA37	P4	3,1127	-12,24597	-6,645081	-0,1966	1,5182	-22,1873	-16,7590	-14,7014	-22,1873	
38	XBA38	P4	3,1321	-6,168848	-2,728995	0,3011	0,8810	-10,0300	-7,0338	-6,3380	-10,0300	
39	XBA39	P4	3,1408	1,391353	2,462336	1,5965	-0,0402	11,8657	10,8151	8,8511	11,8657	
40	XBA40	P4	2,4729	4,842024	3,152372	1,3069	-0,2981	15,4124	13,1276	11,2016	15,4124	
41	XBA41	P4	2,0587	17,65391	11,4529	3,3433	-1,6228	50,4858	41,8764	35,9170	50,4858	
42	XBA42	P4	1,7995	5,9194	2,39415	0,8265	-0,6507	20,4814	16,5528	14,5802	20,4814	
43	XBA43	P4	2,1274	-35,05428	-26,81557	-7,4715	1,6952	-80,6445	-69,3466	-58,3466	-80,6445	
44	XBA44	P4	2,1274	-41,31386	-30,03352	-8,7678	1,8152	-97,9279	-83,8647	-71,1651	-97,9279	

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Jenis Profil Yang dipakai
- [4] Panjang batang L (m)
- [5] N_D = gaya Aksial Akibat Beban Mati (kN)
- [6] N_L = gaya Aksial Akibat Beban Hidup (kN)
- [7] N_{WKA} = gaya Aksial Akibat Beban Angin Kanan (kN)
- [8] N_{WKI} = gaya Aksial Akibat Beban Angin Kiri (kN)
- [9] N_{U1} = 1,2N_D + 1,6N_L
- [10] N_{U2} = 0,9N_D + 1,2 N_L + 1,2 N_{WKA}
- [11] N_{U3} = 0,9N_D + 1,2 N_L + 1,2 N_{WKI}
- [12] N_{U(MAKS)} = gaya aksial batang maksimum (kN)
- [13] Keterangan

Tabel 4.5
Tabel Perencanaan batang

NO	Batang	N _g Tarik (KN)	N _g Tekan (FN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λc	ω	φ/N _h (KN)	KL/r < 240	φ/N _h (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XAA1	0.0000	-97.1800	2.1274	P4	2045.1572	38.3540	-	-	-	-	55.4662	441.7540	Aman
2	XAA2	0.0000	-80.2878	2.1274	P4	2045.1572	38.3540	-	-	-	-	55.4662	441.7540	Aman
3	XAA3	17.1165	-	1.7995	P4	2045.1572	38.3540	46.9175	0.5176	1.7267	241.6219	-	-	Aman
4	XAA4	43.6630	-	2.0587	P4	2045.1572	38.3540	53.6754	0.5922	1.5093	276.4247	-	-	Aman
5	XAA5	8.4735	-	2.4729	P4	2045.1572	38.3540	64.4766	0.7113	1.2365	332.0501	-	-	Aman
6	XAA6	6.2719	-	3.1408	P4	2045.1572	38.3540	81.8909	0.9034	0.9893	421.7329	-	-	Aman
7	XAA7	0.0000	-5.8954	3.1321	P4	2045.1572	38.3540	-	-	-	-	81.6627	441.7540	Aman
8	XAA8	0.0000	-22.3709	3.1127	P4	2045.1572	38.3540	-	-	-	-	81.1571	441.7540	Aman
9	XAA9	0.0000	-28.0864	3.1023	P4	2045.1572	38.3540	-	-	-	-	80.8853	441.7540	Aman
10	XAA10	0.0000	-36.6272	3.0875	P4	2045.1572	38.3540	-	-	-	-	80.5011	441.7540	Aman
11	XAA11	0.0000	-43.2017	3.0806	P4	2045.1572	38.3540	-	-	-	-	80.3198	441.7540	Aman
12	XAA12	0.0000	-53.1967	3.0696	P4	2045.1572	38.3540	-	-	-	-	80.0336	441.7540	Aman
13	XAA13	0.0000	-45.4176	3.0614	P4	2045.1572	38.3540	-	-	-	-	79.8193	441.7540	Aman
14	XAA14	0.0000	-46.2925	3.0482	P4	2045.1572	38.3540	-	-	-	-	79.4758	441.7540	Aman
15	XAA15	0.0000	-44.6824	3.0447	P4	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
16	XAA16	0.0000	-46.0678	3.0351	P4	2045.1572	38.3540	-	-	-	-	79.1329	441.7540	Aman
17	XAA17	0.0000	-48.7093	3.0293	P4	2045.1572	38.3540	-	-	-	-	78.9815	441.7540	Aman
18	XAA18	0.0000	-50.7886	3.0227	P4	2045.1572	38.3540	-	-	-	-	78.8114	441.7540	Aman
19	XAA19	0.0000	-61.0411	3.0192	P4	2045.1572	38.3540	-	-	-	-	78.7194	441.7540	Aman
20	XAA20	0.0000	-66.5026	3.0150	P4	2045.1572	38.3540	-	-	-	-	78.6088	441.7540	Aman
21	XAA21	0.0000	-74.1252	3.0096	P4	2045.1572	38.3540	-	-	-	-	78.4686	441.7540	Aman
22	XAA22	0.0000	-70.3443	3.0067	P4	2045.1572	38.3540	-	-	-	-	78.3923	441.7540	Aman
23	XAA23	0.0000	-69.2910	3.0067	P4	2045.1572	38.3540	-	-	-	-	78.3923	441.7540	Aman
24	XAA24	0.0000	-68.7694	3.0096	P4	2045.1572	38.3540	-	-	-	-	78.4686	441.7540	Aman
25	XAA25	0.0000	-68.6857	3.0150	P4	2045.1572	38.3540	-	-	-	-	78.6088	441.7540	Aman
26	XAA26	0.0000	-67.6189	3.0192	P4	2045.1572	38.3540	-	-	-	-	78.7194	441.7540	Aman
27	XAA27	0.0000	-66.6088	3.0227	P4	2045.1572	38.3540	-	-	-	-	78.8114	441.7540	Aman
28	XAA28	0.0000	-62.9094	3.0293	P4	2045.1572	38.3540	-	-	-	-	78.9815	441.7540	Aman
29	XAA29	0.0000	-59.1255	3.0351	P4	2045.1572	38.3540	-	-	-	-	79.1329	441.7540	Aman
30	XAA30	0.0000	-57.2100	3.0447	P4	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
31	XAA31	0.0000	-50.3209	3.0482	P4	2045.1572	38.3540	-	-	-	-	79.4758	441.7540	Aman
32	XAA32	0.0000	-45.2471	3.0614	P4	2045.1572	38.3540	-	-	-	-	79.8193	441.7540	Aman

1. Batang Atas

Tabel 4.5 Lanjutan

NO	Batang	Nu Tarik (KN)	Nu Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λc	ω	ϕN_n (KN)	KL/r < 240		ϕN_n (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XAA33	0.0000	-47.3113	3.0696	P4	2045.1572	38.3540	-	-	-	-	80.0336	441.7540	Aman
34	XAA34	0.0000	-40.0844	3.0806	P4	2045.1572	38.3540	-	-	-	-	80.3198	441.7540	Aman
35	XAA35	0.0000	-34.7428	3.0875	P4	2045.1572	38.3540	-	-	-	-	80.5011	441.7540	Aman
36	XAA36	0.0000	-27.1703	3.1023	P4	2045.1572	38.3540	-	-	-	-	80.8853	441.7540	Aman
37	XAA37	0.0000	-22.1873	3.1127	P4	2045.1572	38.3540	-	-	-	-	81.1571	441.7540	Aman
38	XAA38	0.0000	-10.0300	3.1321	P4	2045.1572	38.3540	-	-	-	-	81.6627	441.7540	Aman
39	XAA39	11.8657	-	3.1408	P4	2045.1572	38.3540	81.8909	0.9034	0.9893	421.7329	-	-	Aman
40	XAA40	15.4124	-	2.4729	P4	2045.1572	38.3540	64.4766	0.7113	1.2365	332.0501	-	-	Aman
41	XAA41	50.4858	-	2.0587	P4	2045.1572	38.3540	53.6754	0.5922	1.5093	276.4247	-	-	Aman
42	XAA42	20.4814	-	1.7995	P4	2045.1572	38.3540	46.9175	0.5176	1.7267	241.6219	-	-	Aman
43	XAA43	0.0000	-80.6445	2.1274	P4	2045.1572	38.3540	-	-	-	-	55.4662	441.7540	Aman
44	XAA44	0.0000	-97.9279	2.1274	P4	2045.1572	38.3540	-	-	-	-	55.4662	441.7540	Aman

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Nu Tarik = Gaya Tarik
- [4] Nu Tekan = Gaya Tekan
- [5] Panjang batang
- [6] Profil terpasang
- [7] Ag = Luas penampang profil (mm²)
- [8] r = Jari-jari girasi profil terkecil (mm)
- [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
- [10] $\lambda c = (1/3.14) * (KL/r) * (f_y/E)^{0.5}$ (Parameter Kelangsingan Batang tekan)
- [11] $\omega =$ Koefisien Tekuk
 $\lambda c < 0.25; \omega = 1$
 $0.25 < \lambda c < 1.2; \omega = 1.43 / (1.6 - 0.6 \lambda c)$
 $\lambda c > 1.2; \omega = 1.25 \lambda c^2$
- [12] $\phi N_n = 0.85 \cdot Ag \cdot (f_y / \omega)$; Kuat Tekan Nominal
- [13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
- [14] $\phi N_n = 0.9 \cdot Ag \cdot f_y$; Kuat Tarik Nominal
- [15] Nu $\leq \phi N_n$; Profil aman dipakai

Tabel 4.6
Tabel Perencanaan batang

1. Batang Vertikal

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r > 200	λ _c	ω	φN/n (KN)	KL/r < 240	φN/n (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XAV1	40.8697	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
2	XAV2	256.9554	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
3	XAV3	305.4782	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
4	XAV4	0.0000	-77.1771	3.0000	PXX5	10064.4960	52.3240	-	-	-	-	57.3351	2173.9311	Aman
5	XAV5	96.5960	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
6	XAV6	94.2762	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
7	XAV7	75.3319	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
8	XAV8	53.7179	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
9	XAV9	46.4861	-	3.0000	PX5	3935.4760	46.7360	54.1903	0.7082	1.2621	636.1244	-	-	Aman
10	XAV10	52.8242	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
11	XAV11	43.7790	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
12	XAV12	26.3514	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
13	XAV13	19.9572	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
14	XAV14	25.7944	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
15	XAV15	0.0000	-1.9908	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
16	XAV16	0.0000	-12.4995	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
17	XAV17	0.0000	-12.4067	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
18	XAV18	0.0000	-22.1910	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
19	XAV19	0.0000	-17.9479	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
20	XAV20	0.0000	-5.5497	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
21	XAV21	2.5650	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
22	XAV22	6.6072	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
23	XAV23	24.6158	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
24	XAV24	5.1853	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
25	XAV25	4.4367	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
26	XAV26	1.8114	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
27	XAV27	0.0000	-4.7145	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
28	XAV28	0.0000	-5.0640	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
29	XAV29	4.3201	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
30	XAV30	2.0608	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
31	XAV31	9.0939	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
32	XAV32	30.0129	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman

Tabel 4.6 Lanjutan

NO	Batang	Nu Tarik (KN)	Nu Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λc	ω	ϕN_n (KN)	KL/r < 240	ϕN_n (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XAV33	20.6468	-	3.0000	P5	2774.1880	47.7320	62.8246	0.6931	1.2895	438.8748	-	-	Aman
34	XAV34	21.8901	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
35	XAV35	43.8758	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
36	XAV36	49.3909	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
37	XAV37	49.2363	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
38	XAV38	47.9502	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
39	XAV39	97.9511	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
40	XAV40	135.5245	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
41	XAV41	150.0911	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
42	XAV42	0.0000	-52.6826	3.0000	PXX5	10064.4960	52.3240	-	-	-	-	57.3351	2173.9311	Aman
43	XAV43	361.7996	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
44	XAV44	260.0545	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
45	XAV45	56.7467	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Nu Tarik = Gaya Tarik
- [4] Nu Tekan = Gaya Tekan
- [5] Panjang batang
- [6] Profil terpasang
- [7] Ag = Luas penampang profil (mm²)
- [8] i = Jari-jari girasi profil terkecil (mm)
- [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
- [10] $\lambda c = (1/3.14) * (KL/r) * (fy/E)^{0.5}$ (Parameter Kelangsingan Batang tekan)
- [11] $\omega =$ Koefisien Tekuk
- $\lambda c < 0.25; \omega = 1$
- $0.25 < \lambda c < 1.2; \omega = 1.43 / (1.6 - 0.6 \lambda c)$
- $\lambda c > 1.2; \omega = 1.25 \lambda c^2$
- [12] $\phi N_n = 0.85 \cdot Ag \cdot (fy / \omega)$; Kuat Tekan Nominal
- [13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
- [14] $\phi N_n = 0.9 \cdot Ag \cdot fy$; Kuat Tarik Nominal
- [15] $N_u \leq \phi N_n$; Profil aman dipakai

Tabel 4.7
Tabel Perencanaan batang

1. Batang Diagonal

NO	Batang	N _t Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λ _c	ω	φN _t (KN)	KL/r < 240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XAD1	0.0000	-45.4129	2.1140	PXX5	10064.4960	52.3240	-	-	-	-	40.4017	2173.9311	Aman
2	XAD2	208.8549	-	1.5146	PXX5	10064.4960	52.3240	28.9459	0.3193	2.7988	733.5912	-	-	Aman
3	XAD3	209.1309	-	1.5146	PXX5	10064.4960	52.3240	28.9459	0.3193	2.7988	733.5912	-	-	Aman
4	XAD4	0.0000	-40.9656	2.1140	PXX5	10064.4960	52.3240	-	-	-	-	40.4017	2173.9311	Aman
5	XAD5	233.0835	-	2.1140	PXX5	10064.4960	52.3240	40.4017	0.4457	2.0052	1023.9219	-	-	Aman
6	XAD6	0.0000	-277.5627	1.5146	PXX5	10064.4960	52.3240	-	-	-	-	28.9459	2173.9311	Aman
7	XAD7	0.0000	-277.5018	1.5146	PXX5	10064.4960	52.3240	-	-	-	-	28.9459	2173.9311	Aman
8	XAD8	240.8273	-	2.1140	PXX5	10064.4960	52.3240	40.4017	0.4457	2.0052	1023.9219	-	-	Aman
9	XAD9	210.9804	-	1.9861	PXX5	10064.4960	52.3240	37.9574	0.4188	2.1343	961.9745	-	-	Aman
10	XAD10	0.0000	-370.9313	1.4746	PXX5	10064.4960	52.3240	-	-	-	-	28.1826	2173.9311	Aman
11	XAD11	0.0000	-373.6769	1.4746	PXX5	10064.4960	52.3240	-	-	-	-	28.1826	2173.9311	Aman
12	XAD12	209.9938	-	1.9861	PXX5	10064.4960	52.3240	37.9574	0.4188	2.1343	961.9745	-	-	Aman
13	XAD13	0.0000	-268.1168	2.0735	PXX5	10064.4960	52.3240	-	-	-	-	39.6286	2173.9311	Aman
14	XAD14	42.5390	-	1.5230	PXX5	10064.4960	52.3240	29.1071	0.3211	2.7833	737.6762	-	-	Aman
15	XAD15	46.1143	-	1.5230	PXX5	10064.4960	52.3240	29.1071	0.3211	2.7833	737.6762	-	-	Aman
16	XAD16	0.0000	-258.0999	2.0735	PXX5	10064.4960	52.3240	-	-	-	-	39.6286	2173.9311	Aman
17	XAD17	0.0000	-278.8368	2.2175	PXX5	10064.4960	52.3240	-	-	-	-	42.3808	2173.9311	Aman
18	XAD18	108.0008	-	1.6206	PXX5	10064.4960	52.3240	30.9719	0.3417	2.6157	784.9379	-	-	Aman
19	XAD19	106.3728	-	1.6206	PXX5	10064.4960	52.3240	31.0752	0.3428	2.6070	787.5544	-	-	Aman
20	XAD20	0.0000	-272.6378	2.2249	PXX5	10064.4960	52.3240	-	-	-	-	42.5220	2173.9311	Aman
21	XAD21	0.0000	-335.8596	2.4802	PXX5	10064.4960	52.3240	-	-	-	-	47.4005	2173.9311	Aman
22	XAD22	128.0818	-	1.8255	PXX5	10064.4960	52.3240	34.8875	0.3849	2.3221	884.1731	-	-	Aman
23	XAD23	124.9613	-	1.8194	PXX5	10064.4960	52.3240	34.7716	0.3836	2.3299	881.2360	-	-	Aman
24	XAD24	0.0000	-328.9156	2.4719	PXX5	10064.4960	52.3240	-	-	-	-	47.2431	2173.9311	Aman
25	XAD25	0.0000	-316.0525	2.4602	PXX5	10064.4960	52.3240	-	-	-	-	47.0183	2173.9311	Aman
26	XAD26	150.2267	-	1.8310	PXX5	10064.4960	52.3240	34.9932	0.3861	2.3151	886.8507	-	-	Aman
27	XAD27	147.5883	-	1.8310	PXX5	10064.4960	52.3240	34.9932	0.3861	2.3151	886.8507	-	-	Aman
28	XAD28	0.0000	-310.7621	2.4602	PXX5	10064.4960	52.3240	-	-	-	-	47.0183	2173.9311	Aman
29	XAD29	0.0000	-315.3883	2.4325	PX5	3935.4760	46.7360	-	-	-	-	52.0484	850.0628	Aman
30	XAD30	195.0198	-	1.8513	PX5	3935.4760	46.7360	39.6114	0.4370	2.0452	392.5475	-	-	Aman
31	XAD31	192.6869	-	1.8513	PX5	3935.4760	46.7360	39.6114	0.4370	2.0452	392.5475	-	-	Aman
32	XAD32	0.0000	-310.6831	2.4325	PX5	3935.4760	46.7360	-	-	-	-	52.0484	850.0628	Aman

Tabel 4.7 Lanjutan

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λ _c	ω	ΦN _u (KN)	KL/r < 240		ΦN _t (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XAD33	0.0000	-338.1662	2.4168	PX5	3935.4760	46.7360	-	-	-	-	51.7122	850.0628	Aman
34	XAD34	152.4635	-	1.8631	PX5	3935.4760	46.7360	39.8637	0.4398	2.0323	395.0479	-	-	Aman
35	XAD35	149.9301	-	1.8631	PX5	3935.4760	46.7360	39.8637	0.4398	2.0323	395.0479	-	-	Aman
36	XAD36	0.0000	-333.3233	2.4168	PX5	3935.4760	46.7360	-	-	-	-	51.7122	850.0628	Aman
37	XAD37	0.0000	-290.9828	2.3934	PX5	3935.4760	46.7360	-	-	-	-	51.2104	850.0628	Aman
38	XAD38	150.9248	-	1.8810	PX5	3935.4760	46.7360	40.2477	0.4440	2.0129	398.8536	-	-	Aman
39	XAD39	148.7969	-	1.8810	PX5	3935.4760	46.7360	40.2477	0.4440	2.0129	398.8536	-	-	Aman
40	XAD40	0.0000	-287.0203	2.3934	PX5	3935.4760	46.7360	-	-	-	-	51.2104	850.0628	Aman
41	XAD41	0.0000	-257.5449	2.3817	PX5	3935.4760	46.7360	-	-	-	-	50.9607	850.0628	Aman
42	XAD42	162.9552	-	1.8901	PX5	3935.4760	46.7360	40.4422	0.4462	2.0032	400.7809	-	-	Aman
43	XAD43	161.0445	-	1.8901	PX5	3935.4760	46.7360	40.4422	0.4462	2.0032	400.7809	-	-	Aman
44	XAD44	0.0000	-254.3351	2.3623	PX5	3935.4760	46.7360	-	-	-	-	50.9607	850.0628	Aman
45	XAD45	0.0000	-243.8999	2.3623	PX5	3935.4760	46.7360	-	-	-	-	50.5464	850.0628	Aman
46	XAD46	152.9015	-	1.9054	PX5	3935.4760	46.7360	40.7699	0.4498	1.9871	404.0281	-	-	Aman
47	XAD47	151.2072	-	1.9054	PX5	3935.4760	46.7360	40.7699	0.4498	1.9871	404.0281	-	-	Aman
48	XAD48	0.0000	-241.2118	2.3623	PX5	3935.4760	46.7360	-	-	-	-	50.5464	850.0628	Aman
49	XAD49	0.0000	-215.5329	2.3469	P5	2774.1880	47.7520	-	-	-	-	49.1481	599.2246	Aman
50	XAD50	127.4314	-	1.9178	P5	2774.1880	47.7520	40.1620	0.4431	2.0172	280.5607	-	-	Aman
51	XAD51	125.8507	-	1.9178	P5	2774.1880	47.7520	40.1620	0.4431	2.0172	280.5607	-	-	Aman
52	XAD52	0.0000	-212.7030	2.3469	P5	2774.1880	47.7520	-	-	-	-	49.1481	599.2246	Aman
53	XAD53	0.0000	-190.2805	2.3201	P5	2774.1880	47.7520	-	-	-	-	48.5866	599.2246	Aman
54	XAD54	148.7452	-	1.9398	P5	2774.1880	47.7520	40.6228	0.4482	1.9943	283.7794	-	-	Aman
55	XAD55	147.2215	-	1.9398	P5	2774.1880	47.7520	40.6228	0.4482	1.9943	283.7794	-	-	Aman
56	XAD56	0.0000	-188.0503	2.3201	P5	2774.1880	47.7520	-	-	-	-	48.5866	599.2246	Aman
57	XAD57	0.0000	-164.5935	2.3125	P5	2774.1880	47.7520	40.7559	0.4496	1.9878	284.7092	-	-	Aman
58	XAD58	135.0453	-	1.9462	P5	2774.1880	47.7520	40.7559	0.4496	1.9878	284.7092	-	-	Aman
59	XAD59	133.6937	-	1.9462	P5	2774.1880	47.7520	40.7559	0.4496	1.9878	284.7092	-	-	Aman
60	XAD60	0.0000	-162.6030	2.3125	P5	2774.1880	47.7520	-	-	-	-	48.4270	599.2246	Aman
61	XAD61	0.0000	-129.2655	2.2897	P5	2774.1880	47.7520	-	-	-	-	47.9506	599.2246	Aman
62	XAD62	112.3203	-	1.9654	P5	2774.1880	47.7520	41.1590	0.4541	1.9683	287.5253	-	-	Aman
63	XAD63	111.1190	-	1.9654	P5	2774.1880	47.7520	41.1590	0.4541	1.9683	287.5253	-	-	Aman
64	XAD64	0.0000	-127.4027	2.2897	P5	2774.1880	47.7520	-	-	-	-	47.9506	599.2246	Aman
65	XAD65	0.0000	-98.4972	2.2747	P5	2774.1880	47.7520	-	-	-	-	47.6350	599.2246	Aman
66	XAD66	109.6296	-	1.9784	P5	2774.1880	47.7520	41.4309	0.4571	1.9554	289.4245	-	-	Aman

Tabel 4.7 Lanjutan

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tahan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φN _u (KN)	KL/r<240	φN _u (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
67	XAD67	108.6200	-	1.9784	P5	2774.1880	47.7520	41.4309	0.4571	1.9554	289.4245	-	-	Aman
68	XAD68	0.0000	-97.1204	2.2747	P5	2774.1880	47.7520	-	-	-	-	47.6350	599.2246	Aman
69	XAD69	0.0000	-77.9108	2.2559	P5	2774.1880	47.7520	-	-	-	-	47.2426	599.2246	Aman
70	XAD70	85.4803	-	1.9948	P5	2774.1880	47.7520	41.7741	0.4609	1.9393	291.8224	-	-	Aman
71	XAD71	84.3946	-	1.9948	P5	2774.1880	47.7520	41.7741	0.4609	1.9393	291.8224	-	-	Aman
72	XAD72	0.0000	-76.5073	2.2559	P5	2774.1880	47.7520	-	-	-	-	47.2426	599.2246	Aman
73	XAD73	0.0000	-55.7593	2.2448	P5	2774.1880	47.7520	-	-	-	-	47.0085	599.2246	Aman
74	XAD74	52.1871	-	2.0047	P5	2774.1880	47.7520	41.9819	0.4632	1.9297	293.2736	-	-	Aman
75	XAD75	51.4212	-	2.0047	P5	2774.1880	47.7520	41.9819	0.4632	1.9297	293.2736	-	-	Aman
76	XAD76	0.0000	-54.6578	2.2448	P5	2774.1880	47.7520	-	-	-	-	47.0085	599.2246	Aman
77	XAD77	0.0000	-35.8092	2.2299	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
78	XAD78	36.8356	-	2.0180	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
79	XAD79	35.7862	-	2.0180	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
80	XAD80	0.0000	-34.6863	2.2299	P5	2774.1880	47.7520	42.2609	0.4662	1.9170	295.2229	-	-	Aman
81	XAD81	0.0000	-28.8186	2.2078	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
82	XAD82	10.0289	-	2.0382	P5	2774.1880	47.7520	-	-	-	-	46.2348	599.2246	Aman
83	XAD83	9.3260	-	2.0382	P5	2774.1880	47.7520	-	-	-	-	46.2348	599.2246	Aman
84	XAD84	0.0000	-28.1705	2.2078	P5	2774.1880	47.7520	42.6837	0.4709	1.8980	298.1765	-	-	Aman
85	XAD85	0.0000	-7.2622	2.1932	P5	2774.1880	47.7520	42.6837	0.4709	1.8980	298.1765	-	-	Aman
86	XAD86	0.0000	-10.7042	2.0518	P5	2774.1880	47.7520	-	-	-	-	46.2348	599.2246	Aman
87	XAD87	0.0000	-11.5535	2.0518	P5	2774.1880	47.7520	-	-	-	-	45.9284	599.2246	Aman
88	XAD88	0.0000	-6.0577	2.1932	P5	2774.1880	47.7520	-	-	-	-	42.9684	599.2246	Aman
89	XAD89	0.0000	-6.7935	2.0518	P5	2774.1880	47.7520	-	-	-	-	45.9284	599.2246	Aman
90	XAD90	0.0000	-11.2898	2.1932	P5	2774.1880	47.7520	-	-	-	-	42.9684	599.2246	Aman
91	XAD91	0.0000	-12.4817	2.1932	P5	2774.1880	47.7520	-	-	-	-	45.9284	599.2246	Aman
92	XAD92	0.0000	-5.9270	2.0518	P5	2774.1880	47.7520	-	-	-	-	45.9284	599.2246	Aman
93	XAD93	15.9942	-	2.0382	P5	2774.1880	47.7520	42.6837	0.4709	1.8980	298.1765	-	-	Aman
94	XAD94	0.0000	-32.3744	2.2078	P5	2774.1880	47.7520	-	-	-	-	46.2348	599.2246	Aman
95	XAD95	0.0000	-33.1893	2.2078	P5	2774.1880	47.7520	-	-	-	-	46.2348	599.2246	Aman
96	XAD96	16.8348	-	2.0382	P5	2774.1880	47.7520	42.6837	0.4709	1.8980	298.1765	-	-	Aman
97	XAD97	36.7396	-	2.0180	P5	2774.1880	47.7520	42.2609	0.4662	1.9170	295.2229	-	-	Aman
98	XAD98	0.0000	-44.3562	2.2299	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
99	XAD99	0.0000	-45.4328	2.2299	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
100	XAD100	37.7836	-	2.0180	P5	2774.1880	47.7520	42.2609	0.4662	1.9170	295.2229	-	-	Aman

Tabel 4.7 Lanjutan

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λ _c	ω	φN _n (KN)	KL/r < 240		φN _n (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
106	XAD106	0.0000	-95.0422	2.2559	P5	2774.1880	47.7520	-	-	-	-	47.2426	599.2246	Aman
107	XAD107	0.0000	-96.2850	2.2559	P5	2774.1880	47.7520	-	-	-	-	47.2426	599.2246	Aman
108	XAD108	77.7906	-	1.9948	P5	2774.1880	47.7520	41.7741	0.4609	1.9393	291.8224	-	-	Aman
109	XAD109	101.0155	-	1.9784	P5	2774.1880	47.7520	41.4309	0.4571	1.9554	289.4245	-	-	Aman
110	XAD110	0.0000	-112.7495	2.2747	P5	2774.1880	47.7520	-	-	-	-	-	-	Aman
111	XAD111	0.0000	-114.0817	2.2747	P5	2774.1880	47.7520	-	-	-	-	47.6350	599.2246	Aman
112	XAD112	102.0088	-	1.9784	P5	2774.1880	47.7520	41.4309	0.4571	1.9554	289.4245	-	-	Aman
113	XAD113	101.7241	-	1.9654	P5	2774.1880	47.7520	41.1590	0.4541	1.9683	287.5253	-	-	Aman
114	XAD114	0.0000	-140.5195	2.2897	P5	2774.1880	47.7520	-	-	-	-	-	-	Aman
115	XAD115	0.0000	-142.2823	2.2897	P5	2774.1880	47.7520	-	-	-	-	47.9506	599.2246	Aman
116	XAD116	102.8627	-	1.9654	P5	2774.1880	47.7520	41.1590	0.4541	1.9683	287.5253	-	-	Aman
117	XAD117	124.6979	-	1.9462	P5	2774.1880	47.7520	40.7559	0.4496	1.9878	284.7092	-	-	Aman
118	XAD118	0.0000	-174.3361	2.3125	P5	2774.1880	47.7520	-	-	-	-	-	-	Aman
119	XAD119	0.0000	-176.2832	2.3125	P5	2774.1880	47.7520	-	-	-	-	48.4270	599.2246	Aman
120	XAD120	126.0139	-	1.9462	P5	2774.1880	47.7520	40.6228	0.4482	1.9943	283.7794	-	-	Aman
121	XAD121	142.2073	-	1.9398	P5	2774.1880	47.7520	-	-	-	-	-	-	Aman
122	XAD122	0.0000	-191.7819	2.3201	P5	2774.1880	47.7520	-	-	-	-	-	-	Aman
123	XAD123	0.0000	-193.9948	2.3201	P5	2774.1880	47.7520	-	-	-	-	-	-	Aman
124	XAD124	143.6870	-	1.9398	P5	2774.1880	47.7520	40.6228	0.4482	1.9943	283.7794	-	-	Aman
125	XAD125	122.8845	-	1.9178	P5	2774.1880	47.7520	40.1620	0.4431	2.0172	280.5607	-	-	Aman
126	XAD126	0.0000	-213.5248	2.3469	P5	2774.1880	47.7520	-	-	-	-	-	-	Aman
127	XAD127	0.0000	-216.4796	2.3469	P5	2774.1880	47.7520	-	-	-	-	49.1481	599.2246	Aman
128	XAD128	124.5106	-	1.9178	P5	2774.1880	47.7520	-	-	-	-	-	-	Aman
129	XAD129	150.9077	-	1.9054	PX5	3935.4760	46.7360	40.1620	0.4431	2.0172	280.5607	-	-	Aman
130	XAD130	0.0000	-235.7346	2.3623	PX5	3935.4760	46.7360	40.7699	0.4498	1.9871	404.0281	-	-	Aman
131	XAD131	0.0000	-238.5103	2.3623	PX5	3935.4760	46.7360	-	-	-	-	-	-	Aman
132	XAD132	152.5941	-	1.9054	PX5	3935.4760	46.7360	-	-	-	-	50.5464	850.0628	Aman
133	XAD133	162.3288	-	1.8901	PX5	3935.4760	46.7360	40.7699	0.4498	1.9871	404.0281	-	-	Aman
134	XAD134	0.0000	-252.8160	2.3817	PX5	3935.4760	46.7360	40.4422	0.4462	2.0032	400.7809	-	-	Aman
135	XAD135	0.0000	-256.1187	2.3817	PX5	3935.4760	46.7360	-	-	-	-	-	-	Aman
136	XAD136	164.3155	-	1.8901	PX5	3935.4760	46.7360	-	-	-	-	50.9607	850.0628	Aman
137	XAD137	147.4858	-	1.8810	PX5	3935.4760	46.7360	40.4422	0.4462	2.0032	400.7809	-	-	Aman
138	XAD138	0.0000	-284.0685	2.3934	PX5	3935.4760	46.7360	40.2477	0.4440	2.0129	398.8536	-	-	Aman
139	XAD139	0.0000	-288.0736	2.3934	PX5	3935.4760	46.7360	-	-	-	-	51.2104	850.0628	Aman

Tabel 4.7 Lanjutan

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λc	ω	φN _t (KN)	KL/r < 240		φN _t (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
145	XAD145	190.1623	-	1.8513	PX5	3935.4760	46.7360	39.6114	0.4370	2.0452	392.5475	-	-	Aman
146	XAD146	0.0000	-308.0188	2.4325	PX5	3935.4760	46.7360	-	-	-	-	52.0484	850.0628	Aman
147	XAD147	0.0000	-312.6039	2.4325	PX5	3935.4760	46.7360	-	-	-	-	52.0484	850.0628	Aman
148	XAD148	192.3730	-	1.8513	PX5	3935.4760	46.7360	39.6114	0.4370	2.0452	392.5475	-	-	Aman
149	XAD149	151.4853	-	1.8310	PXX5	10064.4960	52.3240	34.9932	0.3861	2.3151	886.8507	-	-	Aman
150	XAD150	0.0000	-309.2285	2.4602	PXX5	10064.4960	52.3240	-	-	-	-	47.0183	2173.9311	Aman
151	XAD151	0.0000	-314.4945	2.4602	PXX5	10064.4960	52.3240	-	-	-	-	47.0183	2173.9311	Aman
152	XAD152	154.2544	-	1.8310	PXX5	10064.4960	52.3240	34.9932	0.3861	2.3151	886.8507	-	-	Aman
153	XAD153	95.4396	-	1.8194	PXX5	10064.4960	52.3240	34.7716	0.3836	2.3299	881.2360	-	-	Aman
154	XAD154	0.0000	-376.0079	2.4719	PXX5	10064.4960	52.3240	-	-	-	-	47.2431	2173.9311	Aman
155	XAD155	0.0000	-386.3856	2.4802	PXX5	10064.4960	52.3240	-	-	-	-	47.4005	2173.9311	Aman
156	XAD156	99.8765	-	1.8255	PXX5	10064.4960	52.3240	34.8875	0.3849	2.3221	884.1731	-	-	Aman
157	XAD157	90.8084	-	1.6260	PXX5	10064.4960	52.3240	31.0752	0.3428	2.6070	781.5544	-	-	Aman
158	XAD158	0.0000	-319.8225	2.2249	PXX5	10064.4960	52.3240	-	-	-	-	42.5220	2173.9311	Aman
159	XAD159	0.0000	-331.7124	2.2175	PXX5	10064.4960	52.3240	-	-	-	-	42.3808	2173.9311	Aman
160	XAD160	93.9752	-	1.6206	PXX5	10064.4960	52.3240	30.9719	0.3417	2.6157	784.9379	-	-	Aman
161	XAD161	19.9681	-	1.5230	PXX5	10064.4960	52.3240	29.1071	0.3211	2.7833	737.6762	-	-	Aman
162	XAD162	0.0000	-283.5074	1.0368	PXX5	10064.4960	52.3240	-	-	-	-	19.8143	2173.9311	Aman
163	XAD163	0.0000	-301.0168	2.0735	PXX5	10064.4960	52.3240	-	-	-	-	39.6286	2173.9311	Aman
164	XAD164	13.5071	-	1.0368	PXX5	10064.4960	52.3240	19.8143	0.2186	4.0886	502.1651	-	-	Aman
165	XAD165	0.0000	-365.0942	1.4746	PXX5	10064.4960	52.3240	-	-	-	-	28.1826	2173.9311	Aman
166	XAD166	205.8602	-	1.9861	PXX5	10064.4960	52.3240	37.9574	0.4188	2.1343	961.9745	-	-	Aman
167	XAD167	208.9031	-	1.9861	PXX5	10064.4960	52.3240	37.9574	0.4188	2.1343	961.9745	-	-	Aman
168	XAD168	0.0000	-359.3784	1.4746	PXX5	10064.4960	52.3240	-	-	-	-	28.1826	2173.9311	Aman
169	XAD169	0.0000	-301.9608	1.5146	PXX5	10064.4960	52.3240	-	-	-	-	28.9459	2173.9311	Aman
170	XAD170	222.7852	-	2.1140	PXX5	10064.4960	52.3240	40.4017	0.4457	2.0052	1023.9219	-	-	Aman
171	XAD171	209.1848	-	2.1140	PXX5	10064.4960	52.3240	40.4017	0.4457	2.0052	1023.9219	-	-	Aman
172	XAD172	0.0000	-302.3355	1.5146	PXX5	10064.4960	52.3240	-	-	-	-	28.9459	2173.9311	Aman
173	XAD173	211.0552	-	1.5146	PXX5	10064.4960	52.3240	28.9459	0.3193	2.7988	733.5912	-	-	Aman
174	XAD174	0.0000	-64.2313	2.1140	PXX5	10064.4960	52.3240	-	-	-	-	40.4017	2173.9311	Aman
175	XAD175	0.0000	-67.8362	2.1140	PXX5	10064.4960	52.3240	-	-	-	-	40.4017	2173.9311	Aman
176	XAD176	210.2190	-	1.5146	PXX5	10064.4960	52.3240	28.9459	0.3193	2.7988	733.5912	-	-	Aman

Tabel 4.8
Tabel Perencanaan batang

I. Batang Bawah

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm.)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λc	ω	KL/r < 240	Φ/N _n (KN)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XAB1	18.0713	-	2.1274	PXX8	13741.9080	70.1040	30.3457	0.3348	2.6697	1050.0710	-	-	Aman
2	XAB2	0.0000	-864.7654	2.1274	PXX8	13741.9080	70.1040	-	-	-	-	30.3457	2968.2521	Aman
3	XAB3	0.0000	-1255.8510	1.7995	PXX8	13741.9080	70.1040	-	-	-	-	25.6686	2968.2521	Aman
4	XAB4	0.0000	-2195.7510	2.0587	PXX8	13741.9080	70.1040	-	-	-	-	29.3659	2968.2521	Aman
5	XAB5	0.0000	-1924.7176	2.4698	PXX8	13741.9080	70.1040	-	-	-	-	35.2311	2968.2521	Aman
6	XAB6	0.0000	-1573.9060	3.1438	PXX8	13741.9080	70.1040	-	-	-	-	44.8451	2968.2521	Aman
7	XAB7	0.0000	-1264.5620	3.1321	PXX8	13741.9080	70.1040	-	-	-	-	44.6778	2968.2521	Aman
8	XAB8	0.0000	-956.1398	3.1127	PX8	8258.0480	73.1520	-	-	-	-	42.5511	1783.7384	Aman
9	XAB9	0.0000	-671.8660	3.1023	PX8	8258.0480	73.1520	-	-	-	-	42.4086	1783.7384	Aman
10	XAB10	0.0000	-494.0084	3.0875	PX8	8258.0480	73.1520	-	-	-	-	42.2072	1783.7384	Aman
11	XAB11	0.0000	-321.4662	3.0806	PX8	8258.0480	73.1520	-	-	-	-	42.1121	1783.7384	Aman
12	XAB12	0.0000	-224.3802	3.0696	PX8	8258.0480	73.1520	-	-	-	-	41.9621	1783.7384	Aman
13	XAB13	0.0000	-141.0400	3.0614	P8	5419.3440	74.6760	-	-	-	-	40.9956	1170.5783	Aman
14	XAB14	0.0000	-44.3785	3.0482	P8	5419.3440	74.6760	-	-	-	-	40.8192	1170.5783	Aman
15	XAB15	9.5278	-	3.0447	P8	5419.3440	74.6760	40.7726	0.4498	1.9869	556.4037	-	-	Aman
16	XAB16	60.3614	-	3.0351	P8	5419.3440	74.6760	40.6431	0.4484	1.9933	554.6363	-	-	Aman
17	XAB17	126.8312	-	3.0293	P8	5419.3440	74.6760	40.5653	0.4475	1.9971	553.5755	-	-	Aman
18	XAB18	144.2483	-	3.0227	P8	5419.3440	74.6760	40.4779	0.4466	2.0014	552.3829	-	-	Aman
19	XAB19	154.3470	-	3.0192	P8	5419.3440	74.6760	40.4307	0.4460	2.0037	551.7386	-	-	Aman
20	XAB20	167.6760	-	3.0150	P8	5419.3440	74.6760	40.3739	0.4454	2.0066	550.9634	-	-	Aman
21	XAB21	155.5192	-	3.0096	P8	5419.3440	74.6760	40.3019	0.4446	2.0102	549.9806	-	-	Aman
22	XAB22	137.1474	-	3.0067	P8	5419.3440	74.6760	40.2627	0.4442	2.0121	549.4459	-	-	Aman
23	XAB23	133.7441	-	3.0067	P8	5419.3440	74.6760	40.2627	0.4442	2.0121	549.4459	-	-	Aman
24	XAB24	143.3226	-	3.0096	P8	5419.3440	74.6760	40.3019	0.4446	2.0102	549.9806	-	-	Aman
25	XAB25	152.2410	-	3.0150	P8	5419.3440	74.6760	40.3739	0.4454	2.0066	550.9634	-	-	Aman
26	XAB26	134.5850	-	3.0192	P8	5419.3440	74.6760	40.4307	0.4460	2.0037	551.7386	-	-	Aman
27	XAB27	123.4729	-	3.0227	P8	5419.3440	74.6760	40.4779	0.4466	2.0014	552.3829	-	-	Aman
28	XAB28	103.9564	-	3.0293	P8	5419.3440	74.6760	40.5653	0.4475	1.9971	553.5755	-	-	Aman
29	XAB29	38.3709	-	3.0351	P8	5419.3440	74.6760	40.6431	0.4484	1.9933	554.6363	-	-	Aman
30	XAB30	0.0000	-7.0813	3.0447	P8	5419.3440	74.6760	-	-	-	-	40.7726	1170.5783	Aman
31	XAB31	0.0000	-57.2005	3.0482	P8	5419.3440	74.6760	-	-	-	-	40.8192	1170.5783	Aman
32	XAB32	0.0000	-149.9751	3.0614	P8	5419.3440	74.6760	-	-	-	-	40.9956	1170.5783	Aman

Tabel 4.8 Lanjutan

NO	Batang	Nu Tarik (KN)	Nu Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λc	ω	φNn (KN)	KL/r < 240		φNn (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XAB33	0.0000	-230.0128	3.0696	P8	5419.3440	74.6760	-	-	-	-	41.1057	1170.5783	Aman
34	XAB34	0.0000	-323.1209	3.0806	PX8	8258.0480	73.1520	-	-	-	-	42.1121	1783.7384	Aman
35	XAB35	0.0000	-492.2493	3.0875	PX8	8258.0480	73.1520	-	-	-	-	42.2072	1783.7384	Aman
36	XAB36	0.0000	-667.3334	3.1023	PX8	8258.0480	73.1520	-	-	-	-	42.4086	1783.7384	Aman
37	XAB37	0.0000	-946.4411	3.1127	PX8	8258.0480	73.1520	-	-	-	-	42.5511	1783.7384	Aman
38	XAB38	0.0000	-1250.7460	3.1321	PX8	8258.0480	73.1520	-	-	-	-	42.8162	1783.7384	Aman
39	XAB39	0.0000	-1535.2610	3.1438	PXX8	13741.9080	70.1040	-	-	-	-	44.8451	2968.2521	Aman
40	XAB40	0.0000	-1904.7700	2.4698	PXX8	13741.9080	70.1040	-	-	-	-	35.2311	2968.2521	Aman
41	XAB41	0.0000	-2185.9800	2.0587	PXX8	13741.9080	70.1040	-	-	-	-	29.3659	2968.2521	Aman
42	XAB42	0.0000	-1251.7290	1.7995	PXX8	13741.9080	70.1040	-	-	-	-	25.6686	2968.2521	Aman
43	XAB43	0.0000	-816.8250	2.1274	PXX8	13741.9080	70.1040	-	-	-	-	30.3457	2968.2521	Aman
44	XAB44	29.1274	-	2.1274	PXX8	13741.9080	70.1040	30.3457	0.3348	2.6697	1050.0710	-	-	Aman

Tumpuan

1	XAP1	907.2861	-	2.1274	PXX8	13741.9080	70.1040	30.3457	0.3348	2.6697	1050.0710	-	-	Aman
2	XAP2	284.6851	-	1.4500	PXX8	13741.9080	70.1040	20.6836	0.2282	3.9168	715.7269	-	-	Aman
3	XAP3	0.0000	-1282.4740	2.6555	PXX8	13741.9080	70.1040	-	-	-	-	37.8792	2968.2521	Aman
4	XAP4	0.0000	-1293.2940	2.6555	PXX8	13741.9080	70.1040	-	-	-	-	37.8792	2968.2521	Aman
5	XAP5	278.9957	-	1.4500	PXX8	13741.9080	70.1040	20.6836	0.2282	3.9168	715.7269	-	-	Aman
6	XAP6	886.6885	-	2.1274	PXX8	13741.9080	70.1040	30.3457	0.3348	2.6697	1050.0710	-	-	Aman

Keterangan

[1] Nomer

[2] Nama Batang

[3] Nu Tarik = Gaya Tarik

[4] Nu Tekan = Gaya Tekan

[5] Panjang batang

[6] Profil terpasang

[7] Ag= Luas penampang profil (mm²)

[8] r = Jari-jari girasi profil terkecil (mm)

[9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)

[10] λc = (1/3.14)*(KL/r) * (fy/E)^{0.5}
(Parameter Kelangsingan Batang tekan)

[11] ω = Koefisien Tekuk

λc < 0.25; ω = 1

0.25 < λc < 1.2 ; ω = 1.43 / (1.6 - 0.6λc)

λc > 1.2 ; ω = 1.25 λc²

[12] φNn = 0.85 Ag (fy/ω); Kuat Tekan Nominal

[13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)

[14] φNn = 0.9 Ag .fy; Kuat Tarik Nominal

[15] Nu ≤ φNn; Profil aman dipakai

Tabel Perencanaan batang KK_XB

1. Batang Atas

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λ _c	ω	φN _h (KN)	KL/r < 240	φN _h (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XBA1	0.0000	-97.1800	2.1274	P4	2045.1572	38.3540	-	-	-	-	55.4662	441.7540	Aman
2	XBA2	0.0000	-80.2878	2.1274	P4	2045.1572	38.3540	-	-	-	-	55.4662	441.7540	Aman
3	XBA3	17.1165	-	1.7995	P4	2045.1572	38.3540	46.9175	0.5176	1.7267	241.6219	-	-	Aman
4	XBA4	43.6630	-	2.0587	P4	2045.1572	38.3540	53.6754	0.5922	1.5093	276.4247	-	-	Aman
5	XBA5	8.4735	-	2.4729	P4	2045.1572	38.3540	64.4766	0.7113	1.2565	332.0501	-	-	Aman
6	XBA6	6.2719	-	3.1408	P4	2045.1572	38.3540	81.8909	0.9034	0.9893	421.7329	-	-	Aman
7	XBA7	0.0000	-5.8954	3.1321	P4	2045.1572	38.3540	-	-	-	-	81.6627	441.7540	Aman
8	XBA8	0.0000	-22.3709	3.1127	P4	2045.1572	38.3540	-	-	-	-	81.1571	441.7540	Aman
9	XBA9	0.0000	-28.0864	3.1023	P4	2045.1572	38.3540	-	-	-	-	80.8853	441.7540	Aman
10	XBA10	0.0000	-36.6272	3.0875	P4	2045.1572	38.3540	-	-	-	-	80.5011	441.7540	Aman
11	XBA11	0.0000	-43.2017	3.0806	P4	2045.1572	38.3540	-	-	-	-	80.3198	441.7540	Aman
12	XBA12	0.0000	-53.1967	3.0696	P4	2045.1572	38.3540	-	-	-	-	80.0336	441.7540	Aman
13	XBA13	0.0000	-45.4176	3.0614	P4	2045.1572	38.3540	-	-	-	-	79.8193	441.7540	Aman
14	XBA14	0.0000	-46.2925	3.0482	P4	2045.1572	38.3540	-	-	-	-	79.4758	441.7540	Aman
15	XBA15	0.0000	-44.6824	3.0447	P4	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
16	XBA16	0.0000	-46.0678	3.0351	P4	2045.1572	38.3540	-	-	-	-	79.1329	441.7540	Aman
17	XBA17	0.0000	-48.7093	3.0293	P4	2045.1572	38.3540	-	-	-	-	78.9815	441.7540	Aman
18	XBA18	0.0000	-50.7886	3.0227	P4	2045.1572	38.3540	-	-	-	-	78.8114	441.7540	Aman
19	XBA19	0.0000	-61.0411	3.0192	P4	2045.1572	38.3540	-	-	-	-	78.7194	441.7540	Aman
20	XBA20	0.0000	-66.5026	3.0150	P4	2045.1572	38.3540	-	-	-	-	78.6088	441.7540	Aman
21	XBA21	0.0000	-74.1252	3.0096	P4	2045.1572	38.3540	-	-	-	-	78.4686	441.7540	Aman
22	XBA22	0.0000	-70.3443	3.0067	P4	2045.1572	38.3540	-	-	-	-	78.3923	441.7540	Aman
23	XBA23	0.0000	-69.2910	3.0067	P4	2045.1572	38.3540	-	-	-	-	78.3923	441.7540	Aman
24	XBA24	0.0000	-68.7694	3.0096	P4	2045.1572	38.3540	-	-	-	-	78.4686	441.7540	Aman
25	XBA25	0.0000	-68.6857	3.0150	P4	2045.1572	38.3540	-	-	-	-	78.6088	441.7540	Aman
26	XBA26	0.0000	-67.6189	3.0192	P4	2045.1572	38.3540	-	-	-	-	78.7194	441.7540	Aman
27	XBA27	0.0000	-66.6088	3.0227	P4	2045.1572	38.3540	-	-	-	-	78.8114	441.7540	Aman
28	XBA28	0.0000	-62.9094	3.0293	P4	2045.1572	38.3540	-	-	-	-	78.9815	441.7540	Aman
29	XBA29	0.0000	-59.1255	3.0351	P4	2045.1572	38.3540	-	-	-	-	79.1329	441.7540	Aman
30	XBA30	0.0000	-57.2100	3.0447	P4	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
31	XBA31	0.0000	-50.3209	3.0482	P4	2045.1572	38.3540	-	-	-	-	79.4758	441.7540	Aman
32	XBA32	0.0000	-45.2471	3.0614	P4	2045.1572	38.3540	-	-	-	-	79.8193	441.7540	Aman

Tabel 4.5 Lanjutan

NO	Batang	Nu Tarik (KN)	Nu Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λc	ω	φNn (KN)	KL/r < 240		φNn (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XBA33	0.0000	-47.3113	3.0696	P4	2045.1572	38.3540	-	-	-	-	80.0336	441.7540	Aman
34	XBA34	0.0000	-40.0844	3.0806	P4	2045.1572	38.3540	-	-	-	-	80.3198	441.7540	Aman
35	XBA35	0.0000	-34.7428	3.0875	P4	2045.1572	38.3540	-	-	-	-	80.5011	441.7540	Aman
36	XBA36	0.0000	-27.1703	3.1023	P4	2045.1572	38.3540	-	-	-	-	80.8853	441.7540	Aman
37	XBA37	0.0000	-22.1873	3.1127	P4	2045.1572	38.3540	-	-	-	-	81.1571	441.7540	Aman
38	XBA38	0.0000	-10.0300	3.1321	P4	2045.1572	38.3540	-	-	-	-	81.6627	441.7540	Aman
39	XBA39	11.8657	-	3.1408	P4	2045.1572	38.3540	81.8909	0.9034	0.9893	421.7329	-	-	Aman
40	XBA40	15.4124	-	2.4729	P4	2045.1572	38.3540	64.4766	0.7113	1.2565	332.0501	-	-	Aman
41	XBA41	50.4858	-	2.0587	P4	2045.1572	38.3540	53.6754	0.5922	1.5093	276.4247	-	-	Aman
42	XBA42	20.4814	-	1.7995	P4	2045.1572	38.3540	46.9175	0.5176	1.7267	241.6219	-	-	Aman
43	XBA43	0.0000	-80.6445	2.1274	P4	2045.1572	38.3540	-	-	-	-	55.4662	441.7540	Aman
44	XBA44	0.0000	-97.9279	2.1274	P4	2045.1572	38.3540	-	-	-	-	55.4662	441.7540	Aman

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Nu Tarik = Gaya Tarik
- [4] Nu Tekan = Gaya Tekan
- [5] Panjang batang
- [6] Profil terpasang
- [7] Ag= Luas penampang profil (mm²)
- [8] r = Jari-jari girasi profil terkecil (mm)
- [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
- [10] λc = (1/3.14)*(KL/r)*(fy/E)^{0.5} (Parameter Kelangsingan Batang tekan)
- [11] ω = Koefisien Tekuk
λc < 0.25; ω = 1
0.25 < λc < 1.2 ; ω = 1.43/(1.6-0.6λc)
λc > 1.2 ; ω = 1.25 λc²
- [12] φNn = 0.85.Ag.(fy/ω); Kuat Tekan Nominal
- [13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
- [14] φNn = 0.9.Ag. .fy ; Kuat Tarik Nominal
- [15] Nu ≤ φNn: Profil aman dipakai

Tabel Perencanaan batang KK_XB

2. Batang Vertikal

NO	Batang	N _u Tarik (kN)	N _u Tekan (kN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								λc	ω	φN _u (kN)	KL/r < 240	KL/r > 240	φN _u (kN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XBV1	40.8697	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
2	XBV2	256.9554	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
3	XBV3	305.4782	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
4	XBV4	0.0000	-77.1771	3.0000	PXX5	10064.4960	52.3240	-	-	-	-	57.3351	2173.9311	Aman
5	XBV5	96.5960	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
6	XBV6	94.2762	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
7	XBV7	75.3319	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
8	XBV8	53.7179	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
9	XBV9	46.4861	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
10	XBV10	52.8242	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
11	XBV11	43.7790	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
12	XBV12	26.3514	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
13	XBV13	19.9572	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
14	XBV14	25.7944	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
15	XBV15	0.0000	-1.9908	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
16	XBV16	0.0000	-12.4995	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
17	XBV17	0.0000	-12.4067	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
18	XBV18	0.0000	-22.1910	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
19	XBV19	0.0000	-17.9479	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
20	XBV20	0.0000	-5.5497	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
21	XBV21	2.5650	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
22	XBV22	6.6072	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
23	XBV23	24.6158	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
24	XBV24	5.1853	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
25	XBV25	4.4367	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
26	XBV26	1.8114	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
27	XBV27	0.0000	-4.7145	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
28	XBV28	0.0000	-5.0640	3.0000	P5	2774.1880	47.7520	-	-	-	-	62.8246	599.2246	Aman
29	XBV29	4.3201	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
30	XBV30	2.0608	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
31	XBV31	9.0939	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
32	XBV32	30.0129	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman

Lanjutan

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λ _c	ω	φN _t (KN)	KL/r < 240		φN _t (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XBV33	20.6468	-	3.0000	P5	2774.1880	47.7520	62.8246	0.6931	1.2895	438.8748	-	-	Aman
34	XBV34	21.8901	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
35	XBV35	43.8758	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
36	XBV36	49.3909	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
37	XBV37	49.2363	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
38	XBV38	47.9502	-	3.0000	PX5	3935.4760	46.7360	64.1903	0.7082	1.2621	636.1244	-	-	Aman
39	XBV39	97.9511	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
40	XBV40	135.5245	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
41	XBV41	150.0911	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
42	XBV42	0.0000	-52.6826	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
43	XDV43	361.7996	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	57.3351	2173.9311	Aman
44	XBV44	260.0545	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman
45	XBV45	56.7467	-	3.0000	PXX5	10064.4960	52.3240	57.3351	0.6325	1.4130	1453.0730	-	-	Aman

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Nu Tarik = Gaya Tarik
- [4] Nu Tekan = Gaya Tekan
- [5] Panjang batang
- [6] Profil terpasang
- [7] Ag= Luas penampang profil (mm²)
- [8] r = Jari-jari girasi profil terkecil (mm)
- [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
- [10] λ_c = (1/3.14)*(KL/r)*(f_y/E)^{0.5} (Parameter Kelangsingan Batang tekan)
- [11] ω = Koefisien Tekuk
λ_c < 0.25; ω = 1
0.25 < λ_c < 1.2 ; ω = 1.43/(1.6-0.6λ_c)
λ_c > 1.2 ; ω = 1.25 λ_c²
- [12] φN_t = 0.85·Ag·(f_y/ω); Kuat Tekan Nominal
- [13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
- [14] φN_t = 0.9·Ag·f_y; Kuat Tarik Nominal
- [15] Nu ≤ φN_t; Profil aman dipakai

Tabel Perencanaan batang KK_XB

3. Batang Diagonal

NO	Batang	N _{tarik} (KN)	N _{tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φNn (KN)	KL/r<240	φNn (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XBD1	0.0000	-45.4129	2.1140	PXX5	10064.4960	52.3240	-	-	-	-	40.4017	2173.9311	Aman
2	XBD2	208.8549	-	1.5146	PXX5	10064.4960	52.3240	28.9459	0.3193	2.7988	733.5912	-	-	Aman
3	XBD3	209.1309	-	1.5146	PXX5	10064.4960	52.3240	28.9459	0.3193	2.7988	733.5912	-	-	Aman
4	XBD4	0.0000	-40.9656	2.1140	PXX5	10064.4960	52.3240	-	-	-	-	40.4017	2173.9311	Aman
5	XBD5	233.0835	-	2.1140	PXX5	10064.4960	52.3240	40.4017	0.4457	2.0052	1023.9219	-	-	Aman
6	XBD6	0.0000	-277.5627	1.5146	PXX5	10064.4960	52.3240	-	-	-	-	28.9459	2173.9311	Aman
7	XBD7	0.0000	-277.5018	1.5146	PXX5	10064.4960	52.3240	-	-	-	-	28.9459	2173.9311	Aman
8	XBD8	240.8273	-	2.1140	PXX5	10064.4960	52.3240	40.4017	0.4457	2.0052	1023.9219	-	-	Aman
9	XBD9	210.9804	-	1.9861	PXX5	10064.4960	52.3240	37.9574	0.4188	2.1343	961.9745	-	-	Aman
10	XBD10	0.0000	-370.9313	1.4746	PXX5	10064.4960	52.3240	-	-	-	-	28.1826	2173.9311	Aman
11	XBD11	0.0000	-373.6769	1.4746	PXX5	10064.4960	52.3240	-	-	-	-	28.1826	2173.9311	Aman
12	XBD12	209.9938	-	1.9861	PXX5	10064.4960	52.3240	37.9574	0.4188	2.1343	961.9745	-	-	Aman
13	XBD13	0.0000	-268.1168	2.0735	PXX5	10064.4960	52.3240	-	-	-	-	39.6286	2173.9311	Aman
14	XBD14	42.5390	-	1.5230	PXX5	10064.4960	52.3240	29.1071	0.3211	2.7833	737.6762	-	-	Aman
15	XBD15	46.1143	-	1.5230	PXX5	10064.4960	52.3240	29.1071	0.3211	2.7833	737.6762	-	-	Aman
16	XBD16	0.0000	-258.0999	2.0735	PXX5	10064.4960	52.3240	-	-	-	-	39.6286	2173.9311	Aman
17	XBD17	0.0000	-278.8368	2.2175	PXX5	10064.4960	52.3240	-	-	-	-	42.3808	2173.9311	Aman
18	XBD18	108.0008	-	1.6206	PXX5	10064.4960	52.3240	30.9719	0.3417	2.6157	784.9379	-	-	Aman
19	XBD19	106.3728	-	1.6260	PXX5	10064.4960	52.3240	31.0752	0.3428	2.6070	787.5544	-	-	Aman
20	XBD20	0.0000	-272.6378	2.2249	PXX5	10064.4960	52.3240	-	-	-	-	42.5220	2173.9311	Aman
21	XBD21	0.0000	-335.8596	2.4802	PXX5	10064.4960	52.3240	-	-	-	-	47.4005	2173.9311	Aman
22	XBD22	128.0818	-	1.8255	PXX5	10064.4960	52.3240	34.8875	0.3849	2.3221	884.1731	-	-	Aman
23	XBD23	124.9613	-	1.8194	PXX5	10064.4960	52.3240	34.7716	0.3836	2.3299	881.2360	-	-	Aman
24	XBD24	0.0000	-328.9156	2.4719	PXX5	10064.4960	52.3240	-	-	-	-	47.2431	2173.9311	Aman
25	XBD25	0.0000	-316.0525	2.4602	PXX5	10064.4960	52.3240	-	-	-	-	47.0183	2173.9311	Aman
26	XBD26	150.2267	-	1.8310	PXX5	10064.4960	52.3240	34.9932	0.3861	2.3151	886.8507	-	-	Aman
27	XBD27	147.5883	-	1.8310	PXX5	10064.4960	52.3240	34.9932	0.3861	2.3151	886.8507	-	-	Aman
28	XBD28	0.0000	-310.7621	2.4602	PXX5	10064.4960	52.3240	-	-	-	-	47.0183	2173.9311	Aman
29	XBD29	0.0000	-315.3883	2.4325	PX5	3935.4760	46.7360	-	-	-	-	52.0484	850.0628	Aman
30	XBD30	195.0198	-	1.8513	PX5	3935.4760	46.7360	39.6114	0.4370	2.0452	392.5475	-	-	Aman
31	XBD31	192.6869	-	1.8513	PX5	3935.4760	46.7360	39.6114	0.4370	2.0452	392.5475	-	-	Aman
32	XBD32	0.0000	-510.6831	2.4325	PX5	3935.4760	46.7360	-	-	-	-	52.0484	850.0628	Aman

Lanjutan

NO	Batang	N _U Tank (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λc	ω	φN _t (KN)	KL/r < 240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XBD33	0.0000	-338.1662	2.4168	PX5	3935.4760	46.7360	-	-	-	-	51.7122	850.0628	Aman
34	XBD34	152.4635	-	1.8631	PX5	3935.4760	46.7360	39.8637	0.4398	2.0323	395.0479	-	-	Aman
35	XBD35	149.9301	-	1.8631	PX5	3935.4760	46.7360	39.8637	0.4398	2.0323	395.0479	-	-	Aman
36	XBD36	0.0000	-333.3233	2.4168	PX5	3935.4760	46.7360	-	-	-	-	51.7122	850.0628	Aman
37	XBD37	0.0000	-290.9828	2.3934	PX5	3935.4760	46.7360	-	-	-	-	51.2104	850.0628	Aman
38	XBD38	150.9248	-	1.8810	PX5	3935.4760	46.7360	40.2477	0.4440	2.0129	398.8536	-	-	Aman
39	XBD39	148.7969	-	1.8810	PX5	3935.4760	46.7360	40.2477	0.4440	2.0129	398.8536	-	-	Aman
40	XBD40	0.0000	-287.0203	2.3934	PX5	3935.4760	46.7360	-	-	-	-	51.2104	850.0628	Aman
41	XBD41	0.0000	-257.5449	2.3817	PX5	3935.4760	46.7360	-	-	-	-	50.9607	850.0628	Aman
42	XBD42	162.9552	-	1.8901	PX5	3935.4760	46.7360	40.4422	0.4462	2.0032	400.7809	-	-	Aman
43	XBD43	161.0445	-	1.8901	PX5	3935.4760	46.7360	40.4422	0.4462	2.0032	400.7809	-	-	Aman
44	XBD44	0.0000	-254.3351	2.3817	PX5	3935.4760	46.7360	-	-	-	-	50.9607	850.0628	Aman
45	XBD45	0.0000	-243.8999	2.3623	PX5	3935.4760	46.7360	-	-	-	-	50.5464	850.0628	Aman
46	XBD46	152.9015	-	1.9054	PX5	3935.4760	46.7360	40.7699	0.4498	1.9871	404.0281	-	-	Aman
47	XBD47	151.2072	-	1.9054	PX5	3935.4760	46.7360	40.7699	0.4498	1.9871	404.0281	-	-	Aman
48	XBD48	0.0000	-241.2118	2.3623	PX5	3935.4760	46.7360	-	-	-	-	50.5464	850.0628	Aman
49	XBD49	0.0000	-215.5329	2.3469	P5	2774.1880	47.7520	-	-	-	-	49.1481	599.2246	Aman
50	XBD50	127.4314	-	1.9178	P5	2774.1880	47.7520	40.1620	0.4431	2.0172	280.5607	-	-	Aman
51	XBD51	125.8507	-	1.9178	P5	2774.1880	47.7520	40.1620	0.4431	2.0172	280.5607	-	-	Aman
52	XBD52	0.0000	-212.7030	2.3469	P5	2774.1880	47.7520	-	-	-	-	49.1481	599.2246	Aman
53	XBD53	0.0000	-190.2805	2.3201	P5	2774.1880	47.7520	-	-	-	-	48.5866	599.2246	Aman
54	XBD54	148.7452	-	1.9398	P5	2774.1880	47.7520	40.6228	0.4482	1.9943	283.7794	-	-	Aman
55	XBD55	147.2215	-	1.9398	P5	2774.1880	47.7520	40.6228	0.4482	1.9943	283.7794	-	-	Aman
56	XBD56	0.0000	-188.0503	2.3201	P5	2774.1880	47.7520	-	-	-	-	48.5866	599.2246	Aman
57	XBD57	0.0000	-164.5935	2.3125	P5	2774.1880	47.7520	-	-	-	-	48.4270	599.2246	Aman
58	XBD58	135.0453	-	1.9462	P5	2774.1880	47.7520	40.7559	0.4496	1.9878	284.7092	-	-	Aman
59	XBD59	133.6937	-	1.9462	P5	2774.1880	47.7520	40.7559	0.4496	1.9878	284.7092	-	-	Aman
60	XBD60	0.0000	-162.6030	2.3125	P5	2774.1880	47.7520	-	-	-	-	48.4270	599.2246	Aman
61	XBD61	0.0000	-129.2655	2.2897	P5	2774.1880	47.7520	-	-	-	-	47.9506	599.2246	Aman
62	XBD62	112.3203	-	1.9654	P5	2774.1880	47.7520	41.1590	0.4541	1.9683	287.5253	-	-	Aman
63	XBD63	111.1190	-	1.9654	P5	2774.1880	47.7520	41.1590	0.4541	1.9683	287.5253	-	-	Aman
64	XBD64	0.0000	-127.4027	2.2897	P5	2774.1880	47.7520	-	-	-	-	47.9506	599.2246	Aman
65	XBD65	0.0000	-98.4972	2.2747	P5	2774.1880	47.7520	-	-	-	-	47.6350	599.2246	Aman
66	XBD66	109.5296	-	1.9784	P5	2774.1880	47.7520	41.4309	0.4571	1.9554	289.4245	-	-	Aman

Lanjutan

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	ΦN_h (KN)	KL/r<240	ΦN_h (KN)	
11		[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
67	XBD67	108.6200	-	1.9784	P5	2774.1880	47.7520	41.4309	0.4571	1.9554	289.4245	-	-	Aman
68	XBD68	0.0000	-97.1204	2.2747	P5	2774.1880	47.7520	-	-	-	-	47.6350	599.2246	Aman
69	XBD69	0.0000	-77.9108	2.2559	P5	2774.1880	47.7520	-	-	-	-	47.2426	599.2246	Aman
70	XBD70	85.4803	-	1.9948	P5	2774.1880	47.7520	41.7741	0.4600	1.9393	291.8224	-	-	Aman
71	XBD71	84.3946	-	1.9948	P5	2774.1880	47.7520	41.7741	0.4609	1.9393	291.8224	-	-	Aman
72	XBD72	0.0000	-76.5073	2.2559	P5	2774.1880	47.7520	-	-	-	-	47.2426	599.2246	Aman
73	XBD73	0.0000	-55.7593	2.2448	P5	2774.1880	47.7520	-	-	-	-	47.0085	599.2246	Aman
74	XBD74	52.1871	-	2.0047	P5	2774.1880	47.7520	41.9819	0.4632	1.9297	293.2736	-	-	Aman
75	XBD75	51.4212	-	2.0047	P5	2774.1880	47.7520	41.9819	0.4632	1.9297	293.2736	-	-	Aman
76	XBD76	0.0000	-54.6578	2.2448	P5	2774.1880	47.7520	-	-	-	-	47.0085	599.2246	Aman
77	XBD77	0.0000	-35.8092	2.2299	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
78	XBD78	36.8356	-	2.0180	P5	2774.1880	47.7520	42.2609	0.4662	1.9170	295.2229	-	-	Aman
79	XBD79	35.7862	-	2.0180	P5	2774.1880	47.7520	42.2609	0.4662	1.9170	295.2229	-	-	Aman
80	XBD80	0.0000	-34.6863	2.2299	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
81	XBD81	0.0000	-28.8186	2.2078	P5	2774.1880	47.7520	-	-	-	-	46.2348	599.2246	Aman
82	XBD82	10.0289	-	2.0382	P5	2774.1880	47.7520	42.6837	0.4709	1.8980	298.1765	-	-	Aman
83	XBD83	9.3260	-	2.0382	P5	2774.1880	47.7520	42.6837	0.4709	1.8980	298.1765	-	-	Aman
84	XBD84	0.0000	-28.1705	2.2078	P5	2774.1880	47.7520	-	-	-	-	46.2348	599.2246	Aman
85	XBD85	0.0000	-7.2622	2.1932	P5	2774.1880	47.7520	-	-	-	-	45.9284	599.2246	Aman
86	XBD86	0.0000	-10.7042	2.0518	P5	2774.1880	47.7520	-	-	-	-	42.9684	599.2246	Aman
87	XBD87	0.0000	-11.5535	2.0518	P5	2774.1880	47.7520	-	-	-	-	42.9684	599.2246	Aman
88	XBD88	0.0000	-6.0577	2.1932	P5	2774.1880	47.7520	-	-	-	-	45.9284	599.2246	Aman
89	XBD89	0.0000	-6.7935	2.0518	P5	2774.1880	47.7520	-	-	-	-	42.9684	599.2246	Aman
90	XBD90	0.0000	-11.2898	2.1932	P5	2774.1880	47.7520	-	-	-	-	45.9284	599.2246	Aman
91	XBD91	0.0000	-12.4817	2.1932	P5	2774.1880	47.7520	-	-	-	-	45.9284	599.2246	Aman
92	XBD92	0.0000	-5.9270	2.0518	P5	2774.1880	47.7520	-	-	-	-	42.9684	599.2246	Aman
93	XBD93	15.9942	-	2.0382	P5	2774.1880	47.7520	42.6837	0.4709	1.8980	298.1765	-	-	Aman
94	XBD94	0.0000	-32.3744	2.2078	P5	2774.1880	47.7520	-	-	-	-	46.2348	599.2246	Aman
95	XBD95	0.0000	-33.1893	2.2078	P5	2774.1880	47.7520	-	-	-	-	46.2348	599.2246	Aman
96	XBD96	16.8348	-	2.0382	P5	2774.1880	47.7520	42.6837	0.4709	1.8980	298.1765	-	-	Aman
97	XBD97	36.7396	-	2.0180	P5	2774.1880	47.7520	42.2609	0.4662	1.9170	295.2229	-	-	Aman
98	XBD98	0.0000	-44.3562	2.2299	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
99	XBD99	0.0000	-45.4328	2.2299	P5	2774.1880	47.7520	-	-	-	-	46.6977	599.2246	Aman
100	XBD100	37.7836	-	2.0180	P5	2774.1880	47.7520	42.2609	0.4662	1.9170	295.2229	-	-	Aman

Lanjutan

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ϕ	φN _t (KN)	KL/r<240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
145	XBD145	190.1623	-	1.8513	PX5	3935.4760	46.7360	39.6114	0.4370	2.0452	392.5475	-	-	Aman
146	XBD146	0.0000	-308.0188	2.4325	PX5	3935.4760	46.7360	-	-	-	-	52.0484	850.0628	Aman
147	XBD147	0.0000	-312.6039	2.4325	PX5	3935.4760	46.7360	-	-	-	-	52.0484	850.0628	Aman
148	XBD148	192.3730	-	1.8512	PX5	3935.4760	46.7360	39.6114	0.4370	2.0452	392.5475	-	-	Aman
149	XBD149	151.4853	-	1.8310	PXX5	10064.4960	52.3240	34.9932	0.3861	2.3151	886.8507	-	-	Aman
150	XBD150	0.0000	-309.2285	2.4602	PXX5	10064.4960	52.3240	-	-	-	-	47.0183	2173.9311	Aman
151	XBD151	0.0000	-314.4945	2.4602	PXX5	10064.4960	52.3240	-	-	-	-	47.0183	2173.9311	Aman
152	XBD152	154.2544	-	1.8310	PXX5	10064.4960	52.3240	34.9932	0.3861	2.3151	886.8507	-	-	Aman
153	XBD153	95.4396	-	1.8194	PXX5	10064.4960	52.3240	34.7716	0.3836	2.3299	881.2360	-	-	Aman
154	XBD154	0.0000	-376.0079	2.4719	PXX5	10064.4960	52.3240	-	-	-	-	47.2431	2173.9311	Aman
155	XBD155	0.0000	-386.3856	2.4802	PXX5	10064.4960	52.3240	-	-	-	-	47.4005	2173.9311	Aman
156	XBD156	99.8765	-	1.8255	PXX5	10064.4960	52.3240	34.8875	0.3849	2.3221	884.1731	-	-	Aman
157	XBD157	90.8084	-	1.6260	PXX5	10064.4960	52.3240	31.0752	0.3428	2.6070	787.5544	-	-	Aman
158	XBD158	0.0000	-319.8225	2.2249	PXX5	10064.4960	52.3240	-	-	-	-	42.5220	2173.9311	Aman
159	XBD159	0.0000	-331.7124	2.2175	PXX5	10064.4960	52.3240	-	-	-	-	42.3808	2173.9311	Aman
160	XBD160	93.9752	-	1.6206	PXX5	10064.4960	52.3240	30.9719	0.3417	2.6157	784.9379	-	-	Aman
161	XBD161	19.9681	-	1.5230	PXX5	10064.4960	52.3240	29.1071	0.3211	2.7833	737.6762	-	-	Aman
162	XBD162	0.0000	-283.5074	1.0368	PXX5	10064.4960	52.3240	-	-	-	-	19.8143	2173.9311	Aman
163	XBD163	0.0000	-301.0168	2.0735	PXX5	10064.4960	52.3240	-	-	-	-	39.6286	2173.9311	Aman
164	XBD164	13.5071	-	1.0368	PXX5	10064.4960	52.3240	19.8143	0.2186	4.0886	502.1651	-	-	Aman
165	XBD165	0.0000	-365.0942	1.4746	PXX5	10064.4960	52.3240	-	-	-	-	28.1826	2173.9311	Aman
166	XBD166	205.8602	-	1.9861	PXX5	10064.4960	52.3240	37.9574	0.4188	2.1343	961.9745	-	-	Aman
167	XBD167	208.9031	-	1.9861	PXX5	10064.4960	52.3240	37.9574	0.4188	2.1343	961.9745	-	-	Aman
168	XBD168	0.0000	-359.3784	1.4746	PXX5	10064.4960	52.3240	-	-	-	-	28.1826	2173.9311	Aman
169	XBD169	0.0000	-301.9608	1.5146	PXX5	10064.4960	52.3240	-	-	-	-	28.9459	2173.9311	Aman
170	XBD170	222.7852	-	2.1140	PXX5	10064.4960	52.3240	40.4017	0.4457	2.0052	1023.9219	-	-	Aman
171	XBD171	209.1848	-	2.1140	PXX5	10064.4960	52.3240	40.4017	0.4457	2.0052	1023.9219	-	-	Aman
172	XBD172	0.0000	-302.3355	1.5146	PXX5	10064.4960	52.3240	-	-	-	-	28.9459	2173.9311	Aman
173	XBD173	211.0552	-	1.5146	PXX5	10064.4960	52.3240	28.9459	0.3193	2.7988	733.5912	-	-	Aman
174	XBD174	0.0000	-64.2313	2.1140	PXX5	10064.4960	52.3240	-	-	-	-	40.4017	2173.9311	Aman
175	XBD175	0.0000	-67.8362	2.1140	PXX5	10064.4960	52.3240	-	-	-	-	40.4017	2173.9311	Aman
176	XBD176	210.2190	-	1.5146	PXX5	10064.4960	52.3240	28.9459	0.3193	2.7988	733.5912	-	-	Aman

Tabel Perencanaan batang KK_XB

1. Batang Bawah

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φN _h (t.N)	KL/r<240	φN _h (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XBB1	18.0713	-	2.1274	PXX8	13741.9080	70.1040	30.3457	0.3348	2.6697	1050.0710	-	-	Aman
2	XBB2	0.0000	-864.7654	2.1274	PXX8	13741.9080	70.1040	-	-	-	-	30.3457	2968.2521	Aman
3	XBB3	0.0000	-1255.8510	1.7995	PXX8	13741.9080	70.1040	-	-	-	-	25.6686	2968.2521	Aman
4	XBB4	0.0000	-2195.7510	2.0587	PXX8	13741.9080	70.1040	-	-	-	-	29.3659	2968.2521	Aman
5	XBB5	0.0000	-1924.7170	2.4698	PXX8	13741.9080	70.1040	-	-	-	-	35.2311	2968.2521	Aman
6	XBB6	0.0000	-1573.9060	3.1438	PXX8	13741.9080	70.1040	-	-	-	-	44.8451	2968.2521	Aman
7	XBB7	0.0000	-1264.5620	3.1321	PXX8	13741.9080	70.1040	-	-	-	-	44.6778	2968.2521	Aman
8	XBB8	0.0000	-956.1398	3.1127	PX8	8258.0480	73.1520	-	-	-	-	42.5511	1783.7384	Aman
9	XBB9	0.0000	-671.8660	3.1023	PX8	8258.0480	73.1520	-	-	-	-	42.4086	1783.7384	Aman
10	XBB10	0.0000	-494.0084	3.0875	PX8	8258.0480	73.1520	-	-	-	-	42.2072	1783.7384	Aman
11	XBB11	0.0000	-321.4662	3.0806	PX8	8258.0480	73.1520	-	-	-	-	42.1121	1783.7384	Aman
12	XBB12	0.0000	-224.3802	3.0696	PX8	8258.0480	73.1520	-	-	-	-	41.9621	1783.7384	Aman
13	XBB13	0.0000	-141.0400	3.0614	P8	5419.3440	74.6760	-	-	-	-	40.9956	1170.5783	Aman
14	XBB14	0.0000	-44.3785	3.0482	P8	5419.3440	74.6760	-	-	-	-	40.8192	1170.5783	Aman
15	XBB15	9.5278	-	3.0447	P8	5419.3440	74.6760	40.7726	0.4498	1.9869	556.4037	-	-	Aman
16	XBB16	60.3614	-	3.0351	P8	5419.3440	74.6760	40.6431	0.4484	1.9933	554.6563	-	-	Aman
17	XBB17	126.8312	-	3.0293	P8	5419.3440	74.6760	40.5653	0.4475	1.9971	553.5755	-	-	Aman
18	XBB18	144.2483	-	3.0227	P8	5419.3440	74.6760	40.4779	0.4466	2.0014	552.3829	-	-	Aman
19	XBB19	154.3470	-	3.0192	P8	5419.3440	74.6760	40.4307	0.4460	2.0037	551.7386	-	-	Aman
20	XBB20	167.6760	-	3.0150	P8	5419.3440	74.6760	40.3739	0.4454	2.0066	550.9634	-	-	Aman
21	XBB21	155.5192	-	3.0096	P8	5419.3440	74.6760	40.3019	0.4446	2.0102	549.9806	-	-	Aman
22	XBB22	137.1474	-	3.0067	P8	5419.3440	74.6760	40.2627	0.4442	2.0121	549.4459	-	-	Aman
23	XBB23	133.7441	-	3.0067	P8	5419.3440	74.6760	40.2627	0.4442	2.0121	549.4459	-	-	Aman
24	XBB24	143.3226	-	3.0096	P8	5419.3440	74.6760	40.3019	0.4446	2.0102	549.9806	-	-	Aman
25	XBB25	152.2410	-	3.0150	P8	5419.3440	74.6760	40.3739	0.4454	2.0066	550.9634	-	-	Aman
26	XBB26	134.5850	-	3.0192	P8	5419.3440	74.6760	40.4307	0.4460	2.0037	551.7386	-	-	Aman
27	XBB27	123.4729	-	3.0227	P8	5419.3440	74.6760	40.4779	0.4466	2.0014	552.3829	-	-	Aman
28	XBB28	103.9564	-	3.0293	P8	5419.3440	74.6760	40.5653	0.4475	1.9971	553.5755	-	-	Aman
29	XBB29	38.3709	-	3.0351	P8	5419.3440	74.6760	40.6431	0.4484	1.9933	554.6563	-	-	Aman
30	XBB30	0.0000	-7.0813	3.0447	P8	5419.3440	74.6760	-	-	-	-	40.7726	1170.5783	Aman
31	XBB31	0.0000	-57.2005	3.0482	P8	5419.3440	74.6760	-	-	-	-	40.8192	1170.5783	Aman
32	XBB32	0.0000	-149.9751	3.0614	P8	5419.3440	74.6760	-	-	-	-	40.9956	1170.5783	Aman

Tabel 4.8 Lanjutan

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								λc	ω	ΦN _n (KN)	KL/r < 240	ΦN _n (KN)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XBB33	0.0000	-230.0128	3.0696	P8	5419.3440	74.6760	-	-	-	-	41.1057	1170.5783	Aman
34	XBB34	0.0000	-323.1209	3.0806	PX8	8258.0480	73.1520	-	-	-	-	42.1121	1783.7384	Aman
35	XBB35	0.0000	-492.2493	3.0875	PX8	8258.0480	73.1520	-	-	-	-	42.2072	1783.7384	Aman
36	XBB36	0.0000	-667.3334	3.1023	PX8	8258.0480	73.1520	-	-	-	-	42.4086	1783.7384	Aman
37	XBB37	0.0000	-946.4411	3.1127	PX8	8258.0480	73.1520	-	-	-	-	42.5511	1783.7384	Aman
38	XBB38	0.0000	-1250.7460	3.1321	PX8	8258.0480	73.1520	-	-	-	-	42.8162	1783.7384	Aman
39	XBB39	0.0000	-1535.2610	3.1438	PXX8	13741.9080	70.1040	-	-	-	-	44.8451	2968.2521	Aman
40	XBB40	0.0000	-1904.7700	2.4698	PXX8	13741.9080	70.1040	-	-	-	-	35.2311	2968.2521	Aman
41	XBB41	0.0000	-2185.9800	2.0587	PXX8	13741.9080	70.1040	-	-	-	-	29.3659	2968.2521	Aman
42	XBB42	0.0000	-1251.7290	1.7995	PXX8	13741.9080	70.1040	-	-	-	-	25.6686	2968.2521	Aman
43	XBB43	0.0000	-816.8250	2.1274	PXX8	13741.9080	70.1040	-	-	-	-	30.3457	2968.2521	Aman
44	XBB44	29.1274	-	2.1274	PXX8	13741.9080	70.1040	30.3457	0.3348	2.6697	1050.0710	-	-	Aman

Tumpuan

1	XBP1	907.2861	-	2.1274	PXX8	13741.9080	70.1040	30.3457	0.3348	2.6697	1050.0710	-	-	Aman
2	XBP2	284.6851	-	1.4500	PXX8	13741.9080	70.1040	20.6836	0.2282	3.9168	715.7269	-	-	Aman
3	XBP3	0.0000	-1282.4740	2.6555	PXX8	13741.9080	70.1040	-	-	-	-	37.8792	2968.2521	Aman
4	XBP4	0.0000	-1293.2940	2.6555	PXX8	13741.9080	70.1040	-	-	-	-	37.8792	2968.2521	Aman
5	XBP5	278.9957	-	1.4500	PXX8	13741.9080	70.1040	20.6836	0.2282	3.9168	715.7269	-	-	Aman
6	XBP6	886.6885	-	2.1274	PXX8	13741.9080	70.1040	30.3457	0.3348	2.6697	1050.0710	-	-	Aman

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Nu Tarik = Gaya Tarik
- [4] Nu Tekan = Gaya Tekan
- [5] Panjang batang
- [6] Profil terpasang
- [7] Ag = Luas penampang profil (mm²)
- [8] r = Jari-jari girasi profil terkecil (mm)
- [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
- [10] λc = (1/3.14) * (KL/r) * (fy/E)^{0.5} (Parameter Kelangsingan Batang tekan)
- [11] ω = Koefisien Tekuk
λc < 0.25; ω = 1
0.25 < λc < 1.2 ; ω = 1.43 / (1.6 - 0.6λc)
λc > 1.2 ; ω = 1.25 λc²
- [12] ΦN_n = 0.85 * Ag * (fy/ω); Kuat Tekan Nominal
- [13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
- [14] ΦN_n = 0.9 * Ag * fy; Kuat Tarik Nominal
- [15] Nu ≤ ΦN_n; Profil aman dipakai

Tabel 4.5
Tabel Perencanaan batang XC

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φNn (KN)	KL/r<240	φNn (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XCA1	22.2546	-	3.4677	P3	2045.1572	38.3540	90.4132	0.9975	0.8960	465.6222	-	-	Aman
2	XCA2	22.5381	-	2.2053	P3	2045.1572	38.3540	57.4989	0.6343	1.4090	296.1155	-	-	Aman
3	XCA3	15.5608	-	2.5200	P3	2045.1572	38.3540	65.7048	0.7249	1.2330	338.3752	-	-	Aman
4	XCA4	4.6317	-	3.1623	P3	2045.1572	38.3540	82.4498	0.9096	0.9826	424.6109	-	-	Aman
5	XCA5	0.0000	-5.9905	3.1321	P3	2045.1572	38.3540	-	-	-	-	81.6627	441.7540	Aman
6	XCA6	0.0000	-11.7839	3.1127	P3	2045.1572	38.3540	-	-	-	-	81.1571	441.7540	Aman
7	XCA7	0.0000	-16.4218	3.1023	P3	2045.1572	38.3540	-	-	-	-	80.8853	441.7540	Aman
8	XCA8	0.0000	-22.0895	3.0875	P3	2045.1572	38.3540	-	-	-	-	80.5011	441.7540	Aman
9	XCA9	0.0000	-25.7573	3.0783	P3	2045.1572	38.3540	-	-	-	-	80.2609	441.7540	Aman
10	XCA10	0.0000	-28.2831	3.0675	P3	2045.1572	38.3540	-	-	-	-	79.9788	441.7540	Aman
11	XCA11	0.0000	-32.2446	3.0575	P3	2045.1572	38.3540	-	-	-	-	79.7170	441.7540	Aman
12	XCA12	0.0000	-34.2655	3.0447	P3	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
13	XCA13	0.0000	-36.3200	3.0430	P3	2045.1572	38.3540	-	-	-	-	79.3409	441.7540	Aman
14	XCA14	0.0000	-38.7246	3.0321	P3	2045.1572	38.3540	-	-	-	-	79.0555	441.7540	Aman
15	XCA15	0.0000	-40.2734	3.0279	P3	2045.1572	38.3540	-	-	-	-	78.9458	441.7540	Aman
16	XCA16	0.0000	-42.1623	3.0203	P3	2045.1572	38.3540	-	-	-	-	78.7492	441.7540	Aman
17	XCA17	0.0000	-44.0187	3.0181	P3	2045.1572	38.3540	-	-	-	-	78.6905	441.7540	Aman
18	XCA18	0.0000	-44.8878	3.0130	P3	2045.1572	38.3540	-	-	-	-	78.5586	441.7540	Aman
19	XCA19	0.0000	-44.9378	3.0088	P3	2045.1572	38.3540	-	-	-	-	78.4482	441.7540	Aman
20	XCA20	0.0000	-43.8878	3.0054	P3	2045.1572	38.3540	-	-	-	-	78.3594	441.7540	Aman
21	XCA21	0.0000	-44.0485	3.0054	P3	2045.1572	38.3540	-	-	-	-	78.3594	441.7540	Aman
22	XCA22	0.0000	-45.6806	3.0088	P3	2045.1572	38.3540	-	-	-	-	78.4482	441.7540	Aman
23	XCA23	0.0000	-46.1243	3.0130	P3	2045.1572	38.3540	-	-	-	-	78.5586	441.7540	Aman
24	XCA24	0.0000	-46.2719	3.0181	P3	2045.1572	38.3540	-	-	-	-	78.6905	441.7540	Aman
25	XCA25	0.0000	-44.8948	3.0203	P3	2045.1572	38.3540	-	-	-	-	78.7492	441.7540	Aman
26	XCA26	0.0000	-43.6215	3.0279	P3	2045.1572	38.3540	-	-	-	-	78.9458	441.7540	Aman
27	XCA27	0.0000	-41.9724	3.0321	P3	2045.1572	38.3540	-	-	-	-	79.0555	441.7540	Aman
28	XCA28	0.0000	-38.7434	3.0430	P3	2045.1572	38.3540	-	-	-	-	79.3409	441.7540	Aman
29	XCA29	0.0000	-36.0289	3.0447	P3	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
30	XCA30	0.0000	-33.0012	3.0575	P3	2045.1572	38.3540	-	-	-	-	79.7170	441.7540	Aman
31	XCA31	0.0000	-27.6136	3.0675	P3	2045.1572	38.3540	-	-	-	-	79.9788	441.7540	Aman
32	XCA32	0.0000	-27.3603	3.0783	P3	2045.1572	38.3540	-	-	-	-	80.2609	441.7540	Aman

1. Batang Atas

Tabel 4.5 Lanjutan

NO	Batang	N _{U, Tarik} (KN)	N _{U, Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λc	ω	ϕN_n (KN)	KL/r < 240		ϕN_n (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XCA38	15.2047	-	2,5200	P3	2045,1572	38,3540	65,7048	0,7249	1,2330	338,3752	-	-	Aman
34	XCA34	0,0000	-16,3130	3,1023	P3	2045,1572	38,3540	-	-	-	-	-	-	Aman
35	XCA35	0,0000	-11,4007	3,1127	P3	2045,1572	38,3540	-	-	-	-	-	-	Aman
36	XCA36	0,0000	-5,6008	3,1321	P3	2045,1572	38,3540	-	-	-	-	-	-	Aman
37	XCA37	4,6583	-	3,1623	P3	2045,1572	38,3540	82,4498	0,9096	0,9826	424,6109	-	-	Aman
38	XCA38	15,2047	-	2,5200	P3	2045,1572	38,3540	65,7048	0,7249	1,2330	338,3752	-	-	Aman
39	XCA39	22,5518	-	2,2053	P3	2045,1572	38,3540	57,4989	0,6343	1,4090	296,1155	-	-	Aman
40	XCA40	22,5198	-	3,4677	P3	2045,1572	38,3540	90,4132	0,9975	0,8960	465,6222	-	-	Aman

Keterangan

- [1] Nomor
 [2] Nama Batang
 [3] Nu Tarik = Gaya Tarik
 [4] Nu Tekan = Gaya Tekan
 [5] Panjang batang
 [6] Profil terpasang
 [7] Ag= Luas penampang profil (mm²)
 [8] r = Jari-jari girasi profil terkecil (mm)
 [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
 [10] $\lambda c = (1/3.14) * (KL/r) * (\sqrt{f_y/E})^{0.75}$ (Parameter Kelangsingan Batang tekan)
 [11] $\omega =$ Koefisien Tekuk
 $\lambda c < 0.25; \omega = 1$
 $0.25 < \lambda c < 1.2 ; \omega = 1.43 / (1.6 - 0.6 \lambda c)$
 $\lambda c > 1.2 ; \omega = 1.25 \lambda c^2$
 [12] $\phi N_n = 0.85 \cdot Ag \cdot (f_y / \omega)$; Kuat Tekan Nominal
 [13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
 [14] $\phi N_n = 0.9 \cdot Ag \cdot f_y$; Kuat Tarik Nominal
 [15] Nu ≤ ϕN_n ; Profil aman dipakai

Tabel 4.5
Tabel Perencanaan batang

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λc	ω	φNn (KN)	KL/r < 240	φNtr (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XCA1	77,3854	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	FALSE	-	Aman
2	XCA2	0,0000	-203,1681	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
3	XCA3	0,0000	-34,4648	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
4	XCA4	0,0000	-35,9284	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
5	XCA5	0,0000	-27,2527	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
6	XCA6	8,0318	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
7	XCA7	10,7095	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
8	XCA8	0,0000	-3,4244	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
9	XCA9	25,2501	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
10	XCA10	20,4873	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
11	XCA11	25,5272	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
12	XCA12	12,7933	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
13	XCA13	0,0000	-2,2818	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
14	XCA14	17,1094	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
15	XCA15	12,1487	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
16	XCA16	0,6697	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
17	XCA17	19,0089	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
18	XCA18	15,7334	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
19	XCA19	17,5323	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
20	XCA20	42,2027	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
21	XCA21	17,6577	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
22	XCA22	16,2707	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
23	XCA23	20,4809	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
24	XCA24	3,5740	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
25	XCA25	14,9617	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
26	XCA26	20,4142	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
27	XCA27	0,2854	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
28	XCA28	14,6828	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
29	XCA29	27,4472	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
30	XCA30	12,4158	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
31	XCA31	12,2926	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
32	XCA32	0,0000	-2,7471	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman

Lanjutan Batang Vertikal

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	ΦN _t (KN)	KL/r<240	ΦN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
33	XCA33	10,1614	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
34	XCA34	6,4446	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman
35	XCA35	0,0000	-24,2116	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
36	XCA36	0,0000	-36,4030	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
37	XCA37	0,0000	-33,1555	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
38	XCA38	0,0000	-197,1134	3,0000	P3	2045,1572	38,3540	-	-	-	-	78,2187	441,7540	Aman
39	XCA39	70,8065	-	3,0000	P3	2045,1572	38,3540	78,2187	0,8629	1,0357	402,8213	-	-	Aman

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Nu Tarik = Gaya Tarik
- [4] Nu Tekan = Gaya Tekan
- [5] Panjang batang
- [6] Profil terpasang
- [7] A_g= Luas penampang profil (mm²);
- [8] r = Jari-jari girasi profil terkecil (mm)
- [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
- [10] λc = (1/3.14)*(KL/r) (fy/E)^{0.5} (Parameter Kelangsingan Batang tekan)
- [11] ω = Koefisien Tekuk
- λc < 0.25; ω = 1
- 0.25 < λc < 1.2 ; ω = 1.43/(1.6-0.6λc)
- λc > 1.2 ; ω = 1.25 λc²
- [12] ΦN_t = 0.85.A_g.(fy/ω); Kuat Tekan Nominal
- [13] KL/r<240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
- [14] ΦN_t = 0.9.A_g .fy ; Kuat Tarik Nominal
- [15] Nu ≤ ΦN_t; Profil aman dipakai

Tabel Perencanaan batang Kuda-Kuda XC

1. Batang Bawah

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φN _t (KN)	KL/r<240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XCB1	0.0000	-24449.1800	3.47	P4	13741.9080	70.1040	-	-	-	-	49.4652	2968.2521	Aman
2	XCB2	0.0000	-58572.5000	3.16	P4	13741.9080	70.1040	-	-	-	-	45.1084	2968.2521	Aman
3	XCB3	0.0000	-56781.0900	3.13	P4	13741.9080	70.1040	-	-	-	-	44.6778	2968.2521	Aman
4	XCB4	0.0000	-45816.2900	3.11	P4	13741.9080	70.1040	-	-	-	-	44.4012	2968.2521	Aman
5	XCB5	0.0000	-42067.3900	3.10	P4	13741.9080	70.1040	-	-	-	-	44.2524	2968.2521	Aman
6	XCB6	0.0000	-39043.9600	3.09	P4	13741.9080	70.1040	-	-	-	-	44.0423	2968.2521	Aman
7	XCB7	0.0000	-31967.7900	3.08	P4	13741.9080	70.1040	-	-	-	-	43.9109	2968.2521	Aman
8	XCB8	0.0000	-18828.3500	3.07	P4	8258.0480	73.1520	-	-	-	-	41.9333	1783.7384	Aman
9	XCB9	0.0000	-30034.3500	3.06	P4	8258.0480	73.1520	-	-	-	-	41.7961	1783.7384	Aman
10	XCB10	0.0000	-18907.2000	3.04	P4	8258.0480	73.1520	-	-	-	-	41.6220	1783.7384	Aman
11	XCB11	0.0000	-5561.6150	3.04	P4	8258.0480	73.1520	-	-	-	-	41.5989	1783.7384	Aman
12	XCB12	0.0000	-12138.4300	3.03	P4	8258.0480	73.1520	-	-	-	-	41.4492	1783.7384	Aman
13	XCB13	0.0000	-6550.9200	3.03	P4	5419.3440	74.6760	-	-	-	-	40.5470	1170.5783	Aman
14	XCB14	4597.9190	-	3.02	P4	5419.3440	74.6760	40.4460	0.4462	2.0030	551.9475	-	-	Aman
15	XCB15	0.0000	-3275.7520	3.02	P4	5419.3440	74.6760	-	-	-	-	40.4159	1170.5783	Aman
16	XCB16	0.0000	-1054.4720	3.01	P4	5419.3440	74.6760	-	-	-	-	40.3481	1170.5783	Aman
17	XCB17	4624.0840	-	3.01	P4	5419.3440	74.6760	40.2914	0.4445	2.0107	549.8379	-	-	Aman
18	XCB18	0.0000	-2555.1340	3.01	P4	5419.3440	74.6760	-	-	-	-	40.2458	1170.5783	Aman
19	XCB19	0.0000	-3661.9600	3.01	P4	5419.3440	74.6760	-	-	-	-	40.2458	1170.5783	Aman
20	XCB20	0.0000	-6649.5580	3.01	P4	5419.3440	74.6760	-	-	-	-	40.2914	1170.5783	Aman
21	XCB21	0.0000	-6660.2270	3.01	P4	5419.3440	74.6760	-	-	-	-	40.3481	1170.5783	Aman
22	XCB22	0.0000	-3679.0270	3.02	P4	5419.3440	74.6760	-	-	-	-	40.4159	1170.5783	Aman
23	XCB23	0.0000	-2575.1290	3.02	P4	5419.3440	74.6760	-	-	-	-	40.4460	1170.5783	Aman
24	XCB24	4587.6760	-	3.03	P4	5419.3440	74.6760	40.5470	0.4473	1.9980	553.3252	-	-	Aman
25	XCB25	0.0000	-1086.9430	3.03	P4	5419.3440	74.6760	-	-	-	-	40.6033	1170.5783	Aman
26	XCB26	0.0000	-3300.2990	3.04	P4	5419.3440	74.6760	-	-	-	-	40.7499	1170.5783	Aman
27	XCB27	4555.9150	-	3.04	P4	5419.3440	74.6760	40.7726	0.4498	1.9869	556.4037	-	-	Aman
28	XCB28	0.0000	-6581.5000	3.06	P4	5419.3440	74.6760	-	-	-	-	40.9431	1170.5783	Aman
29	XCB29	0.0000	-12165.4700	3.07	P4	5419.3440	74.6760	-	-	-	-	41.0775	1170.5783	Aman
30	XCB30	0.0000	-5582.1370	3.08	P4	5419.3440	74.6760	-	-	-	-	41.2224	1170.5783	Aman

Lanjutan Batang Bawah

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik ϕN_h (KN)	Ket		
								KL/r < 200	λc	ω				
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
31	XCB31	0.0000	-18963.4400	3.09	P4	5419.3440	74.6760	-	-	-	-	41.3458	1170.5783	Aman
32	XCB32	0.0000	-30021.2000	3.10	P4	5419.3440	74.6760	-	-	-	-	41.5431	1170.5783	Aman
33	XCB33	0.0000	-18857.1900	3.11	P4	5419.3440	74.6760	-	-	-	-	41.6827	1170.5783	Aman
34	XCB34	0.0000	-31992.9600	3.13	P4	5419.3440	74.6760	-	-	-	-	41.9424	1170.5783	Aman
35	XCB35	0.0000	-39080.8600	3.16	P4	5419.3440	74.6760	-	-	-	-	42.3466	1170.5783	Aman
36	XCB36	0.0000	-42103.5400	3.47	P4	5419.3440	74.6760	-	-	-	-	46.4367	1170.5783	Aman
37	XCB37	0.0000	-45917.3700	3.16	P4	5419.3440	74.6760	-	-	-	-	42.3466	1170.5783	Aman
38	XCB38	0.0000	-56979.4300	2.52	P4	5419.3440	74.6760	-	-	-	-	33.7463	1170.5783	Aman
39	XCB39	0.0000	-58887.7700	2.21	P4	5419.3440	74.6760	-	-	-	-	29.5317	1170.5783	Aman
40	XCB40	0.0000	-24580.0100	3.47	P4	5419.3440	74.6760	-	-	-	-	46.4367	1170.5783	Aman

Keterangan

- [1] Nomer
 [2] Nama Batang
 [3] Nu Tarik = Gaya Tarik
 [4] Nu Tekan = Gaya Tekan
 [5] Panjang batang
 [6] Profil terpasang
 [7] Ag= Luas penampang profil (mm²)
 [8] r = Jari-jari girasi profil terkecil (mm)
 [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
 [10] $\lambda c = (1/3.14) * (KL/r) * (f_y/E)^{0.5}$ (Parameter Kelangsingan Batang tekan)
- [11] $\omega =$ Koefisien Tekuk
 $\lambda c < 0.25; \omega = 1$
 $0.25 < \lambda c < 1.2; \omega = 1.43 / (1.6 - 0.6 \lambda c)$
 $\lambda c > 1.2; \omega = 1.25 \lambda c^2$
- [12] $\phi N_h = 0.85 \cdot A_g \cdot (f_y / \omega)$; Kuat Tekan Nominal
- [13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
- [14] $\phi N_h = 0.9 \cdot A_g \cdot f_y$; Kuat Tarik Nominal
- [15] $N_u \leq \phi N_n$; Profil aman dipakai

Tabel 4.5
Tabel Perencanaan batang

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λc	ω	φN _t (KN)	KL/r < 240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XDA1	0.0000	-1889.20	2.6760	P3	2045.1572	38.3540	-	-	-	-	69.7707	441.7540	Aman
2	XDA2	0.0000	-4569.39	3.2539	P3	2045.1572	38.3540	-	-	-	-	84.8375	441.7540	Aman
3	XDA3	0.0000	-7218.00	3.1687	P3	2045.1572	38.3540	-	-	-	-	82.6161	441.7540	Aman
4	XDA4	0.0000	-10599.28	3.1264	P3	2045.1572	38.3540	-	-	-	-	81.5144	441.7540	Aman
5	XDA5	0.0000	-13560.72	3.1074	P3	2045.1572	38.3540	-	-	-	-	81.0196	441.7540	Aman
6	XDA6	0.0000	-16658.31	3.0852	P3	2045.1572	38.3540	-	-	-	-	80.4399	441.7540	Aman
7	XDA7	0.0000	-19911.14	3.0783	P3	2045.1572	38.3540	-	-	-	-	80.2609	441.7540	Aman
8	XDA8	0.0000	-22082.54	3.0654	P3	2045.1572	38.3540	-	-	-	-	79.9248	441.7540	Aman
9	XDA9	0.0000	-24040.24	3.0556	P3	2045.1572	38.3540	-	-	-	-	79.6671	441.7540	Aman
10	XDA10	0.0000	-26082.66	3.0447	P3	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
11	XDA11	0.0000	-27162.32	3.0414	P3	2045.1572	38.3540	-	-	-	-	79.2976	441.7540	Aman
12	XDA12	0.0000	-28042.51	3.0321	P3	2045.1572	38.3540	-	-	-	-	79.0555	441.7540	Aman
15	XDA13	0.0000	-28507.64	3.0252	P3	2045.1572	38.3540	-	-	-	-	78.8769	441.7540	Aman
14	XDA14	0.0000	-28570.06	3.0192	P3	2045.1572	38.3540	-	-	-	-	78.7194	441.7540	Aman
15	XDA15	0.0000	-28156.79	3.0160	P3	2045.1572	38.3540	-	-	-	-	78.6352	441.7540	Aman
16	XDA16	0.0000	-27571.24	3.0121	P3	2045.1572	38.3540	-	-	-	-	78.5348	441.7540	Aman
17	XDA17	0.0000	-26802.96	3.0073	P3	2045.1572	38.3540	-	-	-	-	78.4101	441.7540	Aman
18	XDA18	0.0000	-25017.64	3.0048	P3	2045.1572	38.3540	-	-	-	-	78.3442	441.7540	Aman
19	XDA19	0.0000	-25019.66	3.0048	P3	2045.1572	38.3540	-	-	-	-	78.3442	441.7540	Aman
20	XDA20	0.0000	-26791.44	3.0073	P3	2045.1572	38.3540	-	-	-	-	78.4101	441.7540	Aman
21	XDA21	0.0000	-27560.66	3.0121	P3	2045.1572	38.3540	-	-	-	-	78.5348	441.7540	Aman
22	XDA22	0.0000	-28142.90	3.0160	P3	2045.1572	38.3540	-	-	-	-	78.6352	441.7540	Aman
23	XDA23	0.0000	-28543.98	3.0192	P3	2045.1572	38.3540	-	-	-	-	78.7194	441.7540	Aman
24	XDA24	0.0000	-28490.62	3.0252	P3	2045.1572	38.3540	-	-	-	-	78.8769	441.7540	Aman
25	XDA25	0.0000	-28021.96	3.0321	P3	2045.1572	38.3540	-	-	-	-	79.0555	441.7540	Aman
26	XDA26	0.0000	-27130.62	3.0414	P3	2045.1572	38.3540	-	-	-	-	79.2976	441.7540	Aman
27	XDA27	0.0000	-26060.85	3.0447	P3	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
28	XDA28	0.0000	-24014.97	3.0556	P3	2045.1572	38.3540	-	-	-	-	79.6671	441.7540	Aman
29	XDA29	0.0000	-22052.04	3.0654	P3	2045.1572	38.3540	-	-	-	-	79.9248	441.7540	Aman
30	XDA30	0.0000	-19887.89	3.0783	P3	2045.1572	38.3540	-	-	-	-	80.2609	441.7540	Aman

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λ _c	ω	ΦN _n (KN)	KL/r < 240		ΦN _n (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
31	XDA31	0.0000	-16636.55	3.0852	P3	2045.1572	38.3540	-	-	-	-	80.4399	441.7540	Aman
32	XDA32	0.0000	-13539.94	3.1074	P3	2045.1572	38.3540	-	-	-	-	81.0196	441.7540	Aman
33	XDA33	0.0000	-10595.02	3.1264	P3	2045.1572	38.3540	-	-	-	-	81.5144	441.7540	Aman
34	XDA34	0.0000	-7184.17	3.1687	P3	2045.1572	38.3540	-	-	-	-	82.6161	441.7540	Aman
35	XDA35	0.0000	-4547.83	3.2539	P3	2045.1572	38.3540	-	-	-	-	84.8375	441.7540	Aman
36	XDA36	0.0000	-1811.54	2.6760	P3	2045.1572	38.3540	-	-	-	-	69.7707	441.7540	Aman

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Nu Tarik = Gaya Tarik
- [4] Nu Tekan = Gaya Tekan
- [5] Panjang batang
- [6] Profil terpasang
- [7] Ag = Luas penampang profil (mm²)
- [8] r = Jari-jari girasi profil terkecil (mm)
- [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
- [10] λ_c = (1/3.14) * (KL/r) * (f_y/E)^{0.5} (Parameter Kelangsingan Batang tekan)
- [11] ω = Koefisien Tekuk
λ_c < 0.25; ω = 1
0.25 < λ_c < 1.2 ; ω = 1.43 / (1.6 - 0.6λ_c)
λ_c > 1.2 ; ω = 1.25 λ_c²
- [12] ΦN_n = 0.85 · Ag · (f_y/ω); Kuat Tekan Nominal
- [13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
- [14] ΦN_n = 0.9 · Ag · f_y; Kuat Tarik Nominal
- [15] Nu ≤ ΦN_n; Profil aman dipakai

Tabel 4.6
Tabel Perencanaan batang

1. Batang Vertikal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φN _t (KN)	KL/r<240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XDV1	0.00	-46594.90	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
2	XDV2	0.00	-19585.35	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
3	XDV3	0.00	-11172.22	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
4	XDV4	0.00	-5604.32	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
5	XDV5	0.00	-3668.41	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
6	XDV6	0.00	-7233.35	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
7	XDV7	923.91	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
8	XDV8	0.00	-2112.85	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman
9	XDV9	0.00	-7162.45	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman
10	XDV10	3961.42	-	3.00	P4	3935.48	46.7360	64.1903	0.7082	1.2621	636.12	-	-	Aman
11	XDV11	0.00	-948.10	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman
12	XDV12	0.00	-4995.35	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman
13	XDV13	5808.16	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
14	XDV14	1615.29	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
15	XDV15	140.25	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
16	XDV16	7955.58	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
17	XDV17	4976.96	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
18	XDV18	4463.97	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
19	XDV19	9964.41	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
20	XDV20	4470.82	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
21	XDV21	4967.90	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
22	XDV22	7924.87	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
23	XDV23	162.41	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
24	XDV24	1610.66	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
25	XDV25	5783.87	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
26	XDV26	0.00	-4970.18	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman
27	XDV27	0.00	-935.09	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman
28	XDV28	3925.32	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman
29	XDV29	0.00	-7111.03	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman
30	XDV30	0.00	-2162.87	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman
31	XDV31	947.25	-	3.00	P4	2774.19	47.7520	62.8246	0.6931	1.2895	438.87	-	-	Aman

1. Batang Vertikal

NO	Batang	Nu Tarik (KN)	Nu Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λc	ω	ϕN_n (KN)	KL/r < 240		ϕN_n (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
32	XDV32	0.00	-7250.64	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman
33	XDV33	0.00	-3662.01	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman
34	XDV34	0.00	-5670.94	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman
35	XDV35	0.00	-11123.64	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman
36	XDV36	0.00	-19674.41	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman
37	XDV37	0.00	-46370.97	3.00	P4	2774.19	47.7520	-	-	-	-	62.82	599.22	Aman

Keterangan

- [1] Nomer
- [2] Nama Batang
- [3] Nu Tarik = Gaya Tarik
- [4] Nu Tekan = Gaya Tekan
- [5] Panjang batang
- [6] Profil terpasang
- [7] Ag = Luas penampang profil (mm²)
- [8] r = Jari-jari girasi profil terkecil (mm)
- [9] KL/r < 200 (syarat angka perbandingan kelangsingan batang tekan)
- [10] $\lambda c = (1/3.14) * (KL/r) * (\bar{f}_y / E)^{0.5}$ (Parameter Kelangsingan Batang tekan)
- [11] $\omega =$ Koefisien Tekuk
 $\lambda c < 0.25; \omega = 1$
 $0.25 < \lambda c < 1.2; \omega = 1.43 / (1.6 - 0.6 \lambda c)$
 $\lambda c > 1.2; \omega = 1.25 \lambda c^2$
- [12] $\phi N_n = 0.85 \cdot Ag \cdot (\bar{f}_y / \omega)$; Kuat Tekan Nominal
- [13] KL/r < 240 (syarat Angka Perbandingan Kelangsingan Batang tarik)
- [14] $\phi N_n = 0.9 \cdot Ag \cdot \bar{f}_y$; Kuat Tarik Nominal
- [15] Nu ≤ ϕN_n ; Profil aman dipakai

Tabel Perencanaan batang KK XD

1. Batang Diagonal

NO	Batang	NuTangk (KN)	NuTeban (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r<200	λc	ω	ϕNn (KN)	KL/r<240		ϕNn (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XDD1	4557.5610	-	2.912199	P4	10064.50	52.3240	55.6570	0.6140	1.4556	1410.5459	-	-	Aman
2	XDD2	1028.4510	-	3.468083	P4	10064.50	52.3240	66.2809	0.7312	1.2223	1679.7926	-	-	Aman
3	XDD3	360.8619	-	3.594496	P4	10064.50	52.3240	68.6969	0.7579	1.1793	1741.0217	-	-	Aman
4	XDD4	587.3875	-	3.673472	P4	10064.50	52.3240	70.2063	0.7745	1.1539	1779.2743	-	-	Aman
5	XDD5	468.2032	-	3.71431	P4	10064.50	52.3240	70.9867	0.7831	1.1412	1799.0545	-	-	Aman
6	XDD6	2408.2190	-	3.768076	P4	10064.50	52.3240	72.0143	0.7945	1.1250	1825.0965	-	-	Aman
7	XDD7	3629.0330	-	3.786304	P4	10064.50	52.3240	72.3627	0.7983	1.1195	1833.9254	-	-	Aman
8	XDD8	1585.8530	-	3.823205	P4	10064.50	52.3240	73.0679	0.8061	1.1087	1851.7987	-	-	Aman
9	XDD9	2143.7910	-	3.8544	P4	10064.50	52.3240	73.6641	0.8127	1.0998	1866.9082	-	-	Aman
10	XDD10	2003.7290	-	3.892351	P4	10064.50	52.3240	74.3894	0.8207	1.0890	1885.2901	-	-	Aman
11	XDD11	0.0000	-126.7781	3.905125	P4	10064.50	52.3240	-	-	-	-	74.6335	2173.9311	Aman
12	XDD12	45.4011	-	3.943805	P4	10064.50	52.3240	75.3728	0.8315	1.0748	1910.2122	-	-	Aman
13	XDD13	0.0000	-1002.5120	3.976443	P4	10064.50	52.3240	-	-	-	-	75.9965	2173.9311	Aman
14	XDD14	0.0000	-1976.1120	2.004719	P4	10064.50	52.3240	-	-	-	-	38.3136	2173.9311	Aman
15	XDD15	0.0000	-3286.9990	2.014702	P4	10064.50	52.3240	-	-	-	-	38.5044	2173.9311	Aman
16	XDD16	0.0000	-4224.9350	2.028109	P4	10064.50	52.3240	-	-	-	-	38.7606	2173.9311	Aman
17	XDD17	0.0000	-4949.3530	2.04842	P4	10064.50	52.3240	-	-	-	-	39.1488	2173.9311	Aman
18	XDD18	0.0000	-6697.7410	2.062092	P4	10064.50	52.3240	-	-	-	-	39.4101	2173.9311	Aman
19	XDD19	0.0000	-6670.8450	2.062092	P4	10064.50	52.3240	-	-	-	-	39.4101	2173.9311	Aman
20	XDD20	0.0000	-4956.5850	2.04842	P4	10064.50	52.3240	-	-	-	-	39.1488	2173.9311	Aman
21	XDD21	0.0000	-4221.9000	2.028109	P4	10064.50	52.3240	-	-	-	-	38.7606	2173.9311	Aman
22	XDD22	0.0000	-3248.5210	2.014702	P4	10064.50	52.3240	-	-	-	-	38.5044	2173.9311	Aman
23	XDD23	0.0000	-2005.1780	2.004719	P4	10064.50	52.3240	-	-	-	-	38.3136	2173.9311	Aman
24	XDD24	0.0000	-999.4317	3.976443	P4	10064.50	52.3240	-	-	-	-	75.9965	2173.9311	Aman
25	XDD25	78.9527	-	3.943805	P4	10064.50	52.3240	75.3728	0.8315	1.0748	1910.2122	-	-	Aman
26	XDD26	0.0000	-154.9260	3.905125	P4	10064.50	52.3240	-	-	-	-	74.6335	2173.9311	Aman
27	XDD27	1994.9000	-	3.892351	P4	10064.50	52.3240	74.3894	0.8207	1.0890	1885.2901	-	-	Aman
28	XDD28	2187.1570	-	3.8544	P4	10064.50	52.3240	73.6641	0.8127	1.0998	1866.9082	-	-	Aman
29	XDD29	1536.2620	-	3.823205	P4	3935.48	46.7360	81.8043	0.9025	0.9903	810.6780	-	-	Aman

1. Batang Diagonal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r<200	λ_c	ω	ϕN_h (KN)	KL/r<240		ϕN_h (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
30	XDD30	3649.8360	-	3.786304	P4	3935.48	46.7360	81.0147	0.8938	1.0000	802.8535	-	-	Aman
31	XDD31	2421.9000	-	3.768076	P4	3935.48	46.7360	80.6247	0.8895	1.0048	798.9884	-	-	Aman
32	XDD32	482.3426	-	3.71431	P4	3935.48	46.7360	79.4743	0.8768	1.0194	787.5878	-	-	Aman

1. Batang Atas

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λ _c	ω	φN _t (KN)	KL/r<240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XEA1	0.0000	-9802.07	3.443269	P3	2045.1572	38.3540	-	-	-	-	89.7760	441.7540	Aman
2	XEA2	0.0000	-12903.28	3.23858	P3	2045.1572	38.3540	-	-	-	-	84.4392	441.7540	Aman
3	XEA3	0.0000	-13379.90	3.15913	P3	2045.1572	38.3540	-	-	-	-	82.3677	441.7540	Aman
4	XEA4	0.0000	-15170.40	3.123604	P3	2045.1572	38.3540	-	-	-	-	81.4414	441.7540	Aman
5	XEA5	0.0000	-17567.17	3.092329	P3	2045.1572	38.3540	-	-	-	-	80.6260	441.7540	Aman
6	XEA6	0.0000	-19775.40	3.080584	P3	2045.1572	38.3540	-	-	-	-	80.3198	441.7540	Aman
7	XEA7	0.0000	-21325.85	3.069609	P3	2045.1572	38.3540	-	-	-	-	80.0336	441.7540	Aman
8	XEA8	0.0000	-22900.39	3.055552	P3	2045.1572	38.3540	-	-	-	-	79.6671	441.7540	Aman
9	XEA9	0.0000	-24361.16	3.044733	P3	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
10	XEA10	0.0000	-24722.23	3.041381	P3	2045.1572	38.3540	-	-	-	-	79.2976	441.7540	Aman
11	XEA11	0.0000	-25213.21	3.03966	P3	2045.1572	38.3540	-	-	-	-	79.0181	441.7540	Aman
12	XEA12	0.0000	-25114.13	3.025244	P3	2045.1572	38.3540	-	-	-	-	78.8769	441.7540	Aman
13	XEA13	0.0000	-24649.05	3.018095	P3	2045.1572	38.3540	-	-	-	-	78.6905	441.7540	Aman
14	XEA14	0.0000	-24009.57	3.014963	P3	2045.1572	38.3540	-	-	-	-	78.6088	441.7540	Aman
15	XEA15	0.0000	-23288.65	3.011245	P3	2045.1572	38.3540	-	-	-	-	78.5119	441.7540	Aman
16	XEA16	0.0000	-22617.46	3.006011	P3	2045.1572	38.3540	-	-	-	-	78.3754	441.7540	Aman
17	XEA17	0.0000	-21164.19	3.003748	P3	2045.1572	38.3540	-	-	-	-	78.3164	441.7540	Aman
18	XEA18	0.0000	-21162.40	3.003748	P3	2045.1572	38.3540	-	-	-	-	78.3164	441.7540	Aman
19	XEA19	0.0000	-22607.85	3.006011	P3	2045.1572	38.3540	-	-	-	-	78.3754	441.7540	Aman
20	XEA20	0.0000	-23280.66	3.011245	P3	2045.1572	38.3540	-	-	-	-	78.5119	441.7540	Aman
21	XEA21	0.0000	-23994.75	3.014963	P3	2045.1572	38.3540	-	-	-	-	78.6088	441.7540	Aman
22	XEA22	0.0000	-24623.35	3.018095	P3	2045.1572	38.3540	-	-	-	-	78.6905	441.7540	Aman
23	XEA23	0.0000	-25098.10	3.025244	P3	2045.1572	38.3540	-	-	-	-	78.8769	441.7540	Aman
24	XEA24	0.0000	-25189.00	3.03066	P3	2045.1572	38.3540	-	-	-	-	79.0181	441.7540	Aman
25	XEA25	0.0000	-24690.37	3.041381	P3	2045.1572	38.3540	-	-	-	-	79.2976	441.7540	Aman
26	XEA26	0.0000	-24333.10	3.044733	P3	2045.1572	38.3540	-	-	-	-	79.3850	441.7540	Aman
27	XEA27	0.0000	-22875.71	3.055552	P3	2045.1572	38.3540	-	-	-	-	79.6671	441.7540	Aman
28	XEA28	0.0000	-21289.62	3.069609	P3	2045.1572	38.3540	-	-	-	-	80.0336	441.7540	Aman
29	XEA29	0.0000	-19746.47	3.080584	P3	2045.1572	38.3540	-	-	-	-	80.3198	441.7540	Aman

Lanjutan

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarif		Ket
								KL/r < 200	λ _c	ω	φN _h (KN)	KL/r < 240	φN _h (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
30	XEA30	0.0000	-17537.97	3.092329	P3	2045.1572	38.3540	-	-	-	-	80.6260	441.7540	Aman
31	XEA31	0.0000	-15153.79	3.123604	P3	2045.1572	38.3540	-	-	-	-	81.4414	441.7540	Aman
32	XFA32	0.0000	-13362.62	3.15913	P3	2045.1572	38.3540	-	-	-	-	82.3677	441.7540	Aman
33	XEA33	0.0000	-13002.24	3.23858	P3	2045.1572	38.3540	-	-	-	-	84.4392	441.7540	Aman
34	XEA34	0.0000	-9824.12	3.443269	P3	2045.1572	38.3540	-	-	-	-	89.7760	441.7540	Aman

Tabel Perencanaan batang KK_XE

1. Batang Vertikal		NO Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
[1]	[2]								[3]	[4]	[5]	[6]	[7]	[8]	
1	XEV1	0.00	-36449.23	3.00	P4	10064.50	52.3240	-	[9]	[10]	[11]	[12]	[13]	[14]	[15]
2	XEV2	0.00	-12324.75	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
3	XEV3	0.00	-3751.87	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
4	XEV4	0.00	-1514.11	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
5	XEV5	0.00	-4306.07	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
6	XEV6	3203.57	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
7	XEV7	0.00	-375.60	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
8	XEV8	0.00	-5390.20	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
9	XEV9	5050.56	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
10	XEV10	562.26	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
11	XEV11	0.00	-2843.93	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
12	XEV12	6784.69	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
13	XEV13	3691.84	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
14	XEV14	2131.37	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
15	XEV15	9502.45	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
16	XEV16	5726.12	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
17	XEV17	5087.43	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
18	XEV18	10591.59	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
19	XEV19	5089.29	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
20	XEV20	5712.30	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
21	XEV21	9473.88	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
22	XEV22	2144.51	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
23	XEV23	3673.66	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
24	XEV24	6774.22	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
25	XEV25	0.00	-2840.39	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
26	XEV26	565.18	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
27	XEV27	5028.02	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman
28	XEV28	0.00	-5380.17	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
29	XEV29	0.00	-378.77	3.00	P4	10064.50	52.3240	-	-	-	-	-	57.3351	2173.93	Aman
30	XEV30	3154.99	-	3.00	P4	10064.50	52.3240	0.6325	57.3351	0.6325	1.4130	1453.07	-	-	Aman

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λ _c	ω	φN _t (KN)	KL/r < 240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
31	XEV31	0.00	-4283.70	3.00	P4	10064.50	52.32	-	-	-	-	57.34	2173.93	Aman
32	XEV32	0.00	-1606.50	3.00	P4	10064.50	52.32	-	-	-	-	57.34	2173.93	Aman
33	XEV33	0.00	-3682.22	3.00	P4	10064.50	52.32	-	-	-	-	57.34	2173.93	Aman
34	XEV34	0.00	-12421.20	3.00	P4	10064.50	52.32	-	-	-	-	57.34	2173.93	Aman
35	XEV35	0.00	-36162.52	3.00	P4	10064.50	52.32	-	-	-	-	57.34	2173.93	Aman

1. Batang Diagonal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λ _c	ω	φN _t (KN)	KL/r<240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XED1	9434.03	-	2.912199	P4	10064.4960	52.3240	55.6570	0.6140	1.4556	1410.5459	-	-	Aman
2	XED2	2687.66	-	3.468083	P4	10064.4960	52.3240	66.2809	0.7312	1.2223	1679.7926	-	-	Aman
3	XED3	913.37	-	3.594496	P4	10064.4960	52.3240	68.6969	0.7579	1.1793	1741.0217	-	-	Aman
4	XED4	211.29	-	3.673472	P4	10064.4960	52.3240	70.2063	0.7745	1.1539	1779.2743	-	-	Aman
5	XED5	2379.69	-	3.71431	P4	10064.4960	52.3240	70.9867	0.7831	1.1412	1799.0545	-	-	Aman
6	XED6	2032.27	-	3.768076	P4	10064.4960	52.3240	72.0143	0.7945	1.1250	1825.0965	-	-	Aman
7	XED7	1803.60	-	3.786304	P4	10064.4960	52.3240	72.3627	0.7983	1.1195	1833.9254	-	-	Aman
8	XED8	2309.36	-	3.823205	P4	10064.4960	52.3240	73.0679	0.8061	1.1087	1851.7987	-	-	Aman
9	XED9	1483.62	-	3.8544	P4	10064.4960	52.3240	73.6641	0.8127	1.0998	1866.9082	-	-	Aman
10	XED10	0.00	-502.70	3.044733	P4	10064.4960	52.3240	-	-	-	-	58.1900	2173.9311	Aman
11	XED11	0.00	-105.72	3.041381	P4	10064.4960	52.3240	-	-	-	-	58.1259	2173.9311	Aman
12	XED12	0.00	-2059.38	3.032095	P4	10064.4960	52.3240	-	-	-	-	57.9485	2173.9311	Aman
13	XED13	0.00	-2668.09	3.025244	P4	10064.4960	52.3240	-	-	-	-	57.8175	2173.9311	Aman
14	XED14	0.00	-3587.23	3.019205	P4	10064.4960	52.3240	-	-	-	-	57.7021	2173.9311	Aman
15	XED15	0.00	-4286.38	3.015974	P4	10064.4960	52.3240	-	-	-	-	57.6404	2173.9311	Aman
16	XED16	0.00	-4171.19	3.012125	P4	10064.4960	52.3240	-	-	-	-	57.5668	2173.9311	Aman
17	XED17	0.00	-5561.01	3.007341	P4	10064.4960	52.3240	-	-	-	-	57.4754	2173.9311	Aman
18	XED18	0.00	-5538.03	3.004813	P4	10064.4960	52.3240	-	-	-	-	57.4271	2173.9311	Aman
19	XED19	0.00	-4184.63	3.004813	P4	10064.4960	52.3240	-	-	-	-	57.4271	2173.9311	Aman
20	XED20	0.00	-4277.04	3.007341	P4	10064.4960	52.3240	-	-	-	-	57.4754	2173.9311	Aman
21	XED21	0.00	-3550.79	3.012125	P4	10064.4960	52.3240	-	-	-	-	57.5668	2173.9311	Aman
22	XED22	0.00	-2702.31	3.015974	P4	10064.4960	52.3240	-	-	-	-	57.6404	2173.9311	Aman
23	XED23	0.00	-2042.84	3.019205	P4	10064.4960	52.3240	-	-	-	-	57.7021	2173.9311	Aman
24	XED24	0.00	-89.14	3.025244	P4	10064.4960	52.3240	-	-	-	-	57.8175	2173.9311	Aman
25	XED25	0.00	-523.32	3.032095	P4	10064.4960	52.3240	-	-	-	-	57.9485	2173.9311	Aman
26	XED26	1476.72	-	3.041381	P4	10064.4960	52.3240	58.1259	0.6413	1.3938	1473.1162	-	-	Aman
27	XED27	2339.80	-	3.044733	P4	10064.4960	52.3240	58.1900	0.6420	1.3922	1474.7398	-	-	Aman
28	XED28	1768.83	-	3.065436	P4	10064.4960	52.3240	58.5857	0.6463	1.3828	1484.7674	-	-	Aman
29	XED29	2041.82	-	3.078327	P4	3935.4760	46.7360	65.8663	0.7266	1.2300	652.7330	-	-	Aman
30	XED30	2418.02	-	3.085191	P4	3935.4760	46.7360	66.0132	0.7283	1.2272	654.1884	-	-	Aman

lanjutan

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r<200	λc	ω	φ/Nh (KN)	KL/r<240		φ/Nh (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
31	XED31	166.88	-	3.107427	P4	3935.4760	46.7360	66.4889	0.7335	1.2184	658.9034	-	-	Aman
32	XED32	991.76	-	3.126404	P4	3935.4760	46.7360	66.8950	0.7380	1.2110	662.9273	-	-	Aman
33	XED33	2578.45	-	3.168659	P4	3935.4760	46.7360	67.7991	0.7480	1.1949	671.8871	-	-	Aman
34	XED34	9486.45	-	3.253859	P4	3935.4760	46.7360	69.6221	0.7681	1.1636	689.9531	-	-	Aman

1. Batang Bawah

NO	Batang	N _{UTarik} (KN)	N _{UTekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λc	ω	φN _t (KN)	KL/r < 240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XEB1	0.00	-35844.41	3.443269	P4	10064.4960	52.3240	-	-	-	-	65.8067	2173.9311	Aman
2	XEB2	0.00	-25306.06	3.23858	P4	10064.4960	52.3240	-	-	-	-	61.8947	2173.9311	Aman
3	XEB3	0.00	-22905.57	3.15913	P4	10064.4960	52.3240	-	-	-	-	60.3763	2173.9311	Aman
4	XEB4	0.00	-21896.52	3.123604	P4	10064.4960	52.3240	-	-	-	-	59.6973	2173.9311	Aman
5	XEB5	0.00	-15497.32	3.092329	P4	10064.4960	52.3240	-	-	-	-	59.0996	2173.9311	Aman
6	XEB6	0.00	-17913.62	3.080584	P4	10064.4960	52.3240	-	-	-	-	58.8752	2173.9311	Aman
7	XEB7	0.00	-16174.08	3.069609	P4	10064.4960	52.3240	-	-	-	-	58.6654	2173.9311	Aman
8	XEB8	0.00	-6960.39	3.055552	P4	10064.4960	52.3240	-	-	-	-	58.3968	2173.9311	Aman
9	XEB9	0.00	-11150.07	3.044733	P4	10064.4960	52.3240	-	-	-	-	58.1900	2173.9311	Aman
10	XEB10	0.00	-9947.85	3.041381	P4	10064.4960	52.3240	-	-	-	-	58.1259	2173.9311	Aman
11	XEB11	0.00	-3303.79	3.03066	P4	10064.4960	52.3240	-	-	-	-	57.9210	2173.9311	Aman
12	XEB12	0.00	-8977.20	3.025244	P4	10064.4960	52.3240	-	-	-	-	57.8175	2173.9311	Aman
13	XEB13	0.00	-10519.85	3.018095	P4	10064.4960	52.3240	-	-	-	-	57.6809	2173.9311	Aman
14	XEB14	0.00	-7868.21	3.014963	P4	10064.4960	52.3240	-	-	-	-	57.6210	2173.9311	Aman
15	XEB15	0.00	-14349.97	3.011245	P4	10064.4960	52.3240	-	-	-	-	57.5500	2173.9311	Aman
16	XEB16	0.00	-17473.05	3.006011	P4	10064.4960	52.3240	-	-	-	-	57.4499	2173.9311	Aman
17	XEB17	0.00	-19213.57	3.003748	P4	10064.4960	52.3240	-	-	-	-	57.4067	2173.9311	Aman
18	XEB18	0.00	-19226.03	3.003748	P4	10064.4960	52.3240	-	-	-	-	57.4067	2173.9311	Aman
19	XEB19	0.00	-17477.22	3.006011	P4	10064.4960	52.3240	-	-	-	-	57.4499	2173.9311	Aman
20	XEB20	0.00	-14361.14	3.011245	P4	10064.4960	52.3240	-	-	-	-	57.5500	2173.9311	Aman
21	XEB21	0.00	-7903.22	3.014963	P4	10064.4960	52.3240	-	-	-	-	57.6210	2173.9311	Aman
22	XEB22	0.00	-10531.88	3.018095	P4	10064.4960	52.3240	-	-	-	-	57.6809	2173.9311	Aman
23	XEB23	0.00	-9001.13	3.025244	P4	10064.4960	52.3240	-	-	-	-	57.8175	2173.9311	Aman
24	XEB24	0.00	-3335.12	3.03066	P4	10064.4960	52.3240	-	-	-	-	57.9210	2173.9311	Aman
25	XEB25	0.00	-9968.49	3.041381	P4	10064.4960	52.3240	-	-	-	-	58.1259	2173.9311	Aman
26	XEB26	0.00	-11165.42	3.044733	P4	10064.4960	52.3240	-	-	-	-	58.1900	2173.9311	Aman
27	XEB27	0.00	-6990.47	3.055552	P4	10064.4960	52.3240	-	-	-	-	58.3968	2173.9311	Aman
28	XEB28	0.00	-16182.48	3.069609	P4	10064.4960	52.3240	-	-	-	-	58.6654	2173.9311	Aman
29	XEB29	0.00	-17930.33	3.080584	P4	3935.4760	46.7360	-	-	-	-	65.9146	850.0628	Aman

lanjutan

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λ _c	ω	φN/n (KN)	KL/r<240	φN/n (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
30	XEB30	0.00	-15335.24	3.092329	P4	3935.4760	46.7360	-	-	-	-	66.1659	850.0628	Aman
31	XEB31	0.00	-21912.62	3.123604	P4	3935.4760	46.7360	-	-	-	-	66.8351	850.0628	Aman
32	XEB32	0.00	-22990.66	3.15913	P4	3935.4760	46.7360	-	-	-	-	67.5952	850.0628	Aman
33	XEB33	0.00	-25282.58	3.23858	P4	10064.4960	52.3240	-	-	-	-	61.8947	2173.9311	Aman
34	XEB34	0.00	-35895.85	3.443269	P4	10064.4960	52.3240	-	-	-	-	65.8067	2173.9311	Aman

