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TUGAS AKHIR

PERENCANAAN SISTEM STRUKTUR PADA STADION TAMBAKSARI SURABAYA

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Oleh :
Ferry Nugroho
3198.100.102

Dosen Pembimbing :
Ir. Agus Hari Wahyono, MSc.,PhD.

ABSTRAK

Stadion adalah bangunan yang digunakan untuk menyelenggarakan even-even olah raga, seni dan sosial dengan menampung banyak penonton/orang. Stadion perlu didesain dengan bentuk yang beragam sesuai dengan kebutuhan serta dengan menerapkan berbagai sistem struktur yang ada. Sehingga dapat secara maksimal mewujudkan desain perencanaan yang sesuai dengan perencana.

Dalam tugas akhir ini Stadion Tambaksari Surabaya pada bagian bangunan utama didesain dengan menggunakan struktur beton mengingat pada bagian ini digunakan untuk menampung penonton. Pada bagian rangka atap didesain dengan sistem struktur baja berbentuk kantilever yang didesain dengan profil pipa (circular hollow section). Sedangkan pada bagian penutup atap digunakan sistem struktur yang memanfaatkan struktur tenda dengan bahan membran agar dapat mengakomodasi bentang yang luas dan dengan beban mati yang relatif kecil.

Bangunan stadion memiliki kekhasan dalam mempertimbangkan beban hidup yang relatif besar dibandingkan dengan jenis-jenis bangunan yang lain, yaitu sebesar 500 kg /m^2. Hal ini dapat dilihat pada fungsi stadion sendiri untuk menampung penonton, yang gerakannya cenderung aktif. Dengan syarat-syarat tersebut maka Stadion ini akan direncanakan dengan menggunakan sistem struktur yang ada, sehingga didapatkan sebuah desain yang memadai.

Kata Kunci : Sistem struktur, Stadion

KATA PENGANTAR

Assalamualikum Wr. Wb.

Dengan mengucapkan rasa syukur kami panjatkan kepada Allah SWT atas segala Berkah-Nya sehingga Saya dapat menyelesaikan laporan tugas akhir ini yang berjudul **"Perencanaan Sistem Struktur Pada Stadion Tambaksari Surabaya"**.

Penyelesaian tugas akhir ini sangat penting sebagai penerapan ilmu yang telah di dapat selama ini di jurusan Teknik sipil ITS. Penyusunan laporan tugas akhir ini tidak lepas dari bantuan pihak-pihak yang berhubungan dalam penyelesaian tugas akhir ini. Sehingga saya mengucapkan rasa terima kasih yang sebesar-besarnya kepada :

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Hormat Saya

Penyusun

"Mereka-mereka itu datang dengan tangan terbuka seperti tahu saja segala kesulitan kita dan terlalu banyak keajaiban di sekitar kita sampai-sampai kita tidak percaya"

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- Agung-Ita, setelah tak pikir-pikir nggak mungkin kayaknya Ta-ku selesai tanpa you berdua.
- All Crew D-SIGN, Awan, Didik Is, Radit" kirun",Oky,Sulton"othong", Yoni, Adi"kuro",Monyong,Usman,Benny"bendot", Sigit,Agus, mbahHarto, AgungP, Denny"kingkong", Karnadi"karpet",Wisnu,Teguh, Igna"ganthet",sorry D-SIGN tak tinggal ngerjakan TA, alhamdulillah akhirnya proyek mulai mengalir juga.
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BAB I

PENDAHULUAN

BAB I

PENDAHULUAN

1.1. LATAR BELAKANG

Dengan semakin berkembangnya dunia olah raga di Indonesia, maka semakin banyak pula even-even olah raga yang diselenggarakan. Stadion sebagi salah satu tempat olah raga terbuka (*outdoor*) merupakan sarana yang sering digunakan dalam even olah raga. Selain itu juga dimanfaatkan sebagai penyelenggaraan aktivitas seni dan sosial.

Namun beberapa gedung olah raga di Surabaya saat ini dalam kondisi yang kurang memadai, salah satunya adalah stadion Tambaksari Surabaya. Sehingga dalam rangka memenuhi kebutuhan tersebut dimasa mendatang perlu direncanakan sebuah stadion dengan desain yang lebih memadai.

Sebagai sebuah bangunan umum, stadion memiliki kekhasan dengan kemampuannya di dalam mengakomodasi penonton dalam jumlah yang besar. Dengan kecenderungan aktivitas mereka yang aktif. Dengan kondisi ini beban hidup perlu diperhatikan sehingga dapat mewakili kondisi senyatanya. Sistem struktur stadion Tambaksari Surabaya. Selain itu juga diperhatikan desain sesuai dengan kebutuhan arsitektural yang ada.

Untuk menunjang desain Stadion tersebut maka perlu dilakukan perencanaan sistem struktur stadion. Dalam hal ini untuk struktur utama didesain menggunakan konstruksi beton bertulang, pada bagian ini meliputi

bagian tribun penonton dan penyangga konstruksi atap. Pada bagian rangka atap didesain menggunakan konstruksi baja, dengan sistem *space truss* (rangka batang ruang) membentuk struktur kantilever. Sedangkan pada penutup atap didesain dengan sistem tenda, yaitu berupa penutup membran. Sistem ini digunakan dengan kelebihan mamapu mengakomodasi bentang yang luas dengan beban mati yang tidak besar.

1.2. PERMASALAHAN

Semakin berkembang kebutuhan akan desain struktur yang kompleks, maka akan semakin memberikan tantangan bagi perencanaan struktur bangunan. Maka dalam tugas akhir ini akan mengangkat permasalahan tentang perencanaan sistem struktur pada stadion Tambaksari. Tentu diperlukan perhatian khusus nya dalam mempertimbangkan aspek beban hidup akibat penonton dan juga beban angin akibat struktur atap.

1.3. MAKSUD DAN TUJUAN

Dengan terus berkembangnya dunia arsitektur di Indonesia maka perencanaan sebuah bangunan akan selalu dituntut untuk memenuhi unsur estetika dan keindahan. Kemajuan ini akan berimplikasi dengan tuntukan kebutuhan struktur yang layak guna menunjang bangunan tersebut.

Demikian halnya pada desain stadion Tambaksari ini selain harus memenuhi unsur arsitektural maka juga harus memenuhi unsur struktural. Maka perencanaan sistem struktur stadion Tambaksari Surabaya bertujuan untuk menganalisa desain konstruksi stadion yang baru

sehingga di dapatkan sistem struktur yang layak dan aman.

1.4. LINGKUP PERMASALAHAN

Dalam tugas akhir ini diperlukan batasan-batasan untuk lebih memperjelas pelaksanaan tugas akhir ini, yaitu :

1. Elemen konstruksi atap direncanakan dengan konstruksi baja
2. Elemen struktur yang meliputi balok, kolom, plat lantai, dan tribun direncanakan dengan konstruksi beton.
3. Tidak melakukan detail perencanaan.
4. Tidak melakukan analisa biaya pada pelaksannan konstruksi stadion ini.
5. Tidak memberikan pembahasan tentang metode pelaksanaan konstruksi

1.5. SISTEMATIKA PENULISAN

Tugas akhir ini disusun dengan sistematika sebagai berikut :

Bab I Pendahuluan

Pendahuluan berisi latar belakang, permasalahan, permasalahan, lingkup permasalahn, maksud dan tujuan,dan sistematika penulisan

Bab II Dasar-dasar Perencanaan

Berisi tentang teori-teori dasar pada perencanaan bangunan sekunder, perencanaan struktur baja, dan juga struktur utama.

Bab III Perencanaan Struktur Sekunder

Perencanaan struktur sekunder meliputi pelat lantai, balok anak dan tribun.

Bab IV Perencanaan Struktur Atap

Pada bagian ini meliputi analisa beban-beban pada atap, dan perencanaan sistem pada rangka atap kantilever.

Bab V Perencanaan Struktur Utama

Meliputi pembebanan, analisa struktur utama, perencanaan elemen balok, kolom, dan juga hubungan kolom balok.

Bab VI Penutup

Penutup terdiri dari kesimpulan dan penutup.

Lampiran

Berisi tabel-tabel perhitungan, data-data output analaisa struktur, data-data perencanaan dan gambar.

BAB II

DASAR-DASAR PERENCANAAN

BAB II

DASAR-DASAR PERENCANAAN

2.1 KONSEP DESAIN

Dalam tugas akhir ini akan dilakukan perencanaan sistem struktur stadion yang meliputi konstruksi beton dan baja. Diharapkan akan didapatkan desain sistem struktur yang mampu memikul beban-beban yang ada.

Oleh karena struktur yang ada harus stabil artinya :

- Suatu elemen struktur tidak menerima tegangan secara dominan dibandingkan elemen lain yang serupa.
- Tidak mengalami deformasi yang berlebihan sehingga dimungkinkan struktur dapat kembali seperti semula.

2.2 PROSEDUR DESAIN

Dalam pelaksanaan tugas akhir ini diperlukan acuan yang mengarahkan tugas akhir ini mencapai tujuan yang diharapkan. Maka diperlukan prosedur desain yang meliputi beberapa tahapan penyelesaian yaitu :

1. Mengumpulkan dan mempelajari data dan literatur yang berkaitan. (data gambar struktur baik denah dan tampak, literatur mengenai konstruksi beton bertulang dan baja).
2. Menentukan konsep desain struktur dan peraturan yang digunakan serta menentukan metode analisa yang digunakan.
3. Memodelkan struktur utama dan menentukan sistem struktur.
4. Menentukan beban-beban yang bekerja.

5. Melakukan analisa terhadap sistem struktur sehingga akan didapatkan :
   - Gaya-gaya yang bekerja dalam elemen struktur
   - Perilaku struktur khususnya deformasi yang terjadi
6. Menentukan dimensi elemen struktur dan melakukan kontrol.
7. Pengambilan kesimpulan
8. Menuangkan hasil dalam bentuk gambar.

2.3 PERATURAN-PERATURAN

Dalam tugas akhir ini digunakan beberapa aturan antara lain :

- SK SNI T-15-03 1991 untuk perencanaan struktur beton bertulang
- LRFD untuk perencanaan struktur baja.
- Peraturan Pembebanan Indonesia Untuk Gedung 1983 untuk menentukan beban-beban yang bekerja.

2.4 SISTEM STRUKTUR

Dalam desain sebuah struktur maka biasanya dibuat untuk memenuhi fungsi-fungsi tertentu. Misalnya kebutuhan bentang yang lebar dan arah pembebanan yang spesifik, maka diperlukan sistem struktur yang mampu mengakomodasi kebutuhan tersebut. Sistem struktur yang digunakan juga harus mampu menjaga agar tetap stabil, sehingga sistem struktur yang dipilih akan berpengaruh pada bahan yang dipilih dan juga bentuk struktur itu sendiri.

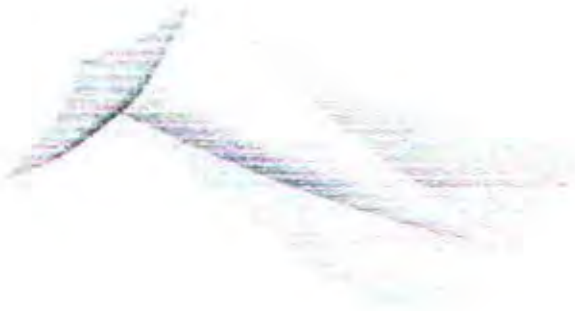
Dalam perencanaan stadion ini dilakukan perencanaan elemen penutup atap, rangka atap dan struktur utama stadion. Untuk penutup atap digunakan struktur membran, rangka atap menggunakan *space truss* dan struktur utama menggunakan struktur beton.

2.4.1 Struktur Membran

Membran merupakan struktur permukaan fleksibel tipis yang memikul beban dengan mengalami terutama tegangan tarik. Struktur ini cenderung dapat menyesuaikan diri sesuai dengan bagaimana struktur ini dibebani.

Dasar mekanisme pikul beban pada struktur membran adalah tarik. Membran yang memikul beban tegak lurus terhadap permukaannya dapat mengalami deformasi secara tiga dimensi, ini bergantung pada kondisi tumpuan dan pembebananya. Aksi pikul beban pada membran serupa dengan yang terjadi pada sistem kabel menyilang.

Pada perencanaan atap kali ini, tidak dilakukan analisa tegangan maupun perencanaan elemen atap. Namun penutup atap berupa membran hanya dianalisa menerima beban-beban dan diteruskan pada ujung-ujung membran yang berhubungan pada rangka atap.



Gambar 2.1 Struktur membran.

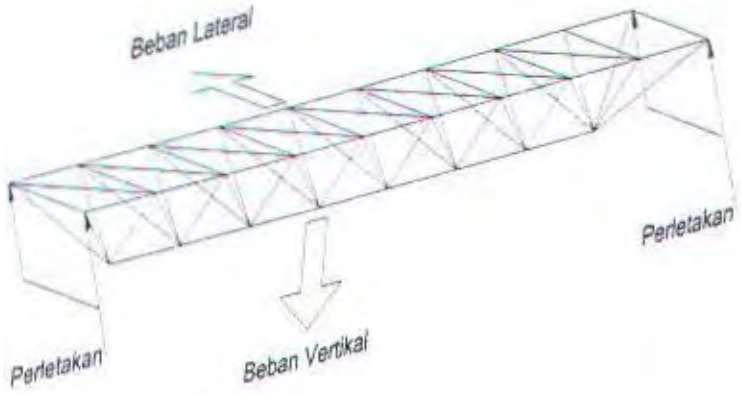
Secara umum sistem struktur membran bila diterapkan dalam pada penutup atap memiliki kelebihan yaitu selain berat sendirinya relatif ringan juga memiliki kemampuan menaungi area dengan bentang yang luas.

2.4.2 Struktur Rangka Batang Ruang (*Space Truss*)

Rangka batang merupakan struktur dengan kombinasi dari elemen-elemen batang tarik dan tekan membentuk bentang tertentu. Rangka batang biasa dikenal sebagai struktur yang digunakan untuk memperoleh bentang yang cukup lebar dan dengan karakteristik beban yang relatif besar pula, dibandingkan dengan yang didapat dalam balok sederhana.

Struktur rangka batang memiliki anggapan-anggapan sebagai dasar analisa, yang akan memberikan jaminan bahwa setiap elemen batang akan berada di bawah gaya tarik sederhana dan gaya tekan sederhana yaitu :

- Batang-batang dihubungkan dengan sendi-sendi pada ujung-ujungmya
- Beban-beban diterapkan hanya pada pertemuan-pertemuan atau titik buhul.



Gambar 2.2 *Space Truss*

Analisa rangka batang dapat ditentukan dengan mengkategorikan bentuk rangka batang sebagai rangka statis tertentu atau rangka tak tentu. Sehingga dapat dianalisa dengan menggunakan kaidah hukum keseimbangan statika, serta jika tidak mencukupi maka untuk menentukan tegangan batang-batang diperlukan juga perhitungan elastisitas bahan.

Rangka batang ruang merupakan struktur yang pada prinsipnya sama dengan rangka batang bidang namun didesain dalam bentuk struktur tiga dimensi khususnya untuk menahan gaya lateral yang bekerja tegak lurus arah bentang. Analisa struktur untuk rangka batang ruang menggunakan cara yang berbeda dengan rangka

batang bidang namun asumsi-asumsi yang digunakan tetap sama seperti pada rangka batang bidang.

2.5 BEBAN KERJA

Dalam perencanaan struktur dikenal beberapa macam beban yang bekerja pada struktur yaitu

1. Beban Mati

Beban mati merupakan beban yang diakibatkan oleh berat elemen struktur itu sendiri. Dan juga elemen-elemen lain yang melekat secara tetap pada struktur tersebut. Beban ini akibat pengaruh gaya gravitasi sehingga arah beban ke bawah. Dalam mendesain struktur perlu diperkirakan terlebih dahulu besarnya beban mati sebagai sebuah perencanaan awal.

2. Beban Hidup

Beban hidup merupakan beban-beban yang bisa ada atau tidak ada pada struktur untuk suatu waktu yang diberikan. Beban hidup memiliki karakteristik dapat berpindah atau bergerak. Secara khas beban hidup ini bekerja vertikal ke bawah, namun untuk beberapa kasus dapat berarah horizontal. Besarnya beban hidup akan berbeda sesuai dengan kegunaan struktur. Pada umumnya beban hidup berupa beban orang, perabot ruangan, kendaraan, dan lain-lain.

Dalam perencanaan stadion sesuai dengan PPI 1983 beban hidup yang dikenakan pada elemen pelat lantai adalah sebesar 400 kg/m^2 sedangkan pada elemen tribun adalah sebesar 500 kg/m^2.

3. Beban Angin

Beban angin merupakan beban akibat adanya tiupan angin. Pada dasarnya beban angin merupakan beban hidup, namun karena memiliki karakteristik khusus beban angin dipisah. Beban angin sangat tergantung kepada kecepatan angin, ketinggian, letak geografis dan bentuk permukaan bangunan. Angin yang mengenai sebuah bangunan pada dasarnya akan menyebabkan elemen struktur bangunan mengalami beban tekan/tiup dan sebagian yang lain mengalami beban hisap. Pada struktur tertentu misalnya struktur fleksibel angin dapat menyebabkan efek dinamis yaitu terjadi efek tekan dan hisap pada elemen struktur yang sama secara bergantian sehingga akan terjadi getaran konstan (*flutter*).

4. Beban Gempa

Beban gempa merupakan akibat dari fenomena getaran pada tanah. Hal ini bisa diakibatkan oleh berbagai sebab misalnya keruntuhan tanah, gerakan lapisan bumi (tektonik) atau aktivitas gunung berapi (vulkanik). Namun secara umum pengaruh gempa bumi suatu daerah dengan daerah lain dapat berbeda artinya beban gempa bangunan di suatu tempat dapat berbeda dengan tempat lain. Selain itu beban gempa akan sangat bergantung dari besarnya beban mati sebuah struktur. Semakin besar beban mati akan menimbulkan beban gempa yang besar pula.

Penentuan Gaya geser Gempa

Perhitungan gaya geser horizontal total akibat gempa dalah :

$V = C \cdot I \cdot K \cdot W_t$

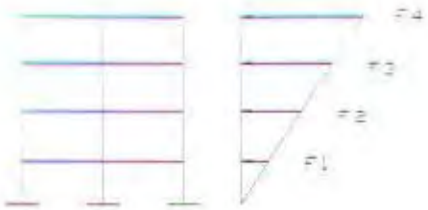
Keterangan :

C = Koefisien gempa dasar

I = faktor keutamaan

K = faktor jenis struktur

W_t = berat total bangunan



Gambar 2.3 Distribusi gaya gempa

Distribusi gaya geser horizontal untuk masing-masing tingkat adalah

$$F_i = \frac{Wi \cdot Hi}{\sum Wi \cdot Hi} \times V$$

Keterangan :

W_i = berat tingkat ke-i

H_i = tinggi tingkat ke-i.

5. **Kombinasi Pembebanan**

Dalam perencananaan ini sesuai dengan SK SNI T-15-1991-03 pasal 3.2.2 digunakan kombinasi pembebanan sebagai berikut :

- 1.2 D + 1.6 L
- 0.75(1.2 D + 1.6 L + 1 W)
- 0.9 D + 1.3 W
- 0.9 (D ± E)

2.6. PERENCANAAN STRUKTUR BAJA

2.6.1Perencanaan Batang Tarik

Komponen struktur yang mengalami gaya tarik aksial terfaktor N_u harus memenuhi:

$$N_u \leq \phi.N_n$$

dimana $\phi.N_n$ adalah kuat tarik rencana yang besarnya diambil sebagai nilai terendah di antara dua perhitungan menggunakan harga-harga ϕ dan N_n di bawah ini:

Kekuatan leleh

$\phi = 0.9$

$N_n = A_g f_y$,

Dan kekuatan putus

$\phi = 0.75$

$N_n = A_e f_u$

Keterangan :

A_g = luas penampang bruto, mm^2

A_e = luas penampang efektif menurut LRFD butir 10.2, mm^2

f_y = tegangan leleh, Mpa

f_u = tegangan tarik putus, Mpa

Luas penampang efektif ditentukan sebagai berikut:

$$A_e = AU$$

Keterangan :

A = luas penampang menurut LRFD butir 10.2.1 sampai dengan 10.2.4, mm^2

U = faktor reduksi

= $1-(\underline{x}/L) \leq 0.9$ atau menurut LRFD butir 10.2.3 dan 10.2.

$\underline{x}$ = eksentrisitas sambungan, jarak tegak lurus arah arah gaya tarik, antara titik berat penampang komponen yang disambung dengan bidang sambungan, mm

L = panjang sambungan dalam arah gaya tarik.

2.6.2Perencanaan Batang Tekan

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

$$N_u \leq \phi \cdot N_n$$

$$N_n = A_g \cdot fcr$$

Keterangan :

ϕ_n = faktor reduksi kekuatan (LRFD Tabel 6.4-2)

N_n = kuat tekan nominal komponen struktur

Dalam perencanaan ini digunakan profil Circular Hollow Section atau profil pipa. Maka untuk perhitungan digunakan:

untuk $\lambda c\sqrt{Q} \leq 1.5$ $\quad fcr = Q \cdot \left(0.685^{Q \cdot \lambda c^2}\right) \cdot fy$

untuk $\lambda c\sqrt{Q} \geq 1.5$ $\quad fcr = \dfrac{0.877}{\lambda c^2} fy$

Nilai Q ditentukan oleh syarat kelangsingan penampang

Bila $\frac{D}{t} \le \lambda r$ maka $Q = 1$

Bila $\frac{D}{t} \ge \lambda r$ maka $Q = \frac{0.0379E}{fy\left(D/t\right)} + \frac{2}{3}$

dan

$$\lambda c = \frac{\lambda}{\pi}\sqrt{\frac{fy}{E}}$$

$$\lambda r = 0.114 \cdot \frac{E}{fy}$$

Keterangan :

f_{cr} = kekuatan kritis

f_y = kekuatan leleh

E = modulus elastisitas baja

D = diameter profil pipa

t = tebal profil pipa

Juga dilakukan kontrol komponen struktur tekan

$$\lambda = \frac{K \cdot l}{r}$$

$\lambda \le \lambda_{ijin} = 200$

Keterangan :

α = faktor kelangsingan

K = faktor panjang efektif

l = panjang elemen

2.7. PERENCANAAN STRUKTUR BETON

2.7.1Desain Pelat

Pelat meruapakan elemen beton, yang terdapat 2 macam yaitu :

- Pelat satu arah yaitu pelat yang memiliki perbandingan panjang dan lebar melebihi nilai 2. Pada pelat satu arah pembebanan yang diterima pelat akan diteruskan pada balok-balok (pemikul bagian yang lebih panjang) dan hanya sebagian kecil saja yang akan diteruskan kepada gelagar (pemikul pada bagian panel yang lebih pendek).
- Pelat dua arah yaitu pelaat yang rasio panjang dibandingkan dengan lebar kurang dari dua sehingga sebagian besar pembebanan yang diterima diteruskan pada keseluruhan pemikul di sekeliling panel dari pelat.

Dalam perencanaan ini akan diuraikan sistem pelat yang terdapat dalam kasus struktur perancangan ini yaitu sistem pelat dua arah.

1. Perencanaan Awal

Persyaratan ketebalan minimum pelat ditentukan berdasarkan pada harga perbandingan kekakuan lentur penampang balok terhadap kekakuan lentur pelat yang diketahui sebagai α dan rata-rata harga α dari balok-balok yang mengapit pelat adalah α_m. Dalam perhitungan kekakuan lentur pelat, lebar pelat dihitung sebagai lebar yang dibatasi dalam arah lateral oleh sumbu dari panel yang bersebelahan. Secara matematis dinyatakan sebagai berikut :

$$\alpha = \frac{E_{cb} I_b}{E_{cs} I_s}$$

$$\alpha_m = \frac{(\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4)}{4}$$

Keterangan :

E_{cb} = modulud elastisitas balok

E_{cs} = modulud elastisitas pelat

I_b = momen inersia balok terhadap sumbu titik pusat penampang bruto balok

I_s = momen inersia pelat terhadap sumbu titik pusat penampang bruto pelat

$\alpha_1, \alpha_2, \alpha_3, \alpha_4$ = α balok pendukung pelat

Dalam Segala hal tebal minimum dari pelat tidak boleh kurang dari harga berikut :

- Untuk $\alpha_m < 2$ 120 mm
- Untuk $\alpha_m > 2$ 90 mm

Momen inersia balok dan pelat dapat ditentukan sebagai berikut

$$Ib = \frac{1}{12} \times bw \times h^3 \times k$$

$$Is = \frac{1}{12} \times b \times t^3$$

dengan

$$k = \frac{1 + \left(\frac{be}{bw} - 1\right)\left(\frac{t}{h}\right)\left[4 - 6\left(\frac{t}{h}\right) + 4\left(\frac{t}{h}\right)^2 + \left(\frac{be}{bw} - 1\right)\left(\frac{t}{h}\right)^3\right]}{1 + \left(\frac{be}{bw} - 1\right)\left(\frac{t}{h}\right)}$$

Keterangan :

be : lebar efekti harga minimum

bw : lebar badan balok

b : bentang pelat

h : tinggi balok

t : tebal pelat

Sedangkan untuk menentukan lebar efektif (be) menurut SK SNI T-15-03 1991 3.1.10 disebutkan beberapa kriteria dari balok T,

Interior

be_1 = ¼ x Lb

be_2 = bw +16t

be_3 = ½ (Lb - bw)

Eksterior

be_1 = 1/12 x Lb

be_2 = 6t

be_3 = ½ (Lb - bw)

dari perhitungan diatas diambil nilai yang paling minimum.

Untuk memenuhi syarat lendutan , ketebalan minimum pelat harus memenuhi persyaratn SK SNI T-15-1991-03 pasal 3.2.5-3.3 yaitu

$$h_1 = \frac{\ln\left(0{,}8 + \frac{fy}{1500}\right)}{36 + 5\beta\left[\alpha_m - 0{,}12\left(1 + \frac{1}{\beta}\right)\right]}$$

dan

$$h_2 = \frac{\ln\left(0{,}8 + \frac{fy}{1500}\right)}{36 + 9\beta}$$

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serta tidak perlu lebih dari

$$h_2 = \frac{\ln\left(0{,}8 + \frac{fy}{1500}\right)}{36}$$

Keterangan :

f_y = kekuatan leleh dalam Mpa

ln = panjang bentang bersih balok

2. Pemodelan dan Analisa Struktur Pelat

Pemodelan pelat dalam tugas akhir ini, pelat dianggap terjepit elastis pada keempat sisinya. Hal ini disebabkan pada tepi-tepi pelat pasti terjadi perputaran sudut. Pertimbangan lain permodelan ini adalah bila pelat dianggap terjepit penuh pada keempat sisinya maka, maka dianggap momen-momen yang terjadi sebagian besar diterima oleh tumpuan sehingga nilai momen di lapangan akan lebih kecil sedangkan pada keadaan sesungguhnya tepi pelat dapat berputar. Jika pelat dimodelkan terjepit elastis pada keempat sisinya, maka besarnya momen pada lapangan akan mendekati momen tumpuannya, sehingga permodelan struktur lebih aman.

Dalam tugas akhir ini khusus perencanaan analisa gaya-gaya dalam pelat berdasarkan PBI 1971 dan pembebanannya berdasarkan PPI 1983. Secara umum langkah-langkah perencanaan pelat adalah :

- Data-data perencanaan
- Preliminary tebal pelat dan kontrol ketebalan
- Pembebanan pelat
- Analisa gaya-gaya dalam pelat
- Penulangan pelat

3. Penulangan Pelat

Tahapan yang digunakan penulis dalam menentukan tulangan lentur pelat antara lain :

1. Menentukan data d, fy, fc', dan Mu
2. Menghitung Mn

$$Mn = \frac{Mu}{\phi}$$

Keterangan :

Mu = momen ultimate yang diperoleh dari perhitungan.

Ø = faktor reduksi kekuatan

3. Menentukan batasan harga tulangan dengan menggunakan rasio tulangan yang disyaratkan SK SNI T-15-1991-03 3.16.12-2.1 sebagai berikut :

$$m = \frac{fy}{0.85 \cdot fc}$$

$$Rn = \frac{Mn}{b \cdot d^2}$$

$$\rho b = \frac{0.85 \times fc' \times \beta_1}{fy}\left(\frac{600}{600 + fy}\right)$$

ρ_{max} = 0.75 ρ_b

ρ_{min} = 0.002

Hitung rasio tulangan yang dibutuhkan

$$\rho = \frac{1}{m}\left(1 - \sqrt{1 - \frac{2 \times m \times Rn}{fy}}\right)$$ dan dibandingkan dengan harga ρ_{min} dan ρ_{max}

4. Menentukan luas tulangan (As) dari ρ yang didapatkan

As = ρx b x d

Keterangan :

ρ = rasio tulangan

b = lebar pelat (diambil per meter)

d = tebal pelat

2.7.2Desain Balok

Pada dasarnya balok merupakan elemen lentur sama halnya dengan elemen pelat. Maka syarat-syarat maupun perhitungan penulangan menggunakan cara yang hampir sama dengan perhitungan lentur pada pelat. Pada perhitungan balok dalam menentukan penulangan tekan dihitung sesuai dengan SK SNI T-15-1991 pasal 3.14.3-2 bahwa tulangan tekan dasumsikan setengah dari tulangan tarik.

Pada balok kuat geser rencana harus memenuhi ketentuan sebagai berikut :

1. Dalam komponen struktur utama terutama yang dibebani lentur gaya geser rencana V_{ub} harus ditentukan dari pertimbangan mengenai gaya statis pada bagian dari komponen struktur di antara sisi muka join.

   Gaya geser rencana dihitung dari :

$$V_{u,b} = 1.05\left(V_{D,b} + V_{L,b} + \frac{4.0}{K} V_{E,b}\right)$$

   Keterangan :

   M_{kap} = momen kapasitas

   $M_{kap'}$ = momen kapasitas balok di sendi plastis pada bidang muka kolom disebelahnya.

   l_n = bentang bersih balok

   V_D = gaya geser balok akibat beban mati

   V_L = gaya geser balok akibat beban hidup

   $V_{E,B}$ = gaya geser balok akibat beban gempa

Selanjutnya penulangan akibat geser dihitung dengan cara-cara sebagai berikut :

1. Tentukan besarnya Vu yang dihitung dari gaya geser sejarak d dari tumpuan.
2. Dihitung kemampuan geser yang mampu diterima oleh beton yaitu sebesar

$$Vc = \frac{1}{6} \times \sqrt{fc'} \times bw \times d$$

Keterangan :

Vc = Kemampuan geser akibat beton
f_c' = Kekuatan tekan beton
bw = lebar badan balok
d = tinggi balok

3. Selanjutnya dilakukan chek terhadap kemampuan penampang sebesar

$$Vn > \frac{Vu}{\phi}$$

$$Vn = \frac{5}{6} \times \sqrt{fc'} \times bw \times d$$

Keterangan :

Vn = kuat geser nominal
Vu = besarnya gaya geser yang terjadi
Ø = faktor reduksi geser = 0.6

4. Menghitung besarnya luas tulangan geser

$$S = \frac{Av \times fy \times d}{\left(\frac{Vu}{\phi} - Vc\right)}$$

Keterangan :

S = jarak tulangan
Av = Luas tulangan geser
f_y = kekuatan leleh tulangan baja

5. Kontrol jarak antar tulangan bila

$$Vn - Vc \geq \frac{1}{3}\sqrt{fc'} \times bw \times d \qquad \text{maka } S_{max} = \frac{d}{4}$$

$$Vn - Vc \leq \frac{1}{3}\sqrt{fc'} \times bw \times d \qquad \text{maka } S_{max} = \frac{d}{2}$$

2.7.3Desain Kolom

Perencanaan kolom meliputi penulangan lentur kolom dan penulangan geser kolom. Suatu komponen struktur yang menerima momen lentur dan kasial tekan secara serentak harus diperhitungkan sebagai beam column, dengan mempertimbangkan pengaruh tekuk yang terjadi akibat kelangsingan komponen struktur tersebut.

Untuk perencanaan kali ini untuk perhitungan tulangan memanjang (lentur) menggunakan program bantu PCCOL. Namun secara umum akan dijabarkan teori umum untuk perhitungan kolom,seperti di bawah ini.

- Pembatasan Penulangan Kolom

  Nilai dari ρ adalah $0.01 \leq \rho \leq 0.08$. Hal ini berarti rasio penulangan kolom disyaratkan untuk tidak boleh kurang dari 1% dan tidak boleh lebih dari 8% dari luas bruto penampang kolom, hal ini sesuai SK SNI T-15-1991-03 pasal 3.3.9.1.

  Pembatasan rasio tulangan miimum ini ditujukan untuk mencegah terjadinya rangkak (creep) yang terjadi pada beton. Pertimbangan lainnya adalah untuk kemudahan pelaksanaan lapangan. Jumlah minimum batang tulangan memanjang kolom dengan

sengkang pengikat segiemapt dan 6 buah untuk pengikat sengkang spiral

- Kolom Pendek

Suatu unsur tekan pendek bila dibebani gaya aksial lebih besar dari kapasitasnya akan mengalami keruntuhan bahan (runtuhnya beton) sebelum mencapai ragam keruntuhan tekuknya. Oleh sebab itu untuk perancangan struktur tekan pendek, bahaya akibat tekuk tidak diperhitungkan. Suatu komponen struktur tekan dikatakan pendek apabila perbandingan kelangsinangan :

$$\frac{k \cdot Ln}{r} < 34 - 12\frac{M_{1b}}{M_{2b}}$$

$M_2 > M_1$ (braced frame)

Nilai $\frac{M_{1b}}{M2b} = 1 \rightarrow \frac{k \cdot Ln}{r} < 22$ (unbraced frame)

Nilai r dapat diambil sebesar $\sqrt{1/A}$ atau

r = 0.3 h dalam arah momen yang ditinjau untuk kolom persegi

r = 0.25 h untuk kolom bulat (d=diameter kolom)

- Kolom Panjang

Apabila nilai perbandingan kelangsingan untuk kolom pendek tidak terpenuhi maka dapat disebut kolom panjang. Kolom dengan perbandingan kelangsingan yang besar akan menimbulkan lendutan ke samping (menekuk) akibat momen sekunder yang terjadi, sehingga mengurangi kekuatan nominal dari kolom

panjang tersebut. Untuk itu dalam perhitungan kolom panjangdiperlukan suatu faktor pembesaran momen yang diperhitungkan terhadap panjang tekuk kolom.

Dalam peraturan ACI, perhitungan dari pengaruh kelangsingan dapat didekati dengan menggunakan cara pembesaran momen, dimana jumlah dari momen primer dan sekunder dikalikan dengan suatu faktor pembesaran δ.

Di dalam SK SNI T-15-1991-03 pasal 3.3.11.5 menyebutkan bahwa pabila suatu kolom adalah kolom panjang, maka momen yang terjadi harus diperbesardengan suatu faktor pembesaran menjadi :

$Mc = \delta \cdot M_{2b} + \delta \cdot M_{2s}$

Keterangan :

Mc = Momen rencana kolom setelah diperbesar

M_{2b} = Momen berfaktor terbesar pada ujung kolom akibat beban yang tidak menimbulkan goyangan berarti seperti beban gravitasi.

$$\delta_b = \frac{Cm}{1-(Pu/\phi Pc)} \geq 1 \quad \text{SKSNI T-15-1991-03 psl 3.3.7}$$

$$\delta_b = \frac{Cm}{1-\left(\sum Pu/\phi Pc\right)} \geq 1 \quad \text{SKSNI T-15-1991-03 psl 3.3.8}$$

$$Cm = 0.6 + 0.4\left[\frac{M_{1b}}{M_{2b}}\right] > 0.4 \quad \text{SKSNI T-15-1991-03 psl 3.3.12}$$

- Penulangan Utama Kolom

  Kuat lentur kolom harus memenuhi persamaan.

$$\sum M_{u.k} = 1.05 \cdot \sum \left(M_{D.K} + M_{L.K} + \frac{4.0}{K} M_{E.K} \right)$$

keterangan :

$\sum M_{U.K}$ = Jumlah momen rencanan kolom

$M_{D.K}$ = momen pada kolom akibat beban mati

$M_{L.K}$ = momen pada kolom akibat beban hidup

$M_{E.K}$ = momen pada kolom akibat beban gempa

K = faktor jenis struktur

Dari penjelasan di atas tahapan-tahapan penulangan lentur kolom adalah :

1. Tetapkan apakah kolom termasuk braced atau unbraced.
2. Tetapkan apakah kolom termasuk kolom pendek atau kolom panjang. Seperti telah dijelaskan di atas, bila termasuk kolom pendek maka tidak perlu dilakukan pembesaran momen dan sebaliknya. Peninjauan kolom pendek atau kolom panjang dilakukan pada kedua arah sumbu global. Hal ini dilakukan sebagai langkah keamanan.
3. Momen yang telah diperoleh dari langkah 2, kemudian dihitung momen ekuvalensi. Dimana momen dua arah biaxial dijadikan satu arah, ke arah kritis. Selanjutnya dibuat diagram interaksi M-N untuk mendapatkan besarnya rasio tulangan ρ.
4. Menghitung besarnya luasan tulangan berdasarkan rasio tulangan dengan memperhatikan batasan ρ maksimum dan ρ minimum.

5. Kontrol kekuatan penampang dengan syarat :
   Pn penampang > Pn yang terjadi

- Penulangan geser Kolom

  Penulangan geser kolom ditentukan dengan menghitung gaya geser rencana sebagi berikut :

$$V_{u,b} = 1.05\left(V_{D,k} + V_{L,k} + \frac{4.0}{K} V_{E,k}\right)$$

Keterangan :

h_n = tinggi bersih kolom

V_D = gaya geser kolom akibat beban mati

V_L = gaya geser kolom akibat beban hidup

$V_{E,B}$ = gaya geser kolom akibat beban gempa

2.8. Hubungan Balok Kolom

Besarnya gaya geser pada join kolom balok dihitung dengan rumus :

$$V_{jh} = C_{ki} + T_{ka} - V_{kol}$$

$$C_k = T_{ki} = 0.70\frac{M_{kap,ki}}{Z_{ka}}$$

$$T_{ka} = C_{ka} = 0.70\frac{M_{kap,ka}}{Z_{ka}}$$

$$V_{kol} = \frac{0.70\left(\frac{l_{ki}}{l_{ki}'} M_{kap,ki} + \frac{l_{ka}}{l_{ka}'} M_{kap,ka}\right)}{\frac{1}{2}\left(h_{k,a} + h_{k,b}\right)}$$

Tegangan geser horizontal nominal dalam join adalah

$$v_{jh} = \frac{V_{jh}}{b_j h_c}$$

Keterangan :

b_j = lebar efektif join (mm)

h_c = tinggi total penampang kolom dalam arah geser yang ditinjau (mm)

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

a) Tegangan tekan rata-rata minimal pada penampang bruto kolom beton di atas join, termasuk tegangan prategang, apabila ada, melebihi nilai 0.1 f_c', maka :

$$V_{ch} = \frac{2}{3}\sqrt{\left(\frac{N_{u.k}}{A_g}\right)} - 0.1 f_c' b_j h_c$$

b) Balok diberi gaya prategang yang melewati join, maka:

$$V_{ch}' = P_{cs}$$

dengan P_{cs} adalah gaya permanen dalam baja prategang yang terletak di sepertiga bagian tengah tinggi kolom

c) 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:

$$V_{ch} = 0.5\frac{A_s'}{A_s} V_{jh}\left(1 + \frac{N_{u.k}}{0.4 A_g f_c'}\right)$$

dimana rasio $\frac{A_s'}{A_s}$ tidak boleh diambil lebih besar dari satu

BAB III

PERENCANAAN STRUKTUR SEKUNDER

BAB III

PERENCANAAN STRUKTUR SEKUNDER

3.1 Perencanaan Awal

Untuk membantu proses perencanaan perlu dilakukan perencanaan awal pada elemen bangunan sekunder maupun bangunan primer

- Balok Induk

  Menurut persyaratan SK SNI T-15-1991-03 untuk dimensi balok pada dua ujung menerus sebagai berikut,

  $h = \frac{1}{16} \times Lbx(0.4 + \frac{fy}{700})$ SKSNI T-15-1991-03 tab 3.2.5(a)

  $1.5 \le \frac{h}{b} \le 2$ (Wang - Salmon)

  Keterangan :

  Lb : bentang kotor balok (cm)

  fy : mutu tulangan baja (Mpa)

  Perhitungan

  Balok A 1-2 L = 800 cm

  $$h = \frac{1}{16} \times 800 \times (0.4 + \frac{390}{700}) = 47.86cm \approx 60cm$$

  $$b = \frac{2}{3} \times h = \frac{2}{3} \times 60 = 40cm$$

  Dimensi 60x40

  Balok 1 A-B L = 789.5 cm

  $$h = \frac{1}{16} \times 789.5 \times (0.4 + \frac{390}{700}) = 47.23cm \approx 60cm$$

  $$b = \frac{2}{3} \times h = \frac{2}{3} \times 60 = 40cm$$

  Dimensi 60x40

Balok 2 A-B L = 763.3 cm

$$h = \frac{1}{16} \times 763.3 \times (0.4 + \frac{390}{700}) = 45.66cm \approx 60cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 60 = 40cm$$

Dimensi 60x40

Balok 3 A-B L = 737.8 cm

$$h = \frac{1}{16} \times 737.8 \times (0.4 + \frac{390}{700}) = 38.1cm \approx 60cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 60 = 40cm$$

Dimensi 60x40

Balok 1 L-M L = 711.6 cm

$$h = \frac{1}{16} \times 711.6 \times (0.4 + \frac{390}{700}) = 38.12cm \approx 60cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 60 = 40cm$$

Dimensi 60x40

Balok 2 L-M L = 656.8 cm

$$h = \frac{1}{16} \times 656.8 \times (0.4 + \frac{320}{700}) = 35.19cm \approx 60cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 60 = 40cm$$

Dimensi 60x40

Balok 3 L-M L = 582 cm

$$h = \frac{1}{16} \times 582 \times (0.4 + \frac{320}{700}) = 31.18cm \approx 70cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 50 = 45cm$$

Dimensi 60x40

Balok Tribun L = 894.4 cm

$$h = \frac{1}{16} \times 894.4 \times (0.4 + \frac{390}{700}) = 53.5cm \approx 60cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 60 = 40cm$$

Dimensi 60x40

- Balok Anak

Balok 1-2 C-D L = 388.2 cm

$$h = \frac{1}{16} \times 388.2 \times (0.4 + \frac{320}{700}) = 27.17cm \approx 50cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 50 = 35cm$$

Dimensi 50x35

Balok 2-3 A-B L = 375.1 cm

$$h = \frac{1}{16} \times 388.2 \times (0.4 + \frac{320}{700}) = 27.17cm \approx 50cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 50 = 35cm$$

Dimensi 50x35

Balok 1-2 N-O L = 347.1 cm

$$h = \frac{1}{16} \times 388.2 \times (0.4 + \frac{320}{700}) = 27.17cm \approx 50cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 50 = 35cm$$

Dimensi 50x35

Balok 2-3 I-J L = 309.7 cm

$$h = \frac{1}{16} \times 388.2 \times (0.4 + \frac{320}{700}) = 27.17cm \approx 50cm$$

$$b = \frac{2}{3} \times h = \frac{2}{3} \times 50 = 35cm$$

Dimensi 50x35

- Kolom

  Dimensi balok induk

  b = 60 cm

  h = 60 cm

  Kolom 1 (A-2)

  Kolom didesain b = h, L = 500 cm

$$\frac{I_{kolom}}{L_{kolom}} \geq \frac{I_{balok}}{L_{balok}} \Rightarrow \frac{\frac{1}{12}b \cdot h^3}{500} \geq \frac{\frac{1}{12}40 \cdot 60^3}{800}$$

  $b^4 \geq 5400000 \Rightarrow b \geq 48.2$ cm

  didesain 60 x 60

  Kolom 2 (A-1)

  Kolom didesain b = 2/3 h, L = 750 cm

$$\frac{I_{kolom}}{L_{kolom}} \geq \frac{I_{balok}}{L_{balok}} \Rightarrow \frac{\frac{1}{12}b \cdot h^3}{750} \geq \frac{\frac{1}{12}40 \cdot 60^3}{800}$$

  $3/2 \cdot b^4 \geq 8100000 \Rightarrow b \geq 48.2$ cm

  diambil b = 60 cm ; h = 100 cm

  didesain 60 x 100

3.2 Desain Pelat

Dalam perencanaan ini pelat didesain sebagai solid slab. Permodelan struktur yang digunakan adalah bahwa pelat difokuskan hanya menerima gaya gravitasi yaitu beban mati dan beban hidup. Pelat ditopang oleh balok anak dan balok induk dengan sisi-sisinya diasumsikan merupakan perletakan jepit.

3.2.1 Perencanaan Dimensi Pelat

Menurut SK SNI T-15-03 1991 3.1.10 disebutkan beberapa kriteria menentukan lebar efektif (be) dari balok T

Contoh perhitungan

Direncanakan menggunakan ketebalan pelat 15 cm

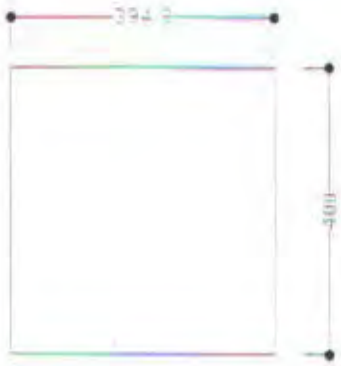
Pelat ukuran 394.8 cm x 400 cm

Ln = 400 -(40/2 + 35/2) = 362.5 cm

Sn = 394.8 -(40/2 + 35/2) = 357.3 cm

β = Ln/Sn = 362.5/357.3 = 1.015

Pelat dua arah



Interior (Balok 50/35)

be_1 = ¼ x Lb = ¼ x 394.8 = 98.7 cm (diambil)

be_2 = bw + 16t = 40 + 16x15 = 280 cm

be_3 = ½(Lb-bw) = ½(400-40) = 180 cm

$$k = \frac{1+\left(\frac{98.7}{35}-1\right)\left(\frac{15}{50}\right)\left[4-6\left(\frac{15}{50}\right)+4\left(\frac{15}{50}\right)^2+\left(\frac{98.7}{35}-1\right)\left(\frac{15}{50}\right)^3\right]}{1+\left(\frac{98.7}{35}-1\right)\left(\frac{15}{50}\right)}$$

$$k = 1.61$$

$$Ib = \frac{1}{12}\times bw\times h^3\times k = \frac{1}{12}\times 35\times 50^3\times 2.61 = 951823.6\cdot cm^4$$

$$Is = \frac{1}{12}\times bs\times t^3 = \frac{1}{12}\times 400\times 15^3 = 112500\cdot cm^2$$

$$\alpha_1 = \frac{lb}{ls} = 8.5$$

Interior (Balok 50/35)

be1 = ¼ x Lb = ¼ x 400 = 100 cm (diambil)

be2 = bw + 16t = 40 + 16x15 = 280 cm

be3 = ½(Lb-bw) = ½(394.8-40) = 177.4 cm

$$k = \frac{1+\left(\frac{100}{35}-1\right)\left(\frac{15}{50}\right)\left[4-6\left(\frac{15}{50}\right)+4\left(\frac{15}{50}\right)^2+\left(\frac{100}{35}-1\right)\left(\frac{15}{50}\right)^3\right]}{1+\left(\frac{100}{35}-1\right)\left(\frac{15}{50}\right)}$$

$$k = 2.61$$

$$lb = \frac{1}{12}\times bw\times h^3\times k = \frac{1}{12}\times 35\times 50^3\times 2.61 = 951823.6\cdot cm^4$$

$$ls = \frac{1}{12}\times bs\times t^3 = \frac{1}{12}\times 400\times 15^3 = 112500\cdot cm^2$$

$$\alpha_2 = \frac{lb}{ls} = 8.5$$

Eksterior (balok 60/40)

be1 = bw + 1/12xLb = 40 + 1/12x394.8 = 72.9 cm

be2 = 6t = 6 x 15 = 90 cm

be3 = ½(Lb - bw) = ½(400 - 40) = 180 cm

$$k = \frac{1+\left(\frac{72.9}{40}-1\right)\left(\frac{15}{60}\right)\left[4-6\left(\frac{15}{60}\right)+4\left(\frac{15}{60}\right)^2+\left(\frac{72.9}{40}-1\right)\left(\frac{15}{60}\right)^3\right]}{1+\left(\frac{72.9}{40}-1\right)\left(\frac{15}{60}\right)}$$

$$k = 1.304$$

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$$lb = \frac{1}{12} \times bw \times h^3 \times k = \frac{1}{12} \times 40 \times 60^3 \times 1.304 = 938840 \cdot cm^4$$

$$ls = \frac{1}{12} \times bs \times t^3 = \frac{1}{12} \times 400 \times 15^3 = 112500 \cdot cm^4$$

$$\alpha_3 = \frac{lb}{ls} = 7.664$$

Eksterior (balok 60/40)

be_1 = bw + 1/12xLb = 40 + 1/12x400 = 73.33 cm

be_2 = 6t = 6 x 15 = 90 cm

be_3 = ½(Lb - bw) = ½(400 - 40) = 180 cm

$$k = \frac{1 + \left(\frac{73.33}{40} - 1\right)\left(\frac{15}{60}\right)\left[4 - 6\left(\frac{15}{60}\right) + 4\left(\frac{15}{60}\right)^2 + \left(\frac{73.33}{40} - 1\right)\left(\frac{15}{60}\right)^3\right]}{1 + \left(\frac{73.33}{40} - 1\right)\left(\frac{15}{60}\right)}$$

$$k = 1.304$$

$$lb = \frac{1}{12} \times bw \times h^3 \times k = \frac{1}{12} \times 40 \times 60^3 \times 1.304 = 938840 \cdot cm^4$$

$$ls = \frac{1}{12} \times bs \times t^3 = \frac{1}{12} \times 400 \times 15^3 = 112500 \cdot cm^4$$

$$\alpha_4 = \frac{lb}{ls} = 7.664$$

$$\alpha_m = \frac{(\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4)}{4}$$

$$= \frac{(8.5 + 8.5 + 7.664 + 7.664)}{4} = 8.082$$

Syarat ketebalan plat dua arah menurut SK SNI T-15-1991-03 yaitu tidak kurang dari beberapa hal berikut :

$$h_1 = \frac{\ln\left(0{,}8 + \frac{fy}{1500}\right)}{36 + 5\beta\left[\alpha_m - 0{,}12\left(1 + \frac{1}{\beta}\right)\right]}$$

$$h_1 = \frac{362.5 \times \left(0{,}8 + \frac{320}{1500}\right)}{36 + 5 \times 1.015\left[8.082 - 0{,}12\left(1 + \frac{1}{1.015}\right)\right]} = 4.846 \cdot cm$$

tetapi juga tidak boleh kurang dari

$$h_2 = \frac{\ln\left(0{,}8 + \frac{fy}{1500}\right)}{36 + 9\beta}$$

$$h_2 = \frac{362.5\left(0{,}8 + \frac{320}{1500}\right)}{36 + 9 \times 1.015} = 8.139 \cdot cm$$

dan tidak perlu lebih dari

$$h_2 = \frac{\ln\left(0{,}8 + \frac{fy}{1500}\right)}{36}$$

$$h_2 = \frac{362.5\left(0{,}8 + \frac{320}{1500}\right)}{36} = 10.204 \cdot cm$$

Maka diambil tebal 12 cm sesuai dengan tebal minimum pelat SK SNI T-15-1991-03 pasal 3.2.5. 3).(2).a)

3.2.2 Pembebanan Pelat

Pembebanan Pelat Lantai

- Beban Mati (DL)
  - Berat Sendiri : 0.12 x 2400 =288 kg/m^2
  - Spesi Penutup lantai :0.02 x 2200= 44 kg/m^2
  - Pipa + utilitas = 30 kg/m^2

DL =362 kg/m^2

- Beban Hidup (LL)
  - Beban hidup LL = 500 kg/m^2

Kombinasi Pembebanan

Qu = 1.2 DL + 1.6 LL

Qu = 1.2 (362) + 1.6(500)

= 1234.4 ~ 1240 kg/m^2

3.2.3 Penulangan Pelat

Data-data perencanaan untuk penulangan pelat

- Dimensi pelat
- Tebal pelat 100 mm
- Tebal decking 20 mm
- Diameter tulangan rencana 10 mm
- Mutu tulangan dengan fy 320 Mpa
- Mutu beton fc' 35 Mpa

dx = 120 - 20 - ½ (10) = 95 mm

dy = 120 - 20 - 10 - ½ (10) = 85 mm

β_1 = 0.85 untuk fc' hingga 35 Mpa (3.3.2-7) maka dari tabel didapatkan β_1 = 0.81

$Q_{ultimate}$ = 1240 kg/m^2

dx = 95 mm

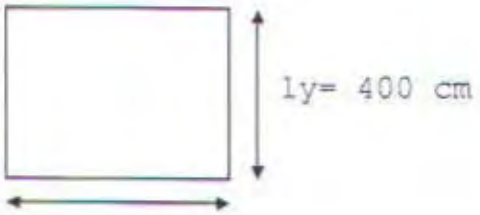
dy = 85 mm

$$\rho b = \frac{0.85 \times 35 \times 0.81}{320}\left(\frac{600}{600+320}\right) = 0.0491$$

ρ_{max} = 0.75 x 0.0491

= 0.037

ρ_{min} = 1.4/fy = 1.4/320 =0.0044



ly/lx = 400/394.8 = 1.013

Dengan menggunakan koefisien momen PBI 1971 tabel 13.3.1 didapatkan

Persamaan momen di lapangan:

- M_{lx} = + 0.001 q lx^2 x ;dengan nilai x = 48
- M_{ly} = + 0.001 q lx^2 x ;dengan nilai x = 48

Persamaan momen di tumpuan:

- M_{tx} = - 0.001 q lx^2 x ;dengan nilai x = 48
- M_{ty} = - 0.001 q lx^2 x ;dengan nilai x = 48

Sehingga :

M_{lx} = 0.001 x 1240 x 3.948^2 x 48
= 927.7 kgm ≈ 928 kgm

M_{ly} = 0.001 x 1240 x 3.948^2 x 48
= 927.7 kgm ≈ 928 kgm

M_{tx} = -0.001 x 1240 x 3.948^2 x 48
= -927.7 kgm ≈ -928 kgm

M_{ty} = -0.001 x 1240 x 3.948^2 x 48
= -927.7 kgm ≈ -928 kgm

Penulangan arah x (lapangan)

$$Rn = \frac{0.928 \times 10^7}{0.8 \times 1000 \times 95^2} = 1.285 \text{ Mpa}$$

$$m = \frac{320}{0.85 \times 35} = 10.76$$

$$\rho = \frac{1}{10.76}\left(1 - \sqrt{1 - \frac{2 \times 10.76 \times 1.285}{320}}\right) = 0.0041$$

$$\rho_{min}(= 0.0044) > \rho$$

maka digunakan ρ = 0.0044

As_{perlu} = ρ.b.d

= 0.0044x1000x95 = 418 mm^2

menurut SK SNI 15-1991 pasal 3.16.6-5

disebutkan :

Jarak tulangan utama ≤ 3xtebal pelat (=360 mm)

≤ 500 mm

Digunakn tulangan lentur Ø 10-150

As_{ada} = (3.14x0.25x10^2) x (1000/150)

= 523.33 mm^2 > 418 mm^2 Ok!

Kontrol kekuatan

$$\rho = \frac{As_{ada}}{b \times d} = \frac{523.33}{1000 \times 95} = 0.00551 > (\rho_{min} = 0.0044)$$ Ok!

$$Mu = \phi \times As \times fy\left(d - \frac{a}{2}\right)$$

$$a = \frac{523.33 \times 320}{0.85 \times 35 \times 1000} = 5.63 \text{ mm}$$

$$Mu = 0.85 \times 523.33 \times 320\left(95 - \frac{5.63}{2}\right)$$

= 13.12x10^6 Nmm > M_{lx} (=9.28x10^6 Nmm) Ok!

Penulangan arah y (lapangan)

$$Rn = \frac{0.928 \times 10^7}{0.8 \times 1000 \times 85^2} = 1.606 \text{ Mpa}$$

$$m = \frac{320}{0.85 \times 35} = 10.76$$

$$\rho = \frac{1}{10.76}\left(1 - \sqrt{1 - \frac{2 \times 10.76 \times 1.606}{320}}\right) = 0.0052$$

$$\rho_{min}(= 0.0044) < \rho < \rho_{max}(= 0.037)$$

maka digunakan ρ = 0.0052

AS_{perlu} = ρ.b.d

= 0.0052x1000x85 = 442 mm^2

menurut SK SNI 15-1991 pasal 3.16.6-5

disebutkan :

Jarak tulangan utama ≤ 3xtebal pelat (=360 mm)

≤ 500 mm

Digunakan tulangan lentur Ø 10-150

AS_{ada} = (3.14x0.25x10^2) x (1000/150)

= 523.33 mm^2 > 442 mm^2 Ok!

Kontrol kekuatan

$$\rho = \frac{As_{ada}}{b \times d} = \frac{523.33}{1000 \times 85} = 0.00616 > (\rho_{min} = 0.0044)$$ Ok!

$$Mu = \phi \times As \times fy\left(d - \frac{a}{2}\right)$$

$$a = \frac{523.33 \times 320}{0.85 \times 35 \times 1000} = 5.63 \text{ mm}$$

$$Mu = 0.85 \times 523.33 \times 320\left(85 - \frac{5.63}{2}\right)$$

$= 11.7\text{x}10^6$ Nmm > M_{ly} ($=9.28\text{x}10^6$ Nmm) Ok!

Penulangan arah x (tumpuan)

$$Rn = \frac{0.928 \times 10^7}{0.8 \times 1000 \times 95^2} = 1.285 \text{ Mpa}$$

$$m = \frac{320}{0.85 \times 35} = 10.76$$

$$\rho = \frac{1}{10.76}\left(1 - \sqrt{1 - \frac{2 \times 10.76 \times 1.285}{320}}\right) = 0.0041$$

$\rho_{min} (= 0.0044) > \rho$

maka digunakan ρ = 0.0044

As_{perlu} = ρ.b.d

= 0.0044x1000x95 = 418 mm^2

menurut SK SNI 15-1991 pasal 3.16.6-5

disebutkan :

Jarak tulangan utama ≤ 3xtebal pelat (=360 mm)

≤ 500 mm

Digunakn tulangan lentur Ø 10-150

As_{ada} = (3.14x0.25x10^2) x (1000/150)

= 523.33 mm^2 > 418 mm^2 Ok!

Kontrol kekuatan

$$\rho = \frac{As_{ada}}{b \times d} = \frac{523.33}{1000 \times 95} = 0.00551 > (\rho_{min} = 0.0044)$$ Ok!

$$Mu = \phi \times As \times fy\left(d - \frac{a}{2}\right)$$

$$a = \frac{523.33 \times 320}{0.85 \times 35 \times 1000} = 5.63 \text{ mm}$$

$$Mu = 0.85 \times 523.33 \times 320\left(95 - \frac{5.63}{2}\right)$$

$= 13.12 \times 10^6$ Nmm > M_{1x} ($=9.28 \times 10^6$ Nmm) Ok!

Penulangan arah y (tumpuan)

$$Rn = \frac{0.928 \times 10^7}{0.8 \times 1000 \times 85^2} = 1.606 \text{ Mpa}$$

$$m = \frac{320}{0.85 \times 35} = 10.76$$

$$\rho = \frac{1}{10.76}\left(1 - \sqrt{1 - \frac{2 \times 10.76 \times 1.606}{320}}\right) = 0.0052$$

$$\rho_{min}(= 0.0044) < \rho < \rho_{max}(= 0.037)$$

maka digunakan $\rho = 0.0052$

$As_{perlu} = \rho.b.d$

$= 0.0052 \times 1000 \times 85 = 442 \text{ mm}^2$

menurut SK SNI 15-1991 pasal 3.16.6-5

disebutkan :

Jarak tulangan utama ≤ 3xtebal pelat (=360 mm)

≤ 500 mm

Digunakan tulangan lentur Ø 10-150

As_{ada} = (3.14x0.25x10^2) x (1000/150)

= 523.33 mm^2 > 442 mm^2 Ok!

Kontrol kekuatan

$$\rho = \frac{As_{ada}}{b \times d} = \frac{523.33}{1000 \times 85} = 0.00616 > (\rho_{min} = 0.0044) \quad \text{Ok!}$$

$$Mu = \phi \times As \times fy\left(d - \frac{a}{2}\right)$$

$$a = \frac{523.33 \times 320}{0.85 \times 35 \times 1000} = 5.63 \text{ mm}$$

$$Mu = 0.85 \times 523.33 \times 320\left(85 - \frac{5.63}{2}\right)$$

= 11.7x10^6 Nmm > M_{1y} (=9.28x10^6 Nmm) Ok!

3.3 Desain Balok anak

3.3.1 Pemodelan dan Analisa

Pemodelan balok anak adalah sebagai balok yang bertumpu pada balok induk. Permodelan tersebut secara garis besar dapat diwakili seperti pada gambar. Balok anak menerima beban ekuivalen akibat pelat dan juga beban sendiri yang telah didefinisikan dalam program analisa. Untuk analisa balok anak dilakukan dengan bantuan program SAP 2000-8.0.

Gambar 3.1. Pemodelan balok anak

3.3.2 Penulangan Balok Anak

Contoh perhitungan balok C-D 1-2 :

Data-data perencanaan :

h = 500 mm

b = 350 mm

Tebal decking 40 mm

Ø sengkang = 10 mm

Ø utama = 19 mm

Mutu tulangan dengan fy 320 Mpa

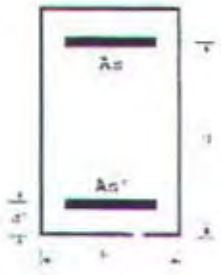
Mutu beton fc' 35 Mpa

d = 500 - 40 - 10 - ½ (22) = 439 mm ≈ 440 mm

β_1 = 0.85 untuk fc' hingga 35 Mpa (3.3.2-7) maka dari tabel didapatkan β_1 = 0.81

1. Perhitungan penulangan pada tumpuan

   Pada bagian tumpuan balok direncanakan sebagai balok persegi.



- Perhitungan tulangan lentur

Mu = -22.99 tm ≈ -30 tm

Mn = -30/0.8 = -37.5 tm

$$X_{max} = 0.75 \times 442 \frac{600}{600+320} = 215.7 \cdot mm$$

$$a_{max} = 0.85 \times 215.7 = 183.35 \cdot mm$$

$$Cc = 0.85 \times 35 \times 183.35 \times 350 = 1909137.53 \cdot N$$

Mn_{max} = 1909137.53 x(440-0.5x183.77)

= 637.94 x 10^6 Nmm = 63794 kgm

Mn_{max} > Mn (= 37500 tm)

Balok dianalisa sebagai balok dengan tulangan tunggal

$$Rn = \frac{30 \times 10^7}{0.8 \times 350 \times 440^2} = 5.509$$

$$m = \frac{320}{0.85 \times 35} = 10.76$$

$$\rho_{perlu} = \frac{1}{10.76}\left(1 - \sqrt{1 - \frac{2 \times 10.76 \times 5.509}{320}}\right) = 0.0192$$

$$\rho_{min} = \frac{1.4}{fy} = \frac{1.4}{320} = 0.0044$$

$$\rho b = \frac{0.85 \times 35 \times 0.81}{320}\left(\frac{600}{600+320}\right) = 0.0491$$

ρ_{max} = 0.75 x 0.0491

= 0.0368

$\rho_{min}(=0.0044) < \rho_{perlu} < \rho_{max}(=0.0368)$

maka digunakan ρ = 0.0192

As = $\rho_{perlu} \cdot b \cdot d$

= 0.0192·350·440 = 2956.8 mm^2

Digunakan tulangan lentur Ø 22

Juml. Tul= $2956.8/(3.14 \times 0.25 \times 22^2)$

= 7.78 ≈ 8 batang

Penulangan tekan diambil,

As' = ½ As

= 1481.7 mm^2

Juml. Tul= $1478.4/(3.14 \times 0.25 \times 22^2)$

= 3.89 ≈ 4 batang

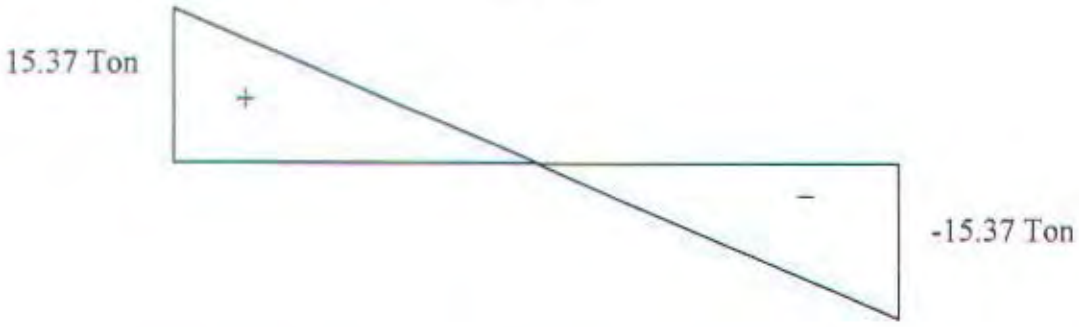
maka tulangan yang dipakai :

tulangan atas (tarik) = 8-D22

tulangan bawah (tekan) = 4-D22

- Penulangan Geser

Vu = 15370 kg (pada tumpuan)



Dihitung Vu sejarak d dari muka tumpuan

Vu = (4500-441)x15370/4500 = 13932 kg

$$\frac{Vu}{0.6} = \frac{13932}{0.6} = 23220 \cdot kg$$

$$Vc = \frac{1}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \times \frac{1}{6} \sqrt{35} \times 350 \times 441 = 140901.7 \cdot N$$

chek kemampuan penampang untuk geser

$$Vn = \frac{5}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{5}{6} \sqrt{35} \times 350 \times 441 = 760955.8 \cdot N$$

Vn > $\frac{Vu}{0.6}$ Tulangan sengkang diperlukan

Dipakai D tulangan 10 mm

Av = 2 x 3.14 x 0.25 x 10^2 = 157 mm^2

$$S = \frac{Av \times fy \times d}{\left(\frac{Vu}{\phi} - Vc\right)} = \frac{157 \times 320 \times 441}{\left(\frac{13932 \times 9.81}{0.6} - 84541\right)} = 154.7 \cdot mm$$

bila $Vn - Vc \geq \frac{1}{3} \sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{4}$

$$\frac{1}{3} \sqrt{fc'} \times bw \times d = \frac{1}{3} \sqrt{35} \times 350 \times 441 = 304382.3 \cdot N$$

$$Vn - Vc = \frac{13932 \times 9.81}{0.6} - 140901.7 = 86886.5 \cdot N$$

Harga $Vn - Vc \leq \frac{1}{3} \sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{2}$

$$S_{max} = \frac{d}{2} = \frac{441}{2} = 220.5 \cdot mm$$

Jadi diambil jarak tulangan diambil 120 mm

2. Perhitungan penulangan pada lapangan

Pada bagian lapangan balok direncanakan sebagai balok T.

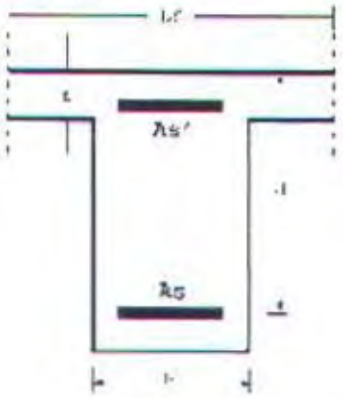
Lebar b efektif :

be_1 = ¼ x L = ¼ x 800 = 200 cm

be_2 = bw + $16 \cdot t_{flens}$ = 35 + 16 x 12 = 227 m

be_3 = jarak antar balok = 400 m

diambil be = 200 m



- Perhitungan tulangan lentur

Mu = 11.87 tm

Pengecekan terhadap anggapan balok T palsu

Mr = $\emptyset \cdot 0.85 \cdot fc' \cdot be \cdot h_{flens}(d - 1/2 \cdot h_{flens})$

= 0.8x0.85x35x2000x120(440-0.5x120)

= 2176272000 Nmm = 217627.2 kgm = 217.627 tm

Mr > Mu

maka flens mencukupi menerima beban, sehingga dianggap sebagai balok T palsu.

$$Rn = \frac{11.87 \times 10^7}{0.8 \times 350 \times 440^2} = 2.18$$

$$m = \frac{320}{0.85 \times 35} = 10.76$$

$$\rho_{perlu} = \frac{1}{10.76}\left(1 - \sqrt{1 - \frac{2 \times 10.76 \times 2.18}{320}}\right) = 0.00708$$

$$\rho_{min} = \frac{1.4}{fy} = \frac{1.4}{320} = 0.0044$$

$$\rho b = \frac{0.85 \times 35 \times 0.81}{320}\left(\frac{600}{600 + 320}\right) = 0.0491$$

ρ_{max} = 0.75 x 0.0491

= 0.0368

$\rho_{min}(= 0.0044) < \rho_{perlu} < \rho_{max}(= 0.0368)$

maka digunakan ρ = 0.00708

As = $\rho_{perlu} \cdot b \cdot d$

= 0.00708·350·440 = 1090.3 mm^2

Digunakan tulangan lentur Ø 19

Juml. Tul= 1090.3/(3.14x0.25x22^2)

= 2.87 ≈ 4 batang

Penulangan tekan diambil praktis,

As' = ½ As

= ½ 1093.2 = 546.6 mm^2

Juml. Tul= 545.15/(3.14x0.25x22^2)

= 1.43 ≈ 2 batang

maka tulangan yang dipakai :

tulangan atas (tekan) = 4-D22

tulangan bawah (tarik) = 2-D22

3.4 Desain Tribun

3.4.1 Pemodelan dan Analisa

Tribun adalah bagian dari stadion untuk tempat duduk penonton dibentuk dari susunan beberapa elemen balok pracetak. Balok yang digunakan berbentuk balok T analisa yang digunakan mengacu pada analisa balok T. Balok tersebut didesain sebagai balok dengan dua tumpuan sederhana, yang menumpu pada balok tribun pada bagian struktur utama.

Gambar 3.2. Permodelan struktur tribun

3.4.2 Perencanaan Awal

Data-data perencanaan :

be = 750 mm

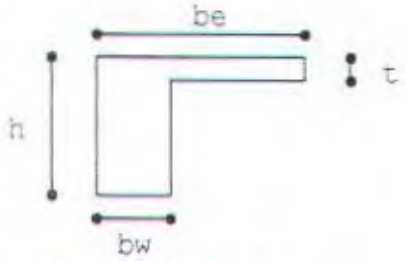
bw = 300 mm

h = 520 mm

t = 12 mm

fy = 390 Mpa

fc' = 35 Mpa



Gambar 3.1 Penampang tribun

Lebar b efektif :

$be_1 = bw + 1/12 \cdot L = 0.3 + 1/12 \times 7.872 = 0.956$ m

$be_2 = bw + 6 \cdot t_{flens} = 0.3 + 6 \times 0.12 = 1.02$ m

$b_{act} = 0.75$ m $< be_1$

$< be_2$

maka seluruh lebar flens terpakai dalam perhitungan.

Pembebanan Balok T

- Beban mati
  - Berat sendiri balok = 0.21×2400 = 504 kg/m
  - Berat tempat duduk = 30 kg/m

  qD = 534 kg/m
- Beban hidup
  - qL = 0.75×500 kg/m^2 = 375 kg/m

Kombinasi pembebanan

$qu = 1.2\ qD + 1.6\ qL$

$= 1.2 \cdot 534 + 1.6 \cdot 375$

$= 1240.8$ kg/m

$M_u = 1/8 \cdot q \cdot L^2$

$= 1/8 \times 1240.8 \times 7.872^2$

$= 9611.3$ kgm

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3.4.3 Penulangan Balok T

1. Penulangan Lentur Tribun

Balok T direncanakn dengan tulangan tunggal, dan tidak dihitung penulangn pada tumpuan.

Persyaratan tulangan :

$$\rho b = \frac{0.85 \times 35 \times 0.81}{390}\left(\frac{600}{600+390}\right)$$

= 0.0374

ρ_{max} = 0.75 x 0.0374

= 0.028

ρ_{min} = 1.4/fy = 1.4/390 = 0.00359

Direncankan tulangan utama Ø 22 mm dan tulangan sengkang Ø10 mm

d = 520-40-10-0.5x22 = 459 mm

be = 750 mm

Pengecekan terhadap anggapan balok T palsu

Mr = $\emptyset \cdot 0.85 \cdot fc' \cdot be \cdot h_{flens}(d - 1/2 \cdot h_{flens})$

= 0.8x0.85x35x750x120(460.5-0.5x120)

= 857871000 Nmm = 85.7 x 10^7 Nmm

Mr > Mu

maka flens mencukupi menerima beban, sehingga dianggap sebagai balok T palsu.

Mu = 9611.3 kgm = $9.6113 \cdot 10^7$ Nmm

$$Rn = \frac{9.6113 \times 10^7}{0.8 \times 300 \times 459^2} = 1.9008$$

$$m = \frac{390}{0.85 \times 35} = 13.11$$

$$\rho = \frac{1}{13.11}\left(1 - \sqrt{1 - \frac{2 \times 13.11 \times 1.9008}{390}}\right) = 0.01825$$

$\rho_{min}(= 0.00359) < \rho$

maka digunakan ρ = 0.01825

As_{perlu} = ρ.be.d

= 0.01825x300x520 = 2847 mm^2

Digunakan tulangan lentur Ø 22

Juml. Tul= $2847/(3.14x0.25x22^2)$

= 7.49 ≈ 8 batang

Tulangan tekan diambil

As' = ½ As

= ½ 2847 = 1423.5 mm^2

Juml. Tul= $1423.5/(3.14x0.25x22^2)$

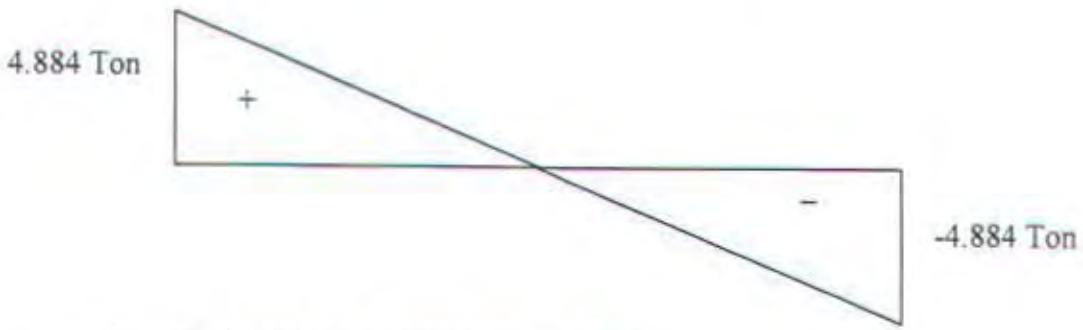
= 3.74 ≈ 4 batang

maka tulangan yang dipakai :

tulangan atas (tekan) = 8-D22

tulangan bawah (tarik) = 4-D22

2. Penulangan Geser



Vu = 4884 kg (pada tumpuan)

= 47912 N

$$Vc = \frac{1}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \times \frac{1}{6} \sqrt{35} \times 300 \times 459 = 135774 \cdot N$$

chek kemampuan penampang untuk geser

$$Vn = \frac{5}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{5}{6}\sqrt{35} \times 300 \times 459 = 678870.2 \cdot N$$

Vn > $\frac{Vu}{0.6}$ Tulangan sengkang diperlukan

Dipakai D tulangan 10 mm

Av = 2 x 3.14 x 0.25 x 10^2 = 157 mm^2

$$Vs = \frac{A_v \cdot fy \cdot d}{s}$$

$$= \frac{157 \cdot 390 \cdot 459}{250}$$

$$= 112418.3 \cdot N$$

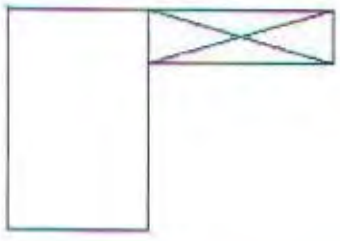
$$\phi(Vc + Vs) = 0.6(135774 + 112418.3)$$

$$= 148915.4 \cdot N > 47912 \cdot N$$ Ok!