1. Batang Atas

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λc	ω	φ/Nr (KN)	KL/r < 240	φ/Nr (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XFA1	0.00	-14754.25	3.404717	P3	2045.16	38.3540	-	-	-	-	88.7708	441.75	Aman
2	XFA2	0.00	-15508.70	3.234826	P3	2045.16	38.3540	-	-	-	-	84.3413	441.75	Aman
3	XFA3	0.00	-15349.18	3.162278	P3	2045.16	38.3540	-	-	-	-	82.4498	441.75	Aman
4	XFA4	0.00	-17087.68	3.1127	P3	2045.16	38.3540	-	-	-	-	81.1571	441.75	Aman
5	XFA5	0.00	-18792.96	3.092329	P3	2045.16	38.3540	-	-	-	-	80.6260	441.75	Aman
6	XFA6	0.00	-19780.45	3.073906	P3	2045.16	38.3540	-	-	-	-	80.1456	441.75	Aman
7	XFA7	0.00	-20404.05	3.061388	P3	2045.16	38.3540	-	-	-	-	79.8193	441.75	Aman
8	XFA8	0.00	-21098.30	3.048213	P3	2045.16	38.3540	-	-	-	-	79.4758	441.75	Aman
9	XFA9	0.00	-20941.39	3.041381	P3	2045.16	38.3540	-	-	-	-	79.2976	441.75	Aman
10	XFA10	0.00	-20597.60	3.029257	P3	2045.16	38.3540	-	-	-	-	78.9815	441.75	Aman
11	XFA11	0.00	-19769.40	3.025244	P3	2045.16	38.3540	-	-	-	-	78.8769	441.75	Aman
12	XFA12	0.00	-18665.53	3.018095	P3	2045.16	38.3540	-	-	-	-	78.6905	441.75	Aman
13	XFA13	0.00	-17592.26	3.013984	P3	2045.16	38.3540	-	-	-	-	78.5833	441.75	Aman
14	XFA14	0.00	-17061.17	3.009585	P3	2045.16	38.3540	-	-	-	-	78.4686	441.75	Aman
15	XFA15	0.00	-16780.43	3.005395	P3	2045.16	38.3540	-	-	-	-	78.3594	441.75	Aman
16	XFA16	0.00	-15642.45	3.002815	P3	2045.16	38.3540	-	-	-	-	78.2921	441.75	Aman
17	XFA17	0.00	-15638.24	3.002815	P3	2045.16	38.3540	-	-	-	-	78.2921	441.75	Aman
18	XFA18	0.00	-16774.61	3.005395	P3	2045.16	38.3540	-	-	-	-	78.3594	441.75	Aman
19	XFA19	0.00	-17054.95	3.009585	P3	2045.16	38.3540	-	-	-	-	78.4686	441.75	Aman
20	XFA20	0.00	-17581.36	3.013984	P3	2045.16	38.3540	-	-	-	-	78.5833	441.75	Aman
21	XFA21	0.00	-18641.63	3.018095	P3	2045.16	38.3540	-	-	-	-	78.6905	441.75	Aman
22	XFA22	0.00	-19754.86	3.025244	P3	2045.16	38.3540	-	-	-	-	78.8769	441.75	Aman
23	XFA23	0.00	-20575.23	3.029257	P3	2045.16	38.3540	-	-	-	-	78.9815	441.75	Aman
24	XFA24	0.00	-20915.76	3.041381	P3	2045.16	38.3540	-	-	-	-	79.2976	441.75	Aman
25	XFA25	0.00	-21076.16	3.048213	P3	2045.16	38.3540	-	-	-	-	79.4758	441.75	Aman
26	XFA26	0.00	-20385.41	3.061388	P3	2045.16	38.3540	-	-	-	-	79.8193	441.75	Aman
27	XFA27	0.00	-19754.39	3.073906	P3	2045.16	38.3540	-	-	-	-	80.1456	441.75	Aman
28	XFA28	0.00	-18785.17	3.092329	P3	2045.16	38.3540	-	-	-	-	80.6260	441.75	Aman
29	XFA29	0.00	-17092.46	3.1127	P3	2045.16	38.3540	-	-	-	-	81.1571	441.75	Aman
30	XFA30	0.00	-15362.77	3.162278	P3	2045.16	38.3540	-	-	-	-	82.4498	441.75	Aman
31	XFA31	0.00	-15608.39	3.234826	P3	2045.16	38.3540	-	-	-	-	84.3413	441.75	Aman
32	XFA32	0.00	-14752.37	3.404717	P3	2045.16	38.3540	-	-	-	-	88.7708	441.75	Aman

Tabel Perencanaan batang

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik			Ket
								KL/r<200	λc	ω	φN _h (KN)	KL/r<240	φN _h (KN)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	
1	XFV1	0.00	-25169.66	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman	
2	XFV2	0.00	-6580.31	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman	
3	XFV3	0.00	-778.33	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman	
4	XFV4	0.00	-2863.15	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman	
5	XFV5	4309.94	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
6	XFV6	536.68	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
7	XFV7	5623.87	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
8	XFV8	1978.08	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
9	XFV9	1978.08	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
10	XFV10	0.00	-1292.89	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman	
11	XFV11	7564.76	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
12	XFV12	5332.98	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
13	XFV13	4180.88	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
14	XFV14	10390.39	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
15	XFV15	6063.35	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
16	XFV16	5323.47	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
17	XFV17	10766.40	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
18	XFV18	5318.86	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
19	XFV19	6055.08	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
20	XFV20	10351.35	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
21	XFV21	4195.10	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
22	XFV22	5332.01	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
23	XFV23	7552.59	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
24	XFV24	0.00	-1288.44	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman	
25	XFV25	1990.16	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
26	XFV26	5579.04	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
27	XFV27	0.00	-3714.53	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman	
28	XFV28	500.89	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman	
29	XFV29	4326.36	-	3.00	P4	3935.48	46.7360	64.1903	0.7082	1.2621	636.12	-	-	Aman	
30	XFV30	0.00	-2902.75	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman	
31	XFV31	0.00	-663.01	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman	
32	XFV32	0.00	-6691.82	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman	
33	XFV33	0.00	-24987.13	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman	

1. Batang Vertikal

Tabel Perencanaan batang

1. Batang Vertikal

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								λc	ω	φN _h (KN)	KL/r<200	KL/r<240	φN _h (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XFD1	7361.11	-	3.306373	P4	10064.50	52.3240	63.1904	0.6971	1.2820	1601.47	-	-	Aman
2	XFD2	2574.44	-	3.493437	P4	10064.50	52.3240	66.7655	0.7366	1.2134	1692.07	-	-	Aman
3	XFD3	1898.63	-	3.605551	P4	10064.50	52.3240	68.9082	0.7602	1.1757	1746.38	-	-	Aman
4	XFD4	2210.58	-	3.702553	P4	10064.50	52.3240	70.7620	0.7807	1.1449	1793.36	-	-	Aman
5	XFD5	2419.84	-	3.75	P4	10064.50	52.3240	71.6688	0.7907	1.1304	1816.34	-	-	Aman
6	XFD6	1935.69	-	3.798539	P4	10064.50	52.3240	72.5965	0.8009	1.1159	1839.85	-	-	Aman
7	XFD7	1726.98	-	3.835635	P4	10064.50	52.3240	73.3055	0.8087	1.1051	1857.82	-	-	Aman
8	XFD8	1007.55	-	3.879639	P4	10064.50	52.3240	74.1465	0.8180	1.0926	1879.13	-	-	Aman
9	XFD9	0.00	-556.56	3.905125	P4	10064.50	52.3240	-	-	-	-	74.63	2173.93	Aman
10	XFD10	0.00	-880.34	3.956817	P4	10064.50	52.3240	-	-	-	-	75.62	2173.93	Aman
11	XFD11	0.00	-2800.34	3.976443	P4	10064.50	52.3240	-	-	-	-	76.00	2173.93	Aman
12	XFD12	0.00	-3432.75	2.00804	P4	10064.50	52.3240	-	-	-	-	38.38	2173.93	Aman
13	XFD13	0.00	-3544.86	2.021392	P4	10064.50	52.3240	-	-	-	-	38.63	2173.93	Aman
14	XFD14	0.00	-3048.84	2.038234	P4	10064.50	52.3240	-	-	-	-	38.95	2173.93	Aman
15	XFD15	0.00	-2769.37	2.058665	P4	10064.50	52.3240	-	-	-	-	39.34	2173.93	Aman
16	XFD16	0.00	-4359.05	2.075867	P4	10064.50	52.3240	-	-	-	-	39.67	2173.93	Aman
17	XFD17	0.00	-4346.42	2.075867	P4	10064.50	52.3240	-	-	-	-	39.67	2173.93	Aman
18	XFD18	0.00	-2776.29	2.058665	P4	10064.50	52.3240	-	-	-	-	39.34	2173.93	Aman
19	XFD19	0.00	-3046.31	2.038234	P4	10064.50	52.3240	-	-	-	-	38.95	2173.93	Aman
20	XFD20	0.00	-3500.37	2.021392	P4	10064.50	52.3240	-	-	-	-	38.63	2173.93	Aman
21	XFD21	0.00	-3464.80	2.00804	P4	10064.50	52.3240	-	-	-	-	38.38	2173.93	Aman
22	XFD22	0.00	-2778.76	3.976443	P4	10064.50	52.3240	-	-	-	-	76.00	2173.93	Aman
23	XFD23	0.00	-868.23	3.956817	P4	10064.50	52.3240	-	-	-	-	75.62	2173.93	Aman
24	XFD24	0.00	-570.72	3.905125	P4	10064.50	52.3240	-	-	-	-	74.63	2173.93	Aman
25	XFD25	987.01	-	3.879639	P4	10064.50	52.3240	74.1465	0.8180	1.0926	1879.13	-	-	Aman
26	XFD26	1777.76	-	3.835635	P4	10064.50	52.3240	73.3055	0.8087	1.1051	1857.82	-	-	Aman
27	XFD27	1868.93	-	3.798539	P4	10064.50	52.3240	72.5965	0.8009	1.1159	1839.85	-	-	Aman
28	XFD28	2453.65	-	3.75	P4	10064.50	52.3240	71.6688	0.7907	1.1304	1816.34	-	-	Aman
29	XFD29	2179.45	-	3.702553	P4	3935.48	46.7360	79.2227	0.8740	1.0226	785.09	-	-	Aman
30	XFD30	1922.43	-	3.605551	P4	3935.48	46.7360	77.1472	0.8511	1.0501	764.53	-	-	Aman
31	XFD31	2434.23	-	3.493437	P4	3935.48	46.7360	74.7483	0.8246	1.0838	740.75	-	-	Aman
32	XFD32	7490.48	-	3.306373	P4	3935.48	46.7360	70.7457	0.7805	1.1451	701.09	-	-	Aman

Tabel Perencanaan batang KK_XF

1. Batang Bawah

NO Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket		
							λc	ω	φ/Nh (KN)	KL/r<240	φ/Nh (KN)			
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XFBI	0.00	-28617.19	3.404717	P4	10064.4960	52.3240	-	-	-	-	65.0699	2173.9311	Aman
2	XFBI	0.00	-20128.23	3.234826	P4	10064.4960	52.3240	-	-	-	-	61.8230	2173.9311	Aman
3	XFBI	0.00	-17400.23	3.162278	P4	10064.4960	52.3240	-	-	-	-	60.4365	2173.9311	Aman
4	XFBI	0.00	-11143.90	3.1127	P4	10064.4960	52.3240	-	-	-	-	59.4890	2173.9311	Aman
5	XFBI	0.00	-15219.76	3.092329	P4	10064.4960	52.3240	-	-	-	-	59.0996	2173.9311	Aman
6	XFBI	0.00	-13236.96	3.073906	P4	10064.4960	52.3240	-	-	-	-	58.7475	2173.9311	Aman
7	XFBI	0.00	-5655.71	3.061388	P4	10064.4960	52.3240	-	-	-	-	58.5083	2173.9311	Aman
8	XFBI	0.00	-10685.37	3.048213	P4	10064.4960	52.3240	-	-	-	-	58.2565	2173.9311	Aman
9	XFBI	0.00	-9973.01	3.041381	P4	10064.4960	52.3240	-	-	-	-	58.1259	2173.9311	Aman
10	XFBI	0.00	-4875.92	3.029257	P4	10064.4960	52.3240	-	-	-	-	57.8942	2173.9311	Aman
11	XFBI	0.00	-11353.45	3.025244	P4	10064.4960	52.3240	-	-	-	-	57.8175	2173.9311	Aman
12	XFBI	0.00	-13547.60	3.018095	P4	10064.4960	52.3240	-	-	-	-	57.6809	2173.9311	Aman
13	XFBI	0.00	-12267.23	3.013984	P4	10064.4960	52.3240	-	-	-	-	57.6023	2173.9311	Aman
14	XFBI	0.00	-19481.13	3.009585	P4	10064.4960	52.3240	-	-	-	-	57.5183	2173.9311	Aman
15	XFBI	0.00	-21716.37	3.005395	P4	10064.4960	52.3240	-	-	-	-	57.4382	2173.9311	Aman
16	XFBI	0.00	-23185.71	3.002815	P4	10064.4960	52.3240	-	-	-	-	57.3889	2173.9311	Aman
17	XFBI	0.00	-23189.76	3.002815	P4	10064.4960	52.3240	-	-	-	-	57.3889	2173.9311	Aman
18	XFBI	0.00	-21718.59	3.005395	P4	10064.4960	52.3240	-	-	-	-	57.4382	2173.9311	Aman
19	XFBI	0.00	-19485.55	3.009585	P4	10064.4960	52.3240	-	-	-	-	57.5183	2173.9311	Aman
20	XFBI	0.00	-12300.42	3.013984	P4	10064.4960	52.3240	-	-	-	-	57.6023	2173.9311	Aman
21	XFBI	0.00	-13559.34	3.018095	P4	10064.4960	52.3240	-	-	-	-	57.6809	2173.9311	Aman
22	XFBI	0.00	-11380.74	3.025244	P4	10064.4960	52.3240	-	-	-	-	57.8175	2173.9311	Aman
23	XFBI	0.00	-4907.28	3.029257	P4	10064.4960	52.3240	-	-	-	-	57.8942	2173.9311	Aman
24	XFBI	0.00	-9998.49	3.041381	P4	10064.4960	52.3240	-	-	-	-	58.1259	2173.9311	Aman
25	XFBI	0.00	-10695.30	3.048213	P4	10064.4960	52.3240	-	-	-	-	58.2565	2173.9311	Aman
26	XFBI	0.00	-5702.17	3.061388	P4	10064.4960	52.3240	-	-	-	-	58.5083	2173.9311	Aman
27	XFBI	0.00	-13239.96	3.073906	P4	10064.4960	52.3240	-	-	-	-	58.7475	2173.9311	Aman
28	XFBI	0.00	-15251.25	3.092329	P4	10064.4960	52.3240	-	-	-	-	59.0996	2173.9311	Aman
29	XFBI	0.00	-11158.02	3.1127	P4	3935.4760	46.7360	-	-	-	-	66.6018	850.0628	Aman
30	XFBI	0.00	-17447.81	3.162278	P4	3935.4760	46.7360	-	-	-	-	67.6626	850.0628	Aman
31	XFBI	0.00	-20047.88	3.234826	P4	3935.4760	46.7360	-	-	-	-	69.2149	850.0628	Aman
32	XFBI	0.00	-28667.53	3.404717	P4	3935.4760	46.7360	-	-	-	-	72.8500	850.0628	Aman

Tabel Perencanaan batang KK_XG

I. Batang Atas

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarif Φ/Nh (KN)	Ket		
								KL/r<200	λc	ω				
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XGA1	0.00	-14754.25	3.404717	P3	2045.16	38.3540	-	-	-	-	88.7708	441.75	Aman
2	XGA2	0.00	-15508.70	3.234826	P3	2045.16	38.3540	-	-	-	-	84.3413	441.75	Aman
3	XGA3	0.00	-15349.18	3.162278	P3	2045.16	38.3540	-	-	-	-	82.4498	441.75	Aman
4	XGA4	0.00	-17087.68	3.1127	P3	2045.16	38.3540	-	-	-	-	81.1571	441.75	Aman
5	XGA5	0.00	-18792.96	3.092329	P3	2045.16	38.3540	-	-	-	-	80.6260	441.75	Aman
6	XGA6	0.00	-19780.45	3.073906	P3	2045.16	38.3540	-	-	-	-	80.1456	441.75	Aman
7	XGA7	0.00	-20404.05	3.061388	P3	2045.16	38.3540	-	-	-	-	79.8193	441.75	Aman
8	XGA8	0.00	-21098.30	3.048213	P3	2045.16	38.3540	-	-	-	-	79.4758	441.75	Aman
9	XGA9	0.00	-20941.39	3.041381	P3	2045.16	38.3540	-	-	-	-	79.2976	441.75	Aman
10	XGA10	0.00	-20597.60	3.029257	P3	2045.16	38.3540	-	-	-	-	78.9815	441.75	Aman
11	XGA11	0.00	-19769.40	3.025244	P3	2045.16	38.3540	-	-	-	-	78.8769	441.75	Aman
12	XGA12	0.00	-18665.53	3.018095	P3	2045.16	38.3540	-	-	-	-	78.6905	441.75	Aman
13	XGA13	0.00	-17592.26	3.013984	P3	2045.16	38.3540	-	-	-	-	78.5833	441.75	Aman
14	XGA14	0.00	-17061.17	3.009585	P3	2045.16	38.3540	-	-	-	-	78.4586	441.75	Aman
15	XGA15	0.00	-16780.43	3.005395	P3	2045.16	38.3540	-	-	-	-	78.3594	441.75	Aman
16	XGA16	0.00	-15642.45	3.002815	P3	2045.16	38.3540	-	-	-	-	78.2921	441.75	Aman
17	XGA17	0.00	-15638.24	3.002815	P3	2045.16	38.3540	-	-	-	-	78.2921	441.75	Aman
18	XGA18	0.00	-16774.61	3.005395	P3	2045.16	38.3540	-	-	-	-	78.3594	441.75	Aman
19	XGA19	0.00	-17054.95	3.009585	P3	2045.16	38.3540	-	-	-	-	78.4686	441.75	Aman
20	XGA20	0.00	-17581.36	3.013984	P3	2045.16	38.3540	-	-	-	-	78.5833	441.75	Aman
21	XGA21	0.00	-18641.63	3.018095	P3	2045.16	38.3540	-	-	-	-	78.6905	441.75	Aman
22	XGA22	0.00	-19754.86	3.025244	P3	2045.16	38.3540	-	-	-	-	78.8769	441.75	Aman
23	XGA23	0.00	-20575.23	3.029257	P3	2045.16	38.3540	-	-	-	-	78.9815	441.75	Aman
24	XGA24	0.00	-20915.76	3.041381	P3	2045.16	38.3540	-	-	-	-	79.2976	441.75	Aman
25	XGA25	0.00	-21076.16	3.048213	P3	2045.16	38.3540	-	-	-	-	79.4758	441.75	Aman
26	XGA26	0.00	-20385.41	3.061388	P3	2045.16	38.3540	-	-	-	-	79.8193	441.75	Aman
27	XGA27	0.00	-19754.39	3.073906	P3	2045.16	38.3540	-	-	-	-	80.1456	441.75	Aman
28	XGA28	0.00	-18785.17	3.092329	P3	2045.16	38.3540	-	-	-	-	80.6260	441.75	Aman
29	XGA29	0.00	-17092.46	3.1127	P3	2045.16	38.3540	-	-	-	-	81.1571	441.75	Aman
30	XGA30	0.00	-15362.77	3.162278	P3	2045.16	38.3540	-	-	-	-	82.4498	441.75	Aman
31	XGA31	0.00	-15608.39	3.234826	P3	2045.16	38.3540	-	-	-	-	84.3413	441.75	Aman
32	XGA32	0.00	-14752.37	3.404717	P3	2045.16	38.3540	-	-	-	-	88.7708	441.75	Aman

Tabel Perencanaan batang KK_XG

1. Batang Vertikal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φNn (KN)	KL/r<240	φNn (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XGV1	0.00	-25169.66	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
2	XGV2	0.00	-6580.31	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
3	XGV3	0.00	-778.33	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
4	XGV4	0.00	-2863.15	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
5	XGV5	4309.94	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
6	XGV6	536.68	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
7	XGV7	0.00	-3759.38	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
8	XGV8	5623.87	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
9	XGV9	1978.08	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
10	XGV10	0.00	-1292.89	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
11	XGV11	7564.76	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
12	XGV12	5352.98	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
13	XGV13	4180.88	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
14	XGV14	10390.39	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
15	XGV15	6063.35	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
16	XGV16	5323.47	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
17	XGV17	10766.40	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
18	XGV18	5318.86	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
19	XGV19	6055.08	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
20	XGV20	10351.35	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
21	XGV21	4195.10	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
22	XGV22	5332.01	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
23	XGV23	7552.59	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
24	XGV24	0.00	-1288.44	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
25	XGV25	1990.16	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
26	XGV26	5579.04	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
27	XGV27	0.00	-3714.53	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
28	XGV28	500.89	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
29	XGV29	4326.36	-	3.00	P4	3935.48	46.7360	64.1903	0.7082	1.2621	636.12	-	-	Aman
30	XGV30	0.00	-2902.75	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman
31	XGV31	0.00	-663.01	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman
32	XGV32	0.00	-6691.82	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman
33	XGV33	0.00	-24987.13	3.00	P4	3935.48	46.7360	-	-	-	-	64.19	850.06	Aman

Tabel Perencanaan batang KK_XG

3. Batang diagonal

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								λc	ω	φN _u (KN)	KL/r < 240	KL/r < 240	φN _u (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XGD1	7361.11	-	3.306373	P4	10064.50	52.3240	63.1904	0.6971	1.2820	1601.47	-	-	Aman
2	XGD2	2574.44	-	3.493437	P4	10064.50	52.3240	66.7655	0.7366	1.2134	1692.07	-	-	Aman
3	XGD3	1898.63	-	3.605551	P4	10064.50	52.3240	68.9082	0.7602	1.1757	1746.38	-	-	Aman
4	XGD4	2210.58	-	3.702553	P4	10064.50	52.3240	70.7620	0.7807	1.1449	1793.36	-	-	Aman
5	XGD5	2419.84	-	3.75	P4	10064.50	52.3240	71.6688	0.7907	1.1304	1816.34	-	-	Aman
6	XGD6	1935.69	-	3.798539	P4	10064.50	52.3240	72.5965	0.8009	1.1159	1839.85	-	-	Aman
7	XGD7	1726.98	-	3.835635	P4	10064.50	52.3240	73.3055	0.8087	1.1051	1857.82	-	-	Aman
8	XGD8	1007.55	-	3.879639	P4	10064.50	52.3240	74.1465	0.8180	1.0926	1879.13	-	-	Aman
9	XGD9	0.00	-556.56	3.905125	P4	10064.50	52.3240	-	-	-	-	74.63	2173.93	Aman
10	XGD10	0.00	-880.34	3.956817	P4	10064.50	52.3240	-	-	-	-	75.62	2173.93	Aman
11	XGD11	0.00	-2800.34	3.976443	P4	10064.50	52.3240	-	-	-	-	76.00	2173.93	Aman
12	XGD12	0.00	-3432.75	2.00804	P4	10064.50	52.3240	-	-	-	-	38.38	2173.93	Aman
13	XGD13	0.00	-3544.86	2.021392	P4	10064.50	52.3240	-	-	-	-	38.63	2173.93	Aman
14	XGD14	0.00	-3048.84	2.038234	P4	10064.50	52.3240	-	-	-	-	38.95	2173.93	Aman
15	XGD15	0.00	-2769.37	2.058665	P4	10064.50	52.3240	-	-	-	-	39.34	2173.93	Aman
16	XGD16	0.00	-4359.05	2.075867	P4	10064.50	52.3240	-	-	-	-	39.67	2173.93	Aman
17	XGD17	0.00	-4346.42	2.075867	P4	10064.50	52.3240	-	-	-	-	39.67	2173.93	Aman
18	XGD18	0.00	-2776.29	2.058665	P4	10064.50	52.3240	-	-	-	-	39.34	2173.93	Aman
19	XGD19	0.00	-3046.31	2.038234	P4	10064.50	52.3240	-	-	-	-	38.95	2173.93	Aman
20	XGD20	0.00	-3500.37	2.021392	P4	10064.50	52.3240	-	-	-	-	38.63	2173.93	Aman
21	XGD21	0.00	-3464.80	2.00804	P4	10064.50	52.3240	-	-	-	-	38.38	2173.93	Aman
22	XGD22	0.00	-2778.76	3.976443	P4	10064.50	52.3240	-	-	-	-	76.00	2173.93	Aman
23	XGD23	0.00	-868.23	3.956817	P4	10064.50	52.3240	-	-	-	-	75.62	2173.93	Aman
24	XGD24	0.00	-570.72	3.905125	P4	10064.50	52.3240	-	-	-	-	74.63	2173.93	Aman
25	XGD25	987.01	-	3.879639	P4	10064.50	52.3240	74.1465	0.8180	1.0926	1879.13	-	-	Aman
26	XGD26	1777.76	-	3.835635	P4	10064.50	52.3240	73.3055	0.8087	1.1051	1857.82	-	-	Aman
27	XGD27	1868.93	-	3.798539	P4	10064.50	52.3240	72.5965	0.8009	1.1159	1839.85	-	-	Aman
28	XGD28	2453.65	-	3.75	P4	10064.50	52.3240	71.6688	0.7907	1.1304	1816.34	-	-	Aman
29	XGD29	2179.45	-	3.702553	P4	3935.48	46.7360	79.2227	0.8740	1.0226	785.09	-	-	Aman
30	XGD30	1922.43	-	3.605551	P4	3935.48	46.7360	77.1472	0.8511	1.0501	764.53	-	-	Aman
31	XGD31	2434.23	-	3.493437	P4	3935.48	46.7360	74.7483	0.8246	1.0838	740.75	-	-	Aman
32	XGD32	7490.48	-	3.306373	P4	3935.48	46.7360	70.7457	0.7805	1.1451	701.09	-	-	Aman

Tabel Perencanaan batang KK_XG

1. Batang Bawah

NO Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket	
							KL/r<200	λc	ω	φN _t (KN)	KL/r<240	φN _t (KN)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XGB1	0.00	-28617.19	3.404717	P4	10064.4960	52.3240	-	-	-	-	65.0699	2173.9311	Aman
2	XGB2	0.00	-20128.23	3.234826	P4	10064.4960	52.3240	-	-	-	-	61.8230	2173.9311	Aman
3	XGB3	0.00	-17400.23	3.162278	P4	10064.4960	52.3240	-	-	-	-	60.4365	2173.9311	Aman
4	XGB4	0.00	-11143.90	3.11127	P4	10064.4960	52.3240	-	-	-	-	59.4890	2173.9311	Aman
5	XGB5	0.00	-15219.76	3.092329	P4	10064.4960	52.3240	-	-	-	-	59.0996	2173.9311	Aman
6	XGB6	0.00	-13236.96	3.073906	P4	10064.4960	52.3240	-	-	-	-	58.7475	2173.9311	Aman
7	XGB7	0.00	-5655.71	3.061388	P4	10064.4960	52.3240	-	-	-	-	58.5083	2173.9311	Aman
8	XGB8	0.00	-10685.37	3.048213	P4	10064.4960	52.3240	-	-	-	-	58.2565	2173.9311	Aman
9	XGB9	0.00	-9973.01	3.041381	P4	10064.4960	52.3240	-	-	-	-	58.1259	2173.9311	Aman
10	XGB10	0.00	-4875.92	3.029257	P4	10064.4960	52.3240	-	-	-	-	57.8942	2173.9311	Aman
11	XGB11	0.00	-11353.45	3.025244	P4	10064.4960	52.3240	-	-	-	-	57.8175	2173.9311	Aman
12	XGB12	0.00	-13547.60	3.018095	P4	10064.4960	52.3240	-	-	-	-	57.6809	2173.9311	Aman
13	XGB13	0.00	-12267.23	3.013984	P4	10064.4960	52.3240	-	-	-	-	57.6023	2173.9311	Aman
14	XGB14	0.00	-19481.13	3.009585	P4	10064.4960	52.3240	-	-	-	-	57.5183	2173.9311	Aman
15	XGB15	0.00	-21716.37	3.005395	P4	10064.4960	52.3240	-	-	-	-	57.4382	2173.9311	Aman
16	XGB16	0.00	-23185.71	3.002815	P4	10064.4960	52.3240	-	-	-	-	57.3889	2173.9311	Aman
17	XGB17	0.00	-25189.76	3.002815	P4	10064.4960	52.3240	-	-	-	-	57.3889	2173.9311	Aman
18	XGB18	0.00	-21718.59	3.005395	P4	10064.4960	52.3240	-	-	-	-	57.4382	2173.9311	Aman
19	XGB19	0.00	-19485.55	3.009585	P4	10064.4960	52.3240	-	-	-	-	57.5183	2173.9311	Aman
20	XGB20	0.00	-12300.42	3.013984	P4	10064.4960	52.3240	-	-	-	-	57.6023	2173.9311	Aman
21	XGB21	0.00	-13559.34	3.018095	P4	10064.4960	52.3240	-	-	-	-	57.6809	2173.9311	Aman
22	XG322	0.00	-11380.74	3.025244	P4	10064.4960	52.3240	-	-	-	-	57.8175	2173.9311	Aman
23	XGB23	0.00	-4907.28	3.029257	P4	10064.4960	52.3240	-	-	-	-	57.8942	2173.9311	Aman
24	XGB24	0.00	-9998.49	3.041381	P4	10064.4960	52.3240	-	-	-	-	58.1259	2173.9311	Aman
25	XGB25	0.00	-10695.30	3.048213	P4	10064.4960	52.3240	-	-	-	-	58.2565	2173.9311	Aman
26	XGB26	0.00	-5702.17	3.061388	P4	10064.4960	52.3240	-	-	-	-	58.5083	2173.9311	Aman
27	XGB27	0.00	-13239.96	3.073906	P4	10064.4960	52.3240	-	-	-	-	58.7475	2173.9311	Aman
28	XGB28	0.00	-15251.25	3.092329	P4	10064.4960	52.3240	-	-	-	-	59.0996	2173.9311	Aman
29	XGB29	0.00	-11158.02	3.1127	P4	10064.4960	52.3240	-	-	-	-	66.6018	850.0628	Aman
30	XGB30	0.00	-17447.81	3.162278	P4	3935.4760	46.7360	-	-	-	-	67.6626	850.0628	Aman
31	XGB31	0.00	-20047.88	3.234826	P4	3935.4760	46.7360	-	-	-	-	69.2149	850.0628	Aman
32	XGB32	0.00	-28667.53	3.404717	P4	3935.4760	46.7360	-	-	-	-	72.8500	850.0628	Aman

Tabel Perencanaan batang KK_XH

1. Batang Atas

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								λc	ω	φN _n (KN)	KL/r < 240	φN _n (KN)	KL/r < 240	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XHA1	0.0000	-11441.8400	3.306373	P3	13741.9080	70.1040	-	-	-	-	47.1638	2968.2521	Aman
2	XHA2	0.0000	-12423.8600	3.175153	P3	13741.9080	70.1040	-	-	-	-	45.2920	2968.2521	Aman
3	XHA3	0.0000	-12668.6000	3.132092	P3	13741.9080	70.1040	-	-	-	-	44.6778	2968.2521	Aman
4	XHA4	0.0000	-13042.9400	3.099742	P3	13741.9080	70.1040	-	-	-	-	44.2163	2968.2521	Aman
5	XHA5	0.0000	-13163.2600	3.076102	P3	13741.9080	70.1040	-	-	-	-	43.8791	2968.2521	Aman
6	XHA6	0.0000	-12809.5600	3.057466	P3	13741.9080	70.1040	-	-	-	-	43.6133	2968.2521	Aman
7	XHA7	0.0000	-11465.2500	3.046457	P3	13741.9080	70.1040	-	-	-	-	43.4563	2968.2521	Aman
8	XHA8	0.0000	-10108.7400	3.033562	P3	8258.0480	73.1520	-	-	-	-	41.4693	1783.7384	Aman
9	XHA9	0.0000	-8105.8880	3.026549	P3	8258.0480	73.1520	-	-	-	-	41.3734	1783.7384	Aman
10	XHA10	0.0000	-5972.9790	3.017018	P3	8258.0480	73.1520	-	-	-	-	41.2431	1783.7384	Aman
11	XHA11	0.0000	-4780.8790	3.013984	P3	8258.0480	73.1520	-	-	-	-	41.2017	1783.7384	Aman
12	XHA12	0.0000	-5163.8020	3.008056	P3	8258.0480	73.1520	-	-	-	-	41.1206	1783.7384	Aman
13	XHA13	0.0000	-5931.7940	3.003748	P3	5419.3440	74.6760	-	-	-	-	40.2237	1170.5783	Aman
14	XHA14	0.0000	-5972.5360	3.001666	P3	5419.3440	74.6760	-	-	-	-	40.1959	1170.5783	Aman
15	XHA15	0.0000	-5969.6210	3.001666	P3	5419.3440	74.6760	-	-	-	-	40.1959	1170.5783	Aman
16	XHA16	0.0000	-5929.1040	3.003748	P3	5419.3440	74.6760	-	-	-	-	40.2237	1170.5783	Aman
17	XHA17	0.0000	-5160.0860	3.008056	P3	5419.3440	74.6760	-	-	-	-	40.2814	1170.5783	Aman
18	XHA18	0.0000	-4772.9680	3.013984	P3	5419.3440	74.6760	-	-	-	-	40.3608	1170.5783	Aman
19	XHA19	0.0000	-5952.2550	3.017018	P3	5419.3440	74.6760	-	-	-	-	40.4014	1170.5783	Aman
20	XHA20	0.0000	-8096.5770	3.026549	P3	5419.3440	74.6760	-	-	-	-	40.5291	1170.5783	Aman
21	XHA21	0.0000	-10091.9400	3.033562	P3	5419.3440	74.6760	-	-	-	-	40.6230	1170.5783	Aman
22	XHA22	0.0000	-11444.9600	3.046457	P3	5419.3440	74.6760	-	-	-	-	40.7957	1170.5783	Aman
23	XHA23	0.0000	-12795.0600	3.057466	P3	5419.3440	74.6760	-	-	-	-	40.9431	1170.5783	Aman
24	XHA24	0.0000	-13147.7000	3.076102	P3	5419.3440	74.6760	-	-	-	-	41.1926	1170.5783	Aman
25	XHA25	0.0000	-13031.5900	3.099742	P3	5419.3440	74.6760	-	-	-	-	41.5092	1170.5783	Aman
26	XHA26	0.0000	-12659.4100	3.132092	P3	5419.3440	74.6760	-	-	-	-	41.9424	1170.5783	Aman
27	XHA27	0.0000	-12438.0300	3.175153	P3	5419.3440	74.6760	-	-	-	-	42.5191	1170.5783	Aman
28	XHA28	0.0000	-11420.7800	3.306373	P3	5419.3440	74.6760	-	-	-	-	44.2762	1170.5783	Aman

1. Batang Vertikal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λ _c	ω	ΦN _h (KN)	KL/r<240	ΦN _h (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XHV1	-9679.786	-	3.00	P4	13741.91	70.1040	42.7936	0.4721	1.8931	1480.8142	-	-	Aman
2	XHV2	-3412.72	-	3.00	P5	13741.91	70.1040	42.7936	0.4721	1.8931	1480.8142	-	-	Aman
3	XHV3	1649.189	-	3.00	P6	13741.91	70.1040	42.7936	0.4721	1.8931	1480.8142	-	-	Aman
4	XHV4	1566.412	-	3.00	P7	13741.91	70.1040	42.7936	0.4721	1.8931	1480.8142	-	-	Aman
5	XHV5	-1338.725	-	3.00	P8	13741.91	70.1040	42.7936	0.4721	1.8931	1480.8142	-	-	Aman
6	XHV6	6516.306	-	3.00	P9	13741.91	70.1040	42.7936	0.4721	1.8931	1480.8142	-	-	Aman
7	XHV7	4537.615	-	3.00	P10	13741.91	70.1040	42.7936	0.4721	1.8931	1480.8142	-	-	Aman
8	XHV8	2143.098	-	3.00	P11	8258.05	73.1520	41.0105	0.4524	1.9754	852.8007	-	-	Aman
9	XHV9	10406.96	-	3.00	P12	8258.05	73.1520	41.0105	0.4524	1.9754	852.8007	-	-	Aman
10	XHV10	9926.063	-	3.00	P13	8258.05	73.1520	41.0105	0.4524	1.9754	852.8007	-	-	Aman
11	XHV11	9919.01	-	3.00	P14	8258.05	73.1520	41.0105	0.4524	1.9754	852.8007	-	-	Aman
12	XHV12	13964.66	-	3.00	P15	8258.05	73.1520	41.0105	0.4524	1.9754	852.8007	-	-	Aman
13	XHV13	7794.132	-	3.00	P16	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
14	XHV14	5711.14	-	3.00	P17	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
15	XHV15	10731.13	-	3.00	P18	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
16	XHV16	5706.234	-	3.00	P19	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
17	XHV17	7787.401	-	3.00	P20	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
18	XHV18	13935.12	-	3.00	P21	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
19	XHV19	9925.17	-	3.00	P22	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
20	XHV20	9908.255	-	3.00	P23	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
21	XHV21	10398.77	-	3.00	P24	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
22	XHV22	2155.393	-	3.00	P25	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
23	XHV23	4548.197	-	3.00	P26	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
24	XHV24	6495.719	-	3.00	P27	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
25	XHV25	-1298.448	-	3.00	P28	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
26	XHV26	1540.74	-	3.00	P29	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
27	XHV27	1701.209	-	3.00	P30	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
28	XHV28	-3460.388	-	3.00	P31	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman
29	XHV29	-9621.554	-	3.00	P32	5419.34	74.6760	40.1735	0.4432	2.0166	548.2290	-	-	Aman

Tabel Perencanaan batang KK_XH

3. Batang Diagonal

NO	Batang	N _U Tarik (KN)	N _T Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λc	ω	φN _t (KN)	KL/r < 240		φN _t (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XHD1	2230.89	-	3.40	P4	10064.50	52.3240	65.0699	0.7179	1.2450	1649.10	-	-	Aman
2	XHD2	4727.89	-	3.58	P4	10064.50	52.3240	68.4871	0.7556	1.1829	1735.70	-	-	Aman
3	XHD3	1907.45	-	3.66	P4	10064.50	52.3240	69.9864	0.7721	1.1576	1773.70	-	-	Aman
4	XHD4	468.96	-	3.73	P4	10064.50	52.3240	71.3263	0.7869	1.1358	1807.66	-	-	Aman
5	XHD5	643.62	-	3.79	P4	10064.50	52.3240	72.4794	0.7996	1.1177	1836.88	-	-	Aman
6	XHD6	0.00	-1384.51	3.85	P4	10064.50	52.3240	-	-	-	-	73.54	2173.93	Aman
7	XHD7	0.00	-2989.62	3.89	P4	10064.50	52.3240	-	-	-	-	74.27	2173.93	Aman
8	XHD8	0.00	-3646.57	3.94	P4	10064.50	52.3240	-	-	-	-	75.25	2173.93	Aman
9	XHD9	0.00	-6097.79	3.97	P4	10064.50	52.3240	-	-	-	-	75.87	2173.93	Aman
10	XHD10	0.00	-6261.63	2.01	P4	10064.50	52.3240	-	-	-	-	38.44	2173.93	Aman
11	XHD11	0.00	-3870.11	2.02	P4	10064.50	52.3240	-	-	-	-	38.63	2173.93	Aman
12	XHD12	0.00	-1059.28	2.05	P4	10064.50	52.3240	-	-	-	-	39.08	2173.93	Aman
13	XHD13	0.00	-69.04	2.07	P4	10064.50	52.3240	-	-	-	-	39.54	2173.93	Aman
14	XHD14	0.00	-1159.41	2.09	P4	10064.50	52.3240	-	-	-	-	39.87	2173.93	Aman
15	XHD15	0.00	-1151.99	2.09	P4	10064.50	52.3240	-	-	-	-	39.87	2173.93	Aman
16	XHD16	0.00	-71.02	2.07	P4	10064.50	52.3240	-	-	-	-	39.54	2173.93	Aman
17	XHD17	0.00	-1058.29	2.05	P4	10064.50	52.3240	-	-	-	-	39.08	2173.93	Aman
18	XHD18	0.00	-3831.77	2.02	P4	10064.50	52.3240	-	-	-	-	38.63	2173.93	Aman
19	XHD19	0.00	-6288.33	2.01	P4	10064.50	52.3240	-	-	-	-	38.44	2173.93	Aman
20	XHD20	0.00	-6078.58	3.97	P4	10064.50	52.3240	-	-	-	-	75.87	2173.93	Aman
21	XHD21	0.00	-3635.53	3.94	P4	10064.50	52.3240	-	-	-	-	75.25	2173.93	Aman
22	XHD22	0.00	-3011.77	3.89	P4	10064.50	52.3240	-	-	-	-	74.27	2173.93	Aman
23	XHD23	0.00	-1396.27	3.85	P4	10064.50	52.3240	-	-	-	-	73.54	2173.93	Aman
24	XHD24	662.39	-	3.79	P4	10064.50	52.3240	72.4794	0.7996	1.1177	1836.88	-	-	Aman
25	XHD25	420.87	-	3.73	P4	10064.50	52.3240	71.3263	0.7869	1.1358	1807.66	-	-	Aman
26	XHD26	1932.03	-	3.66	P4	10064.50	52.3240	69.9864	0.7721	1.1576	1773.70	-	-	Aman
27	XHD27	4674.21	-	3.58	P4	10064.50	52.3240	68.4871	0.7556	1.1829	1735.70	-	-	Aman
28	XHD28	2297.87	-	3.40	P4	10064.50	52.3240	65.0699	0.7179	1.2450	1649.10	-	-	Aman

Tabel Perencanaan batang KK_XH

4. Batang Bawah

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λ _c	ω	φN _n (KN)	KL/r<240	φN _n (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XHB1	0.00	-14443.03	3.31	P4	10064.50	52.3240	-	-	-	-	63.19	2173.93	Aman
2	XHB2	0.00	-3552.44	3.18	P4	10064.50	52.3240	-	-	-	-	60.68	2173.93	Aman
3	XHB3	0.00	-9951.19	3.13	P4	10064.50	52.3240	-	-	-	-	59.86	2173.93	Aman
4	XHB4	0.00	-8299.35	3.10	P4	10064.50	52.3240	-	-	-	-	59.24	2173.93	Aman
5	XHB5	0.00	-1267.36	3.08	P4	10064.50	52.3240	-	-	-	-	58.79	2173.93	Aman
6	XHB6	0.00	-7054.48	3.06	P4	10064.50	52.3240	-	-	-	-	58.43	2173.93	Aman
7	XHB7	0.00	-8237.89	3.05	P4	10064.50	52.3240	-	-	-	-	58.22	2173.93	Aman
8	XHB8	0.00	-4986.99	3.03	P4	10064.50	52.3240	-	-	-	-	57.98	2173.93	Aman
9	XHB9	0.00	-13372.62	3.03	P4	10064.50	52.3240	-	-	-	-	57.84	2173.93	Aman
10	XHB10	0.00	-18063.30	3.02	P4	10064.50	52.3240	-	-	-	-	57.66	2173.93	Aman
11	XHB11	0.00	-17359.29	3.01	P4	10064.50	52.3240	-	-	-	-	57.60	2173.93	Aman
12	XHB12	0.00	-23153.02	3.01	P4	10064.50	52.3240	-	-	-	-	57.49	2173.93	Aman
13	XHB13	0.00	-23914.89	3.00	P4	10064.50	52.3240	-	-	-	-	57.41	2173.93	Aman
14	XHB14	0.00	-21882.96	3.00	P4	10064.50	52.3240	-	-	-	-	57.37	2173.93	Aman
15	XHB15	0.00	-21875.25	3.00	P4	10064.50	52.3240	-	-	-	-	57.41	2173.93	Aman
16	XHB16	0.00	-23912.98	3.00	P4	10064.50	52.3240	-	-	-	-	57.41	2173.93	Aman
17	XHB17	0.00	-23151.56	3.01	P4	10064.50	52.3240	-	-	-	-	57.49	2173.93	Aman
18	XHB18	0.00	-17384.91	3.01	P4	10064.50	52.3240	-	-	-	-	57.60	2173.93	Aman
19	XHB19	0.00	-18074.94	3.02	P4	10064.50	52.3240	-	-	-	-	57.66	2173.93	Aman
20	XHB20	0.00	-13397.14	3.03	P4	10064.50	52.3240	-	-	-	-	57.84	2173.93	Aman
21	XHB21	0.00	-5013.80	3.03	P4	10064.50	52.3240	-	-	-	-	57.98	2173.93	Aman
22	XHB22	0.00	-8253.73	3.05	P4	10064.50	52.3240	-	-	-	-	58.22	2173.93	Aman
23	XHB23	0.00	-7061.47	3.06	P4	10064.50	52.3240	-	-	-	-	58.43	2173.93	Aman
24	XHB24	0.00	-1292.64	3.08	P4	10064.50	52.3240	-	-	-	-	58.79	2173.93	Aman
25	XHB25	0.00	-8286.98	3.10	P4	10064.50	52.3240	-	-	-	-	59.24	2173.93	Aman
26	XHB26	0.00	-9960.89	3.13	P4	10064.50	52.3240	-	-	-	-	59.86	2173.93	Aman
27	XHB27	0.00	-3518.27	3.18	P4	10064.50	52.3240	-	-	-	-	60.68	2173.93	Aman
28	XHB28	0.00	-14459.42	3.31	P4	10064.50	52.3240	-	-	-	-	63.19	2173.93	Aman

Tabel Perencanaan batang KK_XI

1. Batang Atas

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		
								KL/r<200	λ _c	ω	φN _n (KN)	KL/r<240	φN _n (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
1	XIA1	-8636.815	-	3.224	P3	10064.50	52.3240	61.6108	0.6797	1.3149	1561.44	-	-
2	XIA2	-7961.946	-	3.162	P3	10064.50	52.3240	60.4365	0.6667	1.3405	1531.67	-	-
3	XIA3	-8698.204	-	3.118	P3	10064.50	52.3240	59.5920	0.6574	1.3595	1510.27	-	-
4	XIA4	-8777.565	-	3.085	P3	10064.50	52.3240	58.9632	0.6505	1.3740	1494.34	-	-
5	XIA5	-8122.921	-	3.065	P3	10064.50	52.3240	58.5857	0.6463	1.3828	1484.77	-	-
6	XIA6	-6157.173	-	3.050	P3	10064.50	52.3240	58.2907	0.6431	1.3898	1477.29	-	-
7	XIA7	-4168.941	-	3.037	P3	10064.50	52.3240	58.0344	0.6402	1.3959	1470.80	-	-
8	XIA8	-1839.719	-	3.028	P3	10064.50	52.3240	57.8680	0.6384	1.4000	1466.58	-	-
9	XIA9	551.7104	-	3.018	P3	10064.50	52.3240	57.6809	0.6363	1.4045	1461.84	-	-
10	XIA10	1522.023	-	3.013	P3	10064.50	52.3240	57.5842	0.6353	1.4069	1459.39	-	-
11	XIA11	-179.3729	-	3.007	P3	10064.50	52.3240	57.4754	0.6541	1.4095	1456.63	-	-
12	XIA12	-2057.175	-	3.004	P3	10064.50	52.3240	57.4067	0.6333	1.4112	1454.89	-	-
13	XIA13	-2777.734	-	3.001	P3	10064.50	52.3240	57.3554	0.6328	1.4125	1453.59	-	-
14	XIA14	-2776.566	-	3.001	P3	10064.50	52.3240	57.3554	0.6328	1.4125	1453.59	-	-
15	XIA15	-2057.205	-	3.004	P3	10064.50	52.3240	57.4067	0.6333	1.4112	1454.89	-	-
16	XIA16	-177.7867	-	3.007	P3	10064.50	52.3240	57.4754	0.6341	1.4095	1456.63	-	-
17	XIA17	1533.711	-	3.013	P3	10064.50	52.3240	57.5842	0.6353	1.4069	1459.39	-	-
18	XIA18	565.9484	-	3.018	P3	10064.50	52.3240	57.6809	0.6363	1.4045	1461.84	-	-
19	XIA19	-1829.162	-	3.028	P3	10064.50	52.3240	57.8680	0.6384	1.4000	1466.58	-	-
20	XIA20	-4155.704	-	3.037	P3	10064.50	52.3240	58.0344	0.6402	1.3959	1470.80	-	-
21	XIA21	-6137.784	-	3.050	P3	10064.50	52.3240	58.2907	0.6431	1.3898	1477.29	-	-
22	XIA22	-8110.295	-	3.065	P3	10064.50	52.3240	58.5857	0.6463	1.3828	1484.77	-	-
23	XIA23	-8763.468	-	3.085	P3	10064.50	52.3240	58.9632	0.6505	1.3740	1494.34	-	-
24	XIA24	-8688.964	-	3.118	P3	10064.50	52.3240	59.5920	0.6574	1.3595	1510.27	-	-
25	XIA25	-7964.796	-	3.162	P3	10064.50	52.3240	60.4365	0.6667	1.3405	1531.67	-	-
26	XIA26	-8607.334	-	3.224	P3	10064.50	52.3240	61.6108	0.6797	1.3149	1561.44	-	-

Tabel Perencanaan batang KK_XI

2. Batang Vertikal

NO	Batang	N _{uT} (KN)		N _{uT} Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
		[3]	[4]						KL/r < 200	λc	ω	φN _t (KN)	KL/r < 240	φN _t (KN)	
[1]	[2]	[3]	[4]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XIV1	0.00	-1024.53	-	3.000	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
2	XIV2	2537.62	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
3	XIV3	2997.90	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
4	XIV4	187.04	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
5	XIV5	6459.13	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
6	XIV6	5409.53	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
7	XIV7	4017.97	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
8	XIV8	11061.69	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
9	XIV9	11679.45	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
10	XIV10	13021.15	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
11	XIV11	15944.19	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
12	XIV12	8163.61	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
13	XIV13	5095.98	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
14	XIV14	10193.66	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
15	XIV15	5090.13	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
16	XIV16	8142.24	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
17	XIV17	15928.28	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
18	XIV18	13015.12	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
19	XIV19	11664.79	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
20	XIV20	11058.07	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
21	XIV21	4039.17	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
22	XIV22	5414.81	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
23	XIV23	6456.09	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
24	XIV24	221.00	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
25	XIV25	2982.33	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
26	XIV26	2549.29	-	-	3.000	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
27	XIV27	0.00	-981.06	-	3.000	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman

Tabel Perencanaan batang KK_XI

3. Batang Diagonal

NO	Batang	N _{UTarik} (KN)	N _{UTekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φNn (KN)	KL/r<240	φNn (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XID1	4941.264	-	3.354	P4	10064.50	52.3240	64.1026	0.7072	1.2638	1624.59	-	-	Aman
2	XID2	0.00	-15710.17	3.514	P4	10064.50	52.3240	-	-	-	-	67.16	2173.93	Aman
3	XID3	0.00	-7490.99	3.645	P4	10064.50	52.3240	-	-	-	-	69.66	2173.93	Aman
4	XID4	0.00	-12500.79	3.714	P4	10064.50	52.3240	-	-	-	-	70.99	2173.93	Aman
5	XID5	0.00	-10799.80	3.762	P4	10064.50	52.3240	-	-	-	-	71.90	2173.93	Aman
6	XID6	0.00	-3428.93	3.823	P4	10064.50	52.3240	-	-	-	-	73.07	2173.93	Aman
7	XID7	0.00	-9226.87	3.861	P4	10064.50	52.3240	-	-	-	-	73.78	2173.93	Aman
8	XID8	0.00	-9452.80	3.899	P4	10064.50	52.3240	-	-	-	-	74.51	2173.93	Aman
9	XID9	0.00	-5153.22	3.950	P4	10064.50	52.3240	-	-	-	-	75.50	2173.93	Aman
10	XID10	0.00	-12440.96	3.970	P4	10064.50	52.3240	-	-	-	-	75.87	2173.93	Aman
11	XID11	0.00	-15896.86	4.023	P4	10064.50	52.3240	-	-	-	-	76.88	2173.93	Aman
12	XID12	0.00	-14632.69	4.049	P4	10064.50	52.3240	-	-	-	-	77.39	2173.93	Aman
13	XID13	0.00	-22458.64	4.083	P4	10064.50	52.3240	-	-	-	-	78.04	2173.93	Aman
14	XID14	0.00	-23987.30	4.124	P4	10064.50	52.3240	-	-	-	-	78.82	2173.93	Aman
15	XID15	0.00	-23566.13	4.159	P4	10064.50	52.3240	-	-	-	-	79.48	2173.93	Aman
16	XID16	0.00	-23562.24	4.159	P4	10064.50	52.3240	-	-	-	-	79.48	2173.93	Aman
17	XID17	0.00	-23986.63	4.124	P4	10064.50	52.3240	-	-	-	-	78.82	2173.93	Aman
18	XID18	0.00	-22461.83	4.083	P4	10064.50	52.3240	-	-	-	-	78.04	2173.93	Aman
19	XID19	0.00	-14662.96	4.049	P4	10064.50	52.3240	-	-	-	-	77.39	2173.93	Aman
20	XID20	0.00	-15906.40	4.023	P4	10064.50	52.3240	-	-	-	-	76.88	2173.93	Aman
21	XID21	0.00	-12468.40	3.970	P4	10064.50	52.3240	-	-	-	-	75.87	2173.93	Aman
22	XID22	0.00	-5185.23	3.950	P4	10064.50	52.3240	-	-	-	-	75.50	2173.93	Aman
23	XID23	0.00	-9467.63	3.899	P4	10064.50	52.3240	-	-	-	-	74.51	2173.93	Aman
24	XID24	0.00	-9246.36	3.861	P4	10064.50	52.3240	-	-	-	-	73.78	2173.93	Aman
25	XID25	0.00	-3451.06	3.823	P4	10064.50	52.3240	-	-	-	-	73.07	2173.93	Aman
26	XID26	0.00	-10814.26	3.762	P4	10064.50	52.3240	-	-	-	-	71.90	2173.93	Aman

Tabel Perencanaan batang KK_XI

4. Batang Bawah

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φNn (KN)	KL/r<240	φNn (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XIB1	0.00	-4807.19	3.224	P4	10064.50	52.3240	-	-	-	-	61.61	2173.93	Aman
2	XIB2	0.00	-2802.49	3.162	P4	10064.50	52.3240	-	-	-	-	60.44	2173.93	Aman
3	XIB3	0.00	-2954.62	3.118	P4	10064.50	52.3240	-	-	-	-	59.59	2173.93	Aman
4	XIB4	2642.71	-	3.085	P4	10064.50	52.3240	58.9632	0.6505	1.3740	1494.34	-	-	Aman
5	XIB5	0.00	-4166.28	3.065	P4	10064.50	52.3240	-	-	-	-	58.59	2173.93	Aman
6	XIB6	0.00	-6227.27	3.050	P4	10064.50	52.3240	-	-	-	-	58.29	2173.93	Aman
7	XIB7	0.00	-4028.41	3.037	P4	10064.50	52.3240	-	-	-	-	58.03	2173.93	Aman
8	XIB8	0.00	-12586.81	3.028	P4	10064.50	52.3240	-	-	-	-	57.87	2173.93	Aman
9	XIB9	0.00	-17762.72	3.018	P4	10064.50	52.3240	-	-	-	-	57.68	2173.93	Aman
10	XIB10	0.00	-19787.25	3.013	P4	10064.50	52.3240	-	-	-	-	57.58	2173.93	Aman
11	XIB11	0.00	-25503.12	3.007	P4	10064.50	52.3240	-	-	-	-	57.48	2173.93	Aman
12	XIB12	0.00	-24286.92	3.004	P4	10064.50	52.3240	-	-	-	-	57.41	2173.93	Aman
13	XIB13	0.00	-19959.64	3.001	P4	10064.50	52.3240	-	-	-	-	57.36	2173.93	Aman
14	XIB14	0.00	-19944.85	3.001	P4	10064.50	52.3240	-	-	-	-	57.36	2173.93	Aman
15	XIB15	0.00	-24277.13	3.004	P4	10064.50	52.3240	-	-	-	-	57.41	2173.93	Aman
16	XIB16	0.00	-25504.16	3.007	P4	10064.50	52.3240	-	-	-	-	57.48	2173.93	Aman
17	XIB17	0.00	-19806.46	3.013	P4	10064.50	52.3240	-	-	-	-	57.58	2173.93	Aman
18	XIB18	0.00	-17772.62	3.018	P4	10064.50	52.3240	-	-	-	-	57.68	2173.93	Aman
19	XIB19	0.00	-12607.91	3.028	P4	10064.50	52.3240	-	-	-	-	57.87	2173.93	Aman
20	XIB20	0.00	-4051.06	3.037	P4	10064.50	52.3240	-	-	-	-	58.03	2173.93	Aman
21	XIB21	0.00	-6237.20	3.050	P4	10064.50	52.3240	-	-	-	-	58.29	2173.93	Aman
22	XIB22	0.00	-4173.51	3.065	P4	10064.50	52.3240	-	-	-	-	58.59	2173.93	Aman
23	XIB23	2627.34	-	3.085	P4	10064.50	52.3240	58.9632	0.6505	1.3740	1494.34	-	-	Aman
24	XIB24	0.00	-2934.37	3.118	P4	10064.50	52.3240	-	-	-	-	59.59	2173.93	Aman
25	XIB25	0.00	-2813.73	3.162	P4	10064.50	52.3240	-	-	-	-	60.44	2173.93	Aman
26	XIB26	0.00	-4819.56	3.224	P4	10064.50	52.3240	-	-	-	-	61.61	2173.93	Aman

Tabel Perencanaan batang KK_Xj

1. Batang Atas

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/i<200	λc	ω	φN _t (KN)	KL/r<240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XJA1	0.00	-4644.78	3.20	P3	10064.50	52.3240	-	-	-	-	61.07	2173.93	Aman
2	XJA2	0.00	-4957.46	3.14	P3	10064.50	52.3240	-	-	-	-	59.97	2173.93	Aman
3	XJA3	0.00	-4968.89	3.10	P3	10064.50	52.3240	-	-	-	-	59.19	2173.93	Aman
4	XJA4	0.00	-3949.37	3.07	P3	10064.50	52.3240	-	-	-	-	58.71	2173.93	Aman
5	XJA5	0.00	-1353.16	3.06	P3	10064.50	52.3240	-	-	-	-	58.40	2173.93	Aman
6	XJA6	1135.43	-	3.04	P3	10064.50	52.3240	58.0344	0.6402	1.3959	1470.80	-	-	Aman
7	XJA7	4465.54	-	3.03	P3	10064.50	52.3240	57.9485	0.6393	1.3980	1468.62	-	-	Aman
8	XJA8	7231.55	-	3.02	P3	10064.50	52.3240	57.6809	0.6363	1.4045	1461.84	-	-	Aman
9	XJA9	7086.14	-	3.01	P3	10064.50	52.3240	57.5842	0.6353	1.4069	1459.39	-	-	Aman
10	XJA10	3946.22	-	3.01	P3	10064.50	52.3240	57.4754	0.6341	1.4095	1456.63	-	-	Aman
11	XJA11	256.08	-	3.00	P3	10064.50	52.3240	57.3889	0.6331	1.4117	1454.44	-	-	Aman
12	XJA12	0.00	-1349.82	3.00	P3	10064.50	52.3240	-	-	-	-	57.36	2173.93	Aman
13	XJA13	0.00	-1349.59	3.00	P3	10064.50	52.3240	-	-	-	-	57.36	2173.93	Aman
14	XJA14	253.52	-	3.00	P3	10064.50	52.3240	57.3889	0.6331	1.4117	1454.44	-	-	Aman
15	XJA15	3952.01	-	3.01	P3	10064.50	52.3240	57.4754	0.6341	1.4095	1456.63	-	-	Aman
16	XJA16	7095.42	-	3.01	P3	10064.50	52.3240	57.5842	0.6353	1.4069	1459.39	-	-	Aman
17	XJA17	7259.29	-	3.02	P3	10064.50	52.3240	57.6809	0.6363	1.4045	1461.84	-	-	Aman
18	XJA18	4474.40	-	3.03	P3	10064.50	52.3240	57.9485	0.6393	1.3980	1468.62	-	-	Aman
19	XJA19	1146.71	-	3.04	P3	10064.50	52.3240	58.0344	0.6402	1.3959	1470.80	-	-	Aman
20	XJA20	0.00	-1342.32	3.06	P3	10064.50	52.3240	-	-	-	-	58.40	2173.93	Aman
21	XJA21	0.00	-3934.31	3.07	P3	10064.50	52.3240	-	-	-	-	58.71	2173.93	Aman
22	XJA22	0.00	-4960.57	3.10	P3	10064.50	52.3240	-	-	-	-	59.19	2173.93	Aman
23	XJA23	0.00	-4951.65	3.14	P3	10064.50	52.3240	-	-	-	-	59.97	2173.93	Aman
24	XJA24	0.00	-4638.34	3.20	P3	10064.50	52.3240	-	-	-	-	61.07	2173.93	Aman

Tabel Perencanaan batang KK_Xj

2. Batang Vertikal

NO	Batang	N _{U,T} ank (KN)	N _{U,T} ekanan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φN/n (KN)	KL/r<240	φN/n (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XJV1	1844.93	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
2	XJV2	2905.02	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
3	XJV3	932.13	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
4	XJV4	6846.17	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
5	XJV5	6102.07	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
6	XJV6	5646.78	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
7	XJV7	12050.40	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
8	XJV8	14000.31	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
9	XJV9	16312.70	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
10	XJV10	16724.62	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
11	XJV11	8341.38	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
12	XJV12	3563.69	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
13	XJV13	7591.23	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
14	XJV14	3554.23	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
15	XJV15	8349.06	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
16	XJV16	16690.71	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
17	XJV17	16348.53	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
18	XJV18	13990.99	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
19	XJV19	12077.43	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
20	XJV20	5628.92	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
21	XJV21	6137.18	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
22	XJV22	6833.09	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
23	XJV23	925.46	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
24	XJV24	2899.46	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
25	XJV25	1789.77	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman

Tabel Perencanaan batang KK_Xj

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φN _t (KN)	KL/r<240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XJD1	1095.32	-	3.55	P4	10064.50	52.3240	67.8667	0.7487	1.1937	1719.98	-	-	Aman
2	XJD2	0.00	-420.60	3.65	P4	10064.50	52.3240	-	-	-	-	69.77	2173.93	Aman
3	XJD3	0.00	-656.17	3.74	P4	10064.50	52.3240	-	-	-	-	71.44	2173.93	Aman
4	XJD4	0.00	-2795.41	3.80	P4	10064.50	52.3240	-	-	-	-	72.71	2173.93	Aman
5	XJD5	0.00	-4932.68	3.85	P4	10064.50	52.3240	-	-	-	-	73.66	2173.93	Aman
6	XJD6	0.00	-5310.28	3.92	P4	10064.50	52.3240	-	-	-	-	75.00	2173.93	Aman
7	XJD7	0.00	-7693.33	3.94	P4	10064.50	52.3240	-	-	-	-	75.37	2173.93	Aman
8	XJD8	0.00	-6478.94	2.01	P4	10064.50	52.3240	-	-	-	-	38.38	2173.93	Aman
9	XJD9	0.00	-303.31	2.02	P4	10064.50	52.3240	-	-	-	-	38.70	2173.93	Aman
10	XJD10	4377.95	-	2.05	P4	10064.50	52.3240	39.1488	0.4319	2.0694	992.17	-	-	Aman
11	XJD11	5954.17	-	2.08	P4	10064.50	52.3240	39.6733	0.4377	2.0420	1005.46	-	-	Aman
12	XJD12	2620.22	-	2.09	P4	10064.50	52.3240	40.0051	0.4413	2.0251	1013.87	-	-	Aman
13	XJD13	2624.39	-	2.09	P4	10064.50	52.3240	40.0051	0.4413	2.0251	1013.87	-	-	Aman
14	XJD14	5971.26	-	2.08	P4	10064.50	52.3240	39.6733	0.4377	2.0420	1005.46	-	-	Aman
15	XJD15	4386.48	-	2.05	P4	10064.50	52.3240	39.1488	0.4319	2.0694	992.17	-	-	Aman
16	XJD16	0.00	-243.43	2.02	P4	10064.50	52.3240	-	-	-	-	38.70	2173.93	Aman
17	XJD17	0.00	-6503.12	2.01	P4	10064.50	52.3240	-	-	-	-	38.38	2173.93	Aman
18	XJD18	0.00	-7665.42	3.94	P4	10064.50	52.3240	-	-	-	-	75.37	2173.93	Aman
19	XJD19	0.00	-5325.78	3.92	P4	10064.50	52.3240	-	-	-	-	75.00	2173.93	Aman
20	XJD20	0.00	-4917.17	3.85	P4	10064.50	52.3240	-	-	-	-	73.66	2173.93	Aman
21	XJD21	0.00	-2828.03	3.80	P4	10064.50	52.3240	-	-	-	-	72.71	2173.93	Aman
22	XJD22	0.00	-657.74	3.74	P4	10064.50	52.3240	-	-	-	-	71.44	2173.93	Aman
23	XJD23	0.00	-435.35	3.65	P4	10064.50	52.3240	-	-	-	-	69.77	2173.93	Aman
24	XJD24	1094.77	-	3.55	P4	10064.50	52.3240	67.8667	0.7487	1.1937	1719.98	-	-	Aman

Tabel Perencanaan batang KK_Xj

4. Batang Bawah

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φN _{tr} (KN)	KL/r<240	φN _{tr} (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XJB1	0.00	-2021.42	3.20	P4	10064.50	52.3240	-	-	-	-	61.07	2173.93	Aman
2	XJB2	0.00	-1196.14	3.14	P4	10064.50	52.3240	-	-	-	-	59.97	2173.93	Aman
3	XJB3	5090.26	-	3.10	P4	10064.50	52.3240	59.1935	0.6530	1.3686	1500.17	-	-	Aman
4	XJB4	0.00	-2055.50	3.07	P4	10064.50	52.3240	-	-	-	-	58.71	2173.93	Aman
5	XJB5	0.00	-4384.36	3.06	P4	10064.50	52.3240	-	-	-	-	58.40	2173.93	Aman
6	XJB6	0.00	-3327.65	3.04	P4	10064.50	52.3240	-	-	-	-	58.03	2173.93	Aman
7	XJB7	0.00	-11777.86	3.03	P4	10064.50	52.3240	-	-	-	-	57.95	2173.93	Aman
8	XJB8	0.00	-17629.04	3.02	P4	10064.50	52.3240	-	-	-	-	57.68	2173.93	Aman
9	XJB9	0.00	-18703.13	3.01	P4	10064.50	52.3240	-	-	-	-	57.58	2173.93	Aman
10	XJB10	0.00	-28583.94	3.01	P4	10064.50	52.3240	-	-	-	-	57.48	2173.93	Aman
11	XJB11	0.00	-25181.70	3.00	P4	10064.50	52.3240	-	-	-	-	57.39	2173.93	Aman
12	XJB12	0.00	-17513.92	3.00	P4	10064.50	52.3240	-	-	-	-	57.36	2173.93	Aman
13	XJB13	0.00	-17479.70	3.00	P4	10064.50	52.3240	-	-	-	-	57.36	2173.93	Aman
14	XJB14	0.00	-25171.55	3.00	P4	10064.50	52.3240	-	-	-	-	57.39	2173.93	Aman
15	XJB15	0.00	-28580.91	3.01	P4	10064.50	52.3240	-	-	-	-	57.48	2173.93	Aman
16	XJB16	0.00	-18727.81	3.01	P4	10064.50	52.3240	-	-	-	-	57.58	2173.93	Aman
17	XJB17	0.00	-17634.20	3.02	P4	10064.50	52.3240	-	-	-	-	57.68	2173.93	Aman
18	XJB18	0.00	-11802.64	3.03	P4	10064.50	52.3240	-	-	-	-	57.95	2173.93	Aman
19	XJB19	0.00	-3334.55	3.04	P4	10064.50	52.3240	-	-	-	-	58.03	2173.93	Aman
20	XJB20	0.00	-4413.13	3.06	P4	10064.50	52.3240	-	-	-	-	58.40	2173.93	Aman
21	XJB21	0.00	-2058.69	3.07	P4	10064.50	52.3240	-	-	-	-	58.71	2173.93	Aman
22	XJB22	5082.60	-	3.10	P4	10064.50	52.3240	59.1935	0.6530	1.3686	1500.17	-	-	Aman
23	XJB23	0.00	-1194.57	3.14	P4	10064.50	52.3240	-	-	-	-	59.97	2173.93	Aman
24	XJB24	0.00	-2021.44	3.20	P4	10064.50	52.3240	-	-	-	-	61.07	2173.93	Aman

Tabel Perencanaan batang KK_XK

1. Batang Atas

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λ _c	ω	φN _t (KN)	KL/r < 240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XKA1	0.00	-3.49	3.16	P3	10064.50	52.3240	-	-	-	-	60.38	2173.93	Aman
2	XKA2	0.00	-200.03	3.11	P3	10064.50	52.3240	-	-	-	-	59.49	2173.93	Aman
3	XKA3	0.00	-32.12	3.08	P3	10064.50	52.3240	-	-	-	-	58.83	2173.93	Aman
4	XKA4	481.33	-	3.06	P3	10064.50	52.3240	58.5083	0.6455	1.3846	1482.81	-	-	Aman
5	XKA5	1004.79	-	3.04	P3	10064.50	52.3240	58.1259	0.6413	1.3938	1473.12	-	-	Aman
6	XKA6	1717.41	-	3.03	P3	10064.50	52.3240	57.9485	0.6393	1.3980	1468.62	-	-	Aman
7	XKA7	2558.06	-	3.02	P3	10064.50	52.3240	57.7240	0.6368	1.4035	1462.93	-	-	Aman
8	XKA8	2525.89	-	3.01	P3	10064.50	52.3240	57.5668	0.6351	1.4073	1458.95	-	-	Aman
9	XKA9	1120.24	-	3.01	P3	10064.50	52.3240	57.4890	0.6342	1.4092	1456.97	-	-	Aman
10	XKA10	0.00	-26.39	3.00	P3	10064.50	52.3240	-	-	-	-	57.38	2173.93	Aman
11	XKA11	0.00	-180.39	3.00	P3	10064.50	52.3240	-	-	-	-	57.35	2173.93	Aman
12	XKA12	0.00	-180.94	3.00	P3	10064.50	52.3240	-	-	-	-	57.35	2173.93	Aman
13	XKA13	0.00	-30.89	3.00	P3	10064.50	52.3240	-	-	-	-	57.38	2173.93	Aman
14	XKA14	1116.31	-	3.01	P3	10064.50	52.3240	57.4890	0.6342	1.4092	1456.97	-	-	Aman
15	XKA15	2537.65	-	3.01	P3	10064.50	52.3240	57.5668	0.6351	1.4073	1458.95	-	-	Aman
16	XKA16	2560.66	-	3.02	P3	10064.50	52.3240	57.7240	0.6368	1.4035	1462.93	-	-	Aman
17	XKA17	1716.70	-	3.03	P3	10064.50	52.3240	57.9485	0.6393	1.3980	1468.62	-	-	Aman
18	XKA18	1005.51	-	3.04	P3	10064.50	52.3240	58.1259	0.6413	1.3938	1473.12	-	-	Aman
19	XKA19	483.54	-	3.06	P3	10064.50	52.3240	58.5083	0.6455	1.3846	1482.81	-	-	Aman
20	XKA20	0.00	-31.50	3.08	P3	10064.50	52.3240	-	-	-	-	58.83	2173.93	Aman
21	XKA21	0.00	-194.47	3.11	P3	10064.50	52.3240	-	-	-	-	59.49	2173.93	Aman
22	XKA22	0.03	-	3.16	P3	10064.50	52.3240	60.3763	0.6661	1.3418	1530.15	-	-	Aman

Tabel Perencanaan batang KK_XK

2. Batang Vertikal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								λc	ω	φN _h (KN)	KL/r<200	KL/r<240	φN _h (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XKV1	6182.93	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
2	XKV2	3095.61	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
3	XKV3	6116.65	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
4	XKV4	7322.54	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
5	XKV5	7755.59	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
6	XKV6	13334.67	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
7	XKV7	17213.41	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
8	XKV8	22467.77	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
9	XKV9	21818.40	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
10	XKV10	4759.11	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
11	XKV11	0.00	-866.41	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
12	XKV12	4039.55	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
13	XKV13	0.00	-932.68	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
14	XKV14	4631.86	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
15	XKV15	21801.29	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
16	XKV16	22541.37	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
17	XKV17	17145.31	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
18	XKV18	13327.25	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
19	XKV19	7781.66	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
20	XKV20	7279.21	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
21	XKV21	6121.92	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
22	XKV22	3160.88	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
23	XKV23	6160.59	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman

Tabel Perencanaan batang KK_XK

3. Batang Diagonal

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λc	ω	φN _n (KN)	KL/r < 240	φN _n (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XKD1	0.00	-1053.85	3.611108	P4	10064.50	52.3240	-	-	-	-	69.01	2173.93	Aman
2	XKD2	0.00	-944.30	3.702553	P4	10064.50	52.3240	-	-	-	-	70.76	2173.93	Aman
3	XKD3	0.00	-4392.66	3.786304	P4	10064.50	52.3240	-	-	-	-	72.36	2173.93	Aman
4	XKD4	0.00	-6185.16	3.835635	P4	10064.50	52.3240	-	-	-	-	73.31	2173.93	Aman
5	XKD5	0.00	-6679.45	3.905125	P4	10064.50	52.3240	-	-	-	-	74.63	2173.93	Aman
6	XKD6	0.00	-9374.71	3.943805	P4	10064.50	52.3240	-	-	-	-	75.37	2173.93	Aman
7	XKD7	0.00	-9146.51	4.002811	P4	10064.50	52.3240	-	-	-	-	76.50	2173.93	Aman
8	XKD8	584.86	-	4.056218	P4	10064.50	52.3240	77.5212	0.8552	1.0450	1964.66	-	-	Aman
9	XKD9	11642.89	-	4.090037	P4	10064.50	52.3240	78.1675	0.8624	1.0364	1981.04	-	-	Aman
10	XKD10	10538.54	-	4.158654	P4	10064.50	52.3240	79.4789	0.8768	1.0193	2014.28	-	-	Aman
11	XKD11	4280.05	-	4.200428	P4	10064.50	52.3240	80.2773	0.8856	1.0092	2034.51	-	-	Aman
12	XKD12	4210.92	-	4.200428	P4	10064.50	52.3240	80.2773	0.8856	1.0092	2034.51	-	-	Aman
13	XKD13	10532.08	-	4.158654	P4	10064.50	52.3240	79.4789	0.8768	1.0193	2014.28	-	-	Aman
14	XKD14	11745.01	-	4.090037	P4	10064.50	52.3240	78.1675	0.8624	1.0364	1981.04	-	-	Aman
15	XKD15	660.38	-	4.056218	P4	10064.50	52.3240	77.5212	0.8552	1.0450	1964.66	-	-	Aman
16	XKD16	0.00	-9257.44	4.002811	P4	10064.50	52.3240	-	-	-	-	76.50	2173.93	Aman
17	XKD17	0.00	-9328.42	3.943805	P4	10064.50	52.3240	-	-	-	-	75.37	2173.93	Aman
18	XKD18	0.00	-6673.99	3.905125	P4	10064.50	52.3240	-	-	-	-	74.63	2173.93	Aman
19	XKD19	0.00	-6209.98	3.835635	P4	10064.50	52.3240	-	-	-	-	73.31	2173.93	Aman
20	XKD20	0.00	-4358.32	3.786304	P4	10064.50	52.3240	-	-	-	-	72.36	2173.93	Aman
21	XKD21	0.00	-913.36	3.702553	P4	10064.50	52.3240	-	-	-	-	70.76	2173.93	Aman
22	XKD22	0.00	-1100.21	3.611108	P4	10064.50	52.3240	-	-	-	-	69.01	2173.93	Aman

Tabel Perencanaan batang KK_XK

1. Batang Bawah

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik			Ket
								KL/r<200	λc	ω	ϕ/Nn (KN)	KL/r<240	ϕ/Nn (KN)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	
1	XKB1	1584.47	-	3.16	P4	10064.50	52.3240	60.3763	0.6661	1.3418	1530.15	-	-	Aman	
2	XKB2	7147.50	-	3.11	P4	10064.50	52.3240	59.4890	0.6563	1.3618	1507.66	-	-	Aman	
3	XKB3	1074.41	-	3.08	P4	10064.50	52.3240	58.8320	0.6490	1.3770	1491.01	-	-	Aman	
4	XKB4	0.00	-2464.20	3.06	P4	10064.50	52.3240	-	-	-	-	58.51	2173.93	Aman	
5	XKB5	0.00	-3021.07	3.04	P4	10064.50	52.3240	-	-	-	-	58.13	2173.93	Aman	
6	XKB6	0.00	-12772.12	3.03	P4	10064.50	52.3240	-	-	-	-	57.95	2173.93	Aman	
7	XKB7	0.00	-19742.39	3.02	P4	10064.50	52.3240	-	-	-	-	57.72	2173.93	Aman	
8	XKB8	0.00	-16692.30	3.01	P4	10064.50	52.3240	-	-	-	-	57.57	2173.93	Aman	
9	XKB9	0.00	-31398.08	3.01	P4	10064.50	52.3240	-	-	-	-	57.49	2173.93	Aman	
10	XKB10	0.00	-23347.16	3.00	P4	10064.50	52.3240	-	-	-	-	57.38	2173.93	Aman	
11	XKB11	0.00	-13617.43	3.00	P4	10064.50	52.3240	-	-	-	-	57.35	2173.93	Aman	
12	XKB12	0.00	-13518.50	3.00	P4	10064.50	52.3240	-	-	-	-	57.35	2173.93	Aman	
13	XKB13	0.00	-23277.31	3.00	P4	10064.50	52.3240	-	-	-	-	57.38	2173.93	Aman	
14	XKB14	0.00	-31399.23	3.01	P4	10064.50	52.3240	-	-	-	-	57.49	2173.93	Aman	
15	XKB15	0.00	-16744.17	3.01	P4	10064.50	52.3240	-	-	-	-	57.57	2173.93	Aman	
16	XKB16	0.00	-19729.45	3.02	P4	10064.50	52.3240	-	-	-	-	57.72	2173.93	Aman	
17	XKB17	0.00	-12791.01	3.03	P4	10064.50	52.3240	-	-	-	-	57.95	2173.93	Aman	
18	XKB18	0.00	-3028.82	3.04	P4	10064.50	52.3240	-	-	-	-	58.13	2173.93	Aman	
19	XKB19	0.00	-2456.88	3.06	P4	10064.50	52.3240	-	-	-	-	58.51	2173.93	Aman	
20	XKB20	1052.97	-	3.08	P4	10064.50	52.3240	58.8320	0.6490	1.3770	1491.01	-	-	Aman	
21	XKB21	7113.46	-	3.11	P4	10064.50	52.3240	59.4890	0.6563	1.3618	1507.66	-	-	Aman	
22	XKB22	1593.79	-	3.16	P4	10064.50	52.3240	60.3763	0.6661	1.3418	1530.15	-	-	Aman	

Tabel Perencanaan batang KK_XL

1. Batang Atas

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								λ.c	ω	φN _t (KN)	KL/r<240	φN _t (KN)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XL/A1	1002.48	-	3.12	P3	10064.50	52.3240	59.6973	0.6586	1.3571	1512.94	-	-	Aman
2	XL/A2	600.59	-	3.09	P3	10064.50	52.3240	59.0536	0.6515	1.3719	1496.63	-	-	Aman
3	XL/A3	1180.68	-	3.07	P3	10064.50	52.3240	58.6252	0.6468	1.3819	1485.77	-	-	Aman
4	XL/A4	1596.30	-	3.04	P3	10064.50	52.3240	58.1900	0.6420	1.3922	1474.74	-	-	Aman
5	XL/A5	2527.72	-	3.03	P3	10064.50	52.3240	57.9765	0.6396	1.3973	1469.33	-	-	Aman
6	XL/A6	3647.60	-	3.02	P3	10064.50	52.3240	57.7240	0.6368	1.4035	1462.93	-	-	Aman
7	XL/A7	3622.69	-	3.01	P3	10064.50	52.3240	57.5842	0.6353	1.4069	1459.39	-	-	Aman
8	XL/A8	964.06	-	3.01	P3	10064.50	52.3240	57.4754	0.6341	1.4095	1456.63	-	-	Aman
9	XL/A9	63.42	-	3.00	P3	10064.50	52.3240	57.3809	0.6330	1.4118	1454.23	-	-	Aman
10	XL/A10	0.00	-16.79	3.00	P3	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
11	XL/A11	0.00	-15.20	3.00	P3	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
12	XL/A12	58.05	-	3.00	P3	10064.50	52.3240	57.3809	0.6330	1.4118	1454.23	-	-	Aman
13	XL/A13	975.78	-	3.01	P3	10064.50	52.3240	57.4754	0.6341	1.4095	1456.63	-	-	Aman
14	XL/A14	3605.91	-	3.01	P3	10064.50	52.3240	57.5842	0.6253	1.4069	1459.39	-	-	Aman
15	XL/A15	3662.54	-	3.02	P3	10064.50	52.3240	57.7240	0.6368	1.4035	1462.93	-	-	Aman
16	XL/A16	2529.25	-	3.03	P3	10064.50	52.3240	57.9765	0.6396	1.3973	1469.33	-	-	Aman
17	XL/A17	1594.26	-	3.04	P3	10064.50	52.3240	58.1900	0.6420	1.3922	1474.74	-	-	Aman
18	XL/A18	1173.24	-	3.07	P3	10064.50	52.3240	58.6252	0.6468	1.3819	1485.77	-	-	Aman
19	XL/A19	607.86	-	3.09	P3	10064.50	52.3240	59.0536	0.6515	1.3719	1496.63	-	-	Aman
20	XL/A20	1005.70	-	3.12	P3	10064.50	52.3240	59.6973	0.6586	1.3571	1512.94	-	-	Aman

Tabel Perencanaan batang KK_XL

2. Batang Vertikal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λc	ω	φN _t (KN)	KL/r < 240		φN _t (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XLV1	15577.86	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
2	XLV2	7552.82	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
3	XLV3	8016.82	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
4	XLV4	8850.32	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
5	XLV5	14541.57	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
6	XLV6	20412.08	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
7	XLV7	29111.71	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
8	XLV8	19486.00	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
9	XLV9	0.00	-9332.01	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
10	XLV10	0.00	-9118.93	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
11	XLV11	520.87	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
12	XLV12	0.00	-9152.11	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
13	XLV13	0.00	-9126.32	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
14	XLV14	18978.91	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
15	XLV15	28996.01	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
16	XLV16	20433.05	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
17	XLV17	14542.60	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
18	XLV18	8723.95	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
19	XLV19	7964.62	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
20	XLV20	7620.33	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
21	XLV21	15450.67	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman

Tabel Perencanaan batang KK_XL

3. Batang Diagonal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λ _c	ω	φN _t (KN)	KL/r<240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XLD1	0.00	-1232.36	3.68	P4	10064.50	52.3240	-	-	-	-	70.32	2173.93	Aman
2	XLD2	0.00	-4440.62	3.76	P4	10064.50	52.3240	-	-	-	-	71.78	2173.93	Aman
3	XLD3	0.00	-7027.27	3.82	P4	10064.50	52.3240	-	-	-	-	72.95	2173.93	Aman
4	XLD4	0.00	-8737.51	3.89	P4	10064.50	52.3240	-	-	-	-	74.39	2173.93	Aman
5	XLD5	0.00	-11139.91	3.94	P4	10064.50	52.3240	-	-	-	-	75.25	2173.93	Aman
6	XLD6	0.00	-10891.20	4.00	P4	10064.50	52.3240	-	-	-	-	76.50	2173.93	Aman
7	XLD7	7616.58	-	4.05	P4	10064.50	52.3240	77.3927	0.8538	1.0468	1961.40	-	-	Aman
8	XLD8	33180.35	-	4.10	P4	10064.50	52.3240	78.2975	0.8638	1.0347	1984.34	-	-	Aman
9	XLD9	19582.91	-	4.16	P4	10064.50	52.3240	79.4789	0.8768	1.0193	2014.28	-	-	Aman
10	XLD10	5564.40	-	4.21	P4	10064.50	52.3240	80.4112	0.8871	1.0075	2037.90	-	-	Aman
11	XLD11	5567.15	-	4.21	P4	10064.50	52.3240	80.4112	0.8871	1.0075	2037.90	-	-	Aman
12	XLD12	19686.46	-	4.16	P4	10064.50	52.3240	79.4789	0.8768	1.0193	2014.28	-	-	Aman
13	XLD13	32843.68	-	4.10	P4	10064.50	52.3240	78.2975	0.8638	1.0347	1984.34	-	-	Aman
14	XLD14	7891.57	-	4.05	P4	10064.50	52.3240	77.3927	0.8538	1.0468	1961.40	-	-	Aman
15	XLD15	0.00	-10873.87	4.00	P4	10064.50	52.3240	-	-	-	-	76.50	2173.93	Aman
16	XLD16	0.00	-11162.49	3.94	P4	10064.50	52.3240	-	-	-	-	75.25	2173.93	Aman
17	XLD17	0.00	-8807.78	3.89	P4	10064.50	52.3240	-	-	-	-	74.39	2173.93	Aman
18	XLD18	0.00	-6960.30	3.82	P4	10064.50	52.3240	-	-	-	-	72.95	2173.93	Aman
19	XLD19	0.00	-4365.32	3.76	P4	10064.50	52.3240	-	-	-	-	71.78	2173.93	Aman
20	XLD20	0.00	-1339.79	3.68	P4	10064.50	52.3240	-	-	-	-	70.32	2173.93	Aman

Tabel Perencanaan batang KK_XL

4. Batang Bawah

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r<200	λc	ω	φN _{tn} (KN)	KL/r<240		φN _{tn} (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XLB1	8611.57	-	3.12	P4	10064.50	52.3240	59.6973	0.6586	1.3571	1512.94	-	-	Aman
2	XLB2	7568.74	-	3.09	P4	10064.50	52.3240	59.0536	0.6515	1.3719	1496.63	-	-	Aman
3	XLB3	1924.38	-	3.07	P4	10064.50	52.3240	58.6252	0.6468	1.3819	1485.77	-	-	Aman
4	XLB4	0.00	-2795.91	3.04	P4	10064.50	52.3240	-	-	-	-	58.19	2173.93	Aman
5	XLB5	0.00	-12407.91	3.03	P4	10064.50	52.3240	-	-	-	-	57.98	2173.93	Aman
6	XLB6	0.00	-19514.06	3.02	P4	10064.50	52.3240	-	-	-	-	57.72	2173.93	Aman
7	XLB7	0.00	-11700.07	3.01	P4	10064.50	52.3240	-	-	-	-	57.58	2173.93	Aman
8	XLB8	0.00	-21367.15	3.01	P4	10064.50	52.3240	-	-	-	-	57.48	2173.93	Aman
9	XLB9	0.00	-32196.61	3.00	P4	10064.50	52.3240	-	-	-	-	57.38	2173.93	Aman
10	XLB10	0.00	-20539.89	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
11	XLB11	0.00	-20528.23	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
12	XLB12	0.00	-32220.31	3.00	P4	10064.50	52.3240	-	-	-	-	57.38	2173.93	Aman
13	XLB13	0.00	-21173.72	3.01	P4	10064.50	52.3240	-	-	-	-	57.48	2173.93	Aman
14	XLB14	0.00	-11700.99	3.01	P4	10064.50	52.3240	-	-	-	-	57.58	2173.93	Aman
15	XLB15	0.00	-19556.15	3.02	P4	10064.50	52.3240	-	-	-	-	57.72	2173.93	Aman
16	XLB16	0.00	-12440.76	3.03	P4	10064.50	52.3240	-	-	-	-	57.98	2173.93	Aman
17	XLB17	0.00	-2784.02	3.04	P4	10064.50	52.3240	-	-	-	-	58.19	2173.93	Aman
18	XLB18	1906.53	-	3.07	P4	10064.50	52.3240	58.6252	0.6468	1.3819	1485.77	-	-	Aman
19	XLB19	7501.79	-	3.09	P4	10064.50	52.3240	59.0536	0.6515	1.3719	1496.63	-	-	Aman
20	XLB20	8634.68	-	3.12	P4	10064.50	52.3240	59.6973	0.6586	1.3571	1512.94	-	-	Aman

Tabel Perencanaan batang KK_XM

1. Batang Atas

NO	Batang	N _t Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λ _c	ω	φN _t (KN)	KL/r < 240		φN _t (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XMA1	4440.92	-	3.08	P3	10064.50	52.3240	58.8752	0.6495	1.3760	1492.10	-	-	Aman
2	XMA2	12627.62	-	3.05	P3	10064.50	52.3240	58.2907	0.6431	1.3898	1477.29	-	-	Aman
3	XMA3	18793.29	-	3.04	P3	10064.50	52.3240	58.0643	0.6406	1.3952	1471.55	-	-	Aman
4	XMA4	28111.10	-	3.02	P3	10064.50	52.3240	57.7695	0.6373	1.4024	1464.08	-	-	Aman
5	XMA5	25589.82	-	3.01	P3	10064.50	52.3240	57.6023	0.6355	1.4064	1459.85	-	-	Aman
6	XMA6	12167.34	-	3.01	P3	10064.50	52.3240	57.4623	0.6339	1.4098	1456.30	-	-	Aman
7	XMA7	4425.94	-	3.00	P3	10064.50	52.3240	57.3809	0.6330	1.4118	1454.23	-	-	Aman
8	XMA8	0.00	-1062.72	2.25	P3	10064.50	52.3240	-	-	-	-	43.00	2173.93	Aman
9	XMA9	0.00	-1056.10	3.00	P3	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
10	XMA10	4412.22	-	2.25	P3	10064.50	52.3240	43.0035	0.4744	1.8839	1089.86	-	-	Aman
11	XMA11	12118.02	-	3.00	P3	10064.50	52.3240	57.3379	0.6326	1.4129	1453.15	-	-	Aman
12	XMA12	25564.37	-	3.00	P3	10064.50	52.3240	57.3809	0.6330	1.4118	1454.23	-	-	Aman
13	XMA13	28088.54	-	3.01	P3	10064.50	52.3240	57.4623	0.6339	1.4098	1456.30	-	-	Aman
14	XMA14	18798.26	-	3.01	P3	10064.50	52.3240	57.6023	0.6355	1.4064	1459.85	-	-	Aman
15	XMA15	12709.59	-	3.02	P3	10064.50	52.3240	57.7695	0.6373	1.4024	1464.08	-	-	Aman
16	XMA16	4444.59	-	3.04	P5	10064.50	52.3240	58.0643	0.6406	1.3952	1471.55	-	-	Aman

Tabel Perencanaan batang KK_XM

2. Batang Vertikal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	A _g (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λ _c	ω	φN _n (KN)	KL/r < 200		φN _n (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XMV1	13273.39	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
2	XMV2	6053.68	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
3	XMV3	4107.37	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
4	XMV4	13991.59	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
5	XMV5	1979.90	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
6	XMV6	18998.86	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
7	XMV7	0.00	-1302.73	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
8	XMV8	0.00	-5984.75	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
9	XMV9	794.85	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
10	XMV10	0.00	-5973.94	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
11	XMV11	0.00	-1350.73	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
12	XMV12	18833.47	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
13	XMV13	1929.28	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
14	XMV14	13715.16	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
15	XMV15	4226.58	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
16	XMV16	6226.98	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
17	XMV17	13292.76	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman

Tabel Perencanaan batang KK_XM

3. Batang Diagonal

NO	Batang	N _U Tarik (KN)	N _U Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r<200	λc	ω	φN _t (KN)	KL/r<240		φN _t (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XMD1	27569.03	-	2.38	P4	10064.50	52.3240	45.5183	0.5022	1.7798	1153.60	-	-	Aman
2	XMD4	27606.78	-	2.38	P4	10064.50	52.3240	45.5183	0.5022	1.7798	1153.60	-	-	Aman
3	XMD5	18500.96	-	2.32	P4	10064.50	52.3240	44.4141	0.4900	1.8240	1125.61	-	-	Aman
4	XMD8	18744.43	-	2.32	P4	10064.50	52.3240	44.4141	0.4900	1.8240	1125.61	-	-	Aman
5	XMD9	25208.08	-	2.30	P4	10064.50	52.3240	43.9053	0.4844	1.8452	1112.72	-	-	Aman
6	XMD12	25347.02	-	2.30	P4	10064.50	52.3240	43.9053	0.4844	1.8452	1112.72	-	-	Aman
7	XMD13	26054.38	-	2.26	P4	10064.50	52.3240	43.1147	0.4756	1.8790	1092.68	-	-	Aman
8	XMD16	26327.35	-	2.26	P4	10064.50	52.3240	43.1147	0.4756	1.8790	1092.68	-	-	Aman
9	XMD17	0.00	-7589.16	2.23	P4	10064.50	52.3240	-	-	-	-	42.55	2173.93	Aman
10	XMD18	6341.38	-	2.02	P4	10064.50	52.3240	38.6322	0.4262	2.0970	979.08	-	-	Aman
11	XMD19	6016.52	-	2.02	P4	10064.50	52.3240	38.6322	0.4262	2.0970	979.08	-	-	Aman
12	XMD20	0.00	-7274.65	2.23	P4	10064.50	52.3240	-	-	-	-	42.55	2173.93	Aman
13	XMD21	0.00	-17222.38	2.19	P4	10064.50	52.3240	-	-	-	-	41.92	2173.93	Aman
14	XMD22	20570.31	-	2.05	P4	10064.50	52.3240	39.2139	0.4326	2.0659	993.82	-	-	Aman
15	XMD23	20136.82	-	2.05	P4	10064.50	52.3240	39.2139	0.4326	2.0659	993.82	-	-	Aman
16	XMD24	0.00	-16954.32	2.19	P4	10064.50	52.3240	-	-	-	-	41.92	2173.93	Aman
17	XMD25	0.00	-12138.01	2.16	P4	10064.50	52.3240	-	-	-	-	41.36	2173.93	Aman
18	XMD26	14052.90	-	2.08	P4	10064.50	52.3240	39.7395	0.4384	2.0386	1007.14	-	-	Aman
19	XMD27	13778.93	-	2.08	P4	10064.50	52.3240	39.7395	0.4384	2.0386	1007.14	-	-	Aman
20	XMD28	0.00	-11865.79	2.16	P4	10064.50	52.3240	-	-	-	-	41.36	2173.93	Aman
21	XMD29	0.00	-4487.01	2.13	P4	10064.50	52.3240	-	-	-	-	40.75	2173.93	Aman
22	XMD30	8039.01	-	2.11	P4	10064.50	52.3240	40.3398	0.4450	2.0083	1022.35	-	-	Aman
23	XMD31	7797.40	-	2.11	P4	10064.50	52.3240	40.3398	0.4450	2.0083	1022.35	-	-	Aman
24	XMD32	0.00	-4204.63	2.13	P4	10064.50	52.3240	-	-	-	-	40.75	2173.93	Aman
25	XMD33	7800.17	-	2.11	P4	10064.50	52.3240	40.3398	0.4450	2.0083	1022.35	-	-	Aman
26	XMD34	0.00	-4196.05	2.13	P4	10064.50	52.3240	-	-	-	-	40.75	2173.93	Aman
27	XMD35	0.00	-4477.02	2.13	P4	10064.50	52.3240	-	-	-	-	40.75	2173.93	Aman
28	XMD36	8039.37	-	2.11	P4	10064.50	52.3240	40.3398	0.4450	2.0083	1022.35	-	-	Aman
29	XMD37	13718.92	-	2.08	P4	10064.50	52.3240	39.7395	0.4384	2.0386	1007.14	-	-	Aman

3. Lanjutan Batang Diagonal

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λ_c	ω	ϕN_t (KN)	KL/r < 240	ϕN_t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
30	XMD38	0.00	-11825.61	2.16	P4	10064.50	52.3240	-	-	-	-	41.36	2173.93	Aman
31	XMD39	0.00	-12099.86	2.16	P4	10064.50	52.3240	-	-	-	-	41.36	2173.93	Aman
32	XMD40	13994.27	-	2.08	P4	10064.50	52.3240	39.7395	0.4384	2.0386	1007.14	-	-	Aman
33	XMD41	20022.97	-	2.05	P4	10064.50	52.3240	39.2139	0.4326	2.0659	993.82	-	-	Aman
34	XMD42	0.00	-16957.66	2.19	P4	10064.50	52.3240	-	-	-	-	41.92	2173.93	Aman
35	XMD43	0.00	-17229.95	2.19	P4	10064.50	52.3240	-	-	-	-	41.92	2173.93	Aman
36	XMD44	20455.35	-	2.05	P4	10064.50	52.3240	39.2139	0.4326	2.0659	993.82	-	-	Aman
37	XMD45	5998.85	-	2.02	P4	10064.50	52.3240	38.6322	0.4262	2.0970	979.08	-	-	Aman
38	XMD46	0.00	-7303.09	2.23	P4	10064.50	52.3240	-	-	-	-	42.55	2173.93	Aman
39	XMD47	0.00	-7614.81	2.23	P4	10064.50	52.3240	-	-	-	-	42.55	2173.93	Aman
40	XMD48	6319.62	-	2.02	P4	10064.50	52.3240	38.6322	0.4262	2.0970	979.08	-	-	Aman
41	XMD50	26244.95	-	2.26	P4	10064.50	52.3240	43.1147	0.4756	1.8790	1092.68	-	-	Aman
42	XMD51	25978.64	-	2.26	F4	10064.50	52.3240	43.1147	0.4756	1.8790	1092.68	-	-	Aman
43	XMD54	25081.40	-	2.30	P4	10064.50	52.3240	43.9053	0.4844	1.8452	1112.72	-	-	Aman
44	XMD55	24935.01	-	2.30	P4	10064.50	52.3240	43.9053	0.4844	1.8452	1112.72	-	-	Aman
45	XMD58	18741.37	-	2.32	P4	10064.50	52.3240	44.4141	0.4900	1.8240	1125.61	-	-	Aman
46	XMD59	18505.08	-	2.32	P4	10064.50	52.3240	44.4141	0.4900	1.8240	1125.61	-	-	Aman
47	XMD62	27698.90	-	2.38	P4	10064.50	52.3240	45.5183	0.5022	1.7798	1153.60	-	-	Aman
48	XMD63	27653.39	-	2.38	P4	10064.50	52.3240	45.5183	0.5022	1.7798	1153.60	-	-	Aman

Tabel Perencanaan batang KK_XM

4. Batang Bawah

NO	Batang	N _t Tarik (KN)	N _t Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r < 200	λc	ω	φN _t (KN)	KL/r < 240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XMB1	18936.56	-	3.08	P4	10064.50	52.3240	58.8752	0.6495	1.3760	1492.10	-	-	Aman
2	XMB2	0.00	-2173.08	3.05	P4	10064.50	52.3240	-	-	-	-	58.29	2173.93	Aman
3	XMB3	0.00	-12075.24	3.04	P4	10064.50	52.3240	-	-	-	-	58.06	2173.93	Aman
4	XMB4	0.00	-45554.88	3.02	P4	10064.50	52.3240	-	-	-	-	57.77	2173.93	Aman
5	XMB5	0.00	-51176.65	3.01	P4	10064.50	52.3240	-	-	-	-	57.60	2173.93	Aman
6	XMB6	0.00	-28205.74	3.01	P4	10064.50	52.3240	-	-	-	-	57.46	2173.93	Aman
7	XMB7	4624.96	-	3.00	P4	10064.50	52.3240	57.3809	0.6330	1.4118	1454.23	-	-	Aman
8	XMB8	12898.36	-	3.00	P4	10064.50	52.3240	57.3379	0.6326	1.4129	1453.15	-	-	Aman
9	XMB9	12902.78	-	3.00	P4	10064.50	52.3240	57.3379	0.6326	1.4129	1453.15	-	-	Aman
10	XMB10	4643.40	-	3.00	P4	10064.50	52.3240	57.3809	0.6330	1.4118	1454.23	-	-	Aman
11	XMB11	0.00	-28168.71	3.01	P4	10064.50	52.3240	-	-	-	-	57.46	2173.93	Aman
12	XMB12	0.00	-51031.66	3.01	P4	10064.50	52.3240	-	-	-	-	57.60	2173.93	Aman
13	XMB13	0.00	-45421.70	3.02	P4	10064.50	52.3240	-	-	-	-	57.77	2173.93	Aman
14	XMB14	0.00	-12140.83	3.04	P4	10064.50	52.3240	-	-	-	-	58.06	2173.93	Aman
15	XMB15	0.00	-2336.46	3.05	P4	10064.50	52.3240	-	-	-	-	58.29	2173.93	Aman
16	XMB16	18860.30	-	3.08	P4	10064.50	52.3240	58.8752	0.6495	1.3760	1492.10	-	-	Aman

Tabel Perencanaan batang KK_XN

1. Batang Atas

NO	Batang	N _u Tarik (KN)	N _u Tekan (KN)	L (m)	Profil	Ag (m ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	φN _t (KN)	KL/r<240	φN _t (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XNA1	2651.902	-	3.043041	P3	10064.50	52.3240	58.1577	0.6416	1.3930	1473.92	-	-	Aman
2	XNA2	6926.536	-	3.023971	P3	10064.50	52.3240	57.7932	0.6376	1.4018	1464.68	-	-	Aman
3	XNA3	2822.446	-	3.014963	P3	10064.50	52.3240	57.6210	0.6357	1.4060	1460.32	-	-	Aman
4	XNA4	920.1241	-	3.006659	P3	10064.50	52.3240	57.4623	0.6339	1.4098	1456.30	-	-	Aman
5	XNA5	311.7944	-	3.002016	P3	10064.50	52.3240	57.3736	0.6330	1.4120	1454.05	-	-	Aman
6	XNA6	-93.11871	-	3.000017	P3	10064.50	52.3240	57.3354	0.6325	1.4130	1453.08	-	-	Aman
7	XNA7	-98.15935	-	3.000017	P3	10064.50	52.3240	57.3354	0.6325	1.4130	1453.08	-	-	Aman
8	XNA8	314.8465	-	3.002016	P3	10064.50	52.3240	57.3736	0.6330	1.4120	1454.05	-	-	Aman
9	XNA9	922.7582	-	3.006659	P3	10064.50	52.3240	57.4623	0.6339	1.4098	1456.30	-	-	Aman
10	XNA10	2819.866	-	3.014963	P3	10064.50	52.3240	57.6210	0.6357	1.4060	1460.32	-	-	Aman
11	XNA11	6910.885	-	3.023971	P3	10064.50	52.3240	57.7932	0.6376	1.4018	1464.68	-	-	Aman
12	XNA12	2668.886	-	3.043041	P3	10064.50	52.3240	58.1577	0.6416	1.3930	1473.92	-	-	Aman

Tabel Perencanaan batang KK_XN

2. Batang Vertikal

NO	Batang	Nu Tank (KN)	Nu Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								KL/r<200	λc	ω	ϕNn (KN)	KL/r<240	ϕNn (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XNV1	41337.45	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
2	XNV2	18126.72	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
3	XNV3	0.00	-16122.24	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
4	XNV4	0.00	-2952.25	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
5	XNV5	0.00	-16470.27	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
6	XNV6	0.00	-8889.70	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
7	XNV7	1882.69	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
8	XNV8	0.00	-8848.09	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
9	XNV9	0.00	-16404.40	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
10	XNV10	0.00	-2808.47	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
11	XNV11	0.00	-16581.07	3.00	P4	10064.50	52.3240	-	-	-	-	57.34	2173.93	Aman
12	XNV12	18274.84	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman
13	XNV13	41002.16	-	3.00	P4	10064.50	52.3240	57.3351	0.6325	1.4130	1453.07	-	-	Aman

Tabel Perencanaan batang KK_XN

3. Batang Diagonal

NO	Batang	N ₁ Tarik (KN)	N ₁ Tekan (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan			Analisa Batang Tarik		Ket	
								KL/r < 200	λ.c	ω	φN _t (KN)	KL/r < 240		φN _t (KN)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XND1	9.00	-19138.03	3.90	P4	10064.50	52.3240	-	-	-	-	74.51	2173.93	Aman
2	XND2	0.00	-49387.72	3.98	P4	10064.50	52.3240	-	-	-	-	76.12	2173.93	Aman
3	XND3	19253.57	-	4.04	P4	10064.50	52.3240	77.1364	0.8510	1.0503	1954.91	-	-	Aman
4	XND4	25642.78	-	4.10	P4	10064.50	52.3240	78.4278	0.8652	1.0330	1987.64	-	-	Aman
5	XND5	11411.14	-	4.17	P4	10064.50	52.3240	79.6114	0.8783	1.0176	2017.63	-	-	Aman
6	XND6	4302.32	-	4.24	P4	10064.50	52.3240	80.9490	0.8930	1.0008	2051.53	-	-	Aman
7	XND7	4395.73	-	4.24	P4	10064.50	52.3240	80.9490	0.8930	1.0008	2051.53	-	-	Aman
8	XND8	11430.39	-	4.17	P4	10064.50	52.3240	79.6114	0.8783	1.0176	2017.63	-	-	Aman
9	XND9	25657.79	-	4.10	P4	10064.50	52.3240	78.4278	0.8652	1.0330	1987.64	-	-	Aman
10	XND10	18966.59	-	4.04	P4	10064.50	52.3240	77.1364	0.8510	1.0503	1954.91	-	-	Aman
11	XND11	0.00	-49076.89	3.98	P4	10064.50	52.3240	-	-	-	-	76.12	2173.93	Aman
12	XND12	9.00	-19448.08	3.90	P4	10064.50	52.3240	-	-	-	-	74.51	2173.93	Aman

Tabel Perencanaan batang KK_XN

4. Batang Bawah

NO	Batang	N _{U Tarik} (KN)	N _{U Tekan} (KN)	L (m)	Profil	Ag (mm ²)	r (mm)	Analisa Batang Tekan				Analisa Batang Tarik		Ket
								λ _c	ω	φN _h (KN)	KL/r < 200	KL/r < 240	φN _h (KN)	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1	XNB1	0.00	-7323.85	3.043041	P4	10064.50	52.3240	-	-	-	-	58.16	2173.93	Aman
2	XNB2	0.00	-20363.80	3.023971	P4	10064.50	52.3240	-	-	-	-	57.79	2173.93	Aman
3	XNB3	0.00	-28427.78	3.014963	P4	10064.50	52.3240	-	-	-	-	57.62	2173.93	Aman
4	XNB4	0.00	-26979.26	3.006659	P4	10064.50	52.3240	-	-	-	-	57.46	2173.93	Aman
5	XNB5	0.00	-8106.98	3.002016	P4	10064.50	52.3240	-	-	-	-	57.37	2173.93	Aman
6	XNB6	2758.51	-	3.000017	P4	10064.50	52.3240	57.3354	0.6325	1.4130	1453.08	-	-	Aman
7	XNB7	2728.18	-	3.000017	P4	10064.50	52.3240	57.3354	0.6325	1.4130	1453.08	-	-	Aman
8	XNB8	0.00	-8159.80	3.002016	P4	10064.50	52.3240	-	-	-	-	57.37	2173.93	Aman
9	XNB9	0.00	-27044.88	3.006659	P4	10064.50	52.3240	-	-	-	-	57.46	2173.93	Aman
10	XNB10	0.00	-28298.82	3.014963	P4	10064.50	52.3240	-	-	-	-	57.62	2173.93	Aman
11	XNB11	0.00	-20542.30	3.023971	P4	10064.50	52.3240	-	-	-	-	57.79	2173.93	Aman
12	XNB12	0.00	-7268.46	3.043041	P4	10064.50	52.3240	-	-	-	-	58.16	2173.93	Aman

1	XPD1	9377.37	-	0.8099173	P4	10064.50	52.3240	15.4789	0.1708	5.2338	392.29	-	-	Aman
2	XPD2	2672.42	-	0.735679	P4	10064.50	52.3240	14.0601	0.1551	5.7619	356.33	-	-	Aman
3	XPD3	9502.44	-	0.8099173	P4	10064.50	52.3240	15.4789	0.1708	5.2338	392.29	-	-	Aman

TABEL PERHITUNGAN
STRUKTUR
BETON BERTULANG

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
1	PORTAL A-AS ₁ Y1	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B646	0	M _{Tump}	68.61388	26.28102	1.316095	19.3768	124.386	109.3618	67.8414	96.0872	81.11602	
			1.37815	M _{Lap}	-14.2032	-7.33083	0.262534	34.81708	-28.7731	17.1089	-56.1724	-8.28869	-30.7748	
			2.7563	M _{Lap}	-128.885	-46.5888	-0.79103	50.25737	-229.204	-112.159	-217.201	-149.679	-179.68	
			0	M _{Lap}	73.4087	32.22535	0.418948	-12.342	139.651	84.55398	110.2082	93.93327	100.8289	
		B647	1.37585	M _{Lap}	87.19024	32.61613	0.87953	3.988784	156.814	116.5632	107.6326	114.2779	109.9179	
			2.7517	M _{Lap}	67.82961	26.06175	1.340112	20.31956	123.094	109.3977	65.88232	95.44777	79.83221	
			0	M _{Lap}	-153.434	-58.0677	-1.25331	-46.84	-277.029	-247.265	-148.112	-213.759	-181.618	
		B648	1.42415	M _{Lap}	-21.5916	-8.85702	-0.414	-29.6382	-40.0812	-59.5017	2.999455	-38.0219	-18.4804	
			2.8483	M _{Tump}	74.46645	32.65079	0.425307	-12.4365	141.601	85.8354	111.6841	95.28884	102.2307	
		B649	0	M _{Tump}	46.91838	21.77344	0.33533	0.478966	91.1396	63.5901	62.37302	63.48453	62.47859	
			1.5	M _{Lap}	-2.76592	-1.92235	-0.06226	27.47744	-6.39487	24.71639	-32.947	4.474713	-12.7053	
			3	M _{Lap}	-92.6255	-34.6181	-0.45986	54.47591	-166.54	-62.0114	-176.121	-102.389	-135.743	
			0	M _{Lap}	-74.3385	-28.07	-0.4644	-53.6949	-134.118	-152.265	-39.2136	-113.141	-78.338	
		B650	1.5	M _{Lap}	6.368371	1.345725	-6.58E-02	-26.6693	9.79521	-20.4889	35.5581	-0.93537	16.00457	
	3	M _{Tump}	46.89991	21.76142	0.332707	0.356291	91.0982	63.43351	62.47569	63.41617	62.49302			
	0	M _{Tump}	54.17549	25.43284	0.415428	0.107123	105.703	73.15029	72.66361	73.37689	72.43701			
B651	1.5	M _{Lap}	7.745479	2.151807	6.80E-02	26.63383	12.7375	37.47533	-18.4985	17.94943	1.02735			
	3	M _{Lap}	-78.8598	-30.1292	-0.27946	53.16054	-142.839	-46.0537	-157.515	-85.3321	-118.236			
	0	M _{Lap}	-73.3706	-25.2344	-0.45012	-53.0681	-128.42	-148.8	-37.0734	-110.126	-75.7477			
B652	1.5	M _{Lap}	10.49443	4.601244	-1.92E-02	-26.5424	19.9553	-13.9576	41.7935	5.536946	22.29892			
	3	M _{Tump}	54.1841	25.43692	0.411778	-1.67E-02	105.72	73.03077	72.80636	73.34568	72.49145			
	0	M _{Tump}	-44.847	-3.19331	-0.17533	-52.9415	-58.9257	-104.745	6.542716	-65.9618	-32.2404			
B653	3	M _{Lap}	16.87673	-2.97294	-4.32E-02	4.29E-03	15.4954	15.83849	15.85673	15.80356	15.89166			
	6	M _{Tump}	-44.3008	-2.75258	8.89E-02	52.95009	-57.5651	7.37559	-103.876	-31.4774	-65.0226			

BALOK LANTAI 1

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey {8}	Ex {9}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0 M Tump-	53.83527	25.31134	0.411481	-9.81E-03	105.1	72.5925	72.35387	72.90215	72.04422		
	B654		1.5 M Lap	10.5796	4.630775	0.11554	26.54048	20.1048	41.92987	-13.8779	22.50754	5.544404		
			3 M Lap	-72.8514	-25.0498	-0.1804	53.09077	-127.501	-36.5868	-147.964	-75.7412	-108.809		
	B655		0 M Tump-	-80.0546	-30.6067	-0.54468	-53.2209	-145.036	-159.393	-47.2861	-120.676	-86.0031		
			1.5 M Lap	6.96972	1.845153	-0.06773	-26.6777	11.3159	-19.5522	36.51354	6.07E-03	16.95523		
			3 M Tump-	53.81877	25.29701	0.409232	-0.13447	105.058	72.43455	72.45911	72.83417	72.05949		
	B656		0 M Tump-	51.81269	23.64451	0.385808	7.10E-02	100.006	69.49549	69.10323	69.72684	68.87188		
			1.5 M Lap	6.591964	1.423751	6.08E-02	26.6931	10.1884	35.86541	-20.2284	16.29064	-0.65359		
			3 M Lap	-78.8041	-29.797	-0.2643	53.31515	-142.24	-45.6187	-157.414	-84.9996	-118.033		
	B657		0 M Lap	-78.0233	-29.0565	-0.50378	-53.2967	-140.118	-156.35	-44.1098	-117.548	-82.9126		
			1.5 M Lap	6.980035	1.791566	-6.02E-02	-26.6756	11.2425	-19.5706	36.48606	-8.25E-03	16.9237		
			3 M Tump-	51.80805	23.63966	0.383474	-0.05447	99.9931	69.35503	69.22784	69.67692	68.90595		
	B658		0 M Tump-	51.88813	23.70313	0.38639	5.95E-02	100.191	69.5997	69.23132	69.83996	68.99106		
			1.5 M Lap	7.12682	1.858991	0.058053	26.67336	11.5266	36.67964	-19.371	17.11739	0.191263		
			3 M Lap	-77.8098	-28.9852	-0.27028	53.28721	-139.748	-44.0945	-155.827	-83.4593	-116.463		
	B659		0 M Lap	-79.0056	-29.8548	-0.49602	-53.2935	-142.574	-157.879	-45.65	-119.073	-84.4561		
			1.5 M Lap	6.530039	1.425481	-5.58E-02	-26.68	10.1168	-20.2769	35.78611	-0.70814	16.21733		
			3 M Tump-	51.89036	23.70578	0.384495	-6.64E-02	100.198	69.47088	69.36815	69.80231	69.03672		
	B660		0 M Tump-	53.83087	25.30542	0.414326	0.138996	105.086	72.74128	72.18836	72.94365	71.98599		
			1.5 M Lap	7.285117	2.070288	4.72E-02	26.66027	12.0546	36.96179	-19.0545	17.40115	0.506162		
			3 M Lap	-79.4359	-30.1648	-0.32003	53.18154	-143.587	-46.6718	-158.151	-85.9954	-118.828		
	B661		0 M Lap	-73.4729	-25.4952	-0.39826	-53.0407	-128.96	-149.027	-37.3904	-110.335	-76.0826		
			1.5 M Lap	10.26268	4.403167	7.07E-03	-26.5138	19.3603	-14.2874	41.38705	5.205399	21.89422		
			3 M Tump-	53.82295	25.30157	0.412399	1.31E-02	105.07	72.59776	72.31041	72.89124	72.01694		

PORTAL A-AS₁ Y₁

BALOK LANTAI 1

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0	M _{Tump}	-44.3892	-2.79313	-0.10193	-52.8688	-57.736	-103.913	7.175982	-65.129	-31.6076	
	B662		3	M _{Lap}	16.87818	-2.99047	-3.78E-02	1.90E-03	15.4691	15.8282	15.84799	15.79906	15.87714	
			6	M _{Tump}	-44.7557	-3.18781	2.64E-02	52.87257	-58.8073	6.522705	-104.526	-32.3192	-65.6844	
	B663		0	M _{Tump}	53.93569	25.39384	0.410824	-1.15E-02	105.353	72.74795	72.51323	73.05834	72.20284	
			1.5	M _{Lap}	10.52265	4.591449	7.27E-02	26.50701	19.9735	41.79668	-13.9139	22.36748	5.515311	
			3	M _{Lap}	-73.0657	-25.2109	-0.26535	53.02551	-128.016	-37.0087	-148.195	-76.1775	-109.026	
	B664		0	M _{Lap}	-79.9366	-30.525	-0.44413	-53.1563	-144.764	-159.118	47.2102	-120.375	-85.9537	
			1.5	M _{Lap}	7.088831	1.935201	-1.68E-02	-26.6471	11.6029	-19.3222	36.64714	0.251037	17.07386	
			3	M _{Tump}	53.93899	25.39542	0.410629	-0.13779	105.359	72.61972	72.65039	73.02281	72.2473	
	B665		0	M _{Tump}	52.22541	23.97124	0.371776	6.96E-02	101.024	70.12874	69.74838	70.35084	69.52627	
			1.5	M _{Lap}	6.706271	1.541861	7.28E-03	26.66406	10.5145	36.01251	-19.9866	16.41978	-0.39387	
			3	M _{Lap}	-78.9882	-29.8875	-0.35721	53.25852	-142.606	-45.9578	-157.576	-85.3654	-118.168	
	B666		0	M _{Lap}	-78.5634	-29.5499	-0.37746	-53.2451	-141.556	-157.134	45.0818	-118.277	-83.9395	
			1.5	M _{Lap}	6.918986	1.710889	-2.95E-03	-26.6512	11.0402	-19.6419	36.32746	-5.54E-02	16.74102	
			3	M _{Tump}	52.22604	23.97172	0.371556	-5.73E-02	101.026	69.99645	69.88261	70.31162	69.56743	
	B667		0	M _{Tump}	-78.5634	-29.5499	-0.37746	53.24508	-141.556	45.3196	-156.896	-84.7322	-117.484	
			1.5	M _{Lap}	6.918986	1.710889	-2.95E-03	26.65117	11.0402	36.3256	-19.64	16.73481	-4.92E-02	
			3	M _{Lap}	52.22604	23.97172	0.371556	5.73E-02	101.026	70.11669	69.76237	70.3477	69.53136	
	B668		0	M _{Lap}	52.22541	23.97124	0.371776	-6.96E-02	101.024	69.9826	69.89452	70.307	69.57011	
			1.5	M _{Lap}	6.706271	1.541861	7.28E-03	-26.6641	10.5145	-19.982	36.00792	-0.37857	16.40449	
			3	M _{Tump}	-78.9882	-29.8875	-0.35721	-53.2585	-142.606	-157.801	-45.7328	-118.918	-84.6152	
	B669		0	M _{Tump}	-79.9366	-30.525	-0.44413	53.15633	-144.764	-47.49	-158.838	-86.8863	-119.442	
			1.5	M _{Lap}	7.088831	1.935201	-1.68E-02	26.64706	11.6029	36.63659	-19.3117	17.03869	0.286213	
			3	M _{Lap}	53.93899	25.39542	0.410629	0.13779	105.359	72.90908	72.36103	73.10962	72.16049	

PORTAL A-AS Y1

BALOK LANTAI 1

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B654	0 M _{Tump-}	53.83527	25.31134	0.411481	-9.81E-03	105.1	72.5925	72.35387	72.90215	72.04422		
			1.5 M _{Lap}	10.5796	4.630775	0.11554	26.54048	20.1048	41.92987	-13.8779	22.50754	5.544404		
			3 M _{Lap}	-72.8514	-25.0498	-0.1804	53.09077	-127.501	-36.5868	-147.964	-75.7412	-108.809		
		B655	0 M _{Tump-}	-80.0546	-30.6067	-0.54468	-53.2209	-145.036	-159.393	-47.2861	-120.676	-86.0031		
			1.5 M _{Lap}	6.96972	1.845153	-0.06773	-26.6777	11.3159	-19.5522	36.51354	6.07E-03	16.95523		
			3 M _{Tump-}	53.81877	25.29701	0.409232	-0.13447	105.058	72.43455	72.45911	72.83417	72.05949		
		B656	0 M _{Tump-}	51.81269	23.64451	0.385808	7.10E-02	100.006	69.49549	69.10323	69.72684	68.87188		
			1.5 M _{Lap}	6.591964	1.423751	6.08E-02	26.6931	10.1884	35.86541	-20.2284	16.29064	-0.65359		
			3 M _{Lap}	-78.8041	-29.797	-0.2643	53.31515	-142.24	-45.6187	-157.414	-84.9996	-118.033		
		B657	0 M _{Lap}	-78.0233	-29.0565	-0.50378	-53.2967	-140.118	-156.35	-44.1098	-117.548	-82.9126		
			1.5 M _{Lap}	6.980035	1.791566	-6.02E-02	-26.6756	11.2425	-19.5706	36.48606	-8.25E-03	16.9237		
			3 M _{Tump-}	51.80805	23.63966	0.383474	-0.05447	99.9931	69.35503	69.22784	69.67692	68.90595		
		B658	0 M _{Tump-}	51.88813	23.70313	0.38639	5.95E-02	100.191	69.5997	69.23132	69.83996	68.99106		
			1.5 M _{Lap}	7.12682	1.858991	0.058053	26.67336	11.5266	36.67964	-19.371	17.11739	0.191263		
			3 M _{Lap}	-77.8098	-28.9852	-0.27028	53.28721	-139.748	-44.0945	-155.827	-83.4593	-116.463		
		B659	0 M _{Lap}	-79.0056	-29.8548	-0.49602	-53.2935	-142.574	-157.879	-45.65	-119.073	-84.4561		
			1.5 M _{Lap}	6.530039	1.425481	-5.58E-02	-26.68	10.1168	-20.2769	35.78611	-0.70814	16.21733		
			3 M _{Tump-}	51.89036	23.70578	0.384495	-6.64E-02	100.198	69.47088	69.36815	69.80231	69.03672		
		B660	0 M _{Tump-}	53.83087	25.30542	0.414326	0.138996	105.086	72.74128	72.18836	72.94365	71.98599		
			1.5 M _{Lap}	7.285117	2.070288	4.72E-02	26.66027	12.0546	36.96179	-19.0545	17.40115	0.506162		
			3 M _{Lap}	-79.4359	-30.1648	-0.32003	53.18154	-143.587	-46.6718	-158.151	-85.9954	-118.828		
		B661	0 M _{Lap}	-73.4729	-25.4952	-0.39826	-53.0407	-128.96	-149.027	-37.3904	-110.335	-76.0826		
			1.5 M _{Lap}	10.26268	4.403167	7.07E-03	-26.5138	19.3603	-14.2874	41.38705	5.205399	21.89422		
			3 M _{Tump-}	53.82295	25.30157	0.412399	1.31E-02	105.07	72.59776	72.31041	72.89124	72.01694		

No	Portal	Balok	Jarak (m)	Ltk momen	M _L (kNm)	M _L (kNm)	Beban Gempa		Mu _j (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0	M _{Lap}	73.4037	32.22535	0.418948	12.34199	139.651	110.4722	84.29005	101.7087	93.05348	
	B636		1.37585	M _{Lap}	87.19024	32.61613	0.87953	-3.98878	156.814	108.1867	116.0091	111.765	112.4309	
			2.7517	M _{Lap}	67.62961	26.06175	1.340112	20.31956	123.094	109.3977	65.89232	95.44777	79.33221	
	B637		1.37815	M _{Lap}	68.61338	26.28102	1.316095	-19.3768	124.386	68.67054	108.5327	83.87982	93.3234	
			2.7517	M _{Tump.}	-14.2032	-7.33083	0.262534	-34.8171	-28.7731	-56.007	16.94351	-30.2235	-8.34001	
					-123.835	-46.5888	-0.79103	-50.2574	-229.204	-217.699	-111.661	-181.342	-148.018	

Keterangan:

- {1} Nomor
- {2} Portal yang ditinjau
- {3} Nomor Elemen Balok
- {4} Jarak Elemen Balok (m)
- {5} Letak/daerah Momen
- {6} M_D Momen yang terjadi akibat beban mati
- {7} M_L Momen yang terjadi akibat beban hidup
- {8} E_Y Momen yang terjadi akibat Gempa arah Y
- {9} E_X Momen yang terjadi akibat Gempa arah X
- {10} Mu_j = 1,2 M_D + 1,5 M_L
- {11} Mu₂ = 1,05 M_D + 0,63 M_L + 1,05 E_X + 0,315E_Y
- {12} Mu₃ = 1,05 M_D + 0,63 M_L - 1,05 E_X - 0,315E_Y
- {13} Mu₄ = 1,05 M_D + 0,63 M_L + 1,05 E_Y + 0,315E_X
- {14} Mu₅ = 1,05 M_D + 0,63 M_L - 1,05 E_Y - 0,315E_X
- {15} Keterangan Balok

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B353	0 1.3782 2.7517	0 M Tump- M Lap M Lap	62.98248 -17.8562 -128.185	25.36599 -8.89696 -48.806	0.765373 0.575748 0.386122	-20.4314 -36.5409 -52.6505	116.1646 -35.6625 -231.912	60.90032 -62.5407 -220.504	103.324 13.83258 -110.181	76.47993 -35.2599 -181.522	87.74441 -13.4482 -149.163	
		B352	0 1.3759 2.7517	0 M Lap M Lap M Lap	70.45273 81.74019 62.25168	32.26419 32.18722 25.16509	2.16E-02 0.409212 0.796866	12.97368 4.22588 21.42545	136.166 149.5878 114.9662	107.931 101.7969 103.966	80.67264 110.4134 58.47053	98.41115 105.2037 88.804	90.19245 107.0066 73.63254	
		B351	0 1.4242 2.8483	0 M Lap M Lap M Tump-	-143.43 -19.3928 71.39478	-56.9767 -8.30055 32.67272	-1.04365 -0.51352 1.66E-02	49.3087 31.19043 13.07216	-263.278 -36.5522 137.9501	-135.051 6.996452 109.2793	-237.942 -58.1799 81.81733	-172.06 -16.306 99.68351	-200.933 -34.8775 91.41315	
		B350	0 1.5 3 0 1.5 3	0 M Tump- M Lap M Lap M Lap M Lap M Tump-	45.60037 0.679633 -81.6039 -73.9419 4.479997 45.53905	21.96345 -0.59155 -32.1466 -29.1744 0.87256 21.91952	0.137041 0.347913 0.558785 -0.79603 -0.3338 0.128431	-0.53842 -28.8755 -57.2125 56.32011 27.95905 -0.402	89.86196 -0.13092 -149.359 -135.409 6.772093 89.7181	61.19519 -29.8687 -165.834 -37.1335 34.50557 61.24366	62.23953 30.55057 -46.0393 -154.904 -23.9982 62.00694	61.69165 -8.38952 -123.372 -79.1138 13.71032 61.63352	61.74307 9.071397 -88.5012 -112.924 -3.2029 61.61708	
		B349	0 1.5 3	0 M Lap M Lap M Tump-	51.61604 7.322632 -74.3336	25.33371 2.398396 -29.5369	0.147485 0.289766 0.432046	-0.15593 -28.0137 -55.8716	102.4732 12.62459 -136.459	70.03982 -20.1234 -155.188	70.27435 38.5229 -38.1295	70.26283 0.67968 -113.804	70.05134 17.71983 -79.5126	
		B348	0 1.5 3	0 M Lap M Lap M Lap	8.897118 51.58786 -41.591	3.777014 25.32094 -3.35508	-0.24845 0.140624 -0.44613	27.83214 -2.37E-02 55.36328	16.71976 102.4189 -55.2773	40.86698 70.13881 12.2067	-17.424 70.10006 -103.775	20.22775 70.25962 -28.8132	3.215237 69.97926 -62.7552	
		B346	0 3 6	0 M Tump- M Lap M Tump-	15.43236 -39.1956	-2.69247 -2.02985	4.59E-03 0.455314	-2.50E-02 -55.4133	14.21089 -50.2824	14.48289 -100.475	14.53256 15.60644	14.50466 -59.4113	14.51079 -25.457	

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BALOK LANTAI 2

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B345	0 1.5 3	M Lap M Lap M Lap	50.98215 9.42595 -69.4931	24.85377 3.924411 -26.005	0.141535 0.209122 0.276708	-1.31E-02 -27.7485 -55.4838	100.9446 17.5902 -125	69.21994 -16.7004 -147.522	69.15833 41.43964 -31.18	69.33361 3.848437 -106.538	69.04466 20.89082 -72.164	
		B344	0 1.5 3	M Lap M Lap M Lap	-75.2861 6.491949 50.90713	-29.7782 2.011175 24.80057	-0.48867 -0.17585 0.13697	55.58437 27.85291 0.121462	-137.988 11.00822 100.7695	-39.601 37.27375 69.24752	-156.02 -21.1066 68.90616	-80.8147 16.67261 69.25892	-114.807 -0.50544 68.89476	
		B343	0 1.5 3	M Tump- M Tump- M Lap	49.95828 6.520843 -74.2794	23.96979 1.636282 -29.6972	0.135485 0.168857 0.202229	-8.65E-02 -27.8487 -55.6109	98.3016 10.44306 -136.651	67.50898 -21.3102 -155.03	67.60534 37.0657 -38.3749	67.67216 -0.7173 -114.008	67.44216 16.47279 -79.3975	
		B342	0 1.5 3	M Lap M Lap M Lap	-74.3395 6.483571 49.94378	-29.2046 1.877618 23.95984	-0.42311 -0.14562 0.131876	55.57112 27.81014 4.92E-02	-135.935 10.78447 98.26828	-38.2389 37.14543 67.62883	-154.672 -21.1641 67.44251	-79.3947 16.59794 67.68962	-113.516 -0.61665 67.38171	
		B341	0 1.5 3	M Tump- M Tump- M Lap	49.50215 6.921636 -73.0217	23.62574 1.988442 -28.6489	0.133903 0.133506 0.133109	-7.49E-02 -27.799 -55.5231	97.20377 11.48747 -133.464	66.82499 -20.6265 -152.979	66.89796 37.66736 -36.4642	66.97848 -9.61E-02 -112.072	66.74448 17.13695 -77.3715	
		B340	0 1.5 3	M Lap M Lap M Lap	-74.7452 6.052438 49.48729	-29.5882 1.516014 23.6202	-0.35599 -0.11239 0.131205	55.50865 27.78504 6.14E-02	-137.035 9.688548 97.17706	-38.9511 36.44903 66.9482	-155.295 -21.8287 66.73655	-80.0116 15.94443 66.99949	-114.234 -1.32413 66.68526	
		B339	0 1.5 3	M Tump- M Tump- M Lap	50.98591 7.582124 -73.1845	24.8526 2.685069 -28.4825	0.138423 0.106747 7.51E-02	-0.14878 -27.7664 -55.384	100.9473 13.39466 -133.393	69.07973 -19.4683 -152.917	69.30496 38.77393 -36.6581	69.29083 1.018488 -112.155	69.09387 18.28716 -77.4205	
		B338	0 1.5 3	M Tump- M Lap M Lap	-71.5211 8.405811 50.96995	-27.2555 3.294544 24.84456	-0.28985 -7.67E-02 0.136444	55.22709 27.60744 -1.22E-02	-129.434 15.35824 100.9152	-34.371 39.86531 69.20067	-150.165 -18.062 69.14036	-75.176 19.51747 69.30993	-109.36 2.28586 69.0311	

PORTAL A-AS_Y1

BALOK LANTAI 2

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B337	0	M Lap	-40.041	-2.25385	-0.13045	54.98825	-51.6553	14.23363	-101.16	-26.2786	-60.6473	
			3	M Lap	15.40585	-2.72117	1.66E-04	-5.89E-03	14.13314	14.45567	14.46794	14.46012	14.46348	
			6	M Lap	-40.7986	-3.18849	0.130786	-55	-54.0599	-102.556	12.86157	-62.035	-27.6596	
		B336	0	M Lap	51.13732	24.98294	0.134698	4.54E-04	101.3375	69.47634	69.39052	69.57501	69.29185	
			1.5	M Tump.	9.070775	3.732459	5.74E-02	-27.5855	16.85686	-17.0709	40.82246	3.24659	20.50494	
			3	M Tump.	-70.3586	-26.518	-1.99E-02	-55.1714	-126.859	-148.519	-32.6466	-107.983	-73.1829	
		B335	0	M Lap	-74.3733	-29.2198	-0.18693	55.30332	-136	-38.4909	-154.51	-79.2762	-113.725	
			1.5	M Lap	7.05793	2.377932	-0.02651	27.72046	12.27421	38.00706	-20.1892	17.61303	0.204816	
			3	M Lap	51.12638	24.97567	0.133905	0.137602	101.3127	69.60403	69.2307	69.60131	69.23342	
		B334	0	M Lap	49.57739	23.6787	9.38E-02	-7.41E-02	97.37879	66.92562	67.02206	67.04903	66.89865	
			1.5	M Tump.	6.527274	1.774722	2.20E-02	-27.7287	10.67228	-21.1365	37.07993	-0.7397	16.68313	
			3	M Tump.	-73.8857	-29.1293	-4.98E-02	-55.3834	-135.27	-154.1	-37.7632	-113.429	-78.4334	
		B333	0	M Lap	-74.1345	-29.3263	-0.10784	55.37166	-135.884	-38.2106	-154.423	-78.988	-113.646	
			1.5	M Lap	6.400887	1.674798	-7.09E-03	27.71756	10.36074	36.87726	-21.3252	16.49964	-0.94753	
			3	M Lap	49.5735	23.67591	9.36E-02	6.36E-02	97.36967	67.06415	66.87186	67.08633	66.84968	
		B332	0	M Lap	-74.1345	-29.3263	-0.10784	-55.3717	-135.884	-154.491	-38.1426	-113.872	-78.7616	
			1.5	M Tump.	6.400887	1.674798	-7.09E-03	-27.7176	10.36074	-21.3296	36.88173	-0.96243	16.51454	
			3	M Tump.	49.5735	23.67591	9.36E-02	-6.35E-02	97.36967	66.93086	67.00515	67.04634	66.88967	
		B331	0	M Lap	49.57739	23.6787	9.38E-02	7.41E-02	97.37879	67.08117	66.86651	67.09569	66.85199	
			1.5	M Tump.	6.527274	1.774722	2.20E-02	27.72872	10.67228	37.09381	-21.1504	16.72939	-0.78597	
			3	M Lap	-73.8857	-29.1293	-4.98E-02	55.38337	-135.27	-37.7945	-154.068	-78.5379	-113.325	
		B330	0	M Lap	-74.3733	-29.2198	-0.18693	-55.3033	-136	-154.628	-38.3731	-114.117	-78.8837	
			1.5	M Lap	7.05793	2.377932	-2.65E-02	-27.7205	12.27421	-20.2059	38.02376	0.149139	17.66871	
			3	M Lap	51.12638	24.97567	0.133905	-0.1376	101.3127	69.31506	69.51967	69.51462	69.32011	

PORTAL A-AS_Y1

BALOK LANTAI 2

No {1}	Portal {2}	Balok {3}	Jarak (m) {4}	Ltk momen {5}	D _L (kNm) {6}	L _L (kNm) {7}	Beban Gempa		Mu ₁ (kNm) {10}	Mu ₂ (kNm) {11}	Mu ₃ (kNm) {12}	Mu ₄ (kNm) {13}	Mu ₅ (kNm) {14}	Ket {15}
							Ey {8}	Ex {9}						
		B329	0 1.5 3	M Lap M Lap M Tump-	51.13732 9.070775 -70.3586	24.98294 3.732459 -26.518	0.134698 0.057389 -0.01992	-4.54E-04 27.5855 55.17144	101.3375 16.85686 -126.859	69.47538 40.85861 -32.6591	69.39148 -17.1071 -148.507	69.57472 20.62545 -73.2248	69.29214 3.126074 -107.941	
		B328	0 3 6	M Tump- M Tump- M Lap	-40.041 15.40585 -40.7986	-2.25385 -2.72117 -3.18849	-0.13045 1.66E-04 0.130786	-54.9883 5.89E-03 55.00004	-51.6553 14.13314 -54.0599	-101.242 14.46804 12.94396	14.31581 14.45556 -102.639	-60.9212 14.46383 -27.3849	-26.0047 14.45977 -62.3096	
		B327	0 1.5 3	M Lap M Lap M Tump-	-71.5211 8.405811 50.96995	-27.2555 3.294544 24.84456	-0.28985 -7.67E-02 0.136444	-55.2271 -27.6074 1.22E-02	-129.434 15.35824 100.9152	-150.348 -18.1103 69.22632	-34.1884 39.91363 69.11471	-109.969 2.124783 69.31763	-74.5673 19.67855 69.0234	
		B326	0 1.5 3	M Tump- M Lap M Lap	50.98591 7.582124 -73.1845	24.8526 2.685069 -28.4825	0.138423 0.106747 7.51E-02	0.148778 27.76641 55.38405	100.9473 13.39466 -133.393	69.39217 38.84118 -36.6108	68.99253 -19.5355 -152.965	69.38456 18.51133 -77.2629	69.00014 0.79432 -112.312	
		B325	0 1.5 3	M Lap M Lap M Tump-	-74.7452 6.052438 49.48729	-29.5882 1.516014 23.6202	-0.35599 -0.11239 0.131205	-55.5086 -27.785 -0.06142	-137.035 9.688548 97.17706	-155.519 -21.8995 66.81921	-38.7268 36.51984 66.86554	-114.982 -1.56015 66.96079	-79.264 16.18044 66.72396	
		B324	0 1.5 3	M Tump- M Lap M Tump-	6.921636 -73.0217 -74.3395	1.988442 -28.6489 -29.2046	0.133506 0.133109 -0.42311	27.79903 55.52314 -55.5711	11.48747 -133.464 -135.935	37.75147 -36.3803 -154.938	-20.7106 -153.063 -37.9724	17.41731 -77.092 -114.404	-0.37644 -112.351 -78.5062	
		B323	0 1.5 3	M Lap M Lap M Lap	6.483571 49.94378 49.95828	1.877618 23.95984 23.96979	-0.14562 0.131876 0.135485	-27.8101 -4.92E-02 8.65E-02	10.78447 98.26828 98.3016	-21.2559 67.52559 67.6907	37.23717 67.54574 67.42362	-0.92244 67.65865 67.72668	16.90374 67.41268 67.38764	
		B322	0 1.5 3	M Lap M Lap M Lap	6.520843 -74.2794	1.636282 -29.6972	0.168857 0.202229	27.84871 55.61088	10.44306 -136.651	37.17207 -38.2475	-21.4166 -155.158	16.82739 -78.9729	-1.0719 -114.432	

PORTAL A-A5_Y1

BALOK LANTAI 2

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B321	0 1.5 3	0 M Tump- M Tump- M Lap	-75.2861 6.491949 50.90713	-29.7782 2.011175 24.80057	-0.48867 -0.17585 0.13697	-55.5844 -27.8529 -0.12146	-137.988 11.00822 100.7695	-156.328 -21.2174 68.99245	-39.2931 37.38454 69.16123	-115.833 -0.87473 69.1824	-79.7884 17.0419 68.97129	
		B320	0 1.5 3	0 M Lap M Lap M Lap	50.98215 9.42595 -69.4931	24.85377 3.924411 -26.005	0.141535 0.209122 0.276708	1.31E-02 27.74847 55.48382	100.9446 17.5902 -125	69.2475 41.57139 -31.0057	69.13078 -16.8321 -147.696	69.34188 21.32997 -71.5829	69.03639 3.409281 -107.119	
		B319	0 1.5 3 6	0 M Tump- M Tump- M Lap M Lap	-41.591 15.43236 -39.1956 -71.1564	-3.35508 -2.69247 -2.02985 -26.7669	-0.44613 4.59E-03 0.455314 -0.63751	-55.3633 0.025031 55.41335 -55.688	-55.2773 14.21089 -50.2824 -128.215	-104.056 14.53546 15.89329 -150.251	12.48776 14.48 -100.762 -32.9042	-63.6921 14.52043 -24.5009 -109.789	-27.8763 14.49502 -60.3674 -73.3663	
		B318	1.5 3	M Lap M Lap	8.897118 51.58786	3.777014 25.32094	-0.24845 0.140624	-27.8321 2.37E-02	16.71976 102.4189	-17.5805 70.18865	41.0235 70.05022	2.693502 70.27457	20.74948 69.96431	
		B317	0 1.5 3	0 M Tump- M Tump- M Lap	51.61604 7.322632 -74.3336	25.33371 2.398396 -29.5369	0.147485 0.289766 0.432046	0.155925 28.01374 55.87155	102.4732 12.62459 -136.459	70.36726 38.70546 -37.8573	69.9469 -20.3059 -155.46	70.36106 18.32833 -78.6053	69.95311 7.12E-02 -114.712	
		B316	0 1.5 3	0 M Tump- M Lap M Lap	-73.9419 4.479997 45.53905	-29.1744 0.87256 21.91952	-0.79603 -0.3338 0.128431	-56.3201 -27.9591 0.401996	-135.409 6.772093 89.7181	-155.406 -24.2084 62.08785	-36.632 34.71586 61.16275	-114.595 -3.90388 61.88678	-77.4422 14.4113 61.36382	
		B315	0 1.5 3	0 M Lap M Lap M Tump-	45.60037 0.679633 -81.6039	21.96345 -0.59155 -32.1466	0.137041 0.347913 0.558785	0.538417 28.87545 57.21249	89.86196 -0.13092 -149.359	62.32586 30.76976 -45.6873	61.10885 -30.0879 -166.186	62.03085 9.802014 -87.3278	61.40386 -9.12014 -124.545	
		B314	0 1.4242 2.8483	0 M Tump- M Lap M Lap	-143.43 -19.3928 71.39478	-56.9767 -8.30055 32.67272	-1.04365 -0.51352 1.66E-02	-49.3087 -31.1904 -13.0722	-263.278 -36.5522 137.9501	-238.599 -58.5035 81.82779	-134.393 7.319967 109.2689	-203.124 -35.9559 91.44804	-169.868 -15.2276 99.64862	

PORTAL A-AS_Y1

BALOK LANTAI 2

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B312	1.3759	M _{Lap}	81.74019	32.18722	0.409212	4.225884	149.5878	110.6712	101.5391	107.866	104.3443	
			2.7517	M _{Lap}	62.25168	25.16509	0.796866	21.42545	114.9662	103.966	58.47053	88.804	73.63254	
			0	M _{Lap}	62.98248	25.36599	0.765373	20.43138	116.1646	103.8062	60.41813	89.3517	74.87265	

Keterangan:

- {1} Nomor
- {2} Portal yang ditinjau
- {3} Nomor Elemen Balok
- {4} Jarak Elemen Balok (m)
- {5} Letak/daerah Momen
- {6} M_b Momen yang terjadi akibat beban mati
- {7} M_L Momen yang terjadi akibat beban hidup
- {8} E_y Momen yang terjadi akibat Gempa arah Y
- {9} E_x Momen yang terjadi akibat Gempa arah X
- {10} Mu₁ = 1,2 M_b + 1,6 M_L
- {11} Mu₂ = 1,05 M_b + 0,63 M_L + 1,05 E_x + 0,315E_y
- {12} Mu₃ = 1,05 M_b + 0,63 M_L - 1,05 E_x - 0,315E_y
- {13} Mu₄ = 1,05 M_b + 0,63 M_L + 1,05 E_y + 0,315E_x
- {14} Mu₅ = 1,05 M_b + 0,63 M_L - 1,05 E_y - 0,315E_x
- {15} Keterangan Balok

No	Portal	Balok	Jarak (m)	Titik moment	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B162	0 1.37815 2.7517	0 M _{Tump.} M _{Lap} M _{Lap}	65.41047 -19.8546 -134.61	26.86628 -9.51139 -51.5351	0.192115 0.264803 0.337491	-13.9064 -25.1502 -36.394	121.4786 -39.0437 -243.988	71.06554 -53.1638 -211.915	100.148 -0.51515 -135.7	81.42795 -34.4837 -184.917	89.78554 -19.1952 -162.698	
		B161	0 1.37585 2.7517	0 M _{Lap} M _{Lap} M _{Lap}	76.0899 86.29327 65.72066	34.84321 34.49124 27.19411	-7.16E-02 8.69E-02 0.245416	9.223716 -2.66783 14.55939	147.057 158.7379 122.3754	111.508 109.5636 101.5036	92.18325 115.1113 70.77433	104.676 111.5883 90.98288	99.01528 113.0865 81.29509	
		B160	0 1.42415 2.8483	0 M _{Lap} M _{Lap} M _{Tump.}	-151.161 -20.5426 76.82686	-60.6689 -8.90754 35.15101	-0.6465 -0.36679 -8.71E-02	34.38914 21.81322 9.237302	-278.464 -38.9032 148.4338	-161.036 -4.39312 112.4851	-232.846 -49.9698 93.1416	-186.787 -20.6954 105.6317	-207.094 -33.6675 99.99502	
		B159	0 1.5 3	0 M _{Tump.} M _{Lap} M _{Lap}	47.93216 2.044288 -81.2064	22.7195 -0.14118 -32.0018	8.12E-02 0.455595 0.829941	-0.34272 -20.3972 -40.4517	93.86978 2.227265 -148.651	64.30778 -19.216 -147.641	64.97631 23.33113 -63.215	64.6194 -3.88919 -117.299	64.66469 8.004311 -93.557	
		B158	0 1.5 3	0 M _{Lap} M _{Lap} M _{Tump.}	-79.775 2.719027 47.85022	-31.4323 0.114035 22.66042	-0.7293 -0.3263 7.67E-02	39.70823 19.67536 -0.35751	-146.022 3.445289 93.67693	-62.1022 23.48317 64.16757	-145.03 -17.6295 64.87002	-91.8238 8.781945 64.48671	-115.308 -2.9283 64.55088	
		B157	0 1.5 3	0 M _{Tump.} M _{Lap} M _{Lap}	56.90834 8.050329 -78.1705	28.42852 2.756174 -31.9162	2.95E-02 0.250262 0.470991	-5.73E-02 -19.8302 -39.6031	113.7756 14.07027 -144.87	77.61282 -10.5537 -143.621	77.71462 30.93212 -60.7513	77.67667 4.205494 -114.167	77.65077 16.17298 -90.2058	
		B156	0 1.5 3	0 M _{Lap} M _{Lap} M _{Tump.}	-75.8145 9.197334 56.84639	-29.0488 4.171413 28.3916	-0.51646 -0.24588 0.024708	39.47896 19.70115 -0.07666	-137.455 17.71106 113.6422	-56.6158 32.89395 77.5027	-139.196 -8.32357 77.64812	-86.0124 18.23288 77.57721	-109.8 6.3375 77.57362	
		B155	0 3 6	0 M _{Tump.} M _{Lap} M _{Tump.}	-43.4192 14.72011 -38.7918	-4.3479 -3.22999 -2.11208	-0.40297 1.79E-02 0.438812	39.17665 -2.18E-02 -39.2202	-59.0597 12.49615 -49.9295	-7.32081 13.40402 -83.105	-89.3379 13.43842 -1.01907	-36.4118 13.43318 -53.9556	-60.2469 13.40926 -30.1684	

PORTAL A-AS₁ Y1

BALOK LANTAI 3

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0	M _{Tump-}	53.74037	25.96839	3.51E-02	3.61E-02	106.0379	72.83638	72.73856	72.83564	72.7393	
		B154	1.5	M _{Lap}	10.55472	4.538198	0.178031	-19.632	19.92678	-6.61597	34.49901	7.944384	19.93866	
			3	M _{Lap}	-69.9937	-25.892	0.321004	-39.3	-125.42	-130.969	-48.6415	-101.848	-77.7629	
		B153	0	M _{Lap}	-78.8433	-31.0632	-0.35421	39.34766	-144.313	-61.1519	-143.559	-90.3328	-114.378	
			1.5	M _{Lap}	6.09826	1.931612	-0.16124	19.68338	10.41037	28.23849	-12.995	13.65269	1.590774	
			3	M _{Lap}	53.68018	25.92645	0.031725	1.91E-02	105.8985	72.72792	72.6678	72.73719	72.65853	
		B152	0	M _{Lap}	54.76509	26.68916	3.42E-02	-8.80E-03	108.4208	74.31905	74.31597	74.35066	74.28436	
			1.5	M _{Lap}	6.698658	1.577928	0.159042	-19.6672	10.56307	-12.5727	28.6281	1.999524	14.05585	
			3	M _{Tump-}	-78.7306	-32.5333	0.283873	-39.3255	-146.53	-144.365	-61.9607	-115.253	-91.0736	
		B151	0	M _{Tump-}	-79.323	-31.7438	-0.30492	39.29228	-145.978	-62.1269	-144.449	-91.2308	-115.345	
			1.5	M _{Lap}	6.379078	1.954552	-0.13646	19.63457	10.78218	28.50271	-12.6439	13.97101	1.887791	
			3	M _{Lap}	54.71834	26.65291	3.20E-02	-0.02314	108.3067	74.23138	74.2598	74.27191	74.21927	
		B150	0	M _{Lap}	54.06229	26.12644	3.30E-02	-1.84E-03	106.6771	73.23355	73.21658	73.25919	73.19094	
			1.5	M _{Lap}	7.327236	2.196485	0.123719	-19.624	12.30706	-11.4888	29.64359	3.025737	15.12903	
			3	M _{Tump-}	-76.7706	-30.7335	0.214388	-39.2461	-141.298	-141.112	-58.8304	-112.109	-87.8338	
		B149	0	M _{Tump-}	-79.9679	-32.4564	-0.23721	39.22829	-147.892	-63.2988	-145.529	-92.306	-116.522	
			1.5	M _{Lap}	5.732793	1.339488	-0.10291	19.60639	9.022534	27.4176	-13.691	12.93126	0.795357	
			3	M _{Lap}	54.07065	26.13538	3.14E-02	-1.55E-02	106.7014	73.23307	73.24587	73.26753	73.21141	
		B148	0	M _{Lap}	53.72356	25.95524	3.25E-02	-4.49E-02	105.9967	72.7246	72.79847	72.78146	72.74161	
			1.5	M _{Lap}	8.010974	3.00824	0.101779	-19.6011	14.42635	-10.2423	30.85577	4.239245	16.37418	
			3	M _{Tump-}	-75.0644	-28.9388	0.171109	-39.1572	-136.379	-138.11	-55.9879	-109.204	-84.8942	
		B147	0	M _{Tump-}	-73.7116	-27.9694	-0.2065	39.05787	-133.205	-54.0722	-135.964	-82.9315	-107.104	
			1.5	M _{Lap}	8.691067	3.499417	-8.74E-02	19.49902	16.02835	31.77669	-9.11618	17.38065	5.27985	
			3	M _{Tump-}	53.73092	25.96827	3.17E-02	-5.98E-02	106.0263	72.72462	72.83032	72.79187	72.76308	

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BALOK LANTAI 3

No	Portal	Balok	Jarak (m)	Ltk moment	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							E _y	E _x						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B146	0 M _{Tump.}	-40.8561	-2.69484	-2.69484	-0.1099	38.82527	-53.339	-3.86472	-85.3285	-32.4821	-56.7112	
			3 M _{Lap}	14.65111	-3.28755	-3.28755	1.25E-02	-5.85E-03	12.32125	13.31029	13.31473	13.32374	13.30128	
			6 M _{Lap}	-41.493	-3.88027	-3.88027	0.1348	-38.837	-56	-86.7485	-5.27583	-58.1043	-33.9201	
		B145	0 M _{Lap}	56.13042	27.80915	27.80915	3.34E-02	4.78E-02	111.8511	76.51742	76.39598	76.5068	76.40661	
			1.5 M _{Lap}	9.915318	4.259387	4.259387	3.88E-02	-19.4772	18.7134	-7.34433	33.53333	6.99964	19.18903	
			3 M _{Lap}	-73.6626	-28.2904	-28.2904	0.044326	-39.0022	-133.66	-136.107	-54.2303	-107.408	-82.9295	
			0 M _{Lap}	-79.0284	-31.6386	-31.6386	-7.58E-02	39.07731	-145.456	-61.9049	-143.919	-90.6824	-115.142	
		B144	1.5 M _{Lap}	7.218206	2.572997	2.572997	-2.25E-02	19.55544	12.77864	29.72622	-11.326	15.3364	3.063805	
			3 M _{Tump.}	56.10202	27.78457	27.78457	3.07E-02	3.36E-02	111.7777	76.45634	76.36646	76.45425	76.36855	
		B143	0 M _{Tump.}	53.8932	26.01129	26.01129	3.70E-02	3.05E-03	106.2899	72.98983	72.96012	73.01479	72.93516	
			1.5 M _{Lap}	6.424952	1.682574	1.682574	2.25E-02	-19.5506	10.40206	-12.7148	28.32727	1.671389	13.94105	
			3 M _{Lap}	-78.4061	-31.6461	-31.6461	7.96E-03	-39.1043	-144.721	-143.32	-61.2065	-114.573	-89.954	
			0 M _{Lap}	-78.4053	-31.6135	-31.6135	-5.12E-02	39.09664	-144.668	-61.2068	-143.277	-89.9805	-114.504	
		B142	1.5 M _{Lap}	6.424949	1.698424	1.698424	-8.06E-03	19.54356	10.42742	28.33441	-12.702	13.96397	1.668439	
			3 M _{Tump.}	53.89242	26.01036	26.01036	3.51E-02	-9.51E-03	106.2875	72.97464	72.97249	73.00745	72.93968	
			0 M _{Tump.}	-78.4053	-31.6135	-31.6135	-0.05124	-39.0966	-144.668	-143.31	-61.1745	-114.611	-89.8729	
		B141	1.5 M _{Lap}	6.424949	1.698424	1.698424	-8.06E-03	-19.5436	10.42742	-12.7071	28.33948	1.651524	13.98088	
			3 M _{Lap}	53.89242	26.01036	26.01036	3.51E-02	9.51E-03	106.2875	72.99462	72.95251	73.01345	72.93369	
		B140	0 M _{Lap}	53.8932	26.01129	26.01129	3.70E-02	-3.05E-03	106.2899	72.98343	72.96651	73.01287	72.93708	
			1.5 M _{Lap}	6.424952	1.682574	1.682574	2.25E-02	19.5506	10.40206	28.34144	-12.729	13.98827	1.624175	
			3 M _{Tump.}	-78.4061	-31.6461	-31.6461	7.96E-03	39.10425	-144.721	-61.2015	-143.325	-89.9373	-114.59	
			0 M _{Tump.}	-79.0284	-31.6386	-31.6386	-7.58E-02	-39.0773	-145.456	-143.967	-61.8571	-115.301	-90.5232	
		B139	1.5 M _{Lap}	7.218206	2.572997	2.572997	-2.25E-02	-19.5554	12.77864	-11.3402	29.74042	3.016475	15.38373	
			3 M _{Tump.}	56.10202	27.78457	27.78457	3.07E-02	-3.36E-02	111.7777	76.38582	76.43697	76.43309	76.3897	

BALOK LANTAI 3

PORTAL A-AS Y1

No Portal	Balok	Jarak (m)	Ltk moment	DL (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
						Ey	Ex						
{1}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
B138		0 M _{Tump-}	56.13042	27.80915	3.34E-02	-4.78E-02	111.8511	76.417	76.49641	76.47667	76.43673		
		1.5 M _{Lap}	9.915318	4.259387	3.88E-02	19.47721	18.7134	33.5578	7.36881	19.2706	6.91839		
		3 M _{Lap}	-73.6626	-28.2904	4.43E-02	39.00224	-133.66	-54.2024	-136.135	-82.8364	-107.501		
B137		0 M _{Lap}	-40.8561	-2.69484	-0.1099	-38.8253	-53.339	-85.3978	-3.79549	-56.942	-32.2513		
		3 M _{Lap}	14.65111	-3.28755	1.25E-02	5.85E-03	12.32125	13.32257	13.30245	13.32743	13.29759		
		6 M _{Lap}	-41.493	-3.88027	0.1348	38.83696	-56	-5.1909	-86.8334	-33.637	-58.3874		
B136		0 M _{Lap}	-73.7116	-27.9694	-0.2065	-39.0579	-133.205	-136.094	-53.9421	-107.538	-82.4979		
		1.5 M _{Lap}	8.691067	3.499417	-8.74E-02	-19.499	16.02835	-9.17125	31.83176	5.096273	17.56423		
		3 M _{Tump-}	53.73092	25.96827	3.17E-02	5.98E-02	106.0263	72.85027	72.70468	72.82957	72.72538		
B135		0 M _{Tump-}	53.72356	25.95524	3.25E-02	0.044914	105.9967	72.81892	72.70416	72.80976	72.71332		
		1.5 M _{Lap}	8.010974	3.00824	0.101779	19.60107	14.42635	30.9199	-10.3065	16.58792	4.025509		
		3 M _{Lap}	-75.0644	-28.9388	0.171109	39.15722	-136.379	-55.8801	-138.218	-84.5349	-109.563		
B134		0 M _{Lap}	-79.9679	-32.4564	-0.23721	-39.2283	-147.892	-145.678	-63.1494	-117.02	-91.8078		
		1.5 M _{Lap}	5.732793	1.339488	-0.10291	-19.6064	9.022534	-13.7558	27.48244	0.57924	13.14738		
		3 M _{Tump-}	54.07065	26.13538	3.14E-02	1.55E-02	106.7014	73.26564	73.2133	73.27731	73.20163		
B133		0 M _{Tump-}	54.06229	26.12644	3.30E-02	1.84E-03	106.6771	73.23741	73.21273	73.26035	73.18979		
		1.5 M _{Lap}	7.327236	2.196485	0.123719	19.62397	12.30706	29.72153	-11.5668	15.38884	2.765927		
		3 M _{Lap}	-76.7706	-30.7335	0.214388	39.24611	-141.298	-58.6953	-141.247	-87.3836	-112.559		
B132		0 M _{Lap}	-79.323	-31.7438	-0.30492	-39.2923	-145.978	-144.641	-61.9348	-115.985	-90.5905		
		1.5 M _{Lap}	6.379078	1.954552	-0.13646	-19.6346	10.78218	-12.7299	28.58868	1.60123	14.25757		
		3 M _{Tump-}	54.71834	26.65291	3.20E-02	2.31E-02	108.3067	74.27996	74.21121	74.28648	74.20469		
B131		0 M _{Tump-}	54.76509	26.68916	0.03421	8.80E-03	108.4208	74.33753	74.2975	74.35621	74.27882		
		1.5 M _{Lap}	6.698658	1.577928	0.159042	19.66716	10.56307	28.7283	-12.6729	14.38983	1.665536		
		3 M _{Tump-}	-78.7306	-32.5333	0.283873	39.32552	-146.53	-61.7819	-144.544	-90.4775	-115.849		

PORTAL A-AS_Y1

BALOK LANTAI 3

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B130	0 M Tump- 1.5 M Lap 3 M Lap	-78.8433 6.099826 53.68018	-31.0632 1.931612 25.92645	-0.35421 -0.16124 3.17E-02	-39.3477 -19.6834 -1.91E-02	-144.313 10.41037 105.8985	-143.782 -13.0966 72.68779	-60.9287 28.34008 72.70793	-115.122 1.25216 72.72515	-89.5889 13.99131 72.67057		
		B129	0 M Lap 1.5 M Lap 3 M Lap	53.74037 10.55472 -69.9937	25.96639 4.538198 -25.892	3.51E-02 0.178031 0.321004	-0.03606 19.63197 39.3	106.0379 19.92678 -125.42	72.76065 34.61117 -48.4393	72.81429 -6.72812 -131.171	72.81292 20.31252 -77.0888	72.76202 7.570519 -102.522		
		B128	0 M Lap 3 M Lap 6 M Tump- 0 M Tump- 1.5 M Lap 3 M Lap	-43.4192 14.72011 -38.7918 -75.8145 9.197334 56.84639	-4.3479 -3.22999 -2.11208 -29.0488 4.171413 28.3916	-0.40297 0.01792 0.438812 -0.51646 -0.24588 2.47E-02	-39.1767 2.18E-02 39.22017 -39.479 -19.7012 7.67E-02	-59.0597 12.49615 -49.9295 -137.455 17.71106 113.6422	-89.5918 13.44971 -0.74262 -139.522 -8.47847 77.66369	-7.06694 13.39273 -83.3814 -56.2904 33.04885 77.48714	-61.0931 13.44689 -29.2469 -110.884 5.821156 77.6255	-35.5656 13.39555 -54.8771 -84.9278 18.74923 77.52532		
		B126	0 M Lap 1.5 M Lap 3 M Tump- 0 M Tump- 1.5 M Lap 3 M Lap	-78.1705 -79.775 2.719027 47.85022 47.93216	-31.4323 0.114035 22.66042 22.7195 -0.14118	0.470991 -0.7293 -0.3263 7.67E-02 8.12E-02	39.60308 -39.7082 -19.6754 0.35751 0.342723	-144.87 -146.022 3.445289 93.67693 93.86978	-60.4546 -145.489 -17.8351 64.91834 65.0275	-143.918 -61.6427 23.68873 64.11925 64.25659	-89.2167 -116.84 -3.61353 64.71194 64.83532	-115.156 -90.2923 9.467174 64.44878 64.44878		
		B124	1.5 M Lap 3 M Tump- 0 M Tump- 1.42415 M Lap 2.8483 M Lap	2.044288 -81.2064 -151.161 -20.5426 76.82686	-0.14118 -32.0018 -60.6689 -8.90754 35.15101	0.455595 0.829941 -0.6465 -0.36679 -8.71E-02	20.39722 40.45172 -34.3891 -21.8132 -9.2373	2.227265 -148.651 -278.464 -38.9032 148.4338	23.61816 -62.6921 -233.253 -50.2009 93.08674	-19.503 -148.164 -160.628 -4.16204 112.5399	8.961061 -91.8142 -208.452 -34.4378 99.81216	-4.84594 -119.042 -185.429 -19.9252 105.8145		
PORTAL A-AS Y1														
BALOK LANTAI 3														

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0	M _{Lap}	76.0899	34.84321	-7.16E-02	-9.22372	147.057	92.13817	111.5531	98.86501	104.8262	
		B122	1.37585	M _{Lap}	86.29327	34.49124	8.69E-02	2.667835	158.7379	115.166	109.5088	113.2691	111.4058	
			2.7517	M _{Lap}	65.72066	27.19411	0.245416	14.55939	122.3754	101.5036	70.77433	90.98288	81.29509	
		B121	0	M _{Lap}	65.41047	26.86628	0.192115	13.9064	121.4786	100.269	70.94451	90.18899	81.02451	
			1.37815	M _{Lap}	-19.8546	-9.51139	0.264803	25.15021	-39.0437	-0.34832	-53.3306	-18.6391	-35.0398	
			2.7563	M _{Tump.}	-134.61	-51.5351	0.337491	36.39402	-243.988	-135.488	-212.128	-161.989	-185.626	

Keterangan:

- {1} Nomor
- {2} Portal yang ditinjau
- {3} Nomor Elemen Balok
- {4} Jarak Elemen Balok (m)
- {5} Letak/daerah Momen
- {6} M_D Momen yang terjadi akibat beban mati
- {7} M_L Momen yang terjadi akibat beban hidup
- {8} E_y Momen yang terjadi akibat Gempa arah Y
- {9} E_x Momen yang terjadi akibat Gempa arah X
- {10} Mu₁ = 1,2 M_D + 1,6 M_L
- {11} Mu₂ = 1,05 M_D + 0,63 M_L + 1,05 E_x + 0,315E_y
- {12} Mu₃ = 1,05 M_D + 0,63 M_L - 1,05 E_x - 0,315E_y
- {13} Mu₄ = 1,05 M_D + 0,63 M_L + 1,05 E_y + 0,315E_x
- {14} Mu₅ = 1,05 M_D + 0,63 M_L - 1,05 E_y - 0,315E_x
- {15} Keterangan Balok

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa			Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
		B68	0 1.37815 2.7563	0 M Tump- M Lap M Lap	71.66594 -20.8031 -131.136	26.33046 -9.77426 -45.879	2.742562 -0.62197 -3.9865	-5.72189 -12.0672 -18.4126	128.1279 -40.6025 -230.77	86.69335 -40.8675 -187.186	96.9815 -15.1345 -146.008	92.91472 -32.4553 -176.583	90.76013 -23.5468 -156.611		
		B67	0 1.37585 2.7517	0 M Lap M Lap M Lap	96.38016 92.2296 70.27439	39.30338 32.70999 26.1166	3.207851 2.842528 2.477205	2.232623 -1.84369 -5.92	178.5416 163.0115 126.1158	129.315 116.4079 84.80589	122.6056 118.4888 95.67725	130.0318 119.8523 90.97783	121.8888 115.0445 89.50531		
		B66	0 1.42415 2.8483	0 M Lap M Lap M Tump-	-167.593 -25.6739 97.16869	-57.962 -9.44606 39.06991	-4.69456 -0.91537 2.863811	18.33345 11.07988 3.825913	-293.851 -45.9224 179.1143	-194.718 -21.5633 131.5605	-230.26 -44.254 121.7219	-211.643 -30.3797 130.8533	-213.335 -35.4376 122.429		
		B65	0 1.5 3	0 M Tump- M Lap M Lap	66.69262 -0.71467 -89.2848	25.52302 -1.76132 -29.0457	1.157792 -0.34618 -1.85015	0.892792 -10.0167 -20.9263	120.868 -3.67572 -153.615	87.40889 -12.4867 -134.603	84.80462 8.766591 -89.4924	87.60366 -5.3788 -120.582	84.60984 1.658724 -103.513		
		B64	0 1.5 3	0 M Lap M Lap M Tump-	-91.1259 -2.15834 65.64643	-30.3125 -2.80856 24.69542	-1.17343 -0.10821 0.957022	20.55214 9.980725 -0.59069	-157.851 -7.08371 118.2884	-93.569 6.410025 84.1681	-135.989 -14.4813 84.80564	-109.537 -1.00534 85.30567	-120.021 -7.06596 83.66806		
		B63	0 1.5 3	0 M Tump- M Lap M Lap	83.93016 7.285006 -90.523	39.20848 2.573371 -34.0617	1.320091 0.113323 -1.09345	0.749474 -10.2732 -21.2958	163.4498 12.8594 -163.126	114.0308 -1.48065 -139.213	111.6252 20.02161 -93.803	114.4502 6.153423 -124.364	111.2058 12.38754 -108.652		
		B62	0 1.5 3	0 M Lap M Lap M Tump-	-102.202 1.143301 83.32619	-41.9472 -1.51736 38.91244	-1.34452 -6.04E-02 1.223633	21.17265 10.17374 -0.82516	-189.758 -1.05581 162.2513	-111.931 10.90792 111.5264	-155.547 -10.4189 112.4883	-128.482 3.385795 113.0322	-138.997 -2.89673 110.9825		
		B61	0 1.5 3	0 M Tump- M Lap M Tump-	80.66532 4.923513 -91.9811	36.88706 0.510275 -35.8665	1.067696 5.00E-02 -0.96779	0.716877 -10.1277 -20.9723	155.8177 6.724656 -167.764	109.0265 -5.12719 -141.502	106.8484 16.10951 -96.8503	109.2843 2.353385 -126.799	106.5905 8.628939 -111.554		

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BALOK LANTAI 4

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0 M Tump-	-93.7914	-35.0094	-1.22903	20.95783	-168.565	-98.9183	-142.155	-115.226	-125.848		
		B60	1.5 M Lap	3.734188	0.745949	-0.11486	10.11116	5.674544	14.97191	-6.19022	7.455608	1.326082		
			3 M Lap	80.09699	36.50127	0.999713	-0.73462	154.5184	106.6412	107.5541	107.9159	106.2793		
			0 M Lap	69.02926	26.42251	1.308744	0.720594	125.1111	90.29578	87.95802	90.72807	87.52573		
		B59	1.5 M Lap	1.936241	-2.01328	0.115838	-10.1503	-0.89776	-9.85663	11.38601	-2.31103	3.8404		
			3 M Lap	-86.3196	-30.4491	-1.07707	-21.0212	-152.302	-132.23	-87.407	-117.571	-102.066		
			0 M Lap	-85.2378	-27.2654	-1.38553	21.01019	-145.91	-85.0526	-128.301	-101.513	-111.84		
		B58	1.5 M Lap	2.078629	-0.72038	-7.50E-02	10.11952	1.341747	12.3306	-8.87316	4.837653	-1.38021		
			3 M Tump-	68.23221	25.82469	1.235595	-0.77116	123.1982	87.49286	88.33388	88.96783	86.85891		
			0 M Tump-	83.92548	39.35567	1.298485	0.719025	163.6796	114.0798	111.7518	114.5057	111.3259		
		B57	1.5 M Lap	5.646279	1.449957	7.09E-02	-10.0982	9.095465	-3.73871	17.42284	3.735574	9.948557		
			3 M Lap	-93.7957	-36.4558	-1.1567	-20.9154	-170.884	-143.778	-99.1271	-129.256	-113.65		
			0 M Lap	-98.4779	-39.0977	-1.37928	20.90364	-180.73	-106.519	-149.548	-122.897	-133.17		
			1.5 M Lap	3.164296	3.15E-02	-6.80E-02	10.08964	3.847497	13.91503	-7.23036	6.449157	0.235509		
		B56	3 M Tump-	83.64365	39.16062	1.243261	-0.72437	163.0294	112.1281	112.866	113.5743	111.4198		
			0 M Tump-	84.57472	39.84556	1.28643	0.704742	165.2426	115.0514	112.761	115.4789	112.3334		
			1.5 M Lap	4.318385	0.383913	0.0585	-10.0863	5.796322	-5.796	15.34834	1.660414	7.891924		
		B55	3 M Lap	-97.1008	-39.0777	-1.16943	-20.8773	-179.045	-148.864	-104.285	-134.379	-118.771		
			0 M Lap	-95.6734	-36.7533	-1.36458	20.85258	-173.613	-102.146	-145.077	-118.476	-128.747		
			1.5 M Lap	4.906918	1.455085	-5.42E-02	10.06636	8.216437	16.62156	-4.48362	9.182909	2.955025		
		B54	3 M Tump-	84.32442	39.66345	1.256079	-0.71986	164.6508	113.1684	113.8888	114.6207	112.4365		
			0 M Tump-	68.66421	26.14436	1.279408	0.732716	124.228	89.74073	87.396	90.14255	86.99418		
			1.5 M Lap	4.087992	0.39227	5.01E-02	-10.0808	5.533223	-6.02955	15.1086	1.416651	7.662393		
		B53	3 M Tump-	-81.651	-25.3598	-1.17925	-20.8943	-138.557	-124.021	-79.3998	-109.53	-93.8903		

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BALOK LANTAI 4

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0 M Tump-	-90.0107	-32.408	-1.27864	20.86874	-159.866	-93.4189	-136.438	-109.697	-120.159		
			1.5 M Lap	-0.18059	-3.17916	7.65E-03	10.08339	-5.30336	8.392658	-12.7776	0.975744	-5.36072		
		B52	3 M Lap	68.48671	26.04965	1.263334	-0.70196	123.8635	87.98321	88.66143	89.4277	87.21694		
			0 M Lap	79.79282	36.30333	1.050728	0.676746	153.8367	107.6951	105.612	107.97	105.3371		
			1.5 M Lap	4.653553	0.812859	4.05E-03	-10.0379	6.884838	-5.14023	15.93689	2.240631	8.556033		
		B51	3 M Lap	-91.6485	-34.6776	-1.04264	-20.7526	-165.462	-140.197	-95.9592	-125.71	-110.446		
			0 M Lap	-93.8435	-36.0125	-1.14547	20.7454	-170.232	-99.8017	-142.645	-115.891	-126.556		
		B50	1.5 M Lap	3.543346	0.138021	-5.69E-02	10.03052	4.472849	14.32158	-6.70665	6.907331	0.707603		
			3 M Tump-	79.76737	36.28853	1.031663	-0.68437	153.7825	106.2239	107.0111	107.4852	105.7498		
			0 M Tump-	83.38767	38.84388	1.293649	0.685697	162.2154	113.1562	110.9012	113.603	110.4544		
		B49	1.5 M Lap	2.432372	-1.18653	7.08E-02	-10.0726	1.020394	-8.74744	12.36039	-1.29204	4.904985		
			3 M Lap	-99.6857	-41.2169	-1.15202	-20.8309	-185.57	-152.872	-108.401	-138.408	-122.865		
			0 M Lap	-95.0475	-36.4312	-1.37178	20.83923	-172.347	-101.302	-144.201	-117.628	-127.875		
		B48	1.5 M Lap	4.645146	1.118807	-6.72E-02	10.05572	7.364266	16.1196	-4.9551	8.679288	2.485215		
			3 M Tump-	83.17493	38.66883	1.23746	-0.72779	161.68	111.3207	112.0694	112.7651	110.625		
			0 M Tump-	83.02111	38.8207	1.881473	0.701148	161.7385	112.9581	110.3003	113.8256	109.4328		
		B47	1.5 M Lap	3.955825	0.371617	6.34E-02	-10.0372	5.341577	-6.13136	14.90683	1.292602	7.482867		
			3 M Lap	-96.2723	-38.0775	-1.75464	-20.7756	-176.451	-147.442	-102.708	-133.461	-116.688		
			0 M Lap	-97.2364	-38.9029	-1.88051	20.77863	-178.928	-105.382	-147.832	-122.036	-131.178		
		B46	1.5 M Lap	3.464069	-4.35E-02	-2.08E-02	10.04384	4.087326	14.14936	-6.92959	6.751862	0.467906		
			3 M Tump-	83.0017	38.81593	1.838923	-0.69096	161.7075	111.4596	111.7521	113.319	109.8926		
		B45	0 M Tump-	-97.2364	-38.9029	-1.88051	-20.7786	-178.928	-149.017	-104.197	-135.127	-118.087		
			1.5 M Lap	3.464069	-4.35E-02	-2.08E-02	-10.0438	4.087326	-6.94269	14.16246	0.424245	6.795523		
			3 M Tump-	83.0017	38.81593	1.838923	0.69096	161.7075	112.9106	110.3011	113.7543	109.4573		

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BALOK LANTAI 4

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa			Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
				0 M _{Tump}	83.02111	38.8207	1.881473	-0.70115	161.7385	111.4857	111.7728	113.3839	109.8745		
		B44	1.5 M _{Lap}	3.955825	0.371617	0.371617	6.34E-02	10.03721	5.341577	14.94678	-6.17131	7.616043	1.159427		
			3 M _{Lap}	-96.2723	-38.0775	-38.0775	-1.75464	20.77556	-176.451	-103.813	-146.336	-120.373	-129.777		
			0 M _{Lap}	-95.0475	-36.4312	-36.4312	-1.37178	-20.8392	-172.347	-145.065	-100.438	-130.756	-114.747		
		B43	1.5 M _{Lap}	4.645146	1.118807	1.118807	-0.06716	-10.0557	7.364266	-4.99741	16.16191	2.344184	8.820319		
			3 M _{Lap}	83.17493	38.66883	38.66883	1.23746	0.727786	161.68	112.849	110.5411	113.2236	110.1665		
			0 M _{Lap}	83.38767	38.84388	38.84388	1.293649	-0.6857	162.2154	111.7162	112.3412	113.171	110.8864		
			1.5 M _{Lap}	2.432372	-1.18653	-1.18653	0.070815	10.07259	1.020394	12.405	-8.79205	5.053697	-1.44075		
		B42	3 M _{Tump}	-99.6857	-41.2169	-41.2169	-1.15202	20.83088	-185.57	-109.127	-152.146	-125.285	-135.989		
			0 M _{Tump}	-93.8435	-36.0125	-36.0125	-1.14547	-20.7454	-170.232	-143.367	-99.08	-128.961	-113.486		
			1.5 M _{Lap}	3.543346	0.138021	0.138021	-0.0569	-10.0305	4.472849	-6.7425	14.35743	0.588106	7.026828		
		B41	3 M _{Lap}	79.76737	36.28853	36.28853	1.031663	0.684366	153.7825	107.6611	105.574	107.9163	105.3187		
			0 M _{Lap}	79.79282	36.30333	36.30333	1.050728	-0.67675	153.8367	106.274	107.0332	107.5437	105.7635		
			1.5 M _{Lap}	4.653553	0.812859	0.812859	4.05E-03	10.03794	6.884838	15.93944	-5.14278	8.564531	2.232133		
		B40	3 M _{Tump}	-91.6485	-34.6776	-34.6776	-1.04264	20.75262	-165.462	-96.616	-139.54	-112.636	-123.52		
			0 M _{Tump}	-90.0107	-32.408	-32.408	-1.27864	-20.8687	-159.866	-137.243	-92.6133	-122.844	-107.012		
			1.5 M _{Lap}	-0.18059	-3.17916	-3.17916	-7.65E-03	-10.0834	-5.30336	-12.7825	8.397479	-5.37679	0.991814		
		B39	3 M _{Lap}	68.48671	26.04965	26.04965	1.263334	0.701963	123.8635	89.45733	87.18731	89.86994	86.7747		
			0 M _{Lap}	68.66421	26.14436	26.14436	1.279408	-0.73272	124.228	88.20202	88.9347	89.68093	87.45579		
			1.5 M _{Lap}	4.087992	0.39227	0.39227	5.01E-02	10.08081	5.533223	15.14015	-6.0611	7.767561	1.311483		
		B38	3 M _{Tump}	-81.651	-25.3598	-25.3598	-1.17925	20.89434	-138.557	-80.1427	-123.278	-96.3668	-107.054		
			0 M _{Tump}	-95.6734	-36.7533	-36.7533	-1.36458	-20.8526	-173.613	-145.937	-101.287	-131.613	-115.61		
			1.5 M _{Lap}	4.906918	1.455085	1.455085	-5.42E-02	-10.0664	8.216437	-4.5178	16.65573	2.841103	9.296831		
		B37	3 M _{Tump}	84.32442	39.66345	39.66345	1.256079	0.719863	164.6508	114.6801	112.3771	115.0743	111.983		

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BALOK LANTAI 4

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa			Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
			0	M _{Tump}	84.57472	39.84556	1.28643	-0.70474	165.2426	113.5714	114.2409	115.0349	112.7774		
		B36	1.5	M _{Lap}	4.318385	0.383913	5.85E-02	10.08628	5.796322	15.3852	-5.83286	8.014773	1.537565		
			3	M _{Lap}	-97.1008	-39.0777	-1.16943	20.87731	-179.045	-105.022	-148.128	-121.226	-131.923		
			0	M _{Lap}	-98.4779	-39.0977	-1.37928	-20.9036	-180.73	-150.417	-105.65	-136.066	-120		
			1.5	M _{Lap}	3.164296	3.15E-02	-6.80E-02	-10.0896	3.847497	-7.27321	13.95788	9.27E-02	6.591981		
		B35	3	M _{Lap}	83.64365	39.16062	1.243261	0.724368	163.0294	113.6492	111.3448	114.0306	110.9634		
			0	M _{Lap}	83.92548	39.35567	1.298485	-0.71902	163.6796	112.5699	113.2618	114.0527	111.7789		
			1.5	M _{Lap}	5.646279	1.449957	7.09E-02	10.09819	9.095465	17.4675	-3.78337	10.09743	3.586696		
		B34	3	M _{Tump}	-93.7957	-36.4558	-1.1567	20.91541	-170.884	-89.8558	-143.049	-116.079	-126.826		
			0	M _{Tump}	-85.2378	-27.2654	-1.38553	-21.0102	-145.91	-129.174	-84.1797	-114.75	-98.6039		
			1.5	M _{Lap}	2.078629	-0.72038	-7.50E-02	-10.1195	1.341747	-8.92038	12.37783	-1.53764	4.995084		
		B33	3	M _{Lap}	68.23221	25.82469	1.235595	0.771162	123.1982	89.1123	86.71444	89.45366	86.37308		
			0	M _{Lap}	69.02926	26.42251	1.308744	-0.72059	125.1111	88.78253	89.47127	90.27409	87.9797		
			1.5	M _{Lap}	1.936241	-2.01328	0.115838	10.15029	-0.89776	11.45898	-9.92961	4.083659	-2.55428		
		B32	3	M _{Tump}	-86.3196	-30.4491	-1.07707	21.02118	-152.302	-88.0855	-131.551	-104.328	-115.309		
			0	M _{Tump}	-93.7914	-35.0094	-1.22903	-20.9578	-168.565	-142.93	-98.144	-128.429	-112.645		
			1.5	M _{Lap}	3.734188	0.745949	-0.11466	-10.1116	5.674544	-6.26246	15.04415	1.085297	7.696393		
		B31	3	M _{Lap}	80.09699	36.50127	0.999713	0.734623	154.5184	108.1839	106.0114	108.3787	105.8165		
			0	M _{Lap}	80.66532	36.88706	1.067696	-0.71688	155.8177	107.521	108.3538	108.8327	107.0422		
			1.5	M _{Lap}	4.923513	0.510275	5.00E-02	10.1277	6.724656	16.14098	-5.15866	8.733837	2.248487		
		B30	3	M _{Tump}	-91.9811	-35.8665	-0.96779	20.97228	-167.764	-97.46	-140.892	-113.586	-124.766		
			0	M _{Tump}	-102.202	-41.9472	-1.34452	-21.1726	-189.758	-156.394	-111.084	-141.82	-125.658		
			1.5	M _{Lap}	1.143301	-1.51736	-6.04E-02	-10.1737	-1.05581	-10.4569	10.946	-3.02366	3.512727		
		B29	3	M _{Tump}	83.32619	38.91244	1.223633	0.825159	162.2513	113.2592	110.7555	113.5521	110.4626		

PORTAL A-A5_Y1

BALOK LANTAI 4

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	L _L (kNm)	Beban Gempa		Mu _j (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0	M _{Tump}	83.93016	39.20848	1.320091	-0.74947	163.4498	112.4569	113.1991	113.978	111.678	
		B28	1.5	M _{Lap}	7.285006	2.573371	0.113323	10.27316	12.8594	20.093	-1.55204	12.62552	5.915445	
			3	M _{Lap}	-90.523	-34.0617	-1.09345	21.2958	-163.126	-94.4918	-138.524	-110.948	-122.068	
			0	M _{Lap}	-91.1259	-30.3125	-1.17343	-20.5521	-157.851	-136.729	-92.8297	-122.485	-107.073	
		B27	1.5	M _{Lap}	-2.15834	-2.80856	-0.10821	-9.98073	-7.08371	-14.5495	6.478195	-7.2932	-0.77811	
			3	M _{Lap}	65.64643	24.69542	0.957022	0.590694	118.2884	85.40856	83.56518	85.67781	83.29593	
			0	M _{Lap}	66.69262	25.52302	1.157792	-0.89279	120.868	85.53402	86.67948	87.0412	85.1723	
		B26	1.5	M _{Lap}	-0.71467	-1.76132	-0.34618	10.01675	-3.67572	8.548499	-12.2686	0.931748	-4.65183	
			3	M _{Tump}	-89.2848	-29.0457	-1.85015	20.92629	-153.615	-90.658	-133.438	-107.399	-116.697	
			0	M _{Tump}	-167.593	-57.962	-4.69456	-18.3335	-293.851	-233.218	-191.76	-223.193	-201.785	
			1.42415	M _{Lap}	-25.6739	-9.44606	-0.91537	-11.0797	-45.9224	-44.8307	-20.9866	-37.3599	-28.4574	
		B25	2.8483	M _{Lap}	97.16869	39.06991	2.863811	-3.82591	179.1143	123.5261	129.7563	128.443	124.8393	
			0	M _{Lap}	96.38016	39.30338	3.207851	-2.23262	178.5416	124.6265	127.2941	128.6253	123.2953	
			1.37585	M _{Lap}	1.37585	1.37585	1.37585	1.37585	1.37585	1.37585	1.37585	1.37585	1.37585	
		B24	2.7517	M _{Lap}	70.27439	26.1166	2.477205	5.920001	126.1158	97.23789	83.24525	94.70744	85.7757	
			0	M _{Lap}	71.66594	26.33046	2.742562	5.721886	128.1279	98.70931	84.96554	96.51951	87.15534	
			1.37815	M _{Lap}	-20.8031	-9.77426	-0.62197	12.06725	-40.6025	-15.5263	-40.4757	-24.8529	-31.1491	
		B23	2.7563	M _{Tump}	-131.136	-45.879	-3.9865	18.41261	-230.77	-148.519	-184.674	-164.983	-168.211	

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Mu ₆ (kNm)	Ket
							Ey	Ex							
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
		B22	0 4.17815 8.3563	0 M Tump- M Lap M Tump-	-19.2502 9.686313 -18.9663	0.243551 -0.14062 -0.5248	8.63E-02 -3.01E-02 -0.14656	2.170012 -9.17E-03 2.18835	-22.7106 11.40098 -23.5992	-17.7536 10.06501 -22.5892	-22.365 10.10326 -17.9013	-19.2852 10.0496 -21.0885	-20.8335 10.11867 -19.402		
		B21	0 3 6	0 M Tump- M Lap M Tump-	-12.2677 5.184505 -7.05566	-0.87749 0.15896 1.195407	4.46E-03 5.68E-03 6.89E-03	2.895592 -1.85E-02 -2.93249	-16.1253 6.475742 -6.55414	-10.3922 5.52629 -9.73229	-16.4757 5.56146 -3.57839	-12.5171 5.544023 -7.57184	-14.3507 5.543727 -5.73884		
		B20	0 3 6	0 M Tump- M Lap M Tump-	-10.7078 4.942937 -9.09873	-0.38122 -2.26E-02 0.336117	1.24E-02 -5.79E-03 -2.40E-02	2.947967 -3.37E-03 -2.95471	-13.4593 5.895443 -10.3807	-8.38407 5.170509 -12.4519	-14.5826 5.181244 -6.2319	-10.5417 5.16873 -10.2979	-12.425 5.183023 -8.38595		
		B19	0 3 6	0 M Tump- M Lap M Tump-	-10.6133 4.948624 -9.18186	-0.3435 -1.97E-02 0.304099	1.01E-03 -7.05E-04 -2.42E-03	2.916557 -3.29E-03 -2.92314	-13.2856 5.906828 -10.5317	-8.29766 5.179968 -12.5194	-14.4231 5.187321 -6.37932	-10.4406 5.181867 -10.3727	-12.2801 5.185421 -8.52605		
		B18	0 3 6	0 M Tump- M Lap M Tump-	-9.79568 5.023683 -9.84936	0.318493 5.38E-02 -0.21097	-5.26E-03 -1.58E-03 2.09E-03	2.91776 -2.22E-03 -2.9222	-11.2452 6.114435 -12.1568	-7.02282 5.305904 -13.5424	-13.1468 5.311568 -7.40708	-9.17124 5.306372 -11.393	-10.9984 5.3111 -9.55644		
		B17	0 3 6	0 M Tump- M Lap M Tump-	-9.83815 4.936827 -9.9806	0.195398 -0.018 -0.23139	-1.10E-02 -6.64E-05 1.09E-02	2.900499 -1.74E-03 -2.90399	-11.4931 5.895397 -12.3469	-7.16489 5.170479 -13.6712	-13.249 5.174182 -7.57965	-9.30484 5.171711 -11.5288	-11.1091 5.172949 -9.72206		
		B16	0 3 6	0 M Tump- M Lap M Tump-	-10.3198 4.930106 -9.51236	-0.26449 -2.12E-02 0.222112	-8.75E-03 2.65E-04 9.28E-03	2.89263 -1.13E-03 -2.89488	-12.807 5.882227 -11.0595	-7.96794 5.162165 -12.8848	-14.037 5.164361 -6.81135	-10.1005 5.163187 -10.7502	-11.9044 5.16334 -8.9459		
		B15	0 3 6	0 M Tump- M Lap M Tump-	-10.634 5.011642 -9.03516	-0.6083 0.050181 0.709659	-1.22E-02 -4.16E-04 1.14E-02	2.892875 -8.74E-04 -2.89462	-13.734 6.094259 -9.70834	-8.51522 5.292789 -12.0762	-14.5825 5.294887 -6.00471	-10.6505 5.293125 -9.94029	-12.4473 5.29455 -8.14064		

PORTAL A-A5 Y1

BALOK LANTAI 5

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Mu ₆ (kNm)	Ket
							Ey	Ex							
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
		B14	0 M Tump- 3 M Lap 6 M Tump-	-9.7229 4.91959 -10.1303	0.195412 -3.16E-02 -0.25858	-5.39E-03 1.46E-03 8.31E-03	2.872039 -6.35E-04 -2.87331	-11.3548 5.852973 -12.5701	-7.07199 5.145464 -13.8141	-13.0999 5.145879 -7.78539	-9.18691 5.147001 -11.6961	-10.985 5.144341 -9.90338			
		B13	0 M Tump- 3 M Lap 6 M Tump-	-9.48099 4.958758 -10.2939	0.427107 6.65E-03 -0.41381	1.07E-03 7.65E-04 4.63E-04	2.885692 -4.16E-04 -2.88652	-10.6938 5.961146 -13.0148	-6.65565 5.210688 -14.1	-12.7163 5.211108 -8.03859	-8.77585 5.211556 -11.9781	-10.5961 5.210212 -10.1605			
		B12	0 M Tump- 3 M Lap 6 M Tump-	-9.91519 4.960653 -9.8559	-5.78E-03 7.28E-03 2.03E-02	-1.09E-03 -3.06E-04 4.79E-04	2.878027 -2.51E-04 -2.87853	-11.9075 5.964436 -11.7945	-7.39301 5.212913 -13.3582	-13.4362 5.213634 -7.31358	-9.50916 5.212873 -11.2421	-11.32 5.213674 -9.42965			
		B11	0 M Tump- 3 M Lap 6 M Tump-	-9.91519 4.960653 -9.8559	-5.78E-03 7.28E-03 2.03E-02	-1.09E-03 -3.06E-04 4.79E-04	2.87803 -2.51E-04 2.87853	-11.9075 5.964436 -11.7945	-13.4369 5.213441 -7.31328	-7.39232 5.213106 -13.3585	-11.3223 5.213031 -9.42864	-9.50687 5.213516 -11.2431			
		B10	0 M Tump- 3 M Lap 6 M Tump-	-9.48099 4.958758 -10.2939	0.427107 6.65E-03 -0.41381	1.07E-03 7.65E-04 4.63E-04	-2.88569 4.16E-04 2.886523	-10.6938 5.961146 -13.0148	-12.7156 5.211561 -8.0383	-6.65632 5.210206 -14.1003	-10.5938 5.211818 -10.1596	-8.77809 5.20995 -11.979			
		B9	0 M Tump- 3 M Lap 6 M Tump-	-9.7229 4.91959 -10.1303	0.195412 -3.16E-02 -0.25858	-5.39E-03 1.46E-03 8.31E-03	-2.87204 6.35E-04 2.873308	-11.3548 5.852973 -12.5701	-13.1033 5.146797 -7.78016	-7.0686 5.144546 -13.8193	-10.9963 5.147401 -9.88593	-9.17558 5.143941 -11.7136			
		B8	0 M Tump- 3 M Lap 6 M Tump-	-10.634 5.011642 -9.03516	-0.6083 5.02E-02 0.708659	-1.22E-02 -4.16E-04 0.01141	-2.89287 8.74E-04 2.894623	-13.734 6.094259 -9.70834	-14.5903 5.294625 -5.99752	-8.50751 5.293051 -12.0834	-12.473 5.293676 -8.11668	-10.6248 5.294 -9.96425			
		B7	0 M Tump- 3 M Lap 6 M Tump-	-10.3198 4.930106 -9.51236	-0.26449 -2.12E-02 0.222112	-8.75E-03 2.65E-04 9.28E-03	-2.89263 1.13E-03 2.894881	-12.807 5.882227 -11.0595	-14.0425 5.164528 -6.8055	-7.96243 5.161998 -12.8906	-11.9228 5.163895 -8.92642	-10.0821 5.162631 -10.7697			

PORTAL A-AS Y1

BALOK LANTAI 5

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu _j (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Mu ₆ (kNm)	Ket
							Ey	Ex							
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
		B6	0 M _{Tump}	-9.83815	0.193398	-1.10E-02	-2.9005	-11.4931	-13.2559	-7.15797	-11.1322	-9.28175			
			3 M _{Lap}	4.936827	-1.80E-02	6.64E-05	1.74E-03	5.895397	5.17414	5.17052	5.172809	5.171851			
			6 M _{Tump}	-9.9806	-0.23139	1.09E-02	2.903986	-12.3469	-7.5728	-13.678	-9.69925	-11.5516			
		B5	0 M _{Tump}	-9.79568	0.318493	-5.26E-03	-2.91776	-11.2452	-13.1501	-7.01951	-11.0094	-9.1602			
			3 M _{Lap}	5.023683	5.38E-02	-1.58E-03	2.22E-03	6.114435	5.310569	5.306903	5.307772	5.309701			
			6 M _{Tump}	-9.84936	-0.21097	2.09E-03	2.922203	-12.1568	-7.40577	-13.5437	-9.55205	-11.3974			
		B4	0 M _{Tump}	-10.6133	-0.3435	1.01E-03	-2.91656	-13.2856	-14.4224	-8.29829	-12.278	-10.4427			
			3 M _{Lap}	4.948624	-1.97E-02	-7.05E-04	3.29E-03	5.906828	5.186876	5.180412	5.18394	5.183348			
			6 M _{Tump}	-9.18186	0.304099	-2.42E-03	2.923137	-10.5317	-6.38084	-12.5179	-8.53112	-10.3676			
		B3	0 M _{Tump}	-10.7078	-0.38122	1.24E-02	-2.94797	-13.4593	-14.5748	-8.39191	-12.3989	-10.5678			
			3 M _{Lap}	4.942937	-2.26E-02	-5.79E-03	3.37E-03	5.895443	5.177593	5.17416	5.170855	5.180898			
			6 M _{Tump}	-9.09873	0.336117	-2.40E-02	2.954714	-10.3807	-6.24703	-12.4368	-8.43641	-10.2474			
		B2	0 M _{Tump}	-12.2677	-0.87749	4.46E-03	-2.89559	-16.1253	-16.4729	-10.395	-14.3414	-12.5265			
			3 M _{Lap}	5.184505	0.15896	5.68E-03	1.85E-02	6.475742	5.565036	5.522715	5.555646	5.532104			
			6 M _{Tump}	-7.05566	1.195407	6.89E-03	2.932492	-6.55414	-3.57405	-9.73662	-5.72437	-7.5863			
		B1	0 M _{Tump}	-19.2502	0.243551	8.63E-02	-2.17001	-22.7106	-22.3106	-17.808	-20.6523	-19.4663			
			4.17815 M _{Lap}	9.688313	-0.14062	-3.01E-02	9.17E-03	11.40098	10.08427	10.084	10.05537	10.11289			
			8.3563 M _{Tump}	-18.9663	-0.5248	-0.14656	2.188352	-23.5992	-17.9936	-22.4968	-19.7098	-20.7807			

Keterangan:

- {1} Nomor
- {2} Portal yang ditinjau
- {3} Nomor Elemen Balok
- {4} Jarak Elemen Balok (m)
- {5} Letak/daerah Momen
- {6} M_b Momen yang terjadi akibat beban mati
- {7} M_L Momen yang terjadi akibat beban hidup
- {8} E_y Momen yang terjadi akibat Gempa arah Y
- {9} E_x Momen yang terjadi akibat Gempa arah X
- {10} $Mu_j = 1,2 M_b + 1,6 M_L$
- {11} $Mu_2 = 1,05 M_b + 0,63 M_L + 1,05 E_x + 0,315 E_y$
- {12} $Mu_3 = 1,05 M_b + 0,63 M_L - 1,05 E_x - 0,315 E_y$
- {13} $Mu_4 = 1,05 M_b + 0,63 M_L + 1,05 E_y + 0,315 E_x$
- {14} $Mu_6 = 1,05 M_b + 0,63 M_L - 1,05 E_y - 0,315 E_x$
- {15} Keterangan Balok

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _r (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							E _y {8}	E _x {9}						
	{1}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B594	0 1.37585 2.7517	0 M _{Tump} M _{Lap} M _{Lap}	66.302084 5.7892239 -74.61522	44.98712 3.7984473 -49.96214	0.6525405 0.3842985 0.1160564	0.4353459 10.93481 21.434273	151.54189 13.024584 -169.4777	98.621738 20.074311 -87.27958	97.296411 -3.130897 -132.3647	98.781376 12.319685 -102.9485	97.13677 4.623728 -116.6958	
		B595	0 1.42415 2.8483	0 M _{Lap} M _{Lap} M _{Tump}	-79.75234 4.8628812 65.271879	-54.20787 3.2904731 44.563189	-0.870263 -9.20E-02 0.6862141	-21.13778 -9.8912 1.3553744	-182.4354 11.100214 149.62736	-140.3597 -3.235725 98.249582	-95.42211 17.593771 94.970981	-125.4631 3.9666697 97.75775	-110.3187 10.39138 95.46281	
		B596	0 1.5 3 0 1.5 3	0 M _{Tump} M _{Lap} M _{Lap} 0 M _{Lap} M _{Lap} M _{Tump}	76.106788 5.1147394 -92.73063 -93.32518 4.8240379 76.119929	54.039718 3.7234837 -64.59275 -65.51035 3.2646384 54.039628	-0.260887 5.53E-02 0.3715209 6.14E-02 -9.98E-02 -0.261094	-0.198285 9.4772965 19.152878 -19.19078 -9.573445 4.39E-02	177.79169 12.095261 -214.6252 -216.8068 11.012267 177.80732	113.66677 17.684857 -117.833 -159.3939 -2.961606 113.93473	114.24753 -2.252315 -158.2881 -119.132 17.20553 114.00705	113.62076 10.759702 -131.6373 -145.2436 4.00149 113.71057	114.2935 4.67284 -144.4838 -133.2823 10.24243 114.2312	
		B598	0 1.5 3 0 1.5 3	0 M _{Tump} M _{Lap} M _{Lap} 0 M _{Lap} M _{Lap} M _{Tump}	76.313177 4.7562194 -93.65406 -92.81867 5.1496783 76.264704	54.06815 3.3734892 -65.32117 -64.82562 3.6123231 54.050261	-0.243871 0.1094109 0.4626931 3.50E-03 -0.119167 -0.241834	-0.102551 9.5746589 19.251869 -19.20716 -9.534267 0.1386219	178.08485 11.105046 -216.8987 -215.1034 11.959331 177.99806	114.00727 17.207185 -119.1289 -158.4662 -2.365592 114.19898	114.37627 -2.968528 -159.8493 -118.1333 17.731444 114.06023	113.9034 10.250228 -132.9389 -144.3463 4.5545058 113.91934	114.4801 3.98843 -146.0393 -132.2532 10.81135 114.3399	
		B600	0 1.5 3 0 1.5 3	0 M _{Tump} M _{Lap} M _{Lap} 0 M _{Lap} M _{Lap} M _{Tump}	64.313747 4.662722 -81.84163 -81.94319 4.6055599 64.300987	43.321596 3.1623924 -54.99681 -55.17591 3.0682888 43.312492	0.1100957 0.1138772 0.1176587 -0.277244 -8.14E-02 0.1145069	-0.336891 9.4640706 19.265032 -186.2048 19.27482 0.3260248	146.49105 10.655094 -186.2048 -186.6133 10.435934 146.46117	94.502984 16.861311 -100.3164 -141.1271 -3.204891 95.181302	95.141096 -3.08498 -140.847 -100.4753 16.742611 94.42451	94.83152 9.9889185 -114.3897 -127.1639 3.6989869 95.025836	94.81256 3.787412 -126.7737 -114.4385 9.838733 94.57998	
		B601	0 1.5 3	0 M _{Lap} M _{Lap} M _{Tump}	-81.94319 4.6055599 64.300987	-55.17591 3.0682888 43.312492	-0.277244 -8.14E-02 0.1145069	-19.27482 -9.4744 0.3260248	-186.6133 10.435934 146.46117	-141.1271 -3.204891 95.181302	-100.4753 16.742611 94.42451	-127.1639 3.6989869 95.025836	-114.4385 9.838733 94.57998	

PORTAL A-AS Y3 LTI

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							E _y {8}	E _x {9}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B602	0 M _{Tump.} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	76.270627 5.2987189 -92.52651 -93.98549 4.5714917 76.27515 76.244311	54.036711 3.7974721 -64.44177 -65.72805 3.1570966 54.042246 53.978155	-0.239902 7.67E-02 0.3933853 7.21E-02 -8.36E-02 -0.239238 -0.231947	-0.144202 9.5537908 19.251784 -19.31727 -9.610172 9.69E-02 -0.123824	177.98349 12.434418 -214.1386 -217.9475 10.537145 177.99777 177.85822	113.9003 18.011716 -117.4129 -160.3539 -3.327972 114.16193 113.85969	114.35427 -2.099592 -158.0894 -119.833 16.906047 114.10911 114.26584	113.82997 11.046085 -131.2738 -146.1027 3.6740685 113.91485 113.78022	114.4246 4.86604 -144.2285 -134.0842 9.904006 114.3562 114.3453		
		B603	1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	-93.08159 -93.59086 4.7503544 76.238245 76.169626 5.0061831 -93.01058	-65.01127 -65.41858 3.2800122 53.978607 53.929758 3.4712999 -64.98716	0.3972122 8.14E-02 -7.46E-02 -0.230495 -0.23146 7.02E-02 0.3718429	19.366993 -19.37192 -9.626613 0.1186979 -0.125447 9.6296904 19.384827	-215.7159 -216.9788 10.948445 177.85167 177.69116 11.5615 -215.5922	-118.2323 -159.799 -3.077152 114.10871 113.74923 17.576696 -118.1318	-159.1532 -119.1692 17.185712 114.00465 114.15848 -2.689874 -159.0742	-132.1751 -145.5008 3.9436024 113.85205 113.67131 10.550465 -132.1064	-145.2104 -133.4674 10.16496 114.2613 114.2364 4.335427 -145.0997		
		B604	1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	4.7913634 76.166358 76.294105 5.0438495 -93.05973 -93.40098 4.8719836	3.3270136 53.924911 54.051588 3.5096105 -65.03237 -65.10858 3.4699314	-6.12E-02 -0.230134 -0.238957 5.94E-02 0.3576944 0.112918 -6.29E-02	-9.637802 0.1172233 -0.103709 9.6325486 19.368807 -19.31619 -9.589172	11.072858 177.67949 178.03547 11.667996 -215.7235 -216.2549 11.398271	-3.01202 113.99796 113.97714 17.639974 -118.2332 -159.3364 -2.786794	17.26592 113.89678 114.34548 -2.625781 -159.133 -118.8425 17.390073	4.026783 113.74265 113.87774 10.603686 -145.2251 -132.2064 4.2150406	10.22712 114.1521 114.4449 4.410507 -145.1599 -133.1217 10.38824		
		B605	1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	76.291628 54.048447	54.048447	-0.237025	0.1378456	178.02747	114.22681	114.08666	113.95128	114.3622		

PORTAL A-AS Y3 LTI

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							E _y {8}	E _x {9}						
	{1}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B610	0 1.5 3 0 1.5 3	M _{Tump.} M _{Lap} M _{Lap} M _{Lap} M _{Lap} M _{Tump.}	64.432576 4.7284916 -81.82891 -82.0561 4.6144344	43.401348 3.172438 -55.05647 -55.22253 3.0907246	0.1130493 5.54E-02 -2.17E-03 -0.150429 -1.77E-02	-0.334663 9.5157848 19.366233 -19.36881 -9.519401	146.76125 10.750091 -186.2851 -186.8234 10.482481	94.681267 16.97259 -100.2721 -141.3337 -3.208643	95.312839 -3.045486 -140.9398 -100.5645 16.793268	95.010336 10.019238 -114.5078 -127.2082 3.7750871	94.98377 3.907866 -126.704 -114.69 9.809538	
		B611	0 1.5 3	M _{Tump.} M _{Lap} M _{Lap}	76.031312 5.1120096 -92.66062	53.84366 3.6308978 -64.58186	-0.235833 1.10E-02 0.257738	-0.132105 9.5958503 19.323806	177.38743 11.943848 -214.5237	113.54139 17.734169 -117.609	113.96738 -2.424017 -158.3514	113.46515 10.689269 -131.6226	114.0436 4.620883 -144.3378	
		B612	0 1.5 3	M _{Tump.} M _{Lap} M _{Lap}	76.031312 5.1120096 -92.66062	53.84366 3.6308978 -64.58186	-0.235833 1.10E-02 0.257738	-0.132105 9.5958503 19.323806	177.38743 11.943848 -214.5237	113.54139 17.734169 -117.609	113.96738 -2.424017 -158.3514	113.46515 10.689269 -131.6226	114.0436 4.620883 -144.3378	
		B613	0 1.5 3	M _{Tump.} M _{Lap} M _{Lap}	76.031312 5.1120096 -92.66062	53.84366 3.6308978 -64.58186	-0.235833 1.10E-02 0.257738	-0.132105 9.5958503 19.323806	177.38743 11.943848 -214.5237	113.54139 17.734169 -117.609	113.96738 -2.424017 -158.3514	113.46515 10.689269 -131.6226	114.0436 4.620883 -144.3378	
		B614	0 1.5 3	M _{Tump.} M _{Lap} M _{Lap}	76.031312 5.1120096 -92.66062	53.84366 3.6308978 -64.58186	-0.235833 1.10E-02 0.257738	-0.132105 9.5958503 19.323806	177.38743 11.943848 -214.5237	113.54139 17.734169 -117.609	113.96738 -2.424017 -158.3514	113.46515 10.689269 -131.6226	114.0436 4.620883 -144.3378	
		B615	0 1.5 3	M _{Tump.} M _{Lap} M _{Lap}	76.031312 5.1120096 -92.66062	53.84366 3.6308978 -64.58186	-0.235833 1.10E-02 0.257738	-0.132105 9.5958503 19.323806	177.38743 11.943848 -214.5237	113.54139 17.734169 -117.609	113.96738 -2.424017 -158.3514	113.46515 10.689269 -131.6226	114.0436 4.620883 -144.3378	
		B616	0 1.5 3	M _{Tump.} M _{Lap} M _{Lap}	76.031312 5.1120096 -92.66062	53.84366 3.6308978 -64.58186	-0.235833 1.10E-02 0.257738	-0.132105 9.5958503 19.323806	177.38743 11.943848 -214.5237	113.54139 17.734169 -117.609	113.96738 -2.424017 -158.3514	113.46515 10.689269 -131.6226	114.0436 4.620883 -144.3378	
		B617	0 1.5 3	M _{Tump.} M _{Lap} M _{Lap}	76.031312 5.1120096 -92.66062	53.84366 3.6308978 -64.58186	-0.235833 1.10E-02 0.257738	-0.132105 9.5958503 19.323806	177.38743 11.943848 -214.5237	113.54139 17.734169 -117.609	113.96738 -2.424017 -158.3514	113.46515 10.689269 -131.6226	114.0436 4.620883 -144.3378	

PORTAL A-AS Y3 LTI

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey {8}	Ex {9}						
	{1}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B618	0	M _{Tump.}	-92.8883	-64.85812	0.202761	19.399488	-215.2389	-117.96	-158.8267	-132.0696	-144.7171	
			1.5	M _{Lap}	4.9931137	3.4897051	-1.65E-02	9.6450403	11.575265	17.563374	-2.680807	10.462133	4.420435	
			3	M _{Lap}	76.021204	53.83753	-0.235787	-0.109407	177.36549	113.55076	113.92906	113.45787	114.0219	
		B619	0	M _{Lap}	76.031312	53.84366	-0.235833	0.1321054	177.38743	113.81881	113.68996	113.54837	113.9604	
			1.5	M _{Lap}	5.1120096	3.6308978	0.0109525	-9.59585	11.943848	-2.417117	17.727268	4.6438829	10.66627	
			3	M _{Tump.}	-92.66062	-64.58186	0.257738	-19.32381	-214.5237	-158.189	-117.7714	-143.7966	-132.1638	
			0	M _{Tump.}	-82.0561	-55.22253	-0.150429	19.368812	-186.8234	-100.6592	-141.239	-115.0059	-126.8923	
		B620	1.5	M _{Lap}	4.6144344	3.0907246	-1.77E-02	9.5194013	10.482481	16.7821	-3.197474	9.7723099	3.812315	
			3	M _{Lap}	64.431645	43.403984	0.114974	-0.330009	146.76435	94.687444	95.30803	95.014507	94.98097	
			0	M _{Lap}	64.432576	43.401348	0.1130493	0.3346632	146.76125	95.38406	94.610046	95.221174	94.77293	
		B621	1.5	M _{Lap}	4.7284916	3.172438	5.54E-02	-9.515785	10.750091	-3.010558	16.937662	4.0242934	9.902811	
			3	M _{Tump.}	-81.82891	-55.05647	-2.17E-03	-19.36623	-186.2851	-140.9412	-100.2707	-126.7086	-114.5033	
			0	M _{Tump.}	-93.40098	-65.10858	0.1112918	19.316189	-216.2549	-118.7724	-159.4065	-132.888	-145.2909	
		B622	1.5	M _{Lap}	4.8719836	3.4699314	-6.29E-02	9.5891716	11.398271	17.350467	-2.747188	10.256219	4.34706	
			3	M _{Lap}	76.291628	54.048447	-0.237025	-0.137846	178.02747	113.93733	114.37613	113.86443	114.449	
			0	M _{Lap}	76.294105	54.051588	-0.238957	0.1037093	178.03547	114.19493	114.12769	113.94307	114.3795	
		B623	1.5	M _{Lap}	5.0438495	3.5096105	5.94E-02	-9.632549	11.667996	-2.588378	17.602571	4.5351807	10.47901	
			3	M _{Tump.}	-93.05973	-65.03237	0.3576944	-19.36881	-215.7235	-158.9077	-118.4585	-144.4087	-132.9575	
			0	M _{Tump.}	-93.43695	-65.27088	0.1077351	19.392827	-216.5578	-118.8331	-159.6259	-133.0076	-145.4513	
		B624	1.5	M _{Lap}	4.7913634	3.3270136	-6.12E-02	9.637802	11.072858	17.227364	-2.973464	10.098598	4.155302	
			3	M _{Lap}	76.166358	53.924911	-0.230134	-0.117223	177.67949	113.75179	114.14295	113.6688	114.2259	
			0	M _{Lap}	76.169626	53.929758	-0.23146	0.1254466	177.69116	114.01266	113.89505	113.75034	114.1574	
		B625	1.5	M _{Lap}	5.0061831	3.4712999	7.02E-02	-9.62969	11.5615	-2.645653	17.532476	4.4837597	10.40306	
			3	M _{Tump.}	-93.01058	-64.98716	0.3718429	-19.38483	-215.5922	-158.84	-118.3661	-144.3188	-132.8872	

PORTAL A-AS Y3 LTI

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
	{1}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B626	0	M _{Tump-}	-93.59086	-65.41858	8.14E-02	19.371923	-216.9788	-119.118	-159.8503	-133.2965	-145.6717	
			1.5	M _{Lap}	4.7503544	3.2800122	-0.074566	9.6266128	10.948445	17.138735	-3.030175	10.008368	4.100191	
			3	M _{Lap}	76.238245	53.978607	-0.230495	-0.118698	177.85167	113.85944	114.25392	113.77727	114.3361	
		B627	0	M _{Lap}	76.244311	53.978155	-0.231947	0.1238236	177.85822	114.11972	114.00581	113.85822	114.2673	
			1.5	M _{Lap}	5.0080195	3.4834445	8.26E-02	-9.621585	11.583135	-2.623644	17.529625	4.5089557	10.39703	
			3	M _{Tump-}	-93.08159	-65.01127	0.3972122	-19.36699	-215.7159	-158.903	-118.4826	-144.3763	-133.0092	
			0	M _{Tump-}	-93.98549	-65.72805	7.21E-02	19.317269	-217.9475	-119.7876	-160.3993	-133.9328	-146.254	
		B628	1.5	M _{Lap}	4.5714917	3.1570966	-8.36E-02	9.6101715	10.537145	16.853388	-3.275314	9.7284766	3.849598	
			3	M _{Lap}	76.27515	54.042246	-0.239238	-9.69E-02	177.99777	113.95839	114.31265	113.85379	114.4173	
			0	M _{Lap}	76.270627	54.036711	-0.239902	0.1442024	177.98349	114.20313	114.05144	113.92081	114.3338	
		B629	1.5	M _{Lap}	5.2987189	3.7974721	7.67E-02	-9.553791	12.434418	-2.051244	17.963369	5.0271968	10.88493	
			3	M _{Tump-}	-92.52651	-64.44177	0.3933853	-19.25178	-214.1386	-157.8416	-117.6607	-143.4024	-132.0999	
			0	M _{Tump-}	-81.94319	-55.17591	-0.277244	19.274824	-186.6133	-100.6499	-140.9524	-115.0207	-126.5816	
		B630	1.5	M _{Lap}	4.6055599	3.0682888	-8.14E-02	9.4743998	10.435934	16.691349	-3.153629	9.6678588	3.869861	
			3	M _{Lap}	64.300987	43.312492	0.1145069	-0.326025	146.46117	94.49665	95.109163	94.820441	94.78537	
			0	M _{Lap}	64.313747	43.321596	0.1100957	0.3368913	146.49105	95.210456	94.433624	95.043761	94.60032	
		B631	1.5	M _{Lap}	4.662722	3.1623924	0.1138772	-9.464071	10.655094	-3.013238	16.789568	4.0265541	9.749776	
			3	M _{Tump-}	-81.84163	-54.99681	0.1176587	-19.26503	-186.2048	-140.7729	-100.3905	-126.5266	-114.6368	
			0	M _{Tump-}	-92.81867	-64.82562	3.50E-03	19.207156	-215.1034	-118.1311	-158.4684	-132.2458	-144.3537	
		B632	1.5	M _{Lap}	5.1496783	3.6123231	-0.119167	9.534267	11.959331	17.656368	-2.290517	10.561094	4.804757	
			3	M _{Lap}	76.264704	54.050261	-0.241834	-0.138622	177.99806	113.90787	114.35133	113.83201	114.4272	
			0	M _{Lap}	76.313177	54.06815	-0.243871	0.1025515	178.08485	114.22263	114.16091	113.96801	114.4155	
		B633	1.5	M _{Lap}	4.7562194	3.3734892	0.1094109	-9.574659	11.105046	-2.899599	17.138256	4.2181924	10.02046	
			3	M _{Tump-}	-93.65406	-65.32117	0.4626931	-19.25187	-216.8987	-159.5578	-119.4204	-145.0676	-133.9106	

PORTAL A-AS Y3 LTI

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket	
							Ey {8}	Ex {9}							
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
	PORTAL A-AS Y3 LTI	B634	0	M _{Tump.}	-93.32518	-65.51035	6.14E-02	19.190783	-216.8068	-119.0933	-159.4326	-133.1534	-145.3725		
			1.5	M _{Lap}	4.8240379	3.2646384	-9.98E-02	9.5734449	9.5734449	11.012267	17.142628	-2.898704	10.03276	4.211164	
			3	M _{Lap}	76.119929	54.039628	-0.261094	-4.39E-02	177.80732	177.80732	113.84256	114.09922	113.68292	114.2589	
		B635	0	M _{Lap}	76.106788	54.039718	-0.260887	0.1982846	0.1982846	177.79169	114.08317	113.83113	113.74568	114.1686	
			1.5	M _{Lap}	5.1147394	3.7234837	5.53E-02	-9.477297	12.095261	-2.217465	-2.217465	17.650008	4.7890055	10.64354	
			3	M _{Tump.}	-92.73063	-64.59275	0.3715209	-19.15288	-19.15288	-214.6252	-158.0541	-118.0671	-143.7037	-132.4175	
		B636	0	M _{Tump.}	-79.75234	-54.20787	-0.870263	21.137775	21.137775	-182.4354	-95.97038	-139.8114	-112.1463	-123.6355	
			1.42415	M _{Lap}	4.8628812	3.2904731	-0.092024	9.8912003	9.8912003	11.100214	17.535796	-3.177749	10.198126	4.159921	
			2.8483	M _{Lap}	65.271879	44.563189	0.6862141	-1.355374	149.62736	149.62736	95.403296	97.817267	96.903864	96.3167	
		B637	0	M _{Lap}	66.302084	44.98712	0.6525405	-0.435346	151.54189	151.54189	97.707511	98.210637	98.507108	97.41104	
			1.37585	M _{Lap}	5.7892239	3.7984473	0.3842985	-10.93481	13.024584	13.024584	-2.888789	19.832203	5.4307553	11.51266	
			2.7517	M _{Tump.}	-74.61522	-49.96214	0.1160564	-21.43427	-169.4777	-169.4777	-132.2916	-87.3527	-116.4521	-103.1922	

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							E _y {8}	E _x {9}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B260	M _{Tump.}	0	66.55738	45.1485	0.125689	0.435869	152.1065	98.82606	97.83155	98.59808	98.0595	
			M _{Lap}	1.37585	6.178907	4.031365	0.449802	11.52337	13.86487	21.26884	-3.213619	13.12977	4.92546	
			M _{Lap}	2.7517	-74.0896	-49.65245	0.773915	22.61088	-168.3515	-85.08996	-133.0604	-101.1401	-117.01	
		B261	M _{Lap}	0	-84.2392	-56.59632	-0.967363	-22.38082	-191.6412	-147.9115	-100.3023	-132.1726	-116.041	
			M _{Lap}	1.42415	2.852155	2.222259	-0.384358	-10.51552	6.978201	-6.76758	15.55715	0.678822	8.11075	
			M _{Tump.}	2.8483	65.73733	44.81521	0.198647	1.349785	150.5891	98.73762	95.77793	97.89154	96.624	
		B262	M _{Tump.}	0	79.03455	55.92757	-7.16E-02	-0.225381	184.3256	117.9614	118.4799	118.0745	118.367	
			M _{Lap}	1.5	7.945376	5.323654	0.36312	10.13786	18.0523	22.45569	0.937406	15.27125	8.12184	
			M _{Lap}	3	-89.9971	-63.28026	0.797853	20.50111	-209.245	-112.5861	-156.141	-127.0679	-141.659	
		B263	M _{Lap}	0	-100.205	-69.49243	-0.534135	-20.48032	-231.4335	-170.6677	-127.3225	-156.0073	-141.983	
			M _{Lap}	1.5	2.842019	2.218729	-0.298453	-10.1626	6.960389	-6.382822	15.14666	0.867325	7.89651	
			M _{Lap}	3	79.03536	55.92989	-6.28E-02	0.155124	184.3303	118.3661	118.0799	118.2059	118.24	
		B264	M _{Tump.}	0	75.79428	52.62975	-8.17E-02	-0.173984	175.1607	112.5323	112.9491	112.6002	112.881	
			M _{Lap}	1.5	6.349557	4.231509	0.2723	10.13869	14.38988	20.06428	-1.398514	12.81249	5.85328	
			M _{Lap}	3	-89.9485	-62.16673	0.626256	20.45137	-207.4049	-111.9397	-155.2822	-126.5112	-140.711	
		B265	M _{Lap}	0	-95.2436	-65.0254	-0.411001	-20.43038	-218.3329	-162.5531	-119.3904	-147.8389	-134.105	
			M _{Lap}	1.5	3.71259	2.800734	-0.242554	-10.11577	8.936282	-5.035284	16.36065	2.221532	9.10383	
			M _{Tump.}	3	75.81541	52.62687	-7.41E-02	0.198837	175.1815	112.9465	112.5757	112.7459	112.776	
		B266	M _{Tump.}	0	66.7391	43.91481	2.77E-02	-0.41348	150.3506	97.31694	98.16783	97.64118	97.8436	
			M _{Lap}	1.5	6.089675	3.943388	0.225806	10.04153	13.61703	19.49323	-1.736241	12.27867	5.47832	
			M _{Lap}	3	-81.4131	-54.02804	0.42396	20.49654	-184.1405	-97.86648	-141.1763	-112.6198	-126.423	
		B267	M _{Lap}	0	-87.4564	-57.58482	-0.41622	-20.50765	-197.0834	-149.7718	-106.4435	-135.0046	-121.211	
			M _{Lap}	1.5	3.13124	2.203593	-0.187098	-10.05223	7.283238	-5.937709	15.28984	1.313161	8.03897	
			M _{Tump.}	3	66.86553	43.99201	0.042024	0.403196	150.6259	98.36037	97.48718	98.0949	97.7526	

PORTAL A-AS Y3 LT2

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	L _{tk} momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B268	M _{Tump.}	0	79.63461	55.61374	-8.69E-02	-0.211112	184.5435	118.404	118.902	118.4953	118.811	
			M _{Lap}	1.5	6.742014	4.649994	0.176267	10.13933	15.53041	20.71043	-0.693212	13.38758	6.62964	
			M _{Lap}	3	-93.0039	-64.31375	0.439421	20.48978	-214.5067	-116.5191	-159.8244	-131.2561	-145.087	
		B269	M _{Lap}	0	98.8567	68.10235	-0.236463	-20.54651	-227.5918	-168.3523	-125.0557	-153.4244	-139.984	
			M _{Lap}	1.5	3.884576	2.801009	-0.158245	-10.19151	9.143107	-4.907489	16.59437	2.466959	9.21992	
			M _{Tump.}	3	79.77253	55.70436	-0.080027	0.163495	184.854	119.0014	118.7084	118.8224	118.887	
		B270	M _{Tump.}	0	75.76876	52.54708	-8.54E-02	-0.190611	174.9978	112.4348	112.8889	112.5121	112.812	
			M _{Lap}	1.5	5.36118	3.634516	0.148117	10.20028	12.24864	18.67593	-2.837961	11.28759	4.55037	
			M _{Lap}	3	-91.8997	-63.27804	0.381666	20.59116	-211.5245	-114.6189	-158.1008	-129.4729	-143.247	
		B271	M _{Lap}	0	93.8604	64.27869	-0.170088	-20.59939	-215.4784	-160.732	-117.3661	-145.7164	-132.382	
			M _{Lap}	1.5	4.368223	3.12279	-0.125144	-10.20728	10.23833	4.203073	17.31106	3.207298	9.90069	
			M _{Tump.}	3	75.74357	52.52427	-8.02E-02	0.184827	174.9311	112.7898	112.4522	112.5951	112.647	
		B272	M _{Tump.}	0	78.03584	54.26321	-8.61E-02	-0.190872	180.4641	115.8959	116.351	115.9729	116.274	
			M _{Lap}	1.5	5.509653	3.708219	0.114165	10.21027	12.54473	18.87806	-2.635435	11.45742	4.7852	
			M _{Lap}	3	-93.8699	-64.84677	0.314469	20.61142	-216.3987	-117.6758	-161.1579	-132.594	-146.24	
		B273	M _{Lap}	0	96.9907	66.66624	-0.105522	-20.61765	-223.0548	-165.5217	-122.1582	-150.4453	-137.235	
			M _{Lap}	1.5	3.969913	2.810423	-9.38E-02	-10.21625	9.260571	-4.817632	16.69558	2.622391	9.25556	
			M _{Tump.}	3	78.07716	54.28709	-8.20E-02	0.185143	180.5519	116.3504	116.0133	116.1541	116.21	
		B274	M _{Tump.}	0	79.644	55.62002	-8.82E-02	-0.170295	184.5648	118.4602	118.8734	118.5206	118.813	
			M _{Lap}	1.5	5.970406	4.163327	8.61E-02	10.21364	13.82581	19.64325	-1.859607	12.19948	5.58417	
			M _{Lap}	3	-94.5565	-65.29336	0.260289	20.59758	-217.9372	-118.7097	-162.1286	-133.6576	-147.181	
		B275	M _{Lap}	0	97.3576	67.15029	-6.40E-02	-20.55585	-224.2696	-166.134	-122.9264	-151.0725	-137.988	
			M _{Lap}	1.5	4.603145	3.258611	-0.07479	-10.17488	10.73755	-3.820958	17.59341	3.602609	10.1698	
			M _{Tump.}	3	79.71058	55.66752	-8.56E-02	0.206084	184.7207	118.9561	118.5772	118.7417	118.792	

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Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B276	M _{Tump.}	0	64.10599	41.92609	2.64E-02	-0.411072	144.0089	93.3014	94.14804	93.62293	93.8265	
			M _{Lap}	1.5	4.638839	3.095466	6.71E-02	10.09366	10.51935	17.44041	-3.798556	10.0709	3.57095	
			M _{Lap}	3	-81.6816	-53.73516	0.107865	20.59838	-183.9942	-97.95658	-141.2811	-113.0171	-126.221	
		B277	M _{Lap}	0	-81.6073	-53.52953	-0.116295	-20.6015	-183.576	-141.0795	-97.74305	-126.0228	-112.8	
			M _{Lap}	1.5	4.640587	3.170588	-4.29E-02	-10.09653	10.64165	-3.744773	17.48495	3.644661	10.0955	
			M _{Tump.}	3	64.03514	41.87071	3.05E-02	0.408447	143.8353	94.05393	93.17695	93.77617	93.4547	
		B278	M _{Tump.}	0	78.16453	54.38063	-8.84E-02	-0.208619	180.8064	116.0857	116.5794	116.1741	116.491	
			M _{Lap}	1.5	5.116583	3.531379	3.55E-02	10.18044	11.79011	18.29781	-3.103451	10.84126	4.3531	
			M _{Lap}	3	-94.7847	-65.31787	0.159303	20.56949	-218.2502	-119.026	-162.3223	-134.0275	-147.321	
		B279	M _{Lap}	0	-95.4137	-65.57	4.38E-02	-20.61913	-219.4085	-163.1298	-119.8572	-147.9426	-135.044	
			M _{Lap}	1.5	4.802429	3.401333	-2.25E-02	-10.22538	11.20505	-3.558342	17.92912	3.940794	10.43	
			M _{Tump.}	3	78.16527	54.37267	-8.87E-02	0.168359	180.7946	116.4771	116.1795	116.2882	116.368	
		B280	M _{Tump.}	0	77.96257	54.132	2.49E-02	-0.18778	180.1663	115.7745	116.1532	115.9308	115.997	
			M _{Lap}	1.5	5.054027	3.499066	1.60E-02	10.23087	11.66334	18.25858	-3.236296	10.75062	4.27166	
			M _{Lap}	3	-94.7078	-65.13386	7.06E-03	20.64951	-217.8636	-118.7934	-162.1618	-133.9656	-146.99	
		B281	M _{Lap}	0	-95.1719	-65.44753	-2.96E-02	-20.6513	-218.9224	-162.8557	-119.4693	-147.6987	-134.626	
			M _{Lap}	1.5	4.829434	3.347342	-3.29E-03	-10.23088	11.15107	-3.563728	17.92319	3.953546	10.4059	
			M _{Tump.}	3	77.97748	54.14221	2.30E-02	0.189547	180.2005	116.1922	115.7797	116.0698	115.902	
		B282	M _{Tump.}	0	-95.1719	-65.44753	-2.96E-02	20.6513	-218.9224	-119.4879	-162.837	-134.6884	-147.637	
			M _{Lap}	1.5	4.829434	3.347342	-3.29E-03	10.23088	11.15107	17.92112	-3.561653	10.399	3.96046	
			M _{Lap}	3	77.97748	54.14221	2.30E-02	-0.189547	180.2005	115.7942	116.1777	115.9504	116.022	
		B283	M _{Lap}	0	77.96257	54.132	2.49E-02	0.18778	180.1663	116.1689	115.7589	116.0491	115.879	
			M _{Lap}	1.5	5.054027	3.499066	1.60E-02	-10.23087	11.66334	-3.226242	18.24852	4.305174	10.7171	
			M _{Tump.}	3	-94.7078	-65.13386	7.06E-03	-20.64951	-217.8636	-162.1573	-118.7978	-146.9748	-133.98	

PORTAL A-AS Y3 LT2

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	L _{tk} momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B284	M _{Tump.}	0	-95.4137	-65.57	4.38E-02	20.61913	-219.4085	-119.8297	-163.1574	-134.9525	-148.035	
			M _{Lap}	1.5	4.802429	3.401333	-2.25E-02	10.22538	11.20505	17.91496	-3.544182	10.38279	3.988	
			M _{Lap}	3	78.16527	54.37267	-8.87E-02	-0.168359	180.7946	116.1236	116.533	116.1821	116.475	
		B285	M _{Lap}	0	78.16453	54.38063	-8.84E-02	0.208619	180.8064	116.5238	116.1413	116.3055	116.36	
			M _{Lap}	1.5	5.116583	3.531379	3.55E-02	-10.18044	11.79011	-3.081104	18.27546	4.427588	10.7668	
			M _{Tump.}	3	-94.7847	-65.31787	0.159303	-20.56949	-218.2502	-162.222	-119.1264	-146.9863	-134.362	
		B286	M _{Tump.}	0	-81.6073	-53.52953	-0.116295	20.6015	-183.576	-97.81631	-141.0062	-113.0439	-125.779	
			M _{Lap}	1.5	4.640587	3.170588	-4.29E-02	10.09653	10.64165	17.45794	-3.717761	10.00547	3.7347	
			M _{Lap}	3	64.03514	41.87071	0.030542	-0.408447	143.8353	93.19619	94.03469	93.51885	93.712	
		B287	M _{Lap}	0	64.10599	41.92609	2.64E-02	0.411072	144.0089	94.16466	93.28479	93.8819	93.5675	
			M _{Lap}	1.5	4.638839	3.095466	6.71E-02	-10.09366	10.51935	-3.756271	17.39812	3.71898	9.92995	
			M _{Tump.}	3	-81.6816	-53.73516	0.107865	-20.59838	-183.9942	-141.2132	-98.02454	-125.9941	-113.244	
		B288	M _{Tump.}	0	-97.3576	-67.15029	-6.40E-02	20.55585	-224.2696	-122.9667	-166.0937	-138.1223	-150.938	
			M _{Lap}	1.5	4.603145	3.258611	-7.48E-02	10.17488	10.73755	17.54629	-3.77384	10.01278	3.75967	
			M _{Lap}	3	79.71058	55.66752	-8.56E-02	-0.206084	184.7207	118.5233	119.01	118.6119	118.921	
		B289	M _{Lap}	0	79.644	55.62002	-8.82E-02	0.170295	184.5648	118.8178	118.5158	118.6279	118.706	
			M _{Lap}	1.5	5.970406	4.163327	0.086056	-10.21364	13.82581	-1.805393	19.58904	5.764884	12.0188	
			M _{Tump.}	3	-94.5565	-65.29336	0.260289	-20.59758	-217.9372	-161.9646	-118.8737	-146.6341	-134.204	
		B290	M _{Tump.}	0	-96.9907	-66.66624	-0.105522	20.61765	-223.0548	-122.2246	-165.4552	-137.4562	-150.224	
			M _{Lap}	1.5	3.969913	2.810423	-9.38E-02	10.21625	9.260571	16.6365	-4.758554	9.058631	2.81932	
			M _{Lap}	3	78.07716	54.28709	-8.20E-02	-0.185143	180.5519	115.9616	116.4021	116.0374	116.326	
		B291	M _{Lap}	0	78.03584	54.26321	-8.61E-02	0.190872	180.4641	116.2967	115.9502	116.0931	116.154	
			M _{Lap}	1.5	5.509653	3.708219	0.114165	-10.21027	12.54473	-2.563511	18.80614	5.024951	11.2177	
			M _{Tump.}	3	-93.8699	-64.84677	0.314469	-20.61142	-216.3987	-160.9597	-117.8739	-145.5792	-133.254	

PORTAL A-AS Y3 LT2

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	L _{tk} momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B292	M _{Tump.}	0	-93.8604	-64.27869	-0.170088	20.59939	-215.4784	-117.4733	-160.6248	-132.7388	-145.359	
			M _{Lap}	1.5	4.368223	3.12279	-0.125144	10.20728	10.23833	17.23222	-4.124232	9.637885	3.4701	
			M _{Lap}	3	75.74357	52.52427	-0.080199	-0.184827	174.9311	112.4017	112.8404	112.4786	112.763	
		B293	M _{Lap}	0	75.76876	52.54708	-8.54E-02	0.190611	174.9978	112.8351	112.4886	112.6322	112.692	
			M _{Lap}	1.5	5.36118	3.634516	0.148117	-10.20028	12.24864	-2.744647	18.58262	4.861421	10.9765	
			M _{Tump.}	3	-91.8997	-63.27804	0.381666	-20.59116	-211.5245	-157.8604	-114.8594	-142.4453	-130.274	
		B294	M _{Tump.}	0	-98.8567	-68.10235	-0.236463	20.54651	-227.5918	-125.2047	-168.2034	-140.4801	-152.928	
			M _{Lap}	1.5	3.884576	2.801009	-0.158245	10.19151	9.143107	16.49468	-4.807795	8.887609	2.79927	
			M _{Lap}	3	79.77253	55.70436	-8.00E-02	-0.163495	184.854	118.658	119.0518	118.7194	118.99	
		B295	M _{Lap}	0	79.63461	55.61374	-8.69E-02	0.211112	184.5435	118.8473	118.4587	118.6283	118.678	
			M _{Lap}	1.5	6.742014	4.649994	0.176267	-10.13933	15.53041	-0.582164	20.59939	6.99802	13.0174	
			M _{Tump.}	3	-93.0039	-64.31375	0.439421	-20.48978	-214.5067	-159.5476	-116.7959	-144.1647	-132.179	
		B296	M _{Tump.}	0	-87.4564	-57.58482	-0.41622	20.50765	-197.0834	-106.7057	-149.5096	-122.0847	-134.131	
			M _{Lap}	1.5	3.13124	2.203593	-0.187098	10.05223	7.283238	15.17197	-5.819837	7.646065	1.70607	
			M _{Lap}	3	66.86553	43.99201	4.20E-02	-0.403196	150.6259	97.51365	98.33389	97.84089	98.0067	
		B297	M _{Lap}	0	66.7391	43.91481	2.77E-02	0.41348	150.3506	98.18525	97.29952	97.90167	97.5831	
			M _{Lap}	1.5	6.089675	3.943388	0.225806	-10.04153	13.61703	-1.593983	19.35097	5.952508	11.8045	
			M _{Tump.}	3	-81.4131	-54.02804	0.42396	-20.49654	-184.1405	-140.9092	-98.13357	-125.5326	-113.51	
		B298	M _{Tump.}	0	-95.2436	-65.0254	-0.411001	20.43038	-218.3329	-119.6493	-162.2942	-134.9677	-146.976	
			M _{Lap}	1.5	3.71259	2.800734	-0.242554	10.11577	8.936282	16.20784	-4.882475	8.594469	2.7309	
			M _{Lap}	3	75.81541	52.62687	-7.41E-02	-0.198837	175.1815	112.529	112.9932	112.6207	112.902	
		B299	M _{Lap}	0	75.79428	52.62975	-8.17E-02	0.173984	175.1607	112.8977	112.5838	112.7098	112.772	
			M _{Lap}	1.5	6.349557	4.231509	0.2723	-10.13869	14.38988	-1.226965	19.89274	6.425113	12.2407	
			M _{Tump.}	3	-89.9485	-62.16673	0.626256	-20.45137	-207.4049	-154.8876	-112.3343	-139.3956	-127.826	

PORTAL A-AS Y3 LT2

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B300	M _{Tump.}	0	-100.205	-69.49243	-0.534135	20.48032	-231.4335	-127.659	-170.3312	-143.1047	-154.886	
			M _{Lap}	1.5	2.842019	2.218729	-0.298453	10.1626	6.960389	14.95863	-6.194796	7.269762	1.49408	
			M _{Lap}	3	79.03536	55.92989	-6.28E-02	-0.155124	184.3303	118.0403	118.4056	118.1082	118.338	
		B301	M _{Lap}	0	79.03455	55.92757	-7.16E-02	0.225381	184.3256	118.4347	118.0066	118.2164	118.225	
			M _{Lap}	1.5	7.945376	5.323654	0.36312	-10.13786	18.0523	1.166171	22.22692	8.884395	14.5087	
			M _{Tump.}	3	-89.9971	-63.28026	0.797853	-20.50111	-209.245	-155.6384	-113.0887	-139.9836	-128.743	
		B302	M _{Tump.}	0	-84.2392	-56.59632	-0.967363	22.38082	-191.6412	-100.9117	-147.302	-118.0727	-130.141	
			M _{Lap}	1.42415	2.852155	2.222259	-0.384358	10.51552	6.978201	15.31501	-6.525435	7.303598	1.48597	
			M _{Lap}	2.8483	65.73733	44.81521	0.198647	-1.349785	150.5891	95.90308	98.61248	97.04117	97.4744	
		B303	M _{Lap}	0	66.55738	45.1485	0.125689	-0.435869	152.1065	97.91074	98.74688	98.32348	98.3341	
			M _{Lap}	1.37585	6.178907	4.031365	0.449802	-11.52337	13.86487	-2.930244	20.98547	5.870041	12.1852	
			M _{Tump.}	2.7517	-74.0896	-49.65245	0.773915	-22.61088	-168.3515	-132.5728	-85.57753	-115.385	-102.765	

PORTAL A-AS Y3 LT2

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Luk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B100	0 M _{Tump.} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap}	153.37732 4.6512713 -161.4781 -153.645	88.36546 2.8316128 -91.70223 -84.26756	2.8259372 -5.686796 -14.19953 14.19468	325.43752 10.112106 -340.4973 -319.2021	220.03239 0.7214551 -242.533 -199.9152	213.40047 12.614047 -212.1159 -228.9165	218.76901 4.9592109 -232.7941 -211.2903	214.6639 8.376291 -221.8548 -217.5414			
		B101	1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	1.2677333 138.77716 138.40231	0.3348788 75.937322 75.688593	5.6835364 -2.827607 2.8335945	2.0570861 288.03231 287.18453	7.4825026 190.93668 196.33464	-4.398315 196.1764 189.67785	3.2413934 193.8296 195.07591	-0.157206 193.2835 190.9366			
		B102	1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap}	4.4474997 -146.9106 -148.0242	2.4483656 -79.79186 -81.07457	9.39E-02 -0.933191 -1.390499	9.2543846 -303.9597 -307.3483	0.2763476 -219.7254 -192.0793	12.148342 -189.3246 -220.9254	4.5212862 -209.9768 -203.5041	7.903404 -199.0733 -209.5006			
		B103	1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	1.6169577 133.85476 133.70591	0.9093858 73.893342 73.911295	5.6624431 -2.828492 2.885839	3.3953666 278.85506 278.70516	8.1833969 184.50262 190.36025	-3.64196 189.69799 183.55039	3.9447646 187.4501 189.11369	0.596673 186.7505 184.797			
		B104	1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap}	3.4002886 -144.3087 -152.9114	1.7769797 -79.35734 -84.27703	0.1416323 -0.906571 -1.403022	6.9235138 -300.1421 -318.3369	-1.134989 -216.5737 -199.4128	10.514589 -186.4647 -227.8901	3.0776933 -206.9018 -210.7204	6.301907 -196.1366 -216.5825			
		B105	1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	2.9312179 141.37047 141.20208	1.6685766 78.614183 78.582685	-0.145877 1.1112673 1.0999978	6.1871841 295.42726 295.17479	9.9042998 201.17402 194.36453	-1.646336 5.7221916 199.84174	5.9345103 197.7105 195.6968	2.535773			
		B106	1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap}	5.3391656 -147.9271 -155.4459	3.0470332 -81.48862 -85.19786	0.1454157 -0.809166 -1.498574	11.282252 -307.8943 -322.8517	1.7584577 -221.6006 -202.6002	13.293052 -191.7219 -231.1855	5.9345103 -211.9162 -214.037	9.116999 -201.4063 -219.7488			
		B107	1.5 M _{Lap} 3 M _{Tump.}	0.4903808 139.02336	2.68E-02 76.251564	-0.162121 1.1743321	0.6314164 288.83053	6.3266323 191.31	-5.263002 194.32418	2.1153535 193.7018	-1.051723			

PORTAL A-AS Y3 LTS

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _r (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B108	0	M _{Tump-}	138.55274	75.900028	1.2049307	2.8748362	287.70334	196.69553	189.89927	195.46815	191.1266	
			1.5	M _{Lap}	5.7057985	3.2125923	0.2103577	-5.64982	11.987106	2.1489736	13.881069	6.4562039	9.573839	
			3	M _{Lap}	-144.5445	-78.47484	-0.784215	-14.17448	-299.0131	-216.3411	-186.0806	-206.4992	-195.9225	
		B109	0	M _{Lap}	-153.3273	-83.9553	-1.432657	13.984435	-318.3212	-199.6531	-228.1178	-210.9847	-216.7863	
			1.5	M _{Lap}	-0.194406	-0.156072	-0.226538	5.6519895	-0.483002	5.5607778	-6.165681	1.2400598	-1.844963	
			3	M _{Tump-}	135.53514	74.643156	0.9795805	-2.680456	282.07122	186.83118	191.843	189.5213	189.1529	
		B110	0	M _{Tump-}	135.46015	74.832143	1.1444882	2.9672632	282.28361	192.85355	185.90127	191.51381	187.241	
			1.5	M _{Lap}	7.4564239	4.1597735	0.1522434	-5.344071	15.603346	4.8865848	16.01322	8.9263758	11.97343	
			3	M _{Lap}	-137.9506	-75.5126	-0.840001	-13.6554	-286.3609	-207.0239	-177.8183	-197.6045	-187.2376	
		B111	0	M _{Lap}	-137.8868	-74.9262	-3.10019	15.702977	-285.3461	-176.4731	-207.4963	-190.2934	-193.6759	
			1.42415	M _{Lap}	-1.81827	-0.753574	-0.234489	5.9723944	-3.387643	3.8132144	-8.581086	-0.748845	-4.019027	
			2.8483	M _{Tump-}	118.99305	65.716204	2.6312119	-3.758188	247.93759	163.22665	169.46118	167.92286	164.765	
		B112	0	M _{Tump-}	121.34995	66.77595	3.0862304	-1.644552	252.46146	168.73168	170.24091	172.2088	166.7638	
			1.37585	M _{Lap}	18.162673	9.5973709	0.6821018	-7.052316	37.151001	17.927081	32.30722	23.611878	26.62242	
			2.7517	M _{Lap}	-99.00832	-54.52636	-1.722027	-12.46008	-206.0522	-151.9359	-124.6848	-144.0434	-132.5773	
		B69	0	M _{Lap}	121.34995	66.77595	3.0862304	1.6445515	252.46146	172.18524	166.78735	173.24487	165.7277	
			1.37585	M _{Lap}	18.162673	9.5973709	0.6821018	7.052316	37.151001	32.736944	17.497357	28.054837	22.17946	
			2.7517	M _{Tump-}	-99.00832	-54.52636	-1.722027	12.46008	-206.0522	-125.7697	-150.851	-136.1935	-140.4271	
		B70	0	M _{Tump-}	-137.8868	-74.9262	-3.10019	-15.70298	-285.3461	-209.4494	-174.52	-200.1863	-183.783	
			1.42415	M _{Lap}	-1.81827	-0.753574	-0.234489	-5.972394	-3.387643	3.8132144	3.9609424	-4.511453	-0.256418	
			2.8483	M _{Lap}	118.99305	65.716204	2.6312119	3.7581879	247.93759	171.11884	161.56898	170.29051	162.3973	
		B71	0	M _{Lap}	135.46015	74.832143	1.1444882	-2.967263	282.28361	186.6223	192.13252	189.64444	189.1104	
			1.5	M _{Lap}	7.4564239	4.1597735	0.1522434	5.3440708	15.603346	16.109134	4.7906714	12.29314	8.606665	
			3	M _{Tump-}	-137.9506	-75.5126	-0.840001	13.655405	-286.3609	-178.3475	-206.4947	-189.0016	-195.8405	

PORTAL A-AS Y3 LT3

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B72	0 M _{Tump.} 1.5 M _{Jap.} 3 M _{Jap.} 0 M _{Jap.} 1.5 M _{Jap.} 3 M _{Tump.} 0 M _{Tump.}	-153.3273 -0.194406 135.53514 138.55274 5.7057985 -144.5445 141.20208 5.3391656 -147.9271 -152.9114 2.9312179 141.37047 133.70591 3.4002886 -144.3087 -148.0242 1.6169577 133.85476 138.40231 4.4474997 -146.9106 -153.645 1.2677333 138.77716	-83.9553 -0.156072 74.643156 75.900028 3.2125923 -78.47484 78.582685 3.0470332 -81.48862 -84.27703 1.6685766 78.614183 73.911295 1.7769797 -79.35734 -81.07457 0.9093858 73.893342 75.688593 2.4483656 -79.79186 -84.26756 0.3348788 75.937322	-1.4322657 -0.226538 0.9795805 1.2049307 0.2103577 -0.784215 1.0999978 0.1454157 -0.809166 -1.403022 -0.145877 1.1112673 1.189836 0.1416323 -0.906571 -1.390499 -0.104403 1.1816917 1.1210308 9.39E-02 -0.933191 -1.281704 -8.67E-02 1.1083433	-13.98444 -5.651989 2.6804563 -2.874836 5.6498196 14.174475 -2.912613 5.5362885 13.98519 -13.98156 -5.544066 2.8934244 -2.885839 5.5899076 14.065654 -14.15338 -5.662443 2.8284921 -2.833595 5.6815069 14.196608 -14.19468 -5.683536 2.8276075	-318.3212 -0.483002 282.07122 287.70334 11.987106 -299.0131 295.17479 11.282252 -307.8943 -318.3369 6.1871841 295.42726 278.70516 6.9235138 -300.1421 -307.3483 3.3953666 278.85506 287.18453 9.2543846 -303.9597 -319.2021 2.0570861 288.03231	-229.0204 -6.3084 192.46013 190.65837 14.013595 -186.5747 195.05753 13.384664 -192.2317 -228.774 -1.738238 201.35408 184.29999 10.603817 -187.0358 -221.8014 -3.707734 190.44245 190.38409 12.207512 -189.9126 -229.724 -4.452924 196.87465	-198.7505 5.703497 186.21404 195.93642 2.0164483 -215.847 200.48102 1.6668458 -221.0908 -198.5289 9.9962026 194.57779 189.61065 -1.224217 -216.0026 -191.2033 8.249171 183.75815 195.62839 0.2171781 -219.1375 -199.1077 7.5371111 190.23842	-219.7949 -2.320694 191.20999 193.657 10.01559 -197.5693 198.0068 9.4223721 -203.1055 -219.5288 2.2294301 200.04419 187.29561 6.5993351 -198.0404 -212.4207 0.3774255 189.23205 193.29074 8.1006355 -201.033 -220.233 -0.339235 195.61099	-207.9761 1.715791 187.4642 192.9378 6.014453 -204.8524 197.5317 5.629137 -210.217 -207.7741 6.028534 195.8877 186.615 2.780265 -204.998 -200.584 4.164012 184.9686 192.7217 4.324055 -208.0171 -208.5987 3.423422 191.5021		
PORTAL A-AS Y3 LT3														

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Lok momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey {8}	Ex {9}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B81	0 M _{Tump.} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap}	153.37732 4.6512713 -161.4781 -162.7171	88.36546 2.8316128 -91.70223 -92.37438	1.1070546 0.0788579 -0.949339 -1.267445	-2.825937 5.6867963 14.19953 -14.19972	325.43752 10.112106 -340.4973 -343.0595	214.09792 12.663727 -212.714 -244.3577	219.33494 0.6717746 -241.9349 -213.7398	216.98867 8.5418926 -223.8484 -234.8525	216.4442 4.793609 -230.8005 -223.245		
		B82	1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	4.0291786 153.37209 133.78837	2.4700266 88.314435 73.932762	-7.35E-02 1.1203872 1.177374	-5.689903 2.8199139 -2.812667	8.7870568 325.3496 278.83847	-0.210806 219.99262 184.473	11.784314 213.36495 189.63786	3.9172292 218.74346 187.40568	7.656279 214.6141 186.7052		
		B83	1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap}	2.3931385 -146.4054 -146.0485	1.1063844 -80.71999 -79.76451	6.55E-02 -1.046378 -1.252366	5.6776567 14.16798 -14.07682	4.6419813 -304.8385 -302.8814	9.1919891 -190.0325 -218.7777	-2.772354 -219.1261 -188.4274	5.0670523 -201.2151 -209.3517	1.352583 -207.9435 -197.8533		
		B84	1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	2.4876624 133.62046 125.77213	1.498113 73.760733 65.498394	-3.42E-02 1.1839148 1.0981403	-5.610821 2.855174 -2.870786	5.3821757 278.36173 255.72399	-2.346286 190.14161 170.65632	9.4579993 183.39988 175.99314	1.7525116 188.91324 173.57348	5.359202 184.6283 173.076		
		B85	1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap}	3.5669066 -136.0416 -140.5977	1.768975 -70.96044 -74.20673	3.05E-02 -1.037079 -1.179112	5.5709292 14.012645 -14.01042	7.1106479 -276.7867 -287.448	10.718799 -173.1622 -209.4602	-0.999387 -201.9354 -179.2954	6.6466059 -184.2238 -200.0291	3.072807 -190.8739 -188.7264		
		B86	1.5 M _{Lap} 3 M _{Tump.} 0 M _{Tump.}	1.5168213 126.22799 153.10341	0.3187876 65.844302 88.12162	-3.94E-02 1.1002653 1.1767969	-5.572125 2.8661741 -2.846378	2.3302458 256.82447 324.71869	-4.069651 177.37737 213.6572	7.656648 170.66523 218.89321	-3.12E-03 176.07942 216.61423	3.590113 171.9632 215.9362		
		B87	1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap}	4.6068036 -161.2931 -164.6261	2.9604272 -91.20077 -93.89037	5.35E-02 -1.069721 -1.259477	5.6154764 14.077331 -14.16976	10.264848 -339.473 -347.7759	12.615328 -212.37 -247.2834	0.7890981 -241.2585 -216.7334	8.5273029 -223.5031 -237.7943	4.877123 -230.1254 -226.2224		
		B88	1.5 M _{Lap} 3 M _{Tump.}	3.0425398 153.30789	1.6836643 88.257695	-6.86E-02 1.1222843	-5.683921 2.8019194	6.3449107 325.18178	-1.73435 219.87117	10.2451 213.2801	2.392914 218.63664	6.117837 214.5146		

PORTAL A-AS Y3 LT3

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B89	0 M _{Tump.} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.}	151.57052 3.1032116 -162.7674 -162.8129 3.0907427	87.135633 1.6979412 -92.73975 -92.79816 1.6820464	2.0251319 6.20E-02 -1.901168 -2.002402 -1.85E-02	-2.813672 5.6976 14.208872 -14.20312 -5.696729	321.30164 6.4405598 -343.7045 -343.8526 6.4001655	211.72806 10.330079 -215.0114 -244.9605 -1.682425	216.36093 -1.673929 -243.6523 -213.8724 10.292363	215.28458 6.1879003 -226.8523 -235.9929 2.4910726	212.8044 2.46825 -231.8114 -222.8399 6.118865		
		B90	3 M _{Tump.} 0 M _{Tump.} 1.5 M _{Lap} 3 M _{Lap}	151.5911 -162.8129 3.0907427	87.162257 -92.79816 1.6820464	2.002402 -1.85E-02 1.9653984	2.8096567 14.203115 5.6967293	321.36893 -343.8526 6.4001655	217.65212 -215.1339 10.280707	210.51364 -243.6989 -1.670769	217.03159 -227.045 6.0800121	211.1342 -231.7879 2.529926		
		B91	0 M _{Lap} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.}	151.5911 151.57052 3.1032116 -162.7674 -164.6261	87.162257 87.135633 1.6979412 -92.73975 -93.89037	1.9653984 2.0251319 6.20E-02 -1.901168 -1.259477	-2.809657 2.813672 -5.6976 -14.20887 14.169761	321.36893 321.30164 6.4405598 -343.7045 -347.7759	211.75184 217.63677 -1.63488 -244.85 -217.5269	216.41392 210.45222 10.291031 -213.8136 -246.4899	215.2615 217.05719 2.5984123 -235.8039 -228.8673	212.9043 211.0318 6.057738 -222.8598 -235.1494		
		B92	0 M _{Lap} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.}	151.5911 151.57052 3.1032116 -162.7674 -164.6261	87.162257 87.135633 1.6979412 -92.73975 -93.89037	1.9653984 2.0251319 6.20E-02 -1.901168 -1.259477	-2.809657 2.813672 -5.6976 -14.20887 14.169761	321.36893 321.30164 6.4405598 -343.7045 -347.7759	211.75184 217.63677 -1.63488 -244.85 -217.5269	216.41392 210.45222 10.291031 -213.8136 -246.4899	215.2615 217.05719 2.5984123 -235.8039 -228.8673	212.9043 211.0318 6.057738 -222.8598 -235.1494		
		B93	0 M _{Lap} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.}	151.5911 151.57052 3.1032116 -162.7674 -164.6261	87.162257 87.135633 1.6979412 -92.73975 -93.89037	1.9653984 2.0251319 6.20E-02 -1.901168 -1.259477	-2.809657 2.813672 -5.6976 -14.20887 14.169761	321.36893 321.30164 6.4405598 -343.7045 -347.7759	211.75184 217.63677 -1.63488 -244.85 -217.5269	216.41392 210.45222 10.291031 -213.8136 -246.4899	215.2615 217.05719 2.5984123 -235.8039 -228.8673	212.9043 211.0318 6.057738 -222.8598 -235.1494		
		B94	0 M _{Lap} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.}	151.5911 151.57052 3.1032116 -162.7674 -164.6261	87.162257 87.135633 1.6979412 -92.73975 -93.89037	1.9653984 2.0251319 6.20E-02 -1.901168 -1.259477	-2.809657 2.813672 -5.6976 -14.20887 14.169761	321.36893 321.30164 6.4405598 -343.7045 -347.7759	211.75184 217.63677 -1.63488 -244.85 -217.5269	216.41392 210.45222 10.291031 -213.8136 -246.4899	215.2615 217.05719 2.5984123 -235.8039 -228.8673	212.9043 211.0318 6.057738 -222.8598 -235.1494		
		B95	0 M _{Lap} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.}	151.5911 151.57052 3.1032116 -162.7674 -164.6261	87.162257 87.135633 1.6979412 -92.73975 -93.89037	1.9653984 2.0251319 6.20E-02 -1.901168 -1.259477	-2.809657 2.813672 -5.6976 -14.20887 14.169761	321.36893 321.30164 6.4405598 -343.7045 -347.7759	211.75184 217.63677 -1.63488 -244.85 -217.5269	216.41392 210.45222 10.291031 -213.8136 -246.4899	215.2615 217.05719 2.5984123 -235.8039 -228.8673	212.9043 211.0318 6.057738 -222.8598 -235.1494		
		B96	0 M _{Lap} 1.5 M _{Lap} 3 M _{Lap} 0 M _{Lap} 1.5 M _{Lap} 3 M _{Tump.}	151.5911 151.57052 3.1032116 -162.7674 -164.6261	87.162257 87.135633 1.6979412 -92.73975 -93.89037	1.9653984 2.0251319 6.20E-02 -1.901168 -1.259477	-2.809657 2.813672 -5.6976 -14.20887 14.169761	321.36893 321.30164 6.4405598 -343.7045 -347.7759	211.75184 217.63677 -1.63488 -244.85 -217.5269	216.41392 210.45222 10.291031 -213.8136 -246.4899	215.2615 217.05719 2.5984123 -235.8039 -228.8673	212.9043 211.0318 6.057738 -222.8598 -235.1494		

PORTAL A-AS Y3 LT3

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
	PORTAL A-AS Y3 LT3	B97	0	M _{Tump-}	-146.0485	-79.76451	-1.252366	14.076815	-302.8814	-189.2164	-217.9887	-200.4833	-206.7217	
			1.5	M _{Lap}	2.4876624	1.498113	-3.42E-02	5.6108206	5.3821757	9.4364373	-2.324724	5.2873285	1.824385	
			3	M _{Lap}	133.62046	73.760733	1.1839148	-2.855174	278.36173	184.14575	189.39574	187.11448	186.427	
		B98	0	M _{Lap}	133.78837	73.932762	1.177374	2.812667	278.83847	190.37961	183.73126	189.17766	184.9332	
			1.5	M _{Lap}	2.3931385	1.1063844	6.55E-02	-5.677657	4.6419813	-2.73109	9.1507254	1.4901286	4.929507	
			3	M _{Tump-}	-146.4054	-80.71999	-1.046378	-14.16798	-304.8385	-219.7853	-189.3733	-210.1409	-199.0177	
	B99	0	M _{Tump-}	-162.7171	-92.37438	-1.267445	14.199721	-343.0595	-214.5383	-243.5592	-225.9067	-232.1909		
		1.5	M _{Lap}	4.0291786	2.4700266	-7.35E-02	5.6899034	8.7870568	11.737991	-0.164483	7.5018683	4.07164		
		3	M _{Lap}	153.37209	88.314435	1.1203872	-2.819914	325.3496	214.0708	219.28677	216.96692	216.3907		

Tabel Momen Balok Portal As Y4

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0	M _{Tump-}	-57.559	-24.935	-1.9236	-22.6988	-108.966	-100.585	-51.7061	-85.3157	-66.9759	
	B218		1.4242	M _{Lap}	-12.542	-5.1434	0.324246	1.462591	-23.2794	-14.7712	-18.0469	-15.6079	-17.2102	
			2.8483	M _{Tump-}	14.3508	6.94495	2.572088	25.62399	28.33285	47.15902	-8.27176	30.21588	8.671384	
			0	M _{Tump-}	167.52	77.8159	5.69E-02	-3.25835	325.5296	221.5169	228.3236	223.9535	225.8869	
	B219		1.5	M _{Lap}	22.2507	10.7007	0.523819	6.106887	43.82199	36.68195	23.52748	32.57839	27.63103	
			3	M _{Lap}	-143.6	-65.414	0.990782	15.47213	-276.987	-175.437	-208.553	-186.081	-197.909	
			0	M _{Lap}	-180.54	-86.119	-1.02318	-16.7634	-354.441	-261.748	-225.9	-250.179	-237.469	
	B220		1.5	M _{Lap}	4.3429	0.6298	-0.45309	-6.99219	6.219165	-2.5277	12.44134	2.278541	7.635104	
			3	M _{Tump-}	168.643	78.379	0.117	2.779042	327.7775	229.4083	223.4986	227.4517	225.4552	
			0	M _{Tump-}	139.933	74.4628	0.143801	-3.11853	287.0595	190.6116	197.0699	193.0094	194.6721	
	B221		1.5	M _{Lap}	1.73159	2.1124	0.410626	6.925349	5.457743	10.54994	-4.25198	5.761622	0.536338	
			3	M _{Lap}	-157.05	-79.238	0.677451	16.96923	-315.246	-196.796	-232.858	-208.77	-220.883	
			0	M _{Lap}	-161.61	-86.127	-0.99844	-17.0104	-331.736	-242.127	-205.776	-230.358	-217.545	
	B222		1.5	M _{Lap}	-0.1363	-0.9801	-0.3402	-6.92528	-1.7318	-8.13933	6.618077	-3.29929	1.778044	
			3	M _{Tump-}	140.753	75.1668	0.318044	3.159858	289.171	198.5643	191.7282	196.4755	193.8169	
			0	M _{Tump-}	162.825	90.9223	0.309616	-3.08594	340.8653	225.1042	231.3897	227.6	228.8939	
	B223		1.5	M _{Lap}	6.91126	3.82062	0.305804	6.958041	14.40651	17.06608	2.261541	12.17669	7.150936	
			3	M _{Lap}	-169.59	-92.281	0.301992	17.00202	-351.154	-218.256	-254.15	-230.53	-241.876	
			0	M _{Lap}	-173.77	-93.702	-0.93361	-17.0472	-358.447	-259.685	-223.298	-247.841	-235.141	
	B224		1.5	M _{Lap}	5.02856	3.22775	-0.2287	-6.9849	11.19868	-9.27E-02	14.71966	4.873098	9.753854	
			3	M _{Tump-}	163.243	91.157	0.476209	3.07743	341.7431	232.2156	225.453	230.3037	227.3649	
			0	M _{Tump-}	144.132	73.9512	0.151477	-3.18568	291.2799	194.6303	201.2248	197.0831	198.772	
	B225		1.5	M _{Lap}	2.18463	0.22506	0.208645	6.972234	2.981646	9.822216	-4.95092	4.850978	2.03E-02	
			3	M _{Lap}	-160.35	-82.501	0.265813	17.13015	-324.418	-202.27	-238.41	-214.665	-226.015	
			0	M _{Lap}	-157.57	-80.191	-0.63866	-17.157	-317.394	-234.188	-197.756	-222.047	-209.897	
	B226		1.5	M _{Lap}	3.55809	1.35414	-0.17799	-7.01294	6.436335	-2.83055	12.00875	2.193138	6.985067	
			3	M _{Tump-}	144.104	73.8998	0.282682	3.131106	291.165	201.2433	194.4899	199.1497	196.5835	

PORTAL A-AS Y4 LT2

Tabel Momen Balok Portal As Y4

No Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu _j (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket	
						Ey	Ex							
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
PORTAL A-AS_Y4_LT2	B227	0	M _{Tump.}	141.068	74.8058	0.149587	-3.15456	288.9714	191.9843	198.5147	194.4129	196.0861		
		1.5	M _{Lap.}	4.312	2.46401	0.170144	7.027643	9.116821	13.51255	-1.35269	8.472288	3.687571		
		3	M _{Lap.}	-153.03	-78.878	0.1907	17.20985	-309.839	-192.243	-228.504	-204.752	-215.995		
	B228	0	M _{Lap.}	-161.6	-85.616	-0.53218	-17.229	-330.903	-241.874	-205.358	-229.602	-217.63		
		1.5	M _{Lap.}	0.42678	-0.6202	-0.14288	-7.03924	-0.48019	-7.37883	7.493602	-2.31	2.424778		
		3	M _{Tump.}	141.868	75.3752	0.246415	3.150481	290.8413	199.8329	193.0616	197.6984	195.1961		
	B229	0	M _{Tump.}	162.202	90.2686	0.151598	-3.16334	339.0716	223.9071	230.4546	226.3436	228.0181		
		1.5	M _{Lap.}	6.09401	3.39275	0.130958	7.043836	12.74122	15.97343	1.09887	10.89246	6.179835		
		3	M _{Lap.}	-170.6	-92.483	0.110318	17.25102	-352.691	-219.244	-255.541	-231.843	-242.942		
	B230	0	M _{Lap.}	-172.13	-92.494	-0.46026	-17.2793	-354.55	-257.299	-220.723	-244.937	-233.085		
		1.5	M _{Lap.}	5.41505	3.42411	-0.10926	-7.06115	11.97664	0.394372	15.29162	5.504012	10.18198		
		3	M _{Tump.}	162.379	90.3423	0.241743	3.156988	339.4021	230.8043	224.0223	228.6615	226.165		
	B231	0	M _{Tump.}	144.191	73.9961	0.181736	-3.15896	291.4232	194.7587	201.278	197.2141	198.8226		
		1.5	M _{Lap.}	1.89127	7.24E-02	0.106239	7.05563	2.385365	9.473323	-5.41043	4.36552	-0.30263		
		3	M _{Lap.}	-160.99	-82.851	3.07E-02	17.27022	-325.754	-203.096	-239.383	-215.767	-226.712		
B232	0	M _{Lap.}	-156.92	-79.863	-0.43344	-17.2928	-316.088	-233.376	-196.788	-220.985	-209.18			
	1.5	M _{Lap.}	3.81095	1.46708	-9.48E-02	-7.04431	6.920462	-2.50063	12.35214	2.607261	7.244247			
	3	M _{Tump.}	143.96	73.797	0.243848	3.204143	290.8269	201.091	194.2087	198.9152	196.3845			
B233	0	M _{Tump.}	141.658	75.511	0.372233	-3.12549	290.8074	193.1485	199.4775	195.7194	196.9067			
	1.5	M _{Lap.}	4.01733	2.31719	8.20E-02	7.066705	8.528307	13.1239	-1.76784	7.990139	3.36592			
	3	M _{Lap.}	-154.21	-79.877	-0.20824	17.2589	-312.852	-194.185	-230.297	-207.023	-217.459			
B234	0	M _{Lap.}	-161.01	-85.477	-0.44443	-17.2714	-329.981	-241.19	-204.64	-228.823	-217.008			
	1.5	M _{Lap.}	0.93107	-0.2469	-1.75E-02	-7.07438	0.722185	-6.61156	8.255665	-1.42474	3.068846			
	3	M _{Tump.}	142.291	75.9835	0.409456	3.12264	292.3233	200.6833	193.8678	198.6892	195.862			
B235	0	M _{Tump.}	161.406	89.4954	0.102542	-3.20257	336.8801	222.5282	229.189	224.9575	226.7598			
	1.5	M _{Lap.}	5.76057	3.186	3.82E-02	7.055041	12.01028	15.47559	0.635963	10.31818	5.793371			
	3	M _{Lap.}	-170.47	-92.123	-2.62E-02	17.31265	-351.961	-218.861	-255.201	-231.605	-242.457			

Tabel Momen Balok Portal As Y4

No	Portal	Balok	Jarak (m)	Lfk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		M _{Uj} (kNm)	M _{U2} (kNm)	M _{U3} (kNm)	M _{U4} (kNm)	M _{U5} (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B236	0	M _{Tump-}	-173.7	-94.576	-0.52836	-17.3091	-359.763	-260.31	-223.628	-247.976	-235.962	
			1.5	M _{Lap}	4.17711	2.00668	-0.20797	-7.07173	8.223224	-1.84066	13.14101	3.204211	8.096141	
			3	M _{Lap}	161.471	89.5896	0.112416	3.165605	337.1082	229.345	222.6264	227.1009	224.8705	
		B237	0	M _{Lap}	158.364	88.3484	1.979551	-3.14535	331.3938	219.2622	224.6203	223.029	220.8535	
			1.5	M _{Lap}	3.04381	1.35298	0.20909	7.085362	5.817343	11.55387	-3.45711	6.499813	1.596945	
			3	M _{Tump-}	-172.86	-94.642	-1.56137	17.31608	-358.861	-223.438	-258.818	-237.313	-244.944	
			0	M _{Tump-}	-171.33	-93.734	-2.03982	-17.302	-355.575	-257.762	-220.143	-246.544	-231.361	
		B238	1.5	M _{Lap}	3.74803	1.77767	-3.48E-02	-7.07449	7.341901	-2.38383	12.49455	2.790325	7.320396	
			3	M _{Lap}	158.245	88.2895	1.970161	3.153059	331.1569	225.7107	217.848	224.8412	218.7175	
			0	M _{Lap}	-171.33	-93.734	-2.03982	17.30204	-355.575	-221.428	-256.477	-235.644	-242.261	
		B239	1.5	M _{Lap}	3.74803	1.77767	-0.03483	7.07449	7.341901	12.4726	-2.36188	7.247254	2.863467	
			3	M _{Tump-}	158.245	88.2895	1.970161	-3.15306	331.1569	219.0893	224.4695	222.8548	220.7039	
			0	M _{Tump-}	158.364	88.3484	1.979551	3.145351	331.3938	225.8674	218.0151	225.0106	218.8719	
		B240	1.5	M _{Lap}	3.04381	1.35298	0.20909	-7.08536	5.817343	-3.32539	11.42215	2.036035	6.060723	
			3	M _{Lap}	-172.86	-94.642	-1.56137	-17.3161	-358.861	-259.802	-222.455	-248.222	-234.034	
			0	M _{Lap}	-173.7	-94.576	-0.52836	17.30907	-359.763	-223.961	-259.977	-237.072	-246.867	
		B241	1.5	M _{Lap}	4.17711	2.00668	-0.20797	7.071734	8.223224	13.00999	-1.70963	7.659403	3.640948	
			3	M _{Tump-}	161.471	89.5896	0.112416	-3.16561	337.1082	222.6973	229.2742	225.1066	226.8649	
			0	M _{Tump-}	161.406	89.4954	0.102542	3.202569	336.8801	229.2536	222.4636	226.9751	224.7421	
		B242	1.5	M _{Lap}	5.76057	3.186	0.038159	-7.05504	12.01028	0.660003	15.45155	5.873505	10.23805	
			3	M _{Lap}	-170.47	-92.123	-2.62E-02	-17.3127	-351.961	-255.217	-218.844	-242.512	-231.55	
			0	M _{Lap}	-161.01	-85.477	-0.44443	17.27141	-329.981	-204.92	-240.91	-217.942	-227.889	
		B243	1.5	M _{Lap}	0.93107	-0.2469	-1.75E-02	7.074384	0.722185	8.244648	-6.60054	3.032123	-1.38802	
			3	M _{Tump-}	142.291	75.9835	0.409456	-3.12264	292.3233	194.1258	200.4254	196.7219	197.8293	
			0	M _{Tump-}	141.658	75.511	0.372233	3.125487	290.8074	199.7121	192.914	197.6884	194.9377	
		B244	1.5	M _{Lap}	4.01733	2.31719	8.20E-02	-7.0667	8.528307	-1.71618	13.07224	3.538115	7.817944	
			3	M _{Lap}	-154.21	-79.877	-0.20824	-17.2589	-312.852	-230.428	-194.053	-217.896	-206.586	