Jadi diambil jarak tulangan diambil 250 mm

3. Penulangan Lentur Flens

Pada bagian flens direncanakan sebagai pelat pendek yang dianggap terjepit pada sisi balok dan bebas pada sisi lainnya. Untuk penulangan flens berdasarkan momen yang terjadi akibat beban-beban yang terjadi pada bagian flens.



Lebar Flens = be-bw

= 750-300 = 350 mm

Tebal flens = 120 mm

Pembebanan flens (per m panjang balok):

- Beban mati
  - Berat sendiri balok = 0.012x1x2400 = 28.8 kg/m

  qD = 28.8 kg/m
- Beban hidup
  - qL = 1.0 x 500 kg/m^2 = 500 kg/m

Kombinasi pembebanan

qu = 1.2 qD + 1.6 qL

= 1.2·28.8 + 1.6·500

= 834.56 kg/m

M_u = 1/2·q·L^2

= 1/2 x 834.56 x 0.350^2

= 51.12 kgm

$$Rn = \frac{0.05112 \times 10^7}{0.8 \times 1000 \times 95^2} = 0.071 \text{ Mpa}$$

$$m = \frac{320}{0.85 \times 35} = 10.76$$

$$\rho = \frac{1}{10.76}\left(1 - \sqrt{1 - \frac{2 \times 10.76 \times 0.071}{320}}\right) = 2.2 \cdot 10^{8}$$

$\rho_{min} (= 0.0044) > \rho$

maka digunakan ρ = 0.0044

As_{perlu} = ρ.b.d

= 0.0044x1000x95 = 418 mm^2

menurut SK SNI 15-1991 pasal 3.16.6-5

disebutkan :

Jarak tulangan utama ≤ 3xtebal pelat (=360 mm)

≤ 500 mm

Digunakn tulangan lentur Ø 10-15

As_{ada} = (3.14x0.25x10^2) x (1000/150)

= 523.33 mm^2 > 418 mm^2 Ok!

3.5 Perancangan Tangga 1

3.5.1 Perencanan Awal

Data-data perencanaan :

fc' = 35 Mpa

fy = 32 Mpa

Panjang dan lebar tangga = 5.5 m x 4.0 m

Tinggi tangga = 5.0 m

Tinggi bordes = 2.5 m

Lebar bordes = 1.5 m

Direncanakan

Lebar injakan (l) = 25 cm

Tinggi injakan (t) = 18.0 cm

Tebal pelat bordes = 14.0 cm

Persyaratan perencanaan

60 ≤ 2t + 1 < 62 (cm)

2t+1 = 2·18+25 = 61 Ok!

Jumlah injakan = 250/18 = 13.89 ≈ 14

Sudut kemiringan tangga = tg^{-1} (250/350) = 35.54°

Jarak horizontal = 14 x 25 = 350 cm

Tebal rata-rata injakan

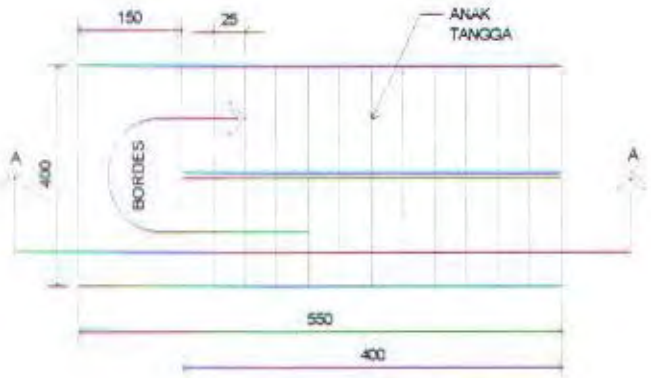
Luas segitiga injakan = 0.5 x (25 x 18) = 225 cm^2

$$225 = 0.5 \times \sqrt{25^2 \times 18^2} \times d$$

$$d = 14.6 \cdot cm$$

tebal pelat rata-rata = 14.6+0.5·14.6

= 21.92 cm



DENAH (TAMPAK ATAS) TANGGA

Gambar 3.4. Denah (Tampak Atas) Tangga

3.5.2 Pembebanan Tangga

Pembebanan Pelat Tangga

- Beban Mati (DL) per m lebar

- Berat Sendiri : 0.2192x2400/cos35.54		= 647 kg/m
- Spesi Penutup lantai :0.02 x 2200		= 44 kg/m
- sandaran		= 50 kg/m
	DL	= 741 kg/m

- Beban Hidup (LL) per m lebar

- Beban hidup	LL	= 300 kg/m

Kombinasi Pembebanan

Qu = 1.2 DL + 1.6 LL

Qu = 1.2(741) + 1.6(300)

= 1369.2 ≈ 1370 kg/m^2

Pembebanan Pelat Bordes

- Beban Mati (DL) per m lebar

- Berat Sendiri : 0.14x2400		= 336 kg/m
- Spesi Penutup lantai :0.02 x 2200		= 44 kg/m
- sandaran		= 50 kg/m
	DL	= 430 kg/m

- Beban Hidup (LL) per m lebar

- Beban hidup	LL	= 300 kg/m

Kombinasi Pembebanan

Qu = 1.2 DL + 1.6 LL

Qu = 1.2(430) + 1.6(300)

= 996 kg/m^2

3.5.3 Analisa gaya-gaya pada tangga

Perhitungan momen dalam tangga dan bordes dilakukan dengan analisa program bantu SAP 2000. Yang hasilnya adalah :

M_{tangga} = 5.74 tm

M_{bordes} = 4.34 tm

3.5.4 Penulangan Tangga

Data-data perencanaan untuk penulangan pelat

- Tebal pelat 140 mm
- Tebal decking 20 mm
- Diameter tulangan rencana 10 mm
- Mutu tulangan dengan fy 320 Mpa
- Mutu beton fc' 35 Mpa

dx = 140 - 20 - ½ (15) = 112.5 mm

β_1 = 0.85 untuk fc' hingga 35 Mpa (SK SNI T-1991 3.3.2-7) maka dari tabel didapatkan β_1 = 0.81

$$\rho b = \frac{0.85 \times 35 \times 0.81}{320}\left(\frac{600}{600+320}\right) = 0.0491$$

ρ_{max} = 0.75 x 0.0491

= 0.037

ρ_{min} = 1.4/fy = 1.4/320 =0.0044

1. Penulangan Pelat tangga

Mu = 5.74 tm

$$Rn = \frac{5.74 \times 10^7}{0.8 \times 1000 \times 112.5^2} = 5.67 \text{ Mpa}$$

$$m = \frac{320}{0.85 \times 35} = 10.76$$

$$\rho = \frac{1}{10.76}\left(1-\sqrt{1-\frac{2\times 10.76\times 5.67}{320}}\right) = 0.0198$$

$$\rho_{min}(=0.0044) < \rho < \rho_{max}(=0.037)$$

maka digunakan ρ = 0.0198

As_{perlu} = ρ.b.d

= 0.0189x1000x112.5 = 2231.5 mm^2

menurut SK SNI 15-1991 pasal 3.16.6-5

disebutkan :

Jarak tulangan utama ≤ 3xtebal pelat (=450 mm)

≤ 500 mm

Digunakan tulangan lentur Ø 10-75

As_{ada} = (3.14x0.25x15^2) x (1000/75)

= 2355 mm^2 > 2231.5 mm^2 Ok!

2. Penulangan Pelat Bordes

Mu = 4.34 tm

$$Rn = \frac{4.34\times 10^7}{0.8\times 1000\times 112.5^2} = 4.28 \text{ Mpa}$$

$$m = \frac{320}{0.85\times 35} = 10.76$$

$$\rho = \frac{1}{10.76}\left(1-\sqrt{1-\frac{2\times 10.76\times 4.28}{320}}\right) = 0.0145$$

$$\rho_{min}(=0.0044) < \rho < \rho_{max}(=0.037)$$

maka digunakan ρ = 0.0145

As_{perlu} = ρ.b.d

= 0.0145x1000x112.5 = 1632.1 mm^2

menurut SK SNI 15-1991 pasal 3.16.6-5

disebutkan :

Jarak tulangan utama ≤ 3xtebal pelat (=450 mm)

≤ 500 mm

Digunakan tulangan lentur Ø 10-100

As_{ada} = (3.14x0.25x15^2) x (1000/100)

= 1766.25 mm^2 > 1632.1 mm^2 Ok!

3.6 Perancangan Tangga 2

3.6.1 Perencanan Awal

Data-data perencanaan :

fc' = 35 Mpa

fy = 32 Mpa

Panjang dan lebar tangga = 4.0 m x 4.0 m

Tinggi tangga = 2.0 m

Tinggi bordes = 2.0 m

Lebar bordes = 100 m

Direncanakan

Lebar injakan (l) = 27.0 cm

Tinggi injakan (t) = 18.0 cm

Tebal pelat bordes = 14.0 cm

Persyaratan perencanaan

60 ≤ 2t + l < 62 (cm)

2t+l = 2·18+26 = 62 Ok!

Jumlah injakan = 200/18 = 11.1 ≈ 11

Sudut kemiringan tangga = tg^{-1} (200/300) = 33.7°

Jarak horizontal = 11 x 26.0 = 286 ≈ 300 cm

Tebal rata-rata injakan

Luas segitiga injakan = 0.5 x (27 x 18) = 243 cm^2

$$243 = 0.5 \times \sqrt{27^2 \times 18^2} \times d$$

$$d = 14.98 \cdot cm$$

tebal pelat rata-rata = 14.98+0.5·14.98

= 22.46 cm

3.6.2 Pembebanan Tangga

Pembebanan Pelat Tangga

- Beban Mati (DL) per m lebar

- Berat Sendiri : 0.2246x2400/cos33.7		= 648 kg/m
- Spesi Penutup lantai :0.02 x 2200		= 44 kg/m
- sandaran		= 50 kg/m
	DL	= 742 kg/m

- Beban Hidup (LL) per m lebar

- Beban hidup	LL	= 300 kg/m

Kombinasi Pembebanan

Qu = 1.2 DL + 1.6 LL

Qu = 1.2(742) + 1.6(300)

= 1369.4 ≈ 1370 kg/m^2

Pembebanan Pelat Bordes

- Beban Mati (DL) per m lebar

- Berat Sendiri : 0.14x2400		= 336 kg/m
- Spesi Penutup lantai :0.02 x 2200		= 44 kg/m
- sandaran		= 50 kg/m
	DL	= 430 kg/m

- Beban Hidup (LL) per m lebar

- Beban hidup	LL	= 300 kg/m

Kombinasi Pembebanan

Qu = 1.2 DL + 1.6 LL

Qu = 1.2(430) + 1.6(300)

= 996 kg/m^2

3.6.3 Analisa gaya-gaya pada tangga

Perhitungan momen dalam tangga dan bordes dilakukan dengan analisa program bantu SAP 2000. Yang hasilnya adalah :

M_{tangga} = 3.13 tm

M_{bordes} = 2.23 tm

3.6.4 Penulangan Tangga

Data-data perencanaan untuk penulangan pelat

- Tebal pelat 140 mm
- Tebal decking 20 mm
- Diameter tulangan rencana 15 mm
- Mutu tulangan dengan fy 320 Mpa
- Mutu beton fc' 35 Mpa

dx = 140 - 20 - ½ (15) = 112.5 mm

β_1 = 0.85 untuk fc' hingga 35 Mpa (SK SNI T-1991 3.3.2-7) maka dari tabel didapatkan β_1 = 0.81

$$\rho b = \frac{0.85 \times 35 \times 0.81}{320}\left(\frac{600}{600+320}\right) = 0.0491$$

ρ_{max} = 0.75 x 0.0491

= 0.037

ρ_{min} = 1.4/fy = 1.4/320 =0.0044

3. Penulangan Pelat tangga

Mu = 3.37 tm

$$Rn = \frac{3.13\times10^{7}}{0.8\times1000\times112.5^{2}} = 3.1 \text{ Mpa}$$

$$m = \frac{320}{0.85\times35} = 10.76$$

$$\rho = \frac{1}{10.76}\left(1-\sqrt{1-\frac{2\times10.76\times3.1}{320}}\right) = 0.011$$

$$\rho_{min}(=0.0044) < \rho < \rho_{max}(=0.037)$$

maka digunakan ρ = 0.011

As_{perlu} = ρ.b.d

= 0.011x1000x112.5 = 1237.5 mm^2

menurut SK SNI 15-1991 pasal 3.16.6-5

disebutkan :

Jarak tulangan utama ≤ 3xtebal pelat (=450 mm)

≤ 500 mm

Digunakan tulangan lentur Ø 10-125

As_{ada} = (3.14x0.25x15^2) x (1000/125)

= 1413 mm^2 > 1237.5 mm^2 Ok!

4. Penulangan Pelat Bordes

Mu = 2.23 tm

$$Rn = \frac{2.23\times10^{7}}{0.8\times1000\times112.5^{2}} = 2.2 \text{ Mpa}$$

$$m = \frac{320}{0.85\times35} = 10.76$$

$$\rho = \frac{1}{10.76}\left(1-\sqrt{1-\frac{2\times10.76\times2.2}{320}}\right) = 0.0072$$

$\rho_{min}(=0.0044) < \rho < \rho_{max}(=0.037)$

maka digunakan ρ = 0.0076

As_{perlu} = ρ.b.d

= 0.0072x1000x112.5 = 810 mm^2

menurut SK SNI 15-1991 pasal 3.16.6-5

disebutkan :

Jarak tulangan utama ≤ 3xtebal pelat (=450 mm)

≤ 500 mm

Digunakan tulangan lentur Ø 10-200

As_{ada} = (3.14x0.25x15^2) x (1000/200)

= 883.13 m^2 > 810 mm^2 Ok!

BAB IV

PERENCANAAN STRUKTUR ATAP

BAB IV

PERENCANAAN STRUKTUR ATAP

4.1 Desain Atap

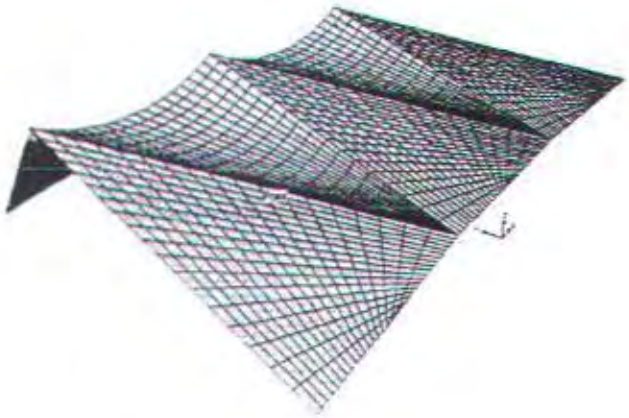
Atap merupakan bagian dari struktur Stadion digunakan sebagai pelindung di area tribun penonton. Atap didesain untuk melingkupi seluruh area tribun mengelilingi stadion.

Struktur atap terdiri dari dua bagian yaitu penutup atap dan rangka atap. Penutup atap terbuat dari bahan membran fiber dari bahan polikarbon. Bahan ini memiliki kelebihan selain kuat juga ringan. Rangka atap terbuat dari bahan rangka baja.

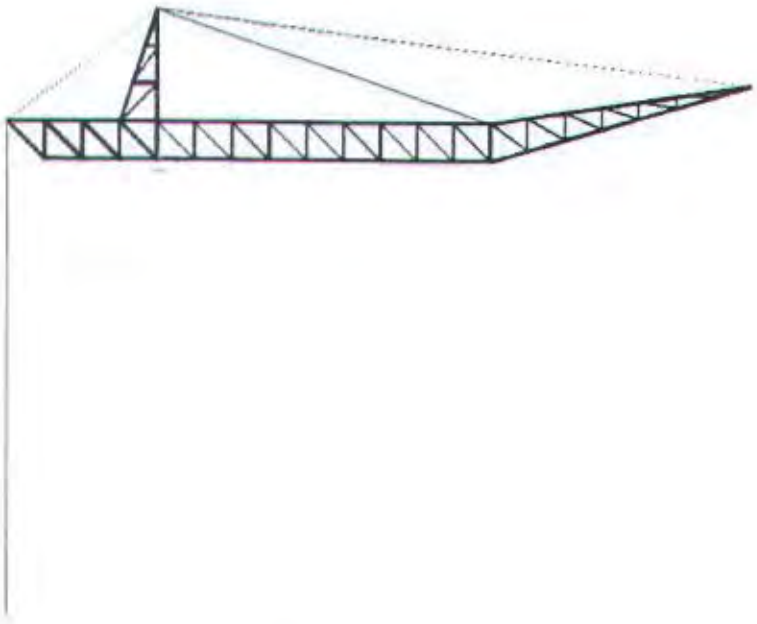
4.2 Pemodelan Struktur

Dalam mendesain atap,, struktur penutup dimodelkan sebagai sistem tenda dengan sebuah asumsi bahwa struktur tersebut tidak mengalami perubahan bentuk (tetap). Beban diteruskan pada ujung-ujung membran dengan perletakan sebagi sendi. Reaksi yang ditimbulkan selanjutnya diteruskan sebagai beban yang bekerja pada rangka batang.

Rangka batang dimodelkan sebagai struktur space truss, yang membentuk kantilever. Untuk memperoleh kestabilan struktur ditambah dengan elemen kabel yang akan menerima beban tarik menuju ke perletakan bawah. Perletakan dibawah dihubungkan dengan kolom baja sebagai kolom tarik yang selanjutnya menghubungkan ke bagian struktur bawah.



Gambar 4.1 Perspektif Penutup Atap



Gambar 4.2 Rangka Atap

4.3 Pembebanan

Pembebanan yang didesain pada struktur atap meliputi :

- Beban mati

  Beban mati terjadi akibat berat membran dan berat rangka baja. Perhitungan beban mati dilakukan dengan memasukkan data dimensi membran dan juga profil rangka baja pada analisa SAP 2000.

- Beban hidup

  Beban hidup yang bekerja pada rangka baja adalah beban pekerja. Sesuai dengan Peraturan Pembebanan PPI 1983 beban hidup yang bekerja pada rangka batang diwujudkan sebagi beban terpusat P = 100 kg.

- Beban angin

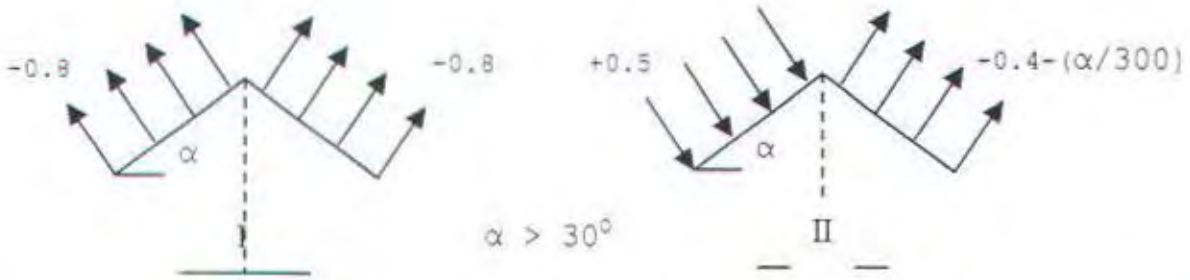
  Beban angin bekerja pada membran penutup atap. Sesuai dengan PPI 1983 pasal 4.4.(2) besarnya beban angin untuk daerah sekitar pantai adalah sebesar 40 kg/m^2 dan pada pasal 4.3.(3) maka besarnya koefisien beban angin untuk atap miring tanpa dinding diperhitungkan dengan memperhatikan dua kondisi.

Gambar 4.3 Potongan Melintang Atap

Maka didapatkan sudut miring atap pada arah datang angin adalah

- Arctg(7/4) = 60.23°
- Arctg(5/(27.8687-23.8708) = 51.36°

Besarnya sudut α = 60.23° s/d 51.36° > 30°



Gambar 4.4 Koefisien angin pada atap pelana tanpa dinding (arah angin dari kiri)

Dari dua kondisi di atas diambil kondisi yang paling berbahaya.

Pada kondisi II sisi atap kanan, diambil sudut terbesar untuk menentukan koefisien menjadi

= -0.4-(60.23/300) = 0.60

Sesuai dengan peraturan pembebanan diambil tekanan tiup sebesr 40 kg/m^2 untuk daerah tepi pantai samapi 5 km dari pantai.

Maka besrnya beban angin tegak lurus terhadap permukaan atap adalah

Untuk kondisi I

$q_{ka/ki}$ = -0.8·40 = 0.32 kg/m^2

Untuk kondisi II

q_{ka} = 0.5·40 = 0.20 kg/m^2

q_{ki} = 0.6·40 = 0.24 kg/m^2

Kombinasi pembebanan yang dilakukan meliputi

- 1.4 DL
- 1.2 DL + 1.6 LL
- 1.2 DL + 1.3 WL + 0.5 LL
- 1.2 DL - 1.3 WL + 0.5 LL
- 0.9 DL + 1.3 WL
- 0.9 DL - 1.3 WL

4.4 Analisa Struktur Rangka Atap

Analisa struktur atap meliputi 2 macam yaitu analisa beban pada penutup atap sehingga menghasilkan beban-beban pada perletakan. Selanjutnya dijadikan beban-beban terpusat pada rangka atap. Analisa pada rangka atap akan menghasilkan gaya dalam pada batang-batang rangka atap. Selain itu juga dihasilkan reaksi pada perletakan rangka atap yang menjadi beban terpusat pada pembebanan struktur utama

4.5 Simulasi Kegagalan Struktur

Pada analisa struktur atap dilakukan pula permodelan struktur dengan mensimulasikan terjadinya kegagalan pada elemen struktur kabel. Kabel pada bagian tertentu disimulasikan tidak bekerja atau putus. Selanjutnya dilakukan analisa pengaruhnya terhadap elemen rangka atap. Pada bagian ini rangka atap dirangkai untuk seluruh atap stadion. Simulasi yang dilakukan ada tiga macam yaitu :

1. Simulasi 1

   Pada bagian ini semua elemen struktur bekerja secara normal, tidak terjadi kegagalan struktur.

2. Simulasi 2

   Pada bagian ini terjadi kegagalan struktur atau putus 2 bentang kabel bawah pada sisi panjang stadion.

3. Simulasi 3

Pada bagian ini terjadi kegagalan struktur atau putus 4 bentang kabel bawah pada sisi panjang stadion

Dari ketiga simulasi tersebut dilakukan perbandingan untuk digunakan dalam perencanaan elemen struktur rangka atap.

Dari hasil simulasi tersebut juga dapat dilihat bahwa akibat simulasi kedua maka akan terjadi perubahan gaya aksial pada elemen rangka atap namun perubahan yang terjadi tidak seragam pada masing-masing elemen bergantung pada posisis mana elemen tersebut berada. Demikian halnya pada simulasi ketiga. Sehingga sebuah elemen dapat tiba-tiba memiliki gaya aksial yang jauh lebih besar, lebih kecil ataupun berubah dari tekan menjadi tarik dan sebaliknya.

Hasil dari perbandingan tersebut ditabelkan dan dibuat grafik pada bagian lampiran.

4.6 Perencanaan Dimensi

Dalam merencanakan batang-batang rangka atap, didesain menggunakan profil Circular Hollow Section (CHS). Sesuai dengan peraturan LRFD perencanaan batang-batang tersebut adalah sebagi berikut :

Gambar 4.5 Penampang Profil CHS

4.6.1 Perencanaan Batang Tarik

Contoh perhitungan :

1. Batang diagonal

Pu = 21310 kg

Dicoba profil CHS 165.2-5.0

Ag = 25.16 cm^2

g = 19.8 kg/m

r = 5.67 cm

l = 150 cm

Kontrol kelangsingan

$\lambda = l/r = 150/5.67 = 26.5 < \lambda_{ijin} = 300$

Kuat tarik rencana

$Pu \leq \emptyset Pn$

Kontrol kuat leleh

$\emptyset Pn = 0.9 \cdot Ag \cdot fy$

$= 0.9x19.8x2500$

$= 44550$ kg

Kontrol kuat putus

$\emptyset Pn = 0.75 \cdot A_e \cdot f_u$

$= 0.75x19.8x3200$

$= 47520$ kg

keterangan

$A_e = A \cdot U$ untuk pengelasan A = Ag & U = 1

Maka $A_e = A_g$

Diambil yang terkecil

Pu < ØPn = 44550 kg Ok!

2. Batang horizontal atas

Pu = 16750 kg

Dicoba profil CHS 165.2-5.0

Ag = 25.16 cm^2

g = 19.8 kg/m

r = 5.67 cm

l = 200 cm

Kontrol kelangsingan

$\lambda = l/r = 150/5.67 = 26.5 < \lambda_{ijin} = 300$

Kuat tarik rencana

Pu ≤ ØPn

Kontrol kuat leleh

ØPn = 0.9·Ag·fy

= 0.9x19.8x2500

= 44550 kg

Kontrol kuat putus

$ØPn = 0.75 \cdot A_e \cdot f_u$

= 0.75x19.8x3200

= 47520 kg

keterangan

$A_e = A \cdot U$ untuk pengelasan A = Ag & U = 1

Maka $A_e = A_g$

Diambil yang terkecil

Pu < ØPn = 44550 kg Ok!

4.6.2 Perencanaan Batang Tekan

Pu ≤ ØPn

D/t ≤ λr

$\lambda \leq \lambda_{ijin}$ λ_{ijin} batang tekan = 200

Contoh perhitungan

1. Batang horizontal bawah

Pu = -49550 kg

Dicoba profil CHS 165.2-5.0

Ag = 25.16 cm^2

g = 19.8 kg/m

r = 5.67 cm

l = 200 cm

Kontrol kelangsingan elemen penampang

$$\frac{D}{t} = \frac{165.2}{5.0} = 33.04$$

$$\lambda r = \frac{0.144E}{fy} = \frac{0.144 \cdot 2 \cdot 10^5}{250} = 115.2$$

$$\frac{D}{t} \le \lambda r \rightarrow \quad Q = 1$$

Kontrol kelangsingan komponen struktur tekan

K = 0.9 (untuk chord member)

Kl = 0.9 x 200 = 180 cm

λ = Kl/r = 180/5.67 = 31.75

$\lambda \le \lambda_{ijin} = 200$

$$\lambda c = \frac{\lambda}{\pi}\sqrt{\frac{fy}{E}} = \frac{31.75}{3.14}\sqrt{\frac{250}{2 \cdot 10^5}} = 0.358$$

$$\lambda c\sqrt{Q} = 0.358\sqrt{1} = 0.358 \le 1.5$$

$$Fcr = Q \cdot \left(0.685^{Q \cdot \lambda c^2}\right) \cdot fy$$

$$= 1 \cdot \left(0.685^{0.358^2}\right) \cdot 2500$$

$$= 2381.67 \cdot kg/cm^2$$

$\phi Pn = 0.85 \cdot Fcr \cdot A_g$

= 0.75x2381.67x25.16

= 50934.4 kg

Pu $\le$ ØPn Ok !

2. Batang vertikal

Pu = -14740 kg

Dicoba profil CHS 89.1-4.0

Ag = 10.69 cm^2

g = 8.39 kg/m

r = 3.01 cm

l = 230.7 cm

Kontrol kelangsingan elemen penampang

$$\frac{D}{t} = \frac{89.1}{4.0} = 22.275$$

$$\lambda r = \frac{0.144E}{fy} = \frac{0.144 \cdot 2 \cdot 10^5}{250} = 115.2$$

$$\frac{D}{t} \le \lambda r \rightarrow Q = 1$$

Kontrol kelangsingan komponen struktur tekan

K = 0.9 (untuk chord member)

Kl = 0.9 x 230.7 = 207.63 cm

λ = Kl/r = 207.63/3.01 = 68.98

$\lambda \le \lambda_{ijin} = 200$

$$\lambda c = \frac{\lambda}{\pi}\sqrt{\frac{fy}{E}} = \frac{68.98}{3.14}\sqrt{\frac{250}{2 \cdot 10^5}} = 0.777$$

$$\lambda c\sqrt{Q} = 0.777\sqrt{1} = 0.777 \le 1.5$$

$$Fcr = Q \cdot \left(0.685^{Q \cdot \lambda c^2}\right) \cdot fy$$

$$= 1 \cdot \left(0.685^{0.777^2}\right) \cdot 2500$$

$$= 1989.8 \cdot kg/cm^2$$

$\phi Pn = 0.85 \cdot Fcr \cdot A_g$

= 0.75x1989.8x10.69

= 15953.6 kg

Pu $\le$ ϕPn Ok !

4.6.3 Perencanan Kabel Tarik

Kabel tarik direncanakan dengan baja BJ 50

f_y = 290 MPa

f_u = 5000 Mpa

Gambar 4.6 Penampang Kabel

Perhitungan kabel depan

P_u = 37.041 ton = 37041 kg

L = 25.20974 m

Kuat tarik rencana

Pu = ØPn

Kontrol kuat leleh

ØPn = 0.9·Ag·fy

37041 = 0.9xAgx2900

$$A_g = \frac{37041}{0.9x2900}$$

$$= 14.19cm^2$$

Kontrol kuat putus

ØPn = 0.75·Ae·fu

37041 = 0.75xAex5000

$$A_g = \frac{37041}{0.75x5000}$$

$$= 9.88cm^2$$

∴diambil yang terbesar Ag = 14.19 cm^2 dengan $\phi = 4.25cm$

$\approx 5cm$

Perhitungan kabel tengah

P_u = 40.7573 ton = 40757.3 kg

L = 14.25 m

Kuat tarik rencana

Pu = ØPn

Kontrol kuat leleh

ØPn = 0.9·Ag·fy

40757 = 0.9xAgx2900

$$A_g = \frac{40757}{0.9x2900}$$

$$= 15.62cm^2$$

Kontrol kuat putus

ØPn = 0.75·Ae·fu

40757 = 0.75xAex5000

$$A_g = \frac{40757}{0.75x5000}$$

$$= 10.87cm^2$$

∴diambil yang terbesar Ag = 15.62cm² dengan $\phi = 4.46cm$

$\approx 5cm$

Perhitungan kabel bawah

P_u = 68.811 ton = 68811 kg

L = 20.76951 m

Kuat tarik rencana

Pu = ØPn

Kontrol kuat leleh

ØPn = 0.9·Ag·fy

68811 = 0.9xAgx2900

$$A_g = \frac{68811}{0.9x2900}$$

$$= 26.36cm^2$$

Kontrol kuat putus

ØPn = 0.75·Ae·fu

68811 = 0.75xAex5000

$$A_g = \frac{68811}{0.75x5000}$$

$$= 18.35cm^2$$

∴diambil yang terbesar Ag = 26.36cm² dengan $\phi = 5.795cm$

$\approx 6cm$

4.6.4 Perencanan Kolom Tarik

Pu = 57376 kg

Dicoba profil Pipa 318.5-6.0

Ag = 46.2 cm²

l = 400 cm

BJ 41

Kontrol kelangsingan

$\lambda = l/r = 400/3.01 = 133.33 < \lambda_{ijin} = 300$

Kuat tarik rencana

Pu ≤ ØPn

Kontrol kuat leleh

ØPn = 0.9·Ag·fy

= 0.9x46.2x2500

= 103950 kg

Kontrol kuat putus

$\text{ØPn} = 0.75 \cdot A_e \cdot f_u$

= 0.75x46.2x3200

= 110880 kg

keterangan

$A_e = A \cdot U$ untuk pengelasan A = Ag & U = 1

Maka $A_e = A_g$

Diambil yang terkecil

Pu < ØPn = 103950 kg Ok

Gambar 4.7 Penampang Kolom Tarik

4.7 Pelaksanaan Pemasangan Rangka Atap

Untuk mengetahui urutan pelaksanaan pemasangan rangka atap guna mencegah terjadinya kegagalan. Akan dijelaskan sebagai berikut

1. Tahap 1

Pemasangan segmen pertama rangka atap sepanjang 13.5 m. Rangka atap diangkat oleh kran kemudian diletakkan pada perletakan dengan dibantu dengan perancah/scafolding sekaligus sebagi akses pemasangan. Selanjutnya kabel utama bawah dipasang. Untuk menjaga kestabilan karena rangka atap belum terpasang penuh dilakukan pemasangan kabel sementara pada bagian depan yang diangker pada blok beton.

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Gambar 4.8 Pemasangan rangka atap tahap 1

2. Tahap 2

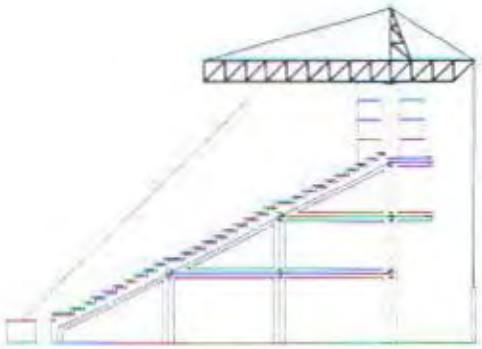
Pemasangan rangka atap bagian atas (segmen kedua) setinggi 4.5 m. Rangka bagian ini diangkat dengan kran dan dilas pada rangka atap sebelumnya.

Gambar 4.9 Pemasangan rangka atap tahap 2

3. Pemasangan segmen rangka atap ketiga sepanjang 6 m. Rangka diangkat oleh kran selanjutnya ketika masih dalam keadaan tergantung disambung dengan rangka atapa sebelumnya.

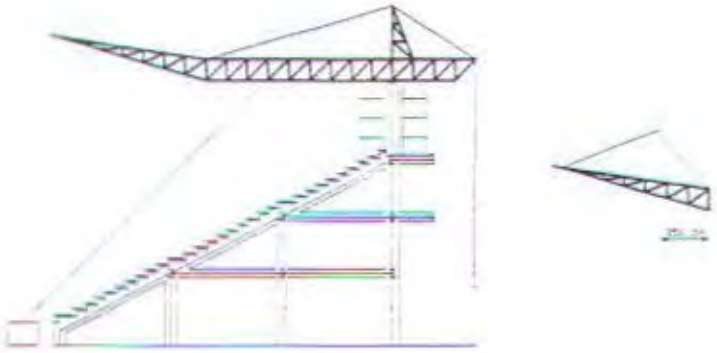
Gambar 4.10 Pemasangan rangka atap tahap 3

4. Pemasangan kabel utama atas bagian depan dan belakang.



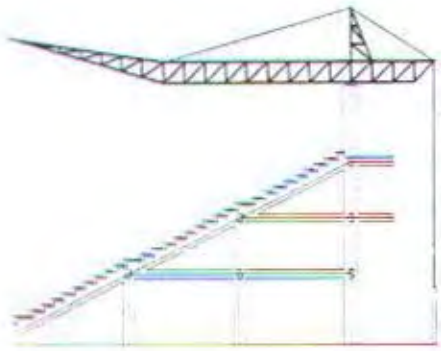
Gambar 4.11 Pemasangan rangka atap tahap 4

5. Pemasangan segmen rangka atap ke empat sepanjang 10.5 m. Rangka diangkat oleh kran selanjutnya ketika masih dalam keadaan tergantung disambung dengan rangka atap sebelumnya.



Gambar 4.12 Pemasangan rangka atap tahap 5

6. Kabel sementara dilepaskan.Dan rangka atap telah selesai.



Gambar 4.13 Pemasangan rangka atap tahap 7

BAB V

PERENCANAAN STRUKTUR UTAMA

BAB V

PERENCANAAN STRUKTUR UTAMA

5.1 Analisa Struktur Utama

Struktur utama secara umum merupakan bagian dari seluruh struktur yang akan menerima pembebanan yang berasal dari beban mati, beban hidup yang merupakan beban gravitasi. Namun juga menerima beban lateral yaitu beban gempa dan juga beban angin.

5.1.1 Permodelan Struktur

Dalam perencanaan struktur Stadion Sepuluh Nopember ini dibagi menjadi 3 bagian yaitu struktur atap, rangka atap dan struktur beton (utama). Struktur atap dimodelkan sebagai struktur membran yang menerima beban mati, hidup dan angin. Selanjutnya diteruskan pada rangka atap dan struktur utama. Selain menerima beban-beban dari atap, struktur utama juga menerima beban lateral.

Secara umum seluruh beban akan diterima oleh elemen rangka (frame), baik balok induk, balok anak, balok miring dan kolom.

5.1.2 Perhitungan Pembebanan Akibat Beban Gravitasi

Pembebanan akibat gravitasi dari pelat akan dihitung menggunakan metode tributary area. Hasil tersebut akan dibebankan secara merata pada frame (balok), sedangkan untuk berat sendiri dari balok kolom akan diperhitungkan lewat program analisa struktur.

1. Pembebanan akibat Pelat

Dari perhitungan pembebanan pelat pada bab sebelumnya didapatkan,

Beban Pelat Lantai :

Beban mati = 423 kg/m^2

Beban Hidup = 400 kg/m^2

Pembebanan Tributary Area

Beban Segitiga

$R = \frac{1}{2} q \times Lx$

$P_1 = P_2 = R$

$R = \frac{1}{2} P (\frac{1}{2} L_x) = \frac{1}{4} P L_x$

Momen Maksimum di tengah bentang :

Beban Segitiga >>

$M_{max} = \frac{1}{4} P L_x (\frac{1}{2} L_x) - P L_x (1/3.1/2 L_x)$

$= 1/12 P L_x^2$

Beban Ekuivalen >>

$M_{max} = 1/8 q_{ek} L_x^2$

$1/12 P L_x^2 = 1/8 q_{ek} L_x^2$

$q_{ek} = 1/3 q Lx$

Beban Trapesium

$P = \frac{1}{2} L_x$

$P_1 = \frac{1}{2} P(\frac{1}{2} L_x) = \frac{1}{4} PL_x$

$P_2 = \frac{1}{2} P (L_y - L_x)$

Beban Trapesium >>

$M_{max} = R \frac{1}{2} L_y - P_1(\frac{1}{2} L_y - 2/3 \frac{1}{2} L_x) - P_2 \frac{1}{2} \frac{1}{2}(L_y - L_x)$

$= 1/8 P L_y^2 - \frac{1}{2} P L_x^2$

Beban ekuivalen >>

$M_{max} = 1/8\ q_{ek}\ L_x^2$

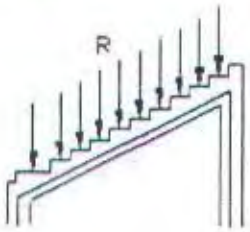
M_{max} Trapesium = M_{max} Ekuivalen

$1/8\ P\ L_y^2 - \frac{1}{2}\ P\ L_x^2 = 1/8\ q_{ek}\ L_x^2$

$\mathbf{q_{ek} = \frac{1}{2}\ qL_x(1-1/3(L_x/L_y)^2)}$

Hasil perhitungan dibuat dalam tabel dan disertakan pada lampiran.

2. Pembebanan akibat Tribun



Gambar 5.1 Pembebanan Pada Balok Tribun

Pembebanan akibat tribun diterima oleh balok Tribun sebagai beban terpusat di sepanjang bentang sesuai dengan posisi tribun. Besarnya nilai R adalah sesuai dengan perhitungan sebagi berikut.

Pembebanan dalam arah vertikal :

Beban Tribun (per elemen / deret) :

Beban mati = 534 kg/m

Beban hidup = 375 kg/m

- Beban mati
  - Berat sendiri balok = 0.21 x 2400 = 504 kg/m
  - Berat tempat duduk = 30 kg/m

  qD = 534 kg/m

- Beban hidup

  - qL = 0.75 x 500 kg/m^2 = 375 kg/m

  Kombinasi pembebanan

  qu = 1.2 qD + 1.6 qL

  = 1.2·534 + 1.6·375 = 1240.8 kg/m

  R = ½ W·L

  = ½ 1240.8·L

Selanjutnya kan ditabelkan sebagai berikut,

Tabel 5.1 Perhitungan Beban akibat tribun

	Tribun A				Tribun B			
	No	L (m)	qu (ton)	R (ton)	No	L (m)	qu (ton)	R (ton)
Tribun atas	1	8.0012	1.2408	4.963944	1	7.6194	1.2408	4.727076
	2	7.9767	1.2408	4.948745	2	7.5493	1.2408	4.683586
	3	7.9521	1.2408	4.933483	3	7.4792	1.2408	4.640096
	4	7.9276	1.2408	4.918283	4	7.4091	1.2408	4.596606
	5	7.8949	1.2408	4.897996	5	7.3157	1.2408	4.53866
	6	7.8703	1.2408	4.882734	6	7.2456	1.2408	4.49517
	7	7.8458	1.2408	4.867534	7	7.1755	1.2408	4.45168
	8	7.8213	1.2408	4.852335	8	7.1054	1.2408	4.40819
	9	7.7968	1.2408	4.837135	9	7.0353	1.2408	4.3647
	10	7.764	1.2408	4.816786	10	6.9418	1.2408	4.306693
Tribun bawah 3	1	7.8703	1.2408	4.882734	1	7.2454	1.2408	4.495046
	2	7.8458	1.2408	4.867534	2	7.1753	1.2408	4.451556
	3	7.8213	1.2408	4.852335	3	7.1052	1.2408	4.408066
	4	7.7968	1.2408	4.837135	4	7.0351	1.2408	4.364576
	5	7.7723	1.2408	4.821935	5	6.965	1.2408	4.321086
	6	7.7478	1.2408	4.806735	6	6.8949	1.2408	4.277596
	7	7.7233	1.2408	4.791535	7	6.8248	1.2408	4.234106
	8	7.6988	1.2408	4.776336	8	6.7547	1.2408	4.190616
	9	7.6743	1.2408	4.761136	9	6.6846	1.2408	4.147126
	10	7.6498	1.2408	4.745936	10	6.6145	1.2408	4.103636
	11	7.6331	1.2408	4.735575	11	6.5678	1.2408	4.074663
Tribun bawah 2	1	7.6085	1.2408	4.720313	1	6.4977	1.2408	4.031173
	2	7.584	1.2408	4.705114	2	6.4276	1.2408	3.987683
	3	7.5595	1.2408	4.689914	3	6.3575	1.2408	3.944193
	4	7.535	1.2408	4.674714	4	6.2874	1.2408	3.900703

	5	7.5105	1.2408	4.659514	5	6.2173	1.2408	3.857213
	6	7.486	1.2408	4.644314	6	6.1472	1.2408	3.813723
	7	7.4615	1.2408	4.629115	7	6.0771	1.2408	3.770233
	8	7.437	1.2408	4.613915	8	6.007	1.2408	3.726743
	9	7.4125	1.2408	4.598715	9	5.9369	1.2408	3.683253
	10	7.388	1.2408	4.583515	10	5.8668	1.2408	3.639763
	11	7.3713	1.2408	4.573155	11	5.8201	1.2408	3.61079
Tribun bawah								
1	1	7.3467	1.2408	4.557893	1	5.75	1.2408	3.5673
	2	7.3222	1.2408	4.542693	2	5.6799	1.2408	3.52381
	3	7.2977	1.2408	4.527493	3	5.6098	1.2408	3.48032
	4	7.2732	1.2408	4.512293	4	5.5397	1.2408	3.43683
	5	7.2487	1.2408	4.497093	5	5.4696	1.2408	3.39334
	6	7.2242	1.2408	4.481894	6	5.3995	1.2408	3.34985
	7	7.1997	1.2408	4.466694	7	5.3294	1.2408	3.30636
	8	7.1752	1.2408	4.451494	8	5.2593	1.2408	3.26287
	9	7.1507	1.2408	4.436294	9	5.1892	1.2408	3.21938
	10	7.1262	1.2408	4.421094	10	5.1191	1.2408	3.17589
	11	7.1095	1.2408	4.410734	11	5.0723	1.2408	3.146855

5.1.3 Perhitungan Pembebanan Akibat Beban Gempa

Beban lateral merupakan beban yang terjadi akibat gempa. Pada perencanaan kali ini digunakan metode statik equivalen sesuai dengan peraturan PPGIUG yang didistribusikan di setiap lantai.

5.1.3.1 Perhitungan berat bangunan total

1. Lantai 1 (h = 1 m)

   Beban Mati

   - Balok tribun =2.4x4.497x0.6x0.4x88 = 227.9 ton
   - Tribun = 2x32x26.67 + 2x56x19.46 = 3886.4 ton
   - Kolom = 2.4x0.5x0.6x0.8 = 0.576 ton

   \+

   Berat total = **4114.88 ton**

2. Lantai 2 (h = 5 m)

Beban Mati

- Pelat =2.4x0.12x(60.0x32+49.5x56
  +62.1x8+55.5x8) = 1622.2 ton
- Balok tribun =2.4x8.994x0.6x0.4x88 = 455.8 ton
- Tribun = 2x32x50.28 + 2x56x39.65 = 7658.3 ton
- Balok induk = 2.4x0.4x0.6x (38.32x32
  +35.66x56) = 1856.6 ton
- Balok anak = 2.4x0.35x0.5x (15.5x40
  +14.2x56) = 642.1 ton
- Kolom = 2.4x88x(2.5x0.6x0.8+
  4.5x0.6x0.8+4.5x 0.6x1.0) = 1279.9 ton
- Utilitas+pipa=0.03(30.3x32+25.5x56) = 71.9 ton
- Spesi lantai = 2.2x0.02x(30.3x32+
  25.5x56) = 105.5 ton

+

Berat mati = 13692.3 ton

Beban Hidup

- Beban hidup =0.4x(60.0x32+49.5x56+62.1x8+55.5x8)
  = 2253.12 ton

Berat total = 13692.3 + 2253.12 = **15945.42 ton**

3. Lantai 3 (h = 9 m)

Beban Mati

- Pelat = 2.4x0.12x(62.1x24+55.5x12+
  23.8x11) = 696.44 ton
- Balok tribun =2.4x8.994x0.6x0.4x88 = 455.8 ton
- Tribun = 2x32x52.07+2x56x44.75 = 8344.1 ton

- Balok induk =2.4x0.4x0.6x(23.7x88+ 3x46) = 1280.8 ton
- Balok anak =2.4x0.35x0.5x(18.76x36 +3x8) = 293.7 ton
- Kolom =2.4x88x(2x0.6x0.8+4x0.6x1) = 591.36 ton
- Utilitas+pipa=0.03x(62.1x24+55.5x12 +23.8x11) = 72.5 ton
- Spesi lantai = 2.2x0.02x(62.1x24+ 55.5x12+23.8x11) = 116.1 ton

Berat mati = 11850.8 ton

Beban Hidup

- Beban hidup = 0.4x(62.1x24+55.5x12+23.8x11) = 967.28 ton

Berat total = 11850.8 + 967.28 = **12818.08 ton**

4. Lantai 4 (h = 13 m)

Beban Mati

- Pelat = 2.4x0.12x(23.8x88) = 696.44 ton
- Balok tribun =2.4x4.5x0.6x0.4x88 = 228.1 ton
- Tribun = 2x32x24.26+2x56x22.04 = 4021.3 ton
- Balok induk =2.4x0.4x0.6x88x(3+7.3)= 522.9 ton
- Balok anak =2.4x0.35x0.5x88x3 = 110.9 ton
- Kolom= 2.4x0.6x0.9x(46x4+22x2+4x (9.5+9+8.5+8+7.50 = 573.12 ton
- Spesi lantai = 2.2x0.02x(23.8x88) = 92.2 ton

Berat mati = 6244.96 ton

Beban Hidup

- Beban hidup = 0.4x(23.8x88)
  = 837.76 ton

Berat total = 6244.96 + 837.76 = **7082.72 ton**

5. Lantai 5 (h = 17 m)

Beban Mati

- Balok tribun =2.4x8.99x0.6x0.4x46 = 238.2 ton
- Tribun = 2x32x26.67 + 2x12x19.46 = 4215.9 ton
- Balok induk = 2.4x0.4x0.6x44x(7.76+ 7.89+8.03) = 600.1 ton
- Kolom = 2.4x0.6x1x(16x7+ 4x6.5+4x6) = 233.28 ton

Berat mati = 5287.48 ton

Berat total = **5287.48 ton**

6. Atap (h = 20.73 m)

Beban Mati

Berat rangka + atap = 6.98x44 = 307.12 ton

Beban Hidup

Beban hidup = 13.36x44 = 587.84 ton

Berat total = 307.12+587.84 = **894.96 ton**

Berat total seluruh bangunan

= 4114.88+15945.42 + 12818.08+7082.72+5287.48+894.96

= **46224.39 ton**

5.1.3.2 Perhitungan Gaya Geser Dasar Gempa

Perhitungan gaya geser horizontal total akibat gempa

$V = C \cdot I \cdot K \cdot W_t$

Dengan penentuan variabel sebagai berikut :

Waktu getar bangunan

$T_x = T_y = 0.06 \cdot H^{3/4}$

$H = 22$ m

$T_x = T_y = 0.06 \cdot 22^{3/4}$

$= 0.6095$ detik

Koefisien gempa dasar sesuai dengan zone gempa empat untuk $T_x = T_y = 0.6095$ detik ; $C = 0.05$

Faktor keutamaan bangunan I = 1.5 untuk gedung yang bersifat monumental.

Faktor jenis struktur K = 2.5 untuk jenis struktur portal dengan ikatan diagonal.

Gaya geser horizontal total akibat gempa

$V_x = V_y = C \cdot I \cdot K \cdot W_t$

$= 0.05 \times 1.5 \times 2.5 \times 46224390$

$= 8667073$ kg

Distribusi gaya geser horizontal arah X

$$F_{i,x} = \frac{Wi \cdot Hi}{\sum Wi \cdot Hi} \times V_x$$

Distribusi gaya geser horizontal arah Y

$$F_{i,y} = \frac{Wi \cdot Hi}{\sum Wi \cdot Hi} \times V_y$$

Tabel 5.2 Distribusi gaya geser dasar horizontal total

Tingkat	hi	Wi (kg)	Wihi (kgm)	Fix,y (kg)	Vix,y (kg)
6	20.73	894.96	18552.5208	400775.66	8634834.40
5	17	5287.48	89887.16	1941762.35	8234058.74
4	13	7082.72	92075.36	1989032.33	6292296.39
3	9	12818.08	115362.72	2492091.04	4303264.06
2	5	15945.42	79727.1	1722282.48	1811173.03
1	1	4114.88	4114.88	88890.55	88890.55
		46143.54	399719.741	8634834.402	

5.1.3.3 Kontrol Drift Antar Tingkat

Sesuai dengan PPKGURG pasal 2.6.3 dijelaskan bahwa perbandingan antar tingkat dan tinggi tingkat tidak lebih dari 0.005 dan dalam segala hal simpangan tidak lebih dari 2 cm.

Besarnya drift diambil dari analisa struktur dengan memperhatikan nilai yang paling besar baik arah x maupun y.

Tabel 5.2 Distribusi gaya geser dasar horizontal total

Tingkat	hi m	A m	Ai m	di	dimaks m	Aimaks m	Kontrol
6	3.73	0.0334	0.018153	0.00486676	0.005	0.02	Ok!
5	4	0.015247	0.014124	0.00353100	0.005	0.02	Ok!
4	4	0.001123	0.000203	0.00005075	0.005	0.02	Ok!
3	4	0.00092	0.000208	0.00005200	0.005	0.02	Ok!
2	4	0.000712	0.000286	0.00007150	0.005	0.02	Ok!
1	1	0.000426	0.000426	0.00042600	0.005	0.02	Ok!

5.1.4 Perhitungan Pembebanan Akibat Beban Angin

Untuk perhitungan akibat beban angin, diperhitungkan yang terjadi pada atap. Dan telah dilakukan analisa pada bab sebelumnya sehingga menghasilkan reaksi yang

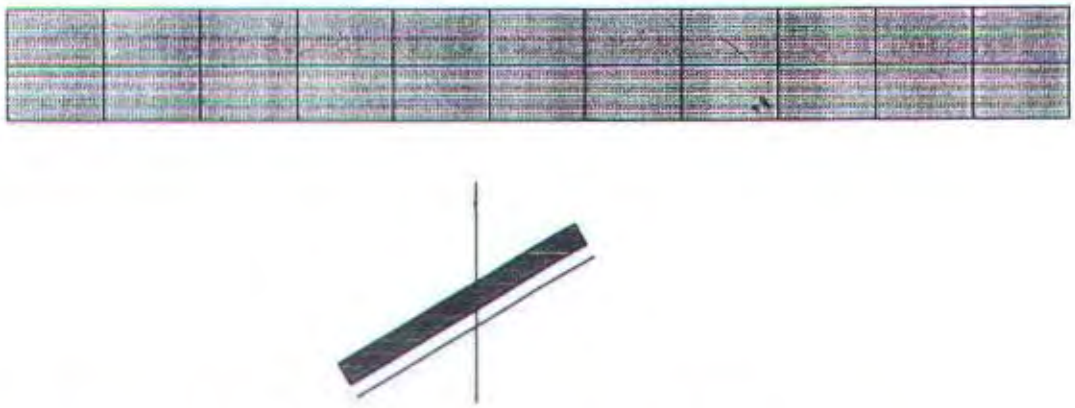
dibebankan pada struktur utama, terutama pada bagian kolom penyangga rangka atap.

5.1.5 Permodelan Pembebanan Untuk Beban Kritis

Juga dilakukan permodelan pembebanan untuk mendapatkan beban kritis terutama pada daerah tribun atas. Kombinasi permodelan pembebanan tersebut antara lain.

1. Model 1

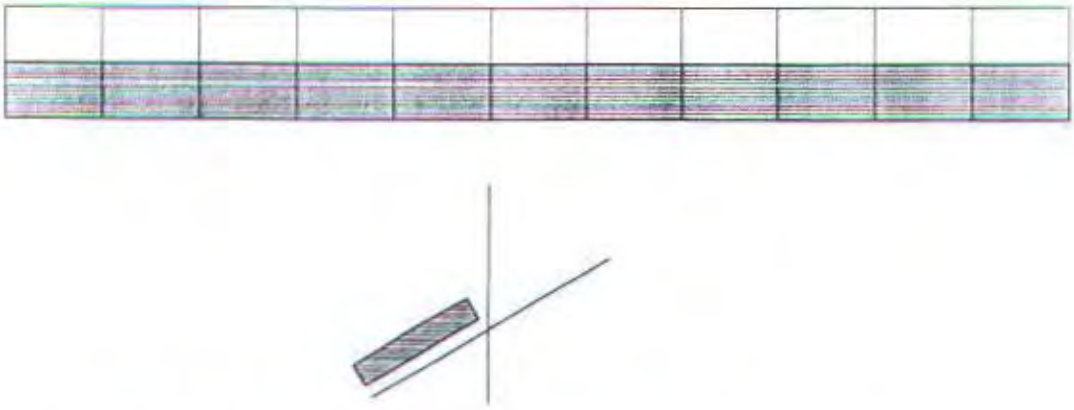
Pembebanan pada bagian tribun atas dilakukan dengan memberi beban hidup penuh pada sisi depan dan belakang.



Gambar 5.2 Model Pembebanan Pertama pada tribun

2. Model 2

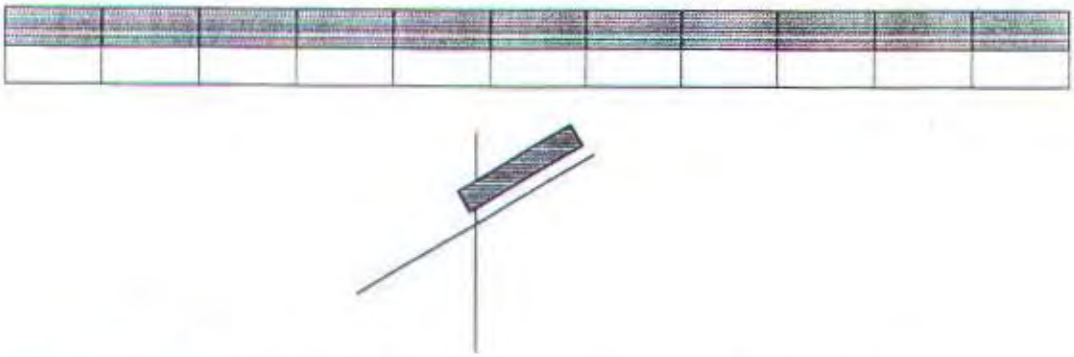
Pembebanan pada bagian tribun atas dilakukan dengan memberi beban hidup penuh pada sisi depan dan menghilangkan beban hidup pada sisi belakang



Gambar 5.3 Model Pembebanan Kedua pada tribun

3. Model 3

Pembebanan pada bagian tribun atas dilakukan dengan menghilangkan beban hidup pada sisi depan dan memberi beban hidup penuh pada sisi belakang.



Gambar 5.4 Model Pembebanan Ketiga pada tribun

4. Model 4

Pembebanan pada bagian tribun atas dilakukan dengan melakukan pemberian beban hidup secara acak.

Gambar 5.5 Model Pembebanan keempat pada tribun

5.2 Perhitungan Elemen Struktur Utama

Setelah dilakukan analisa struktur maka akan dihasilkan besarnya beban pada elemen-elemen struktur. Selanjutnya dilakukan analisa untuk menentukan dimensi maupun penulangan struktur.

5.2.1 Perhitungan Balok Induk Portal

Data-data perencanaan balok induk :

fc' = 35 Mpa

fy = 390 Mpa

Dimensi balok 600/400

D tulangan longitudinal = 22 mm

D tulangan transversal = 10 mm

d = 600 - 40 - 10 - ½ (22) = 539 mm

5.2.1.1 Penulangan Lentur

1. Pada tumpuan

Hasil momen yang didapatkan :

Mu(-) = -44.7094 tm

Mu(+) = 5.07 tm

Tulangan Atas negatif (tarik)

$$Rn = \frac{44.7094 \times 10^7}{0.8 \times 400 \times 539^2} = 4.809$$

$$m = \frac{390}{0.85 \times 35} = 13.11$$

Syarat penulangan

$$\rho b = \frac{0.85 \times 35 \times 0.81}{390}\left(\frac{600}{600+390}\right)$$

$= 0.0374$

$\rho_{max} = 0.75 \times 0.0374$

$= 0.028$

$\rho_{min} = 1.4/fy = 1.4/390 = 0.00359$

$$\rho_{perlu} = \frac{1}{13.11}\left(1-\sqrt{1-\frac{2\times 13.11\times 4.809}{390}}\right) = 0.01353$$

$$\rho_{min}(=0.00359) < \rho_{perlu} < \rho_{max}(=0.028)$$

maka digunakan $\rho = 0.01353$

As $= \rho_{perlu} \cdot b \cdot d$

$= 0.01353 \cdot 400 \cdot 539 = 2917.26\ mm^2$

Digunakan tulangan lentur D 22

Juml. Tul $= 2917.26/(3.14 \times 0.25 \times 22^2)$

$= 7.678 \approx 8$ batang

Tulangan Bawah positif (tekan)

$$\frac{Mu^+}{Mu^-} = \frac{5.07}{44.7094} = 0.1134$$

$\rho' = 0.1134 \cdot 0.01353 = 0.001534$

$$\rho_{min}(=0.00359) > \rho_{perlu}$$

maka digunakan $\rho = 0.00359$

As $= \rho_{perlu} \cdot b \cdot d$

$= 0.00359 \cdot 400 \cdot 539$

$= 330.79\ mm^2$

Juml. Tul $= 330.79/(3.14 \times 0.25 \times 22^2)$

$= 0.87 \approx 2$ batang

tulangan lentur bawah dipakai paling tidak dua batang tulangan (SKSNI 1991 pasal 3.14.9.3-a)

maka tulangan yang dipakai :

tulangan atas = 8-D22

tulangan bawah = 2-D22

2. Pada lapangan

Hasil momen yang didapatkan :

Mu = 33.17004 tm

Tulangan Bawah (tarik)

$$Rn = \frac{33\times10^7}{0.8\times400\times539^2} = 3.55$$

$$m = \frac{390}{0.85\times35} = 13.11$$

Syarat penulangan

$$\rho b = \frac{0.85\times35\times0.81}{390}\left(\frac{600}{600+390}\right)$$

$$= 0.0374$$

ρ_{max} = 0.75 x 0.0374

= 0.028

ρ_{min} = 1.4/fy = 1.4/390 = 0.00359

$$\rho_{perlu} = \frac{1}{13.11}\left(1-\sqrt{1-\frac{2\times13.11\times3.55}{390}}\right) = 0.009722$$

$$\rho_{min}(=0.00359) < \rho_{perlu} < \rho_{max}(=0.028)$$

maka digunakan ρ = 0.009722

As = $\rho_{perlu}\cdot b\cdot d$

= 0.009722·400·539 = 2096.094 mm^2

Digunakan tulangan lentur D 22

Juml. Tul= $2096.094/(3.14x0.25x^2)$

= 5.516 ≈ 6 batang

Tulangan Atas

As' = ½ As

= ½ 2096.094 = 1048.047 mm^2

Juml. Tul= $1048.047/(3.14x0.25x22^2)$

= 2.758 ≈ 4 batang

maka tulangan yang dipakai :

tulangan atas = 4-D22

tulangan bawah = 8-D22

5.2.1.2 Penulangan Geser

Untuk daerah sepanjang d dari muka kolom, spasi maksimum tulangan geser tidak boleh melebihi nilai yang telah diatur dalam SKSNI 1991 pasal 3.14.9.3.3 dan pasal 3.14.9.3.10-b, yaitu :

- d/4 = 539 / 4 = 134.75 mm
- 10 x ϕ tul. Longitudinal = 10x22 = 220 mm
- 24 x ϕ sengkang = 24x10 = 240 mm
- 300 mm

Dipasang tulangan geser ϕ10-100

Untuk daerah diluar sepanjang d dari muka kolom spasi dihitung sebagai berukut.

Gaya geser yang terjadi pada tumpuan

Vu = 28.5810 ton (pada tumpuan)

Dihitung dari muka kolom

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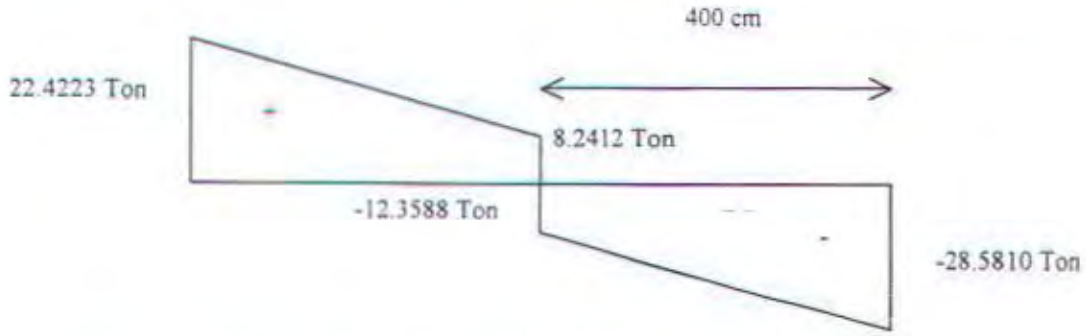


Vu = 28.5810x(4000-300)/4000

= 24.022 ton

= 24022 kg

$$\frac{Vu}{0.6} = \frac{24022}{0.6} = 40.04 \cdot kg$$

$$Vc = \frac{1}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{1}{6} \times \sqrt{35} \times 400 \times 539$$

$$= 251630.6 \cdot N$$

chek kemampuan penampang untuk geser

$$Vn = \frac{5}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{5}{6} \times \sqrt{35} \times 400 \times 539$$

$$= 1258153 \cdot N \approx 125815.3 \cdot kg$$

Vn > $\frac{Vu}{0.6}$ Tulangan sengkang diperlukan

Dipakai D tulangan 10 mm

Av = 2 x 3.14 x 0.25 x 10^2 = 157 mm^2

$$S = \frac{Av \times fy \times d}{\left(\frac{Vu}{\phi} - Vc\right)} = \frac{157 \times 390 \times 539}{\left(\frac{24022 \times 9.81}{0.6} - 251630.6\right)} = 276.8 \cdot mm$$

Kontrol jarak tulangan

bila $Vn - Vc \geq \frac{1}{3}\sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{4}$

$Vn - Vc \leq \frac{1}{3}\sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{2}$

$$\frac{1}{3}\sqrt{fc'} \times bw \times d = \frac{1}{3}\sqrt{35} \times 400 \times 539 = 503261.2 \cdot N$$

$$Vn - Vc = \frac{24022 \times 9.81}{0.6} - 251630.6 = 141129.1 \cdot N$$

Harga $Vn - Vc \leq \frac{1}{3}\sqrt{fc'} \times bw \times d$

$$S_{max} = \frac{d}{2} = \frac{539}{2} = 269.5 \cdot mm$$

Jadi diambil jarak tulangan diambil 200 mm

5.2.1.3 Penulangan Torsi

Tu = 1.464 tm

= $1.4 \cdot 10^7$ Nmm

Σx^2y = $(400^2 \times 600) = 9.6 \cdot 10^7$ mm^3

Kuat momen torsi nominal yang disumbangkan beton :

$$\phi Tc = \phi\left(\frac{1}{15}\sqrt{fc'}\,\Sigma x^2 y\right) = 0.6\left(\frac{1}{15}\sqrt{35} x 9.6 \times 10^7\right) = 2.272 \cdot 10^7\ Nmm$$

Karena : Tu < ϕTc → Torsi diabaikan !

5.2.1.4 Perhitungan Panjang Penyaluran

Perhitungan panjang penyaluran tulangan D-22 berdasarkan SKSNI 1991 pasal 3.5.2 meliputi beberapa hal sebagai berikut :

(1) Panjang penyaluran tulangan tarik

Panjang penyaluran dasar adalah :

$$Ldb = \frac{0{,}02.Ab.fy}{\sqrt{fc'}} = \frac{0{,}02x379.94.x390}{\sqrt{35}} = 500.93mm$$

dan tidak boleh kurang dari :

$$Ldb = 0{,}06.db.fy = 0{,}06x22x390 = 514.8mm$$

Maka panjang penyaluran, $Ld = 1{,}4.Ldb = 1{,}4x514 = 719.6mm$

$Ld \geq 300mm$

(2) Panjang penyaluran tulangan tekan

Panjang penyaluran dasar adalah :

$$Ldb = \frac{.db.fy}{4\sqrt{fc'}} = \frac{22x390}{4x\sqrt{35}} = 362.6mm$$

dan tidak boleh kurang dari :

$$Ldb = 0{,}04.db.fy = 0{,}04x22x390 = 343.2mm$$

$Ld \geq 200mm$

(3) Panjang penyaluran kait standar (hook) dalam tarik

Panjang penyaluran dasar hook adalah :

$$lhb = \frac{100.db}{\sqrt{fc'}} = \frac{100x22}{\sqrt{35}} = 371.9mm$$

Panjang penyaluran hook :

$$ldh = lhb(0{,}7)\left(\frac{fy}{400}\right) = 371.9x0{,}7x\left(\frac{390}{400}\right) = 253.8mm$$

$ldh \geq 8.db = 8x22 = 176mm$

$ldh \geq 150mm$

(4) Panjang penyaluran tulangan momem positif

1/3 tulangan momen positif pada tumpuan dan 1/4 tulangan momen positif komponen struktur menerus harus diteruskan ke dalam tumpuan min. sepanjang :

- 150 mm
- d = 539 mm
- 12 d_b = 12 x 22 = 264 mm

(5) Panjang penyaluran dari tulangan tarik pada momen negatif

1/3 tulangan tarik pada tulangan negatif diteruskan pada jarak terbesar antara :

- d = 539 mm
- 12db = 12 x 22 = 264 mm
- ln / 16 = 8000/16 = 500 mm

5.2.2 Perhitungan Balok Tribun

5.2.2.1 Penulangan Lentur

Data-data perencanaan Balok Tribun :

fc' = 35 Mpa

fy = 390 Mpa

Dimensi balok 700/500

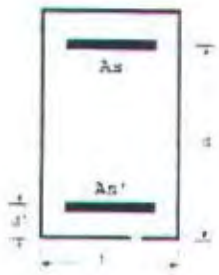
L = 894 cm

D tulangan longitudinal = 25 mm

D tulangan transversal = 12 mm

d = 700 - 40 - 10 - ½ (25) = 637.5 ≈ 638 mm

1. Pada tumpuan



Hasil momen yang didapatkan :

Mu(-) = -85.935 tm

Mu(+) = 50.07 tm

Tulangan Atas Positif (tarik)

$$Rn = \frac{85.935 \times 10^7}{0.8 \times 500 \times 638^2} = 5.27$$

$$m = \frac{390}{0.85 \times 35} = 13.11$$

Syarat penulangan

$$\rho b = \frac{0.85 \times 35 \times 0.81}{390}\left(\frac{600}{600+390}\right)$$

$= 0.0374$

$\rho_{max} = 0.75 \times 0.0374$

$= 0.028$

$\rho_{min} = 1.4/fy = 1.4/390 = 0.00359$

$$\rho_{perlu} = \frac{1}{13.11}\left(1 - \sqrt{1 - \frac{2 \times 13.11 \times 5.27}{390}}\right) = 0.015$$

$$\rho_{min}(=0.00359) < \rho_{perlu} < \rho_{max}(=0.028)$$

maka digunakan $\rho = 0.015$

$As = \rho_{perlu} \cdot b \cdot d$

$= 0.015 \cdot 500 \cdot 638 = 4785 \text{ mm}^2$

Digunakan tulangan lentur D 25

Juml. Tul= $4785/(3.14 \times 0.25 \times 25^2)$

$= 9.75 \approx 10$ batang

Tulangan Bawah positif (tekan)

$$\frac{Mu^{+}}{Mu^{-}} = \frac{50.07}{85.935} = 0.583$$

ρ' = 0.583·0.015 = 0.008745

$$\rho_{min}(=0.00359) < \rho_{perlu} < \rho_{max}(=0.028)$$

maka digunakan ρ = 0.008745

As = ρ_{perlu}·b·d

= 0.008745·500·638

= 2789.655 mm^2

Jum1. Tul = 2789.655/(3.14x0.25x25^2)

= 5.69 ≈ 6 batang

maka tulangan yang dipakai :

tulangan atas = 10-D25

tulangan bawah = 6-D25

2. Pada lapangan

Hasil momen yang didapatkan :

Mu = 43.809 tm

Tulangan Bawah (tarik)

$$Rn = \frac{43.809 \times 10^{7}}{0.8 \times 400 \times 638^{2}} = 3.363$$

$$m = \frac{390}{0.85 \times 35} = 13.11$$

Syarat penulangan

$$\rho b = \frac{0.85 \times 35 \times 0.81}{390}\left(\frac{600}{600+390}\right)$$

= 0.0374

ρ_{max} = 0.75 x 0.0374

= 0.028

ρ_{min} = 1.4/fy = 1.4/390 = 0.00359

$$\rho_{perlu} = \frac{1}{13.11}\left(1 - \sqrt{1 - \frac{2 \times 13.11 \times 3.363}{390}}\right) = 0.00918$$

$$\rho_{min}(= 0.00359) < \rho_{perlu} < \rho_{max}(= 0.028)$$

maka digunakan ρ = 0.00918

As = $\rho_{perlu} \cdot b \cdot d$

= 0.00918·400·638 = 2342.74 mm^2

Digunakan tulangan lentur D 25

Juml. Tul= 2342.74/(3.14x0.25x25^2)

= 4.775 ≈ 6 batang

Tulangan Atas

As' = ½ As

= ½ 2342.74 = 1171.37 mm^2

Juml. Tul= 1171.37 /(3.14x0.25x252^2)

= 2.8875 ≈ 4 batang

maka tulangan yang dipakai :

tulangan atas = 4-D25

tulangan bawah = 6-D25

5.2.2.2 Penulangan Geser

Untuk daerah sepanjang d dari muka kolom, spasi maksimum tulangan geser tidak boleh melebihi nilai yang telah diatur dalam SKSNI 1991 pasal 3.14.9.3.3 dan pasal 3.14.9.3.10-b, yaitu :

- d/4 = 638 / 4 = 159.5 mm
- 10 x ϕ tul. Longitudinal = 10x25 = 250 mm
- 24 x ϕ sengkang = 24x14 = 336 mm
- 300 mm

Dipasang tulangan geser ϕ10-100

Untuk daerah diluar sepanjang d dari muka kolom spasi dihitung sebagai berukut.

Gaya geser yang terjadi pada tumpuan

Vu = 56.8515 ton (pada tumpuan)

Dihitung Vu dari muka kolom

Vu = 56.8515x(4600-300)/4600

= 48.966 ton

= 48966 kg

$$\frac{Vu}{0.6} = \frac{48966}{0.6} = 81610 \cdot kg$$

$$Vc = \frac{1}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{1}{6} \times \sqrt{35} \times 400 \times 638$$

$$= 251630.6 \cdot N$$

chek kemampuan penampang untuk geser

$$Vn = \frac{5}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{5}{6} \times \sqrt{35} \times 400 \times 638$$

$$= 1258153 \cdot N \approx 125815.3 \cdot kg$$

$Vn > \frac{Vu}{0.6}$ Tulangan sengkang diperlukan

Dipakai D tulangan 15 mm

Av = 2 x 3.14 x 0.25 x 14^2 = 307.72 mm^2

$$S = \frac{Av \times fy \times d}{\left(\frac{Vu}{\phi} - Vc\right)} = \frac{307.72 \times 390 \times 638}{\left(\frac{48966 \times 9.81}{0.6} - 251630.6\right)} = 139.46 \cdot mm$$

Kontrol jarak tulangan

bila $Vn - Vc \geq \frac{1}{3}\sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{4}$

$Vn - Vc \leq \frac{1}{3}\sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{2}$

$$\frac{1}{3}\sqrt{fc'} \times bw \times d = \frac{1}{3}\sqrt{35} \times 400 \times 638 = 503261.2 \cdot N$$

$$Vn - Vc = \frac{48966 \times 9.81}{0.6} - 140901.7 = 297332.9 \cdot N$$

Harga $Vn - Vc \leq \frac{1}{3}\sqrt{fc'} \times bw \times d$

$$S_{max} = \frac{d}{2} = \frac{638}{2} = 319 \cdot mm$$

Jadi diambil jarak tulangan diambil 125 mm

5.2.2.3 Penulangan Torsi

Tu = 0.29 tm

= $2.85 \cdot 10^6$ Nmm

$\Sigma x^2y = (500^2 \times 700) = 17.5 \cdot 10^7$ mm^3

Kuat momen torsi nominal yang disumbangkan beton :

$$\phi Tc = \phi\left(\frac{1}{15}\sqrt{fc'}.\Sigma x^2 y\right) = 0.6\left(\frac{1}{15}\sqrt{35}x17.5\times10^7\right) = 6.902\cdot10^7\ Nmm$$

Karena : Tu < ϕTc → Torsi diabaikan !