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Tabel Momen Balok Portal As Y4

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
				0 M _{Tump.}	-156.92	-79.863	-0.43344	17.29276	-316.088	-197.061	-233.103	-210.09	-220.074	
	B245		1.5 M _{Lap}	3.81095	1.46708		-0.0948	7.044309	6.920462	12.29242	-2.44091	7.045175	2.806332	
			3 M _{Lap}	143.96	73.797		0.243848	-3.20414	290.8269	194.3623	200.9374	196.8966	198.4031	
	B246		0 M _{Lap}	144.191	73.9961		0.181736	3.15896	291.4232	201.3925	194.6442	199.2042	196.8325	
			1.5 M _{Lap}	1.89127	0.0724		0.106239	-7.05563	2.385365	-5.3435	9.406393	-7.95E-02	4.142419	
			3 M _{Tump.}	-160.99	-82.851		3.07E-02	-17.2702	-325.754	-239.363	-203.115	-226.647	-215.832	
	B247		0 M _{Tump.}	-172.13	-92.494		-0.46026	17.27929	-354.55	-221.013	-257.009	-234.051	-243.971	
			1.5 M _{Lap}	5.41505	3.42411		-0.10926	7.06115	11.97664	15.22279	0.463206	9.952537	5.733456	
			3 M _{Lap}	162.379	90.3423		0.241743	-3.15699	339.4021	224.1746	230.652	226.6726	228.1539	
	B248		0 M _{Lap}	162.202	90.2686		0.151598	3.163344	339.0716	230.5501	223.8116	228.3365	226.0252	
			1.5 M _{Lap}	6.09401	3.39275		0.130958	-7.04384	12.74122	1.181374	15.89093	6.454847	10.61745	
			3 M _{Tump.}	-170.6	-92.483		0.110318	-17.251	-352.691	-255.471	-219.314	-242.711	-232.074	
	B249		0 M _{Tump.}	-161.6	-85.616		-0.53218	17.22897	-330.903	-205.694	-241.539	-218.748	-228.485	
			1.5 M _{Lap}	0.42678	-0.6202		-0.14288	7.039243	-0.48019	7.403585	-7.28881	2.124721	-2.00995	
			3 M _{Lap}	141.868	75.3752		0.246415	-3.15048	290.8413	193.2169	199.6777	195.7136	197.1809	
	B250		0 M _{Lap}	141.068	74.8058		0.149587	3.15456	288.9714	198.6089	191.8901	196.4002	194.0987	
			1.5 M _{Lap}	4.312	2.46401		0.170144	-7.02764	9.116821	-1.2455	13.40536	4.044873	8.114986	
			3 M _{Tump.}	-153.03	-78.878		0.1907	-17.2098	-309.839	-228.384	-192.363	-215.594	-205.153	
	B251		0 M _{Tump.}	-157.57	-80.191		-0.63866	17.15698	-317.394	-198.159	-233.786	-211.238	-220.706	
			1.5 M _{Lap}	3.55809	1.35414		-0.17799	7.012939	6.436335	11.89662	-2.71842	6.611289	2.566916	
			3 M _{Lap}	144.104	73.8998		0.282682	-3.13111	291.165	194.668	201.0652	197.1771	198.5561	
	B252		0 M _{Lap}	144.132	73.9512		0.151477	3.185678	291.2799	201.3202	194.5348	199.0901	196.765	
			1.5 M _{Lap}	2.18463	0.22506		0.208645	-6.97223	2.981646	-4.81947	9.690769	0.458471	4.412824	
			3 M _{Tump.}	-160.35	-82.501		0.265813	-17.1301	-324.418	-238.243	-202.437	-225.457	-215.223	
			0 M _{Tump.}	-173.77	-93.702		-0.93361	17.04723	-358.447	-223.886	-259.097	-237.102	-245.881	
	B253		1.5 M _{Lap}	5.02856	3.22775		-0.2287	6.984898	11.19868	14.57558	5.14E-02	9.273584	5.353368	
			3 M _{Lap}	163.243	91.157		0.476209	-3.07743	341.7431	225.753	231.9156	228.365	229.3037	

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Tabel Momen Balok Portal As Y4

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B254	0	M _{Tump.}	162.825	90.9223	0.309616	3.085939	340.8653	231.5847	224.9092	229.5441	226.9498	
			1.5	M _{Lap}	6.91126	3.82062	0.305804	-6.95804	14.40651	2.454198	16.87343	7.793124	11.5345	
			3	M _{Lap}	-169.59	-92.281	0.301992	-17.002	-351.154	-253.96	-218.446	-241.242	-231.165	
			0	M _{Lap}	-161.61	-86.127	-0.99844	17.01041	-331.736	-206.405	-241.498	-219.641	-228.261	
		B255	1.5	M _{Lap}	-0.1363	-0.9801	-0.3402	6.925276	-1.7318	6.403753	-7.925	1.063631	-2.58488	
			3	M _{Tump.}	140.753	75.1668	0.318044	-3.15986	289.171	191.9286	198.3639	194.4848	195.8076	
			0	M _{Tump.}	139.933	74.4628	0.143801	3.118535	287.0595	197.1605	190.521	194.9741	192.7074	
		B256	1.5	M _{Lap}	1.73159	2.1124	0.410626	-6.92535	5.457743	-3.99329	10.29125	1.398652	4.899308	
			3	M _{Lap}	-157.05	-79.238	0.677451	-16.9692	-315.246	-232.431	-197.222	-219.461	-210.193	
			0	M _{Lap}	-180.54	-86.119	-1.02318	16.76342	-354.441	-226.544	-261.103	-239.618	-248.03	
		B257	1.5	M _{Lap}	4.3429	0.6298	-0.45309	6.992187	6.219165	12.1559	-2.24225	6.683619	3.230026	
			3	M _{Tump.}	168.643	78.379	0.117	-2.77904	327.7775	223.5723	229.3346	225.7009	227.206	
			0	M _{Tump.}	167.52	77.8159	5.69E-02	3.258354	325.5296	228.3594	221.481	226.0063	223.8341	
		B258	1.5	M _{Lap}	22.2507	10.7007	0.523819	-6.10689	43.82199	23.85748	36.35194	28.73105	31.47837	
			3	M _{Lap}	-143.6	-65.414	0.990782	-15.4721	-276.987	-207.928	-176.061	-195.828	-188.161	
			0	M _{Tump.}	-57.559	-24.935	-1.9236	22.6988	-108.966	-52.9179	-99.3736	-71.0154	-81.2761	
		B259	1.4242	M _{Lap}	-12.542	-5.1434	0.324246	-1.46259	-23.2794	-17.8426	-14.9755	-16.5293	-16.2888	
			2.8483	M _{Lap}	14.3508	6.94495	2.572088	-25.624	28.33285	-6.65134	45.53861	14.07277	24.81449	

PORTAL A-AS_Y4 LT2

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	fk mome	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B552	0	M _{Tump.}	-17.08	-10.151	-1.15741	-31.26	-36.7368	-57.5164	8.85889	-35.3909	-13.2665	
			1.4242	M _{Lap}	2.02146	0.74234	0.510039	0.991927	3.613499	3.792393	1.388021	3.438205	1.742209	
			2.8483	M _{Tump.}	-3.5009	-2.2496	2.177488	33.24389	-7.80045	30.4988	-40.6852	7.664992	-17.8514	
			0	M _{Tump.}	75.128	43.9897	-6.87E-02	-0.44232	160.5371	106.1119	107.084	106.3865	106.8094	
		B553	1.5	M _{Lap}	9.63724	6.32277	0.18525	8.714075	21.68112	23.31058	4.894315	17.04189	11.163	
			3	M _{Lap}	-85.888	-49.344	0.439167	17.87047	-182.016	-102.367	-140.172	-115.179	-127.36	
			0	M _{Lap}	-96.863	-56.564	-0.41818	-18.9316	-206.739	-157.352	-117.332	-143.744	-130.939	
		B554	1.5	M _{Lap}	4.31161	2.78251	-0.21562	-9.52022	9.625956	-3.78397	16.34433	3.054903	9.505451	
			3	M _{Tump.}	75.4518	44.1292	-0.01307	-0.10885	161.1489	106.9074	107.1442	106.9778	107.0738	
			0	M _{Tump.}	73.4134	42.7948	-6.59E-03	-0.21296	156.5679	103.8192	104.2705	103.9708	104.1188	
		B555	1.5	M _{Lap}	6.61131	3.76714	0.222218	9.554733	13.96101	19.41765	-0.78729	12.55825	6.07211	
			3	M _{Lap}	-90.225	-53.261	0.451028	19.32242	-193.487	-107.86	-148.721	-121.731	-134.851	
			0	M _{Lap}	-93.74	-54.576	-0.40712	-19.3399	-199.81	-153.245	-112.375	-139.33	-126.291	
		B556	1.5	M _{Lap}	4.91114	3.19486	-0.19822	-9.57061	11.00514	-2.94212	17.28104	3.946586	10.39233	
			3	M _{Tump.}	73.5278	42.9659	1.07E-02	0.198667	156.9788	104.4846	104.0607	104.3465	104.1989	
			0	M _{Tump.}	73.835	43.7075	-5.17E-02	-0.22785	158.534	104.8069	105.318	104.9364	105.1886	
		B557	1.5	M _{Lap}	5.53869	3.50063	0.189932	9.582864	12.24743	18.14285	-2.10082	11.23905	4.802985	
			3	M _{Lap}	-92.792	-54.706	0.431587	19.39358	-198.881	-111.398	-152.396	-125.335	-138.459	
			0	M _{Lap}	-94.449	-55.951	-0.32579	-19.4276	-202.859	-154.921	-113.918	-140.882	-127.958	
		B558	1.5	M _{Lap}	4.71089	2.88041	-0.18042	-9.61081	10.26173	-3.3871	16.90928	3.54424	9.977944	
			3	M _{Tump.}	73.8357	43.7114	-3.51E-02	0.205947	158.5411	105.2709	104.8605	105.0937	105.0376	
			0	M _{Tump.}	73.1176	42.8673	-7.96E-03	-0.22485	156.3288	103.5413	104.0185	103.7007	103.8591	
		B559	1.5	M _{Lap}	6.43378	4.10695	0.173231	9.621662	14.29165	19.50016	-0.81446	12.55556	6.130132	
			3	M _{Lap}	-90.285	-52.653	0.35442	19.46817	-192.587	-107.417	-148.524	-121.466	-134.475	
			0	M _{Lap}	-93.85	-55.015	-0.3087	-19.484	-200.643	-153.757	-112.646	-139.663	-126.74	
		B560	1.5	M _{Lap}	4.61352	2.89602	-0.15092	-9.64562	10.16986	-3.50675	16.84413	3.471855	9.865522	
			3	M _{Tump.}	73.0422	42.8067	6.87E-03	0.192798	156.1414	103.8671	103.4579	103.7305	103.5946	

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Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Lfk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B561	0	M _{Tump.}	73.1672	42.8365	-5.75E-03	-0.21751	156.339	103.5824	104.0427	103.738	103.8871	
			1.5	M _{Lap}	5.90068	3.60284	0.142483	9.656091	12.84535	18.64928	-1.71828	11.65677	5.274223	
			3	M _{Lap}	-91.401	-53.631	0.290721	19.52969	-195.49	-109.16	-150.356	-123.301	-136.215	
			0	M _{Lap}	-92.762	-54.18	-0.25312	-19.5533	-198.003	-152.145	-110.923	-137.959	-125.109	
		B562	1.5	M _{Lap}	5.32798	3.4034	-0.12394	-9.67619	11.83903	-2.46052	17.93757	4.560385	10.91667	
			3	M _{Lap}	73.3835	42.9873	5.23E-03	0.200942	156.8399	104.3473	103.9221	104.2035	104.0659	
			0	M _{Tump.}	73.0848	42.7788	-4.95E-03	-0.21709	156.1479	103.4602	103.9192	103.6161	103.7633	
		B563	1.5	M _{Lap}	5.35396	3.31738	0.115152	9.684017	11.73256	17.9161	-2.49288	10.88298	4.540234	
			3	M _{Lap}	-92.412	-54.144	0.235254	19.58513	-197.524	-110.504	-151.781	-124.727	-137.559	
			0	M _{Lap}	-93.286	-54.798	-0.19856	-19.6027	-199.62	-153.118	-111.828	-138.856	-126.09	
		B564	1.5	M _{Lap}	4.90678	2.98459	-9.72E-02	-9.69946	10.66349	-3.18264	17.24747	3.875001	10.18983	
			3	M _{Tump.}	73.0648	42.7673	4.11E-03	0.203825	156.1055	103.8768	103.4461	103.73	103.5929	
			0	M _{Tump.}	73.1374	42.8862	-3.31E-03	-0.21267	156.3828	103.5882	104.0369	103.7421	103.883	
		B565	1.5	M _{Lap}	6.2278	4.00824	8.91E-02	9.704952	13.88654	19.28265	-1.15389	12.215	5.913762	
			3	M _{Lap}	-90.716	-52.87	0.181522	19.62257	-193.451	-107.899	-149.221	-122.188	-134.932	
			0	M _{Lap}	-93.424	-54.797	-0.1379	-19.6494	-199.784	-153.292	-111.942	-138.951	-126.283	
		B566	1.5	M _{Lap}	4.82802	3.00643	-6.78E-02	-9.71836	10.60391	-3.26216	17.1891	3.831017	10.09592	
			3	M _{Tump.}	73.0452	42.8097	2.35E-03	0.212687	156.1498	103.8917	103.4436	103.7371	103.5981	
			0	M _{Tump.}	73.8581	43.6902	-4.67E-02	-0.21976	158.534	104.8303	105.3213	104.9575	105.1941	
		B567	1.5	M _{Lap}	5.68692	3.49274	6.25E-02	9.722859	12.41269	18.40038	-2.057	11.30002	5.043365	
			3	M _{Lap}	-92.519	-54.705	0.171742	19.66548	-198.55	-110.906	-152.312	-125.234	-137.984	
			0	M _{Lap}	-93.059	-54.769	-7.39E-02	-19.677	-199.301	-152.901	-111.532	-138.492	-125.941	
		B568	1.5	M _{Lap}	5.52104	3.53087	-5.81E-02	-9.72541	12.27465	-2.20843	18.25152	4.897049	11.14604	
			3	M _{Tump.}	74.0666	43.8304	-4.23E-02	0.226152	159.0086	105.6073	105.159	105.41	105.3563	
			0	M _{Tump.}	73.6297	43.0557	-1.61E-03	-0.27823	157.2448	104.1437	104.7289	104.347	104.5256	
		B569	1.5	M _{Lap}	5.24091	3.19142	4.53E-02	9.733227	11.39537	17.7477	-2.72059	10.62705	4.400064	
			3	M _{Lap}	-93.183	-54.673	9.21E-02	19.74468	-199.296	-111.525	-153.047	-125.969	-138.602	

PORTAL A-AS Y4 LTI

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Lfk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B570	0	M _{Tump.}	-95.841	-56.669	-1.01E-02	-19.6647	-205.68	-156.986	-115.684	-142.54	-130.13	
			1.5	M _{Lap}	4.10293	2.42638	-5.72E-03	-9.7653	8.805712	4.41867	16.09205	2.754615	8.918763	
			3	M _{Lap}	74.0122	43.522	-1.37E-03	0.134112	158.4498	105.272	104.9912	105.1724	105.0908	
		B571	0	M _{Lap}	96.9624	59.8716	5.41E-02	-8.87E-02	212.1494	139.4535	139.6057	139.5585	139.5007	
			1.5	M _{Lap}	6.95921	4.54661	-4.52E-03	9.825839	15.62562	20.48724	-0.14417	13.26192	7.081142	
			3	M _{Tump.}	-113.08	-68.778	-6.32E-02	19.74036	-245.74	-141.355	-182.77	-155.911	-168.215	
			0	M _{Tump.}	-116.72	-71.49	-5.50E-02	-19.799	-254.447	-188.4	-146.788	-173.888	-161.299	
		B572	1.5	M _{Lap}	5.14964	3.20094	4.16E-03	-9.8799	11.30107	212.2073	17.7963	4.315914	10.53151	
			3	M _{Lap}	96.984	59.8916	6.33E-02	3.92E-02	139.626	139.626	139.5037	139.6437	139.486	
			0	M _{Lap}	-116.72	-71.49	-5.50E-02	19.79903	-254.447	-146.822	-188.365	-161.415	-173.773	
		B573	1.5	M _{Lap}	5.14964	3.20094	4.16E-03	9.879903	11.30107	17.79892	-2.9515	10.54025	4.307171	
			3	M _{Tump.}	96.984	59.8916	6.33E-02	-3.92E-02	212.2073	139.5436	139.5861	139.619	139.5107	
			0	M _{Tump.}	96.9624	59.8716	5.41E-02	8.87E-02	212.1494	139.6398	139.4194	139.6144	139.4448	
		B574	1.5	M _{Lap}	6.95921	4.54661	-4.52E-03	-9.82584	15.62562	-0.14702	20.49009	7.071644	13.27142	
			3	M _{Lap}	-113.08	-68.778	-6.32E-02	-19.7404	-245.74	-182.81	-141.316	-168.347	-155.778	
			0	M _{Lap}	-95.841	-56.669	-1.01E-02	19.6647	-205.68	-115.69	-156.979	-130.151	-142.518	
		B575	1.5	M _{Lap}	4.10293	2.42638	-5.72E-03	9.765295	8.805712	16.08845	-4.41507	8.906751	2.766627	
			3	M _{Tump.}	74.0122	43.522	-1.37E-03	-0.13411	158.4498	104.9904	105.2729	105.088	105.1753	
			0	M _{Tump.}	73.6297	43.0557	-1.61E-03	0.278229	157.2448	104.7279	104.1447	104.5223	104.3503	
		B576	1.5	M _{Lap}	5.24091	3.19142	4.53E-02	-9.73323	11.39537	-2.69207	17.71919	4.495115	10.532	
			3	M _{Lap}	-93.183	-54.673	9.21E-02	-19.7447	-199.296	-152.988	-111.583	-138.408	-126.163	
			0	M _{Lap}	-93.059	-54.769	-7.39E-02	19.67697	-199.301	-111.579	-152.854	-126.096	-138.337	
		B577	1.5	M _{Lap}	5.52104	3.53087	-5.81E-02	9.725408	12.27465	18.21493	-2.17184	11.02406	5.019033	
			3	M _{Tump.}	74.0666	43.8304	-4.23E-02	-0.22615	159.0086	105.1324	105.6339	105.2675	105.4988	
			0	M _{Tump.}	73.8581	43.6902	4.67E-02	0.219762	158.534	105.2918	104.8598	105.096	105.0557	
		B578	1.5	M _{Lap}	5.68692	3.49274	6.25E-02	-9.72286	12.41269	-2.01762	18.36101	5.174619	11.16877	
			3	M _{Lap}	-92.519	-54.705	0.171742	-19.6655	-198.55	-152.203	-111.014	-137.623	-125.595	

PORTAL A-AS Y4 LTI

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Lfk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B579	0	M _{Tump.}	-93.424	-54.797	-0.1379	19.64941	-199.784	-112.029	-153.206	-126.572	-138.662	
			1.5	M _{Lap}	4.82802	3.00643	-0.06778	9.718363	10.60391	17.1464	-3.21946	9.953586	3.973348	
			3	M _{Lap}	73.0452	42.8097	2.35E-03	-0.21269	156.1498	103.445	103.8902	103.6031	103.7321	
		B580	0	M _{Lap}	73.1374	42.8862	-3.31E-03	0.212666	156.3828	104.0348	103.5903	103.8761	103.7491	
			1.5	M _{Lap}	6.2278	4.00824	8.91E-02	-9.70495	13.88654	-1.09775	19.22651	6.100882	12.02788	
			3	M _{Tump.}	-90.716	-52.87	0.181522	-19.6226	-193.451	-149.107	-108.014	-134.551	-122.57	
			0	M _{Tump.}	-93.286	-54.798	-0.19856	19.60274	-199.62	-111.953	-152.993	-126.507	-138.439	
		B581	1.5	M _{Lap}	4.90678	2.98459	-9.72E-02	9.699456	10.66349	17.18622	-3.12139	9.985658	4.079174	
			3	M _{Lap}	73.0648	42.7673	4.11E-03	-0.20382	156.1055	103.4487	103.8742	103.6016	103.7213	
			0	M _{Lap}	73.0848	42.7788	-4.95E-03	0.217095	156.1479	103.9161	103.4633	103.7529	103.6265	
		B582	1.5	M _{Lap}	5.35396	3.31738	0.115152	-9.68402	11.73256	-2.42034	17.84355	4.782053	10.64117	
			3	M _{Tump.}	-92.412	-54.144	0.235254	-19.5851	-197.524	-151.633	-110.653	-137.065	-125.221	
			0	M _{Tump.}	-92.762	-54.18	-0.25312	19.55332	-198.003	-111.083	-151.985	-125.641	-137.428	
		B583	1.5	M _{Lap}	5.32798	3.4034	-0.12394	9.676191	11.83903	17.85949	-2.38243	10.65639	4.820668	
			3	M _{Lap}	73.3835	42.9873	5.23E-03	-0.20094	156.8399	103.9254	104.344	104.0769	104.1925	
			0	M _{Lap}	73.1672	42.8365	-5.75E-03	0.217506	156.339	104.0391	103.586	103.875	103.7501	
		B584	1.5	M _{Lap}	5.90068	3.60284	0.142483	-9.65609	12.84535	-1.62851	18.55951	5.573438	11.35756	
			3	M _{Tump.}	-91.401	-53.631	0.290721	-19.5297	-195.49	-150.173	-109.343	-135.605	-123.911	
			0	M _{Tump.}	-93.85	-55.015	-0.3087	19.48403	-200.643	-112.841	-153.563	-127.388	-139.015	
		B585	1.5	M _{Lap}	4.61352	2.89602	-0.15092	9.645617	10.16986	16.74905	-3.41167	9.548594	3.788783	
			3	M _{Lap}	73.0422	42.8067	6.87E-03	-0.1928	156.1414	103.4622	103.8628	103.609	103.716	
			0	M _{Lap}	73.1176	42.8673	-0.00796	0.224846	156.3288	104.0135	103.5463	103.8424	103.7174	
		B586	1.5	M _{Lap}	6.43378	4.10695	0.173231	-9.62166	14.29165	-0.70533	19.39103	6.493917	12.19178	
			3	M _{Tump.}	-90.285	-52.653	0.35442	-19.4682	-192.587	-148.301	-107.641	-133.731	-122.21	
			0	M _{Tump.}	-94.449	-55.951	-0.32579	19.42757	-202.859	-114.124	-154.716	-128.642	-140.197	
		B587	1.5	M _{Lap}	4.71089	2.88041	-0.18042	9.610813	10.26173	16.79561	-3.27343	9.599052	3.923132	
			3	M _{Lap}	73.8357	43.7114	-3.51E-02	-0.20595	158.5411	104.8384	105.293	104.964	105.1674	

PORTAL A-AS Y4 LTI

Tabel Momen Balok Portal As Y3

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B588	0	M _{Tump.}	73.835	43.7075	-5.17E-02	0.227854	158.534	105.2854	104.8395	105.0799	105.045	
			1.5	M _{Lap}	5.53869	3.50063	0.189932	-9.58286	12.24743	-1.98116	18.02319	5.201843	10.84019	
			3	M _{Lap}	-92.792	-54.706	0.431587	-19.3936	-198.881	-152.124	-111.67	-137.553	-126.241	
			0	M _{Lap}	-93.74	-54.576	-0.40712	19.33989	-199.81	-112.632	-152.989	-127.146	-138.475	
		B589	1.5	M _{Lap}	4.91114	3.19486	-0.19822	9.570611	11.00514	17.15616	-2.81725	9.97607	4.362842	
			3	M _{Tump.}	73.5278	42.9659	1.07E-02	-0.19867	156.9788	104.0674	104.4779	104.2213	104.324	
			0	M _{Tump.}	73.4134	42.7948	-6.59E-03	0.212958	156.5679	104.2664	103.8233	104.105	103.9847	
		B590	1.5	M _{Lap}	6.61131	3.76714	0.222218	-9.55473	13.96101	-0.64729	19.27765	6.538768	12.09159	
			3	M _{Lap}	-90.225	-53.261	0.451028	-19.3224	-193.487	-148.437	-108.144	-133.904	-122.678	
			0	M _{Lap}	-96.863	-56.564	-0.41818	18.93159	-206.739	-117.595	-157.088	-131.818	-142.866	
		B591	1.5	M _{Lap}	4.31161	2.78251	-0.21562	9.520218	9.625956	16.20848	-3.64813	9.052641	3.507714	
			3	M _{Tump.}	75.4518	44.1292	-1.31E-02	0.108851	161.1489	107.136	106.9157	107.0464	107.0053	
			0	M _{Tump.}	75.128	43.9897	-6.87E-02	0.44232	160.5371	107.0407	106.1551	106.6652	106.5307	
		B592	1.5	M _{Lap}	9.63724	6.32277	0.18525	-8.71408	21.68112	5.011022	23.19387	11.55203	16.65287	
			3	M _{Lap}	-85.888	-49.344	0.439167	-17.8705	-182.016	-139.895	-102.644	-126.437	-116.101	
			0	M _{Tump.}	-17.08	-10.151	-1.15741	31.26004	-36.7368	8.129722	-56.7872	-15.6971	-32.9604	
		B593	1.4242	M _{Lap}	2.02146	0.74234	0.510039	-0.99193	3.613499	1.709346	3.471068	2.813291	2.367123	
			2.8483	M _{Lap}	-3.5009	-2.2496	2.177488	-33.2439	-7.80045	-39.3134	29.12698	-13.2787	3.092266	

PORTAL A-AS Y4 L1

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu _j (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							E _y	E _x						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B688	0 3,438284 6,876568	0 M Tump- M Lap	-21,7061 14,27337 -22,6855	-6,99217 6,118354 -10,2339	2,433946 -0,14257 -6,85933	0,607442 -0,10594 -0,33067	-37,2348 26,91741 -43,5968	-25,792 18,68545 -32,775	-28,601 18,99775 -27,7592	-24,4495 18,65853 -37,5736	-29,9435 19,02467 -22,9606	BLK LT 1
		B690	0 3,437363 6,874726	0 M Tump- M Lap	-21,3615 12,16104 -27,5019	-7,4729 5,138529 -12,174	6,695501 9,77E-02 -6,50001	4,70E-02 3,68E-02 2,65E-02	-37,5905 22,8149 -52,4807	-24,979 16,07579 -38,5663	-29,296 15,93695 -34,527	-20,0924 16,12059 -43,3633	-34,1826 15,89214 -29,73	BLK LT 1
		B693	0 1,774169 3,548338	0 M Tump- M Lap	13,0999 1,943469 -31,3319	3,984815 1,043152 -12,2879	0,106557 -3,30331 -6,71318	-0,46375 -5,51E-02 0,353458	22,09558 4,001206 -57,2589	15,81196 1,593383 -42,3834	16,71869 3,796274 -38,8963	16,23113 -0,78802 -47,5774	16,29952 6,183678 -33,7023	BLK LT 1
		B694	0 3,548338 1,774169	0 M Tump- M Lap	13,0999 -31,3319 -10,7104	3,984815 -12,2879 -0,53806	0,106557 -6,71318 7,874762	-0,46375 0,353458 0,153786	22,09558 -57,2589 -13,7134	15,81196 -42,3834 -8,94287	16,71869 -38,8963 -14,2269	16,23113 -47,5774 -3,26795	16,29952 -33,7023 -19,9018	BLK LT 1
		B354	0 3,438284 6,876568	0 M Tump- M Lap	-21,7061 13,24821 -25,0223	-6,99217 5,580683 -11,7864	2,433946 -8,74E-02 -2,60866	0,607442 -0,13239 -0,87221	-37,2348 24,82694 -48,885	-25,792 17,25992 -35,4364	-28,601 17,59297 -31,9613	-24,4495 17,29302 -36,7127	-29,9435 17,55987 -30,685	BLK LT 2
		B356	0 3,437363 6,874726	0 M Tump- M Lap	-14,7575 14,70049 -29,027	-3,80897 6,523078 -13,0688	1,599313 -0,17103 -1,94137	0,296219 -1,17E-02 -0,31959	-23,8034 28,07751 -55,7425	-17,0803 19,47891 -39,6588	-18,7099 19,61119 -37,7646	-16,1225 19,36179 -40,8508	-19,6677 19,72831 -36,5726	BLK LT 2
		B163	0 3,438284 6,876568	0 M Tump- M Lap	-9,63717 16,33125 -30,9251	-0,49132 7,398805 -14,651	0,16851 -5,17E-03 -0,17885	0,230385 -0,13033 -0,49105	-12,3507 31,43559 -60,5518	-10,1336 21,67058 -42,2735	-10,7235 21,94754 -41,1296	-10,1791 21,76257 -42,044	-10,6781 21,85554 -41,359	BLK LT 3
		BT1	0 3,858017 7,716035	0 M Tump- M Lap	-29,3107 28,85565 -38,0862	-6,78395 12,28576 -15,2505	0,612412 -0,30615 -1,22471	0,346856 -0,17911 -0,70507	-46,0272 54,284 -70,1042	-34,493 37,75396 -50,7245	-35,6072 38,32296 -48,4722	-34,2978 37,66059 -51,1064	-35,8024 38,41634 -48,0903	BLK TRIBUN LT3

PORTAL A-AS_X 1 & 47

No	Portal	Balok	Jarak (m)	L _{tk} momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu _j (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Mu ₆ (kNm)	Ket
							Ey	Ex							
BT3			0	M _{Tump-}	-23,4969	-4,80402	0,685744	0,358384	-35,8827	-27,1059	-28,2906	-26,8653	-28,5312	BLK TRIBUN LT2	
			3,857196	M _{Lap}	20,22219	7,823238	0,22083	6,32E-02	36,78981	26,29781	26,02606	26,4137	25,91017		25,91017
			7,714393	M _{Tump-}	-61,113	-26,133	-0,24408	-0,23207	-115,148	-80,953	-80,3119	-80,9618	-80,3031		-80,3031
			0	M _{Tump-}	-24,5598	-6,53173	5,947263	-8,24E-03	-39,9225	-28,038	-31,7675	-23,6607	-36,1448		-36,1448
			4,073169	M _{Lap}	23,03993	8,739336	1,390164	-0,17565	41,63085	29,95118	29,44424	31,10205	28,29336		28,29336
			8,146337	M _{Tump-}	-64,0135	-26,7696	-3,16693	-0,34306	-119,648	-85,4369	-82,7213	-87,5124	-80,6457		-80,6457
BT6			0	M _{Tump-}	-23,4969	-4,80402	0,685744	0,358384	-35,8827	-27,1059	-28,2906	-26,8653	-28,5312	BLK TRIBUN LT1	
			3,857196	M _{Lap}	20,22219	7,823238	0,22083	6,32E-02	36,78981	26,29781	26,02606	26,4137	25,91017		25,91017
			7,714393	M _{Tump-}	-61,113	-26,133	-0,24408	-0,23207	-115,148	-80,953	-80,3119	-80,9618	-80,3031		-80,3031
			0	M _{Tump-}	-24,5598	-6,53173	5,947263	-8,24E-03	-39,9225	-28,038	-31,7675	-23,6607	-36,1448		-36,1448
			4,073169	M _{Lap}	23,03993	8,739336	1,390164	-0,17565	41,63085	29,95118	29,44424	31,10205	28,29336		28,29336
			8,146337	M _{Tump-}	-64,0135	-26,7696	-3,16693	-0,34306	-119,648	-85,4369	-82,7213	-87,5124	-80,6457		-80,6457

No	Portal	Balok	Jarak (m)	L _{tk} momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu _j (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Mu ₆ (kNm)	Ket
							Ey	Ex							
B689			0	M _{Tump-}	-54,1824	-35,6034	4,442621	2,54803	-121,984	-75,2468	-83,3965	-73,8543	-84,789	BLK LT 3	
			3,15	M _{Lap}	26,40681	19,48901	0,968243	0,697733	62,87058	41,04284	38,96761	41,24167	38,76878		38,76878
			6,3	M _{Tump-}	-6,40528	-5,58321	-2,50613	-1,15256	-16,6195	-12,2426	-8,24334	-13,2375	-7,24847		-7,24847
			0	M _{Tump-}	-54,4305	-35,6592	1,65565	2,756758	-122,371	-76,2012	-83,0335	-77,0105	-82,2242		-82,2242
			3,15	M _{Lap}	25,87283	19,21324	0,358251	0,726724	61,78859	40,14673	38,39491	39,8759	38,66574		38,66574
			6,3	M _{Tump-}	-7,2251	-6,07895	-0,93915	-1,30331	-18,3964	-13,0804	-9,75178	-12,8127	-10,0194		-10,0194
B355			0	M _{Tump-}	-40,3478	-28,0892	0,298933	1,440344	-93,3601	-58,4549	-61,6679	-59,2938	-60,829	BLK LT 2	
			3,15	M _{Lap}	32,17488	22,59842	0,116622	0,351471	74,76734	48,42642	47,61485	48,2538	47,78747		47,78747
			6,3	M _{Tump-}	-8,70371	-6,8786	-0,06569	-0,7374	-21,4502	-14,2674	-12,6775	-13,7737	-13,1712		-13,1712
			0	M _{Tump-}	-75,0103	-42,0751	0,206926	2,37316	-157,333	-102,711	-107,825	-104,303	-106,233		-106,233
			3,603471	M _{Lap}	53,63283	33,06335	-6,57E-02	0,779969	117,2608	77,94264	76,34613	77,32104	76,96773		76,96773
			7,206941	M _{Tump-}	-5,71507	-5,46478	-0,33842	-0,81322	-15,6017	-10,4041	-8,48315	-10,0552	-8,83213		-8,83213
B164			0	M _{Tump-}	-40,3478	-28,0892	0,298933	1,440344	-93,3601	-58,4549	-61,6679	-59,2938	-60,829	BLK LT 1	
			3,15	M _{Lap}	32,17488	22,59842	0,116622	0,351471	74,76734	48,42642	47,61485	48,2538	47,78747		47,78747
			6,3	M _{Tump-}	-8,70371	-6,8786	-0,06569	-0,7374	-21,4502	-14,2674	-12,6775	-13,7737	-13,1712		-13,1712
			0	M _{Tump-}	-75,0103	-42,0751	0,206926	2,37316	-157,333	-102,711	-107,825	-104,303	-106,233		-106,233
			3,603471	M _{Lap}	53,63283	33,06335	-6,57E-02	0,779969	117,2608	77,94264	76,34613	77,32104	76,96773		76,96773
			7,206941	M _{Tump-}	-5,71507	-5,46478	-0,33842	-0,81322	-15,6017	-10,4041	-8,48315	-10,0552	-8,83213		-8,83213
BT2			0	M _{Tump-}	-23,4969	-4,80402	0,685744	0,358384	-35,8827	-27,1059	-28,2906	-26,8653	-28,5312	BLK TRIBUN	
			3,857196	M _{Lap}	20,22219	7,823238	0,22083	6,32E-02	36,78981	26,29781	26,02606	26,4137	25,91017		25,91017
			7,714393	M _{Tump-}	-61,113	-26,133	-0,24408	-0,23207	-115,148	-80,953	-80,3119	-80,9618	-80,3031		-80,3031
			0	M _{Tump-}	-24,5598	-6,53173	5,947263	-8,24E-03	-39,9225	-28,038	-31,7675	-23,6607	-36,1448		-36,1448
			4,073169	M _{Lap}	23,03993	8,739336	1,390164	-0,17565	41,63085	29,95118	29,44424	31,10205	28,29336		28,29336
			8,146337	M _{Tump-}	-64,0135	-26,7696	-3,16693	-0,34306	-119,648	-85,4369	-82,7213	-87,5124	-80,6457		-80,6457

PORTAL A-A5 X 2 & 46

No	Portal	Balok	Jarak (m)	Lok momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B692	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-53,1308 36,42614 -18,8185	-38,2474 28,22693 -15,3684	1,039026 -0,16765 -1,37434	0,996095 7,73E-02 -0,84157	-124,953 88,87445 -47,1716	-78,51 56,05872 -30,758	-81,2564 56,0021 -28,1249	-78,4785 55,87871 -31,1496	-81,288 56,18211 -27,7333	BLK LT 1
		B691	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-36,6789 16,67939 -43,3636	-25,1002 12,01261 -31,0392	4,843545 1,072713 -2,69812	1,900583 0,495786 -0,90901	-84,175 39,23545 -101,699	-50,8046 25,93978 -66,8909	-57,8473 24,22282 -63,2821	-48,6415 26,36383 -68,2059	-60,0104 23,79878 -61,9671	BLK LT 1
		B358	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-54,0284 35,80104 -19,1711	-38,6366 27,86188 -15,7093	0,389894 -2,74E-02 -0,4446	1,045468 9,93E-02 -0,84685	-126,653 87,54026 -48,1402	-79,8503 55,23974 -31,0557	-82,2915 55,04842 -28,9972	-80,3322 55,14664 -30,7601	-81,8096 55,14152 -29,2929	BLK LT 2
		B357	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-30,2991 19,32369 -44,4548	-21,4974 13,52413 -31,6189	1,162077 0,206776 -0,74852	1,724661 0,43937 -0,84592	-70,7549 44,82704 -103,936	-43,1805 29,33655 -67,7214	-47,5344 28,28361 -65,4734	-43,594 29,1656 -47,8765	-47,1209 28,45456 -65,545	BLK LT 2
		B165	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-29,84 44,27995 -26,4016	-26,9693 32,12466 -18,8511	0,225424 4,36E-02 -0,1382	0,665092 1,16E-02 -0,64188	-78,9589 104,5354 -61,8437	-47,5533 66,7584 -40,3154	-49,092 66,70656 -38,8804	-47,8765 66,78192 -39,9452	-48,7689 66,68303 -39,2506	BLK LT 3
		BT5	0 3,603471 7,206941	0 M _{Tump} M _{Lap} M _{Tump}	-83,1262 80,62831 -31,9218	-39,2748 45,37286 -17,6839	0,109321 -0,20373 -0,51677	0,461875 3,96E-02 -0,38274	-162,591 169,3505 -66,6004	-111,506 113,222 -45,2234	-112,545 113,2673 -44,0941	-111,765 113,0432 -45,3219	-112,286 113,4461 -43,9956	BLK TRIBUN
		BT4	0 3,603471 7,206941	0 M _{Tump} M _{Lap} M _{Tump}	-46,9732 23,62861 -93,7606	-27,968 15,24658 -55,2721	0,718948 0,392355 6,58E-02	1,728557 0,775207 -0,17814	-101,117 52,74885 -200,948	-64,9003 35,35294 -133,436	-68,9832 33,47782 -133,104	-65,6423 35,07155 -133,257	-68,2411 33,75922 -133,283	BLK TRIBUN

PORTAL A-AS X 3 x 45

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT9	0 3,603471 7,206941	0 M _{Tump} M _{Lap} M _{Tump}	-89,9521 56,2145 -73,9235	-46,0721 31,65874 -41,3837	0,905675 -0,52286 -1,95139	0,162345 -0,05605 -0,27444	-181,658 118,1114 -154,922	-123,019 78,74668 -104,594	-123,931 79,19378 -102,789	-122,473 78,40357 -105,827	-124,477 79,53688 -101,556	BLK TRIBUN LT3
		BT8	0 3,603471 7,206941	0 M _{Tump} M _{Lap} M _{Tump}	-77,165 47,37749 -104,385	-41,5953 25,99765 -57,1828	0,372035 0,141298 -8,94E-02	0,386075 0,129785 -0,1265	-159,15 98,44922 -216,754	-106,706 66,30566 -145,79	-107,751 65,9441 -145,468	-106,716 66,31412 -145,763	-107,741 65,93563 -145,495	BLK TRIBUN LT2
		BT7	0 3,816084 7,632169	0 M _{Tump} M _{Lap} M _{Tump}	-29,4639 28,68185 -73,1813	-29,6027 22,25273 -51,8358	6,684573 1,727786 -3,229	0,269706 1,76E-02 -0,23456	-82,721 70,02258 -170,755	-47,198 44,69786 -110,76	-51,9756 43,57246 -108,233	-42,483 45,95487 -112,961	-56,6906 42,31545 -106,033	BLK TRIBUN LT1
		B699	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-46,5131 27,60018 -48,9338	-34,2541 20,40512 -35,0053	7,65135 -0,13574 -7,92282	0,729341 -1,23E-02 -0,75385	-110,622 65,76841 -114,729	-67,2428 41,77979 -76,7211	-73,5948 41,89104 -70,1467	-62,1551 41,68903 -81,9903	-78,6824 41,9818 -64,8775	BLK LT 1
		B698	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-48,0298 25,4582 -51,7011	-34,5451 19,16756 -37,1895	7,791287 9,19E-02 -7,60743	0,710027 4,54E-03 -0,70095	-112,908 61,21794 -121,544	-68,9949 38,8404 -80,8478	-75,3945 38,77295 -74,5832	-63,7902 38,90462 -85,9241	-80,5992 38,70872 -69,5069	BLK LT 1
		B697	0 1,625 3,25	0 M _{Tump} M _{Lap} M _{Lap}	33,38096 4,535397 -55,823	14,21 3,507813 -28,317	0,619199 -3,81213 -8,24346	0,205185 -0,21651 -0,63821	62,79314 11,05498 -112,295	44,4128 5,543931 -79,7206	43,59181 8,400246 -73,187	44,7171 2,901149 -85,3105	43,28751 11,04303 -67,5971	BLK LT 1
		B696	0 1,625 3,25	0 M _{Lap} M _{Lap} M _{Tump}	-21,5775 10,58599 33,41533	-7,34581 3,359345 14,0645	8,721801 4,527518 0,333234	0,428355 0,200142 -2,81E-02	-37,6463 18,07813 62,6016	-24,0871 14,86799 44,02222	-30,4813 11,59536 43,87124	-17,9914 18,04861 44,28778	-36,577 8,414734 43,60568	BLK LT 1
		B695	0 0,65 1,3	0 M _{Tump} M _{Lap} M _{Lap}	-16,1771 -6,90438 -1,24E-02	-11,2566 -5,11703 -3,37E-02	-1,50E-03 1,00E-03 3,50E-03	0,140205 0,068748 -2,71E-03	-37,4231 -16,4725 -6,88E-02	-23,9309 -10,4008 -3,60E-02	-24,2244 -10,5458 -0,03248	-24,035 -10,4506 -3,14E-02	-24,1202 -10,496 -3,70E-02	KANTILEVER

PORTAL A-A5' X 4 & 44

PORTAL A-AS X 4 & 44																						
B360	0	M	Tump-	-47,3338	-33,8195	2,161374	0,475241	-110,912	-69,8269	-72,1866	-68,5876	-73,4259	BLK LT 2									
	3,15	M	Lap	26,6399	19,76452	-7,81E-02	-6,20E-03	63,59111	40,39244	40,45464	40,33963	40,50745										
	6,3	M	Tump-	-50,0337	-36,7211	-2,31748	-0,48765	-118,794	-76,9117	-74,4276	-78,2566	-73,0827										
B359	0	M	Tump-	-39,7982	-30,9798	1,304175	0,546053	-97,3255	-60,3212	-62,2895	-59,764	-62,8468	BLK LT 2									
	3,15	M	Lap	28,73003	20,75717	-0,19856	3,59E-02	67,68751	43,21869	43,26841	43,04637	43,44073										
	6,3	M	Tump-	-53,389	-37,5755	-1,70129	-0,47427	-124,188	-80,7649	-78,6971	-81,6668	-77,7953										
B166	0	M	Tump-	-38,0861	-27,9887	3,33E-02	4,47E-02	-90,4853	-57,5659	-57,6807	-57,5743	-57,6724	BLK LT 3									
	3,15	M	Lap	29,07396	21,57521	4,37E-02	7,56E-03	69,40909	44,14174	44,09834	44,1683	44,07178										
	6,3	M	Tump-	-54,4132	-38,9305	5,41E-02	-2,96E-02	-127,585	-81,6741	-81,6461	-81,6126	-81,7076										

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT12	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-62,114 49,457 -26,913	-26,786 24,74987 -13,3944	0,384375 -0,19645 -0,77728	1,07E-02 4,30E-03 -2,13E-03	-117,394 98,94809 -53,7271	-81,9625 67,46481 -36,9446	-82,2272 67,57954 -36,4504	-81,6879 67,31726 -37,5143	-82,5018 67,7271 -35,8807	BLK TRIBUN LT3
		BT11	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-73,75 48,811 -104,93	-35,9975 30,96513 -62,5145	-0,47677 -3,63E-02 0,404138	-1,59E-02 5,22E-03 2,63E-02	-146,096 108,1168 -225,943	-100,283 70,75311 -149,409	-99,9492 70,76504 -149,719	-100,622 70,72259 -149,132	-99,6104 70,7956 -149,997	BLK TRIBUN LT2
		BT10	0 3,8161 7,6322	0 M Tump- M Lap M Tump-	-21,748 43,748 -100,5	-9,26709 17,83407 -53,0513	2,941835 1,038724 -0,86439	3,24E-02 9,36E-03 -1,37E-02	-40,9253 81,03225 -205,484	-27,7133 57,50802 -139,235	-29,6347 56,83395 -138,662	-25,5748 58,2646 -139,861	-31,7731 56,0774 -138,037	BLK TRIBUN LT1
		B702	0 3,15 6,3	0 M Tump- M Lap M Tump-	-26,093 33,495 -51,719	-19,765 25,48241 -39,3398	-2,28306 -0,3053 1,672451	-3,61E-02 -7,18E-03 2,17E-02	-62,9356 80,9657 -125,006	-40,6066 51,11983 -78,5393	-39,0925 51,32724 -79,6385	-42,2581 50,90071 -77,326	-37,441 51,5464 -80,8518	BLK LT 1
		B701	0 3,15 6,3	0 M Tump- M Lap M Tump-	-50,964 25,208 -43,421	-38,723 20,29652 -30,7536	-1,27093 4,91E-02 1,369097	-2,76E-03 2,51E-03 7,78E-03	-123,114 62,7243 -101,311	-78,3113 39,27354 -64,5272	-77,5048 39,23734 -65,406	-79,2434 39,30777 -63,5266	-76,5727 39,2031 -66,4066	BLK LT 1
		B700	0 1,625 3,25	0 M Tump- M Lap M Tump-	-40,377 -2,6606 3,4543	-26,0735 -0,93461 1,515262	-1,53482 -0,94838 -0,36194	-2,35E-02 -1,36E-02 -3,68E-03	-90,1703 -4,68804 6,569548	-59,3305 -3,69537 4,463733	-58,3143 -3,06941 4,699474	-60,4414 -4,38246 4,200413	-57,2035 -2,38232 4,96279	BLK LT 1
		B362	0 3,15 6,3	0 M Tump- M Lap M Tump-	-25,836 32,15 -54,667	-19,9974 24,76191 -40,5484	-0,71045 -9,37E-02 0,522971	-1,67E-02 -5,95E-03 4,84E-03	-62,9987 78,19871 -130,477	-39,9672 49,32143 -82,7755	-39,4844 49,39298 -83,1151	-40,477 49,2569 -82,3947	-38,9745 49,4575 -83,496	BLK LT 2
		B361	0 3,15 6,3	0 M Tump- M Lap M Tump-	-56,231 28,414 -31,743	-41,3072 22,58261 -23,5972	-0,27777 -9,03E-02 0,097088	2,28E-03 2,99E-03 3,71E-03	-133,569 70,22869 -75,8466	-85,1513 44,03635 -48,1615	-84,9811 44,08698 -48,2305	-85,3572 43,96775 -48,0929	-84,7753 44,1556 -48,2991	BLK LT 2
		B167	0 3,15 6,3	0 M Tump- M Lap M Tump-	-30,117 35,554 -43,576	-21,3883 26,49684 -35,6877	-0,06267 2,69E-02 0,116395	-0,01113 -1,23E-03 8,68E-03	-70,362 85,05968 -109,392	-45,1292 54,03183 -68,1927	-45,0663 54,01748 -68,2842	-45,1671 54,05247 -68,1135	-45,0285 53,9968 -68,3634	BLK LT 3

PORTAL A-A5 X 5 & 43

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₆ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT15	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-60,782 37,692 -51,775	-27,0913 18,77869 -25,0315	0,845248 -0,4666 -1,77845	-3,11E-02 1,94E-02 6,99E-02	-116,284 75,27652 -102,18	-80,6549 51,2808 -70,6202	-81,1221 51,53394 -69,6467	-80,0108 50,92356 -71,9788	-81,7662 51,8912 -68,2881	BLK TRIBUN LT3
		BT14	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-85,388 47,188 -96,54	-44,5266 29,20052 -57,5146	0,284051 0,11457 -5,49E-02	-6,35E-03 -3,09E-03 1,77E-04	-173,708 103,3465 -207,872	-117,626 67,97666 -137,619	-117,792 67,91096 -137,585	-117,413 68,06314 -137,659	-118,005 67,8245 -137,544	BLK TRIBUN LT2
		BT13	0 3,8161 7,6322	0 M Tump- M Lap M Tump-	-75,924 56,077 -113,18	-21,5285 15,97423 -44,5095	7,494752 1,940674 -3,6134	-5,36E-02 -1,38E-02 2,60E-02	-125,554 92,85114 -207,03	-90,9784 69,5414 -147,99	-95,5875 68,34778 -145,768	-85,4303 70,97794 -150,665	-101,136 66,9112 -143,093	BLK TRIBUN LT1
		B707	0 3,15 6,3	0 M Tump- M Lap M Tump-	-45,563 27,429 -50,226	-34,3914 20,28519 -35,1078	7,361606 -0,13779 -7,63718	-6,58E-02 6,65E-04 6,71E-02	-109,702 65,37114 -116,444	-67,2579 41,53745 -77,1907	-71,7575 41,62286 -72,5203	-61,7987 41,43568 -82,8534	-77,2166 41,7246 -66,8576	BLK LT 1
		B706	0 3,15 6,3	0 M Tump- M Lap M Tump-	-46,889 25,523 -52,712	-35,2671 19,03457 -36,7334	7,323173 4,74E-02 -7,22835	-7,25E-02 -2,20E-03 6,81E-02	-112,694 61,08294 -122,028	-69,221 38,80358 -80,6953	-73,6824 38,77832 -76,2845	-63,7852 38,84004 -86,0582	-79,1182 38,7419 -70,9216	BLK LT 1
		B705	0 1,625 3,25	0 M Tump- M Lap M Lap	47,691 3,8803 -73,088	22,89055 4,44282 -36,6939	0,505588 -3,71693 -7,93944	4,61E-02 2,99E-02 1,37E-02	93,85442 11,76489 -146,416	64,70454 5,733833 -102,346	64,28925 8,01278 -97,3732	65,04228 2,979939 -108,192	63,9515 10,7667 -91,5277	BLK LT 1
		B704	0 1,625 3,25	0 M Lap M Lap M Tump-	-32,853 13,881 51,281	-19,171 2,722842 24,61667	9,76909 4,952412 0,135734	-0,15272 -3,37E-02 8,54E-02	-70,0976 21,01387 100,9244	-43,6568 17,81522 69,48641	-49,4906 14,76587 69,22153	-36,3643 21,47998 69,5234	-56,7831 11,1011 69,1845	BLK LT 1
		B703	0,65 1,3	M Lap M Lap	-34,074 -15,837	-24,7513 -11,8174	-1,10E-02 -7,27E-03	-4,24E-02 -1,94E-02	-80,4914 -37,9122	-51,4194 -24,0964	-51,3234 -24,0511	-51,3964 -24,0875	-51,3465 -24,06	BIK KANTILEVER
					#####	6,02E-02	-3,49E-03	3,67E-03	0,120142	6,15E-02	5,60E-02	5,62E-02	0,06126	

PORTA A-AS X 6 R 42

		PORTA A-AS_X 6 & 42													
B364	0 M_Tump-	-47,415	-33,8813	2,138865	-2,70E-02	-111,108	-70,4854	-71,7761	-68,8934	-73,368	BLK LT 2				
	3,15 M_Lap	26,836	19,85206	-7,82E-02	5,85E-04	63,96631	40,6604	40,70847	40,60247	40,7664					
	6,3 M_Tump-	-49,561	-36,4842	-2,29534	2,82E-02	-117,848	-75,7173	-74,3305	-77,4251	-72,6227					
B363	0 M_Tump-	-44,732	-29,3375	1,225045	-1,88E-02	-100,619	-65,0852	-65,8175	-64,171	-66,7318	BLK LT 2				
	3,15 M_Lap	27,261	21,06362	-0,21313	1,73E-03	66,4155	41,82926	41,95989	41,67134	42,1178					
	6,3 M_Tump-	-51,392	-38,6049	-1,6513	2,23E-02	-123,439	-78,7798	-77,7862	-80,0098	-76,5561					
B168	0 M_Tump-	-43,457	-31,8223	6,78E-02	3,39E-03	-103,064	-65,6529	-65,7028	-65,6055	-65,7501	BLK LT 3				
	3,15 M_Lap	28,163	20,86969	4,27E-02	-1,42E-03	67,18653	42,7305	42,7066	42,76292	42,6742					
	6,3 M_Tump-	-50,865	-36,508	1,75E-02	-6,24E-03	-119,451	-76,4096	-76,4075	-76,3921	-76,425					

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT16	0 3,6035 7,2069	M Tump- M Lap M Tump-	-62,114 49,457 -26,913	-26,786 24,74987 -13,3944	0,384375 -0,19645 -0,77728	1,07E-02 4,30E-03 -2,13E-03	-117,394 98,94809 -53,7271	-81,9625 67,46481 -36,9446	-82,2272 67,57954 -36,4504	-81,6879 67,31726 -37,5143	-82,5018 67,7271 -35,8807	BLK TRIBUN LT3
		BT17	0 3,6035 7,2069	M Tump- M Lap M Tump-	-73,75 48,811 -104,93	-35,9975 30,96513 -62,5145	-0,47677 -3,63E-02 0,404138	-1,59E-02 5,22E-03 2,63E-02	-146,096 108,1168 -225,943	-100,283 70,75311 -149,409	-99,9492 70,76504 -149,719	-100,622 70,72259 -149,132	-99,6104 70,7956 -149,997	BLK TRIBUN LT2
		BT16	0 3,8161 7,6322	M Tump- M Lap M Tump-	-21,748 43,748 -100,5	-9,26709 17,83407 -53,0513	2,941835 1,038724 -0,86439	3,24E-02 9,36E-03 -1,37E-02	-40,9253 81,03225 -205,484	-27,7133 57,50802 -139,235	-29,6347 56,83395 -138,662	-25,5748 58,2646 -139,861	-31,7731 56,0774 -138,037	BLK TRIBUN LT1
		B710	0 3,15 6,3	M Tump- M Lap M Tump-	-26,093 33,495 -51,719	-19,765 25,48241 -39,3398	-2,28906 -0,3053 1,672451	-3,61E-02 -7,18E-03 2,17E-02	-62,9356 80,9657 -125,006	-40,6066 51,11983 -78,5393	-39,0925 51,32724 -79,6385	-42,2581 50,90071 -77,326	-37,441 51,5464 -80,8518	BLK LT 1
		B709	0 3,15 6,3	M Tump- M Lap M Tump-	-50,964 25,208 -43,421	-38,723 20,29652 -30,7536	-1,27093 4,91E-02 1,369097	-2,76E-03 2,51E-03 7,78E-03	-123,114 62,7243 -101,311	-78,3113 39,27354 -64,5272	-77,5048 39,23734 -65,406	-79,2434 39,30777 -63,5266	-76,5727 39,2031 -66,4066	BLK LT 1
		B708	0 1,625 3,25	M Tump- M Lap M Tump-	-40,377 -2,6606 3,4543	-26,0735 -0,93461 1,515262	-1,53482 -0,94838 -0,36194	-2,35E-02 -1,36E-02 3,68E-03	-90,1703 -4,68804 6,569548	-59,3305 -3,69537 4,463733	-58,3143 -3,06941 4,699474	-60,4414 -4,38246 4,200413	-57,2035 -2,38232 4,96279	BLK LT 1
		B366	0 3,15 6,3	M Tump- M Lap M Tump-	-25,836 32,15 -54,667	-19,9974 24,76191 -40,5484	-0,71045 -9,37E-02 0,522971	-1,67E-02 -5,95E-03 4,84E-03	-62,9987 78,19871 -130,477	-39,9672 49,32143 -82,7755	-39,4844 49,39298 -83,1151	-40,477 49,2569 -82,3947	-38,9745 49,4575 -83,496	BLK LT 2
		B365	0 3,15 6,3	M Tump- M Lap M Tump-	-56,231 28,414 -31,743	-41,3072 22,58261 -23,5972	-0,27777 -9,03E-02 0,097088	2,28E-03 2,99E-03 3,71E-03	-133,569 70,22889 -75,8466	-85,1513 44,03635 -48,1615	-84,9811 44,08698 -48,2305	-85,3572 43,96775 -48,0929	-84,7753 44,1556 -48,2991	BLK LT 2
		B169	3,15 6,3	M Lap M Tump-	-30,117 35,554 -43,576	-21,3883 26,49684 -35,6877	-0,06267 2,69E-02 0,116395	-0,01113 -1,23E-03 8,68E-03	-70,362 85,05968 -109,392	-45,1292 54,03183 -68,1927	-45,0663 54,01748 -68,2842	-45,1671 54,05247 -68,1135	-45,0285 53,9968 -68,3634	BLK LT 3

PORTAL A-AS X 7 & 41

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Mu ₆ (kNm)	Ket
							Ey	Ex							
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
		B716	0 1,575 3,15	0 M Tump- M Lap M Tump-	35,33258 3,618557 -50,1293	20,4589 2,021662 -29,1853	1,40E-02 -3,7431 -7,50019	-0,72249 -4,68E-02 0,628818	75,13334 7,576928 -106,852	49,23411 3,84488 -72,7249	50,74252 6,301384 -69,3203	49,77542 1,128128 -78,6997	50,2012 9,018137 -63,3455	BLK LT 1	
		B715	0 1,575 3,15	0 M Tump- M Lap M Tump-	8,262161 33,75823 34,4656	5,584416 19,81972 20,19473	3,483167 -0,1853 -4,13E-02	1,36E-03 -0,72448 -0,76018	18,84966 72,22142 73,67028	13,29208 47,11349 48,10037	11,09482 48,75163 49,72275	15,85121 47,50978 2,83647	8,535697 48,35534 49,19434	BLK LT 1	
		B369	0 1,575 3,15	0 M Tump- M Lap M Tump-	3,18686 -50,1258 -51,0368	1,183706 -30,5971 -31,1192	-1,18747 -2,33369 2,145037	-2,74E-02 0,705452 0,72518	5,718161 -109,106 -111,035	3,68915 -71,9026 -71,7566	4,494725 -71,9138 -74,6309	2,83647 -74,1364 -70,713	5,347405 -69,68 -75,6745	BLK LT 2	
		B368	0 1,575 3,15	0 M Tump- M Lap M Tump-	7,368618 32,95672 40,68781	5,660315 19,53622 24,21378	1,023439 -9,82E-02 0,054955	-1,77E-02 -0,7606 -0,52726	17,89885 70,80601 87,56743	11,60683 46,08282 57,44058	10,99926 47,74192 58,51319	12,37208 46,56971 57,8685	10,23402 47,25503 58,08527	BLK LT 2	
		B171	0 1,575 3,15	0 M Tump- M Lap M Lap	3,08601 -56,5497 -53,5262	1,645911 -33,6917 -33,0252	-1,85E-03 -5,87E-02 8,68E-02	-1,07E-02 0,505906 0,469514	6,336669 -121,766 -117,072	4,265441 -80,0902 -76,488	4,289027 -81,1157 -77,5287	4,271924 -80,5052 -76,7694	4,282543 -80,7007 -77,2474	BLK LT 3	
		B170	0 1,575 3,15	0 M Tump- M Lap M Tump-	10,23428 41,17742 -61,3762	7,087398 24,29639 -28,0731	8,56E-02 8,45E-02 0,85132	-2,85E-02 -0,52661 -7,18E-02	23,62098 88,28713 -118,568	15,20806 58,0167 -81,9383	15,21405 59,06933 -82,3238	15,29199 58,46588 -81,2598	15,13012 58,62016 -83,0023	BLK LT 3	
		BT21	3,603471 7,206941	M Lap M Tump-	37,9796 -50,6058	18,84315 -23,9208	-0,44322 -1,73777	-8,40E-03 5,50E-02	75,72456 -99,0002	51,60133 -68,6957	51,8982 -67,7165	51,28173 -70,0135	52,2178 -66,3988	BLK TRIBUN	
		BT20	3,603471 7,206941	M Lap M Tump-	48,4554 -98,5498	29,50452 -57,0077	0,107281 -9,27E-02	1,69E-02 4,39E-02	105,3537 -209,472	69,5175 -139,375	69,41452 -139,409	69,58397 -139,476	69,34806 -139,309	BLK TRIBUN	

PORTAL A-A5_X8 & 40

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu _j (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT19	0 M Tump- 3,816084 M Lap	-46,8072 36,30352	-21,9951 15,7693	7,282441 1,873575	4,37E-02 9,84E-03	-91,3607 68,79511	-60,6846 48,65386	-65,3442 47,45285	-55,3441 50,02371	-70,6647 46,08301		BLK TRIBUN
		B714	7,632169 M Tump- 0 M Tump- 3,15 M Lap 6,3 M Tump-	7,632169 -48,2678 25,38656 -51,6064	7,632169 -35,4259 19,12515 -36,3934	7,632169 7,09926 4,15E-02 -7,01616	2,92E-02 1,04E-02 1,08E-03 -8,48E-03	7,632169 -114,603 61,06411 -120,157	7,632169 -70,7325 38,72871 -79,3336	7,632169 -75,2664 38,68075 -74,8956	7,632169 -65,536 38,75163 -84,4842	7,632169 -80,4629 38,65784 -69,7449		BLK LT 1
		B713	0 M Tump- 1,625 M Lap 3,25 M Lap 0 M Tump-	47,49306 5,614977 -69,4207 -39,5234	23,30233 4,745459 -36,5004 -19,1084	0,641189 -3,6014 -7,84399 9,338276	1,08E-02 -2,19E-02 -0,05457 4,73E-02	94,2754 14,33071 -141,705 -78,0014	64,76154 7,727971 -98,4151 -50,5465	64,33481 10,04276 -93,3588 -56,5291	65,22484 5,097011 -104,14 -43,7177	63,87151 12,67372 -87,6336 -63,3579		BLK LT 1
		B712	1,625 M Lap 3,25 M Tump- 0 M Tump-	9,404854 48,99896 -31,4697	2,190847 23,49005 -23,1638	4,80149 0,264703 3,69E-03	2,83E-02 9,18E-03 -7,42E-03	14,79118 96,38283 -74,8257	12,79747 66,34067 -47,643	9,713189 66,15462 -47,6297	16,3058 66,52847 -47,6348	6,204865 65,96681 -47,6379		BLK LT 1
		B711	0,65 M Lap 1,3 M Tump- 0 M Tump-	-14,5189 5,11E-02 -40,9307	-11,0336 0,040418 -29,1476	1,73E-03 -2,34E-04 1,231607	4,05E-03 -6,72E-04 -1,00E-03	-35,0764 0,126029 -95,753	-22,1997 7,84E-02 -60,9533	-22,1923 7,99E-02 -61,7271	-22,1955 7,87E-02 -60,0473	-22,1966 7,96E-02 -62,6331		LISPLANK
		B367	3,15 M Lap 6,3 M Tump-	28,33664 -53,0433	21,23015 -38,4617	-0,20973 -1,65106	1,12E-02 2,33E-02	67,97221 -125,191	43,07412 -80,422	43,18282 -79,4308	42,91177 -81,6527	43,34517 -78,2001		BLK LT 2

PORTAL A-AS₁ X 8 & 40

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B719	0 1,575 3,15	M Tump- M Lap M Tump-	3,1743 -3,2654 -38,579	1,297788 -2,27772 -26,3931	0,398105 0,582634 0,767164	1,34E-04 -6,22E-05 -2,59E-04	5,885612 -7,56287 -88,524	4,276158 -4,6802 -56,8944	4,025069 -5,04713 -57,3772	4,568666 -4,25192 -56,3303	3,73256 -5,47541 -57,9412	BLK LT 1
		B371	0 1,575 3,15	M Tump- M Lap M Tump-	3,0034 -4,0621 -40,002	1,297504 -1,81041 -25,4582	0,113916 0,175035 0,236153	1,77E-04 -2,22E-04 -6,21E-04	5,680036 -7,77117 -88,735	4,007023 -5,35085 -57,9665	3,934885 -5,46066 -58,114	4,090621 -5,22204 -57,7925	3,85129 -5,58947 -58,2881	BLK LT 2
		B172	0 1,575 3,15	M Tump- M Lap M Tump-	-0,711 15,349 2,5351	4,04E-02 10,51733 0,454397	-5,91E-02 6,08E-02 0,180651	2,36E-04 -5,93E-05 -3,55E-04	-0,78861 35,2466 3,769203	-0,73949 22,76152 3,004699	-0,70276 22,72335 2,891634	-0,7831 22,80623 3,137738	-0,65915 22,6786 2,7586	BLK LT 3
		BT24	0 3,6035 7,2069	M Tump- M Lap M Tump-	-84,752 74,4 -42,752	-46,0486 44,65015 -25,0933	0,358689 -0,21884 -0,79637	-3,77E-04 1,20E-04 6,16E-04	-175,38 160,7206 -91,4518	-117,888 106,1811 -60,9487	-118,113 106,3188 -60,4483	-117,624 106,0202 -61,5345	-118,377 106,48 -59,8625	BLK TRIBUN
		BT23	0 3,6035 7,2069	M Tump- M Lap M Tump-	-61,923 23,37 -79,278	-25,9167 10,31935 -43,1247	-0,36373 3,61E-02 0,435907	-6,97E-04 -5,04E-04 -3,11E-04	-115,775 44,55473 -164,134	-81,4622 31,05032 -110,274	-81,2316 31,02865 -110,548	-81,729 31,07722 -109,953	-80,9648 31,0017 -110,868	BLK TRIBUN
		BT22	0 3,8161 7,6322	M Tump- M Lap M Tump-	-27,914 78,685 -115,97	-16,5091 45,37941 -68,0348	1,849577 0,720323 -0,40893	-1,10E-03 -1,07E-03 -1,04E-03	-59,9114 167,029 -248,023	-39,129 111,434 -164,764	-40,2919 110,9824 -164,504	-37,7688 111,9642 -165,063	-41,6522 110,452 -164,204	BLK TRIBUN
		B718	0 3,15 6,3	M Tump- M Lap M Tump-	-43,718 29,799 -41,486	-31,3987 24,53097 -29,609	-0,79951 -3,08E-02 0,737907	9,47E-04 -1,63E-03 -4,20E-03	-102,7 75,00797 -97,1574	-65,9363 46,73172 -61,9858	-65,4346 46,75454 -62,4419	-66,5246 46,71027 -61,4403	-64,8463 46,776 -62,9873	BLK LT 1
		B717	0 1,625 3,25	M Tump- M Lap M Tump-	-36,872 -2,0187 1,2323	-24,6242 -0,98488 -3,46E-02	-0,95275 -0,66361 -0,37447	-7,41E-03 -1,92E-03 3,56E-03	-83,6446 -3,99823 1,423474	-54,5363 -2,95115 1,157927	-53,9205 -2,52904 1,386365	-55,2311 -3,43749 0,880077	-53,2257 -2,0427 1,66421	BLK LT1
		B370	0 3,15 6,3	M Tump- M Lap M Tump-	-45,082 25,798 -48,123	-29,7603 20,78066 -38,7481	-0,22681 -3,60E-02 0,154894	-1,74E-05 -2,96E-04 -5,74E-04	-101,715 64,20678 -119,745	-66,1568 40,16819 -74,8923	-66,0139 40,19146 -74,9887	-66,3235 40,14198 -74,778	-65,8472 40,2177 -75,103	BLK LT 2

PORTA A-AS X 9 & 39

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey {8}	Ex {9}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B725	0 1,575 3,15	0 M Tump- M Lap M Lap	35,39329 3,381658 -50,6639	20,5033 1,819671 -29,6337	1,78E-02 -3,73652 -7,49084	0,722437 4,95E-02 -0,62351	75,27722 6,969464 -108,211	50,8442 3,572067 -74,8806	49,31587 5,822201 -68,852	50,32629 0,789368 -79,9281	49,83377 8,6049 -63,8045	BLK LT 1
		B724	0 1,575 3,15	0 M Lap M Lap M Tump-	-49,412 8,59932 33,79335	-31,026 5,861159 19,84469	7,135817 3,477405 -0,18101	-0,73235 -4,03E-03 0,724293	19,69704 72,30353 72,85385	13,81297 48,68866 49,18945	11,63067 47,28168 47,61505	16,37182 48,02327 48,60506	9,071811 47,94708 48,19944	BLK LT 1
		B374	0 1,575 3,15	0 M Lap M Lap M Lap	34,14034 3,113067 -49,9481	19,92841 1,175575 -30,347	-3,49E-02 -1,18876 -2,34261	0,760183 2,89E-02 -0,70229	72,85385 5,616601 -108,493	49,18945 3,665269 -73,0394	47,61505 4,353396 -70,0888	48,60506 2,770255 -74,2451	48,19944 5,24841 -68,8831	BLK LT 2
		B373	0 1,575 3,15	0 M Lap M Lap M Tump-	-51,9633 6,749946 32,64586	-31,9493 5,121877 19,28941	2,142785 1,025433 -9,19E-02	-0,72772 1,64E-02 0,760426	-113,475 16,29494 70,03809	-74,7786 10,65441 47,19997	-74,6004 9,974043 45,66099	-72,6688 11,39608 46,5735	-76,7102 9,23237 46,28746	BLK LT 2
		B174	0 1,575 3,15	0 M Lap M Lap M Lap	42,54071 1,62952 -61,3156	25,6622 0,494242 -37,4435	5,94E-02 -2,18E-03 -6,38E-02	0,52721 1,09E-02 -0,50539	92,10838 2,746212 -133,488	61,40723 2,033136 -88,5215	60,26265 2,011602 -87,42	61,06341 2,023515 -88,1969	60,60647 2,021223 -87,7445	BLK LT 3
		B173	0 1,575 3,15	0 M Lap M Lap M Tump-	-44,974 15,30271 42,76212	-26,2591 11,09188 25,53922	8,38E-02 8,64E-02 8,90E-02	-0,46976 2,83E-02 0,526326	-95,9833 36,11026 92,17729	-64,2328 23,11264 61,5706	-63,2991 22,99883 60,40926	-63,8259 23,15534 61,24913	-63,7059 22,95613 60,73073	BLK LT 3
		BT27	3,603471 7,206941	M Lap M Tump-	-87,4495 57,97143 -72,9123	-47,741 34,88285 -42,9355	0,85475 -0,44417 -1,7431	7,12E-02 8,48E-03 -0,05425	-181,325 125,3783 -156,192	-121,555 82,71519 -104,213	-122,243 82,9772 -103,001	-120,979 82,38248 -105,455	-122,819 83,3099 -101,76	BLK TRIBUN 3
		BT26	0 3,603471 7,206941	0 M Tump- M Lap M Tump-	-54,0319 27,54475 -78,8198	-24,5571 12,70204 -39,719	0,310006 0,107725 -9,46E-02	7,81E-03 -1,76E-02 -4,30E-02	-104,13 53,37697 -158,134	-72,0986 36,93974 -107,859	-72,3103 36,9088 -107,709	-71,8765 37,03185 -107,897	-72,5324 36,8167 -107,671	BLK TRIBUN 2

PORTAL A-A S₁ X 10 & 38

No {1}	Portal {2}	Balok {3}	Jarak (m) {4}	Ltk momen {5}	D _L (kNm) {6}	L _L (kNm) {7}	Beban Gempa		Mu _j (kNm) {10}	Mu ₂ (kNm) {11}	Mu ₃ (kNm) {12}	Mu ₄ (kNm) {13}	Mu ₆ (kNm) {14}	Ket {15}
							Ey {8}	Ex {9}						
				0 M Tump-	-78,4999	-47,1316	7,267384	-5,98E-02	-169,611	-109,891	-114,344	-104,506	-119,73	
		BT25	3,816084	M Lap	57,0511	33,11611	1,868386	-1,32E-02	121,4471	81,34149	80,19211	82,72445	78,80915	BLK TRIBUN 1
			7,632169	M Tump-	-108,655	-61,9389	-3,53061	3,34E-02	-229,488	-154,186	-152,032	-156,806	-149,413	
			0	M Tump-	-46,6609	-33,99	7,088314	-2,78E-02	-110,377	-68,204	-72,6112	-62,9736	-77,8416	
		B723	3,15	M Lap	25,65637	19,36123	4,17E-02	-8,67E-03	61,76561	39,14079	39,13274	39,17781	39,09572	BLK LT 1
			6,3	M Lap	-52,6737	-37,3572	-7,00493	1,05E-02	-122,98	-81,0379	-76,6469	-86,1943	-71,4905	
			0	M Tump-	50,43453	25,16184	0,6346	-8,45E-02	100,7804	68,91934	68,69709	69,44791	68,16852	
		B722	1,625	M Lap	3,867898	3,308785	-3,5955	2,31E-02	9,935534	5,037531	7,254124	2,377834	9,913821	BLK LT 1
			3,25	M Lap	-75,8563	-41,2333	-7,82561	0,130811	-157,001	-107,954	-103,298	-113,802	-97,4504	
			0	M Lap	-34,7533	-14,867	9,325447	2,00E-02	-65,4913	-42,8987	-48,8158	-36,0592	-55,6553	
		B721	1,625	M Lap	13,3286	5,288883	4,791234	-3,82E-02	24,45654	18,79619	15,85787	22,3458	12,30826	BLK LT 1
			3,25	M Tump-	52,07644	25,4448	0,257021	-9,64E-02	103,2034	70,69027	70,73071	70,95001	70,47097	
			0	M Tump-	-32,2365	-23,7245	-1,75E-02	6,78E-03	-76,6431	-48,7932	-48,7964	-48,811	-48,7786	
		B720	0,65	M Lap	-14,9442	-11,3441	-9,04E-03	3,78E-03	-36,0835	-22,837	-22,8393	-22,8464	-22,8298	Kantilever
			1,3	M Tump-	-3,25E-02	-1,99E-02	-6,25E-04	7,83E-04	-0,07078	-4,60E-02	-4,73E-02	-4,70E-02	-4,62E-02	
			0	M Tump-	-50,0336	-36,5948	1,235241	-2,13E-03	-118,592	-75,2031	-75,9769	-74,2937	-76,8863	
		B372	3,15	M Lap	26,54158	19,7382	-0,20979	-0,01139	63,43101	40,22568	40,38177	40,07986	40,52759	BLK LT 2
			6,3	M Tump-	-47,5305	-33,9984	-1,65481	-2,07E-02	-111,434	-71,869	-70,7831	-73,0701	-69,582	

PORTAL A-A5, X 10 & 88

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT30	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-62,114 49,457 -26,913	-26,786 24,74987 -13,3944	0,384375 -0,19645 -0,77728	1,07E-02 4,30E-03 -2,13E-03	-117,394 98,94809 -53,7271	-81,9625 67,46481 -36,9446	-82,2272 67,57954 -36,4504	-81,6879 67,31726 -37,5143	-82,5018 67,7271 -35,8807	BLK TRIBUN LT3
		BT29	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-73,75 48,811 -104,93	-35,9975 30,96513 -62,5145	-0,47677 -3,63E-02 0,404138	-1,59E-02 5,22E-03 2,63E-02	-146,096 108,1168 -225,943	-100,283 70,75311 -149,409	-99,9492 70,76504 -149,719	-100,622 70,72259 -149,132	-99,6104 70,7956 -149,997	BLK TRIBUN LT2
		BT28	0 3,8161 7,6322	0 M Tump- M Lap M Tump-	-21,748 43,748 -100,5	-9,26709 17,83407 -53,0513	2,941835 1,038724 -0,86439	3,24E-02 9,36E-03 -1,37E-02	-40,9253 81,03225 -205,484	-27,7133 57,50802 -139,235	-29,6347 56,83395 -138,662	-25,5748 58,2646 -139,861	-31,7731 56,0774 -138,037	BLK TRIBUN LT1
		B728	0 3,15 6,3	0 M Tump- M Lap M Tump-	-26,093 33,495 -51,719	-19,765 25,48241 -39,3398	-2,28306 -0,3053 1,672451	-3,61E-02 -7,18E-03 2,17E-02	-62,9356 80,9657 -125,006	-40,6066 51,11983 -78,5393	-39,0925 51,32724 -79,6385	-42,2581 50,90071 -77,326	-37,441 51,5464 -80,8518	BLK LT 1
		B727	0 3,15 6,3	0 M Tump- M Lap M Tump-	-40,377 25,208 -43,421	-26,0735 20,29652 -30,7536	-1,53482 4,91E-02 1,369097	-2,36E-02 2,51E-03 7,78E-03	-90,1703 62,7243 -101,311	-59,3305 39,27354 -64,5272	-58,3143 39,23734 -65,406	-60,4414 39,30777 -63,5266	-57,2035 39,2031 -66,4066	BLK LT 1
		B726	0 1,625 3,25	0 M Tump- M Lap M Tump-	-2,6606 3,4543 -25,836	-0,93461 1,515262 -19,9974	-0,94838 -0,36194 -0,71045	-1,36E-02 -3,68E-03 -1,67E-02	-4,68804 6,569548 -62,9987	-3,69537 4,463733 -39,9672	-3,06941 4,699474 -39,4844	-4,38246 4,200413 -40,477	-2,38232 4,96279 -38,9745	BLK LT 1
		B376	0 3,15 6,3	0 M Tump- M Lap M Tump-	-56,231 28,414 -31,743	-41,3072 22,58261 -23,5972	-0,27777 -9,03E-02 0,097088	-2,28E-03 2,99E-03 3,71E-03	-133,569 70,22889 -75,8466	-85,1513 44,03635 -48,1615	-84,9811 44,08698 -48,2305	-85,3572 43,96775 -48,0929	-84,7753 44,1556 -48,2991	BLK LT 2
		B375	0 3,15 6,3	0 M Tump- M Lap M Tump-	-30,117 35,554 -43,576	-21,3883 26,49684 -35,6877	-0,06267 2,69E-02 0,116395	-0,01113 -1,23E-03 8,68E-03	-70,362 85,05968 -109,392	-45,1292 54,03183 -68,1927	-45,0663 54,01748 -68,2842	-45,1671 54,05247 -68,1135	-45,0285 53,9968 -68,3634	BLK LT 3

PORTAL A-AS₁ X 11 & 37

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT33	0 M Tump- 3,6035 M Lap	0 M Tump- M Lap	-60,7819 37,6922	-27,0913 18,77869	0,845248 -0,4666	-3,11E-02 1,94E-02	-116,284 75,27652	-80,6549 51,2808	-81,1221 51,53394	-80,0108 50,92356	-81,7662 51,8912	BLK TRIBUN LT3
		BT32	7,2069 M Tump- 0 M Tump-	M Tump- M Lap	-51,7749 -85,388	-25,0315 -44,5266	0,284051 0,11457	6,99E-02 -6,35E-03	-102,18 -173,708	-70,6202 -117,626	-69,6467 -117,792	-71,9788 -117,413	-68,2881 -118,005	BLK TRIBUN LT2
		BT31	3,8161 M Lap 7,6322 M Tump-	M Lap M Tump-	47,1881 -96,5404	29,20052 -57,5146	0,11457 -5,49E-02	-3,09E-03 1,77E-04	103,3465 -207,872	67,97666 -137,619	67,91096 -137,585	68,06314 -137,659	67,8245 -137,544	BLK TRIBUN LT1
		B733	0 M Tump- 3,15 M Lap 6,3 M Tump-	M Tump- M Lap M Tump-	-45,5629 27,429	-34,3914 20,28519	7,361606 -0,13779	-6,58E-02 6,65E-04	-109,702 65,37114	-67,2579 41,53745	-71,7575 41,62286	-61,7987 41,43568	-77,2166 41,7246	BLK LT 1
		B732	0 M Tump- 3,15 M Lap 6,3 M Tump-	M Tump- M Lap M Tump-	-50,2263 -46,889	-35,1078 -35,2671	7,63718 7,323173	6,71E-02 -7,25E-02	-116,444 -112,694	-77,1907 -69,221	-72,5203 -73,6824	-82,8534 -63,7852	-66,8576 -79,1182	BLK LT 1
		B731	0 M Tump- 1,625 M Lap 3,25 M Lap	M Tump- M Lap M Lap	47,6913 3,88031	22,89055 4,44282	0,505588 -3,71693	4,61E-02 2,99E-02	93,85442 11,76489	64,70454 5,733833	64,28925 8,01278	65,04228 2,979939	63,9515 10,7667	BLK LT 1
		B730	0 M Lap 1,625 M Lap 3,25 M Tump-	M Lap M Lap M Tump-	-32,8533 13,8811	-19,171 2,722842	9,76909 4,952412	-0,15272 -3,37E-02	-70,0976 21,01387	-43,6568 17,81522	-49,4906 14,76587	-36,3643 21,47998	-56,7831 11,1011	BLK LT 1
		B729	0 M Tump- 0,65 M Lap 1,3 M Lap	M Tump- M Lap M Lap	51,2814 -34,0744	24,61667 -24,7513	0,135734 -1,10E-02	8,54E-02 -4,24E-02	100,9244 -80,4914	69,48641 -51,4194	69,22153 -51,3234	69,5234 -51,3964	69,1845 -51,3465	BIK KANTILEVER
					1,98E-02	6,02E-02	-3,49E-03	3,67E-03	0,120142	6,15E-02	5,60E-02	5,62E-02	0,06126	

PORTA A-AS X 12 & 36

		PORTA A-AS X 12 & 36											
B378	0	M	Tump-	-47,4148	-33,8813	2,138865	-2,70E-02	-111,108	-70,4854	-71,7761	-68,8934	-73,368	BLK LT 2
	3,15	M	Lap	26,8358	19,85206	-7,82E-02	5,85E-04	63,96631	40,6604	40,70847	40,60247	40,7664	
	6,3	M	Tump-	-49,5608	-36,4842	-2,29534	2,82E-02	-117,848	-75,7173	-74,3305	-77,4251	-72,6227	
B377	0	M	Tump-	-44,7321	-29,3375	1,225045	-1,88E-02	-100,619	-65,0852	-65,8175	-64,171	-66,7318	BLK LT 2
	3,15	M	Lap	27,2614	21,06362	-0,21313	1,73E-03	66,4155	41,82926	41,95989	41,67134	42,1178	
	6,3	M	Tump-	-51,3923	-38,6049	-1,6513	2,23E-02	-123,439	-78,7798	-77,7862	-80,0098	-76,5561	
B176	0	M	Tump-	-43,4569	-31,8223	6,78E-02	3,39E-03	-103,064	-65,6529	-65,7028	-65,6055	-65,7501	BLK LT 3
	3,15	M	Lap	28,1625	20,86969	4,27E-02	-1,42E-03	67,18653	42,7305	42,7066	42,76292	42,6742	
	6,3	M	Tump-	-50,8653	-36,508	1,75E-02	-6,24E-03	-119,451	-76,4096	-76,4075	-76,3921	-76,425	

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT36	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-62,114 49,457 -26,913	-26,786 24,74987 -13,3944	0,384375 -0,19645 -0,77728	1,07E-02 4,30E-03 -2,13E-03	-117,394 98,94809 -53,7271	-81,9625 67,46481 -36,9446	-82,2272 67,57954 -36,4504	-81,6879 67,31726 -37,5143	-82,5018 67,7271 -35,8807	BLK TRIBUN LT3
		BT35	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-73,75 48,811 -104,93	-35,9975 30,96513 -62,5145	-0,47677 -3,63E-02 0,404138	-1,59E-02 5,22E-03 2,63E-02	-146,096 108,1168 -225,943	-100,283 70,75311 -149,409	-99,9492 70,76504 -149,719	-100,622 70,72259 -149,132	-99,6104 70,79556 -149,997	BLK TRIBUN LT2
		BT34	0 3,8161 7,6322	0 M Tump- M Lap M Tump-	-21,748 43,748 -100,5	-9,26709 17,83407 -53,0513	2,941835 1,038724 -0,86439	3,24E-02 9,36E-03 -1,37E-02	-40,9253 81,03225 -205,484	-27,7133 57,50902 -139,235	-29,6347 56,83395 -138,662	-25,5748 58,2646 -139,861	-31,7731 56,0774 -138,037	BLK TRIBUN LT1
		B736	0 3,15 6,3	0 M Tump- M Lap M Tump-	-26,093 33,495 -51,719	-19,765 25,48241 -39,3398	-2,28306 -0,3053 1,672451	-3,61E-02 -7,18E-03 2,17E-02	-62,9356 80,9657 -125,006	-40,6066 51,11983 -78,5393	-39,0925 51,32724 -79,6385	-42,2581 50,90071 -77,326	-37,441 51,5484 -80,8518	BLK LT 1
		B735	0 3,15 6,3	0 M Tump- M Lap M Tump-	-50,964 25,208 -43,421	-38,723 20,29652 -30,7536	-1,27093 4,91E-02 1,369097	-2,76E-03 2,51E-03 7,78E-03	-123,114 62,7243 -101,311	-78,3113 39,27354 -64,5272	-77,5048 39,23734 -65,406	-79,2434 39,30777 -63,5266	-76,5727 39,2031 -66,4066	BLK LT 1
		B734	0 1,625 3,25	0 M Tump- M Lap M Tump-	-40,377 -2,6606 3,4543	-26,0735 -0,93461 1,515262	-1,53482 -0,94838 -0,36194	-2,35E-02 -1,36E-02 -3,68E-03	-90,1703 -4,68804 6,569548	-59,3305 -3,69537 4,463733	-58,3143 -3,06941 4,699474	-60,4414 -4,38246 4,200413	-57,2035 -2,38232 4,96279	BLK LT 1
		B380	0 3,15 6,3	0 M Tump- M Lap M Tump-	-25,836 32,15 -54,667	-19,9974 24,76191 -40,5484	-0,71045 -9,37E-02 0,522971	-1,67E-02 -5,95E-03 4,84E-03	-62,9987 78,19871 -130,477	-39,9672 49,32143 -82,7755	-39,4844 49,39298 -83,1151	-40,477 49,2569 -82,3947	-38,9745 49,4575 -83,496	BLK LT 2
		B379	0 3,15 6,3	0 M Tump- M Lap M Tump-	-56,231 28,414 -31,743	-41,3072 22,58261 -23,5972	-0,27777 -9,03E-02 0,097088	2,28E-03 2,99E-03 3,71E-03	-133,569 70,22889 -75,8466	-85,1513 44,03635 -48,1615	-84,9811 44,08698 -48,2305	-85,3572 43,96775 -48,0929	-84,7753 44,1556 -48,2991	BLK LT 2
		B177	0 3,15 6,3	0 M Tump- M Lap M Tump-	-30,117 35,554 -43,576	-21,3883 26,49684 -35,6877	-0,06267 2,69E-02 0,116395	-0,01113 -1,23E-03 8,68E-03	-70,362 85,05968 -109,392	-45,1292 54,03183 -68,1927	-45,0663 54,01748 -68,2842	-45,1671 54,05247 -68,1135	-45,0285 53,9968 -68,3634	BLK LT 3

PORTAL A-AS X 138 35

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₆ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT45	0 M Tump- 3,6035 M Lap 7,2069 M Tump- 0 M Tump- 3,6035 M Lap 7,2069 M Tump- 0 M Tump- 3,8161 M Lap 7,6322 M Tump- 0 M Tump- 3,15 M Lap 6,3 M Tump- 0 M Tump- 3,15 M Lap 6,3 M Tump- 0 M Tump- 1,625 M Lap 3,25 M Lap 0 M Lap 1,625 M Lap 3,25 M Tump- 0 M Tump- 0,65 M Lap 1,3 M Lap	M Tump- M Lap M Tump- M Tump- M Lap M Tump- M Lap M Tump- M Tump- M Lap M Tump- M Tump- M Lap M Tump- M Lap M Lap M Lap M Tump- M Tump- M Lap M Lap	-60,7819 37,6922 -51,7749 -85,388 47,1881 -96,5404 -75,9238 56,077 -113,179 -45,5629 27,429 -50,2263 -46,889 25,523 -52,7122 47,6913 3,88031 -73,0882 -32,8533 13,8811 51,2814 -34,0744 -15,8369 1,98E-02	-27,0913 18,77869 -25,0315 -44,5266 29,20052 -57,5146 -21,5285 15,97423 -44,5095 -34,3914 20,28519 -35,1078 -35,2671 19,03457 -36,7334 22,89055 4,44282 -36,6939 -19,171 2,722842 24,61667 -24,7513 -11,8174 6,02E-02	0,845248 -0,4666 -1,77845 0,284051 0,11457 -5,49E-02 7,494752 1,940674 -3,6134 7,361606 -0,13779 -7,63718 7,323173 4,74E-02 -7,22835 0,505588 -3,71693 -7,93944 9,76909 4,952412 0,135734 -1,10E-02 -7,27E-03 -3,49E-03	-3,11E-02 1,94E-02 6,99E-02 -6,35E-03 -3,09E-03 1,77E-04 -5,36E-02 -1,38E-02 2,60E-02 -6,58E-02 6,65E-04 6,71E-02 -7,25E-02 -2,20E-03 6,81E-02 4,61E-02 2,99E-02 1,37E-02 -0,15272 -3,37E-02 8,54E-02 -4,24E-02 -1,94E-02 3,67E-03	-116,284 75,27652 -102,18 -173,708 103,3465 -207,872 -125,554 92,85114 -207,03 -109,702 65,37114 -116,444 -112,694 61,08294 -122,028 93,85442 11,76489 -146,416 -70,0976 21,01387 100,9244 -80,4914 -37,9122 0,120142	-80,6549 51,2808 -70,6202 -117,626 67,97666 -137,619 -90,9784 69,5414 -147,99 -67,2579 41,53745 -77,1907 -69,221 38,80358 -80,6953 64,70454 5,733833 -102,346 -43,6568 17,81522 69,48641 -51,4194 -24,0964 6,15E-02	-80,0108 50,92356 -71,9788 -117,413 68,06314 -137,659 -85,4303 70,97794 -150,665 -61,7987 41,43568 -82,8534 -63,7852 38,84004 -86,0582 65,04228 2,979939 -108,192 -36,3643 21,47998 -51,3234 -24,0511 5,62E-02	-81,7662 51,8912 -68,2881 -118,005 67,8245 -137,544 -101,136 66,9112 -143,093 -77,2166 41,7246 -66,8576 -79,1182 38,7419 -70,9216 63,9515 10,7667 -91,5277 -56,7831 11,1011 69,1845 -51,3465 -24,06 0,06126	BLK TRIBUN LT3 BLK TRIBUN LT2 BLK TRIBUN LT1 BLK LT 1 BLK LT 1 BLK LT 1 BLK LT 1 BIK KANTILEVER	

PORTA A-AS X 16 & 32

		PORTA A-AS X 16 & 32												
B386	0 M Tump-	-47,4148	-33,8813	2,138865	-2,70E-02	-111,108	-70,4854	-71,7761	-68,8934	-73,368	BLK LT 2			
	3,15 M Lap	26,8358	19,85206	-7,82E-02	5,85E-04	63,96631	40,6604	40,70847	40,60247	40,7664				
	6,3 M Tump-	-49,5608	-36,4842	-2,29534	2,82E-02	-117,848	-75,7173	-74,3305	-77,4251	-72,6227				
B385	0 M Tump-	-44,7321	-29,3375	1,225045	-1,88E-02	-100,619	-65,0852	-65,8175	-64,171	-66,7318	BLK LT 2			
	3,15 M Lap	27,2614	21,06362	-0,21313	1,73E-03	66,4155	41,82926	41,95989	41,67134	42,1178				
	6,3 M Tump-	-51,3923	-38,6049	-1,6513	2,23E-02	-123,439	-78,7798	-77,7862	-80,0098	-76,5561				
B180	0 M Tump-	-43,4569	-31,8223	6,78E-02	3,39E-03	-103,064	-65,6529	-65,7028	-65,6055	-65,7501	BLK LT 3			
	3,15 M Lap	28,1625	20,86969	4,27E-02	-1,42E-03	67,18653	42,7305	42,7066	42,76292	42,6742				
	6,3 M Tump-	-50,8653	-36,508	1,75E-02	-6,24E-03	-119,451	-76,4096	-76,4075	-76,3921	-76,425				

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Mu ₆ (kNm)	Ket
							Ey	Ex							
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
		BT39	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-60,7819 37,6922 -51,7749	-27,0913 18,77869 -25,0315	0,845248 -0,4666 -1,77845	-3,11E-02 1,94E-02 6,99E-02	-116,284 75,27652 -102,18	-80,6549 51,2808 -70,6202	-81,1221 51,53394 -69,6467	-80,0108 50,92356 -71,9788	-81,7662 51,8912 -68,2881	BLK TRIBUN LT3	
		BT38	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-85,388 47,1881 -96,5404	-44,5266 29,20052 -57,5146	0,284051 0,11457 -5,49E-02	-6,35E-03 -3,09E-03 1,77E-04	-173,708 103,3465 -207,872	-117,626 67,97666 -137,619	-117,792 67,91096 -137,585	-117,413 68,06314 -137,659	-118,005 67,8245 -137,544	BLK TRIBUN LT2	
		BT37	0 3,8161 7,6322	0 M Tump- M Lap M Tump-	-75,9238 56,077 -113,179	-21,5285 15,97423 -44,5095	7,494752 1,940674 -3,6134	-5,36E-02 -1,38E-02 2,60E-02	-125,554 92,85114 -207,03	-90,9784 69,5414 -147,99	-95,5875 68,34778 -145,768	-85,4303 70,97794 -150,665	-101,136 66,9112 -143,093	BLK TRIBUN LT1	
		B741	0 3,15 6,3	0 M Tump- M Lap M Tump-	-45,5629 27,429 -50,2263	-34,3914 20,28519 -35,1078	7,361606 -0,13779 -7,63718	-6,58E-02 6,65E-04 6,71E-02	-109,702 65,37114 -116,444	-67,2579 41,53745 -77,1907	-71,7575 41,62286 -72,5203	-61,7987 41,43568 -82,8534	-77,2166 41,7246 -66,8576	BLK LT 1	
		B740	0 3,15 6,3	0 M Tump- M Lap M Tump-	-46,889 25,523 -52,7122	-35,2671 19,03457 -36,7334	7,323173 4,74E-02 -7,22835	-7,25E-02 -2,20E-03 6,81E-02	-112,694 61,08294 -122,028	-69,221 38,80358 -80,6953	-73,6924 38,77832 -76,2845	-63,7852 38,84004 -86,0582	-79,1182 38,7419 -70,9216	BLK LT 1	
		B739	0 1,625 3,25	0 M Tump- M Lap M Lap	47,6913 3,88031 -73,0882	22,89055 4,44282 -36,6939	0,505588 -3,71693 -7,93944	4,61E-02 2,99E-02 1,37E-02	93,85442 11,76489 -146,416	64,70454 5,733833 -102,346	64,28925 8,01278 -97,3732	65,04228 2,979939 -108,192	63,9515 10,7667 -91,5277	BLK LT 1	
		B738	0 1,625 3,25	0 M Lap M Lap M Tump-	-32,8533 13,8811 51,2814	-19,171 2,722842 24,61667	9,76909 4,952412 0,135734	-0,15272 -3,37E-02 8,54E-02	-70,0976 21,01387 100,9244	-43,6568 17,81522 69,48641	-49,4906 14,76587 69,22153	-36,3643 21,47998 69,5234	-56,7831 11,1011 69,1845	BLK LT 1	
		B737	0 0,65 1,3	0 M Tump- M Lap M Lap	-34,0744 -15,8369 1,98E-02	-24,7513 -11,8174 6,02E-02	-1,10E-02 -7,27E-03 -3,49E-03	-4,24E-02 -1,94E-02 3,67E-03	-80,4914 -37,9122 0,120142	-51,4194 -24,0964 6,15E-02	-51,3234 -24,0511 5,60E-02	-51,3964 -24,0875 5,62E-02	-51,3465 -24,06 0,06126	BIK KANTILEVER	

PORTA A-AS X 14 8 34

		PORTA A-AS X 14 & 34													
B382	0	M	Tump-	-47,4148	-33,8813	2,138865	-2,70E-02	-111,108	-70,4854	-71,7761	-68,8934	-73,368	BLK LT 2		
	3,15	M	Lap	26,8358	19,85206	-7,82E-02	5,85E-04	63,96631	40,6604	40,70847	40,60247	40,7664			
	6,3	M	Tump-	-49,5608	-36,4842	-2,29534	2,82E-02	-117,848	-75,7173	-74,3305	-77,4251	-72,6227			
B381	0	M	Tump-	-44,7321	-29,3375	1,225045	-1,88E-02	-100,619	-65,0852	-65,8175	-64,171	-66,7318	BLK LT 2		
	3,15	M	Lap	27,2614	21,06362	-0,21313	1,73E-03	66,4155	41,82926	41,95989	41,67134	42,1178			
	6,3	M	Tump-	-51,3923	-38,6049	-1,6513	2,23E-02	-123,439	-78,7798	-77,7862	-80,0098	-76,5561			
B178	0	M	Tump-	-43,4569	-31,8223	6,78E-02	3,39E-03	-103,064	-65,6529	-65,7028	-65,6055	-65,7501	BLK LT 3		
	3,15	M	Lap	28,1625	20,86969	4,27E-02	-1,42E-03	67,18653	42,7305	42,7066	42,76292	42,6742			
	6,3	M	Tump-	-50,8653	-36,508	1,75E-02	-6,24E-03	-119,451	-76,4096	-76,4075	-76,3921	-76,425			

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT42	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-62,114 49,457 -26,913	-26,786 24,74987 -13,3944	0,384375 -0,19645 -0,77728	1,07E-02 4,30E-03 -2,13E-03	-117,394 98,94809 -53,7271	-81,9625 67,46481 -36,9446	-82,2272 67,57954 -36,4504	-81,6879 67,31726 -37,5143	-82,5018 67,7271 -35,8807	BLK TRIBUN LT3
		BT41	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-73,75 48,811 -104,93	-35,9975 30,96513 -62,5145	-0,47677 -3,63E-02 0,404138	-1,59E-02 5,22E-03 2,63E-02	-146,096 108,1168 -225,943	-100,283 70,75311 -149,409	-99,9492 70,76504 -149,719	-100,622 70,72259 -149,132	-99,6104 70,7956 -149,997	BLK TRIBUN LT2
		BT40	0 3,8161 7,6322	0 M Tump- M Lap M Tump-	-21,748 43,748 -100,5	-9,26709 17,83407 -53,0513	2,941835 1,038724 -0,86439	3,24E-02 9,36E-03 -1,37E-02	-40,9253 81,03225 -205,484	-27,7133 57,50802 -139,235	-29,6347 56,83395 -138,662	-25,5748 58,2646 -139,861	-31,7731 56,0774 -138,037	BLK TRIBUN LT1
		B744	0 3,15 6,3	0 M Tump- M Lap M Tump-	-26,093 33,495 -51,719	-19,765 25,48241 -39,3398	-2,28306 -0,3053 1,672451	-3,61E-02 -7,18E-03 2,17E-02	-62,9356 80,9657 -125,006	-40,6066 51,11983 -78,5393	-39,0925 51,32724 -79,6385	-42,2581 50,90071 -77,326	-37,441 51,5464 -80,8518	BLK LT 1
		B743	0 3,15 6,3	0 M Tump- M Lap M Tump-	-40,377 25,208 -43,421	-26,0735 20,29652 -30,7536	-1,53482 4,91E-02 1,369097	-2,35E-02 2,51E-03 7,78E-03	-90,1703 62,7243 -101,311	-59,3305 39,27354 -64,5272	-58,3143 39,23734 -65,406	-60,4414 39,30777 -63,5266	-57,2035 39,2031 -66,4066	BLK LT 1
		B742	1,625 3,25	M Lap M Tump-	-2,6606 3,4543	-0,93461 1,515262	-0,94838 -0,36194	-1,36E-02 -3,68E-03	-4,68804 6,569548	-3,69537 4,463733	-3,06941 4,699474	-4,38246 4,200413	-2,38232 4,96279	BLK LT 1
		B384	0 3,15 6,3	0 M Tump- M Lap M Tump-	-25,836 32,15 -54,667	-19,9974 24,76191 -40,5484	-0,71045 -9,37E-02 0,522971	-1,67E-02 -5,95E-03 4,84E-03	-62,9987 78,19871 -130,477	-39,9672 49,32143 -82,7755	-39,4844 49,39298 -83,1151	-40,477 49,2569 -82,3947	-38,9745 49,4575 -83,496	BLK LT 2
		B383	0 3,15 6,3	0 M Tump- M Lap M Tump-	-56,231 28,414 -31,743	-41,3072 22,58261 -23,5972	-0,27777 -9,03E-02 0,097088	2,28E-03 2,99E-03 3,71E-03	-133,569 70,22889 -75,8466	-85,1513 44,03635 -48,1615	-84,9811 44,08698 -48,2305	-85,3572 43,96775 -48,0929	-84,7753 44,1556 -48,2991	BLK LT 2
		B179	0 3,15 6,3	0 M Tump- M Lap M Tump-	-30,117 35,554 -43,576	-21,3883 26,49684 -35,6877	-0,06267 2,69E-02 0,116395	-0,01113 -1,23E-03 8,68E-03	-70,362 85,05968 -109,392	-45,1292 54,03183 -68,1927	-45,0863 54,01748 -68,2842	-45,1671 54,05247 -68,1135	-45,0285 53,9968 -68,3634	BLK LT 3

PORTAL A-AS X 15 & 33

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT48	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-62,114 49,457 -26,913	-26,786 24,74987 -13,3944	0,384375 -0,19645 -0,77728	1,07E-02 4,30E-03 -2,13E-03	-117,394 98,94809 -53,7271	-81,9625 67,46481 -36,9446	-82,2272 67,57954 -36,4504	-81,6879 67,31726 -37,5143	-82,5018 67,7271 -35,8807	BLK TRIBUN LT3
		BT47	0 3,6035 7,2069	0 M Tump- M Lap M Tump-	-73,75 48,811 -104,93	-35,9975 30,96513 -62,5145	-0,47677 -3,63E-02 0,404138	-1,59E-02 5,22E-03 2,63E-02	-146,096 108,1168 -225,943	-100,283 70,75311 -149,409	-99,9492 70,72259 -149,719	-100,622 70,72259 -149,132	-99,6104 70,7956 -149,997	BLK TRIBUN LT2
		BT46	0 3,8161 7,6322	0 M Tump- M Lap M Tump-	-21,748 43,748 -100,5	-9,26709 17,83407 -53,0513	2,941835 1,038724 -0,86439	3,24E-02 9,36E-03 -1,37E-02	-40,9253 81,03225 -205,484	-27,7133 57,50802 -139,235	-29,6347 56,83395 -138,662	-25,5748 58,2646 -139,861	-31,7731 56,0774 -138,037	BLK TRIBUN LT1
		B752	0 3,15 6,3	0 M Tump- M Lap M Tump-	-50,964 33,495 -51,719	-38,723 25,48241 -39,3398	-1,27093 -0,3053 1,672451	-2,76E-03 -7,18E-03 2,17E-02	-123,114 80,9657 -125,006	-78,3113 51,11983 -78,5393	-77,5048 51,32724 -77,6385	-79,2434 50,90071 -77,326	-76,5727 51,5464 -80,8518	BLK LT 1
		B751	0 3,15 6,3	0 M Tump- M Lap M Tump-	-40,377 25,208 -43,421	-30,7536 20,29652 -30,7536	1,369097 4,91E-02 -1,53482	7,78E-03 2,51E-03 -2,35E-02	-101,311 62,7243 -90,1703	-64,5272 39,27354 -59,3305	-65,406 39,23734 -58,3143	-63,5266 39,30777 -60,4414	-66,4066 39,2031 -57,2035	BLK LT 1
		B750	0 1,625 3,25	0 M Tump- M Lap M Tump-	-2,6606 3,4543 -25,836	-0,93461 1,515262 -19,9974	-0,94838 -0,36194 -0,71045	-1,36E-02 -3,68E-03 -1,67E-02	-4,68804 6,569548 -62,9987	-3,69537 4,463733 -39,9672	-3,06941 4,699474 -39,4844	-4,38246 4,200413 -40,477	-2,38232 4,96279 -38,9745	BLK LT 1
		B388	0 3,15 6,3	0 M Tump- M Lap M Tump-	-56,231 28,414 -31,743	-41,3072 22,58261 -23,5972	-0,27777 -9,03E-02 0,097088	2,28E-03 2,99E-03 3,71E-03	-133,569 70,22889 -75,8466	-85,1513 44,03635 -48,1615	-84,9811 44,08698 -48,2305	-85,3572 43,96775 -48,0929	-84,7753 44,1556 -48,2991	BLK LT 2
		B387	0 3,15 6,3	0 M Tump- M Lap M Tump-	-30,117 35,554 -43,576	-21,3883 26,49684 -35,6877	-0,06267 2,69E-02 0,116395	-0,01113 -1,23E-03 8,68E-03	-70,362 85,05968 -109,392	-45,1292 54,03183 -68,1927	-45,0663 54,01748 -68,2842	-45,1671 54,05247 -68,1135	-45,0285 53,9968 -68,3634	BLK LT 3

PORTAL A-AS₁ X 17 & 31

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B758	0 1,575 3,15	0 M _{Tump} M _{Lap} M _{Tump}	35,33258 3,618557 -50,1293	20,4589 2,021662 -29,1853	1,40E-02 -3,7431 -7,50019	-0,72249 4,68E-02 0,628818	75,13334 7,576928 -106,852	49,23411 3,84488 -72,7249	50,74252 6,301384 -69,3203	49,77542 1,128128 -78,6997	50,2012 9,018137 -63,3455	BLK LT 1
		B757	0 1,575 3,15	0 M _{Tump} M _{Lap} M _{Tump}	-50,0512 8,262161 33,75823	-31,5545 5,584416 19,81972	7,151637 3,483167 -0,1853	0,727202 1,36E-03 -0,72448	-110,549 18,84966 72,22142	-69,4168 13,29208 47,11349	-75,4494 11,09482 48,75163	-64,6948 15,85121 47,50978	-80,1714 8,535697 48,35534	BLK LT 1
		B391	0 1,575 3,15	0 M _{Tump} M _{Lap} M _{Tump}	34,4656 3,18686 -50,1258	20,19473 1,183706 -30,5971	-4,13E-02 -1,18747 -2,33369	-0,76018 -2,74E-02 0,705452	73,67028 5,718161 -109,106	48,10037 3,68915 -71,9026	49,72275 4,494725 -71,9138	48,62878 2,83647 -74,1364	49,19434 5,347405 -69,68	BLK LT 2
		B390	0 1,575 3,15	0 M _{Tump} M _{Lap} M _{Tump}	-51,0368 7,368618 32,95672	-31,1192 5,660315 19,53622	2,145037 1,023439 -9,82E-02	0,72518 -1,77E-02 -0,7606	-111,035 17,89885 70,80601	-71,7566 11,60883 46,08282	-74,6309 10,99926 47,74192	-70,713 12,37208 46,56971	-75,6745 10,23402 47,25503	BLK LT 2
		B183	0 1,575 3,15	0 M _{Tump} M _{Lap} M _{Lap}	40,68781 3,08601 -56,5497	24,21378 1,645911 -33,6917	0,054955 -1,85E-03 -5,87E-02	-0,52726 -1,07E-02 0,505906	87,56743 6,336669 -121,766	57,44058 4,265441 -80,0902	58,51319 4,289027 -81,1157	57,8685 4,271924 -80,5052	58,08527 4,282543 -80,7007	BLK LT 3
		B182	0 1,575 3,15	0 M _{Lap} M _{Lap} M _{Tump}	-53,5262 10,23428 41,17742	-33,0252 7,087398 24,29639	8,68E-02 8,56E-02 8,45E-02	0,469514 -2,85E-02 -0,52661	-117,072 23,62098 88,28713	-76,488 15,20806 58,0167	-77,5287 15,21405 59,06933	-76,7694 15,29199 58,46588	-77,2474 15,13012 58,62016	BLK LT 3
		BT51	0 3,603471 7,206941	0 M _{Tump} M _{Lap} M _{Tump}	-61,3762 37,9796 -50,6058	-28,0731 18,84315 -23,9208	0,85132 -0,44322 -1,73777	-7,18E-02 -8,40E-03 5,50E-02	-118,568 75,72456 -99,0002	-81,9383 51,60133 -68,6957	-82,3238 51,8982 -67,7165	-81,2598 51,28173 -70,0135	-83,0023 52,2178 -66,3988	BLK TRIBUN
		BT50	0 3,603471 7,206941	0 M _{Tump} M _{Lap} M _{Tump}	-80,844 48,4554 -98,5498	-44,4255 29,50452 -57,0077	0,307227 0,107281 -9,27E-02	-1,02E-02 1,69E-02 4,39E-02	-168,094 105,3537 -209,472	-112,788 69,5175 -139,375	-112,96 69,41452 -139,409	-112,555 69,58397 -139,476	-113,194 69,34806 -139,309	BLK TRIBUN

PORTAL A-AS X 18 & 30

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0	M _{Tump-}	-46,8072	-21,9951	7,282441	4,37E-02	-91,3607	-60,6646	-65,3442	-55,3441	-70,6647	
		BT49	3,816084	M _{Lap}	36,30352	15,7693	1,873575	9,84E-03	68,79511	48,65386	47,45285	50,02371	46,08301	BLK TRIBUN
			7,632169	M _{Tump-}	7,632169	7,632169	7,632169	7,632169	7,632169	7,632169	7,632169	7,632169	7,632169	
			0	M _{Tump-}	-48,2678	-35,4259	7,09926	2,92E-02	-114,603	-70,7325	-75,2664	-65,536	-80,4629	
		B756	3,15	M _{Lap}	25,38656	19,12515	4,15E-02	1,04E-02	61,06411	38,72871	38,68075	38,75163	38,65784	BLK LT 1
			6,3	M _{Tump-}	-51,6064	-36,3934	-7,01616	-8,48E-03	-120,157	-79,3336	-74,8956	-84,4842	-69,7449	
			0	M _{Tump-}	47,49306	23,30233	0,641189	1,08E-02	94,2754	64,76154	64,33481	65,22484	63,87151	
		B755	1,625	M _{Lap}	5,614977	4,745459	-3,6014	-2,19E-02	14,33071	7,727971	10,04276	5,097011	12,67372	BLK LT 1
			3,25	M _{Lap}	-69,4207	-36,5004	-7,84399	-0,05457	-141,705	-98,4151	-93,3588	-104,14	-87,6336	
			0	M _{Tump-}	-39,5234	-19,1084	9,338276	4,73E-02	-78,0014	-50,5465	-56,5291	-43,7177	-63,3579	
		B754	1,625	M _{Lap}	9,404854	2,190847	4,80149	2,83E-02	14,79118	12,79747	9,713189	16,3058	6,204865	BLK LT 1
			3,25	M _{Tump-}	48,99896	23,49005	0,264703	9,18E-03	96,38283	66,34067	66,15462	66,52847	65,96681	
			0	M _{Tump-}	-31,4697	-23,1638	3,69E-03	-7,42E-03	-74,8257	-47,643	-47,6297	-47,6348	-47,6379	LISPLANK
		B753	0,65	M _{Lap}	-14,5189	-11,0336	1,73E-03	-4,05E-03	-35,0764	-22,1997	-22,1923	-22,1955	-22,1966	
			1,3	M _{Tump-}	5,11E-02	0,040418	-2,34E-04	-6,72E-04	0,126029	7,84E-02	7,99E-02	7,87E-02	7,96E-02	
			0	M _{Tump-}	-40,9307	-29,1476	1,231607	-1,00E-03	-95,753	-60,9533	-61,7271	-60,0473	-62,6331	
		B389	3,15	M _{Lap}	28,33664	21,23015	-0,20973	1,12E-02	67,97221	43,07412	43,18282	42,91177	43,34517	BLK LT 2
			6,3	M _{Tump-}	-53,0433	-38,4617	-1,65106	2,33E-02	-125,191	-80,422	-79,4308	-81,6527	-78,2001	

PORTAL A-AS X 18 & 30

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B761	0 1,575 3,15	0 M _{Tump} M _{Lap} M _{Tump}	3,174292 -3,26543 -38,5791	1,297788 -2,27772 -26,3931	0,398105 0,582634 0,767164	1,34E-04 6,22E-05 -2,59E-04	5,885612 -7,56287 -88,524	4,276158 -4,6802 -56,8944	4,025069 -5,04713 -57,3772	4,568666 -4,25192 -56,3303	3,732561 -5,47541 -57,9412	BLK LT 1
		B393	0 1,575 3,15	0 M _{Tump} M _{Lap} M _{Tump}	3,003359 -4,06209 -40,0015	1,297504 -1,81041 -25,4582	0,113916 0,175035 0,236153	1,77E-04 -2,22E-04 6,21E-04	5,680036 -7,77117 -88,735	4,007023 -5,35085 -57,9665	3,934885 -5,46066 -58,114	4,090621 -5,22204 -57,7925	3,851287 -5,58947 -58,2881	BLK LT 2
		B184	0 1,575 3,15	0 M _{Tump} M _{Lap} M _{Tump}	-0,71101 15,34906 2,53514	4,04E-02 10,51733 0,454397	-5,91E-02 6,08E-02 0,180651	2,36E-04 -5,93E-05 -3,55E-04	-0,78861 35,2466 3,769203	-0,73949 22,76152 3,004699	-0,70276 22,72335 2,891634	-0,7831 22,80623 3,137738	-0,65915 22,67864 2,758595	BLK LT 3
		BT54	0 3,603471 7,206941	0 M _{Tump} M _{Lap} M _{Tump}	-84,7519 74,40033 -42,7521	-46,0486 44,65015 -25,0933	0,358689 -0,21884 -0,79637	-3,77E-04 1,20E-04 6,16E-04	-175,38 160,7206 -91,4518	-117,888 106,1811 -60,9487	-118,113 106,3188 -60,4483	-117,624 106,0202 -61,5345	-118,377 106,4797 -59,8625	BLK TRIBUN
		BT53	0 3,603471 7,206941	0 M _{Tump} M _{Lap} M _{Tump}	-61,9232 23,3698 -79,2783	-25,9167 10,31935 -43,1247	-0,36373 3,61E-02 0,435907	-6,97E-04 -5,04E-04 -3,11E-04	-115,775 44,55473 -164,134	-81,4622 31,05032 -110,274	-81,2316 31,02865 -110,548	-81,729 31,07722 -109,953	-80,9648 31,00175 -110,868	BLK TRIBUN
		BT52	0 3,816084 7,632169	0 M _{Tump} M _{Lap} M _{Tump}	-27,914 78,68491 -115,973	-16,5091 45,37941 -68,0348	1,849577 0,720323 -0,40893	-1,10E-03 -1,07E-03 -1,04E-03	-59,9114 167,029 -248,023	-39,129 111,434 -164,764	-40,2919 110,9824 -164,504	-37,7688 111,9642 -165,063	-41,6522 110,4522 -164,204	BLK TRIBUN
		B760	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-43,7183 29,79868 -41,4859	-31,3987 24,53097 -29,609	-0,79951 -3,08E-02 0,737907	9,47E-04 -1,63E-03 -4,20E-03	-102,7 75,00797 -97,1574	-65,9363 46,73172 -61,9858	-65,4346 46,75454 -62,4419	-66,5246 46,71027 -61,4403	-64,8463 46,77598 -62,9873	BLK LT 1
		B759	0 1,625 3,25	0 M _{Tump} M _{Lap} M _{Tump}	-36,8716 -2,01869 1,232299	-24,6242 -0,98488 -3,46E-02	-0,95275 -0,66361 -0,37447	-7,41E-03 -1,92E-03 3,56E-03	-83,6446 -3,99823 1,423474	-54,5363 -2,95115 1,157927	-53,9205 -2,52904 1,386365	-55,2311 -3,43749 0,880077	-53,2257 -2,0427 1,664215	BLK LT 2
		B392	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-45,0823 25,7981 -48,1231	-29,7603 20,78066 -38,7481	-0,22681 -3,60E-02 0,154894	-1,74E-05 -2,96E-04 -5,74E-04	-101,715 64,20678 -119,745	-66,1568 40,16819 -74,8923	-66,0139 40,19146 -74,9887	-66,3235 40,14198 -74,778	-65,8472 40,21767 -75,103	BLK LT 2

PORTA A-AS X 19 & 29

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B767	0 1,575 3,15	0 M Tump- M Lap M Lap	35,39329 3,381658 -50,6639	20,5033 1,819671 -29,6337	1,78E-02 -3,73652 -7,49084	0,722437 4,95E-02 -0,62351	75,27722 6,969464 -108,211	50,8442 3,572067 -74,8806	49,31587 5,822201 -68,852	50,32629 0,789368 -79,9281	49,83377 8,6049 -63,8045	BLK LT 1
		B766	0 1,575 3,15	0 M Lap M Lap M Lap	-49,412 8,59932 33,79335	-31,026 5,861159 19,84469	7,135817 3,477405 -0,18101	-0,73235 -4,03E-03 0,724293	-108,936 19,69704 72,30353	-69,9502 13,81297 48,68866	-72,9078 11,63067 47,28168	16,37182 11,63067 48,02327	9,071811 9,071811 47,94708	BLK LT 1
		B396	0 1,575 3,15	0 M Tump- M Lap M Lap	34,14034 3,113067 -49,9481	19,92841 1,175575 -30,347	-3,49E-02 -1,18876 -2,34261	0,760183 2,89E-02 -0,70229	72,85385 5,616601 -108,493	49,18945 3,665269 -73,0394	47,61505 4,353396 -70,0888	48,60506 2,770255 -74,2451	48,19944 5,24841 -68,8831	BLK LT 2
		B395	0 1,575 3,15	0 M Lap M Lap M Tump-	-51,9633 6,749946 32,64586	-31,9493 5,121877 19,28941	2,142785 1,025433 -9,19E-02	-0,72772 1,64E-02 0,760426	-113,475 16,29494 70,03809	-74,7786 10,65441 47,19997	-74,6004 9,974043 45,66099	11,39608 11,39608 46,5735	9,23237 9,23237 46,28746	BLK LT 2
		B186	0 1,575 3,15	0 M Tump- M Lap M Lap	42,54071 1,62952 -61,3156	25,6622 0,494242 -37,4435	5,94E-02 -2,18E-03 -6,38E-02	0,52721 1,09E-02 -0,50539	92,10838 2,746212 -133,488	61,40723 2,033136 -88,5215	60,26265 2,011602 -87,42	61,06341 2,023515 -88,1969	60,60647 2,021223 -87,7445	BLK LT 3
		B185	0 1,575 3,15	0 M Lap M Lap M Tump-	-44,974 15,30271 42,76212	-26,2591 11,09188 25,53922	8,38E-02 8,64E-02 8,90E-02	-0,46976 2,83E-02 0,526326	-95,9833 36,11026 92,17729	-64,2328 23,11264 61,5706	-63,2991 22,99883 60,40926	-63,8259 23,15534 61,24913	-63,7059 22,95613 60,73073	BLK LT 3
		BT57	3,603471 7,206941	M Lap M Tump-	57,97143 -72,9123	34,88285 -42,9355	-0,44417 -1,7431	8,48E-03 -0,05425	125,3783 -156,192	82,71519 -104,213	82,9772 -103,001	82,38248 -105,455	83,3099 -101,76	BLK TRIBUN
		BT56	0 3,603471 7,206941	0 M Tump- M Lap M Tump-	-54,0319 27,54475 -78,8198	-24,5571 12,70204 -39,719	0,310006 0,107725 -9,46E-02	7,81E-03 -1,76E-02 -4,30E-02	-104,13 53,37697 -158,134	-72,0986 36,93974 -107,859	-72,3103 36,9088 -107,709	-71,8765 37,03185 -107,897	-72,5324 36,8167 -107,671	BLK TRIBUN

PORTAL A-AS X 20 & 28

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu _j (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT55	0 3,816084 7,632169	0 M _{Tump} M _{Lap} M _{Tump}	-78,4999 57,0511 -108,655	-47,1316 33,11611 -61,9389	7,267384 1,868386 -3,53061	-5,98E-02 1,32E-02 3,34E-02	-169,611 121,4471 -229,488	-109,891 81,34149 -154,186	-114,344 80,19211 -152,032	-104,506 82,72445 -156,806	-119,73 78,80915 -149,413	BLK TRIBUN
		B765	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Lap}	-46,6609 25,65637 -52,6737	-33,99 19,36123 -37,3572	7,088314 4,17E-02 -7,00493	-2,78E-02 -8,67E-03 1,05E-02	-110,377 61,76561 -122,98	-68,204 39,14079 -81,0379	-72,6112 39,13274 -76,6469	-62,9736 39,17781 -86,1943	-77,8416 39,09572 -71,4905	BLK LT 1
		B764	0 1,625 3,25	0 M _{Tump} M _{Lap} M _{Lap}	50,43453 3,867898 -75,8563	25,16184 3,308785 -41,2333	0,6346 -3,5955 -7,82561	-8,45E-02 2,31E-02 0,130811	100,7804 9,935534 -157,001	68,91934 5,037531 -107,954	68,69709 7,254124 -103,298	69,44791 2,377834 -113,802	68,16852 9,913821 -97,4504	BLK LT 1
		B763	0 1,625 3,25	0 M _{Lap} M _{Lap} M _{Tump}	13,3286 52,07644 -32,2365	-14,867 25,4448 -23,7245	9,325447 4,791234 -1,75E-02	2,00E-02 -3,82E-02 6,78E-03	-65,4913 24,45654 -76,6431	-42,8987 18,79619 -48,7932	-48,8158 15,85787 -48,7964	-36,0592 22,3458 70,95001	-55,6553 12,30826 70,47097	BLK LT 1
		B762	0,65 1,3	M _{Lap} M _{Tump}	-14,9442 -3,25E-02	-11,3441 -1,99E-02	-9,04E-03 -6,25E-04	3,78E-03 7,83E-04	-36,0835 -0,07078	-22,837 -4,60E-02	-22,8393 -4,73E-02	-22,8464 -4,70E-02	-22,8298 -4,62E-02	LISPLANK
		B394	0 3,15 6,3	0 M _{Tump} M _{Lap} M _{Tump}	-50,0336 26,54158 -47,5305	-36,5948 19,7382 -33,9984	1,235241 -0,20979 -1,65481	-2,13E-03 -0,01139 -2,07E-02	-118,592 63,43101 -111,434	-75,2031 40,22568 -71,869	-75,9769 40,38177 -70,7831	-74,2937 40,07986 -73,0701	-76,8863 40,52759 -69,582	BLK LT 2

PORTAL A-AS₁ X 20 & 28

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT60	0 3,603471 7,206941	0 M Tump- M Lap M Tump-	-80,6725 75,53354 -44,565	-42,444 45,65454 -26,6892	0,418479 -0,1941 -0,80668	-6,07E-03 -2,04E-03 1,98E-03	-164,717 163,6875 -96,1807	-111,32 108,0093 -63,8595	-111,571 108,1359 -63,3554	-111,008 107,8681 -64,4538	-111,883 108,277 -62,761	BLK TRIBUN
		BT59	0 3,603471 7,206941	0 M Tump- M Lap M Tump-	-85,4693 42,91584 -105,004	-44,7226 25,79564 -64,1284	-0,42675 2,07E-02 0,468072	-7,69E-03 4,37E-03 -1,64E-02	-174,119 92,77203 -228,61	-118,044 61,3148 -150,524	-117,792 61,31097 -150,785	-118,364 61,3332 -150,168	-117,472 61,29257 -151,141	BLK TRIBUN
		BT58	0 3,816084 7,632169	0 M Tump- M Lap M Tump-	-27,1308 75,9045 -122,317	-15,6676 43,29085 -73,0533	1,872498 0,675976 -0,52055	-7,38E-03 -5,12E-04 6,35E-03	-57,6252 160,3508 -263,666	-37,7758 107,1854 -174,614	-38,94 106,7606 -174,299	-36,3941 107,6826 -175,001	-40,3217 106,2633 -173,912	BLK TRIBUN
		B770	0 3,15 6,3	0 M Tump- M Lap M Tump-	-29,3018 33,72216 -48,0554	-22,1392 25,67771 -36,5751	-2,06064 -0,45316 1,154314	-2,19E-02 2,50E-03 -1,69E-02	-70,5848 81,55093 -116,187	-45,3407 51,4451 -73,1546	-44,0884 51,72535 -73,8464	-46,8714 51,1102 -72,2938	-42,5578 52,06026 -74,7072	BLK LT 1
		B769	0 3,15 6,3	0 M Tump- M Lap M Tump-	-48,8633 26,73551 -42,4673	-37,1805 21,47476 -29,9396	-0,56228 0,066471 0,695221	-1,93E-02 1,69E-02 5,32E-02	-118,125 66,44223 -98,8642	-74,9276 41,64012 -63,1777	-74,5327 41,56265 -63,7275	-75,3266 41,67652 -62,7059	-74,1337 41,52625 -64,1994	BLK LT 1
		B768	0 1,625 3,25	0 M Tump- M Lap M Tump-	-39,438 -2,79011 2,255919	-26,2649 -1,43577 0,704381	-0,95837 -0,6692 -0,38003	9,42E-02 3,06E-02 -3,29E-02	-89,3495 -5,64537 3,834113	-58,1598 -4,01278 2,658179	-57,7539 -3,65553 2,966771	-58,9334 -4,52716 2,403067	-56,9802 -3,14115 3,221884	BLK LT 1
		B398	0 3,15 6,3	0 M Tump- M Lap M Tump-	-28,5398 31,72122 -52,8194	-22,1581 24,7885 -38,3345	-0,63943 -0,1402 0,359027	1,10E-02 4,48E-03 -2,01E-03	-69,7007 77,72707 -124,718	-44,1163 48,88458 -79,5001	-43,7365 48,9635 -79,7221	-44,5943 48,77824 -79,2347	-43,2584 49,06984 -79,9874	BLK LT 2
		B397	0 3,15 6,3	0 M Tump- M Lap M Tump-	-55,4367 26,77224 -35,8204	-39,5756 20,85542 -28,7832	-0,11465 -0,01462 8,54E-02	-6,07E-03 -2,71E-03 6,51E-04	-129,845 65,49535 -89,0376	-83,1836 41,24231 -55,7173	-83,0987 41,25721 -55,7724	-83,2634 41,23356 -55,655	-83,0189 41,26597 -55,8347	BLK LT 2
		B187	0 3,15 6,3	0 M Tump- M Lap M Tump-	-39,5395 39,54577 -26,1706	-27,6586 29,60561 -23,1998	-8,02E-02 2,01E-02 0,120491	9,04E-03 2,39E-03 -4,25E-03	-91,7011 94,82389 -68,5244	-58,9571 60,18344 -42,0615	-58,9256 60,16574 -42,1285	-59,0228 60,19647 -41,9698	-58,8599 60,1527 -42,2202	BLK LT 3

PORTAL A-AS_X 21 & 27

No	Portal	Balok	Jarak (m)	Ltk momen	DL (kNm)	LL (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		BT63	3,603471	0 M _{Tump} M _{Lap}	-92,4666 56,66	-50,952 33,99415	0,830339 -0,44961	1,54E-03 2,04E-03	-192,483 122,3826	-128,927 80,76554	-129,453 81,05309	-128,317 80,43658	-130,062 81,38206	BLK TRIBUN
			7,206941	0 M _{Tump} M _{Lap}	-70,518 -83,3212	-41,5019 -46,6399	-1,72957 0,241692	-5,63E-03 1,00E-02	-151,025 -174,609	-100,741 -116,784	-99,6393 -116,957	-102,008 -116,613	-98,3723 -117,127	BLK TRIBUN
		BT62	3,603471	0 M _{Tump} M _{Lap}	46,361 -100,261	27,51967 -58,763	9,36E-02 -5,45E-02	2,74E-03 -4,56E-03	99,66468 -214,334	66,04881 -142,317	65,98408 -142,273	66,1156 -142,354	65,91729 -142,237	BLK TRIBUN
			7,206941	0 M _{Tump} M _{Lap}	-77,3283 55,47201	-44,9596 32,23776	7,084586 1,846013	1,10E-02 -8,97E-04	-164,729 118,1468	-107,276 79,13595	-111,762 77,97485	-102,077 80,49343	-116,962 76,61737	BLK TRIBUN
		BT61	3,816084	0 M _{Tump} M _{Lap}	-112,985 -45,6602	-65,8676 -33,66	-3,39256 7,000307	-1,28E-02 -2,15E-02	-240,97 -108,648	-161,213 -66,9665	-159,048 -71,3316	-163,697 -61,8055	-156,564 -76,4926	BLK LT 1
			7,632169	0 M _{Tump} M _{Lap}	27,51067 -49,9657	20,33304 -35,7436	-0,11963 -7,23957	5,82E-04 2,27E-02	65,54567 -117,149	41,65895 -77,2391	41,73309 -72,7258	41,57059 -82,5768	41,82145 -67,388	BLK LT 1
		B775	3,15	0 M _{Tump} M _{Lap}	-46,8845 25,53487	-34,5101 19,02882	6,960687 3,80E-02	-4,24E-02 -5,75E-03	-111,478 61,08795	-68,822 38,80569	-73,1182 38,79384	-63,6747 38,83784	-78,2655 38,7617	BLK LT 1
			6,3	0 M _{Tump} M _{Lap}	-52,693 37,61709	-37,5019 22,00728	-6,88473 0,6133	3,09E-02 0,292926	-123,235 80,35215	-81,0901 53,86329	-76,8176 52,86177	-86,1731 54,09877	-71,7346 52,62629	BLK LT 1
		B774	3,15	0 M _{Tump} M _{Lap}	-64,9283 4,104246	-39,8166 3,564676	-7,70388 -3,54529	-0,2456 2,37E-02	-141,62 10,62858	-95,9437 5,463285	-90,5745 7,647123	-101,426 2,840104	-85,0927 10,2703	BLK LT 1
			3,25	0 M _{Tump} M _{Lap}	-31,0985 15,61403	-19,3205 8,291788	8,999718 4,711826	-0,28249 -3,31E-03	-68,2309 32,00369	-42,287 23,09931	-47,3636 20,1378	-35,4646 26,56493	-54,186 16,67218	BLK LT 1
		B772	1,625	0 M _{Tump} M _{Lap}	38,71857 -31,8329	22,30992 -23,4373	0,423934 -3,85E-03	0,275869 6,44E-04	82,15816 -75,6991	55,13295 -48,1905	54,28655 -48,1894	55,24178 -48,1938	54,17772 -48,1861	LISPLANK
			3,25	0 M _{Tump} M _{Lap}	-14,7244 -64,9283	-11,1896 -39,8166	-1,93E-03 -7,70388	1,57E-04 -0,2456	-35,5726 -141,62	-22,5105 -95,9437	-22,5096 -90,5745	-22,512 -101,426	-22,5081 -85,0927	LISPLANK

PORTAL A-AS X 22 & 26

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu _J (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
	PTL AS-AS_X 228,26	B400	0	M _{Tump-}	-47,8295	-34,159	1,949474	-1,67E-03	-112,05	-71,1288	-72,3535	-69,6947	-73,7876	BLK LT 2
			3,15	M _{Lap}	26,55584	19,68413	-6,94E-02	3,55E-04	63,36162	40,26313	40,30614	40,21183	40,35744	
			6,3	M _{Tump-}	-49,7061	-36,5423	-2,08836	2,38E-03	-118,115	-75,8684	-74,5578	-77,4051	-73,0211	
		B399	0	M _{Tump-}	-44,7846	-32,5826	1,111954	8,69E-03	-105,874	-67,1915	-67,9103	-66,3806	-68,7212	BLK LT 2
			3,15	M _{Lap}	27,58667	20,44426	-0,1986	2,26E-03	65,81482	41,78571	41,90607	41,63807	42,0537	
			6,3	M _{Tump-}	-50,6893	-36,5985	-1,50915	4,17E-03	-119,385	-93,873	-76,7606	-75,8011	-77,8667	
	B188	0	M _{Tump-}	-39,8621	-28,7741	8,16E-02	-1,24E-03	-60,0072	-59,9584	-60,0072	-59,8975	-60,0681	BLK LT 3	
		3,15	M _{Lap}	29,01013	21,53599	4,40E-02	-2,41E-04	69,26973	44,04191	44,0147	44,07441	43,9822		
		6,3	M _{Tump-}	-52,765	-38,2236	6,36E-03	7,63E-04	-124,476	-79,4813	-79,4869	-79,4771	-79,491		

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0	M _{Tump-}	-81,1499	-42,6949	0,370546	-6,78E-04	-165,692	-111,989	-112,221	-111,716	7,206941	BLK TRIBUN
		BT66	3,603471	M _{Lap}	75,43144	45,61166	-0,23232	-9,01E-04	163,4964	107,8642	108,0125	107,6941	-62,3393	
			6,49063	M _{Tump-}	-44,2919	-26,524	-0,83519	-1,12E-03	-95,5887	-63,4809	-62,9524	-64,0939	-39,0625	
			0	M _{Tump-}	-85,9692	-45,9522	-2,25E-02	5,26E-03	-176,687	-119,219	-119,216	-119,24	-119,196	
		BT65	3,603471	M _{Lap}	42,73558	25,29887	0,166425	1,23E-03	91,76089	60,86437	60,75693	60,98578	60,63552	BLK TRIBUN
			7,206941	M _{Tump-}	-104,864	-63,8923	0,355382	-2,80E-03	-228,065	-150,251	-150,469	-149,987	-150,732	
			0	M _{Tump-}	-29,7572	-11,2812	0,67801	-5,32E-03	-53,7586	-38,1443	-38,5602	-37,642	-39,0625	
		BT64	3,816084	M _{Lap}	73,39058	43,65819	0,583856	1,35E-03	157,9218	104,7501	104,3794	105,1782	103,9513	BLK TRIBUN
			7,632169	M _{Tump-}	-124,719	-76,7051	0,489703	8,02E-03	-272,391	-179,116	-179,441	-178,762	-179,796	
			0	M _{Tump-}	-29,6019	-22,3122	-2,01365	2,87E-03	-71,2219	-45,77	-44,5074	-47,2522	-43,0253	
		B778	3,15	M _{Lap}	34,60433	26,4026	-0,46174	1,71E-03	83,76936	52,82454	53,11184	52,4839	53,45248	BLK LT 1
			6,3	M _{Tump-}	-45,991	-34,9522	1,090163	5,56E-04	-111,113	-69,9864	-70,6544	-69,1656	-71,4553	
			0	M _{Tump-}	-45,4567	-34,5817	-0,62509	4,81E-03	-109,879	-69,7078	-69,3241	-70,1708	-68,8612	
		B777	3,15	M _{Lap}	20,12767	16,34888	0,158715	-9,99E-04	50,31141	31,48279	31,3849	31,60018	31,26751	BLK LT 1
			6,3	M _{Tump-}	-59,0896	-42,7902	0,942523	-6,81E-03	-139,372	-88,7121	-89,2916	-88,0144	-89,9894	
			0	M _{Tump-}	-67,0846	-47,4555	-0,52954	8,86E-05	-156,43	-100,503	-100,169	-100,892	-99,7798	
		B776	3,25	M _{Lap}	46,87501	33,05602	0,30393	1,72E-03	109,1396	70,1416	69,94651	70,36372	69,72438	BLK LT 1
			6,5	M _{Tump-}	6,251192	-4,02268	1,137396	3,35E-03	1,065146	4,391261	3,667668	5,224785	2,834144	
			0	M _{Tump-}	-28,5754	-22,1126	-0,54327	9,12E-04	-69,6707	-44,1053	-43,765	-44,5053	-43,365	
		B402	3,15	M _{Lap}	31,86981	24,95348	-0,18094	-2,67E-04	78,16934	49,12671	49,24127	48,99392	49,37407	BLK LT 2
			6,3	M _{Tump-}	-52,4865	-38,0501	0,181385	-1,44E-03	-123,864	-79,0268	-79,138	-78,8924	-79,2724	
			0	M _{Tump-}	-55,0674	-39,2736	-0,33642	-1,76E-03	-128,919	-82,671	-82,4554	-82,917	162	
		B401	3,15	M _{Lap}	26,58194	20,45199	0,099771	7,95E-04	64,62151	40,82805	40,76353	40,9008	40,69078	BLK LT 2
			6,3	M _{Tump-}	-36,5703	-29,892	0,535966	3,35E-03	-91,7116	-57,0584	-57,4031	-56,6669	-57,7946	
			0	M _{Tump-}	-39,148	-27,3148	-0,12266	7,01E-04	-90,6813	-58,3516	-58,2758	-58,4423	-58,1852	
		B189	3,15	M _{Lap}	39,59453	29,69593	-1,48E-03	-5,06E-04	95,02693	60,2817	60,2837	60,28098	60,28442	BLK LT 3
			6,3	M _{Tump-}	-26,4645	-23,3629	0,119689	-1,71E-03	-69,1382	-42,4705	-42,5423	-42,3813	-42,6315	

PORTAL A-AS X 23 & 25

No	Portal	Balok	Jarak (m)	Ltk momen	D _L (kNm)	L _L (kNm)	Beban Gempa		Mu ₁ (kNm)	Mu ₂ (kNm)	Mu ₃ (kNm)	Mu ₄ (kNm)	Mu ₅ (kNm)	Ket
							Ey	Ex						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
			0	M _{Tump-}	-50,9679	0,814222	-3,69E-16	-192,5	-128,936	-129,449	-128,337	-130,047	76,82621	
		BT69	3,603471	M _{Lap}	33,96162	-0,44768	-1,76E-16	122,2927	80,71462	80,99666	80,38557	81,3257	-157,43	BLK TRIBUN
			7,206941	M _{Tump-}	-77,0998	-43,6386	6,886664	-7,99E-16	-162,341	-106,278	-110,616	-101,216	-115,678	
			0	M _{Tump-}	-205,964	-99,8269	-0,12799	0,185458	-0,24621	-130,047	-116,68	-116,446	-116,806	
		BT68	3,603471	M _{Lap}	46,39327	27,54953	7,51E-02	-2,18E-18	99,75117	66,09278	66,0455	66,14795	65,99033	BLK TRIBUN
			7,206941	M _{Tump-}	-70,5885	-41,5511	-1,70958	1,66E-17	-151,188	-100,834	-99,7566	-102,09	-98,5	
			0	M _{Tump-}	-77,0998	-43,6386	6,886664	-7,99E-16	-162,341	-106,278	-110,616	-101,216	-115,678	
		BT67	3,816084	M _{Lap}	55,88901	32,52594	1,821402	-1,56E-16	118,6099	79,31243	78,16495	80,65116	76,82621	BLK TRIBUN
			7,632169	M _{Tump-}	-113,21	-66,6122	-3,24386	4,88E-16	-242,431	-161,858	-159,814	-164,242	-157,43	
			0	M _{Tump-}	-45,6887	-33,5816	6,870839	-8,62E-16	-108,557	-66,9652	-71,2939	-61,9152	-76,3439	
		B782	3,15	M _{Lap}	27,5368	20,35612	-0,12134	3,25E-17	65,61395	41,69977	41,77621	41,61058	41,8654	BLK LT 1
			6,3	M _{Tump-}	-49,885	-35,7758	-7,11353	9,27E-16	-117,103	-77,1587	-72,6772	-82,3872	-67,4488	
			0	M _{Tump-}	-47,0458	-34,9565	6,815291	-6,27E-16	-112,385	-69,2738	-73,5675	-64,2646	-78,5767	
		B781	3,15	M _{Lap}	25,47382	18,86848	3,46E-02	1,15E-17	60,75816	38,64557	38,62374	38,67104	38,59828	BLK LT 1
			6,3	M _{Tump-}	-52,6539	-37,3762	-6,74599	6,50E-16	-122,987	-80,9585	-76,7086	-85,9169	-71,7503	
			0	M _{Tump-}	-33,4445	-27,2079	8,678367	-8,82E-16	-83,6661	-49,5241	-54,9914	-43,1455	-61,37	
		B780	3,25	M _{Lap}	32,61425	23,48452	0,568014	-8,05E-17	76,71233	49,21913	48,86128	49,63662	48,44379	BLK LT 1
			6,5	M _{Tump-}	-62,1331	-43,4133	-7,54234	7,21E-16	-144,021	-94,966	-90,2143	-100,51	-84,6707	
			0	M _{Tump-}	-32,1763	-23,7629	4,11E-02	-2,15E-16	-76,6323	-48,7428	-48,7687	-48,7126	-48,7989	
		B779	0,65	M _{Lap}	-14,8976	-11,3584	0,021299	-1,09E-16	-36,0505	-22,7916	-22,805	-22,7759	-22,8206	LISPLANK
			1,3	M _{Tump-}	3,56E-04	-1,00E-02	1,51E-03	-3,05E-18	-1,56E-02	-5,48E-03	-6,43E-03	-4,37E-03	-7,54E-03	
			0	M _{Tump-}	-39,8893	-28,8287	6,30E-02	-4,46E-16	-93,9931	-60,026	-60,0657	-59,9797	-60,112	
		B190	3,15	M _{Lap}	29,00823	21,53438	4,38E-02	-8,55E-17	69,26488	44,03909	44,01151	44,07127	43,97933	BLK LT 3
			6,3	M _{Tump-}	-52,7415	-38,1722	2,46E-02	2,75E-16	-124,365	-79,4193	-79,4348	-79,4012	-79,4529	

PORTAL A-AS X24

Keterangan:

- {1} Nomor
- {2} Portal yang ditinjau
- {3} Nomor Elemen Balok
- {4} Jarak Elemen Balok (m)
- {5} Letak/daerah Momen
- {6} M_b Momen yang terjadi akibat beban mati
- {7} M_L Momen yang terjadi akibat beban hidup
- {8} E_y Momen yang terjadi akibat Gempa arah Y
- {9} E_x Momen yang terjadi akibat Gempa arah X
- {10} $Mu_1 = 1,2 M_b + 1,6 M_L$
- {11} $Mu_2 = 1,05 M_b + 0,63 M_L + 1,05 E_x + 0,315 E_y$
- {12} $Mu_3 = 1,05 M_b + 0,63 M_L - 1,05 E_x - 0,315 E_y$
- {13} $Mu_4 = 1,05 M_b + 0,63 M_L + 1,05 E_y + 0,315 E_x$
- {14} $Mu_5 = 1,05 M_b + 0,63 M_L - 1,05 E_y - 0,315 E_x$
- {15} Keterangan Balok

Tabel Penulangan Lentur Balok Portal As X5 & 43

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm f_c = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	Mu	Mu/0,8	ρ_{min}	ρ_b	ρ_{maks}	Prabal	m	Rn	d petu	d pasai	Analisis	R _{n,ada}	P _{pasai}	P _{pasai}	A _{s,petu}	ϕ	A _{1,0}	n	tul	A _{s,ada}	a	Mn	CEK	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
B702	M Tump-	-62.94	78.67	0.0035	0.0271	0.02032	0.01016	18.824	3.675	267.109	490	T. Sblh	1.092	0.00302	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Lap	80.97	101.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	302.964	490	T. Sblh	1.405	0.00388	0.0039	570.961	20	314.29	1.8	2	628.571	39.440	118.242	OK
	M Tump-	-125.01	156.26	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.449	490	T. Sblh	2.169	0.006	0.006	881.531	20	314.29	2.8	3	942.857	59.160	173.644	OK
	M Tump-	-123.11	153.89	0.0035	0.0271	0.02032	0.01016	18.824	3.675	373.589	490	T. Sblh	2.1365	0.00591	0.0059	868.186	20	314.29	2.8	3	942.857	59.160	173.644	OK
B701	M Lap	62.72	78.41	0.0035	0.0271	0.02032	0.01016	18.824	3.675	266.66	490	T. Sblh	1.0885	0.00301	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Tump-	-101.31	126.64	0.0035	0.0271	0.02032	0.01016	18.824	3.675	338.897	490	T. Sblh	1.7581	0.00486	0.0049	714.432	20	314.29	2.3	3	942.857	59.160	173.644	OK
	M Tump-	-90.17	112.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	319.721	490	T. Sblh	1.5648	0.00433	0.0043	635.871	20	314.29	2.0	3	942.857	59.160	173.644	OK
B700	M Lap	-4.69	5.86	0.0035	0.0271	0.02032	0.01016	18.824	3.675	72.9014	490	T. Sblh	0.0814	0.00022	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Tump-	6.57	8.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	86.2994	490	T. Sblh	0.114	0.00032	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Tump-	-63.00	78.75	0.0035	0.0271	0.02032	0.01016	18.824	3.675	267.243	490	T. Sblh	1.0933	0.00302	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
B362	M Lap	78.20	97.75	0.0035	0.0271	0.02032	0.01016	18.824	3.675	297.742	490	T. Sblh	1.3571	0.00375	0.0038	551.449	20	314.29	1.8	2	628.571	39.440	118.242	OK
	M Tump-	-130.48	163.10	0.0035	0.0271	0.02032	0.01016	18.824	3.675	384.598	490	T. Sblh	2.2643	0.00626	0.0063	920.111	20	314.29	2.9	3	942.857	59.160	173.644	OK
	M Tump-	-133.57	166.96	0.0035	0.0271	0.02032	0.01016	18.824	3.675	389.128	490	T. Sblh	2.3179	0.00641	0.0064	941.913	20	314.29	3.0	3	942.857	59.160	173.644	OK
B361	M Lap	70.23	87.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	282.162	490	T. Sblh	1.2187	0.00337	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Tump-	-75.85	94.81	0.0035	0.0271	0.02032	0.01016	18.824	3.675	293.23	490	T. Sblh	1.3162	0.00364	0.0036	534.862	20	314.29	1.7	2	628.571	39.440	118.242	OK
	M Tump-	-70.36	87.95	0.0035	0.0271	0.02032	0.01016	18.824	3.675	282.429	490	T. Sblh	1.2211	0.00338	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
B167	M Lap	85.06	106.32	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.529	490	T. Sblh	1.4761	0.00408	0.0041	599.831	20	314.29	1.9	2	628.571	39.440	118.242	OK
	M Tump-	-109.39	136.74	0.0035	0.0271	0.02032	0.01016	18.824	3.675	352.154	490	T. Sblh	1.8984	0.00525	0.0052	771.42	20	314.29	2.5	3	942.857	59.160	173.644	OK

Tabel Penulangan Lentur Balok Portal X7 & 41

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm $f'c$ = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	[1]	[2]	[3]	Mu	kNm	[4]	Mu/0,8	kNm	[5]	P_{min}	[6]	P_b	P_{maks}	[7]	ρ_{prakti}	[8]	m	[9]	R_n	[10]	d_{perlu}	[11]	d_{pakai}	Analisis	[12]	$R_{n,ada}$	[13]	P_{perso}	[14]	P_{prakti}	$A_{s,perlu}$	[16]	ϕ	[17]	$A_{j,e}$	[18]	n	[19]	tul pakai	[20]	$A_{s,ada}$	[21]	a	[22]	Min	[23]	CEK	[24]	[25]
B710	M Tump-	-62.94	78.67	0.0035	0.0271	0.02032	0.01016	18.824	3.675	267.109	490	T.Sblh	1.092	0.00302	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																									
	M Lap	80.97	101.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	302.964	490	T.Sblh	1.405	0.00388	0.0039	570.961	20	314.29	1.8	2	628.571	39.440	118.242	OK																									
	M Tump-	-125.01	156.26	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.449	490	T.Sblh	2.169	0.006	0.006	881.531	20	314.29	2.8	3	942.857	59.160	173.644	OK																									
	M Tump-	-123.11	153.89	0.0035	0.0271	0.02032	0.01016	18.824	3.675	373.589	490	T.Sblh	2.1365	0.00591	0.0059	868.186	20	314.29	2.8	3	942.857	59.160	173.644	OK																									
B709	M Lap	62.72	78.41	0.0035	0.0271	0.02032	0.01016	18.824	3.675	266.66	490	T.Sblh	1.0885	0.00301	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																									
	M Tump-	-101.31	126.64	0.0035	0.0271	0.02032	0.01016	18.824	3.675	338.897	490	T.Sblh	1.7581	0.00486	0.0049	714.432	20	314.29	2.3	3	942.857	59.160	173.644	OK																									
	M Tump-	-90.17	112.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	319.721	490	T.Sblh	1.5648	0.00433	0.0043	635.871	20	314.29	2.0	3	942.857	59.160	173.644	OK																									
B708	M Lap	-4.69	5.86	0.0035	0.0271	0.02032	0.01016	18.824	3.675	72.9014	490	T.Sblh	0.0814	0.00022	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																									
	M Tump-	6.57	8.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	86.2994	490	T.Sblh	0.114	0.00032	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																									
	M Tump-	-63.00	78.75	0.0035	0.0271	0.02032	0.01016	18.824	3.675	267.243	490	T.Sblh	1.0933	0.00302	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																									
B366	M Lap	78.20	97.75	0.0035	0.0271	0.02032	0.01016	18.824	3.675	297.742	490	T.Sblh	1.3571	0.00375	0.0038	551.449	20	314.29	1.8	2	628.571	39.440	118.242	OK																									
	M Tump-	-130.48	163.10	0.0035	0.0271	0.02032	0.01016	18.824	3.675	384.598	490	T.Sblh	2.2643	0.00626	0.0063	920.111	20	314.29	2.9	3	942.857	59.160	173.644	OK																									
	M Tump-	-133.57	166.96	0.0035	0.0271	0.02032	0.01016	18.824	3.675	389.128	490	T.Sblh	2.3179	0.00641	0.0064	941.913	20	314.29	3.0	3	942.857	59.160	173.644	OK																									
B365	M Lap	70.23	87.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	282.162	490	T.Sblh	1.2187	0.00337	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																									
	M Tump-	-75.85	94.81	0.0035	0.0271	0.02032	0.01016	18.824	3.675	293.23	490	T.Sblh	1.3162	0.00364	0.0036	534.862	20	314.29	1.7	2	628.571	39.440	118.242	OK																									
	M Tump-	-70.36	87.95	0.0035	0.0271	0.02032	0.01016	18.824	3.675	282.429	490	T.Sblh	1.2211	0.00338	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																									
B169	M Lap	83.06	106.32	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.529	490	T.Sblh	1.4761	0.00408	0.0041	599.831	20	314.29	1.9	2	628.571	39.440	118.242	OK																									
	M Tump-	-109.39	136.74	0.0035	0.0271	0.02032	0.01016	18.824	3.675	352.154	490	T.Sblh	1.8984	0.00525	0.0052	771.42	20	314.29	2.5	3	942.857	59.160	173.644	OK																									

Tabel Penulangan Lentur Balok Portal X9 & 39

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm f_c = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	[1]	[2]	Mu kNm	[3]	Mu/0,8 kNm	P_{min}	[5]	P_b	[6]	P_{maks}	[7]	P_{seksi}	[8]	m mm	R_n	d pasai mm	[11]	d pasai	[12]	Analisis	[13]	R_{nada}	P_{seksi}	[15]	P_{seksi}	A_{sperlu} mm	ϕ mm	$A_{l,p}$ mm	[19]	n	tul pakai	[21]	A_{sada} mm ²	[22]	a mm	[23]	M_n kNm	[24]	CEK	[25]
B719	M Tump-	5.89	7.36	0.0271	0.02032	0.01016	18.824	3.675	81.6838	490	T.Sblh	0.102	0.00028	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	
	M Lap	-7.56	9.45	0.0271	0.02032	0.01016	18.824	3.675	92.5941	490	T.Sblh	0.131	0.00036	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	
	M Tump-	-88.52	110.65	0.0271	0.02032	0.01016	18.824	3.675	316.789	490	T.Sblh	1.536	0.00425	0.0042	624.261	20	314.29	2.0	2	628.571	39.440	118.242	OK																	
	M Tump-	-102.70	128.37	0.0271	0.02032	0.01016	18.824	3.675	341.213	490	T.Sblh	1.7822	0.00493	0.0049	724.229	20	314.29	2.3	3	942.857	59.160	173.644	OK																	
B718	M Lap	75.01	93.76	0.0271	0.02032	0.01016	18.824	3.675	291.604	490	T.Sblh	1.3017	0.0036	0.0036	528.948	20	314.29	1.7	2	628.571	39.440	118.242	OK																	
	M Tump-	-97.16	121.45	0.0271	0.02032	0.01016	18.824	3.675	331.878	490	T.Sblh	1.6861	0.00466	0.0047	685.143	20	314.29	2.2	3	942.857	59.160	173.644	OK																	
	M Tump-	-83.64	104.56	0.0271	0.02032	0.01016	18.824	3.675	307.935	490	T.Sblh	1.4516	0.00401	0.004	589.852	20	314.29	1.9	2	628.571	39.440	118.242	OK																	
	M Lap	-4.00	5.00	0.0271	0.02032	0.01016	18.824	3.675	67.3246	490	T.Sblh	0.0694	0.00019	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	
B370	M Tump-	1.42	1.78	0.0271	0.02032	0.01016	18.824	3.675	40.1712	490	T.Sblh	0.0247	6.8E-05	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	
	M Tump-	-101.72	127.14	0.0271	0.02032	0.01016	18.824	3.675	339.573	490	T.Sblh	1.7652	0.00488	0.0049	717.284	20	314.29	2.3	3	942.857	59.160	173.644	OK																	
	M Lap	64.21	80.26	0.0271	0.02032	0.01016	18.824	3.675	269.793	490	T.Sblh	1.1142	0.00308	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	
	M Tump-	-119.74	149.68	0.0271	0.02032	0.01016	18.824	3.675	368.441	490	T.Sblh	2.078	0.00574	0.0057	844.425	20	314.29	2.7	3	942.857	59.160	173.644	OK																	
B371	M Tump-	5.68	7.10	0.0271	0.02032	0.01016	18.824	3.675	80.2445	490	T.Sblh	0.0986	0.00027	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	
	M Lap	-7.77	9.71	0.0271	0.02032	0.01016	18.824	3.675	93.8605	490	T.Sblh	0.1349	0.00037	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	
	M Tump-	-88.73	110.92	0.0271	0.02032	0.01016	18.824	3.675	317.167	490	T.Sblh	1.5399	0.00426	0.0043	625.749	20	314.29	2.0	2	628.571	39.440	118.242	OK																	
	M Tump-	-0.79	0.99	0.0271	0.02032	0.01016	18.824	3.675	29.9001	490	T.Sblh	0.0137	3.8E-05	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	
B172	M Lap	35.25	44.06	0.0271	0.02032	0.01016	18.824	3.675	199.893	490	T.Sblh	0.6117	0.00169	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	
	M Tump-	3.77	4.71	0.0271	0.02032	0.01016	18.824	3.675	65.3679	490	T.Sblh	0.0654	0.00018	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK																	

Tabel Penulangan Lentur Balok Portal As X13 &35

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm $f'c$ = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	[1]	[2]	[3]	Mu/0,8 kNm	[4]	ρ_{min}	[5]	ρ	[6]	ρ_{maks}	[7]	P_{pakai}	[8]	m	[9]	Rn	d	[10]	d	[11]	d	[12]	Analisis	[13]	R _{pas}	Phono	P _{pakai}	A _{bersih}	ϕ	A _{1/2}	[19]	n	tul pakai	[21]	A _{sada} mm ²	[22]	a	[23]	Mn kNm	[24]	CEK	[25]
B736	M Tump-	-62.94	78.67	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	267.109	510	T.Sblh	1.008	0.00279	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Lap	80.97	101.21	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	302.964	510	T.Sblh	1.297	0.00359	0.0036	548.57	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-125.01	156.26	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	376.449	510	T.Sblh	2.003	0.00554	0.0055	846.961	20	314.29	2.7	3	942.857	59.160	181.187	OK																
	M Tump-	-123.11	153.89	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	373.589	510	T.Sblh	1.9722	0.00545	0.0055	834.14	20	314.29	2.7	3	942.857	59.160	181.187	OK																
B735	M Lap	62.72	78.41	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	266.566	510	T.Sblh	1.0048	0.00278	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-101.31	126.64	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	338.897	510	T.Sblh	1.6229	0.00449	0.0045	686.415	20	314.29	2.2	3	942.857	59.160	181.187	OK																
	M Tump-	-90.17	112.71	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	319.721	510	T.Sblh	1.4445	0.00399	0.004	610.935	20	314.29	1.9	2	628.571	39.440	123.270	OK																
	M Lap	-4.69	5.86	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	72.9014	510	T.Sblh	0.0751	0.00021	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
B734	M Tump-	6.57	8.21	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	86.2994	510	T.Sblh	0.1052	0.00029	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-63.00	78.75	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	267.243	510	T.Sblh	1.0092	0.00279	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Lap	78.20	97.75	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	297.742	510	T.Sblh	1.2527	0.00346	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-130.48	163.10	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	384.598	510	T.Sblh	2.0902	0.00578	0.0058	884.028	20	314.29	2.8	3	942.857	59.160	181.187	OK																
B380	M Tump-	-133.57	166.96	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	389.128	510	T.Sblh	2.1397	0.00591	0.0059	904.975	20	314.29	2.9	3	942.857	59.160	181.187	OK																
	M Lap	70.23	87.79	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	282.162	510	T.Sblh	1.125	0.00311	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-75.85	94.81	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	293.23	510	T.Sblh	1.215	0.00336	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-70.36	87.95	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	282.429	510	T.Sblh	1.1272	0.00312	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
B177	M Lap	85.06	106.32	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	310.529	510	T.Sblh	1.3626	0.00377	0.0038	576.309	20	314.29	1.8	2	628.571	39.440	123.270	OK																
	M Tump-	-109.39	136.74	0.0035	0.0271	0.02032	0.01016	0.02032	0.01016	18.824	3.675	352.154	510	T.Sblh	1.7524	0.00484	0.0048	741.168	20	314.29	2.4	3	942.857	59.160	181.187	OK																

Tabel Penulangan Lentur Balok Portal As X15 & 33

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm f_c = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	[1]	[2]	Mu kNm	[3]	Mu/0,8 kNm	ρ_{min}	[5]	ρ_b	[6]	ρ_{maks}	[7]	ρ_{pakai}	[8]	m	Rn	d _{pakai}	[11]	d _{perlu}	[12]	Analisis	[13]	R _{ngata}	P _{pasai}	[15]	P _{pasai}	A _{sperlu}	[17]	ϕ	A _g	[19]	n	tul pakai	[21]	A _{sada} mm ²	a	[23]	Mn kNm	[24]	CEK	[25]
B744	M Tump-	-62.94	78.67	0.0035	0.0271	0.02032	0.01016	18.824	3.675	267.109	510	T. Sblh	1.008	0.00279	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Lap	80.97	101.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	302.964	510	T. Sblh	1.297	0.00359	0.0036	548.57	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-125.01	156.26	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.449	510	T. Sblh	2.003	0.00554	0.0055	846.961	20	314.29	2.7	3	942.857	59.160	181.187	OK																
B743	M Tump-	-123.11	153.89	0.0035	0.0271	0.02032	0.01016	18.824	3.675	373.589	510	T. Sblh	1.9722	0.00545	0.0055	834.14	20	314.29	2.7	3	942.857	59.160	181.187	OK																
	M Lap	62.72	78.41	0.0035	0.0271	0.02032	0.01016	18.824	3.675	266.66	510	T. Sblh	1.0048	0.00278	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-101.31	126.64	0.0035	0.0271	0.02032	0.01016	18.824	3.675	338.897	510	T. Sblh	1.6229	0.00449	0.0045	686.415	20	314.29	2.2	3	942.857	59.160	181.187	OK																
B742	M Tump-	-90.17	112.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	319.721	510	T. Sblh	1.4445	0.00399	0.004	610.935	20	314.29	1.9	2	628.571	39.440	123.270	OK																
	M Lap	-4.69	5.86	0.0035	0.0271	0.02032	0.01016	18.824	3.675	72.9014	510	T. Sblh	0.0751	0.00021	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	6.57	8.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	86.2994	510	T. Sblh	0.1052	0.00029	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
B384	M Tump-	-63.00	78.75	0.0035	0.0271	0.02032	0.01016	18.824	3.675	267.243	510	T. Sblh	1.0092	0.00279	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Lap	78.20	97.75	0.0035	0.0271	0.02032	0.01016	18.824	3.675	297.742	510	T. Sblh	1.2527	0.00346	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-130.48	163.10	0.0035	0.0271	0.02032	0.01016	18.824	3.675	384.598	510	T. Sblh	2.0902	0.00578	0.0058	884.028	20	314.29	2.8	3	942.857	59.160	181.187	OK																
B383	M Tump-	-133.57	166.96	0.0035	0.0271	0.02032	0.01016	18.824	3.675	389.128	510	T. Sblh	2.1397	0.00591	0.0059	904.975	20	314.29	2.9	3	942.857	59.160	181.187	OK																
	M Lap	70.23	87.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	282.162	510	T. Sblh	1.125	0.00311	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Tump-	-75.85	94.81	0.0035	0.0271	0.02032	0.01016	18.824	3.675	293.23	510	T. Sblh	1.215	0.00336	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
B179	M Tump-	-70.36	87.95	0.0035	0.0271	0.02032	0.01016	18.824	3.675	282.429	510	T. Sblh	1.1272	0.00312	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																
	M Lap	83.06	106.32	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.529	510	T. Sblh	1.3626	0.00377	0.0038	576.309	20	314.29	1.8	2	628.571	39.440	123.270	OK																
	M Tump-	-109.39	136.74	0.0035	0.0271	0.02032	0.01016	18.824	3.675	332.154	510	T. Sblh	1.7324	0.00484	0.0048	741.168	20	314.29	2.4	3	942.857	59.160	181.187	OK																

Tabel Penulangan Lentur Balok Portal As X17 & 31

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm $f'c$ = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	[1]	[2]	Mu kNm	[3]	Mu/0,8 kNm	P_{min}	[5]	P_b	[6]	ρ_{maks}	[7]	P_{pakai}	[8]	m mm	R_n	[10]	d pakai	[11]	d tul	[12]	Analisis	[13]	R_{nada}	[14]	P_{pasai}	[15]	P_{pasai}	A_{sperlu} mm ²	[17]	ϕ	A_{j0} mm	[19]	n	tul pakai	[21]	A_{sada} mm ²	[22]	a mm	[23]	Mn kNm	[24]	CEK	[25]
B752	M Tump-	-62.94	78.67	0.0035	0.0271	0.02032	0.01016	18.824	3.675	267.109	510	T. Sblh	1.008	0.00279	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
	M Lap	80.97	101.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	302.964	510	T. Sblh	1.297	0.00359	0.0036	548.57	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
	M Tump-	-125.01	156.26	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.449	510	T. Sblh	2.003	0.00554	0.0055	846.961	20	314.29	2.7	3	942.857	59.160	181.187	OK																			
	M Tump-	-123.11	153.89	0.0035	0.0271	0.02032	0.01016	18.824	3.675	373.589	510	T. Sblh	1.9722	0.00545	0.0055	834.14	20	314.29	2.7	3	942.857	59.160	181.187	OK																			
B751	M Lap	62.72	78.41	0.0035	0.0271	0.02032	0.01016	18.824	3.675	266.66	510	T. Sblh	1.0048	0.00278	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
	M Tump-	-101.31	126.64	0.0035	0.0271	0.02032	0.01016	18.824	3.675	338.897	510	T. Sblh	1.6229	0.00449	0.0045	686.415	20	314.29	2.2	3	942.857	59.160	181.187	OK																			
	M Tump-	-90.17	112.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	319.721	510	T. Sblh	1.4445	0.00399	0.004	610.935	20	314.29	1.9	2	628.571	39.440	123.270	OK																			
	M Lap	-4.69	5.86	0.0035	0.0271	0.02032	0.01016	18.824	3.675	72.9014	510	T. Sblh	0.0751	0.00021	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
B750	M Tump-	6.57	8.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	86.2994	510	T. Sblh	0.1052	0.00029	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
	M Tump-	-63.00	78.75	0.0035	0.0271	0.02032	0.01016	18.824	3.675	267.243	510	T. Sblh	1.0092	0.00279	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
	M Lap	78.20	97.75	0.0035	0.0271	0.02032	0.01016	18.824	3.675	297.742	510	T. Sblh	1.2527	0.00346	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
	M Tump-	-130.48	163.10	0.0035	0.0271	0.02032	0.01016	18.824	3.675	384.598	510	T. Sblh	2.0902	0.00578	0.0058	884.028	20	314.29	2.8	3	942.857	59.160	181.187	OK																			
B388	M Tump-	-133.57	166.96	0.0035	0.0271	0.02032	0.01016	18.824	3.675	389.128	510	T. Sblh	2.1397	0.00591	0.0059	904.975	20	314.29	2.9	3	942.857	59.160	181.187	OK																			
	M Lap	70.23	87.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	282.162	510	T. Sblh	1.125	0.00311	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
	M Tump-	-75.85	94.81	0.0035	0.0271	0.02032	0.01016	18.824	3.675	293.23	510	T. Sblh	1.215	0.00336	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
	M Tump-	-70.36	87.95	0.0035	0.0271	0.02032	0.01016	18.824	3.675	282.429	510	T. Sblh	1.1272	0.00312	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																			
B3181	M Lap	83.06	106.32	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.529	510	T. Sblh	1.3626	0.00377	0.0038	576.309	20	314.29	1.8	2	628.571	39.440	123.270	OK																			
	M Tump-	-109.39	136.74	0.0035	0.0271	0.02032	0.01016	18.824	3.675	352.154	510	T. Sblh	1.7524	0.00484	0.0048	741.168	20	314.29	2.4	3	942.857	59.160	181.187	OK																			

Tabel Penulangan Lentur Balok Portal As X19 & 29

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm f'_c = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	[1]	Mu kNm	[3]	Mu/0,8 kNm	[4]	ρ_{min}	[5]	ρ_b	[6]	ρ_{maks}	[7]	Prabai	[8]	m	[9]	Rn	[10]	d pasif	[11]	d pasif	[12]	Analisis	[13]	Rnada	[14]	Pkuat	[15]	Pkuat	[16]	A _s perlu	[17]	ϕ	A ₁₀	[19]	n	tul pakai	[21]	A _s ada	mm ²	[22]	a	mm	[23]	Mn	kNm	[24]	CEK	[25]
B759	M Tump-	-83.64	-83.64	104.56	0.0035	0.0271	0.02032	0.01016	18.824	3.675	307.935	510	T. Sblh	1.340	0.0037	0.0037	566.721	20	314.29	1.8	2	628.571	39.440	123.270	OK																							
	M Lap	-4.00	-4.00	5.00	0.0035	0.0271	0.02032	0.01016	18.824	3.675	67.3246	510	T. Sblh	0.064	0.00018	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
	M Tump-	1.42	1.42	1.78	0.0035	0.0271	0.02032	0.01016	18.824	3.675	40.1712	510	T. Sblh	0.023	6.3E-05	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
B760	M Tump-	-102.70	-102.70	128.37	0.0035	0.0271	0.02032	0.01016	18.824	3.675	341.213	510	T. Sblh	1.6452	0.00455	0.0045	695.828	20	314.29	2.2	3	942.857	59.160	181.187	OK																							
	M Lap	75.01	75.01	93.76	0.0035	0.0271	0.02032	0.01016	18.824	3.675	291.604	510	T. Sblh	1.2016	0.00332	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
	M Tump-	-97.16	-97.16	121.45	0.0035	0.0271	0.02032	0.01016	18.824	3.675	331.878	510	T. Sblh	1.5564	0.0043	0.0043	658.275	20	314.29	2.1	3	942.857	59.160	181.187	OK																							
B761	M Tump-	5.89	5.89	7.36	0.0035	0.0271	0.02032	0.01016	18.824	3.675	81.6838	510	T. Sblh	0.0943	0.00026	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
	M Lap	-7.56	-7.56	9.45	0.0035	0.0271	0.02032	0.01016	18.824	3.675	92.5941	510	T. Sblh	0.1212	0.00033	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
	M Tump-	-88.52	-88.52	110.65	0.0035	0.0271	0.02032	0.01016	18.824	3.675	316.789	510	T. Sblh	1.4181	0.00392	0.0039	599.78	20	314.29	1.9	2	628.571	39.440	123.270	OK																							
	M Tump-	-101.72	-101.72	127.14	0.0035	0.0271	0.02032	0.01016	18.824	3.675	339.573	510	T. Sblh	1.6294	0.0045	0.0045	689.155	20	314.29	2.2	3	942.857	59.160	181.187	OK																							
B392	M Lap	64.21	64.21	80.26	0.0035	0.0271	0.02032	0.01016	18.824	3.675	269.793	510	T. Sblh	1.0286	0.00284	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
	M Tump-	-119.74	-119.74	149.68	0.0035	0.0271	0.02032	0.01016	18.824	3.675	368.441	510	T. Sblh	1.9182	0.0053	0.0053	811.311	20	314.29	2.6	3	942.857	59.160	181.187	OK																							
	M Tump-	5.68	5.68	7.10	0.0035	0.0271	0.02032	0.01016	18.824	3.675	80.2445	510	T. Sblh	0.091	0.00025	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
B393	M Lap	-7.77	-7.77	9.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	93.8605	510	T. Sblh	0.1245	0.00034	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
	M Tump-	-88.73	-88.73	110.92	0.0035	0.0271	0.02032	0.01016	18.824	3.675	317.167	510	T. Sblh	1.4215	0.00393	0.0039	601.21	20	314.29	1.9	2	628.571	39.440	123.270	OK																							
	M Tump-	-0.79	-0.79	0.99	0.0035	0.0271	0.02032	0.01016	18.824	3.675	29.9001	510	T. Sblh	0.0126	3.5E-05	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
B184	M Lap	35.25	35.25	44.06	0.0035	0.0271	0.02032	0.01016	18.824	3.675	199.893	510	T. Sblh	0.5646	0.00156	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							
	M Tump-	3.77	3.77	4.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	65.3679	510	T. Sblh	0.0604	0.00017	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK																							

Tabel Penulangan Lentur Balok Portal As X21 & 27

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm $f'c$ = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	[2]	Mu kNm	Mu/0,8 kNm	ρ_{min}	ρ_b	ρ_{maks}	Ppaku	m	Rtn	d paku	[11]	d paku	Analisis	Rnada	Ppaku	Asperlu	ϕ	A_{10}	n	tul pakai	Asada mm ²	a	Mn kNm	CEK	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
B770	M Tump-	-70,58	88,23	0,0035	0,0271	0,02032	0,01016	18,824	3,675	282,876	510	T. Sblh	1,131	0,00313	0,0035	535,5	20	314,29	1,7	2	628,571	39,440	123,270	OK	
	M Lap	81,55	101,94	0,0035	0,0271	0,02032	0,01016	18,824	3,675	304,057	510	T. Sblh	1,306	0,00361	0,0036	552,536	20	314,29	1,8	2	628,571	39,440	123,270	OK	
	M Tump-	-116,19	145,23	0,0035	0,0271	0,02032	0,01016	18,824	3,675	362,926	510	T. Sblh	1,861	0,00515	0,0051	787,204	20	314,29	2,5	3	942,857	59,160	181,187	OK	
	M Tump-	-118,12	147,66	0,0035	0,0271	0,02032	0,01016	18,824	3,675	365,94	510	T. Sblh	1,8923	0,00523	0,0052	800,335	20	314,29	2,5	3	942,857	59,160	181,187	OK	
B769	M Lap	66,44	83,05	0,0035	0,0271	0,02032	0,01016	18,824	3,675	274,449	510	T. Sblh	1,0644	0,00294	0,0035	535,5	20	314,29	1,7	2	628,571	39,440	123,270	OK	
	M Tump-	-98,86	123,58	0,0035	0,0271	0,02032	0,01016	18,824	3,675	334,78	510	T. Sblh	1,5838	0,00438	0,0044	669,839	20	314,29	2,1	3	942,857	59,160	181,187	OK	
	M Tump-	-89,35	111,69	0,0035	0,0271	0,02032	0,01016	18,824	3,675	318,263	510	T. Sblh	1,4313	0,00396	0,004	605,374	20	314,29	1,9	2	628,571	39,440	123,270	OK	
	M Lap	-5,65	7,06	0,0035	0,0271	0,02032	0,01016	18,824	3,675	79,9993	510	T. Sblh	0,0904	0,00025	0,0035	535,5	20	314,29	1,7	2	628,571	39,440	123,270	OK	
B398	M Tump-	3,83	4,79	0,0035	0,0271	0,02032	0,01016	18,824	3,675	65,9284	510	T. Sblh	0,0614	0,00017	0,0035	535,5	20	314,29	1,7	2	628,571	39,440	123,270	OK	
	M Tump-	-69,70	87,13	0,0035	0,0271	0,02032	0,01016	18,824	3,675	281,099	510	T. Sblh	1,1166	0,00309	0,0035	535,5	20	314,29	1,7	2	628,571	39,440	123,270	OK	
	M Lap	77,73	97,16	0,0035	0,0271	0,02032	0,01016	18,824	3,675	296,842	510	T. Sblh	1,2451	0,00344	0,0035	535,5	20	314,29	1,7	2	628,571	39,440	123,270	OK	
	M Tump-	-124,72	155,90	0,0035	0,0271	0,02032	0,01016	18,824	3,675	376,015	510	T. Sblh	1,9979	0,00552	0,0055	845,01	20	314,29	2,7	3	942,857	59,160	181,187	OK	
B397	M Tump-	-129,84	162,31	0,0035	0,0271	0,02032	0,01016	18,824	3,675	383,665	510	T. Sblh	2,08	0,00575	0,0057	879,744	20	314,29	2,8	3	942,857	59,160	181,187	OK	
	M Lap	65,50	81,87	0,0035	0,0271	0,02032	0,01016	18,824	3,675	272,487	510	T. Sblh	1,0492	0,0029	0,0035	535,5	20	314,29	1,7	2	628,571	39,440	123,270	OK	
	M Tump-	-89,04	111,30	0,0035	0,0271	0,02032	0,01016	18,824	3,675	317,707	510	T. Sblh	1,4263	0,00394	0,0039	603,261	20	314,29	1,9	2	628,571	39,440	123,270	OK	
	M Tump-	-91,70	114,63	0,0035	0,0271	0,02032	0,01016	18,824	3,675	322,424	510	T. Sblh	1,469	0,00406	0,0041	621,306	20	314,29	2,0	2	628,571	39,440	123,270	OK	
B187	M Tump-	94,82	118,53	0,0035	0,0271	0,02032	0,01016	18,824	3,675	327,868	510	T. Sblh	1,519	0,0042	0,0042	642,464	20	314,29	2,0	3	942,857	59,160	181,187	OK	
	M Lap	-68,52	85,66	0,0035	0,0271	0,02032	0,01016	18,824	3,675	278,716	510	T. Sblh	1,0977	0,00303	0,0035	535,5	20	314,29	1,7	2	628,571	39,440	123,270	OK	

Tabel Penulangan Lentur Balok Portal As X23 & 25

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 \emptyset Tul. Pokok = 20 mm $f'c$ = 25 Mpa
 \emptyset Tul. Sengk = 10 mm d' = 60 mm

Balok	[1]	[2]	[3]	Mu kNm	Mu/0,8 kNm	P_{min}	P_b	P_{maks}	P_{pakai}	m mm	R_n	d pakai mm	d pasai mm	Analisis	$R_{n,uds}$	P_{pakai}	$A_{s,perlu}$ mm ²	\emptyset mm	$A_{j,c}$ mm	n	tul pakai	$A_{s,kada}$ mm ²	a mm	Mn kNm	CEK
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
B778	M Tump-	-71.22	89.03	0.0035	0.0271	0.02032	0.01016	18.824	3.675	284.149	510	T. Sblh	1.141	0.00315	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK	
	M Lap	83.77	104.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	308.164	510	T. Sblh	1.342	0.00371	0.0037	567.566	20	314.29	1.8	2	628.571	39.440	123.270	OK	
	M Tump-	-111.11	138.89	0.0035	0.0271	0.02032	0.01016	18.824	3.675	354.913	510	T. Sblh	1.780	0.00492	0.0049	752.827	20	314.29	2.4	3	942.857	59.160	181.187	OK	
	M Tump-	-109.88	137.35	0.0035	0.0271	0.02032	0.01016	18.824	3.675	352.937	510	T. Sblh	1.7602	0.00487	0.0049	744.466	20	314.29	2.4	3	942.857	59.160	181.187	OK	
B777	M Lap	50.31	62.89	0.0035	0.0271	0.02032	0.01016	18.824	3.675	238.821	510	T. Sblh	0.806	0.00223	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK	
	M Tump-	-139.37	174.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	397.491	510	T. Sblh	2.2327	0.00617	0.0062	944.291	20	314.29	3.0	4	1257.14	78.880	236.625	OK	
	M Tump-	-156.43	195.54	0.0035	0.0271	0.02032	0.01016	18.824	3.675	421.115	510	T. Sblh	2.5059	0.00693	0.0069	1059.87	20	314.29	3.4	4	1257.14	78.880	236.625	OK	
	M Lap	109.14	136.42	0.0035	0.0271	0.02032	0.01016	18.824	3.675	351.748	510	T. Sblh	1.7484	0.00483	0.0048	739.459	20	314.29	2.4	3	942.857	59.160	181.187	OK	
B402	M Tump-	1.07	1.33	0.0035	0.0271	0.02032	0.01016	18.824	3.675	34.7492	510	T. Sblh	0.0171	4.7E-05	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK	
	M Tump-	-69.67	87.09	0.0035	0.0271	0.02032	0.01016	18.824	3.675	281.038	510	T. Sblh	1.1161	0.00309	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK	
	M Lap	78.17	97.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	297.686	510	T. Sblh	1.2522	0.00346	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK	
	M Tump-	-123.86	154.83	0.0035	0.0271	0.02032	0.01016	18.824	3.675	374.725	510	T. Sblh	1.9842	0.00549	0.0055	839.221	20	314.29	2.7	3	942.857	59.160	181.187	OK	
B401	M Tump-	-128.92	161.15	0.0035	0.0271	0.02032	0.01016	18.824	3.675	382.294	510	T. Sblh	2.0652	0.00571	0.0057	873.469	20	314.29	2.8	3	942.857	59.160	181.187	OK	
	M Lap	64.62	80.78	0.0035	0.0271	0.02032	0.01016	18.824	3.675	270.663	510	T. Sblh	1.0352	0.00286	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK	
	M Tump-	-91.71	114.64	0.0035	0.0271	0.02032	0.01016	18.824	3.675	322.442	510	T. Sblh	1.4692	0.00406	0.0041	621.377	20	314.29	2.0	2	628.571	39.440	123.270	OK	
	M Tump-	-90.68	113.35	0.0035	0.0271	0.02032	0.01016	18.824	3.675	320.626	510	T. Sblh	1.4527	0.00402	0.004	614.397	20	314.29	2.0	2	628.571	39.440	123.270	OK	
B189	M Lap	93.03	118.78	0.0035	0.0271	0.02032	0.01016	18.824	3.675	328.219	510	T. Sblh	1.5223	0.00421	0.0042	643.84	20	314.29	2.0	3	942.857	59.160	181.187	OK	
	M Tump-	-69.14	86.42	0.0035	0.0271	0.02032	0.01016	18.824	3.675	279.962	510	T. Sblh	1.1076	0.00306	0.0035	535.5	20	314.29	1.7	2	628.571	39.440	123.270	OK	

Tabel Penulangan Lentur Balok Portal As X23 & 25

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm f_c = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	Mu	Mu/0.8	ρ_{min}	ρ_b	ρ_{maks}	ρ_{pakai}	m	Rn	d penit	d pakai	Analisis	R _{nada}	P _{pasai}	A _{sperlu}	ϕ	A _{ic}	n	tul pakai	A _{sada}	a	Mn	CEK	
[1]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
M Tump-	75.13	93.92	0.0035	0.0271	0.02032	0.01016	18.824	3.675	291.848	490	T.Sblh	1.304	0.0036	529.832	20	314.29	1.7	2	628.571	39.440	118.242	OK	
M Lap	7.58	9.47	0.0035	0.0271	0.02032	0.01016	18.824	3.675	92.6801	490	T.Sblh	0.131	0.00036	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	-106.85	133.56	0.0035	0.0271	0.02032	0.01016	18.824	3.675	348.041	490	T.Sblh	1.854	0.00513	753.507	20	314.29	2.4	3	942.857	59.160	173.644	OK	
M Tump-	-110.55	138.19	0.0035	0.0271	0.02032	0.01016	18.824	3.675	354.011	490	T.Sblh	1.9184	0.0053	779.577	20	314.29	2.5	3	942.857	59.160	173.644	OK	
M Lap	18.85	23.56	0.0035	0.0271	0.02032	0.01016	18.824	3.675	146.181	490	T.Sblh	0.3271	0.0009	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	72.22	90.28	0.0035	0.0271	0.02032	0.01016	18.824	3.675	286.136	490	T.Sblh	1.2533	0.00346	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	73.67	92.09	0.0035	0.0271	0.02032	0.01016	18.824	3.675	288.992	490	T.Sblh	1.2785	0.00353	519.515	20	314.29	1.7	2	628.571	39.440	118.242	OK	
M Lap	5.72	7.15	0.0035	0.0271	0.02032	0.01016	18.824	3.675	80.5134	490	T.Sblh	0.0992	0.00027	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	-109.11	136.38	0.0035	0.0271	0.02032	0.01016	18.824	3.675	351.694	490	T.Sblh	1.8934	0.00523	769.405	20	314.29	2.4	3	942.857	59.160	173.644	OK	
M Tump-	-111.03	138.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	354.789	490	T.Sblh	1.9269	0.00533	783.005	20	314.29	2.5	3	942.857	59.160	173.644	OK	
M Lap	17.90	22.37	0.0035	0.0271	0.02032	0.01016	18.824	3.675	142.447	490	T.Sblh	0.3106	0.00086	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	70.81	88.51	0.0035	0.0271	0.02032	0.01016	18.824	3.675	283.319	490	T.Sblh	1.2288	0.0034	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	87.57	109.46	0.0035	0.0271	0.02032	0.01016	18.824	3.675	315.073	490	T.Sblh	1.5196	0.0042	617.516	20	314.29	2.0	2	628.571	39.440	118.242	OK	
M Lap	6.34	7.92	0.0035	0.0271	0.02032	0.01016	18.824	3.675	84.756	490	T.Sblh	0.11	0.0003	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Lap	-121.77	152.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	371.538	490	T.Sblh	2.1131	0.00584	858.683	20	314.29	2.7	3	942.857	59.160	173.644	OK	
M Lap	-117.07	146.34	0.0035	0.0271	0.02032	0.01016	18.824	3.675	364.306	490	T.Sblh	2.0316	0.00562	825.577	20	314.29	2.6	3	942.857	59.160	173.644	OK	
M Lap	23.62	29.53	0.0035	0.0271	0.02032	0.01016	18.824	3.675	163.64	490	T.Sblh	0.4099	0.00113	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	88.29	110.36	0.0035	0.0271	0.02032	0.01016	18.824	3.675	316.365	490	T.Sblh	1.5321	0.00424	622.591	20	314.29	2.0	2	628.571	39.440	118.242	OK	

Tabel Penulangan Lentur Balok Portal As X23 & 25

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm f_c = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	M _{tu} kNm	M _{tu} /0,8 kNm	ρ_{min}	ρ_b	ρ_{maks}	P _{prabal}	m	R _n	d _{pasir}	d _{pasir}	Analisis	R _{n,uda}	P _{prabu}	A _{stperbu}	ϕ	A _{l,0}	n	tul pakal	A _{s,ada} mm ²	a	Mn kNm	CEK		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
B714	M Tump- -114.60	143.25	0.0035	0.0271	0.02032	0.01016	18.824	3.675	360.444	490	T. Sblh	1.989	0.0055	808.166	20	314.29	2.6	3	942.857	59.160	173.644	OK		
	M Lap 61.06	76.33	0.0035	0.0271	0.02032	0.01016	18.824	3.675	263.107	490	T. Sblh	1.060	0.00293	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK		
	M Tump- -120.16	150.20	0.0035	0.0271	0.02032	0.01016	18.824	3.675	369.075	490	T. Sblh	2.085	0.00576	847.335	20	314.29	2.7	3	942.857	59.160	173.644	OK		
B713	M Tump- 94.28	117.84	0.0035	0.0271	0.02032	0.01016	18.824	3.675	326.918	490	T. Sblh	1.636	0.00452	664.82	20	314.29	2.1	3	942.857	59.160	173.644	OK		
	M Lap 14.33	17.91	0.0035	0.0271	0.02032	0.01016	18.824	3.675	127.46	490	T. Sblh	0.2487	0.00069	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK		
	M Lap -141.71	177.13	0.0035	0.0271	0.02032	0.01016	18.824	3.675	400.805	490	T. Sblh	2.4591	0.0068	999.291	20	314.29	3.2	4	1257.14	78.880	226.567	OK		
B712	M Tump- -78.00	97.50	0.0035	0.0271	0.02032	0.01016	18.824	3.675	297.366	490	T. Sblh	1.3536	0.00374	550.057	20	314.29	1.8	2	628.571	39.440	118.242	OK		
	M Lap 14.79	18.49	0.0035	0.0271	0.02032	0.01016	18.824	3.675	129.492	490	T. Sblh	0.2567	0.00071	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK		
	M Tump- 96.38	120.48	0.0035	0.0271	0.02032	0.01016	18.824	3.675	330.552	490	T. Sblh	1.6726	0.00462	679.681	20	314.29	2.2	3	942.857	59.160	173.644	OK		
	M Tump- -74.83	93.53	0.0035	0.0271	0.02032	0.01016	18.824	3.675	291.25	490	T. Sblh	1.2985	0.00359	527.662	20	314.29	1.7	2	628.571	39.440	118.242	OK		
B711	M Lap -35.08	43.85	0.0035	0.0271	0.02032	0.01016	18.824	3.675	199.41	490	T. Sblh	0.6087	0.00168	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK		
	M Tump- 0.13	0.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	11.953	490	T. Sblh	0.0022	6E-06	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK		
	M Tump- -95.75	119.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	329.47	490	T. Sblh	1.6617	0.00459	675.239	20	314.29	2.1	3	942.857	59.160	173.644	OK		
B367	M Lap 67.97	84.97	0.0035	0.0271	0.02032	0.01016	18.824	3.675	277.591	490	T. Sblh	1.1796	0.00326	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK		
	M Tump- -125.19	156.49	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.726	490	T. Sblh	2.1725	0.00601	882.831	20	314.29	2.8	3	942.857	59.160	173.644	OK		

Tabel Penulangan Lentur Balok Portal As X23 & 25

f_y deform = 400 Mpa $b = 300$ mm
 f_y polos = 240 Mpa $h = 550$ mm
 penutup beton = 40 Mpa $d = 490$ mm
 ϕ Tul. Pokok = 20 mm $f'c = 25$ Mpa
 ϕ Tul. Sengk = 10 mm $d' = 60$ mm

Balok	Mu	Mu/0.8	P_{min}	P_b	P_{maks}	P_{pakai}	ρ_t	Rt	d partu	d pakai	Analisis	R_{nada}	P_{pakai}	A_{spatu}	ϕ	A_{lap}	n	tul	A_{sada}	a	Mn	CEK		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
B725	M Tump-	75.28	94.10	0.0035	0.0271	0.02032	0.01016	18.824	3.675	292.127	490	T.Sblh	1.306	0.00361	0.0036	530.847	20	314.29	1.7	2	628.571	39.440	118.242	OK
	M Lap	6.97	8.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	88.8873	490	T.Sblh	0.121	0.00033	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Lap	-108.21	135.26	0.0035	0.0271	0.02032	0.01016	18.824	3.675	350.247	490	T.Sblh	1.878	0.00519	0.0052	763.089	20	314.29	2.4	3	942.857	59.160	173.644	OK
B724	M Lap	-108.94	136.17	0.0035	0.0271	0.02032	0.01016	18.824	3.675	351.419	490	T.Sblh	1.8905	0.00523	0.0052	768.204	20	314.29	2.4	3	942.857	59.160	173.644	OK
	M Lap	19.70	24.62	0.0035	0.0271	0.02032	0.01016	18.824	3.675	149.431	490	T.Sblh	0.3418	0.00094	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Tump-	72.30	90.38	0.0035	0.0271	0.02032	0.01016	18.824	3.675	286.299	490	T.Sblh	1.2547	0.00347	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
B374	M Tump-	72.85	91.07	0.0035	0.0271	0.02032	0.01016	18.824	3.675	287.386	490	T.Sblh	1.2643	0.00349	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Lap	5.62	7.02	0.0035	0.0271	0.02032	0.01016	18.824	3.675	79.7952	490	T.Sblh	0.0975	0.00027	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Lap	-108.49	135.62	0.0035	0.0271	0.02032	0.01016	18.824	3.675	350.704	490	T.Sblh	1.8828	0.0052	0.0052	765.08	20	314.29	2.4	3	942.857	59.160	173.644	OK
B373	M Lap	-113.47	141.84	0.0035	0.0271	0.02032	0.01016	18.824	3.675	358.665	490	T.Sblh	1.9692	0.00544	0.0054	800.211	20	314.29	2.5	3	942.857	59.160	173.644	OK
	M Lap	16.29	20.37	0.0035	0.0271	0.02032	0.01016	18.824	3.675	135.915	490	T.Sblh	0.2828	0.00078	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Tump-	70.04	87.55	0.0035	0.0271	0.02032	0.01016	18.824	3.675	281.778	490	T.Sblh	1.2154	0.00336	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
B174	M Tump-	92.11	115.14	0.0035	0.0271	0.02032	0.01016	18.824	3.675	55.7965	490	T.Sblh	1.5984	0.00442	0.0044	649.538	20	314.29	2.1	3	942.857	59.160	173.644	OK
	M Lap	2.75	3.43	0.0035	0.0271	0.02032	0.01016	18.824	3.675	389.011	490	T.Sblh	0.0477	0.00013	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Lap	-133.49	166.86	0.0035	0.0271	0.02032	0.01016	18.824	3.675	329.866	490	T.Sblh	1.6657	0.0046	0.0046	676.864	20	314.29	3.0	3	942.857	59.160	173.644	OK
B173	M Lap	-95.98	119.98	0.0035	0.0271	0.02032	0.01016	18.824	3.675	323.328	490	T.Sblh	0.6267	0.00173	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
	M Lap	36.11	45.14	0.0035	0.0271	0.02032	0.01016	18.824	3.675	202.328	490	T.Sblh	1.5996	0.00442	0.0044	650.024	20	314.29	2.1	3	942.857	59.160	173.644	OK
	M Tump-	92.18	115.22	0.0035	0.0271	0.02032	0.01016	18.824	3.675	323.26	490	T.Sblh	1.5996	0.00442	0.0044	650.024	20	314.29	2.1	3	942.857	59.160	173.644	OK
B127	M Tump-	-181.33	226.66	0.0035	0.0271	0.02032	0.01016	18.824	3.675	453.387	490	T.Sblh	3.1467	0.0087	0.0087	1278.68	20	314.29	4.1	5	1571.43	98.599	277.012	OK
	M Lap	125.38	156.72	0.0035	0.0271	0.02032	0.01016	18.824	3.675	377.008	490	T.Sblh	2.1758	0.00601	0.006	884.154	20	314.29	2.8	3	942.857	59.160	173.644	OK
	M Tump-	-156.19	195.24	0.0035	0.0271	0.02032	0.01016	18.824	3.675	420.793	490	T.Sblh	2.7105	0.00749	0.0075	1101.45	20	314.29	3.5	4	1257.14	78.880	226.567	OK

Tabel Penulangan Lentur Balok Portal As X23 & 25

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm $f'c$ = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	Mu	Mu/0.8	ρ_{min}	P_b	P_{pakai}	P_{pakai}	m	Rn	d pakai	d pakai	Analisis	R _{nda}	ρ_{nom}	Pakai	As _{perbu}	ϕ	A _{1c}	n	tul	A _{sada}	a	Mn	CEK	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
M Tump-	-109.70	137.13	0.0035	0.0271	0.02032	0.01016	18.824	3.675	352.652	490	T.Sblh	1.904	0.00526	0.0053	773.605	20	314.29	2.5	3	942.857	59.160	173.644	OK	
M Lap	65.37	81.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	272.228	490	T.Sblh	1.134	0.00314	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	-116.44	145.56	0.0035	0.0271	0.02032	0.01016	18.824	3.675	363.328	490	T.Sblh	2.021	0.00559	0.0056	821.15	20	314.29	2.6	3	942.857	59.160	173.644	OK	
M Lap	-112.69	140.87	0.0035	0.0271	0.02032	0.01016	18.824	3.675	357.43	490	T.Sblh	1.9557	0.00541	0.0054	794.706	20	314.29	2.5	3	942.857	59.160	173.644	OK	
M Tump-	61.08	76.35	0.0035	0.0271	0.02032	0.01016	18.824	3.675	263.148	490	T.Sblh	1.06	0.00293	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Lap	-122.03	152.54	0.0035	0.0271	0.02032	0.01016	18.824	3.675	371.937	490	T.Sblh	2.1177	0.00585	0.0059	860.529	20	314.29	2.7	3	942.857	59.160	173.644	OK	
M Tump-	93.85	117.32	0.0035	0.0271	0.02032	0.01016	18.824	3.675	326.187	490	T.Sblh	1.6287	0.0045	0.0045	661.851	20	314.29	2.1	3	942.857	59.160	173.644	OK	
M Lap	11.76	14.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	115.487	490	T.Sblh	0.2042	0.00056	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Lap	-146.42	183.02	0.0035	0.0271	0.02032	0.01016	18.824	3.675	407.413	490	T.Sblh	2.5409	0.00702	0.007	1032.51	20	314.29	3.3	4	1257.14	78.880	226.567	OK	
M Lap	-70.10	87.62	0.0035	0.0271	0.02032	0.01016	18.824	3.675	281.898	490	T.Sblh	1.2165	0.00336	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Lap	21.01	26.27	0.0035	0.0271	0.02032	0.01016	18.824	3.675	154.345	490	T.Sblh	0.3647	0.00101	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	100.92	126.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	338.25	490	T.Sblh	1.7514	0.00484	0.0048	711.707	20	314.29	2.3	3	942.857	59.160	173.644	OK	
M Tump-	-80.49	100.61	0.0035	0.0271	0.02032	0.01016	18.824	3.675	302.075	490	T.Sblh	1.3968	0.00386	0.0039	567.616	20	314.29	1.8	2	628.571	39.440	118.242	OK	
M Lap	-37.91	47.39	0.0035	0.0271	0.02032	0.01016	18.824	3.675	207.314	490	T.Sblh	0.6579	0.00182	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Lap	0.12	0.15	0.0035	0.0271	0.02032	0.01016	18.824	3.675	11.6705	490	T.Sblh	0.0021	5.8E-06	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	-111.11	138.88	0.0035	0.0271	0.02032	0.01016	18.824	3.675	354.905	490	T.Sblh	1.9282	0.00533	0.0053	783.52	20	314.29	2.5	3	942.857	59.160	173.644	OK	
M Lap	63.97	79.96	0.0035	0.0271	0.02032	0.01016	18.824	3.675	269.287	490	T.Sblh	1.1101	0.00307	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	-117.85	147.31	0.0035	0.0271	0.02032	0.01016	18.824	3.675	365.511	490	T.Sblh	2.0451	0.00565	0.0057	831.049	20	314.29	2.6	3	942.857	59.160	173.644	OK	
M Tump-	-100.62	125.77	0.0035	0.0271	0.02032	0.01016	18.824	3.675	337.737	490	T.Sblh	1.7461	0.00483	0.0048	709.551	20	314.29	2.3	3	942.857	59.160	173.644	OK	
M Lap	66.42	83.02	0.0035	0.0271	0.02032	0.01016	18.824	3.675	274.394	490	T.Sblh	1.1526	0.00319	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	-123.44	154.30	0.0035	0.0271	0.02032	0.01016	18.824	3.675	374.081	490	T.Sblh	2.1421	0.00592	0.0059	870.475	20	314.29	2.8	3	942.857	59.160	173.644	OK	
M Tump-	-103.06	128.83	0.0035	0.0271	0.02032	0.01016	18.824	3.675	341.817	490	T.Sblh	1.7886	0.00494	0.0049	726.796	20	314.29	2.3	3	942.857	59.160	173.644	OK	
M Lap	67.19	83.98	0.0035	0.0271	0.02032	0.01016	18.824	3.675	275.982	490	T.Sblh	1.1659	0.00322	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK	
M Tump-	-119.45	149.31	0.0035	0.0271	0.02032	0.01016	18.824	3.675	367.989	490	T.Sblh	2.0729	0.00573	0.0057	842.356	20	314.29	2.7	3	942.857	59.160	173.644	OK	

Tabel Penulangan Lentur Balok Portal As X23 & 25

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm $f'c$ = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	Mu	Mu/0.8	ρ_{min}	ρ_b	ρ_{maks}	ρ_{pakai}	m	Rn	d_paku	d_paku	Analisis	Rn_ada	ρ_{pakai}	A_{sperlu}	ϕ	$A_{s,e}$	a	Mn	CEK				
[1]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
M Tump-	-109.70	137.13	0.0035	0.0271	0.02032	0.01016	18.824	3.675	352.652	490	T.Sblh	1.904	0.00526	0.0053	773.605	20	314.29	2.5	3	942.857	59.160	173.644	OK
M Lap	65.37	81.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	272.228	490	T.Sblh	1.134	0.00314	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	-116.44	145.56	0.0035	0.0271	0.02032	0.01016	18.824	3.675	363.328	490	T.Sblh	2.021	0.00559	0.0056	821.15	20	314.29	2.6	3	942.857	59.160	173.644	OK
M Tump-	-112.69	140.87	0.0035	0.0271	0.02032	0.01016	18.824	3.675	357.43	490	T.Sblh	1.9557	0.00541	0.0054	794.706	20	314.29	2.5	3	942.857	59.160	173.644	OK
M Lap	61.08	76.35	0.0035	0.0271	0.02032	0.01016	18.824	3.675	263.148	490	T.Sblh	1.06	0.00293	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	-122.03	152.54	0.0035	0.0271	0.02032	0.01016	18.824	3.675	371.937	490	T.Sblh	2.1177	0.00585	0.0059	860.529	20	314.29	2.7	3	942.857	59.160	173.644	OK
M Tump-	93.85	117.32	0.0035	0.0271	0.02032	0.01016	18.824	3.675	326.187	490	T.Sblh	1.6287	0.0045	0.0045	661.851	20	314.29	2.1	3	942.857	59.160	173.644	OK
M Lap	11.76	14.71	0.0035	0.0271	0.02032	0.01016	18.824	3.675	115.487	490	T.Sblh	0.2042	0.00056	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Lap	-146.42	183.02	0.0035	0.0271	0.02032	0.01016	18.824	3.675	407.413	490	T.Sblh	2.5409	0.00702	0.007	1032.51	20	314.29	3.3	4	1257.14	78.880	226.567	OK
M Lap	-70.10	87.62	0.0035	0.0271	0.02032	0.01016	18.824	3.675	281.898	490	T.Sblh	1.2165	0.00336	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Lap	21.01	26.27	0.0035	0.0271	0.02032	0.01016	18.824	3.675	154.345	490	T.Sblh	0.3647	0.00101	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	100.92	126.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	338.25	490	T.Sblh	1.7514	0.00484	0.0048	711.707	20	314.29	2.3	3	942.857	59.160	173.644	OK
M Tump-	-80.49	100.61	0.0035	0.0271	0.02032	0.01016	18.824	3.675	302.075	490	T.Sblh	1.3968	0.00386	0.0039	567.616	20	314.29	1.8	2	628.571	39.440	118.242	OK
M Lap	-37.91	47.39	0.0035	0.0271	0.02032	0.01016	18.824	3.675	207.314	490	T.Sblh	0.6579	0.00182	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Lap	0.12	0.15	0.0035	0.0271	0.02032	0.01016	18.824	3.675	11.6705	490	T.Sblh	0.0021	5.8E-06	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	-111.11	138.88	0.0035	0.0271	0.02032	0.01016	18.824	3.675	354.905	490	T.Sblh	1.9282	0.00533	0.0053	783.52	20	314.29	2.5	3	942.857	59.160	173.644	OK
M Lap	63.97	79.96	0.0035	0.0271	0.02032	0.01016	18.824	3.675	269.287	490	T.Sblh	1.1101	0.00307	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	-117.85	147.31	0.0035	0.0271	0.02032	0.01016	18.824	3.675	365.511	490	T.Sblh	2.0451	0.00565	0.0057	831.049	20	314.29	2.6	3	942.857	59.160	173.644	OK
M Tump-	-100.62	125.77	0.0035	0.0271	0.02032	0.01016	18.824	3.675	337.737	490	T.Sblh	1.7461	0.00483	0.0048	709.551	20	314.29	2.3	3	942.857	59.160	173.644	OK
M Lap	66.42	83.02	0.0035	0.0271	0.02032	0.01016	18.824	3.675	274.394	490	T.Sblh	1.1526	0.00319	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	-123.44	154.30	0.0035	0.0271	0.02032	0.01016	18.824	3.675	374.081	490	T.Sblh	2.1421	0.00592	0.0059	870.475	20	314.29	2.8	3	942.857	59.160	173.644	OK
M Tump-	-103.06	128.83	0.0035	0.0271	0.02032	0.01016	18.824	3.675	341.817	490	T.Sblh	1.7886	0.00494	0.0049	726.796	20	314.29	2.3	3	942.857	59.160	173.644	OK
M Lap	67.19	83.98	0.0035	0.0271	0.02032	0.01016	18.824	3.675	275.982	490	T.Sblh	1.1659	0.00322	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	-119.45	149.31	0.0035	0.0271	0.02032	0.01016	18.824	3.675	367.989	490	T.Sblh	2.0729	0.00573	0.0057	842.356	20	314.29	2.7	3	942.857	59.160	173.644	OK

Tabel Penulangan Lentur Balok Portal As X23 & 25

f_y deform = 400 Mpa b = 300 mm
 f_y polos = 240 Mpa h = 550 mm
 penutup beton = 40 Mpa d = 490 mm
 ϕ Tul. Pokok = 20 mm $f'c$ = 25 Mpa
 ϕ Tul. Sengk = 10 mm d' = 60 mm

Balok	Mu	Mu/0,8	ρ_{min}	ρ_b	ρ_{paksa}	ρ_{paksa}	P_{paksa}	m	Rn	d _{pasir}	d _{pasir}	Analisis	R _{n,ada}	ρ_{paksa}	P_{paksa}	A _{s,perlu}	ϕ	A _{1,0}	n	tul	A _{s,ada}	a	Mn	CEK
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
M Tump-	-110.38	137.97	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	353.736	490	T.Sblh	1.915	0.0053	0.0053	778.367	20	314.29	2.5	3	942.857	59.160	173.644	OK
M Lap	61.77	77.21	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	264.614	490	T.Sblh	1.072	0.00296	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Lap	-122.98	153.72	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	373.385	490	T.Sblh	2.134	0.0059	0.0059	867.24	20	314.29	2.8	3	942.857	59.160	173.644	OK
M Tump-	100.78	125.98	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	338.009	490	T.Sblh	1.7489	0.00483	0.0048	710.692	20	314.29	2.3	3	942.857	59.160	173.644	OK
M Lap	9.94	12.42	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	106.129	490	T.Sblh	0.1724	0.00048	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Lap	-157.00	196.25	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	421.882	490	T.Sblh	2.7246	0.00753	0.0075	1107.15	20	314.29	3.5	4	1257.14	78.880	226.567	OK
M Lap	-65.49	81.86	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	272.478	490	T.Sblh	1.1365	0.00314	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Lap	24.46	30.57	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	166.509	490	T.Sblh	0.4244	0.00117	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	103.20	129.00	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	342.048	490	T.Sblh	1.791	0.00495	0.005	727.779	20	314.29	2.3	3	942.857	59.160	173.644	OK
M Tump-	-76.64	95.80	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	294.765	490	T.Sblh	1.3301	0.00368	0.0037	540.478	20	314.29	1.7	2	628.571	39.440	118.242	OK
M Lap	-36.08	45.10	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	202.253	490	T.Sblh	0.6262	0.00173	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	-0.07	0.09	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	8.95755	490	T.Sblh	0.0012	3.4E-06	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	-118.59	148.24	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	366.663	490	T.Sblh	2.058	0.00569	0.0057	836.297	20	314.29	2.7	3	942.857	59.160	173.644	OK
M Lap	63.43	79.29	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	268.158	490	T.Sblh	1.1008	0.00304	0.0035	514.5	20	314.29	1.6	2	628.571	39.440	118.242	OK
M Tump-	-111.43	139.29	0.0035	0.0271	0.02032	0.01016	0.01016	18.824	3.675	355.426	490	T.Sblh	1.9338	0.00535	0.0053	785.821	20	314.29	2.5	3	942.857	59.160	173.644	OK

Penulangan Balok Portal As A - 23 dan As A - 25

Balok	[2]	Mu kNm	Mu/0,8 kNm	P _{min}	P _b	P _{maks}	P _{pakan}	m mm	R _n	d _{perlu}	d _{pakai}	Analisis	R _{n_{pada}}	P _{baru}	P _{pakan}	A _{s_{perlu}}	O mm	A ₁₀	n	tul pakai	A _{s_{pada}} mm ²	a mm	Mn kNm	CJK	Ket
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]
B166	Tum Ki -	165.69	207.11	0.0035	0.0271	0.0203	0.010	18.824	3.675	375.337	439	T.Sblh	2.687	0.00743	0.00743	1304.18	22	380.29	3.4	4	1521.14	71.583	245.335	OK	
	Lap +	163.50	204.37	0.0035	0.0271	0.0203	0.010	18.824	3.675	372.842	439	T.Sblh	2.651	0.00733	0.00733	1286.9	22	380.29	3.4	4	1521.14	71.583	245.335	OK	
	Tum Ka -	95.59	119.49	0.0035	0.0271	0.0203	0.010	18.824	3.675	285.085	439	T.Sblh	1.550	0.00428	0.00428	752.391	22	380.29	2.0	2	760.571	35.792	128.112	OK	
B165	Tum Ki -	176.69	220.86	0.0035	0.0271	0.0203	0.010	18.824	3.675	387.59	439	T.Sblh	2.865	0.00792	0.00792	1390.72	22	380.29	3.7	4	1521.14	71.583	245.335	OK	
	Lap +	91.76	114.70	0.0035	0.0271	0.0203	0.010	18.824	3.675	279.318	439	T.Sblh	1.488	0.00411	0.00411	722.262	22	380.29	1.9	2	760.571	35.792	128.112	OK	
	Tum Ka -	228.06	285.08	0.0035	0.0271	0.0203	0.010	18.824	3.675	440.352	439	T.rangka	3.698	0.01022	0.01022	1795.13	22	380.29	4.7	5	1901.43	89.479	299.863	OK	
B164	Tum Ki -	53.76	67.20	0.0035	0.0271	0.0203	0.010	18.824	3.675	213.793	439	T.Sblh	0.872	0.00241	0.00241	614.6	22	380.29	1.6	2	760.571	35.792	128.112	OK	
	Lap +	157.92	197.40	0.0035	0.0271	0.0203	0.010	18.824	3.675	366.43	439	T.Sblh	2.561	0.00708	0.00708	1243.02	22	380.29	3.3	4	1521.14	71.583	245.335	OK	
	Tum Ka -	272.39	340.49	0.0035	0.0271	0.0203	0.010	18.824	3.675	481.245	439	T.rangka	4.417	0.01221	0.01221	2144.02	22	380.29	5.6	6	2281.71	107.375	351.669	OK	
B378	Tum Ki -	71.22	89.03	0.0035	0.0271	0.0203	0.010	18.824	3.675	284.149	489	T.Sblh	1.241	0.00343	0.00343	513.45	22	380.29	1.4	2	760.571	47.722	141.509	OK	
	Lap +	83.77	104.71	0.0035	0.0271	0.0203	0.010	18.824	3.675	308.164	489	T.Sblh	1.460	0.00404	0.00404	591.94	22	380.29	1.6	2	760.571	47.722	141.509	OK	
	Tum Ka -	111.11	138.89	0.0035	0.0271	0.0203	0.010	18.824	3.675	354.913	489	T.Sblh	1.936	0.00535	0.00535	785.157	22	380.29	2.1	3	1140.86	71.583	206.818	OK	
B377	Tum Ki -	109.88	137.35	0.0035	0.0271	0.0203	0.010	18.824	3.675	352.937	489	T.Sblh	1.915	0.00529	0.00529	776.437	22	380.29	2.0	3	1140.86	71.583	206.818	OK	
	Lap +	50.31	62.89	0.0035	0.0271	0.0203	0.010	18.824	3.675	238.821	489	T.Sblh	0.877	0.00242	0.00242	513.45	22	380.29	1.4	2	760.571	47.722	141.509	OK	
	Tum Ka -	139.37	174.21	0.0035	0.0271	0.0203	0.010	18.824	3.675	397.491	489	T.Sblh	2.429	0.00671	0.00671	984.844	22	380.29	2.6	3	1140.86	71.583	206.818	OK	
B376	Tum Ki -	156.43	195.54	0.0035	0.0271	0.0203	0.010	18.824	3.675	421.115	489	T.Sblh	2.726	0.00754	0.00754	1105.39	22	380.29	2.9	3	1140.86	71.583	206.818	OK	
	Lap +	109.14	136.42	0.0035	0.0271	0.0203	0.010	18.824	3.675	351.748	489	T.Sblh	1.902	0.00526	0.00526	771.214	22	380.29	2.0	3	1140.86	71.583	206.818	OK	
	Tum Ka -	1.07	1.33	0.0035	0.0271	0.0203	0.010	18.824	3.675	34.7492	489	T.Sblh	0.019	5.11E-05	0.0035	513.45	22	380.29	1.4	2	760.571	47.722	141.509	OK	
B402	Tum Ka -	69.67	87.09	0.0035	0.0271	0.0203	0.010	18.824	3.675	281.038	489	T.Sblh	1.214	0.00336	0.0035	513.45	22	380.29	1.4	4	1521.14	95.444	268.499	OK	
	Lap +	78.17	97.71	0.0035	0.0271	0.0203	0.010	18.824	3.675	297.686	489	T.Sblh	1.362	0.00377	0.00377	552.369	22	380.29	1.5	2	760.571	47.722	141.509	OK	
	Tum Ka -	123.86	154.83	0.0035	0.0271	0.0203	0.010	18.824	3.675	374.725	489	T.Sblh	2.158	0.00597	0.00597	875.261	22	380.29	2.3	4	1521.14	95.444	268.499	OK	
B401	Tum Ki -	128.92	161.15	0.0035	0.0271	0.0203	0.010	18.824	3.675	382.294	489	T.Sblh	2.246	0.00621	0.00621	910.979	22	380.29	2.4	4	1521.14	95.444	268.499	OK	
	Lap +	64.62	80.78	0.0035	0.0271	0.0203	0.010	18.824	3.675	270.663	489	T.Sblh	1.126	0.00311	0.0035	513.45	22	380.29	1.4	2	760.571	47.722	141.509	OK	
	Tum Ka -	91.71	114.64	0.0035	0.0271	0.0203	0.010	18.824	3.675	322.442	489	T.Sblh	1.598	0.00442	0.00442	648.062	22	380.29	1.7	4	1521.14	95.444	268.499	OK	
B189	Tum Ki -	90.68	113.35	0.0035	0.0271	0.0203	0.010	18.824	3.675	320.626	492	T.Sblh	1.561	0.00431	0.00431	636.875	16	201.14	3.2	4	804.571	50.483	150.216	OK	
	Lap +	95.03	118.78	0.0035	0.0271	0.0203	0.010	18.824	3.675	328.219	492	T.Sblh	1.636	0.00452	0.00452	667.395	16	201.14	3.3	4	804.571	50.483	150.216	OK	
	Tum Ka -	69.14	86.42	0.0035	0.0271	0.0203	0.010	18.824	3.675	279.962	492	T.Sblh	1.190	0.00329	0.0035	516.6	16	201.14	2.6	4	804.571	50.483	150.216	OK	

Penulangan Balok Portal As A - 24

Balok	[1]	[2]	Mu kNm	Mu/0,8 kNm	P _{min}	Ph	P _{laks}	P _{pakai}	m	Rn	d _{perlu}	d _{pakai}	Analisis	Rn _{pakai}	P _{baru}	P _{pakai}	As _{perlu}	O	A ₁₀	n	tul pakai	As _{ada} mm ²	a	Mn kNm	CEK
	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]		
B169	Tum Ki - Lap +	128.94 80.71	161.17 100.89	0.0035 0.0035	0.0271 0.0271	0.0203 0.0203	0.010 0.010	3.675 3.675	331.098 261.967	439 439	T. Sblh T. Sblh	2.091 1.309	0.00578 0.00362	0.00578 0.00362	1014.87 635.315	22 22	380.29 380.29	2.7 1.7	4 2	1521.14 760.571	71.583 35.792	245.335 128.112	245.335 128.112	OK OK	
B168	Tum Ka - Tum Ki - Lap +	162.34 0.25 99.75	202.93 0.31 124.69	0.0035 0.0035 0.0035	0.0271 0.0271 0.0271	0.0203 0.0203 0.0203	0.010 0.010 0.010	3.675 3.675 3.675	14.4686 371.523 291.226	439 439 439	T. Sblh T. Sblh T. Sblh	0.004 2.632 1.617	1.115-05 0.00728 0.00447	0.0035 0.00728 0.00447	614.6 1277.81 785.154	22 22 22	380.29 380.29 380.29	1.6 3.4 2.1	4 4 3	1521.14 1521.14 1140.86	71.583 71.583 53.687	245.335 245.335 188.085	245.335 245.335 188.085	OK OK OK	
B167	Tum Ka - Tum Ki - Lap +	151.19 162.34 118.61	188.98 202.93 148.26	0.0035 0.0035 0.0035	0.0271 0.0271 0.0271	0.0203 0.0203 0.0203	0.010 0.010 0.010	3.675 3.675 3.675	358.533 371.523 317.564	439 439 439	T. Sblh T. Sblh T. Sblh	2.452 2.632 1.923	0.00678 0.00728 0.00532	0.00678 0.00728 0.00532	1190.02 1277.81 933.594	22 22 22	380.29 380.29 380.29	3.1 3.4 2.5	4 4 3	1521.14 1521.14 1140.86	71.583 71.583 53.687	245.335 245.335 188.085	245.335 245.335 188.085	OK OK OK	
B1782	Tum Ka - Tum Ki - Lap +	242.43 108.56 65.61	303.04 135.70 82.02	0.0035 0.0035 0.0035	0.0271 0.0271 0.0271	0.0203 0.0203 0.0203	0.010 0.010 0.010	3.675 3.675 3.675	454.01 350.808 272.733	439 489 489	T. rangkai T. Sblh T. Sblh	3.931 1.892 1.143	0.01087 0.00523 0.00316	0.01087 0.00523 0.00316	1908.21 767.098 513.45	22 22 22	380.29 380.29 380.29	5.0 2.0 1.4	6 4 2	2281.71 1521.14 760.571	107.375 95.444 47.722	351.669 268.499 141.509	351.669 268.499 141.509	OK OK OK	
B1781	Tum Ka - Tum Ki - Lap +	117.10 112.39 60.76	146.38 140.48 75.95	0.0035 0.0035 0.0035	0.0271 0.0271 0.0271	0.0203 0.0203 0.0203	0.010 0.010 0.010	3.675 3.675 3.675	364.355 356.939 262.447	489 489 489	T. Sblh T. Sblh T. Sblh	2.041 1.958 1.059	0.00564 0.00541 0.00293	0.00564 0.00541 0.00335	827.488 794.149 513.45	22 22 22	380.29 380.29 380.29	2.2 2.1 1.4	4 4 2	1521.14 1521.14 760.571	95.444 95.444 47.722	268.499 268.499 141.509	268.499 268.499 141.509	OK OK OK	
B1780	Tum Ka - Tum Ki - Lap +	122.99 83.67 76.71	153.73 104.58 95.89	0.0035 0.0035 0.0035	0.0271 0.0271 0.0271	0.0203 0.0203 0.0203	0.010 0.010 0.010	3.675 3.675 3.675	373.395 307.974 294.898	489 489 489	T. Sblh T. Sblh T. Sblh	2.143 1.458 1.337	0.00592 0.00403 0.0037	0.00592 0.00403 0.0037	869.061 591.211 542.073	22 22 22	380.29 380.29 380.29	2.3 1.6 1.4	4 4 2	1521.14 1521.14 760.571	95.444 95.444 47.722	268.499 268.499 141.509	268.499 268.499 141.509	OK OK OK	
B1779	Tum Ka - Lap +	144.02 76.63	180.03 95.79	0.0035 0.0035	0.0271 0.0271	0.0203 0.0203	0.010 0.010	3.675 3.675	404.066 294.745	489 489	T. Sblh T. Sblh	2.510 1.335	0.00694 0.00369	0.00694 0.00369	1017.7 541.507	22 22	380.29 380.29	2.7 1.4	4 4	1521.14 1521.14	95.444 95.444	268.499 268.499	268.499 268.499	OK OK	
B1779	Lap +	36.05	45.06	0.0035	0.0271	0.0203	0.010	3.675	202.16	489	T. Sblh	0.628	0.00174	0.00335	513.45	22	380.29	1.4	2	760.571	47.722	141.509	141.509	OK	
B1779	Lap +	0.02	0.02	0.0035	0.0271	0.0203	0.010	3.675	4.21065	489	T. Sblh	0.000	7.5E-07	0.0035	513.45	22	380.29	1.4	4	1521.14	95.444	268.499	268.499	OK	
B190	Tum Ki - Lap +	93.99 69.26	117.49 86.58	0.0035 0.0035	0.0271 0.0271	0.0203 0.0203	0.010 0.010	3.675 3.675	326.428 280.218	489 489	T. Sblh T. Sblh	1.638 1.207	0.00453 0.00334	0.00453 0.00334	664.184 513.45	22 22	380.29 380.29	1.7 1.4	4 2	1521.14 760.571	95.444 47.722	268.499 141.509	268.499 141.509	OK OK	
B190	Lap +	124.37	155.46	0.0035	0.0271	0.0203	0.010	3.675	375.482	489	T. Sblh	2.167	0.00599	0.00599	878.804	22	380.29	2.3	4	1521.14	95.444	268.499	268.499	OK	

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa $b = 350$ mm
 f_y polos = 240 Mpa $h = 600$ mm
 penutup beton = 40 Mpa $d = 539$ mm
 ϕ Tul. Pokok = 22 mm $f_c = 25$ Mpa
 ϕ Tul. Sengk = 10 mm $d' = 61$ mm

	M Tump-	-53.76	67.20	0.0035	0.0271	0.02032	0.01016	18.824	3.675	228.555	539	T. Sblh	0.661	0.00183	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
B164	M Lap	157.92	197.40	0.0035	0.0271	0.02032	0.01016	18.824	3.675	391.731	539	T. Sblh	1.941	0.00537	0.00537	1012.41	22	380.29	2.7	3	1140.86	61.357	231.969	OK
	M Tump-	-272.39	340.49	0.0035	0.0271	0.02032	0.01016	18.824	3.675	514.473	539	T. Sblh	3.349	0.00926	0.00926	1746.24	22	380.29	4.6	5	1901.43	102.262	371.059	OK
	M Tump-	-176.69	220.86	0.0035	0.0271	0.02032	0.01016	18.824	3.675	414.351	539	T. Sblh	2.172	0.006	0.006	1132.7	22	380.29	3.0	3	1140.86	61.357	231.969	OK
B165	M Lap	91.76	114.70	0.0035	0.0271	0.02032	0.01016	18.824	3.675	298.604	539	T. Sblh	1.128	0.00312	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-228.06	285.08	0.0035	0.0271	0.02032	0.01016	18.824	3.675	470.756	539	T. Sblh	2.8036	0.00775	0.00775	1462.08	22	380.29	3.8	4	1521.14	81.809	303.070	OK
	M Tump-	-165.69	207.11	0.0035	0.0271	0.02032	0.01016	18.824	3.675	401.252	539	T. Sblh	2.037	0.00563	0.00563	1062.22	22	380.29	2.8	3	1140.86	61.357	231.969	OK
B166	M Lap	163.50	204.37	0.0035	0.0271	0.02032	0.01016	18.824	3.675	398.585	539	T. Sblh	2.010	0.00556	0.00556	1048.14	22	380.29	2.8	3	1140.86	61.357	231.969	OK
	M Tump-	-95.59	119.49	0.0035	0.0271	0.02032	0.01016	18.824	3.675	329.187	539	T. Sblh	1.371	0.00379	0.00379	612.801	22	380.29	1.6	2	760.571	47.722	156.720	OK
	M Tump-	-162.34	202.93	0.0035	0.0271	0.02032	0.01016	18.824	3.675	397.174	539	T. Sblh	1.996	0.00552	0.00552	1040.74	20	314.29	3.3	4	1257.14	67.611	254.041	OK
B167	M Lap	118.61	148.26	0.0035	0.0271	0.02032	0.01016	18.824	3.675	339.49	539	T. Sblh	1.458	0.00403	0.00403	760.385	20	314.29	2.4	3	942.857	50.708	193.718	OK
	M Tump-	-242.43	303.04	0.0035	0.0271	0.02032	0.01016	18.824	3.675	485.357	539	T. Sblh	2.980	0.00824	0.00824	1554.18	20	314.29	4.9	5	1571.43	84.514	312.239	OK
	M Tump-	-0.25	0.31	0.0035	0.0271	0.02032	0.01016	18.824	3.675	15.4676	539	T. Sblh	0.003	8.4E-06	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
B168	M Lap	99.75	124.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	311.333	539	T. Sblh	1.2263	0.00339	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-151.19	188.98	0.0035	0.0271	0.02032	0.01016	18.824	3.675	383.288	539	T. Sblh	1.8586	0.00514	0.00514	969.237	20	314.29	3.1	4	1257.14	67.611	254.041	OK
	M Tump-	-128.94	161.17	0.0035	0.0271	0.02032	0.01016	18.824	3.675	353.959	539	T. Sblh	1.585	0.00438	0.00438	826.581	20	314.29	2.6	3	942.857	50.708	193.718	OK
B169	M Lap	80.71	100.89	0.0035	0.0271	0.02032	0.01016	18.824	3.675	280.055	539	T. Sblh	0.9922	0.00274	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-162.34	202.93	0.0035	0.0271	0.02032	0.01016	18.824	3.675	397.174	539	T. Sblh	1.9957	0.00552	0.00552	1040.74	20	314.29	3.3	4	1257.14	67.611	254.041	OK

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] M_u = Momen rencana balok (dari tabel)
- [4] $M_u / 0.8$
- [5] $p_{min} = 1.4 / f_y$
- [6] $p_s = ((0.85 \cdot f_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y))$
- [7] $p_{maks} = 0.5 \cdot p_b$
- [8] p_{pakar}
- [9] $m = f_y / (0.85 \cdot f_c)$
- [10] $R_n = p \cdot f_y \cdot (1 - 1/2 \cdot p \cdot m)$
- [11] $d_{perlu} = \sqrt{(M_u / (R_n \cdot b))}$
- [12] $d_{pakar} = h - d'$
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $p_{ada} = p \cdot (Rn_{ada} / Rn)$
- [16] p_{pakar}
- [17] $As_{perlu} = p_{ada} \cdot b \cdot d_{ada}$
- [18] O tulangan dipakai
- [19] $A10 = Luas$ 1 tulangan
- [20] $n = As / A10$
- [21] jumlah tul. Dipasang
- [22] $As_{ada} = n_{terpasang} \cdot A10$
- [23] $a = (As_{ada} \cdot f_y) / 0.85 \cdot f_c \cdot b$
- [24] $Mn = As_{ada} \cdot f_y \cdot (d - a/2)$
- [25] CEK : Mn > Mu 0.8 OK

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa b = 350 mm
 f_y polos = 240 Mpa h = 600 mm
 penutup beton = 40 Mpa d = 539 mm
 \emptyset Tul. Pokok = 22 mm f_c = 25 Mpa
 \emptyset Tul. Sengk = 10 mm d' = 61 mm

	M Tump-	-57.63	72.03	0.0035	0.0271	0.02032	0.01016	18.824	3.675	236.632	539	T. Sblh	0.708	0.00196	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
BT58	M Lap	160.35	200.44	0.0035	0.0271	0.02032	0.01016	18.824	3.675	394.732	539	T. Sblh	1.971	0.00545	0.00545	1027.98	22	380.29	2.7	3	1140.86	61.357	231.969	OK
	M Tump-	-263.67	329.58	0.0035	0.0271	0.02032	0.01016	18.824	3.675	506.167	539	T. Sblh	3.241	0.00896	0.00896	1690.31	22	380.29	4.4	5	1901.43	102.262	371.059	OK
	M Tump-	-174.12	217.65	0.0035	0.0271	0.02032	0.01016	18.824	3.675	411.33	539	T. Sblh	2.1405	0.00592	0.00592	1116.25	22	380.29	2.9	3	1140.86	61.357	231.969	OK
BT59	M Lap	92.77	115.97	0.0035	0.0271	0.02032	0.01016	18.824	3.675	300.245	539	T. Sblh	1.1405	0.00315	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-228.61	285.76	0.0035	0.0271	0.02032	0.01016	18.824	3.675	471.318	539	T. Sblh	2.8103	0.00777	0.00777	1465.57	22	380.29	3.9	4	1521.14	81.809	303.070	OK
	M Tump-	-164.72	205.90	0.0035	0.0271	0.02032	0.01016	18.824	3.675	400.07	539	T. Sblh	2.025	0.0056	0.0056	1055.97	22	380.29	2.8	3	1140.86	61.357	231.969	OK
BT60	M Lap	163.69	204.61	0.0035	0.0271	0.02032	0.01016	18.824	3.675	398.818	539	T. Sblh	2.012	0.00556	0.00556	1049.37	22	380.29	2.8	3	1140.86	61.357	231.969	OK
	M Tump-	-96.18	120.23	0.0035	0.0271	0.02032	0.01016	18.824	3.675	305.711	539	T. Sblh	1.182	0.00327	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-164.73	205.91	0.0035	0.0271	0.02032	0.01016	18.824	3.675	400.085	539	T. Sblh	2.025	0.0056	0.0056	1056.05	20	314.29	3.4	4	1257.14	67.611	254.041	OK
BT61	M Lap	118.15	147.68	0.0035	0.0271	0.02032	0.01016	18.824	3.675	338.827	539	T. Sblh	1.452	0.00401	0.00401	757.417	20	314.29	2.4	3	942.857	50.708	193.718	OK
	M Tump-	-240.97	301.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	483.891	539	T. Sblh	2.962	0.00819	0.00819	1544.81	20	314.29	4.9	5	1571.43	84.514	312.239	OK
	M Tump-	-174.61	218.26	0.0035	0.0271	0.02032	0.01016	18.824	3.675	311.198	539	T. Sblh	1.2252	0.00339	0.0035	660.275	20	314.29	3.6	4	1257.14	67.611	254.041	OK
BT62	M Lap	99.66	124.58	0.0035	0.0271	0.02032	0.01016	18.824	3.675	411.908	539	T. Sblh	2.1465	0.00593	0.00593	1119.39	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-214.33	267.92	0.0035	0.0271	0.02032	0.01016	18.824	3.675	456.365	539	T. Sblh	2.6349	0.00728	0.00728	1374.06	20	314.29	4.4	5	1571.43	84.514	312.239	OK
	M Tump-	-192.48	240.60	0.0035	0.0271	0.02032	0.01016	18.824	3.675	432.477	539	T. Sblh	2.3662	0.00654	0.00654	1233.97	20	314.29	3.9	4	1257.14	67.611	254.041	OK
BT63	M Lap	122.38	152.98	0.0035	0.0271	0.02032	0.01016	18.824	3.675	344.847	539	T. Sblh	1.5045	0.00416	0.00416	784.572	20	314.29	2.5	3	942.857	50.708	193.718	OK
	M Tump-	-151.02	188.78	0.0035	0.0271	0.02032	0.01016	18.824	3.675	383.081	539	T. Sblh	1.8566	0.00513	0.00513	968.19	20	314.29	3.1	4	1257.14	67.611	254.041	OK

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] M_u = Momen rencana balok (dari tabel)
- [4] $M_u/0,8$
- [5] $\rho_{min} = 1,4/f_y$
- [6] $\rho_b = ((0,85 \cdot f_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y))$
- [7] $\rho_{maks} = 0,5 \cdot \rho_b$
- [8] ρ_{pakai}
- [9] $m = f_y / (0,85 \cdot f_c)$
- [10] $R_n = \rho \cdot f_y \cdot (1 - \rho / m)$
- [11] $d_{pakai} = \sqrt{(M_u / (R_n \cdot b))}$
- [12] $d_{pakai} = h - d'$
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $\rho_{ada} = \rho \cdot (Rn_{ada} / Rn)$
- [16] ρ_{pakai}
- [17] $As_{pakai} = \rho_{ada} \cdot b \cdot d_{ada}$
- [18] O tulangan dipakai
- [19] $A_{IO} = Luas$ tulangan
- [20] $n = As_{ada} / A_{IO}$
- [21] jumlah tul. Dipasang
- [22] $As_{ada} = n \cdot terpasang \cdot A_{IO}$
- [23] $a = (As_{ada} \cdot f_y) / 0,85 \cdot f_c \cdot b$
- [24] $Mn = As_{ada} \cdot f_y \cdot (d - a / 2)$
- [25] CEK : $Mn > Mu$ OK

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa b = 350 mm
 f_y polos = 240 Mpa h = 600 mm
 penutup beton = 40 Mpa d = 539 mm
 \emptyset Tul. Pokok = 22 mm f_c = 25 Mpa
 \emptyset Tul. Sengk = 10 mm d' = 61 mm

	M Tump-	-59.91	74.89	0.0035	0.0271	0.02032	0.01016	18.824	3.675	241.28	539	T. Sblh.	0.737	0.00204	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
B152	M Lap	167.03	208.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	402.868	539	T. Sblh.	2.053	0.00568	0.00568	1070.79	22	380.29	2.8	3	1140.86	61.357	231.969	OK
	M Tump-	-248.02	310.03	0.0035	0.0271	0.02032	0.01016	18.824	3.675	490.922	539	T. Sblh.	3.049	0.00843	0.00843	1590.03	22	380.29	4.2	5	1901.43	102.262	371.059	OK
	M Tump-	-115.77	144.72	0.0035	0.0271	0.02032	0.01016	18.824	3.675	335.408	539	T. Sblh.	1.4232	0.00393	0.00393	742.209	22	380.29	2.0	2	760.571	40.905	157.757	OK
	M Lap	44.55	55.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	208.072	539	T. Sblh.	0.5477	0.00151	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-164.13	205.17	0.0035	0.0271	0.02032	0.01016	18.824	3.675	399.361	539	T. Sblh.	2.0177	0.00558	0.00558	1052.23	22	380.29	2.8	3	1140.86	61.357	231.969	OK
B154	M Tump-	-175.38	219.23	0.0035	0.0271	0.02032	0.01016	18.824	3.675	412.816	539	T. Sblh.	2.156	0.00596	0.00596	1124.33	22	380.29	3.0	3	1140.86	61.357	231.969	OK
	M Lap	160.72	200.90	0.0035	0.0271	0.02032	0.01016	18.824	3.675	395.187	539	T. Sblh.	1.976	0.00546	0.00546	1030.35	22	380.29	2.7	3	1140.86	61.357	231.969	OK
	M Tump-	-91.45	114.31	0.0035	0.0271	0.02032	0.01016	18.824	3.675	298.1	539	T. Sblh.	1.124	0.00311	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-169.61	212.01	0.0035	0.0271	0.02032	0.01016	18.824	3.675	405.969	539	T. Sblh.	2.085	0.00576	0.00576	1087.34	20	314.29	3.5	4	1257.14	67.611	254.041	OK
	M Lap	121.45	151.81	0.0035	0.0271	0.02032	0.01016	18.824	3.675	343.526	539	T. Sblh.	1.493	0.00413	0.00413	778.574	20	314.29	2.5	3	942.857	50.708	193.718	OK
B155	M Tump-	-229.49	286.86	0.0035	0.0271	0.02032	0.01016	18.824	3.675	472.222	539	T. Sblh.	2.821	0.0078	0.0078	1471.2	20	314.29	4.7	5	1571.43	84.514	312.239	OK
	M Tump-	-104.13	130.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	318.093	539	T. Sblh.	1.2801	0.00354	0.00354	667.554	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Lap	53.38	66.72	0.0035	0.0271	0.02032	0.01016	18.824	3.675	227.742	539	T. Sblh.	0.6562	0.00181	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-158.13	197.67	0.0035	0.0271	0.02032	0.01016	18.824	3.675	391.994	539	T. Sblh.	1.944	0.00537	0.00537	1013.77	20	314.29	3.2	4	1257.14	67.611	254.041	OK
	M Tump-	-181.33	226.66	0.0035	0.0271	0.02032	0.01016	18.824	3.675	419.755	539	T. Sblh.	2.2291	0.00616	0.00616	1162.44	20	314.29	3.7	4	1257.14	67.611	254.041	OK
B157	M Lap	125.38	156.72	0.0035	0.0271	0.02032	0.01016	18.824	3.675	349.042	539	T. Sblh.	1.5413	0.00426	0.00426	803.776	20	314.29	2.6	3	942.857	50.708	193.718	OK
	M Tump-	-156.19	195.24	0.0035	0.0271	0.02032	0.01016	18.824	3.675	389.579	539	T. Sblh.	1.9201	0.00531	0.00531	1001.31	20	314.29	3.2	4	1257.14	67.611	254.041	OK

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] M_u = Momen rencana balok (dari tabel)
- [4] $M_u/0,8$
- [5] $p_{min} = 1,4/f_y$
- [6] $p_b = ((0,85 \cdot f_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y))$
- [7] $p_{maks} = 0,5 \cdot p_b$
- [8] p_{pakar}
- [9] $m = f_y / (0,85 \cdot f_c)$
- [10] $R_n = p \cdot f_y \cdot (1 - 1/2p \cdot m)$
- [11] $d_{pakar} = \sqrt{(M_u / (R_n \cdot b))}$
- [12] $d_{pakar} = h - d'$
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $\rho_{ada} = \rho \cdot (Rn_{ada} / Rn)$
- [16] ρ_{pakar}
- [17] $As_{perlu} = \rho_{ada} \cdot b \cdot d_{ada}$
- [18] \emptyset tulangan dipakai
- [19] $A_{10} = Luas$ 1 tulangan
- [20] $n = A_s / A_{10}$
- [21] jumlah tul. Dipasang
- [22] $As_{ada} = n \cdot A_{10}$
- [23] $a = (As_{ada} \cdot f_y) / 0,85 \cdot f_c \cdot b$
- [24] $Mn = As_{ada} \cdot f_y \cdot (d - a/2)$
- [25] C/EK = Mn > Mu 0,8 OK

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa $b = 350$ mm
 f_y polos = 240 Mpa $h = 600$ mm
 penutup beton = 40 Mpa $d = 539$ mm
 \emptyset Tul. Pokok = 22 mm $f_c = 25$ Mpa
 \emptyset Tul. Sengk = 10 mm $d' = 61$ mm

	M Tump-	-125.55	156.94	0.0035	0.0271	0.02032	0.01016	18.824	3.675	349.287	539	T. Sblh	1.543	0.00427	0.00427	804.904	20	314.29	2.6	3	942.857	50.708	193.718	OK
BT43	M Lap	92.85	116.06	0.0035	0.0271	0.02032	0.01016	18.824	3.675	300.372	539	T. Sblh	1.141	0.00316	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-207.03	258.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	448.522	539	T. Sblh	2.545	0.00704	0.00704	1327.23	20	314.29	4.2	5	1571.43	84.514	312.239	OK
	M Tump-	-173.71	217.14	0.0035	0.0271	0.02032	0.01016	18.824	3.675	410.844	539	T. Sblh	2.1354	0.0059	0.0059	1113.61	20	314.29	3.5	4	1257.14	67.611	254.041	OK
	M Lap	103.35	129.18	0.0035	0.0271	0.02032	0.01016	18.824	3.675	316.894	539	T. Sblh	1.2705	0.00351	0.00351	662.535	20	314.29	2.1	3	942.857	50.708	193.718	OK
BT44	M Tump-	-207.87	259.84	0.0035	0.0271	0.02032	0.01016	18.824	3.675	449.432	539	T. Sblh	2.5554	0.00706	0.00706	1332.63	20	314.29	4.2	5	1571.43	84.514	312.239	OK
	M Tump-	-116.28	145.36	0.0035	0.0271	0.02032	0.01016	18.824	3.675	336.145	539	T. Sblh	1.4295	0.00395	0.00395	745.476	20	314.29	2.4	3	942.857	50.708	193.718	OK
	M Lap	75.28	94.10	0.0035	0.0271	0.02032	0.01016	18.824	3.675	270.456	539	T. Sblh	0.9254	0.00256	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-102.18	127.73	0.0035	0.0271	0.02032	0.01016	18.824	3.675	315.101	539	T. Sblh	1.2561	0.00347	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
BT46	M Tump-	-40.93	51.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	199.417	539	T. Sblh	0.503	0.00139	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Lap	81.03	101.29	0.0035	0.0271	0.02032	0.01016	18.824	3.675	280.605	539	T. Sblh	0.996	0.00275	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-205.48	256.85	0.0035	0.0271	0.02032	0.01016	18.824	3.675	446.843	539	T. Sblh	2.526	0.00698	0.00698	1317.32	22	380.29	3.5	4	1521.14	81.809	303.070	OK
	M Tump-	-146.10	182.62	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.778	539	T. Sblh	1.796	0.00496	0.00496	936.594	22	380.29	2.5	3	1140.86	61.357	231.969	OK
BT47	M Lap	108.12	135.15	0.0035	0.0271	0.02032	0.01016	18.824	3.675	324.125	539	T. Sblh	1.3291	0.00367	0.00367	693.116	22	380.29	1.8	2	760.571	40.905	157.757	OK
	M Tump-	-225.94	282.43	0.0035	0.0271	0.02032	0.01016	18.824	3.675	468.561	539	T. Sblh	2.7776	0.00768	0.00768	1448.48	22	380.29	3.8	4	1521.14	81.809	303.070	OK
	M Tump-	-117.39	146.74	0.0035	0.0271	0.02032	0.01016	18.824	3.675	337.746	539	T. Sblh	1.443	0.00399	0.00399	752.593	22	380.29	2.0	2	760.571	40.905	157.757	OK
	M Lap	98.95	123.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.077	539	T. Sblh	1.216	0.00336	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
BT48	M Tump-	-53.73	67.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	228.488	539	T. Sblh	0.660	0.00183	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] M_u = Momen rencana balok (dari tabel)
- [4] $M_u / 0,8$
- [5] $\rho_{min} = 1,4 / f_y$
- [6] $\rho_b = ((0,85 \cdot f_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y))$
- [7] $\rho_{maks} = 0,5 \cdot \rho_b$
- [8] ρ_{pakar}
- [9] $m = f_y / (0,85 \cdot f_c)$
- [10] $R_n = \rho \cdot f_y \cdot (1 - 1/2 \rho \cdot m)$
- [11] $d_{perlu} = \sqrt{(M_n / (R_n \cdot b))}$
- [12] $d_{pakar} = h - d'$
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $\rho_{ada} = \rho \cdot (Rn_{ada} / Rn)$
- [16] ρ_{pakar}
- [17] $As_{perlu} = \rho_{ada} \cdot b \cdot d_{ada}$
- [18] O tulangan dipakai
- [19] $A10 = Luas$ tulangan
- [20] $n = A_s / A10$
- [21] jumlah tul. Dipasang
- [22] $As_{ada} = n \cdot As_{pakar}$
- [23] $a = (As_{ada} \cdot f_y) / 0,85 \cdot f_c \cdot b$
- [24] $Mn = As_{ada} \cdot f_y \cdot (d - a/2)$
- [25] $CHK = Mn < Mu$ 0,8 OK

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa b = 350 mm
 f_y polos = 240 Mpa h = 600 mm
 penutup beton = 40 Mpa d = 539 mm
 \emptyset Tul. Pokok = 22 mm f_c = 25 Mpa
 \emptyset Tul. Sengk = 10 mm d' = 61 mm

	M Tump-	-125.55	156.94	0.0035	0.0271	0.02032	0.01016	18.824	3.675	349.287	539	T. Sblh	1.543	0.00427	0.00427	804.904	20	314.29	2.6	3	942.857	50.708	193.718	OK
B137	M Lap	92.85	116.06	0.0035	0.0271	0.02032	0.01016	18.824	3.675	300.372	539	T. Sblh	1.141	0.00316	0.00316	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-207.03	258.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	448.522	539	T. Sblh	2.545	0.00704	0.00704	1327.23	20	314.29	4.2	5	1571.43	84.514	312.239	OK
	M Tump-	-173.71	217.14	0.0035	0.0271	0.02032	0.01016	18.824	3.675	410.844	539	T. Sblh	2.1354	0.0059	0.0059	1113.61	20	314.29	3.5	4	1257.14	67.611	254.041	OK
B138	M Lap	103.35	129.18	0.0035	0.0271	0.02032	0.01016	18.824	3.675	316.894	539	T. Sblh	1.2705	0.00351	0.00351	662.535	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-207.87	259.84	0.0035	0.0271	0.02032	0.01016	18.824	3.675	449.432	539	T. Sblh	2.5354	0.00706	0.00706	1332.63	20	314.29	4.2	5	1571.43	84.514	312.239	OK
	M Tump-	-116.28	145.36	0.0035	0.0271	0.02032	0.01016	18.824	3.675	336.145	539	T. Sblh	1.4295	0.00395	0.00395	745.476	20	314.29	2.4	3	942.857	50.708	193.718	OK
B139	M Lap	75.28	94.10	0.0035	0.0271	0.02032	0.01016	18.824	3.675	270.456	539	T. Sblh	0.9254	0.00256	0.00256	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-102.18	127.73	0.0035	0.0271	0.02032	0.01016	18.824	3.675	315.101	539	T. Sblh	1.2561	0.00347	0.00347	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-40.93	51.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	199.417	539	T. Sblh	0.503	0.00139	0.00139	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
B140	M Lap	81.03	101.29	0.0035	0.0271	0.02032	0.01016	18.824	3.675	280.605	539	T. Sblh	0.996	0.00275	0.00275	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-205.48	256.85	0.0035	0.0271	0.02032	0.01016	18.824	3.675	446.843	539	T. Sblh	2.526	0.00698	0.00698	1317.32	22	380.29	3.5	4	1521.14	81.809	303.070	OK
	M Tump-	-146.10	182.62	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.778	539	T. Sblh	1.796	0.00496	0.00496	936.594	22	380.29	2.5	3	1140.86	61.357	231.969	OK
B141	M Lap	108.12	135.15	0.0035	0.0271	0.02032	0.01016	18.824	3.675	324.125	539	T. Sblh	1.3291	0.00367	0.00367	693.116	22	380.29	1.8	2	760.571	40.905	157.757	OK
	M Tump-	-225.94	282.43	0.0035	0.0271	0.02032	0.01016	18.824	3.675	468.561	539	T. Sblh	2.7776	0.00768	0.00768	1448.48	22	380.29	3.8	4	1521.14	81.809	303.070	OK
	M Tump-	-117.39	146.74	0.0035	0.0271	0.02032	0.01016	18.824	3.675	337.746	539	T. Sblh	1.443	0.00399	0.00399	752.593	22	380.29	2.0	2	760.571	40.905	157.757	OK
B142	M Lap	98.95	123.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.077	539	T. Sblh	1.216	0.00336	0.00336	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-53.73	67.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	228.488	539	T. Sblh	0.660	0.00183	0.00183	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] M_u = Momen rencana balok (dari tabel)
- [4] $M_u / 0,8$
- [5] $\rho_{min} = 1,4/f_y$
- [6] $\rho_t = ((0,85 \cdot f_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y))$
- [7] $\rho_{maks} = 0,5 \cdot \rho_b$
- [8] ρ_{pakar}
- [9] $m = f_y / (0,85 \cdot f_c)$
- [10] $R_n = \rho \cdot f_y \cdot (1 - \rho / m)$
- [11] $d_{perlu} = \sqrt{(M_u / (R_n \cdot b))}$
- [12] $d_{pakar} = h - d'$
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $\rho_{ada} = \rho \cdot (Rn_{ada} / Rn)$
- [16] ρ_{pakar}
- [17] $As_{perlu} = \rho_{ada} \cdot b \cdot d_{ada}$
- [18] \emptyset tulangan dipakai
- [19] $A_{10} = \text{Luas 1 tulangan}$
- [20] n
- [21] n jumlah tul. Dipasang
- [22] $As_{ada} = n \cdot \rho_{pakar} \cdot A_{10}$
- [23] $a = (As_{ada} \cdot f_y) / 0,85 \cdot f_c \cdot b$
- [24] $Mn = As_{ada} \cdot f_y \cdot (d - a/2)$
- [25] CEFK $\cdot Mn > Mu \cdot 0,8$ OK

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa b = 350 mm
 f_y polos = 240 Mpa h = 600 mm
 penutup beton = 40 Mpa d = 539 mm
 \emptyset Tul. Pokok = 22 mm f_c = 25 Mpa
 \emptyset Tul. Sengk = 10 mm d' = 61 mm

	M Tump-	-125.55	156.94	0.0035	0.0271	0.02032	0.01016	18.824	3.675	349.287	539	T. Sblh	1.543	0.00427	0.00427	804.904	22	380.29	2.1	3	1140.86	61.357	231.969	OK
BT31	M Lap	92.85	116.06	0.0035	0.0271	0.02032	0.01016	18.824	3.675	300.372	539	T. Sblh	1.141	0.00316	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-207.03	258.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	448.522	539	T. Sblh	2.545	0.00704	0.00704	1327.23	22	380.29	3.5	4	1521.14	81.809	303.070	OK
	M Tump-	-173.71	217.14	0.0035	0.0271	0.02032	0.01016	18.824	3.675	410.844	539	T. Sblh	2.1354	0.0059	0.0059	1113.61	22	380.29	2.9	3	1140.86	61.357	231.969	OK
	M Lap	103.35	129.18	0.0035	0.0271	0.02032	0.01016	18.824	3.675	316.894	539	T. Sblh	1.2705	0.00351	0.00351	662.535	22	380.29	1.7	2	760.571	40.905	157.757	OK
BT32	M Tump-	-207.87	259.84	0.0035	0.0271	0.02032	0.01016	18.824	3.675	449.432	539	T. Sblh	2.5554	0.00706	0.00706	1332.63	22	380.29	3.5	4	1521.14	81.809	303.070	OK
	M Tump-	-116.28	145.36	0.0035	0.0271	0.02032	0.01016	18.824	3.675	336.145	539	T. Sblh	1.430	0.00395	0.00395	745.476	22	380.29	2.0	2	760.571	40.905	157.757	OK
	M Lap	75.28	94.10	0.0035	0.0271	0.02032	0.01016	18.824	3.675	270.456	539	T. Sblh	0.925	0.00256	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-102.18	127.73	0.0035	0.0271	0.02032	0.01016	18.824	3.675	315.101	539	T. Sblh	1.256	0.00347	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
BT34	M Tump-	-40.93	51.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	199.417	539	T. Sblh	0.503	0.00139	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Lap	81.03	101.29	0.0035	0.0271	0.02032	0.01016	18.824	3.675	280.605	539	T. Sblh	0.996	0.00275	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-205.48	256.85	0.0035	0.0271	0.02032	0.01016	18.824	3.675	446.843	539	T. Sblh	2.526	0.00698	0.00698	1317.32	22	380.29	3.5	4	1521.14	81.809	303.070	OK
	M Tump-	-146.10	182.62	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.778	539	T. Sblh	1.796	0.00496	0.00496	936.594	22	380.29	2.5	3	1140.86	61.357	231.969	OK
BT35	M Lap	108.12	135.15	0.0035	0.0271	0.02032	0.01016	18.824	3.675	324.125	539	T. Sblh	1.3291	0.00367	0.00367	693.116	22	380.29	1.8	2	760.571	40.905	157.757	OK
	M Tump-	-225.94	282.43	0.0035	0.0271	0.02032	0.01016	18.824	3.675	468.561	539	T. Sblh	2.7776	0.00768	0.00768	1448.48	22	380.29	3.8	4	1521.14	81.809	303.070	OK
	M Tump-	-117.39	146.74	0.0035	0.0271	0.02032	0.01016	18.824	3.675	337.746	539	T. Sblh	1.443	0.00399	0.00399	752.593	22	380.29	2.0	2	760.571	40.905	157.757	OK
	M Lap	98.95	123.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.077	539	T. Sblh	1.216	0.00336	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
BT36	M Tump-	-53.73	67.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	228.488	539	T. Sblh	0.660	0.00183	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] M_u = Momen rencana balok (dari tabel)
- [4] $M_u / b \cdot h$
- [5] ρ_{min} = $1.4 / f_y$
- [6] ρ_b = $(0.85 \cdot f_c \cdot \beta_1) / f_y \cdot (600 / (600 + f_y))$
- [7] ρ_{maks} = $0.5 \cdot \rho_b$
- [8] ρ_{pakai}
- [9] m = $f_y / (0.85 \cdot f_c)$
- [10] R_n = $\rho \cdot f_y \cdot (1 - 1/2 \rho \cdot m)$
- [11] d_{perlu} = $\sqrt{(M_n / (R_n \cdot b))}$
- [12] d_{pakai} = $h - d'$
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $\rho_{ada} = \rho \cdot (Rn_{ada} / Rn)$
- [16] ρ_{pakai}
- [17] $As_{perlu} = \rho_{ada} \cdot b \cdot d_{ada}$
- [18] O tulangan dipakai
- [19] $A10$ = Luas 1 tulangan
- [20] $n = A_s \cdot A10$
- [21] jumlah tul. Dipasang
- [22] $As_{ada} = n_{terpasang} \cdot A10$
- [23] $a = (As_{ada} \cdot fy) / 0.85 \cdot fc \cdot b$
- [24] $Mn = As_{ada} \cdot fy \cdot (d - a/2)$
- [25] CEK = Mn > Mu 0.8 OK

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa b = 350 mm
 f_y polos = 240 Mpa h = 600 mm
 penutup beton = 40 Mpa d = 539 mm
 \emptyset Tul. Pokok = 22 mm f_c = 25 Mpa
 \emptyset Tul. Sengkang = 10 mm d' = 61 mm

	M Tump-	-169.61	212.01	0.0035	0.0271	0.02032	0.01016	18.824	3.675	405.969	539	T. Sblh	2.085	0.00576	0.00576	1087.34	20	314.29	3.5	4	1257.14	67.611	254.041	OK
B125	M Lap	121.45	151.81	0.0035	0.0271	0.02032	0.01016	18.824	3.675	343.526	539	T. Sblh	1.493	0.00413	0.00413	778.574	20	314.29	2.5	3	942.857	50.708	193.718	OK
	M Tump-	-229.49	286.86	0.0035	0.0271	0.02032	0.01016	18.824	3.675	472.222	539	T. Sblh	2.821	0.0078	0.0078	1471.2	20	314.29	4.7	5	1571.43	84.514	312.239	OK
	M Tump-	-104.13	130.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	318.093	539	T. Sblh	1.2801	0.00354	0.00354	667.554	20	314.29	2.1	3	942.857	50.708	193.718	OK
B126	M Lap	53.38	66.72	0.0035	0.0271	0.02032	0.01016	18.824	3.675	227.742	539	T. Sblh	0.6562	0.00181	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-158.13	197.67	0.0035	0.0271	0.02032	0.01016	18.824	3.675	391.994	539	T. Sblh	1.944	0.00537	0.00537	1013.77	20	314.29	3.2	4	1257.14	67.611	254.041	OK
	M Tump-	-181.33	226.66	0.0035	0.0271	0.02032	0.01016	18.824	3.675	419.755	539	T. Sblh	2.2291	0.00616	0.00616	1162.44	20	314.29	3.7	4	1257.14	67.611	254.041	OK
B127	M Tump-	-181.33	226.66	0.0035	0.0271	0.02032	0.01016	18.824	3.675	349.042	539	T. Sblh	1.5413	0.00426	0.00426	803.776	20	314.29	2.6	3	942.857	50.708	193.718	OK
	M Lap	125.38	156.72	0.0035	0.0271	0.02032	0.01016	18.824	3.675	389.579	539	T. Sblh	1.9201	0.00531	0.00531	1001.31	20	314.29	3.2	4	1257.14	67.611	254.041	OK
	M Tump-	-156.19	195.24	0.0035	0.0271	0.02032	0.01016	18.824	3.675	199.417	539	T. Sblh	0.503	0.00139	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
B128	M Tump-	-40.93	51.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	280.605	539	T. Sblh	0.996	0.00275	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Lap	81.03	101.29	0.0035	0.0271	0.02032	0.01016	18.824	3.675	446.843	539	T. Sblh	2.526	0.00698	0.00698	1317.32	22	380.29	3.5	4	1521.14	81.809	303.070	OK
	M Tump-	-205.48	256.85	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.778	539	T. Sblh	1.796	0.00496	0.00496	936.594	22	380.29	2.5	3	1140.86	61.357	231.969	OK
B129	M Tump-	-146.10	182.62	0.0035	0.0271	0.02032	0.01016	18.824	3.675	324.125	539	T. Sblh	1.3291	0.00367	0.00367	693.116	22	380.29	1.8	2	760.571	40.905	157.757	OK
	M Lap	108.12	135.15	0.0035	0.0271	0.02032	0.01016	18.824	3.675	468.561	539	T. Sblh	2.7776	0.00768	0.00768	1448.48	22	380.29	3.8	4	1521.14	81.809	303.070	OK
	M Tump-	-225.94	282.43	0.0035	0.0271	0.02032	0.01016	18.824	3.675	337.746	539	T. Sblh	1.443	0.00399	0.00399	752.593	22	380.29	2.0	2	760.571	40.905	157.757	OK
B130	M Tump-	-117.39	146.74	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.077	539	T. Sblh	1.216	0.00336	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Lap	98.95	123.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	228.488	539	T. Sblh	0.660	0.00183	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-53.73	67.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	228.488	539	T. Sblh	0.660	0.00183	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] M_u = Momen rencana balok (dari tabel)
- [4] $M_u / 0.8$
- [5] $\rho_{min} = 1.4 / f_y$
- [6] $\rho_b = ((0.85 \cdot f_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y))$
- [7] $\rho_{mak} = 0.5 \cdot \rho_b$
- [8] ρ_{pakai}
- [9] $m = f_y / (0.85 \cdot f_c)$
- [10] $R_n = \rho \cdot f_y \cdot (1 - \rho / m)$
- [11] $d_{perlu} = \sqrt{(M_u / (R_n \cdot b))}$
- [12] $d_{pakai} = h - d'$
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $\rho_{ada} = \rho \cdot (Rn_{ada} / Rn)$
- [16] ρ_{pakai}
- [17] $As_{perlu} = \rho_{ada} \cdot b \cdot d_{ada}$
- [18] \emptyset tulangan dipakai
- [19] $A10 = Luas \emptyset$ tulangan
- [20] $n = As_{ada} / 10$
- [21] jumlah tul. Dipasang
- [22] $As_{ada} = n_{terpasang} \cdot A_{10}$
- [23] $\alpha = (As_{ada} \cdot f_y) / 0.85 \cdot f_c \cdot b$
- [24] $Mn = As_{ada} \cdot f_y \cdot (d - \alpha \cdot 2)$
- [25] C/FK = $Mn > Mu$ 0.8 OK

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa b = 350 mm
 f_y polos = 240 Mpa h = 600 mm
 penutup beton = 40 Mpa d = 539 mm
 \emptyset Tul. Pokok = 22 mm f_c = 25 Mpa
 \emptyset Tul. Sengk = 10 mm d' = 61 mm

	M Tump-	-91.36	114.20	0.0035	0.0271	0.02032	0.01016	18.824	3.675	297.952	539	T. Sblh	1.123	0.0031	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
B119	M Lap	68.80	85.99	0.0035	0.0271	0.02032	0.01016	18.824	3.675	258.35	539	T. Sblh	0.846	0.00234	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	7.63	9.54	0.0035	0.0271	0.02032	0.01016	18.824	3.675	86.1173	539	T. Sblh	0.094	0.00026	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-168.09	210.12	0.0035	0.0271	0.02032	0.01016	18.824	3.675	404.15	539	T. Sblh	2.0664	0.00571	0.00571	1077.62	20	314.29	3.4	4	1257.14	67.611	254.041	OK
	M Lap	105.35	131.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	319.957	539	T. Sblh	1.2951	0.00358	0.00358	675.402	20	314.29	2.1	3	942.857	50.708	193.718	OK
B120	M Tump-	-209.47	261.84	0.0035	0.0271	0.02032	0.01016	18.824	3.675	451.159	539	T. Sblh	2.5751	0.00712	0.00712	1342.89	20	314.29	4.3	5	1571.43	84.514	312.239	OK
	M Lap	-118.57	148.21	0.0035	0.0271	0.02032	0.01016	18.824	3.675	339.431	539	T. Sblh	1.4576	0.00403	0.00403	760.119	20	314.29	2.4	3	942.857	50.708	193.718	OK
	M Tump-	75.72	94.66	0.0035	0.0271	0.02032	0.01016	18.824	3.675	271.259	539	T. Sblh	0.9309	0.00257	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
	M Tump-	-99.00	123.75	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.159	539	T. Sblh	1.217	0.00336	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK
B122	M Tump-	-59.91	74.89	0.0035	0.0271	0.02032	0.01016	18.824	3.675	241.28	539	T. Sblh	0.737	0.00204	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Lap	167.03	208.79	0.0035	0.0271	0.02032	0.01016	18.824	3.675	402.868	539	T. Sblh	2.053	0.00568	0.00568	1070.79	22	380.29	2.8	3	1140.86	61.357	231.969	OK
	M Tump-	-248.02	310.03	0.0035	0.0271	0.02032	0.01016	18.824	3.675	490.922	539	T. Sblh	3.049	0.00843	0.00843	1590.03	22	380.29	4.2	5	1901.43	102.262	371.059	OK
	M Tump-	-115.77	144.72	0.0035	0.0271	0.02032	0.01016	18.824	3.675	335.408	539	T. Sblh	1.4232	0.00393	0.00393	742.209	22	380.29	2.0	2	760.571	40.905	157.757	OK
B123	M Lap	44.55	55.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	208.072	539	T. Sblh	0.5477	0.00151	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK
	M Tump-	-164.13	205.17	0.0035	0.0271	0.02032	0.01016	18.824	3.675	399.361	539	T. Sblh	2.0177	0.00558	0.00558	1052.23	22	380.29	2.8	3	1140.86	61.357	231.969	OK
	M Tump-	-175.38	219.23	0.0035	0.0271	0.02032	0.01016	18.824	3.675	412.816	539	T. Sblh	2.156	0.00596	0.00596	1124.33	22	380.29	3.0	3	1140.86	61.357	231.969	OK
	M Lap	160.72	200.90	0.0035	0.0271	0.02032	0.01016	18.824	3.675	395.187	539	T. Sblh	1.976	0.00546	0.00546	1030.35	22	380.29	2.7	3	1140.86	61.357	231.969	OK
B124	M Tump-	-91.45	114.31	0.0035	0.0271	0.02032	0.01016	18.824	3.675	298.1	539	T. Sblh	1.124	0.00311	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] M_u = Momen rencana balok (dari tabel)
- [4] $M_u / 0,8$
- [5] ρ_{min} = $1,4/f_y$
- [6] ρ_b = $((0,85 \cdot f_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y))$
- [7] ρ_{maks} = $0,5 \cdot \rho_b$
- [8] ρ_{pakai}
- [9] m = $f_y / (0,85 \cdot f_c)$
- [10] R_n = $p \cdot f_y \cdot (1 - 1/2p \cdot m)$
- [11] d_{perlu} = $\sqrt{(M_u / (R_n \cdot b))}$
- [12] d_{pakai} = $h - d'$
- [14] Rn_{ada} = $Mn / b \cdot d^2$
- [15] ρ_{ada} = $\rho \cdot (Rn_{ada} / Rn)$
- [16] ρ_{pakai}
- [17] As_{perlu} = $\rho_{ada} \cdot b \cdot d_{ada}$
- [18] O tulangan dipakai
- [19] $A10$ = Luas 1 tulangan
- [20] n = $As_{ada} / A10$
- [21] jumlah tul. Dipasang
- [22] As_{ada} = $n \cdot terpasang \cdot A10$
- [23] a = $(As_{ada} \cdot fy) / 0,85 \cdot f_c \cdot b$
- [24] Mn = $As_{ada} \cdot fy \cdot (d - a / 2)$
- [25] CEFK $Mn > Mu \cdot 0,8$ OK

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa b = 350 mm
 f_y polos = 240 Mpa h = 600 mm
 penutup beton = 40 Mpa d = 539 mm
 \emptyset Tul. Pokok = 22 mm f'_c = 25 Mpa
 \emptyset Tul. Sengkang = 10 mm d' = 61 mm

Balok	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
	Mu kNm	$Mu/0,8$ kNm	ρ_{min}	ρ_b	ρ_{maks}	ρ_{pakai}	m mm	Rn	d_{perlu}	d_{pakai}	Analisis	Rn_{ada}	ρ_{barn}	ρ_{pakai}	AS_{perlu} mm	O mm	A_{10}	n	tul pakai	AS_{ada} mm ²	a mm	Mn kNm	CEK.		
BT13	M Tump-	-125.55	156.94	0.0035	0.0271	0.02032	18.824	3.675	349.287	539	T. Sblh	1.543	0.00427	0.00427	804.904	20	314.29	2.6	3	942.857	50.708	193.718	OK		
	M Lap	92.85	116.06	0.0035	0.0271	0.02032	18.824	3.675	300.372	539	T. Sblh	1.141	0.00316	0.00316	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK		
	M Tump-	-207.03	258.79	0.0035	0.0271	0.02032	18.824	3.675	448.522	539	T. Sblh	2.545	0.00704	0.00704	1327.23	20	314.29	4.2	5	1571.43	84.514	312.239	OK		
	M Tump-	-173.71	217.14	0.0035	0.0271	0.02032	18.824	3.675	410.844	539	T. Sblh	2.1354	0.0059	0.0059	1113.61	20	314.29	3.5	4	1257.14	67.611	254.041	OK		
BT14	M Lap	103.35	129.18	0.0035	0.0271	0.02032	18.824	3.675	316.894	539	T. Sblh	1.2705	0.00351	0.00351	662.535	20	314.29	2.1	3	942.857	50.708	193.718	OK		
	M Tump-	-207.87	259.84	0.0035	0.0271	0.02032	18.824	3.675	449.432	539	T. Sblh	2.5554	0.00706	0.00706	1332.63	20	314.29	4.2	5	1571.43	84.514	312.239	OK		
	M Tump-	-116.28	145.36	0.0035	0.0271	0.02032	18.824	3.675	336.145	539	T. Sblh	1.4295	0.00395	0.00395	745.476	20	314.29	2.4	3	942.857	50.708	193.718	OK		
	M Lap	75.28	94.10	0.0035	0.0271	0.02032	18.824	3.675	270.456	539	T. Sblh	0.9254	0.00236	0.00236	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK		
BT15	M Tump-	-102.18	127.73	0.0035	0.0271	0.02032	18.824	3.675	315.101	539	T. Sblh	1.2561	0.00347	0.00347	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK		
	M Tump-	-40.93	51.16	0.0035	0.0271	0.02032	18.824	3.675	199.417	539	T. Sblh	0.503	0.00139	0.00139	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK		
	M Lap	81.03	101.29	0.0035	0.0271	0.02032	18.824	3.675	280.605	539	T. Sblh	0.996	0.00275	0.00275	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK		
	M Tump-	-205.48	256.85	0.0035	0.0271	0.02032	18.824	3.675	446.843	539	T. Sblh	2.526	0.00698	0.00698	1317.32	22	380.29	3.5	4	1521.14	81.809	303.070	OK		
BT16	M Tump-	-146.10	182.62	0.0035	0.0271	0.02032	18.824	3.675	376.778	539	T. Sblh	1.796	0.00496	0.00496	936.594	22	380.29	2.5	3	1140.86	61.357	231.969	OK		
	M Lap	108.12	135.15	0.0035	0.0271	0.02032	18.824	3.675	324.125	539	T. Sblh	1.3291	0.00367	0.00367	693.116	22	380.29	1.8	2	760.571	40.905	157.757	OK		
	M Tump-	-225.94	282.43	0.0035	0.0271	0.02032	18.824	3.675	468.561	539	T. Sblh	2.7776	0.00768	0.00768	1448.48	22	380.29	3.8	4	1521.14	81.809	303.070	OK		
	M Tump-	-117.39	146.74	0.0035	0.0271	0.02032	18.824	3.675	337.746	539	T. Sblh	1.443	0.00399	0.00399	752.593	22	380.29	2.0	2	760.571	40.905	157.757	OK		
BT18	M Lap	98.95	123.69	0.0035	0.0271	0.02032	18.824	3.675	310.077	539	T. Sblh	1.216	0.00336	0.00336	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK		
	M Tump-	-53.73	67.16	0.0035	0.0271	0.02032	18.824	3.675	228.488	539	T. Sblh	0.660	0.00183	0.00183	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK		

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] Mu = Momen rencana balok (dari tabel)
- [4] $Mu/0,8$
- [5] $\rho_{min} = 1.4/f_y$
- [6] $\rho_b = ((0,85 \cdot f'_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y))$
- [7] $\rho_{maks} = 0,5 \cdot \rho_b$
- [8] ρ_{pakai}
- [9] $m = f_y / (0,85 \cdot f'_c)$
- [10] $R_n = \rho \cdot f_y \cdot (1 - \rho \cdot m)$
- [11] $d_{perlu} = \sqrt{(M_n / (R_n \cdot b))}$
- [12] $d_{pakai} = h - d'$
- [13] Analisis
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $\rho_{ada} = \rho \cdot (Rn_{ada} / Rn)$
- [16] ρ_{pakai}
- [17] $AS_{perlu} = \rho_{ada} \cdot b \cdot d_{ada}$
- [18] O tulangan dipakai
- [19] $A10 = Luas 1 tulangan$
- [20] $n = AS_{10} / A_{10}$
- [21] jumlah tul. Dipasang
- [22] $AS_{ada} = n \cdot tepasang \cdot A_{10}$
- [23] $a = (AS_{ada} \cdot f_y) / 0,85 \cdot f'_c \cdot b$
- [24] $Mn = AS_{ada} \cdot f_y \cdot (d - a / 2)$
- [25] CEK $Mn = Mu \cdot 0,8 \cdot OK$

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa $b = 350$ mm
 f_y polos = 240 Mpa $h = 600$ mm
 penutup beton = 40 Mpa $d = 539$ mm
 \emptyset Tul. Pokok = 22 mm $f_c = 25$ Mpa
 \emptyset Tul. Sengkang = 10 mm $d' = 61$ mm