5.2.2.4 Perhitungan Panjang Penyaluran

Perhitungan panjang penyaluran tulangan D-25 berdasarkan SKSNI 1991 pasal 3.5.2 meliputi beberapa hal sebagai berikut :

(6) Panjang penyaluran tulangan tarik

Panjang penyaluran dasar adalah :

$$Ldb = \frac{0{,}02.Ab.fy}{\sqrt{fc'}} = \frac{0{,}02x490.9.x390}{\sqrt{35}} = 647.15mm$$

dan tidak boleh kurang dari :

$$Ldb = 0{,}06.db.fy = 0{,}06x25x390 = 585mm$$

Maka panjang penyaluran, $Ld = 1{,}4.Ld = 1{,}4x647.15 = 906mm$

$Ld \geq 300mm$

(7) Panjang penyaluran tulangan tekan

Panjang penyaluran dasar adalah :

$$Ldb = \frac{.db.fy}{4\sqrt{fc'}} = \frac{25x390}{4x\sqrt{35}} = 445mm$$

dan tidak boleh kurang dari :

$$Ldb = 0{,}04.db.fy = 0{,}04x25x390 = 390mm$$

$Ld \geq 200mm$

(8) Panjang penyaluran kait standar (hook) dalam tarik

Panjang penyaluran dasar hook adalah :

$$lhb = \frac{100.db}{\sqrt{fc'}} = \frac{100x25}{\sqrt{35}} = 456mm$$

Panjang penyaluran hook :

$$ldh = lhb(0,7)\left(\frac{fy}{400}\right) = 456x0,7x\left(\frac{390}{400}\right) = 312mm$$

$$ldh \geq 8.db = 8x25 = 200mm$$

$$ldh \geq 150mm$$

(9) Panjang penyaluran tulangan momem positif

1/3 tulangan momen positif pada tumpuan dan 1/4 tulangan momen positif komponen struktur menerus harus diteruskan ke dalam tumpuan min. sepanjang :

- 150 mm
- d = 638 mm
- 12 d_b = 12 x 25 = 300 mm

(10) Panjang penyaluran dari tulangan tarik pada momen negatif

1/3 tulangan tarik pada tulangan negatif diteruskan pada jarak terbesar antara :

- d = 638 mm
- 12db = 12 x 25 = 300 mm
- ln / 16 = 6600/16 = 412,5 mm

5.2.3 Perhitungan Balok Tribun Atas

Data-data perencanaan Balok Tribun :

fc' = 35 Mpa

fy = 390 Mpa

Dimensi balok 700/500

L = 447 cm

D tulangan longitudinal = 25 mm

D tulangan transversal = 10 mm

d = 700 - 40 - 10 - ½ (25) = 637.5 ≈ 638 mm

5.2.3.1 Penulangan Lentur

Hasil momen yang didapatkan :

Mu = -99.26 tm

Tulangan Atas (tarik)

$$Rn = \frac{99.26 \times 10^7}{0.8 \times 500 \times 638^2} = 6.09$$

$$m = \frac{390}{0.85 \times 35} = 13.11$$

Syarat penulangan

$$\rho b = \frac{0.85 \times 35 \times 0.81}{390}\left(\frac{600}{600+390}\right)$$

$$= 0.0374$$

ρ_{max} = 0.75 x 0.0374

= 0.028

ρ_{min} = 1.4/fy = 1.4/390 = 0.00359

$$\rho_{perlu} = \frac{1}{13.11}\left(1 - \sqrt{1 - \frac{2 \times 13.11 \times 6.09}{390}}\right) = 0.01765$$

$$\rho_{min}(=0.00359) < \rho_{perlu} < \rho_{max}(=0.028)$$

maka digunakan ρ = 0.01765

As = $\rho_{perlu} \cdot b \cdot d$

= 0.01765·500·638 = 5633.4 mm^2

Digunakan tulangan lentur D 25

Jumi. Tul= 5633.4/(3.14x0.25x25^2)

= 11.5 ≈ 12 batang

Tulangan Bawah (tekan)

Diambil setengah dari tulangan tarik

As' = ½ As

= ½ 4856.4 = 2428.2 mm^2

Jumi. Tul= 2816.7/(3.14x0.25x25^2)

= 5.7 ≈ 6 batang

maka tulangan yang dipakai :

tulangan atas = 12-D25

tulangan bawah = 6-D25

5.2.3.2 Penulangan Geser

Untuk daerah sepanjang d dari muka kolom, spasi maksimum tulangan geser tidak boleh melebihi nilai yang telah diatur dalam SKSNI 1991 pasal 3.14.9.3.3 dan pasal 3.14.9.3.10-b, yaitu :

- d/4 = 638 / 4 = 159.5 mm
- 10 x ϕ tul. Longitudinal = 10x25 = 250 mm
- 24 x ϕ sengkang = 24x15 = 360 mm
- 300 mm

Dipasang tulangan geser ϕ10-125

Untuk daerah diluar sepanjang d dari muka kolom spasi dihitung sebagai berukut.

Gaya geser yang terjadi pada tumpuan

Vu = 43.4 ton (pada tumpuan)

Dihitung Vu dari muka kolom

Vu = 43.4x(4000-500)/4000

= 37.975 ton

= 37975 kg

$$\frac{Vu}{0.6} = \frac{37975}{0.6} = 63292 \cdot kg$$

$$Vc = \frac{1}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{1}{6} \times \sqrt{35} \times 500 \times 638$$

$$= 314538.2 \cdot N$$

chek kemampuan penampang untuk geser

$$Vn = \frac{5}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{5}{6} \times \sqrt{35} \times 500 \times 638$$

$$= 1572691.2 \cdot N \approx 160315.1 \cdot kg$$

Vn > $\frac{Vu}{0.6}$ Tulangan sengkang diperlukan

Dipakai D tulangan 15 mm

Av = 2 x 3.14 x 0.25 x 15^2 = 354 mm^2

$$S = \frac{Av \times fy \times d}{\left(\frac{Vu}{\phi} - Vc\right)} = \frac{354 \times 390 \times 638}{\left(\frac{37975 \times 9.81}{0.6} - 314538.2\right)} = 287.5 \cdot mm$$

Kontrol jarak tulangan

bila $Vn - Vc \geq \frac{1}{3}\sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{4}$

$Vn - Vc \leq \frac{1}{3}\sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{2}$

$$\frac{1}{3}\sqrt{fc'} \times bw \times d = \frac{1}{3}\sqrt{35} \times 500 \times 638 = 629076.5 \cdot N$$

$$Vn - Vc = \frac{48966 \times 9.81}{0.6} - 140901.7 = 306353.05 \cdot N$$

Harga $Vn - Vc \leq \frac{1}{3}\sqrt{fc'} \times bw \times d$

$$S_{max} = \frac{d}{2} = \frac{638}{2} = 319 \cdot mm$$

Jadi diambil jarak tulangan diambil 200 mm

5.2.3.3 Penulangan Torsi

Tu = 2.37 tm

= $2.325 \cdot 10^7$ Nmm

Σx^2y = $(500^2 \times 700) = 17.5 \cdot 10^7$ mm^3

Kuat momen torsi nominal yang disumbangkan beton :

$$\phi Tc = \phi\left(\frac{1}{15}\sqrt{fc'}\,\Sigma x^2 y\right) = 0.6\left(\frac{1}{15}\sqrt{35} x 17.5 \times 10^7\right) = 6.902 \cdot 10^7\ Nmm$$

Karena : Tu < ϕTc → Torsi diabaikan !

5.2.4 Perhitungan Balok Kantilever

Data-data perencanaan Balok Tribun :

fc' = 35 Mpa

fy = 390 Mpa

Dimensi balok 600/400

L = 300 cm

D tulangan longitudinal = 25 mm

D tulangan transversal = 10 mm

d = 600 - 40 - 10 - ½ (25) = 537.5 ≈ 538 mm

5.2.4.1 Penulangan Lentur

Hasil momen yang didapatkan :

Mu = -59.46 tm

Tulangan Atas (tarik)

$$Rn = \frac{59.46 \times 10^7}{0.8 \times 400 \times 538^2} = 6.41$$

$$m = \frac{390}{0.85 \times 35} = 13.11$$

Syarat penulangan

$$\rho b = \frac{0.85 \times 35 \times 0.81}{390}\left(\frac{600}{600+390}\right)$$

= 0.0374

ρ_{max} = 0.75 x 0.0374

= 0.028

$\rho_{min} = 1.4/fy = 1.4/390 = 0.00359$

$$\rho_{perlu} = \frac{1}{13.11}\left(1-\sqrt{1-\frac{2\times 13.11\times 6.41}{390}}\right) = 0.0149$$

$\rho_{min}(=0.00359) < \rho_{perlu} < \rho_{max}(=0.028)$

maka digunakan ρ = 0.0149

As = $\rho_{perlu} \cdot b \cdot d$

= $0.0149 \cdot 400 \cdot 538$ = 3204.1 mm^2

Digunakan tulangan lentur D 25

Juml. Tul= $3204.1/(3.14x0.25x25^2)$

= 6.5 ≈ 8 batang

Tulangan Bawah (tekan)

Diambil setengah dari tulangan tarik

As' = ½ As

= ½ 4856.4 = 2428.2 mm^2

Juml. Tul= $1602.15/(3.14x0.25x25^2)$

= 3.25 ≈ 4 batang

maka tulangan yang dipakai :

tulangan atas = 8-D25

tulangan bawah = 4-D25

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5.2.4.2 Penulangan Geser

Untuk daerah sepanjang d dari muka kolom, spasi maksimum tulangan geser tidak boleh melebihi nilai yang telah diatur dalam SKSNI 1991 pasal 3.14.9.3.3 dan pasal 3.14.9.3.10-b, yaitu :

- d/4 = 638 / 4 = 159.5 mm

- 10 x ϕ tul. Longitudinal = 10x25 = 250 mm
- 24 x ϕ sengkang = 24x10 = 360 mm
- 300 mm

Dipasang tulangan geser ϕ10-125

Untuk daerah diluar sepanjang d dari muka kolom spasi dihitung sebagai berukut.

Gaya geser yang terjadi pada tumpuan

Vu = -26.89 ton (pada tumpuan)

Dihitung Vu dari muka kolom

Vu = 26.89x(3000-500)/3000

= 22.408 ton

= 22408 kg

$$\frac{Vu}{0.6} = \frac{22408}{0.6} = 37347 \cdot kg$$

$$Vc = \frac{1}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{1}{6} \times \sqrt{35} \times 400 \times 539$$

$$= 251630.6 \cdot N$$

chek kemampuan penampang untuk geser

$$Vn = \frac{5}{6} \times \sqrt{fc'} \times bw \times d$$

$$= \frac{5}{6} \times \sqrt{35} \times 400 \times 539$$

$$= 1258153 \cdot N \approx 125815.3 \cdot kg$$

Vn > $\frac{Vu}{0.6}$ Tulangan sengkang diperlukan

Dipakai D tulangan 10 mm

Av = 2 x 3.14 x 0.25 x 10^2 = 157 mm^2

$$S = \frac{Av \times fy \times d}{\left(\frac{Vu}{\phi} - Vc\right)} = \frac{157 \times 390 \times 539}{\left(\frac{22408 \times 9.81}{0.6} - 251630.6\right)} = 223.5 \cdot mm$$

Kontrol jarak tulangan

bila $Vn - Vc \geq \frac{1}{3}\sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{4}$

$Vn - Vc \leq \frac{1}{3}\sqrt{fc'} \times bw \times d$ maka $S_{max} = \frac{d}{2}$

$$\frac{1}{3}\sqrt{fc'} \times bw \times d = \frac{1}{3}\sqrt{35} \times 400 \times 539 = 503261.2 \cdot N$$

$$Vn - Vc = \frac{22408 \times 9.81}{0.6} - 251630.6 = 14740.2 \cdot N$$

Harga $Vn - Vc \leq \frac{1}{3}\sqrt{fc'} \times bw \times d$

$$S_{max} = \frac{d}{2} = \frac{539}{2} = 269.5 \cdot mm$$

Jadi diambil jarak tulangan diambil 200 mm

5.2.4.3 Penulangan Torsi

Tu = 2.37 tm

= $2.325 \cdot 10^7$ Nmm

$\Sigma x^2y = (500^2 \times 700) = 17.5 \cdot 10^7$ mm^3

Kuat momen torsi nominal yang disumbangkan beton :

$$\phi Tc = \phi\left(\frac{1}{15}\sqrt{fc'}\,\Sigma x^2 y\right) = 0.6\left(\frac{1}{15}\sqrt{35}x17.5\times10^7\right) = 6.902\cdot10^7\ Nmm$$

Karena : Tu < ϕTc → Torsi diabaikan !

5.2.5 Perhitungan Kolom

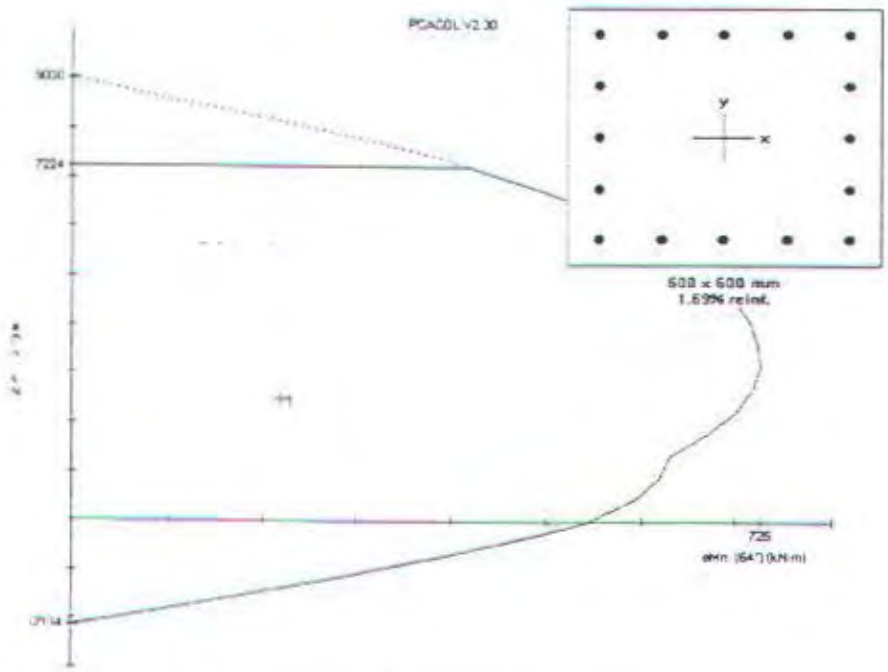
5.2.5.1 Perhitungan tulangan memanjang

1. Kolom 1

Data-data sebagai berikut :

- Dimensi kolom 600 mm x 600 mm
- fy = 390 Mpa
- fc' = 35 Mpa
- Beban aksial = -250.3875 Ton
- Momen arah X = 9.69156 Ton m.
- Momen arah Y = 19.7888 Ton m.

Data-data tersebut dimasukkan ke dalam input program bantu analisa kolom "PCACOOL" didapatkan hasil analisa seperti pada gambar.



Gambar 5.6 Diagram Interaksi kolom 1

Dari **analisa tersebut** didapatkan :

ρ = 1.69 %

As = 6080 mm^2

16 D-22

Jarak antar tulangan = 98 mm

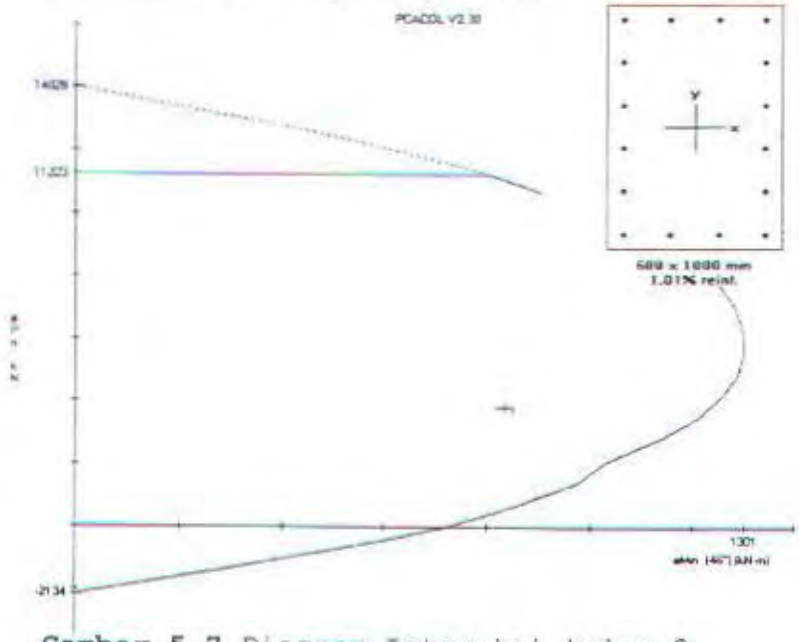
Sesuai dengan

2. Kolom 2

Data-data sebagai berikut :

- Dimensi kolom 1000 mm x 600 mm
- fy = 390 Mpa
- fc' = 35 Mpa
- Beban aksial = -383.1412 Ton
- Momen arah X = 58.13531 Ton m.
- Momen arah Y = 59.96000 Ton m.

Data-data tersebut dimasukkan ke dalam input program bantu analisa kolom "PCACOOL" didapatkan hasil analisa seperti pada gambar.



Gambar 5.7 Diagram Interaksi kolom 2

Dari analisa tersebut didapatkan :

ρ = 1.01 %

As = 6080 mm^2

16 D-22

Jarak antar tulangan = 137 mm

Sesuai dengan SK SNI T-15-1991-03 pasal 3.3.9-1

1% < ρ < 8% Ok!

5.2.5.2 Perhitungan tulangan geser

1. Kolom 1

Vuk = (Muka + Mukb)/hn

= (75.06 + 75.06)/3.6

= 41.7 ton = 417 kN

d = 600-40-10-0.5x22 = 539 mm

$$Vc = \left(1 + \frac{N_u}{14 \cdot A_g}\right)\frac{\sqrt{fc'}}{6} bw \cdot d$$

$$= \left(1 + \frac{250.3875 \cdot 9.81}{14 \cdot 360000}\right)\frac{\sqrt{fc'}}{6} 600 \cdot 539$$

$$= 319032.12 \cdot N$$

Dipakai D tulangan 15 mm

Av = 2 x 3.14 x 0.25 x 15^2 = 354 mm^2

$$Vs = \frac{A_v \cdot fy \cdot d}{s}$$

$$= \frac{354 \cdot 390 \cdot 539}{150}$$

$$= 496095.6 \cdot N$$

$$\phi(Vc + Vs) = 0.6(319032.12 + 496095.6)$$

$$= 489076.63 \cdot N > 417000 \cdot N \qquad \text{Ok!}$$

2. Kolom 2

Vuk = (Muka + Mukb)/hn

= (84.5 + 84.5)/4.7

= 35.957 ton = 359.57 kN

d = 800-40-10-0.5x22 = 739 mm

$$Vc = \left(1 + \frac{N_u}{14 \cdot A_g}\right)\frac{\sqrt{fc'}}{6} bw \cdot d$$

$$= \left(1 + \frac{383.1412 \cdot 9.81}{14 \cdot 600 \cdot 1000}\right)\frac{\sqrt{fc'}}{6} 600 \cdot 739$$

$$= 437393.9 \cdot N$$

Dipakai D tulangan 15 mm

Av = 2 x 3.14 x 0.25 x 15^2 = 354 mm^2

$$Vs = \frac{A_v \cdot fy \cdot d}{s}$$

$$= \frac{354 \cdot 390 \cdot 739}{200}$$

$$= 510131.7 \cdot N$$

$$\phi(Vc + Vs) = 0.6(437393.9 + 510131.7)$$

$$= 568515.36 \cdot N > 359570 \cdot N \qquad \text{Ok!}$$

5.2.6 Perhitungan Hubungan Balok Kolom

1. Hubungan Balok Kolom Interior

Data-data perencanaan :

- Dimensi kolom 600 mm x 600 mm
- Dimensi balok induk 600 mm x 400 mm
- As balok induk 8D-22
- As'balok induk 4D-22
- fy = 390 Mpa
- fc' = 35 Mpa

Tinjauan Balok Utama

As = $8x0.25x3.14x22^2$

= 3039.52 mm^2

$$T = 0.70\frac{M_{kap}}{d}$$

$$= 0.70 \cdot As \cdot \alpha \cdot fy\frac{\left(d - a_2\right)}{d}$$

$$= 0.70 \cdot 2279.64 \cdot 390 \cdot 1.25 \cdot \frac{\left(539 - a_2\right)}{539}$$

$$= 1443.3\left(539 - a/2\right)$$

$$T = C = 0.85 \cdot fc' \cdot a \cdot b$$

$$= 0.85 \cdot 35 \cdot a \cdot 400$$

$$= 11900a$$

$11900a = 1443.3\left(539 - a/2\right)$ dibagi a

$$a = \frac{777938.7}{12621.6} = 61.64 \cdot mm$$

$$M_{kap} = 2279.64 \cdot 390 \cdot 1.25 \cdot \left(539 - 61.64/2\right)$$

$$= 564752884.4 \cdot Nmm$$

$$= 564.75 \cdot kNm$$

$$T = 0.7 \cdot M_{kap}/d$$

$$= 0.7 \times 564.75/0.539$$

$$= 733.44 \cdot kN$$

Tinjauan Kolom

$$V_{kol} = 0.70 \times \frac{\left[\frac{l_{ki}}{l_{ki}'} \times M_{kap,ki} + \frac{l_{ka}}{l_{ka}'} \times M_{kap,ka}\right]}{0.5\left(h_{ka} + h_{kb}\right)}$$

$$= 0.70 \times \frac{\left[\frac{8000}{7400} \times 564752884.4 + \frac{8000}{7400} \times 564752884.4\right]}{0.5\left(4000 + 5000\right)}$$

$$= 189946.92 \cdot N$$

$$V_{jh} = T - V_{kol} + C$$

$$= 733440 - 189946.92 + 733440$$

$$= 1276933.08 \cdot N$$

Mencari lebar join bj

Bila $b_j > b$

1. $b_j = b_k = 600$ mm
2. $b_j = b + 0.5h_k$

$= 400 + 0.5 \times 600$

$= 700$ mm

diambil harga terkecil $b_j = 600$ mm

$$V_{jh} = \frac{V_{jh}}{b_j \times h_k}$$

$$= \frac{1276933.08}{600 \times 600}$$

$$= 3.547 \cdot N / mm^2$$

Syarat : $1.5\sqrt{fc'} = 1.5\sqrt{35} = 8.874 \cdot N / mm^2 > 3.547 \cdot N / mm^2$ Ok!

Tegangan geser yang dipikul oleh beton

$$V_{ch} = \frac{2}{3}\sqrt{\left[\frac{N_{nk}}{A_g} - 0.1fc'\right]}$$

$$= \frac{2}{3}\sqrt{\left[\frac{2503850}{600 \times 600} - 0.1 \times 35\right]}$$

$$= 1.713 \cdot N / mm^2$$

$$V_{sh} = V_{jh} - V_{ch}$$

$$= 3.547 - 1.713$$

$$= 1.834 \cdot N / mm^2$$

Penulangan geser yang dibutuhkan

$$A_{sh} = \frac{V_{sh} \cdot b \cdot s}{fy}$$

$$= \frac{1.834 \cdot 600 \cdot 50}{390}$$

$$= 141.077 \cdot mm^2$$

Dipakai tulangan 2D-10 = 157 mm^2 > 151.077 mm^2

2. Hubungan Balok Kolom Interior

Data-data perencanaan :

- Dimensi kolom 800 mm x 600 mm
- Dimensi balok induk 600 mm x 400 mm
- As balok induk 8D-22

- As'balok induk 4D-22
- fy = 390 Mpa
- fc' = 35 Mpa

Tinjauan Balok Utama

As = $8 \times 0.25 \times 3.14 \times 22^2$

= 3039.52 mm^2

$$T = 0.70 \frac{M_{kap}}{d}$$

$$= 0.70 \cdot As \cdot \alpha \cdot fy \frac{\left(d - a/2\right)}{d}$$

$$= 0.70 \cdot 3039.52 \cdot 390 \cdot 1.25 \cdot \frac{\left(739 - a/2\right)}{739}$$

$$= 1403.6\left(739 - a/2\right)$$

$$T = C = 0.85 \cdot fc' \cdot a \cdot b$$

$$= 0.85 \cdot 35 \cdot a \cdot 600$$

$$= 17850a$$

$17850a = 1403.6\left(739 - a/2\right)$ dibagi a

$$a = 55.91 \cdot mm$$

$$M_{kap} = 3039.52 \cdot 390 \cdot 1.25 \cdot \left(739 - 55.91/2\right)$$

$$= 1053602305 \cdot Nmm$$

$$= 1053.6 \cdot kNm$$

$$T = 0.7 \, M_{kap}/d$$

$$= 0.7 \times 1053.6/0.739$$

$$= 997.997 \cdot kN$$

Tinjauan Kolom

$$V_{kol} = 0.70 \times \frac{\left[\frac{l_{ka}}{l_{ka}'} \times M_{kap.ka}\right]}{0.5(h_{ka} + h_{kb})}$$

$$= 0.70 \times \frac{\left[\frac{8000}{7400} \times 1053602305\right]}{0.5(4000 + 5000)}$$

$$= 177182.4 \cdot N$$

$$V_{jh} = T - V_{kol}$$

$$= 997997 - 177182.4$$

$$= 820814.6 \cdot N$$

Mencari lebar join bj

Bila $b_j > b$

1. $b_j = b_k = 600$ mm

2. $b_j = b + 0.5h_k$

$= 400 + 0.5 \times 800$

$= 800$ mm

diambil harga terkecil $b_j = 600$ mm

$$V_{jh} = \frac{V_{jh}}{b_j \times h_k}$$

$$= \frac{820814.6}{600 \times 800}$$

$$= 1.71 \cdot N / mm^2$$

Syarat : $1.5\sqrt{fc'} = 1.5\sqrt{35} = 8.874 \cdot N / mm^2 > 1.71 \cdot N / mm^2$ Ok!

Tegangan geser yang dipikul oleh beton

$$V_{ch} = \frac{2}{3}\sqrt{\left[\frac{N_{uk}}{A_g} - 0.1fc'\right]}$$

$$= \frac{2}{3}\sqrt{\left[\frac{3831412}{600\times800} - 0.1\times35\right]}$$

$$= 1.41 \cdot N/mm^2$$

$$V_{sh} = V_{jh} - V_{ch}$$

$$= 1.71 - 1.41$$

$$= 0.30 \cdot N/mm^2$$

Penulangan geser yang dibutuhkan

$$A_{sh} = \frac{V_{sh} \cdot b \cdot s}{fy}$$

$$= \frac{0.30 \cdot 600 \cdot 100}{390}$$

$$= 46.15 \cdot mm^2$$

Dipakai tulangan 2D-10 = 157 mm^2 > 46.15 mm^2

BAB VI

PENUTUP

BAB VI

PENUTUP

6.1 Kesimpulan

Dalam laporan tugas akhir tentang Perencanaan Sistem Struktur pada Stadion Tambaksari Surabaya ini dapat disimpulkan beberapa hal sebagai berikut :

1. Dari hasil simulasi kegagalan elemen kabel maka akan terjadi perubahan gaya aksial pada elemen rangka atap namun perubahan yang terjadi tidak seragam pada masing-masing elemen bergantung pada posisi mana elemen tersebut berada, elemen dapat tiba-tiba memiliki gaya aksial yang jauh lebih besar, lebih kecil ataupun berubah dari tekan menjadi tarik dan sebaliknya.
2. Defleksi maksimum dan perbedaaanya akibat simulasi kegagalan kabel adalah :

	Defleksi	
	Δ_{maks} (m)	% perbedaan
Simulasi 1 (Normal)	0.5658 m	-
Simulasi 2 (2 kabel putus)	0.8529 m	50.74
Simulasi 3 (4 kabel putus)	1.3400 m	136.83

3. Secara umum struktur masih bertahan meskipun disimulasikan 2 posisi kabel yang bersebelahan dianggap putus dan 4 posisi kabel yang bersebelahan dianggap putus, hanya saja terjadi perubahan defleksi dan gaya aksial yang besar.

6.2 Saran

Dalam tugas akhir ini terdapat beberapa saran yang perlu untuk diperhatikan :

1. Perlu dilakukan perencanaan bangunan bawah untuk melengkapi beberapa akibat yang muncul dengan penggunaan sistem struktur tersebut.
2. Perlu dilakukan anlisa lebih mendalam tentang perilaku beban hidup akibat penonton yang sifatnya dinamis.

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LAMPIRAN

TABEL PENULANGAN PELAT LANTAI

el	lx cm	ly cm	ly/lx	x	Momen	kgm	d mm	Rn Mpa	ρ perlu	ρ min	ρ maks	ρ pakai	As pelu mm2	Jara m
	394.8	400	1.013171	48	Mlx	927.7206	95	1.28493161	0.00411	0.0044	0.037	0.0044	418	1
				48	Mly	927.7206	85	1.60505298	0.00516	0.0044	0.037	0.00516	438.513	1
				48	Mtx	927.7206	95	1.28493161	0.00411	0.0044	0.037	0.0044	418	1
				48	Mty	927.7206	85	1.60505298	0.00516	0.0044	0.037	0.00516	438.513	1
	388.2	400	1.030397	40.432	Mlx	755.536	95	1.0464487	0.00333	0.0044	0.037	0.0044	418	1
				43.912	Mly	820.5688	85	1.41966916	0.00455	0.0044	0.037	0.00455	386.557	1
				40.432	Mtx	755.536	95	1.0464487	0.00333	0.0044	0.037	0.0044	418	1
				43.912	Mty	820.5688	85	1.41966916	0.00455	0.0044	0.037	0.00455	386.557	1
	381.7	400	1.047943	38.877	Mlx	702.3512	95	0.97278561	0.00309	0.0044	0.037	0.0044	418	1
				36.479	Mly	659.0435	85	1.14021371	0.00363	0.0044	0.037	0.0044	374	1
				38.877	Mtx	702.3512	95	0.97278561	0.00309	0.0044	0.037	0.0044	418	1
				36.479	Mty	659.0435	85	1.14021371	0.00363	0.0044	0.037	0.0044	374	1
	375.1	400	1.066382	36.234	Mlx	632.164	95	0.87557338	0.00278	0.0044	0.037	0.0044	418	1
				38.664	Mly	674.56	85	1.16705888	0.00372	0.0044	0.037	0.0044	374	1
				36.234	Mtx	632.164	95	0.87557338	0.00278	0.0044	0.037	0.0044	418	1
				38.664	Mty	674.56	85	1.16705888	0.00372	0.0044	0.037	0.0044	374	1
	381.7	400	1.047943	29.78	Mlx	538.0139	95	0.74517166	0.00236	0.0044	0.037	0.0044	418	1
				38.479	Mly	695.1759	85	1.2027264	0.00384	0.0044	0.037	0.0044	374	1
				29.78	Mtx	538.0139	95	0.74517166	0.00236	0.0044	0.037	0.0044	418	1
				38.479	Mty	695.1759	85	1.2027264	0.00384	0.0044	0.037	0.0044	374	1
	375.1	400	1.066382	36.234	Mlx	632.164	95	0.87557338	0.00278	0.0044	0.037	0.0044	418	1
				38.664	Mly	674.56	85	1.16705888	0.00372	0.0044	0.037	0.0044	374	1
				36.234	Mtx	632.164	95	0.87557338	0.00278	0.0044	0.037	0.0044	418	1
				38.664	Mty	674.56	85	1.16705888	0.00372	0.0044	0.037	0.0044	374	1
	365.8	400	1.093494	54.545	Mlx	905.0249	95	1.25349709	0.004	0.0044	0.037	0.0044	418	1
				49.87	Mly	827.4607	85	1.43159285	0.00459	0.0044	0.037	0.00459	389.888	1
				54.545	Mtx	905.0249	95	1.25349709	0.004	0.0044	0.037	0.0044	418	1
				49.87	Mty	827.4607	85	1.43159285	0.00459	0.0044	0.037	0.00459	389.888	1
	347.1	400	1.152406	49.668	Mlx	742.0122	95	1.02771772	0.00327	0.0044	0.037	0.0044	418	1
				47.048	Mly	702.8669	85	1.21603278	0.00388	0.0044	0.037	0.0044	374	1
				49.668	Mtx	742.0122	95	1.02771772	0.00327	0.0044	0.037	0.0044	418	1
				47.048	Mty	702.8669	85	1.21603278	0.00388	0.0044	0.037	0.0044	374	1

el	lx cm	ly cm	ly/lx	x	Momen kgm		d mm	Rn Mpa	ρ perlu	ρ min	ρ maks	ρ pakai	As pelu mm2	Jara m
	328.4	400	1.218027	46.721	Mlx	624.7997	95	0.86537348	0.00274	0.0044	0.037	0.0044	418	1
				38	Mly	508.173	85	0.87919203	0.00279	0.0044	0.037	0.0044	374	1
				46.721	Mtx	624.7997	95	0.86537348	0.00274	0.0044	0.037	0.0044	418	1
				38	Mty	508.173	85	0.87919203	0.00279	0.0044	0.037	0.0044	374	1
	309.7	400	1.291572	54.663	Mlx	650.1248	95	0.90044992	0.00286	0.0044	0.037	0.0044	418	1
				38	Mly	451.9472	85	0.78191556	0.00248	0.0044	0.037	0.0044	374	1
				54.663	Mtx	650.1248	95	0.90044992	0.00286	0.0044	0.037	0.0044	418	1
				38	Mty	451.9472	85	0.78191556	0.00248	0.0044	0.037	0.0044	374	1
	328.4	400	1.218027	51.721	Mlx	691.6645	95	0.9579841	0.00304	0.0044	0.037	0.0044	418	1
				38	Mly	508.173	85	0.87919203	0.00279	0.0044	0.037	0.0044	374	1
				51.721	Mtx	691.6645	95	0.9579841	0.00304	0.0044	0.037	0.0044	418	1
				38	Mty	508.173	85	0.87919203	0.00279	0.0044	0.037	0.0044	374	1
	309.7	400	1.291572	54.663	Mlx	650.1248	95	0.90044992	0.00286	0.0044	0.037	0.0044	418	1
				38	Mly	451.9472	85	0.78191556	0.00248	0.0044	0.037	0.0044	374	1
				54.663	Mtx	650.1248	95	0.90044992	0.00286	0.0044	0.037	0.0044	418	1
				38	Mty	451.9472	85	0.78191556	0.00248	0.0044	0.037	0.0044	374	1
	399.7	400	1.000751	51.03	Mlx	1010.918	95	1.40016283	0.00448	0.0044	0.037	0.00448	425.948	1
				38	Mly	752.7895	85	1.30240406	0.00416	0.0044	0.037	0.0044	374	1
				51.03	Mtx	1010.918	95	1.40016283	0.00448	0.0044	0.037	0.00448	425.948	1
				38	Mty	752.7895	85	1.30240406	0.00416	0.0044	0.037	0.0044	374	1
	300	399.7	1.332333	54.7	Mlx	1083.621	95	1.50085975	0.00481	0.0044	0.037	0.00481	457.417	1
				38	Mly	752.7895	85	1.30240406	0.00416	0.0044	0.037	0.0044	374	1
				54.7	Mtx	1083.621	95	1.50085975	0.00481	0.0044	0.037	0.00481	457.417	1
				38	Mty	752.7895	85	1.30240406	0.00416	0.0044	0.037	0.0044	374	1

Perencanaan Batang Tekan untuk Rangka Atap

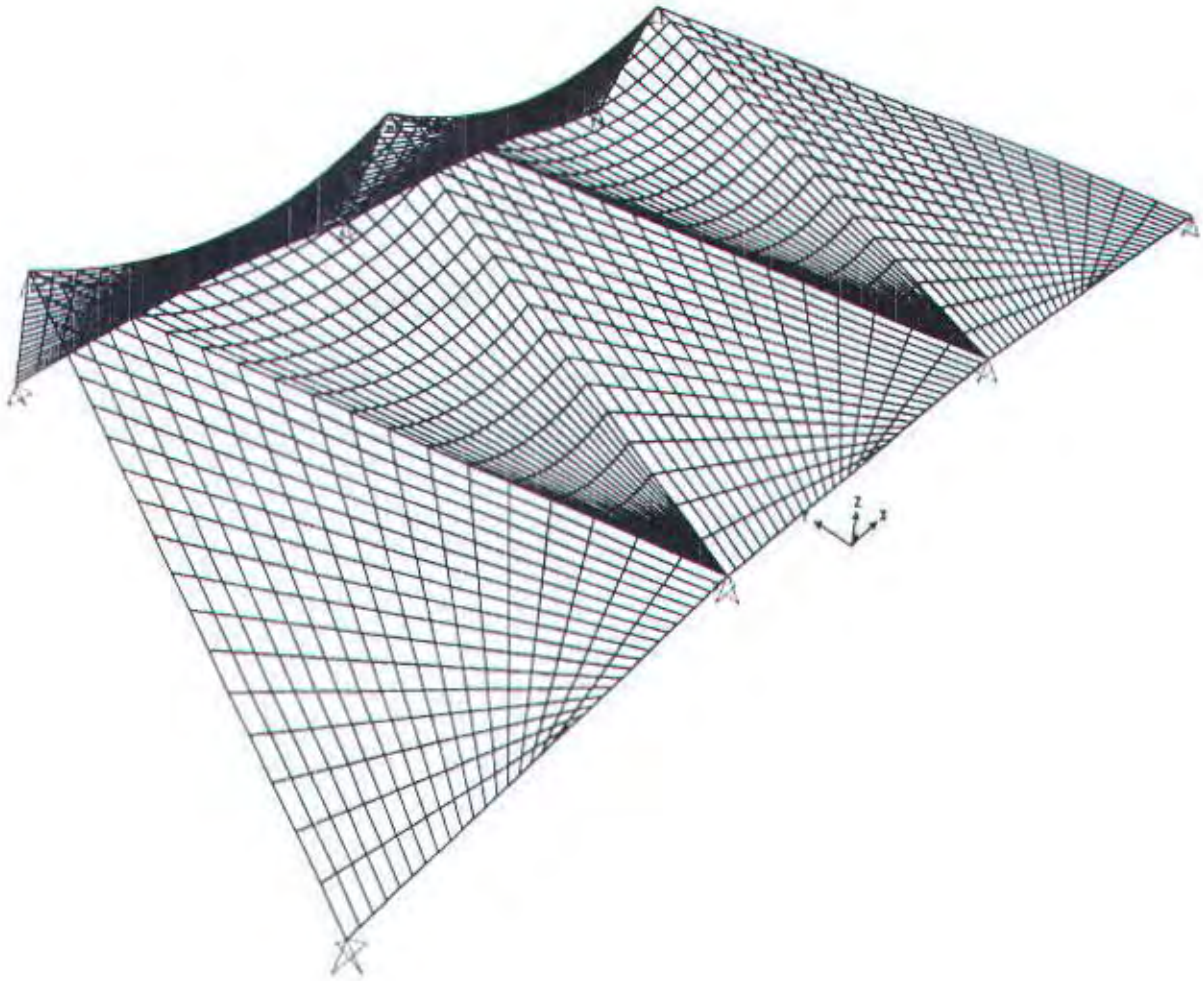
Pu (kg)	L cm	Profil	D (mm)	t (mm)	Ag (cm2)	r (cm)	λ	Kuat Leleh (ØPn)	Kuat Putus (ØPn)	Kuat Pakai (ØPn)
12830	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
6576.5	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
21131.8	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
19627	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
11542.8	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
9864.9	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
8486.9	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
7355	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
6539.6	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
5823.1	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
5085.9	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
21312.6	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
17767.3	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
11980.6	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
10836.2	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
9609.7	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
8492.4	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
7695.8	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
7119.3	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
6822.1	305.328	CHS 89.1-4.0	89.1	4	10.69	3.01	101.438	24052.5	25656	24052.5
10904	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
16747.9	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
11432.4	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
7442.2	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
4512.8	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
2229.4	304.795	CHS 89.1-4.0	89.1	4	10.69	3.01	101.261	24052.5	25656	24052.5
0	230	CHS 89.1-4.0	89.1	4	10.69	3.01	76.412	24052.5	25656	24052.5
523.9	304.795	CHS 89.1-4.0	89.1	4	10.69	3.01	101.261	24052.5	25656	24052.5
274.5	230	CHS 89.1-4.0	89.1	4	10.69	3.01	76.412	24052.5	25656	24052.5
609.4	304.795	CHS 89.1-4.0	89.1	4	10.69	3.01	101.261	24052.5	25656	24052.5
225.4	230	CHS 89.1-4.0	89.1	4	10.69	3.01	76.412	24052.5	25656	24052.5
572.4	304.795	CHS 89.1-4.0	89.1	4	10.69	3.01	101.261	24052.5	25656	24052.5
287.7	230	CHS 89.1-4.0	89.1	4	10.69	3.01	76.412	24052.5	25656	24052.5
513.5	304.795	CHS 89.1-4.0	89.1	4	10.69	3.01	101.261	24052.5	25656	24052.5
245.6	230	CHS 89.1-4.0	89.1	4	10.69	3.01	76.412	24052.5	25656	24052.5
486.9	304.795	CHS 89.1-4.0	89.1	4	10.69	3.01	101.261	24052.5	25656	24052.5

Pu (kg)	L cm	Profil	D (mm)	t (mm)	Ag (cm2)	r (cm)	λ	Kuat Leleh (ØPn)	Kuat Putus (ØPn)	Kuat Pakai (ØPn)
215.2	230	CHS 89.1-4.0	89.1	4	10.69	3.01	76.412	24052.5	25656	24052.5
543.3	304.795	CHS 89.1-4.0	89.1	4	10.69	3.01	101.261	24052.5	25656	24052.5
119.7	230	CHS 89.1-4.0	89.1	4	10.69	3.01	76.412	24052.5	25656	24052.5
812.9	304.795	CHS 89.1-4.0	89.1	4	10.69	3.01	101.261	24052.5	25656	24052.5
3181.1	230	CHS 89.1-4.0	89.1	4	10.69	3.01	76.412	24052.5	25656	24052.5
11296.4	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
17302.7	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
12115	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
8178.6	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
5231.8	200	CHS 89.1-4.0	89.1	4	10.69	3.01	66.4452	24052.5	25656	24052.5
3170.6	258.094	CHS 89.1-4.0	89.1	4	10.69	3.01	85.7455	24052.5	25656	24052.5
3863.6	258.094	CHS 89.1-4.0	89.1	4	10.69	3.01	85.7455	24052.5	25656	24052.5
2706.3	258.094	CHS 89.1-4.0	89.1	4	10.69	3.01	85.7455	24052.5	25656	24052.5
3264.2	258.094	CHS 89.1-4.0	89.1	4	10.69	3.01	85.7455	24052.5	25656	24052.5
4448.1	234.815	CHS 89.1-4.0	89.1	4	10.69	3.01	78.0116	24052.5	25656	24052.5
4493.5	234.815	CHS 89.1-4.0	89.1	4	10.69	3.01	78.0116	24052.5	25656	24052.5
2731.1	258.094	CHS 89.1-4.0	89.1	4	10.69	3.01	85.7455	24052.5	25656	24052.5
4875.1	221.172	CHS 89.1-4.0	89.1	4	10.69	3.01	73.4791	24052.5	25656	24052.5
4925.8	221.172	CHS 89.1-4.0	89.1	4	10.69	3.01	73.4791	24052.5	25656	24052.5
3138.1	258.094	CHS 89.1-4.0	89.1	4	10.69	3.01	85.7455	24052.5	25656	24052.5
6088.6	216.688	CHS 89.1-4.0	89.1	4	10.69	3.01	71.9894	24052.5	25656	24052.5
6142.5	216.688	CHS 89.1-4.0	89.1	4	10.69	3.01	71.9894	24052.5	25656	24052.5
8347.3	221.92	CHS 89.1-4.0	89.1	4	10.69	3.01	73.7276	24052.5	25656	24052.5
8402.2	221.92	CHS 89.1-4.0	89.1	4	10.69	3.01	73.7276	24052.5	25656	24052.5
6878.4	46.141	CHS 89.1-4.0	89.1	4	10.69	3.01	15.3292	24052.5	25656	24052.5
6773.7	46.141	CHS 89.1-4.0	89.1	4	10.69	3.01	15.3292	24052.5	25656	24052.5
14235	236.223	CHS 89.1-4.0	89.1	4	10.69	3.01	78.4794	24052.5	25656	24052.5
14319.8	236.223	CHS 89.1-4.0	89.1	4	10.69	3.01	78.4794	24052.5	25656	24052.5
1946.8	263.169	CHS 89.1-4.0	89.1	4	10.69	3.01	87.4316	24052.5	25656	24052.5
670.5	262.631	CHS 89.1-4.0	89.1	4	10.69	3.01	87.2528	24052.5	25656	24052.5
1146.9	183.595	CHS 89.1-4.0	89.1	4	10.69	3.01	60.995	24052.5	25656	24052.5
2644.6	263.169	CHS 89.1-4.0	89.1	4	10.69	3.01	87.4316	24052.5	25656	24052.5
906	153.34	CHS 89.1-4.0	89.1	4	10.69	3.01	50.9435	24052.5	25656	24052.5
2230	216.782	CHS 89.1-4.0	89.1	4	10.69	3.01	72.0206	24052.5	25656	24052.5
564.1	183.47	CHS 89.1-4.0	89.1	4	10.69	3.01	60.9535	24052.5	25656	24052.5
2067.8	216.782	CHS 89.1-4.0	89.1	4	10.69	3.01	72.0206	24052.5	25656	24052.5
1155.1	76.66	CHS 89.1-4.0	89.1	4	10.69	3.01	25.4684	24052.5	25656	24052.5
3096.6	183.595	CHS 89.1-4.0	89.1	4	10.69	3.01	60.995	24052.5	25656	24052.5
3160.9	183.595	CHS 89.1-4.0	89.1	4	10.69	3.01	60.995	24052.5	25656	24052.5

Perencanaan Batang Tekan untuk Rangka Atap

L cm	Profil	D (mm)	t (mm)	Ag (cm2)	r (cm)	D/t	λr	Kontrol Penamp.	Q	K	λ	Kontrol Btg. Tekan	λc	Fcr (kg/cm2)	
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
230.705	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.62	OK	0.4123	2344.26	
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
230	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	36.51	OK	0.4111	2345.18	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
200	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	31.75	OK	0.3574	2382.02	5
184.564	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	29.3	OK	0.3299	2399.17	6
184.564	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	29.3	OK	0.3299	2399.17	6
138.423	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	21.97	OK	0.2474	2442.78	6
236.223	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	37.5	OK	0.4222	2336.97	5
236.223	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	37.5	OK	0.4222	2336.97	5

L cm	Profil	D (mm)	t (mm)	Ag (cm2)	r (cm)	D/t	λr	Kontrol Penamp.	Q	K	λ	Kontrol Btg. Tekan	λc	Fcr (kg/cm2)	
138.423	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	21.97	OK	0.2474	2442.78	6
236.223	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	37.5	OK	0.4222	2336.97	5
236.223	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	37.5	OK	0.4222	2336.97	5
258.094	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	40.97	OK	0.4613	2306.63	
92.282	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	14.65	OK	0.1649	2474.40	
92.282	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	14.65	OK	0.1649	2474.40	
258.094	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	40.97	OK	0.4613	2306.63	
236.223	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	37.5	OK	0.4222	2336.97	5
236.223	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	37.5	OK	0.4222	2336.97	5
236.223	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	37.5	OK	0.4222	2336.97	5
236.223	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	37.5	OK	0.4222	2336.97	5
258.094	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	40.97	OK	0.4613	2306.63	
258.094	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	40.97	OK	0.4613	2306.63	
183.595	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	29.14	OK	0.3281	2400.21	6
171.05	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	27.15	OK	0.3057	2413.15	
254.02	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	40.32	OK	0.4540	2312.46	5
171.05	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	27.15	OK	0.3057	2413.15	6
133.3	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	21.16	OK	0.2382	2446.89	
153.34	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	24.34	OK	0.2741	2429.96	6
133.3	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	21.16	OK	0.2382	2446.89	
183.47	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	29.12	OK	0.3279	2400.34	60
170.955	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	27.14	OK	0.3055	2413.24	60
202.437	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	32.13	OK	0.3618	2379.20	59
170.955	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	27.14	OK	0.3055	2413.24	60
66.7	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	10.59	OK	0.1192	2486.59	62
76.66	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	12.17	OK	0.1370	2482.31	62
66.7	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	10.59	OK	0.1192	2486.59	62
171.05	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	27.15	OK	0.3057	2413.15	6
171.05	CHS 165.2-5.0	165.2	5	25.16	5.67	33.04	115.2	OK	1	0.9	27.15	OK	0.3057	2413.15	6



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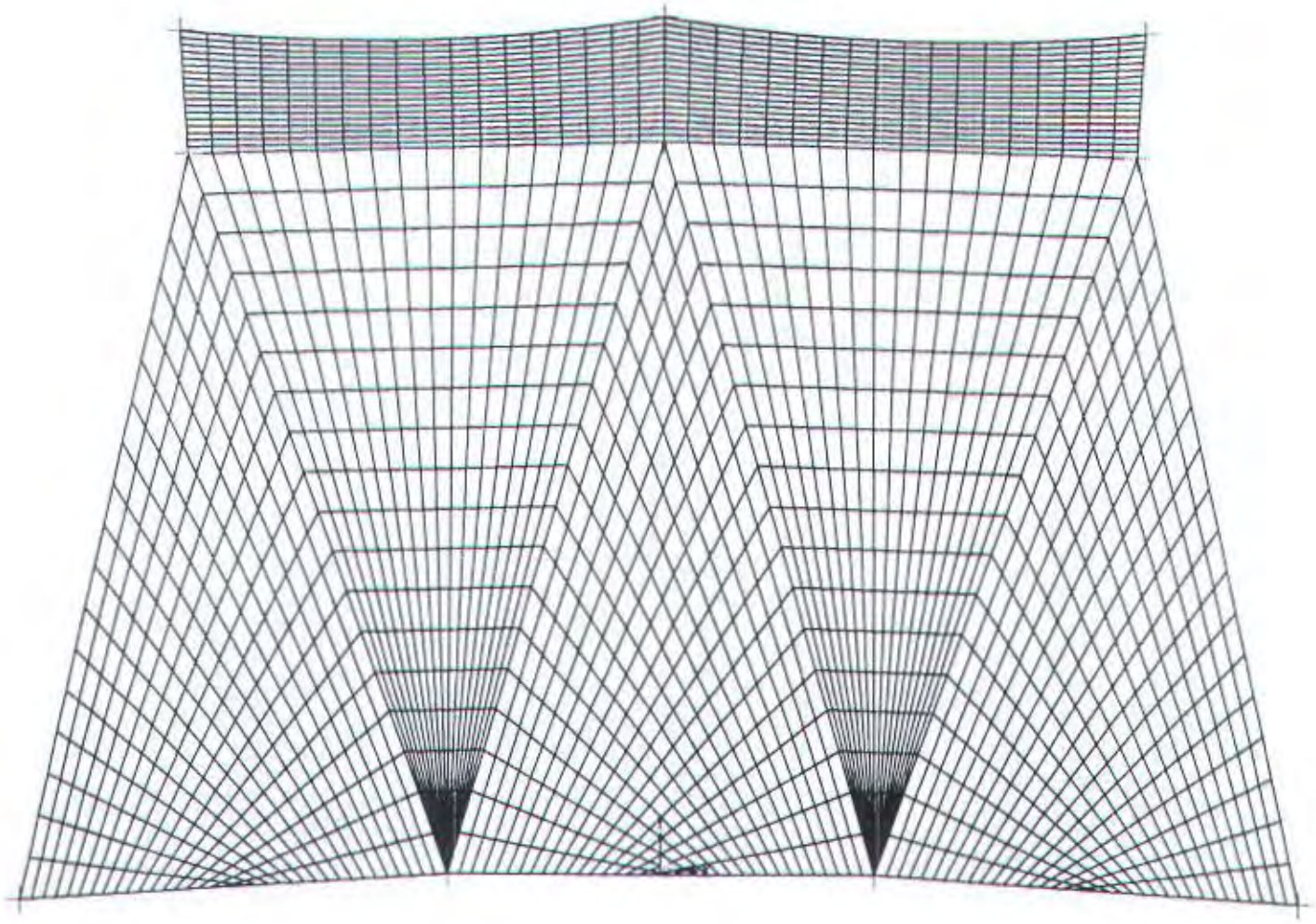

3.0.8 - File:CANOPY_V8 - 3-D View - Ton, m, C Units

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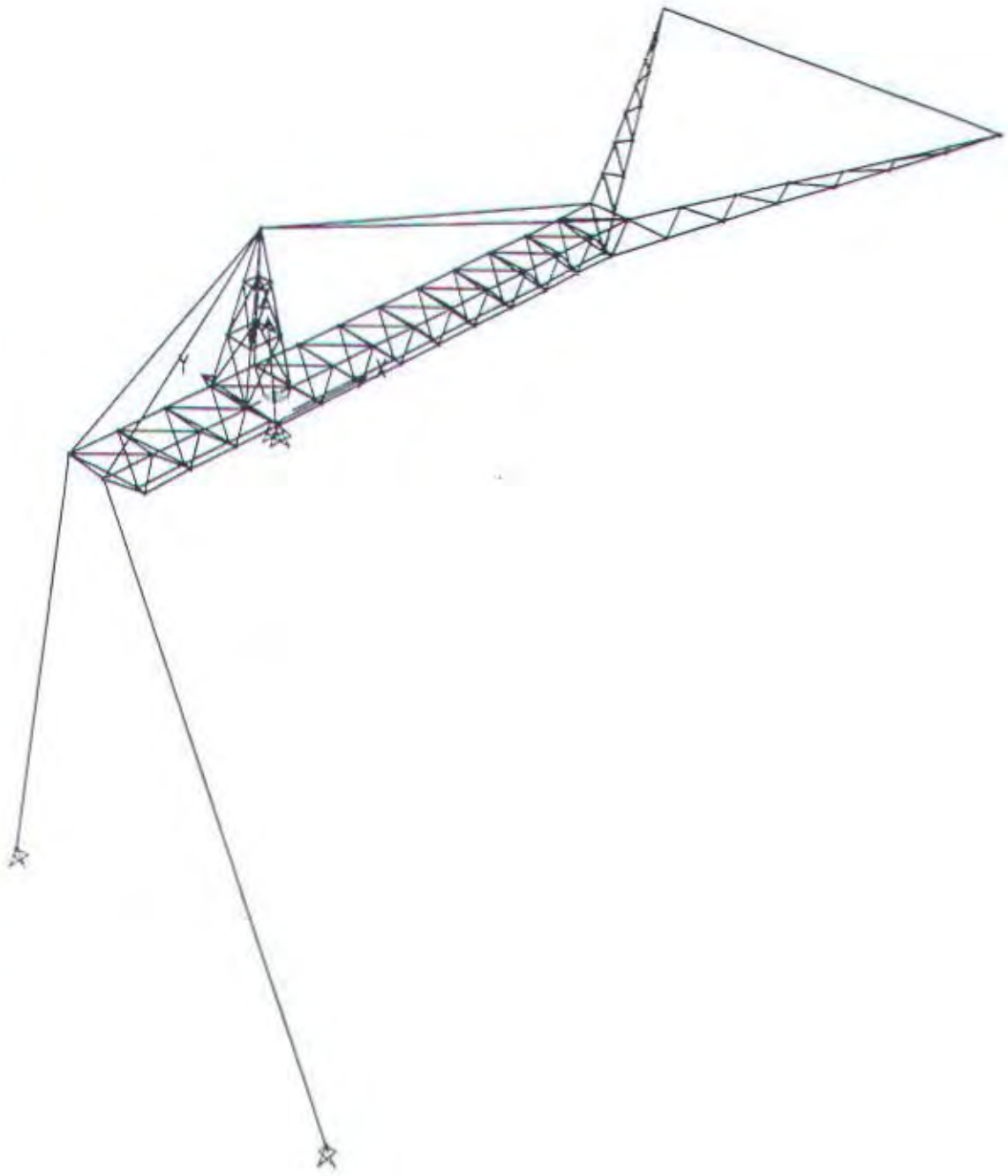
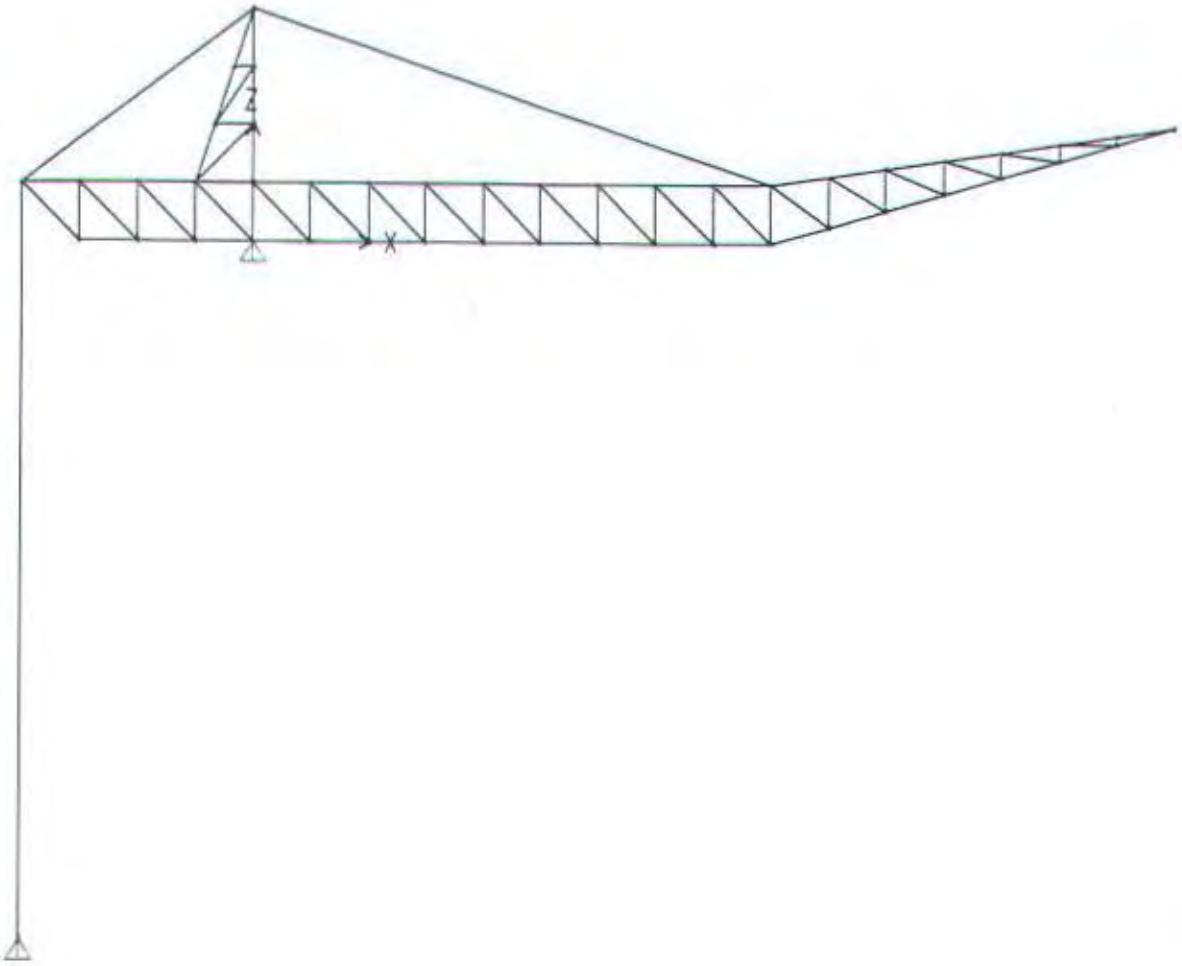
I N T R E A C T I O N S

JOINT	LOAD	F1	F2	F3	M1	M2	M3
3	BMATI	0.0000	-0.1576	-0.0731	0.0000	0.0000	0.0000
3	BANGIN1	1.413E-05	2.7240	1.4133	0.0000	0.0000	0.0000
3	BANGIN2	1.513E-05	2.3926	1.4948	0.0000	0.0000	0.0000
3	BHIDUP	-1.115E-05	-1.9079	-1.1077	0.0000	0.0000	0.0000
4	BMATI	4.923E-03	-0.0109	0.3086	0.0000	0.0000	0.0000
4	BANGIN1	-0.0815	0.1696	-5.0302	0.0000	0.0000	0.0000
4	BANGIN2	-0.0611	0.1099	-3.7346	0.0000	0.0000	0.0000
4	BHIDUP	0.0512	-0.1000	3.1826	0.0000	0.0000	0.0000
5	BMATI	-4.923E-03	-0.0109	0.3086	0.0000	0.0000	0.0000
5	BANGIN1	0.0815	0.1696	-5.0302	0.0000	0.0000	0.0000
5	BANGIN2	0.0611	0.1099	-3.7347	0.0000	0.0000	0.0000
5	BHIDUP	-0.0512	-0.1000	3.1827	0.0000	0.0000	0.0000
7	BMATI	0.0000	0.2059	0.8326	0.0000	0.0000	0.0000
7	BANGIN1	-1.233E-05	-3.4715	-12.2020	0.0000	0.0000	0.0000
7	BANGIN2	-1.408E-05	-2.8721	-6.5009	0.0000	0.0000	0.0000
7	BHIDUP	1.016E-05	2.3461	6.6059	0.0000	0.0000	0.0000





Joint Coordinates

Joint Text	CoordSys Text	CoordType Text	GlobalX m	GlobalY m	GlobalZ m
2	GLOBAL	Cartesian	0	1.15	2
3	GLOBAL	Cartesian	2	1.15	2
4	GLOBAL	Cartesian	4	1.15	2
5	GLOBAL	Cartesian	6	1.15	2
6	GLOBAL	Cartesian	8	1.15	2
7	GLOBAL	Cartesian	10	1.15	2
8	GLOBAL	Cartesian	12	1.15	2
10	GLOBAL	Cartesian	0	-1.15	2
11	GLOBAL	Cartesian	2	-1.15	2
12	GLOBAL	Cartesian	4	-1.15	2
13	GLOBAL	Cartesian	6	-1.15	2
14	GLOBAL	Cartesian	8	-1.15	2
15	GLOBAL	Cartesian	10	-1.15	2
16	GLOBAL	Cartesian	12	-1.15	2
17	GLOBAL	Cartesian	0	-7.348E-16	0
18	GLOBAL	Cartesian	2	-3.674E-16	0
19	GLOBAL	Cartesian	4	0	0
20	GLOBAL	Cartesian	6	3.674E-16	0
21	GLOBAL	Cartesian	8	7.348E-16	0
22	GLOBAL	Cartesian	10	1.102E-15	0
23	GLOBAL	Cartesian	12	1.47E-15	0
25	GLOBAL	Cartesian	0	-0.7667	3.667
26	GLOBAL	Cartesian	0	-0.3833	5.333
27	GLOBAL	Cartesian	0	0	7
28	GLOBAL	Cartesian	0	0.3833	5.333
30	GLOBAL	Cartesian	0	0.7667	3.667
31	GLOBAL	Cartesian	-0.667	-0.3833	5.333
33	GLOBAL	Cartesian	-1.333	-0.7667	3.667
34	GLOBAL	Cartesian	-0.667	0.3833	5.333
35	GLOBAL	Cartesian	-1.333	0.7667	3.667
41	GLOBAL	Cartesian	14	1.15	2
43	GLOBAL	Cartesian	14	-1.15	2
45	GLOBAL	Cartesian	14	1.47E-15	0
48	GLOBAL	Cartesian	-2	1.15	2
49	GLOBAL	Cartesian	-2	-1.15	2
50	GLOBAL	Cartesian	-2	-7.348E-16	0
51	GLOBAL	Cartesian	-4	0	0
104	GLOBAL	Cartesian	24	-7.1085	4
105	GLOBAL	Cartesian	24	7.1085	4
106	GLOBAL	Cartesian	22	-5.9168	3.6
107	GLOBAL	Cartesian	20	-4.7251	3.2
108	GLOBAL	Cartesian	18	-3.5334	2.8
109	GLOBAL	Cartesian	16	-2.3417	2.4
110	GLOBAL	Cartesian	22	-5.6868	3.2
111	GLOBAL	Cartesian	20	-4.2651	2.4
112	GLOBAL	Cartesian	18	-2.8434	1.6
113	GLOBAL	Cartesian	16	-1.4217	0.8
114	GLOBAL	Cartesian	22	5.9168	3.6
115	GLOBAL	Cartesian	20	4.7251	3.2
116	GLOBAL	Cartesian	18	3.5334	2.8
117	GLOBAL	Cartesian	16	2.3417	2.4
118	GLOBAL	Cartesian	22	5.6868	3.2
119	GLOBAL	Cartesian	20	4.2651	2.4
120	GLOBAL	Cartesian	18	2.8434	1.6
121	GLOBAL	Cartesian	16	1.4217	0.8

TABLE: Connectivity - Frame/Cable

Frame	JointI	JointJ	Length	Frame	JointI	JointJ	Length
Text	Text	Text	m	Text	Text	Text	m
1	51	50	2	56	2	10	2.3
2	17	50	2	57	10	3	3.04795
3	17	18	2	58	3	11	2.3
4	18	19	2	59	11	4	3.04795
5	19	20	2	60	4	12	2.3
6	20	21	2	61	12	5	3.04795
7	21	22	2	62	5	13	2.3
8	22	23	2	63	13	6	3.04795
9	23	45	2	64	6	14	2.3
10	51	49	3.05328	65	14	7	3.04795
11	49	50	2.30705	66	7	15	2.3
12	10	50	3.05328	67	15	8	3.04795
13	10	17	2.30705	68	8	16	2.3
14	10	18	3.05328	69	16	41	3.04795
15	11	18	2.30705	70	41	43	2.3
16	19	11	3.05328	71	48	2	2
17	12	19	2.30705	72	2	3	2
18	20	12	3.05328	73	3	4	2
19	13	20	2.30705	74	4	5	2
20	21	13	3.05328	75	5	6	2
21	14	21	2.30705	76	6	7	2
22	22	14	3.05328	77	7	8	2
23	15	22	2.30705	78	8	41	2
24	23	15	3.05328	79	113	45	2.58094
25	16	23	2.30705	80	121	45	2.58094
26	45	16	3.05328	81	112	113	2.58094
27	43	45	2.30705	82	120	121	2.58094
28	48	51	3.05328	83	43	113	2.34815
29	50	48	2.30705	84	41	121	2.34815
30	2	50	3.05328	85	113	109	1.84564
31	17	2	2.30705	86	121	117	1.84564
32	2	18	3.05328	87	111	112	2.58094
33	18	3	2.30705	88	109	112	2.21172
34	3	19	3.05328	89	117	120	2.21172
35	19	4	2.30705	90	119	120	2.58094
36	4	20	3.05328	91	112	108	1.38423
37	20	5	2.30705	92	109	43	2.36223
38	5	21	3.05328	93	117	41	2.36223
39	21	6	2.30705	94	120	116	1.38423
40	6	22	3.05328	95	108	111	2.16688
41	22	7	2.30705	96	108	109	2.36223
42	7	23	3.05328	97	116	117	2.36223
43	23	8	2.30705	98	116	119	2.16688
44	8	45	3.05328	99	110	111	2.58094
45	45	41	2.30705	100	111	107	0.92282
46	49	10	2	101	119	115	0.92282
47	10	11	2	102	118	119	2.58094
48	11	12	2	103	107	108	2.36223
49	12	13	2	104	115	116	2.36223
50	13	14	2	105	107	110	2.2192
51	14	15	2	106	115	118	2.2192
52	15	16	2	107	110	106	0.46141
53	16	43	2	108	106	107	2.36223
54	48	49	2.3	109	114	115	2.36223
55	49	2	3.04795	110	118	114	0.46141

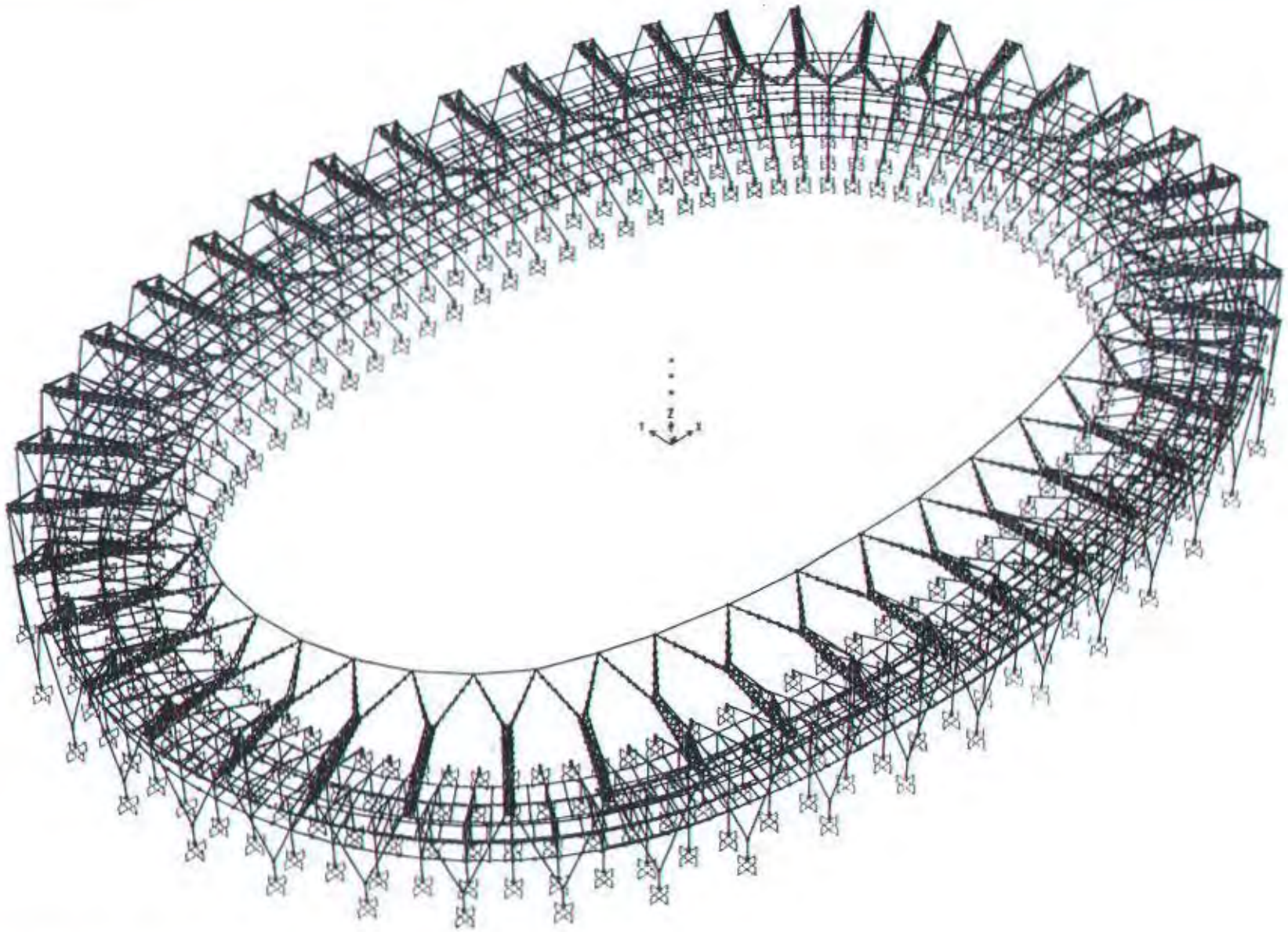
Frame	JointI	JointJ	Length
Text	Text	Text	m
111	104	110	2.58094
112	105	118	2.58094
113	104	106	2.36223
114	105	114	2.36223
115	33	49	1.83595
116	25	49	2.63169
117	10	25	1.7105
118	48	33	2.62631
119	25	2	2.5402
120	35	48	1.83595
121	30	48	2.63169
122	30	2	1.7105
123	33	25	1.333
124	35	33	1.5334
125	25	30	1.5334
126	30	35	1.333
127	31	33	1.8347
128	26	33	2.16782
129	25	26	1.70955
130	26	30	2.02437
131	34	35	1.8347
132	35	28	2.16782
133	28	30	1.70955
134	31	26	0.667
135	34	31	0.7666
136	26	28	0.7666
137	28	34	0.667
138	27	31	1.83595
139	26	27	1.7105
140	27	34	1.83595
141	27	28	1.7105