Balok	Mu kNm	Mu/0,8 kNm	ρ_{min}	ρ_b	ρ_{maks}	ρ_{pakar}	m mm	Rn	d _{perlu}	d _{pakar}	Analisis	Rn _{ada}	ρ_{baru}	ρ_{pakar}	As _{perlu} mm ²	O	A ₁₀	n	jumlah pakar	As _{ada} mm ²	a	Mn kNm	CEK	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
M Tump-	-82.72	103.40	0.0035	0.0271	0.02032	0.01016	18.824	3.675	283.514	539	T.Sblh	1.017	0.00281	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK	
M Lap	70.02	87.53	0.0035	0.0271	0.02032	0.01016	18.824	3.675	260.847	539	T.Sblh	0.861	0.00238	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK	
M Tump-	-170.75	213.44	0.0035	0.0271	0.02032	0.01016	18.824	3.675	407.336	539	T.Sblh	2.099	0.0058	0.0058	1094.68	20	314.29	3.5	4	1257.14	67.611	254.041	OK	
M Tump-	-159.15	198.94	0.0035	0.0271	0.02032	0.01016	18.824	3.675	393.252	539	T.Sblh	1.9565	0.00541	0.00541	1020.28	20	314.29	3.2	4	1257.14	67.611	254.041	OK	
M Lap	98.45	123.06	0.0035	0.0271	0.02032	0.01016	18.824	3.675	309.295	539	T.Sblh	1.2103	0.00335	0.0035	660.275	20	314.29	2.1	3	942.857	50.708	193.718	OK	
M Tump-	-216.75	270.94	0.0035	0.0271	0.02032	0.01016	18.824	3.675	458.934	539	T.Sblh	2.6646	0.00737	0.00737	1389.57	20	314.29	4.4	5	1571.43	84.514	312.239	OK	
M Tump-	-181.66	227.07	0.0035	0.0271	0.02032	0.01016	18.824	3.675	420.14	539	T.Sblh	2.2332	0.00617	0.00617	1164.57	20	314.29	3.7	4	1257.14	67.611	254.041	OK	
M Lap	118.11	147.64	0.0035	0.0271	0.02032	0.01016	18.824	3.675	338.776	539	T.Sblh	1.452	0.00401	0.00401	757.189	20	314.29	2.4	3	942.857	50.708	193.718	OK	
M Tump-	-154.92	193.65	0.0035	0.0271	0.02032	0.01016	18.824	3.675	387.992	539	T.Sblh	1.9045	0.00526	0.00526	993.176	20	314.29	3.2	4	1257.14	67.611	254.041	OK	
M Tump-	-40.93	51.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	199.417	539	T.Sblh	0.503	0.00139	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK	
M Lap	81.03	101.29	0.0035	0.0271	0.02032	0.01016	18.824	3.675	280.605	539	T.Sblh	0.996	0.00275	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK	
M Tump-	-205.48	256.85	0.0035	0.0271	0.02032	0.01016	18.824	3.675	446.843	539	T.Sblh	2.526	0.00698	0.00698	1317.32	22	380.29	3.5	4	1521.14	81.809	303.070	OK	
M Tump-	-146.10	182.62	0.0035	0.0271	0.02032	0.01016	18.824	3.675	376.778	539	T.Sblh	1.796	0.00496	0.00496	936.594	22	380.29	2.5	3	1140.86	61.357	231.969	OK	
M Lap	108.12	135.15	0.0035	0.0271	0.02032	0.01016	18.824	3.675	324.125	539	T.Sblh	1.3291	0.00367	0.00367	693.116	22	380.29	1.8	2	760.571	40.905	157.757	OK	
M Tump-	-225.94	282.43	0.0035	0.0271	0.02032	0.01016	18.824	3.675	468.561	539	T.Sblh	2.7776	0.00768	0.00768	1448.48	22	380.29	3.8	4	1521.14	81.809	303.070	OK	
M Tump-	-117.39	146.74	0.0035	0.0271	0.02032	0.01016	18.824	3.675	337.746	539	T.Sblh	1.443	0.00399	0.00399	752.593	22	380.29	2.0	2	760.571	40.905	157.757	OK	
M Lap	98.95	123.69	0.0035	0.0271	0.02032	0.01016	18.824	3.675	310.077	539	T.Sblh	1.216	0.00336	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK	
M Tump-	-53.73	67.16	0.0035	0.0271	0.02032	0.01016	18.824	3.675	228.488	539	T.Sblh	0.6660	0.00183	0.0035	660.275	22	380.29	1.7	2	760.571	40.905	157.757	OK	

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] Mu = Momen rencana balok (dari tabel)
- [4] Mu/0,8
- [5] $\rho_{min} = 1,4/f_y$
- [6] $\rho_b = ((0,85 \cdot f_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y))$
- [7] $\rho_{maks} = 0,5 \cdot \rho_b$
- [8] ρ_{pakar}
- [9] $m = f_y / (0,85 \cdot f_c)$
- [10] $R_n = \rho \cdot f_y \cdot (1 - \rho / m)$
- [11] $d_{perlu} = \sqrt{(M_n / (R_n \cdot b))}$
- [12] $d_{pakar} = h - d'$
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $\rho_{ada} = Rn / (Rn_{ada} \cdot Rn)$
- [16] ρ_{pakar}
- [17] $As_{perlu} = \rho_{ada} \cdot b \cdot d_{ada}$
- [18] O tulangan dipakai
- [19] A10 = Luas 1 tulangan
- [20] n = jumlah tul. Dipasang
- [21] $As_{ada} = n \cdot \rho_{pakar} \cdot A_{10}$
- [22] $As_{ada} = n \cdot \rho_{pakar} \cdot A_{10}$
- [23] $a = (As_{ada} \cdot f_y) / 0,85 \cdot f_c \cdot b$
- [24] $Mn = As_{ada} \cdot f_y \cdot (d - a / 2)$
- [25] CEK = Mn - Mu > 0,8 OK

Tabel Penulangan Lentur Balok Tribun

f_y deform = 400 Mpa $b = 350$ mm
 f_y polos = 240 Mpa $h = 600$ mm
 penutup beton = 40 Mpa $d = 539$ mm
 \varnothing Tul. Pokok = 22 mm $f_c = 25$ Mpa
 \varnothing Tul. Sengk = 10 mm $d' = 61$ mm

Balok	Mtu kNm	Mtu/0,8 kNm	ρ_{min}	ρ_b	ρ_{Maks}	ρ_{Pakai}	m mm	Rn	d_{Perlu}	d_{Pakai}	Analisis	Rn_{ada}	ρ_{baru}	ρ_{Pakai}	As_{Perlu} mm	\varnothing	A_{10}	n	tul pakai	As_{ada} mm ²	a mm	Mn kNm	CEK	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
B11	M Tump- M Lap	-46.03 54.28	57.53 67.85	0.0035 0.0035	0.0271 0.0271	0.02032 0.02032	0.01016 0.01016	18.824 18.824	3.675 3.675	211.482 229.669	539 539	T.Sblh T.Sblh	0.566 0.667	0.00156 0.00184	0.0035 0.0035	660.275 660.275	20 20	314.29 314.29	2.1 2.1	3 3	942.857 942.857	50.708 50.708	193.718 193.718	OK OK
B12	M Tump- M Lap	-70.10 -157.33	87.63 196.67	0.0035 0.0035	0.0271 0.0271	0.02032 0.02032	0.01016 0.01016	18.824 18.824	3.675 3.675	260.999 390.999	539 539	T.Sblh T.Sblh	0.862 1.9341	0.00238 0.00535	0.0035 0.00535	660.275 1008.63	20 20	314.29 314.29	2.1 3.2	3 4	942.857 1257.14	50.708 67.611	193.718 254.041	OK OK
B13	M Tump- M Lap	117.26 -15.60	146.58 19.50	0.0035 0.0035	0.0271 0.0271	0.02032 0.02032	0.01016 0.01016	18.824 18.824	3.675 3.675	337.554 123.127	539 539	T.Sblh T.Sblh	1.4415 0.1918	0.00398 0.00053	0.00398 0.0035	751.736 660.275	20 20	314.29 314.29	2.4 2.1	3 3	942.857 942.857	50.708 50.708	193.718 193.718	OK OK
B14	M Tump- M Lap	-35.88 36.78	44.85 45.98	0.0035 0.0035	0.0271 0.0271	0.02032 0.02032	0.01016 0.01016	18.824 18.824	3.675 3.675	186.728 189.058	539 539	T.Sblh T.Sblh	0.4411 0.4522	0.00122 0.00125	0.0035 0.0035	660.275 660.275	20 20	314.29 314.29	2.1 2.1	3 3	942.857 942.857	50.708 50.708	193.718 193.718	OK OK
B15	M Tump- M Lap	-115.15 -101.12	143.94 126.40	0.0035 0.0035	0.0271 0.0271	0.02032 0.02032	0.01016 0.01016	18.824 18.824	3.675 3.675	334.5 313.457	539 539	T.Sblh T.Sblh	1.4155 1.243	0.00391 0.00344	0.00391 0.0035	738.195 660.275	20 20	314.29 314.29	2.3 2.1	3 3	942.857 942.857	50.708 50.708	193.718 193.718	OK OK
B16	M Tump- M Lap	52.75 -200.95	65.94 251.19	0.0035 0.0035	0.0271 0.0271	0.02032 0.02032	0.01016 0.01016	18.824 18.824	3.675 3.675	226.398 441.884	539 539	T.Sblh T.Sblh	0.648 2.470	0.00179 0.00683	0.0035 0.00683	660.275 1288.24	20 20	314.29 314.29	2.1 4.1	3 5	942.857 1571.43	50.708 84.514	193.718 312.239	OK OK
B17	M Tump- M Lap	-162.59 169.35	203.24 211.69	0.0035 0.0035	0.0271 0.0271	0.02032 0.02032	0.01016 0.01016	18.824 18.824	3.675 3.675	397.48 405.658	539 539	T.Sblh T.Sblh	1.9988 2.0819	0.00553 0.00575	0.00553 0.00575	1042.34 1085.67	20 20	314.29 314.29	3.3 3.5	4 4	1257.14 1257.14	67.611 67.611	254.041 254.041	OK OK
B18	M Tump- M Lap	-66.60 -39.92	83.25 49.90	0.0035 0.0035	0.0271 0.0271	0.02032 0.02032	0.01016 0.01016	18.824 18.824	3.675 3.675	254.393 196.959	539 539	T.Sblh T.Sblh	0.8187 0.4908	0.00226 0.00136	0.0035 0.0035	660.275 660.275	20 20	314.29 314.29	2.1 2.1	3 3	942.857 942.857	50.708 50.708	193.718 193.718	OK OK
B19	M Tump- M Lap	41.63 -119.65	52.04 149.56	0.0035 0.0035	0.0271 0.0271	0.02032 0.02032	0.01016 0.01016	18.824 18.824	3.675 3.675	201.129 340.972	539 539	T.Sblh T.Sblh	0.5118 1.4709	0.00141 0.00407	0.0035 0.00407	660.275 767.038	20 20	314.29 314.29	2.1 2.4	3 3	942.857 942.857	50.708 50.708	193.718 193.718	OK OK

Keterangan :

- [1] Balok Ditinjau
- [2] Analisis : M Tump Negatif, M Tump Positif, M Lap
- [3] Mtu = Momen rencana balok (dari tabel)
- [4] $Mtu/0,8$
- [5] ρ_{min} = 1.4/ f_y
- [6] $\rho_b = ((0,85 \cdot f_c \cdot \beta_1) / f_y) \cdot (600 / (600 + f_y \cdot y))$
- [7] $\rho_{maks} = 0,5 \cdot \rho_b$
- [8] ρ_{Pakai}
- [9] $m = f_y / (0,85 \cdot f_c)$
- [10] $R_n = \rho \cdot f_y \cdot (1 - \rho \cdot m)$
- [11] $d_{perlu} = \sqrt{(M_n / (R_n \cdot b))}$
- [12] $d_{pakai} = h - d'$
- [13] Rn_{ada}
- [14] $Rn_{ada} = Mn / b \cdot d^2$
- [15] $\rho_{ada} = \rho \cdot (Rn_{ada} / Rn)$
- [16] ρ_{Pakai}
- [17] $As_{perlu} = \rho_{ada} \cdot b \cdot d_{ada}$
- [18] \varnothing tulangan dipakai
- [19] $A_{10} = Luas 1$ tulangan
- [20] $n = As_{ada} / A_{10}$
- [21] jumlah tul. Dipasang
- [22] $As_{ada} = n \cdot tepasang \cdot A_{10}$
- [23] $a = (As_{ada} \cdot f_y) / 0,85 \cdot f_c \cdot b$
- [24] $Mn = As_{ada} \cdot f_y \cdot (d - a / 2)$
- [25] CEK $Mn < Mu$ 0,8 OK

Tabel Gaya Geser Balok Portal As Y1

No Portal	Balok	Jarak (m)	daerah geser	V _d (kNm)	V _l (kNm)	Beban Gempa		Vu1 (kNm)	Vu2 (kNm)	Vu3 (kNm)	Vu4 (kNm)	Vu5 (kNm)	Ket
						V _{lx}	V _{ex}						
{1}	{2}	{3}	{4}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
	B312	0	M _{lampa,ki}	51.09677	22.6359184	0.21679774	11.4616463	97.5335946	80.015258	55.8092182	71.7502943	64.07418	
		1.37815	M _{lap}	71.95866	26.2216163	0.21679774	11.4616463	128.304982	104.179235	79.9731952	95.9142713	88.23816	
		2.7563	M _{lap}	91.83129	28.8651564	0.21679774	11.4616463	156.381799	126.710924	102.504884	118.44596	110.7698	
		0	M _{lap}	-20.9892	-1.7772041	-0.5068662	11.9651506	-28.030563	-10.75455	-35.562041	-19.921483	-26.3951	
	B313	1.37585	M _{lap}	1.774236	2.00872235	-0.5068662	11.9651506	5.34303847	15.5321877	-9.2753028	6.36525535	-0.10837	
		2.7517	M _{lap}	24.53767	5.7946488	-0.5068662	11.9651506	38.7166401	41.8189258	17.0114352	32.6519934	26.17837	
		0	M _{lap}	-99.7625	-34.339665	-0.4508048	12.774647	-174.65843	-113.1132	-139.65596	-122.83391	-129.935	
	B314	1.42415	M _{lap}	-77.8355	-30.283116	-0.4508048	12.774647	-141.85564	-87.534313	-114.07706	-97.25502	-104.356	
		2.8483	M _{lampa,ka}	-55.9086	-26.226567	-0.4508048	12.774647	-109.05286	-61.985422	-88.498173	-71.676129	-78.7775	
		0	M _{lampa,ki}	20.34046	12.7457925	-0.1375763	-18.456836	44.801824	9.96432194	48.8103497	23.4289775	35.34569	
	B315	1.5	M _{lap}	43.67401	17.2457925	-0.1375763	-18.456836	80.0020768	37.2995431	76.1455709	50.7641987	62.68092	
		3	M _{lap}	67.00755	21.7457925	-0.1375763	-18.456836	115.20233	64.6347643	103.480792	78.0994199	90.01614	
		0	M _{lap}	-64.4979	-20.88237	-0.3495384	-18.478134	-110.80928	-100.39084	-61.366548	-87.066321	-74.6911	
	B316	1.5	M _{lap}	-41.1644	-16.38237	-0.3495384	-18.478134	-75.609026	-73.055617	-34.031327	-59.7311	-47.3558	
		3	M _{lampa,ka}	-17.8308	-11.88237	-0.3495384	-18.478134	-40.408773	-45.720396	-6.6961058	-32.395878	-20.0206	
		0	M _{lampa,ki}	19.96835	13.0686712	-8.82E-02	-18.1456	44.8718962	10.1193826	48.2806821	23.3916021	35.00846	
	B317	1.5	M _{lap}	43.3019	17.5686712	-8.82E-02	-18.1456	80.072149	37.4546038	75.6159033	50.7268233	62.34368	
		3	M _{lap}	66.63544	22.0686712	-8.82E-02	-18.1456	115.272402	64.789825	102.951125	78.0620445	89.6789	
		0	M _{lap}	-65.6223	-21.245904	-0.2949908	-18.145902	-112.74026	-101.4345	-63.142265	-88.314084	-76.2627	
	B318	1.5	M _{lap}	-42.2888	-16.745904	-0.2949908	-18.145902	-77.54001	-74.099282	-35.807044	-60.978862	-48.9275	
		3	M _{lampa,ka}	-18.9553	-12.245904	-0.2949908	-18.145902	-42.339757	-46.764061	-8.4718229	-33.643641	-21.5922	
		0	M _{lampa,ki}	-37.9013	-0.3040141	-0.1330257	-12.551584	-45.967977	-53.208956	-26.766823	-44.081315	-35.8945	
	B319	3	M _{lap}	-0.68421	-0.3040141	-0.1330257	-12.551584	-1.3074718	-14.131014	12.3111196	-5.003373	3.183479	
		6	M _{lap}	36.53288	-0.3040141	-0.1330257	-12.551584	43.3330338	24.9469289	51.389062	34.0745694	42.26142	
		0	M _{lap}	18.09845	11.7935252	-3.39E-02	-18.051369	40.5879054	7.46880123	45.3980045	20.7116728	32.15513	
	B320	1.5	M _{lap}	41.4321	16.2935252	-3.39E-02	-18.051369	75.7881582	34.8040224	72.7332257	48.046894	59.49035	
		3	M _{lampa,ka}	64.76564	20.7935252	-3.39E-02	-18.051369	110.988411	62.1392436	100.068447	75.3821152	86.82558	

PORTAL A-AS Y1 LT2

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	daerah geser	V _d (kNm)	V _i (kNm)	Beban Gempa		Vu ₁ (kNm)	Vu ₂ (kNm)	Vu ₃ (kNm)	Vu ₄ (kNm)	Vu ₅ (kNm)	Ket
							V _{ey}	V _{ex}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
	PORTAL A-AS Y1 LT3	B159	0	M _{lap}	21.63217	13.3453915	-0.2309664	12.8563314	47.3112248	44.5477638	17.6949766	34.9285998	27.31414	
			1.5	M _{lap}	44.96571	17.8453915	-0.2309664	12.8563314	82.5114776	71.882985	45.0301978	62.263821	54.64936	
			3	M _{Jump,ka}	68.29925	22.3453915	-0.2309664	12.8563314	117.71173	99.2182062	72.365419	89.5990422	81.98458	
		0	M _{Jump,ki}	-99.7625	-34.339665	-0.4508048	12.774647	-174.65843	-113.1132	-139.65596	-122.83391	-129.935		
		1.42415	M _{lap}	-77.8355	-30.283116	-0.4508048	12.774647	-141.85564	-87.534313	-114.07706	-97.25502	-104.356		
		2.8483	M _{lap}	-55.9086	-26.226567	-0.4508048	12.774647	-109.05286	-61.955422	-88.498173	-71.676129	-78.7775		
		0	M _{lap}	-20.9892	-1.7772041	-0.5068662	11.9651506	-28.030563	-10.75455	-55.562041	-19.921483	-26.3951		
		1.37585	M _{lap}	1.774236	2.00872235	-0.5068662	11.9651506	5.34303847	15.5321877	-9.2753028	6.36525535	-0.10837		
		2.7517	M _{lap}	24.53767	5.7946488	-0.5068662	11.9651506	38.7166401	41.8189258	17.0114352	32.6519934	26.17837		
		0	M _{lap}	51.09677	22.6359184	0.21679774	11.4616463	97.5335946	80.015258	55.8092182	71.7502943	64.07418		
	1.37815	M _{lap}	71.95866	26.2216163	0.21679774	11.4616463	128.304982	104.179233	79.9731952	95.9142713	88.23816			
	2.7563	M _{Jump,ka}	91.83129	28.8651564	0.21679774	11.4616463	156.381799	126.710924	102.504884	118.44596	110.7698			

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	daerah geser	V _d (kNm)	V _L (kNm)	Beban Gempa		V _{U1} (kNm)	V _{U2} (kNm)	V _{U3} (kNm)	V _{U4} (kNm)	V _{U5} (kNm)	Ket
							V _{gy}	V _{ex}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B149	0	M _{Tump.Ki}	-69.877	-23.732478	-9.49E-02	12.625054	-121.82433	-75.095878	-101.54868	-84.445078	-92.1995	
			1.5	M _{Jap}	-46.5434	-19.232478	-9.49E-02	12.625054	-86.624073	-47.760657	-74.213455	-57.109857	-64.8643	
			3	M _{Jap}	-23.2099	-14.732478	-9.49E-02	12.625054	-51.42382	-20.425436	-46.878234	-29.774636	-37.529	
		B150	0	M _{Jap}	22.26138	14.2542109	-4.85E-02	12.6254553	49.5203955	45.5960533	19.113154	36.2806939	28.42851	
			1.5	M _{Jap}	45.59493	18.7542109	-4.85E-02	12.6254553	84.7206483	72.9312745	46.4485752	63.6159151	55.76373	
			3	M _{Tump.Ka}	68.92847	23.2542109	-4.85E-02	12.6254553	119.920901	100.266496	73.7835964	90.9511363	83.09896	
		B151	0	M _{Tump.Ki}	-70.068	-23.834476	-0.1157146	12.6447739	-122.21676	-75.346553	-101.82768	-84.725512	-92.4487	
			1.5	M _{Jap}	-46.7345	-19.334476	-0.1157146	12.6447739	-87.016503	-48.011332	-74.492457	-57.390291	-65.1135	
			3	M _{Jap}	-23.4009	-14.834476	-0.1157146	12.6447739	-51.816251	-20.676111	-47.157236	-30.05507	-37.7783	
		B152	0	M _{Jap}	23.23389	15.1196909	-6.93E-02	12.6450587	52.0721743	47.1764774	20.6655037	37.8314347	30.01055	
			1.5	M _{Jap}	46.56743	19.6196909	-6.93E-02	12.6450587	87.2724271	74.5116986	48.0007249	65.1666559	57.34577	
			3	M _{Tump.Ka}	69.90098	24.1196909	-6.93E-02	12.6450587	122.47268	101.84692	75.3359461	92.5018771	84.68099	
		B153	0	M _{Tump.Ki}	-69.1423	-22.967722	-0.1331153	12.6419178	-119.71907	-73.836957	-100.30112	-83.226607	-90.9115	
			1.5	M _{Jap}	-45.8087	-18.467722	-0.1331153	12.6419178	-84.518816	-46.501736	-72.965901	-55.891385	-63.5763	
			3	M _{Jap}	-22.4752	-13.967722	-0.1331153	12.6419178	-49.318564	-19.166515	-45.63068	-28.556164	-36.241	
		B154	0	M _{Jap}	19.57538	12.3819032	-8.27E-02	12.6460733	43.3014991	41.6070822	15.1024102	32.2514561	24.45804	
			1.5	M _{Jap}	42.90892	16.8819032	-8.27E-02	12.6460733	78.5017519	68.9423034	42.4376314	59.5866773	51.79326	
			3	M _{Tump.Ka}	66.24247	21.3819032	-8.27E-02	12.6460733	113.702005	96.2775246	69.7728526	86.9218985	79.12848	
		B156	0	M _{Tump.Ki}	-69.6009	-23.542597	-0.1779466	12.7038474	-121.1892	-74.629762	-101.19574	-84.097881	-91.7276	
			1.5	M _{Jap}	-46.2673	-19.042597	-0.1779466	12.7038474	-85.988945	-47.294541	-73.860514	-56.762659	-64.3924	
			3	M _{Jap}	-22.9338	-14.542597	-0.1779466	12.7038474	-50.788692	-19.95932	-46.525293	-29.427438	-37.0572	
		B157	0	M _{Jap}	23.74769	15.4471629	-0.1271003	12.699116	53.2126941	47.960827	21.3727567	38.5335581	30.80003	
			1.5	M _{Jap}	47.08124	19.9471629	-0.1271003	12.699116	88.4129469	75.2960482	48.7079779	65.8687793	58.13525	
			3	M _{Tump.Ka}	70.41478	24.4471629	-0.1271003	12.699116	123.6132	102.631269	76.0431991	93.2040005	85.47047	
		B158	0	M _{Tump.Ki}	-67.3132	-22.016942	-0.2636297	12.8395664	-116.00299	-71.151071	-97.948073	-80.78192	-88.3172	
			1.5	M _{Jap}	-43.9797	-17.516942	-0.2636297	12.8395664	-80.802738	-43.815849	-70.612852	-53.446699	-60.982	
			3	M _{Jap}	-20.6461	-13.016942	-0.2636297	12.8395664	-45.602485	-16.480628	-43.277631	-26.11477	-33.6468	

PORTAL A-AS Y1 L13

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	daerah geser	V _d (kNm)	V _L (kNm)	Beban Gempa		Vu1 (kNm)	Vu2 (kNm)	Vu3 (kNm)	Vu4 (kNm)	Vu5 (kNm)	Ket
							V _{xy} [8]	V _{ex} [9]						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B139	0 M _{Jap}	-70.287	-23.998293	-4.48E-02	-12.564002	-122.74165	-102.12656	-75.713952	-92.924925	-84.9156		
			1.5 M _{Jap}	-46.9534	-19.498293	-4.48E-02	-12.564002	-87.541395	-74.79134	-48.378731	-65.589704	-57.5804		
			3 M _{Jump,ka}	-23.6199	-14.998293	-4.48E-02	-12.564002	-52.341143	-47.456119	-21.045509	-38.254483	-30.2451		
		B140	0 M _{Jump,Ki}	22.66794	14.4476223	0.01709959	-12.587063	50.3177196	19.6923054	46.143656	28.9563651	36.85031		
			1.5 M _{Jap}	46.00148	18.9476223	0.01709959	-12.587063	85.5179724	47.0275266	73.4495868	56.2915863	64.18553		
			3 M _{Jap}	69.33502	23.4476223	0.01709959	-12.587063	120.718225	74.3627478	100.784808	83.6268075	91.52075		
		B141	0 M _{Jap}	-69.321	-23.431237	-3.54E-02	-12.586873	-120.67513	-100.77605	-74.321324	-91.5507	-83.5467		
			1.5 M _{Jap}	-45.9874	-18.931237	-3.54E-02	-12.586873	-85.474876	-73.440826	-46.986103	-64.215478	-56.2115		
			3 M _{Jump,ka}	-22.6539	-14.431237	-3.54E-02	-12.586873	-50.274623	-46.105605	-19.650881	-36.880237	-28.8762		
		B142	0 M _{Jump,Ki}	-69.321	-23.431237	-3.54E-02	12.5868732	-120.67513	-74.343613	-100.75376	-83.620969	-91.4764		
			1.5 M _{Jap}	-45.9874	-18.931237	-3.54E-02	12.5868732	-85.474876	-47.008392	-73.418336	-56.285748	-64.1412		
			3 M _{Jap}	-22.6539	-14.431237	-3.54E-02	12.5868732	-50.274623	-19.673171	-46.083315	-28.950527	-36.806		
		B143	0 M _{Jap}	22.66794	14.4476223	1.71E-02	12.5870633	50.3177196	46.1251384	19.6815326	36.886215	28.92046		
			1.5 M _{Jap}	46.00148	18.9476223	1.71E-02	12.5870633	85.5179724	73.4603596	47.0167538	64.2214362	56.25568		
			3 M _{Jump,ka}	69.33502	23.4476223	1.71E-02	12.5870633	120.718225	100.795581	74.351975	91.5566574	83.5909		
		B144	0 M _{Jump,Ki}	-70.287	-23.998293	-4.48E-02	12.5640024	-122.74165	-75.742156	-102.09836	-85.009604	-92.8309		
			1.5 M _{Jap}	-46.9534	-19.498293	-4.48E-02	12.5640024	-87.541395	-48.406935	-74.763136	-57.674383	-65.4957		
			3 M _{Jap}	-23.6199	-14.998293	-4.48E-02	12.5640024	-52.341143	-21.071714	-47.427914	-30.339161	-38.1605		
		B145	0 M _{Jap}	21.84549	13.9942768	3.46E-03	12.5676906	48.605432	44.9513259	18.556994	35.7166187	27.7917		
			1.5 M _{Jap}	45.17904	18.4942768	3.46E-03	12.5676906	83.8056848	72.2865471	45.8922152	63.0518399	55.12692		
			3 M _{Jump,ka}	68.51238	22.9942768	3.46E-03	12.5676906	119.005938	99.6217683	73.2274364	90.3870611	82.46214		
		B147	0 M _{Jump,Ki}	-67.4415	-22.046797	-8.33E-02	12.586604	-116.20467	-71.513363	-97.892745	-80.825734	-88.5804		
			1.5 M _{Jap}	-44.108	-17.546797	-8.33E-02	12.586604	-81.004418	-44.178142	-70.557522	-53.490533	-61.2451		
			3 M _{Jap}	-20.7744	-13.046797	-8.33E-02	12.586604	-45.804165	-16.842921	-43.222301	-26.155312	-33.9099		
		B148	0 M _{Jap}	21.26837	13.2977114	-3.30E-02	12.5832611	46.7983769	43.9113822	17.5073019	34.638436	26.78023		
			1.5 M _{Jap}	44.60191	17.7977114	-3.30E-02	12.5832611	81.9986297	71.2466034	44.8425231	61.9736772	54.11545		
			3 M _{Jump,ka}	67.93545	22.2977114	-3.30E-02	12.5832611	117.198882	98.5818246	72.1777443	89.3088984	81.45067		

PORTAL A-AS Y1 LT3

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	Jarak geser	V _d (kNm)	V _l (kNm)	Beban Gempa		Vu ₁ (kNm)	Vu ₂ (kNm)	Vu ₃ (kNm)	Vu ₄ (kNm)	Vu ₅ (kNm)	Ket
							V _{EV}	V _{EX}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B130	0 M _{Jump.Ki} 1.5 M _{Jap} 3 M _{Jap}	0 1.5 3	-69.1423 -45.8087 -22.4752	-22.967722 -18.467722 -13.967722	-0.1331153 -0.1331153 -0.1331153	-12.641918 -12.641918 -12.641918	-119.71907 -84.518816 -49.318564	-100.38498 -73.049764 -45.714542	-73.753095 -46.417874 -19.082652	-91.191015 -63.855794 -36.520573	-82.9471 -55.6118 -28.2766	
		B131	0 M _{Jap} 1.5 M _{Jap} 3 M _{Jump.Ka}	0 1.5 3	23.23389 46.56743 69.90098	15.1196909 19.6196909 24.1196909	-6.93E-02 -6.93E-02 -6.93E-02	-12.645059 -12.645059 -12.645059	52.0721743 87.2724271 122.47268	20.6218541 47.9570753 75.2922965	47.220127 74.5553482 101.890569	29.8650477 57.2002689 84.5354901	37.97695 65.31215 92.64738	
		B132	0 M _{Jump.Ki} 1.5 M _{Jap} 3 M _{Jap}	0 1.5 3	-70.068 -46.7345 -23.4009	-23.834476 -19.334476 -14.834476	-0.1157146 -0.1157146 -0.1157146	-12.644774 -12.644774 -12.644774	-122.21676 -87.016503 -51.816251	-101.90058 -74.565357 -47.938432	-75.273653 -47.938432 -20.60321	-92.69172 -65.356498 -38.021277	-84.4825 -57.1473 -29.8121	
		B133	0 M _{Jap} 1.5 M _{Jap} 3 M _{Jump.Ka}	0 1.5 3	22.26138 45.59493 68.92847	14.2542109 18.7542109 23.2542109	-4.85E-02 -4.85E-02 -4.85E-02	-12.625455 -12.625455 -12.625455	49.5203955 84.7206483 119.920901	19.0825971 46.4178183 73.7530395	45.6266101 72.9618313 100.297053	28.3266571 55.6618783 82.9970995	36.38255 63.71777 91.05299	
		B134	0 M _{Jump.Ki} 1.5 M _{Jap} 3 M _{Jap}	0 1.5 3	-69.877 -46.5434 -23.2099	-23.732478 -19.232478 -14.732478	-9.49E-02 -9.49E-02 -9.49E-02	-12.625054 -12.625054 -12.625054	-121.82433 -86.624073 -51.42382	-101.60849 -74.273271 -46.938049	-75.036063 -47.700842 -20.36362	-92.398862 -65.063641 -37.72842	-84.2457 -56.9105 -29.5753	
		B135	0 M _{Jap} 1.5 M _{Jap} 3 M _{Jump.Ka}	0 1.5 3	21.26837 44.60191 67.93545	13.2977114 17.7977114 22.2977114	-3.30E-02 -3.30E-02 -3.30E-02	-12.583261 -12.583261 -12.583261	46.7983769 81.9986297 117.198882	17.4865339 44.8217551 72.1569763	43.9321501 71.2673713 98.6025925	26.7110015 54.0462227 81.3814439	34.70768 62.0429 89.37812	
		B136	0 M _{Jump.Ki} 1.5 M _{Jap} 3 M _{Jap}	0 1.5 3	-67.4415 -44.108 -20.7744	-22.046797 -17.546797 -13.046797	-8.33E-02 -8.33E-02 -8.33E-02	-12.586604 -12.586604 -12.586604	-116.20467 -81.004418 -45.804165	-97.945232 -70.610011 -43.274789	-71.460875 -44.125654 -16.790432	-88.755315 -61.420093 -34.084872	-80.6508 -53.3156 -25.9803	
		B137	0 M _{Jap} 3 M _{Jap} 6 M _{Jump.Ka}	0 3 6	-37.1313 -0.68421 36.53288	0.18144704 -0.3040141 -0.3040141	-3.87E-02 -0.1330257 -0.1330257	-12.453196 -12.551584 -12.551584	-44.267196 -1.3074718 43.3530338	-51.961549 -14.131014 24.9469289	-25.785473 12.3111196 51.389062	-42.836875 -5.003373 34.0745694	-34.9101 3.183479 42.26142	
		B138	0 M _{Jump.Ki} 1.5 M _{Jap} 3 M _{Jap}	0 1.5 3	21.84549 45.17904 68.51258	13.9942768 18.4942768 22.9942768	3.46E-03 3.46E-03 3.46E-03	-12.567691 -12.567691 -12.567691	48.605432 83.8056848 119.005938	18.5591757 45.8943969 73.2296181	44.9491441 72.2843653 99.6195865	27.7989736 55.1341948 82.469416	35.709335 63.04457 90.37979	

PORTAL A-AS Y1 LT3

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	daerah geser	V _d (kNm)	V _l (kNm)	Beban Gempa		Vu ₁ (kNm)	Vu ₂ (kNm)	Vu ₃ (kNm)	Vu ₄ (kNm)	Vu ₅ (kNm)	Ket
							V _{gy}	V _{ex}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B121	0 1.37815 2.7563	0 M _{Jump.Ki} M _{Jap} M _{Jap}	51.09677 71.95866 91.83129	22.63359 26.22161 28.86515	0.21679774 0.21679774 0.21679774	11.4616463 11.4616463 11.4616463	97.5335946 128.304982 156.381799	80.015258 104.179235 126.710924	55.8092182 79.9731952 102.504884	71.7502943 95.9142713 118.44596	64.07418 88.23816 110.7698	
		B122	0 1.37585 2.7517	0 M _{Jap} M _{Jap} M _{Jap}	-20.9892 1.774236 24.53767	-1.7772041 2.00872235 5.7946488	-0.5068662 -0.5068662 -0.5068662	11.9651506 11.9651506 11.9651506	-28.030563 5.34303847 38.7166401	-10.75455 15.5321877 41.8189258	-35.562041 -9.2753028 17.0114352	-19.921483 6.36525335 32.6519934	-26.3951 -0.10837 26.17837	
		B123	0 1.42415 2.8483	0 M _{Jap} M _{Jap} M _{Jump.Ka}	-99.7625 -77.8355 -55.9086	-34.339665 -30.283116 -26.226567	-0.4508048 -0.4508048 -0.2309664	12.774647 12.774647 12.774647	-174.65843 -141.85564 -109.05286	-113.1132 -87.534313 -61.955422	-139.65596 -114.07706 -88.498173	-97.25502 -71.676129 26.829111	-104.356 -78.7775 35.41363	
		B124	0 1.5 3	0 M _{Jump.Ki} M _{Jap} M _{Jap}	21.63217 44.96571 68.29925	13.3433915 17.8433915 22.3433915	-0.2309664 -0.2309664 -0.2309664	-12.856331 -12.856331 -12.856331	47.3112248 82.5114776 117.71173	17.5494678 44.884689 72.2199102	44.6932726 72.0284938 99.363715	26.829111 54.1643322 81.4995534	35.41363 62.74885 90.08407	
		B125	0 1.5 3	0 M _{Jap} M _{Jap} M _{Jump.Ka}	-67.3132 -43.9797 -20.6461	-22.016942 -17.516942 -13.016942	-0.2636297 -0.2636297 -0.2636297	-12.839566 -12.839566 -12.839566	-116.00299 -80.802738 -45.602485	-98.11416 -70.778939 -43.443718	-70.984984 -43.649763 -16.314541	-88.870847 -61.535625 -34.200404	-80.2285 -52.8931 -25.5579	
		B126	0 1.5 3	0 M _{Jump.Ki} M _{Jap} M _{Jap}	23.74769 47.08124 70.41478	15.4471629 19.9471629 24.4471629	-0.1271003 -0.1271003 -0.1271003	-12.699116 -12.699116 -12.699116	53.2126941 88.4129469 123.6132	21.2926835 48.6279047 75.9631259	48.0409002 75.3761214 102.711343	30.533115 57.8683362 85.2035574	38.80047 66.13569 93.47091	
		B127	0 1.5 3	0 M _{Jap} M _{Jap} M _{Jump.Ka}	-69.6009 -46.2673 -22.9338	-23.542597 -19.042597 -14.542597	-0.1779466 -0.1779466 -0.1330257	-12.703847 -12.703847 -12.551584	-121.1892 -85.988945 -50.788692	-101.30784 -73.97262 -46.637399	-74.517656 -47.182435 -19.847213	-92.101304 -64.766083 -37.430862	-83.7242 -56.389 -29.0538	
		B128	0 3 6	0 M _{Jump.Ki} M _{Jap} M _{Jap}	-37.9013 -0.68421 36.53288	-0.3040141 -0.3040141 -0.3040141	-0.1330257 -0.1330257 -0.1330257	-12.551584 -12.551584 -12.551584	-45.967977 -1.3074718 43.3530338	-53.208956 -14.131014 24.9469289	-26.766823 12.311196 51.389062	-44.081315 -5.003373 34.0745694	-35.8945 3.183479 42.26142	
		B129	0 1.5 3	0 M _{Jap} M _{Jap} M _{Jump.Ka}	19.57538 42.90892 66.24247	12.3819032 16.8819032 21.3819032	-8.27E-02 -8.27E-02 -8.27E-02	-12.646073 -12.646073 -12.646073	43.3014991 78.5017519 113.702005	15.0503283 42.3855495 69.7207707	41.6591641 68.9943853 96.3296065	24.2844299 51.6196511 78.9548723	32.42506 59.76028 87.0955	

PORTAL A-AS Y1 L3

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	daerah geser	V _d (kNm)	V _l (kNm)	Beban Gempa		Vu ₁ (kNm)	Vu ₂ (kNm)	Vu ₃ (kNm)	Vu ₄ (kNm)	Vu ₅ (kNm)	Ket
							V _{ey}	V _{ex}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
	B60		0	M _{Jap}	-67.0157	-20.86379	-1.1334038	7.24913915	-113.80086	-76.236061	-90.765209	-82.41723	-84.604	
			1.5	M _{Jap}	-52.9071	-20.86379	-1.1334038	7.24913915	-96.870608	-61.44209	-75.951238	-67.603259	-69.7901	
			3	M _{Jump,ka}	-38.7986	-20.86379	-1.1334038	7.24913915	-79.940336	-46.628119	-61.137266	-52.789288	-54.9761	
	B61		0	M _{Jump,Ki}	38.28587	21.1861121	1.06873918	7.250648	79.840819	61.4972436	45.5975771	56.9535406	50.14128	
			1.5	M _{Jap}	52.39441	21.1861121	1.06873918	7.250648	96.7710718	76.3112148	60.4115483	71.7675118	64.95525	
			3	M _{Jap}	66.50295	21.1861121	1.06873918	7.250648	113.701325	91.125186	75.2255195	86.581483	79.76922	
	B62		0	M _{Jap}	-69.9477	-23.274721	-1.1487132	7.35032236	-121.17674	-80.752115	-95.464103	-86.998906	-89.2173	
			1.5	M _{Jap}	-55.8391	-23.274721	-1.1487132	7.35032236	-104.24648	-65.938144	-80.650132	-72.184935	-74.4033	
			3	M _{Jump,ka}	-41.7306	-23.274721	-1.1487132	7.35032236	-87.316231	-51.124173	-65.836161	-57.370964	-59.5894	
	B63		0	M _{Jump,Ki}	37.95165	20.8106716	1.08345008	7.36417844	78.8390562	61.0336311	44.8862829	56.4172958	49.50262	
			1.5	M _{Jap}	52.0602	20.8106716	1.08345008	7.36417844	112.699562	90.6615735	74.5142253	86.0452382	79.13056	
			3	M _{Jap}	66.16874	20.8106716	1.08345008	7.36417844	129.7364676	107.609508	88.491032	100.728105	92.410678	
	B64		0	M _{Jap}	-60.9105	-15.323054	-0.9802933	7.07364676	-80.679256	-51.677061	-65.914134	-57.596707	-59.9945	
			1.5	M _{Jap}	-46.802	-15.323054	-0.9802933	7.07364676	-63.749003	-36.86309	-51.100163	-42.782736	-45.1805	
			3	M _{Jump,ka}	-32.6934	-15.323054	-0.9802933	7.07364676	-47.33775936	-24.8226474	-21.8226474	-18.226474	-15.226474	
	B65		0	M _{Jump,Ki}	32.55009	15.2940954	1.23993278	7.23775936	63.5306595	51.8030998	35.8226474	47.3946972	40.23105	
			1.5	M _{Jap}	46.65863	15.2940954	1.23993278	7.23775936	80.4609123	66.617071	50.6366186	62.2086684	55.04502	
			3	M _{Jap}	60.76718	15.2940954	1.23993278	7.23775936	97.3911651	81.4310422	65.4505898	77.0226396	69.85899	
	B66		0	M _{Jump,Ki}	-102.916	-31.960539	-2.7234907	-5.1792324	-174.636	-134.49298	-121.90079	-132.68801	-123.706	
			1.42415	M _{Jap}	-89.5208	-31.960539	-2.7234907	-5.1792324	-158.56186	-120.4281	-107.83591	-118.62313	-109.641	
			2.8483	M _{Jap}	-76.1257	-31.960539	-2.7234907	-5.1792324	-142.48771	-106.36322	-93.771037	-104.55825	-95.576	
	B67		0	M _{Jap}	-4.96497	3.8157431	0.2362459	-3.3385045	0.14722571	-6.2403119	0.62171254	-3.6128704	-2.00573	
			1.37585	M _{Jap}	7.975857	3.8157431	0.2362459	-3.3385045	15.6762179	7.34755626	14.2095807	9.97499778	11.58214	
			2.7517	M _{Jap}	20.91668	3.8157431	0.2362459	-3.3385045	31.2052101	20.9354244	27.7974489	23.562866	25.17001	
	B68		0	M _{Jap}	60.69302	26.0662828	2.53709078	-4.1692674	114.537672	76.5708778	83.7279722	81.500051	78.7988	
			1.37815	M _{Jap}	73.65548	26.0662828	2.53709078	-4.1692674	130.092624	90.1814607	97.3385551	95.110634	92.40938	
			2.7563	M _{Jump,ka}	86.61794	26.0662828	2.53709078	-4.1692674	145.647576	103.792044	110.949138	108.721217	106.02	

PORTAL A-AS Y1 LT4

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	daerah geser	V _d (kNm)	V _L (kNm)	Beban Gempa		Vu ₁ (kNm)	Vu ₂ (kNm)	Vu ₃ (kNm)	Vu ₄ (kNm)	Vu ₅ (kNm)	Ket
							V _{xy}	V _{ex}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B51	0 M _{Jump.Ki}	38.24923	20.891205	1.08891628	7.19675115	79.3250063	61.22275	45.4235553	56.7334914	49.91281		
			1.5 M _{Jap}	52.35778	20.891205	1.08891628	7.19675115	96.2552591	76.0367212	60.2375265	71.5474626	64.72679		
			3 M _{Jap}	66.46632	20.891205	1.08891628	7.19675115	113.185512	90.8506924	75.0514977	86.3614338	79.54076		
		B52	0 M _{Jap}	-61.8398	-16.483571	-1.1382425	7.26057341	-100.58141	-68.051331	-82.581443	-74.224461	-76.4083		
			1.5 M _{Jap}	-47.7312	-16.483571	-1.1382425	7.26057341	-83.651161	-53.23736	-67.767472	-59.41049	-61.5943		
			3 M _{Jump.Ka}	-33.6227	-16.483571	-1.1382425	7.26057341	-66.720908	-38.423389	-52.9535	-44.596519	-46.7804		
		B53	0 M _{Jump.Ki}	30.5794	14.0472274	1.09627925	7.27580877	59.1708497	48.9430555	32.9732012	44.4011013	37.51516		
			1.5 M _{Jap}	44.68795	14.0472274	1.09627925	7.27580877	76.1011025	63.7570267	47.7871724	59.2150725	52.32913		
			3 M _{Jap}	58.79649	14.0472274	1.09627925	7.27580877	93.0313553	78.5709979	62.6011436	74.0290437	67.1431		
		B54	0 M _{Jap}	-67.8261	-21.638463	-1.1435939	7.24699948	-116.01291	-77.690559	-92.098794	-83.767645	-85.9317		
			1.5 M _{Jap}	-53.7176	-21.638463	-1.1435939	7.24699948	-99.082654	-62.786588	-77.284823	-68.953674	-71.1177		
			3 M _{Jump.Ka}	-39.6091	-21.638463	-1.1435939	7.24699948	-82.152401	-47.972617	-62.470852	-54.139703	-56.3038		
		B55	0 M _{Jump.Ki}	40.07748	22.3796754	1.0884319	7.25086558	83.9004539	64.1368119	48.2242821	59.6074232	52.75367		
			1.5 M _{Jap}	54.18602	22.3796754	1.0884319	7.25086558	100.830707	78.9507831	63.0382533	74.4213944	67.56764		
			3 M _{Jap}	68.29457	22.3796754	1.0884319	7.25086558	117.760959	93.7647543	77.8522245	89.23553656	82.38161		
		B56	0 M _{Jap}	-68.6746	-22.349155	-1.1454427	7.26021647	-118.16819	-78.925904	-93.45073	-85.104064	-87.2726		
			1.5 M _{Jap}	-54.5661	-22.349155	-1.1454427	7.26021647	-101.23794	-64.111933	-78.636759	-70.290093	-72.4586		
			3 M _{Jump.Ka}	-40.4575	-22.349155	-1.1454427	7.26021647	-84.307684	-49.297962	-63.822788	-55.476121	-57.6446		
		B57	0 M _{Jump.Ki}	39.1668	21.680617	1.08694759	7.26080921	81.6891472	62.7501668	46.8176905	58.2123785	51.35548		
			1.5 M _{Jap}	53.27534	21.680617	1.08694759	7.26080921	98.6194	77.564138	61.6316617	73.0263497	66.16945		
			3 M _{Jap}	67.38389	21.680617	1.08694759	7.26080921	115.549653	92.3781092	76.4456329	87.8403209	80.98342		
		B58	0 M _{Jap}	-59.9162	-14.636058	-1.1519862	7.30769185	-95.317135	-64.822531	-79.442926	-71.040402	-73.2251		
			1.5 M _{Jap}	-45.8077	-14.636058	-1.1519862	7.30769185	-78.386882	-50.00856	-64.628955	-56.22643	-58.4111		
			3 M _{Jump.Ka}	-31.6991	-14.636058	-1.1519862	7.30769185	-61.456629	-35.194588	-49.814984	-41.412459	-43.5971		
		B59	0 M _{Jump.Ki}	32.51631	15.902886	1.08482323	7.29783534	64.4641941	52.165394	36.1565012	47.5988301	40.72307		
			1.5 M _{Jap}	46.62486	15.902886	1.08482323	7.29783534	81.3944469	66.9793652	50.9704724	62.4128013	55.53704		
			3 M _{Jap}	60.7334	15.902886	1.08482323	7.29783534	98.3246997	81.7933364	65.7844436	77.2267725	70.35101		

PORTAL A-AS Y1 LT4

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	Jarak (m)	daerah geser	V _d (kNm)	V _L (kNm)	Beban Gempa		Vu1 (kNm)	Vu2 (kNm)	Vu3 (kNm)	Vu4 (kNm)	Vu5 (kNm)	Ket
								V _{EY}	V _{EX}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}	
		B42	0 M _{Lap}	40.76794	22.8640648	1.10063519	-7.2473968	85.504036	49.947633	64.4737682	56.0834385	58.33796			
			1.5 M _{Lap}	54.87649	22.8640648	1.10063519	-7.2473968	102.434289	64.7616062	79.2877394	70.8974097	73.15194			
			3 M _{Tump.ka}	68.98503	22.8640648	1.10063519	-7.2473968	119.364542	79.5755774	94.1017106	85.7113809	87.96591			
		B43	0 M _{Tump.Ki}	-67.089	-21.116158	-1.1298367	-7.262185	-114.2926	-91.727772	-75.765386	-87.220496	-80.2727			
			1.5 M _{Lap}	-52.9804	-21.116158	-1.1298367	-7.262185	-97.362342	-76.9138	-60.951415	-72.406524	-65.4587			
			3 M _{Lap}	-38.8719	-21.116158	-1.1298367	-7.262185	-80.43209	-62.099829	-46.137444	-57.592553	-50.6447			
		B44	0 M _{Lap}	39.41192	21.7300972	1.40765813	-7.2250484	82.0624607	47.9295897	62.2153668	54.274629	55.87033			
			1.5 M _{Lap}	53.52046	21.7300972	1.40765813	-7.2250484	98.9927135	62.7435609	77.029338	69.0886002	70.6843			
			3 M _{Tump.ka}	67.62901	21.7300972	1.40765813	-7.2250484	115.922966	77.5575321	91.8433092	83.9025714	85.49827			
		B45	0 M _{Tump.Ki}	-67.97	-21.996944	-1.4259536	-7.2247907	-116.75907	-93.261747	-77.191336	-88.999602	-81.4535			
			1.5 M _{Lap}	-53.8614	-21.996944	-1.4259536	-7.2247907	-99.828819	-78.447776	-62.377365	-74.185631	-66.6395			
			3 M _{Lap}	-39.7529	-21.996944	-1.4259536	-7.2247907	-82.898566	-63.633805	-47.563393	-59.371639	-51.8255			
		B46	0 M _{Lap}	-67.97	-21.996944	-1.4259536	-7.22479067	-116.75907	-78.089687	-62.377365	-74.185631	-66.6395			
			1.5 M _{Lap}	-53.8614	-21.996944	-1.4259536	-7.22479067	-99.828819	-78.089687	-62.377365	-74.185631	-66.6395			
			3 M _{Tump.ka}	-39.7529	-21.996944	-1.4259536	-7.22479067	-82.898566	-63.633805	-47.563393	-59.371639	-51.8255			
		B47	0 M _{Tump.Ki}	39.41192	21.7300972	1.40765813	-7.22504842	82.0624607	63.1021914	47.0427651	58.8264096	51.31855			
			1.5 M _{Lap}	53.52046	21.7300972	1.40765813	-7.22504842	98.9927135	77.9161626	61.8567363	73.6403808	66.13252			
			3 M _{Lap}	67.62901	21.7300972	1.40765813	-7.22504842	115.922966	92.7301338	76.6707075	88.454352	80.94649			
		B48	0 M _{Lap}	-67.089	-21.116158	-1.1298367	-7.26218497	-114.2926	-76.477183	-91.015974	-82.645319	-84.8478			
			1.5 M _{Lap}	-52.9804	-21.116158	-1.1298367	-7.26218497	-97.362342	-61.663212	-76.202003	-67.831348	-70.0339			
			3 M _{Tump.ka}	-38.8719	-21.116158	-1.1298367	-7.26218497	-80.43209	-46.849241	-61.388032	-53.017377	-55.2199			
		B49	0 M _{Tump.Ki}	40.76794	22.8640648	1.10063519	7.24739683	85.504036	65.1671683	49.2542348	60.6492985	53.7721			
			1.5 M _{Lap}	54.87649	22.8640648	1.10063519	7.24739683	102.434289	79.9811395	64.068206	75.4632697	68.58608			
			3 M _{Lap}	68.98503	22.8640648	1.10063519	7.24739683	119.364542	94.7951107	78.8821772	90.2772409	83.40005			
		B50	0 M _{Lap}	-67.0038	-21.189583	-1.115135	7.19623352	-114.30785	-76.498613	-90.908172	-82.60747	-84.7993			
			1.5 M _{Lap}	-52.8952	-21.189583	-1.115135	7.19623352	-97.3776	-61.684642	-76.094201	-67.793499	-69.9853			
			3 M _{Tump.ka}	-38.7867	-21.189583	-1.115135	7.19623352	-80.447348	-46.870671	-61.28023	-52.979528	-55.1714			

PORTAL A-AS Y1 LTA

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	daerah geser	V ₀ (kNm)	V ₁ (kNm)	Beban Gempa		Vu1 (kNm)	Vu2 (kNm)	Vu3 (kNm)	Vu4 (kNm)	Vus (kNm)	Ket
							V _{ky}	V _{ex}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
				0 M _{Jump.Ki}	60.69302	26.0662828	2.53709078	-4.1692674	114.537672	76.5708778	83.7279722	81.500051	78.7988	
	B23		1.37815	M _{Jap}	73.65548	26.0662828	2.53709078	-4.1692674	130.092624	90.1814607	97.3385551	95.110634	92.40938	
			2.7563	M _{Jap}	86.61794	26.0662828	2.53709078	-4.1692674	145.647576	103.792044	110.949138	108.721217	106.02	
			0	M _{Jap}	-4.96497	3.8157431	0.2362459	-3.3385045	0.14722571	-6.2403119	0.62171254	-3.6128704	-2.00573	
	B24		1.37585	M _{Jap}	7.975857	3.8157431	0.2362459	-3.3385045	15.6762179	7.34755626	14.2095807	9.97499778	11.58214	
			2.7517	M _{Jap}	20.91668	3.8157431	0.2362459	-3.3385045	31.2052101	20.9354244	27.7974489	23.562866	25.17001	
			0	M _{Jap}	-102.916	-31.960539	-2.7234907	-5.1792324	-174.636	-134.49298	-121.90079	-132.68801	-123.706	
	B25		1.42415	M _{Jap}	-89.5208	-31.960539	-2.7234907	-5.1792324	-158.56186	-120.4281	-107.83591	-118.62313	-109.641	
			2.8483	M _{Jump.Ka}	-76.1257	-31.960539	-2.7234907	-5.1792324	-142.48771	-106.36322	-93.771037	-104.55825	-95.576	
			0	M _{Jump.Ki}	-60.9105	-15.323054	-0.9802933	-7.0736468	-97.609508	-81.34569	-65.873447	-76.867075	-70.3521	
	B27		1.5	M _{Jap}	-46.802	-15.323054	-0.9802933	-7.0736468	-80.679256	-66.531719	-51.059476	-62.053104	-55.5381	
			3	M _{Jap}	-32.6934	-15.323054	-0.9802933	-7.0736468	-63.749003	-51.717748	-36.245505	-47.239153	-40.7241	
			0	M _{Jap}	37.95165	20.8106716	1.08345008	-7.3641784	78.8390562	45.5688564	60.3510576	51.7778634	54.14205	
	B28		1.5	M _{Jap}	52.0602	20.8106716	1.08345008	-7.3641784	95.769309	60.3828276	75.1650288	66.5918346	68.95602	
			3	M _{Jump.Ka}	66.16874	20.8106716	1.08345008	-7.3641784	112.699562	75.1967988	89.979	81.4058058	83.76999	
			0	M _{Jump.Ki}	-69.9477	-23.274721	-1.1487132	-7.3503224	-121.17674	-96.187792	-80.028426	-91.62961	-84.5866	
	B29		1.5	M _{Jap}	-55.8391	-23.274721	-1.1487132	-7.3503224	-104.24648	-81.373821	-65.214455	-76.815638	-69.7726	
			3	M _{Jap}	-41.7306	-23.274721	-1.1487132	-7.3503224	-87.316231	-66.55985	-50.400484	-62.001667	-54.9587	
			0	M _{Jap}	38.28587	21.1861121	1.06873918	-7.250648	79.840819	46.2708828	60.8239379	52.3856323	54.70919	
	B30		1.5	M _{Jap}	52.39441	21.1861121	1.06873918	-7.250648	96.7710718	61.084854	75.6379091	67.1996035	69.52316	
			3	M _{Jump.Ka}	66.50295	21.1861121	1.06873918	-7.250648	113.701325	75.8988252	90.4518803	82.0135747	84.33713	
			0	M _{Jump.Ki}	-67.0157	-20.86379	-1.1334038	-7.2491392	-113.80086	-91.479253	-75.542017	-86.984188	-80.0371	
	B31		1.5	M _{Jap}	-52.9071	-20.86379	-1.1334038	-7.2491392	-96.870608	-76.665282	-60.728045	-72.170217	-65.2231	
			3	M _{Jap}	-38.7986	-20.86379	-1.1334038	-7.2491392	-79.940356	-61.851311	-45.914074	-57.356245	-50.4091	
			0	M _{Jap}	32.51631	15.902886	1.08482323	-7.2978353	64.4641941	36.8399398	51.4819554	43.0011939	45.3207	
	B32		1.5	M _{Jap}	46.62486	15.902886	1.08482323	-7.2978353	81.3944469	51.653911	66.2959266	57.8151681	60.13467	
			3	M _{Jump.Ka}	60.7334	15.902886	1.08482323	-7.2978353	98.3246997	66.4678822	81.1098978	72.6291363	74.94864	

PORTAL A-AS Y1 LT4

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	daerah geser	V _d (kNm)	V _L (kNm)	Beban Gempa		Vu ₁ (kNm)	Vu ₂ (kNm)	Vu ₃ (kNm)	Vu ₄ (kNm)	Vu ₅ (kNm)	Ket
							V _{xy}	V _{ex}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
	PORTAL A-AS Y1 LTS	B19	0	M _{Jump.Ki}	-10.1215	-0.1004423	1.23E-03	0.95632672	-12.306467	-9.6862887	-11.695348	-10.388287	-10.9933	
			3	M _{Jap}	-0.224	-0.1004423	1.23E-03	0.95632672	-0.4295056	0.70605269	-1.3030064	0.00405437	-0.60101	
			6	M _{Jump.Ka}	9.67347	-0.1004423	1.23E-03	0.95632672	11.447456	11.0983941	9.08933497	10.3963958	9.791333	
		B20	0	M _{Jump.Ki}	-10.1567	-1.10E-01	7.34E-03	0.96582552	-12.364167	-9.7174634	-11.750321	-10.421951	-11.0458	
			3	M _{Jap}	-2.59E-01	-1.10E-01	7.34E-03	0.96582552	-0.4872053	0.674878	-1.3579794	-0.0296093	-0.65349	
			6	M _{Jump.Ka}	9.638224	-1.10E-01	7.34E-03	0.96582552	11.3897563	11.0672194	9.03436196	10.3627321	9.738849	
		B21	0	M _{Jump.Ki}	-10.7537	-0.3352828	3.56E-04	0.95252248	-13.440882	-10.502343	-12.502865	-11.202185	-11.803	
			3	M _{Jap}	-0.85622	-0.3352828	3.56E-04	0.95252248	-1.5639202	-0.1100016	-2.1105233	-8.10E-01	-1.41068	
			6	M _{Jump.Ka}	9.041245	-0.3352828	3.56E-04	0.95252248	10.3130414	10.2823398	8.28181808	9.58249781	8.98166	
		B22	0	M _{Jump.Ki}	-13.8009	9.54E-02	2.92E-02	-0.5094069	-16.408496	-14.956523	-13.905191	-14.560617	-14.3011	
			4.17815	M _{Jap}	-1.65E-02	9.54E-02	2.92E-02	-0.5094069	1.33E-01	-0.482936	0.56839654	-0.0870297	0.17249	
			8.3563	M _{Jump.Ka}	13.76785	9.54E-02	2.92E-02	-0.5094069	16.6739886	13.9906511	15.0419836	14.3865573	14.64608	

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	daerah geser	V _d (kNm)	V _L (kNm)	Beban Gempa		Vu1 (kNm)	Vu2 (kNm)	Vu3 (kNm)	Vu4 (kNm)	Vus (kNm)	Ket
							V _{xy}	V _{ex}						
{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}
		B10	0	M _{Jump.Ki}	-9.7365	0.13597597	-2.41E-04	-0.9518297	-11.490238	-11.158157	-9.1591624	-10.458739	-9.85858	
			3	M _{Jap}	0.140969	0.13597597	-2.41E-04	-0.9518297	0.38672383	-0.7658153	1.23317905	-6.64E-02	0.533762	
			6	M _{Jump.ka}	10.03844	0.13597597	-2.41E-04	-0.9518297	12.2636854	9.62652605	11.6255204	10.3259434	10.9261	
			0	M _{Jump.Ki}	-9.90514	-3.00E-03	-2.35E-04	-0.9490921	-11.890965	-11.398909	-9.4056673	-10.701499	-10.1031	
		B11	3	M _{Jap}	-7.68E-03	-3.00E-03	-2.35E-04	-0.9490921	-1.40E-02	-1.0065674	0.98667408	-0.3091575	0.289264	
			6	M _{Jump.ka}	9.889792	-3.00E-03	-2.35E-04	-0.9490921	11.8629578	9.38577403	11.3790155	10.0831839	10.68161	
			0	M _{Jump.Ki}	-9.90514	-3.00E-03	-2.35E-04	0.94909207	-11.890965	-9.4058154	-11.398761	-10.103571	-10.701	
		B12	3	M _{Jap}	-0.00768	-3.00E-03	-2.35E-04	0.94909207	-0.0140038	0.98652597	-1.0064193	2.89E-01	-0.30866	
			6	M _{Jump.ka}	9.889792	-3.00E-03	-2.35E-04	0.94909207	11.8629578	11.3788674	9.38592214	10.6811119	10.08368	
			0	M _{Jump.Ki}	-9.7565	0.13597597	-2.41E-04	0.95182966	-11.490238	-9.1593145	-11.158005	-9.8590867	-10.4582	
		B13	3	M _{Jap}	0.140969	0.13597597	-2.41E-04	0.95182966	0.38672383	1.23302694	-0.7656632	0.53325468	-0.06589	
			6	M _{Jump.ka}	10.03844	0.13597597	-2.41E-04	0.95182966	12.2636854	11.6253683	9.62667816	10.9255961	10.32645	
			0	M _{Jump.Ki}	-9.82924	0.07550617	-1.99E-03	0.94642407	-11.674274	-9.2800122	-11.266247	-9.9770989	-10.5692	
		B14	3	M _{Jap}	0.068231	0.07550617	-1.99E-03	0.94642407	0.20268746	1.11232919	-0.8739056	0.41524249	-1.77E-01	
			6	M _{Jump.ka}	9.965699	0.07550617	-1.99E-03	0.94642407	12.0796491	11.5046706	9.51843576	10.8075839	10.21552	
			0	M _{Jump.Ki}	-10.1641	-0.2122133	-3.22E-03	0.95340185	-12.536418	-9.8059057	-11.806018	-10.509026	-11.1029	
		B15	3	M _{Jap}	-0.2666	-0.2122133	-3.22E-03	0.95340185	-0.6594568	0.58643571	-1.4136767	-0.1166847	-7.11E-01	
			6	M _{Jump.ka}	9.630872	-0.2122133	-3.22E-03	0.95340185	11.2175048	10.9787771	8.9786647	10.2756567	9.681785	
			0	M _{Jump.Ki}	-10.026	-7.75E-02	-2.72E-03	0.95225268	-12.155184	-9.577125	-11.575139	-10.279033	-10.8732	
		B16	3	M _{Jap}	-1.29E-01	-7.75E-02	-2.72E-03	0.95225268	-0.2782225	0.8152164	-1.1827977	0.11330804	-0.48089	
			6	M _{Jump.ka}	9.768913	-7.75E-02	-2.72E-03	0.95225268	11.5987391	11.2075578	9.20954371	10.5056494	9.911452	
			0	M _{Jump.Ki}	-9.86945	7.28E-02	-3.04E-03	0.95395591	-11.726836	-9.3163525	-11.317746	-10.019743	-10.6144	
		B17	3	M _{Jap}	2.80E-02	7.28E-02	-3.04E-03	0.95395591	0.15012515	1.07598886	-0.9254045	0.37259826	-0.22201	
			6	M _{Jump.ka}	9.925486	7.28E-02	-3.04E-03	0.95395591	12.0270867	11.4683303	9.46693686	10.7649397	10.17033	
			0	M _{Jump.Ki}	-9.87794	8.64E-02	-1.02E-03	0.95872971	-11.715367	-9.3110909	-11.323783	-10.016504	-10.6184	
		B18	3	M _{Jap}	0.019526	8.64E-02	-1.02E-03	0.95872971	0.16159497	1.08125046	-0.931442	0.37583757	-0.22603	
			6	M _{Jump.ka}	9.916994	8.64E-02	-1.02E-03	0.95872971	12.0385566	11.4735919	9.46089939	10.768179	10.16631	

PORTAL A-AS Y1 LTS

Tabel Gaya Geser Balok Portal As Y1

No	Portal	Balok	Jarak (m)	Jarak geser (m)	daerah geser	V _d (kNm)	V _i (kNm)	Beban Gempa			V _{u1} (kNm)	V _{u2} (kNm)	V _{u3} (kNm)	V _{u4} (kNm)	V _{u5} (kNm)	Ket										
								V _{ey}	V _{ex}	V _{ex}																
{1}	{2}	{3}	{4}	{5}		{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}	{14}	{15}											
B1			4,17815	M _{Tump.Ki}	-13,8009	9,54E-02	9,54E-02	2,92E-02	-0,5094069	-16,408496	-14,956523	-13,905191	-14,560617	-14,3011												
																8,3563	M _{Lap}	-0,01652	9,54E-02	2,92E-02	-0,5094069	0,13274619	-0,482936	0,56839654	-8,70E-02	0,17249
B2			3	M _{Lap}	-0,85622	-0,3352828	3,56E-04	-0,9525225	-13,440882	-12,50264	-0,1102261	-1,4099328	-0,81059													
															6	M _{Tump.Ki}	-10,7537	-0,3352828	3,56E-04	-0,9525225	-1,5639202	-2,1102988	-10,502568	-11,802274	-11,2029	
																										0
B3			3	M _{Lap}	-10,1567	-0,11007	7,34E-03	-0,9658255	-12,364167	-11,745697	-9,7220873	-11,030421	-10,4374													
															6	M _{Tump.Ki}	-0,25924	-0,11007	7,34E-03	-0,9658255	-0,4872053	-1,3533556	0,67025415	-0,6380793	4,50E-02	
																										0
B4			3	M _{Lap}	-0,224	-0,1004423	1,23E-03	-0,9563267	-12,306467	-11,694575	-9,6870617	-10,990773	-10,3909													
															6	M _{Tump.Ki}	-0,224	-0,1004423	1,23E-03	-0,9563267	-0,4295056	-1,3022334	0,70527969	-0,5984315	1,48E-03	
																										0
B5			3	M _{Lap}	1,95E-02	8,64E-02	-1,02E-03	-0,9587297	-11,715367	-11,324423	-9,310451	-10,620504	-10,0144													
															6	M _{Tump.Ki}	-0,224	-0,1004423	1,23E-03	-0,9563267	-0,9587297	0,16159497	-0,9320819	1,08189037	-0,2281621	0,377971
B6			3	M _{Lap}	2,80E-02	7,28E-02	-3,04E-03	-0,9539559	-11,726836	-11,31966	-9,3144385	-10,620735	-10,0134													
															6	M _{Tump.Ki}	-10,026	7,28E-02	-3,04E-03	-0,9539559	12,0270867	9,46502285	11,4702443	-0,228394	0,378978	
																										0
B7			3	M _{Lap}	-0,12856	-7,75E-02	-2,72E-03	-0,9522527	-12,155184	-11,576856	-9,5754085	-10,878953	-10,2733													
															6	M _{Tump.Ki}	-10,026	-7,75E-02	-2,72E-03	-0,9522527	-0,2782225	-1,1845142	0,81695294	-0,4866112	0,11903	
																										0
B8			3	M _{Lap}	-0,2666	-0,2122133	-3,22E-03	-0,9534019	-12,536418	-11,80805	-9,8038742	-11,109669	-10,5023													
															6	M _{Tump.Ki}	-10,1641	-0,2122133	-3,22E-03	-0,9534019	-0,6594568	-1,4157082	0,38846719	-0,7173279	-0,10991	
																										0
B9			3	M _{Lap}	9,82924	7,55E-02	-1,99E-03	-0,9464241	-11,674274	-11,267503	-9,2787565	-10,573346	-9,97291													
															6	M _{Tump.Ki}	6,82E-02	7,55E-02	-1,99E-03	-0,9464241	0,20268746	-0,8751614	1,11358491	-0,1810047	0,419428	
																										0

PORTAL A-AS Y1 LTS

Perencanaan Kolom

batang	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k.l/r	Pembesaran	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K11	3	Atas	1			5,657	2	26,67	OK	-184,947	-61,6858	3,602372	85,23054	-320,634	91,641,44	41,729,63	91,641,44	39,287,89	1,014
		Bawah				2,829	2	26,67	OK	-159,497	-61,6858	3,602372	85,23054	-290,093	93,238,31	42,456,78	93,238,31	39,972,49	1,012
K12	3	Atas	1	2,829	1,6			21,33	tidak	-572,931	-278,166	-32,4832	-18,7993	-1132,58	95,959,52	43,695,90	95,959,52	64,279,86	1,030
		Bawah		1,414	1,6			21,33	tidak	-547,48	-278,166	-32,4832	-18,7993	-1102,04	96,541,33	43,960,84	96,541,33	64,669,59	1,029
K13	4	Atas	2	2,121	1,6			30,22	OK	-364,245	-175,868	-15,7408	-17,4199	-718,483	95,889,31	43,663,93	95,889,31	32,005,28	1,039
		Bawah		1,061	1,6			30,22	OK	-330,311	-175,868	-15,7408	-17,4199	-677,762	97,153,48	44,239,58	97,153,48	32,427,23	1,036
K14	3	Atas	1	2,829	1,6			21,33	tidak	-1050,83	-546,947	-9,68766	-13,6823	-2136,11	96,855,27	44,103,79	96,855,27	64,879,89	1,058
		Bawah		1,414	1,6			21,33	tidak	-1025,38	-546,947	-9,68766	-13,6823	-2105,57	97,177,81	44,250,66	97,177,81	65,095,95	1,057
K15	4	Atas	2	2,121	1,6			30,22	OK	-778,414	-395,321	-7,02218	-12,9318	-1566,61	96,535,46	43,958,16	96,535,46	32,220,95	1,088
		Bawah		1,061	1,6			30,22	OK	-744,48	-395,321	-7,02218	-12,9318	-1525,89	97,118,01	44,223,43	97,118,01	32,415,39	1,085
K16	3,5	Atas	3	2,424	1,6			25,78	OK	-493,199	-241,772	-4,6644	-12,9441	-978,674	96,081,73	43,751,55	96,081,73	44,081,27	1,038
		Bawah		1,212	1,6			25,78	OK	-463,507	-241,772	-4,6644	-12,9441	-943,043	96,883,44	44,116,62	96,883,44	44,449,09	1,037
K17	3	Atas	1			5,657	2	26,67	OK	-1031,53	-334,778	15,83813	-19,9621	-1773,48	91,361,96	41,602,37	91,361,96	39,168,07	1,082
		Bawah				2,829	2	26,67	OK	-1006,08	-334,778	15,83813	-19,9621	-1742,94	91,617,42	41,718,70	91,617,42	39,277,60	1,080
K18	4	Atas	2			4,243	3	56,67	OK	-781,649	-248,436	10,77663	-15,2924	-1335,48	91,151,32	41,506,45	91,151,32	8,653,90	1,346
		Bawah				2,121	3	56,67	OK	-747,714	-248,436	10,77663	-15,2924	-1294,76	91,602,07	41,711,70	91,602,07	8,696,70	1,330
K19	3,5	Atas	3			4,849	4	64,44	OK	-535,738	-162,806	5,53051	-13,9819	-903,376	90,708,18	41,304,66	90,708,18	6,658,55	1,292
		Bawah				2,424	4	64,44	OK	-506,046	-162,806	5,53051	-13,9819	-867,745	91,273,50	41,562,09	91,273,50	6,700,05	1,275
K20	3,5	Atas	4			4,849	5	80,56	OK	-282,799	-71,4039	1,184067	-13,9569	-453,605	89,009,21	40,531,02	89,009,21	4,181,66	1,221
		Bawah				2,424	5	80,56	OK	-253,107	-71,4039	1,184067	-13,9569	-417,975	90,001,11	40,982,69	90,001,11	4,228,25	1,197
K21	2	Atas	5			8,486	6	46,67	OK	-39,8092	0,430637	0,443116	2,89E-02	-47,082	78,298,32	35,653,74	78,298,32	10,960,82	1,007
		Bawah				4,243	6	46,67	OK	-22,8421	0,430637	0,443116	2,89E-02	-26,7215	77,906,06	35,475,12	77,906,06	10,905,91	1,004

Perhitungan Momen Rencana (MC) arah y (as A2)

Perencanaan Kolom

Perhitungan	Panjang	Ujung	Lt	KL Tengah		Kolom Tepi		k.l/r	Pembesaran	PD	PL	PEx	Pey	Pu	EI1	EI2	EI PAKAI	Pc	δb
				ψ	K	ψ	K												
K22	3	Atas	1			5.657	2	26.67	OK	-298.553	-108.108	-0.75484	47.74994	-531.237	92.510.96	42.125.57	92.510.96	39.660.67	1.023
		Bawah				2.829	2	26.67	OK	-273.103	-108.108	-0.75484	47.74994	-500.696	93.501.69	42.576.71	93.501.69	40.085.40	1.021
K23	3	Atas	1	2.829	1.6			21.33	tidak	-762.263	-366.778	0.493593	-18.5883	-1501.56	95.845.90	43.644.16	95.845.90	64.203.75	1.041
		Bawah		1.414	1.6			21.33	tidak	-736.813	-366.778	0.493593	-18.5883	-1471.02	96.277.71	43.840.79	96.277.71	64.493.00	1.040
K24	4	Atas	2	2.121	1.6			30.22	OK	-487.554	-225.212	0.293369	-18.1726	-945.404	95.336.10	43.412.02	95.336.10	31.820.64	1.052
		Bawah		1.061	1.6			30.22	OK	-453.62	-225.212	0.293369	-18.1726	-904.683	96.243.90	43.825.40	96.243.90	32.123.64	1.049
K25	3	Atas	1	2.829	1.6			21.33	tidak	-1025.68	-537.532	0.220213	-11.5548	-2090.87	96.945.09	44.144.69	96.945.09	64.940.05	1.057
		Bawah		1.414	1.6			21.33	tidak	-1000.23	-537.532	0.220213	-11.5548	-2060.33	97.276.69	44.295.69	97.276.69	65.162.18	1.056
K26	4	Atas	2	2.121	1.6			30.22	OK	-747.513	-380.829	0.120078	-12.1108	-1506.34	96.576.36	43.976.78	96.576.36	32.234.60	1.084
		Bawah		1.061	1.6			30.22	OK	-713.578	-380.829	0.120078	-12.1108	-1465.62	97.184.69	44.253.79	97.184.69	32.437.65	1.081
K27	3.5	Atas	3	2.424	1.6			25.78	OK	-456.995	-221.394	0.138384	-12.4718	-902.625	95.931.88	43.683.32	95.931.88	44.012.52	1.035
		Bawah		1.212	1.6			25.78	OK	-427.303	-221.394	0.138384	-12.4718	-866.994	96.795.56	44.076.60	96.795.56	44.408.77	1.034
K28	3	Atas	1			5.657	2	26.67	OK	-857.026	-268.731	-0.26329	-17.4577	-1458.4	91.016.30	41.444.97	91.016.30	39.019.88	1.066
		Bawah				2.829	2	26.67	OK	-831.575	-268.731	-0.26329	-17.4577	-1427.86	91.318.56	41.582.60	91.318.56	39.149.47	1.065
K29	4	Atas	2	4.243			3	56.67	OK	-648.421	-196.954	0.057513	-13.4131	-1093.23	90.703.46	41.302.51	90.703.46	8.611.38	1.268
		Bawah		2.121			3	56.67	OK	-614.487	-196.954	0.057513	-13.4131	-1052.51	91.235.69	41.544.87	91.235.69	8.661.91	1.254
K30	3.5	Atas	3	4.849			4	64.44	OK	-438.273	-124.551	0.37894	-12.1648	-725.21	90.069.33	41.013.76	90.069.33	6.611.66	1.224
		Bawah		2.424			4	64.44	OK	-408.581	-124.551	0.37894	-12.1648	-689.579	90.738.54	41.318.49	90.738.54	6.660.78	1.209
K31	3.5	Atas	4	4.849			5	80.56	OK	-224.504	-48.1614	0.520561	-11.9691	-346.463	87.683.75	39.927.47	87.683.75	4.119.39	1.163
		Bawah		2.424			5	80.56	OK	-194.812	-48.1614	0.520561	-11.9691	-310.832	88.828.95	40.448.94	88.828.95	4.173.19	1.142
K32	2	Atas	5	8.486			6	46.67	OK	-37.359	-0.22521	0.013303	-6.98E-03	-45.1911	79.105.88	36.021.47	79.105.88	11.073.87	1.007
		Bawah		4.243			6	46.67	OK	-20.3919	-0.22521	0.013303	-6.98E-03	-24.8306	79.342.53	36.129.23	79.342.53	11.107.00	1.004

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A4)

batang	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K33	3	Atas	1			5,657	2	26,67	OK	-298,553	-108,108	-0,75484	47,74994	-531,237	92,510,96	42,125,57	92,510,96	39,660,67	1,023
		Bawah				2,829	2	26,67	OK	-273,103	-108,108	-0,75484	47,74994	-500,696	93,501,69	42,576,71	93,501,69	40,085,40	1,021
K34	3	Atas	1	1,6				21,33	tidak	-762,263	-366,778	0,493593	-18,5883	-1501,56	95,845,90	43,644,16	95,845,90	64,203,75	1,041
		Bawah		1,6			21,33	tidak	-736,813	-366,778	0,493593	-18,5883	-1471,02	96,277,71	43,840,79	96,277,71	64,493,00	1,040	
K35	4	Atas	2	1,6				30,22	OK	-487,554	-225,212	0,293369	-18,1726	-945,404	95,336,10	43,412,02	95,336,10	31,820,64	1,052
		Bawah		1,6			30,22	OK	-453,62	-225,212	0,293369	-18,1726	-904,683	96,243,90	43,825,40	96,243,90	32,123,64	1,049	
K36	3	Atas	1	1,6				21,33	tidak	-1025,68	-537,532	0,220213	-11,5548	-2090,87	96,945,09	44,144,69	96,945,09	64,940,05	1,057
		Bawah		1,6			21,33	tidak	-1000,23	-537,532	0,220213	-11,5548	-2060,33	97,276,69	44,295,69	97,276,69	65,162,18	1,056	
K37	4	Atas	2	1,6				30,22	OK	-747,513	-380,829	0,120078	-12,1108	-1506,34	96,576,36	43,976,78	96,576,36	32,234,60	1,084
		Bawah		1,6			30,22	OK	-713,578	-380,829	0,120078	-12,1108	-1465,62	97,184,69	44,253,79	97,184,69	32,437,65	1,081	
K38	3,5	Atas	3	1,6				25,78	OK	-456,995	-221,394	0,138384	-12,4718	-902,625	95,931,88	43,683,32	95,931,88	44,012,52	1,035
		Bawah		1,6			25,78	OK	-427,303	-221,394	0,138384	-12,4718	-866,994	96,795,56	44,076,60	96,795,56	44,408,77	1,034	
K39	3	Atas	1			5,657	2	26,67	OK	-857,026	-268,731	-0,26329	-17,4577	-1458,4	91,016,30	41,444,97	91,016,30	39,019,88	1,066
		Bawah				2,829	2	26,67	OK	-831,575	-268,731	-0,26329	-17,4577	-1427,86	91,318,56	41,582,60	91,318,56	39,149,47	1,065
K40	4	Atas	2			4,243	3	56,67	OK	-648,421	-196,954	0,057513	-13,4131	-1093,23	90,703,46	41,302,51	90,703,46	8,611,38	1,268
		Bawah				2,121	3	56,67	OK	-614,487	-196,954	0,057513	-13,4131	-1052,51	91,235,69	41,544,87	91,235,69	8,661,91	1,254
K41	3,5	Atas	3			4,849	4	64,44	OK	-438,273	-124,551	0,37894	-12,1648	-725,21	90,069,33	41,013,76	90,069,33	6,611,66	1,224
		Bawah				2,424	4	64,44	OK	-408,581	-124,551	0,37894	-12,1648	-689,579	90,738,54	41,318,49	90,738,54	6,660,78	1,209
K42	3,5	Atas	4			4,849	5	80,56	OK	-224,504	-48,1614	0,520561	-11,9691	-346,463	87,683,75	39,927,47	87,683,75	4,119,39	1,163
		Bawah				2,424	5	80,56	OK	-194,812	-48,1614	0,520561	-11,9691	-310,832	88,828,95	40,448,94	88,828,95	4,173,19	1,142
K43	2	Atas	5			8,486	6	46,67	OK	-37,359	-0,22521	0,013303	-6,98E-03	-45,1911	79,105,88	36,021,47	79,105,88	11,073,87	1,007
		Bawah				4,243	6	46,67	OK	-20,3919	-0,22521	0,013303	-6,98E-03	-24,8306	79,342,53	36,129,23	79,342,53	11,107,00	1,004

Perhitungan Momen Rencana (MC) arah y (as A5)
Perencanaan Kolom

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k.l/r	Pembesaran		PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI _{PAKAI} (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K		Momen											
K44	3	Atas	1			5.657	2	26.67	OK	-276.104	-125.466	-0.73711	47.06156	-532.069	95.134.32	43.320.14	95.134.32	40.785.34	1.022	
K45	3	Bawah	1	2.829	1.6	2.829	2	26.67	OK	-250.653	-125.466	-0.73711	47.06156	-501.529	96.348.80	43.873.16	96.348.80	41.306.00	1.021	
K46	4	Atas	2	1.414	1.6			21.33	tidak	-755.236	-386.314	0.353976	-18.3571	-1524.39	96.628.51	44.000.53	96.628.51	64.727.99	1.041	
K47	3	Bawah	1	2.121	1.6			21.33	tidak	-729.785	-386.314	0.353976	-18.3571	-1493.84	97.076.95	44.204.73	97.076.95	65.028.38	1.040	
K48	4	Atas	2	1.061	1.6			30.22	OK	-483.193	-244.891	0.31605	-17.9469	-971.657	96.509.05	43.946.13	96.509.05	32.212.14	1.053	
K49	3.5	Bawah	2	2.829	1.6			21.33	tidak	-449.259	-244.891	0.31605	-17.9469	-930.936	97.465.90	44.381.84	97.465.90	32.531.51	1.050	
K50	3	Atas	1	1.414	1.6			30.22	OK	-1049.44	-540.894	-1.20235	-11.8225	-2124.76	96.727.22	44.045.48	96.727.22	64.794.11	1.058	
K51	4	Bawah	3	2.424	1.6			25.78	OK	-778.76	-394.216	-0.53041	-12.0689	-2094.22	97.048.79	44.191.91	97.048.79	65.009.52	1.057	
K52	3.5	Atas	1	1.212	1.6			25.78	OK	-744.826	-394.216	-0.53041	-12.0689	-1565.26	96.493.53	43.939.07	96.493.53	32.206.96	1.088	
K53	3.5	Bawah	2			5.657	2	26.67	OK	-493.828	-244.9	0.151206	-12.379	-984.433	97.074.96	44.203.83	97.074.96	32.401.02	1.085	
K54	2	Atas	2			2.829	2	26.67	OK	-464.135	-244.9	0.151206	-12.379	-948.802	96.229.53	43.818.85	96.229.53	44.149.08	1.039	
K55	3.5	Bawah	3	4.243		4.243	3	56.67	OK	-777.757	-193.977	-1.19024	-17.0634	-1243.67	88.903.85	44.185.38	88.903.85	44.518.37	1.037	
K56	3.5	Atas	3	2.121			3	56.67	OK	-752.307	-193.977	-1.19024	-17.0634	-1213.13	89.191.14	40.613.87	89.191.14	38.114.25	1.058	
K57	3.5	Bawah	4	4.849		4.849	4	64.44	OK	-600.047	-151.458	-0.76134	-13.263	-962.389	89.006.50	40.529.79	89.006.50	8.450.27	1.056	
K58	3.5	Atas	4	2.424			4	64.44	OK	-566.113	-151.458	-0.76134	-13.263	-921.668	89.517.69	40.762.56	89.517.69	8.498.80	1.234	
K59	2	Bawah	5	4.849			5	80.56	OK	-421.829	-108.542	-0.27704	-12.1068	-679.862	89.173.16	40.605.68	89.173.16	6.545.87	1.221	
K60	2	Atas	5	2.424			5	80.56	OK	-392.137	-108.542	-0.27704	-12.1068	-644.231	89.825.78	40.902.86	89.825.78	6.593.78	1.209	
K61	2	Bawah	6	8.486			6	46.67	OK	-239.574	-61.1358	0.00232	-11.9676	-385.306	89.100.97	40.572.81	89.100.97	4.185.97	1.195	
K62	2	Atas	6	4.243			6	46.67	OK	-209.881	-61.1358	0.00232	-11.9676	-349.675	90.301.28	41.119.38	90.301.28	4.242.36	1.181	
K63	2	Bawah	6					46.67	OK	-37.0055	-0.18679	0.002403	2.24E-03	-44.7055	79.059.41	36.000.31	79.059.41	11.067.37	1.159	
K64	2	Atas	6					46.67	OK	-20.0385	-0.18679	0.002403	2.24E-03	-24.345	79.261.46	36.092.31	79.261.46	11.095.65	1.004	

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A7)

Kode	Panjang batang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran		PL (kN)	PEX (kN)	Pey (kN)	Pu (kN)	EI1 (kNm2)	EI2 (kNm2)	EI PAKAI (kNm2)	Pc (kN)	δb
				ψ	K	ψ	K		Momen	Momen									
K66	3	Atas	1		5.657	2	26.67		OK	-296.323	-140.988	-0.04627	46.94532	-581.169	95.704.48	43.579.77	95.704.48	41,029.77	1.024
K67	3	Bawah	1		2.829	2	26.67		OK	-270.873	-140.988	-0.04627	46.94532	-550.628	96.855.34	44,103.82	96.855.34	41,523.16	1.023
K68	4	Atas	1	2.829	1.6		21.33		tidak	-720.52	-362.313	0.041437	-18.2686	-1444.32	96.407.62	43,899.95	96.407.62	64,580.03	1.039
K68	4	Bawah	2	2.121	1.6		30.22		tidak	-695.069	-362.313	0.041437	-18.2686	-1413.78	96,874.61	44,112.59	96,874.61	64,892.84	1.038
K69	3	Atas	1	1.061	1.6		30.22		OK	-447.829	-220.868	0.024553	-17.831	-890.783	96,159.12	43,786.79	96,159.12	32,095.34	1.049
K69	3	Bawah	1	2.829	1.6		21.33		tidak	-413.895	-220.868	0.024553	-17.831	-850.062	97,183.29	44,253.16	97,183.29	32,437.18	1.046
K70	4	Atas	2	1.414	1.6		21.33		tidak	-1055.15	-554.94	0.02808	-11.4758	-2154.09	96,991.66	44,165.90	96,991.66	64,971.25	1.058
K70	4	Bawah	2	2.121	1.6		30.22		OK	-1029.7	-554.94	0.02808	-11.4758	-2123.55	97,314.35	44,312.83	97,314.35	65,187.41	1.057
K71	3.5	Atas	3	1.061	1.6		30.22		OK	-777.148	-398.325	0.018145	-11.9528	-1569.9	96,654.70	44,012.46	96,654.70	32,260.75	1.088
K71	3.5	Bawah	3	2.424	1.6		25.78		OK	-743.214	-398.325	0.018145	-11.9528	-1529.18	97,240.65	44,279.28	97,240.65	32,456.33	1.085
K72	3	Atas	1		5.657	2	26.67		OK	-490.704	-243.638	0.011816	-12.3448	-978.666	96,244.65	43,825.74	96,244.65	44,156.02	1.038
K72	3	Bawah	1		2.829	2	26.67		OK	-461.012	-243.638	0.011816	-12.3448	-943.035	97,055.37	44,194.91	97,055.37	44,527.97	1.037
K73	4	Atas	2		4.243	3	56.67		OK	-884.926	-290.072	-0.06125	-17.33	-1526.03	91,463.25	41,648.49	91,463.25	39,211.50	1.069
K73	4	Bawah	2		2.121	3	56.67		OK	-859.475	-290.072	-0.06125	-17.33	-1495.49	91,763.87	41,785.38	91,763.87	39,340.38	1.068
K74	3.5	Atas	3		4.849	4	64.44		OK	-674.636	-218.16	-0.05242	-13.3264	-1158.62	91,325.28	41,585.66	91,325.28	8,670.42	1.287
K74	3.5	Bawah	3		2.121	3	56.67		OK	-640.702	-218.16	-0.05242	-13.3264	-1117.9	91,856.18	41,827.41	91,856.18	8,720.82	1.272
K75	3.5	Atas	4		4.849	5	80.56		OK	-464.119	-146.089	-0.02593	-12.1272	-790.684	91,054.38	41,462.31	91,054.38	6,683.96	1.246
K75	3.5	Bawah	4		2.424	5	80.56		OK	-434.426	-146.089	-0.02593	-12.1272	-755.053	91,726.30	41,768.27	91,726.30	6,733.29	1.230
K76	2	Atas	5		2.424	5	80.56		OK	-246.137	-66.7989	-0.00684	-12.0003	-402.243	89,646.22	40,821.09	89,646.22	4,211.58	1.189
K76	2	Bawah	5		8.486	6	46.67		OK	-216.445	-66.7989	-0.00684	-12.0003	-366.612	90,859.24	41,373.45	90,859.24	4,268.57	1.167
					4.243	6	46.67		OK	-36.6055	0.150288	-0.0017	-3.13E-04	-43.6861	78,622.45	35,801.34	78,622.45	11,006.20	1.007
					4.243	6	46.67		OK	-19.6384	0.150288	-0.0017	-3.13E-04	-23.3256	78,451.55	35,723.51	78,451.55	10,982.27	1.004

Perencanaan Kolom

batang	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran	PD	PL	PEx	Pey	Pu	EI1	EI2	EI _{PAKAL}	Pc	δb
				ψ	K	ψ	K												
K77	3	Atas	1		5.657	2	26.67	OK	-277.123	-126.42	0.132855	47.11644	-534.819	95.182.12	43.341.91	95.182.12	40.805.83	1.022	
		Bawah			2.829	2	26.67	OK	-251.672	-126.42	0.132855	47.11644	-504.279	96.394.08	43.893.78	96.394.08	41.325.41	1.021	
K78	3	Atas	1	1.6			21.33	tidak	-754.675	-385.133	-0.05145	-18.3424	-1521.82	96.598.42	43.986.83	96.598.42	64.707.84	1.041	
		Bawah		1.6			21.33	tidak	-729.225	-385.133	-0.05145	-18.3424	-1491.28	97.046.74	44.190.97	97.046.74	65.008.15	1.040	
K79	4	Atas	2	1.6	2.121	1.6	30.22	OK	-483.029	-244.359	-0.06115	-17.9034	-970.609	96.485.33	43.935.33	96.485.33	32.204.22	1.053	
		Bawah		1.6	1.061	1.6	30.22	OK	-449.095	-244.359	-0.06115	-17.9034	-929.888	97.441.74	44.370.84	97.441.74	32.523.44	1.050	
K80	3	Atas	1	1.6	2.829	1.6	21.33	tidak	-1068.42	-568.213	-0.14463	-11.5374	-2191.25	97.138.45	44.232.74	97.138.45	65.069.58	1.059	
		Bawah		1.6	1.414	1.6	21.33	tidak	-1042.97	-568.213	-0.14463	-11.5374	-2160.71	97.458.62	44.378.53	97.458.62	65.284.05	1.058	
K81	4	Atas	2	1.6	2.121	1.6	30.22	OK	-790.725	-411.862	-0.11202	-12.0282	-1607.85	96.864.66	44.108.06	96.864.66	32.330.83	1.090	
		Bawah		1.6	1.061	1.6	30.22	OK	-756.791	-411.862	-0.11202	-12.0282	-1567.13	97.444.37	44.372.04	97.444.37	32.524.32	1.087	
K82	3.5	Atas	3	1.6	2.424	1.6	25.78	OK	-499.012	-253.204	-0.08176	-12.4322	-1003.94	96.524.18	43.953.02	96.524.18	44.284.26	1.039	
		Bawah		1.6	1.212	1.6	25.78	OK	-469.319	-253.204	-0.08176	-12.4322	-968.31	97.328.66	44.319.35	97.328.66	44.653.35	1.037	
K83	3	Atas	1		5.657	2	26.67	OK	-875.159	-281.233	-0.20929	-17.399	-1500.16	91.261.84	41.556.78	91.261.84	39.125.15	1.068	
		Bawah			2.829	2	26.67	OK	-849.708	-281.233	-0.20929	-17.399	-1469.62	91.562.22	41.693.56	91.562.22	39.253.93	1.067	
K84	4	Atas	2		4.243	3	56.67	OK	-663.184	-208.092	-0.11369	-13.3548	-1128.77	91.023.11	41.448.07	91.023.11	8.641.73	1.278	
		Bawah			2.121	3	56.67	OK	-629.249	-208.092	-0.11369	-13.3548	-1088.05	91.553.64	41.689.65	91.553.64	8.692.10	1.264	
K85	3.5	Atas	3		4.849	4	64.44	OK	-451.976	-135.532	-0.0239	-12.1537	-759.222	90.578.91	41.245.80	90.578.91	6.649.06	1.235	
		Bawah			2.424	4	64.44	OK	-422.283	-135.532	-0.0239	-12.1537	-723.591	91.249.30	41.551.07	91.249.30	6.698.27	1.220	
K86	3.5	Atas	4		4.849	5	80.56	OK	-236.411	-58.3007	0.018248	-12.0316	-376.974	88.807.92	40.439.37	88.807.92	4.172.20	1.177	
		Bawah			2.424	5	80.56	OK	-206.718	-58.3007	0.018248	-12.0316	-341.343	89.998.48	40.981.50	89.998.48	4.228.13	1.155	
K87	2	Atas	5		8.486	6	46.67	OK	-36.624	0.13474	0.001149	5.00E-04	-43.7332	78.642.95	35.810.67	78.642.95	11.009.07	1.007	
		Bawah			4.243	6	46.67	OK	-19.6569	0.13474	0.001149	5.00E-04	-23.3727	78.490.08	35.741.06	78.490.08	10.987.67	1.004	

Perhitungan Momen Rencana (MC) arah v (as A8)

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A9)

No	Panjang batang	Ujung	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran	PD (kN)	PL (kN)	PE _x (kN)	PE _y (kN)	P _u (kN)	EI ₁ (kNm ²)	EI ₂ (kNm ²)	EI _{PAKAI} (kNm ²)	P _c (kN)	δ _b
				ψ	K	ψ	K												
K88	3	Atas	1		5.657	2	26.67	OK	-245.827	-102.557	0.587385	47.01585	-459.082	94.108.94	42.853.22	94.108.94	40.345.74	1.019	
		Bawah			2.829	2	26.67	OK	-220.376	-102.557	0.587385	47.01585	-428.542	95.428.20	43.453.96	95.428.20	40.911.33	1.018	
K89	3	Atas	1	2.829	1.6		21.33	tidak	-727.387	-362.796	-0.26443	-18.3202	-1453.34	96.302.80	43.852.22	96.302.80	64.509.81	1.039	
		Bawah			1.414	1.6		21.33	tidak	-701.937	-362.796	-0.26443	-18.3202	-1422.8	96.763.53	44.062.01	96.763.53	64.818.44	1.038
K90	4	Atas	2	2.121	1.6		30.22	OK	-456.003	-221.927	-0.2503	-17.9119	-902.287	95.989.90	43.709.74	95.989.90	32.038.86	1.049	
		Bawah			1.061	1.6		30.22	OK	-422.069	-221.927	-0.2503	-17.9119	-861.566	96.988.54	44.164.47	96.988.54	32.372.18	1.046
K91	3	Atas	1	2.829	1.6		21.33	tidak	-1007.01	-508.593	1.283086	-11.7604	-2022.17	96.463.92	43.925.59	96.463.92	64.617.74	1.055	
		Bawah			1.414	1.6		21.33	tidak	-981.564	-508.593	1.283086	-11.7604	-1991.63	96.796.21	44.076.90	96.796.21	64.840.33	1.054
K92	4	Atas	2	2.121	1.6		30.22	OK	-735.843	-361.596	0.588442	-12.0077	-1461.56	96.112.66	43.765.64	96.112.66	32.079.83	1.082	
		Bawah			1.061	1.6		30.22	OK	-701.909	-361.596	0.588442	-12.0077	-1420.84	96.720.86	44.042.58	96.720.86	32.282.83	1.079
K93	3.5	Atas	3	2.424	1.6		25.78	OK	-450.825	-211.996	-0.10364	-12.3431	-880.184	95.557.68	43.512.92	95.557.68	43.840.85	1.035	
		Bawah			1.212	1.6		25.78	OK	-421.133	-211.996	-0.10364	-12.3431	-844.553	96.421.58	43.906.30	96.421.58	44.237.19	1.033
K94	3	Atas	1		5.657	2	26.67	OK	-766.546	-184.169	1.066905	-17.0446	-1214.53	88.588.98	40.339.67	88.588.98	37.979.26	1.056	
		Bawah			2.829	2	26.67	OK	-741.096	-184.169	1.066905	-17.0446	-1183.99	88.873.14	40.469.06	88.873.14	38.101.08	1.055	
K95	4	Atas	2		4.243	3	56.67	OK	-588.962	-141.736	0.652262	-13.2448	-933.532	88.602.66	40.345.90	88.602.66	8.411.93	1.227	
		Bawah			2.121	3	56.67	OK	-555.028	-141.736	0.652262	-13.2448	-892.81	89.107.12	40.575.61	89.107.12	8.459.82	1.213	
K96	3.5	Atas	3		4.849	4	64.44	OK	-410.174	-98.3253	0.226152	-12.1079	-649.529	88.570.23	40.331.13	88.570.23	6.501.61	1.200	
		Bawah			2.424	4	64.44	OK	-380.481	-98.3253	0.226152	-12.1079	-613.898	89.210.80	40.622.82	89.210.80	6.548.63	1.185	
K97	3.5	Atas	4		4.849	5	80.56	OK	-228.408	-51.1721	-0.0135	-11.9811	-355.965	88.021.83	40.081.41	88.021.83	4.135.27	1.167	
		Bawah			2.424	5	80.56	OK	-198.716	-51.1721	-0.0135	-11.9811	-320.334	89.180.00	40.608.79	89.180.00	4.189.68	1.146	
K98	2	Atas	5		8.486	6	46.67	OK	-37.0969	-0.28772	-0.00698	-1.23E-03	-44.9766	79.187.58	36.058.67	79.187.58	11.085.31	1.007	
		Bawah			4.243	6	46.67	OK	-20.1298	-0.28772	-0.00698	-1.23E-03	-24.6161	79.494.92	36.198.62	79.494.92	11.128.33	1.004	

Perencanaan Kolom

No	Panjang m	Ujung	Perhitungan Momen Rencana (MC) arah y (as A10)		k _l /r	Pembesaran Momen	PD (kN)	PL (kN)	PE _x (kN)	PE _y (kN)	P _u (kN)	EI ₁₁ (kNm ²)	EI ₂ (kNm ²)	EI _{PAKAI} (kNm ²)	P _c (kN)	δ _b		
			KL Tengah														Kolom Tepi	
			ψ	K													ψ	K
K99	3	Atas	5.657	2	26.67	OK	-294.059	-138.868	-0.58674	46.75947	-575.059	95.610.86	43.537.14	95.610.86	40.989.63	1.024		
		Bawah	2.829	2	26.67	OK	-268.608	-138.868	-0.58674	46.75947	-544.519	96.767.13	44.063.65	96.767.13	41.485.34	1.022		
K100	3	Atas	2.829	1.6	21.33	tidak	-721.482	-363.55	0.37528	-18.19	-1447.46	96.434.34	43.912.12	96.434.34	64.597.92	1.039		
		Bawah	1.414	1.6	21.33	tidak	-696.031	-363.55	0.37528	-18.19	-1416.92	96.901.13	44.124.67	96.901.13	64.910.61	1.038		
K101	4	Atas	2.121	1.6	30.22	OK	-447.122	-220.776	0.270345	-17.7856	-889.788	96.174.01	43.793.57	96.174.01	32.100.31	1.048		
		Bawah	1.061	1.6	30.22	OK	-413.188	-220.776	0.270345	-17.7856	-849.067	97.200.45	44.260.97	97.200.45	32.442.91	1.046		
K102	3	Atas	2.829	1.6	21.33	tidak	-1035.52	-527.224	-1.26288	-11.7319	-2086.19	96.568.12	43.973.03	96.568.12	64.904.68	1.056		
		Bawah	1.414	1.6	21.33	tidak	-1010.07	-527.224	-1.26288	-11.7319	-2055.65	96.892.28	44.120.64	96.892.28	64.904.68	1.086		
K103	4	Atas	2.121	1.6	30.22	OK	-764.503	-380.251	-0.56796	-11.9724	-1525.81	96.267.24	43.836.02	96.267.24	32.131.43	1.083		
		Bawah	1.061	1.6	30.22	OK	-730.568	-380.251	-0.56796	-11.9724	-1485.08	96.855.14	44.103.73	96.855.14	32.327.65	1.038		
K104	3.5	Atas	2.424	1.6	25.78	OK	-484.699	-234.806	0.118205	-12.3048	-957.328	95.931.37	43.683.08	95.931.37	44.012.29	1.036		
		Bawah	1.212	1.6	25.78	OK	-455.007	-234.806	0.118205	-12.3048	-921.697	96.743.32	44.052.81	96.743.32	44.384.81	1.059		
K105	3	Atas	5.657	2	26.67	OK	-787.974	-202.726	-1.12263	-17.0431	-1269.93	89.171.88	40.605.10	89.171.88	38.229.16	1.057		
		Bawah	2.829	2	26.67	OK	-762.523	-202.726	-1.12263	-17.0431	-1239.39	89.461.43	40.736.95	89.461.43	38.353.29	1.241		
K106	4	Atas	4.243	3	56.67	OK	-610.423	-160.333	-0.70056	-13.2538	-989.04	89.353.78	40.687.93	89.353.78	8.483.24	1.227		
		Bawah	2.121	3	56.67	OK	-576.489	-160.333	-0.70056	-13.2538	-948.319	89.869.56	40.922.79	89.869.56	8.532.21	1.218		
K107	3.5	Atas	4.849	4	64.44	OK	-432.331	-117.569	-0.25106	-12.1152	-706.908	89.664.64	40.829.48	89.664.64	6.581.95	1.203		
		Bawah	2.424	4	64.44	OK	-402.639	-117.569	-0.25106	-12.1152	-671.277	90.324.34	41.129.88	90.324.34	6.630.38	1.190		
K108	3.5	Atas	4.849	5	80.56	OK	-246.863	-67.6287	0.007234	-11.9876	-404.442	89.731.47	40.859.91	89.731.47	4.215.59	1.168		
		Bawah	2.424	5	80.56	OK	-217.171	-67.6287	0.007234	-11.9876	-368.811	90.947.94	41.413.84	90.947.94	4.272.74	1.007		
K109	2	Atas	8.486	6	46.67	OK	-36.8348	-0.06047	0.005406	-1.75E-03	-44.2985	78.897.49	35.926.58	78.897.49	11.044.70	1.004		
		Bawah	4.243	6	46.67	OK	-19.8677	-0.06047	0.005406	-1.75E-03	-23.938	78.964.23	35.956.97	78.964.23	11.054.04			

Perencanaan Kolom

Perhitungan batang	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran	PD (kN)	PL (kN)	PEX (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K110	3	Kolom Atas	1			5.657	2	26.67	OK	-309.98	-154.858	-0.382238	47.49116	-619.749	96.323.56	43.861.67	96.323.56	41.295.18	1.026
		Bawah				2.829	2	26.67	OK	-284.53	-154.858	-0.382238	47.49116	-589.208	97.445.29	44.372.46	97.445.29	41.776.08	1.024
K111	3	Atas	1	2.829	1.6			21.33	tidak	-775.102	-406.666	-0.08026	-18.8434	-1580.79	96.959.84	44.151.40	96.959.84	64.949.93	1.042
		Bawah		1.414	1.6			21.33	tidak	-749.651	-406.666	-0.08026	-18.8434	-1550.25	97.401.47	44.352.51	97.401.47	65.245.77	1.041
K112	4	Atas	2	2.121	1.6			30.22	OK	-491.431	-253.062	0.085439	-18.3322	-994.617	96.715.53	44.040.15	96.715.53	32.281.05	1.054
		Bawah		1.061	1.6			30.22	OK	-457.497	-253.062	0.085439	-18.3322	-953.896	97.662.15	44.471.21	97.662.15	32.597.01	1.051
K113	3	Atas	1	2.829	1.6			21.33	tidak	-1080.45	-576.61	0.156666	-11.6216	-2219.11	97.184.40	44.253.66	97.184.40	65.100.36	1.060
		Bawah		1.414	1.6			21.33	tidak	-1055	-576.61	0.156666	-11.6216	-2188.57	97.501.43	44.398.02	97.501.43	65.312.73	1.059
K114	4	Atas	2	2.121	1.6			30.22	OK	-804.799	-422	0.117488	-12.0729	-1640.96	96.952.16	44.147.91	96.952.16	32.360.04	1.092
		Bawah		1.061	1.6			30.22	OK	-770.865	-422	0.117488	-12.0729	-1600.24	97.523.09	44.407.88	97.523.09	32.550.59	1.089
K115	3.5	Atas	3	2.424	1.6			25.78	OK	-514.579	-264.629	0.085052	-12.3662	-1040.9	96.698.17	44.032.25	96.698.17	44.364.09	1.041
		Bawah		1.212	1.6			25.78	OK	-484.887	-264.629	0.085052	-12.3662	-1005.27	97.481.92	44.389.14	97.481.92	44.723.67	1.039
K116	3	Atas	1			5.657	2	26.67	OK	-884.238	-289.062	0.154152	-17.1979	-1523.59	91.435.63	41.635.91	91.435.63	39.199.66	1.069
		Bawah				2.829	2	26.67	OK	-858.787	-289.062	0.154152	-17.1979	-1493.04	91.735.99	41.772.69	91.735.99	39.328.43	1.068
K117	4	Atas	2			4.243	3	56.67	OK	-671.879	-215.547	0.06031	-13.22	-1151.13	91.244.96	41.549.09	91.244.96	8.662.79	1.284
		Bawah				2.121	3	56.67	OK	-637.945	-215.547	0.06031	-13.22	-1110.41	91.775.54	41.790.69	91.775.54	8.713.16	1.270
K118	3.5	Atas	3			4.849	4	64.44	OK	-460.37	-142.768	-0.00473	-12.1385	-780.873	90.906.87	41.395.14	90.906.87	6.673.14	1.242
		Bawah				2.424	4	64.44	OK	-430.678	-142.768	-0.00473	-12.1385	-745.242	91.578.35	41.700.90	91.578.35	6.722.43	1.227
K119	3.5	Atas	4			4.849	5	80.56	OK	-242.762	-63.9571	-0.02846	-12.0232	-393.646	89.380.62	40.700.15	89.380.62	4.199.10	1.185
		Bawah				2.424	5	80.56	OK	-213.069	-63.9571	-0.02846	-12.0232	-358.015	90.588.69	41.250.25	90.588.69	4.255.86	1.163
K120	2	Atas	5			8.486	6	46.67	OK	-36.6134	0.138972	-0.00274	-6.34E-06	-43.7137	78.637.35	35.808.12	78.637.35	11.008.28	1.007
		Bawah				4.243	6	46.67	OK	-19.6463	0.138972	-0.00274	-6.34E-06	-23.3532	78.479.51	35.736.25	78.479.51	10.986.19	1.004

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A12)

batang	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k.l/r	Pembesaran	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	F11 (kNm ²)	E 2 (kNm ²)	E1 (kNm ²)
				ψ	K	ψ	K										
K121	3	Atas	1			5.657	2	26.67	OK	-334.281	-176.431	-2.1E-14	48.28953	-683.428	97.03809	44.18764	97.380
		Bawah				2.829	2	26.67	OK	-308.831	-176.431	-2.1E-14	48.28953	-652.887	98.09880	44.63064	98.083
K122	3	Atas	1	2.829	1.6			21.33	tidak	-786.186	-418.818	7.23E-15	-19.5102	-1613.53	97.16070	44.22287	97.16070
		Bawah		1.414	1.6			21.33	tidak	-760.736	-418.818	7.23E-15	-19.5102	-1582.99	97.49887	44.41239	97.49887
K123	4	Atas	2	2.121	1.6			30.22	OK	-488.471	-251.388	3.4E-15	-18.952	-988.386	96.70781	44.03664	96.70781
		Bawah		1.061	1.6			30.22	OK	-454.536	-251.388	3.4E-15	-18.952	-947.665	97.66022	44.47033	97.66022
K124	3	Atas	1	2.829	1.6			21.33	tidak	-1078.16	-574.689	-1.7E-14	-11.7413	-2213.29	97.16837	44.24636	97.16837
		Bawah		1.414	1.6			21.33	tidak	-1052.7	-574.689	-1.7E-14	-11.7413	-2182.75	97.48591	44.35026	97.48591
K125	4	Atas	2	2.121	1.6			30.22	OK	-804.424	-421.724	-3.4E-14	-12.1443	-1640.07	96.94968	44.14678	96.94968
		Bawah		1.061	1.6			30.22	OK	-770.49	-421.724	-3.4E-14	-12.1443	-1599.35	97.52084	44.43685	97.52084
K126	3.5	Atas	3	2.424	1.6			25.78	OK	-513.9	-264.096	-1.1E-14	-12.3125	-1003.6	97.47370	44.58539	97.47370
		Bawah		1.212	1.6			25.78	OK	-484.208	-264.096	-1.1E-14	-12.3125	-1003.6	97.47370	44.58539	97.47370
K127	3	Atas	1			5.657	2	26.67	OK	-883.296	-288.871	-4.7E-14	-16.9495	-1522.15	91.43973	41.63778	91.43973
		Bawah				2.829	2	26.67	OK	-857.845	-288.871	-4.7E-14	-16.9495	-1491.61	91.74050	41.77474	91.74050
K128	4	Atas	2	4.243				3	56.67	-672.192	-216.198	-7E-15	-13.0526	-1152.55	91.27064	41.56078	91.27064
		Bawah		2.121				3	56.67	-638.258	-216.198	-7E-15	-13.0526	-1111.83	91.80179	41.80265	91.80179
K129	3.5	Atas	3	4.849				4	64.44	-461.177	-143.702	2.68E-15	-12.0874	-783.335	90.95398	41.41659	90.95398
		Bawah		2.424				4	64.44	-431.485	-143.702	2.68E-15	-12.0874	-747.704	91.62621	41.72270	91.62621
K130	3.5	Atas	4	4.849				5	80.56	-244.56	-65.4925	-4.1E-14	-11.9716	-398.259	89.52630	40.76649	89.52630
		Bawah		2.424				5	80.56	-214.867	-65.4925	-4.1E-14	-11.9716	-362.629	90.73744	41.31799	90.73744
K131	2	Atas	5	8.486				6	46.67	-36.7774	-0.00599	-2.2E-14	-4.70E-04	-44.1424	78.82694	35.89445	78.82694
		Bawah		4.243				6	46.67	-19.8103	-0.00599	-2.2E-14	-4.70E-04	-23.7819	78.83361	35.89749	78.83361

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A13)

No	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran	PD (kN)	PL (kN)	PEX (kN)	PEY (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K132	3	Kolom Atas	1			5.657	2	26.67	OK	-309.98	-154.858	-0.38238	47.49116	-619.749	96.323.56	43.861.67	96.323.56	41.295.18	1.026
		Bawah				2.829	2	26.67	OK	-284.53	-154.858	-0.38238	47.49116	-589.208	97.445.29	44.372.46	97.445.29	41.776.08	1.024
K133	3	Kolom Atas	1	1.6				21.33	tidak	-775.102	-406.666	-0.08026	-18.8434	-1580.79	96.959.84	44.151.40	96.959.84	64.949.93	1.042
		Bawah		1.6				21.33	tidak	-749.651	-406.666	-0.08026	-18.8434	-1550.25	97.401.47	44.352.51	97.401.47	65.245.77	1.041
K134	4	Kolom Atas	2	1.6				30.22	OK	-491.431	-253.062	0.085439	-18.3322	-994.617	96.715.53	44.040.15	96.715.53	32.281.05	1.054
		Bawah		1.6				30.22	OK	-457.497	-253.062	0.085439	-18.3322	-953.896	97.662.15	44.471.21	97.662.15	32.597.01	1.051
K135	3	Kolom Atas	1	1.6				21.33	tidak	-1080.45	-576.61	0.156666	-11.6216	-2188.57	97.501.43	44.398.02	97.501.43	65.312.73	1.059
		Bawah		1.6				21.33	tidak	-1055	-576.61	0.156666	-11.6216	-1640.96	96.952.16	44.147.91	96.952.16	32.360.04	1.092
K136	4	Kolom Atas	2	1.6				30.22	OK	-804.799	-422	0.117488	-12.0729	-1600.24	97.523.09	44.407.88	97.523.09	32.550.59	1.089
		Bawah		1.6				30.22	OK	-770.865	-422	0.117488	-12.0729	-1040.9	96.698.17	44.032.25	96.698.17	44.364.09	1.041
K137	3.5	Kolom Atas	3	1.6				25.78	OK	-514.579	-264.629	0.085052	-12.3662	-1005.27	97.481.92	44.389.14	97.481.92	44.723.67	1.039
		Bawah		1.6				25.78	OK	-484.887	-264.629	0.085052	-12.3662	-1523.59	91.435.63	41.635.91	91.435.63	39.199.66	1.069
K138	3	Kolom Atas	1			5.657	2	26.67	OK	-884.238	-289.062	0.154152	-17.1979	-1493.04	91.735.99	41.772.69	91.735.99	39.328.43	1.068
		Bawah				2.829	2	26.67	OK	-858.787	-289.062	0.154152	-17.1979	-1151.13	91.244.96	41.549.09	91.244.96	8.662.79	1.284
K139	4	Kolom Atas	2			4.243	3	56.67	OK	-671.879	-215.547	0.06031	-13.22	-1110.41	91.775.54	41.790.69	91.775.54	8.713.16	1.270
		Bawah				2.121	3	56.67	OK	-637.945	-215.547	0.06031	-13.22	-780.873	90.906.87	41.395.14	90.906.87	6.673.14	1.242
K140	3.5	Kolom Atas	3			4.849	4	64.44	OK	-460.37	-142.768	-0.00473	-12.1385	-745.242	91.578.35	41.700.90	91.578.35	6.722.43	1.227
		Bawah				2.424	4	64.44	OK	-430.678	-142.768	-0.00473	-12.1385	-393.646	89.380.62	40.700.15	89.380.62	4.199.10	1.185
K141	3.5	Kolom Atas	4			4.849	5	80.56	OK	-242.762	-63.9571	-0.02846	-12.0232	-358.015	90.588.69	41.250.25	90.588.69	4.255.86	1.163
		Bawah				2.424	5	80.56	OK	-213.069	-63.9571	-0.02846	-12.0232	-43.7137	78.637.35	35.808.12	78.637.35	11.008.28	1.007
K142	2	Kolom Atas	5			8.486	6	46.67	OK	-36.6134	0.138972	-0.00274	-6.34E-06	-23.3532	78.479.51	35.736.25	78.479.51	10.986.19	1.004
		Bawah				4.243	6	46.67	OK	-19.6463	0.138972	-0.00274	-6.34E-06						

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A14)

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k.l/r	Pembesaran		PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K		Momen											
K143	3	Atas	1			5.657	2	26.67	OK	-294.039	-138.868	-0.58674	46.75947	-575.059	95,610.86	43,537.14	95,610.86	40,989.63	1.024	
K144	3	Bawah	1	2.829	1.6	2.829	2	26.67	OK	-268.608	-138.868	-0.58674	46.75947	-544.519	96,767.13	44,063.65	96,767.13	41,485.34	1.022	
K145	4	Atas	2	1.414	1.6	1.414	2	21.33	tidak	-721.482	-363.55	0.37528	-18.19	-1447.46	96,434.34	43,912.12	96,434.34	64,597.92	1.039	
K146	3	Bawah	1	2.121	1.6	2.121	2	30.22	OK	-696.031	-363.55	0.37528	-18.19	-1416.92	96,901.13	44,124.67	96,901.13	64,910.61	1.038	
K147	4	Atas	2	1.061	1.6	1.061	2	30.22	OK	-447.122	-220.776	0.270345	-17.7856	-889.788	96,174.01	43,793.57	96,174.01	32,100.31	1.048	
K148	3.5	Bawah	1	2.829	1.6	2.829	2	21.33	tidak	-413.188	-220.776	0.270345	-17.7856	-849.067	97,200.45	44,260.97	97,200.45	32,442.91	1.046	
K149	3	Atas	2	1.414	1.6	1.414	2	21.33	tidak	-1035.52	-527.224	-1.26288	-11.7319	-2086.19	96,568.12	43,973.03	96,568.12	64,687.54	1.057	
K150	4	Bawah	1	2.121	1.6	2.121	2	30.22	OK	-1010.07	-527.224	-1.26288	-11.7319	-2055.65	96,267.24	43,836.02	96,267.24	64,904.68	1.056	
K151	3.5	Atas	3	1.061	1.6	1.061	2	25.78	OK	-764.503	-380.251	-0.56796	-11.9724	-1525.81	96,855.14	44,103.73	96,855.14	32,131.43	1.086	
K152	3.5	Bawah	1	2.424	1.6	2.424	2	25.78	OK	-730.568	-380.251	-0.56796	-11.9724	-1485.08	95,931.37	43,683.08	95,931.37	44,012.29	1.038	
K153	2	Atas	1	1.212	1.6	1.212	2	26.67	OK	-484.699	-234.806	0.118205	-12.3048	-957.328	96,743.32	44,052.81	96,743.32	44,384.81	1.036	
K154	4	Bawah	2			5.657	2	26.67	OK	-787.974	-202.726	-1.12263	-17.0431	-1269.93	89,171.88	40,605.10	89,171.88	38,229.16	1.059	
K155	3.5	Atas	3	4.243	3	4.243	3	56.67	OK	-762.523	-202.726	-1.12263	-17.0431	-1239.39	89,461.43	40,736.95	89,461.43	38,353.29	1.057	
K156	4	Bawah	2	2.121	1.6	2.121	2	30.22	OK	-610.423	-160.333	-0.70056	-13.2538	-989.04	89,353.78	40,687.93	89,353.78	8,483.24	1.241	
K157	3.5	Atas	3	4.849	4	4.849	4	64.44	OK	-576.489	-160.333	-0.70056	-13.2538	-948.319	89,869.56	40,922.79	89,869.56	8,532.21	1.227	
K158	3.5	Bawah	4	2.424	4	2.424	4	64.44	OK	-432.331	-117.569	-0.25106	-12.1152	-706.908	89,664.64	40,829.48	89,664.64	6,581.95	1.218	
K159	2	Atas	5	4.849	5	4.849	5	80.56	OK	-402.639	-117.569	-0.25106	-12.1152	-671.277	90,324.34	41,129.88	90,324.34	6,630.38	1.203	
K160	2	Bawah	5	2.424	5	2.424	5	80.56	OK	-246.863	-67.6287	0.007234	-11.9876	-404.442	89,731.47	40,859.91	89,731.47	4,215.59	1.190	
K161	2	Atas	6	8.486	6	8.486	6	46.67	OK	-217.171	-67.6287	0.007234	-11.9876	-368.811	90,947.94	41,413.84	90,947.94	4,272.74	1.168	
K162	2	Bawah	6	4.243	6	4.243	6	46.67	OK	-36.8348	-0.06047	0.005406	-1.75E-03	-44.2985	78,897.49	35,926.58	78,897.49	11,044.70	1.007	
K163	2	Atas	6	4.243	6	4.243	6	46.67	OK	-19.8677	-0.06047	0.005406	-1.75E-03	-23.938	78,964.23	35,956.97	78,964.23	11,054.04	1.004	

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A15)

Kode	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K154	3	Atas	1		5.657	2	26.67	OK	-245.827	-102.557	0.587385	47.01585	-459.082	94.108.94	42.853.22	94.108.94	40.345.74	1.019	
		Bawah			2.829	2	26.67	OK	-220.376	-102.557	0.587385	47.01585	-428.542	95.428.20	43.453.96	95.428.20	40.911.33	1.018	
K155	3	Atas	1	2.829	1.6		21.33	tidak	-727.387	-362.796	-0.26443	-18.3202	-1453.34	96.302.80	43.852.22	96.302.80	64.509.81	1.039	
		Bawah			1.414	1.6		21.33	tidak	-701.937	-362.796	-0.26443	-18.3202	-1422.8	96.763.53	44.062.01	96.763.53	64.818.44	1.038
K156	4	Atas	2	2.121	1.6		30.22	OK	-456.003	-221.927	-0.2503	-17.9119	-902.287	95.989.90	43.709.74	95.989.90	32.038.86	1.049	
		Bawah			1.061	1.6		30.22	OK	-422.069	-221.927	-0.2503	-17.9119	-861.566	96.988.54	44.164.47	96.988.54	32.372.18	1.046
K157	3	Atas	1	2.829	1.6		21.33	tidak	-1007.01	-508.593	1.283086	-11.7604	-2022.17	96.463.92	43.925.59	96.463.92	64.617.74	1.055	
		Bawah			1.414	1.6		21.33	tidak	-981.564	-508.593	1.283086	-11.7604	-1991.63	96.796.21	44.076.90	96.796.21	64.840.33	1.054
K158	4	Atas	2	2.121	1.6		30.22	OK	-735.843	-361.596	0.588442	-12.0077	-1461.56	96.112.66	43.765.64	96.112.66	32.079.83	1.082	
		Bawah			1.061	1.6		30.22	OK	-701.909	-361.596	0.588442	-12.0077	-1420.84	96.720.86	44.042.58	96.720.86	32.282.83	1.079
K159	3.5	Atas	3	2.424	1.6		25.78	OK	-450.825	-211.996	-0.10364	-12.3431	-880.184	95.557.68	43.512.92	95.557.68	43.840.85	1.035	
		Bawah			1.212	1.6		25.78	OK	-421.133	-211.996	-0.10364	-12.3431	-844.553	96.421.58	43.906.30	96.421.58	44.237.19	1.033
K160	3	Atas	1		5.657	2	26.67	OK	-766.546	-184.169	1.066905	-17.0446	-1214.53	88.588.98	40.339.67	88.588.98	37.979.26	1.056	
		Bawah			2.829	2	26.67	OK	-741.096	-184.169	1.066905	-17.0446	-1183.99	88.873.14	40.469.06	88.873.14	38.101.08	1.055	
K161	4	Atas	2		4.243	3	56.67	OK	-588.962	-141.736	0.652262	-13.2448	-933.532	88.602.66	40.345.90	88.602.66	8.411.93	1.227	
		Bawah			2.121	3	56.67	OK	-555.028	-141.736	0.652262	-13.2448	-892.81	89.107.12	40.575.61	89.107.12	8.459.82	1.213	
K162	3.5	Atas	3		4.849	4	64.44	OK	-410.174	-98.3253	0.226152	-12.1079	-649.529	88.570.23	40.331.13	88.570.23	6.501.61	1.200	
		Bawah			2.424	4	64.44	OK	-380.481	-98.3253	0.226152	-12.1079	-613.898	89.210.80	40.622.82	89.210.80	6.548.63	1.185	
K163	3.5	Atas	4		4.849	5	80.56	OK	-228.408	-51.1721	-0.0135	-11.9811	-355.965	88.021.83	40.081.41	88.021.83	4.135.27	1.167	
		Bawah			2.424	5	80.56	OK	-198.716	-51.1721	-0.0135	-11.9811	-320.334	89.180.00	40.608.79	89.180.00	4.189.68	1.146	
K164	2	Atas	5		8.486	6	46.67	OK	-37.0969	-0.28772	-0.00698	-1.23E-03	-44.9766	79.187.58	36.058.67	79.187.58	11.085.31	1.007	
		Bawah			4.243	6	46.67	OK	-20.1298	-0.28772	-0.00698	-1.23E-03	-24.6161	79.494.92	36.198.62	79.494.92	11.128.33	1.004	

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A16)

batang	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k.l/r	Pembesaran	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K165	3	Atas	1		5.657	2	26.67	OK	-277.123	-126.42	0.132855	47.11644	-534.819	95.182.12	43.341.91	95.182.12	40.805.83	1.022	
		Bawah			2.829	2	26.67	OK	-251.672	-126.42	0.132855	47.11644	-504.279	96.394.08	43.893.78	96.394.08	41.325.41	1.021	
K166	3	Atas	1	2.829	1.6		21.33	tidak	-754.675	-385.133	-0.05145	-18.3424	-1521.82	96.598.42	43.986.83	96.598.42	64.707.84	1.041	
		Bawah			1.414	1.6		21.33	tidak	-729.225	-385.133	-0.05145	-18.3424	-1491.28	97.046.74	44.190.97	97.046.74	65.008.15	1.040
K167	4	Atas	2	2.121	1.6		30.22	OK	-483.029	-244.359	-0.06115	-17.9034	-970.609	96.485.33	43.935.33	96.485.33	32.204.22	1.053	
		Bawah			1.061	1.6		30.22	OK	-449.095	-244.359	-0.06115	-17.9034	-929.888	97.441.74	44.370.84	97.441.74	32.523.44	1.050
K168	3	Atas	1	2.829	1.6		21.33	tidak	-1068.42	-568.213	-0.14463	-11.5374	-2191.25	97.138.45	44.378.53	97.138.45	65.069.58	1.059	
		Bawah			1.414	1.6		21.33	tidak	-1042.97	-568.213	-0.14463	-11.5374	-2160.71	97.458.62	44.378.53	97.458.62	65.284.05	1.058
K169	4	Atas	2	2.121	1.6		30.22	OK	-790.725	-411.862	-0.11202	-12.0282	-1607.85	96.864.66	44.108.06	96.864.66	32.330.83	1.090	
		Bawah			1.061	1.6		30.22	OK	-756.791	-411.862	-0.11202	-12.0282	-1567.13	97.444.37	44.372.04	97.444.37	32.524.32	1.087
K170	3.5	Atas	3	2.424	1.6		25.78	OK	-499.012	-253.204	-0.08176	-12.4322	-1003.94	96.524.18	43.953.02	96.524.18	44.284.26	1.039	
		Bawah			1.212	1.6		25.78	OK	-469.319	-253.204	-0.08176	-12.4322	-968.31	97.328.66	44.319.35	97.328.66	44.653.35	1.037
K171	3	Atas	1		5.657	2	26.67	OK	-875.159	-281.233	-0.20929	-17.399	-1500.16	91.261.84	41.556.78	91.261.84	39.125.15	1.068	
		Bawah			2.829	2	26.67	OK	-849.708	-281.233	-0.20929	-17.399	-1469.62	91.562.22	41.693.56	91.562.22	39.253.93	1.067	
K172	4	Atas	2		4.243	3	56.67	OK	-663.184	-208.092	-0.11369	-13.3548	-1128.77	91.023.11	41.448.07	91.023.11	8.641.73	1.278	
		Bawah			2.121	3	56.67	OK	-629.249	-208.092	-0.11369	-13.3548	-1088.05	91.553.64	41.689.65	91.553.64	8.692.10	1.264	
K173	3.5	Atas	3		4.849	4	64.44	OK	-451.976	-135.532	-0.0239	-12.1537	-759.222	90.578.91	41.245.80	90.578.91	6.649.06	1.235	
		Bawah			2.424	4	64.44	OK	-422.283	-135.532	-0.0239	-12.1537	-723.591	91.249.30	41.551.07	91.249.30	6.698.27	1.220	
K174	3.5	Atas	4		4.849	5	80.56	OK	-236.411	-58.3007	0.018248	-12.0316	-376.974	88.807.92	40.439.37	88.807.92	4.172.20	1.177	
		Bawah			2.424	5	80.56	OK	-206.718	-58.3007	0.018248	-12.0316	-341.343	89.998.48	40.981.50	89.998.48	4.228.13	1.155	
K175	2	Atas	5		8.486	6	46.67	OK	-36.624	0.13474	0.001149	5.00E-04	-43.7332	78.642.95	35.810.67	78.642.95	11.009.07	1.007	
		Bawah			4.243	6	46.67	OK	-19.6569	0.13474	0.001149	5.00E-04	-23.3727	78.490.08	35.741.06	78.490.08	10.987.67	1.004	

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A17)

batang	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k.l/r	Pembesaran		PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K		Momen											
K176	3	Atas	1		5.657	2	26.67		OK	-296.323	-140.988	-0.04627	46.94532	-581.169	95.704.48	43.579.77	95.704.48	41.029.77	1.024	
		Bawah			2.829	2	26.67		OK	-270.873	-140.988	-0.04627	46.94532	-550.628	96.855.34	44.103.82	96.855.34	41.523.16	1.023	
K177	3	Atas	1	2.829	1.6		21.33		tidak	-720.52	-362.313	0.041437	-18.2686	-1444.32	96.407.62	43.899.95	96.407.62	64.580.03	1.039	
		Bawah			1.414	1.6		21.33		tidak	-695.069	-362.313	0.041437	-18.2686	-1413.78	96.874.61	44.112.59	96.874.61	64.892.84	1.038
K178	4	Atas	2	2.121	1.6		30.22		OK	-447.829	-220.868	0.024553	-17.831	-890.783	96.159.12	43.786.79	96.159.12	32.095.34	1.049	
		Bawah			1.061	1.6		30.22		OK	-413.895	-220.868	0.024553	-17.831	-850.062	97.183.29	44.253.16	97.183.29	32.437.18	1.046
K179	3	Atas	1	2.829	1.6		21.33		tidak	-1055.15	-554.94	0.02808	-11.4758	-2123.55	97.314.35	44.312.83	97.314.35	65.187.41	1.057	
		Bawah			1.414	1.6		21.33		tidak	-1029.7	-554.94	0.02808	-11.4758	-2123.55	97.314.35	44.312.83	97.314.35	65.187.41	1.057
K180	4	Atas	2	2.121	1.6		30.22		OK	-777.148	-398.325	0.018145	-11.9528	-1569.9	96.654.70	44.012.46	96.654.70	32.260.75	1.088	
		Bawah			1.061	1.6		30.22		OK	-743.214	-398.325	0.018145	-11.9528	-1529.18	97.240.65	44.279.28	97.240.65	32.456.33	1.085
K181	3.5	Atas	3	2.424	1.6		25.78		OK	-490.704	-243.638	0.011816	-12.3448	-978.666	96.244.65	43.825.74	96.244.65	44.156.02	1.038	
		Bawah			1.212	1.6		25.78		OK	-461.012	-243.638	0.011816	-12.3448	-943.035	97.055.37	44.194.91	97.055.37	44.527.97	1.037
K182	3	Atas	1			5.657	2	26.67		OK	-884.926	-290.072	-0.06125	-17.33	-1526.03	91.463.25	41.648.49	91.463.25	39.211.50	1.069
		Bawah			2.829		26.67		OK	-859.475	-290.072	-0.06125	-17.33	-1495.49	91.763.87	41.785.38	91.763.87	39.340.38	1.068	
K183	4	Atas	2			4.243	3	56.67		OK	-674.636	-218.16	-0.05242	-13.3264	-1158.62	91.325.28	41.585.66	91.325.28	8.670.42	1.287
		Bawah			2.121		56.67		OK	-640.702	-218.16	-0.05242	-13.3264	-1117.9	91.856.18	41.827.41	91.856.18	8.720.82	1.272	
K184	3.5	Atas	3			4.849	4	64.44		OK	-464.119	-146.089	-0.02593	-12.1272	-790.684	91.054.38	41.462.31	91.054.38	6.683.96	1.246
		Bawah			2.424		64.44		OK	-434.426	-146.089	-0.02593	-12.1272	-755.053	91.726.30	41.768.27	91.726.30	6.733.29	1.230	
K185	3.5	Atas	4			4.849	5	80.56		OK	-246.137	-66.7989	-0.00684	-12.0003	-402.243	89.646.22	40.821.09	89.646.22	4.211.58	1.189
		Bawah			2.424		80.56		OK	-216.445	-66.7989	-0.00684	-12.0003	-366.612	90.859.24	41.373.45	90.859.24	4.268.57	1.167	
K186	2	Atas	5			8.486	6	46.67		OK	-36.6055	0.150288	-0.0017	-3.13E-04	-43.6861	78.622.45	35.801.34	78.622.45	11.006.20	1.007
		Bawah			4.243		46.67		OK	-19.6384	0.150288	-0.0017	-3.13E-04	-23.3256	78.451.55	35.723.51	78.451.55	10.982.27	1.004	

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A18)

No	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k.l/r	Pembesaran	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
187	3	Atas	1		5.657	2	26.67		OK	-246.756	-103.473	-0.23537	47.14106	-461.663	94.169.09	42.880.62	94.169.09	40.371.53	1.019
		Bawah			2.829	2	26.67		OK	-221.305	-103.473	-0.23537	47.14106	-431.122	95.486.42	43.480.47	95.486.42	40.936.29	1.018
188	3	Atas	1	2.829	1.6		21.33		tidak	-727.285	-361.864	0.139597	-18.3599	-1451.73	96.271.63	43.838.02	96.271.63	64.488.93	1.039
		Bawah		1.414	1.6		21.33		tidak	-701.835	-361.864	0.139597	-18.3599	-1421.18	96.731.91	44.047.61	96.731.91	64.797.25	1.038
189	4	Atas	2	2.121	1.6		30.22		OK	-456.178	-221.526	0.113803	-17.9205	-901.855	95.962.08	43.697.07	95.962.08	32.029.57	1.049
		Bawah		1.061	1.6		30.22		OK	-422.244	-221.526	0.113803	-17.9205	-861.134	96.959.29	44.151.16	96.959.29	32.362.42	1.046
190	3	Atas	1	2.829	1.6		21.33		tidak	-1026.47	-536.11	0.204441	-11.5497	-2089.54	96.900.31	44.124.30	96.900.31	64.910.06	1.057
		Bawah		1.414	1.6		21.33		tidak	-1001.02	-536.11	0.204441	-11.5497	-2059	97.231.16	44.274.95	97.231.16	65.131.68	1.056
191	4	Atas	2	2.121	1.6		30.22		OK	-748.395	-379.504	0.152088	-12.043	-1505.28	96.516.01	43.949.30	96.516.01	32.214.46	1.084
		Bawah		1.061	1.6		30.22		OK	-714.461	-379.504	0.152088	-12.043	-1464.56	97.122.32	44.225.39	97.122.32	32.416.83	1.081
192	3.5	Atas	3	2.424	1.6		25.78		OK	-456.376	-220.44	0.108857	-12.4411	-900.355	95.894.40	43.666.25	95.894.40	43.995.33	1.035
		Bawah		1.212	1.6		25.78		OK	-426.684	-220.44	0.108857	-12.4411	-864.724	96.758.12	44.059.55	96.758.12	44.391.59	1.034
193	3	Atas	1		5.657	2	26.67		OK	-864.322	-271.601	0.089106	-17.4004	-1471.75	91.037.61	41.454.67	91.037.61	39.029.02	1.067
		Bawah			2.829	2	26.67		OK	-838.872	-271.601	0.089106	-17.4004	-1441.21	91.337.65	41.591.30	91.337.65	39.157.65	1.065
194	4	Atas	2		4.243	3	56.67		OK	-652.501	-198.561	0.009871	-13.3587	-1100.7	90.721.51	41.310.74	90.721.51	8.613.09	1.271
		Bawah			2.121	3	56.67		OK	-618.567	-198.561	0.009871	-13.3587	-1059.98	91.250.89	41.551.79	91.250.89	8.663.35	1.256
195	3.5	Atas	3		4.849	4	64.44		OK	-440.65	-125.461	-0.02607	-12.1542	-729.517	90.086.73	41.021.68	90.086.73	6.612.93	1.225
		Bawah			2.424	4	64.44		OK	-410.957	-125.461	-0.02607	-12.1542	-693.886	90.752.91	41.325.03	90.752.91	6.661.84	1.210
196	3.5	Atas	4		4.849	5	80.56		OK	-225.485	-48.4311	-0.03005	-12.0302	-348.072	87.693.16	39.931.75	87.693.16	4.119.83	1.164
		Bawah			2.424	5	80.56		OK	-195.792	-48.4311	-0.03005	-12.0302	-312.441	88.833.73	40.451.12	88.833.73	4.173.41	1.143
197	2	Atas	5		8.486	6	46.67		OK	-36.7705	0.013538	-0.00477	2.02E-03	-44.103	78.801.57	35.882.90	78.801.57	11.031.27	1.007
		Bawah			4.243	6	46.67		OK	-19.8034	0.013538	-0.00477	2.02E-03	-23.7425	78.786.49	35.876.03	78.786.49	11.029.16	1.004

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A19)

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran	PD (kN)	PL (kN)	PE _x (kN)	Pey (kN)	Pu (kN)	EI ₁ (kNm ²)	EI ₂ (kNm ²)	EI _{PAKAI} (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K198	3	Atas	1		5.657	2	26.67	OK	-276.104	-125.466	-0.73711	47.06156	-532.069	95.134.32	43.320.14	95.134.32	40.785.34	1.022	
		Bawah			2.829	2	26.67	OK	-250.653	-125.466	-0.73711	47.06156	-501.529	96.348.80	43.873.16	96.348.80	41.306.00	1.021	
K199	3	Atas	1	2.829	1.6		21.33	tidak	-755.236	-386.314	0.353976	-18.3571	-1524.39	96.628.51	44.000.53	96.628.51	64.727.99	1.041	
		Bawah			1.414	1.6		21.33	tidak	-729.785	-386.314	0.353976	-18.3571	-1493.84	97.076.95	44.204.73	97.076.95	65.028.38	1.040
K200	4	Atas	2	2.121	1.6		30.22	OK	-483.193	-244.891	0.31605	-17.9469	-971.657	96.509.05	43.946.13	96.509.05	32.212.14	1.053	
		Bawah			1.061	1.6		30.22	OK	-449.259	-244.891	0.31605	-17.9469	-930.936	97.465.90	44.381.84	97.465.90	32.531.51	1.050
K201	3	Atas	1	2.829	1.6		21.33	tidak	-1049.44	-540.894	-1.20235	-11.8225	-2124.76	96.727.22	44.045.48	96.727.22	64.794.11	1.058	
		Bawah			1.414	1.6		21.33	tidak	-1023.99	-540.894	-1.20235	-11.8225	-2094.22	97.048.79	44.191.91	97.048.79	65.009.52	1.057
K202	4	Atas	2	2.121	1.6		30.22	OK	-778.76	-394.216	-0.53041	-12.0689	-1565.26	96.493.53	43.939.07	96.493.53	32.206.96	1.088	
		Bawah			1.061	1.6		30.22	OK	-744.826	-394.216	-0.53041	-12.0689	-1524.54	97.074.96	44.203.83	97.074.96	32.401.02	1.085
K203	3.5	Atas	3	2.424	1.6		25.78	OK	-493.828	-244.9	0.151206	-12.379	-984.433	96.229.53	43.818.85	96.229.53	44.149.08	1.039	
		Bawah			1.212	1.6		25.78	OK	-464.135	-244.9	0.151206	-12.379	-948.802	97.034.45	44.185.38	97.034.45	44.518.37	1.037
K204	3	Atas	1		5.657	2	26.67	OK	-777.757	-193.977	-1.19024	-17.0634	-1243.67	88.903.85	40.483.05	88.903.85	38.114.25	1.058	
		Bawah			2.829	2	26.67	OK	-752.307	-193.977	-1.19024	-17.0634	-1213.13	89.191.14	40.613.87	89.191.14	38.237.42	1.056	
K205	4	Atas	2		4.243	3	56.67	OK	-600.047	-151.458	-0.76134	-13.263	-962.389	89.006.50	40.529.79	89.006.50	8.450.27	1.234	
		Bawah			2.121	3	56.67	OK	-566.113	-151.458	-0.76134	-13.263	-921.668	89.517.69	40.762.56	89.517.69	8.498.80	1.221	
K206	3.5	Atas	3		4.849	4	64.44	OK	-421.829	-108.542	-0.27704	-12.1068	-679.862	89.173.16	40.605.68	89.173.16	6.545.87	1.209	
		Bawah			2.424	4	64.44	OK	-392.137	-108.542	-0.27704	-12.1068	-644.231	89.825.78	40.902.86	89.825.78	6.593.78	1.195	
K207	3.5	Atas	4		4.849	5	80.56	OK	-239.574	-61.1358	0.00232	-11.9676	-385.306	89.100.97	40.572.81	89.100.97	4.185.97	1.181	
		Bawah			2.424	5	80.56	OK	-209.881	-61.1358	0.00232	-11.9676	-349.675	90.301.28	41.119.38	90.301.28	4.242.36	1.159	
K208	2	Atas	5		8.486	6	46.67	OK	-37.0055	-0.18679	0.002403	2.24E-03	-44.7055	79.059.41	36.000.31	79.059.41	11.067.37	1.007	
		Bawah			4.243	6	46.67	OK	-20.0385	-0.18679	0.002403	2.24E-03	-24.345	79.261.46	36.092.31	79.261.46	11.095.65	1.004	

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A20)

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k/lr	Pembesaran Momen	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K209	3	Atas	1		5,657	2	26,67	OK	-298,553	-108,108	-0,75484	47,74994	-531,237	92,510,96	42,125,57	92,510,96	39,660,67	1,023	
		Bawah			2,829	2	26,67	OK	-273,103	-108,108	-0,75484	47,74994	-500,696	93,501,69	42,576,71	93,501,69	40,085,40	1,021	
K210	3	Atas	1	2,829	1,6		21,33	tidak	-762,263	-366,778	0,493593	-18,5883	-1501,56	95,845,90	43,644,16	95,845,90	64,203,75	1,041	
		Bawah			1,414	1,6		21,33	tidak	-736,813	-366,778	0,493593	-18,5883	-1471,02	96,277,71	43,840,79	64,493,00	1,040	
K211	4	Atas	2	2,121	1,6		30,22	OK	-487,554	-225,212	0,293369	-18,1726	-945,404	95,336,10	43,412,02	95,336,10	31,820,64	1,052	
		Bawah			1,061	1,6		30,22	OK	-453,62	-225,212	0,293369	-18,1726	-904,683	96,243,90	43,825,40	32,123,64	1,049	
K212	3	Atas	1	2,829	1,6		21,33	tidak	-1025,68	-537,532	0,220213	-11,5548	-2090,87	96,945,09	44,295,69	96,945,09	64,940,05	1,057	
		Bawah			1,414	1,6		21,33	tidak	-1000,23	-537,532	0,220213	-11,5548	-2060,33	97,276,69	44,295,69	65,162,18	1,056	
K213	4	Atas	2	2,121	1,6		30,22	OK	-747,513	-380,829	0,120078	-12,1108	-1506,34	96,576,36	43,976,78	96,576,36	32,234,60	1,084	
		Bawah			1,061	1,6		30,22	OK	-713,578	-380,829	0,120078	-12,1108	-1465,62	97,184,69	44,253,79	32,437,65	1,081	
K214	3,5	Atas	3	2,424	1,6		25,78	OK	-456,995	-221,394	0,138384	-12,4718	-902,625	95,931,88	43,683,32	95,931,88	44,012,52	1,035	
		Bawah			1,212	1,6		25,78	OK	-427,303	-221,394	0,138384	-12,4718	-866,994	96,795,56	44,076,60	44,408,77	1,034	
K215	3	Atas	1		5,657	2	26,67	OK	-857,026	-268,731	-0,26329	-17,4577	-1458,4	91,016,30	41,444,97	91,016,30	39,019,88	1,066	
		Bawah			2,829	2	26,67	OK	-831,575	-268,731	-0,26329	-17,4577	-1427,86	91,318,56	41,582,60	39,149,47	1,065		
K216	4	Atas	2		4,243	3	56,67	OK	-648,421	-196,954	0,057513	-13,4131	-1093,23	90,703,46	41,302,51	90,703,46	8,611,38	1,268	
		Bawah			2,121	3	56,67	OK	-614,487	-196,954	0,057513	-13,4131	-1052,51	91,235,69	41,544,87	8,661,91	1,254		
K217	3,5	Atas	3		4,849	4	64,44	OK	-438,273	-124,551	0,37894	-12,1648	-725,21	90,069,33	41,013,76	90,069,33	6,611,66	1,224	
		Bawah			2,424	4	64,44	OK	-408,581	-124,551	0,37894	-12,1648	-689,579	90,738,54	41,318,49	6,660,78	1,209		
K218	3,5	Atas	4		4,849	5	80,56	OK	-224,504	-48,1614	0,520561	-11,9691	-346,463	87,683,75	39,927,47	87,683,75	4,119,39	1,163	
		Bawah			2,424	5	80,56	OK	-194,812	-48,1614	0,520561	-11,9691	-310,832	88,828,95	40,448,94	4,173,19	1,142		
K219	2	Atas	5		8,486	6	46,67	OK	-37,359	-0,22521	0,013303	-6,98E-03	-45,1911	79,105,88	36,021,47	79,105,88	11,073,87	1,007	
		Bawah			4,243	6	46,67	OK	-20,3919	-0,22521	0,013303	-6,98E-03	-24,8306	79,342,53	36,129,23	11,107,00	1,004		

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A21)

batang	Panjang m	Ujung	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI PAKAI (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K220	3	Atas	1			5.657	2	26.67	OK	-298.553	-108.108	-0.75484	47.74994	-531.237	92.510.96	42.125.57	92.510.96	39.660.67	1.023
		Bawah				2.829	2	26.67	OK	-273.103	-108.108	-0.75484	47.74994	-500.696	93.501.69	42.576.71	93.501.69	40.085.40	1.021
K221	3	Atas	1	2.829	1.6			21.33	tidak	-762.263	-366.778	0.493593	-18.5883	-1501.56	95.845.90	43.644.16	95.845.90	64.203.75	1.041
		Bawah				1.414	1.6	21.33	tidak	-736.813	-366.778	0.493593	-18.5883	-1471.02	96.277.71	43.840.79	96.277.71	64.493.00	1.040
K222	4	Atas	2	2.121	1.6			30.22	OK	-487.554	-225.212	0.293369	-18.1726	-945.404	95.336.10	43.412.02	95.336.10	31.820.64	1.052
		Bawah				1.061	1.6	30.22	OK	-453.62	-225.212	0.293369	-18.1726	-904.683	96.243.90	43.825.40	96.243.90	32.123.64	1.049
K223	3	Atas	1	2.829	1.6			21.33	tidak	-1025.68	-537.532	0.220213	-11.5548	-2090.87	96.945.09	44.295.69	96.945.09	64.940.05	1.057
		Bawah				1.414	1.6	21.33	tidak	-1000.23	-537.532	0.220213	-11.5548	-2060.33	97.276.69	44.295.69	97.276.69	65.162.18	1.056
K224	4	Atas	2	2.121	1.6			30.22	OK	-747.513	-380.829	0.120078	-12.1108	-1506.34	96.576.36	43.976.78	96.576.36	32.234.60	1.084
		Bawah				1.061	1.6	30.22	OK	-713.578	-380.829	0.120078	-12.1108	-1465.62	97.184.69	44.253.79	97.184.69	32.437.65	1.081
K225	3.5	Atas	3	2.424	1.6			25.78	OK	-456.995	-221.394	0.138384	-12.4718	-902.625	95.931.88	43.683.32	95.931.88	44.012.52	1.035
		Bawah				1.212	1.6	25.78	OK	-427.303	-221.394	0.138384	-12.4718	-866.994	96.795.56	44.076.60	96.795.56	44.408.77	1.034
K226	3	Atas	1			5.657	2	26.67	OK	-857.026	-268.731	-0.26329	-17.4577	-1458.4	91.016.30	41.444.97	91.016.30	39.019.88	1.066
		Bawah				2.829	2	26.67	OK	-831.575	-268.731	-0.26329	-17.4577	-1427.86	91.318.56	41.582.60	91.318.56	39.149.47	1.065
K227	4	Atas	2			4.243	3	56.67	OK	-648.421	-196.954	0.057513	-13.4131	-1093.23	90.703.46	41.302.51	90.703.46	8.611.38	1.268
		Bawah				2.121	3	56.67	OK	-614.487	-196.954	0.057513	-13.4131	-1052.51	91.235.69	41.544.87	91.235.69	8.661.91	1.254
K228	3.5	Atas	3			4.849	4	64.44	OK	-438.273	-124.551	0.37894	-12.1648	-725.21	90.069.33	41.013.76	90.069.33	6.611.66	1.224
		Bawah				2.424	4	64.44	OK	-408.581	-124.551	0.37894	-12.1648	-689.579	90.738.54	41.318.49	90.738.54	6.660.78	1.209
K229	3.5	Atas	4			4.849	5	80.56	OK	-224.504	-48.1614	0.520561	-11.9691	-346.463	87.683.75	39.927.47	87.683.75	4.119.39	1.163
		Bawah				2.424	5	80.56	OK	-194.812	-48.1614	0.520561	-11.9691	-310.832	88.828.95	40.448.94	88.828.95	4.173.19	1.142
K230	2	Atas	5			8.486	6	46.67	OK	-37.359	-0.22521	0.013303	-6.98E-03	-45.1911	79.105.88	36.021.47	79.105.88	11.073.87	1.007
		Bawah				4.243	6	46.67	OK	-20.3919	-0.22521	0.013303	-6.98E-03	-24.8306	79.342.53	36.129.23	79.342.53	11.107.00	1.004

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (as A22)

No	Panjang batang	Ujung	Lt	KL Tengah		Kolom Tepi		k _{l/r}	Pembesaran	PD	PL	PEx	Pey	Pu	EI ₁	EI ₂	EI _{PAKAI}	Pc	δb
				ψ	K	ψ	K												
K231	3	Atas	1			5.657	2	26.67	OK	-184.947	-61.6858	3.602372	85.23054	-320.634	91.641.44	41.729.63	91.641.44	39.287.89	1.014
		Bawah				2.829	2	26.67	OK	-159.497	-61.6858	3.602372	85.23054	-290.093	93.238.31	42.456.78	93.238.31	39.972.49	1.012
K232	3	Atas	1	2.829	1.6			21.33	tidak	-572.931	-278.166	-32.4832	-18.7993	-1132.58	95.959.52	43.695.90	95.959.52	64.279.86	1.030
		Bawah				1.414	1.6	21.33	tidak	-547.48	-278.166	-32.4832	-18.7993	-1102.04	96.541.33	43.960.84	96.541.33	64.669.59	1.029
K233	4	Atas	2	2.121	1.6			30.22	OK	-364.245	-175.868	-15.7408	-17.4199	-718.483	95.889.31	43.663.93	95.889.31	32.005.28	1.039
		Bawah				1.061	1.6	30.22	OK	-330.311	-175.868	-15.7408	-17.4199	-677.762	97.153.48	44.239.58	97.153.48	32.427.23	1.036
K234	3	Atas	1	2.829	1.6			21.33	tidak	-1050.83	-546.947	-9.68766	-13.6823	-2136.11	96.855.27	44.103.79	96.855.27	64.879.89	1.058
		Bawah				1.414	1.6	21.33	tidak	-1025.38	-546.947	-9.68766	-13.6823	-2105.57	97.177.81	44.250.66	97.177.81	65.095.95	1.057
K235	4	Atas	2	2.121	1.6			30.22	OK	-778.414	-395.321	-7.02218	-12.9318	-1566.61	96.535.46	43.958.16	96.535.46	32.220.95	1.088
		Bawah				1.061	1.6	30.22	OK	-744.48	-395.321	-7.02218	-12.9318	-1525.89	97.118.01	44.223.43	97.118.01	32.415.39	1.085
K236	3.5	Atas	3	2.424	1.6			25.78	OK	-493.199	-241.772	-4.6644	-12.9441	-978.674	96.081.73	43.751.55	96.081.73	44.081.27	1.038
		Bawah				1.212	1.6	25.78	OK	-463.507	-241.772	-4.6644	-12.9441	-943.043	96.883.44	44.116.62	96.883.44	44.449.09	1.037
K237	3	Atas	1			5.657	2	26.67	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	39.168.07	1.082
		Bawah				2.829	2	26.67	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	39.277.60	1.080
K238	4	Atas	2			4.243	3	56.67	OK	-781.649	-248.436	10.77663	-15.2924	-1335.48	91.151.32	41.506.45	91.151.32	8.653.90	1.346
		Bawah				2.121	3	56.67	OK	-747.714	-248.436	10.77663	-15.2924	-1294.76	91.602.07	41.711.70	91.602.07	8.696.70	1.330
K239	3.5	Atas	3			4.849	4	64.44	OK	-535.738	-162.806	5.353051	-13.9819	-903.376	90.708.18	41.304.66	90.708.18	6.658.55	1.292
		Bawah				2.424	4	64.44	OK	-506.046	-162.806	5.353051	-13.9819	-867.745	91.273.50	41.562.09	91.273.50	6.700.05	1.275
K240	3.5	Atas	4			4.849	5	80.56	OK	-282.799	-71.4039	1.184067	-13.9569	-453.605	89.009.21	40.531.02	89.009.21	4.181.66	1.221
		Bawah				2.424	5	80.56	OK	-253.107	-71.4039	1.184067	-13.9569	-417.975	90.001.11	40.982.69	90.001.11	4.228.25	1.197
K241	2	Atas	5			8.486	6	46.67	OK	-39.8092	0.430637	0.443116	2.89E-02	-47.082	78.298.32	35.653.74	78.298.32	10.960.82	1.007
		Bawah				4.243	6	46.67	OK	-22.8421	0.430637	0.443116	2.89E-02	-26.7215	77.906.06	35.475.12	77.906.06	10.905.91	1.004

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah y (AS A23)

Perhitungan batang	Panjang m	Ujung	Lt	K.L. Tengah		Kolom Tepi	k./r	Pembesaran	PD (kN)	PL (kN)	PEX (kN)	Pcy (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI _{PAKAI} (kNm ²)	Pc (kN)	δb
				ψ	K													
K247	3	Atas	1			5.657	2	26.67	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	38.046.76	1.046
		Bawah				2.829	2	26.67	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	38.197.89	1.044
K248	4	Atas	2			4.243	2.05	38.72	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	18.020.65	1.076
		Bawah				4.243	2.05	38.72	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	18.147.15	1.072
K249	3.5	Atas	3			4.849	2.19	35.28	-333.187	-78.7256	12.49992	-10.3274	-490.155	88.450.95	40.276.82	88.450.95	21.660.45	1.042
		Bawah				4.849	2.19	35.28	-303.495	-78.7256	12.49992	-10.3274	-490.155	89.243.72	40.637.81	89.243.72	21.854.59	1.039
K250	3.5	Atas	4			4.849	2.19	35.28	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	21.385.20	1.022
		Bawah				4.849	2.19	35.28	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	21.738.47	1.018
K251	2	Atas	5			4.243	2.5	19.44	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	63.673.54	1.001
		Bawah				8.486	2.5	19.44	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	63.819.74	1.000
K244	3	Atas	1	2.829	1.6			21.33	-745.048	-315.356	39.36526	-9.19224	-1398.63	94.279.27	42.930.79	94.279.27	63.154.32	1.038
		Bawah						21.33	-719.597	-315.356	39.36526	-9.19224	-1368.09	94.693.91	43.119.60	94.693.91	63.432.07	1.037
K245	4	Atas	2	2.121	1.6			30.22	-553.941	-233.629	25.86098	-10.5532	-1038.54	94.237.04	42.911.56	94.237.04	31.453.80	1.058
		Bawah						30.22	-520.006	-233.629	25.86098	-10.5532	-997.814	94.995.38	43.256.87	94.995.38	31.706.91	1.055
K246	3.5	Atas	3	1.212	1.52			24.49	-352.633	-151.062	12.41707	-11.6679	-664.859	94.421.69	42.995.64	94.421.69	47.999.63	1.024
		Bawah						24.49	-322.94	-151.062	12.41707	-11.6679	-629.228	95.492.10	43.483.06	95.492.10	48.543.78	1.022
K242	3	Atas	1	2.829	1.6			21.33	-307.629	-104.658	48.90252	-7.18042	-536.608	91.847.21	41.823.33	91.847.21	61.525.17	1.015
		Bawah						21.33	-282.178	-104.658	48.90252	-7.18042	-506.067	92.772.63	42.244.73	92.772.63	62.145.07	1.014
K243	4	Atas	2	1.061	1.45			27.39	-189.43	-66.4777	25.07952	-10.1364	-333.681	92.174.45	41.972.34	92.174.45	37.459.85	1.015
		Bawah						27.39	-155.496	-66.4777	25.07952	-10.1364	-292.96	94.397.73	42.984.73	94.397.73	38.363.39	1.013
K231	3	Atas	1			5.657	2.08	27.73	-184.947	-61.6858	3.602372	85.23054	-320.634	91.641.44	41.729.63	91.641.44	36.323.86	1.015
		Bawah				2.829	2.08	27.73	-159.497	-61.6858	3.602372	85.23054	-290.093	93.238.31	42.456.78	93.238.31	36.956.81	1.013

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah x (as_{v2})

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran Momen	PD (kN)	PL (kN)	PEX (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI _{PAKAI} (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K6	3	Atas	1		5.6571	2	26.667	OK	-745.0478	-315.3558	39.365257	-9.192241	-1398.627	94.279.27	42.930.79	94.279.27	40.418.76	1.061	
		Bawah		2.8286	2	26.667	OK	-719.5972	-315.3558	39.365257	-9.192241	-1368.086	94.693.91	43.119.60	94.693.91	40.596.52	1.060		
K7	4	Atas	2		4.2429	1.8	34	OK	-553.9406	-233.6291	25.860983	-10.55321	-1038.535	94.237.04	42.911.56	94.237.04	24.852.39	1.075	
		Bawah		2.1214	1.8	34	OK	-520.0064	-233.6291	25.860983	-10.55321	-997.8142	94.995.38	43.256.87	94.995.38	25.052.38	1.071		
K8	3.5	Atas	3		4.849	1.9	30.611	OK	-352.6328	-151.062	12.417065	-11.66786	-664.8586	94.421.69	42.995.64	94.421.69	30.719.76	1.037	
		Bawah		2.4245	1.9	30.611	OK	-322.9404	-151.062	12.417065	-11.66786	-629.2277	95.492.10	43.483.06	95.492.10	31.068.02	1.035		
K14	3	Atas	1	2.8286	1.55		20.667	tidak	-1050.827	-546.9473	-9.687662	-13.68226	-2136.109	96.855.27	44.103.79	96.855.27	69.133.20	1.054	
		Bawah		1.4143	1.55		20.667	tidak	-1025.377	-546.9473	-9.687662	-13.68226	-2105.568	75.052.48	44.250.66	75.052.48	857.133.43	1.004	
K15	4	Atas	2	2.1214	1.3		24.556	OK	-778.4142	-395.3209	-7.022181	-12.9318	-1566.61	96.535.46	43.958.16	96.535.46	48.808.07	1.057	
		Bawah		1.0607	1.3		24.556	OK	-744.48	-395.3209	-7.022181	-12.9318	-1525.889	75.006.30	44.223.43	75.006.30	1.217.749	1.002	
K16	3.5	Atas	3	2.4245	1.6		25.778	OK	-493.1995	-241.7715	-4.664398	-12.9441	-978.6738	96.081.73	43.751.55	96.081.73	44.081.27	1.038	
		Bawah		1.2122	1.6		25.778	OK	-463.5071	-241.7715	-4.664398	-12.9441	-943.043	96.883.44	44.116.62	96.883.44	44.449.09	1.037	
K25	3	Atas	1	2.8286	1.55		20.667	tidak	-1025.683	-537.532	0.2202135	-11.55478	-2090.871	96.945.09	44.144.69	96.945.09	69.197.31	1.053	
		Bawah		1.4143	1.55		20.667	tidak	-1000.233	-537.532	0.2202135	-11.55478	-2060.33	97.276.69	44.295.69	97.276.69	69.434.00	1.052	
K26	4	Atas	2	2.1214	1.3		24.556	OK	-747.5127	-380.8286	0.1200775	-12.11084	-1506.341	96.576.36	43.976.78	96.576.36	48.828.75	1.054	
		Bawah		1.0607	1.3		24.556	OK	-713.5785	-380.8286	0.1200775	-12.11084	-1465.62	97.184.69	44.253.79	97.184.69	49.136.32	1.052	
K27	3.5	Atas	3	2.4245	1.6		25.778	OK	-456.9952	-221.394	0.1383842	-12.47184	-902.6247	95.931.88	43.683.32	95.931.88	44.012.52	1.035	
		Bawah		1.2122	1.6		25.778	OK	-427.3028	-221.394	0.1383842	-12.47184	-866.9938	96.795.56	44.076.60	96.795.56	44.408.77	1.034	
K36	3	Atas	1	2.8286	1.55		20.667	tidak	-1036.084	-527.7219	1.2986442	-11.78268	-2087.655	96.573.36	43.975.42	96.573.36	68.931.98	1.053	
		Bawah		1.4143	1.55		20.667	tidak	-1010.633	-527.7219	1.2986442	-11.78268	-2057.115	96.897.40	44.122.97	96.897.40	69.163.27	1.052	
K37	4	Atas	2	2.1214	1.3		24.556	OK	-764.9821	-380.6497	0.6012332	-12.0381	-1527.018	96.272.62	43.838.47	96.272.62	48.675.18	1.055	
		Bawah		1.0607	1.3		24.556	OK	-731.0479	-380.6497	0.6012332	-12.0381	-1486.297	96.860.25	44.106.06	96.860.25	48.972.28	1.053	
K38	3.5	Atas	3	2.4245	1.6		25.778	OK	-485.4057	-235.3225	-0.108355	-12.36193	-959.0028	95.940.75	43.687.35	95.940.75	44.016.59	1.038	
		Bawah		1.2122	1.6		25.778	OK	-455.7133	-235.3225	-0.108355	-12.36193	-923.3719	96.751.75	44.056.65	96.751.75	44.388.67	1.036	
K47	3	Atas	1	2.8286	1.55		20.667	tidak	-1049.44	-540.8939	-1.20235	-11.82249	-2124.758	96.727.22	44.045.48	96.727.22	69.041.80	1.054	
		Bawah		1.4143	1.55		20.667	tidak	-1023.989	-540.8939	-1.20235	-11.82249	-2094.217	97.048.79	44.191.91	97.048.79	69.271	1.053	
K48	4	Atas	2	2.1214	1.3		24.556	OK	-778.7598	-394.2158	-0.530407	-12.06891	-1565.257	96.493.53	43.939.07	96.493.53	48.786.87	1.056	
		Bawah		1.0607	1.3		24.556	OK	-744.8256	-394.2158	-0.530407	-12.06891	-1524.536	97.074.96	44.203.83	97.074.96	49.080.84	1.055	
K49	3.5	Atas	3	2.4245	1.6		25.778	OK	-493.8278	-244.8997	0.151206	-12.37902	-984.433	96.229.53	43.818.85	96.229.53	44.149.08	1.039	
		Bawah		1.2122	1.6		25.778	OK	-464.1354	-244.8997	0.151206	-12.37902	-948.8021	97.034.45	44.185.38	97.034.45	44.518.37	1.037	
K58	3	Atas	1	2.8286	1.55		20.667	tidak	-1026.469	-536.1101	0.2044413	-11.54966	-2089.539	96.900.31	44.124.30	96.900.31	69.165.35	1.053	
		Bawah		1.4143	1.55		20.667	tidak	-1001.018	-536.1101	0.2044413	-11.54966	-2058.998	97.231.16	44.274.95	97.231.16	69.401.50	1.052	
K59	4	Atas	2	2.1214	1.3		24.556	OK	-748.3949	-379.5044	0.1520883	-12.04302	-1505.281	96.516.01	43.949.30	96.516.01	48.798.23	1.054	
		Bawah		1.0607	1.3		24.556	OK	-714.4608	-379.5044	0.1520883	-12.04302	-1464.56	97.122.32	44.225.39	97.122.32	49.104.78	1.052	

Lanjutan Perhitungan Momen Rencana (MC) arah x (as y2)

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi	k.l/r	Pembesaran Momen	PD (kN)	PL (kN)	PE _x (kN)	Pey (kN)	Pu (kN)	EI _I (kNm ²)	EI ₂ (kNm ²)	EI _{PAKAI} (kNm ²)	Pc (kN)	δb
				ψ	K													
K60	3.5	Atas	3	2.4245	1.6		25.778	OK	-456.376	-220.4397	0.1088571	-12.44109	-900.3547	95.894.40	43.666.25	95.894.40	43.995.33	1.035
		Bawah		1.2122	1.6													
K69	3	Atas	1	2.8286	1.55		20.667	tidak	-1055.152	-554.9399	0.0280802	-11.47579	-2154.086	96.991.66	44.165.90	96.991.66	69.230.55	1.055
		Bawah		1.4143	1.55													
K70	4	Atas	2	2.1214	1.3		24.556	OK	-777.1482	-398.3246	0.0181447	-11.95279	-1569.897	96.654.70	44.012.46	96.654.70	48.868.36	1.057
		Bawah		1.0607	1.3													
K71	3.5	Atas	3	2.4245	1.6		25.778	OK	-461.0117	-243.6383	0.0118156	-12.34477	-978.6662	96.244.65	43.825.74	96.244.65	44.156.02	1.038
		Bawah		1.2122	1.6													
K80	3	Atas	1	2.8286	1.55		20.667	tidak	-1068.422	-568.2135	-0.144631	-11.53741	-2191.248	97.138.45	44.232.74	97.138.45	69.335.33	1.056
		Bawah		1.4143	1.55													
K81	4	Atas	2	2.1214	1.3		24.556	OK	-790.7251	-411.8617	-0.112019	-12.02818	-1607.849	96.864.66	44.108.06	96.864.66	48.974.51	1.058
		Bawah		1.0607	1.3													
K82	3.5	Atas	3	2.4245	1.6		25.778	OK	-499.0118	-253.2043	-0.081759	-12.43221	-1003.941	96.524.18	43.953.02	96.524.18	44.284.26	1.039
		Bawah		1.2122	1.6													
K91	3	Atas	1	2.8286	1.55		20.667	tidak	-1007.015	-508.5932	1.2830863	-11.76044	-2022.167	96.463.92	43.925.59	96.463.92	68.853.87	1.051
		Bawah		1.4143	1.55													
K92	4	Atas	2	2.1214	1.3		24.556	OK	-735.8434	-361.5956	0.5884425	-12.0077	-1461.565	96.112.66	43.765.64	96.112.66	48.594.30	1.053
		Bawah		1.0607	1.3													
K93	3.5	Atas	3	2.4245	1.6		25.778	OK	-450.8253	-211.996	-0.103644	-12.34307	-880.184	95.557.68	43.512.92	95.557.68	43.840.85	1.035
		Bawah		1.2122	1.6													
K102	3	Atas	1	2.8286	1.55		20.667	tidak	-1035.524	-527.2236	-1.26288	-11.73193	-2086.186	96.568.12	43.973.03	96.568.12	68.928.24	1.053
		Bawah		1.4143	1.55													
K103	4	Atas	2	2.1214	1.3		24.556	OK	-764.5026	-380.2515	-0.567958	-11.97243	-1525.805	96.267.24	43.836.02	96.267.24	48.672.46	1.055
		Bawah		1.0607	1.3													
K104	3.5	Atas	3	2.4245	1.6		25.778	OK	-484.6989	-234.8057	0.1182052	-12.30484	-957.3279	95.931.37	43.683.08	95.931.37	44.012.29	1.038
		Bawah		1.2122	1.6													
K113	3	Atas	1	2.8286	1.55		20.667	tidak	-1080.448	-576.6101	0.1566657	-11.62155	-2219.114	97.184.40	44.253.66	97.184.40	69.368.13	1.056
		Bawah		1.4143	1.55													
K114	4	Atas	2	2.1214	1.3		24.556	OK	-804.7987	-422	0.1174876	-12.07292	-1640.958	96.952.16	44.147.91	96.952.16	49.018.75	1.059
		Bawah		1.0607	1.3													
K115	3.5	Atas	3	2.4245	1.6		25.778	OK	-514.579	-264.6288	0.085052	-12.36616	-1040.901	96.698.17	44.032.25	96.698.17	44.364.09	1.041
		Bawah		1.2122	1.6													
K124	3	Atas	1	2.8286	1.55		20.667	tidak	-1078.155	-574.6895	-1.71E-14	-11.7413	-2213.29	97.168.37	44.246.36	97.168.37	69.356.68	1.056
		Bawah		1.4143	1.55													
K125	4	Atas	2	2.1214	1.3		24.556	OK	-804.4241	-421.7239	-3.42E-14	-12.14429	-1640.067	96.949.68	44.146.78	96.949.68	49.017.50	1.059
		Bawah		1.0607	1.3													

Lanjutan Perhitungan Momen Rencana (MC) arah x (as_y2)

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k.l/r	Pembesaran Momen	PD (kN)	PL (kN)	PE _x (kN)	Pey (kN)	Pu (kN)	EI ₁ (kNm ²)	EI ₂ (kNm ²)	EI _{PAKAI}	Pc (kN)	δb
				ψ	K	ψ	K												
K126	3.5	Atas	3	2.4245	1.6	25.778	OK	-513.9003	-264.0958	-1.07E-14	-12.31246	-1039.234	96.689.11	44.028.12	96.689.11	44.359.93	1.041		
		Bawah		1.2122	1.6	25.778	OK	-484.2079	-264.0958	-1.07E-14	-12.31246	-1003.603	97.473.70	44.385.39	97.473.70	44.719.89	1.039		
K135	3	Atas	1	2.8286	1.55	20.667	tidak	-1080.448	-576.6101	-0.156666	-11.62155	-2219.114	97.184.40	44.253.66	97.184.40	69.368.13	1.056		
		Bawah		1.4143	1.55	20.667	tidak	-1054.997	-576.6101	-0.156666	-11.62155	-2188.573	97.501.43	44.398.02	97.501.43	69.594.41	1.055		
K136	4	Atas	2	2.1214	1.3	24.556	OK	-804.7987	-422	-0.117488	-12.07292	-1640.958	96.952.16	44.147.91	96.952.16	49.018.75	1.059		
		Bawah		1.0607	1.3	24.556	OK	-770.8645	-422	-0.117488	-12.07292	-1600.237	97.523.09	44.407.88	97.523.09	49.307.41	1.057		
K137	3.5	Atas	3	2.4245	1.6	25.778	OK	-514.579	-264.6288	-0.085052	-12.36616	-1040.901	96.698.17	44.032.25	96.698.17	44.364.09	1.041		
		Bawah		1.2122	1.6	25.778	OK	-484.8866	-264.6288	-0.085052	-12.36616	-1005.27	97.481.92	44.389.14	97.481.92	44.723.67	1.039		
K146	3	Atas	1	2.8286	1.55	20.667	tidak	-1035.524	-527.2236	1.2628797	-11.73193	-2086.186	96.568.12	43.973.03	96.568.12	68.928.24	1.053		
		Bawah		1.4143	1.55	20.667	tidak	-1010.073	-527.2236	1.2628797	-11.73193	-2055.645	96.892.28	44.120.64	96.892.28	69.160	1.052		
K147	4	Atas	2	2.1214	1.3	24.556	OK	-764.5026	-380.2515	0.5679577	-11.97243	-1525.805	96.267.24	43.836.02	96.267.24	48.672.46	1.055		
		Bawah		1.0607	1.3	24.556	OK	-730.5684	-380.2515	0.5679577	-11.97243	-1485.084	96.855.14	44.103.73	96.855.14	48.969.70	1.053		
K148	3.5	Atas	3	2.4245	1.6	25.778	OK	-484.6989	-234.8057	-0.118205	-12.30484	-957.3279	95.931.37	43.683.08	95.931.37	44.012.29	1.038		
		Bawah		1.2122	1.6	25.778	OK	-455.0065	-234.8057	-0.118205	-12.30484	-921.697	96.743.32	44.052.81	96.743.32	44.384.81	1.036		
K157	3	Atas	1	2.8286	1.55	20.667	tidak	-1007.015	-508.5932	-1.283086	-11.76044	-2022.167	96.463.92	43.925.59	96.463.92	68.853.87	1.051		
		Bawah		1.4143	1.55	20.667	tidak	-981.5642	-508.5932	-1.283086	-11.76044	-1991.626	96.796.21	44.076.90	96.796.21	69.091.05	1.050		
K158	4	Atas	2	2.1214	1.3	24.556	OK	-735.8434	-361.5956	-0.588442	-12.0077	-1461.365	96.112.66	43.765.64	96.112.66	48.594.30	1.053		
		Bawah		1.0607	1.3	24.556	OK	-701.9092	-361.5956	-0.588442	-12.0077	-1420.844	96.720.86	44.042.58	96.720.86	48.901.80	1.051		
K159	3.5	Atas	3	2.4245	1.6	25.778	OK	-450.8253	-211.996	0.1036445	-12.34307	-880.184	95.557.68	43.512.92	95.557.68	43.840.85	1.035		
		Bawah		1.2122	1.6	25.778	OK	-421.1329	-211.996	0.1036445	-12.34307	-844.531	96.421.58	43.906.30	96.421.58	44.237.19	1.033		
K168	3	Atas	1	2.8286	1.55	20.667	tidak	-1068.422	-568.2135	0.1446313	-11.53741	-2191.248	97.138.45	44.232.74	97.138.45	69.335.33	1.056		
		Bawah		1.4143	1.55	20.667	tidak	-1042.971	-568.2135	0.1446313	-11.53741	-2160.707	97.458.62	44.378.53	97.458.62	69.563.86	1.055		
K169	4	Atas	2	2.1214	1.3	24.556	OK	-790.7251	-411.8617	0.112019	-12.02818	-1607.849	96.864.66	44.108.06	96.864.66	48.974.51	1.058		
		Bawah		1.0607	1.3	24.556	OK	-756.7909	-411.8617	0.112019	-12.02818	-1567.128	97.444.37	44.372.04	97.444.37	49.267.61	1.056		
K170	3.5	Atas	3	2.4245	1.6	25.778	OK	-499.0118	-253.2043	0.0817587	-12.43221	-1003.941	96.524.18	43.953.02	96.524.18	44.284.26	1.039		
		Bawah		1.2122	1.6	25.778	OK	-469.3194	-253.2043	0.0817587	-12.43221	-968.3101	97.328.66	44.319.35	97.328.66	44.653	1.037		
K179	3	Atas	1	2.8286	1.55	20.667	tidak	-1055.152	-554.9399	-0.02808	-11.47579	-2154.086	96.991.66	44.165.90	96.991.66	69.230.55	1.055		
		Bawah		1.4143	1.55	20.667	tidak	-1029.701	-554.9399	-0.02808	-11.47579	-2123.545	97.314.35	44.312.83	97.314.35	69.460.88	1.054		
K180	4	Atas	2	2.1214	1.3	24.556	OK	-777.1482	-398.3246	-0.018145	-11.95279	-1569.897	96.654.70	44.012.46	96.654.70	48.868.36	1.057		
		Bawah		1.0607	1.3	24.556	OK	-743.2141	-398.3246	-0.018145	-11.95279	-1529.176	97.240.65	44.279.28	97.240.65	49.164.61	1.055		
K181	3.5	Atas	3	2.4245	1.6	25.778	OK	-490.7041	-243.6383	-0.011816	-12.34477	-978.6662	96.244.65	43.825.74	96.244.65	44.156.02	1.038		
		Bawah		1.2122	1.6	25.778	OK	-461.0117	-243.6383	-0.011816	-12.34477	-943.0353	97.055.37	44.194.91	97.055.37	44.527.97	1.037		
K190	3	Atas	1	2.8286	1.55	20.667	tidak	-1026.469	-536.1101	-0.204441	-11.54966	-2089.539	96.900.31	44.124.30	96.900.31	69.165.35	1.053		
		Bawah		1.4143	1.55	20.667	tidak	-1001.018	-536.1101	-0.204441	-11.54966	-2058.998	97.231.16	44.274.95	97.231.16	69.401.50	1.052		
K191	4	Atas	2	2.1214	1.3	24.556	OK	-748.3949	-379.5044	-1.52E-01	-12.04302	-1505.281	96.516.01	43.949.30	96.516.01	48.798.23	1.054		
		Bawah		1.0607	1.3	24.556	OK	-714.4608	-379.5044	-1.52E-01	-12.04302	-1464.56	97.122.32	44.225.39	97.122.32	49.104.78	1.052		

Perencanaan Kolom

Perhitungan Momen Rencana (MC) arah x (as_x)

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k./r	Pembesarar Momen	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI _{PAKAI} (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K1	3	Atas	1	5.657	2	26.67	OK	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	88.746.42	38.046.76	1.046	
		Bawah		2.829	2	26.67	OK	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	89.098.95	38.197.89	1.044	
K2	4	Atas	2	4.243	1.8	34	OK	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	88.746.42	23.404.39	1.077	
		Bawah		2.121	1.8	34	OK	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	89.098.95	23.497.36	1.074	
K3	3.5	Atas	3	4.849	1.9	30.61	OK	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	88.746.42	28.873.33	1.061	
		Bawah		2.424	1.9	30.61	OK	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	89.098.95	28.988.03	1.059	
K4	3.5	Atas	4	4.849	1.9	30.61	OK	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	88.746.42	28.873.33	1.061	
		Bawah		2.424	1.9	30.61	OK	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	89.098.95	28.988.03	1.059	
K5	2	Atas	5	8.486	2.3	17.89	tidak	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	88.746.42	84.545.09	1.020	
		Bawah		4.243	2.3	17.89	tidak	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	89.098.95	84.880.93	1.019	
K17	3	Atas	1	2.829	1.6	21.33	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	91.361.96	61.200.11	1.051	
		Bawah		1.414	1.6	21.33	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	91.617.42	61.371.24	1.050	
K18	4	Atas	2	2.121	1.3	24.56	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	91.361.96	46.192.36	1.068	
		Bawah		1.061	1.3	24.56	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	91.617.42	46.321.52	1.067	
K19	3.5	Atas	3	2.424	1.55	24.97	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	43.328.80	1.030		
		Bawah		1.212	1.55	24.97	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	43.632.96	1.029		
K20	3.5	Atas	4	2.424	1.55	24.97	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88.450.95	40.276.82	88.450.95	43.240.67	1.021		
		Bawah		1.212	1.55	24.97	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89.243.72	40.637.81	89.243.72	43.628.23	1.019		
K21	2	Atas	5	4.243	1.7	13.22	tidak	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	152.280.29	1.003		
		Bawah		2.121	1.7	13.22	tidak	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	154.795.82	1.003		
K28	3	Atas	1	2.829	1.6	21.33	tidak	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	52.897.20	1.001		
		Bawah		1.414	1.6	21.33	tidak	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	53.018.65	1.001		
K29	4	Atas	2	2.121	1.3	24.56	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	46.192.36	1.068		
		Bawah		1.061	1.3	24.56	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	46.321.52	1.067		
K30	3.5	Atas	3	2.424	1.55	24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	44.663.76	1.071		
		Bawah		1.212	1.55	24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	44.788.65	1.069		
K31	3.5	Atas	4	2.424	1.55	24.97	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	43.328.80	1.030		
		Bawah		1.212	1.55	24.97	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	43.632.96	1.029		
K32	2	Atas	5	4.243	1.7	13.22	tidak	-333.187	-78.7256	12.49992	-10.3274	-525.786	88.450.95	40.276.82	88.450.95	154.240.31	1.006		
		Bawah		2.121	1.7	13.22	tidak	-303.495	-78.7256	12.49992	-10.3274	-490.155	89.243.72	40.637.81	89.243.72	155.622.73	1.005		
K39	3	Atas	1	2.829	1.6	21.33	tidak	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	58.497.21	1.008		
		Bawah		1.414	1.6	21.33	tidak	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	59.463.53	1.007		
K40	4	Atas	2	2.121	1.3	24.56	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	39.925.52	1.002		
		Bawah		1.061	1.3	24.56	OK	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	40.017.19	1.001		

Lanjutan Perhitungan Momen Rencana (MC) arah x (as y/l)

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran		PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm2)	EI2 (kNm2)	EI _{PAKAI} (kNm2)	Pc (kN)	δb
				ψ	K	ψ	K		Momen											
K41	3.5	Atas	3	2.424	1.55			24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	44,663.76	1.071	
		Bawah		1.212	1.55			24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	44,788.65	1.069	
K42	3.5	Atas	4	2.424	1.55			24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	44,663.76	1.071	
		Bawah		1.212	1.55			24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	44,788.65	1.069	
K43	2	Atas	5	4.243	1.7			13.22	tidak	-484.085	-116.897	23.71633	-11.5724	-767.937	88,631.23	40,358.91	88,631.23	154,554.68	1.008	
		Bawah		2.121	1.7			13.22	tidak	-450.151	-116.897	23.71633	-11.5724	-727.216	89,253.40	40,642.22	89,253.40	155,639.62	1.008	
K50	3	Atas	1	2.829	1.6			21.33	tidak	-333.187	-78.7256	12.49992	-10.3274	-525.786	88,450.95	40,276.82	88,450.95	59,250.14	1.015	
		Bawah		1.414	1.6			21.33	tidak	-303.495	-78.7256	12.49992	-10.3274	-490.155	89,243.72	40,637.81	89,243.72	59,781.18	1.014	
K51	4	Atas	2	2.121	1.3			24.56	OK	-178.28	-36.4769	4.739697	-10.2416	-272.299	87,326.96	39,765.00	87,326.96	44,152.27	1.010	
		Bawah		1.061	1.3			24.56	OK	-148.588	-36.4769	4.739697	-10.2416	-236.669	88,769.52	40,421.88	88,769.52	44,881.63	1.009	
K52	3.5	Atas	3	2.424	1.55			24.97	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78,967.03	35,958.24	78,967.03	38,604.30	1.002	
		Bawah		1.212	1.55			24.97	OK	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79,148.35	36,040.81	79,148.35	38,692.94	1.001	
K53	3.5	Atas	4	2.424	1.55			24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	44,663.76	1.071	
		Bawah		1.212	1.55			24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	44,788.65	1.069	
K54	2	Atas	5	4.243	1.7			13.22	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	159,316.50	1.019	
		Bawah		2.121	1.7			13.22	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	159,761.99	1.019	
K61	3	Atas	1	2.829	1.6			21.33	tidak	-484.085	-116.897	23.71633	-11.5724	-767.937	88,631.23	40,358.91	88,631.23	59,370.90	1.022	
		Bawah		1.414	1.6			21.33	tidak	-450.151	-116.897	23.71633	-11.5724	-727.216	89,253.40	40,642.22	89,253.40	59,787.67	1.021	
K62	4	Atas	2	2.121	1.3			24.56	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88,450.95	40,276.82	88,450.95	44,720.56	1.020	
		Bawah		1.061	1.3			24.56	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89,243.72	40,637.81	89,243.72	45,121.38	1.018	
K63	3.5	Atas	3	2.424	1.55			24.97	OK	-178.28	-36.4769	4.739697	-10.2416	-272.299	87,326.96	39,765.00	87,326.96	42,691.19	1.011	
		Bawah		1.212	1.55			24.97	OK	-148.588	-36.4769	4.739697	-10.2416	-236.669	88,769.52	40,421.88	88,769.52	43,396.41	1.009	
K64	3.5	Atas	4	2.424	1.55			24.97	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78,967.03	35,958.24	78,967.03	38,604.30	1.002	
		Bawah		1.212	1.55			24.97	OK	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79,148.35	36,040.81	79,148.35	38,692.94	1.001	
K65	2	Atas	5	4.243	1.7			13.22	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	159,316.50	1.019	
		Bawah		2.121	1.7			13.22	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	159,761.99	1.019	
K72	3	Atas	1	2.829	1.6			21.33	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	61,200.11	1.051	
		Bawah		1.414	1.6			21.33	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	61,371.24	1.050	
K73	4	Atas	2	2.121	1.3			24.56	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88,631.23	40,358.91	88,631.23	44,811.71	1.029	
		Bawah		1.061	1.3			24.56	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89,253.40	40,642.22	89,253.40	45,126.28	1.028	
K74	3.5	Atas	3	2.424	1.55			24.97	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88,450.95	40,276.82	88,450.95	43,240.67	1.021	
		Bawah		1.212	1.55			24.97	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89,243.72	40,637.81	89,243.72	43,628.23	1.019	
K75	3.5	Atas	4	2.424	1.55			24.97	OK	-178.28	-36.4769	4.739697	-10.2416	-272.299	87,326.96	39,765.00	87,326.96	42,691.19	1.011	
		Bawah		1.212	1.55			24.97	OK	-148.588	-36.4769	4.739697	-10.2416	-236.669	88,769.52	40,421.88	88,769.52	43,396.41	1.009	

Lanjutan Perhitungan Momen Rencana (MC) arah x (as_y1)

batang	Panjang m	Ujung Kolom	Lt	KL Tengah		Kolom Tepi		k./r	Pembesaran	PD (kN)	PL (kN)	PEX (kN)	Pey (kN)	Pu (kN)	EI1 (kNm2)	EI2 (kNm2)	EI PAKU (kNm2)	Pc (kN)	δb
				ψ	K	ψ	K												
K76	2	Atas	5	4.243	1.7	13.22	13.22	13.22	tidak	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78,967.03	35,958.24	78,967.03	137,702.30	1.000
		Bawah		2.121	1.7	13.22	13.22	13.22	tidak	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79,148.35	36,040.81	79,148.35	138,018.47	1.000
K83	3	Atas	1	2.829	1.6	21.33	21.33	21.33	tidak	-103.153	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	61,200.11	1.051
		Bawah		1.414	1.6	21.33	21.33	21.33	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	61,371.24	1.050
K84	4	Atas	2	2.121	1.3	24.56	24.56	24.56	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	46,192.36	1.068
		Bawah		1.061	1.3	24.56	24.56	24.56	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	46,321.52	1.067
K85	3.5	Atas	3	2.424	1.55	24.97	24.97	24.97	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88,631.23	40,358.91	88,631.23	43,328.80	1.030
		Bawah		1.212	1.55	24.97	24.97	24.97	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89,253.40	40,642.22	89,253.40	43,632.96	1.029
K86	3.5	Atas	4	2.424	1.55	24.97	24.97	24.97	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88,450.95	40,276.82	88,450.95	43,240.67	1.021
		Bawah		1.212	1.55	24.97	24.97	24.97	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89,243.72	40,637.81	89,243.72	43,628.23	1.019
K87	2	Atas	5	4.243	1.7	13.22	13.22	13.22	tidak	-178.28	-36.4769	4.739697	-10.2416	-272.299	87,326.96	39,765.00	87,326.96	152,280.29	1.003
		Bawah		2.121	1.7	13.22	13.22	13.22	tidak	-148.588	-36.4769	4.739697	-10.2416	-236.669	88,769.52	40,421.88	88,769.52	154,795.82	1.003
K94	3	Atas	1	2.829	1.6	21.33	21.33	21.33	tidak	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78,967.03	35,958.24	78,967.03	52,897.20	1.001
		Bawah		1.414	1.6	21.33	21.33	21.33	tidak	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79,148.35	36,040.81	79,148.35	53,018.65	1.001
K95	4	Atas	2	2.121	1.3	24.56	24.56	24.56	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	46,192.36	1.068
		Bawah		1.061	1.3	24.56	24.56	24.56	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	46,321.52	1.067
K96	3.5	Atas	3	2.424	1.55	24.97	24.97	24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	44,663.76	1.071
		Bawah		1.212	1.55	24.97	24.97	24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	44,788.65	1.069
K97	3.5	Atas	4	2.424	1.55	24.97	24.97	24.97	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88,631.23	40,358.91	88,631.23	43,328.80	1.030
		Bawah		1.212	1.55	24.97	24.97	24.97	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89,253.40	40,642.22	89,253.40	43,632.96	1.029
K98	2	Atas	5	4.243	1.7	13.22	13.22	13.22	tidak	-333.187	-78.7256	12.49992	-10.3274	-525.786	88,450.95	40,276.82	88,450.95	154,240.31	1.006
		Bawah		2.121	1.7	13.22	13.22	13.22	tidak	-303.495	-78.7256	12.49992	-10.3274	-490.155	89,243.72	40,637.81	89,243.72	155,622.73	1.005
K105	3	Atas	1	2.829	1.6	21.33	21.33	21.33	tidak	-178.28	-36.4769	4.739697	-10.2416	-272.299	87,326.96	39,765.00	87,326.96	58,497.21	1.008
		Bawah		1.414	1.6	21.33	21.33	21.33	tidak	-148.588	-36.4769	4.739697	-10.2416	-236.669	88,769.52	40,421.88	88,769.52	59,463.53	1.007
K106	4	Atas	2	2.121	1.3	24.56	24.56	24.56	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78,967.03	35,958.24	78,967.03	39,925.52	1.002
		Bawah		1.061	1.3	24.56	24.56	24.56	OK	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79,148.35	36,040.81	79,148.35	40,017.19	1.001
K107	3.5	Atas	3	2.424	1.55	24.97	24.97	24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	44,663.76	1.071
		Bawah		1.212	1.55	24.97	24.97	24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	44,788.65	1.069
K108	3.5	Atas	4	2.424	1.55	24.97	24.97	24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	44,663.76	1.071
		Bawah		1.212	1.55	24.97	24.97	24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	44,788.65	1.071
K109	2	Atas	5	4.243	1.7	13.22	13.22	13.22	tidak	-484.085	-116.897	23.71633	-11.5724	-767.937	88,631.23	40,358.91	88,631.23	154,554.68	1.008
		Bawah		2.121	1.7	13.22	13.22	13.22	tidak	-450.151	-116.897	23.71633	-11.5724	-727.216	89,253.40	40,642.22	89,253.40	155,639.62	1.008
K116	3	Atas	1	2.829	1.6	21.33	21.33	21.33	tidak	-333.187	-78.7256	12.49992	-10.3274	-525.786	88,450.95	40,276.82	88,450.95	59,250.14	1.015
		Bawah		1.414	1.6	21.33	21.33	21.33	tidak	-303.495	-78.7256	12.49992	-10.3274	-490.155	89,243.72	40,637.81	89,243.72	59,781.18	1.014

Lanjutan Perhitungan Momen Rencana (MC) arah x (as y1)

K117	4	Atas	2	2.121	1.3	ψ	K	K	ψ	K	K	k/l/r	Pembesaran		PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI _{PAKAM} (kNm ²)	Pc (kN)	δb
													Momen	OK										
K117	4	Atas	2	2.121	1.3	ψ	K	K	ψ	K	K	24.56	OK	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	44.152.27	1.010	
K118	3.5	Bawah	3	1.061	1.3							24.56	OK	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	44.881.63	1.009	
K119	3.5	Atas	4	2.424	1.55							24.97	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	38.604.30	1.002	
K120	2	Bawah	4	1.212	1.55							24.97	OK	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	38.692.94	1.001	
K121	3	Atas	5	2.424	1.55							24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	44.663.76	1.071	
K122	3	Bawah	5	1.212	1.7							24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	44.788.65	1.069	
K123	3	Atas	1	2.829	1.6							13.22	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	159.316.50	1.019	
K124	4	Bawah	1	1.414	1.6							13.22	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	159.761.99	1.019	
K125	4	Atas	2	2.121	1.3							21.33	tidak	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	59.370.90	1.022	
K126	3.5	Bawah	2	1.061	1.3							21.33	tidak	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	59.787.67	1.021	
K127	3.5	Atas	3	2.424	1.55							24.56	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88.450.95	40.276.82	88.450.95	44.720.56	1.020	
K128	4	Bawah	3	1.061	1.3							24.56	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89.243.72	40.637.81	89.243.72	45.121.38	1.018	
K129	3.5	Atas	4	2.424	1.55							24.97	OK	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	42.691.19	1.011	
K130	3.5	Bawah	4	1.212	1.55							24.97	OK	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	43.396.41	1.009	
K131	2	Atas	5	4.243	1.7							24.97	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	38.604.30	1.002	
K132	3	Bawah	5	2.121	1.7							24.97	tidak	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	38.692.94	1.001	
K133	3	Atas	1	2.829	1.6							13.22	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	159.316.50	1.019	
K134	4	Bawah	1	1.414	1.6							13.22	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	159.761.99	1.019	
K135	4	Atas	2	2.121	1.3							21.33	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	61.200.11	1.051	
K136	3.5	Bawah	2	1.061	1.3							21.33	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	61.371.24	1.050	
K137	4	Atas	3	2.121	1.3							24.56	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	44.811.71	1.029	
K138	3.5	Bawah	3	1.061	1.3							24.56	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	45.126.28	1.028	
K139	3.5	Atas	4	2.424	1.55							24.97	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88.450.95	40.276.82	88.450.95	43.240.67	1.021	
K140	4	Bawah	4	1.212	1.55							24.97	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89.243.72	40.637.81	89.243.72	43.628.23	1.019	
K141	3.5	Atas	5	2.424	1.55							24.97	OK	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	42.691.19	1.011	
K142	2	Bawah	5	1.212	1.55							24.97	OK	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	43.396.41	1.009	
K143	3	Atas	1	2.829	1.6							13.22	tidak	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	137.702.30	1.000	
K144	4	Bawah	1	1.414	1.6							13.22	tidak	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	138.018.47	1.000	
K145	4	Atas	2	2.121	1.3							21.33	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	61.200.11	1.051	
K146	3.5	Bawah	2	1.061	1.3							21.33	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	61.371.24	1.050	
K147	3.5	Atas	3	2.424	1.55							24.56	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	46.192.36	1.068	
K148	4	Bawah	3	1.061	1.3							24.56	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	46.321.52	1.067	
K149	3.5	Atas	4	2.424	1.55							24.97	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	43.328.80	1.030	
K150	4	Bawah	4	1.212	1.55							24.97	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	43.632.96	1.029	

Lanjutan Perhitungan Momen Rencana (MC) arah x (as y1)

batang	Panjang m	Ujung Kolom	Lt	KL Tengah			Kolom Tepi			k./r	Pembesaran Momen	PD (kN)	PL (kN)	PEx (kN)	Pey (kN)	Pu (kN)	EI1 (kNm ²)	EI2 (kNm ²)	EI _{PAKAI} (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K	ψ	K												
K152	3.5	Atas	4	2.424	1.55				24.97	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88.450.95	40.276.82	88.450.95	43.240.67	1.021	
		Bawah		1.212	1.55				24.97	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89.243.72	40.637.81	89.243.72	43.628.23	1.019	
K153	2	Atas	5	4.243	1.7				13.22	tidak	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	152.280.29	1.003	
		Bawah		2.121	1.7				13.22	tidak	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	154.795.82	1.003	
K160	3	Atas	1	2.829	1.6				21.33	tidak	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	52.897.20	1.001	
		Bawah		1.414	1.6				21.33	tidak	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	53.018.65	1.001	
K161	4	Atas	2	2.121	1.3				24.56	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	46.192.36	1.068	
		Bawah		1.061	1.3				24.56	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	46.321.52	1.067	
K162	3.5	Atas	3	2.424	1.55				24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	44.663.76	1.071	
		Bawah		1.212	1.55				24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	44.788.65	1.069	
K163	3.5	Atas	4	2.424	1.55				24.97	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	43.328.80	1.030	
		Bawah		1.212	1.55				24.97	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	43.632.96	1.029	
K164	2	Atas	5	4.243	1.7				13.22	tidak	-333.187	-78.7256	12.49992	-10.3274	-525.786	88.450.95	40.276.82	88.450.95	154.240.31	1.006	
		Bawah		2.121	1.7				13.22	tidak	-303.495	-78.7256	12.49992	-10.3274	-490.155	89.243.72	40.637.81	89.243.72	155.622.73	1.005	
K171	3	Atas	1	2.829	1.6				21.33	tidak	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	58.497.21	1.008	
		Bawah		1.414	1.6				21.33	tidak	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	59.463.53	1.007	
K172	4	Atas	2	2.121	1.3				24.56	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	39.925.52	1.002	
		Bawah		1.061	1.3				24.56	OK	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	40.017.19	1.001	
K173	3.5	Atas	3	2.424	1.55				24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	44.663.76	1.071	
		Bawah		1.212	1.55				24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	44.788.65	1.069	
K174	3.5	Atas	4	2.424	1.55				24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	44.663.76	1.071	
		Bawah		1.212	1.55				24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	44.788.65	1.069	
K175	2	Atas	5	4.243	1.7				13.22	tidak	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	154.554.68	1.008	
		Bawah		2.121	1.7				13.22	tidak	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	155.639.62	1.008	
K182	3	Atas	1	2.829	1.6				21.33	tidak	-333.187	-78.7256	12.49992	-10.3274	-525.786	88.450.95	40.276.82	88.450.95	59.250.14	1.015	
		Bawah		1.414	1.6				21.33	tidak	-303.495	-78.7256	12.49992	-10.3274	-490.155	89.243.72	40.637.81	89.243.72	59.781.18	1.014	
K183	4	Atas	2	2.121	1.3				24.56	OK	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	44.152.27	1.010	
		Bawah		1.061	1.3				24.56	OK	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	44.881.63	1.009	
K184	3.5	Atas	3	2.424	1.55				24.97	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	38.604.30	1.002	
		Bawah		1.212	1.55				24.97	OK	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	38.692.94	1.001	
K185	3.5	Atas	4	2.424	1.55				24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	44.663.76	1.071	
		Bawah		1.212	1.55				24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	44.788.65	1.069	
K186	2	Atas	5	4.243	1.7				13.22	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	159.316.50	1.019	
		Bawah		2.121	1.7				13.22	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	159.761.99	1.019	

Lanjutan Perhitungan Momen Rencana (MC) arah x (as. y I)

Kode	Panjang batang m	Ujung Kolom	Lt	K.L. Tengah		Kolom Tepi		k.l/r	Pembesaran Momen	PD (kN)	PL (kN)	PE _x (kN)	Pey (kN)	Pu (kN)	EI ₁ (kNm ²)	EI ₂ (kNm ²)	EI _{FAKAL} (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K193	3	Atas	1	2.829	1.6			21.33	tidak	-484.085	-116.897	23.71633	-11.5724	-767.937	88,631.23	40,358.91	88,631.23	59,370.90	1.022
		Bawah		1.414	1.6			21.33	tidak	-450.151	-116.897	23.71633	-11.5724	-727.216	89,253.40	40,642.22	89,253.40	59,787.67	1.021
K194	4	Atas	2	2.121	1.3			24.56	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88,450.95	40,276.82	88,450.95	44,720.56	1.020
		Bawah		1.061	1.3			24.56	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89,243.72	40,637.81	89,243.72	45,121.38	1.018
K195	3.5	Atas	3	2.424	1.55			24.97	OK	-178.28	-36.4769	4.739697	-10.2416	-272.299	87,326.96	39,765.00	87,326.96	42,691.19	1.011
		Bawah		1.212	1.55			24.97	OK	-148.588	-36.4769	4.739697	-10.2416	-236.669	88,769.52	40,421.88	88,769.52	43,396.41	1.009
K196	3.5	Atas	4	2.424	1.55			24.97	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78,967.03	35,958.24	78,967.03	38,604.30	1.002
		Bawah		1.212	1.55			24.97	OK	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79,148.35	36,040.81	79,148.35	38,692.94	1.001
K197	2	Atas	5	4.243	1.7			13.22	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	159,316.50	1.019
		Bawah		2.121	1.7			13.22	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	159,761.99	1.019
K204	3	Atas	1	2.829	1.6			21.33	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	61,200.11	1.051
		Bawah		1.414	1.6			21.33	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	61,371.24	1.050
K205	4	Atas	2	2.121	1.3			24.56	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88,631.23	40,358.91	88,631.23	44,811.71	1.029
		Bawah		1.061	1.3			24.56	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89,253.40	40,642.22	89,253.40	45,126.28	1.028
K206	3.5	Atas	3	2.424	1.55			24.97	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88,450.95	40,276.82	88,450.95	43,240.67	1.021
		Bawah		1.212	1.55			24.97	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89,243.72	40,637.81	89,243.72	43,628.23	1.019
K207	3.5	Atas	4	2.424	1.55			24.97	OK	-178.28	-36.4769	4.739697	-10.2416	-272.299	87,326.96	39,765.00	87,326.96	42,691.19	1.011
		Bawah		1.212	1.55			24.97	OK	-148.588	-36.4769	4.739697	-10.2416	-236.669	88,769.52	40,421.88	88,769.52	43,396.41	1.009
K208	2	Atas	5	4.243	1.7			13.22	tidak	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78,967.03	35,958.24	78,967.03	137,702.30	1.000
		Bawah		2.121	1.7			13.22	tidak	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79,148.35	36,040.81	79,148.35	138,018.47	1.000
K215	3	Atas	1	2.829	1.6			21.33	tidak	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	61,200.11	1.051
		Bawah		1.414	1.6			21.33	tidak	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	61,371.24	1.050
K216	4	Atas	2	2.121	1.3			24.56	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	46,192.36	1.068
		Bawah		1.061	1.3			24.56	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	46,321.52	1.067
K217	3.5	Atas	3	2.424	1.55			24.97	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88,631.23	40,358.91	88,631.23	43,328.80	1.030
		Bawah		1.212	1.55			24.97	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89,253.40	40,642.22	89,253.40	43,632.96	1.029
K218	3.5	Atas	4	2.424	1.55			24.97	OK	-333.187	-78.7256	12.49992	-10.3274	-525.786	88,450.95	40,276.82	88,450.95	43,240.67	1.021
		Bawah		1.212	1.55			24.97	OK	-303.495	-78.7256	12.49992	-10.3274	-490.155	89,243.72	40,637.81	89,243.72	43,628.23	1.019
K219	2	Atas	5	4.243	1.7			13.22	tidak	-178.28	-36.4769	4.739697	-10.2416	-272.299	87,326.96	39,765.00	87,326.96	152,280.29	1.003
		Bawah		2.121	1.7			13.22	tidak	-148.588	-36.4769	4.739697	-10.2416	-236.669	88,769.52	40,421.88	88,769.52	154,795.82	1.003
K226	3	Atas	1	2.829	1.6			21.33	tidak	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78,967.03	35,958.24	78,967.03	52,897.20	1.001
		Bawah		1.414	1.6			21.33	tidak	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79,148.35	36,040.81	79,148.35	53,018.65	1.001
K227	4	Atas	2	2.121	1.3			24.56	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91,361.96	41,602.37	91,361.96	46,192.36	1.068
		Bawah		1.061	1.3			24.56	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91,617.42	41,718.70	91,617.42	46,321.52	1.067

Lanjutan Perhitungan Momen Rencana (MC) arah x (as.y1)

batang	Panjang m	Ujung Kolum	Lt	KL Tengah		Kolum Tepi		k.l/r	Pembesaran Momen	PD (kN)	PL (kN)	PE _x (kN)	Pey (kN)	Pu (kN)	EI ₁ (kNm ²)	EI ₂ (kNm ²)	EI _{PAKAI} (kNm ²)	Pc (kN)	δb
				ψ	K	ψ	K												
K228	3.5	Atas	3	2.424	1.55	24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	44.663.76	1.071		
		Bawah		1.212	1.55	24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	44.788.65	1.069		
K229	3.5	Atas	4	2.424	1.55	24.97	OK	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	43.328.80	1.030		
		Bawah		1.212	1.55	24.97	OK	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	43.632.96	1.029		
K230	2	Atas	5	4.243	1.7	13.22	tidak	-333.187	-78.7256	12.49992	-10.3274	-525.786	88.450.95	40.276.82	88.450.95	154.240.31	1.006		
		Bawah		2.121	1.7	13.22	tidak	-303.495	-78.7256	12.49992	-10.3274	-490.155	89.243.72	40.637.81	89.243.72	155.622.73	1.005		
K237	3	Atas	1	2.829	1.6	21.33	tidak	-178.28	-36.4769	4.739697	-10.2416	-272.299	87.326.96	39.765.00	87.326.96	58.497.21	1.008		
		Bawah		1.414	1.6	21.33	tidak	-148.588	-36.4769	4.739697	-10.2416	-236.669	88.769.52	40.421.88	88.769.52	59.463.53	1.007		
K238	4	Atas	2	2.121	1.3	24.56	OK	-30.7349	-9.54E-02	0.509407	-2.92E-02	-37.0345	78.967.03	35.958.24	78.967.03	39.925.52	1.002		
		Bawah		1.061	1.3	24.56	OK	-13.7679	-9.54E-02	0.509407	-2.92E-02	-16.674	79.148.35	36.040.81	79.148.35	40.017.19	1.001		
K239	3.5	Atas	3	2.424	1.55	24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	44.663.76	1.071		
		Bawah		1.212	1.55	24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	44.788.65	1.069		
K240	3.5	Atas	4	2.424	1.55	24.97	OK	-1031.53	-334.778	15.83813	-19.9621	-1773.48	91.361.96	41.602.37	91.361.96	44.663.76	1.071		
		Bawah		1.212	1.55	24.97	OK	-1006.08	-334.778	15.83813	-19.9621	-1742.94	91.617.42	41.718.70	91.617.42	44.788.65	1.069		
K241	2	Atas	5	4.243	1.7	13.22	tidak	-484.085	-116.897	23.71633	-11.5724	-767.937	88.631.23	40.358.91	88.631.23	154.554.68	1.008		
		Bawah		2.121	1.7	13.22	tidak	-450.151	-116.897	23.71633	-11.5724	-727.216	89.253.40	40.642.22	89.253.40	155.639.62	1.008		
K247	3	Atas	1	5.657	2	26.67	OK	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	38.046.76	1.046		
		Bawah		2.829	2	26.67	OK	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	38.197.89	1.044		
K248	4	Atas	2	4.243	1.8	34	OK	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	23.404.39	1.077		
		Bawah		2.121	1.8	34	OK	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	23.497.36	1.074		
K249	3.5	Atas	3	4.849	1.9	30.61	OK	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	28.873.33	1.061		
		Bawah		2.424	1.9	30.61	OK	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	28.988.03	1.059		
K250	3.5	Atas	4	4.849	1.9	30.61	OK	-629.972	-154.229	34.7314	-15.3706	-1002.73	88.746.42	40.411.36	88.746.42	28.873.33	1.061		
		Bawah		2.424	1.9	30.61	OK	-604.522	-154.229	34.7314	-15.3706	-972.193	89.098.95	40.571.89	89.098.95	28.988.03	1.059		
K251	2	Atas	5	8.486	2.3	17.89	tidak	-629.972	#####	34.7314	#####	-1002.73	88.746.42	40.411.36	88.746.42	84.545.09	1.020		
		Bawah		4.243	2.3	17.89	tidak	-604.522	#####	34.7314	#####	-972.193	89.098.95	40.571.89	89.098.95	84.880.93	1.019		

Tabel perhitungan Diagram interaksi Kolom Ukuran 600x600mm

- b = 600 mm
- h = 600 mm
- d' = 60 mm
- d = 540 mm
- cb = 324 mm

Tulangan	12	D	25	Kondisi	1	2	3	4	5	6	7	8	9	10	11	12
$\rho =$	0,0164			c	-	700,0	650,0	600,0	550,0	500,0	410,0	324,0	220,0	160,0	130,0	103,28
n	Asi	d'	a		600,0	595,0	552,5	510,0	467,5	425,0	348,5	275,4	187,0	136,0	110,5	87,8
4	1964,29	60,0	f_{s1}		600,0	548,6	544,6	540,0	534,5	528,0	512,2	488,9	436,4	375,0	323,1	251,4
2	982,143	220,0	f_{s2}		600,0	411,4	396,9	380,0	360,0	336,0	278,0	192,6	0,0	-225,0	-415,4	-678,1
2	982,143	380,0	f_{s3}		600,0	274,3	249,2	220,0	185,5	144,0	43,9	-103,7	-436,4	-825,0	-1153,8	-1607,6
4	1964,29	540,0	f_{s4}		600,0	137,1	101,5	60,0	10,9	-48,0	-190,2	-400,0	-872,7	-1425,0	-1892,3	-2537,1
			C_{s1}		743973,2	743973,2	743973,2	743973,2	743973,2	743973,2	743973,2	743973,2	743973,2	694866,1	592874,3	452140,0
			C_{s2}		371986,6	371986,6	368964,6	352343,8	332700,9	309129,5	252213,1	168282,9	0,0	-220982,1	-392857,1	-392857,1
			C_{s3}		371986,6	248517,2	223909,7	195200,9	161272,3	120558,0	22247,9	-101851,9	-392857,1	-392857,1	-392857,1	-392857,1
			C_{s4}		743973,2	227646,7	157709,5	76116,1	-20312,5	-94285,7	-373693,4	-785714,3	-785714,3	-785714,3	-785714,3	-785714,3
			ΣC_s		2231919,6	1592123,7	1494557,0	1367633,9	1217633,9	1079375,0	644740,9	24690,0	-434598,2	-704687,5	-978554,3	-1119288,6
			C_c		7650000,0	7586250,0	7044375,0	6502500,0	5960625,0	5418750,0	4443375,0	3511350,0	2384250,0	1734000,0	1408875,0	1119288,6
			$C_e + \Sigma C_s$		9881919,6	9178373,7	8538932,0	7870133,9	7178258,9	6498125,0	5088115,9	3536040,0	1949651,8	1029312,5	430320,7	0,0
			$0,65 P_n$		6423,2	5965,9	5550,3	5115,6	4665,9	4223,8	3307,3	2298,4	1267,3	669,1	279,7	0,0
			$0,65 M_n$		0,0	99,3	207,7	302,6	384,8	448,8	549,5	623,1	579,1	501,4	439,2	379,4

Tabel perhitungan Diagram interaksi Kolom Ukuran 600x600mm

b = 600 mm
 h = 600 mm
 d' = 60 mm
 d = 540 mm
 cb = 324 mm

Tulangan	16 D	25	Kondisi	1	2	3	4	5	6	7	8	9	10	11	12
$\rho =$	0,0218		c	-	700,0	650,0	600,0	550,0	490,0	420,0	324,0	220,0	170,0	140,0	123,2
n	Asi	d'	a	600,0	595,0	552,5	510,0	467,5	416,5	357,0	275,4	187,0	144,5	119,0	104,7
5	2455,36	60,0	f_{s1}	600,0	548,6	544,6	540,0	534,5	526,5	514,3	488,9	436,4	388,2	342,9	307,9
2	982,143	180,0	f_{s2}	600,0	445,7	433,8	420,0	403,6	379,6	342,9	266,7	109,1	-35,3	-171,4	-276,4
2	982,143	300,0	f_{s3}	600,0	342,9	323,1	300,0	272,7	232,7	171,4	44,4	-218,2	-458,8	-685,7	-860,6
2	982,143	420,0	f_{s4}	600,0	240,0	212,3	180,0	141,8	85,7	0,0	-177,8	-545,5	-882,4	-1200,0	-1444,9
5	2455,36	540	f_{s5}	600,0	137,1	101,5	60,0	10,9	-61,2	-171,4	-400,0	-872,7	-1305,9	-1714,3	-2029,2
			C_{s1}	929966,5	929966,5	929966,5	929966,5	929966,5	929966,5	929966,5	929966,5	929966,5	901080,0	789660,4	703759,8
			C_{s2}	371986,6	371986,6	371986,6	371986,6	371986,6	351942,9	315864,2	241034,2	86272,3	-34663,9	-168367,3	-271448,1
			C_{s3}	371986,6	315864,2	296437,2	273772,3	246986,6	207628,0	147496,8	22780,3	-214285,7	-392857,1	-392857,1	-392857,1
			C_{s4}	371986,6	214843,8	187645,9	155915,2	118415,2	63313,1	0,0	-174603,2	-392857,1	-392857,1	-392857,1	-392857,1
			C_{s5}	929966,5	284558,4	197136,8	95145,1	-25390,6	-150328,0	-420918,4	-982142,9	-982142,9	-982142,9	-982142,9	-982142,9
			ΣC_s	2975892,9	2117219,4	1983173,1	1826785,7	1641964,3	1402522,5	972409,1	37035,0	-573046,9	-901441,0	-1146564,1	-1335545,4
			C_c	7650000,0	7586250,0	7044375,0	6502500,0	5960625,0	5310375,0	4551750,0	3511350,0	2384250,0	1842375,0	1517250,0	1335545,4
			$C_c + \Sigma C_s$	10625892,9	9703469,4	9027548,1	8329285,7	7602589,3	6712897,5	5524159,1	3548385,0	1811203,1	940934,0	370685,9	0,0
			$0.65 P_n$	6906,8	6307,3	5867,9	5414,0	4941,7	4363,4	3590,7	2306,5	1177,3	611,6	240,9	0,0
			$0.65 M_n$	0,0	125,3	237,4	337,3	425,5	507,7	594,8	701,1	655,7	594,5	531,1	487,4

Tabel perhitungan Diagram interaksi Kolom Ukuran 600x600mm

- b = 600 mm
- h = 600 mm
- d' = 60 mm
- d = 540 mm
- cb = 324 mm

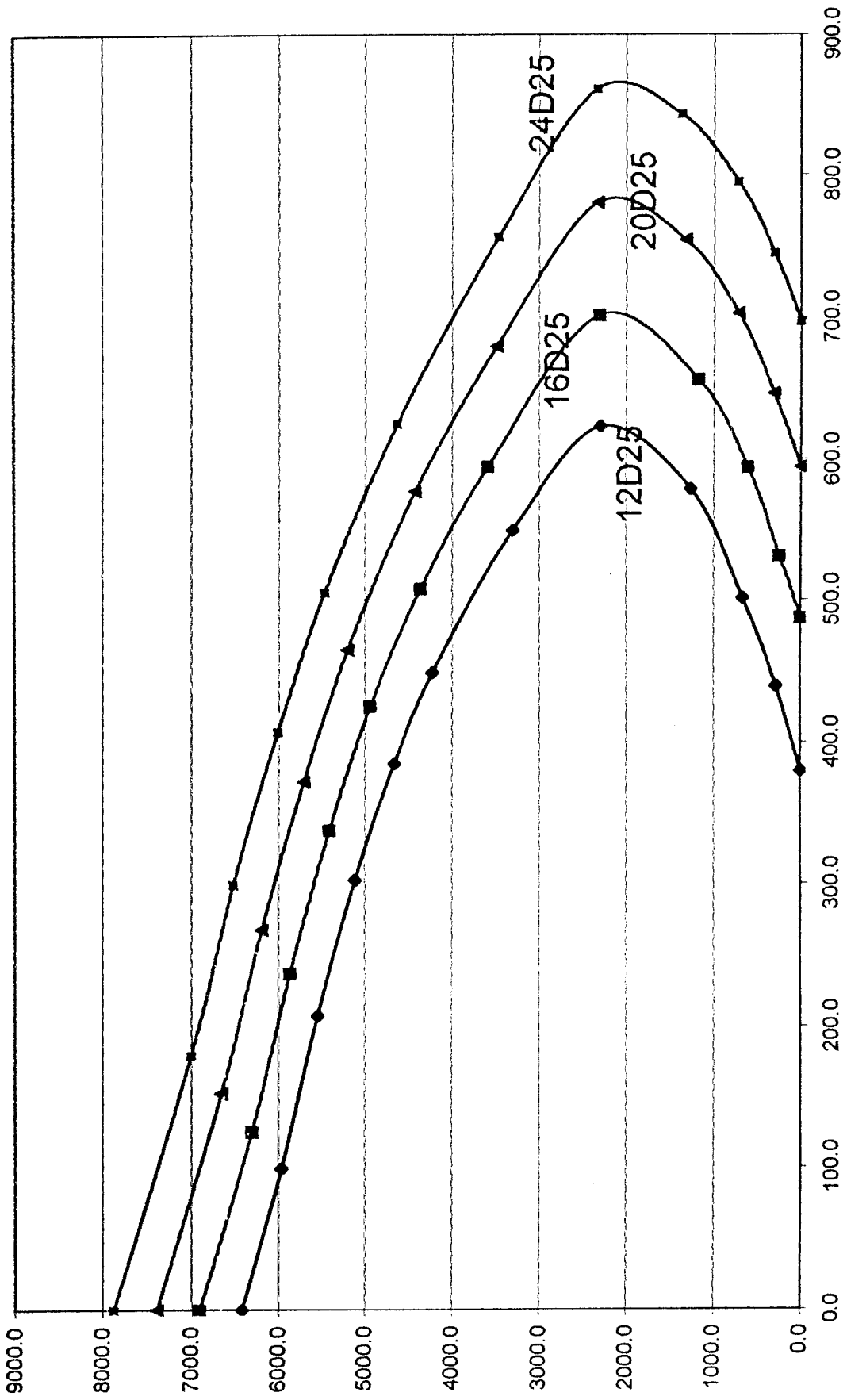
Tulangan	ϕ	D	25	Kondisi	1	2	3	4	5	6	7	8	9	10	11	12
	$\rho =$	0,02728		c	-	700,0	650,0	600,0	550,0	475,0	400,0	324,0	240,0	190,0	160,0	138,1
	n	Asi	d'	a	600,0	595,0	552,5	510,0	467,5	403,8	340,0	275,4	204,0	161,5	136,0	117,4
6	2946,43	60,0	60,0	f_{s1}	600,0	548,6	544,6	540,0	534,5	524,2	510,0	488,9	450,0	410,5	375,0	339,3
2	982,143	156,0	600,0	f_{s2}	600,0	466,3	456,0	444,0	429,8	402,9	366,0	311,1	210,0	107,4	15,0	-77,8
2	982,143	252,0	600,0	f_{s3}	600,0	384,0	367,4	348,0	325,1	281,7	222,0	133,3	-30,0	-195,8	-345,0	-495,0
2	982,143	348,0	600,0	f_{s3}	600,0	301,7	278,8	252,0	220,4	160,4	78,0	-44,4	-270,0	-498,9	-705,0	-912,1
2	982,143	444	600,0	f_{s3}	600,0	219,4	190,2	156,0	115,6	39,2	-66,0	-222,2	-510,0	-802,1	-1065,0	-1329,2
6	2946,43	540	600,0	f_{s3}	600,0	137,1	101,5	60,0	10,9	-82,1	-210,0	-400,0	-750,0	-1105,3	-1425,0	-1746,4
				C_{s1}	1115959,8	1115959,8	1115959,8	1115959,8	1115959,8	1115959,8	1115959,8	1115959,8	1115959,8	1115959,8	1042299,1	937089,0
				C_{s2}	371986,6	371986,6	371986,6	371986,6	371986,6	371986,6	338593,8	284685,0	185379,5	84580,6	-6138,4	-76449,9
				C_{s3}	371986,6	356272,3	339953,6	320915,2	298415,2	255783,6	197165,2	110081,8	-29464,3	-192293,2	-338839,3	-392857,1
				C_{s4}	371986,6	275456,0	252920,7	226629,5	195558,0	136685,9	55736,6	-43650,8	-265178,6	-392857,1	-392857,1	-392857,1
				C_{s5}	371986,6	194639,7	165887,7	132343,8	92700,9	17588,1	-64821,4	-218254,0	-392857,1	-392857,1	-392857,1	-392857,1
				ΣC_{s}	1115959,8	341470,0	236564,2	114174,1	-30468,8	-241917,3	-618750,0	-1178571,4	-1178571,4	-1178571,4	-1178571,4	-1178571,4
				C_c	3719866,1	2655784,4	2483272,7	2282008,9	2044151,8	1656086,7	1023883,9	70250,5	-564732,1	-956038,5	-1266964,3	-1496503,8
				C_c	7650000,0	7586250,0	7044375,0	6502500,0	5960625,0	5147812,5	4335000,0	3511350,0	2601000,0	2059125,0	1734000,0	1496503,8
				$C_c + \Sigma C_{s}$	11369866,1	10242034,4	9527647,7	8784508,9	8004776,8	6803899,2	5358883,9	3581600,5	2036267,9	1103086,5	467035,7	0,0
				$0,65 P_n$	7390,4	6657,3	6193,0	5709,9	5203,1	4422,5	3483,3	2328,0	1323,6	717,0	303,6	0,0000002
				$0,65 M_n$	0,0	152,3	267,9	371,8	464,9	577,1	679,1	780,2	754,2	702,3	645,8	594,4

Tabel perhitungan Diagram interaksi Kolom Ukuran 600x600mm

- b = 600 mm
- h = 600 mm
- d' = 60 mm
- d = 540 mm
- cb = 324 mm

Tulangan	T _{QD}	25	Kondisi	1	2	3	4	5	6	7	8	9	10	11	12
7	3437,5	60,0		600,0	595,0	552,5	510,0	467,5	403,8	331,5	275,4	212,5	170,0	144,5	128,2
2	982,143	140,0		600,0	548,6	544,6	540,0	534,5	524,2	507,7	488,9	456,0	420,0	388,2	361,2
2	982,143	220,0		600,0	480,0	470,8	460,0	447,3	423,2	384,6	340,7	264,0	180,0	105,9	42,9
2	982,143	300,0		600,0	411,4	396,9	380,0	360,0	322,1	261,5	192,6	72,0	-60,0	-176,5	-275,4
2	982,143	380		600,0	342,9	323,1	300,0	272,7	221,1	138,5	44,4	-120,0	-300,0	-458,8	-593,8
2	982,143	460		600,0	274,3	249,2	220,0	185,5	120,0	15,4	-103,7	-312,0	-540,0	-741,2	-912,1
7	3437,5	540,0		600	137,143	101,538	60,000	10,909	-82,105	-230,769	-400,000	-696,000	-1020,000	-1305,882	-1548,803
C_{s1}				1301953,1	1301953,1	1301953,1	1301953,1	1301953,1	1301953,1	1301953,1	1301953,1	1301953,1	1301953,1	1261511,9	1168729,6
C_{s2}				371986,6	371986,6	371986,6	371986,6	371986,6	371986,6	356876,7	313785,5	238415,2	155915,2	83121,1	21266,2
C_{s3}				371986,6	371986,6	368964,6	352343,8	332700,9	295482,8	235997,6	168282,9	49843,8	-58928,6	-173319,3	-270519,9
C_{s4}				371986,6	315864,2	296437,2	273772,3	246986,6	196234,7	115118,5	22780,3	-117857,1	-294642,9	-392857,1	-392857,1
C_{s5}				371986,6	248517,2	223909,7	195200,9	161272,3	96986,6	-5760,6	-101851,9	-306428,6	-392857,1	-392857,1	-392857,1
C_{s6}				371986,6	181170,3	151382,2	116629,5	75558,0	-2261,5	-105769,2	-247354,5	-392857,1	-392857,1	-392857,1	-392857,1
C_{s7}				1301953,1	398381,7	275991,6	133203,1	-35346,9	-282236,8	-793269,2	-1375000,0	-1375000,0	-1375000,0	-1375000,0	-1375000,0
ΣC_s				4463839,3	3189859,7	2990625,0	2745089,3	2454910,7	1978145,6	1105146,8	82595,5	-601930,8	-1056417,4	-1382257,7	-1634095,5
C_c				7650000,0	7586250,0	7044375,0	6502500,0	5960625,0	5147812,5	4226625,0	3511350,0	2709375,0	2167500,0	1842375,0	1634095,5
$C_c + \Sigma C_s$				12113839,3	10776109,7	10035000,0	9247589,3	8415535,7	7123958,1	5331771,8	3593945,5	2107444,2	1111082,6	460117,3	0,0
$0,65 P_n$				7874,0	7004,5	6522,8	6010,9	5470,1	4631,9	3465,7	2336,1	1369,8	722,2	299,1	0,0
$0,65 M_n$				0,0	179,6	299,3	407,3	505,1	624,7	756,4	860,4	843,0	794,9	745,0	696,8

Diagram Interaksi Kolom 600x600



Tabel perhitungan Diagram interaksi Kolom Ukuran 500x500mm

b = 500 mm
 h = 500 mm
 d' = 60 mm
 d = 440 mm
 cb = 264 mm

Tulangan	8 D	25	Kondisi		1	2	3	4	5	6	7	8	9	10	11	12
			c	a												
p =	0.0157				580.0	490.0	430.0	370.0	310.0	264.0	190.0	140.0	110.0	84.14		
n	Asi	d'	a		500.0	416.5	365.5	314.5	263.5	224.4	161.5	119.0	93.5	71.5		
3	1473.21	60.0	f_{s1}		600.0	526.5	516.3	502.7	483.9	463.6	410.5	342.9	272.7	172.1		
2	982.143	250.0	f_{s2}		600.0	293.9	251.2	194.6	116.1	31.8	-189.5	-471.4	-763.6	-1182.8		
3	1473.21	440.0	f_{s3}		600.0	61.2	-14.0	-113.5	-251.6	-400.0	-789.5	-1285.7	-1800.0	-2537.7		
		C_{s1}			557979.9	557979.9	557979.9	557979.9	557979.9	557979.9	557979.9	557979.9	557979.9	557979.9	557979.9	557979.9
		C_{s2}			371986.6	314412.7	295597.7	267759.2	170249.2	93184.8	10379.5	-186090.2	-392857.1	-392857.1	-392857.1	-392857.1
		C_{s3}			557979.9	182056.3	132384.7	58891.0	-20556.5	-370679.7	-589285.7	-589285.7	-589285.7	-589285.7	-589285.7	-589285.7
		ΣC_s			1487946.4	1054448.9	985962.3	884630.1	763230.6	560999.3	280485.0	-20926.3	-217396.0	-508346.6	-611662.9	-759866.0
		C_c			5312500.0	5238125.0	4876875.0	4425312.5	3883437.5	3341562.5	2799687.5	2384250.0	1715937.5	1264375.0	993437.5	759866.5
		$C_c + \Sigma C_s$			6800446.4	6292573.9	5862837.3	5309942.6	4646668.1	3902561.8	3080172.5	2363323.7	1498541.5	756028.4	381774.6	0.5
		$0.65 P_h$			4420.3	4090.2	3810.8	3451.5	3020.3	2536.7	2002.1	1536.2	974.1	491.4	248.2	0.0
		$0.65 M_h$			0.0	58.3	117.5	181.7	241.2	291.0	329.9	355.2	330.5	287.9	249.8	206.0

Tabel perhitungan Diagram interaksi Kolom Ukuran 500x500mm

b = 500 mm
 h = 500 mm
 d' = 60 mm
 d = 440 mm
 cb = 264 mm

Tulangan	12	D	25	Kondisi	1	2	3	4	5	6	7	8	9	10	11	12
$\rho =$	0.0236			c	-	580.0	540.0	490.0	430.0	370.0	310.0	264.0	210.0	160.0	130.0	114.35
n	Asi	d'		a	500.0	493.0	459.0	416.5	365.5	314.5	263.5	224.4	178.5	136.0	110.5	97.2
4	1964.29	60.0	f_{s1}		600.0	537.9	533.3	526.5	516.3	502.7	483.9	463.6	428.6	375.0	323.1	285.2
2	982.143	186.7	f_{s2}		600.0	406.9	392.6	371.4	339.5	297.3	238.7	175.8	66.7	-100.0	-261.5	-379.4
2	982.143	313.3	f_{s3}		600.0	275.9	251.9	216.3	162.8	91.9	-6.5	-112.1	-295.2	-575.0	-846.2	-1044.0
4	1964.29	440.0	f_{s4}		600.0	144.8	111.1	61.2	-14.0	-113.5	-251.6	-400.0	-657.1	-1050.0	-1430.8	-1708.6
			C_{s1}		743973.2	743973.2	743973.2	743973.2	743973.2	743973.2	743973.2	743973.2	743973.2	743973.2	592874.3	518450.2
			C_{s2}		371986.6	371986.6	364711.5	343925.4	312601.2	271117.9	213576.5	151748.5	44605.7	-98214.3	-256868.1	-372639.0
			C_{s3}		371986.6	250065.4	226484.0	191593.0	139013.2	69380.4	-6336.4	-110119.0	-289966.0	-392857.1	-392857.1	-392857.1
			C_{s4}		743973.2	242741.7	176512.9	78521.3	-27408.6	-222973.0	-494239.6	-785714.3	-785714.3	-785714.3	-785714.3	-785714.3
			ΣC_s		2231919.6	1608766.9	1511681.5	1358012.9	1168179.0	861498.6	456973.6	-111.6	-287101.4	-581919.6	-842565.2	-1032760.2
			C_c		5312500.0	5238125.0	4876875.0	4425312.5	3883437.5	3341562.5	2799687.5	2384250.0	1896562.5	1445000.0	1174062.5	1032760.2
			$C_c + \Sigma C_s$		7544419.6	6846891.9	6388556.5	5783325.4	5031616.5	4203061.1	3256661.1	2384138.4	1609461.1	863080.4	331497.3	0.0
			$0.65 P_n$		4903.9	4450.5	4152.6	3759.2	3283.6	2732.0	2116.8	1549.7	1046.1	561.0	215.5	0.0
			$0.65 M_n$		0.0	78.8	140.8	208.5	272.2	329.2	377.2	413.3	400.9	365.9	324.5	297.1

Tabel perhitungan Diagram interaksi Kolom Ukuran 600x600mm

b = 500 mm
 h = 500 mm
 d' = 60 mm
 d = 440 mm
 cb = 264 mm

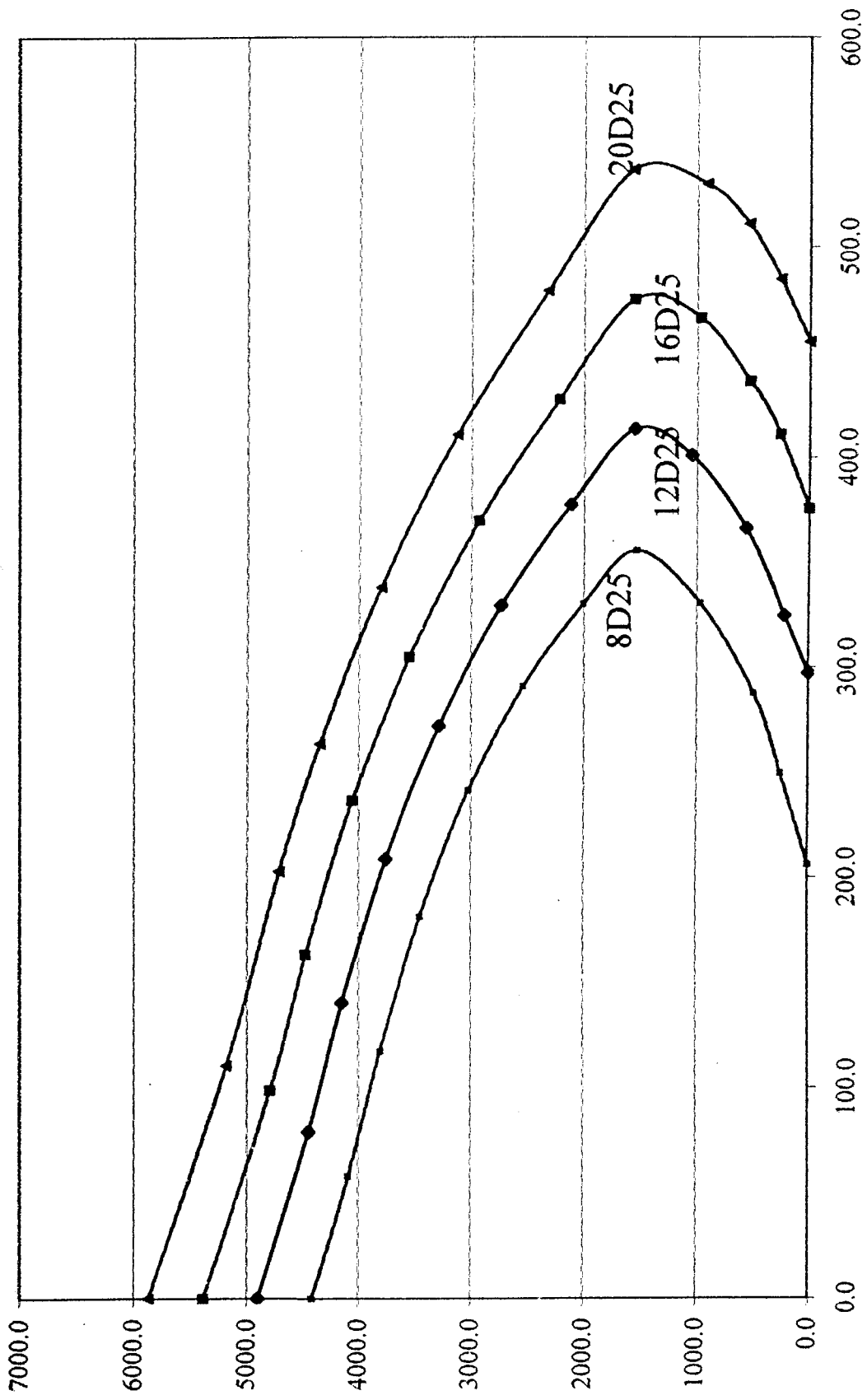
n	Asi	16 D	25	Kondisi		1	2	3	4	5	6	7	8	9	10	11	12
				c	a												
p =	0.0314						580.0	490.0	430.0	370.0	310.0	264.0	210.0	170.0	150.0	128.28	
				500.0	493.0	537.9	533.3	526.5	516.3	502.7	483.9	463.6	428.6	388.2	360.0	319.4	
5	2455.357	60.0	f_{s1}	600.0	439.7	427.8	410.2	383.7	348.6	300.0	300.0	247.7	157.1	52.9	-20.0	-124.9	
2	982.1429	155.0	f_{s2}	600.0	341.4	322.2	293.9	251.2	194.6	116.1	116.1	31.8	-114.3	-282.4	-400.0	-569.3	
2	982.1429	250.0	f_{s3}	600.0	243.1	216.7	177.6	118.6	40.5	-67.7	-67.7	-184.1	-385.7	-617.6	-780.0	-1013.6	
2	982.1429	345.0	f_{s4}	600.0	144.8	111.1	61.2	-14.0	-113.5	-251.6	-251.6	-400.0	-657.1	-952.9	-1160.0	-1457.9	
5	2455.357	440	f_{s5}	600.0	144.8	111.1	61.2	-14.0	-113.5	-251.6	-251.6	-400.0	-657.1	-952.9	-1160.0	-1457.9	
				929966.5	929966.5	929966.5	929966.5	929966.5	929966.5	929966.5	929966.5	929966.5	929966.5	929966.5	929966.5	929966.5	929966.5
			C_{s1}	371986.6	371986.6	371986.6	371986.6	371986.6	371986.6	371986.6	371986.6	371986.6	371986.6	371986.6	371986.6	371986.6	371986.6
			C_{s2}	371986.6	314412.7	295597.7	267759.2	225807.2	170249.2	93184.8	10379.5	10379.5	-112244.9	-277310.9	-392857.1	-392857.1	-392857.1
			C_{s3}	371986.6	217891.8	191927.1	153509.9	95616.2	18946.1	-66532.3	-66532.3	-180803.6	-378826.5	-392857.1	-392857.1	-392857.1	-392857.1
			C_{s4}	929966.5	303427.1	220641.1	98151.6	-34260.8	-278716.2	-617799.5	-617799.5	-982142.9	-982142.9	-982142.9	-982142.9	-982142.9	-982142.9
			ΣC_s	2975892.9	2137684.7	2010119.0	1821373.9	1573127.3	1161997.8	612591.8	612591.8	-167.4	-409781.6	-720105.7	-955747.8	-1158572.7	
			C_c	5312500.0	5238125.0	4876875.0	4425312.5	3883437.5	3341562.5	2799687.5	2799687.5	2384250.0	1896562.5	1354687.5	1354687.5	1354687.5	1354687.5
			$C_c + \Sigma C_s$	8288392.9	7375809.7	6886994.0	6246686.4	5456564.8	4503560.3	3412279.3	3412279.3	2384082.6	1486780.9	815206.8	398939.7	398939.7	0.0
			$0.65 P_n$	5387.5	4794.3	4476.5	4060.3	3546.8	2927.3	2218.0	2218.0	1549.7	966.4	529.9	259.3	259.3	0.0
			$0.65 M_n$	0.0	98.8	163.7	236.3	304.9	369.4	427.4	427.4	474.6	465.9	436.1	411.1	411.1	375.6

Tabel perhitungan Diagram interaksi Kolom Ukuran 500x500mm

b = 500 mm
 h = 500 mm
 d' = 60 mm
 d = 440 mm
 cb = 264 mm

Tulangan	20	D	25	Kondisi	1	2	3	4	5	6	7	8	9	10	11	12
p =	0.03929			c	500.0	585.0	530.0	490.0	430.0	370.0	310.0	264.0	210.0	180.0	160.0	142.41
n	Asi	d'	a		500.0	497.3	450.5	416.5	365.5	314.5	263.5	224.4	178.5	153.0	136.0	121.0
6	2946.43	60.0	f_{s1}		600.0	538.5	532.1	526.5	516.3	502.7	483.9	463.6	428.6	400.0	375.0	347.2
2	982.143	136.0	f_{s2}		600.0	460.5	446.0	433.5	410.2	379.5	336.8	290.9	211.4	146.7	90.0	27.0
2	982.143	212.0	f_{s3}		600.0	382.6	360.0	340.4	304.2	256.2	189.7	118.2	-5.7	-106.7	-195.0	-293.2
2	982.143	288.0	f_{s4}		600.0	304.6	274.0	247.3	198.1	133.0	42.6	-54.5	-222.9	-360.0	-480.0	-613.4
2	982.143	364	f_{s5}		600.0	226.7	187.9	134.3	92.1	9.7	-104.5	-227.3	-440.0	-613.3	-765.0	-933.6
6	2946.43	440	f_{s5}		600.0	148.7	101.9	61.2	-14.0	-113.5	-251.6	-400.0	-657.1	-866.7	-1050.0	-1253.8
			C_{s1}		1115959.8	1115959.8	1115959.8	1115959.8	1115959.8	1115959.8	1115959.8	1115959.8	1115959.8	1115959.8	1042299.1	960422.3
			C_{s2}		371986.6	371986.6	371986.6	371986.6	371986.6	351812.9	309889.8	264843.8	186782.5	123177.1	67522.3	5659.8
			C_{s3}		371986.6	354862.1	332700.9	313458.9	277883.6	230770.4	165419.8	95200.9	-5612.2	-104761.9	-191517.9	-287950.6
			C_{s4}		371986.6	278305.3	248199.5	222059.5	173730.8	109727.9	20949.7	-53571.4	-218877.6	-353571.4	-392857.1	-392857.1
			C_{s5}		371986.6	201748.5	163698.2	130660.1	69578.0	-11314.6	-102649.8	-223214.3	-392857.1	-392857.1	-392857.1	-392857.1
			ΣC_s		1115959.8	375575.2	237590.5	117782.0	-41113.0	-334459.5	-741359.4	-1178571.4	-1178571.4	-1178571.4	-1178571.4	-1178571.4
			C_c		3719866.1	2698437.5	2470135.6	2271906.9	1968025.9	1462497.0	768210.0	20647.3	-493176.0	-790625.0	-1045982.1	-1286154.2
			$C_c - \Sigma C_s$		5312500.0	5283281.3	4786562.5	4425312.5	3883437.5	3341562.5	2799687.5	2384250.0	1896562.5	1625625.0	1445000.0	1286154.2
			$C_c - \Sigma C_s$		9032366.1	7981718.8	7256698.1	6697219.4	5851463.4	4804059.5	3567897.5	2404897.3	1403386.5	835000.0	399017.9	0.0
			$0.65 P_n$		5871.0	5188.1	4716.9	4353.2	3803.5	3122.6	2319.1	1563.2	912.2	542.8	259.4	0.0
			$0.65 M_n$		0.0	110.7	203.0	263.5	337.6	410.5	478.7	536.8	529.8	511.1	484.3	454.7

Grafik Interaksi kolom 500x500



LAMPIRAN 3

GAMBAR STRUKTUR



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TUGAS AKHIR

PERENCANAAN STADION
 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DENAH
 LT. DASAR
 STADION
 1 : 150

DIGAMBAR OLEH

ERIM HIDAYAT 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

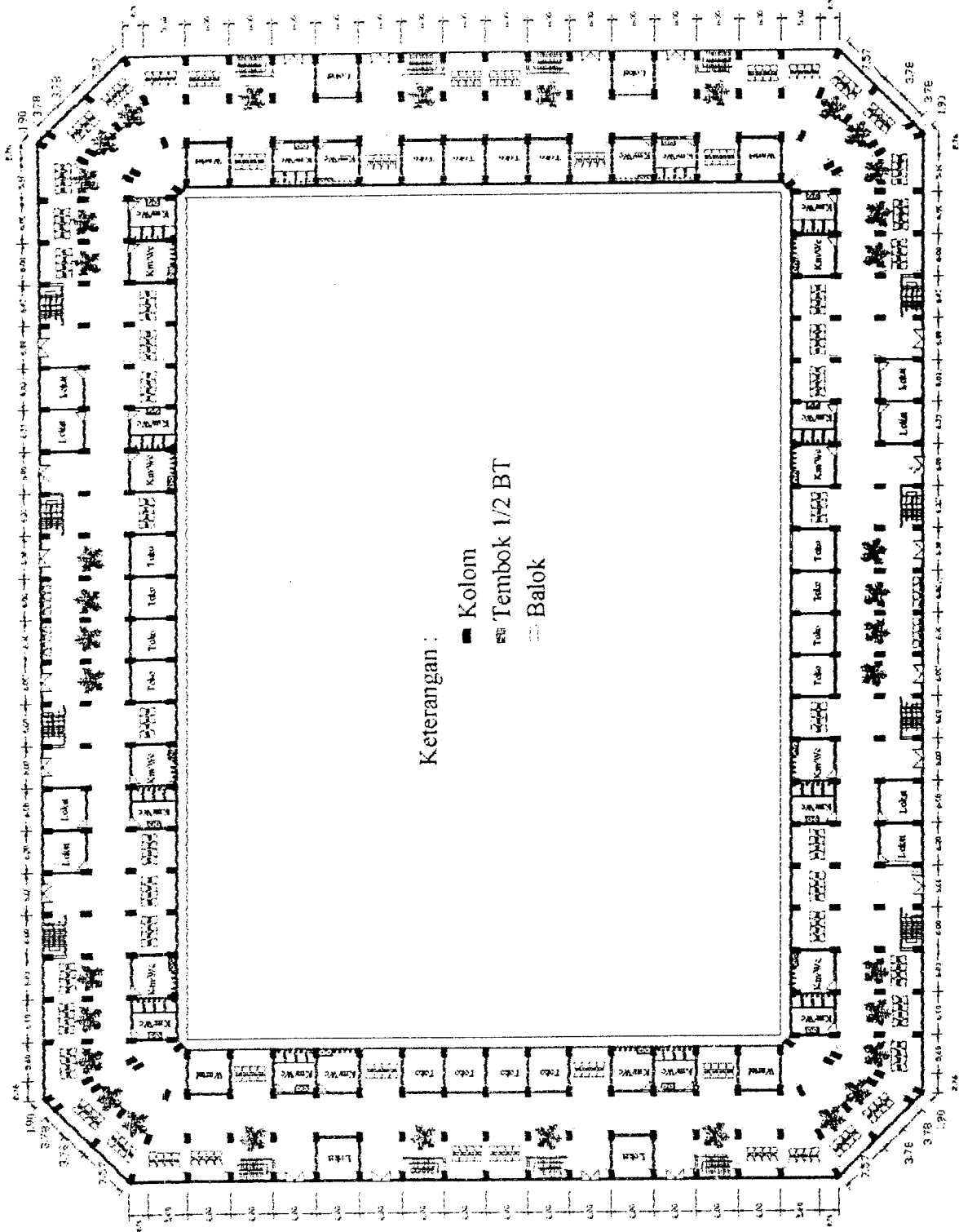
IR. SUHARYATMO .MT

DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN .MT

JML LBR LBR KE



DENAH LANTAI DASAR STADION

SCALE 1 : 150



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PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DENAH
LANTAI
STADION

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

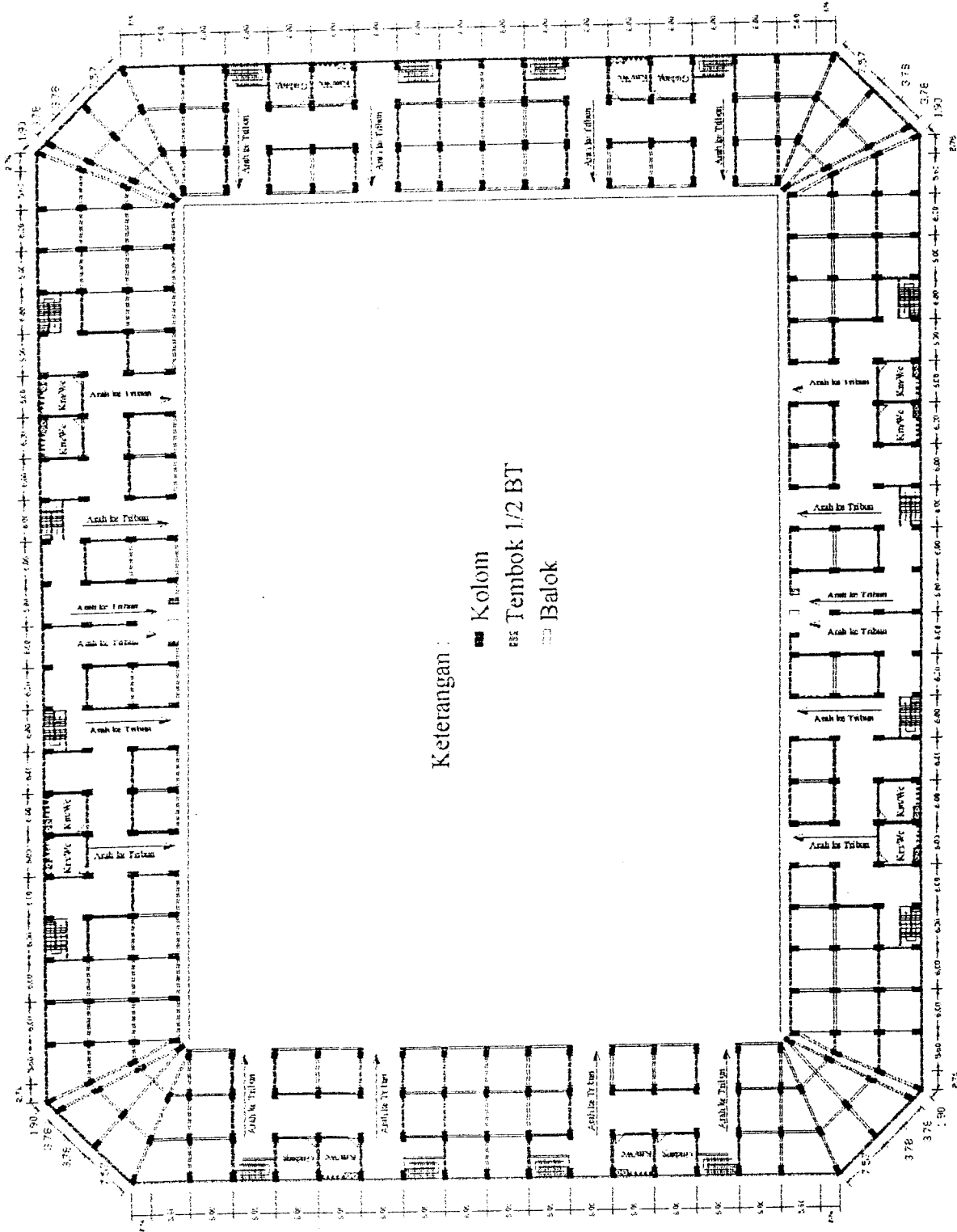
IR. SUHARYATMO . MT

DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

JML LBR LBR KE



DENAH LANTAI 1 STADION
SCALE 1 : 150



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2004

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PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DENAH
LANTAI 2
STADION
1 : 150

DIGAMBAR OLEH

ERIM HIDAYAT 97 511 094

WAHYU TRIN 97 511 125

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

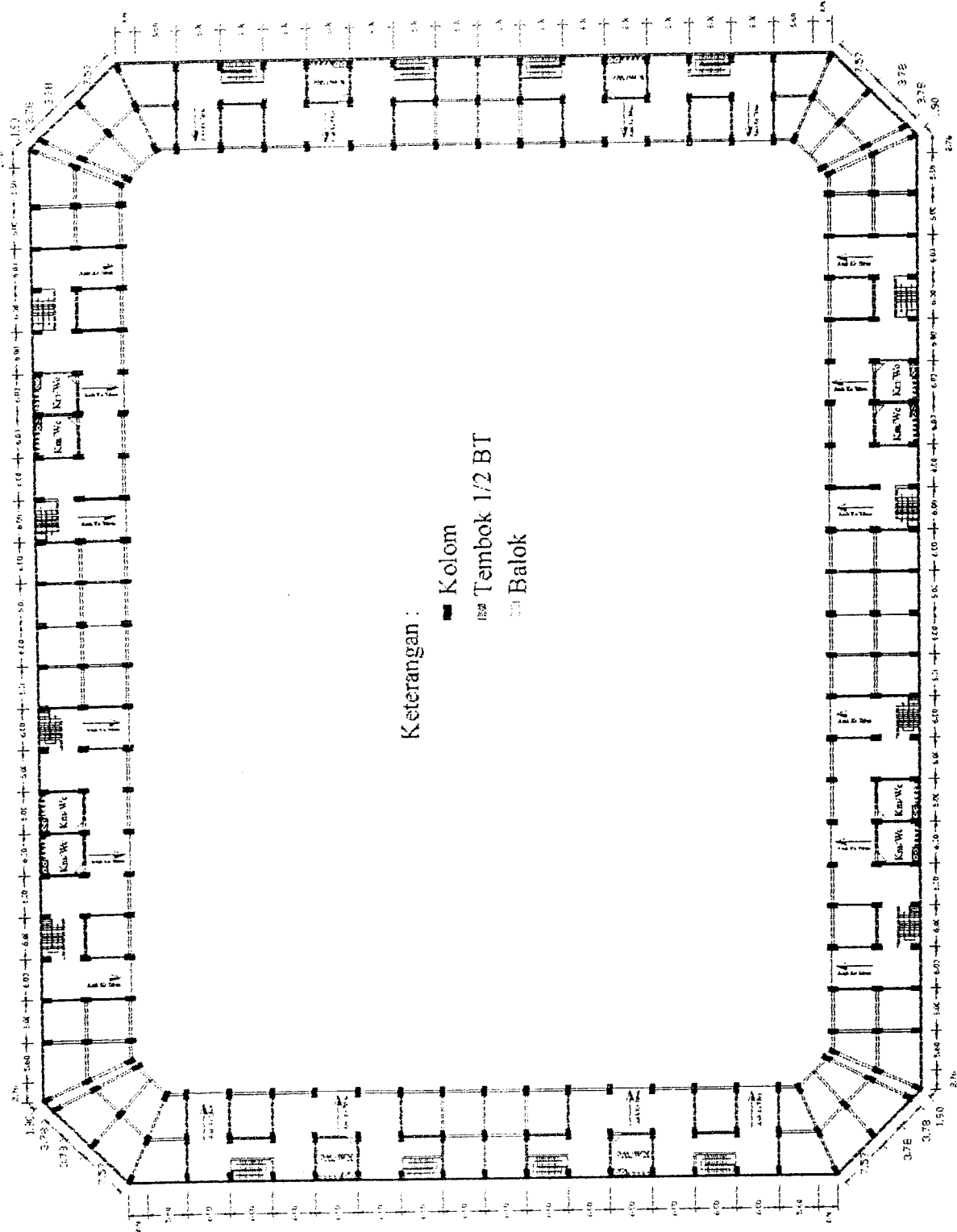
IR. SUHARYATMO . MT

DJSETUJU OLEH

DOSEN PEMBIMBING 1

IR. FAKHURROHMAN . MT

JML LBR LBR KE



Keterangan :

- Kolom
- - - Tembok 1/2 BT
- Balok

DENAH LANTAI 2 STADION

SCALE 1 : 150



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DENGAN ATAP LENGKUNG

GAMBAR SKALA

DENAH
LANTAI 3
STADION
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

Wahyu Trin 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

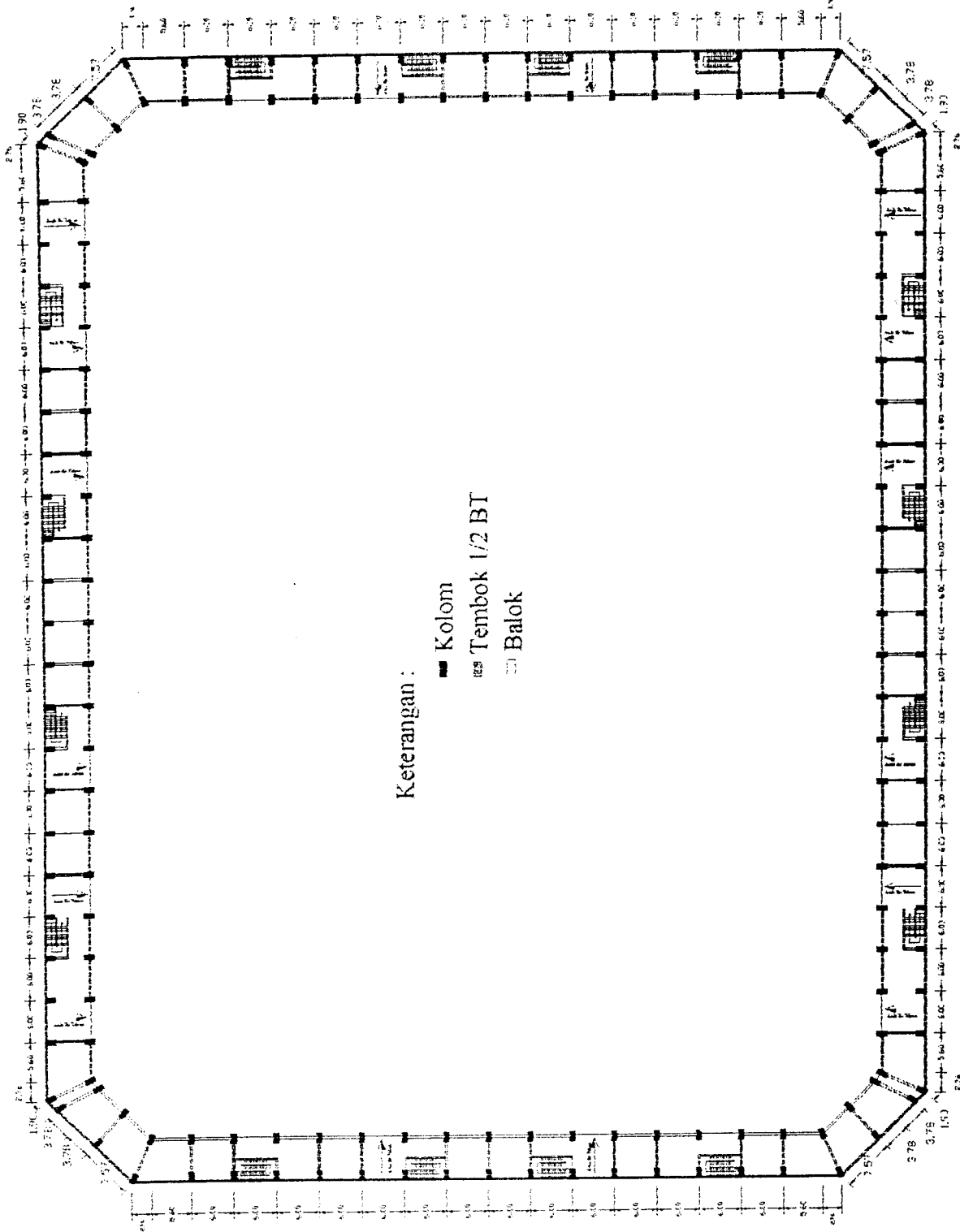
IR. SUHARYATMO . MT

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DOSEN PEMBIMBING 1

IR. FAKHURROHMAN . MT

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DENAH LANTAI 3 STADION

SCALE 1 : 150



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PERENCANAAN STADION
 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DENAH DAN
 RENCANA
 TRIBUN

1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRUN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

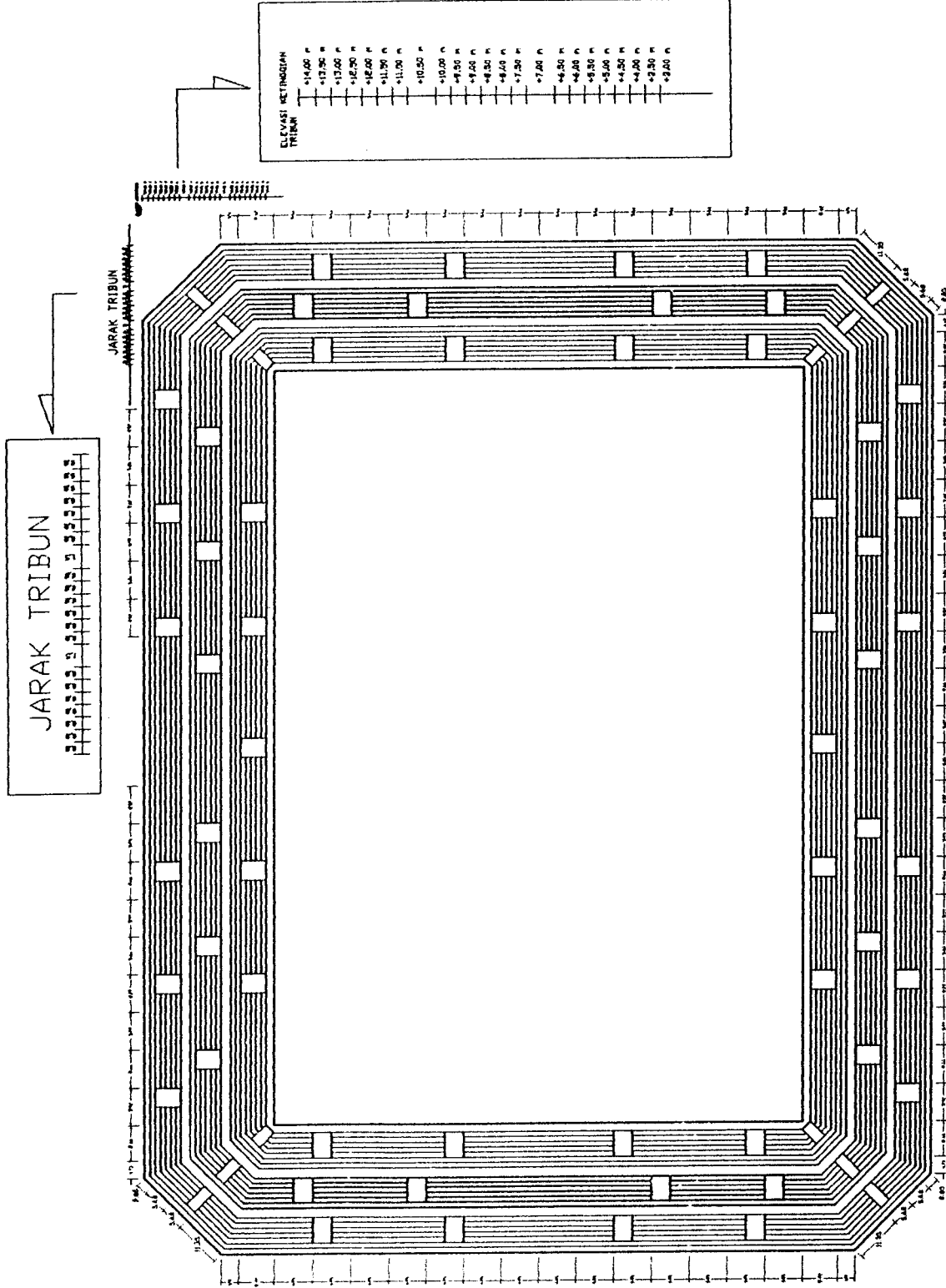
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IR. FAKHTURROHMAN . MT