HASIL OUTPUT RANGKA ATAP

Batang	P max Ton	P min Ton	P extreme Ton
1	12.83 COMB3A	-5.8464 COMB4	12.83
2	5.8464 COMB4	-12.83 COMB3A	-12.83
3	23.2285 COMB4	-49.5492 COMB3A	-49.5492
4	18.8286 COMB4	-36.9602 COMB3A	-36.9602
5	15.2561 COMB4	-27.0942 COMB3A	-27.0942
6	12.4381 COMB4	-19.5602 COMB3A	-19.5602
7	10.1622 COMB4	-13.9374 COMB3A	-13.9374
8	8.2563 COMB4	-9.6686 COMB3A	-9.6686
9	6.5765 COMB4	-6.4384 COMB3A	6.5765
10	21.1318 COMB3A	-11.2374 COMB4	21.1318
11	6.8096 COMB4	-14.7425 COMB3A	-14.7425
12	19.627 COMB3A	-8.9331 COMB4	19.627
13	20.7647 COMB4	-39.9706 COMB3A	-39.9706
14	11.5428 COMB3A	-4.2533 COMB4	11.5428
15	3.5732 COMB4	-9.2359 COMB3A	-9.2359
16	9.8649 COMB3A	-3.8343 COMB4	9.8649
17	3.3257 COMB4	-8.1519 COMB3A	-8.1519
18	8.4869 COMB3A	-3.487 COMB4	8.4869
19	3.1962 COMB4	-7.3356 COMB3A	-7.3356
20	7.355 COMB3A	-3.2796 COMB4	7.355
21	3.1361 COMB4	-6.6668 COMB3A	-6.6668
22	6.5396 COMB3A	-3.1588 COMB4	6.5396
23	3.1122 COMB4	-6.1398 COMB3A	-6.1398
24	5.8231 COMB3A	-3.081 COMB4	5.8231
25	3.0928 COMB4	-5.6277 COMB3A	-5.6277
26	5.0859 COMB3A	-2.9983 COMB4	5.0859
27	2.1882 COMB4	-4.4924 COMB3A	-4.4924
28	21.3126 COMB3A	-11.2551 COMB4	21.3126
29	6.0861 COMB4	-13.2644 COMB3A	-13.2644
30	17.7673 COMB3A	-8.0259 COMB4	17.7673
31	20.9103 COMB4	-40.0438 COMB3A	-40.0438
32	11.9806 COMB3A	-4.5622 COMB4	11.9806
33	3.6402 COMB4	-9.2017 COMB3A	-9.2017
34	10.8362 COMB3A	-4.4136 COMB4	10.8362
35	3.4446 COMB4	-8.2148 COMB3A	-8.2148
36	9.6097 COMB3A	-4.1642 COMB4	9.6097
37	3.2989 COMB4	-7.3533 COMB3A	-7.3533
38	8.4924 COMB3A	-3.9895 COMB4	8.4924
39	3.2115 COMB4	-6.6243 COMB3A	-6.6243
40	7.6958 COMB3A	-3.9014 COMB4	7.6958
41	3.1921 COMB4	-6.1078 COMB3A	-6.1078
42	7.1193 COMB3A	-3.9142 COMB4	7.1193
43	3.256 COMB4	-5.7641 COMB3A	-5.7641
44	6.8221 COMB3A	-4.0849 COMB4	6.8221
45	1.778 COMB4	-3.8196 COMB3A	-3.8196

46	10.904	COMB3A	-5.2952	COMB4	10.904
47	16.7479	COMB3A	-8.5191	COMB4	16.7479
48	11.4324	COMB3A	-6.5239	COMB4	11.4324
49	7.4422	COMB3A	-4.9696	COMB4	7.4422
50	4.5128	COMB3A	-3.7307	COMB4	4.5128
51	2.3284	COMB3A	-2.7086	COMB4	-2.7086
52	0.7047	COMB3A	-1.8228	COMB4	-1.8228
53	-0.3221	COMB4A	-1.1818	COMB3	-1.1818
54	1.9761	COMB4	-2.5447	COMB3A	-2.5447
55	2.2294	COMB3A	-1.1326	COMB4	2.2294
56	0	BMATI	0	BMATI	0
57	0.5239	COMB3A	-0.3095	COMB4	0.5239
58	0.2745	COMB3A	0.0045	COMB4	0.2745
59	0.6094	COMB3A	-0.3668	COMB4	0.6094
60	0.2254	COMB3A	0.027	COMB4	0.2254
61	0.5724	COMB3A	-0.3668	COMB4	0.5724
62	0.2877	COMB2	0.0204	COMB4	0.2877
63	0.5135	COMB3A	-0.3516	COMB4	0.5135
64	0.2456	COMB3A	0.0127	COMB4	0.2456
65	0.4869	COMB3A	-0.3479	COMB4	0.4869
66	0.2152	COMB3A	0.0242	COMB4	0.2152
67	0.5433	COMB3A	-0.3814	COMB4	0.5433
68	0.1197	COMB1	0.0648	COMB4A	0.1197
69	0.8129	COMB3A	-0.5398	COMB4	0.8129
70	3.1811	COMB3A	-2.5062	COMB4	3.1811
71	11.2964	COMB3A	-5.4394	COMB4	11.2964
72	17.3027	COMB3A	-8.7092	COMB4	17.3027
73	12.115	COMB3A	-6.7885	COMB4	12.115
74	8.1786	COMB3A	-5.2798	COMB4	8.1786
75	5.2318	COMB3A	-4.0561	COMB4	5.2318
76	2.9669	COMB3A	-3.0179	COMB4	-3.0179
77	1.1972	COMB3A	-2.0793	COMB4	-2.0793
78	-0.1042	COMB4A	-1.2883	COMB3	-1.2883
79	3.1706	COMB4	-2.6056	COMB3A	3.1706
80	3.8636	COMB4	-3.7	COMB3A	3.8636
81	2.7063	COMB4	-1.7443	COMB3A	2.7063
82	3.2642	COMB4	-2.6253	COMB3A	3.2642
83	4.4481	COMB3A	-2.5664	COMB4	4.4481
84	4.4935	COMB3A	-2.595	COMB4	4.4935
85	2.2143	COMB4	-3.7052	COMB3A	-3.7052
86	2.2391	COMB4	-3.7443	COMB3A	-3.7443
87	2.7311	COMB4	-1.8712	COMB3A	2.7311
88	4.8751	COMB3A	-3.0172	COMB4	4.8751
89	4.9258	COMB3A	-3.0494	COMB4	4.9258
90	3.1381	COMB4	-2.5138	COMB3A	3.1381
91	1.7779	COMB4	-2.7545	COMB3A	-2.7545
92	-0.7854	COMB4	-1.4926	COMB2	-1.4926
93	-0.1445	COMB4A	-1.6115	COMB3	-1.6115
94	1.8129	COMB4	-2.8098	COMB3A	-2.8098
95	6.0886	COMB3A	-4.0213	COMB4	6.0886

96	0.4472	COMB4	-3.193	COMB3A	-3.193
97	-0.0568	COMB4	-2.3973	COMB3A	-2.3973
98	6.1425	COMB3A	-4.0554	COMB4	6.1425
99	4.3907	COMB4	-4.6853	COMB3A	-4.6853
100	0.3388	COMB4	-0.3563	COMB3A	-0.3563
101	0.3904	COMB4	-0.4378	COMB3A	-0.4378
102	4.626	COMB4	-5.0569	COMB3A	-5.0569
103	1.8589	COMB4	-4.9766	COMB3A	-4.9766
104	1.4974	COMB4	-4.4059	COMB3A	-4.4059
105	8.3473	COMB3A	-5.8567	COMB4	8.3473
106	8.4022	COMB3A	-5.8915	COMB4	8.4022
107	6.8784	COMB3A	-4.6264	COMB4	6.8784
108	2.5473	COMB4	-5.177	COMB3A	-5.177
109	2.3503	COMB4	-4.8659	COMB3A	-4.8659
110	6.7737	COMB3A	-4.5601	COMB4	6.7737
111	12.2531	COMB4	-16.5176	COMB3A	-16.5176
112	12.3068	COMB4	-16.6025	COMB3A	-16.6025
113	14.235	COMB3A	-10.6073	COMB4	14.235
114	14.3198	COMB3A	-10.661	COMB4	14.3198
115	0.4277	COMB3A	-0.7687	COMB4	-0.7687
116	1.9468	COMB3A	-1.3756	COMB4	1.9468
117	8.7664	COMB4	-12.065	COMB3A	-12.065
118	0.6705	COMB3A	-0.4424	COMB4	0.6705
119	0.7511	COMB4	-1.1448	COMB3A	-1.1448
120	1.1469	COMB3A	-1.0259	COMB4	1.1469
121	2.6446	COMB3A	-1.7199	COMB4	2.6446
122	9.1113	COMB4	-12.9231	COMB3A	-12.9231
123	0.935	COMB4	-1.3171	COMB3A	-1.3171
124	0.3038	COMB3	-0.497	COMB3A	-0.497
125	0.906	COMB3A	-0.6485	COMB4	0.906
126	0.9413	COMB4	-1.4386	COMB3A	-1.4386
127	0.1428	COMB2	-0.2058	COMB1	-0.2058
128	2.23	COMB3A	-1.6897	COMB4	2.23
129	8.9114	COMB4	-12.0749	COMB3A	-12.0749
130	1.2476	COMB4	-1.7644	COMB3A	-1.7644
131	0.5641	COMB3A	-0.5003	COMB4	0.5641
132	2.0678	COMB3A	-1.4093	COMB4	2.0678
133	7.6242	COMB4	-10.4609	COMB3A	-10.4609
134	1.1019	COMB4	-1.5297	COMB3A	-1.5297
135	0.3661	COMB4	-0.5351	COMB3A	-0.5351
136	1.1551	COMB3A	-0.8478	COMB4	1.1551
137	0.8295	COMB4	-1.2119	COMB3A	-1.2119
138	3.0966	COMB3A	-2.2982	COMB4	3.0966
139	10.1341	COMB4	-13.6931	COMB3A	-13.6931
140	3.1609	COMB3A	-2.2836	COMB4	3.1609
141	9.0878	COMB4	-12.2753	COMB3A	-12.2753



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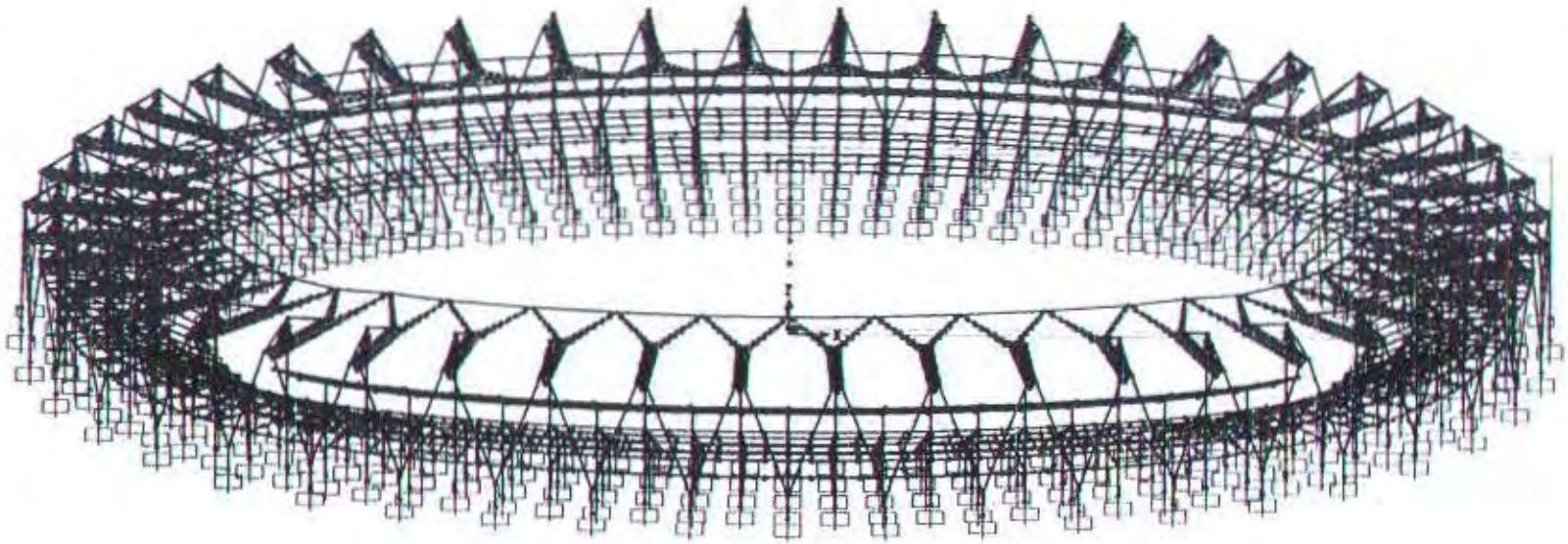

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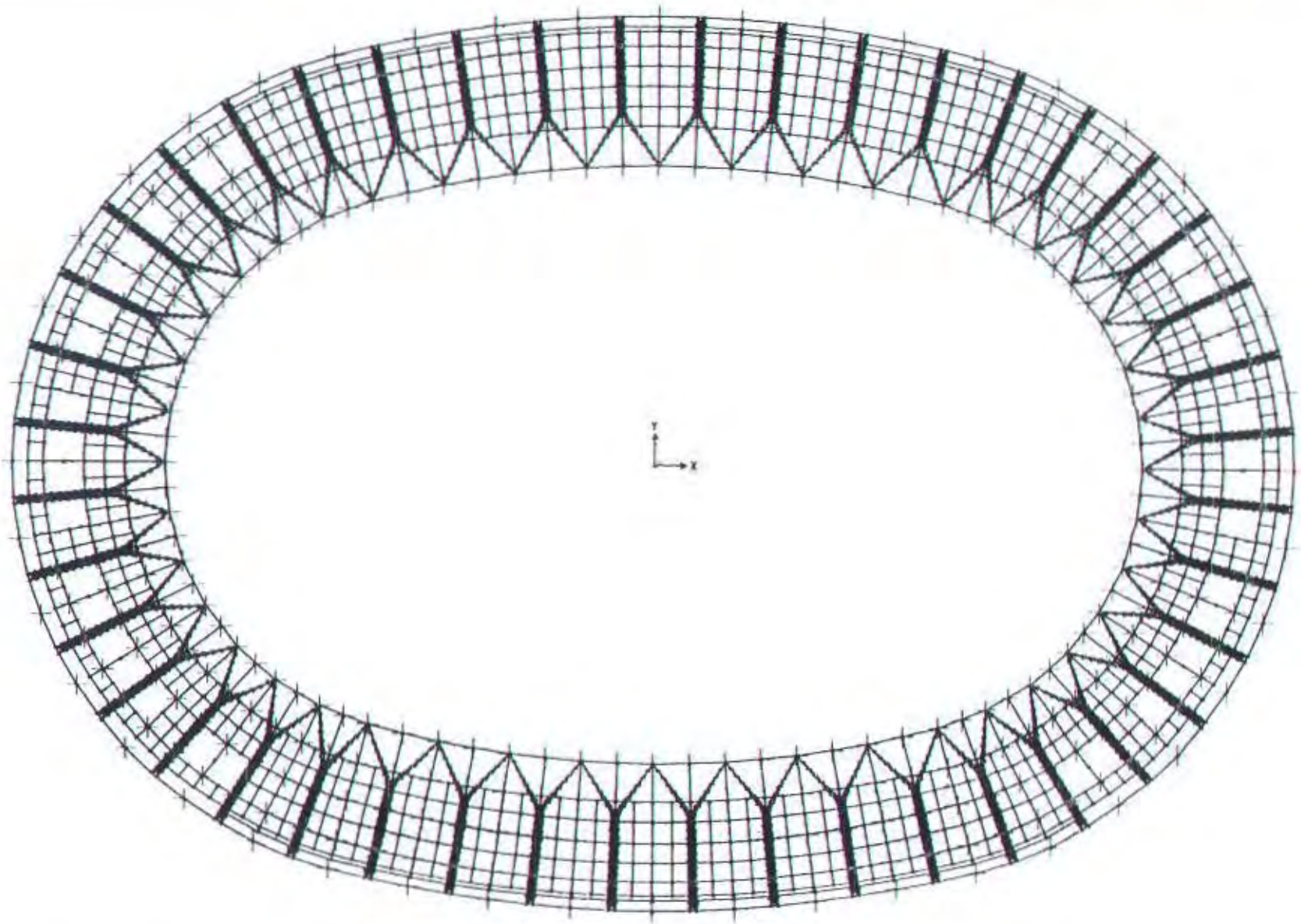

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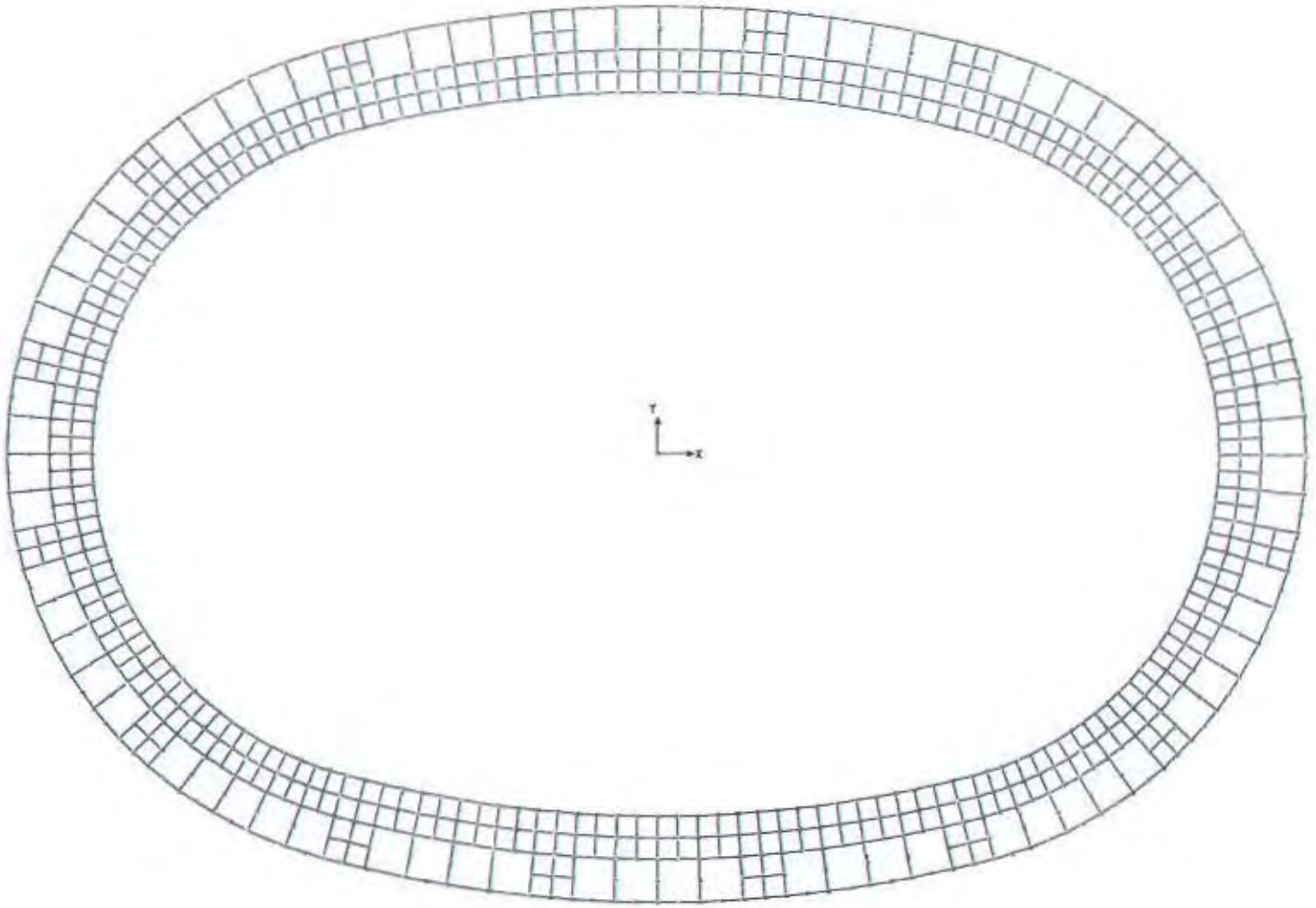

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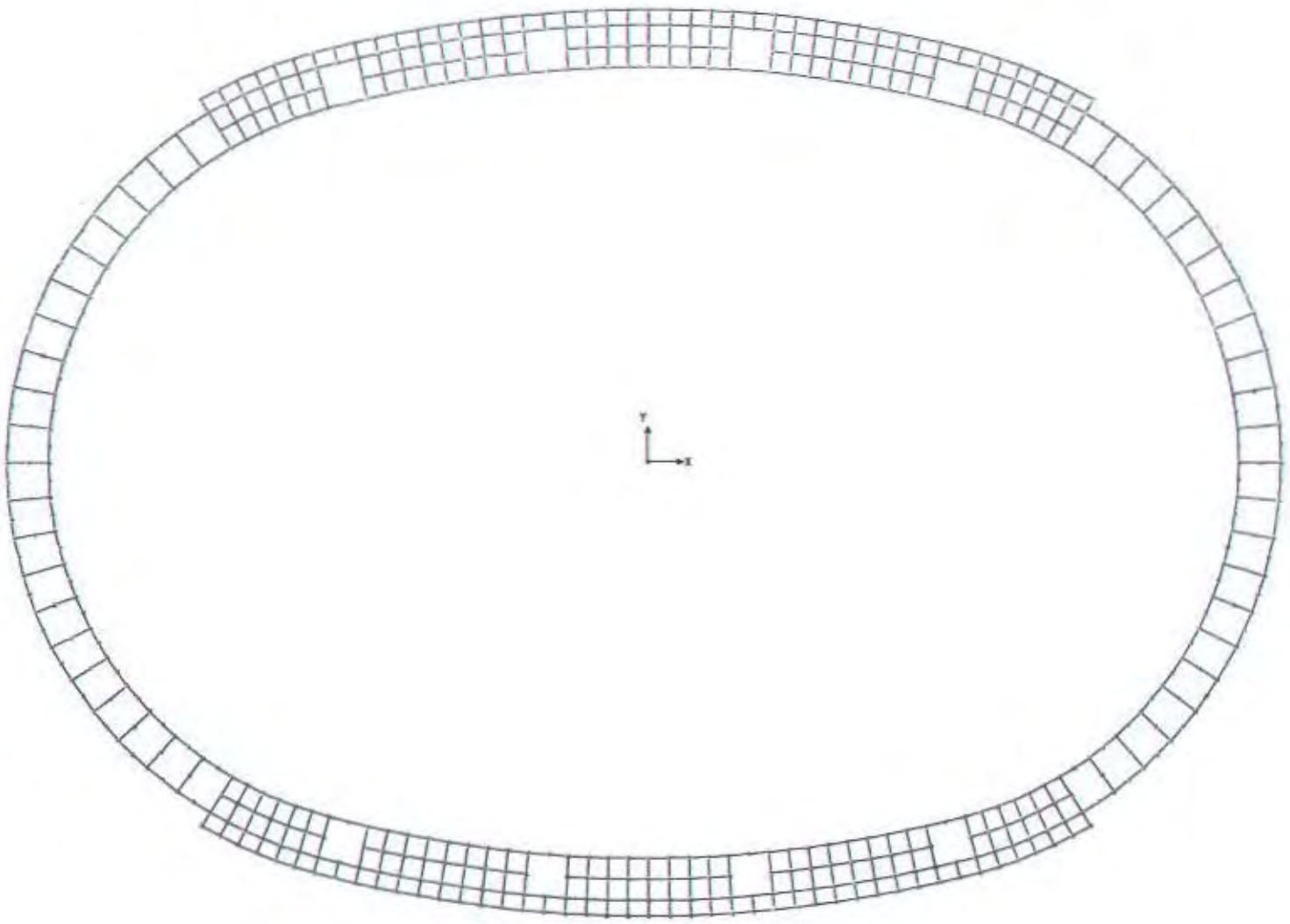


SAP2000 v8.0.8 - File:stadium (bu-3)_V8 - X-Y Plane @ Z=9 - Ton, m, C Units

Tabel Perbandingan Deformasi Akibat Simulasi

Titik	DEF U1			DEF U2			DEF U3		
	SIM-1	SIM-2	SIM-3	SIM-1	SIM-2	SIM-3	SIM-1	SIM-2	SIM-3
6270	-0.00249 COMB2	-0.00617 COMB2	-0.00994 COMB2	-0.07452 COMB2	-0.11716 COMB2	-0.17103 COMB2	-0.56578 COMB2	-0.85294 COMB2	-1.34002 COMB2
6271	-0.00086 COMB4	0.00352 COMB2	-0.00994 COMB2	-0.07452 COMB2	-0.09168 COMB2	-0.17103 COMB2	-0.56578 COMB2	-0.85294 COMB2	-1.34002 COMB2
6321	-0.00016 COMB4	-0.00225 COMB2	-0.00945 COMB2	-0.07452 COMB2	-0.09146 COMB2	-0.11602 COMB2	-0.56578 COMB2	-0.54784 COMB2	-0.8962 COMB2
6372	0.00051 COMB4	-0.00098 COMB4	-0.00287 COMB4	-0.02865 COMB1	-0.02285 COMB1	-0.03085 COMB1	-0.23475 COMB1	-0.23488 COMB1	-0.23826 COMB4
7679	-0.00238 COMB1	-0.00303 COMB1	-0.00254 COMB1	-0.02763 COMB1	-0.03473 COMB1	-0.04496 COMB1	-0.23298 COMB1	-0.35248 COMB1	-0.36254 COMB1
7729	-0.00352 COMB1	-0.00358 COMB1	-0.00256 COMB1	-0.02912 COMB1	-0.03749 COMB1	-0.0309 COMB1	-0.23419 COMB1	-0.22746 COMB1	-0.23306 COMB4
7780	-0.00452 COMB1	-0.00404 COMB1	-0.00351 COMB1	-0.03364 COMB1	-0.03236 COMB1	-0.03166 COMB1	-0.23436 COMB1	-0.23425 COMB1	-0.23322 COMB1

Perbandingan Hasil Output (Axial)Simulasi Kegagalan pada Rangka Atap

Frame	max +					min -				
	sim-1	sim-2		sim-3		sim-1	sim-2		sim-3	
	P (ton)	P (ton)	%	P (ton)	%	P (ton)	P (ton)	%	P (ton)	%
17185	24.39 COMB5	11.89 COMB5	-51.2	8.306 COMB5	-65.9	2.692 BMAT1	0.901 BMAT1	-66.5	0.3842 BMAT1	-85.7
17186	20.11 COMB6	9.909 COMB6	-50.7	6.981 COMB6	-65.3	-50.5 COMB5	-46.8 COMB5	-7.45	-74.47 COMB5	47.39
17187	-0.86 BMAT1	-2.94 BMAT1	240	-4.71 BMAT1	445.3	-41.5 COMB6	-38.4 COMB6	-7.4	-61.06 COMB6	47.07
17188	13.39 COMB5	-0.39 BMAT1	-103	-0.49 BMAT1	-104	-4.94 COMB6	-16.8 COMB6	239	-26.85 COMB6	443.1
17189	10.85 COMB4	-1.32 BMAT1	-112	-3.53 BMAT1	-133	-0.88 COMB5	-9.43 COMB5	966.9	-24.8 COMB5	2705
17190	-0.72 COMB6	-3.3 BMAT1	358.6	-6.38 BMAT1	785.8	-2.61 COMB5	-16.3 COMB5	523.2	-37.7 COMB5	1342
17191	-0.06 BMAT1	-1.27 BMAT1	2199	-3.5 BMAT1	6225	-2.03 COMB4	-13.2 COMB4	551	-30.66 COMB4	1413
17192	-0.91 COMB4	-3.23 BMAT1	297.3	-6.23 BMAT1	666.9	-1.68 COMB5	-16.5 COMB5	880	-37.38 COMB5	2123
17193	-0.05 BMAT1	-1.24 BMAT1	2644	-3.47 BMAT1	7551	-1.28 COMB4	-13.4 COMB4	943.9	-30.41 COMB4	2277
17194	-0.78 COMB6	-3.06 BMAT1	290.5	-6.07 BMAT1	675.2	-1.62 COMB5	-16.3 COMB5	903.8	-37.27 COMB5	2195
17195	-0.04 BMAT1	-1.23 BMAT1	3265	-3.45 BMAT1	9329	-1.25 COMB4	-13.2 COMB4	961.8	-30.34 COMB4	2336
17196	-0.71 COMB4	-2.88 BMAT1	303.6	-5.89 BMAT1	724.7	-1.4 COMB5	-16 COMB5	1044	-36.97 COMB5	2535
17197	-0.03 BMAT1	-1.22 BMAT1	4049	-3.44 BMAT1	11586	-1.08 COMB4	-13 COMB4	1108	-30.11 COMB4	2691
17198	-0.56 COMB4	-2.71 BMAT1	380.8	-5.71 BMAT1	914	-1.21 COMB5	-15.8 COMB5	1211	-36.7 COMB5	2943
17199	-0.03 BMAT1	-1.21 BMAT1	4615	-3.42 BMAT1	13226	-0.94 COMB5	-12.8 COMB4	1264	-29.9 COMB4	3074
17200	-0.41 COMB4	-2.53 BMAT1	514.8	-5.53 BMAT1	1242	-1.01 COMB5	-15.6 COMB5	1448	-36.41 COMB5	3520
17201	-0.01 BMAT1	-1.19 BMAT1	11482	-3.39 BMAT1	32833	-0.92 COMB5	-12.7 COMB4	1272	-29.68 COMB4	3114
17202	-0.26 COMB4	-2.36 BMAT1	799.4	-5.37 BMAT1	1948	-0.81 COMB5	-15.3 COMB5	1782	-36.28 COMB5	4358
17203	-0.11 BMAT1	-1.25 BMAT1	1021	-3.54 BMAT1	3063	-1.03 COMB5	-12.5 COMB4	1117	-29.59 COMB4	2785
17204	-0.12 BMAT1	-2.21 BMAT1	1755	-5.06 BMAT1	4141	-0.84 COMB4	-15.2 COMB5	1719	-35.03 COMB5	4087
17205	14.09 COMB5	5.885 COMB5	-58.2	4.372 COMB5	-69	-0.49 COMB4	-12.4 COMB4	2427	-28.58 COMB4	5723
17206	12.16 COMB5	12.72 COMB5	4.541	24.08 COMB5	97.98	1.071 BMAT1	1.154 BMAT1	7.72	2.7886 BMAT1	160.3
17207	10 COMB6	10.46 COMB4	4.507	19.73 COMB6	97.23	-0.36 COMB5	-27.4 COMB5	7452	-41.98 COMB5	11451
17208	12.6 COMB5	-0.29 BMAT1	-102	-0.65 BMAT1	-105	-0.29 COMB6	-22.4 COMB6	7554	-34.26 COMB6	11607
17209	10.25 COMB4	-3.83 BMAT1	-137	-5.9 BMAT1	-157	0.056 BMAT1	-26.7 COMB5	#####	-41.05 COMB5	#####
17210	16.7 COMB5	12.06 COMB5	-27.8	13.09 COMB5	-21.6	-0.27 BMAT1	-21.8 COMB4	8018	-33.5 COMB6	12382
17211	13.95 COMB6	20.58 COMB5	47.47	48.05 COMB5	244.4	0.08 BMAT1	2.901 BMAT1	3509	6.8512 BMAT1	8421
17212	16.61 COMB5	16.85 COMB5	1.427	39.21 COMB4	136.1	-0.23 BMAT1	-0.2 BMAT1	-12.7	0.4482 BMAT1	-293
17213	13.87 COMB6	20.33 COMB5	46.59	48.44 COMB5	249.2	0.207 COMB4	3.017 BMAT1	1354	7.0573 BMAT1	3303
17214	16.44 COMB5	21.59 COMB5	31.35	39.52 COMB4	140.4	-0.12 BMAT1	0.61 BMAT1	-611	1.7786 BMAT1	-1590
17215	13.71 COMB4	20.77 COMB5	51.44	48.8 COMB5	255.8	0.424 COMB4	3.272 BMAT1	671	7.3016 BMAT1	1620
17216	16.48 COMB5	26.57 COMB5	61.16	39.79 COMB4	141.4	0.16 BMAT1	1.591 BMAT1	892.6	3.2708 BMAT1	1940
17217	13.72 COMB4	21.95 COMB4	59.97	49.2 COMB5	258.5	0.626 COMB4	3.505 BMAT1	459.8	7.5454 BMAT1	1105
17218	16.71 COMB5	31.72 COMB5	89.79	46.97 COMB5	181	0.593 BMAT1	2.725 BMAT1	359.5	4.9177 BMAT1	729.2
17219	13.87 COMB4	26.12 COMB6	88.32	49.58 COMB5	257.4	0.83 COMB4	3.742 BMAT1	350.6	7.7885 BMAT1	837.9
17220	17.13 COMB5	37.06 COMB5	116.3	55.89 COMB5	226.2	1.181 BMAT1	4.014 BMAT1	239.9	6.7191 BMAT1	469
17221	14.16 COMB6	30.43 COMB6	114.9	49.96 COMB5	252.9	1.035 COMB4	3.978 BMAT1	284.4	8.0318 BMAT1	676.2
17222	17.72 COMB5	42.59 COMB5	140.3	64.99 COMB5	266.7	1.464 COMB6	5.458 BMAT1	272.8	8.6741 BMAT1	492.6
17223	14.57 COMB6	34.88 COMB4	139.3	53.15 COMB6	264.7	1.241 COMB4	4.226 BMAT1	240.6	8.282 BMAT1	567.5
17224	18.59 COMB5	48.23 COMB5	159.5	74.22 COMB5	299.3	1.677 COMB2	7.044 BMAT1	320.1	10.775 BMAT1	542.7
17225	15.2 COMB4	39.4 COMB4	159.1	60.61 COMB4	298.6	1.474 COMB4	4.423 BMAT1	200.1	8.5338 BMAT1	479.2
17226	19.44 COMB5	53.7 COMB5	176.2	83.73 COMB5	330.6	1.932 COMB6	8.753 BMAT1	353.1	13.065 BMAT1	576.3
17227	15.81 COMB4	43.77 COMB4	176.9	68.28 COMB4	331.9	1.306 COMB4	4.961 BMAT1	279.8	8.541 BMAT1	553.8
17228	14.84 COMB5	59.32 COMB5	299.7	95.84 COMB5	545.8	1.013 COMB4	10.15 BMAT1	901.6	15.395 BMAT1	1419
17229	15.01 COMB5	48.32 COMB4	222	78.13 COMB4	420.6	3.05 BMAT1	5.735 BMAT1	88.02	8.5266 BMAT1	179.5
17230	12.16 COMB4	27.67 COMB4	127.6	43.53 COMB4	258	0.95 BMAT1	1.97 BMAT1	107.5	2.9636 BMAT1	212.1
17231	20.18 COMB5	9.39 COMB4	-53.5	15.03 COMB6	-25.5	3.429 COMB4	-36.4 COMB5	-1161	-62.39 COMB5	-1919
17232	16.41 COMB5	-4.37 BMAT1	-127	-6.82 BMAT1	-142	3.13 BMAT1	-36.7 COMB5	-1272	-53.74 COMB5	-1817
17233	12.91 COMB6	-3.84 BMAT1	-130	-6.01 BMAT1	-147	1.027 COMB6	-30 COMB4	-3024	-44.31 COMB5	-4416
17234	15.25 COMB5	4.293 COMB5	-71.8	0.744 COMB6	-95.1	-0.41 BMAT1	-23.9 COMB4	5783	-36.22 COMB6	8816
17235	15.48 COMB5	3.821 COMB4	-75.3	0.744 COMB6	-95.2	-0.34 BMAT1	-3.35 COMB1	894.5	-5.043 COMB5	1399
17236	15.75 COMB5	-0.07 COMB4	-100	-3.81 COMB6	-124	-0.2 BMAT1	-4.32 COMB5	2061	-12.01 COMB5	5906
17237	16.26 COMB5	-3.16 COMB4	-119	-4.86 BMAT1	-130	0.109 BMAT1	-8.03 COMB5	-7438	-18.48 COMB5	#####
17238	16.94 COMB5	-3.45 COMB4	-120	-5.4 BMAT1	-132	0.572 BMAT1	-11.5 COMB5	-2119	-24.8 COMB5	-4438
17239	17.81 COMB5	-3.47 BMAT1	-119	-5.78 BMAT1	-132	1.19 BMAT1	-14.9 COMB5	-1350	-30.94 COMB5	-2700
17240	18.87 COMB5	-3.3 BMAT1	-117	-6 BMAT1	-132	1.963 BMAT1	-18 COMB5	-1019	-36.88 COMB5	-1979
17241	20.12 COMB5	-2.97 BMAT1	-115	-6.08 BMAT1	-130	2.892 BMAT1	-21 COMB5	-827	-42.67 COMB5	-1575
17242	21.62 COMB5	-2.34 BMAT1	-111	-5.87 BMAT1	-127	4.002 BMAT1	-22.9 COMB5	-671	-47.51 COMB5	-1287
17243	17.6 COMB6	-3.83 BMAT1	-122	-5.75 BMAT1	-133	-42.8 COMB5	-37.6 COMB5	-12.2	-50.98 COMB5	19.07
17244	-4.41 BMAT1	-4.24 BMAT1	-3.84	-6.4 BMAT1	44.99	-41.2 COMB5	-39.9 COMB5	-3.03	-54.92 COMB5	33.43
17245	-4.21 BMAT1	-5.41 BMAT1	28.44	-8.12 BMAT1	92.74	-39.4 COMB5	-47.6 COMB5	20.92	-66.48 COMB5	68.81
17246	-3.96 BMAT1	-2.74 BMAT1	-30.8	-4.3 BMAT1	8.648	-37.2 COMB5	-39.2 COMB6	5.299	-54.58 COMB6	46.66
17247	-3.88 BMAT1	-2.4 BMAT1	-38	-3.79 BMAT1	-2.34	-36.2 COMB5	-25.9 COMB5	-28.4	-35.54 COMB5	-1.78
17248	-4.87 BMAT1	-2.64 BMAT1	-45.9	-3.9 BMAT1	-20	-43.3 COMB5	-27.7 COMB5	-36	-36.5 COMB5	-15.6
17249	7.763 COMB5	6.596 COMB5	-15	11.11 COMB5	43.13	-35.6 COMB6	-23 COMB4	-35.6	-30.13 COMB4	-15.5
17250	7.261 COMB5	8.25 COMB5	13.62	13.53 COMB5	86.32	0.974 BMAT1	1.116 BMAT1	14.66	1.8743 BMAT1	92.53

17251	5.849	11.69	99.86	20.6	252.3	0.611	1.469	140.6	2.7501	350.4
17252	4.606	9.462	105.4	16.74	263.4	0.574	0.724	26.13	1.0782	87.94
17253	4.483	4.673	4.236	7.196	60.52	0.643	0.672	4.527	1.0337	60.81
17254	3.475	3.731	-56	5.79	-31.7	1.008	0.302	-70	0.5769	-42.8
17255	6.853	2.836	-58.6	4.402	-35.8	-0.01	-0.01	-13.4	-0.015	85.37
17256	1.194	0.895	-25.1	1.234	3.341	0.082	0.08	-2.67	0.0572	-30.5
17257	0.984	0.74	-24.8	1.017	3.313	-0.35	0.072	-120	0.1157	-133
17258	-0.13	0.459	-454	0.71	-648	-1.01	0.034	-103	0.0563	-106
17259	0.881	0.107	-87.8	0.234	-73.5	-0.82	-0.38	-53.8	-0.588	-29.4
17260	0.732	1.547	111.4	3.244	343.4	-1.39	-0.3	-78.4	-0.467	-66.1
17261	-0.12	2.471	-2179	4.469	-3859	-1.12	0.286	-126	0.5736	-151
17262	1.801	2.025	12.49	3.656	103.1	-0.28	-0.08	-72.7	-0.028	-90
17263	1.486	1.612	8.514	2.895	94.82	-0.38	0.124	-133	0.3031	-180
17264	0.593	1.297	118.7	2.344	295.2	-0.33	-1.31	302.3	-2.033	524.1
17265	0.473	3.873	718.9	6.221	1216	-1.42	-1.08	-24	-1.668	17.61
17266	0.917	3.132	241.6	5.049	450.6	-1.18	-2.27	92.24	-4.077	244.6
17267	2.165	-0.2	-109	-0.59	-127	0.339	-1.88	-654	-4.537	-1438
17268	3.242	0.853	-73.7	1.125	-65.3	0.373	-1.47	-493	-3.7	-1091
17269	2.648	0.698	-73.6	0.92	-65.3	-7.78	-4.49	-42.4	-5.758	-26
17270	-0.41	4.491	-1201	6.305	-1646	-6.41	-3.72	-42	-4.758	-25.9
17271	0.553	3.649	560.5	5.129	828.3	-2.44	-3.39	38.76	-5.848	139.5
17272	1.182	-0.09	-108	-0.14	-112	0.13	-2.77	-2238	-4.776	-3788
17273	0.973	7.945	716.4	11.62	1094	-15.9	-0.29	-98.2	-0.577	-96.4
17274	-3.02	7.598	-352	10.29	-441	-17.1	0.509	-103	0.8954	-105
17275	-2.02	8.414	-516	8.427	-517	-13.9	0.044	-100	-0.22	-99.4
17276	12.43	6.886	-44.6	5.387	-56.7	-5.19	-6.03	16.28	-8.182	57.75
17277	13.85	-0.36	-103	-0.56	-104	2.114	-4.93	-333	-6.689	-416
17278	11.3	-1.74	-115	-2.64	-123	-7.14	-11.3	58.32	-17.56	146
17279	-1.06	-3.48	227.5	-5.32	401.2	-6.77	-23.6	249.4	-36.48	439.1
17280	-2.83	9.703	-442	13.43	-574	-17.1	-19.3	13.12	-29.8	74.42
17281	26.23	26.83	2.257	40.76	55.36	-13.9	3.81	-127	5.8111	-142
17282	26.61	21.93	-17.6	33.3	25.14	3.776	1.464	-61.2	2.2184	-41.2
17283	21.76	38.25	75.83	58.74	170	-0.29	5.548	-2012	8.4907	-3027
17284	0.052	38.11	72629	58.63	1E+05	-0.25	5.542	-2358	8.49	-3560
17285	0.169	39.07	22990	59.25	34917	-0.17	5.7	-3443	8.5984	-5143
17286	6.435	31.88	395.3	48.34	651.2	0.102	2.147	2003	3.7014	3525
17287	5.269	13.88	163.5	35.7	577.6	0.247	1.95	688.3	5.0882	1957
17288	1.699	13.49	693.9	35.31	1978	0.137	1.881	1276	5.0193	3572
17289	1.508	13.21	776.5	35.07	2227	0.137	1.825	1235	4.9698	3536
17290	1.478	13.17	790.9	34.98	2266	0.118	1.805	1428	4.9414	4084
17291	1.468	13.1	792.7	34.88	2276	0.106	1.784	1586	4.9163	4547
17292	1.46	13.05	793.7	34.78	2282	0.096	1.768	1738	4.8939	4987
17293	1.461	12.99	789.2	34.73	2277	0.092	1.756	1804	4.8823	5195
17294	1.418	13	816.2	34.33	2320	0.079	1.749	2122	4.8182	6022
17295	1.704	12.24	618.1	36.13	2020	0.096	1.618	1594	5.0537	5192
17296	21.54	9.999	-53.6	29.5	36.94	1.401	1.74	24.22	2.021	44.26
17297	20.8	19.88	-4.42	37.04	78.1	3.484	3.356	-3.65	5.8223	67.13
17298	16.94	16.19	-4.43	31.85	88.05	-1.59	0.577	-136	3.5109	-320
17299	-0.21	13.89	-6736	34.31	#####	-1.31	1.028	-179	3.9633	-404
17300	-0.08	13.71	#####	34.11	#####	-1.1	1.138	-204	4.0704	-471
17301	0.112	13.92	12386	34.28	30649	-0.87	1.301	-250	4.229	-587
17302	0.308	14.07	4471	34.41	11075	-0.64	1.457	-327	4.3815	-784
17303	0.509	14.23	2697	34.52	6682	-0.41	1.616	-494	4.5335	-1206
17304	0.699	14.38	1957	34.78	4876	-0.19	1.774	-1030	4.7071	-2567
17305	1.002	14.74	1371	34.04	3297	-0.01	1.957	#####	4.7329	#####
17306	12.29	12.04	-2.04	27.79	126.2	0.802	-0.08	-110	-0.127	-116
17307	10.12	3.621	-64.2	3.342	-67	-42.7	-30.2	-29.2	-30.51	-28.5
17308	13.44	30.94	130.2	44.44	230.6	-35.1	-24.9	-29	-25.16	-28.3
17309	12.67	25.17	98.71	38.13	201	2.351	3.975	69.08	6.0277	156.4
17310	12.33	24.15	95.82	38.04	208.5	2.146	3.864	80.07	5.8599	173.1
17311	10.04	19.68	96.01	31.02	208.9	-16.8	-34.4	104.1	-54.26	222.1
17312	-3.08	-5.41	75.54	-8.11	163	-16.9	-32.9	94.79	-51.71	205.8
17313	-3.14	-5.32	69.27	-8	154.7	-16	-31	93.31	-49.67	209.8
17314	-3.34	-4.99	49.63	-5.69	70.64	-14.1	-25.6	81.13	-40.48	186.4
17315	1.475	-2.51	-270	-6.23	-523	-11.5	-27.3	136.5	-53.16	360.8
17316	1.875	-1.19	-163	-5.18	-376	-1.16	-22.4	1833	-45.48	3829
17317	1.545	-1.5	-197	-5.44	-452	0.126	-18.6	#####	-46.03	#####
17318	1.245	-1.69	-236	-5.64	-553	-0.14	-18.7	13087	-46.16	32383
17319	0.942	-1.9	-302	-5.84	-719	-0.4	-18.9	4596	-46.3	11383
17320	0.636	-2.11	-432	-6.04	-1049	-0.67	-19.1	2757	-46.45	6837
17321	0.329	-2.32	-804	-6.24	-1995	-0.94	-19.3	1967	-46.58	4882
17322	0.087	-2.54	-3037	-6.47	-7582	-1.24	-19.5	1472	-46.88	3672
17323	-1.01	-3.02	199.3	-4.6	356	-23.1	-16.8	-27.4	-38.28	65.49

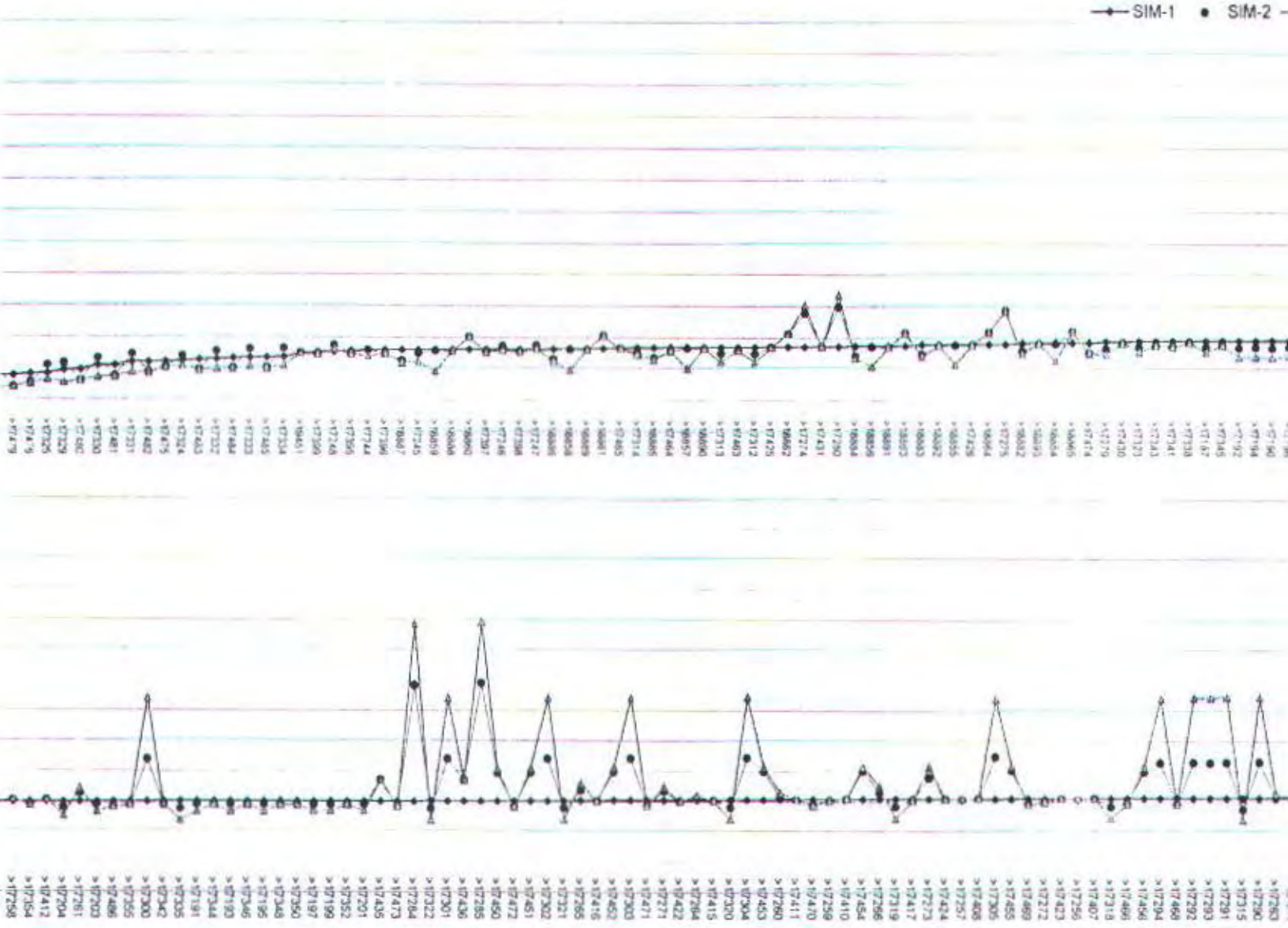
17324	-8.16	-6.41	-21.4	-9.58	17.38	-46.6	-34.3	-26.3	-56.36	21.03
17325	-12.2	-9.48	-22.2	-14	15.1	-67.1	-48.1	-28.3	-79.75	18.93
17326	-17.2	-14.8	-13.7	-21.3	24.06	-87.9	-71.5	-18.7	-116.6	32.6
17327	-15.1	-12.8	-15	-19.3	27.89	-86.6	-70.6	-18.4	-115.8	33.74
17328	-12.9	-10.5	-18.4	-16.9	30.76	-84.1	-67.4	-19.9	-111.7	32.9
17329	-11.1	-8.62	-22.4	-14.9	33.78	-82.1	-64.6	-21.3	-108.1	31.69
17330	-9.6	-7	-27.1	-13.1	36.79	-80.4	-62.2	-22.7	-104.9	30.41
17331	-8.4	-5.69	-32.3	-11.7	39.39	-79.2	-60.2	-24	-102.1	28.94
17332	-7.51	-4.69	-37.5	-10.6	41.09	-78.3	-58.5	-25.2	-99.62	27.29
17333	-6.93	-4	-42.3	-9.79	41.32	-77.7	-57.2	-26.4	-97.52	25.47
17334	-6.69	-3.65	-45.4	-9.33	39.53	-77.7	-56.4	-27.4	-95.93	23.52
17335	-0.06	-2.72	4600	-6.56	11242	-63.9	-46.5	-27.2	-78.81	23.31
17336	24.36	23.67	-2.81	23.43	-3.8	-1.19	-16.3	1271	-38.09	3103
17337	20.07	19.51	-2.79	19.31	-3.77	-50.9	-65.7	29.14	-67.23	32.1
17338	-0.87	-1.64	89.33	-1.6	84.35	-41.8	-53.9	28.94	-55.16	31.89
17339	13.7	15.8	15.39	15.11	10.32	-5	-9.42	88.33	-9.173	83.47
17340	11.09	12.81	15.52	12.25	10.42	-1.08	-8.03	646.2	-9.527	785.9
17341	-0.89	-2.74	208.1	-2.84	220.1	-2.72	-12.6	364	-13.37	390.9
17342	-0.06	-1.06	1684	-1.29	2070	-2.14	-10.2	378.6	-10.83	406.6
17343	-0.99	-2.44	147.2	-2.57	160.3	-1.77	-11.2	534.9	-12.13	585.4
17344	-0.05	-1.05	2005	-1.28	2465	-1.37	-9.1	562.5	-9.83	615.8
17345	-0.86	-2.3	166.2	-2.42	180.9	-1.72	-11.2	555	-12.11	605.7
17346	-0.04	-1.04	2413	-1.27	2969	-1.34	-9.12	579	-9.828	631.9
17347	-0.71	-2.12	199.8	-2.25	217.9	-1.5	-11	635.3	-11.88	694.1
17348	-0.03	-1.03	2982	-1.26	3551	-1.18	-8.93	659.3	-9.716	726.1
17349	-0.56	-1.95	250.6	-2.08	273.7	-1.3	-10.8	730.6	-11.67	798.7
17350	-0.03	-1.03	3193	-1.26	3936	-1.15	-8.77	665.1	-9.713	747
17351	-0.41	-1.78	338.9	-1.91	371	-1.1	-10.6	861.6	-11.46	943.2
17352	-0.02	-1	6371	-1.24	7900	-1.13	-8.6	663.9	-9.666	758.5
17353	-0.26	-1.62	534.3	-1.75	583.4	-0.94	-10.5	1013	-11.32	1106
17354	-0.12	-1.18	851.9	-1.36	1003	-1.27	-8.64	578.1	-9.931	679.4
17355	-0.1	-1.36	1296	-1.53	1467	-1.05	-9.5	803.9	-10.65	913.5
17356	14.97	15.11	0.988	16.41	9.671	-0.57	-7.76	1273	-8.701	1440
17357	12.48	18.14	45.31	19.9	59.41	1.112	1.923	72.87	2.1756	95.58
17358	10.25	14.87	45.02	16.31	59.03	-0.37	-5.54	1385	-5.562	1390
17359	12.73	13.1	2.855	13.57	6.593	-0.31	-4.53	1381	-4.539	1386
17360	10.35	10.65	2.87	11.04	6.632	0.068	-4.71	-7064	-4.719	-7080
17361	18.18	18.38	1.102	23.57	29.63	-0.01	-3.85	76808	-3.853	76962
17362	15.08	15.24	1.08	19.47	29.16	0.056	1.827	3191	2.0177	3535
17363	17.99	19.84	10.29	24.11	34.02	0.012	0.282	2252	0.891	7325
17364	14.92	16.43	10.13	19.92	33.47	0.189	2.019	968.7	2.1907	1060
17365	17.7	21.25	20.05	24.68	39.46	0.102	0.614	504.7	1.1039	986.5
17366	14.67	17.57	19.74	20.37	38.84	0.415	2.249	441.5	2.4243	483.7
17367	17.63	22.85	29.61	25.45	44.38	0.358	1.11	209.7	1.4802	313.2
17368	14.59	18.85	29.19	20.98	43.75	0.617	2.479	301.8	2.6521	329.9
17369	17.74	24.64	38.88	26.41	48.86	0.768	1.759	129.1	2.0105	161.8
17370	14.65	20.28	38.42	21.72	48.28	0.821	2.709	229.9	2.8807	250.8
17371	18.04	26.61	47.54	27.55	52.74	1.333	2.563	92.36	2.6957	102.3
17372	14.85	21.85	47.13	22.61	52.28	1.025	2.94	186.7	3.1101	203.3
17373	18.51	28.76	55.35	29.86	55.94	1.596	3.519	120.6	3.5327	121.4
17374	15.17	23.54	55.1	23.62	55.68	1.231	3.167	157.3	3.3376	171.2
17375	19.26	31.21	62.04	30.48	58.23	1.807	4.647	157.2	4.5397	151.2
17376	15.72	25.47	62.06	24.87	58.23	1.466	3.471	136.8	3.6233	147.2
17377	20.02	33.91	69.43	32.4	61.85	2.074	5.958	187.3	5.7387	176.7
17378	16.25	27.59	69.82	26.35	62.18	1.312	2.932	123.4	3.2334	146.4
17379	15.31	30.65	100.1	31.56	106.1	1.169	6.057	418	6.1846	428.9
17380	15.25	24.91	63.33	25.65	68.16	3.078	4.297	39.6	4.42	43.6
17381	12.35	19.29	56.19	20	61.9	0.965	1.393	44.37	1.4442	49.66
17382	20.4	11.47	-43.8	13.14	-35.6	3.525	3.322	-5.77	3.5641	1.098
17383	16.55	12.2	-26.3	12.83	-22.5	3.195	2.62	-18	2.7137	-15.1
17384	13.11	9.856	-24.8	10.37	-20.9	1.063	0.154	-85.5	0.3773	-64.5
17385	16.95	17.11	0.951	17.25	1.759	-0.1	-0.08	-23.8	-0.057	-42.8
17386	17.13	17.43	1.764	16.93	-1.17	-0.04	-0	-98.9	-0.072	67.21
17387	17.22	15.94	-7.41	15.9	-7.64	0.064	-0.12	-287	-0.125	-295
17388	17.55	14.94	-14.9	15.23	-13.2	0.346	-0.03	-108	0.0138	-96
17389	18.07	14.08	-22	14.73	-18.5	0.781	0.21	-73.1	0.303	-61.2
17390	18.77	13.42	-28.5	14.41	-23.2	1.371	0.606	-55.8	0.7481	-45.4
17391	19.65	12.94	-34.2	14.28	-27.3	2.116	1.155	-45.4	1.3475	-36.3
17392	20.74	12.7	-38.8	14.37	-30.7	3.019	1.867	-38.2	2.1074	-30.2
17393	22.06	12.38	-43.9	14.5	-34.2	4.098	2.713	-33.8	3.0175	-26.4
17394	17.92	10.03	-44.1	11.76	-34.4	-43	-50.7	17.88	-50.97	18.54
17395	-4.43	-5.59	26.05	-5.66	27.74	-41.3	-49.4	19.51	-49.91	20.77
17396	-4.22	-5.53	30.96	-5.62	33.06	-39.5	-48.6	23.09	-49.26	24.67

17397	-3.99	-4.94	23.84	-4.99	25.2	-37.4	-44	17.75	-44.4	18.74
17398	-3.91	-4.79	22.71	-4.83	23.61	-36.4	-42.6	17.05	-42.8	17.7
17399	-4.91	-5.83	18.74	-5.81	18.33	-43.5	-49.9	14.8	-49.77	14.44
17400	7.798	10.29	32	10.33	32.48	-35.8	-41.1	14.66	-40.94	14.32
17401	7.29	9.925	36.14	10.11	38.61	0.974	1.351	38.79	1.377	41.43
17402	5.873	9.767	66.32	10.18	73.35	0.604	1.179	95.28	1.2374	105
17403	4.623	7.896	70.8	8.232	78.09	0.574	0.754	31.47	0.728	26.94
17404	4.494	5.873	30.67	5.689	26.59	0.644	0.842	30.68	0.8155	26.57
17405	8.508	10.16	19.45	9.776	14.9	1.016	1.252	23.31	1.1971	17.88
17406	6.875	8.226	19.65	7.91	15.06	-0.01	-0.01	45.68	-0.013	64.2
17407	1.2	1.413	17.77	1.416	17.99	0.083	0.068	-19.3	0.063	-23.7
17408	0.988	1.162	17.6	1.165	17.82	-0.36	-0.31	-13.5	-0.241	-32.3
17409	-0.13	-0.14	6.098	-0.13	-0.91	-1.01	-1.07	5.568	-1.003	-0.79
17410	0.885	0.924	4.383	0.89	0.496	-0.82	-0.97	5.579	-0.818	-0.79
17411	0.734	0.766	4.32	0.737	0.491	-1.39	-0.81	-41.6	-0.693	-50.1
17412	-0.12	0.375	-406	0.545	-546	-1.13	-0.66	-41.8	-0.56	-50.3
17413	1.812	2.084	15.05	2.131	17.66	-0.28	0.221	-179	0.2282	-191
17414	1.494	1.717	14.9	1.755	17.49	-0.38	-0	-99.9	0.0186	-105
17415	0.595	0.445	-25.2	0.308	-43.2	-0.33	0.025	-108	0.0103	-103
17416	0.474	0.351	-25.9	0.239	-49.5	-1.44	-0.82	-42.8	-0.601	-58.3
17417	0.947	0.419	-55.8	0.29	-69.4	-1.2	-0.69	-42	-0.513	-57.2
17418	2.173	1.135	-47.8	1.007	-53.7	0.345	0.196	-43.2	0.0268	-92.2
17419	3.259	3.694	13.35	3.572	9.61	0.377	0.439	16.46	0.4221	11.87
17420	2.66	3.015	13.35	2.916	9.612	-7.82	-8.88	13.64	-8.793	12.49
17421	-0.41	-0.37	-9.85	-0.4	-4.51	-6.44	-7.31	13.53	-7.232	12.38
17422	0.564	0.045	-92	0.029	-94.8	-2.47	-2.24	-9.3	-2.36	-4.34
17423	1.189	1.187	-0.18	1.106	-7.03	0.132	-0.27	-303	-0.357	-371
17424	0.978	0.977	-0.17	0.91	-6.97	-16.1	-16.3	1.463	-17.06	5.974
17425	-3.06	-3.19	4.345	-3.27	6.757	-17.3	-18.2	5.451	-18.71	8.337
17426	-2.09	-2.5	19.98	-2.49	19.32	-14	-14.8	5.474	-15.22	8.38
17427	12.58	13.2	4.987	13.58	8.007	-5.48	-7.72	40.8	-7.625	39.11
17428	13.99	14.96	6.871	15.33	9.53	2.142	2.278	6.363	2.3333	8.931
17429	11.4	12.19	6.885	12.49	9.557	-7.16	-10.1	41.47	-10.12	41.39
17430	-1.05	-1.8	71.37	-1.81	71.55	-6.77	-12	77.32	-12.03	77.62
17431	-2.87	-2.96	2.821	-3.04	5.612	-17.3	-17.9	3.363	-18.41	6.497
17432	26.41	33.81	28.02	34.28	29.81	-14.1	-14.6	3.375	-15	6.525
17433	26.8	31.18	16.35	31.63	18	3.809	4.435	16.44	4.5003	19.15
17434	21.9	25.47	16.34	25.84	17.99	-0.28	1.044	-471	1.0441	-471
17435	0.03	7.115	23695	7.135	23763	-0.23	1.076	-565	1.0758	-566
17436	0.148	7.196	4772	7.222	4790	-0.15	1.109	-816	1.1098	-816
17437	6.613	12.22	84.8	11.46	73.28	0.116	1.942	1573	1.8336	1479
17438	5.409	12.3	127.5	14.31	164.6	0.253	1.678	562.8	1.9679	677.2
17439	1.938	11.49	492.9	13.76	610	0.142	1.549	987.5	1.8754	1217
17440	1.792	11.68	551.9	13.93	677.3	0.144	1.56	987.2	1.8838	1213
17441	1.765	11.62	558.7	13.89	687.1	0.125	1.537	1127	1.8636	1387
17442	1.758	11.6	560.1	13.88	689.6	0.114	1.524	1242	1.8511	1531
17443	1.752	11.58	560.7	13.86	691.3	0.104	1.512	1348	1.8408	1663
17444	1.758	11.59	559.5	13.88	689.3	0.101	1.51	1391	1.8389	1715
17445	1.698	11.26	563	13.69	706.1	0.086	1.455	1598	1.8049	2006
17446	2.137	13.62	537.4	14.93	599	0.122	1.765	1350	1.9559	1507
17447	21.67	24.11	11.27	23.92	10.38	1.77	3.9	120.4	3.8732	118.9
17448	21	30.1	43.32	31.03	47.73	3.502	4.804	37.2	4.9383	41.03
17449	17.1	24.53	43.43	25.28	47.85	-1.52	0.221	-115	0.4046	-127
17450	0.182	9.482	5101	10.9	5878	-1.23	0.368	-130	0.5717	-146
17451	0.297	9.63	3143	11.02	3612	-1.03	0.524	-151	0.7253	-171
17452	0.506	9.817	1840	11.22	2118	-0.8	0.684	-186	0.8868	-211
17453	0.703	10	1322	11.41	1523	-0.57	0.846	-249	1.049	-285
17454	0.905	10.18	1025	11.6	1182	-0.34	1.007	-398	1.2117	-459
17455	1.1	10.45	849.7	11.84	976.3	-0.16	1.182	-852	1.3828	-980
17456	1.371	10.02	630.5	11.72	754.7	0.017	1.256	7374	1.5007	8833
17457	12.6	13.53	7.378	13.29	5.455	1.109	1.258	13.35	1.223	10.24
17458	10.35	11.11	7.335	10.91	5.424	-42.4	-44.1	4.116	-42.91	1.33
17459	13.47	18.49	37.23	19.74	46.51	-34.8	-36.2	4.087	-35.27	1.32
17460	12.83	19.46	51.69	19.79	54.31	2.369	3.318	40.1	3.3663	42.12
17461	12.49	18.79	50.5	19.2	53.81	2.163	3.066	41.78	3.125	44.5
17462	10.16	15.31	50.64	15.64	53.95	-17.1	-26	52.53	-26.58	55.78
17463	-3.11	-4.33	39.26	-4.4	41.8	-17.1	-25.6	49.7	-26.19	52.95
17464	-3.16	-4.4	39.23	-4.46	41.06	-16.2	-24.9	53.34	-25.31	55.83
17465	-3.35	-3.51	4.937	-3.65	9.103	-14.2	-20.3	42.65	-20.6	44.97
17466	1.347	-0.36	-127	-0.72	-153	-11.6	-12.5	8.008	-14.96	29.18
17467	1.777	-0.46	-126	-0.71	-140	-1.66	-12.9	677.1	-14.66	783.9
17468	1.449	-0.65	-145	-0.92	-163	-0.4	-12.9	3134	-14.81	3602
17469	1.148	-0.86	-175	-1.14	-199	-0.67	-13.2	1869	-15.09	2149

17470	0.845	-1.08	-227	-1.35	-260	-0.93	-13.5	1341	-15.34	1543		
17471	0.539	-1.29	-340	-1.57	-391	-1.2	-13.7	1040	-15.6	1198		
17472	0.279	-1.51	-642	-1.78	-742	-1.47	-13.9	848.6	-15.85	979.1		
17473	0.041	-1.75	-4388	-2.02	-5048	-1.78	-14.3	702.8	-16.19	808		
17474	-1.46	-4.9	235.9	-5.01	243.4	-23.4	-29.9	27.78	-30.67	30.99		
17475	-8.25	-10.1	22.56	-10.3	25.14	-47.1	-60.1	27.59	-61.6	30.71		
17476	-12.3	-15	21.86	-15.3	24.56	-67.9	-86.7	27.72	-88.98	31.1		
17477	-16.9	-20.5	21.51	-20.9	20.29	-86.5	-112	29.37	-110.4	27.67		
17478	-14.9	-18.5	24.42	-18.9	23.38	-85.4	-111	29.71	-109.7	28.39		
17479	-12.8	-16.3	28.07	-16.3	27.42	-83.3	-108	30.06	-107.7	29.32		
17480	-11	-14.5	32.19	-14.5	32.06	-81.5	-106	30.31	-106.2	30.16		
17481	-9.52	-13	36.64	-13.1	37.23	-80.2	-105	30.42	-104.9	30.88		
17482	-8.37	-11.8	41.12	-11.9	42.63	-79.2	-103	30.39	-104.1	31.47		
17483	-7.54	-10.9	45.09	-11.1	47.69	-78.6	-102	30.22	-103.6	31.93		
17484	-7.01	-10.4	47.84	-10.6	51.65	-78.3	-102	29.91	-103.6	32.25		
17485	-6.82	-10.1	48.53	-10.5	53.41	-78.5	-102	29.43	-104	32.34		
17486	-0.1	-1.82	1727	-2.15	2056	-64.6	-83.4	29.22	-85.31	32.13		
18846	42.76	43.87	2.609	84.99	98.78	-1.61	-11.4	609.2	-13.31	724.7		
18847	41.97	43.13	2.77	83.69	99.4	2.723	2.907	6.757	8.7427	221		
18848	40.92	42.1	2.883	81.64	99.52	2.246	2.433	8.307	8.1227	261.6		
18849	39.4	40.61	3.062	78.36	98.87	1.762	1.953	10.82	7.3848	319		
18850	36.46	37.69	3.388	71.52	96.2	1.245	1.44	15.63	6.3079	406.6		
18851	30.21	31.22	3.335	58.83	94.73	0.625	0.804	28.64	4.0789	552.3		
18852	22.85	23.79	4.076	42.35	85.34	0.217	0.358	65.37	2.2395	933.9		
18853	16.71	17.43	4.321	28.09	68.13	-25.1	-27.2	8.439	-46.75	86.36		
18854	-1.57	-1.93	22.87	-7.46	376	-40.4	-42.8	5.949	-81.32	101.2		
18855	-2.17	-2.52	16.58	-8.8	306.4	-44.1	-46.5	5.467	-90.16	104.5		
18856	-2.67	-3.03	13.35	-9.6	259	-45.7	-48.1	5.246	-93.81	105.2		
18857	-3.16	-3.51	11.24	-10.2	224.2	-46.8	-49.2	5.094	-96	105.1		
18858	-3.64	-4	9.704	-10.8	197	-47.7	-50.1	4.98	-97.56	104.5		
18859	-4.12	-4.47	8.608	-11.4	176.3	-48.4	-50.8	4.92	-98.81	104.1		
18860	-4	0.272	-107	0.246	-106	-47.2	-41.8	-11.5	-80.96	71.61		
18861	-3.52	0.714	-120	0.683	-119	-46.5	-16.9	-63.7	-17.13	-63.1		
18862	-3.04	1.146	-138	1.136	-137	-45.6	-16.4	-64.1	-16.46	-63.9		
18863	-2.56	1.547	-160	1.564	-161	-44.5	-15.9	-64.4	-15.77	-64.6		
18864	-2.06	1.897	-192	1.962	-195	-43	-15.4	-64.3	-14.92	-65.3		
18865	-1.48	2.082	-241	2.243	-251	-39.5	-14.6	-63	-13.5	-65.8		
18866	-0.68	1.315	-293	1.553	-327	-32.7	-12.4	-62.1	-11.47	-64.9		
18867	19.37	9.465	-51.1	3.994	-79.4	-20.6	-9.2	-55.3	-7.858	-61.8		
18868	26.54	11.09	-58.2	6.484	-75.6	0.543	-1.67	-408	-2.345	-532		
18869	35.01	13.23	-62.2	8.867	-74.7	1.118	-2	-279	-2.632	-335		
18870	37.8	13.93	-63.2	9.91	-73.8	1.618	-1.8	-212	-2.382	-247		
18871	39.24	14.45	-63.2	10.65	-72.9	2.093	-1.46	-170	-2.007	-196		
18872	40.25	14.95	-62.9	11.29	-71.9	2.566	-1.06	-141	-1.587	-162		
18873	41.02	15.46	-62.3	11.92	-70.9	3.036	-0.63	-121	-1.137	-137		
18874	45.16	66.08	46.33	73.39	62.51	3.558	6.558	84.34	7.6058	113.9		
18875	44.34	64.94	46.46	72.4	63.3	3.081	6.034	95.87	7.1053	130.6		
18876	43.24	63.27	46.33	70.95	64.09	2.597	5.469	110.6	6.5712	153		
18877	41.62	60.66	45.73	68.65	64.92	2.101	4.83	129.9	5.9769	184.4		
18878	38.46	55.34	43.9	63.78	65.83	1.557	3.978	155.5	5.1886	233.2		
18879	31.77	43.55	43.38	52.44	65.05	0.856	2.432	184.1	3.6398	325.2		
18880	23.94	32.91	37.46	39.78	66.14	0.426	1.257	194.8	2.5546	499.1		
18881	17.62	22.34	26.81	29.72	68.68	-24.8	-34.2	37.92	-39.94	81.25		
18882	-1.63	-4.42	170.7	-5.26	222.1	-41	-60.4	47.5	-66.25	61.7		
18883	-2.25	-5.45	141.9	-6.17	173.9	-44.8	-67.1	49.75	-72.15	60.92		
18884	-2.77	-6.12	121.3	-6.78	145.1	-46.5	-70	50.37	-74.56	60.19		
18885	-3.26	-6.7	105.8	-7.32	124.9	-47.7	-71.7	50.47	-76.05	59.5		
18886	-3.75	-7.25	93.5	-7.84	109.4	-48.6	-73.1	50.3	-77.19	58.81		
18887	-4.22	-7.77	84.05	-8.34	97.54	-49.3	-74.1	50.21	-78.05	58.22		
18888	-4.11	-4.62	12.24	-4.62	12.19	-47.7	-60.8	27.47	-64.01	34.24		
18889	-3.64	-4.14	13.82	-4.14	13.79	-47	-50.5	7.489	-50.47	7.463		
18890	-3.16	-3.64	15.31	-3.65	15.53	-46.1	-49.5	7.336	-49.51	7.428		
18891	-2.67	-3.13	17.07	-3.15	17.72	-45	-48.2	7.091	-48.31	7.346		
18892	-2.17	-2.58	18.84	-2.61	20.46	-43.4	-46.3	6.58	-46.51	7.132		
18893	-1.57	-1.87	19.04	-1.95	23.57	-39.8	-41.9	5.261	-42.41	6.502		
18894	-0.67	-0.7	5.456	-0.81	21.69	-32.9	-34.6	5.197	-35.02	6.423		
18895	20.66	19.07	-7.7	20.92	1.268	-20.3	-20.6	1.018	-21.17	4.04		
18896	27.92	27.49	-1.53	29.03	4.007	0.814	0.755	-7.27	0.9751	19.76		
18897	36.82	37.46	1.742	38.87	5.563	1.465	1.559	6.381	1.7593	20.06		
18898	39.75	40.91	2.914	42.17	6.089	1.988	2.155	8.415	2.3352	17.46		
18899	41.26	42.69	3.463	43.86	6.306	2.473	2.679	8.325	2.8461	15.08		
18900	42.3	43.89	3.759	45	6.393	2.95	3.179	7.762	3.338	13.14		
18901	43.08	44.78	3.939	45.87	6.456	3.423	3.667	7.137	3.8214	11.65		

19428	30.83 COMB1		-100		-100	0.7 COMB4		-100		-100
19429	30.4 COMB1	44.81 COMB1	47.37	68.81 COMB1	126.3	4.327 ENV1	0.743 COMB4	-82.8	0.6949 COMB1	-83.9
19430	31.1 COMB1	36.86 COMB4	17.58	56.15 COMB4	80.57	4.387 ENV1	4.813 ENV1	9.689	4.9123 ENV1	11.96
19431	30.67 COMB1	42.14 COMB1	37.39	42.85 COMB1	39.69	4.358 ENV1	6.001 COMB1	37.71	6.1012 ENV1	40.01
19450	25.02 COMB4	34.38 COMB4	37.42	34.95 COMB4	39.71	-44.5 COMB1	-48.6 COMB1	8.89	-46.65 COMB1	4.764
19451	-5.45 ENV1	-5.2 ENV1	-4.56	-5.47 ENV1	0.441	-45.5 COMB1	-43.2 COMB1	-3.9	-45.61 COMB1	0.179

AFIK GAYA AKSIAL (POSITIF) RANGKA ATAP AKIBAT SIMULASI



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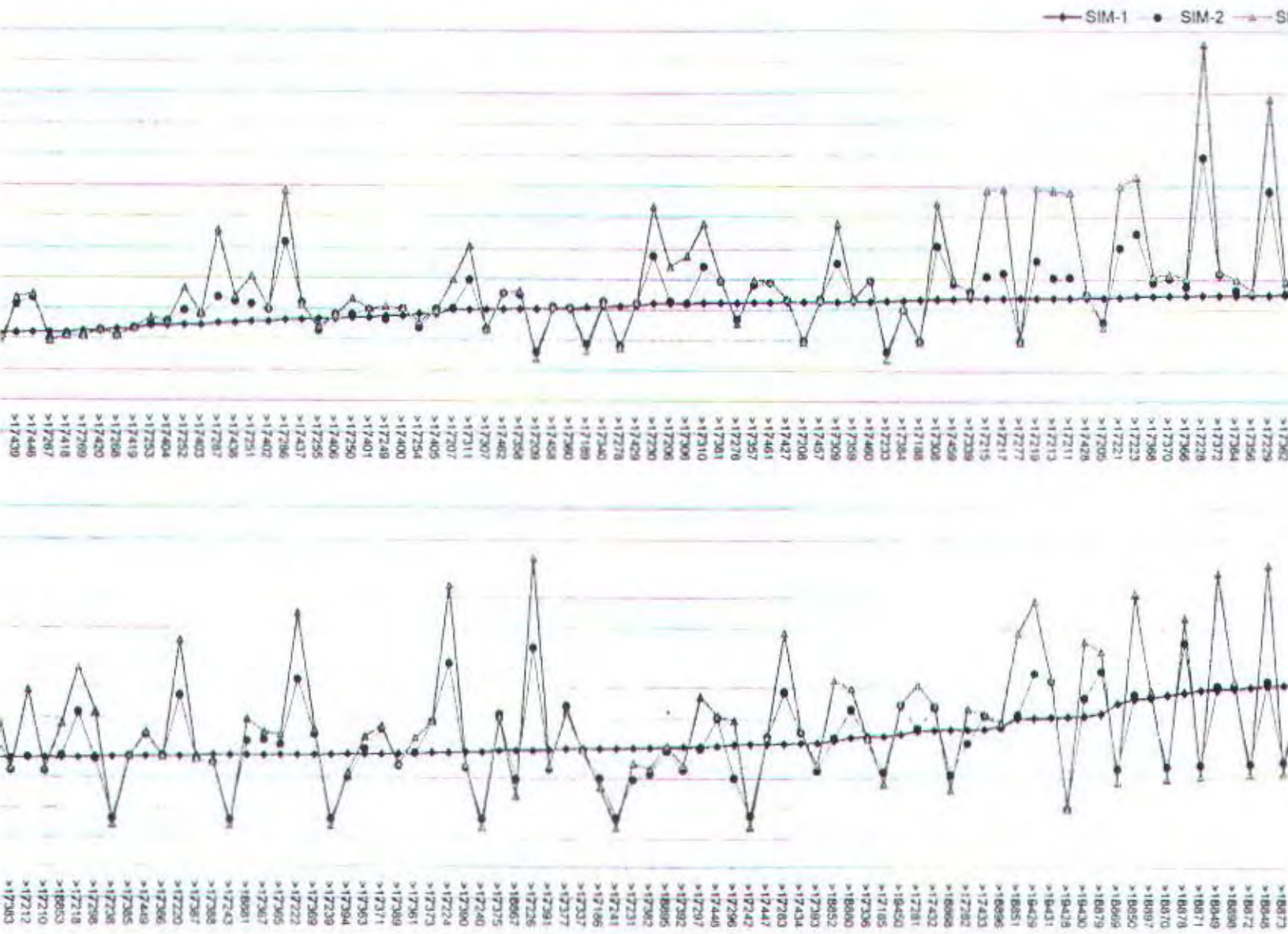

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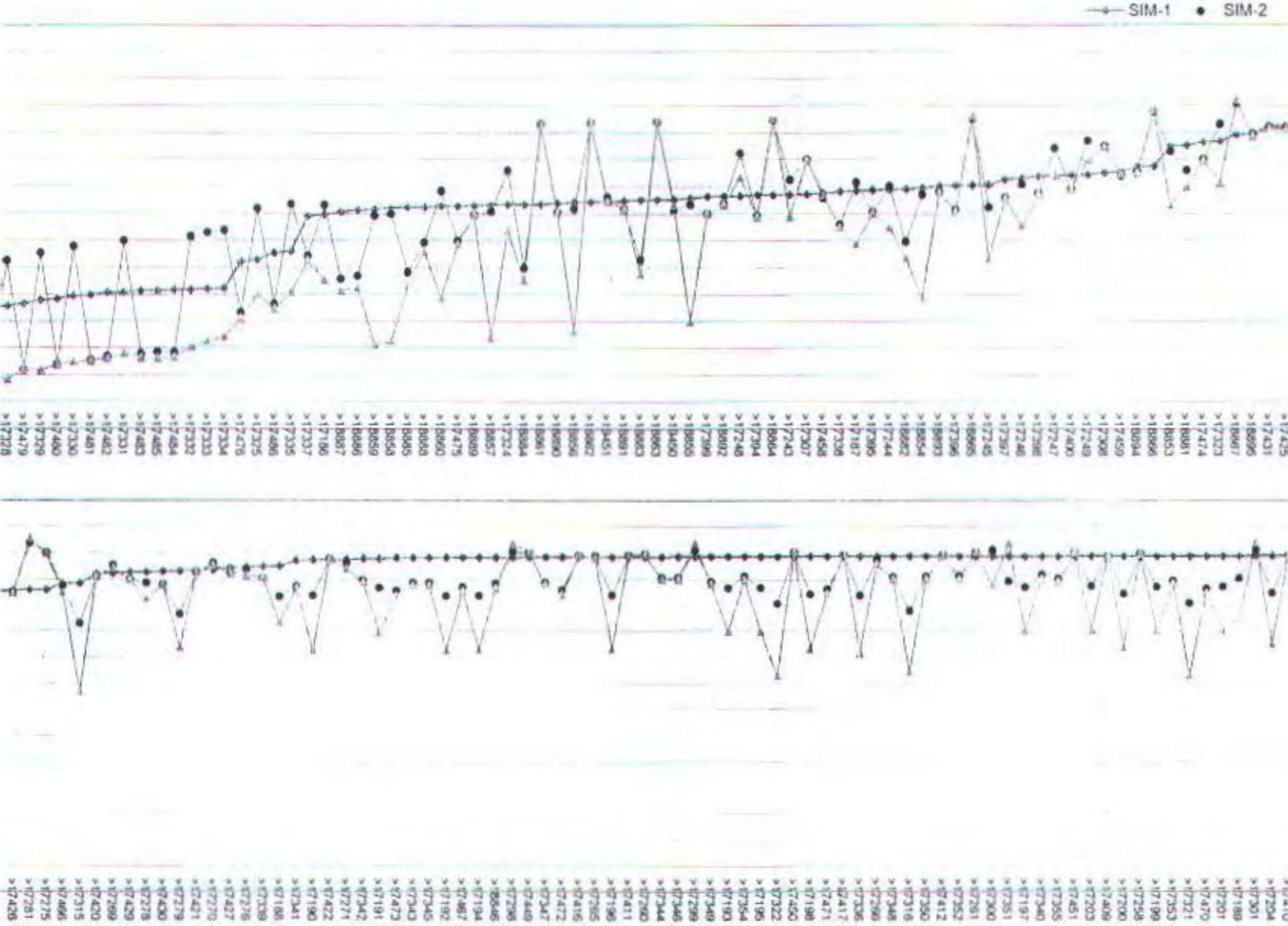

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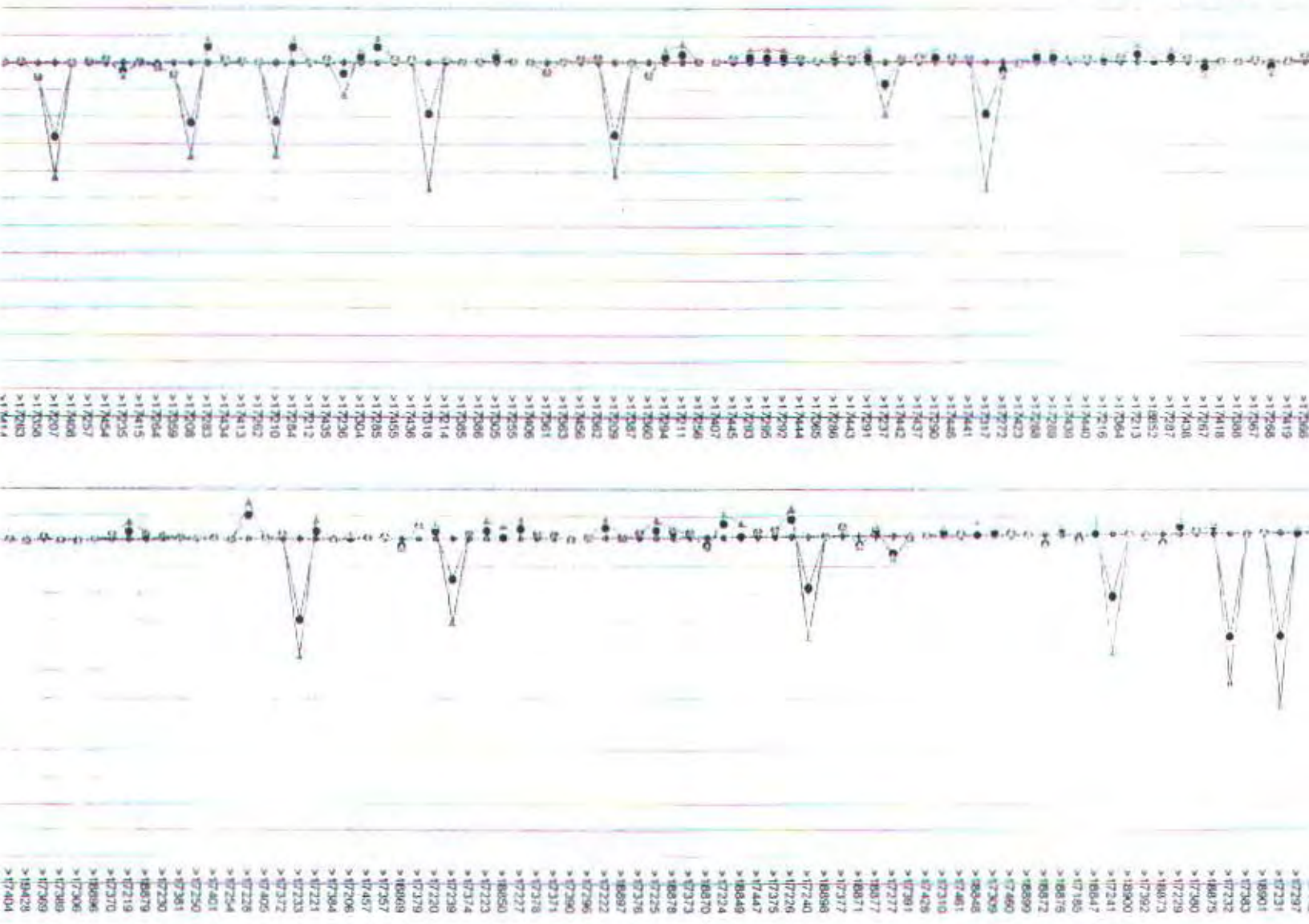


Hasil Output Permodelan Pembebanan Untuk Beban Kritis

P (ton)							V2 (ton)								V3	
max +			min -				max +				min -					
M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-
.6434	4.5293	12.2391	-1.1573	-1.1573	-1.1573	-1.1573	0.3394	0.3394	0.3394	0.3394	-35.353	-32.696	-13.411	-23.054	2.679	2
.0374	8.0374	8.0374	-91.979	-62.928	-65.793	-64.36	43.9663	43.9663	43.9663	43.9663	-43.977	-43.977	-43.977	-43.977	29.9379	29.
0.379	0.379	0.379	-22.106	-22.106	-22.106	-22.106	0.4346	0.4346	0.4346	0.4346	-35.871	-13.695	-33.445	-23.57	2.5673	2.
1.982	171.982	171.982	-162.64	-162.64	-162.64	-162.64	3.8166	3.8166	3.8166	3.8166	-11.984	-11.984	-11.984	-11.984	0.4961	0.
1.982	171.982	171.982	-4E-16	-2E-12	-3E-16	-3E-16	13.825	13.825	13.825	13.825	-14.755	-14.755	-14.755	-14.755	0.0802	0.
0.776	160.776	160.776	-152.73	-152.73	-152.73	-152.73	3.3899	3.3899	3.3979	3.3899	-4.4172	-4.9401	-3.891	-4.4156	0.6553	0.
.4129	4.0273	10.4067	-152.73	-152.73	-152.73	-152.73	1.7064	1.7064	1.7064	1.7064	-33.602	-33.427	-9.1787	-21.303	2.0053	2.
1.967	21.967	21.967	-142.25	-113.12	-116.18	-114.65	42.8475	42.8475	42.8475	42.8475	-42.788	-42.788	-42.788	-42.788	30.5759	30.
.1004	24.1004	24.1004	-61.933	-61.177	-62.732	-61.955	5.7661	5.7661	5.7661	5.7661	-5.6746	-5.6746	-5.6746	-5.6746	2.4018	9.
.6115	-0.3209	-0.3209	-18.99	-18.99	-20.06	-18.99	2.5884	2.5884	2.5884	2.5884	-33.381	-8.8178	-33.338	-21.078	10.2202	10.
0.148	170.148	170.148	-160.93	-160.93	-160.93	-160.93	4.1548	3.9928	4.4975	4.1483	-7.5284	-7.5284	-7.5284	-7.5284	1.7423	1.
0.148	170.148	170.148	-8E-13	-8E-13	-8E-13	-8E-13	14.3083	14.3083	14.3083	14.3083	-13.351	-13.351	-13.351	-13.351	9.9E-17	1E
8.989	158.989	158.989	-151	-151	-151	-151	5.605	5.605	5.605	5.605	-3.8851	-3.8851	-3.8851	-3.8851	0.5136	0.
.5607	4.5297	12.2471	-151	-151	-151	-151	4.366	4.366	4.366	4.366	-35.353	-32.724	-13.381	-23.052	2.6658	2.
.8799	7.8799	7.8799	-92.065	-63.192	-65.701	-64.446	43.8096	43.8096	43.8096	43.8096	-43.556	-43.556	-43.556	-43.556	30.133	30.
0.378	0.378	0.378	-22.422	-22.422	-22.422	-22.422	0.4368	0.4368	0.4368	0.4368	-35.886	-13.679	-33.489	-23.584	2.3664	2.
5.956	165.956	165.956	-156.97	-156.97	-156.97	-156.97	3.7739	4.0676	3.7739	3.7739	-11.926	-11.926	-11.926	-11.926	4.0016	4.
5.956	165.956	165.956	-8E-13	-2E-16	-8E-13	-8E-13	13.7206	13.7206	13.7206	13.7206	-14.641	-14.641	-14.641	-14.641	1.3E-14	2.6
4.873	154.873	154.873	-147.02	-147.02	-147.02	-147.02	6.5292	6.5292	6.5292	6.5292	-4.4279	-4.604	-4.2311	-4.4175	1.3445	1.
9.422	4.0703	10.5244	-147.02	-147.02	-147.02	-147.02	2.3428	2.3428	2.3428	2.3428	-33.732	-33.648	-9.2135	-21.431	1.7417	3.
2.0914	22.0914	22.0914	-143.31	-113.24	-118.18	-115.71	42.4154	42.4154	42.4154	42.4154	-42.009	-42.009	-42.009	-42.009	30.9972	30.
4.2393	24.2393	24.2393	-62.332	-60.663	-64.043	-62.353	6.8207	6.8207	6.8207	6.8207	-7.5056	-7.5056	-7.5056	-7.5056	2.4285	9.
0.3633	-0.3253	-0.3253	-17.403	-17.403	-20.033	-17.403	3.3395	3.3395	3.3395	3.3395	-33.519	-8.8848	-33.543	-21.214	9.9908	9.
60.119	160.119	160.119	-151.37	-151.37	-151.37	-151.37	4.0384	4.019	4.0275	4.0232	-7.4739	-7.4739	-7.4739	-7.4739	5.5511	5.
60.119	160.119	160.119	0	-5E-14	0	0	14.2447	14.2447	14.2447	14.2447	-13.505	-13.505	-13.505	-13.505	1.3E-14	1.3
49.034	149.034	149.034	-141.51	-141.51	-141.51	-141.51	8.7939	8.7939	8.7939	8.7939	-4.5584	-4.5584	-4.5584	-4.5584	1.3276	1.
0.2241	4.4738	12.1185	-141.51	-141.51	-141.51	-141.51	4.915	4.915	4.915	4.915	-35.278	-32.807	-13.141	-22.974	2.2028	4.
7.4331	7.4331	7.4331	-91.354	-62.843	-64.627	-63.735	42.9226	42.9226	42.9226	42.9226	-42.351	-42.351	-42.351	-42.351	30.9085	30.
0.3739	0.3739	0.3739	-23.345	-23.345	-23.345	-23.345	0.4269	0.4269	0.4269	0.4269	-35.727	-13.391	-33.453	-23.422	1.7084	3.
51.802	151.802	151.802	-143.39	-143.39	-143.39	-143.39	3.7121	4.364	3.7121	3.7121	-11.685	-11.685	-11.685	-11.685	7.9227	7.
51.802	151.802	151.802	0	0	-9E-14	0	11.8868	11.8868	11.8868	11.8868	-12.785	-12.785	-12.785	-12.785	1.3E-14	4
40.743	140.743	140.743	-133.65	-133.65	-133.65	-133.65	8.7022	8.7022	8.7022	8.7022	-4.3944	-4.177	-4.5733	-4.3752	2.3124	2.
3.9845	4.0431	10.4596	-133.65	-133.65	-133.65	-133.65	3.0216	3.0216	3.0216	3.0216	-33.635	-33.418	-9.2412	-21.33	2.0737	6.
2.1895	22.1895	22.1895	-143.5	-115.14	-116.65	-115.9	42.4383	42.4383	42.4383	42.4383	-41.811	-41.811	-41.811	-41.811	32.0857	32.
4.3418	24.3418	24.3418	-62.524	-62.662	-62.426	-62.544	1.2494	1.3186	1.2494	1.2494	-13.01	-13.01	-13.01	-13.01	1.7721	7.
0.1412	-0.3203	-0.3203	-20.41	-20.41	-20.41	-20.41	0.9459	0.9459	0.9459	0.9459	-33.649	-9.051	-33.625	-21.338	8.6648	8.

on)		T (ton m)								M2 (ton m)					
-		max +				min -				max +				M	
M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2
-2.682	-2.682	6.24239	6.24239	6.24239	6.24239	-6.2409	-6.2409	-6.2409	-6.2409	7.26658	7.26658	7.26658	7.26658	-7.2649	-7.264
9.8261	-1.0125	0.00072	0.00072	0.00072	0.00072	-0.0285	-0.0285	-0.0285	-0.0285	41.7948	41.7948	41.7948	41.7948	-77.957	-77.95
31.423	-31.423	2.16546	2.16546	2.16546	2.16546	-2.1739	-2.1739	-2.1739	-2.1739	81.9646	81.9646	81.9646	81.9646	-43.726	-43.72
0.3802	-0.3802	2.04977	2.04977	2.04977	2.04977	-2.39	-2.39	-2.39	-2.39	2.17321	2.17321	2.17321	2.17321	-1.7078	-1.707
-1E-15	-1E-17	2.11459	2.11459	2.11459	2.11459	-2.222	-2.222	-2.222	-2.222	0.27861	0.27861	0.27861	0.27861	-0.0326	-0.032
-0.558	-0.558	2.40753	2.40753	2.40753	2.40753	-2.0615	-2.0615	-2.0615	-2.0615	2.89449	2.89449	2.89449	2.89449	-2.5071	-2.507
1.8792	-1.8792	7.65313	7.65313	7.65313	7.65313	-7.6618	-7.6618	-7.6618	-7.6618	6.66146	6.66146	6.66146	6.66146	-6.9126	-6.912
9.4615	-1.8189	1.31866	1.31866	1.31866	1.31866	-0.0009	-0.0009	-0.0009	-0.0009	43.5229	43.5229	43.5229	43.5229	-78.781	-78.78
32.099	-32.099	0.00941	0.00941	0.00941	0.00941	-0.0032	-0.0032	-0.0032	-0.0032	82.841	82.841	82.841	82.841	-45.555	-45.55
1.8602	-1.8602	3.43773	3.43773	3.43773	3.43773	-3.4581	-3.4581	-3.4581	-3.4581	42.3399	42.3399	42.3399	42.3399	-8.7609	-8.760
0.9298	-0.9298	2.61007	2.61007	2.61007	2.61007	-2.2248	-2.2248	-2.2248	-2.2248	3.84062	3.84062	3.84062	3.84062	-3.9511	-3.951
0.9298	-0.9298	2.29366	2.29366	2.29366	2.29366	-2.1429	-2.1429	-2.1429	-2.1429	4.04862	4.04862	4.04862	4.04862	-8E-16	-5E-1
0.5809	-0.5809	1.96254	1.96254	1.96254	1.96254	-2.2778	-2.2778	-2.2778	-2.2778	2.55345	2.55345	2.55345	2.55345	-2.2964	-2.296
3.9339	-3.9339	6.25678	6.25678	6.25678	6.25678	-6.2809	-6.2809	-6.2809	-6.2809	8.32563	8.32563	8.32563	8.32563	-9.2673	-9.267
9.8373	-2.6585	1.76708	1.76708	1.76708	1.76708	-0.0009	-0.0009	-0.0009	-0.0009	42.3727	42.3727	42.3727	42.3727	-78.159	-78.15
31.693	-31.693	2.06373	2.06373	2.06373	2.06373	-2.0687	-2.0687	-2.0687	-2.0687	82.3887	82.3887	82.3887	82.3887	-44.384	-44.38
0.8332	-0.8332	2.13305	2.13305	2.13305	2.13305	-2.4339	-2.4339	-2.4339	-2.4339	9.56601	9.56601	9.56601	9.56601	-8.3296	-8.329
0.8332	-0.8332	2.35521	2.35521	2.35521	2.35521	-2.4511	-2.4511	-2.4511	-2.4511	3.45807	3.45807	3.45807	3.45807	-5E-14	-5E-1
1.2097	-1.2097	2.47095	2.47095	2.47095	2.47095	-2.4511	-2.4511	-2.4511	-2.4511	5.25131	5.25131	5.25131	5.25131	-5.539	-5.53
5.5614	-5.5614	7.60772	7.60772	7.60772	7.60772	-7.6405	-7.6405	-7.6405	-7.6405	12.3794	12.3794	12.3794	12.3794	-12.492	-12.49
-9.365	-3.416	3.44632	3.44632	3.44632	3.44632	-0.0009	-0.0009	-0.0009	-0.0009	44.6751	44.6751	44.6751	44.6751	-79.314	-79.31
32.573	-32.573	0.00936	0.00936	0.00936	0.00936	-0.0033	-0.0033	-0.0033	-0.0033	83.5424	83.5424	83.5424	83.5424	-46.75	-46.7
5.8821	-5.8821	3.32203	3.32203	3.32203	3.32203	-3.2975	-3.2975	-3.2975	-3.2975	41.4471	41.4471	41.4471	41.4471	-13.483	-13.48
1.7935	-1.7935	2.59376	2.59376	2.59376	2.59376	-2.2699	-2.2699	-2.2699	-2.2699	12.6671	12.6671	12.6671	12.6671	-12.158	-12.15
1.7935	-1.7935	2.40571	2.40571	2.40571	2.40571	-2.2653	-2.2653	-2.2653	-2.2653	7.45237	7.45237	7.45237	7.45237	-5E-14	-5E-1
1.3197	-1.3197	2.05008	2.05008	2.05008	2.05008	-2.3168	-2.3168	-2.3168	-2.3168	4.97993	4.97993	4.97993	4.97993	-5.6749	-5.674
7.9223	-7.9223	6.31942	6.31942	6.31942	6.31942	-6.3453	-6.3453	-6.3453	-6.3453	16.9507	16.9507	16.9507	16.9507	-18.479	-18.47
9.4004	-4.2134	3.88903	3.88903	3.88903	3.88903	-0.0009	-0.0009	-0.0009	-0.0009	44.329	44.329	44.329	44.329	-79.305	-79.30
-32.35	-32.35	2.08101	2.08101	2.08101	2.08101	-2.0458	-2.0458	-2.0458	-2.0458	83.2398	83.2398	83.2398	83.2398	-46.162	-46.16
-1.819	-1.819	2.01	2.01	2.01	2.01	-2.3376	-2.3376	-2.3376	-2.3376	18.7481	18.7481	18.7481	18.7481	-16.683	-16.68
1.819	-1.819	3.06068	3.06068	3.06068	3.06068	-3.1528	-3.1528	-3.1528	-3.1528	7.56624	7.56624	7.56624	7.56624	-5E-14	-5E-1
2.1335	-2.1335	2.29278	2.29278	2.29278	2.29278	-3.1528	-3.1528	-3.1528	-3.1528	9.15521	9.15521	9.15521	9.15521	-9.4039	-9.403
10.029	-10.029	5.84069	5.84069	5.84069	5.84069	-5.7954	-5.7954	-5.7954	-5.7954	21.5434	21.5434	21.5434	21.5434	-23.307	-23.30
8.7862	-4.9804	5.51692	5.51692	5.51692	5.51692	-0.0009	-0.0009	-0.0009	-0.0009	47.4507	47.4507	47.4507	47.4507	-80.892	-80.89
33.537	-33.537	1.59534	1.59534	1.59534	1.59534	-1.5949	-1.5949	-1.5949	-1.5949	84.8058	84.8058	84.8058	84.8058	-49.341	-49.34
10.543	-10.543	2.07883	2.07883	2.07883	2.07883	-1.9454	-1.9454	-1.9454	-1.9454	37.3927	37.3927	37.3927	37.3927	-24.954	-24.95

.4938 11.4938 -29.13 -29.13 -29.13 -29.13

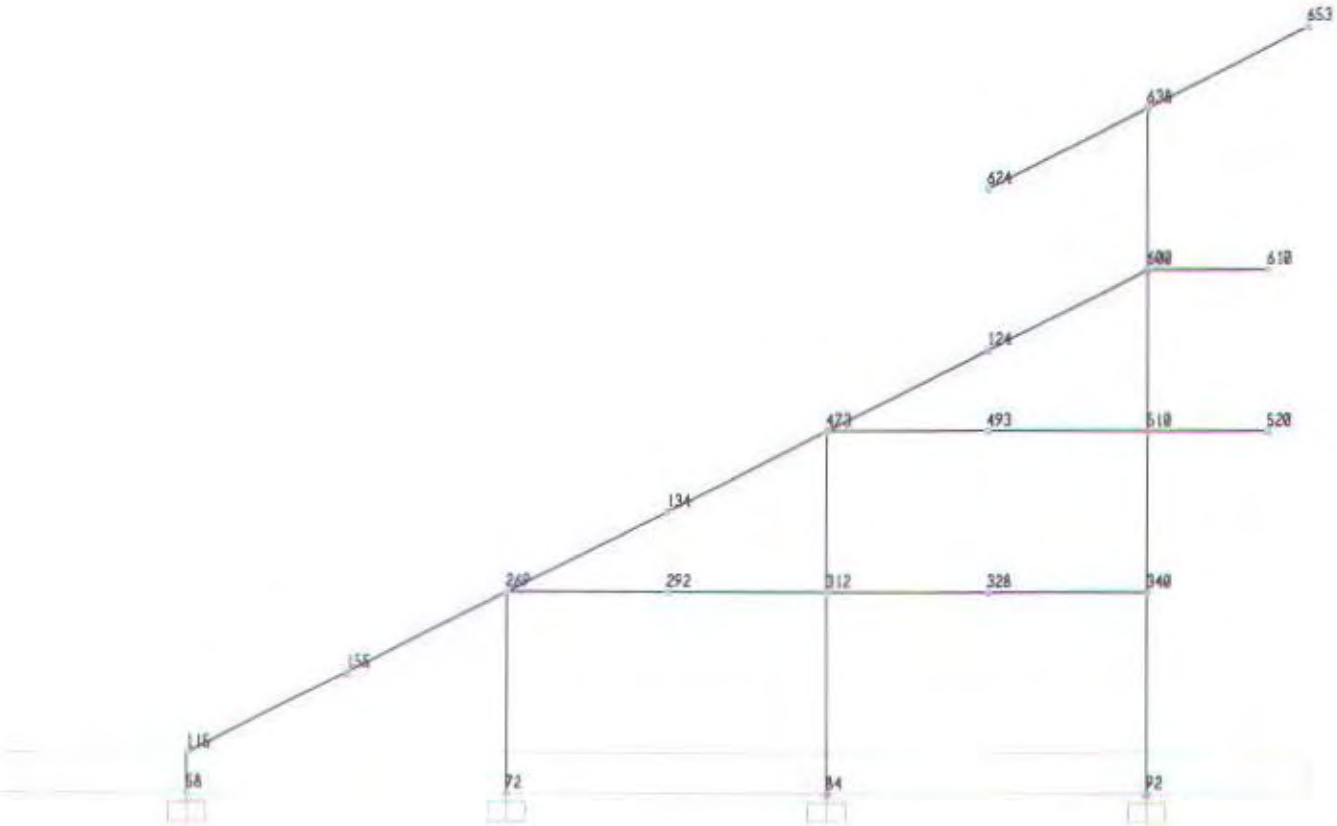
M3 (ton m)					
+		min -			
M-3	M-4	M-1	M-2	M-3	M-4
.5443	34.5443	-41.551	-41.551	-41.551	-41.551
.5545	11.5545	-29.513	-29.513	-29.513	-29.513
43099	6.43099	-93.573	-82.294	-50.002	-66.148
.1622	83.1622	-85.185	-85.185	-85.185	-85.185
.6405	20.6405	-95.329	-50.772	-85.029	-67.901
.4636	17.4636	-45.797	-45.797	-45.797	-45.797
.9979	41.9979	-50.423	-50.423	-50.423	-50.423
66613	5.66613	-41.436	-41.436	-41.436	-41.436
.6737	5.6737	-88.502	-88.702	-33.463	-61.083
.9332	80.9332	-83.637	-83.637	-83.637	-83.637
.9896	20.9896	-41.628	-41.628	-41.628	-41.628
.2058	30.2058	-87.61	-34.624	-85.755	-60.19
.3575	14.3575	-31.027	-31.027	-31.027	-31.027
.7057	37.7057	-54.919	-54.919	-54.919	-54.919
.8225	50.8225	-19.012	-19.012	-19.012	-19.012
52357	9.52357	-91.874	-79.386	-49.774	-64.58
0.348	80.348	-83.004	-83.004	-83.004	-83.004
.0498	26.0498	-94.59	-51.33	-83.926	-67.241
.7791	26.7791	-45.908	-45.908	-45.908	-45.908
.7565	55.7565	-66.365	-66.365	-66.365	-66.365
.8405	15.8405	-37.502	-37.502	-37.502	-37.502
5.647	15.647	-86.322	-80.471	-38.35	-59.096
.4512	77.4512	-81.693	-81.693	-81.693	-81.693
.6336	30.6336	-59.753	-59.753	-59.753	-59.753
88808	7.88808	-86.218	-30.481	-87.23	-58.856
.9052	32.9052	-35.824	-35.824	-35.824	-35.824
.1625	79.1625	-82.663	-82.663	-82.663	-82.663
4.459	34.459	-49.103	-49.103	-49.103	-49.103
.6369	18.6369	-88.319	-73.986	-48.105	-61.045
.4243	78.4243	-78.081	-78.081	-78.081	-78.081
.7931	37.7931	-92.054	-75.726	-88.556	-75.726
.4485	40.4485	-39.672	-39.672	-39.672	-39.672
6.128	146.128	-122.28	-122.28	-122.28	-122.28
.9093	35.9093	-145.24	-145.24	-145.24	-145.24
76521	5.76521	-76.044	-87.705	-36.726	-48.43
.9013	67.9013	-72.198	-72.198	-72.198	-72.198
.8866	27.8866	-57.454	-57.454	-57.454	-57.454
.1413	55.1413	-75.908	-27.295	-69.631	-48.463

41.203	141.203	141.203	-133.28	-133.28	-133.28	-133.28	4.1701	4.7162	3.7199	4.1451	-7.5075	-7.5075	-7.5075	-7.5075	10.0595	10.0	
P (ton)							V2 (ton)								V3		
max +			min -				max +				min -						
M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-	
41.203	141.203	141.203	-8E-13	-8E-13	-8E-13	-8E-13	12.0258	12.0258	12.0258	12.0258	-11.279	-11.279	-11.279	-11.279	0	1.4E	
30.276	130.276	130.276	-123.66	-123.66	-123.66	-123.66	10.8026	10.8026	10.8026	10.8026	-5.0543	-5.0543	-5.0543	-5.0543	2.4215	2.4	
9.8875	4.4593	12.0969	-123.66	-123.66	-123.66	-123.66	5.3768	5.3768	5.3768	5.3768	-35.31	-32.947	-13.05	-22.998	1.5477	7.0	
5.9387	6.9387	6.9387	-91.283	-61.936	-65.394	-63.665	41.5631	41.5631	41.5631	41.5631	-40.844	-40.844	-40.844	-40.844	32.5592	32.5	
0.3675	0.3675	0.3675	-21.089	-21.089	-21.089	-21.089	0.4212	0.4212	0.4212	0.4212	-35.747	-15.528	-33.61	-23.437	0.8717	6.1	
28.292	128.292	128.292	-121.02	-121.02	-121.02	-121.02	3.409	5.0866	3.409	3.409	-11.399	-11.399	-11.399	-11.399	12.1966	12.1	
28.292	128.292	128.292	-2E-12	-2E-12	-2E-12	-2E-12	12.7723	12.7723	12.7723	12.7723	-13.833	-13.833	-13.833	-13.833	1.3E-14		
17.602	117.602	117.602	-111.55	-111.55	-111.55	-111.55	13.0174	13.0174	13.0174	13.0174	-4.4591	-4.0384	-4.8204	-4.4294	3.2876	3.2	
3.8632	4.0465	10.4969	-111.55	-111.55	-111.55	-111.55	3.4129	3.4129	3.4129	3.4129	-33.771	-34.059	-8.8509	-21.455	0.8997	8.5	
21.49	21.49	21.49	-141.65	-113.08	-115.02	-114.05	40.2682	40.2682	40.2682	40.2682	-39.254	-39.254	-39.254	-39.254	34.3654	34.3	
3.5568	23.5568	23.5568	-60.518	-58.835	-62.256	-60.545	5.6659	5.6659	5.6659	5.6659	-15.654	-15.654	-15.654	-15.654	3.0801	8.0	
0.2963	-0.3228	-0.3228	-18.471	-18.471	-19.091	-18.471	7.3654	7.3654	7.3654	7.3654	-33.559	-9.2599	-33.246	-21.253	8.193	8.	
13.993	113.993	113.993	-107.47	-107.47	-107.47	-107.47	4.1515	4.9199	3.9221	4.1259	-8.064	-8.064	-8.064	-8.064	13.5014	13.5	
13.993	113.993	113.993	-2E-12	-4E-17	-2E-12	-2E-12	13.1926	13.1926	13.1926	13.1926	-13.916	-13.916	-13.916	-13.916	1.3E-14	1.3E	
03.525	103.525	103.525	-98.154	-98.154	-98.154	-98.154	4.2245	5.3296	3.3329	4.2474	-11.225	-11.225	-11.225	-11.225	3.52	3	
19.675	4.5477	12.0707	-98.154	-98.154	-98.154	-98.154	4.8132	4.8132	4.8132	4.8132	-34.88	-32.217	-12.981	-22.599	1.1232	11.	
5.4952	6.4952	6.4952	-90.88	-60.621	-65.928	-63.275	38.8524	38.8524	38.8524	38.8524	-39.855	-39.855	-39.855	-39.855	35.7757	35.7	
0.3791	0.3791	0.3791	-20.079	-20.079	-22.304	-20.079	19.3449	19.3449	19.3449	19.3449	-35.678	-13.468	-33.291	-23.379	0.0593	9.1	
4.4992	94.4992	94.4992	-88.981	-88.981	-88.981	-88.981	3.2382	5.2656	3.2382	3.2382	-11.768	-11.768	-11.768	-11.768	17.6589	17.6	
4.4992	94.4992	94.4992	-2E-12	-2E-12	-2E-12	-2E-12	11.5023	11.5023	11.5023	11.5023	-16.318	-16.318	-16.318	-16.318	1.3E-14	2.6E	
5.4175	85.4175	85.4175	-80.873	-80.873	-80.873	-80.873	15.2395	15.2395	15.2395	15.2395	-4.4483	-3.995	-4.8714	-4.4174	5.2463	5.2	
3.8949	3.8435	10.2345	-80.873	-80.873	-80.873	-80.873	3.3769	3.3769	3.3769	3.3769	-33.191	-31.877	-9.9816	-20.929	2.1604	15.7	
4.3115	18.3115	18.3115	-131.46	-100.95	-106.82	-103.89	36.9707	36.9707	36.9707	36.9707	-38.759	-38.759	-38.759	-38.759	38.1699	38.1	
0.3635	20.3635	20.3635	-51.53	-53.188	-50.044	-51.616	22.5967	22.5967	22.5967	22.5967	-1.4402	-1.4402	-1.4402	-1.4402	2.0251	7.0	
2.3208	-0.28	-0.28	-25.865	-25.865	-25.865	-25.865	33.4137	8.3937	33.8122	21.103	0.4642	0.4642	0.4642	0.4642	6.4333	12.1	
6.9343	66.9343	66.9343	-62.575	-62.575	-62.575	-62.575	6.7355	6.7355	6.7355	6.7355	-7.9553	-7.9553	-7.9553	-7.9553	24.1662	24.1	
6.9343	66.9343	66.9343	0	0	0	0	16.2873	16.2873	16.2873	16.2873	-19.409	-19.409	-19.409	-19.409	1.7E-18	1.6E	
0.2143	60.2143	60.2143	-57.207	-57.207	-57.207	-57.207	20.0245	20.0245	20.0245	20.0245	-8.1736	-8.1736	-8.1736	-8.1736	6.6186	6.6	
6.7895	6.6345	11.212	-57.207	-57.207	-57.207	-57.207	8.0435	8.0435	8.0435	8.0435	-34.148	-30.652	-13.118	-21.885	5.6398	22.5	
2.0702	2.0702	2.0702	-89.306	-51.771	-75.524	-61.764	34.3436	34.3436	34.3436	34.3436	-36.115	-36.115	-36.115	-36.115	39.94	39	
5.6598	5.6598	5.6598	-18.847	-12.006	-23.467	-12.43	35.3131	28.3798	34.8763	28.3798	-0.3672	-0.3672	-0.3672	-0.3672	3.482	17.	
8.2352	28.2352	28.2352	-25.854	-25.854	-25.854	-25.854	10.4859	10.4859	10.4859	10.4859	-13.906	-13.906	-13.906	-13.906	33.9615	33.9	
8.2352	28.2352	28.2352	-2E-12	-2E-12	-2E-12	-2E-12	33.9197	33.9197	33.9197	33.9197	-39.182	-39.182	-39.182	-39.182	1.3E-14	1.3E	
5.0023	25.0023	25.0023	-23.938	-23.938	-23.938	-23.938	37.6569	37.6569	37.6569	37.6569	-12.175	-12.175	-12.175	-12.175	9.92	9	
5.9398	5.6347	9.9194	-23.938	-23.938	-23.938	-23.938	11.2501	11.2501	11.2501	11.2501	-30.914	-33.406	-5.2626	-18.538	7.535	18.2	
2.4714	32.4714	32.4714	-126.99	-125.96	-73.006	-99.484	30.5366	30.5366	30.5366	30.5366	-31.964	-31.964	-31.964	-31.964	40.329	40.	
1.9957	21.9957	21.9957	-91.033	-91.033	-91.033	-91.033	21.3352	21.3352	21.3352	21.3352	-17.594	-17.594	-17.594	-17.594	4.6474	8.	
0.9206	10.9206	10.9206	-20.998	-20.998	-20.998	-20.998	30.7659	18.3491	28.7107	18.4704	-2.296	-2.296	-2.296	-2.296	5.5669	13.4	

MILIK PERPUSTAKAAN
INSTITUT TEKNOLOGI
SEPULUH - NOPEMBER

2.7628	-2.7628	2.80907	2.80907	2.80907	2.80907	-2.6214	-2.6214	-2.6214	-2.6214	23.767	23.767	23.767	23.767	-21.221	-21.22
on)		T (ton m)								M2 (ton m)					
-		max +				min -				max +				m	
M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2	M-3	M-4	M-1	M-2
2.7628	-2.7628	1.82796	1.82796	1.82796	1.82796	-2.6214	-2.6214	-2.6214	-2.6214	11.3546	11.3546	11.3546	11.3546	-5E-14	-5E-1
2.3957	-2.3957	2.35594	2.35594	2.35594	2.35594	-2.7605	-2.7605	-2.7605	-2.7605	9.58988	9.58988	9.58988	9.58988	-9.8448	-9.844
12.182	-12.182	5.68549	5.68549	5.68549	5.68549	-7.0029	-7.0029	-7.0029	-7.0029	25.9874	25.9874	25.9874	25.9874	-28.49	-28.4
8.6605	-5.6231	7.18171	7.18171	7.18171	7.18171	-0.0009	-0.0009	-0.0009	-0.0009	48.6872	48.6872	48.6872	48.6872	-81.549	-81.54
34.025	-34.025	2.47299	2.47299	2.47299	2.47299	-2.257	-2.257	-2.257	-2.257	85.484	85.484	85.484	85.484	-50.615	-50.61
2.6372	-2.6372	3.37075	3.37075	3.37075	3.37075	-3.9406	-3.9406	-3.9406	-3.9406	29.0317	29.0317	29.0317	29.0317	-25.513	-25.51
2.6372	-2.6372	5.22456	5.22456	5.22456	5.22456	-5.544	-5.544	-5.544	-5.544	10.6641	10.6641	10.6641	10.6641	-1E-13	-5E-1
3.0833	-3.0833	3.87724	3.87724	3.87724	3.87724	-5.544	-5.544	-5.544	-5.544	13.3671	13.3671	13.3671	13.3671	-13.018	-13.01
-13.45	-13.45	6.56558	6.56558	6.56558	6.56558	-10.077	-10.077	-10.077	-10.077	29.6418	29.6418	29.6418	29.6418	-30.507	-30.50
7.8187	-6.1672	10.4507	10.4507	10.4507	10.4507	-0.0009	-0.0009	-0.0009	-0.0009	53.5604	53.5604	53.5604	53.5604	-83.901	-83.90
35.984	-35.984	0.00934	0.00934	0.00934	0.00934	-0.0033	-0.0033	-0.0033	-0.0033	88.1004	88.1004	88.1004	88.1004	-55.834	-55.83
14.187	-14.187	3.2201	3.2201	3.2201	3.2201	-2.9681	-2.9681	-2.9681	-2.9681	34.6954	34.6954	34.6954	34.6954	-32.883	-32.88
3.4057	-3.4057	5.30445	5.30445	5.30445	5.30445	-5.5729	-5.5729	-5.5729	-5.5729	31.1593	31.1593	31.1593	31.1593	-29.221	-29.22
3.4057	-3.4057	2.92354	2.92354	2.92354	2.92354	-5.5729	-5.5729	-5.5729	-5.5729	13.9288	13.9288	13.9288	13.9288	-5E-14	-1E-1
3.4588	-3.4588	4.1869	4.1869	4.1869	4.1869	-4.6772	-4.6772	-4.6772	-4.6772	13.3477	13.3477	13.3477	13.3477	-14.903	-14.90
18.269	-18.269	5.48442	5.48442	5.48442	5.48442	-10.027	-10.027	-10.027	-10.027	39.147	39.147	39.147	39.147	-42.476	-42.47
7.1941	-6.9378	10.6856	10.6856	10.6856	10.6856	-0.0009	-0.0009	-0.0009	-0.0009	85.9002	85.9002	85.9002	85.9002	-57.203	-57.20
-37.42	-37.42	2.00978	2.00978	2.00978	2.00978	-1.5235	-1.5235	-1.5235	-1.5235	59.6384	59.6384	59.6384	59.6384	-90.043	-90.04
-5.368	-5.368	4.9379	4.9379	4.9379	4.9379	-5.863	-5.863	-5.863	-5.863	42.3298	42.3298	42.3298	42.3298	-36.718	-36.71
-5.368	-5.368	5.44059	5.44059	5.44059	5.44059	-5.9246	-5.9246	-5.9246	-5.9246	19.1927	19.1927	19.1927	19.1927	-5E-14	-1E-1
4.9205	-4.9205	3.53914	3.53914	3.53914	3.53914	-5.9246	-5.9246	-5.9246	-5.9246	18.7553	18.7553	18.7553	18.7553	-21.621	-21.62
25.783	-25.783	4.56735	5.89613	4.56735	4.56735	-11.349	-11.349	-11.349	-11.349	55.5923	55.5923	55.5923	55.5923	-59.715	-59.71
7.3743	-7.3743	11.7184	11.7184	11.7184	11.7184	-0.0008	-0.0008	-0.0008	-0.0008	89.3939	89.3939	89.3939	89.3939	-63.286	-63.28
39.743	-39.743	1.35266	1.35266	1.35266	1.35266	-0.8165	-0.8165	-0.8165	-0.8165	65.7922	65.7922	65.7922	65.7922	-93.178	-93.17
25.729	-25.729	4.70488	4.70488	4.70488	4.70488	-0.5889	-2.0946	-0.5889	-0.5889	61.7423	61.7423	61.7423	61.7423	-53.321	-53.32
8.0537	-8.0537	3.32238	3.32238	3.32238	3.32238	-4.4357	-4.4357	-4.4357	-4.4357	50.2784	50.2784	50.2784	50.2784	-57.795	-57.79
8.0537	-8.0537	2.16973	2.16973	2.16973	2.16973	-3.5996	-3.5996	-3.5996	-3.5996	28.5652	28.5652	28.5652	28.5652	-1E-17	-1E-1
6.3425	-6.3425	2.64527	2.64527	2.64527	2.64527	-2.6395	-2.6395	-2.6395	-2.6395	23.9668	23.9668	23.9668	23.9668	-26.926	-26.92
35.806	-35.806	3.77231	4.69699	3.77231	3.77231	-9.5014	-9.5014	-9.5014	-9.5014	76.1526	76.1526	76.1526	76.1526	-83.978	-83.97
7.8562	-7.8562	9.98865	9.98865	9.98865	9.98865	-0.0009	-0.0009	-0.0009	-0.0009	92.0409	92.0409	92.0409	92.0409	-80.144	-80.14
41.468	-41.468	5.6464	5.6464	5.6464	5.6464	-0.618	-2.7778	-0.618	-0.618	86.9636	86.9636	86.9636	86.9636	-95.698	-95.69
11.818	-11.818	0.69087	0.69087	0.69087	0.69087	-6.0081	-6.0081	-6.0081	-6.0081	69.8133	69.8133	69.8133	69.8133	-82.067	-82.06
11.818	-11.818	3.51661	3.51661	3.51661	3.51661	-3.3116	-3.3116	-3.3116	-3.3116	43.3842	43.3842	43.3842	43.3842	-5E-14	-5E-1
9.2476	-9.2476	5.01628	5.01628	5.01628	5.01628	-3.3116	-3.3116	-3.3116	-3.3116	36.5514	36.5514	36.5514	36.5514	-39.727	-39.72
25.305	-25.305	5.51886	9.04501	5.51886	5.51886	-18.188	-18.188	-18.188	-18.188	54.1856	54.1856	54.1856	54.1856	-58.979	-58.97
7.4404	-7.4404	19.4051	19.4051	19.4051	19.4051	-0.0008	-0.0008	-0.0008	-0.0008	93.0195	93.0195	93.0195	93.0195	-68.297	-68.29
41.923	-41.923	0.01179	0.01179	0.01179	0.01179	-0.0041	-0.0041	-0.0041	-0.0041	70.8796	70.8796	70.8796	70.8796	-96.814	-96.81
25.439	-25.439	14.107	14.107	14.107	14.107	-4.0031	-7.2	-4.0031	-4.0031	62.2946	62.2946	62.2946	62.2946	-51.47	-51.4

M3 (ton m)					
+		min -			
M-3	M-4	M-1	M-2	M-3	M-4
.12489	1.12489	-93.802	-81.804	-51.04	-66.422
8.0175	88.0175	-88.036	-88.036	-88.036	-88.036
.49694	1.49694	-95.642	-51.794	-84.717	-68.255
.55089	9.55089	-47.247	-47.247	-47.247	-47.247
6.8225	46.8225	-50.152	-50.152	-50.152	-50.152
.09999	7.09999	-12.363	-12.363	-12.363	-12.363
.62696	8.62696	-88.171	-87.102	-34.485	-60.793
6.3727	86.3727	-86.582	-86.582	-86.582	-86.582
8.2262	18.2262	-18.18	-18.18	-18.18	-18.18
.06988	8.06988	-86.934	-32.636	-86.44	-59.538
.50701	7.50701	-28.458	-28.458	-28.458	-28.458
44.751	44.751	-48.016	-48.016	-48.016	-48.016
.96891	9.96891	-14.954	-14.954	-14.954	-14.954
.06413	8.06413	-93.814	-81.931	-50.927	-66.429
7.3793	87.3793	-87.859	-87.859	-87.859	-87.859
.28767	7.28767	-95.743	-51.769	-84.934	-68.351
0.8366	10.8366	-47.036	-47.036	-47.036	-47.036
6.6016	46.6016	-50.165	-50.165	-50.165	-50.165
.31325	6.31325	-14.153	-14.153	-14.153	-14.153
.62889	7.62889	-88.636	-87.911	-34.584	-61.247
85.108	85.108	-86.195	-86.195	-86.195	-86.195
19.302	19.302	-20.032	-20.032	-20.032	-20.032
4.8906	14.8906	-87.439	-32.866	-87.204	-60.035
.81318	8.81318	-28.25	-28.25	-28.25	-28.25
3.8403	43.8403	-47.986	-47.986	-47.986	-47.986
1.0512	11.0512	-20.494	-20.494	-20.494	-20.494
.78085	7.78085	-93.511	-82.037	-50.185	-66.111
5.3319	85.3319	-86.894	-86.894	-86.894	-86.894
4.2151	14.2151	-95.222	-50.898	-84.736	-67.817
3.6589	13.6589	-46.339	-46.339	-46.339	-46.339
6.7446	36.7446	-42.961	-42.961	-42.961	-42.961
.65439	7.65439	-21.39	-21.39	-21.39	-21.39
.04043	7.04043	-88.025	-86.249	-34.995	-60.622
4.5543	84.5543	-86.316	-86.316	-86.316	-86.316
7.3113	17.3113	-34.728	-34.728	-34.728	-34.728
.63367	4.63367	-88.109	-34.171	-87.188	-60.679



.0.8 - File:stadium (bu-3)_V8 - Y-Z Plane @ X=0 - Ton, m, C Units

TABLE: Joint Displacements

Joint	OutputCase	CaseType	U1	U2	U3	R1	R2	R3	L	dmaks
Text	Text	Text	m	m	m	Radians	Radians	Radians	m	m
124	BMAT1	LinStatic	0.000056	0.000659	-0.002955	0.00000772	-0.000001864	-2.000017	8	0.01
124	COMB1	Combination	0.000067	0.001861	-0.006052	0.000054	0.000019	-0.00000657	8	0.01
124	COMB2	Combination	0.00006	0.001399	-0.00463	0.00004	0.000014	-0.000003676	8	0.01
124	COMB3	Combination	0.000025	0.000749	-0.00254	0.000023	2.289E-07	-0.00000778	8	0.01
124	COMB4	Combination	0.000741	0.00085	-0.002607	0.000017	0.000156	0.000065	8	0.01
124	COMB5	Combination	-0.000098	0.001103	-0.001512	0.000205	-0.000016	0.000003413	8	0.01
124	COMB6	Combination	-0.000673	0.000836	-0.002502	0.000032	-0.000157	-0.000065	8	0.01
124	COMB7	Combination	0.000169	0.000342	-0.000996	-0.000156	0.000017	-0.000023	8	0.01
134	BMAT1	LinStatic	3.051E-07	0.00066	-0.002097	0.000058	-0.000028	-0.000029	8	0.01
134	COMB1	Combination	-4.261E-06	0.001445	-0.004586	0.00014	-0.000023	-0.000027	8	0.01
134	COMB2	Combination	-4.249E-06	0.001085	-0.003286	0.000105	-0.000017	-0.00002	8	0.01
134	COMB3	Combination	-4.349E-06	0.000617	-0.001893	0.00005	-0.000025	-0.000025	8	0.01
134	COMB4	Combination	0.000623	0.00068	-0.001911	0.000047	0.000016	-0.000041	8	0.01
134	COMB5	Combination	-0.000047	0.001302	-0.002049	0.000016	-0.00003	-0.000021	8	0.01
134	COMB6	Combination	-0.000628	0.000551	-0.001885	0.000052	-0.000057	-0.000009772	8	0.01
134	COMB7	Combination	0.000042	-0.000152	-0.001747	0.000084	-0.000021	-0.000031	8	0.01
155	BMAT1	LinStatic	0.000034	0.000745	-0.001796	0.000042	-0.000022	-0.00002	8	0.01
155	COMB1	Combination	0.000046	0.001625	-0.00379	0.000183	-0.000023	-0.000022	8	0.01
155	COMB2	Combination	0.000034	0.001204	0.002842	0.000137	-0.000017	-0.000016	8	0.01
155	COMB3	Combination	0.000032	0.000684	-0.00162	0.000075	-0.000019	-0.000017	8	0.01
155	COMB4	Combination	0.000499	0.000764	-0.001618	0.000071	0.000102	0.000025	8	0.01
155	COMB5	Combination	0.000028	0.001316	-0.001912	0.000129	-0.000018	-0.00001	8	0.01
155	COMB6	Combination	-0.000431	0.000661	-0.001623	0.000078	-0.00014	-0.000059	8	0.01
155	COMB7	Combination	0.000036	0.000049	-0.001329	0.000021	-0.000019	-0.000024	8	0.01
292	BMAT1	LinStatic	0.000006946	-0.00002	-0.003478	0.000042	0.000197	-4.052E-07	8	0.01
292	COMB1	Combination	0.000015	-0.000007741	-0.007534	-0.000091	0.000574	-4.494E-07	8	0.01
292	COMB2	Combination	0.000011	-0.000005261	-0.005647	0.000068	0.000431	-3.289E-07	8	0.01
292	COMB3	Combination	0.000006469	-0.000003955	-0.00312	-0.000036	0.000178	-2.062E-07	8	0.01
292	COMB4	Combination	0.000505	0.000041	-0.003133	-0.000035	0.000176	6.059E-07	8	0.01
292	COMB5	Combination	-0.000023	0.000811	-0.003086	-0.000011	0.000176	8.276E-07	8	0.01
292	COMB6	Combination	-0.000492	-0.000351	-0.003118	-0.000039	0.000177	-0.000001043	8	0.01
292	COMB7	Combination	0.000036	0.00062	-0.003195	-0.000063	0.000176	-0.000001265	8	0.01
328	BMAT1	LinStatic	0.000012	-0.00002	-0.000589	-0.00008	-0.000016	-4.062E-07	8	0.01
328	COMB1	Combination	0.000016	-0.000007741	-0.00074	-0.000165	-0.000016	-4.494E-07	8	0.01
328	COMB2	Combination	0.000014	-0.000005261	-0.000559	-0.000124	-0.000012	-3.289E-07	8	0.01
328	COMB3	Combination	0.000008118	-0.000003955	-0.000521	-0.000072	-0.000016	-2.062E-07	8	0.01
328	COMB4	Combination	0.000501	0.000041	-0.000541	-0.000069	0.000051	6.059E-07	8	0.01
328	COMB5	Combination	0.000029	0.000811	-0.000513	-0.000026	-0.000023	8.276E-07	8	0.01
328	COMB6	Combination	-0.000464	-0.000351	-0.000506	-0.000073	-0.000084	-0.000001043	8	0.01
328	COMB7	Combination	0.000046	-0.00062	-0.000534	-0.000114	-0.00001	-0.000001265	8	0.01
493	BMAT1	LinStatic	0.000038	-0.000039	-0.003446	0.000069	0.000236	-0.000000993	8	0.01
493	COMB1	Combination	0.000058	-0.000032	-0.007485	0.000138	0.00053	-0.000001253	8	0.01
493	COMB2	Combination	0.00004	-0.000023	-0.005604	0.000103	0.000474	-8.988E-07	8	0.01
493	COMB3	Combination	0.000026	-0.000016	-0.003098	0.000053	0.000215	-5.612E-07	8	0.01
493	COMB4	Combination	0.000767	0.00007	-0.003144	0.000053	0.000213	0.00000114	8	0.01
493	COMB5	Combination	-0.000051	0.000791	-0.003239	-0.000021	0.000219	0.000001397	8	0.01
493	COMB6	Combination	0.000702	-0.000103	-0.003086	0.000054	0.000211	-0.000002403	8	0.01
493	COMB7	Combination	0.000107	-0.000827	-0.002991	0.000126	0.000205	-0.00000266	8	0.01
520	BMAT1	LinStatic	0.000046	-0.000039	-0.004464	0.001434	0.000179	-0.000000993	3	0.00375
520	COMB1	Combination	0.000064	-0.000032	-0.009486	-0.002682	0.000464	-0.000001253	3	0.00375
520	COMB2	Combination	0.000048	-0.000023	-0.006346	-0.002006	0.00035	-8.988E-07	3	0.00375
520	COMB3	Combination	0.000028	-0.000016	-0.003973	-0.001274	0.000162	-5.612E-07	3	0.00375
520	COMB4	Combination	0.000749	0.000067	-0.00407	-0.001292	0.00015	0.00000114	3	0.00375
520	COMB5	Combination	-0.000061	0.000791	-0.003793	-0.001194	0.000125	0.000001397	3	0.00375
520	COMB6	Combination	-0.000685	-0.000103	-0.003938	-0.00128	0.000156	-0.000002403	3	0.00375
520	COMB7	Combination	0.000129	-0.000827	-0.004215	-0.001379	0.00019	-0.00000266	3	0.00375
610	BMAT1	LinStatic	0.000118	-0.000118	-0.005145	-0.001776	0.000599	-0.000002511	3	0.00375
610	COMB1	Combination	0.000174	-0.00014	-0.009996	-0.003344	0.000367	-0.000003419	3	0.00375
610	COMB2	Combination	0.00012	-0.000093	-0.007468	-0.002554	0.000279	-0.000002301	3	0.00375
610	COMB3	Combination	0.000068	-0.00005	-0.004957	-0.001685	0.000104	-0.00000121	3	0.00375
610	COMB4	Combination	0.001987	0.000049	-0.005012	-0.001687	0.000127	6.895E-07	3	0.00375
610	COMB5	Combination	-0.000137	0.000987	-0.005221	-0.002696	0.000158	0.00000237	3	0.00375
610	COMB6	Combination	-0.00092	0.00019	-0.004932	-0.001697	0.000067	-0.000003923	3	0.00375
610	COMB7	Combination	0.000305	-0.001129	-0.001723	-0.000686	0.000026	-0.000005704	3	0.00375
624	BMAT1	LinStatic	0.000204	0.006565	-0.015919	0.004971	0.000691	0.000261	4	0.005
624	COMB1	Combination	-1.048E-06	0.013103	-0.027392	0.007901	0.001452	0.000606	4	0.005
624	COMB2	Combination	-4.959E-06	0.009878	-0.020409	0.005891	0.001093	0.000454	4	0.005
624	COMB3	Combination	0.000903	0.006607	-0.013253	0.003955	0.000629	0.000258	4	0.005
624	COMB4	Combination	0.00347	0.00675	-0.013791	0.004091	0.000613	0.000263	4	0.005
624	COMB5	Combination	0.000271	0.011972	0.00045	0.000535	0.00062	0.000303	4	0.005
624	COMB6	Combination	-0.00358	0.006462	-0.013139	0.003941	0.000632	0.000256	4	0.005
624	COMB7	Combination	-0.00038	0.00124	-0.027366	0.007497	0.000525	0.000215	4	0.005
653	BMAT1	LinStatic	-0.000224	0.006287	-0.015563	0.004626	0.000569	0.000337	4	0.005
653	COMB1	Combination	0.000598	0.015275	-0.031739	-0.009046	0.001394	0.000675	4	0.005
653	COMB2	Combination	0.000363	0.011538	-0.023832	-0.006782	0.001049	0.000505	4	0.005
653	COMB3	Combination	-7.662E-06	0.00794	-0.0159	0.004649	0.000613	0.000305	4	0.005
653	COMB4	Combination	0.00457	0.007707	-0.015713	-0.004579	0.000645	0.000321	4	0.005
653	COMB5	Combination	-0.00086	0.027251	-0.030116	-0.008113	0.000556	0.000334	4	0.005
653	COMB6	Combination	0.004554	0.007868	-0.015993	-0.004697	0.000568	0.000291	4	0.005
653	COMB7	Combination	0.000875	-0.011656	-0.00159	-0.001163	0.000655	0.000279	4	0.005

	P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 max
1	-71.442 COMB1	50.03 COMB6	-50.3422 COMB4	62.9499 COMB5	-79.3351 COMB1	0.027 COMB6	-0.02697 COMB4	12.85302 COMB1	-79.4394 COMB5	49.36035 COM
2	-96.8294 COMB1	50.25 COMB6	-54.3448 COMB1	0.1531 COMB6	-127.234 COMB7	0.56123 COMB6	-0.56247 COMB4	69.27744 COMB7	-37.4687 COMB7	34.74614 COM
3	-147.124 COMB1	32.0461 COMB7	-22.6371 COMB6	1.7199 COMB5	-6.3143 COMB1	0.56123 COMB6	-0.04337 COMB7	10.70339 COMB1	-10.4441 COMB1	15.78715 COM
4	-82.5899 COMB5	24.917 COMB1	-1.7039 COMB7	1.7199 COMB5	-7.1142 COMB7	1.67375 COMB1	-0.01771 COMB1	14.39038 COMB7	-14.1004 COMB7	35.31769 COM
5	-41.4243 COMB1	51.361 COMB1	-56.3826 COMB1	0.0689 COMB4	-4E-16 COMB6	0.8531 COMB6	0.01465 COMB4	0.34402 COMB4	-7.89183 COMB4	40.57457 COM
6	-76.5524 COMB7	21.2348 COMB5	-14.8572 COMB1	0.0194 COMB7	-0.0348 COMB6	0.05699 COMB6	-1.58977 COMB1	7.13454 COMB6	-1.0078 COMB6	35.14741 COM
7	-250.369 COMB1	-0.1179 COMB1	-10.0647 COMB6	5.4147 COMB1	-2.3E-17 COMB7	0.00971 COMB4	-0.87797 COMB4	14.73748 COMB1	-1.1734 COMB1	14.62729 COM
8	-140.372 COMB1	3.1212 COMB6	-3.9281 COMB4	5.4294 COMB5	-1.3432 COMB1	0.0177 COMB4	-0.01771 COMB7	14.53809 COMB5	-14.1838 COMB1	9.49166 COM
9	-36.3317 COMB7	4.3247 COMB1	-1.4409 COMB4	3.5639 COMB5	-4.9833 COMB7	0.2187 COMB1	-0.00311 COMB4	8.10821 COMB5	-11.7188 COMB7	8.32727 COM
10	0 BMATI	22.4429 COMB1	0.1137 COMB5	1.36E-17 COMB1	-4.4E-17 COMB5	1.37821 COMB1	-0.14053 COMB6	7.99E-16 COMB6	-1.9E-16 COMB5	31.68382 COM
11	-98.4205 COMB1	34.8282 COMB1	-36.4513 COMB1	0.4119 BMATI	-4.4E-17 COMB6	0.41191 COMB5	0.01341 COMB2	0.03631 BMATI	-0.04473 BMATI	43.40469 COM
12	-108.883 COMB7	32.7214 COMB7	-33.7944 COMB5	3.5339 COMB6	-0.5143 COMB4	2.19574 COMB4	-2.14846 COMB6	3.44933 COMB6	-3.4245 COMB4	35.87021 COM
13	0 BMATI	0.233 COMB7	-16.581 COMB1	4E-16 COMB4	-9.1E-16 COMB3	0.2187 COMB4	-1.66292 COMB1	1.6E-15 COMB6	-1.6E-15 COMB4	33.17004 COM
14	0 BMATI	-1.1372 COMB5	-54.29 COMB1	0.3062 COMB1	-8.1E-16 COMB4	-0.2744 COMB7	-2.8249 COMB1	0.83762 COMB1	-3.51188 COMB1	14.3171 COM
15	-383.141 COMB1	0.0669 COMB1	-47.4499 COMB2	4.4695 COMB7	-3.9466 COMB5	6.2961 COMB4	-8.79366 COMB4	10.30526 COMB7	-9.8831 COMB7	5.12272 COM
16	-383.141 COMB1	9.3479 COMB4	-8.4793 COMB4	1.3577 COMB5	-1.5329 COMB7	0.537 COMB5	-0.04375 COMB7	10.45631 COMB1	-11.2047 COMB5	32.09823 COM
17	-365.502 COMB1	7.8109 COMB4	-13.4397 COMB4	17.0252 COMB5	-17.3541 COMB7	0.0437 COMB4	-0.05732 COMB4	57.59445 COMB5	-59.4541 COMB7	30.25996 COM
18	-239.881 COMB1	47.0047 COMB4	-78.7079 COMB6	100.281 COMB7	-103.758 COMB5	0.14902 COMB5	-0.19005 COMB7	314.3536 COMB7	-325.338 COMB5	229.3336 COM
19	-131.048 COMB1	173.0333 COMB6	-172.481 COMB4	101.5822 COMB1	-91.5953 COMB7	1.58723 COMB1	-0.12258 COMB4	394.3256 COMB7	-405.541 COMB5	401.3523 COM
20	0 BMATI	-4.3374 COMB7	-26.5914 COMB1	1.6E-15 COMB6	-1.6E-15 COMB4	1.1313 COMB7	0.05199 COMB3	3.2E-15 COMB4	-3.2E-15 COMB6	8.82089 COM
21	-1E-13 COMB5	-6.6732 COMB1	-14.8429 COMB7	3.15E-15 COMB4	-3.2E-15 COMB6	7.15127 COMB6	-6.51851 COMB4	9.65E-15 COMB6	-9.5E-15 COMB4	6.42471 COM
22	-26.9332 COMB1	3.7816 COMB6	-48.2871 COMB1	16.7765 COMB4	+17.1252 COMB6	10.35008 COMB4	-8.5531 COMB4	42.40256 COMB6	-39.7782 COMB6	17.93296 COM
23	-5.9E-13 COMB3	0.8213 COMB1	-12.9629 COMB1	8.06E-16 COMB5	+7.9E-16 COMB7	-0.0454 BMATI	-2.82446 COMB2	1.61E-15 COMB3	-1.6E-15 COMB7	13.43012 COM
24	1.44E-16 COMB2	0.4148 COMB2	-15.2702 COMB1	7.93E-16 COMB7	+8.1E-16 COMB3	3.49553 COMB1	-3.17807 COMB5	3.21E-15 COMB7	-3.2E-15 COMB5	14.73715 COM
25	0 BMATI	-3.1291 COMB4	-14.4357 COMB1	-4.1E-16 COMB3	+1.4E-17 BMATI	2.62261 COMB2	-2.90733 COMB1	8.23E-16 COMB7	-8E-16 COMB5	17.29672 COM
26	-5.1E-14 COMB6	1.8616 COMB1	-12.0924 COMB1	1.59E-15 COMB7	-1.6E-15 COMB5	0.9605 COMB7	-2.25291 COMB5	8.15E-15 COMB1	-8.1E-15 COMB7	12.97075 COM
27	0 BMATI	1.8614 COMB1	-9.0812 COMB2	8.24E-16 COMB7	-7.7E-16 COMB5	0.32326 COMB3	-0.72095 COMB7	3.56E-15 COMB6	-3.2E-15 COMB7	9.3121 COM
28	-7.1E-16 COMB1	1.2423 COMB4	-27.9465 COMB1	4.03E-16 COMB5	-4E-16 COMB7	0.35161 COMB1	-0.04425 COMB5	1.57E-15 COMB7	-1.6E-15 COMB5	16.42826 BMA
29	-5.1E-14 COMB4	-1.4387 BMATI	-21.0429 COMB1	9.09E-17 COMB4	-1E-16 COMB6	1.15295 COMB7	-4.35439 COMB1	3.07E-15 COMB2	+4.2E-15 COMB4	36.04032 COM
30	-9.3E-14 COMB4	8.9208 COMB4	-15.2813 COMB6	1.66E-17 COMB1	-8.2E-17 COMB3	1.9741 COMB1	-4.95498 COMB1	1.9E-15 COMB1	+1.7E-15 COMB5	31.93124 COM
31	-2.1E-15 COMB1	7.9502 COMB1	-1.1224 COMB7	8.12E-16 COMB7	+7.9E-16 COMB5	1.9741 COMB1	0.19381 COMB7	3.15E-15 COMB5	-3.2E-15 COMB7	6.15896 COM
32	-4.4E-16 BMATI	8.7518 COMB1	-0.0356 COMB4	1.01E-17 COMB1	-3E-19 COMB3	2.12467 COMB7	-0.81125 COMB5	1.85E-15 COMB7	+1.7E-15 COMB5	9.62924 BMA
33	-6.8E-15 COMB6	14.4867 COMB1	-6.1986 BMATI	4.03E-16 COMB6	-4E-16 COMB4	0.07741 COMB4	-0.14086 COMB6	1.55E-15 COMB4	-1.4E-15 COMB6	22.19396 COM
34	0 BMATI	0.0819 COMB7	-14.3089 COMB1	2.65E-19 COMB1	-1.3E-19 COMB3	0.15306 COMB6	-0.12856 COMB4	8E-16 COMB4	-8E-16 COMB6	22.00192 COM
35	-1.4E-15 COMB1	12.8915 COMB1	-1.6648 COMB7	1.6E-15 COMB6	-1.6E-15 COMB6	0.12577 COMB1	-0.03914 COMB6	4.8E-15 COMB6	-4.8E-15 COMB4	17.70185 COM
36	-8.1E-16 COMB3	3.8844 COMB7	-2.0871 COMB1	0.3081 COMB4	-0.0185 COMB1	2.12902 COMB1	0.00435 COMB7	1.0824 COMB4	-4E-16 COMB7	6.25396 COM
37	-59.0906 COMB5	29.334 COMB1	-27.298 COMB1	0.7221 COMB5	-0.7195 COMB7	1.44391 COMB5	-0.03108 COMB6	3.34421 COMB7	-2.6394 COMB5	38.09615 COM
38	-15.4425 COMB7	12.4482 COMB6	-17.2154 COMB1	0.0308 COMB7	-0.1466 COMB6	0.09353 COMB4	-0.07169 COMB6	0.66632 COMB6	-0.1438 COMB7	16.50295 COM
39	-8.1E-15 COMB1	22.3151 COMB4	-22.2602 COMB5	9.99E-17 COMB4	-3.2E-15 COMB5	0.03364 COMB4	-0.43634 COMB5	2.52E-14 COMB5	-4.3E-15 COMB7	82.66296 COM
40	-5.6E-14 COMB7	11.0294 COMB1	-18.163 COMB6	3.2E-15 COMB7	-1.6E-15 COMB6	0.42344 COMB1	-0.22569 COMB5	3.15E-15 COMB4	-2.8E-14 COMB7	82.66296 COM
41	-8.4E-15 COMB1	6.8097 COMB1	-2.0114 COMB1	7.15E-17 COMB1	-1.6E-15 COMB6	2.85654 COMB4	-2.92035 COMB6	3.3E-15 COMB6	-3.3E-15 COMB6	-0.54501 COM
42	-49.3634 COMB5	10.7782 COMB4	-7.1427 COMB6	1.8243 COMB6	-1.0425 COMB4	2.09492 COMB1	-2.92035 COMB4	7.84977 COMB4	-4.1634 COMB4	21.54044 COM
43	2.63E-16 COMB1	14.7551 COMB1	-6.4014 COMB6	1.8243 COMB6	-4.4E-17 COMB4	3.49064 COMB1	0.27256 COMB6	4.14939 COMB6	-6.79172 COMB6	31.98962 COM
44	-2.2E-16 BMATI	13.6932 COMB1	0.2171 COMB3	7.99E-16 COMB6	-1.6E-15 COMB7	1.74658 COMB7	0.05405 COMB3	2.68E-15 COMB7	-3.2E-15 COMB5	10.02507 COM
45	-5.1E-14 COMB4	15.1043 COMB1	0.1614 COMB7	7.99E-16 COMB6	-4E-16 COMB4	0.2293 COMB5	-3.24254 COMB1	3E-15 COMB7	-3E-15 COMB5	18.81324 COM
46	-1.3E-14 COMB5	14.5216 COMB1	1.9459 COMB6	5.36E-19 COMB1	-5E-17 COMB6	2.5131 COMB1	-1.75704 COMB5	1.6E-15 COMB4	-1.6E-15 COMB4	17.42249 COM