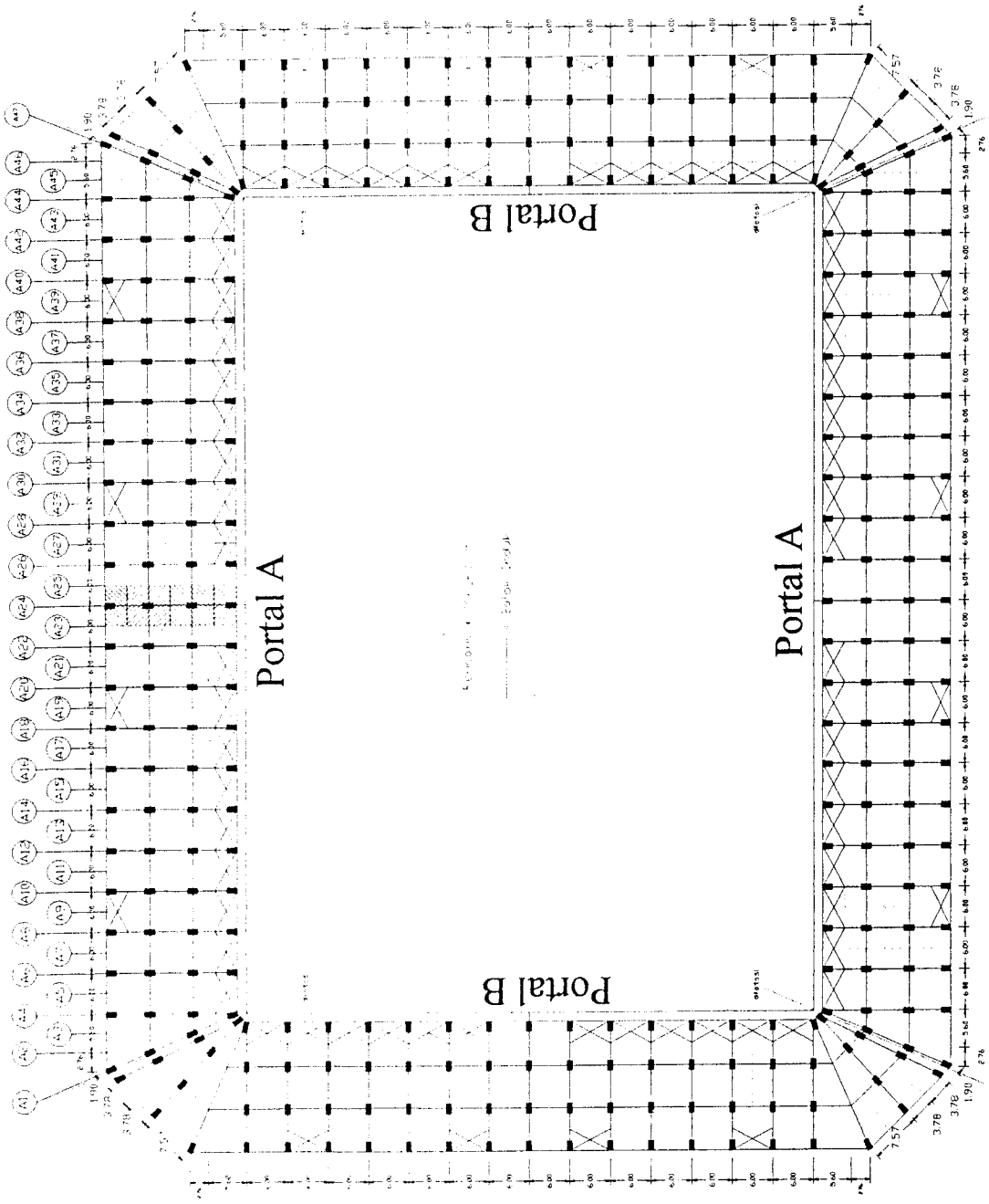
JML GBR GBR KE

15

5



Gambar 2.5. DENAH DAN RENCANA TRIBUN





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GAMBAR SKALA

DENAH DAN
RENC. PEMB.
LANTAI I

1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

Wahyutrin 97 511 123

DIPERIKSA OLEH

Dosen Pembimbing 2

IR. Suharyatmo . MT

DISETUJUI OLEH

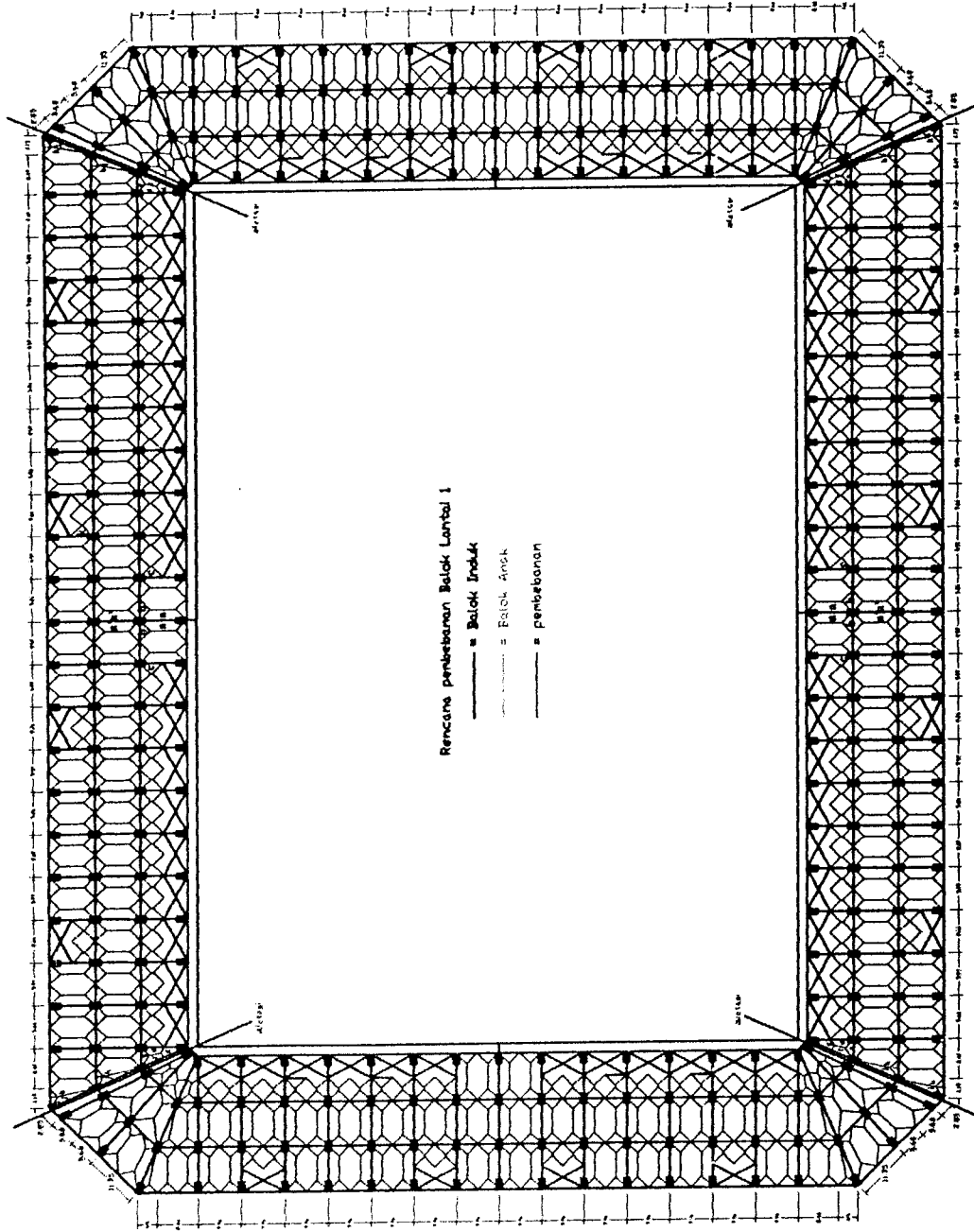
Dosen Pembimbing 1

IR. Fakhriurrohmah . MT

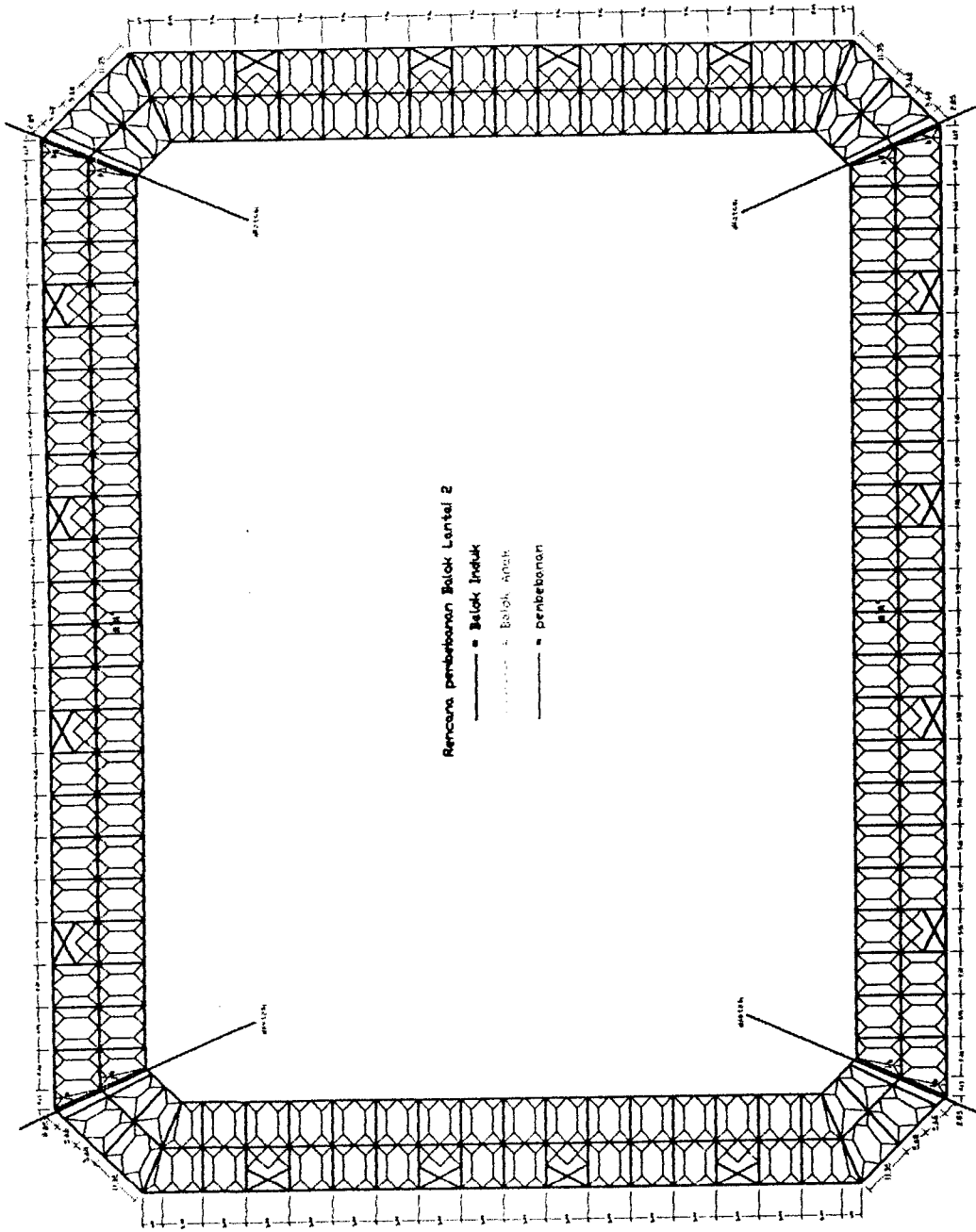
JML GBR GBR KE

15

2



Gambar 2.2. DENAH DAN RENCANA PEMBEBANAN LANTAI I



Gambar 2.3. DENAH DAN RENCANA PEMBEBANAN LT 2



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GAMBAR SKALA

DETAIL
 TULANGAN
 Kolom

DIGAMBAR OLEH

ERI M.HIDAYAT 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

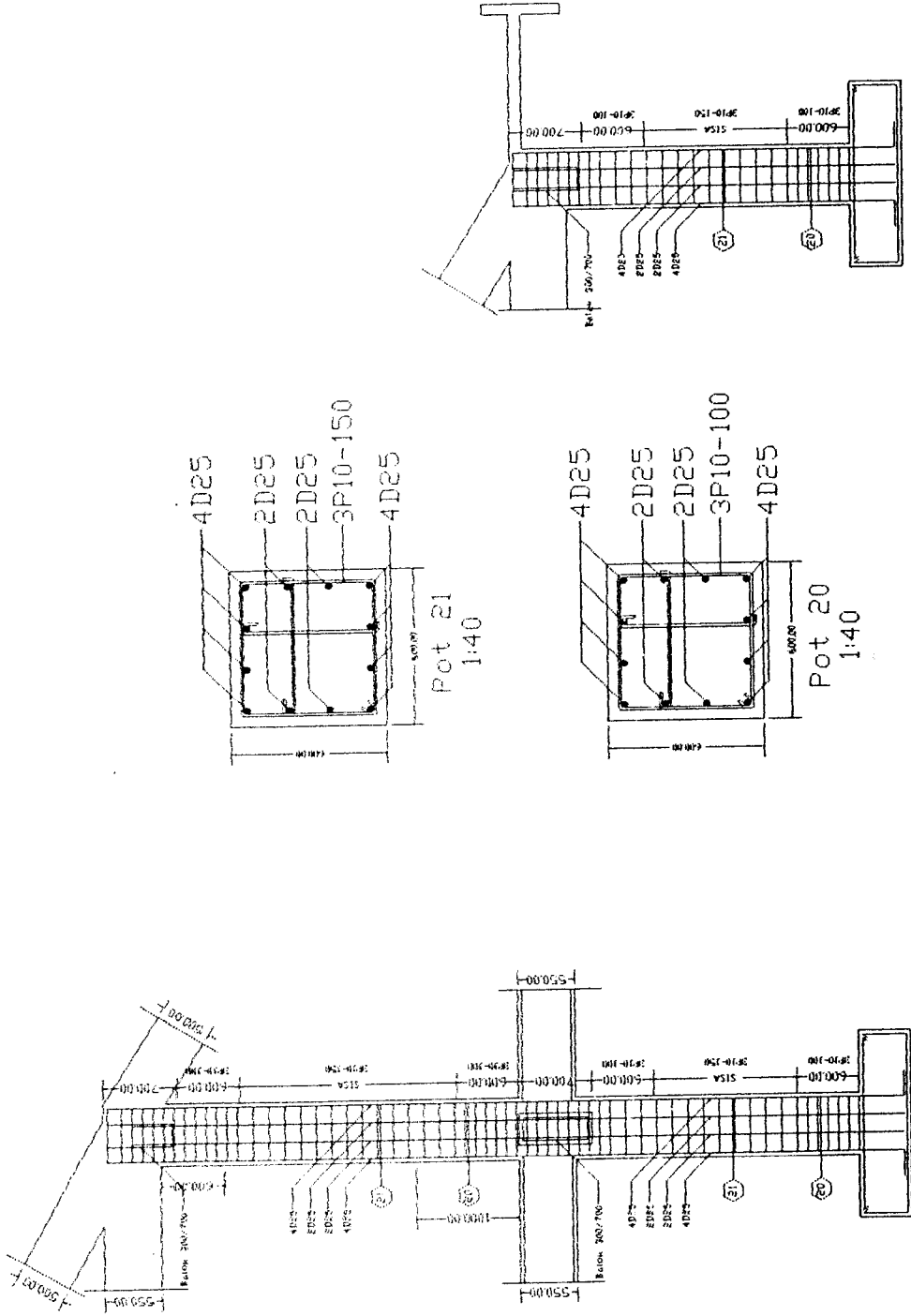
DISETUIJI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

JML GBR **GBR KE**

10





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TUGAS AKHIR

PERENCANAAN STADION
 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
 TULANGAN
 Kolom

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO .MT

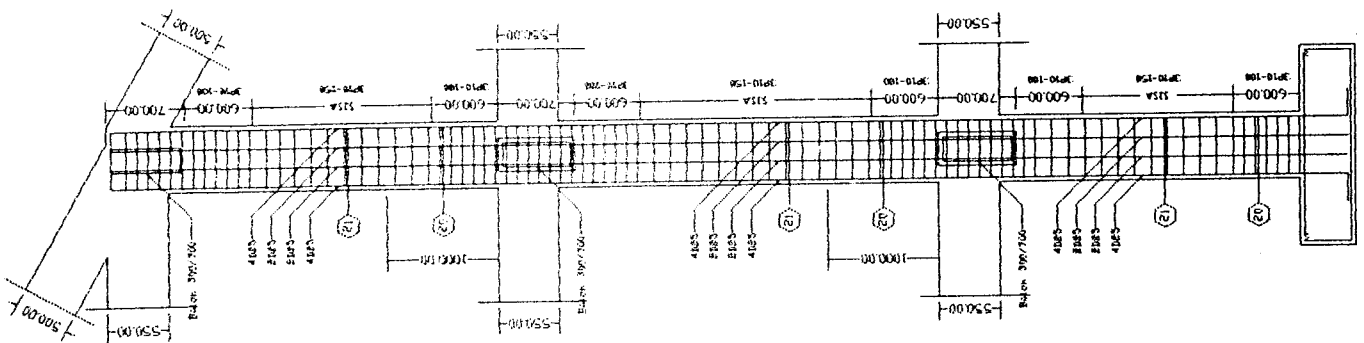
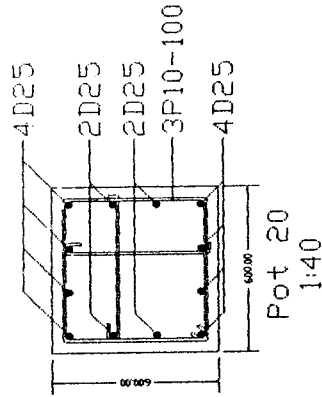
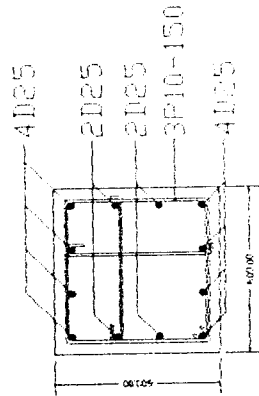
DISETUJUI OLEH

DOSEN PEMBIMBING 1

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PERENCANAAN STADION
 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
 TULANGAN
 Kolom

DIGAMBAR OLEH

ERIM HIDAYAT 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

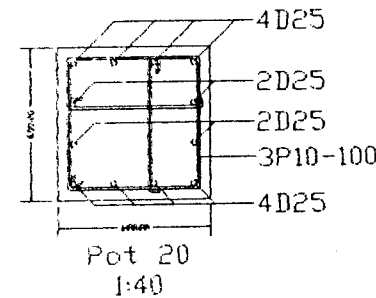
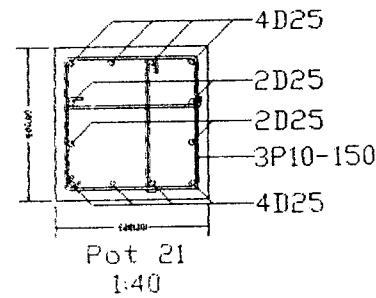
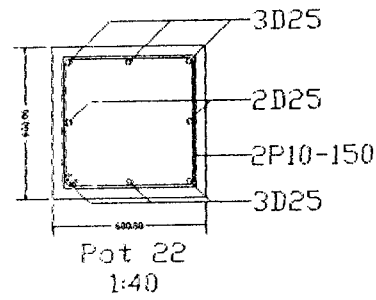
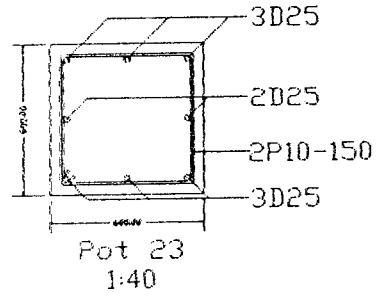
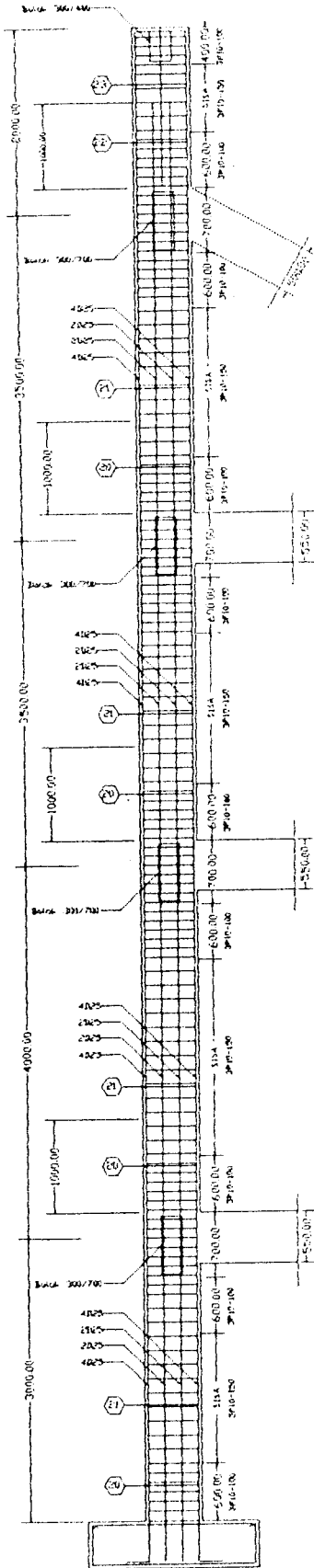
DISETUJUI OLEH

DOSEN PEMBIMBING 1

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2004

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PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
TULANGAN
BLK SLOOF

1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

Wahyu Trini 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

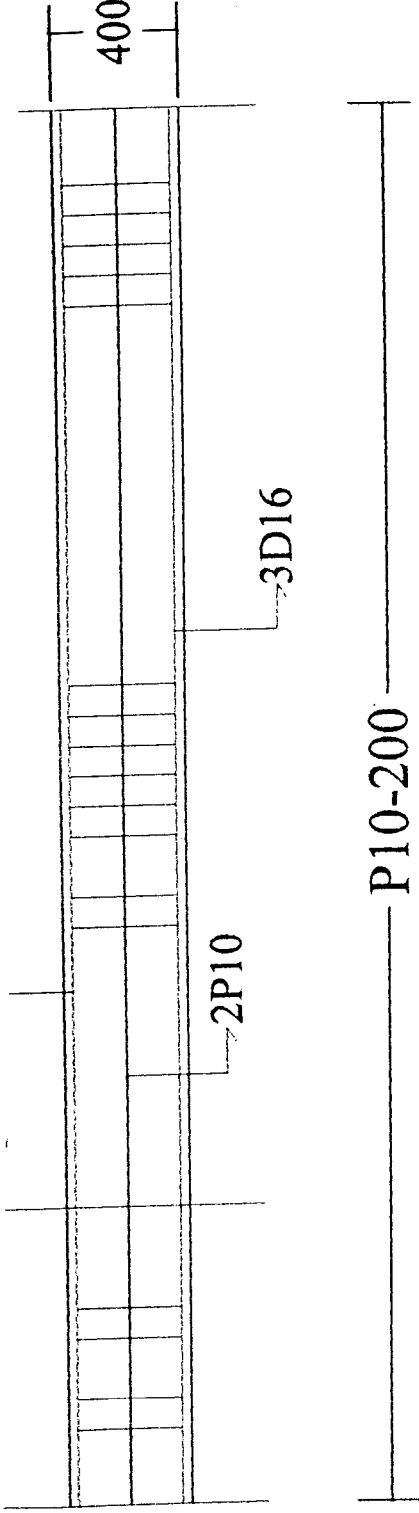
IR. SUHARYATMO . MT

DISETUIJI OLEH

DOSEN PEMBIMBING 1

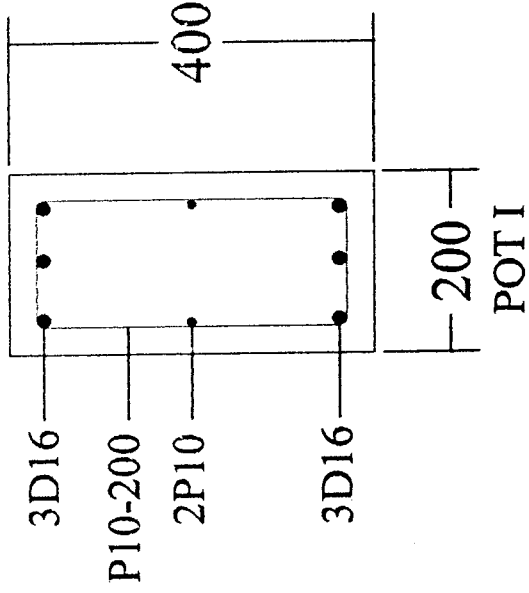
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DETAIL BALOK SLOOF

SCALE 1 : 100



DETAIL POTONGAN BALOK SLOOF



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PERENCANAAN STADION
DENGAN ATAP LIENKUNG

GAMBAR SKALA

DETAIL
TULANGAN
PLAT LANTAI
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

Wahyutrin 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

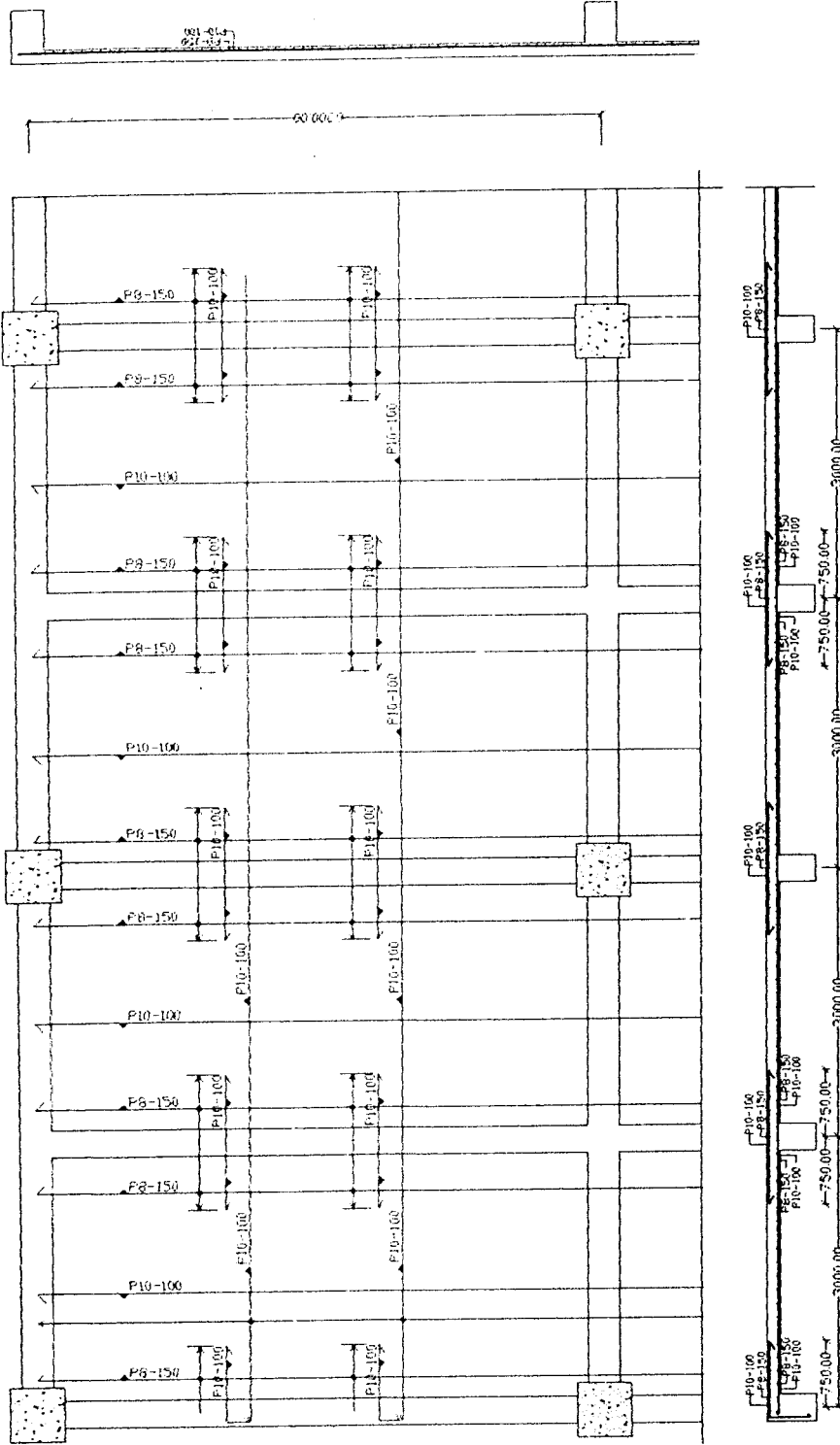
IR. Suharyatmo, MT

DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. Fakhrurohman, MT

JML GBR GBR KE

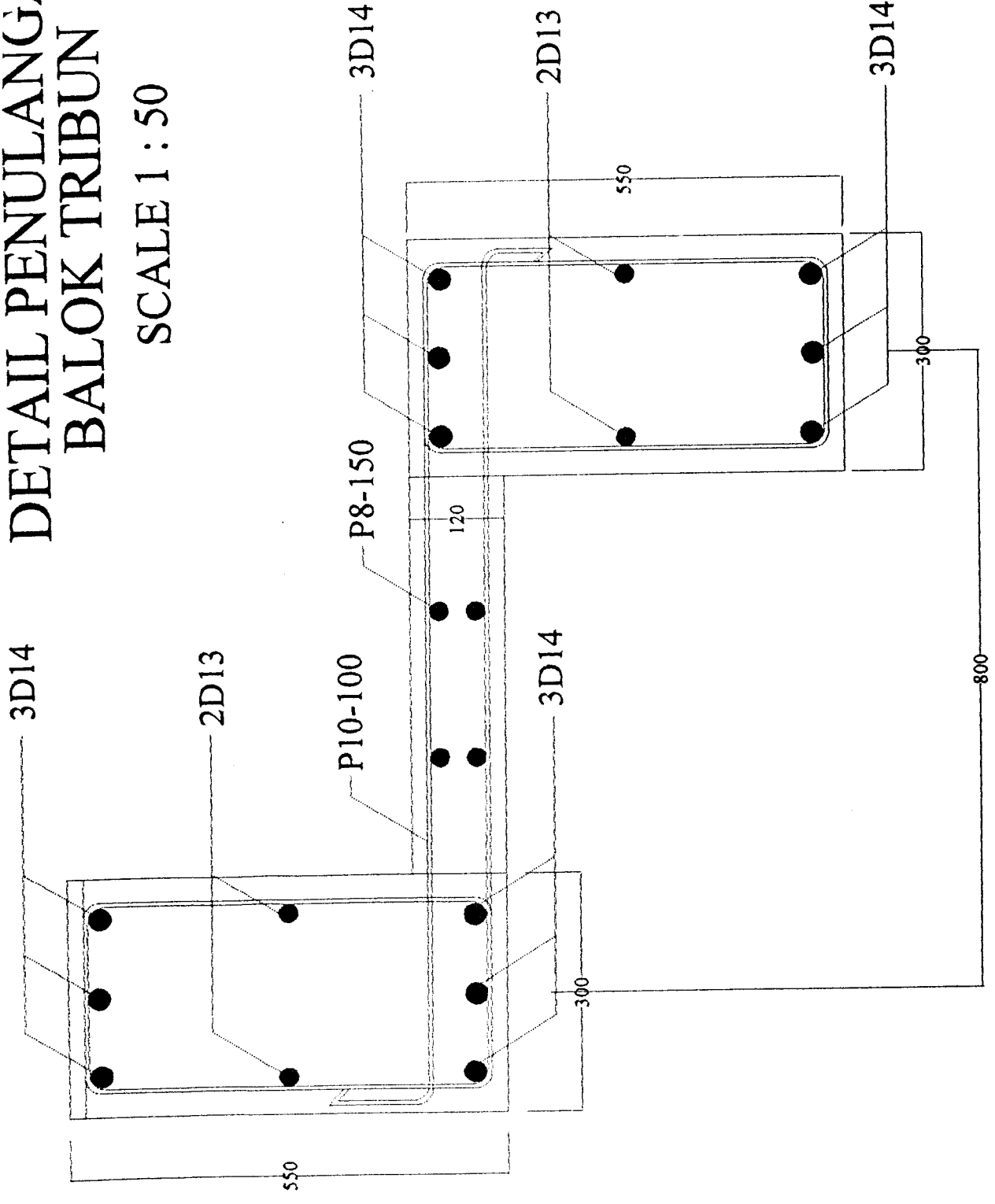


GAMBAR PENULANGAN PELAT LANTAI

SCALE 1 : 150

DETAIL PENULANGAN BALOK TRIBUN

SCALE 1 : 50



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TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
TULANGAN
BLK TRIBUN
1 : 150

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

JML GBR

GBR KE



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 2005

TUGAS AKHIR

PERENCANAAN STADION
 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL,
 TULANGAN
 BALOK

1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

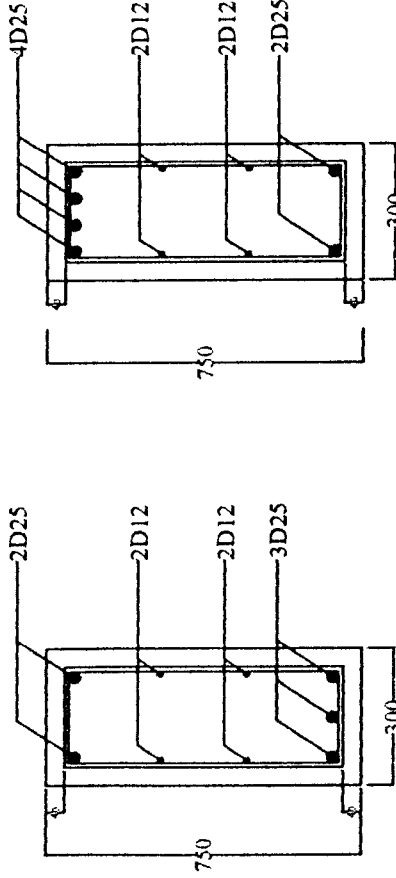
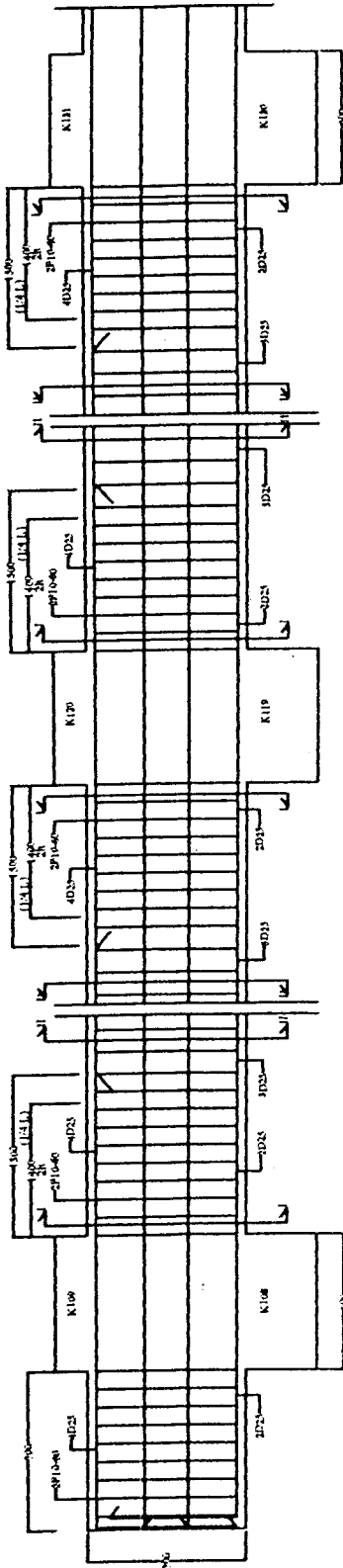
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DOSEN PEMBIMBING 1

IR. FAKHURROHMAN . MT

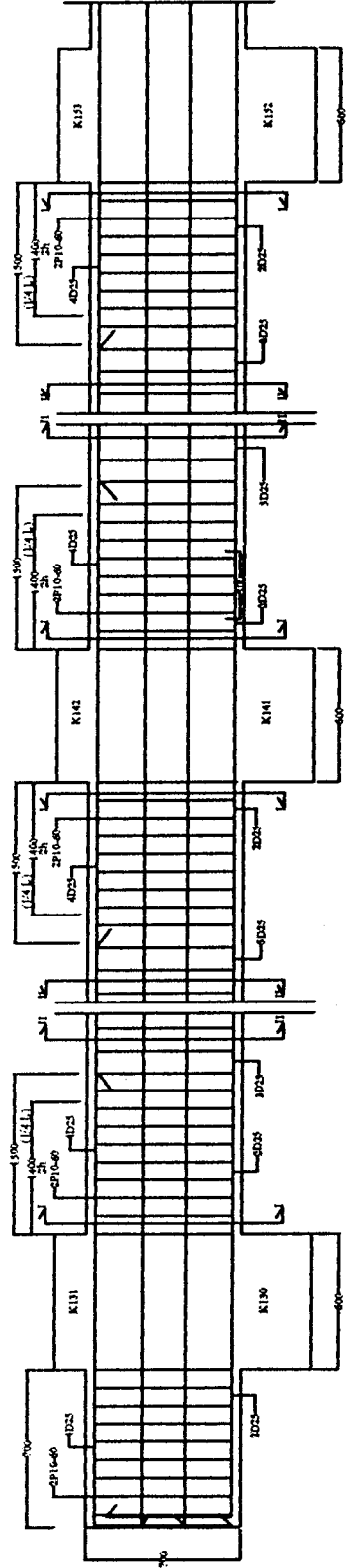
JML GBR GBR KE

1



POTONGAN II-II
 PU 1:40

POTONGAN I-I
 PU 1:40



BALOK LAINLAJ AS 1-11 UNIVERSITAS ISLAM INDONESIA



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PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL:
TULANGAN
BALOK
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

Wahyutrin 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

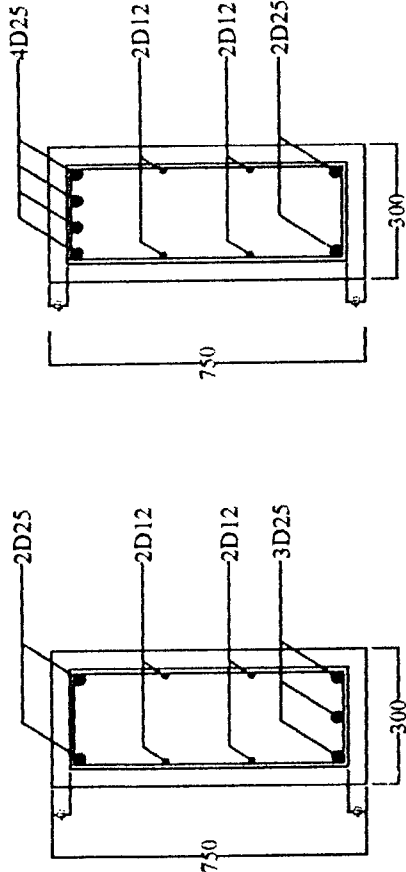
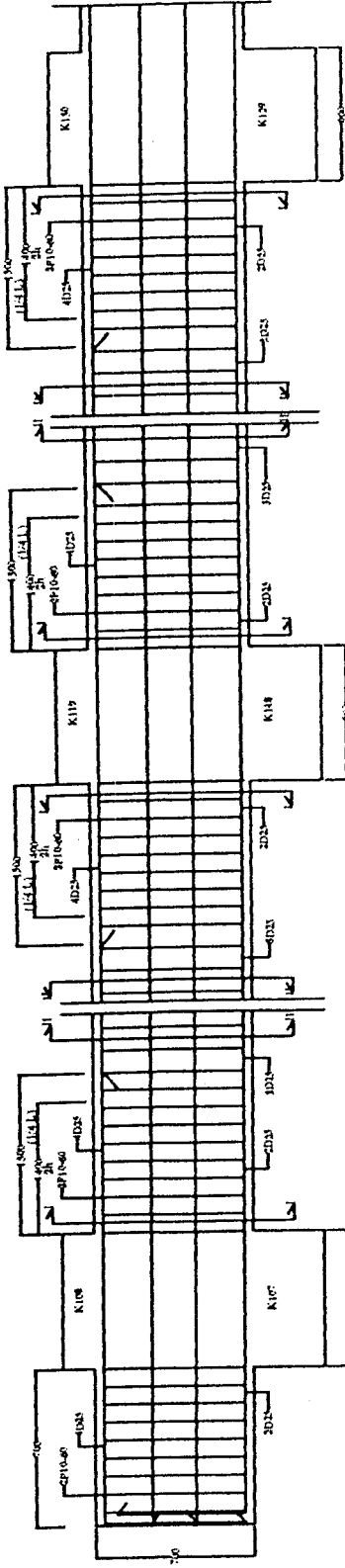
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DOSEN PEMBIMBING 1

IR. FAKHURROHMAN . MT

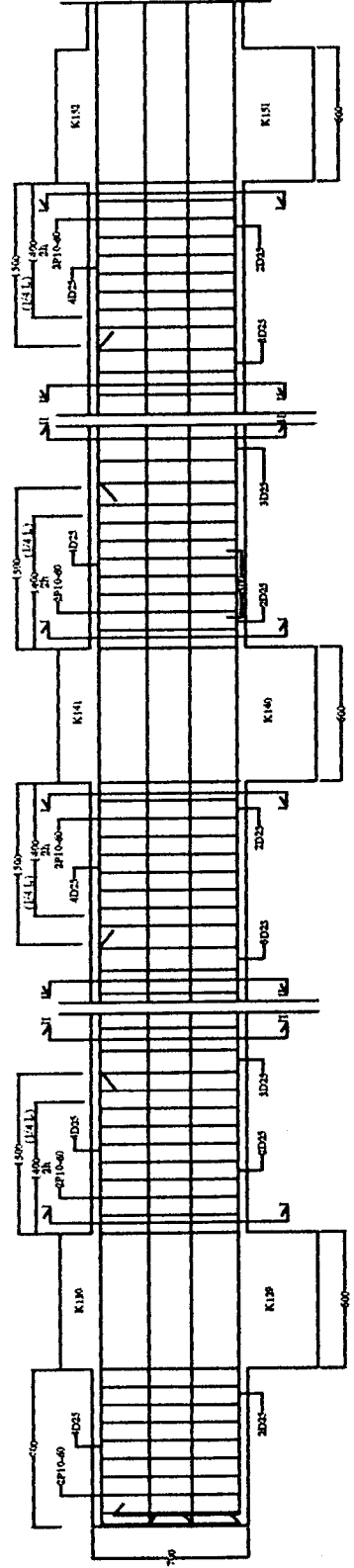
JML GBR GBR KE

2



POTONGAN II-II
PU 1:40

POTONGAN I-I
PU 1:40



BALOK LANJUTAN 2



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TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
TULANGAN
BALOK
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

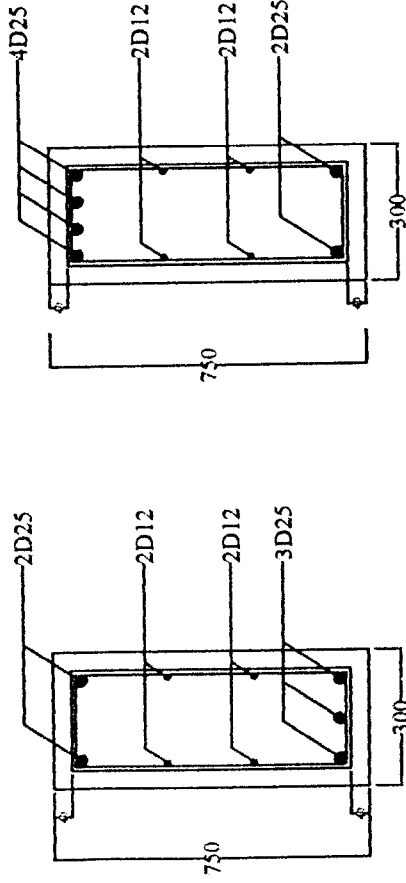
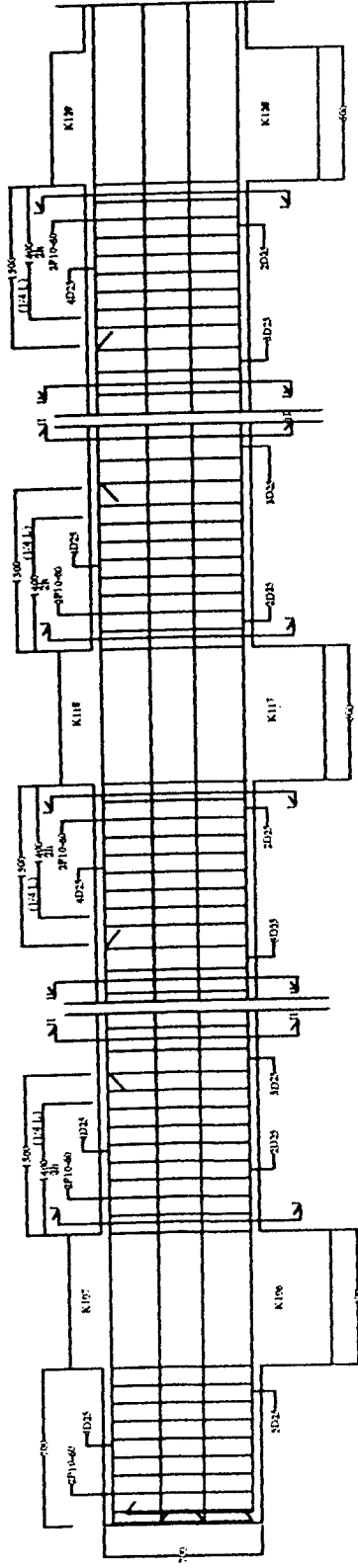
DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHURROHMAN . MT

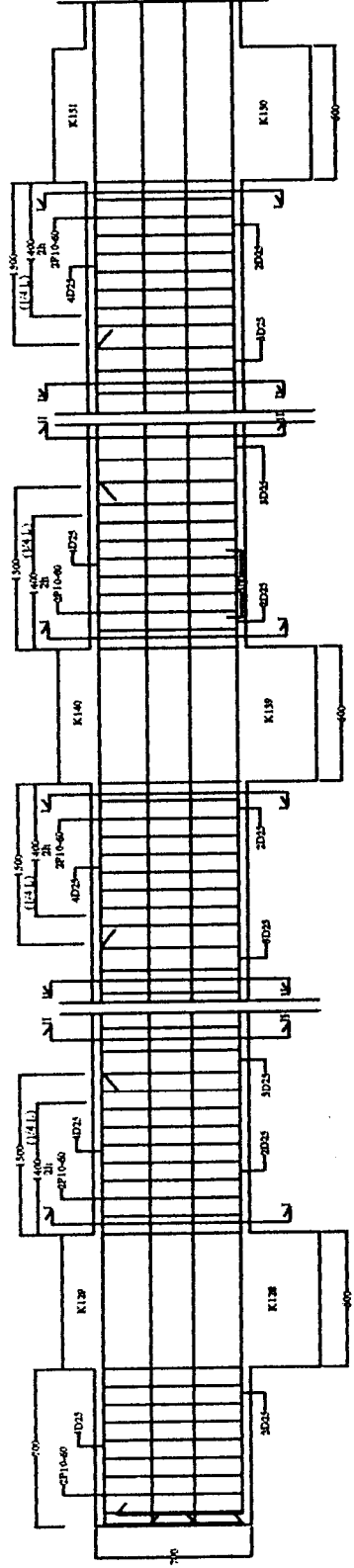
JML GBR GBR KE

3



POTONGAN I-I
PU 1:40

POTONGAN II-II
PU 1:40



BALOK LANTAI 1 AS Y-I POKIAL A (DAN ILLUMINASI LANTAI)



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2005

TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
TULANGAN
BALOK
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

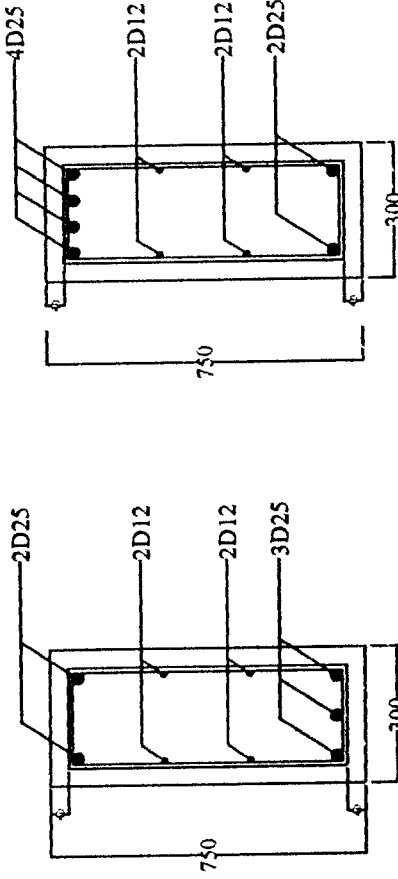
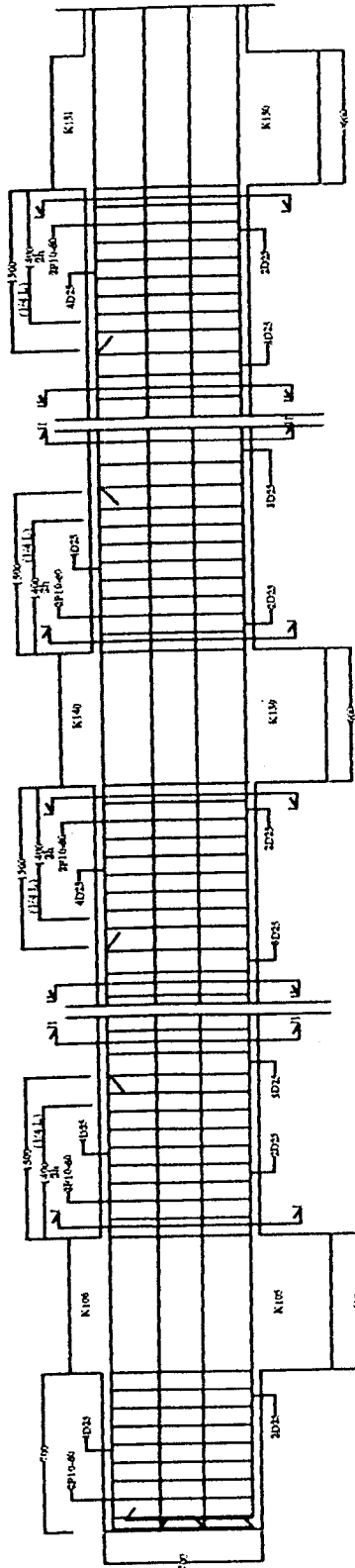
DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

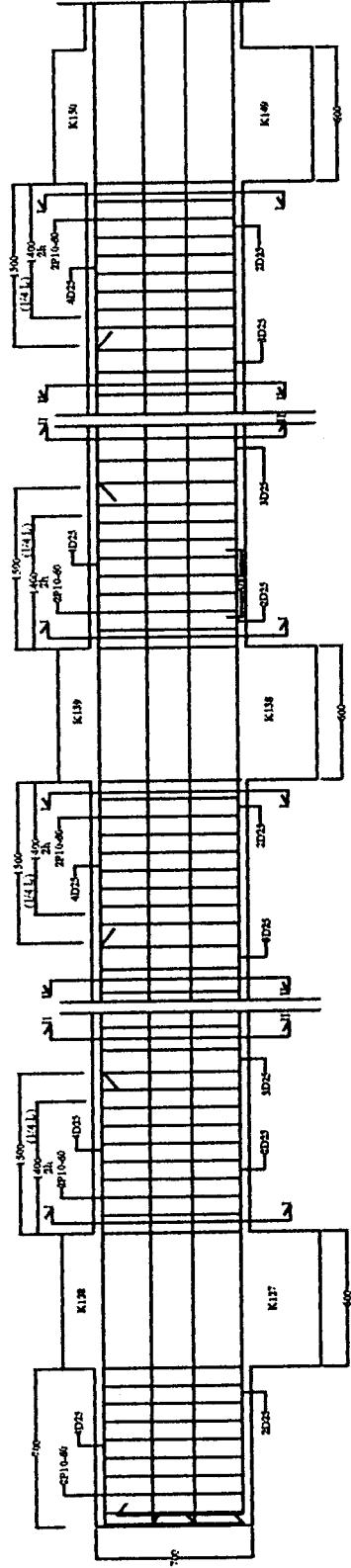
JML GBR GBR KE

4



POTONGAN I-I
PU 1:40

POTONGAN II-II
PU 1:40



BALOK LANJUTAN 1-3-1



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GAMBAR SKALA

DETAIL
TULANGAN
BALOK

1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO .MT

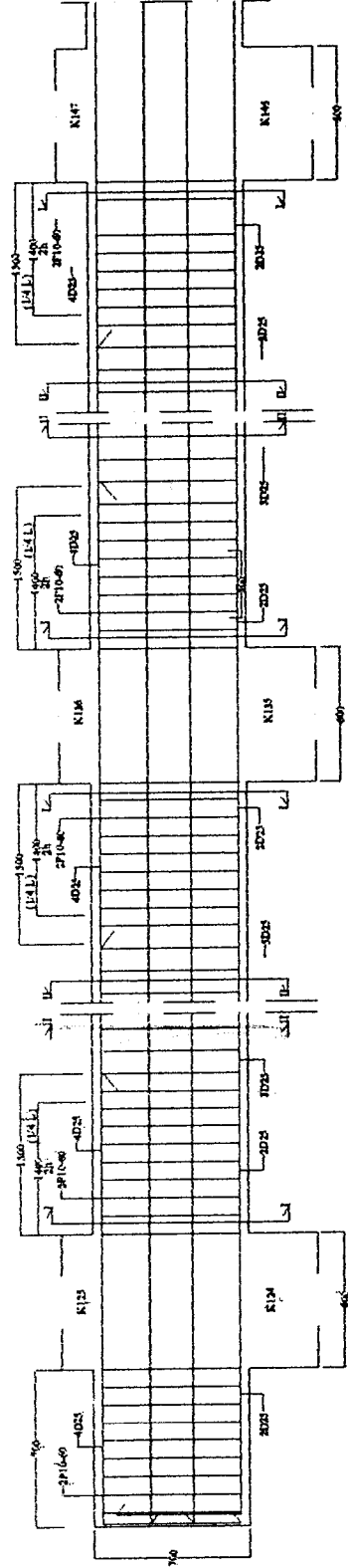
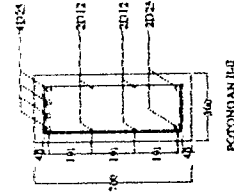
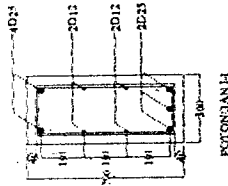
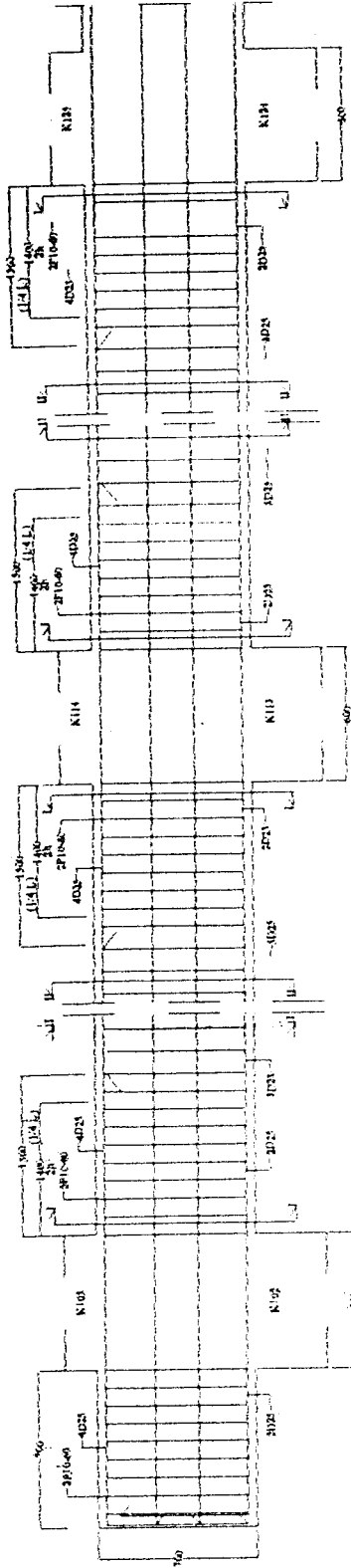
DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHURROHMAN .MT

JML GBR GBR KE

7



BALOK LAIN LAIN



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2005

TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
TULANGAN
BALOK
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

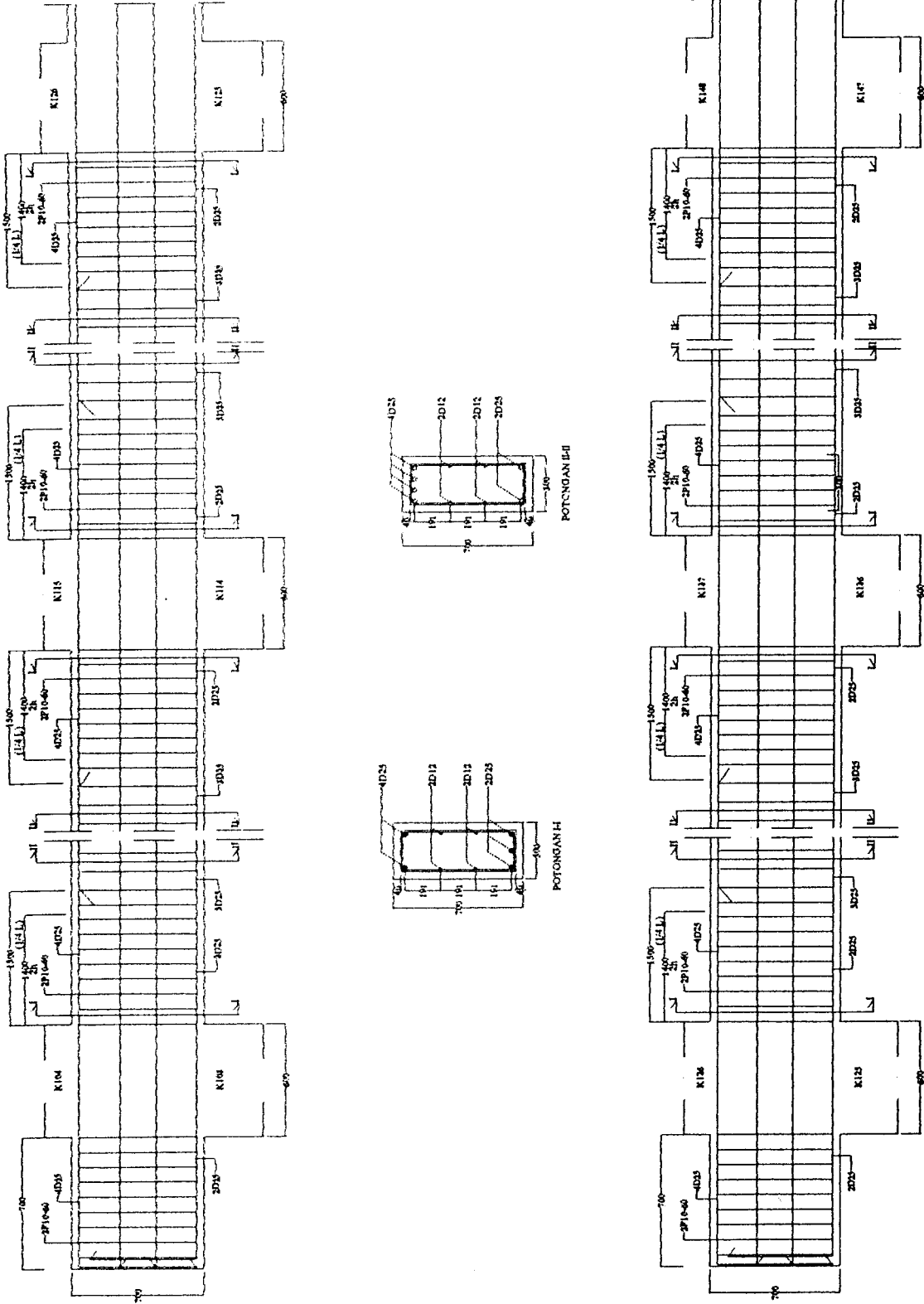
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DOSEN PEMBIMBING 1

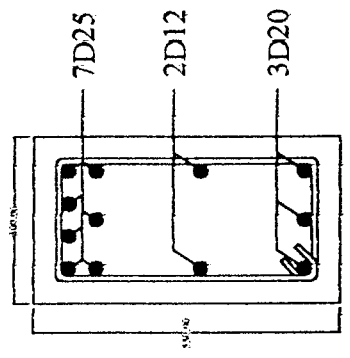
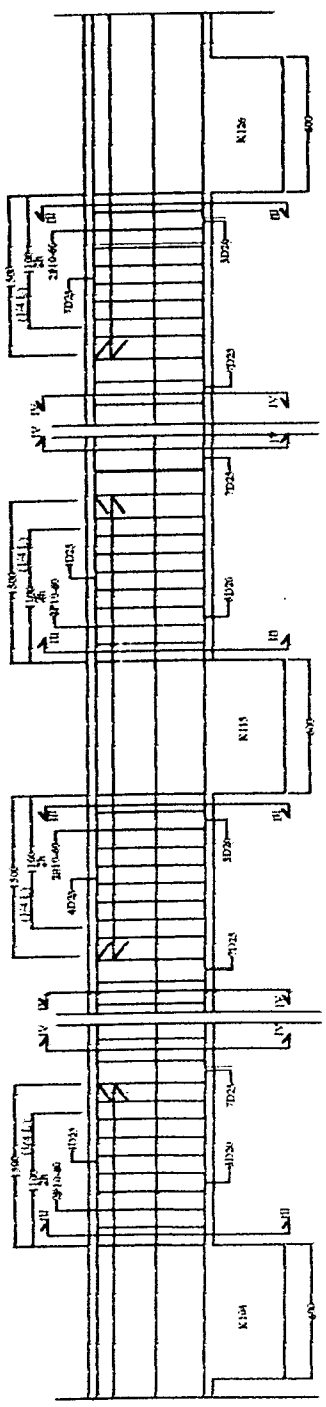
IR. FAKHTURROHMAN . MT

JML GBR GBR KE

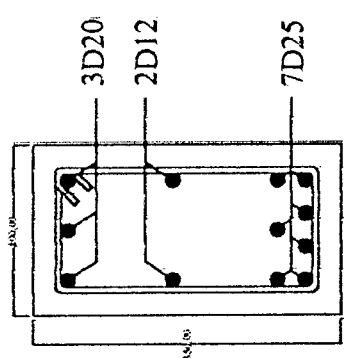
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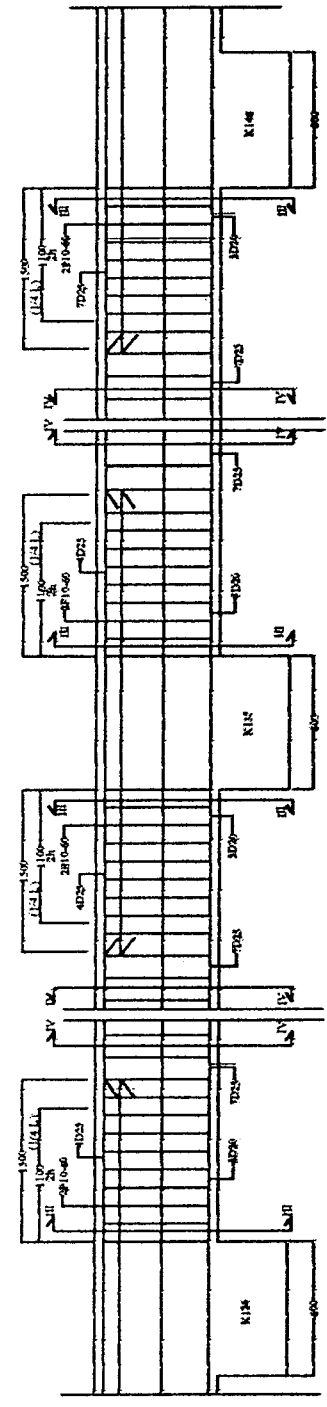
BALUN LAIN LAIN



POTONGAN III-III
PU 1:40



POTONGAN IV-IV
PU 1:40



JURUSAN TEKNIK SIPIL FAK. TEKNIK SIPIL & PERENCANAAN UNIVERSITAS ISLAM INDONESIA 2005	
TUGAS AKHIR	
PERENCANAAN STADION DENGAN ATAP LENGKUNG	
GAMBAR	SKALA
DETAIL TULANGAN BALOK	1 : 150
DIGAMBAR OLEH	
ERI M Hidayat 97 511 094	
WAHYU TRIN 97 511 123	
DIPERIKSA OLEH	
DOSEN PEMBIMBING 2	
IR. SUHARYATMO . MT	
DISETUJUI OLEH	
DOSEN PEMBIMBING 1	
IR. FAKHTURROHMAN . MT	
JML GBR	GBR KE
	5

BALOK LAINLAJ LAD I-4 FUNGSI 13



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TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
TULANGAN
BALOK
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

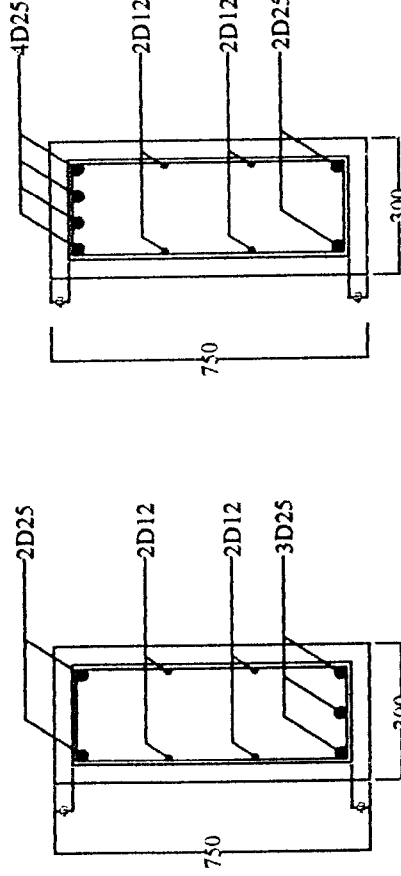
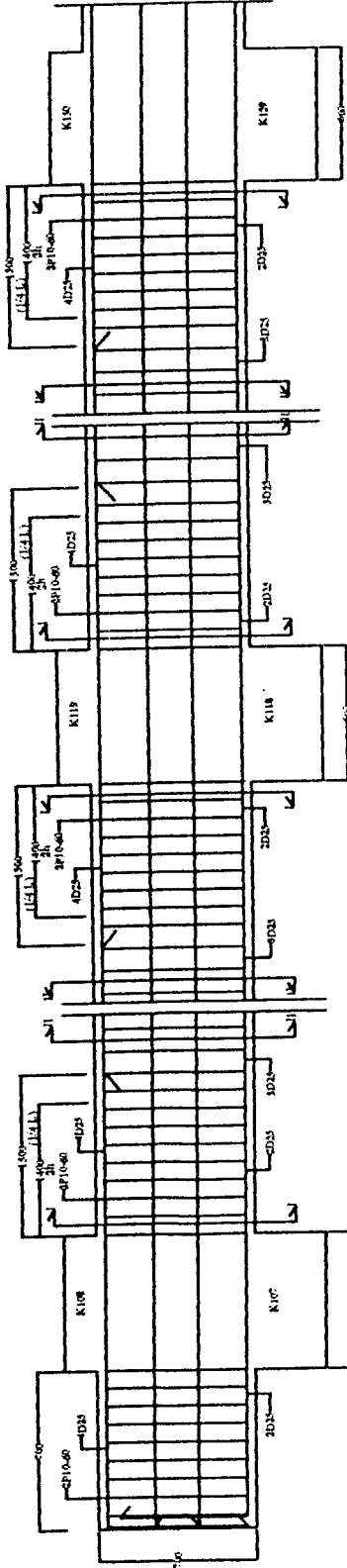
DISETUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHURROHMAN . MT

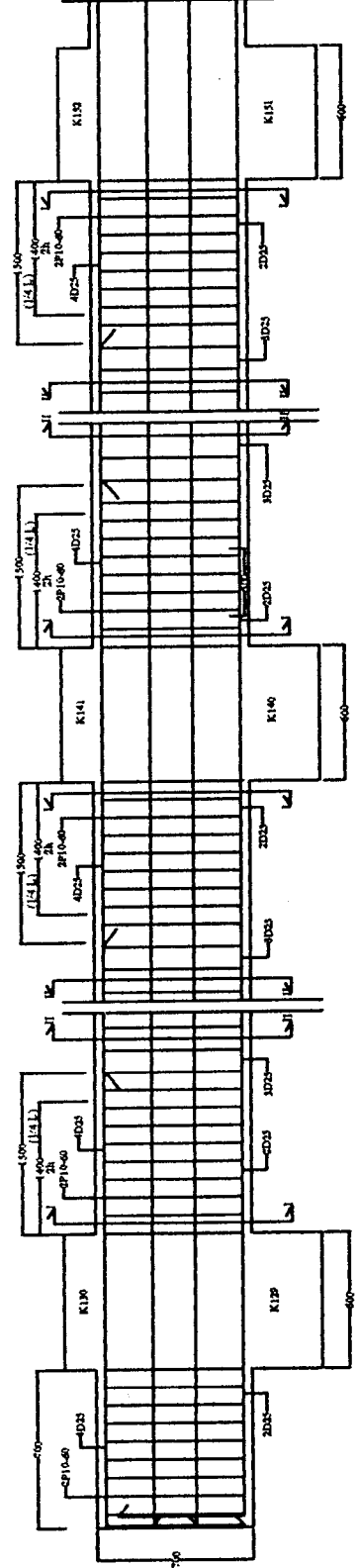
JML GBR GBR KE

2



POTONGAN II-II
PU 1:40

POTONGAN I-I
PU 1:40





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 UNIVERSITAS ISLAM INDONESIA
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TUGAS AKHIR

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 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
 TULANGAN
 BALOK

1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

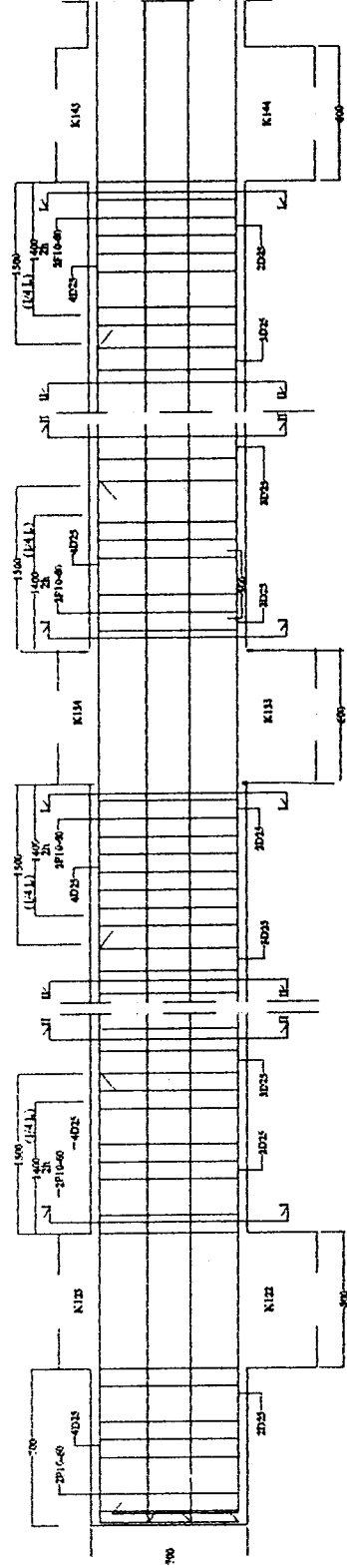
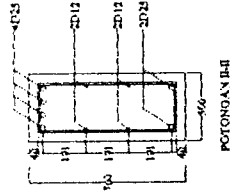
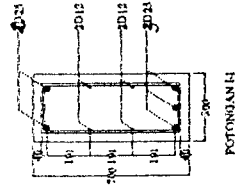
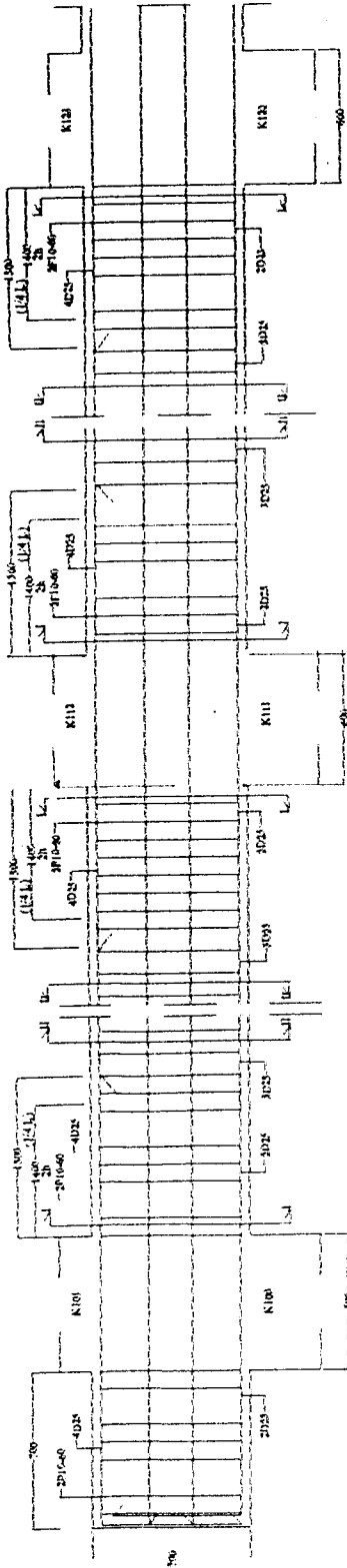
DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

JML GBR **GBR KE**

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 2005

TUGAS AKHIR

PERENCANAAN STADION
 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
 TULANGAN
 BALOK

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

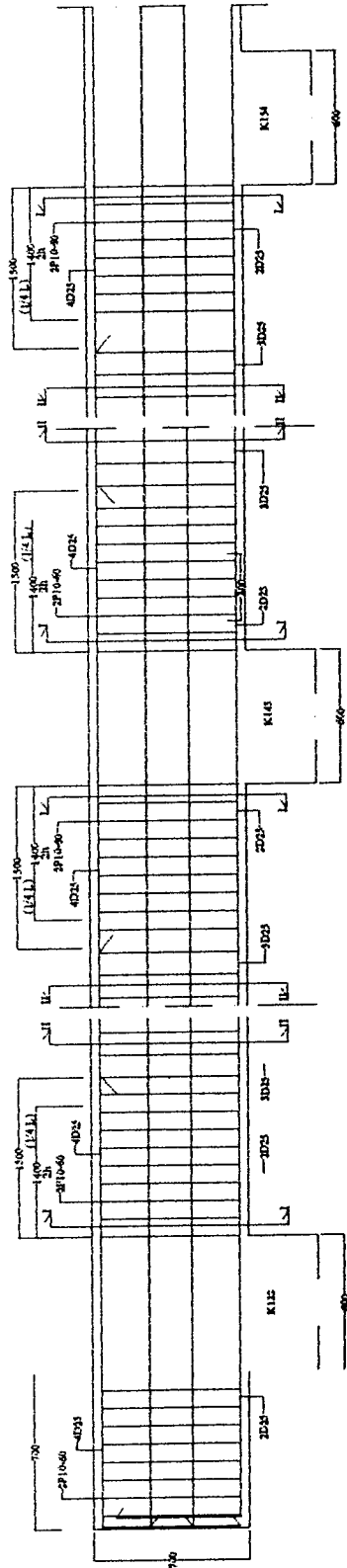
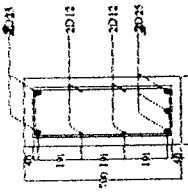
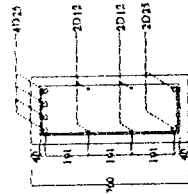
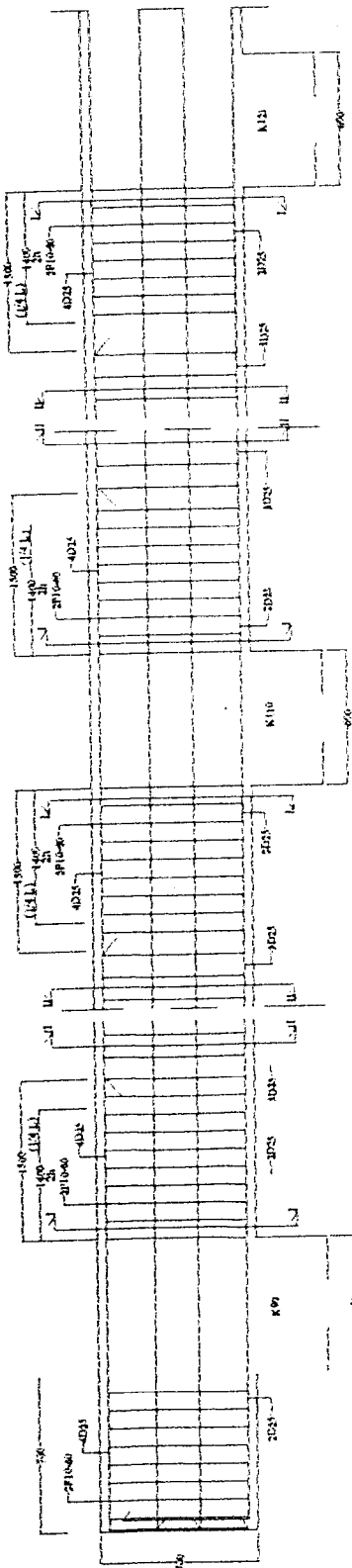
DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

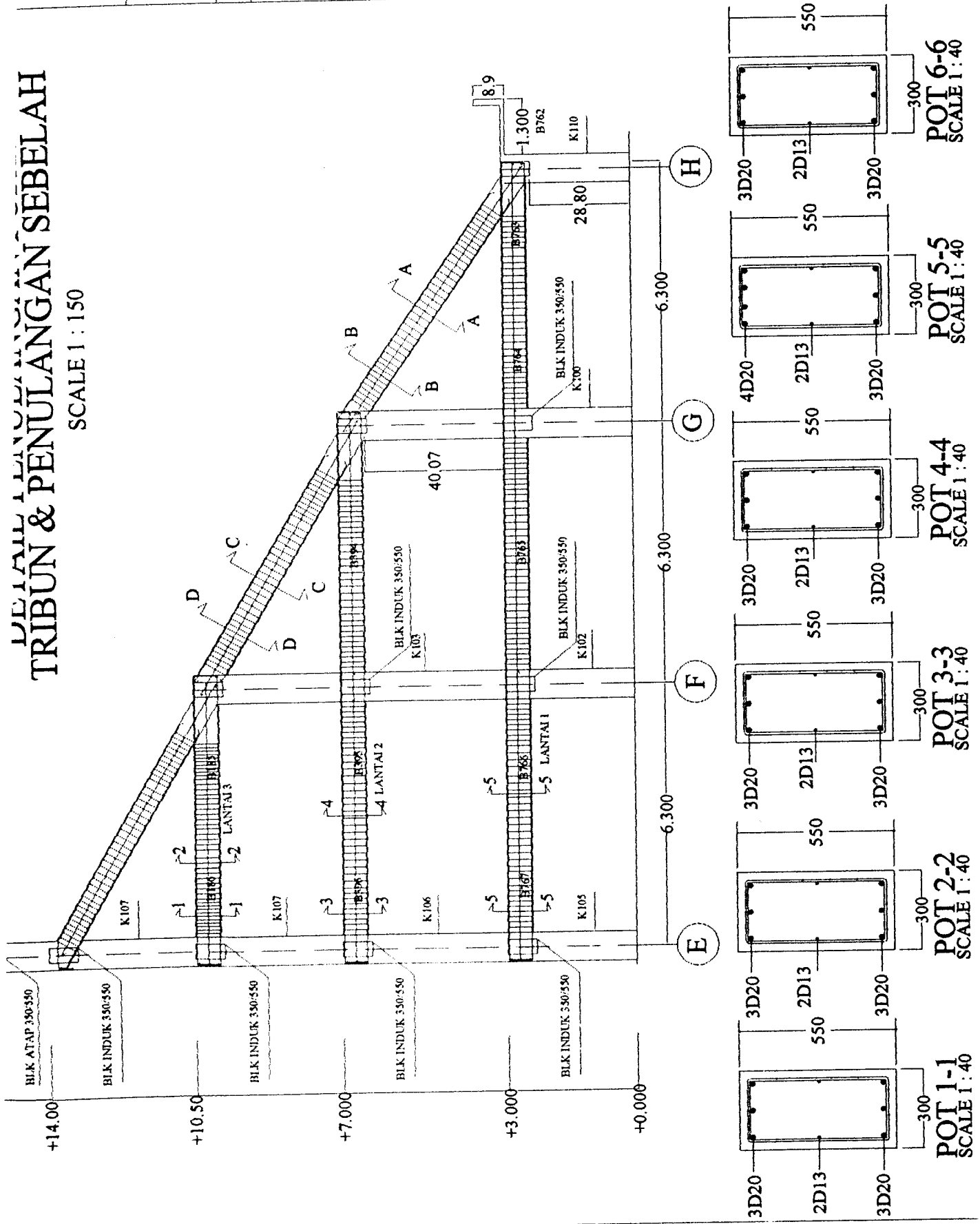
JML GBR GBR KE


10



DETAIL LAINNYA PENULANGAN SEBELAH

SCALE 1 : 150



	
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TUGAS AKHIR	
PERENCANAAN STADION DENGAN ATAP LENGKUNG	
GAMBAR	SKALA
GAMBAR PENJULANGAN PORTAL	1 : 150
DIGAMBAR OLEH	
ERI M Hidayat 97 511 094	
WAHYU TRIN 97 511 123	
DIPERIKSA OLEH	
DOSEN PEMBIMBING 2	
IR. SUHARYATMO .MT	
DISETUJUI OLEH	
DOSEN PEMBIMBING 1	
IR. FAKHTURROHMAN .MT	
JML GBR	GBR KE
1	1



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DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
TULANGAN
KOLOM
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094
WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

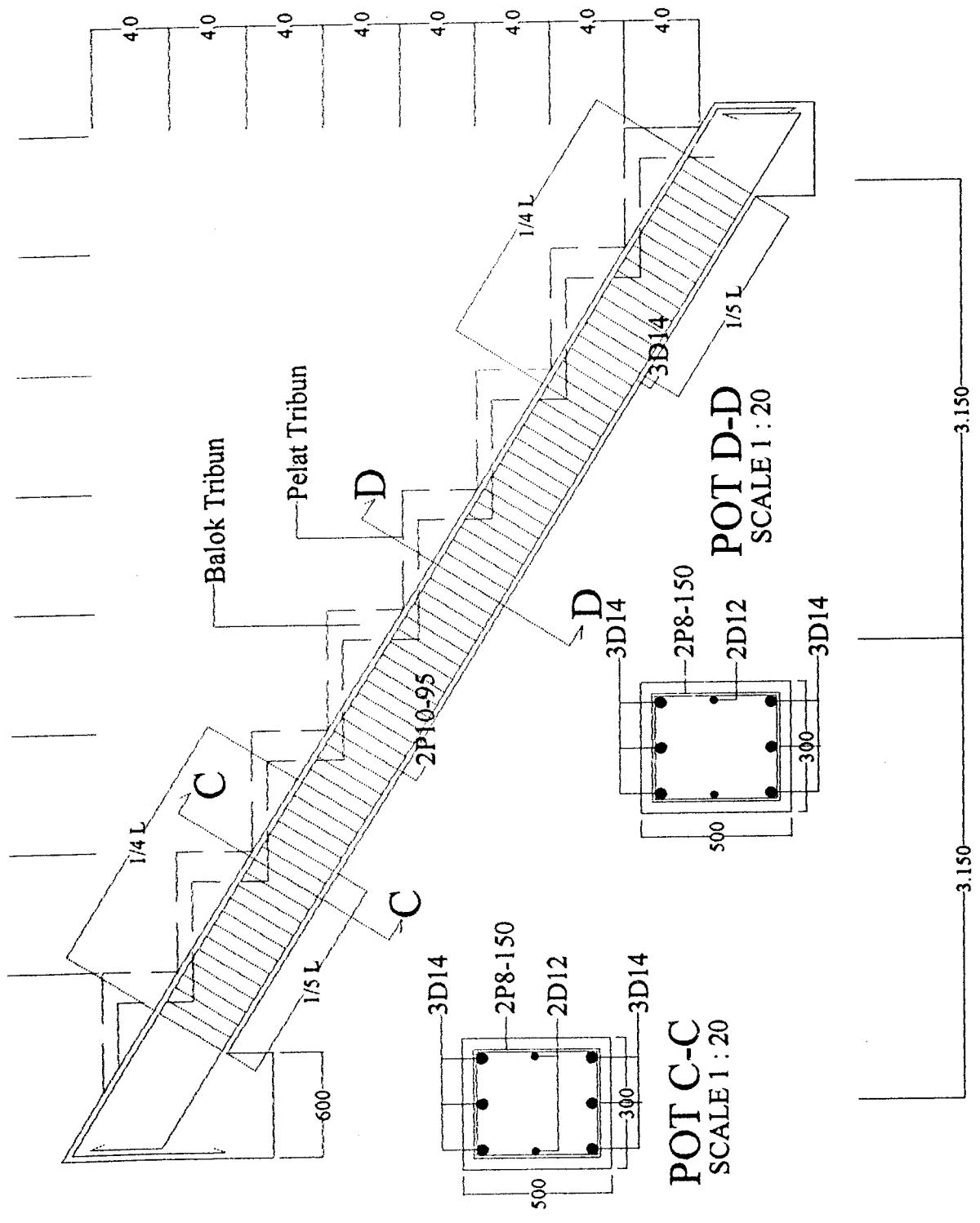
IR. SUHARYATMO . MT

DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHURROHMAN . MT

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DETAIL PENULANGAN BALOK ANAK TRIBUN
SCALE 1 : 150



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TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
TUL BALOK
ANK TRIBUN
1 : 150

DIGAMBAR OLEH

ERIM HIDAYAT 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

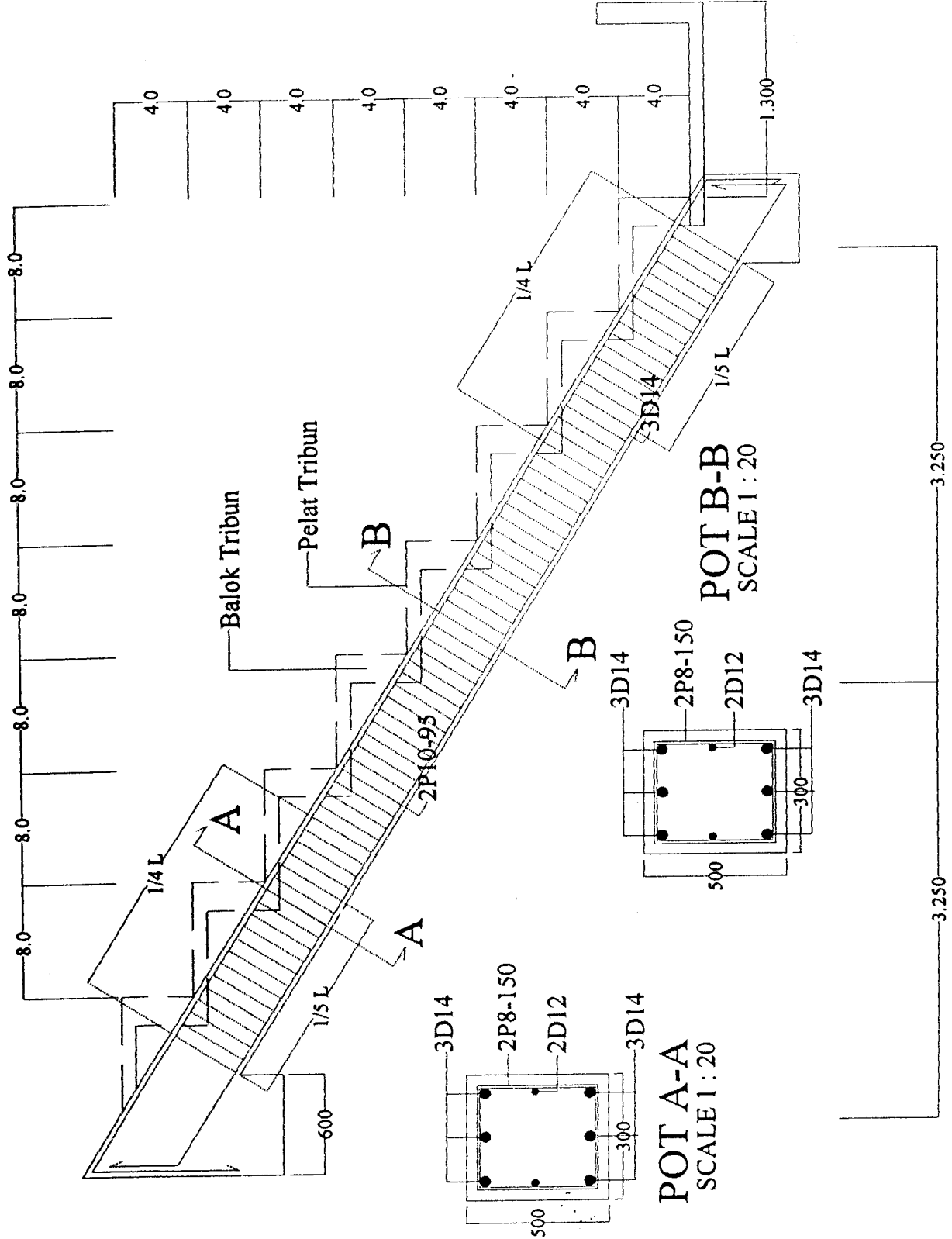
IR. SUHARYATMO . MT

DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

JML GBR GBR KE



DETAIL PENULANGAN BALOK ANAK TRIBUN

SCALE 1 : 150



JURUSAN TEKNIK SIPIL
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 2004

TUGAS AKHIR

PERENCANAAN STADION
 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
 TULANGAN
 KOLOM

1 : 150

DIGAMBAR OLEH

ERIM HIDAYAT 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

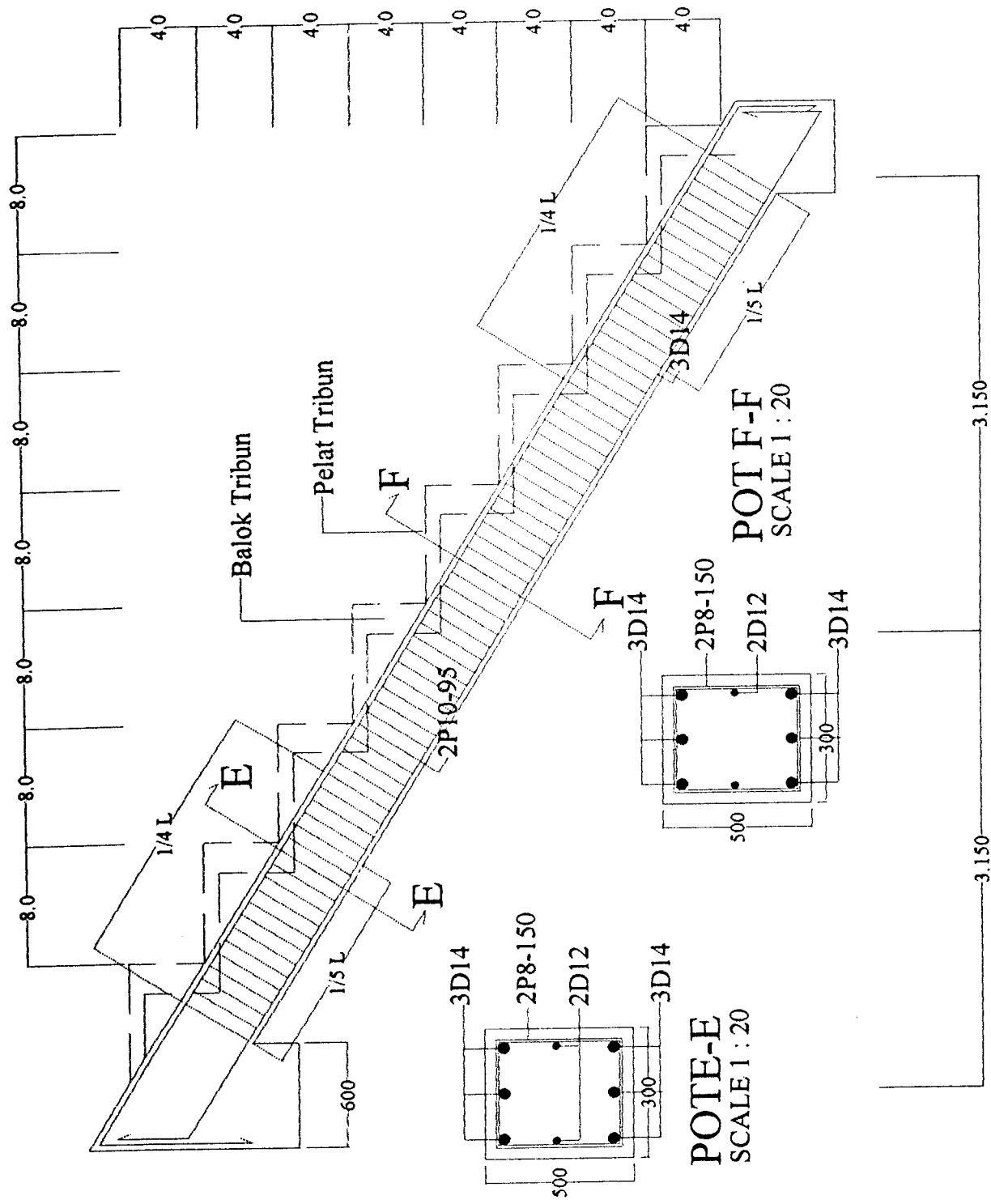
IR. SUHARYATMO . MT

DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

JML GBR GBR KE



DETAIL PENULANGAN BALOK ANAK TRIBUN

SCALE 1 : 150



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2004

TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
TULANGAN
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

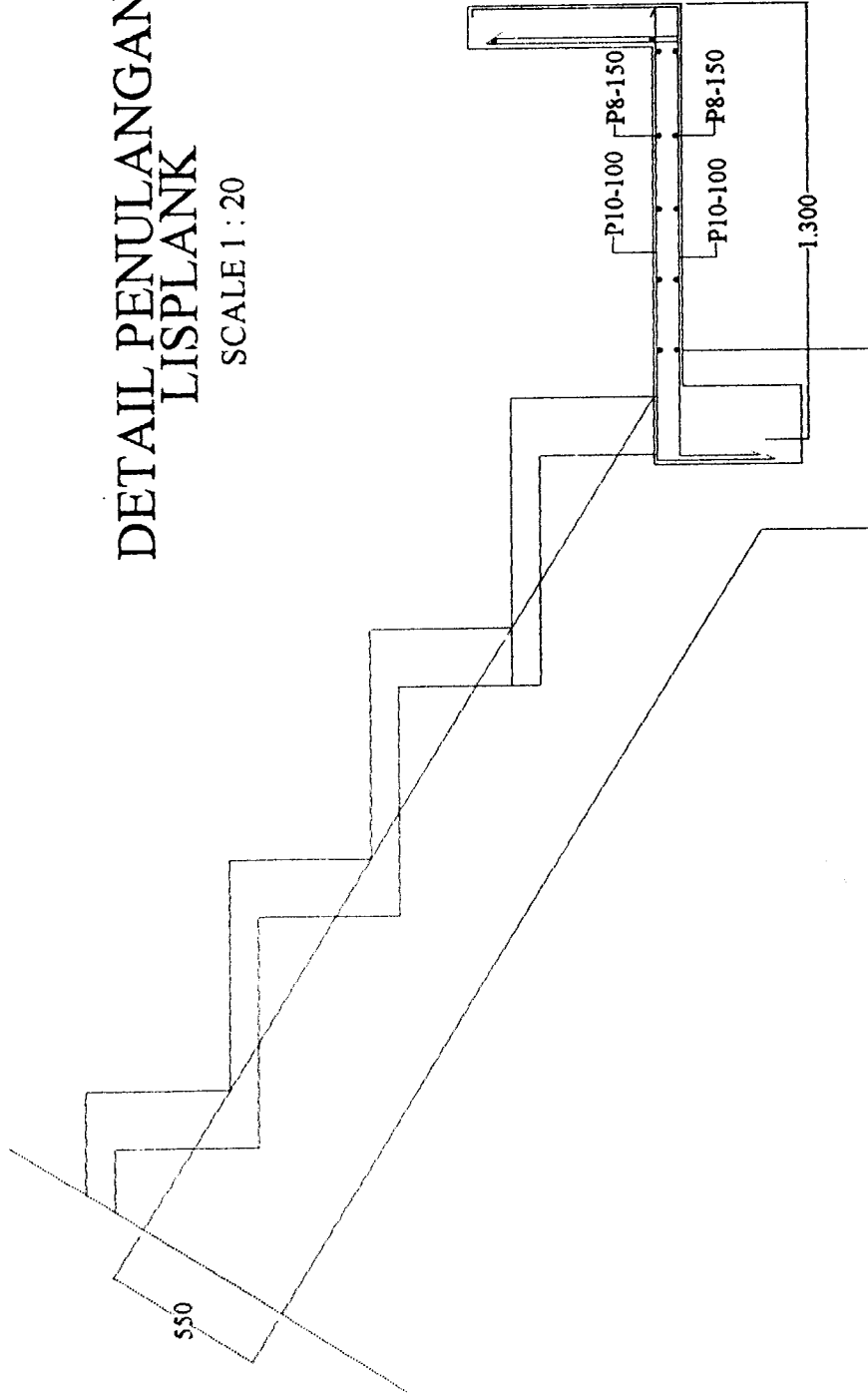
DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

JML GBR GBR KE

DETAIL PENULANGAN LISPLANK

SCALE 1 : 20





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2004

TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

GAMBAR
DENIH/BENTUK
ATAP
1 : 150

DIGAMBAR OLEH

ERI M Hidayat 97 511 094

WAHYU TRIN 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

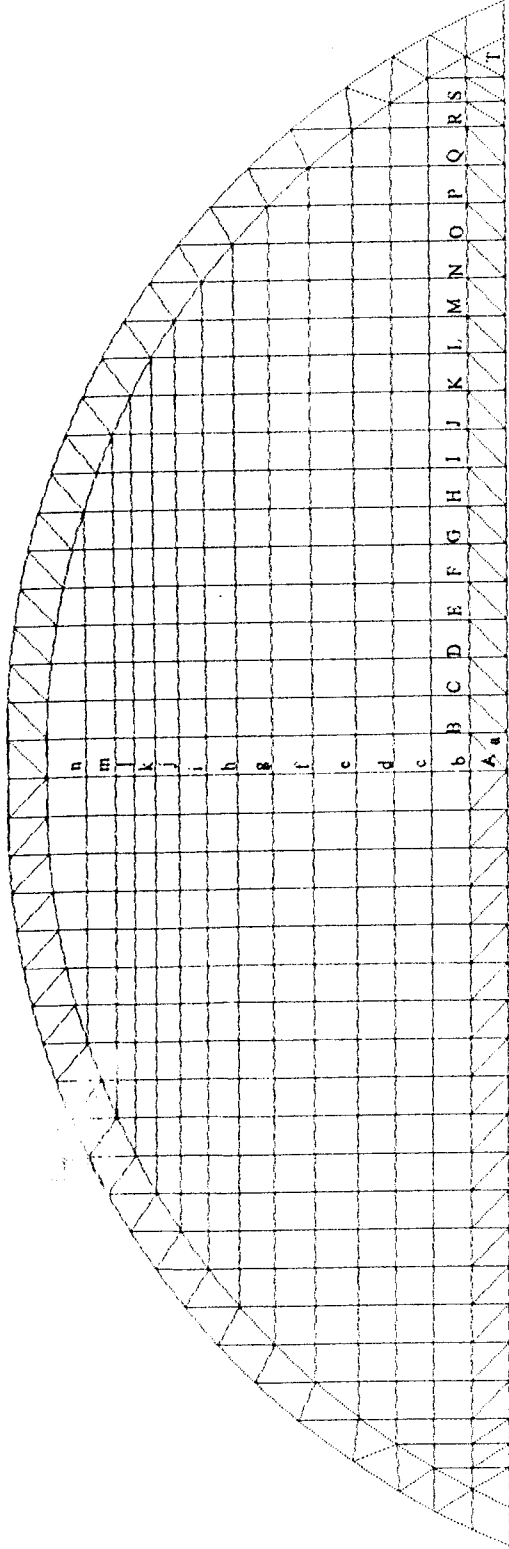
IR. SUHARYATMO . MT

DISETUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

JML GBR GBR KE



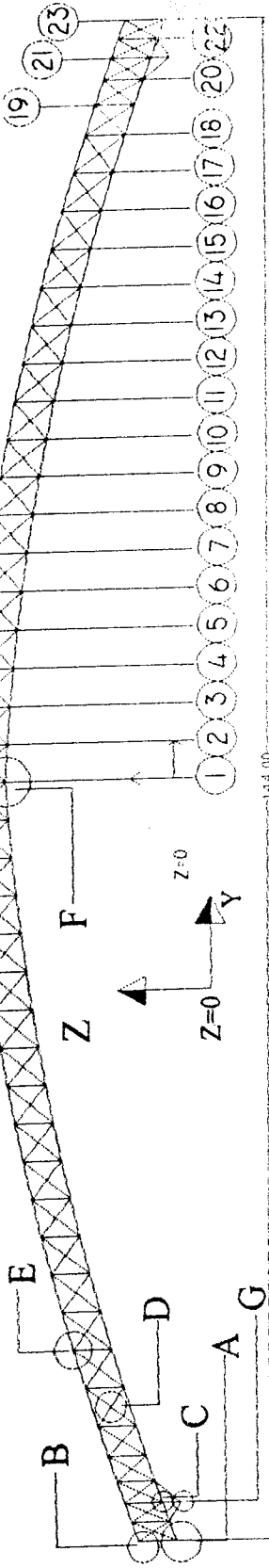
Gambar 2.6. DENAH TAMPAK ATAS KUDA-KUDA

Keterangan : Kuda-kuda arah X (warna merah)

1. Kuda-kuda Xa
2. Kuda-kuda Xb
3. Kuda-kuda Xc
4. Kuda-kuda Xd
5. Kuda-kuda Xe
6. Kuda-kuda Xf
7. Kuda-kuda Xg
8. Kuda-kuda Xh
9. Kuda-kuda Xi
10. Kuda-kuda Xj
11. Kuda-kuda Xk
12. Kuda-kuda Xl
13. Kuda-kuda Xm
14. Kuda-kuda Xn

Kuda-kuda arah Y (warna biru)

- A. Kuda-kuda Ya
- B. Kuda-kuda Yb
- C. Kuda-kuda Yc
- D. Kuda-kuda Yd
- E. Kuda-kuda Ye
- F. Kuda-kuda Yf
- G. Kuda-kuda Yg
- H. Kuda-kuda Yh
- I. Kuda-kuda Yi
- K. Kuda-kuda Yk
- L. Kuda-kuda Yl
- M. Kuda-kuda Ym
- N. Kuda-kuda Yn
- O. Kuda-kuda Yo
- P. Kuda-kuda Yp
- Q. Kuda-kuda Yq

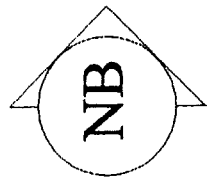


GAMBAR TAMPANG KUDA-KUDA 1
KK1 / XA

NOMOR BATANG & JENIS PROFIL
BATANG HORIZONTAL
XAA1..XAA44/PROFIL PXX4
XABI..XAB44/PROFIL PXX4
BATANG VERTIKAL
XAVI..XAV45/PROFIL PXX5
BATANG DIAGONAL
XADI..XADI76/PROFIL PXX5
BATANG TUMPUAN
XAPI..XBP6/PROFIL PXX8

ELEVASI KUDA 2	
1 Z = 13 / X = 0	13 Z = 7,65 / X = 36
2 Z = 12,8 / X = 3	14 Z = 6,92 / X = 39
3 Z = 12,56 / X = 6	15 Z = 6,31 / X = 42
4 Z = 12,26 / X = 9	16 Z = 5,3 / X = 45
5 Z = 11,92 / X = 12	17 Z = 4,4 / X = 48
6 Z = 11,55 / X = 15	18 Z = 3,46 / X = 51
7 Z = 11,13 / X = 18	19 Z = 2,7 / X = 53,35
8 Z = 10,67 / X = 21	20 Z = 2,04 / X = 55,3
9 Z = 10,15 / X = 24	21 Z = 1,45 / X = 57
10 Z = 9,61 / X = 27	22 Z = 0,725 / X = 58,5
11 Z = 9 / X = 30	23 Z = 0 / X = 60
12 Z = 8,35 / X = 33	

GAMBAR KUDA-KUDA
ARAH XA / Y=0 & DETAIL



UNTUK PEMBACAAN NOMOR BATANG DIAWALI DARI
ARAH KIRI PD GAMBAR KUDA2 DIATAS

JURUSAN TEKNIK SIPIL TEKNIK SIPIL & PERENCANAAN UNIVERSITAS ISLAM INDONESIA 2004	
TUGAS AKHIR	
PERENCANAAN STADION DENGAN ATAP LENGKUNG	
GAMBAR	SKALA
DETAIL KUDA-KUDA KK1 / XA	1 : 150
DIGAMBAR OLEH	
ERI M HIDAYAT 97 511 094	
WAHYU TRIN 97 511 123	
DIPERIKSA OLEH	
DOSEN PEMBIMBING 2	
IR. SUHARYATMO . MT	
DISETUJUI OLEH	
DOSEN PEMBIMBING 1	
IR. FAKHTURROHMAN . MT	
JML GBR	GBR KE
12	1



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TUGAS AKHIR

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GAMBAR SKALA

DETAIL
KUDA-KUDA
KK1 / XA

1 : 150

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

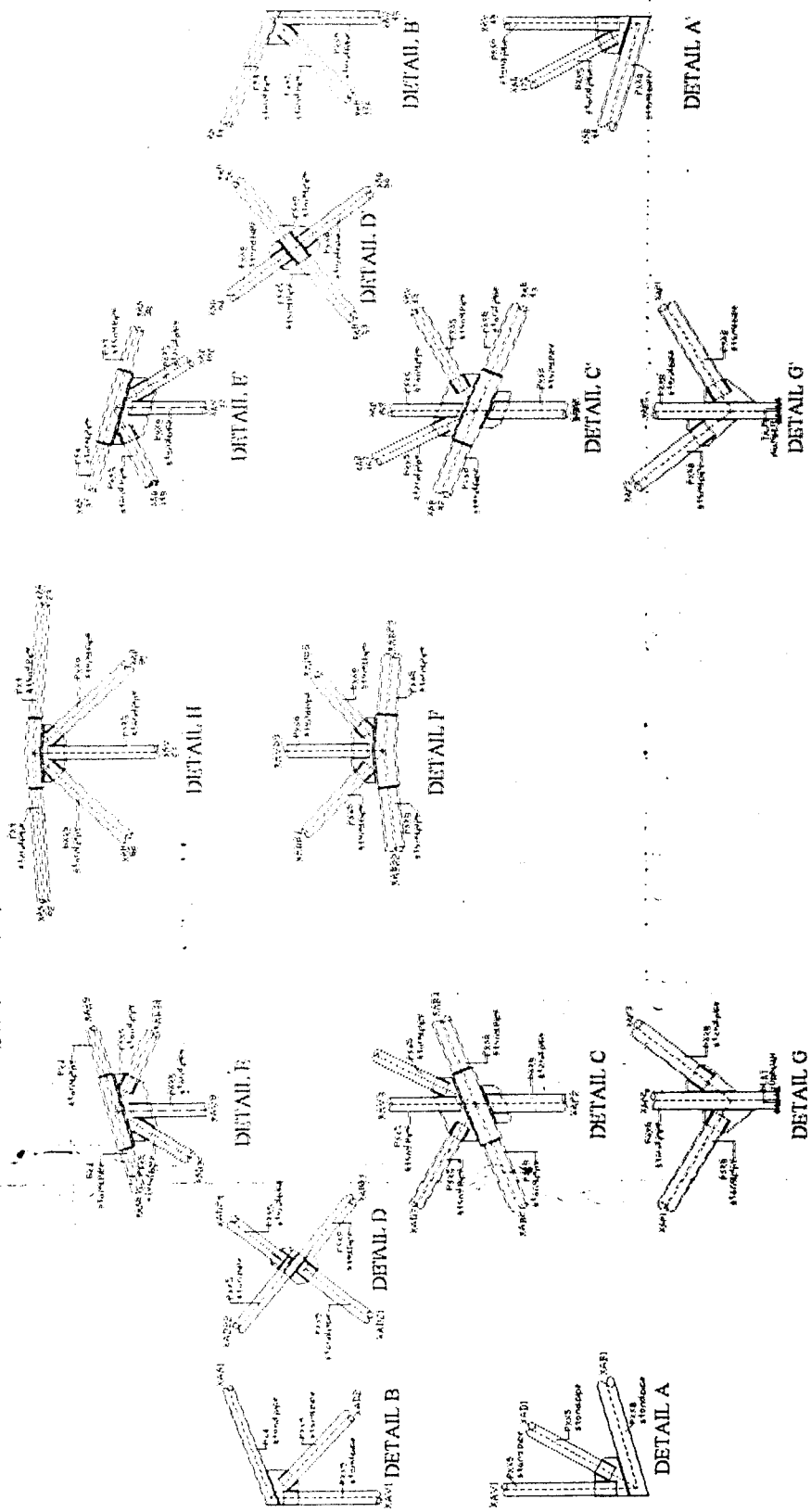
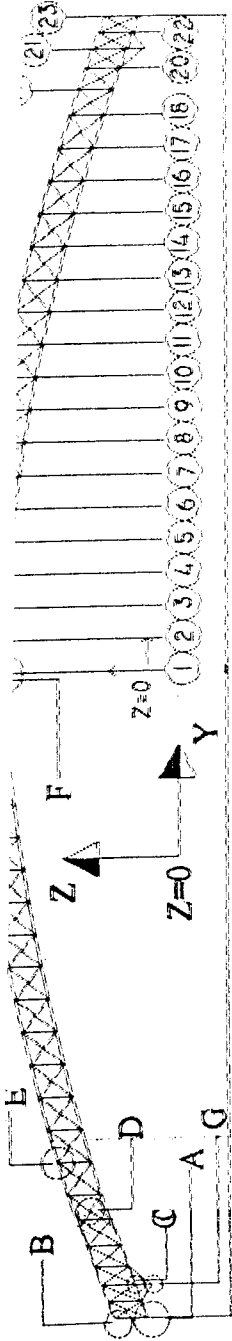
DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

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12

2



GAMBAR TAMPANG KUDA-KUDA 1 / XA
DAN DETAIL



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DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
KUDA-KUDA
KK1 / XA
1 : 150

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

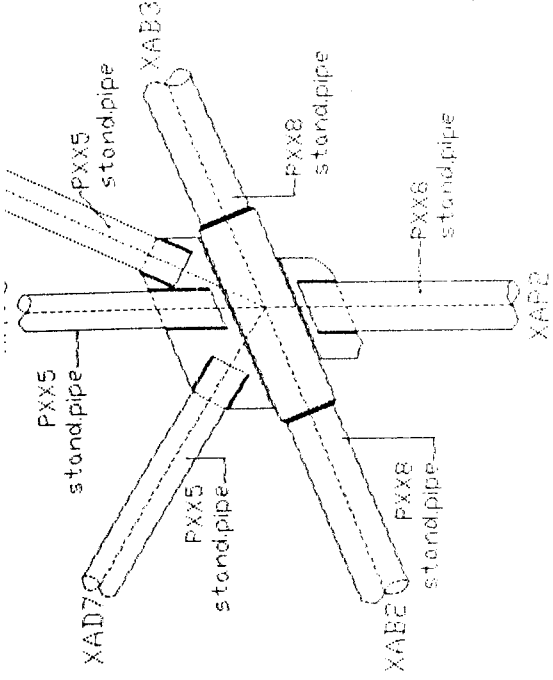
DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

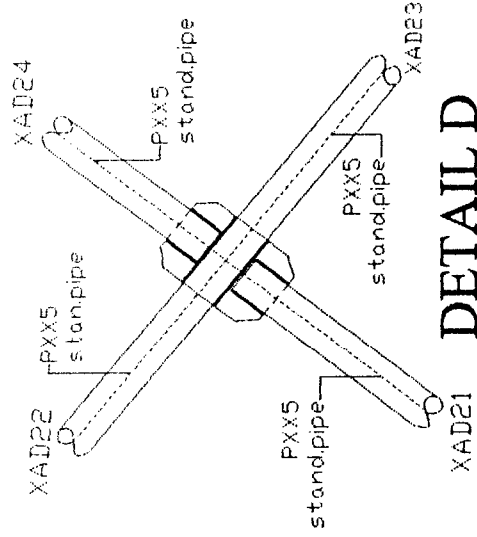
JML GBR GBR KE

12

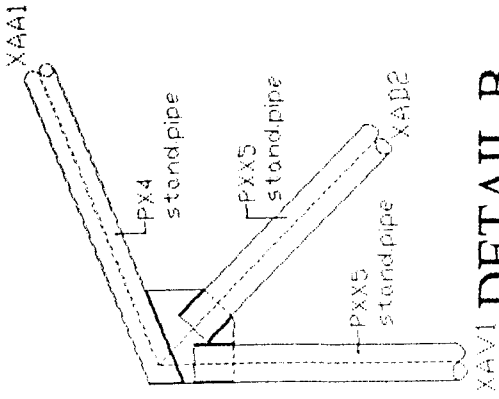
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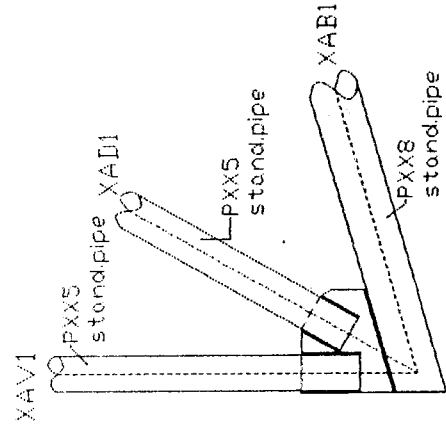
DETAIL C



DETAIL D



DETAIL B



DETAIL A



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 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
 KUDA-KUDA
 KK1 / XA

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

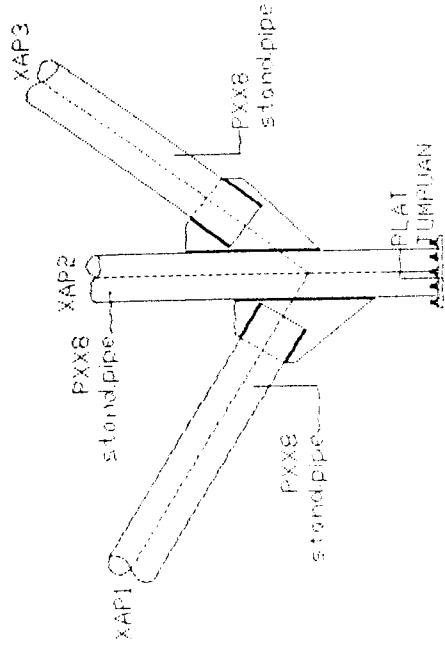
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IR. FAKHTURROHMAN . MT

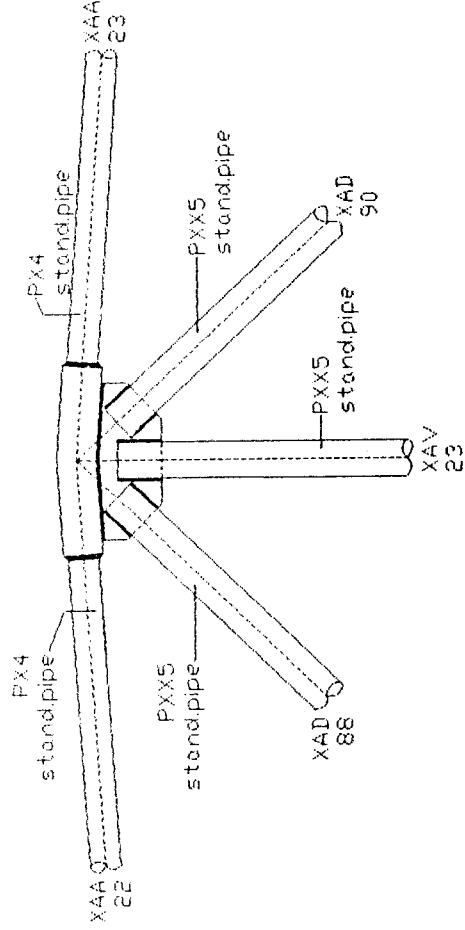
JML GBR GBR KE

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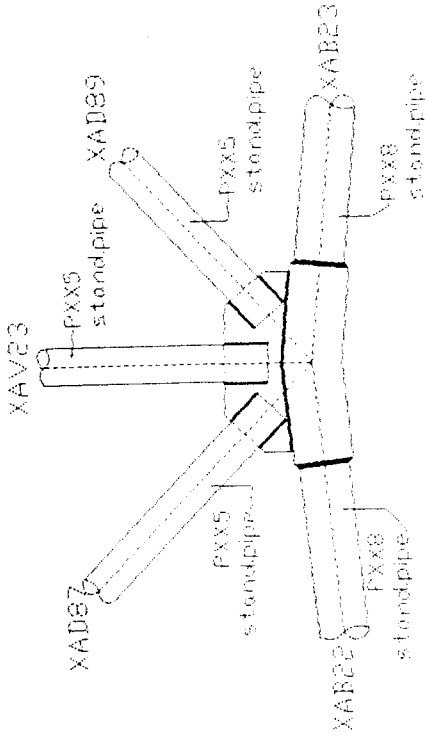
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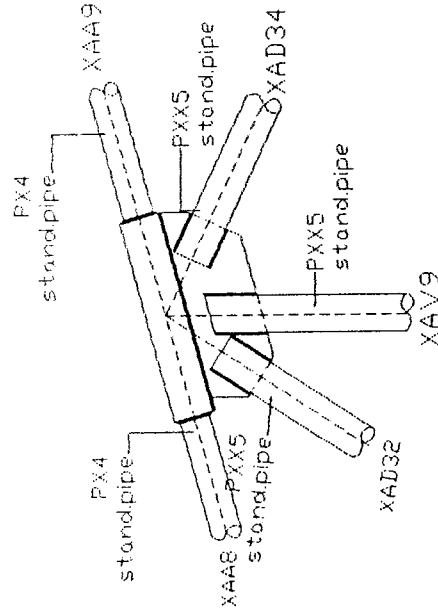
DETAIL G



DETAIL H



DETAIL F



DETAIL E



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UNIVERSITAS INDONESIA
2005

TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
KUDA-KUDA
KK1 / XA

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

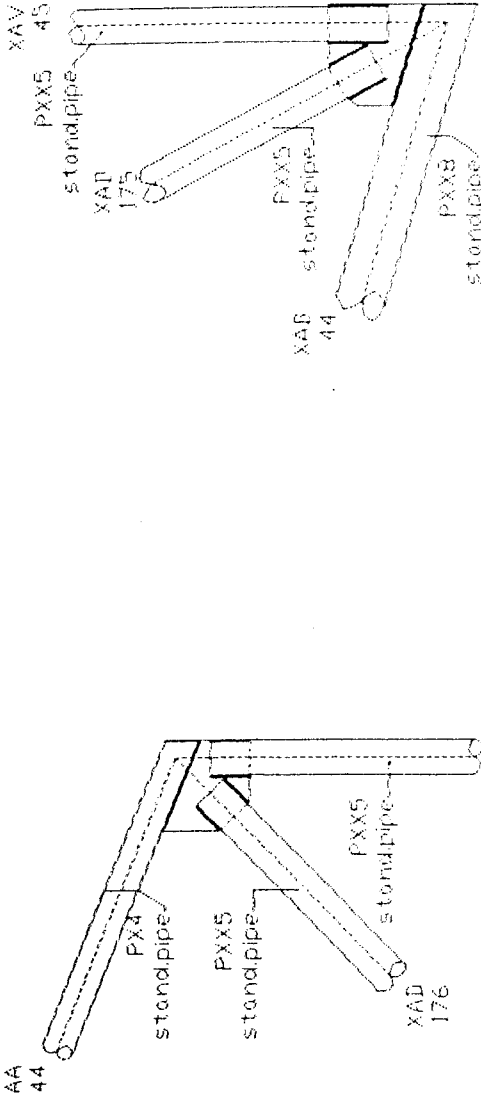
DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

JML GBR GBR KE

12

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DETAIL B

DETAIL A

DETAIL C



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2005

TUGAS AKHIR

PERENCANAAN STADION
DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
KUDA-KUDA
KK1 / XA
1 : 150

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

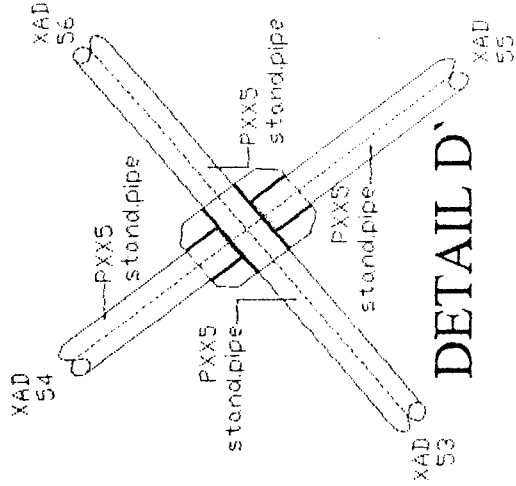
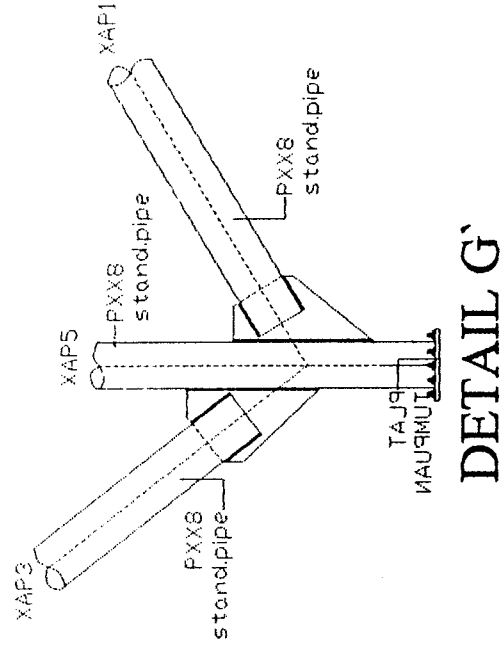
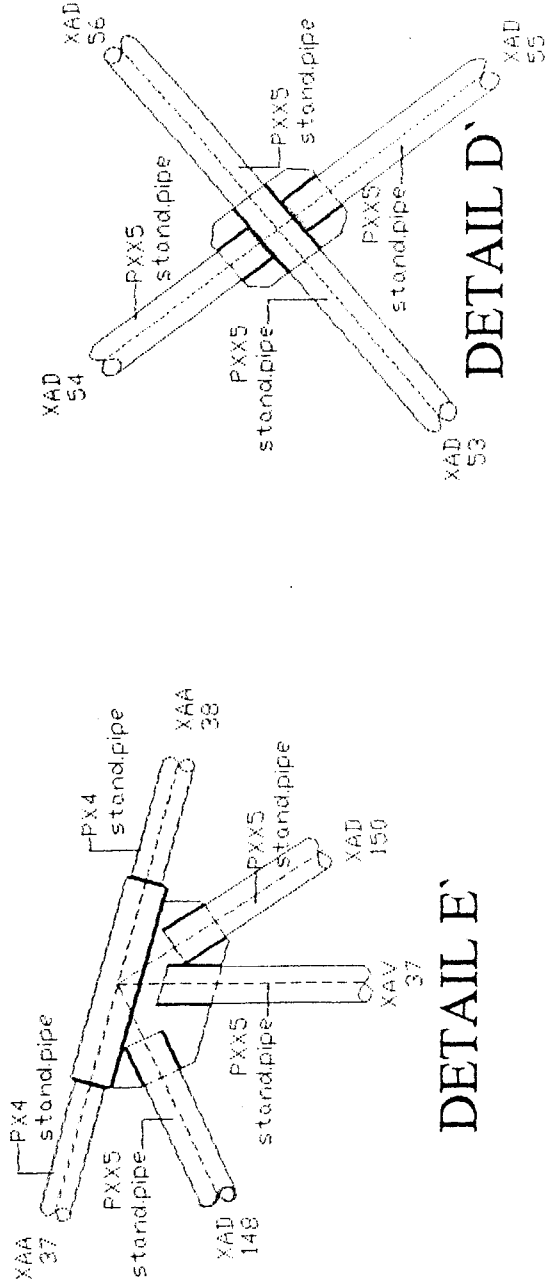
DOSEN PEMBIMBING 1

IR. FAKHURROHMAN . MT

JML GBR GBR KE

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GAMBAR SKALA

DETAIL
KUDA-KUDA
YA
1 : 150

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

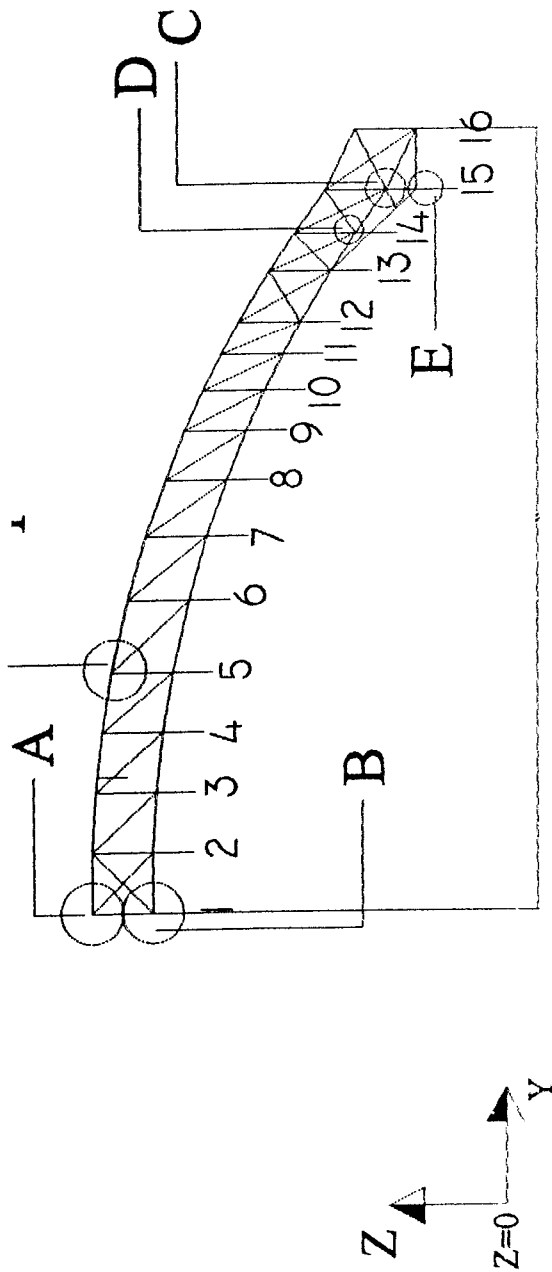
DOSEN PEMBIMBING 1

IR. FAKHURROHMAN . MT

JML GBR GBR KE

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7



GAMBAR TAMPANG KUDA-KUDA 2
KK2 / YA

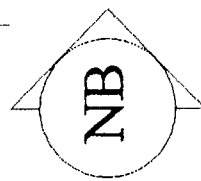
NOMOR BATANG
&
JENIS PROFIL

BATANG HORIZONTAL YAAI..YAA27/PROFIL PXX4 YABI..YABI5/PROFIL PXX5
BATANG VERTIKAL XAV..ABV/PROFIL PXX5
BATANG DIAGONAL YADI..YAD30/PROFIL PXX5
BATANG TUMPUAN YADI8,ABI9,YAVI/PFL PXX8

GAMBAR KUDA-KUDA
ARAH XH / Y = 21,56 & DETAIL

ELEVASI KUDA 2

1 Z=13/Y=0	9 Z=8.31/Y=24
2 Z=13/Y=3	10 Z=7.42/Y=26
3 Z=12.81/Y=6	11 Z=6.5/Y=27.8
4 Z=12.47/Y=9	12 Z=5.6/Y=29.4
5 Z=11.97/Y=12	13 Z=4.19/Y=31.9
6 Z=11.1/Y=15.6	14 Z=2.2/Y=33.8
7 Z=10.2/Y=18.7	15 Z=0/Y=36
8 Z=9.2/Y=21.5	16 Z=0/Y=36



UNTUK PEMBACAAN NOMOR BATANG DIAWALI DARI
ARAH KIRI PD GAMBAR KUDA2 DIATAS



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DETAIL
KUDA-KUDA
YA
1 : 150

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

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DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

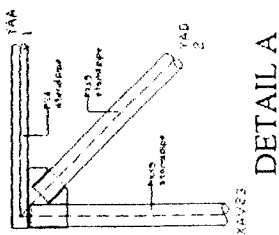
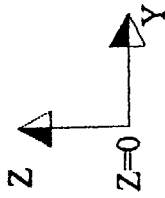
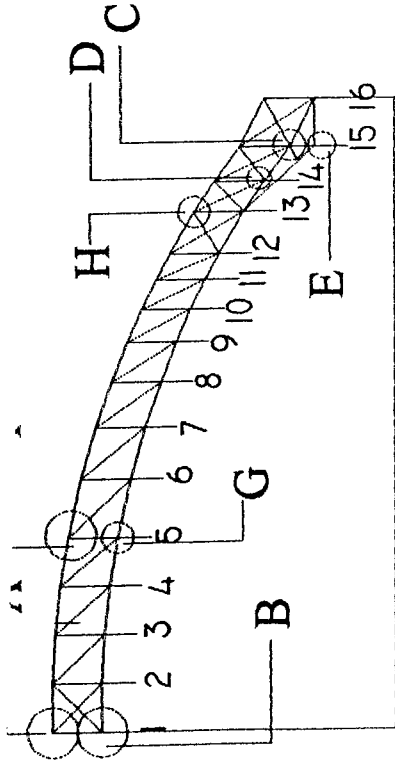
DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN . MT

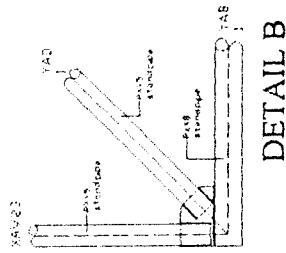
JML GBR GBR KE

12

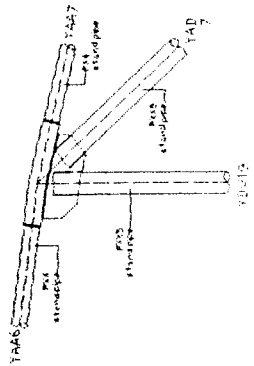
8



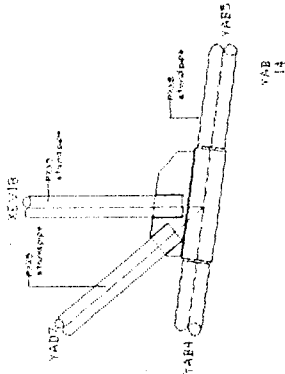
DETAIL A



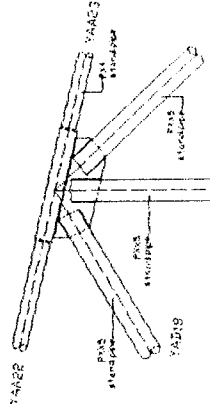
DETAIL B



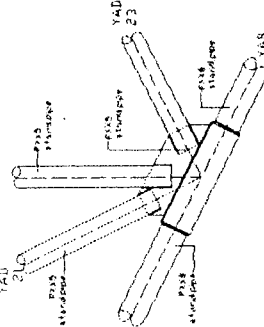
DETAIL F



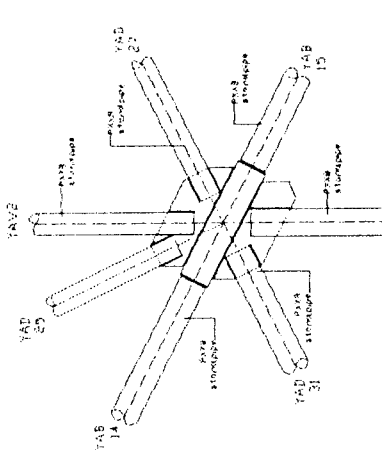
DETAIL G



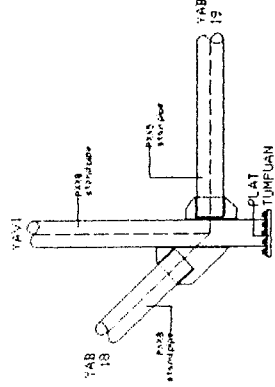
DETAIL H



DETAIL D



DETAIL C



DETAIL E

GAMBAR TAMPANG KUDA-KUDA 2 / YA
DAN DETAIL



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 DENGAN ATAP LENGKUNG

GAMBAR SKALA

DETAIL
 KUDA-KUDA
 YA

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO . MT

DISETUJUI OLEH

DOSEN PEMBIMBING 1

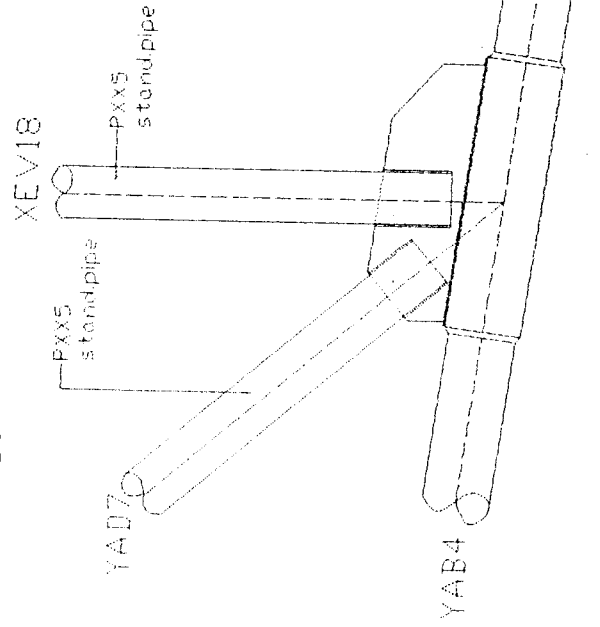
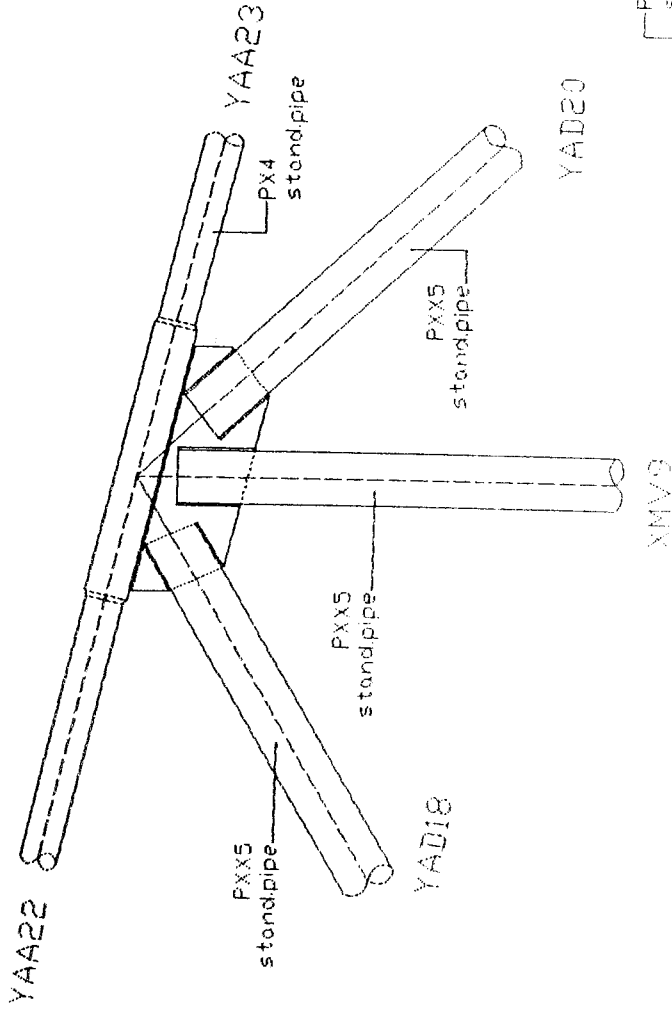
IR. FAKHTURROHMAN . MT

JML GBR GBR KE

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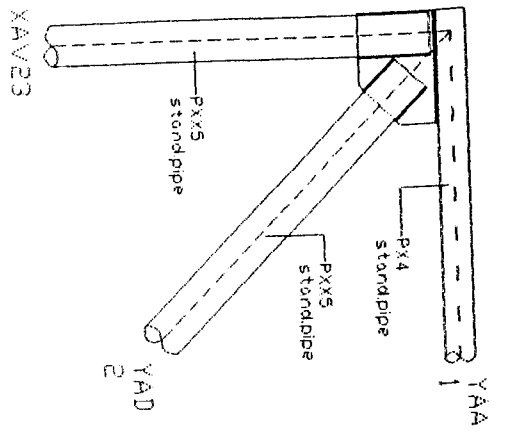
II

DETAIL G

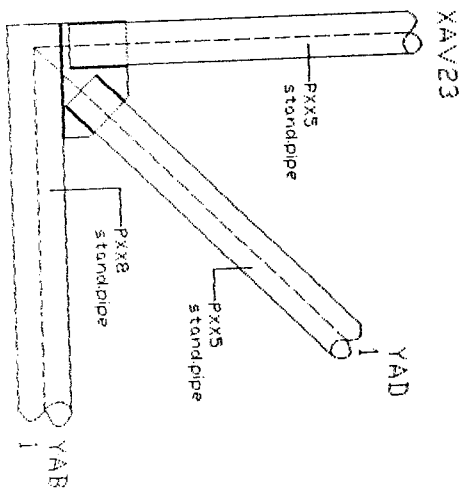


DETAIL H

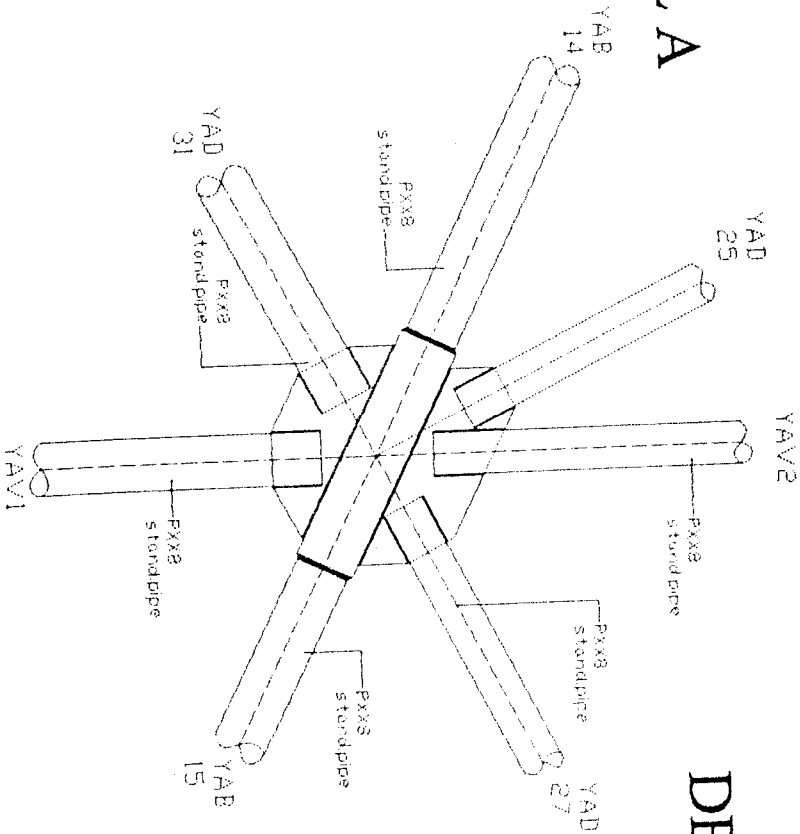
YAB
 14



DETAIL A



DETAIL B



DETAIL C



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PERENCANAAN STADION
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GAMBAR SKALA

DETAIL 1 : 150
KUDA-KUDA
YA

DIGAMBAR OLEH

ERI M HIDAYAT 97 511 094

WAHYU TRI N 97 511 123

DIPERIKSA OLEH

DOSEN PEMBIMBING 2

IR. SUHARYATMO, MT

DISETUJUI OLEH

DOSEN PEMBIMBING 1

IR. FAKHTURROHMAN, MT

JML GBR GBR KE

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