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 max
-13.3794 COMB1	29.3361 COMB1	-27.1096 COMB1	0.002 BMAT1	-4E-16 COMB7	2.14651 COMB5	-3.20944 COMB7	0.71429 COMB1	-0.00577 BMAT1	38.11001 COMB
-16.9432 COMB7	13.3384 COMB1	-11.7239 COMB7	-0.1346 COMB1	-0.0341 COMB6	0.640022 COMB1	-0.41754 COMB5	0.67408 COMB6	-0.42749 COMB4	16.49539 COMB
-8.2E-14 COMB6	5.3874 COMB1	-0.2393 COMB5	7.99E-16 COMB5	-4E-16 COMB7	0.84817 COMB7	-0.41754 COMB5	1.6E-15 COMB6	-1.6E-15 COMB4	3.8467 COMB
-8.9E-16 BMAT1	29.5249 COMB1	-1.2425 COMB6	4E-16 COMB4	-4E-16 COMB6	0.04342 COMB7	-0.41147 COMB1	8.12E-16 COMB4	-7.9E-16 COMB6	37.11335 COMB
-1.4E-14 COMB5	13.3293 COMB4	1.4309 COMB3	5.55E-17 BMAT1	-9.6E-20 COMB1	5.07196 COMB1	-1.40952 COMB7	1.42E-15 COMB4	-1.4E-15 COMB6	17.07354 COMB
-2.9E-14 COMB7	18.1359 COMB4	-8.7539 COMB6	8.24E-16 COMB7	-7.7E-16 COMB1	2.77078 COMB7	-4.04796 COMB1	1.83E-15 COMB1	-1.4E-15 COMB5	30.45824 COMB
0 BMAT1	0.4974 COMB7	-4.4613 BMAT1	7.44E-17 COMB6	-1.1E-16 COMB4	-1.02065 BMAT1	-1.40146 COMB7	1.47E-15 COMB5	-1.6E-15 COMB4	1.41574 BMAT
-2.6E-14 COMB5	-0.5351 COMB3	-9.2386 COMB1	7.74E-16 COMB1	-3.3E-17 COMB1	-0.93843 COMB2	-2.283 COMB1	1.3E-15 COMB7	-4E-16 COMB4	8.21961 COMB
-72.3341 COMB1	2.8154 COMB7	-4.249 COMB7	7.74E-16 COMB1	-7E-16 COMB1	0.00016 COMB7	-1.80941 COMB5	12.6494 COMB1	-0.3732 COMB1	3.48717 COMB
-82.74 BMAT1	54.7521 COMB1	-49.4476 COMB1	82.8139 COMB5	-127.04 COMB7	0.80248 COMB6	-0.53814 COMB1	89.21839 COMB7	-78.497 COMB5	89.57294 COMB
-193.229 COMB1	5.7936 BMAT1	-3.0187 COMB4	1.1673 COMB5	-7.7332 COMB1	0.01434 COMB5	-1.0591 BMAT1	16.48037 COMB7	-14.4183 COMB1	17.90801 BMAT
-8.4E-15 COMB6	27.423 COMB1	4.3174 COMB5	4.01E-16 COMB4	-4E-16 COMB4	0.30307 COMB4	-3.41582 COMB1	7.99E-16 COMB6	-8.1E-16 COMB6	41.27949 COMB
-78.5769 COMB7	56.4025 COMB1	-50.9411 COMB1	0.0329 COMB4	-0.0141 COMB6	0.10481 COMB4	-0.04924 COMB7	0.12184 COMB6	-0.14844 COMB4	34.34433 COMB
-47.619 COMB7	33.333 COMB7	-27.4748 COMB1	0.0131 COMB7	-1.2E-19 COMB1	0.44178 COMB4	0.02577 COMB7	0.01739 COMB7	-0.04114 COMB7	40.37913 COMB
-243.717 COMB1	1.7133 COMB6	-11.8148 COMB5	6.6004 COMB1	-3.3E-16 COMB4	0.46179 COMB4	-0.2623 COMB6	12.30736 COMB1	-11.1747 COMB5	16.2833 COMB
-182.41 COMB1	4.8724 COMB1	-0.6806 COMB6	3.3511 COMB6	-5.349 COMB7	0.0177 COMB4	+0.02341 COMB6	21.43523 COMB7	+5.64429 COMB5	2.18919 COMB
-5.1E-14 COMB4	3.4188 COMB2	-0.9182 COMB5	4.03E-16 COMB4	-4E-16 COMB4	0.11113 COMB4	+0.12811 COMB6	2.39E-15 COMB4	-2.4E-15 COMB6	3.57427 COMB
-2.5E-14 COMB6	29.741 COMB1	2.3947 COMB7	4.03E-16 COMB6	-3.7E-17 COMB7	1.22042 COMB6	-0.07569 COMB4	3.99E-16 COMB5	-2.4E-15 COMB6	39.43957 COMB
-116.26 COMB7	54.9757 COMB1	-54.384 COMB1	0.5002 COMB6	-0.4897 COMB1	2.0429 COMB4	-1.01559 COMB6	3.23339 COMB4	-3.24716 COMB4	44.31318 COMB
4E-16 COMB4	1.9049 COMB2	-3.0241 COMB5	7.96E-16 COMB6	-8E-16 COMB1	0.14113 COMB4	-0.12811 COMB6	1.61E-15 COMB4	-1.6E-15 COMB5	1.30015 COMB
-8.9E-16 BMAT1	2.3867 COMB7	-30.2399 COMB1	7.96E-16 COMB6	-3.2E-16 COMB3	0.12693 COMB1	-0.12811 COMB6	7.96E-16 COMB4	-1.6E-15 COMB4	40.28843 COMB
-8E-16 COMB4	-2.371 COMB5	-15.6121 COMB7	9.98E-17 COMB4	-4E-16 COMB6	0.34149 COMB4	-0.23021 COMB5	1.6E-15 COMB4	-1.6E-15 COMB3	35.33014 COMB
-8E-16 COMB4	-3.3904 COMB6	-56.4302 COMB1	2.7742 COMB6	-3.3005 COMB1	12.49761 COMB4	-10.2592 COMB6	12.30513 COMB6	-10.3873 COMB4	13.90696 COMB
-405.567 COMB1	8.3081 COMB6	-23.1631 COMB7	3.7918 COMB7	-8.1343 COMB4	2.79287 COMB7	-10.2592 COMB6	8.39389 COMB7	-10.5474 COMB5	30.62044 COMB
-390.82 COMB1	8.3081 COMB6	-7.8531 COMB4	18.1477 COMB5	-1.1703 COMB1	0.2437 COMB4	+0.09732 COMB6	61.4421 COMB5	-11.1295 COMB5	32.32563 COMB
-270.961 COMB1	62.6347 COMB4	+63.1999 COMB6	120.7632 COMB7	-103.269 COMB5	0.14902 COMB5	-0.17005 COMB7	319.2716 COMB7	-331.824 COMB5	214.7984 COMB
+44.7667 COMB5	42.1364 COMB6	-42.8749 COMB4	93.267 COMB5	-84.6541 COMB7	0.33387 COMB6	-0.35104 COMB4	384.1948 COMB7	-392.841 COMB5	302.0469 COMB
1.05E-15 COMB2	+7.401 COMB3	+27.5749 COMB1	6.66E-17 COMB1	3.97E-17 COMB2	0.41151 COMB4	0.09858 COMB3	1.65E-15 COMB2	-1.3E-14 COMB1	7.46215 COMB
-2.4E-14 COMB5	-5.3811 COMB7	-26.8041 COMB1	5E-17 COMB4	-1.1E-16 COMB1	0.41151 COMB4	+0.43093 COMB4	1.54E-15 COMB5	-1.7E-15 COMB6	4.8119 COMB
+36.3231 COMB2	-0.9231 COMB6	-52.5436 COMB1	9.3723 COMB4	-3.5375 COMB4	6.19573 COMB6	+6.43093 COMB4	21.7697 COMB6	+21.4185 COMB4	27.99345 COMB
-13.705 COMB7	-1.2414 COMB7	-21.2542 COMB7	0.202 COMB7	6.34E-14 COMB3	+0.2097 COMB7	-3.49273 COMB1	0.17044 COMB7	+0.73279 COMB5	27.68202 COMB
0 BMAT1	0.29 COMB1	-12.8927 COMB1	7.99E-16 COMB6	-4E-16 COMB5	0.09203 COMB7	-1.73304 COMB7	1E-15 COMB7	-2E-16 COMB4	7.31654 COMB
0 BMAT1	0.1894 COMB7	-14.6019 COMB1	7.99E-16 COMB6	0 BMAT1	1.94946 COMB1	0.09203 COMB7	1.63E-17 COMB1	-2E-16 COMB7	17.91163 COMB
-1.3E-14 COMB5	-1.6881 COMB4	-14.2595 COMB1	7.99E-16 COMB5	-4E-16 COMB4	1.61235 COMB5	-2.0625 COMB1	2.26E-15 COMB7	-2.2E-16 COMB5	17.09462 COMB
-24.7237 COMB1	29.3563 COMB1	-27.2215 COMB1	0.0679 COMB4	-0.1234 COMB5	0.41954 COMB7	-2.01714 COMB5	0.29682 COMB4	-0.83574 COMB5	37.49612 COMB
-28.9395 COMB6	12.6019 COMB5	-14.086 COMB1	0.1438 COMB7	-0.1234 COMB1	0.35116 COMB5	-0.71068 COMB1	0.63095 COMB7	-0.85401 COMB7	15.49241 COMB
-1.3E-14 COMB5	1.4203 COMB4	-5.6341 COMB7	4.36E-17 COMB6	-4.1E-16 COMB5	0.41446 COMB1	-0.85972 COMB7	8.03E-16 COMB5	-8E-16 COMB5	4.77845 COMB
-1.9E-16 COMB3	0.3458 COMB7	-27.9359 COMB1	3.94E-16 COMB7	-4E-16 COMB4	0.16229 COMB6	-1.45456 COMB5	1.83E-15 COMB5	-1.6E-15 COMB4	37.09562 COMB
-1E-13 COMB6	8.0791 COMB4	-12.0501 COMB7	7.99E-16 COMB6	-8.8E-16 COMB5	1.04944 COMB7	+5.06294 COMB1	1.87E-15 COMB6	-1.4E-15 COMB5	21.6119 COMB
-2.6E-14 COMB5	8.3891 COMB1	-14.9789 COMB6	7.48E-16 COMB7	-8.1E-16 COMB5	2.99539 COMB1	-2.28155 COMB5	1.61E-15 COMB5	-1.5E-15 COMB7	6.93061 COMB
-5.1E-14 COMB4	8.0333 COMB1	-0.9836 COMB7	8.12E-16 COMB7	-7.9E-16 COMB5	2.25901 COMB2	1.04183 BMAT1	3.12E-15 COMB5	-3.3E-15 COMB7	7.2968 COMB
-24.1469 COMB1	29.3586 COMB1	-27.2192 COMB1	3.025 COMB1	-1.7E-16 COMB4	1.59773 COMB2	-0.00948 COMB1	0.11567 COMB1	-0.10414 COMB1	37.49337 COMB
-31.4454 COMB6	22.0211 COMB2	-11.6064 COMB6	2.2016 COMB7	-0.1744 COMB5	0.20349 COMB4	-0.03795 COMB5	0.44304 COMB7	-0.91677 COMB7	21.57191 COMB
-5.1E-14 COMB4	5.7409 COMB7	-14.2605 COMB1	0 BMAT1	-3.5E-20 COMB3	0.20349 COMB4	-0.17639 COMB4	8.05E-16 COMB4	-7.9E-16 COMB4	20.92584 COMB
-5.1E-14 COMB4	12.5646 COMB1	+8.5535 COMB5	7.93E-16 COMB4	-1E-16 COMB4	0.13205 COMB6	-0.71042 COMB1	1.4E-15 COMB4	-4E-16 COMB5	15.99587 COMB
-1.2E-17 COMB2	6.0285 COMB5	-2.3835 COMB1	7.93E-16 COMB4	-0.156 COMB1	-0.12597 COMB4	-0.54467 COMB1	0.80124 COMB1	-0.40426 COMB1	6.28147 COMB
-56.2693 COMB5	3.1765 COMB4	-16.9969 COMB1	0.529 COMB5	-0.7242 COMB7	0.75931 COMB1	-0.50574 COMB4	2.6391 COMB6	-3.3729 COMB7	14.70448 COMB
0 BMAT1	3.1691 COMB1	-7.6245 COMB7	4E-16 COMB6	+8E-16 COMB4	0.41256 COMB4	0.11985 COMB6	1.6E-15 COMB4	-1.6E-15 COMB4	9.09461 COMB
-2E-13 COMB5	23.9491 COMB4	-23.4954 COMB6	3.21E-15 COMB7	-3.2E-15 COMB5	0.72814 COMB5	-1.51428 COMB7	3.79E-14 COMB5	-3.9E-14 COMB7	87.03726 COMB
-4.7E-17 COMB3	6.242 COMB1	-2.2791 COMB1	1.62E-15 COMB6	-1.6E-15 COMB4	0.43477 COMB4	0.0075 COMB3	4.77E-15 COMB4	-4.8E-15 COMB5	-1.74335 BMAT
-2E-13 COMB5	3.7435 COMB7	-5.4332 COMB1	3.2E-15 COMB6	+0.6215 COMB1	2.99022 COMB4	-4.06551 COMB1	2.5471 COMB1	-2.4572 COMB1	6.45897 COMB
-43.3394 COMB5	15.7461 COMB1	-9.2783 COMB6	2.207 COMB6	-2.8274 COMB4	3.2464 COMB1	-3.17902 COMB2	12.69216 COMB4	-10.1408 COMB6	26.83396 COMB

	P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
	-5.2E-16 COMB1	16.5411 COMB1	0.1741 COMB6	7.99E-16 COMB6	-8E-16 COMB4	0.18748 COMB2	-1.95135 COMB1	1.59E-15 COMB7	-1.6E-15 COMB5	17.24694 COM
	-2.1E-15 COMB1	14.193 COMB1	2.0563 COMB6	7.99E-16 COMB7	-8.1E-16 COMB5	3.84521 COMB1	-2.96425 COMB2	3.37E-15 COMB7	-3E-15 COMB7	14.38421 COM
	-5.1E-15 COMB1	14.193 COMB1	-1.574 COMB1	8E-16 COMB7	-8E-16 COMB5	3.84521 COMB1	0.23754 BMATI	1.6E-15 COMB6	-1.6E-15 COMB4	12.87508 COM
	0 BMATI	12.0811 COMB1	-1.1885 COMB2	8.12E-16 COMB7	-7.9E-16 COMB5	0.89716 COMB7	-3.46139 COMB5	1.63E-15 COMB5	-1.3E-15 COMB7	9.68153 COM
	+1.3E-14 COMB6	17.1973 COMB1	-1.15 COMB6	1.34E-16 COMB4	-1.6E-15 COMB6	0.41449 COMB1	-0.7058 COMB1	3.41E-16 COMB6	-3E-16 COMB6	36.98001 COM
	-4.3E-15 COMB1	27.7119 COMB1	1.6307 BMATI	7.99E-16 COMB5	-9E-16 COMB7	5.1223 COMB1	+1.80424 COMB7	1.87E-15 COMB6	-1.6E-15 COMB4	27.73173 COM
	-4.2E-15 COMB1	18.433 COMB4	-1.3528 COMB5	1.49E-16 COMB4	-9E-17 COMB1	5.1223 COMB1	1.9721 COMB3	3.56E-16 COMB1	-3.2E-15 COMB4	11.32016 COM
	-3.7E-14 COMB7	7.817 COMB7	-8.8688 COMB6	2.02E-17 COMB1	-2.5E-16 COMB4	2.53941 COMB7	-4.70919 COMB1	3.4E-15 COMB7	-3E-15 COMB5	31.98724 COM
	-4.3E-14 COMB1	0.2335 COMB4	-1.8529 COMB2	1.67E-17 COMB6	-7.9E-16 COMB5	-1.66017 COMB5	-3.81972 COMB2	3.18E-15 COMB5	-5.4E-17 COMB1	3.42044 COM
	-5.1E-14 COMB4	0.8226 COMB7	-9.2347 COMB1	8.12E-16 COMB7	-2.4E-15 COMB5	-0.91632 COMB3	-2.17064 COMB7	6.34E-15 COMB5	-3.2E-15 COMB6	7.02546 COM
	-7.1738 COMB1	9.2044 COMB1	-44.0748 COMB4	62.4116 COMB5	-78.1551 COMB1	0.00025 COMB1	-0.98232 COMB6	12.45414 COMB1	-69.7119 COMB1	34.46296 COM
	+195.935 COMB1	52.4121 COMB6	-54.4461 COMB1	62.4116 COMB5	-126.781 COMB7	0.74583 COMB6	-3.37161 COMB4	89.13559 COMB7	-74.6454 COMB5	38.12711 COM
	+113.932 COMB1	17.4906 COMB1	-1.5734 COMB4	1.227 COMB5	-7.4659 COMB7	0.01498 COMB1	-0.31354 COMB1	17.10613 COMB7	-20.1236 COMB7	44.77345 COM
	-5.3E-14 COMB1	24.1765 COMB1	4.8766 COMB5	1.56E-16 COMB4	-6.9E-15 COMB1	0.05395 COMB5	-1.42957 COMB4	1.03E-16 COMB5	-1.6E-15 COMB4	32.92692 COM
	-24.4631 COMB7	51.9183 COMB1	+55.8283 COMB1	3.17E-18 BMATI	-0.1722 COMB1	0.20222 COMB6	-0.31947 COMB1	0.33282 COMB1	-0.60909 COMB1	41.93203 COM
	-258.563 COMB1	1.4063 COMB1	-29.674e COMB1	3.629e COMB1	-4E-16 COMB7	0.25493 COMB4	-0.51445 COMB6	12.31415 COMB1	-2.42704 BMATI	42.32961 COM
	-259.772 COMB1	3.8707 COMB6	-3.4001 COMB4	4.9162 COMB5	-2.179 COMB7	0.01498 COMB5	-0.01771 COMB7	12.31415 COMB1	-12.8466 COMB5	8.2932 COM
	-171.258 COMB1	14.8335 COMB1	1.1291 COMB4	5.0627 COMB5	-3.883 COMB7	3.30075 COMB1	-0.02321 COMB6	12.62871 COMB5	-12.4149 COMB7	18.23893 COM
	-5.2E-14 COMB7	12.8701 COMB1	1.4903 COMB5	3.12E-18 COMB3	-8.7E-20 COMB1	1.54519 COMB6	-4.04242 COMB1	8.04E-16 COMB6	-8.1E-16 COMB6	17.20889 COM
	-8.1E-14 COMB4	9.1297 COMB5	-1.9537 COMB7	7.99E-16 COMB6	-8E-16 COMB4	-1.25528 COMB6	-1.90495 COMB4	3.22E-15 COMB4	-3.2E-15 COMB6	9.96939 COM
	+123.296 COMB7	56.4831 COMB1	-55.8765 COMB1	0.573 COMB6	-0.6076 COMB4	2.20087 COMB4	-2.27428 COMB6	3.71645 COMB6	-3.84133 COMB4	42.82408 COM
	-114.375 COMB7	33.445 COMB7	-13.183 COMB1	4.16E-18 COMB1	-0.1302 COMB7	0.74308 COMB7	-2.51227 COMB1	0.19632 COMB7	-0.19621 COMB7	36.09749 COM
	-8.2E-14 COMB3	2.0084 COMB7	-7.5557 BMATI	4.03E-16 COMB5	-4E-16 COMB7	1.46581 BMATI	-1.97563 COMB6	1.61E-15 COMB5	-1.2E-15 COMB4	8.01849 COM
	+2.5E-17 COMB1	-1.1277 COMB5	-16.1982 COMB1	1.12E-16 COMB5	-7.9E-16 COMB4	3.48505 COMB1	0.90997 COMB4	4.77E-15 COMB4	-2E-15 COMB7	17.66649 COM
	-188.474 BMATI	1.3497 BMATI	-55.066 COMB1	5.0109 COMB7	-4.09 COMB5	8.84992 COMB4	-9.20302 COMB6	10.39987 COMB7	-12.0097 COMB7	9.4622 COM
	-371.936 COMB1	9.2418 COMB6	-9.7205 COMB4	18.5879 COMB5	-2.0079 COMB1	5.0437 COMB4	-0.04378 COMB7	59.19164 COMB5	-15.16 COMB5	28.05763 COM
	-240.727 COMB1	70.7756 COMB4	-5.1488 COMB1	18.5879 COMB5	-106.882 COMB5	0.14902 COMB5	-3.05732 COMB5	23.40907 COMB1	-330.484 COMB5	244.6738 COM
	-188.192 COMB5	127.8709 COMB6	-127.23 COMB4	133.2924 COMB5	-106.882 COMB5	1.24535 COMB1	-3.19005 COMB7	389.1978 COMB7	-402.524 COMB5	335.7888 COM
	-2.1E-15 COMB1	-7.1966 COMB7	-26.9609 COMB1	1.57E-18 COMB3	-1.4E-15 COMB4	1.26535 COMB1	-0.2046 COMB1	4.82E-15 COMB6	-4.3E-15 COMB4	6.68152 COM
	-27.4021 COMB1	0.6691 COMB1	-51.0267 COMB1	3.15E-15 COMB6	-0.234 COMB1	6.75122 COMB6	-6.90967 COMB4	9.38614 COMB1	-0.66023 COMB1	7.84579 COM
	-21.1899 COMB2	1.6249 COMB7	-39.9749 COMB2	13.2744 COMB4	-13.5141 COMB6	11.68457 COMB6	-11.8758 COMB4	31.30795 COMB6	-30.919 COMB4	40.69273 COM
	-5.1E-14 COMB4	-1.2961 COMB3	-15.6728 COMB1	1.6E-15 COMB6	-1.6E-15 COMB6	1.32792 COMB1	-2.22781 COMB4	4.29E-15 COMB7	-4.3E-15 COMB5	21.69198 COM
	1.2E-17 COMB2	+1.035 COMB4	+9.9191 BMATI	7.99E-16 COMB6	-8E-16 COMB4	0.90533 COMB7	-2.12625 BMATI	4.6E-15 COMB7	+4.6E-15 COMB5	6.64819 COM
	0 BMATI	-6.1352 COMB4	-20.5717 COMB1	8E-16 COMB7	-8E-16 COMB5	4.77611 BMATI	-0.72793 COMB7	3.04E-15 COMB4	-3.1E-15 COMB7	37.23033 COM
	-1E-13 COMB6	-4.3385 COMB7	-18.9149 COMB1	8.12E-16 COMB7	-7.9E-16 COMB5	10.31696 COMB1	0.12874 BMATI	1.62E-15 COMB4	-1.6E-15 COMB5	33.30488 COM
	-3.1E-17 COMB1	0.9114 COMB1	-12.7312 COMB1	-6.2E-18 COMB2	-8.3E-18 COMB1	0.45073 COMB7	-0.22514 COMB5	8.11E-16 COMB5	-8.1E-16 COMB6	16.1242 COM
	-25.3668 COMB3	9.3171 COMB4	-14.5293 COMB6	53.7192 COMB7	-53.3765 COMB5	25.33741 COMB7	-25.1897 COMB5	233.8035 COMB5	-145.543 COMB7	78.26524 COM
	-2.034 COMB7	-1.1044 COMB4	-14.4518 COMB1	53.7192 COMB7	-4.1E-16 COMB5	25.33741 COMB7	0.25226 COMB7	7.9E-16 COMB5	-295.693 COMB7	28.4292 COM
	-1.2E-14 COMB7	+0.922 COMB6	-12.3805 COMB1	8.12E-16 COMB7	-7.9E-16 COMB5	0.25226 COMB7	-5.45685 COMB1	1.62E-15 COMB4	-1.6E-15 COMB6	12.61444 COM
	-3.9E-14 COMB6	9.0086 COMB4	-15.2332 COMB6	8.12E-16 COMB7	-5.6E-17 BMATI	-2.05442 COMB5	-5.02645 COMB1	8.23E-16 COMB7	-1.6E-15 COMB7	32.58259 COM
	+25.3346 COMB3	9.7838 COMB1	-12.5315 COMB7	41.1863 COMB7	-40.9023 COMB5	19.45001 COMB7	-19.3287 COMB5	245.5775 COMB5	-247.285 COMB7	73.00997 COM
	-5.1E-14 COMB4	9.2039 COMB1	0.4469 COMB7	7.87E-16 COMB7	-8.1E-16 COMB5	2.21914 COMB1	0.52398 COMB7	3.24E-15 COMB5	-3.1E-15 COMB7	7.30554 COM
	-1.1E-13 COMB6	9.2039 COMB1	0.0833 COMB4	7.99E-16 COMB5	-2E-16 COMB4	2.21914 COMB1	0.95331 COMB3	7.96E-16 COMB6	-3.2E-15 COMB5	5.48786 COM
	-1.1E-13 COMB6	5.5194 COMB1	-8.7065 COMB1	1.99E-16 COMB6	-8E-16 COMB7	0.97417 COMB6	-0.12382 COMB6	3.2E-15 COMB7	-3.1E-18 COMB4	23.01449 COM
	-6.4E-15 COMB6	1.7074 COMB7	-17.9839 COMB1	5.66E-18 COMB1	0 BMATI	0.02501 COMB7	-0.12382 COMB6	1.13E-17 COMB3	-1.1E-17 COMB1	15.38831 COM
	-7.2E-15 COMB6	17.9138 COMB1	-8.145 COMB2	4.03E-16 COMB6	-4E-16 COMB4	0.14216 COMB6	-0.14433 COMB4	1.59E-15 COMB4	-1.6E-15 COMB5	14.45975 COM
	-20.2256 COMB3	13.4347 COMB2	-6.5274 COMB3	0.1557 COMB1	-4E-16 COMB6	0.12404 COMB4	-0.11594 COMB6	0.00971 COMB1	-1.01429 COMB1	36.67398 COM
	-25.6625 COMB3	11.7068 COMB5	-16.28 COMB7	31.281 COMB7	-31.0612 COMB5	14.77718 COMB7	-14.6851 COMB5	202.0137 COMB5	-203.445 COMB7	103.5879 COM
	-26.032 COMB3	13.953 COMB5	-18.2734 COMB7	23.0706 COMB7	-22.9035 COMB5	10.89063 COMB7	-10.8227 COMB5	160.4082 COMB5	-161.578 COMB7	125.4735 COM
	0 BMATI	7.9758 COMB1	-2.6894 COMB1	3.2E-15 COMB4	-3.2E-15 COMB6	0.16585 COMB6	-0.21178 COMB4	6.39E-15 COMB6	-6.4E-15 COMB4	-0.68495 COM
	-2.1E-13 COMB7	6.1826 COMB1	-2.3385 COMB1	3.2E-15 COMB6	-3.2E-15 COMB4	2.82338 COMB4	-2.8498 COMB6	6.5E-15 COMB4	-6.3E-15 COMB6	-1.47816 COM
	-46.4156 COMB5	9.3989 COMB4	-6.7288 COMB6	2.7454 COMB6	-2.0095 COMB4	4.00561 COMB1	1.07868 COMB7	12.59605 COMB6	-9.65069 COMB4	27.50552 COM

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
-1.1E-17 COMB1	25.9099 COMB1	4.397 COMB7	1.13E-12 COMB4	-0.1043 COMB7	5.35346 COMB1	2.10822 COMB7	3.93E-17 COMB1	-0.11374 COMB7	40.71259 COM
-5.1E-14 COMB4	35.4447 COMB1	1.1074 COMB3	1.13E-14 COMB4	-4.7E-17 COMB4	2.2254 COMB4	-5.3248 COMB1	1.42E-15 COMB4	-1.4E-15 COMB4	25.74434 COM
0 BMATI	-8.8418 BMATI	1.1278 COMB5	1E-14 COMB5	-1E-16 COMB6	0.12877 BMATI	-0.31348 COMB7	3.2E-15 COMB7	-3.2E-15 COMB5	16.74444 BMAT
0 BMATI	20.6075 COMB1	4.5124 COMB2	6.94E-18 BMATI	0 BMATI	0.73747 COMB7	-1.79013 BMATI	0 BMATI	-2.7E-17 COMB1	37.23663 COM
-35.3434 BMATI	18.9486 COMB1	3.3567 BMATI	1.11E-17 COMB1	-35.4542 BMATI	3.9E-15 BMATI	-10.3446 COMB1	1.6E-15 COMB6	-23.6475 BMATI	33.11308 COM
-71.4281 COMB1	53.2534 COMB4	-47.1707 COMB4	82.7736 COMB5	-126.605 COMB7	2.027 COMB6	-3.26249 COMB1	83.07245 COMB7	-78.6456 COMB5	49.77269 COM
-6.9E-11 COMB5	5.1601 COMB4	-0.5244 COMB6	7.99E-16 COMB5	-8E-16 COMB4	0.21210 COMB5	-0.443 COMB7	1.54E-15 COMB7	-1.1E-15 COMB5	6.43764 COM
-26.4323 COMB3	54.8866 COMB5	-14.9725 COMB7	16.323 COMB7	-16.2039 COMB5	7.64787 COMB7	-7.64247 COMB5	121.5455 COMB5	-122.474 COMB7	139.5521 COM
0 BMATI	12.2221 COMB1	1.1538 COMB6	1.36E-17 COMB1	-1.3E-17 COMB3	5.52675 COMB1	-2.20144 COMB1	8.36E-16 COMB7	-8.1E-16 COMB4	12.567 COM
0 BMATI	9.3009 COMB2	0.8467 COMB4	4.12E-16 COMB5	-7.9E-16 COMB7	4.14101 COMB2	2.33747 COMB7	1.65E-15 COMB5	-1.4E-15 COMB5	5.54324 COM
-1E-13 COMB6	15.11 COMB4	-4.4457 COMB6	-3E-17 COMB2	-7.9E-16 COMB7	5.08385 COMB1	2.14581 COMB4	1.54E-15 COMB7	-1.5E-15 COMB4	80.4345 COM
-94.7758 COMB1	19.3136 COMB1	-54.4462 COMB1	0.1442 COMB1	-0.1049 COMB4	2.35645 COMB4	-1.43289 COMB4	0.45688 COMB1	-1.13234 COMB1	94.22924 COM
-93.238 COMB7	21.9664 COMB7	-22.1503 COMB6	0.2383 COMB6	-2E-16 COMB6	0.32012 COMB6	-1.44813 COMB1	2.83731 COMB6	-1.23247 COMB1	16.34537 COM
1.8E-15 COMB1	-2.4352 COMB7	-9.5135 COMB1	7.81E-13 COMB3	-2E-16 COMB6	-0.42453 COMB7	-1.12841 COMB1	1.24E-14 COMB6	-1.1E-15 COMB5	7.31545 COM
1.1E-15 COMB3	8.0958 COMB6	-4.6021 COMB4	7.81E-13 COMB3	7.41E-13 COMB3	-0.79431 COMB6	-1.09592 COMB4	4E-16 COMB6	-1E-14 COMB7	4.23715 COM
-196.361 COMB1	24.1419 COMB1	-4.3329 COMB4	1.1762 COMB5	-6.3775 COMB1	0.3074 COMB1	-0.97412 COMB7	17.9134 COMB7	-19.1141 COMB1	43.79849 COM
-61.1231 COMB1	51.2073 COMB1	-55.4164 COMB1	3.1798 COMB1	-4E-16 COMB6	0.81009 COMB6	-0.2771 COMB4	3.42993 COMB1	-3.36625 COMB1	41.90343 COM
-91.3713 COMB7	23.1312 COMB5	-29.6621 COMB1	7.1104 COMB4	-7.6E-18 COMB1	0.26043 COMB6	3.00773 COMB4	3.40352 COMB4	-3.34324 COMB7	40.33227 COM
-261.846 COMB1	-0.8166 COMB3	-19.5784 COMB2	3.3563 COMB1	-4E-16 COMB6	0.50074 COMB4	-0.23349 COMB6	11.4062 COMB1	-5.37644 COMB1	31.78418 COM
-174.417 COMB1	4.5839 BMATI	-3.9049 COMB1	4.8831 COMB5	-4.1512 COMB7	0.0177 COMB4	-1.42787 BMATI	11.55666 COMB6	-13.9225 COMB7	9.82729 COM
-9.7E-14 COMB1	16.551 COMB1	2.9968 COMB4	-9.4E-19 COMB2	-3.5E-19 BMATI	-1.29145 COMB3	-3.30395 COMB1	6.94E-18 BMATI	-8.3E-18 COMB1	14.14733 COM
-5.3E-14 COMB6	8.7202 COMB1	5.4613 COMB5	2.16E-17 COMB1	-3E-18 COMB5	3.95856 COMB1	-1.57451 COMB4	4.06E-16 COMB5	-4.1E-16 COMB7	17.32921 COM
-2.1E-14 COMB1	12.9485 COMB1	1.5985 COMB4	2.16E-17 COMB1	1.2E-17 COMB3	3.95856 COMB1	1.34243 COMB4	1.5E-15 COMB4	-1.4E-15 COMB4	12.96442 COM
-65.0507 COMB1	55.5584 COMB1	-55.8012 COMB1	0.3448 COMB1	-0.4636 COMB4	2.11456 COMB4	0.06211 COMB3	0.143 COMB1	-3.15331 COMB4	42.7048 COM
-124.4 COMB7	33.3242 COMB7	-33.4521 COMB5	0.5139 COMB6	-0.4636 COMB4	3.59041 COMB1	-1.99175 COMB6	3.31233 COMB4	-1.29429 COMB6	35.86192 COM
-5.1E-14 COMB4	-1.4558 COMB6	-7.4077 COMB5	2.03E-16 COMB7	-2E-16 COMB5	2.69419 COMB2	0.85012 COMB6	7.99E-16 COMB4	-8.1E-16 COMB4	13.37096 COM
-5.1E-14 COMB4	0.7356 COMB5	-16.0753 COMB1	2.03E-16 COMB7	-2E-16 COMB5	1.51221 COMB7	-3.42923 COMB1	3.75E-16 COMB5	-8.1E-16 COMB7	17.71797 COM
-401.214 COMB1	-1.3062 COMB7	-58.0674 COMB1	4.377 COMB7	-3.2908 COMB5	10.1364 COMB4	-10.4288 COMB6	13.0851 COMB1	-11.7812 COMB7	7.17697 COM
-361.962 COMB1	6.9399 COMB6	-10.1048 COMB4	3.2147 COMB5	-1.9787 COMB1	0.037 COMB5	-0.04378 COMB7	8.36153 COMB7	-13.7424 COMB1	33.17317 COM
-270.803 COMB1	65.3697 COMB4	-61.2265 COMB4	97.5418 COMB7	-104.575 COMB5	0.14902 COMB5	-0.19005 COMB7	315.6653 COMB7	-321.271 COMB5	217.9335 COM
-169.569 COMB1	81.6399 COMB6	-84.7647 COMB4	97.5418 COMB7	-84.8731 COMB7	0.09972 COMB6	-0.3507 COMB4	383.659 COMB7	-395.142 COMB5	304.3335 COM
-18.9579 COMB4	31.7434 COMB4	-30.9326 COMB6	10.1286 COMB5	-5.9934 COMB7	0.33355 COMB6	-1.30352 COMB1	50.64306 COMB5	-29.9671 COMB7	54.79125 COM
-1E-13 COMB6	-7.1449 COMB7	-26.7626 COMB1	1.65E-15 COMB4	-6.4E-15 COMB4	2.66475 COMB5	-6.35057 COMB4	1.29E-14 COMB4	-6.5E-15 COMB4	4.42175 COM
-34.397 COMB2	-0.4954 COMB1	-52.1912 COMB1	9.6371 COMB4	-9.9422 COMB6	6.29835 COMB6	-4.37138 COMB4	22.79882 COMB6	-22.3693 COMB4	37.26866 COM
-5.2E-14 COMB4	-2.2137 COMB4	-10.768 COMB1	1.6E-15 COMB6	-1.6E-15 COMB4	-0.23607 BMATI	-3.24088 COMB1	4.29E-15 COMB7	-4.3E-15 COMB5	16.3695 COM
-2.6E-14 COMB5	-0.1938 COMB7	-13.6954 COMB1	8.12E-16 COMB7	-7.9E-16 COMB5	-0.06572 COMB7	-0.5122 COMB1	2.96E-15 COMB5	-3E-15 COMB7	7.28087 COM
4E-14 COMB4	-0.1938 COMB7	-13.1707 COMB1	8.12E-16 COMB7	-7.9E-16 COMB5	3.94193 COMB1	-0.26872 COMB7	1.61E-15 COMB4	-3E-15 COMB7	17.94644 COM
-5.2E-14 COMB4	-2.0779 COMB4	-14.3445 COMB1	8.06E-16 COMB7	-2E-16 COMB6	1.33198 COMB7	-3.80791 COMB1	1.62E-15 COMB4	-1.6E-15 COMB5	16.44787 COM
-8.2E-14 COMB3	1.5985 COMB4	-12.0566 COMB1	7.87E-16 COMB6	-8.1E-16 COMB4	0.46939 COMB5	-0.8287 COMB7	1.62E-15 COMB4	-1.6E-15 COMB4	12.91848 COM
2.5E-17 COMB2	1.2421 COMB4	-3.4291 BMATI	7.87E-16 COMB6	-2.9E-16 COMB5	-0.12317 COMB7	-0.8287 COMB7	2.38E-15 COMB5	-1.5E-15 COMB7	5.31964 COM
7.99E-16 COMB3	0.3331 COMB7	-27.4414 COMB1	8.24E-16 COMB7	-1.7E-16 COMB6	0.68886 COMB1	-1.17216 COMB5	1.16E-15 COMB6	-4.8E-15 COMB5	36.79981 COM
-1.3E-16 COMB2	9.005 COMB4	-14.9826 COMB6	4.7E-15 COMB5	-7.7E-16 COMB5	1.45385 COMB7	-5.1468 COMB1	4.73E-15 COMB7	-1.6E-14 COMB5	31.35238 COM
-1E-13 COMB6	8.115 COMB1	-13.1751 COMB6	7.74E-16 COMB5	-4.9E-15 COMB7	4.44548 COMB1	-2.27678 COMB7	1.59E-14 COMB7	-3.4E-15 COMB7	11.20632 COM
-1E-13 COMB6	9.1164 COMB1	-0.6576 COMB7	0 BMATI	-9.2E-16 COMB7	2.14472 COMB7	1.02224 BMATI	3.27E-15 COMB7	-4E-16 COMB6	7.32872 COM
-1E-13 COMB6	14.1295 COMB1	-0.1293 COMB4	1.6E-15 COMB5	-1.6E-15 COMB4	1.55562 COMB2	-0.12838 COMB1	4.9E-15 COMB5	-4.8E-15 COMB4	21.55903 COM
-1.3E-14 COMB6	10.6493 COMB2	-14.0783 COMB1	4E-16 COMB4	-4E-16 COMB6	0.08309 COMB4	-0.22411 COMB6	8E-16 COMB4	-8E-16 COMB6	20.31582 COM
-3.6E-17 COMB3	12.5954 COMB1	-5.5588 COMB5	3.97E-16 COMB4	-4E-16 COMB6	0.65245 COMB1	-0.13779 COMB4	2.41E-15 COMB4	-2.4E-15 COMB6	16.02084 COM
3.2E-15 COMB3	9.4405 COMB2	-2.6341 COMB1	2E-16 COMB4	-0.2847 COMB1	0.3339 COMB1	0.12352 COMB6	1.28716 COMB1	-0.92349 COMB1	11.90025 COM
-41.9549 COMB5	3.496 COMB7	-3.4159 COMB5	0.6243 COMB5	-13.6447 COMB3	7.11919 COMB2	-1.18308 COMB2	40.29626 COMB2	-3.18277 COMB7	5.76531 COM
-19.1346 COMB3	20.3685 COMB6	-20.0986 COMB4	-8.3E-18 COMB2	-13.6447 COMB3	2.09712 COMB4	-2.9108 COMB6	40.93405 COMB3	-6.3E-13 COMB5	60.29592 COM
-1.6E-15 COMB3	13.9462 COMB1	-7.6131 COMB7	2.92E-18 COMB1	-1.2E-17 COMB4	3.5036 COMB1	-0.45617 COMB6	2.42E-17 COMB2	-2.5E-17 COMB3	16.24112 COM
-5.1E-14 COMB4	6.7113 COMB4	-2.3107 COMB1	9.76E-20 COMB4	-1.7E-15 COMB1	1.76474 COMB7	0.03859 BMATI	9.76E-20 COMB4	-9E-17 COMB1	6.50883 COM

	P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
5	-2E-14 COMB7	23.432 COMB1	-23.3744 COMB6	3.2E-15 COMB4	-3.2E-15 COMB6	0.66361 COMB5	-0.64073 COMB7	2.52E-14 COMB5	-2.3E-14 COMB5	96.52937 COM
5	-1.4E-14 COMB4	10.4854 COMB1	-1.3172 COMB6	1.4E-15 COMB6	-1.6E-15 COMB6	0.08143 BMAT1	-0.54356 COMB1	4.48E-15 COMB6	-4.8E-15 COMB4	-1.71326 BMA
5	-7.1E-15 BMAT1	6.2311 COMB1	-1.0494 COMB1	3.09E-15 COMB4	6.4E-17 COMB2	2.9699 COMB4	-1.20935 COMB5	6.13E-15 COMB4	-3.4E-15 COMB1	-1.46231 COM
2	-39.4001 COMB5	9.5837 COMB4	-9.7035 COMB5	0.6909 COMB5	-2.7455 COMB4	1.3169 COMB7	-3.39583 COMB1	12.60321 COMB4	-9.4315L COMB4	26.76311 COM
7	-39.4001 COMB5	9.5682 COMB1	-9.4117 COMB6	2.0998 COMB6	-1.3365 COMB7	0.13001 COMB1	-0.32346 COMB7	6.91343 COMB6	-10.0393 COMB5	14.74179 COM
1	-70.6901 COMB1	12.8439 COMB1	-0.2253 COMB2	-6.9E-16 COMB4	-78.0997 COMB1	0.22816 COMB5	-0.10053 COMB7	12.43133 COMB1	-85.6434 COMB1	8.66684 COM
1	-87.8037 COMB7	54.3437 COMB6	-45.0468 COMB4	62.5279 COMB5	-126.508 COMB7	1.127 COMB6	-1.35393 COMB1	89.02132 COMB7	-78.5719 COMB5	48.81719 COM
6	-5.1E-14 COMB4	14.3166 COMB1	1.6992 COMB6	9.99E-17 COMB4	-2E-16 COMB6	2.10936 COMB1	-1.64395 COMB5	1.61E-15 COMB5	-1.6E-15 COMB7	17.10032 COM
6	-56.8261 COMB1	49.4604 COMB1	-54.6992 COMB1	0.1586 COMB6	-0.171 COMB4	2.0247 COMB5	-0.513 COMB4	1.33098 COMB4	-0.99694 COMB6	38.50452 COM
6	-93.4796 COMB7	22.0163 COMB7	-20.2954 COMB7	0.1586 COMB6	-0.64 COMB7	3.49334 COMB7	-0.3387 COMB5	3.2151 COMB7	-0.99694 COMB6	13.36925 COM
1	-182.885 COMB1	5.6434 COMB7	-2.5552 COMB4	1.7005 COMB5	-7.3341 COMB7	0.49334 COMB7	-0.37431 COMB1	17.74515 COMB7	-24.0565 COMB1	8.25701 COM
3	-3.9E-16 COMB2	3.2907 COMB4	-1.2883 COMB6	9.99E-17 COMB4	-4E-16 COMB6	-0.12425 COMB6	-0.08745 COMB2	1.57E-15 COMB7	-3.1E-16 COMB5	2.42689 COM
2	-2.8E-17 COMB3	28.1205 COMB1	3.2481 COMB6	4E-16 COMB4	-1E-16 COMB6	1.45141 COMB5	-0.12425 COMB6	1.82E-15 COMB6	-1.6E-15 COMB5	37.26437 COM
1	-1.9E-16 COMB3	12.0734 COMB7	1.3365 COMB3	5.29E-18 COMB3	-1.3E-17 COMB4	5.01034 COMB1	-1.05409 COMB7	1.37E-17 BMAT1	-5E-17 COMB5	16.95439 COM
7	-1E-13 COMB5	15.3457 COMB4	-3.8613 COMB6	1.4E-15 COMB5	-1.6E-15 COMB4	2.80422 COMB7	1.94306 COMB5	3.3E-15 COMB7	-3.3E-15 COMB5	31.99578 COM
7	-5E-14 COMB5	27.3935 COMB1	4.2132 COMB5	1.6E-15 COMB5	-4E-16 COMB6	2.80422 COMB7	-0.34068 COMB4	8.12E-15 COMB4	-3.1E-15 COMB7	40.79729 COM
7	0 BMAT1	11.9289 COMB7	-4.5127 COMB1	9.12E-16 COMB7	-7.9E-16 COMB5	-0.0741 COMB7	-0.11893 COMB1	2.41E-15 COMB4	-4.4E-15 COMB5	8.82496 COM
2	-3.3E-17 COMB1	0.7981 COMB7	-0.1414 COMB1	0 BMAT1	-7.9E-16 COMB5	-0.04195 COMB3	-0.1895 COMB1	4.77E-15 COMB7	6.71E-17 COMB2	7.21193 COM
5	-65.3644 COMB1	50.9846 COMB1	-56.7591 COMB1	0.0182 COMB4	-0.0289 COMB6	0.05161 COMB6	-1.11399 COMB5	0.12829 COMB4	-0.1603 COMB6	38.97538 COM
6	-93.6248 COMB7	20.8469 COMB6	-27.2569 COMB1	4.19E-18 COMB1	-0.0289 COMB6	0.33566 COMB4	-0.42168 COMB6	0.09777 COMB6	-0.1603 COMB6	40.49811 COM
7	-246.949 COMB1	2.6255 COMB6	-9.6205 COMB7	6.4968 COMB1	-1.9026 COMB1	0.04443 COMB7	-0.42168 COMB6	21.95957 COMB1	-19.2676 COMB1	15.84419 COM
1	-135.18 COMB2	3.1491 COMB1	-0.5763 COMB4	3.5297 COMB5	-5.3475 COMB7	0.0177 COMB4	-0.02321 COMB6	6.18919 COMB5	-21.4936 COMB7	2.3053 COM
4	-5.2E-14 COMB3	4.831 COMB1	-0.3966 COMB5	-1E-18 COMB2	-3.1E-18 COMB1	0.14987 COMB4	-0.15596 COMB6	1.26E-17 COMB3	-3E-16 COMB7	0.64877 COM
7	-8E-16 COMB4	25.5339 COMB1	1.2175 COMB5	-3.1E-18 COMB3	-2.7E-17 COMB1	0.05232 COMB7	-0.15596 COMB6	2.12E-16 COMB4	-5.3E-17 COMB1	38.9266 COM
7	-2.6E-14 COMB5	19.1225 COMB2	0.9063 COMB7	7.47E-16 COMB4	-4.1E-16 COMB6	0.23114 COMB6	-0.28129 COMB4	3.22E-15 COMB4	-3.2E-15 COMB4	17.95324 COM
5	-62.1785 COMB1	54.3281 COMB1	-57.0316 COMB1	0.5835 COMB6	-0.5766 COMB4	2.2674 COMB4	-2.2421 COMB6	3.75152 COMB6	-3.73695 COMB4	44.23369 COM
5	-124.914 COMB7	12.9553 COMB7	-14.7001 COMB1	0.5835 COMB6	-0.273 COMB7	1.20399 COMB7	-3.42114 COMB1	1.14204 COMB6	-1.88289 COMB7	36.61533 COM
1	-2.6E-14 COMB7	1.7652 COMB1	-6.2403 COMB7	3.97E-16 COMB4	-4E-16 COMB6	0.14987 COMB4	-1.69214 COMB7	1.61E-15 COMB4	-1.6E-15 COMB5	7.40301 COM
3	-2.1E-15 COMB1	2.4026 COMB7	-30.1099 COMB1	3.97E-16 COMB4	-3.5E-19 COMB1	0.05937 COMB1	-0.15596 COMB6	3.94E-16 COMB7	-1.6E-15 COMB6	39.80213 COM
1	-1E-13 COMB6	-2.3523 COMB5	-56.0196 COMB1	1.3651 COMB1	-3.6184 COMB5	8.51484 COMB4	-5.08994 COMB5	3.068 COMB1	-6.69277 COMB5	17.0351 COM
7	-373.068 COMB1	-2.215 COMB2	-24.4836 COMB5	4.9249 COMB7	-3.6184 COMB5	5.08772 COMB7	-8.51705 COMB6	9.88905 COMB7	-12.134 COMB7	29.38141 COM
7	-237.407 COMB1	125.5529 COMB4	-127.413 COMB4	104.8722 COMB5	-104.317 COMB5	0.14902 COMB5	-0.19005 COMB7	323.127 COMB7	-404.074 COMB5	336.4838 COM
3	-61.7112 COMB6	125.6527 COMB2	-26.4031 COMB7	14.469 COMB6	-95.0827 COMB7	0.09872 COMB6	-0.31212 COMB1	394.35 COMB7	-22.3493 COMB6	49.68551 COM
4	-1E-13 COMB6	-6.0227 COMB7	-26.8538 COMB1	3.75E-16 COMB7	-4.2E-16 COMB5	0.37388 COMB4	-2.62286 COMB6	2.07E-15 COMB7	-1.9E-15 COMB5	4.77997 COM
1	-27.5433 COMB1	0.4836 COMB7	-93.8122 COMB1	13.2277 COMB4	-5.9595 COMB5	6.76898 COMB6	-11.736 COMB4	28.4117 COMB4	-30.7445 COMB4	7.7743 COM
1	-12.5336 COMB7	1.7377 COMB7	-21.9758 COMB6	5.6349 COMB7	-13.5524 COMB5	11.66453 COMB6	-6.58513 COMB7	31.31517 COMB6	-29.2928 COMB6	8.74504 COM
1	-19.1346 COMB3	19.5505 COMB6	-18.3024 COMB4	1.26E-17 COMB4	-13.7134 COMB3	3.17787 COMB1	-2.14389 COMB6	41.14007 COMB3	-1E-12 COMB7	54.90713 COM
4	-5.1E-14 COMB6	-1.97 COMB4	-14.2927 COMB1	7.99E-16 COMB5	-8E-16 COMB4	3.17787 COMB1	-2.46049 COMB1	1.82E-15 COMB4	-1.6E-15 COMB6	18.58474 COM
1	-1.7299 BMAT1	2.3618 COMB1	-12.2845 COMB1	5.97E-16 COMB4	-11.5551 COMB1	0.25215 COMB7	-2.46049 COMB1	34.66542 COMB1	-1.6E-14 COMB1	16.9931 COM
1	-19.1346 COMB3	19.5631 COMB6	-17.4189 COMB4	2.78E-17 BMAT1	-13.6292 COMB3	2.09999 COMB4	-2.1835 COMB1	40.88757 COMB3	-4.3E-12 COMB5	52.25674 COM
1	-3.4E-16 COMB1	14.1744 COMB1	-5.2644 COMB7	8.24E-16 COMB5	-7.7E-16 COMB7	0.37514 COMB5	-0.87395 COMB7	1.62E-15 COMB4	-1.6E-15 COMB7	21.39883 COM
4	-1E-13 COMB6	5.696 COMB7	-2.2646 BMAT1	4.03E-16 COMB5	-4E-16 COMB7	0.15684 COMB4	-0.12175 COMB6	1.59E-15 COMB4	-1.6E-15 COMB5	8.30421 COM
2	-1.6E-15 BMAT1	1.2522 COMB4	-12.2509 BMAT1	4E-16 COMB4	-4E-16 COMB6	0.0078 COMB6	-0.04233 BMAT1	1.59E-15 COMB4	-1.6E-15 COMB7	2.84643 COM
1	-3.1E-15 COMB1	-4.1103 COMB5	-27.7951 COMB1	7.75E-16 COMB5	-8.2E-16 COMB7	1.26772 COMB7	-2.4751 BMAT1	3.3E-15 COMB7	-3.1E-15 COMB5	36.54041 COM
5	-4.8E-14 COMB7	8.9654 COMB4	-15.1818 COMB5	1.6E-15 COMB7	-1.6E-15 COMB5	-2.06904 COMB5	-5.05564 COMB1	3.2E-15 COMB6	-3.2E-15 COMB4	32.38698 COM
5	0 BMAT1	8.4749 COMB1	-0.1351 COMB3	1.6E-15 COMB7	0 BMAT1	3.74834 COMB1	-2.39469 COMB7	1.87E-18 COMB3	-3.1E-15 COMB7	4.95552 COM
1	-1E-13 COMB6	9.1697 COMB1	-0.7554 COMB7	7.99E-16 COMB6	-8E-16 COMB4	2.15308 COMB1	0.93109 COMB3	4.79E-15 COMB5	-4.8E-15 COMB7	7.33214 COM
4	-1E-13 COMB6	4.5137 COMB6	-8.0145 BMAT1	1.55E-15 COMB5	-1.6E-15 COMB7	1.07669 COMB5	-0.01113 BMAT1	6.43E-15 COMB4	-6.3E-15 COMB5	9.00087 BMA
1	-1.7299 BMAT1	3.5247 COMB1	-14.0038 COMB1	7.99E-16 COMB6	-11.3678 COMB1	0.14151 COMB6	-0.2051 COMB1	23.04017 BMAT1	-9.6E-15 COMB1	21.19315 COM
1	-19.1346 COMB3	19.8355 COMB6	-16.5475 COMB4	0.2015 COMB5	-13.3341 COMB3	2.19257 COMB4	-2.40216 COMB6	40.00241 COMB3	-0.60442 COMB5	49.64239 COM
1	-2.6E-14 COMB5	5.9199 COMB5	-2.4716 COMB1	2E-16 COMB4	-0.2884 COMB1	0.15778 COMB1	-0.11005 COMB6	1.21952 COMB1	-1.01955 COMB1	8.35752 COM

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 max
-34.3113 COMB5	14.9731 COMB1	-3.2633 COMB6	0.9725 COMB5	-1.1694 COMB7	3.19763 COMB1	-3.19858 COMB4	4.44471 COMB7	-4.63424 COMB7	17.44471 COMB
-19.3751 COMB3	35.3554 COMB5	-23.2809 COMB1	10.8536 COMB5	-15.9023 COMB3	1.92208 COMB4	-3.53221 COMB5	30.78738 COMB2	-4.7E-12 COMB5	58.57218 COMB
0 BMATI	38.3554 COMB5	-31.7759 COMB7	10.9586 COMB5	-23.236 COMB7	2.31401 COMB7	-2.53221 COMB5	58.08758 COMB7	-17.1465 COMB5	79.43977 COMB
-70.9313 COMB1	12.7044 COMB1	-44.8793 COMB4	2E-16 COMB7	-77.6748 COMB1	0.1785 COMB4	-3.13351 COMB6	12.36058 COMB1	-65.3143 COMB1	28.92305 COMB
-59.8528 COMB7	58.3127 COMB6	-44.8793 COMB4	82.5384 COMB5	-126.175 COMB7	0.027 COMB6	-0.60391 COMB5	88.93445 COMB7	-79.5399 COMB6	79.23775 COMB
-4.1E-13 COMB6	15.1485 COMB7	-23.489 COMB6	3.22E-15 COMB7	-4.2E-15 COMB5	0.52349 COMB7	-0.60391 COMB5	2.91E-14 COMB6	-2.8E-14 COMB7	85.04088 COMB
-3.1E-14 COMB4	10.0843 COMB1	0.3625 COMB6	6.15E-18 COMB1	6.15E-18 COMB1	0.22701 COMB5	-1.00905 COMB6	4.25E-14 COMB6	-1.9E-15 COMB4	5.19749 COMB
-5.1E-14 COMB4	10.7654 COMB1	-1.769 COMB5	1.52E-15 COMB4	-1.6E-15 COMB6	0.1612 COMB6	-0.30467 COMB4	3.6E-15 COMB6	-4.9E-16 COMB4	3.35169 COMB
-1.6E-15 COMB2	6.2262 COMB1	-2.2929 COMB1	3.19E-15 COMB4	-3.2E-15 COMB6	2.93129 COMB4	-0.43351 COMB6	4.82E-15 COMB6	-6.5E-15 COMB4	-1.4917 COMB
6.6E-16 COMB5	5.4906 COMB1	-2.3114 COMB3	0.7789 COMB1	-3.2E-15 COMB6	4.01692 COMB1	-0.43351 COMB6	3.15218 COMB1	-2.2871E COMB1	7.13963 COMB
-57.393 COMB1	49.4447 COMB1	-44.713 COMB1	1.7405 COMB4	-3.0131 COMB1	3.14944 COMB6	-1.58011 COMB4	12.75126 COMB6	-9.44731 COMB4	38.17931 COMB
-95.1879 COMB7	21.9997 COMB7	-24.0835 COMB5	0.1669 COMB6	-0.1656 COMB6	0.53125 COMB6	-1.14889 COMB1	1.01852 COMB4	-1.02254 COMB6	18.60636 COMB
-4.1E-16 COMB3	14.3231 COMB1	1.882 COMB6	7.99E-16 COMB6	-8.1E-16 COMB7	2.48736 COMB1	-1.7182 COMB5	3.04E-15 COMB5	-3E-15 COMB7	16.9938 COMB
-184.694 COMB1	8.4486 COMB5	-2.6081 COMB4	1.7238 COMB5	-16.0145 COMB1	3.09522 COMB5	-0.22886 COMB7	11.13461 BMATI	-24.3771 COMB1	8.08737 COMB
-19.8186 COMB3	35.7672 COMB5	-38.7892 COMB7	33.0744 COMB5	-47.124 COMB7	1.92904 COMB7	-1.70132 COMB5	94.24804 COMB7	-66.1488 COMB5	77.57809 COMB
0 BMATI	27.734 COMB1	-2.9436 COMB5	7.74E-15 COMB5	-4.2E-16 COMB7	0.42194 COMB7	-0.37962 COMB5	1.58E-15 COMB7	-1.6E-15 COMB6	41.52398 COMB
-7.3799 BMATI	15.8083 COMB7	-25.5414 BMATI	0.2021 COMB3	-4E-16 COMB7	0.34934 COMB6	-0.35264 COMB4	0.88745 BMATI	-1.6E-15 COMB5	16.64535 COMB
-61.7332 COMB7	50.3798 COMB1	-56.7729 COMB1	0.2215 COMB1	-2.0214 COMB6	0.37548 COMB6	-0.37121 COMB4	0.1319 COMB4	-0.13839 COMB6	19.44623 COMB
-95.7332 COMB7	20.4643 COMB7	-1.2827 COMB6	0.2045 COMB7	-8.1E-16 COMB5	0.0078 COMB6	-0.01358 COMB7	3.18E-15 COMB5	-0.01722 COMB7	2.78047 COMB
-1.2E-17 COMB2	27.7225 COMB1	1.963 COMB7	7.87E-16 COMB7	2.52E-17 COMB2	1.27226 COMB5	-1.17173 COMB7	1.62E-15 COMB4	-3.1E-15 COMB7	36.44571 COMB
-1E-13 COMB6	15.0741 COMB4	-9.9125 COMB6	8.88E-17 COMB1	2.52E-17 COMB2	5.09996 COMB1	-1.17173 COMB7	1.87E-15 COMB6	-3E-16 COMB4	30.62632 COMB
-5.1E-14 COMB4	10.4614 COMB7	-27.5481 COMB1	5E-17 COMB4	-4.2E-18 COMB1	2.21027 COMB7	0.00692 COMB3	5.06E-17 COMB6	-9.7E-17 COMB5	41.18507 COMB
-5.1E-14 COMB6	0.2084 BMATI	-11.9305 COMB5	9.68E-17 COMB3	-1E-16 COMB7	0.37913 COMB4	-3.46877 COMB1	8.06E-16 COMB6	-8.1E-15 COMB6	16.13938 COMB
-2.9E-16 COMB3	0.8795 COMB7	-9.112 COMB1	8.24E-16 COMB7	-7.7E-16 COMB5	-0.9495 COMB3	-2.09926 COMB1	3.17E-15 COMB5	-3.2E-15 COMB7	7.32439 COMB
-2.9E-16 COMB3	0.0962 COMB6	-4.595 COMB4	4.49E-16 COMB4	-3.5E-16 COMB6	-0.7438 COMB6	-1.03669 COMB4	1.4E-15 COMB6	-1.8E-15 COMB4	4.24731 COMB
-250.467 COMB1	3.4965 COMB6	-3.3572 COMB4	6.5125 COMB1	-1.9399 COMB1	0.0177 COMB4	-0.90028 COMB7	22.36759 COMB1	-19.1543 COMB1	9.18984 COMB
-101.847 COMB7	4.8747 COMB1	-0.6863 COMB4	3.4604 COMB5	-5.2656 COMB7	0.0177 COMB4	-0.02321 COMB6	5.95182 COMB5	-21.2697 COMB7	3.40877 COMB
0 BMATI	3.4204 COMB2	-0.9662 COMB5	4E-16 COMB4	-4E-16 COMB6	0.13913 COMB4	-0.13385 COMB6	7.93E-16 COMB4	-8.1E-16 COMB4	1.49647 COMB
0 BMATI	25.151 COMB1	2.3385 COMB7	5.33E-18 COMB1	-1E-16 COMB4	0.06698 COMB7	-0.01284 COMB1	1.93E-16 COMB5	-1.1E-16 COMB3	38.06116 COMB
0 BMATI	13.2404 COMB5	-6.3731 BMATI	-2E-19 COMB3	-6.9E-19 BMATI	0.20372 COMB6	-1.44705 BMATI	1.82E-18 COMB3	-1.4E-17 BMATI	17.58879 COMB
-4.5E-19 COMB3	-1.302 COMB4	-14.951 COMB1	-2E-18 COMB2	-8.1E-16 COMB5	-0.92141 COMB5	-3.39693 COMB1	3.47E-16 COMB4	-4.1E-16 COMB6	17.99981 COMB
-133.762 COMB7	54.4081 COMB1	-56.3515 COMB1	0.4998 COMB6	-0.6914 COMB4	2.02362 COMB4	-1.9951 COMB6	3.25074 COMB6	-3.23153 COMB4	44.2797 COMB
-1.3E-14 COMB5	2.4035 COMB7	-3.242 COMB5	4.29E-18 COMB1	3.15E-18 COMB3	0.13913 COMB4	-0.13385 COMB6	1.6E-15 COMB6	-1.6E-15 COMB5	7.02289 COMB
0 BMATI	2.4035 COMB7	-29.5264 COMB1	4.25E-16 COMB4	3.02E-18 COMB4	0.06698 COMB7	-0.31217 COMB4	8.25E-16 COMB5	-2.1E-16 COMB5	38.78378 COMB
0 BMATI	-2.2332 COMB5	-56.2197 COMB1	4.9027 COMB7	-3.3198 COMB5	10.4227 COMB4	-10.1642 COMB6	12.48276 COMB6	-8.64651 COMB4	16.61051 COMB
-5.1E-14 COMB6	-0.0772 COMB4	-22.9434 COMB7	4.9027 COMB7	0 BMATI	7.20259 COMB7	-0.22567 COMB5	8.57527 COMB7	-13.3502 COMB7	8.69824 COMB
-401.432 COMB1	8.3138 COMB6	-8.4814 COMB4	1.9726 COMB5	-1.5995 COMB7	0.13423 COMB7	-0.04375 COMB7	11.22412 COMB7	-11.4013 COMB5	30.67599 COMB
-267.549 COMB1	63.0694 COMB4	-63.2059 COMB6	99.6641 COMB7	-102.071 COMB5	0.14902 COMB5	-0.19005 COMB7	317.3323 COMB7	-320.709 COMB5	215.5635 COMB
-147.573 COMB1	80.958 COMB6	-83.3234 COMB4	96.6659 COMB5	-87.3721 COMB7	0.24764 COMB5	-0.35068 COMB4	386.1668 COMB7	-396.321 COMB5	301.1423 COMB
-18.9179 COMB6	13.7197 COMB7	-30.3954 COMB6	10.9225 COMB5	-7.1846 COMB7	0.39021 COMB4	-0.44113 COMB6	27.56245 COMB6	-35.9223 COMB7	68.89858 COMB
-5.1E-14 COMB4	-5.8691 COMB7	-26.7259 COMB1	1.83E-16 COMB1	-7E-16 COMB5	6.21428 COMB6	-6.32899 COMB4	1.65E-15 COMB5	-1.6E-15 COMB5	4.63031 COMB
-38.47 COMB2	-0.5052 COMB1	-52.231 COMB1	9.7986 COMB4	-10.0966 COMB6	6.21428 COMB6	-4.73314 COMB4	23.09946 COMB6	-22.571 COMB4	37.52381 COMB
-5.1E-14 COMB4	-1.8937 COMB4	-19.0322 COMB1	1.62E-15 COMB5	-1.6E-15 COMB7	3.15 COMB1	-1.03307 BMATI	4.47E-15 COMB7	-4.5E-15 COMB5	18.60108 COMB
-5E-14 COMB4	-1.2021 BMATI	-14.2613 COMB1	8.24E-16 COMB5	-7.7E-16 COMB7	0.22006 COMB7	-2.45632 COMB1	2.96E-15 COMB5	-3.1E-15 COMB5	16.99196 COMB
-5.1E-14 COMB4	1.461 BMATI	-13.1119 COMB1	8.37E-16 COMB7	-7.6E-16 COMB5	0.39026 COMB5	-0.83622 COMB7	1.67E-15 COMB5	-1.6E-15 COMB5	9.10191 BMATI
-5.2E-14 COMB5	14.1782 COMB1	-2.2056 BMATI	4E-16 COMB4	-4E-16 COMB6	0.12653 COMB4	-0.15881 COMB6	1.6E-15 COMB6	-1.4E-15 COMB4	21.19877 COMB
0 BMATI	0.7718 COMB4	-2.6638 COMB1	4E-16 COMB1	-5.2E-19 COMB3	0.00784 COMB1	-0.00489 COMB4	2E-16 COMB7	-9.8E-16 COMB4	2.94547 COMB
-5.1E-14 COMB4	1.284 COMB4	-27.5637 COMB1	4E-16 COMB4	-4E-16 COMB6	0.19769 COMB1	-0.04514 BMATI	1.6E-15 COMB6	-1.6E-15 COMB4	36.4001 COMB
-1E-13 COMB6	5.322 COMB4	-12.5249 COMB7	2.5E-17 COMB2	-6.3E-19 COMB1	1.19965 COMB7	-5.09002 COMB1	1.62E-15 COMB4	-1.7E-15 COMB7	31.107 COMB
-1E-13 COMB6	8.9373 COMB4	-14.8543 COMB6	1.6E-15 COMB6	-1.6E-15 COMB6	0.01099 COMB1	-2.31034 COMB4	6.29E-15 COMB5	-6.5E-15 COMB7	31.107 COMB
-5.3E-14 COMB5	1.8873 BMATI	-5.5427 COMB5	4.03E-16 COMB6	-4E-16 COMB4	1.56876 BMATI	-0.14787 COMB4	8.12E-16 COMB4	-8E-16 COMB5	8.57881 COMB
5.14E-16 COMB2	8.2321 COMB1	-0.9237 COMB7	7.99E-16 COMB6	-8E-16 COMB4	3.47167 COMB1	1.03167 BMATI	3.2E-15 COMB7	-3.2E-15 COMB4	4.99122 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
0 BMAT1	9.0917 COMB1	-0.7973 BMAT1	3.91E-14 COMB4	-4.5E-14 COMB4	0.12459 COMB1	0.00974 COMB3	3.29E-15 COMB7	-3.3E-15 COMB6	7.17771 COM
-7.1E-14 COMB1	12.901 COMB1	-1.7785 COMB7	2E-14 COMB3	-2E-14 COMB7	0.1045 COMB4	0.10383 COMB6	7.78E-14 COMB7	-8.2E-14 COMB3	19.44474 COM
-1.9E-14 COMB1	14.742 COMB1	1.8747 COMB6	1.39E-17 BMAT1	-2E-14 COMB7	3.4236 COMB1	0.28149 COMB7	1.41E-15 COMB5	-1.6E-15 COMB5	17.86282 COM
-70.9387 COMB1	56.2666 COMB6	-43.7777 COMB4	61.537 COMB4	-125.832 COMB7	1.70587 COMB7	0.10085 COMB2	88.94506 COMB7	-78.5061 COMB5	47.98837 COM
-34.9644 COMB5	4.0441 COMB7	-16.9713 COMB1	0.7411 COMB3	-1.1748 COMB7	0.20389 COMB6	0.17453 COMB4	4.95931 COMB7	-4.2734 COMB7	15.53375 COM
-2E-13 COMB4	-0.1937 COMB5	-7.5168 COMB7	1.65E-17 COMB2	1.23E-17 COMB3	0.11139 COMB4	0.09705 COMB6	8.24E-14 COMB4	-8.2E-15 COMB4	11.42053 COM
-2E-13 COMB4	33.174 COMB1	-7.0168 COMB7	1.94E-14 COMB4	-2.2E-14 COMB4	0.23354 COMB5	-0.01413 COMB6	4.12E-14 COMB6	-1.6E-15 COMB7	4.74482 COM
-66.4444 COMB7	49.4635 COMB1	-54.6991 COMB1	0.1765 COMB4	-0.161 COMB4	0.50507 COMB6	-0.54461 COMB4	1.70254 COMB4	-1.7823E COMB6	38.5077 COM
-2E-13 COMB5	23.7216 COMB4	-23.1154 COMB4	1.94E-14 COMB4	-3E-14 COMB4	0.79541 COMB5	-0.14138 COMB1	2.36E-14 COMB1	-1.8E-15 COMB4	46.1703 COM
0 BMAT1	17.8725 COMB7	-22.0911 COMB6	1.76E-17 BMAT1	-3E-14 COMB6	0.23273 COMB6	-0.70474 COMB7	1.62E-15 COMB7	-2.6E-14 COMB7	77.18139 COM
-1E-13 COMB6	8.2274 COMB1	-2.2937 COMB1	1.49E-15 COMB5	-1.4E-14 COMB1	2.83399 COMB4	-1.74565 COMB5	7.49E-14 COMB7	-1.5E-15 COMB5	-1.45944 COM
-2E-13 COMB7	15.0366 COMB1	-11.2057 COMB6	1.49E-15 COMB3	-1.7E-13 COMB7	1.48741 COMB7	-3.17379 COMB1	3.11E-15 COMB7	-4.6E-15 COMB5	18.69009 COM
-3.2E-15 COMB1	14.3564 COMB1	1.867 COMB6	+3.9E+20 COMB4	+4.2E-14 COMB4	2.44334 COMB1	-1.72345 COMB5	4.72E-14 COMB4	+1.5E-15 COMB7	17.00063 COM
-5.3E-14 COMB4	6.4475 COMB1	-5.9945 COMB1	3.75E-14 COMB4	-3.4174 COMB1	3.29312 COMB5	-3.9452 COMB1	2.43905 COMB1	-2.5178? COMB1	7.45184 COM
-37.2012 COMB5	8.5121 COMB4	-9.3829 COMB6	3.1241 COMB4	-3.7127 COMB4	-1.42551 COMB5	-3.11041 COMB1	12.9307 COMB4	+9.46192 COMB4	24.18077 COM
-143.009 COMB1	11.9203 COMB1	+6.2591 COMB6	2.1241 COMB6	+7.4901 COMB7	0.01438 COMB5	-2.43074 COMB7	17.4395 COMB7	-24.2294 COMB1	40.77607 COM
0 BMAT1	27.3083 COMB1	-0.3394 COMB6	4.06E-14 COMB4	-3.9E-14 COMB5	0.67947 COMB1	+0.06295 COMB4	1.81E-15 COMB4	-1.4E-15 COMB6	30.57966 COM
-66.2712 COMB1	50.5874 COMB1	-56.7582 COMB1	2.2195 COMB1	+4E-14 COMB7	0.87625 COMB7	-0.37372 COMB5	0.36096 COMB1	+0.11393 COMB1	39.97555 COM
-47.0849 COMB7	50.9474 COMB1	-42.5693 COMB2	0.0312 COMB7	+0.0124 COMB6	0.41481 COMB4	-0.06106 COMB4	0.17441 COMB4	+0.11389 COMB1	40.47692 COM
-5.1E-14 COMB4	2.7991 COMB1	-11.8008 COMB5	3.94E-16 COMB7	+4.1E-16 COMB4	0.41681 COMB4	-0.2994 COMB6	1.62E-15 COMB7	+1.6E-15 COMB7	18.67917 COM
-5.1E-14 COMB7	9.9038 BMAT1	-1.1893 COMB6	4.12E-16 COMB7	-3.9E-16 COMB3	0.04998 BMAT1	-0.00623 COMB5	8.24E-16 COMB4	-8E-16 COMB7	16.25306 BMA
-1E-13 COMB6	27.9347 COMB1	1.601 BMAT1	1.78E-16 COMB4	-1.2E-16 COMB6	2.47885 BMAT1	-1.21209 COMB7	1.45E-15 COMB7	-1.4E-15 COMB5	36.56417 COM
-119.247 BMAT1	15.2329 COMB4	-8.7335 COMB6	2.5944 BMAT1	-1.9E-15 COMB5	5.06389 COMB1	-0.0015 BMAT1	6.81923 BMAT1	-6.1E-15 COMB7	31.52792 COM
-247.426 COMB1	2.3662 COMB2	-3.4092 COMB4	6.3693 COMB1	-1.917 COMB1	0.0177 COMB4	-0.21771 COMB7	21.50684 COMB1	+19.2161 COMB1	9.36378 COM
-101.49 COMB7	0.8716 COMB4	+8.8 COMB1	3.4698 COMB3	+5.3593 COMB7	0.01455 COMB5	-3.74694 COMB1	6.04243 COMB5	-21.3647 COMB7	4.90573 COM
-1E-13 COMB4	0.1251 COMB3	-4.3704 COMB5	3.47E-14 COMB4	-4.1E-14 COMB4	-1.50178 COMB3	-2.81285 COMB2	8.23E-14 COMB4	+8.3E-14 COMB4	3.67414 COM
-2E-13 COMB7	0.7372 COMB7	-9.191 COMB1	2.22E-16 COMB1	-1.2E-17 COMB4	-0.93623 COMB3	-2.14364 COMB1	4E-16 COMB6	+8.9E-16 COMB1	7.2805 COM
-2E-13 COMB7	-0.0549 COMB4	+6.4508 BMAT1	9.99E-17 COMB4	0 BMAT1	-0.79909 COMB7	-1.5142 BMAT1	2E-16 COMB5	-2E-16 COMB7	4.94047 COM
-7.1E-14 COMB1	-1.8812 COMB4	-13.8925 COMB1	0 BMAT1	-5.7E-16 COMB3	-0.94367 COMB5	-2.51214 COMB1	3.19E-15 COMB5	-1.7E-17 COMB3	16.19144 COM
-4E-14 COMB1	4.5347 COMB1	-4.5679 COMB6	0 BMAT1	-9.4E-16 COMB4	0.15487 COMB4	-1.77662 COMB7	3.13E-15 COMB5	-3.2E-15 COMB7	6.55205 COM
-1.3E-14 COMB5	25.5364 COMB1	-0.9961 COMB5	0 BMAT1	-8E-16 COMB4	0.09658 COMB7	-0.22454 COMB4	1.58E-15 COMB4	-1.4E-15 COMB6	38.96259 COM
-133.435 COMB7	54.3277 COMB1	-57.0319 COMB1	0.8801 COMB6	-0.87 COMB1	2.26129 COMB4	+2.22979 COMB6	3.72949 COMB4	-3.7044? COMB4	44.2431 COM
-133.435 COMB7	32.8521 COMB7	-12.8588 COMB1	1.97E-16 COMB6	-2.4211 COMB7	1.66091 COMB7	-2.23011 COMB5	1.01786 COMB7	-1.1E-15 COMB6	7.3724 COM
-1.3E-14 COMB4	1.7689 COMB1	-1.7832 COMB4	6.34E-19 BMAT1	-1.3E-17 COMB5	0.15487 COMB4	0.00863 COMB3	2.3E-17 COMB5	-2.1E-17 BMAT1	2.69529 COM
-7.9E-16 COMB4	2.4032 COMB7	-30.1144 COMB1	2.06E-16 COMB7	-3.9E-16 COMB4	0.15487 COMB4	-0.41105 COMB4	7.91E-16 COMB5	-1.4E-15 COMB4	39.85045 COM
-1E-13 COMB6	-2.4448 COMB5	-59.9602 COMB1	1.9658 COMB6	-3.9536 COMB5	8.50983 COMB4	-8.15926 COMB6	11.0791 COMB5	-6.60202 COMB5	17.01337 COM
-372.1 COMB1	7.8588 COMB6	+24.2473 COMB7	5.7661 COMB7	+1.0133 COMB7	7.30559 COMB7	-8.15926 COMB6	11.37089 COMB7	+14.7664 COMB7	30.20353 COM
-236.357 COMB1	72.6035 COMB4	-72.3305 COMB6	101.3133 COMB7	-104.113 COMB5	0.14902 COMB5	-0.19005 COMB7	323.7646 COMB7	+307.121 COMB5	245.8215 COM
-133.187 COMB1	123.6051 COMB6	+126.555 COMB4	109.333 COMB5	+99.5775 COMB7	0.25129 COMB1	-0.12258 COMB4	399.5559 COMB7	+409.244 COMB5	335.3293 COM
0 BMAT1	+6.052 COMB7	+26.4601 COMB1	7.99E-16 COMB6	+8E-16 COMB4	0.60911 COMB4	-0.42839 COMB6	2.35E-15 COMB7	-2.4E-15 COMB7	4.78424 COM
-1.9E-13 COMB5	-8.0467 COMB3	+13.6635 COMB2	3.3E-15 COMB4	-1.1E-15 COMB6	6.69314 COMB6	-6.82208 COMB4	6.09E-15 COMB6	+4.7E-15 COMB4	3.54613 COM
-1.2E-17 COMB2	-1.7733 COMB4	+14.599 COMB1	1.03E-16 COMB3	-3.8E-19 COMB3	2.95736 COMB1	-5.06521 COMB7	6.89E-19 COMB3	+1.9E-15 COMB7	17.83918 COM
-1.2E-17 COMB2	-1.8241 COMB4	-14.2452 COMB1	7.99E-16 COMB6	-8E-16 COMB4	0.66455 COMB7	-2.1131 COMB1	7.99E-16 COMB6	-3.1E-15 COMB5	17.0409 COM
-27.5307 COMB1	14.2387 COMB1	+30.746 COMB1	13.2558 COMB4	-13.6934 COMB6	11.48433 COMB6	-11.6363 COMB4	31.50786 COMB6	+30.726 COMB4	21.57403 COM
-5.1E-14 COMB6	14.2557 COMB1	-14.1127 COMB1	8.03E-16 COMB3	-8E-16 COMB7	0.19511 COMB4	-0.75649 COMB1	3.19E-15 COMB4	-3.2E-15 COMB6	16.19009 COM
-6.9E-14 COMB1	0.1154 COMB4	-14.0774 COMB1	8.25E-16 COMB7	-7.7E-16 COMB5	0.29129 COMB5	-0.85706 COMB7	1.6E-15 COMB6	-1.6E-15 COMB5	14.14843 COM
-1.4E-13 COMB1	0.2229 COMB7	-10.5582 COMB2	1.94E-16 COMB4	-2.1E-16 COMB4	0.42872 COMB1	-0.16603 COMB4	1.22E-15 COMB7	-1.3E-15 COMB5	20.92541 COM
0 BMAT1	1.3344 COMB4	-2.5104 COMB5	1.21E-15 COMB5	-1.9E-16 COMB4	0.42872 COMB1	0.14635 COMB4	1.62E-15 COMB4	+3.2E-15 COMB5	2.85258 COM
0 BMAT1	0.593 COMB4	+28.1587 COMB1	1.21E-15 COMB5	-1.2E-15 COMB7	0.16554 COMB6	-1.42424 COMB5	3.11E-15 COMB7	-3.2E-15 COMB5	37.18302 COM
-1.4E-14 COMB4	8.9138 COMB4	-13.0019 COMB7	8.24E-16 COMB5	-7.7E-16 COMB7	1.00269 COMB7	-5.01209 COMB1	1.51E-15 COMB5	-1.6E-15 COMB5	32.13732 COM
-71.9561 COMB1	42.6377 COMB4	-57.3014 COMB6	62.8259 COMB5	-125.208 COMB7	1.37786 BMAT1	-2.30237 COMB6	78.51906 COMB5	+88.7107 COMB7	47.6904 COM
-1.3E-14 COMB5	15.829 COMB1	+0.0754 BMAT1	1.98E-16 COMB4	-2.1E-16 COMB4	3.24117 COMB1	0.80119 COMB5	3.24E-15 COMB7	+3.2E-15 COMB4	16.33632 COM

	P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
1	0 BMATI	8.5823 COMB7	-2.1028 COMB3	3.24E-17 COMB1	-1.7E-16 COMB6	3.12949 COMB1	1.25834 COMB3	5.74E-16 COMB4	-9.3E-17 COMB1	8.99383 COM
1	-2E-16 COMB3	9.1449 COMB1	-2.7831 COMB7	8.01E-16 COMB4	-1.7E-16 COMB5	2.19707 COMB1	0.94003 COMB3	1.65E-15 COMB5	-1.6E-15 COMB5	7.29014 COM
1	-2.6E-14 COMB5	12.5831 COMB1	-1.6312 COMB1	1.6E-15 COMB5	-1.6E-15 COMB5	1.21918 COMB7	-0.64897 COMB1	6.36E-15 COMB5	-6.4E-15 COMB7	15.97399 COM
1	-1E-13 COMB6	5.3817 COMB5	-2.2215 COMB1	0.1615 COMB4	-0.3117 COMB1	0.13503 COMB3	-0.4858 COMB1	1.07699 COMB1	-1.3437 COMB1	8.13892 COM
7	+30.984 COMB5	19.7152 COMB1	-3.0321 COMB5	0.4532 COMB5	-1.1439 COMB7	0.5167 COMB1	-0.07888 COMB7	3.40002 COMB7	-6.091 COMB7	7.14334 COM
5	-59.9633 COMB1	49.1071 COMB1	-54.8524 COMB1	0.0258 COMB5	-0.2541 COMB4	0.43099 COMB1	-0.3858 COMB4	1.16771 COMB4	-3.47641 COMB1	34.23264 COM
5	-89.3126 COMB7	21.9237 COMB7	-22.0856 COMB6	0.083 COMB6	-0.1569 COMB7	0.42352 COMB1	0.07637 COMB7	0.65778 COMB7	-1.77476 COMB6	15.44877 COM
7	-1.1E-13 COMB5	3.1854 COMB1	-7.6838 COMB7	4.12E-16 COMB4	-3.9E-16 COMB4	0.47205 COMB7	-3.07183 COMB3	2.35E-15 COMB7	-2.4E-16 COMB6	8.86737 COM
5	-3E-13 COMB7	13.8054 COMB4	-23.0746 COMB6	3.19E-15 COMB7	-1.2E-15 COMB5	0.59165 COMB7	-3.33119 COMB1	2.53E-14 COMB5	-2.6E-14 COMB7	83.5579 COM
4	-5.1E-14 COMB6	14.4097 COMB1	2.1053 COMB6	2.06E-16 COMB4	-1.9E-16 COMB6	3.82596 COMB1	-2.9484 COMB2	7.51E-16 COMB6	-7.7E-16 COMB6	16.43193 COM
6	-197.103 COMB1	10.81 COMB2	1.9841 COMB6	8.24E-16 COMB7	-7.1647 COMB1	2.86519 COMB2	-0.00245 COMB1	11.44092 COMB1	-10.3926 COMB1	17.39325 COM
1	-84.4738 COMB5	10.919 COMB1	-1.2454 COMB4	1.6616 COMB5	+7.3174 COMB7	0.5605 COMB1	-0.01771 COMB7	17.03007 COMB7	-13.3567 COMB7	15.30466 COM
4	+1E-13 COMB6	6.2426 COMB1	-2.2783 COMB1	4E-16 COMB4	-4E-16 COMB6	0.40916 COMB6	-0.01301 COMB1	1.95E-15 COMB7	-2E-15 COMB5	-1.70159 BMA
3	-1.7E-14 COMB1	6.2428 COMB1	-1.7101 COMB2	1.6E-15 COMB4	-1.4E-15 COMB4	2.81796 COMB4	-2.44478 COMB4	3.2E-15 COMB7	-3.3E-15 COMB5	-1.40247 COM
3	-1.3E-14 COMB5	20.3319 COMB1	-0.4306 COMB7	1.6E-15 COMB6	5.3E-16 COMB3	1.40117 COMB7	-0.91479 COMB6	1.5E-15 COMB7	-1.2E-15 COMB6	44.08053 COM
4	-45.9206 COMB5	11.3043 COMB7	-6.3567 COMB6	2.8341 COMB6	-2.0179 COMB4	4.02373 COMB1	-0.37642 COMB7	12.90272 COMB4	-9.64663 COMB4	21.25785 COM
7	-9.1577 COMB6	12.2486 COMB1	-6.8367 COMB6	2.4341 COMB6	-1.671 COMB7	2.13563 COMB6	-0.43716 COMB5	12.90272 COMB6	-9.64341 COMB6	26.36497 COM
5	-88.2872 COMB7	51.9123 COMB1	-88.4313 COMB1	4E-16 COMB6	-0.1774 COMB1	2.81733 COMB7	-0.43716 COMB3	0.96039 COMB1	-0.6263 COMB1	41.9255 COM
1	+3E-17 COMB3	-6.2187 COMB3	-29.7796 COMB1	6.94E-18 BMATI	-2E-16 COMB5	0.22027 COMB4	-0.2609 COMB5	-2.3E-18 COMB3	-4.1E-16 COMB5	42.59427 COM
4	-5.3E-16 COMB2	3.383 COMB3	-11.4347 COMB6	4.11E-16 COMB5	-9E-16 COMB5	0.42872 COMB1	-0.51953 COMB6	4.05E-16 COMB5	-1.2E-15 COMB7	17.02338 COM
4	-2.9E-15 COMB1	27.391 COMB1	-1.1033 COMB6	4.12E-16 COMB5	-1.2E-15 COMB4	1.15799 COMB5	-0.74032 COMB1	2.99E-15 COMB4	-8.8E-16 COMB4	36.922 COM
1	+1E-13 COMB6	15.0162 COMB4	1.4668 COMB3	1.17E-15 COMB6	-2.5E-17 COMB2	5.16312 COMB1	-1.46771 COMB7	7.5E-16 COMB6	-3.3E-15 COMB6	16.75159 COM
5	-8.1E-14 COMB7	15.0162 COMB1	+26.1539 COMB1	4.84E-17 COMB5	2.79E-17 BMATI	2.40633 COMB6	-5.33004 COMB1	8.96E-16 COMB6	-8.9E-16 COMB4	30.24094 COM
7	-3E-14 COMB4	-5.5289 COMB4	-22.2718 COMB1	2.25E-16 COMB6	-1.8E-16 COMB4	+2.12595 COMB6	-5.33004 COMB1	4E-16 COMB5	-1.7E-15 COMB5	41.21302 COM
5	-263.371 COMB1	0.6167 COMB1	-13.5623 COMB4	3.8133 COMB1	2.49E-17 COMB5	0.00971 COMB4	-2.17321 COMB7	12.98976 COMB1	-6.07694 COMB1	22.46608 COM
3	-176.555 COMB1	3.3921 COMB6	-2.6691 COMB4	5.2113 COMB5	-2.332 COMB7	0.0177 COMB4	-0.01771 COMB7	12.40566 COMB5	-13.8509 COMB5	8.16483 COM
1	-100.504 COMB7	16.6221 COMB1	1.1794 COMB4	5.3484 COMB5	-3.8001 COMB7	3.28845 COMB1	-0.02321 COMB5	13.1652 COMB5	-15.2891 COMB7	18.29677 COM
2	-9.1E-14 COMB4	12.4552 COMB2	1.5321 COMB5	4.03E-16 COMB5	-4E-16 COMB7	2.47127 COMB2	1.04214 COMB4	1.59E-15 COMB4	-1.6E-15 COMB5	7.96979 COM
6	-2.6E-14 COMB5	12.9244 COMB1	1.569 COMB4	4.03E-16 COMB5	-1.9E-16 COMB5	1.50622 COMB6	-4.03392 COMB1	7.51E-16 COMB6	-1.6E-15 COMB5	17.24924 COM
4	-5.3E-14 COMB6	5.6826 COMB6	-8.0873 COMB1	9E-16 COMB5	-1.1E-17 COMB1	+1.24421 COMB6	-4.63853 COMB1	7.5E-16 COMB5	-5.2E-15 COMB7	5.90164 COM
4	-1.6E-15 COMB2	0.8036 COMB7	-9.1203 COMB1	1.5E-15 COMB5	-9E-16 COMB7	+0.63995 COMB6	-2.39665 COMB5	3.14E-15 COMB7	-6.1E-15 COMB5	7.29315 COM
5	-142.159 COMB7	88.3685 COMB1	-55.7911 COMB1	0.4389 COMB6	-0.5321 COMB4	1.91284 COMB4	-1.98291 COMB6	3.23994 COMB6	-3.3565 COMB4	42.71491 COM
1	-8.3E-14 COMB2	-1.1462 COMB4	-13.0958 COMB1	8.12E-16 COMB7	-7.9E-16 COMB5	1.35142 COMB1	-3.42561 COMB1	4.54E-15 COMB5	-4.6E-15 COMB7	15.40593 COM
3	-5.1E-14 COMB6	-1.7927 COMB3	-13.0958 COMB1	4.06E-16 COMB7	5.34E-18 COMB3	+0.80394 COMB4	-3.42561 COMB1	8E-16 COMB4	-8.2E-16 COMB4	17.87722 COM
4	-5.1E-14 COMB6	0.09 COMB7	-16.1497 COMB1	4E-16 COMB4	-3.9E-16 COMB6	3.36813 COMB1	-1.48257 COMB6	9E-16 COMB7	-9E-16 COMB4	17.67194 COM
1	-196.702 BMATI	0.9289 BMATI	-55.9394 COMB1	6.3152 COMB7	+4.1429 COMB5	9.54911 COMB4	-10.2464 COMB6	13.40695 COMB5	-16.0249 COMB7	9.50132 COM
7	-400.489 COMB1	9.1933 COMB6	-7.5259 COMB4	4.8053 COMB1	-0.9445 BMATI	0.037 COMB5	-0.04375 COMB7	16.43314 COMB1	-14.7677 COMB5	29.25386 COM
3	-361.47 COMB1	82.3093 COMB4	-7.7467 COMB4	18.3176 COMB5	-105.558 COMB5	0.14902 COMB5	-0.05732 COMB6	57.91948 COMB5	-329.048 COMB5	216.1905 COM
2	-189.027 COMB5	79.4332 COMB6	-80.4771 COMB4	100.0697 COMB5	-105.559 COMB5	0.14902 COMB5	-0.19005 COMB7	384.046 COMB7	-397.977 COMB5	296.5218 COM
3	-18.9178 COMB4	30.5641 COMB4	-29.9338 COMB6	13.1257 COMB5	-8.2761 COMB7	0.33355 COMB6	-0.35068 COMB4	65.62861 COMB5	-41.3814 COMB7	152.8203 COM
1	0 BMATI	-6.2041 COMB4	-18.9865 COMB1	2E-16 COMB4	-2E-16 COMB6	10.3456 COMB1	-0.75389 COMB7	7.51E-16 COMB6	-7.9E-16 COMB4	33.48498 COM
2	2.5E-17 COMB2	-3.9829 COMB7	-28.4437 COMB1	8.25E-16 COMB7	+7.7E-16 COMB5	4.98515 COMB7	0.54876 COMB3	1.6E-15 COMB6	-1.6E-15 COMB4	19.23918 COM
4	-9.9E-14 COMB7	-7.6557 COMB4	-12.9604 BMATI	3.2E-15 COMB4	+3.2E-15 COMB6	1.75421 COMB7	-0.67376 COMB5	7.99E-15 COMB4	-8E-15 COMB6	2.84711 COM
1	-1.4E-15 COMB3	-4.2116 BMATI	-26.7414 COMB1	1.7E-15 COMB5	-1.6E-15 COMB7	7.31177 COMB5	-7.36078 COMB7	4.7E-15 COMB7	-4.9E-15 COMB5	5.0893 BMA
4	-5.1E-14 COMB6	5.5797 COMB1	-8.6663 COMB1	2.03E-16 COMB7	-2E-16 COMB5	0.08948 COMB4	+0.1611 COMB6	7.93E-16 COMB5	-8.1E-16 COMB5	23.02498 COM
1	-38.5144 COMB2	1.7149 COMB7	-52.5379 COMB1	9.9322 COMB4	-10.3825 COMB6	4.58074 COMB6	-5.01285 COMB4	23.64458 COMB6	-23.0156 COMB4	37.65823 COM
2	-2.1E-15 COMB1	0.6893 COMB6	-18.0374 COMB1	7.99E-16 COMB7	-9E-16 COMB5	0.48628 COMB7	-0.20143 COMB5	2.31E-15 COMB7	-2.3E-15 COMB7	15.52516 COM
3	-1.6E-15 COMB2	+1.3228 COMB5	-10.8564 COMB2	4.06E-16 COMB6	-3.9E-16 COMB5	0.15037 COMB6	-0.11701 COMB4	1.59E-15 COMB7	-1.6E-15 COMB5	11.64654 COM
5	-71.9335 COMB1	41.6709 COMB4	-57.395 COMB6	62.9096 COMB5	-124.946 COMB7	5.4419+ COMB1	-0.03839 COMB7	78.48332 COMB5	-88.6348 COMB7	47.40242 COM
6	-5.2E-14 COMB4	25.7439 COMB1	2.5525 BMATI	1.6E-15 COMB6	-1.6E-15 COMB6	5.44184 COMB1	1.27331 BMATI	4.3E-15 COMB7	-4.3E-15 COMB5	30.80966 COM
6	-1.3E-14 COMB4	14.2272 COMB1	1.1496 COMB4	7.93E-16 COMB7	-8.1E-16 COMB5	2.95164 COMB1	-5.34974 COMB1	2.37E-15 COMB5	-2.3E-15 COMB7	13.79189 COM
1	0 BMATI	12.4151 COMB1	0.7056 COMB5	8.5E-16 COMB7	-7.5E-16 COMB5	-1.58083 COMB5	-5.34974 COMB1	1.7E-15 COMB6	-1.7E-15 COMB6	12.71165 COM

	P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 max
	-3E-13 COMB7	13.7617 COMB5	-7.4985 COMB7	0 BMAT1	-1.3E-16 COMB1	1.85629 COMB7	+6.20229 COMB5	3.26E-16 COMB1	-1.7E-16 COMB1	38.74453 COMB
	0 BMAT1	17.9001 COMB1	1.0079 COMB5	4E-16 COMB4	-3.8E-28 COMB4	0.09162 COMB4	+0.08662 COMB5	1.36E-17 COMB1	-1.6E-15 COMB6	14.41023 COMB
	-30.4354 COMB7	54.7892 COMB1	-49.3705 COMB1	0.2606 COMB6	-0.033 COMB4	0.78139 BMAT1	-0.71522 COMB4	1.30534 COMB6	-1.05413 COMB1	38.33585 COMB
	0 BMAT1	9.6497 COMB1	-0.0333 COMB5	8.26E-16 COMB3	-7.7E-16 COMB7	1.61482 COMB1	0.12082 BMAT1	3.15E-15 COMB7	-3.2E-15 COMB5	9.85526 COMB
	0 BMAT1	9.0968 COMB1	-1.585 COMB7	1.58E-15 COMB7	-1.7E-15 COMB5	2.93126 COMB7	+0.96777 COMB5	6.6E-15 COMB5	-4.6E-15 COMB7	7.48536 COMB
	-3.1E-14 COMB6	15.3621 COMB1	0.1424 COMB7	1.58E-15 COMB7	-7.9E-16 COMB5	2.93126 COMB7	-1.35686 COMB1	1.6E-15 COMB6	-6.2E-15 COMB7	15.53806 COMB
	1.31E-16 COMB2	6.3522 COMB7	-12.3784 COMB1	6.94E-18 BMAT1	-7.4E-16 COMB5	-0.01282 COMB3	+0.96767 COMB7	1.36E-15 COMB7	-1.2E-16 COMB7	19.02001 COMB
	-194.465 COMB1	1.9635 COMB1	-4.9963 COMB5	2.06E-16 COMB4	-8.6294 COMB1	0.1977 COMB6	+0.28999 COMB4	12.97939 BMAT1	-14.239 COMB1	7.4059 COMB
	-194.465 COMB1	20.5103 COMB1	-1.829 COMB6	1.17E-15 COMB3	-8.6294 COMB1	0.2575 COMB1	+0.31771 COMB7	29.90797 COMB1	-18.8508 COMB7	37.4162 COMB
	-5.1E-14 COMB7	19.4091 COMB1	6.1534 COMB6	8E-16 COMB7	-9E-16 COMB5	0.80187 COMB7	-10.2928 COMB1	3.25E-15 COMB5	-3.1E-15 COMB7	33.51763 COMB
	-1E-13 COMB6	12.631 COMB5	+27.2021 COMB1	1.71E-16 COMB6	-4.3E-16 COMB4	+0.03139 COMB3	-5.45509 COMB7	1.01E-15 COMB4	-1.4E-15 COMB6	41.58682 COMB
	-5.1E-14 COMB7	8.3006 COMB1	+11.9297 COMB7	2.06E-16 COMB7	-1.3E-16 COMB5	0.35941 COMB6	+0.41741 COMB4	4.06E-16 COMB7	-4.2E-16 COMB7	17.20164 COMB
	-1E-13 COMB7	6.2019 COMB1	-0.3142 COMB1	3.17E-15 COMB4	-3.2E-15 COMB6	0.22043 COMB7	+0.31057 COMB5	9.67E-15 COMB6	-9.5E-15 COMB4	-0.43585 COMB
	-68.3849 COMB1	55.7347 COMB1	-52.0049 COMB1	0.2343 COMB1	-1.5E-16 COMB7	2.23609 COMB4	-2.24479 COMB5	1.23856 COMB1	-0.86815 COMB1	41.47129 COMB
	-49.3548 COMB7	23.197 COMB7	-21.7379 COMB5	0.1345 COMB4	-5.3E-16 COMB1	0.31606 COMB6	-0.21905 COMB1	0.66631 COMB7	-1.6167 COMB4	18.71062 COMB
	0 BMAT1	9.5891 COMB2	-6.0606 COMB1	8E-16 COMB6	-0.6834 COMB1	0.3207 COMB5	+3.79458 COMB1	2.85594 COMB1	-2.63242 COMB1	9.223 COMB
	-37.3789 COMB5	6.6212 COMB4	-18.0245 COMB1	2.113 COMB6	-2.9313 COMB4	-1.29605 COMB7	+3.77666 COMB1	13.41998 COMB7	-10.3984 COMB5	26.33564 COMB
	-5.1E-14 COMB6	-2.1345 COMB4	-11.2664 COMB2	7.74E-16 COMB5	-1.6E-15 COMB5	-0.80213 COMB5	-2.83143 COMB2	4.7E-15 COMB5	-3.2E-16 COMB6	8.18142 COMB
	+5.1E-14 COMB6	28.5233 COMB1	+6.1677 COMB7	1.57E-15 COMB4	0 BMAT1	0.72573 COMB1	-2.0185 COMB7	1.39E-17 COMB1	-4.6E-15 COMB7	19.96582 COMB
	-256.487 COMB1	10.9848 COMB6	0.6269 COMB5	4.7262 COMB5	+2E-16 COMB7	0.51257 COMB7	+0.00265 COMB1	12.91216 COMB5	-9.23448 COMB1	15.94045 COMB
	+171.272 COMB1	5.3924 COMB1	-14.782 COMB1	6.0742 COMB5	-6.6138 COMB7	0.0177 COMB4	-3.13364 COMB1	21.83074 COMB7	-16.2657 COMB5	13.23749 COMB
	+5.1E-14 COMB4	-1.3577 COMB6	+14.782 COMB1	2.06E-16 COMB7	-1.9E-16 COMB5	2.62764 BMAT1	-3.13364 COMB1	8.24E-16 COMB4	-7.7E-16 COMB6	18.44045 COMB
	-2.7E-14 COMB7	-0.8142 COMB7	-12.2158 COMB1	3.75E-16 COMB4	-4.2E-16 COMB6	5.56506 COMB1	1.42951 COMB7	1.58E-15 COMB7	-1.6E-15 COMB7	12.54512 COMB
	-1E-13 COMB5	7.5144 COMB5	+14.1275 COMB7	8.48E-16 COMB6	-7.5E-16 COMB4	6.95837 COMB7	-3.43189 COMB5	2.17E-15 COMB4	-2.6E-15 COMB6	20.79007 COMB
	-5.1E-14 COMB4	-0.3735 COMB4	-11.8681 COMB1	1.61E-15 COMB5	1.23E-17 COMB3	-0.32306 COMB3	-0.78179 COMB1	1.6E-15 COMB6	-1.3E-15 COMB4	3.37723 COMB
	-2.6E-14 COMB5	-0.324 COMB7	-16.4016 COMB1	1.61E-15 COMB5	-1.6E-15 COMB7	-0.12965 COMB7	-3.24546 COMB1	3.31E-15 COMB7	-3.4E-15 COMB5	9.18095 COMB
	+7.9E-16 COMB3	-1.0243 COMB5	-12.3035 COMB2	-6.1E-18 COMB3	-1.1E-17 COMB1	-0.96856 COMB6	-3.24546 COMB1	4.47E-17 COMB1	1.35E-19 COMB5	19.15168 COMB
	-1.4E-15 COMB1	-1.7373 BMAT1	-12.4372 COMB1	0 BMAT1	-6.2E-19 COMB4	3.47683 COMB1	-1.23504 COMB7	2.82E-17 COMB2	0 BMAT1	16.58137 COMB
	-1.2E-15 COMB2	1.8345 COMB7	-10.6847 COMB5	4E-16 COMB6	-4E-16 COMB4	2.59445 COMB2	1.1962 COMB7	1.6E-15 COMB4	-1.6E-15 COMB4	12.42455 COMB
	-70.8733 COMB1	38.7625 COMB4	-61.2257 COMB6	62.7473 COMB1	-123.5 COMB7	1.1962 COMB7	-1.29715 COMB1	78.45011 COMB5	-88.379 COMB7	46.81753 COMB
	-9.6E-15 COMB1	0.0956 COMB7	-9.2222 COMB1	7.74E-16 COMB5	-9.2E-16 COMB7	-0.53524 COMB4	-1.98616 COMB1	3.25E-15 COMB7	-3.1E-15 COMB5	7.44783 COMB
	-62.4861 COMB1	55.8312 COMB1	-55.5284 COMB1	0.0695 COMB1	-1.6E-15 COMB6	0.3943 COMB7	+2.1188 COMB5	0.42693 COMB1	-0.21454 COMB1	42.65773 COMB
	-117.035 COMB7	38.7707 COMB5	-38.6986 COMB7	0.715 COMB5	+0.6476 COMB7	2.41268 COMB7	-1.21583 COMB5	4.14554 COMB7	-4.34273 COMB5	66.81022 COMB
	0 BMAT1	51.6256 COMB1	-0.3 COMB5	7.99E-16 COMB6	-6.3E-15 COMB1	0.00912 COMB4	-0.26965 COMB6	1.8E-14 COMB1	-1E-14 COMB1	8.24507 COMB
	-3.6E-16 COMB1	38.7719 COMB2	-1.9E-13 COMB5	2.96E-14 COMB7	-3.5E-14 COMB5	3.70099 COMB1	-7.1E-14 COMB7	1.16E-13 COMB7	-1.3E-13 COMB5	17.82425 COMB
	-2.2E-17 COMB1	15.4538 COMB1	-6.2835 COMB7	4.12E-16 COMB5	-3.9E-16 COMB7	1.93994 COMB4	-2.87762 COMB1	8.12E-16 COMB4	-8.4E-16 COMB6	16.75063 COMB
	-4.4E-16 BMAT1	12.1222 COMB7	-6.7638 BMAT1	3.87E-16 COMB6	-4.1E-16 COMB4	1.74708 BMAT1	-1.86688 COMB7	1.62E-15 COMB4	-1.6E-15 COMB6	14.24226 COMB
	-2.6E-14 COMB7	-1.9991 COMB4	-14.8581 COMB1	4E-16 COMB4	-4E-16 COMB6	4.09491 COMB1	-1.7853 BMAT1	1.6E-15 COMB6	-1.6E-15 COMB4	14.46162 COMB
	1.05E-15 COMB2	-1.2999 COMB7	-13.329 COMB1	1.67E-15 COMB5	-1.5E-15 COMB7	3.41146 COMB7	+4.16544 COMB1	5.11E-15 COMB7	-5.4E-15 COMB5	12.90364 COMB
	-363.057 COMB1	11.2838 COMB4	-7.4122 COMB6	3.0839 COMB1	-1.6935 COMB1	0.41146 COMB7	-0.04375 COMB7	11.3483 COMB1	-13.3662 COMB7	35.20545 COMB
	+234.021 COMB1	37.377 COMB6	-41.6555 COMB4	154.0483 COMB7	-159.566 COMB5	0.14902 COMB5	-0.19005 COMB7	495.1082 COMB5	-499.823 COMB7	141.6827 COMB
	-125.007 COMB1	150.1367 COMB5	-142.321 COMB7	83.4526 COMB6	-87.671 COMB4	3.57348 COMB6	-0.51927 COMB4	196.4935 COMB6	-202.545 COMB4	627.9781 COMB
	-87.8398 COMB7	21.8633 COMB6	-21.9497 COMB7	0.1546 COMB6	-0.1042 COMB7	4.17964 COMB1	-0.28649 COMB7	0.34664 COMB7	-0.63002 COMB7	13.59527 COMB
	-5.1E-14 COMB4	5.2195 COMB7	-28.104 COMB1	1.6E-15 COMB5	0 BMAT1	2.12536 COMB7	-1.46014 COMB1	1.55E-15 COMB4	-4.7E-15 COMB7	6.45751 COMB
	-2E-13 COMB5	-2.4789 COMB5	-26.5596 COMB1	1.7E-15 COMB5	-1.6E-15 COMB4	6.84387 COMB5	-4.84495 COMB4	4.49E-15 COMB5	-5.1E-15 COMB4	5.09124 COMB
	1.61E-15 COMB4	0.3886 COMB1	-17.3753 COMB7	1.7E-15 COMB5	-1.5E-15 COMB7	4.24871 COMB6	-7.14007 COMB7	4.49E-15 COMB5	-5.1E-15 COMB4	19.67453 COMB
	-27.6736 COMB1	7.9242 COMB7	-49.6963 COMB1	14.1456 COMB4	-14.4545 COMB6	10.99331 COMB5	-11.3094 COMB7	32.28166 COMB6	-35.5992 COMB6	9.23891 COMB
	-5.1E-14 COMB4	4.4412 BMAT1	-8.3189 COMB2	1.62E-15 COMB6	-1.6E-15 COMB4	0.91514 COMB5	-1.28009 COMB7	3.96E-15 COMB5	-4E-15 COMB7	11.01927 COMB
	4E-16 COMB4	10.2276 COMB1	-0.4899 COMB2	-2E-19 COMB3	-1.1E-17 COMB1	0.2836 COMB5	0.11932 COMB3	1.37E-17 COMB1	-8E-16 COMB5	3.26822 COMB
	+177.196 COMB1	4.068 COMB5	-4.3822 COMB6	2.3507 COMB5	-7.19 COMB7	0.31914 BMAT1	-0.05017 COMB7	20.59643 COMB1	-17.15 COMB7	10.90635 COMB
	-3.3E-17 COMB1	12.5678 COMB1	-1.6389 COMB1	-4.2E-18 COMB2	-4.1E-16 COMB5	0.80719 COMB1	0.00347 COMB5	2.77E-17 BMAT1	-8.2E-16 COMB4	15.38682 COMB
	-1E-13 COMB6	6.3063 COMB5	-2.0629 COMB7	3.87E-16 COMB7	-4.1E-16 COMB5	0.5826 COMB7	-0.35873 COMB1	8.23E-16 COMB5	-7.7E-16 COMB7	6.84102 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
0 BMATI	26.8472 COMB1	-3.9454 COMB1	8.25E-16 COMB7	-2.5E-17 COMB3	0.44032 COMB1	-0.35533 COMB7	9.01E-16 COMB4	-2.1E-15 COMB4	33.72705 COMB
-1E-13 COMB4	13.9649 COMB7	-7.97 COMB1	1.42E-15 COMB4	-1.6E-15 COMB4	2.73902 COMB7	-5.14559 COMB1	3.26E-15 COMB5	-4.2E-15 COMB7	16.36564 COMB
-2E-13 COMB4	25.0492 COMB1	-13.1637 COMB7	6.99E-16 COMB4	-9E-16 COMB6	5.42524 COMB5	-7.22776 COMB7	1.43E-15 COMB5	-1.8E-15 COMB4	45.21851 COMB
-7.9E-14 COMB4	10.6947 COMB7	-0.8894 COMB1	4.26E-16 COMB6	-0.4521 COMB1	1.49319 COMB1	-2.27851 COMB4	3.12161 COMB1	-1.8E-15 COMB4	14.23527 COMB
-16.2793 COMB5	4.0597 COMB4	-1.3264 COMB6	1.3362 COMB5	-1.9055 COMB7	0.0184 BMATI	-0.32404 COMB7	8.12274 COMB7	-5.1947E COMB5	9.83827 COMB
0 BMATI	7.4234 COMB1	-3.3684 COMB1	1.07E-17 COMB1	-9E-16 COMB7	4.49121 COMB1	1.30233 COMB1	7.93E-16 COMB5	-9E-16 COMB4	5.97875 COMB
0 BMATI	9.0152 COMB1	-2.2082 COMB3	7.99E-16 COMB1	-1.3E-15 COMB1	2.51892 COMB5	0.48453 COMB4	2.34E-15 COMB1	-3.1E-15 COMB7	5.4008 COMB
-1E-13 COMB6	13.1091 COMB1	-0.3052 COMB5	1.65E-15 COMB7	-1.5E-15 COMB5	2.31691 COMB5	-3.11523 COMB1	3.3E-15 COMB5	-4.1E-15 COMB7	14.29513 COMB
-5.3E-14 COMB5	13.5473 COMB1	1.3532 COMB6	7.5E-16 COMB3	-4.1E-16 COMB6	2.24153 COMB1	-1.76347 COMB5	1.64E-15 COMB5	-1.9E-15 COMB4	13.71083 COMB
-9.3E-14 COMB5	5.7741 COMB4	-12.9799 COMB1	1.55E-15 COMB5	-1.6E-15 COMB7	2.19915 COMB5	-4.01529 COMB1	6.94E-15 COMB7	-6.7E-15 COMB5	13.22856 COMB
-49.1699 COMB7	8e.31 COMB1	-51.2136 COMB1	0.0167 COMB4	-0.0114 COMB6	0.02497 COMB4	-1.94072 COMB7	7.14423 COMB4	-0.11525 COMB6	39.93944 COMB
-49.1693 COMB7	23.114 COMB7	-27.6277 COMB7	5.55E-19 COMB1	-0.0021 COMB7	-0.05974 COMB7	-0.84071 COMB1	1.15E-17 COMB3	-0.03579 COMB7	18.17236 COMB
-71.038 COMB1	86.163 COMB4	-64.1561 COMB6	63.1797 COMB5	-71.1997 COMB1	0.027 COMB6	-0.37073 COMB4	74.49712 COMB5	-15.3997 COMB1	46.25151 COMB
-69.0419 COMB7	21.6214 COMB4	-64.1561 COMB6	3.99E-16 COMB4	-121.55 COMB7	1.07294 COMB6	-3.10562 COMB5	33.50455 COMB7	-44.0431 COMB7	99.63677 COMB
0 BMATI	27.5329 COMB7	-24.7742 COMB1	4E-16 COMB1	-4E-16 COMB6	3.84569 COMB7	-0.37944 COMB6	1.41E-15 COMB4	-2.2E-15 COMB4	84.13938 COMB
-5.3E-14 COMB4	12.2488 COMB1	-4.814 COMB7	4E-16 COMB4	-7.7E-14 COMB5	0.71935 COMB1	-0.37464 COMB6	4.29E-15 COMB5	-1.6E-15 COMB7	13.70175 COMB
-5.1E-14 COMB4	11.3026 COMB1	-0.1767 COMB7	8.24E-16 COMB7	-3.5E-19 COMB1	0.65124 COMB7	-0.69855 COMB1	7.55E-16 COMB6	-4.5E-15 COMB7	3.75502 COMB
-1E-13 COMB6	6.5481 COMB7	-2.2445 COMB1	4.79E-17 COMB1	0 BMATI	0.8562 COMB5	-1.43959 COMB7	1.4E-15 COMB4	-1.6E-15 COMB7	-1.72797 BMAT
-241.691 COMB1	4.7059 COMB2	-1.2943 COMB7	5.6737 COMB1	-4.8E-15 COMB6	6.63481 COMB7	-6.64508 COMB5	9.10251 COMB1	-13.1941 COMB1	9.89719 COMB
-180.677 COMB1	3.7114 COMB4	-4.8679 BMATI	6.0359 COMB5	-4.8656 COMB7	0.3177 COMB4	-0.1183 BMATI	19.74287 COMB7	-15.0494 COMB5	6.72784 COMB
-1E-13 COMB4	2.4073 BMATI	-11.1202 COMB1	0.5102 BMATI	-9E-16 COMB5	2.63594 BMATI	-0.29872 COMB5	1.99812 BMATI	-1.05822 BMATI	6.41952 COMB
-83.5761 COMB5	13.7883 COMB7	-15.4098 COMB5	3.2444 COMB6	-2.2369 COMB4	4.74093 COMB1	0.53253 BMATI	14.42572 COMB6	-10.6796 COMB4	42.72401 COMB
-2.3E-14 COMB6	14.1985 COMB1	-3.2898 COMB5	4.12E-16 COMB6	-3.9E-16 COMB4	0.1126 COMB4	-0.57468 COMB6	1.62E-15 COMB4	-1.6E-15 COMB6	20.29277 COMB
-8.3E-14 COMB2	4.433 COMB1	0.0445 COMB4	4E-16 COMB4	0 BMATI	0.12751 COMB4	-0.01705 COMB1	9E-16 COMB4	-9E-16 COMB5	0.64192 COMB
-5.1E-14 COMB4	14.0299 COMB1	-3.9295 COMB5	7.97E-16 COMB4	-4E-16 COMB6	0.12756 COMB7	-0.185 COMB4	9E-16 COMB4	-1.6E-15 COMB4	35.81715 COMB
-37.4124 COMB1	54.6033 COMB7	-29.5045 COMB1	0.0059 COMB1	-8.1E-14 COMB6	0.13984 COMB4	-0.185 COMB4	0.02479 COMB1	-0.01837 COMB2	38.69131 COMB
-86.5293 COMB7	40.9524 COMB2	-27.1669 COMB2	0.1687 COMB6	-0.1634 COMB4	0.52646 COMB6	-0.55153 COMB4	1.02841 COMB6	-1.00636 COMB4	29.012 COMB
-2.4E-14 COMB5	0.5191 COMB5	-3.0723 COMB4	-8.4E-16 COMB2	-2.1E-14 COMB4	0.08891 COMB5	-0.35473 COMB1	7.77E-16 COMB4	-1.6E-15 COMB4	1.92099 COMB
-2.4E-14 COMB5	1.2824 COMB6	-27.08 COMB1	1.47E-16 COMB6	-1.3E-17 COMB4	0.4132 COMB1	-0.35533 COMB7	1.63E-15 COMB7	-1.6E-15 COMB5	23.46317 COMB
1.56E-13 COMB3	-3.2464 COMB4	-17.955 COMB2	7.35E-19 COMB2	-9E-16 COMB7	0.44027 COMB5	0.24827 COMB4	8.51E-16 COMB4	-3.2E-15 COMB4	25.42275 COMB
0 BMATI	-1.522 BMATI	-10.6396 COMB7	7.99E-16 COMB5	-5.9E-14 COMB3	5.10919 COMB1	-0.36034 COMB7	3.2E-15 COMB6	3.84E-17 COMB2	15.36331 COMB
-1E-13 COMB6	13.4889 COMB1	-18.7272 COMB7	1.6E-15 COMB5	-1.6E-15 COMB7	7.17664 COMB5	-0.74617 COMB7	5.94E-15 COMB7	-5.8E-15 COMB5	39.69617 COMB
-73.3811 COMB1	58.8109 COMB1	-54.5487 COMB1	0.0038 COMB1	-0.4511 COMB4	1.9966 COMB7	0.01907 BMATI	2.9728 COMB4	-1.06237 COMB4	44.14716 COMB
-141.435 COMB7	33.0243 COMB5	-32.152 COMB7	0.6593 COMB3	-0.6516 COMB7	3.31393 COMB1	-2.42752 COMB5	4.19811 COMB7	-4.20471 COMB5	35.08215 COMB
-1E-13 COMB6	-1.893 COMB7	-13.1862 COMB1	1.65E-15 COMB5	-1.3E-17 COMB5	1.82983 COMB5	-1.89763 COMB1	1.6E-15 COMB4	-2.9E-15 COMB4	13.99373 COMB
-7.2E-17 COMB3	0.2792 COMB1	-7.7146 COMB1	1.65E-15 COMB5	-1.5E-15 COMB4	0.04306 COMB7	-2.92618 COMB1	3.49E-15 COMB7	-3.8E-15 COMB5	6.66533 COMB
0 BMATI	0.6897 COMB7	-8.6236 COMB1	1.57E-15 COMB4	-1.6E-15 COMB5	-0.34292 COMB2	+1.94771 COMB1	6.12E-15 COMB7	-9E-15 COMB5	5.84897 COMB
0 BMATI	-0.4574 COMB5	-6.8238 COMB2	6.98E-16 COMB6	-9E-16 COMB4	1.85097 COMB5	-1.94771 COMB1	1.62E-15 COMB4	-1.8E-15 COMB4	5.84897 COMB
-4.2E-14 COMB2	1.9422 COMB7	-3.0053 COMB5	6.98E-16 COMB6	-1E-16 COMB4	0.12751 COMB4	-1.59267 COMB7	9E-16 COMB4	-1.3E-15 COMB6	4.9363 COMB
-1E-13 COMB6	2.2845 COMB7	-17.9019 COMB1	4.12E-16 COMB6	-7.9E-16 COMB7	0.7132 COMB5	-0.31419 COMB4	1.57E-15 COMB4	-1.6E-15 COMB4	35.6541 COMB
-1E-13 COMB6	-2.0392 COMB5	-56.713 COMB1	3.971 COMB1	-0.1116 COMB4	11.79638 COMB4	-0.73592 COMB7	9.38432 COMB1	-8.37455 COMB1	15.56059 COMB
-8.9E-16 BMATI	0.5133 COMB1	-29.6946 COMB5	8.4753 COMB7	-4.682 COMB5	19.49227 COMB7	-13.1811 COMB5	16.65155 COMB5	-25.5445 COMB7	19.60084 COMB
-194.873 BMATI	2.1671 COMB4	-5.2392 COMB6	2.3687 COMB5	-7.2515 COMB7	0.09913 COMB6	-0.11926 COMB7	20.68942 COMB1	-17.3042 COMB7	10.84072 COMB
-392.24 COMB1	8.594 COMB4	-8.3448 COMB6	17.0467 COMB5	-2.1647 COMB7	0.0437 COMB4	-0.04375 COMB7	12.96513 COMB5	-57.6008 COMB5	31.0374 COMB
-262.743 COMB1	59.9013 COMB6	-60.2227 COMB4	96.4896 COMB7	-98.6963 COMB5	0.14902 COMB5	-0.19005 COMB7	311.6074 COMB5	-308.751 COMB7	206.1785 COMB
-102.922 COMB2	66.092 COMB4	-61.3962 COMB6	93.0853 COMB5	-83.2302 COMB7	0.37078 COMB6	-0.38988 COMB4	396.19 COMB5	-385.455 COMB7	285.5762 COMB
-12.4306 COMB6	27.4329 COMB7	0.0715 COMB6	9E-16 COMB4	-27.9845 COMB7	0.29159 COMB5	-0.29457 COMB7	1.06E-11 COMB7	-3.2E-15 COMB6	6.29907 COMB
-9.2E-14 COMB7	-3.7414 COMB4	-25.1967 COMB1	3.94E-16 COMB4	-4.1E-16 COMB6	0.30678 COMB4	-0.2855 COMB6	1.64E-15 COMB6	-1.6E-15 COMB4	36.14134 COMB
-9.9E-14 COMB5	-0.5407 COMB5	-17.271 COMB1	-5.1E-18 COMB2	-4.4E-16 COMB5	0.24898 COMB7	-0.32746 COMB5	1.7E-15 COMB5	-4.5E-16 COMB4	15.97297 COMB
-3.3E-17 COMB1	7.7254 COMB1	-7.6041 COMB7	3.62E-16 COMB7	-9E-16 COMB5	3.21178 COMB1	-0.19953 COMB6	1.39E-15 COMB5	-1.6E-15 COMB5	6.21543 COMB
-1E-13 COMB4	8.6625 COMB1	-0.6146 COMB7	8.49E-16 COMB4	-7.5E-14 COMB6	3.17479 COMB5	0.4835 COMB4	3.2E-15 COMB4	-3.2E-15 COMB6	6.16723 COMB
-57.0492 COMB1	54.6334 COMB1	-49.526 COMB1	0.0041 COMB1	-0.1638 COMB4	1.23442 COMB6	-1.45687 COMB7	0.46507 COMB4	-1.00032 COMB4	38.63578 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
-64.5157 COMB7	23.7487 COMB5	-15.7774 COMB7	3.1472 COMB6	-0.1419 COMB4	0.61493 COMB6	-0.5158 COMB4	1.01742 COMB6	-0.9043 COMB7	17.7031 COMB
-141.387 COMB1	3.8527 COMB1	-4.377 COMB4	5.4413 COMB1	-3.9E-19 COMB1	0.09312 COMB7	-0.24065 COMB1	8.74383 COMB1	-18.637 COMB1	4.6026 COMB
-179.075 COMB1	3.9896 COMB4	-1.9281 COMB5	6.0146 COMB5	-2.812 COMB7	0.21498 COMB5	-0.01771 COMB7	16.10812 COMB1	-14.9432 COMB5	10.35384 COM
-89.2202 COMB7	14.2424 COMB1	-1.9856 COMB7	1.9447 COMB5	-4.39E-6 COMB7	0.09062 COMB4	-0.10545 COMB5	19.33613 COMB7	-1.1241 COMB5	20.48783 COM
-4E-13 COMB4	25.982 COMB4	-1.8178 COMB3	4.23E-14 COMB4	0 BMATI	0.17782 COMB2	-0.2104 COMB4	7.99E-16 COMB6	-3.1E-18 COMB4	90.91324 COM
-4E-13 COMB4	16.9785 COMB7	-37.7405 COMB5	4.23E-14 COMB4	-3.7E-14 COMB6	1.69459 COMB5	-1.8742 COMB7	1.29E-16 COMB5	-1.3E-14 COMB7	140.1761 COM
-8.1E-14 COMB6	13.2573 COMB1	-3.4216 COMB1	4.53E-17 COMB1	+1E-17 COMB4	3.34031 COMB1	-0.1944 COMB5	1.41E-15 COMB4	-7.4E-16 COMB4	11.96428 COM
-8.1E-14 COMB5	11.3712 COMB1	0.4509 COMB4	1.61E-15 COMB7	-1.6E-15 COMB1	1.97719 COMB7	-0.17786 COMB4	3.01E-15 COMB2	-3.1E-15 COMB7	9.41829 COM
+1.1E-13 COMB5	6.2644 COMB1	-2.2242 COMB1	9.5E-16 COMB4	-7.9E-14 COMB6	0.35079 COMB5	-0.48362 COMB7	2.19E-15 COMB2	-2.6E-15 COMB4	-1.47423 COM
+2E-13 COMB5	4.4322 COMB1	+1.6731 COMB5	1.6E-15 COMB7	-1.7E-14 COMB5	4.4645 COMB7	+1.31714 COMB5	2.39E-15 COMB7	-3.4E-15 COMB5	0.67112 BMA
-4.3E-14 COMB1	28.3682 COMB1	-0.4497 COMB5	2.09E-16 COMB5	-1.9E-14 COMB7	0.19259 COMB7	-0.17322 COMB1	8.12E-16 COMB5	-7.9E-16 COMB7	36.23118 COM
-8.1E-14 COMB6	12.3814 COMB5	-13.548 COMB1	1.93E-19 COMB4	+1.7E-17 COMB1	3.29474 COMB1	-2.14864 COMB4	8E-16 COMB1	-8E-16 COMB6	14.35725 COM
-8E-14 COMB6	+1.7454 COMB7	+14.057 COMB1	7.47E-16 COMB5	+8.1E-16 COMB7	1.41644 COMB5	+2.40494 COMB1	1.57E-15 COMB4	-1.4E-15 COMB6	15.35229 COM
-8.1E-14 COMB6	+2.3565 COMB4	+6.7183 COMB5	-8E-17 COMB1	+8E-17 COMB1	0.12342 COMB7	+2.03258 COMB5	1.62E-15 COMB7	-1.7E-15 COMB5	7.03447 COM
+177.17 COMB1	1.9104 COMB4	+6.0387 COMB1	2.4793 COMB5	+7.1916 COMB7	0.12382 COMB7	+3.99103 COMB1	13.79815 COMB1	-17.0413 COMB7	11.65981 COM
+22.2449 COMB5	7.3817 COMB4	+10.8513 COMB5	2.7419 COMB5	+3.3517 COMB7	+0.71849 COMB7	+3.07749 COMB1	11.99108 COMB4	-13.7401 COMB5	46.77356 COM
+70.4143 COMB1	31.4042 COMB4	+89.4931 COMB6	64.4381 COMB5	+83.4086 COMB1	0.327 COMB6	+0.71749 COMB7	70.03714 COMB3	+10.6405 COMB4	45.3981 COM
-131.212 COMB7	56.9191 COMB1	+63.6931 COMB6	0.9361 COMB5	+110.472 COMB7	3.37269 COMB7	+3.3462 COMB5	29.24701 COMB7	+87.1834 COMB7	44.11111 COM
-1.6E-14 COMB7	3.1531 COMB4	-27.4105 COMB1	3.87E-16 COMB4	-4.1E-16 COMB4	0.10061 BMATI	-0.08252 COMB1	1.64E-15 COMB5	-1.6E-16 COMB7	34.07968 COM
-5.1E-14 COMB6	-1.705 BMATI	-20.5031 COMB2	8.24E-16 COMB4	-7.7E-14 COMB6	5.04593 COMB1	-1.07074 COMB7	1.65E-15 COMB4	-1.6E-15 COMB5	34.07968 COM
+3.5E-16 COMB1	14.7676 COMB5	+21.2507 COMB7	1.7E-15 COMB5	-1.5E-15 COMB7	5.04593 COMB1	+0.037 COMB1	6.4E-15 COMB5	+6.4E-15 COMB7	50.47924 COM
-5.1E-14 COMB7	4.8663 BMATI	-10.3523 COMB2	4E-16 COMB4	-4E-16 COMB6	3.31674 COMB1	-0.12436 COMB4	8E-16 COMB4	-8E-16 COMB5	19.95175 COM
-5.1E-14 COMB6	11.1288 COMB1	-1.5703 BMATI	1.4E-15 COMB1	-1.4E-15 COMB7	0.31674 COMB1	-0.0495 COMB7	3.38E-15 COMB7	-3.3E-15 COMB5	4.67423 COM
-5E-14 COMB7	2.1831 COMB7	-12.2364 BMATI	4E-16 COMB6	-4E-16 COMB4	0.19259 COMB7	-0.17322 COMB5	8.12E-16 COMB5	-7.9E-16 COMB6	15.67132 BMA
-5.2E-17 COMB3	-4.9328 COMB5	-28.3253 COMB1	4.12E-16 COMB5	-7.9E-14 COMB4	0.99832 COMB5	-0.46023 COMB4	1.53E-15 COMB4	-1.6E-15 COMB6	36.47169 COM
0 BMATI	7.9127 BMATI	-55.1011 COMB1	13.3917 COMB7	-8.0164 COMB5	14.27463 COMB7	-10.4271 COMB1	28.4913 COMB7	-24.3977 COMB7	19.49287 BMA
-2.6E-14 COMB4	25.3359 COMB1	-6.1582 BMATI	4E-16 COMB6	+4E-16 COMB4	0.24359 COMB5	-1.67504 BMATI	1.4E-15 COMB5	-1.6E-15 COMB6	36.60158 COM
0 BMATI	+1.7919 COMB4	-19.305 COMB1	-2.4E-17 COMB3	-3.3E-17 COMB1	+1.10214 COMB5	-3.8937 COMB1	3.25E-15 COMB5	-3.2E-15 COMB7	13.13499 COM
+5.1E-14 COMB5	5.9547 COMB7	+7.5462 COMB1	+2.5E-17 COMB4	+4.4E-17 COMB1	+1.16037 COMB7	+3.11365 COMB1	1.74E-15 COMB7	-1.3E-15 COMB5	3.30786 COM
-1E-13 COMB4	8.9981 COMB7	-8.7589 COMB1	1.7E-15 COMB6	-1.5E-15 COMB4	-0.35189 COMB5	-2.09187 COMB1	5.89E-15 COMB1	-4.7E-15 COMB6	6.00108 COM
0 BMATI	-0.5581 COMB3	-12.7384 COMB1	1.7E-15 COMB6	0 BMATI	+0.25019 COMB3	-1.4985 COMB7	4.73E-17 COMB1	-4.3E-16 COMB7	10.27904 COM
-361.748 COMB1	0.2134 BMATI	-4.1435 COMB7	0.152 BMATI	-0.12 COMB1	0.35063 COMB5	-2.39774 COMB7	0.04867 BMATI	-3.69149 BMATI	4.04314 COM
-361.748 COMB1	8.1284 COMB4	-7.7477 COMB9	2.669 COMB5	-2.4622 COMB7	0.037 COMB5	-2.04378 COMB7	13.25421 COMB5	-13.1322 COMB7	30.37916 COM
-147.027 COMB1	9.1263 COMB4	-9.3065 COMB6	17.0672 COMB5	-17.3474 COMB7	0.0437 COMB4	-0.05732 COMB6	58.93452 COMB7	-57.576 COMB5	36.21852 COM
-230.275 COMB1	72.0972 COMB4	-72.7108 COMB4	99.8604 COMB7	-102.09 COMB5	0.14902 COMB5	-0.19005 COMB7	321.0906 COMB5	-317.83 COMB7	245.6411 COM
-129.836 COMB1	123.2442 COMB4	-116.321 COMB6	132.3094 COMB5	-122.655 COMB7	0.09872 COMB6	-0.30459 COMB1	441.8028 COMB5	-431.404 COMB7	330.1137 COM
-35.9551 COMB7	22.8896 COMB7	-21.2312 COMB5	0.0365 COMB4	3.73E-17 COMB2	-0.05532 COMB6	+0.7741 COMB1	0.14541 COMB7	+0.34083 COMB4	17.56217 COM
-56.124 COMB1	54.6564 COMB1	-49.8032 COMB1	0.0204 COMB1	-7.6E-14 COMB6	-0.01802 COMB3	-0.59158 COMB2	0.07114 COMB1	+0.11129 COMB1	36.60911 COM
+84.9898 COMB6	26.6533 COMB1	+21.6496 COMB7	0.1807 COMB5	+0.193 COMB7	0.54497 COMB5	-1.20761 COMB5	1.08387 COMB5	-1.02226 COMB7	17.60373 COM
-1.7E-14 COMB1	26.3473 COMB1	5.8085 COMB7	1.6E-16 COMB4	+8E-16 COMB5	9.06698 COMB5	-6.23902 COMB4	3.4E-15 COMB5	-4.6E-15 COMB4	5.324 COM
-1.3E-14 COMB2	14.0742 COMB1	2.7907 COMB3	1.6E-15 COMB4	-1.6E-15 COMB6	9.06698 COMB5	-9.27911 COMB7	5.01E-15 COMB6	-3E-15 COMB7	15.173 COM
-3.6E-15 BMATI	8.7974 COMB1	1.9255 COMB6	7.97E-16 COMB5	-8.1E-16 COMB7	3.49422 COMB1	-1.86555 COMB5	1.57E-15 COMB4	-1.6E-15 COMB6	14.57619 COM
-27.7484 COMB1	49.0157 COMB1	+2.6799 COMB1	8E-16 COMB7	+1.5719 COMB2	3.49422 COMB1	+0.773 COMB1	3.40437 COMB1	-2.89509 COMB2	10.92564 COM
-21.2248 COMB2	34.1149 COMB2	-25.4614 COMB1	16.3945 COMB7	-19.2745 COMB5	21.12749 COMB5	-21.9037 COMB7	44.04991 COMB7	+48.0835 COMB5	36.10532 COM
+0.6581 COMB4	3.7804 COMB1	-10.9899 COMB5	4E-16 COMB6	+1.9435 COMB1	0.33874 COMB7	-0.63351 BMATI	7.46277 COMB1	-5.78764 COMB1	14.13268 COM
-3.1721 COMB5	7.7084 COMB7	-11.1728 COMB1	2.5105 COMB5	-4.4305 COMB7	2.89961 COMB7	-4.05048 COMB5	14.88683 COMB7	-15.8681 COMB7	20.70632 COM
-3.1E-15 COMB1	2.3282 COMB1	-4.5084 COMB5	1.68E-17 COMB1	1.26E-17 COMB3	0.08937 COMB7	-0.31275 COMB5	3.9E-19 COMB5	-7.2E-17 COMB1	2.62166 COM
+5.3E-14 COMB1	27.4424 COMB1	-1.2491 COMB7	2.41E-15 COMB5	-2.4E-15 COMB7	0.06707 COMB1	-0.07596 BMATI	5.53E-15 COMB7	-5.6E-15 COMB5	34.77531 COM
-1E-13 COMB4	14.4175 COMB7	1.012 COMB3	7.99E-16 COMB5	-8E-16 COMB4	1.14464 COMB7	-5.08693 COMB1	2.93E-15 COMB7	-2.9E-15 COMB5	15.8902 COM
-1E-13 COMB4	32.409 COMB5	-16.7469 COMB7	1.6E-15 COMB7	-1.6E-15 COMB5	-0.02788 COMB3	-3.26063 COMB7	3E-15 COMB7	-3.4E-15 COMB5	58.57263 COM
-7.9E-16 COMB1	5.6258 COMB6	-0.2888 COMB1	4.06E-16 COMB7	-3.9E-16 COMB5	0.06851 COMB4	-0.12663 COMB6	1.58E-15 COMB5	-1.2E-15 COMB7	7.86302 COM
-7.9E-16 COMB1	13.0579 COMB1	1.608 COMB5	7.49E-16 COMB4	-8.5E-16 COMB6	3.85536 COMB1	0.05955 COMB7	1.67E-15 COMB6	-1.6E-15 COMB6	13.0621 COM

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
-[illegible] COMB1	[illegible] COMB4	-[illegible] COMB6	[illegible] COMB8	-56.3977 COMB1	1.47344 COMB7	-0.02697 COMB4	78.41474 COMB5	-[illegible] COMB4	44.63194 COMB
-54.[illegible] COMB4	-[illegible] BMATI	-[illegible] COMB4	9.54E-18 COMB3	-113.474 COMB7	0.69405 COMB1	0.00173 COMB7	26.7888 COMB7	-[illegible] COMB7	22.72197 COMB
-221.367 COMB1	3.9322 COMB4	-7.393 COMB7	5.9723 COMB8	+4E-16 COMB5	0.68836 COMB7	-0.2068 COMB5	15.10941 COMB5	-17.0226 COMB1	10.1799 COMB
-158.834 COMB1	4.9069 COMB1	-1.3793 COMB6	5.9723 COMB8	-3.6763 COMB7	0.35417 COMB1	+0.00321 COMB6	15.23493 COMB7	-14.7516 COMB5	11.73719 COMB
+1E-13 COMB4	[illegible] COMB1	+0.4461 COMB2	3.9E-18 COMB3	-5.2E-17 COMB1	3.7007 COMB1	-0.19681 COMB5	9.84E-17 COMB1	+2.2E-17 COMB1	8.81695 COMB
-7.3E-17 COMB3	9.8414 COMB1	2.1426 COMB3	8E-16 COMB7	+4E-16 COMB5	3.7007 COMB1	1.44283 COMB5	1.6E-15 COMB5	+1.6E-15 COMB5	5.37536 COMB
+1E-13 COMB4	6.7695 COMB1	-2.4296 COMB7	5.51E-18 COMB4	-1.3E-15 COMB1	2.09157 COMB5	0.89371 COMB3	4.81E-15 COMB5	-3.6E-15 COMB4	6.23537 COMB
+171.759 COMB1	4.5211 COMB5	-4.7424 COMB4	2.9111 COMB5	-7.2944 COMB7	2.06187 COMB5	-0.23159 COMB7	19.74091 COMB1	+17.4752 COMB7	12.91432 COMB
-2.3E-15 COMB1	50.2687 COMB7	+49.2443 COMB5	4.01E-18 COMB6	+4E-16 COMB4	3.44792 COMB7	-3.79387 COMB5	5.71E-18 COMB4	-1.3E-15 COMB4	141.7444 COMB
-9E-14 COMB4	8.3822 COMB1	-0.4381 COMB5	8.14E-17 BMATI	+2E-19 COMB5	0.1859 COMB7	-1.06385 BMATI	7.87E-16 COMB7	-8.1E-16 COMB5	8.08447 BMAT
-1.4E-13 BMATI	12.4403 COMB1	-4.[illegible] BMATI	4.77E-16 COMB4	-3.6E-14 COMB4	1.4704 BMATI	-1.51914 COMB1	1.5E-15 COMB7	+1.7E-15 COMB7	27.95156 COMB
-2.6E-14 COMB4	-1.5853 COMB7	-15.4402 COMB1	-1.3E-17 COMB3	-2.8E-17 COMB1	3.3956 COMB1	0.82527 COMB7	1.42E-15 COMB5	-1.4E-15 COMB4	15.44445 COMB
-4.8E-14 COMB4	3.0422 COMB4	-2.9601 COMB1	7.74E-16 COMB6	+6.2E-14 COMB4	0.82527 COMB7	-0.16971 COMB5	3.15E-15 COMB6	-3.2E-15 COMB4	6.07389 COMB
-2.5E-14 COMB4	2.4132 COMB1	-13.7171 COMB1	3.93E-16 COMB6	+4.1E-16 COMB4	0.55363 COMB7	-0.14947 COMB7	8.24E-16 COMB6	+9E-14 COMB4	19.55721 COMB
-7.9E-16 COMB3	11.3734 COMB1	-3.4183 COMB7	2.4E-18 COMB1	+2.4E-18 COMB4	0.10774 COMB5	-1.02240 COMB7	3.99E-15 COMB4	-4E-15 COMB4	7.93834 COMB
-1.1E-13 COMB4	6.3725 COMB1	-2.1404 COMB1	+9.1E-17 COMB3	+1.7E-15 COMB5	2.43815 COMB4	-5.6092 COMB8	1.49E-15 COMB5	-3.2E-15 COMB6	-0.12496 COMB
-1.1E-13 COMB4	11.1998 COMB1	-1.3291 COMB7	1.6E-15 COMB5	+1.6E-15 COMB7	5.6596 COMB7	-3.38674 COMB6	3.2E-15 COMB4	-2.6E-15 COMB4	6.2643 COMB
-3.2E-16 COMB5	1.1310 COMB7	+11.859 COMB1	7 BMATI	-1.4E-15 COMB7	0.01405 BMATI	-0.38677 COMB1	2.55E-15 COMB6	-1.4E-15 COMB7	11.13063 COMB
-7.2E-17 COMB3	24.3234 COMB1	-8.1454 COMB5	7.93E-16 COMB5	+8E-16 COMB7	-0.00428 COMB3	-1.92507 COMB7	3.2E-15 COMB4	-3.2E-15 COMB4	36.03386 COMB
-68.1944 COMB1	56.0595 COMB1	-55.1302 COMB1	0.105 COMB1	-0.3296 COMB4	1.70768 COMB4	-0.3865 COMB7	2.34639 COMB4	-0.80196 COMB4	43.21291 COMB
-159.153 COMB7	30.9617 COMB5	-30.4691 COMB7	0.9094 COMB5	+0.9244 COMB7	3.30556 COMB7	-3.00778 COMB5	5.39344 COMB7	-5.91749 COMB5	31.45264 COMB
-2.9E-14 COMB4	1.0428 COMB5	-26.196 COMB1	7.87E-16 COMB7	+8.1E-14 COMB5	0.05685 COMB5	-0.3353 COMB1	2.28E-15 COMB6	-1.3E-15 COMB7	33.26349 COMB
-5.3E-14 COMB4	-1.7343 BMATI	+14.4941 COMB1	9.37E-14 COMB2	+4.2E-17 BMATI	5.15174 COMB1	-2.41471 COMB7	1.55E-15 COMB5	+1.7E-15 COMB5	24.39045 COMB
-4.3E-15 COMB2	19.873 COMB5	-16.6424 COMB4	2.4E-18 COMB4	-3.2E-15 COMB5	3.86854 COMB2	2.04247 COMB4	1.19E-14 COMB5	-7.1E-15 COMB4	51.77565 COMB
-91.2203 COMB6	34.7445 COMB1	-49.4111 COMB1	1.1916 COMB1	-0.279 COMB7	4.89245 COMB1	-0.39812 COMB4	4.69461 COMB1	-4.40624 COMB1	38.41471 COMB
-55.2879 COMB1	55.6001 COMB1	-50.2436 COMB1	3.7543 COMB5	-3.6346 COMB7	4.89245 COMB1	0.02453 BMATI	18.02967 COMB1	-13.5591 COMB7	135.8229 COMB
+84.1602 COMB4	41.4212 COMB1	-21.4376 COMB4	3.0292 COMB7	-0.0042 COMB5	0.10702 COMB6	+0.04258 COMB4	9.11711 COMB7	-0.14407 COMB7	17.33507 COMB
8.1E-14 COMB2	1.3744 COMB1	+2.9339 COMB5	1.11E-17 COMB1	+4E-16 COMB5	0.10746 COMB4	-0.16005 COMB5	1.31E-15 COMB5	+2.7E-17 COMB1	1.60449 COMB
-4.8E-14 COMB5	2.1116 COMB7	-15.3382 COMB1	4E-16 COMB7	+4E-16 COMB5	2.79214 COMB1	-0.16005 COMB5	1.61E-15 COMB5	-1.6E-15 COMB7	19.19764 COMB
-33.9457 BMATI	1.3445 COMB5	-34.1014 COMB1	4.203 COMB7	-24.4105 BMATI	17.24614 COMB7	-15.4177 COMB5	21.71525 COMB4	-15.[illegible] COMB7	8.94439 COMB
-71.6353 COMB1	27.6148 COMB4	-74.4422 COMB6	66.494 COMB5	-110.482 COMB7	0.027 COMB6	+0.90723 COMB1	78.45123 COMB5	-86.141 COMB7	48.3509 COMB
-8E-14 COMB7	1.2634 COMB7	+9.8654 COMB1	1.9E-15 COMB5	+1.6E-15 COMB7	-0.20931 COMB7	-1.8476 COMB1	4.52E-15 COMB4	+1.4E-15 COMB6	6.2101 COMB
-1E-13 COMB4	14.6363 COMB1	-4.9172 COMB7	1.93E-15 COMB5	+1.7E-15 COMB7	3.73462 COMB1	-1.36956 COMB7	6.27E-15 COMB7	-5.3E-15 COMB5	17.32059 COMB
-5.1E-14 COMB6	10.9754 COMB1	1.9012 COMB5	6.24E-16 COMB4	-7.7E-16 COMB4	2.84252 COMB2	1.00541 COMB5	1.42E-15 COMB4	-1.6E-15 COMB7	4.79248 COMB
-5.1E-14 COMB6	14.1097 COMB1	2.789 COMB3	2.48E-17 COMB5	0 BMATI	1.93724 COMB7	-3.55192 COMB1	6.75E-18 COMB5	+4.7E-17 COMB5	15.5314 COMB
-5.1E-14 COMB6	6.757 COMB7	+1.6271 BMATI	1.6E-15 COMB5	+1.6E-15 COMB7	0.21219 BMATI	-1.81807 COMB5	5.25E-15 COMB5	+5.3E-15 COMB7	6.36663 COMB
-4.9E-14 COMB4	0.4928 COMB1	-1.7665 COMB4	8.8E-17 COMB1	4.92E-17 COMB4	0.52514 COMB1	-0.16971 COMB5	1.34E-16 COMB1	-1.7E-15 COMB4	0.57186 COMB
-332.999 COMB1	0.7514 COMB5	-1.9472 COMB7	0.3755 COMB1	4.92E-17 COMB4	0.55363 COMB7	-0.16971 COMB5	0.32017 BMATI	-1.58364 COMB1	2.79144 COMB
-319.369 COMB1	8.321 COMB4	+9.6639 COMB6	13.561 COMB5	+15.7212 COMB7	0.0437 COMB4	-0.05732 COMB6	53.32976 COMB7	+48.2226 COMB5	30.77048 COMB
-154.421 COMB1	56.2201 COMB6	-51.4014 COMB4	62.0479 COMB7	+46.1401 COMB5	0.14902 COMB5	+0.19005 COMB7	271.4141 COMB5	+266.485 COMB7	249.1107 COMB
-147.544 COMB7	61.1124 COMB4	-57.1746 COMB6	70.1733 COMB5	+62.0916 COMB7	0.41713 COMB6	-0.43661 COMB4	390.2605 COMB5	+381.344 COMB7	244.4895 COMB
-5.1E-14 COMB5	14.2415 COMB1	-11.1013 BMATI	4.06E-16 COMB5	+3.9E-16 COMB7	0.23899 COMB7	-0.0649 COMB5	8.12E-16 COMB5	-8.1E-16 COMB6	20.68913 COMB
-1.9E-15 BMATI	-1.1314 BMATI	+25.5303 COMB1	1.39E-17 BMATI	2.37E-18 COMB2	0.37543 COMB7	-0.28187 COMB5	8.12E-16 COMB5	-8.1E-16 COMB7	35.71247 COMB
-5.3E-14 COMB4	0.1256 COMB1	-10.7582 COMB1	1.68E-17 COMB1	-7.9E-16 COMB4	-0.15495 COMB3	-0.37706 COMB1	8.13E-16 COMB4	+1.6E-15 COMB6	5.02564 COMB
-5.3E-14 COMB4	11.4083 COMB1	-4.3519 COMB5	8.12E-16 COMB6	1.20E-17 COMB3	+0.02039 COMB7	-3.13229 COMB1	1.57E-15 COMB4	-9.4E-16 COMB6	2.02725 COMB
-1.5E-15 COMB1	13.1979 COMB1	2.8601 COMB4	8.5E-16 COMB4	+7.5E-16 COMB6	-0.98002 COMB4	-3.13229 COMB1	2.25E-15 COMB4	+6.4E-16 COMB6	0.79729 COMB
-1E-13 COMB7	25.5804 COMB1	2.3346 COMB7	8.5E-16 COMB4	-1.4E-16 COMB1	-0.09619 COMB7	-1.75243 COMB4	3.33E-16 BMATI	-2.6E-15 COMB6	5.13067 COMB
-40.5457 COMB2	46.3385 COMB1	-5.3572 COMB1	4.6756 COMB4	-2.2524 COMB2	5.79637 COMB5	-6.35945 COMB7	9.81163 COMB4	-4.58715 COMB2	36.08629 COMB
-191 COMB1	27.3179 COMB7	-10.7364 COMB5	4.7879 COMB7	-6.8875 COMB5	0.56759 COMB5	-1.55315 COMB7	15.71997 COMB6	-15.0219 COMB7	43.60497 COMB
-194.396 COMB1	4.1461 COMB4	-1.7517 COMB6	5.8454 COMB5	-2.8613 COMB7	0.0177 COMB4	-0.02321 COMB4	14.34023 COMB5	-14.2779 COMB5	11.62352 COMB
-74.7771 COMB7	2.8914 COMB5	+1.0801 COMB4	2.6499 COMB5	+0.0035 COMB7	0.23653 COMB5	-0.04577 COMB6	4.16424 COMB7	-4.8155 COMB5	4.04305 COMB
-5.1E-14 COMB5	2.5256 COMB6	-1.4461 COMB7	7.47E-16 COMB7	-4.1E-16 COMB6	0.14027 COMB1	-0.26335 COMB7	1.57E-15 COMB4	-1.3E-15 COMB7	3.75997 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
-1E-13 COMB4	9.2224 COMB1	-2.5333 COMB4	7.7E-16 COMB7	-9.2E-16 COMB5	1.21163 COMB7	-4.79578 COMB1	3.29E-15 COMB6	-3.2E-15 COMB5	10.39349 COMB
-1E-13 COMB4	27.7474 COMB1	-4.827 COMB7	3.2E-15 COMB7	-3.2E-15 COMB5	1.60409 COMB5	-6.64678 COMB1	8.33E-15 COMB5	-8.6E-15 COMB7	42.00419 COMB
-89.0405 COMB1	54.7494 COMB1	-43.4121 COMB1	5.1441 COMB1	-8E-16 COMB7	-0.17036 COMB2	-4.98585 COMB2	0.44383 COMB1	-0.84464 COMB1	38.41369 COMB
-44.7566 COMB6	25.4491 COMB1	-21.3666 COMB7	5.2569 COMB6	-0.1309 COMB4	0.58929 COMB5	-2.33585 COMB7	3.43581 COMB1	-1.05033 COMB4	38.61499 COMB
0 BMAT1	11.1249 COMB7	-3.3329 COMB4	3.93E-16 COMB7	-4.1E-16 COMB4	0.35639 COMB5	-1.64719 COMB7	1.4E-15 COMB5	-1.6E-15 COMB6	15.86245 COMB
0 BMAT1	3.4414 COMB7	-0.6585 COMB4	3.36E-17 COMB1	-2.3E-17 COMB3	0.04434 COMB4	0.00363 COMB6	3.79E-17 COMB4	-1.6E-16 COMB1	2.76332 COMB
-5.2E-14 COMB4	11.3243 COMB1	-2.4194 COMB7	4.25E-16 COMB5	-4E-16 COMB4	0.75383 COMB1	-2.27814 COMB5	1.3E-15 COMB7	-1.7E-15 COMB3	4.83127 COMB
-1E-13 COMB4	8.5294 COMB4	-13.5264 COMB1	7.93E-16 COMB6	-8E-16 COMB4	3.37939 COMB1	0.17176 COMB7	1.68E-15 COMB4	-1.7E-15 COMB6	6.63855 BMAT
-5.1E-14 COMB5	-0.3751 BMAT1	-13.5264 COMB1	-4.4E-16 COMB2	-2.8E-17 BMAT1	3.37939 COMB1	0.14661 BMAT1	7.33E-17 BMAT1	-1.6E-17 BMAT1	14.65156 COMB
-1.4E-15 COMB1	0.9042 COMB4	-1.5628 COMB5	-2.5E-17 COMB3	-8.2E-16 COMB4	0.51291 COMB5	0.14661 BMAT1	4.26E-15 COMB4	-1.1E-16 COMB1	0.77521 COMB
-1E-15 COMB1	0.8734 COMB7	-13.4332 COMB1	7.74E-16 COMB6	-2.5E-17 COMB3	0.51291 COMB5	-0.13145 COMB7	3.21E-17 COMB5	-4.2E-16 COMB4	13.35824 COMB
-70.295 COMB1	0.3691 COMB1	-42.1446 COMB1	4E-16 COMB4	-47.8851 COMB1	0.12054 COMB5	-0.16814 COMB7	10.34324 COMB1	-7.54184 COMB1	52.64401 COMB
-62.3563 COMB6	45.9449 COMB1	-76.7768 COMB6	67.7429 COMB5	-107.127 COMB7	2.20736 COMB1	-2.02697 COMB4	99.136 COMB5	-88.6322 COMB7	43.38367 COMB
-85.9715 COMB4	55.4874 COMB1	-55.472 COMB1	5.1491 COMB4	-0.1974 COMB5	2.04145 COMB4	-0.14052 COMB6	0.82905 COMB5	-0.93674 COMB5	42.69653 COMB
-111.564 COMB7	59.1541 COMB1	-52.5895 COMB1	5.207 COMB7	-0.2432 COMB1	0.18509 COMB5	-3.26135 COMB7	1.03717 COMB1	-1.11768 COMB1	42.72893 COMB
-4E-13 COMB5	4.4772 COMB2	-27.4578 COMB1	3.29E-15 COMB5	-3.3E-15 COMB7	9.64716 COMB1	-4.30443 COMB5	9.69E-15 COMB7	-9.5E-15 COMB5	37.34978 COMB
-2.6E-14 COMB4	-0.1377 BMAT1	-10.9745 COMB2	1.65E-15 COMB5	-1.5E-15 COMB7	4.98718 COMB2	-0.01943 COMB1	2.33E-15 COMB7	-3.2E-15 COMB5	27.98368 COMB
-5.2E-14 COMB4	2.7333 COMB5	-3.3444 COMB7	1.61E-15 COMB7	-1.4E-15 COMB5	0.23653 COMB5	-3.26935 COMB7	4.94E-15 COMB5	-5.1E-15 COMB7	1.74561 COMB
-1.4E-15 COMB1	0.2239 COMB4	-11.7889 COMB1	7.99E-16 COMB4	-8E-16 COMB6	5.25141 COMB1	-1.04822 COMB3	4.82E-15 COMB6	-4.9E-15 COMB4	5.05681 BMAT
-1E-13 COMB4	8.5065 COMB5	-13.6368 COMB7	1.4E-15 COMB5	-1.4E-15 COMB7	9.14232 COMB5	-4.5668 COMB7	3.1E-15 COMB5	-3.3E-15 COMB7	19.28917 COMB
-7.1E-16 COMB1	0.2376 COMB1	-8.1946 COMB1	7.99E-16 COMB5	-8E-16 COMB7	0.63438 BMAT1	-2.10786 COMB5	1.6E-15 COMB5	-1.6E-15 COMB7	22.14359 COMB
-8.9E-16 BMAT1	-0.8763 COMB4	-13.1578 COMB1	0 BMAT1	-4.2E-17 BMAT1	1.31394 COMB1	0.00612 BMAT1	7.26E-17 BMAT1	-6.6E-17 COMB1	10.71159 COMB
-2.4E-14 COMB4	1.3699 COMB7	-2.4933 COMB5	2E-16 COMB6	-2E-16 COMB4	0.00712 COMB4	0.00363 COMB6	7.87E-16 COMB7	-8.1E-16 COMB5	2.67485 COMB
-8E-16 COMB2	1.3699 COMB7	-3.4197 COMB1	0 BMAT1	-1.2E-17 COMB1	0.28834 COMB4	0.00427 COMB7	4.42E-17 COMB1	-1.3E-17 COMB4	2.45805 COMB
-1E-13 COMB7	0.1734 COMB4	-27.2472 COMB1	3.99E-16 COMB7	-4E-16 COMB5	0.33446 COMB7	-0.27824 COMB5	8.02E-16 COMB5	-9E-16 COMB5	16.20412 BMAT
-2.6E-14 COMB4	-5.2014 COMB2	-27.2472 COMB1	-1.2E-17 COMB3	-4.1E-16 COMB6	0.12191 COMB4	-0.43685 COMB5	4.25E-16 COMB5	-8.1E-16 COMB6	36.8137 COMB
1.25E-17 COMB3	14.2203 COMB1	-15.0115 COMB6	3.87E-16 COMB4	-4.1E-16 COMB6	0.24827 COMB7	-1.26078 COMB1	9.37E-16 COMB5	-7.6E-16 COMB7	14.87575 COMB
-2.3E-14 COMB4	10.4713 COMB1	1.3524 COMB5	7.99E-16 COMB5	-9E-16 COMB7	-1.24505 COMB4	-3.19499 COMB2	1.87E-15 COMB4	-4.2E-15 COMB5	6.20124 COMB
0 BMAT1	6.9204 COMB7	0.3753 COMB3	-2.3E-17 COMB3	-9E-16 COMB7	0.40893 COMB1	-1.24505 COMB6	4.2E-15 COMB7	-4.9E-17 COMB1	5.93642 COMB
-190.617 COMB1	3.4285 COMB4	-3.316 COMB1	2.1835 COMB5	-7.5916 COMB1	0.51291 COMB5	-0.19161 COMB7	25.37158 COMB1	-12.5913 COMB1	11.14571 COMB
-83.6251 COMB6	54.655 COMB1	-74.3449 COMB6	69.2 COMB5	-103.452 COMB7	0.05022 COMB1	-0.02697 COMB4	79.36602 COMB5	-88.08 COMB7	56.16418 COMB
-245.325 COMB1	40.9931 COMB2	-37.1266 COMB2	5.234 COMB5	-0.2409 COMB7	0.75936 COMB5	-0.71771 COMB7	1.43062 COMB5	-1.43966 COMB7	29.9568 COMB
-237.823 COMB5	11.298 COMB4	-10.7471 COMB6	6.6094 COMB5	-6.6266 COMB7	0.037 COMB5	-0.04375 COMB7	19.46785 COMB5	-20.2564 COMB7	35.54043 COMB
-126.518 COMB1	11.6845 COMB4	-28.9149 COMB5	5.1705 COMB6	-1.7909 COMB4	0.14902 COMB5	-0.05732 COMB6	17.74829 COMB5	-9.15969 COMB1	89.63709 COMB
-109.326 COMB5	32.6005 COMB7	-28.9149 COMB5	5.1705 COMB6	-2.795 COMB5	0.14902 COMB5	-3.79614 COMB1	17.74529 COMB5	-21.8727 COMB7	89.63709 COMB
0 BMAT1	-0.6073 BMAT1	-4.8375 COMB1	7.74E-16 COMB6	-6.9E-17 COMB1	-0.19973 COMB6	-3.43114 COMB5	4.32E-16 COMB6	-7E-16 COMB6	6.56904 COMB
-221.719 COMB1	3.8332 COMB7	-2.6676 COMB6	7.3572 COMB1	-3.0799 COMB7	2.02071 COMB7	-0.19973 COMB6	15.56517 COMB1	-13.8635 COMB1	21.93474 COMB
-103.103 COMB2	25.7051 COMB1	-2.0187 COMB7	6.4139 COMB5	-0.9329 COMB7	0.47357 COMB1	-0.15891 COMB4	11.42064 COMB2	-16.3925 COMB5	38.65252 COMB
-5.1E-14 COMB5	25.4351 COMB1	3.854 COMB5	7.93E-16 COMB5	-8.1E-16 COMB7	0.52913 COMB6	-1.27767 COMB1	1.6E-15 COMB5	-1.6E-15 COMB6	15.90056 COMB
-2E-13 COMB5	31.3089 COMB5	-12.4876 COMB7	3.29E-15 COMB5	-3.1E-15 COMB7	8.55943 COMB5	-3.52616 COMB7	6.11E-15 COMB7	-6.7E-15 COMB5	36.10355 COMB
0 BMAT1	5.5043 COMB7	-17.9221 COMB1	8.12E-16 COMB4	-7.9E-16 COMB6	-0.00669 COMB3	-0.90126 COMB6	1.6E-15 COMB5	-1.6E-15 COMB7	15.51743 COMB
0 BMAT1	2.1609 COMB1	-7.1099 COMB4	2.06E-16 COMB6	-1.3E-16 COMB4	0.31838 COMB1	-0.1616 COMB7	1.19E-15 COMB4	-1.2E-15 COMB6	6.12541 COMB
-5.1E-14 COMB7	2.9713 COMB5	-1.3472 COMB7	4E-16 COMB7	-4E-16 COMB5	0.38196 COMB7	-3.15348 COMB5	1.46E-15 COMB7	-1.5E-15 COMB5	2.08457 COMB
-5.1E-14 COMB6	10.2583 COMB1	-0.7836 COMB5	8.24E-16 COMB6	-7.7E-16 COMB4	1.19999 COMB5	-3.9336 COMB1	2.88E-15 COMB4	-3E-15 COMB6	10.5598 COMB
-3.8E-14 COMB4	14.1252 COMB5	-4.2278 COMB4	1.5E-15 COMB4	-1.7E-15 COMB6	0.1402 COMB6	-16.0974 COMB5	4.72E-15 COMB6	-3.8E-15 COMB4	16.62936 COMB
-3.8E-14 COMB6	10.2742 COMB6	-19.6692 COMB1	7.99E-16 COMB4	-1.7E-15 COMB4	12.47213 COMB7	-0.54242 COMB6	4.72E-15 COMB6	-1E-15 COMB5	31.34474 COMB
-2.6E-14 COMB7	-5.7834 COMB5	-15.1382 COMB1	7.72E-17 COMB1	-8E-16 COMB6	10.14935 COMB1	-0.4394 COMB7	1.23E-15 COMB7	-1.6E-15 COMB7	24.88479 COMB
-1E-13 COMB4	13.4547 COMB1	-10.5432 COMB4	8.24E-16 COMB4	-7.7E-16 COMB6	0.21841 COMB7	1.02062 COMB3	2.54E-15 COMB5	-2.7E-15 COMB7	17.63303 COMB
-1E-13 COMB4	7.614 COMB6	1.4581 COMB5	4.12E-16 COMB7	-3.9E-16 COMB5	1.09454 COMB5	0.72054 COMB7	8.24E-16 COMB6	-7.7E-16 COMB4	7.54494 COMB
-1E-13 COMB4	7.8052 COMB7	-0.2353 COMB1	4.12E-16 COMB7	-4E-16 COMB5	0.72054 COMB7	-0.6077 COMB4	2.22E-17 COMB1	-9.2E-16 COMB7	1.56304 COMB
-70.2237 COMB1	4.5103 COMB5	-70.3666 COMB1	4E-16 COMB7	-35.3937 COMB1	0.60716 COMB5	-0.93201 COMB7	13.52326 BMAT1	-5.53261 COMB1	26.61509 BMAT
-70.2237 COMB1	22.7204 COMB4	-80.1734 COMB6	70.9706 COMB5	-100.175 COMB7	3.99325 COMB1	-0.02697 COMB4	79.62831 COMB5	-84.4897 COMB7	59.21575 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 max
-54.5494 COMB1	55.1859 COMB2	-62.5477 COMB1	0.294 COMB1	-9E-16 COMB4	1.96287 COMB6	-0.3257 COMB4	1.19482 COMB1	-1.11975 COMB1	42.74035 COMB
-91.4131 COMB6	85.9437 COMB5	-21.5703 COMB6	0.1274 COMB7	-4E-16 COMB5	0.31589 COMB6	-0.20311 COMB5	0.43855 COMB7	-2.19131 COMB7	20.7005 COMB
+171.981 COMB1	54.6596 COMB1	-49.6001 COMB1	0.2542 COMB1	+4.0893 COMB1	0.7977 COMB5	-0.73805 COMB7	13.96712 COMB1	+6.47916 COMB1	38.5894 COMB
-166.791 COMB1	55.2136 COMB2	+36.146 COMB1	0.136 COMB1	-6.3657 COMB7	1.54849 COMB4	-1.67844 COMB5	15.74465 COMB7	-14.0438 COMB7	42.08874 COMB
-119.217 COMB7	19.9597 COMB6	+30.8878 COMB7	0.487 COMB4	+1.291 COMB7	4.81127 COMB7	-1.71094 COMB6	8.10981 COMB7	+3.16444 COMB7	31.19482 COMB
-1E-15 COMB4	19.4801 COMB1	+4.3149 COMB7	4.99E-16 COMB4	-7E-16 COMB4	3.37967 COMB6	+5.54946 COMB5	1.7E-15 COMB1	+2.4E-15 COMB6	20.47559 COMB
+1.1E-14 COMB1	4.8515 COMB6	+27.2112 COMB1	6.99E-16 COMB4	+8.1E-16 COMB1	6.42404 COMB7	0.12244 COMB7	1.03E-14 COMB1	+1.7E-15 COMB6	34.48741 COMB
+2.1E-15 COMB1	+2.9283 BMAT1	+11.9403 COMB1	1.94E-16 COMB4	+2.1E-16 COMB4	0.8109 COMB7	-3.42614 COMB1	8.12E-16 COMB4	+8.1E-16 COMB5	14.70497 COMB
-2.7E-14 COMB4	6.8743 COMB1	+4.794 COMB5	8.24E-16 COMB4	-7.7E-16 COMB4	0.14975 COMB2	+1.97161 COMB6	2.24E-15 COMB4	-2.1E-15 COMB3	8.47048 COMB
+1.1E-14 COMB2	20.7349 COMB1	+3.5968 COMB7	3.4E-15 COMB7	+3E-15 COMB5	6.74515 COMB3	-7.41739 COMB7	5.99E-15 COMB5	+6.8E-23 COMB7	31.31933 COMB
-5.1E-14 COMB4	10.3544 COMB1	9.7415 COMB5	2.41E-15 COMB6	+3.4E-15 COMB7	3.45924 COMB7	-10.4647 COMB1	4.56E-15 COMB7	+3.7E-15 COMB5	28.93077 COMB
+69.9614 COMB1	11.6233 COMB2	-73.374 COMB1	1.4E-15 COMB1	-29.6744 COMB1	0.08025 COMB2	+7.84644 COMB1	24.22195 COMB1	-1.45217 COMB1	41.74374 COMB
+64.6327 COMB6	25.4824 COMB4	+81.3827 COMB6	72.9146 COMB5	-36.982 COMB7	0.25726 COMB4	-1.04609 COMB5	79.9304 COMB5	+49.9123 COMB7	41.66015 COMB
-7.3E-14 COMB1	6.9883 COMB7	+11.8994 COMB1	4E-16 COMB4	+8.6E-19 COMB3	0.04454 COMB7	+2.26523 COMB4	4.12E-16 COMB4	+1.2E-18 COMB6	14.29574 COMB
-1E-13 COMB4	5.4153 COMB7	+4.7944 COMB5	2.99E-16 COMB1	+4E-14 COMB7	3.31434 COMB1	+2.27711 COMB5	2E-15 COMB5	-2E-15 COMB7	5.90461 COMB
-7.1E-15 BMAT1	1.973 COMB5	+3.2484 COMB7	7.99E-16 COMB1	+4E-14 COMB7	0.14196 COMB7	-2.1834 COMB5	2.13E-15 COMB5	-2.1E-15 COMB7	2.65411 COMB
+7.1E-15 BMAT1	1.3297 COMB1	+2.6814 COMB5	7.49E-16 COMB5	+1.8E-15 COMB4	1.19999 COMB5	+2.07784 COMB1	3.98E-15 COMB4	-8.1E-16 COMB5	3.47241 COMB
+1.1E-13 COMB1	3.122 COMB1	-13.8832 COMB1	1.55E-15 COMB6	+8.2E-16 COMB7	4.47766 COMB5	-1.59664 COMB7	3.2E-15 COMB1	+3.7E-15 COMB6	43.5635 COMB
+6.4E-14 COMB6	7.2 COMB5	-13.3699 COMB7	6.94E-18 BMAT1	-1.9E-16 COMB7	4.47766 COMB5	-2.5074 COMB1	3.2E-15 COMB5	+3.2E-15 COMB7	35.01069 COMB
8.25E-18 COMB3	+0.2284 BMAT1	+6.1405 COMB5	3.38E-16 COMB5	+3.3E-17 COMB1	+0.17482 BMAT1	-1.7439 COMB5	4E-16 COMB5	+4.2E-16 COMB5	7.2544 COMB
+4.8E-14 COMB5	21.3261 COMB1	+4.6323 COMB7	7.75E-16 COMB5	+8.2E-16 COMB4	0.60716 COMB5	+0.93201 COMB7	3.3E-15 COMB4	+3.1E-15 COMB6	35.96386 COMB
+5.1E-14 COMB7	24.8441 COMB1	3.4153 COMB4	1.97E-16 COMB6	+2.1E-16 COMB4	0.3677 COMB5	+0.15747 COMB4	1.22E-15 COMB4	+8.3E-16 COMB5	26.97467 COMB
-214.319 COMB1	20.8744 COMB6	1.1339 COMB3	1.1387 COMB1	+1.3E-17 COMB2	0.12191 COMB4	+0.40326 COMB7	2.39568 COMB4	+4.04326 COMB1	14.24464 COMB
-136.461 COMB1	7.7799 COMB1	+1.6911 COMB6	4.9796 COMB5	-4.2065 COMB7	0.0177 COMB4	+0.01771 COMB7	13.41934 COMB5	-12.581 COMB7	16.36798 COMB
-74.1429 COMB7	10.7434 COMB1	+0.1404 COMB1	0.1134 COMB5	-1.26 COMB7	0.37955 COMB1	+0.02325 COMB6	4.74127 COMB7	+1.20743 COMB6	7.21022 COMB
0 BMAT1	8.0403 COMB2	+0.1974 COMB4	8.12E-16 COMB4	-7.3E-14 COMB4	0.30496 COMB4	0.00342 COMB4	1.6E-15 COMB6	+1.6E-15 COMB7	2.31994 COMB
-2.6E-14 COMB7	15.3796 COMB1	+0.0856 COMB7	8.24E-16 COMB4	-7.7E-16 COMB6	3.82164 COMB1	0.02482 COMB3	3.83E-15 COMB6	-4E-15 COMB4	13.11433 COMB
-100.061 COMB6	54.6595 COMB1	-49.5002 COMB1	0.2468 COMB5	-0.241 COMB7	1.85079 COMB6	+0.83515 COMB7	1.62067 COMB5	+1.5895 COMB7	38.5968 COMB
0 BMAT1	0.3095 COMB1	+10.4426 COMB2	4E-16 COMB5	-2E-16 COMB4	0.1701 COMB5	+0.08637 COMB4	1.21E-15 COMB4	+1.4E-15 COMB5	19.56184 COMB
-201.59 COMB1	20.432 COMB4	-82.2671 COMB6	75.2712 COMB5	-93.033 COMB7	0.09902 COMB6	-0.12745 COMB7	80.30049 COMB5	+83.3249 COMB7	63.57311 COMB
-163.614 COMB1	11.0445 COMB4	-19.0023 COMB6	20.0516 COMB5	-15.7987 COMB7	0.0437 COMB4	-0.05732 COMB6	18.13687 COMB5	-42.5094 COMB5	41.55648 COMB
-144.896 COMB1	76.9156 COMB6	-74.4253 COMB4	2.1377 COMB1	-94.3144 COMB5	0.14902 COMB5	+0.04955 COMB7	307.2468 COMB5	+78.2277 COMB5	253.7778 COMB
-37.2625 COMB7	76.9156 COMB6	-33.2987 COMB6	97.0898 COMB7	-32.466 COMB7	4.2421 COMB1	-0.29954 COMB4	394.4012 COMB5	+133.135 COMB7	297.9222 COMB
0 BMAT1	+0.2984 BMAT1	+10.5908 COMB2	0 BMAT1	+2.3E-17 COMB3	3.16364 COMB2	-0.40576 COMB1	8.65E-16 COMB4	+7.7E-16 COMB4	11.19083 COMB
-51.5508 COMB1	59.4672 COMB1	+52.2565 COMB1	1.6E-15 COMB5	+0.0154 COMB1	0.14037 COMB5	-0.47526 COMB7	0.06578 COMB1	+0.07373 COMB1	41.89882 COMB
+95.9561 COMB6	41.539 COMB2	-21.4336 COMB5	0.0128 COMB7	+0.0241 COMB5	1.60216 COMB1	-3.93993 COMB4	0.14991 COMB5	-1.10286 COMB7	31.45736 COMB
-2E-13 COMB5	18.3691 COMB6	-22.6844 COMB7	1.65E-15 COMB5	+1.5E-15 COMB7	16.17853 COMB7	-14.6733 COMB3	3.09E-15 COMB7	+9.5E-15 COMB5	81.14999 COMB
-173.234 COMB1	14.3401 COMB1	+5.8536 COMB1	2.13E-16 COMB6	+3.8909 COMB1	0.16813 COMB7	-0.13267 COMB5	5.6415 BMAT1	+6.56037 COMB1	20.21758 COMB
-173.294 COMB1	15.2494 COMB1	+5.8536 COMB1	1.327 COMB5	+4.4105 COMB7	0.31498 COMB5	+2.73724 COMB1	15.44211 COMB7	-14.1903 COMB7	19.69805 COMB
0 BMAT1	7.389 COMB4	+0.2688 COMB1	4E-16 COMB7	+4E-16 COMB5	3.46928 COMB1	+1.45141 COMB7	7.87E-16 COMB4	+8.1E-16 COMB6	7.34927 COMB
-5.1E-14 COMB6	33.8713 COMB2	+0.4368 COMB4	8.24E-16 COMB4	-7.7E-16 COMB4	0.55979 COMB4	+0.34503 COMB1	1.65E-15 COMB7	-1.6E-15 COMB5	38.36142 COMB
+6.4E-15 COMB3	32.3094 COMB7	-7.0904 COMB5	1.4E-15 COMB4	+1.4E-15 COMB4	4.36514 COMB7	-4.58045 COMB5	3.6E-15 COMB5	+3.4E-15 COMB6	106.854 COMB
-70.9956 COMB1	19.7221 COMB4	-77.1487 COMB1	7.87E-16 COMB7	-14.4191 COMB1	0.2984 COMB4	-0.17158 COMB6	12.42511 COMB1	+4.81424 COMB4	64.91961 COMB
-65.5749 COMB6	19.7222 COMB4	-82.6539 COMB6	77.572 COMB5	+49.8471 COMB7	0.027 COMB6	-0.05662 COMB1	80.66461 COMB5	+82.807 COMB7	40.63653 COMB
-5E-14 COMB6	1.761 COMB2	-13.1344 COMB1	4E-16 COMB7	+4E-16 COMB5	0.16896 COMB5	-3.85267 COMB1	1.2E-15 COMB4	-1.2E-15 COMB6	12.98722 COMB
-1.7E-16 COMB3	-2.2435 COMB4	+9.8501 COMB2	8.24E-16 COMB6	+7.7E-16 COMB4	-1.13639 COMB4	-3.85267 COMB1	2.28E-15 COMB4	-1.2E-15 COMB4	12.98722 COMB
-2.5E-17 COMB2	11.1496 COMB1	-4.5574 COMB6	8.24E-16 COMB6	-1.7E-16 COMB3	-0.1337 COMB3	-1.88528 COMB6	2.48E-17 COMB1	-2.3E-15 COMB4	4.24341 COMB
0 BMAT1	13.1952 COMB1	+0.0048 COMB7	7.99E-16 COMB5	+8E-16 COMB	2.47547 COMB1	-0.29371 COMB4	2.48E-15 COMB4	+2.3E-15 COMB6	1e-16744 COMB
-5.1E-14 COMB7	9.9343 COMB2	0.8127 COMB7	8.12E-16 COMB4	-7.7E-16 COMB4	2.17597 COMB2	0.24022 COMB7	2.9E-15 COMB5	+1.6E-15 COMB5	7.125 COMB
-1E-13 COMB4	4.049 COMB7	-0.4824 COMB5	2.37E-15 COMB7	-2.4E-13 COMB5	1.23069 COMB7	-1.21682 COMB3	7.27E-15 COMB5	-4.2E-15 COMB4	4.91961 COMB
-1.1E-14 COMB1	16.4988 COMB5	-11.4103 COMB7	3.35E-15 COMB3	-3.1E-19 COMB7	1.23069 COMB7	-1.90337 COMB1	3.2E-15 COMB5	-8.7E-15 COMB5	14.43096 COMB
-69.5861 COMB1	18.8796 COMB4	-82.3028 COMB6	80.309 COMB5	+86.4735 COMB7	0.027 COMB6	-3.32258 COMB7	81.10058 COMB5	-82.2627 COMB7	66.00962 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
-85.1151 COMB1	84.4261 COMB1	-49.3038 COMB1	0.0243 COMB1	-4E-14 COMB4	0.40103 COMB7	-0.43754 COMB5	0.59185 COMB1	-0.15844 COMB1	94.69754 COMB
-107.799 COMB1	45.9918 COMB1	-42.7477 COMB6	93.2956 COMB1	-83.4194 COMB7	0.96321 COMB5	-1.89613 COMB7	81.2747 COMB1	-45.7712 COMB7	88.92899 COMB
-63.3971 COMB6	25.1354 COMB1	-42.7477 COMB6	9.1323 COMB6	-83.4194 COMB7	0.027 COMB6	-0.00574 COMB1	4.14852 COMB6	-45.7712 COMB7	36.49371 COMB
-18.2528 BMATI	10.4292 COMB6	-25.1562 BMATI	0.0413 BMATI	-1E-14 COMB4	0.40427 COMB5	-0.41157 COMB7	0.37183 BMATI	-4E-14 COMB4	19.85819 BMAT
-104.103 COMB6	58.2274 COMB1	-54.1323 COMB1	0.3417 COMB7	-0.2141 COMB5	0.44636 COMB1	-1.47984 BMATI	1.8387 COMB7	-1.51697 COMB7	82.12384 COMB
-76.1769 COMB7	21.0404 COMB7	1.6474 COMB1	0.3417 COMB7	-1.6E-13 COMB3	-0.00996 COMB7	-1.39273 COMB1	3.64E-15 COMB4	-1.51697 COMB7	14.40006 COMB
-2.0E-14 COMB4	6.7969 COMB7	-1.0429 COMB1	2.97E-16 COMB4	-1.4E-13 COMB4	0.14027 COMB5	-0.41157 COMB7	3.66E-15 COMB4	-3.4E-15 COMB6	1.20411 COMB
-2.6E-14 COMB7	13.2475 COMB1	1.1575 COMB5	7.74E-16 COMB6	-9.2E-14 COMB1	3.45113 COMB1	-3.47526 COMB7	2.4E-15 COMB4	-2.3E-15 COMB6	12.93398 COMB
-7.7E-14 COMB4	7.142 COMB7	-11.2099 COMB1	7.97E-16 COMB6	-9.1E-13 COMB7	1.78872 COMB7	-3.02548 COMB6	3.2E-15 COMB4	-1.2E-15 COMB4	6.3864 COMB
-3E-13 COMB4	3.8247 COMB6	-4.915 COMB4	1.55E-15 COMB3	-1.1E-14 COMB1	18.41827 COMB5	-3.5466 COMB4	3.29E-15 COMB4	-1.4E-15 COMB5	21.65795 COMB
-173.516 COMB1	3.8281 COMB6	-6.2045 COMB1	3.8231 COMB3	-1.262 COMB1	0.01199 COMB5	-19.8193 COMB7	11.24422 COMB1	-0.17502 COMB5	32.14921 COMB
-149.788 COMB1	3.4612 COMB4	-9.0403 COMB4	5.4438 COMB1	-6.3914 COMB7	0.01139 COMB5	-3.01771 COMB7	14.76014 COMB7	-13.8891 COMB7	18.3196 COMB
-90.3461 COMB2	6.569 COMB7	-2.01 COMB1	3.5704 COMB5	-1.4214 COMB7	1.00958 COMB1	-1.05919 COMB3	7.36449 COMB7	-6.2474 COMB5	7.82319 COMB
-2E-13 COMB7	14.1167 COMB1	-3.7453 COMB5	3.2E-15 COMB3	-3.2E-15 COMB7	9.04243 COMB7	-8.3379 COMB5	6.34E-15 COMB7	-4.2E-15 COMB5	20.82425 COMB
-1E-13 COMB4	5.7023 COMB6	-13.5763 COMB1	7.99E-16 COMB4	-9E-14 COMB6	2.90427 COMB1	-0.16283 COMB5	2.37E-15 COMB5	-2.4E-15 COMB7	7.31596 COMB
-5.2E-14 COMB6	-0.0877 BMATI	-13.5763 COMB1	6E-16 COMB4	-6E-14 COMB6	2.90427 COMB1	0.22113 BMATI	2.37E-15 COMB7	-2.4E-15 COMB5	16.72019 COMB
-8.4E-14 COMB7	0.2524 COMB6	-5.9405 BMATI	7.99E-16 COMB5	-9E-14 COMB7	0.58479 COMB4	-2.14274 COMB6	1.95E-15 COMB4	-1E-15 COMB6	7.9044 BMAT
-1.6796 BMATI	24.6896 BMATI	-12.3234 BMATI	4.12E-16 COMB6	-0.0619 BMATI	3.199 BMATI	-3.20756 COMB7	0.37806 BMATI	-0.17805 BMATI	19.36044 COMB
-133.174 COMB6	84.7511 COMB1	-49.4085 COMB1	0.239 COMB5	-0.3499 COMB7	1.04461 COMB5	-1.16441 COMB1	1.59088 COMB1	-1.91443 COMB7	38.40722 COMB
-1.2E-17 COMB3	-1.2214 COMB5	-7.3009 COMB7	4E-16 COMB7	-4E-14 COMB5	-0.00557 BMATI	-1.65035 COMB4	9.21E-16 COMB4	-7.7E-16 COMB5	7.38716 COMB
-2.2E-14 COMB6	0.333 COMB3	-2.7708 COMB1	8.5E-16 COMB7	-7.5E-14 COMB5	1.23069 COMB7	-1.21642 COMB5	2.84E-15 COMB5	-3E-15 COMB7	4.50347 COMB
-4.3E-14 COMB6	13.4362 COMB5	-20.7119 COMB7	3.1E-15 COMB5	-3.3E-14 COMB7	11.33825 COMB5	-7.64018 COMB7	6.12E-15 COMB4	-9.2E-15 COMB5	26.00815 COMB
-96.9127 COMB6	55.8003 COMB1	-52.2433 COMB1	0.0326 COMB7	-0.0209 COMB5	0.10344 COMB5	-7.64018 COMB7	0.14431 COMB5	-0.13379 COMB7	41.9093 COMB
-1E-13 COMB4	9.9444 COMB2	-13.499 COMB1	4E-16 COMB4	-4E-16 COMB4	3.57619 COMB1	-2.86077 COMB2	2.33E-15 COMB4	-2.3E-15 COMB4	15.31003 COMB
-4.2E-14 COMB2	+2.3906 COMB4	-7.6906 COMB2	8.24E-16 COMB4	-7.7E-16 COMB6	2.68504 COMB2	0.94034 COMB6	2.57E-15 COMB4	-2.7E-15 COMB4	11.48389 COMB
-4.1E-14 COMB1	0.1634 COMB1	-4.3568 COMB7	2.01E-17 COMB3	+2.2E-17 COMB1	1.00784 COMB7	-0.01943 COMB1	8.24E-16 COMB6	-4.7E-17 COMB1	6.02016 COMB
-7.7E-14 COMB4	2.8212 BMATI	-0.1734 COMB5	7.99E-16 COMB5	+8E-14 COMB7	0.35603 COMB7	-0.34512 COMB5	1.4E-15 COMB5	-1.6E-15 COMB7	2.66444 BMAT
-2.8E-14 COMB6	10.1455 COMB1	0.0192 COMB7	8.12E-16 COMB4	-8E-14 COMB7	0.35603 COMB7	-0.35084 COMB1	2.46E-15 COMB6	-2.8E-15 COMB4	4.03556 COMB
-201.7 COMB6	54.7623 COMB1	-49.4173 COMB1	0.3387 COMB5	-0.2138 COMB7	0.73142 COMB5	-1.13197 COMB7	1.91515 COMB5	-1.81637 COMB7	38.40442 COMB
-45.9139 COMB7	21.8593 COMB7	-20.4824 COMB7	-1.3E-17 COMB3	-0.2138 COMB7	0.10376 COMB4	-1.13197 COMB7	0.36876 COMB7	-1.81637 COMB7	15.23065 COMB
-3.9E-17 COMB1	3.7174 COMB4	-0.6524 COMB4	5.97E-16 COMB4	-4.1E-16 COMB6	0.33725 COMB7	-0.329 COMB5	1.42E-15 COMB4	-1.4E-15 COMB5	2.67738 COMB
+1E-13 COMB4	4.0402 COMB5	-1.424 COMB7	5.13E-17 COMB3	5.04E-17 COMB2	1.19021 COMB5	-1.16123 COMB7	4.5E-16 COMB4	-5.5E-16 COMB6	5.4749 COMB
-2.6E-14 COMB6	-0.3482 COMB6	-13.0801 COMB1	8.24E-16 COMB6	-7.7E-14 COMB4	2.82549 COMB1	-1.16123 COMB7	1.65E-15 COMB7	-1.4E-15 COMB7	13.37474 COMB
-5E-14 COMB7	28.1294 COMB1	-5.0638 COMB7	2E-16 COMB6	-7.7E-16 COMB4	1.702 COMB7	-2.44295 COMB7	1.5E-15 COMB7	-4.3E-16 COMB5	36.47708 COMB
-168.639 COMB1	12.5505 COMB4	-9.0525 COMB6	7.4573 COMB5	-7.2184 COMB7	0.037 COMB5	-2.44295 COMB7	21.40793 COMB5	-21.4057 COMB7	37.766 COMB
-119.044 COMB5	37.6228 COMB7	-33.7747 COMB5	9.0107 COMB6	-1.449 COMB4	0.14902 COMB5	-0.19005 COMB7	23.67797 COMB4	-28.4385 COMB6	106.0902 COMB
-79.7441 BMATI	-2.7321 BMATI	-35.7145 COMB1	1.3E-15 COMB7	+1.3311 BMATI	0.47323 COMB7	-0.41358 COMB5	1.04454 BMATI	-2.35322 BMATI	36.08997 COMB
-171.423 COMB1	54.669 COMB1	-49.4906 COMB1	3.9383 COMB5	-6.0729 COMB7	0.94161 COMB5	-0.19584 COMB4	14.67256 COMB7	-15.6921 COMB7	38.58039 COMB
-99.6642 COMB6	22.3865 COMB5	-21.1562 COMB6	0.2939 COMB5	-0.2971 COMB7	0.94161 COMB5	-2.63403 COMB1	0.87391 COMB7	-1.78379 COMB7	15.88949 COMB
+38.2953 COMB6	54.4442 COMB1	-49.7154 COMB1	0.2558 COMB5	-0.2623 COMB7	1.05533 COMB5	-2.92321 COMB7	1.47923 COMB5	-1.68056 COMB7	38.94995 COMB
+1E-13 COMB7	+0.5543 COMB4	-11.8379 COMB1	7.97E-16 COMB5	-8.1E-16 COMB7	0.34733 COMB1	-3.98736 COMB1	3.2E-15 COMB4	-3.2E-15 COMB6	6.01881 COMB
-1E-13 COMB7	-2.1465 COMB3	-11.8379 COMB1	8.12E-16 COMB4	-7.9E-16 COMB4	-1.12757 COMB4	-3.98736 COMB1	9.43E-16 COMB5	-2.3E-15 COMB4	11.1664 COMB
-1E-13 COMB7	24.0247 COMB1	-4.3792 COMB6	8.12E-16 COMB6	-7.9E-16 COMB4	-0.20442 BMATI	-1.99935 COMB4	3.32E-15 COMB1	-1.5E-15 COMB7	6.19756 COMB
2E-16 COMB3	31.5974 COMB5	-13.8595 COMB7	3E-15 COMB7	-3.4E-15 COMB5	7.97819 COMB5	-8.38224 COMB7	6.58E-15 COMB5	-6.2E-15 COMB7	42.59132 COMB
-5E-14 COMB4	1.3931 COMB5	-1.4435 COMB7	3.97E-16 COMB4	-4.1E-16 COMB4	0.20555 COMB7	-0.31622 COMB5	1.51E-15 COMB6	-1.4E-15 COMB4	3.20774 COMB
-1.2E-13 COMB5	2.3587 COMB1	-1.1543 COMB5	7.49E-16 COMB5	-8.5E-16 COMB7	1.14847 COMB5	-0.37613 COMB6	1.5E-15 COMB4	-1.7E-15 COMB5	2.51031 COMB
0 BMATI	10.7911 COMB1	-0.2104 COMB6	-5.1E-17 COMB3	-8.5E-16 COMB7	-0.37613 COMB6	-3.93242 COMB1	1.41E-15 COMB6	-1.7E-15 COMB5	10.70492 COMB
-1.8E-13 COMB5	13.9134 COMB5	-13.4474 COMB7	1.45E-15 COMB7	-1.8E-15 COMB5	11.97212 COMB7	-15.5466 COMB5	6.2E-15 COMB5	-5.5E-15 COMB7	30.07154 COMB
+1E-13 COMB5	10.431 COMB2	-0.4577 COMB1	7.97E-16 COMB5	-8.1E-16 COMB7	0.00434 COMB1	-2.65999 COMB2	4.22E-15 COMB6	-4.2E-15 COMB4	6.28654 COMB
-1.1E-13 COMB2	8.4752 COMB5	-1.8763 COMB4	8.5E-14 COMB7	4.92E-17 COMB3	0.1294 COMB6	-0.34512 COMB5	9.99E-17 COMB3	-2.7E-15 COMB6	1.17557 COMB
0 BMATI	14.5845 COMB1	-2.3653 COMB7	4E-16 COMB6	-7.5E-16 COMB5	0.35603 COMB7	-0.17586 COMB5	2.56E-15 COMB7	-2.4E-15 COMB5	20.21632 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
-118.312 COMB6	55.6889 COMB1	-35.8907 COMB1	1.5851 COMB6	-1.0829 COMB7	5.84823 COMB7	-5.78234 COMB5	13.53184 COMB7	-12.4989 COMB5	42.62409 COM
-99.7211 COMB6	41.4124 COMB1	-33.2549 COMB5	0.0342 COMB7	-2.0145 COMB5	3.7588 COMB1	-0.08125 COMB7	9.12746 COMB6	-0.24875 COMB7	31.48212 COM
-2.7E-14 COMB4	8.0192 COMB7	-13.9078 COMB1	1.59E-15 COMB6	-1.6E-15 COMB4	1.98235 COMB6	-0.03112 COMB4	3.3E-15 COMB4	-3E-15 COMB4	19.62808 COM
-187.759 COMB1	4.6266 COMB4	-5.4654 COMB4	5.5367 COMB1	-1.9E-16 COMB4	0.18095 COMB5	-2.19257 COMB7	14.54659 COMB5	-13.0869 COMB5	11.83937 COM
-125.191 COMB1	11.1912 COMB7	-1.2965 COMB6	2.7924 COMB1	-3.33E-16 COMB7	0.0177 COMB4	-1.32945 COMB1	9.52695 COMB1	-11.5397 COMB7	16.14097 COM
-1.4E-14 COMB4	25.3229 COMB5	0.0159 COMB7	6.12E-16 COMB6	-7.9E-16 COMB4	0.04569 COMB6	-0.32945 COMB1	1.42E-15 COMB4	-1.4E-15 COMB7	35.97695 COM
-193.425 COMB1	14.8943 COMB1	-4.1541 COMB1	0.7811 COMB1	-3.1E-16 COMB4	0.41958 COMB5	-3.44578 COMB7	1.35942 COMB1	-2.86284 COMB1	27.25469 COM
-142.61 COMB1	0.3047 COMB4	-27.4017 COMB1	4.9114 COMB6	-4.1112 COMB7	0.01498 COMB5	-6.65564 COMB1	13.61243 COMB5	-12.5093 COMB7	37.13777 COM
-2E-14 COMB4	-1.6248 COMB3	-16.1549 COMB6	1.57E-15 COMB4	-1.6E-15 COMB6	3.55398 COMB1	-2.77127 COMB4	2.91E-15 COMB4	-3.2E-15 COMB7	23.31745 COM
-8.1E-14 COMB4	0.0932 COMB1	-7.1023 COMB5	4E-16 COMB4	-4E-16 COMB4	1.82243 COMB4	-0.0037 COMB1	1.4E-15 COMB5	-1.4E-15 COMB7	6.34031 COM
-1E-13 COMB4	1.2464 COMB1	-1.2965 COMB5	3.89E-17 COMB1	-7.8E-17 COMB4	0.25447 COMB5	-0.26643 COMB7	9.77E-17 COMB4	-1.9E-16 COMB1	1.16369 COM
-9.1E-14 COMB5	1.6414 COMB4	-3.3641 COMB1	8.24E-16 COMB6	-7.7E-16 COMB4	0.33725 COMB7	-0.309 COMB5	1.57E-15 COMB4	-1.7E-15 COMB5	3.87034 COM
-1.1E-15 COMB1	14.2413 COMB1	-1.4399 COMB7	4E-16 COMB7	-4E-16 COMB5	1.18021 COMB5	-1.16123 COMB7	4.43E-15 COMB1	-4.7E-15 COMB7	20.59432 COM
-3.2E-14 COMB4	5.4349 COMB6	-1.2966 COMB4	8.12E-16 COMB6	-7.9E-16 COMB1	0.28159 COMB7	-0.10435 COMB5	3.14E-15 COMB5	-3.2E-15 COMB7	8.25693 COM
-1E-13 COMB4	21.5879 COMB5	-19.014 COMB7	1.68E-15 COMB6	-1.6E-15 COMB4	8.31695 COMB7	-3.90916 COMB5	9.14E-15 COMB4	-4.4E-15 COMB6	30.94114 COM
-1E-13 COMB4	27.7421 COMB1	-15.4052 COMB7	3.13E-15 COMB6	-3.2E-15 COMB4	6.65513 COMB1	-1.63411 COMB4	6.51E-15 COMB4	-5.1E-15 COMB6	37.15119 COM
-1.6E-15 COMB2	19.1014 COMB7	-1.9008 COMB7	3.19E-15 COMB5	-3.2E-15 COMB7	5.49237 COMB5	-6.04819 COMB7	3.6E-15 COMB5	-4E-15 COMB5	4.51941 COM
0 BMATI	3.3921 COMB1	-3.0239 COMB7	0 BMATI	-3.2E-15 COMB7	-5.06348 BMATI	-6.04819 COMB7	4.4E-15 COMB7	-4E-15 COMB7	13.35905 COM
-5.1E-14 COMB6	1.801 COMB5	-3.3417 COMB7	2.78E-17 BMATI	0 BMATI	0.20555 COMB7	-0.31622 COMB5	7.99E-16 COMB6	-9E-16 COMB4	4.13174 COM
-8.9E-15 COMB1	0.9784 COMB7	+10.9619 COMB1	8.25E-16 COMB5	-7.7E-16 COMB7	3.77841 COMB1	-1.10841 COMB7	1.6E-15 COMB5	-1.6E-15 COMB6	9.99676 COM
-1.1E-13 COMB7	10.8283 COMB5	-25.7048 COMB1	1.6E-15 COMB7	-1.6E-15 COMB5	4.86754 COMB5	-1.38692 COMB7	4.14E-15 COMB5	-4.4E-15 COMB7	59.606 COM
-2.6E-14 COMB7	+0.1493 BMATI	-11.1661 COMB1	6.12E-16 COMB6	-7.9E-16 COMB6	0.49692 COMB7	-0.46337 COMB5	1.43E-15 COMB7	-1.6E-15 COMB7	27.05591 COM
-2.4E-14 COMB4	+0.7589 COMB4	-4.4726 COMB7	1.2E-15 COMB7	-1.2E-15 COMB3	0.30481 COMB4	-0.03665 COMB6	2.91E-15 COMB5	-4E-16 COMB7	4.6812 COM
+190.05 COMB1	4.0141 COMB1	+6.8139 COMB1	3.2866 COMB5	-7.1047 COMB7	0.07003 COMB7	-0.01771 COMB7	14.17488 COMB7	-17.4084 COMB7	22.89966 COM
9.37E-18 COMB2	3.1733 COMB6	-0.8429 COMB4	7.99E-16 COMB5	-1E-16 COMB4	0.06751 COMB5	-0.02824 COMB4	7.99E-16 COMB4	-2.4E-15 COMB6	2.9532 COM
9.37E-18 COMB2	3.5733 COMB6	-0.6864 COMB4	9.99E-17 COMB5	-9E-16 COMB7	0.04511 COMB1	-0.3617 COMB7	2.4E-15 COMB4	-8E-16 COMB6	2.74069 COM
-1E-13 COMB7	1.1754 COMB6	-4.7429 BMATI	9E-16 COMB7	-9E-16 COMB1	0.63348 COMB7	-1.63782 BMATI	3.3E-16 COMB5	-3.2E-15 COMB7	1.99698 COM
-2.1E-15 COMB2	-3.3255 COMB3	-14.3294 COMB1	5.58E-16 COMB1	0 BMATI	-0.98934 COMB4	-3.61218 COMB1	2.79E-17 COMB1	-1.6E-15 COMB7	11.34426 COM
-99.5036 COMB6	55.4836 COMB1	-82.24 COMB1	0.046 COMB7	-0.0184 COMB5	0.11662 COMB5	-1.95999 COMB6	0.21442 COMB4	-0.13578 COMB1	61.91915 COM
-42.0338 COMB7	25.4937 COMB1	0.5353 COMB7	0.046 COMB7	-5.6E-16 COMB1	0.33665 COMB5	-0.72914 COMB7	2.54E-17 COMB2	-0.24876 COMB7	38.64249 COM
-4.8E-15 COMB6	11.3445 COMB1	0.4492 COMB3	0 BMATI	-2.2E-17 COMB1	3.98562 COMB1	-0.72914 COMB7	1.41E-15 COMB5	-1.6E-15 COMB6	11.2142 COM
-1.4E-15 COMB1	13.9999 COMB1	2.7316 COMB3	-1.2E-17 COMB4	-6.1E-17 COMB1	1.89256 COMB7	-3.5555 COMB1	1.12E-14 COMB1	-8.9E-17 COMB1	15.34761 COM
-1E-13 COMB4	7.1255 COMB7	2.2803 BMATI	7.62E-16 COMB4	-8.4E-16 COMB6	0.0151 COMB3	-1.87101 COMB4	2.7E-15 COMB4	-2.4E-15 COMB4	6.23975 COM
-9.6E-14 COMB7	3.3698 COMB7	+0.5403 COMB5	1.4E-15 COMB5	-1.4E-15 COMB5	0.25447 COMB5	-0.26645 COMB7	5.3E-15 COMB6	-5.2E-15 COMB4	1.31862 COM
-171.782 COMB1	3.3698 COMB7	+7.0112 COMB1	4.4715 COMB5	-4.9875 COMB7	0.01498 COMB5	-0.26645 COMB7	12.8794 COMB5	-13.798 COMB7	23.55546 COM
-72.1942 COMB7	-2.6107 COMB3	-12.9859 COMB1	2.22E-17 COMB1	-4.9875 COMB7	-0.01244 COMB6	-3.74325 COMB1	10.63956 COMB7	-13.798 COMB7	17.3398 COM
-177.399 COMB1	6.9932 COMB4	+6.9788 COMB5	2.9434 COMB5	-0.4047 COMB6	0.037 COMB5	-1.9277 COMB6	14.11742 COMB5	+2.54442 COMB4	29.17995 COM
-162.323 COMB1	13.3437 COMB4	-12.3314 COMB6	19.4048 COMB5	-18.9709 COMB7	0.0437 COMB4	-0.05732 COMB6	62.66951 COMB7	-64.9365 COMB5	49.20674 COM
-114.13 COMB4	88.9588 COMB6	-85.5353 COMB4	104.7996 COMB7	-103.72 COMB5	0.29433 COMB6	-0.32023 COMB4	452.7461 COMB5	+452.481 COMB7	330.15 COM
0 BMATI	10.745 COMB1	-0.1761 COMB7	8.24E-16 COMB6	-7.7E-16 COMB4	-0.01614 COMB6	-0.38551 COMB1	1.62E-15 COMB4	-1.6E-15 COMB7	5.08741 COM
-7.2E-17 COMB3	13.4637 COMB1	1.4521 COMB5	2E-16 COMB7	-3.7E-16 COMB7	4.22518 COMB1	-0.08154 COMB7	3.66E-16 COMB7	-2.6E-16 COMB7	12.97629 COM
-2.6E-14 COMB4	7.206 COMB7	+13.7943 COMB1	4E-16 COMB7	-4E-16 COMB5	1.65325 COMB7	-0.20668 COMB7	1.57E-15 COMB5	-4.2E-16 COMB7	19.55675 COM
-174.624 COMB1	4.0824 COMB1	-8.1799 COMB1	5.608 COMB5	-5.4341 COMB7	0.01498 COMB5	-0.20668 COMB7	14.73653 COMB5	-14.6928 COMB7	22.15929 COM
-190.398 COMB1	4.7277 COMB1	-6.1349 COMB2	2.2475 COMB1	-9.1E-16 COMB5	0.13914 COMB7	-0.15659 COMB5	3.47568 COMB1	-7.95136 COMB1	16.52407 COM
-127.854 COMB1	5.0966 COMB1	-24.97 BMATI	5.3263 COMB5	-3.6821 COMB7	0.04347 BMATI	-0.02321 COMB6	14.28074 COMB5	-12.351 COMB5	16.4663 COM
-115.681 COMB6	55.6833 COMB1	-85.6764 COMB1	0.4872 COMB7	-0.4665 COMB5	0.51435 COMB5	-0.42611 COMB7	2.33667 COMB5	-2.38065 COMB7	42.68257 COM
-2.6E-14 COMB7	3.4142 COMB5	-1.7064 COMB7	1.19E-15 COMB4	-1.2E-15 COMB6	0.255 COMB5	-0.25306 COMB7	2.61E-15 COMB6	-2.8E-15 COMB4	4.99369 COM
-1E-13 COMB4	1.8893 COMB4	+0.9426 COMB5	8.24E-16 COMB6	-7.7E-16 COMB4	1.13149 COMB7	-1.13538 COMB5	2.83E-15 COMB5	-3E-15 COMB4	6.55238 COM
-1E-13 COMB4	19.4879 COMB5	-1.7169 BMATI	1.6E-15 COMB4	-1.6E-15 COMB6	1.13149 COMB7	-3.83262 COMB1	5.84E-15 COMB6	-5.9E-15 COMB4	13.10573 COM
-5.4E-16 COMB1	25.7031 COMB1	-19.3419 COMB7	8.74E-17 COMB4	-1.4E-15 COMB6	0.59129 COMB5	-4.17107 COMB7	5.84E-15 COMB6	-1.6E-15 COMB7	66.91771 COM
-1.9E-14 COMB6	11.1435 COMB6	-11.3235 COMB1	1.59E-15 COMB6	-1.6E-15 COMB4	0.75628 COMB1	-0.23236 COMB7	3.2E-15 COMB4	-3.2E-15 COMB4	15.51075 COM
-1.9E-14 COMB6	10.5066 COMB5	-3.4044 COMB1	1.65E-15 COMB5	-4.1E-16 COMB6	6.19019 COMB6	-11.7939 COMB5	3.3E-15 COMB4	+4.6E-15 COMB5	96.72659 COM

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 ma
0 BMAT1	32.2769 COMB2	-25.3932 COMB7	3.4E-15 COMB5	-1.6E-15 COMB7	13.24247 COMB7	+6.82546 COMB5	4.4E-15 COMB7	-1E-14 COMB5	39.46244 COMB
0 BMAT1	21.4474 COMB7	-13.6744 COMB1	1.01E-15 COMB6	-3E-15 COMB7	4.32305 COMB7	+1.49743 COMB4	4.77E-15 COMB1	-1.4E-15 COMB6	34.76514 COMB
-2.6E-14 COMB7	0.0432 COMB1	-5.7216 COMB6	1.61E-15 COMB7	-4E-16 COMB6	1.68193 COMB5	-0.09741 COMB5	1.57E-15 COMB4	-3.7E-15 COMB6	6.32007 COMB
-4.2E-14 COMB4	0.7195 COMB7	-25.5144 COMB1	7.99E-16 COMB4	-4E-16 COMB6	0.31233 COMB7	-0.44907 COMB5	1.43E-15 COMB5	-1.4E-15 COMB7	38.62635 COMB
-2.4E-14 COMB4	14.2778 COMB1	-3.5408 COMB7	4.12E-16 COMB7	-1.6E-15 COMB4	0.55901 COMB7	-0.44907 COMB5	1.41E-15 COMB5	-4.2E-16 COMB5	23.41776 COMB
+100.411 COMB6	55.1942 COMB1	-50.5454 COMB1	1.59E-15 COMB6	-0.2414 COMB1	0.18098 COMB4	-0.25131 COMB5	1.05563 COMB1	-1.10313 COMB1	42.7379 COMB
-1E-13 COMB4	23.1323 COMB1	1.1493 COMB1	1E-16 COMB4	-1E-16 COMB6	0.62909 BMAT1	-1.43432 COMB7	1.71E-16 COMB4	-2.3E-16 COMB4	26.52675 COMB
-2.9E-14 COMB4	13.1311 COMB1	0.9114 COMB4	7.99E-16 COMB5	-9E-16 COMB4	1.30959 COMB1	0.16861 COMB4	2.44E-15 COMB6	-2.5E-15 COMB4	10.71269 COMB
0 BMAT1	14.1949 COMB1	+0.1979 COMB4	1.88E-15 COMB5	-2E-16 COMB4	0.73496 COMB7	-0.31774 COMB1	4E-16 COMB5	+1.7E-16 COMB4	20.33557 COMB
0 BMAT1	21.9089 COMB1	-0.001 COMB7	2E-16 COMB5	+2E-16 COMB4	0.12269 COMB7	+1.4139 COMB1	1.92E-15 COMB4	-1.6E-15 COMB7	28.9426 COMB
0 BMAT1	9.8837 COMB4	+0.7725 COMB4	1E-16 COMB4	+1E-16 COMB6	0.07934 COMB4	+0.92214 COMB7	2.14E-16 COMB6	-1.9E-16 COMB4	12.53353 COMB
-2.6E-14 COMB4	3.9384 COMB6	-0.7725 COMB4	3.99E-16 COMB7	-4E-16 COMB5	0.41637 COMB7	-0.40841 COMB6	4.31E-16 COMB5	+8E-16 COMB4	2.70334 COMB
1.25E-17 COMB3	3.6113 COMB5	-13.9228 COMB1	1.57E-15 COMB4	-1.6E-15 COMB6	1.53667 COMB5	+1.49531 COMB7	4.83E-15 COMB5	-4.7E-15 COMB3	19.55254 COMB
-1E-13 COMB6	5.7533 COMB6	-5.5229 COMB4	7.99E-16 COMB4	+4E-16 COMB6	0.17729 COMB5	-0.23831 COMB7	1.6E-15 COMB5	-1.6E-15 COMB7	9.07329 COMB
-9.7E-15 COMB1	1.2406 COMB7	+0.6187 COMB6	2.12E-16 COMB4	1.25E-17 COMB3	0.00323 BMAT1	-0.02524 COMB4	4.25E-16 COMB5	-4.2E-16 COMB6	1.25786 COMB
-2.6E-14 COMB4	1.1495 COMB6	+3.4542 COMB1	2.12E-16 COMB4	-1.9E-16 COMB6	0.221 COMB4	-0.0617 COMB7	3.75E-16 COMB4	-4.2E-16 COMB4	3.1013 COMB
+1E-13 COMB4	10.9196 COMB1	-0.7077 COMB4	7.74E-16 COMB5	+8.2E-16 COMB4	0.43349 COMB7	+3.57445 COMB1	5.26E-15 COMB5	-3.1E-15 COMB7	15.32833 COMB
-1.1E-14 COMB6	7.2269 COMB7	-1.3385 COMB1	8.12E-16 COMB4	-7.9E-16 COMB6	0.21917 COMB1	-1.85277 COMB1	1.62E-15 COMB1	-1.6E-15 COMB4	8.25921 COMB
0 BMAT1	0.8293 COMB5	-13.165 COMB1	1.6E-15 COMB5	-1.6E-15 COMB7	3.31039 COMB7	-1.30269 COMB1	5.3E-15 COMB1	-5.3E-15 COMB6	10.68772 COMB
-52.143 COMB1	55.1597 COMB1	-52.5839 COMB1	0.2624 COMB1	-1.6E-15 COMB7	0.06646 COMB1	-0.97735 COMB2	1.20849 COMB1	-1.13838 COMB1	42.75091 COMB
-94.695 COMB6	22.6401 COMB4	-21.6003 COMB6	0.1446 COMB7	-3.9E-16 COMB5	0.32534 COMB6	-0.2421 COMB4	0.79382 COMB6	-0.64143 COMB7	17.14957 COMB
-2.8E-15 COMB1	1.519 COMB5	-3.6046 COMB7	4.12E-16 COMB6	-3.9E-16 COMB5	0.255 COMB5	-0.25306 COMB7	1.44E-15 COMB5	-1.5E-15 COMB7	2.22386 COMB
-2E-15 COMB2	0.5149 COMB7	-11.4386 COMB1	8.25E-16 COMB6	-7.7E-16 COMB4	3.55275 COMB1	-1.13538 COMB5	2.94E-15 COMB6	-3E-15 COMB4	11.0611 COMB
0 BMAT1	16.1404 COMB5	-23.252 COMB7	3.2E-15 COMB4	-3.2E-15 COMB6	9.53664 COMB5	-5.90384 COMB7	8.5E-15 COMB6	-8.5E-15 COMB4	32.91711 COMB
+6.4E-15 COMB3	11.3172 COMB1	0.1275 COMB6	7.87E-16 COMB7	-8.1E-16 COMB7	-0.19488 COMB6	+0.76028 COMB1	2.53E-15 COMB4	-1.2E-15 COMB6	3.61412 COMB
-183.928 COMB1	4.8648 COMB1	0.0617 COMB7	5.2733 COMB5	1.87E-16 COMB7	0.01498 COMB5	-0.26954 COMB7	14.21709 COMB5	+6.23436 COMB1	11.84727 COMB
-123.855 COMB1	5.4923 COMB1	+1.1699 COMB6	5.2733 COMB5	-3.9927 COMB7	0.0177 COMB4	-0.01771 COMB7	14.21709 COMB5	-12.3718 COMB7	17.68619 COMB
+68.9472 COMB6	6.4955 COMB1	+2.0174 COMB1	1.647 COMB4	-0.8313 COMB6	1.06521 COMB1	+0.02321 COMB6	3.74732 COMB7	-3.13043 COMB5	8.49026 COMB
-2E-13 COMB5	5.8415 COMB2	+4.5134 COMB5	7.99E-16 COMB5	-4E-16 COMB7	8.28152 COMB7	-7.47372 COMB5	1.61E-15 COMB5	-1.6E-15 COMB4	16.37512 COMB
-3.6E-14 COMB7	9.438 COMB1	-5.4918 COMB4	7.99E-16 COMB5	-5.6E-17 BMAT1	16.99379 COMB5	-5.01739 COMB6	3.24E-15 COMB6	-3.3E-15 COMB7	22.78762 COMB
-2.6E-14 COMB7	10.1643 COMB6	-27.2566 COMB1	8.25E-16 COMB5	-3E-17 COMB3	+0.06143 COMB6	+14.5018 COMB7	3.29E-15 COMB4	-1.3E-15 COMB5	45.65057 COMB
+1E-13 COMB4	0.2566 COMB1	+10.6774 COMB1	1.27E-17 COMB3	+7.7E-16 COMB7	0.41603 COMB7	+0.04142 COMB6	3.12E-15 COMB7	-3E-17 COMB4	14.67616 COMB
-1E-13 COMB4	0.1491 COMB6	-13.4574 COMB1	2E-16 COMB7	+2E-16 COMB4	3.39668 COMB1	-0.01314 COMB6	6.19E-16 COMB5	-1.4E-15 COMB7	14.90111 COMB
-5.4E-14 COMB4	0.969 COMB1	-5.4332 COMB6	1.97E-15 COMB4	-2.8E-17 BMAT1	1.53252 COMB5	0.17501 COMB3	1.61E-15 COMB6	-5.2E-15 COMB4	6.15148 COMB
-99.5945 COMB6	55.5033 COMB1	-52.2403 COMB1	0.0383 COMB4	-0.0461 COMB4	0.33503 COMB5	-0.13514 BMAT1	0.20053 COMB4	+0.2117 COMB4	41.92861 COMB
-2.2E-14 COMB6	11.7503 COMB1	-4.4318 BMAT1	9.99E-17 COMB5	+1E-16 COMB7	0.08514 BMAT1	-0.34144 COMB1	4E-16 COMB5	-4E-16 COMB7	8.16092 COMB
-23.3924 BMAT1	0.5248 COMB1	-23.6652 BMAT1	0.0038 COMB3	+1E-16 COMB7	0.00205 COMB4	-0.04785 COMB6	3.02E-16 COMB5	+0.00195 BMAT1	8.59523 COMB
-144.95 COMB1	55.2561 COMB1	-52.4875 COMB1	8.0667 COMB5	-0.1327 COMB1	0.037 COMB5	-0.10496 COMB7	22.52875 COMB5	-0.60074 COMB1	41.6071 COMB
-129.599 COMB1	8.8397 COMB5	-10.2705 COMB4	8.0667 COMB5	-8.1161 COMB7	0.0437 COMB4	-0.05732 COMB6	22.52875 COMB5	-23.0199 COMB7	28.24894 COMB
-101.379 COMB4	58.7298 COMB1	-55.6296 COMB1	14.2445 COMB5	-13.4239 COMB7	0.14902 COMB5	-0.19005 COMB7	33.01767 COMB7	-36.2942 COMB5	101.4803 COMB
-126.351 COMB6	55.7298 COMB1	-41.5061 COMB2	2.1383 COMB5	-2.1265 COMB7	7.23421 COMB7	-7.12056 COMB5	13.22387 COMB7	-13.215 COMB5	31.55974 COMB
-1.3E-14 COMB7	4.3445 BMAT1	-17.8837 COMB1	7.74E-16 COMB6	-8.2E-16 COMB4	0.19236 COMB5	-1.81365 BMAT1	3.27E-15 COMB5	-3.1E-15 COMB7	15.53802 COMB
-5.1E-14 COMB6	14.2387 COMB1	0.4044 BMAT1	1.39E-17 BMAT1	0 BMAT1	0.17828 BMAT1	+4.24445 COMB1	1.6E-15 COMB5	-1.6E-15 COMB4	14.9417 COMB
9.99E-16 COMB2	3.1423 COMB1	-0.2201 COMB5	4E-16 COMB5	-4E-16 COMB4	0.39471 COMB1	-3.04627 COMB6	1.31E-15 COMB5	-1.3E-15 COMB4	0.90464 COMB
-3.3E-16 COMB1	2.6439 COMB7	-27.2747 COMB1	4E-16 COMB6	-5E-17 COMB4	0.65227 COMB7	-0.39751 COMB5	2.26E-16 COMB1	-1.3E-15 COMB4	36.89205 COMB
-5.3E-14 COMB6	3.5752 COMB5	-6.3264 COMB7	4E-16 COMB4	-4E-16 COMB5	0.65227 COMB7	-0.22696 COMB5	2.24E-15 COMB5	-1.6E-15 COMB7	14.60668 COMB
-3.4E-14 COMB6	2.3944 COMB1	-5.4321 COMB5	7.74E-16 COMB4	-4.2E-16 COMB6	0.9858 COMB5	-0.97704 COMB7	1.6E-15 COMB6	-2.3E-15 COMB7	6.33993 COMB
-5.2E-14 COMB4	22.6443 COMB5	-19.9296 COMB7	1.65E-15 COMB5	-1.5E-15 COMB7	10.94685 COMB7	-14.4161 COMB5	3.09E-15 COMB7	-3.3E-15 COMB5	28.52209 COMB
-2.6E-14 COMB7	3.9917 COMB1	-18.4296 COMB7	9.76E-17 COMB4	-1.1E-16 COMB6	10.94685 COMB7	-0.04173 COMB4	2.49E-16 COMB4	-2.9E-16 COMB5	35.28493 COMB
-3.1E-14 COMB3	3.5341 COMB4	-3.6499 COMB1	1.94E-16 COMB6	-1.9E-16 COMB4	0.20723 COMB4	-0.73994 COMB5	1.6E-15 COMB5	-3.9E-16 COMB4	2.69601 COMB
-1E-13 COMB4	2.1897 COMB3	-13.9601 COMB1	1.62E-15 COMB7	-2.5E-17 COMB3	0.82719 COMB7	-0.73994 COMB5	1.62E-15 COMB5	-3.2E-15 COMB7	19.67085 COMB
-219.617 COMB1	3.8805 COMB4	-5.3948 COMB7	6.6545 COMB1	-3.9245 COMB7	0.225 COMB5	-0.20981 COMB7	14.23313 COMB5	-12.2818 COMB7	10.41927 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 max
-137.663 COMB1	13.9079 COMB1	-1.7312 COMB6	8.6545 COMB1	-0.4884 COMB1	0.2177 COMB4	-0.47523 COMB1	12.31121 COMB1	-14.305 COMB1	10.05553 COMB
-1E-13 COMB4	29.2815 COMB5	-11.7009 COMB7	6.58E-15 COMB5	-6.2E-15 COMB7	3.15978 COMB5	-3.5208 COMB7	1.22E-14 COMB7	-1.3E-14 COMB5	35.17739 COMB
-1.4E-15 COMB1	5.4582 COMB6	-19.823 COMB1	1.55E-15 COMB4	-1.6E-15 COMB4	0.12121 COMB4	-2.4171 COMB6	3.03E-15 COMB5	-3.4E-15 COMB6	31.28974 COMB
-9.9E-15 COMB1	-5.2956 COMB7	-10.0106 COMB5	7.87E-16 COMB5	-8.1E-16 COMB7	0.55631 COMB4	-0.6674 COMB6	2.65E-15 COMB6	-2.4E-15 COMB4	12.92107 COMB
0 BMATI	-5.2905 COMB3	-13.3297 COMB1	0 BMATI	-1.2E-17 COMB5	10.47255 COMB1	-0.3406 COMB7	2.85E-17 COMB5	-1.6E-15 COMB7	25.13204 COMB
-2E-13 COMB5	-0.4402 COMB6	-25.7308 COMB1	2.27E-17 COMB1	-2E-19 COMB5	4.99059 COMB6	-0.08937 COMB1	1.6E-15 COMB5	-1.6E-15 COMB7	19.02019 COMB
-5.1E-14 COMB6	0.5234 BMATI	-25.7306 COMB1	8.12E-16 COMB5	-7.9E-16 COMB7	0.49308 COMB7	-0.57319 COMB5	1.62E-15 COMB4	-1.6E-15 COMB5	38.19724 COMB
-1.9E-15 BMATI	1.7625 COMB6	-2.8484 COMB4	2.78E-17 BMATI	1.27E-17 COMB3	0.41637 COMB7	-0.40841 COMB5	2.25E-16 COMB4	-2.3E-16 COMB4	4.12689 COMB
-1E-13 COMB5	1.5354 COMB5	-6.0545 BMATI	1.75E-16 COMB6	-1.2E-16 COMB4	1.33967 COMB5	-1.49531 COMB7	1.55E-15 COMB5	-1.7E-15 COMB5	5.34313 COMB
-5.1E-16 COMB1	0.9094 COMB1	-13.9229 COMB1	-1.1E-17 COMB2	-2.2E-17 COMB1	0.6821 BMATI	-0.15938 COMB7	1.85E-15 COMB7	-1.6E-15 COMB7	19.82389 COMB
0 BMATI	-2.7734 COMB6	-22.61 COMB1	7.47E-16 COMB7	-8.1E-16 COMB5	1.64681 COMB1	0.19104 COMB5	1.85E-15 COMB7	-1.6E-15 COMB7	29.34042 COMB
-1.4E-15 COMB1	20.0636 COMB1	-9.155 COMB7	7.87E-16 COMB7	2.5E-17 COMB3	1.03731 COMB7	-0.5125 COMB4	1.6E-15 COMB5	-1.7E-15 COMB4	31.19979 COMB
-2.6E-14 COMB7	16.5229 COMB1	1.1839 COMB6	1.57E-15 COMB4	-1.6E-15 COMB6	0.43302 COMB6	-10.4549 COMB1	2.4E-15 COMB4	-3.6E-15 COMB4	25.19229 COMB
-3.7E-13 COMB6	4.3674 COMB7	-2.8577 COMB1	8.12E-16 COMB4	-1.6E-15 COMB4	0.1251 COMB6	-1.84431 COMB6	3.73E-15 COMB6	-2.2E-15 COMB4	8.24939 COMB
0 BMATI	0.2447 COMB6	-3.6068 COMB7	4.12E-16 COMB7	-7.9E-16 COMB6	0.22143 COMB7	0.31387 BMATI	2.39E-15 COMB6	-2.3E-15 COMB7	1.55524 COMB
-2.6E-14 COMB7	0.3245 COMB7	-3.3304 COMB5	2.6E-19 COMB1	-2.5E-17 COMB4	0.9858 COMB5	-0.97704 COMB7	8.46E-16 COMB7	-8E-16 COMB5	7.8948 COMB
-5.7E-15 COMB1	10.2786 COMB7	-10.9163 COMB1	1.6E-15 COMB4	-4.8E-17 COMB1	3.63981 COMB1	-0.97704 COMB7	8.91E-16 COMB7	6.42E-17 COMB2	9.93035 COMB
-216.471 COMB1	10.5717 COMB5	-14.3461 COMB7	1.6E-15 COMB4	-9.5873 COMB1	5.13369 COMB5	-1.74932 COMB7	0.93856 BMATI	-1.19314 COMB1	73.57782 COMB
-216.472 COMB1	4.137 COMB4	-1.7634 COMB6	4.5087 COMB5	-5.0867 COMB7	0.01478 COMB5	-0.01771 COMB7	13 COMB5	-14.1939 COMB7	10.90569 COMB
-134.711 COMB1	6.3139 COMB1	-24.9679 BMATI	0.0201 BMATI	-4.9325 COMB1	0.03067 BMATI	-0.02321 COMB6	12.13934 COMB1	-7.83165 COMB1	19.11077 BMAT
-120.589 COMB6	55.7149 COMB1	-55.6447 COMB1	0.6729 COMB7	-0.6367 COMB5	4.26634 COMB1	-0.87287 COMB7	3.33098 COMB5	-3.43784 COMB7	42.58292 COMB
-1.3E-14 COMB4	-0.28 BMATI	-7.4529 COMB5	1.13E-18 COMB3	-1.1E-17 COMB1	3.10189 COMB4	-0.40477 COMB1	3.19E-15 COMB6	-3.2E-15 COMB4	6.23713 COMB
-5.1E-14 COMB6	6.3892 COMB1	-2.8225 COMB5	4E-16 COMB7	-4E-16 COMB5	0.08756 COMB2	-0.79065 COMB1	1.29E-15 COMB7	-1.3E-15 COMB7	1.03876 COMB
-4E-13 COMB6	15.1957 COMB1	-4.7414 COMB7	3.2E-15 COMB5	-3.2E-15 COMB7	4.19773 COMB5	-4.83614 COMB7	1.56E-14 COMB7	-1.6E-14 COMB5	16.66374 COMB
0 BMATI	11.3693 COMB2	-0.2013 COMB1	2.5E-17 COMB2	-5E-17 COMB3	1.94295 COMB2	-0.42015 COMB1	9.99E-17 COMB3	-1E-16 COMB3	7.48123 COMB
-1.2E-17 COMB3	3.148 COMB5	-1.0686 COMB6	8E-16 COMB7	-1.6E-17 COMB2	1.66964 COMB5	-0.60184 COMB4	1.85E-15 COMB4	-1.6E-15 COMB5	2.1912 COMB
-1.2E-17 COMB3	13.6746 COMB1	-1.2109 COMB7	3.9E-19 COMB3	-8E-16 COMB5	0.27709 COMB6	-3.40888 COMB1	1.55E-15 COMB7	-1.6E-15 COMB6	14.96266 COMB
-6.4E-15 COMB6	7.2874 COMB7	-0.6597 COMB1	7.93E-16 COMB5	-8.1E-16 COMB7	-0.14783 COMB3	-1.8574 COMB4	2.65E-15 COMB6	-2.6E-15 COMB4	6.20549 COMB
-3.1E-13 COMB5	7.6076 COMB1	-1.1182 COMB5	1.62E-15 COMB7	-1.6E-15 COMB7	2.76194 COMB1	-0.41443 COMB6	3.59E-15 COMB6	-3.7E-15 COMB4	5.73949 COMB
-177.048 COMB1	22.4737 COMB5	-19.02 COMB7	0.523 COMB4	-0.1696 COMB2	5.98873 COMB7	-3.53575 COMB5	2.42929 COMB4	-0.65161 COMB1	38.26832 COMB
-161.941 COMB1	16.1763 COMB4	-15.0411 COMB6	21.9589 COMB5	-21.353 COMB7	0.0437 COMB4	-0.05732 COMB6	69.52207 COMB7	-71.2599 COMB5	58.17207 COMB
-148.909 COMB1	102.2842 COMB6	-98.5984 COMB4	115.1584 COMB7	-114.538 COMB5	0.31794 COMB6	-0.34585 COMB4	522.1897 COMB5	-367.123 COMB7	368.5741 COMB
-188.379 COMB1	8.3651 COMB7	-55.7791 COMB4	4.7385 COMB5	-80.4023 COMB7	0.31794 COMB6	-0.27479 COMB1	28.09659 COMB6	-522.615 COMB7	54.37313 COMB
-75.1196 COMB6	5.5875 COMB7	-13.7187 COMB1	1.7546 COMB4	-1.4015 COMB6	3.56166 COMB1	-0.02321 COMB6	3.4299 COMB6	-3.82012 COMB4	15.4414 COMB
-1.1E-13 COMB5	0.0584 COMB4	-7.1369 COMB5	1.61E-15 COMB7	-1.6E-15 COMB6	1.94676 COMB4	-0.23515 COMB4	5.26E-15 COMB6	-5.2E-15 COMB4	8.33042 COMB
2.13E-15 COMB1	7.1159 COMB1	-2.3038 COMB5	1.61E-15 COMB7	-1.6E-15 COMB5	0.25575 COMB6	-3.81178 COMB1	3.61E-15 COMB6	-3.7E-15 COMB4	15.22484 COMB
-2.2E-14 COMB6	14.0277 COMB1	0.0492 COMB3	-1.2E-17 COMB3	-1.7E-17 COMB1	0.00668 BMATI	-3.81178 COMB1	1.63E-15 COMB6	-1.6E-15 COMB6	15.22484 COMB
-5.4E-14 COMB6	2.4048 COMB7	-0.5996 BMATI	-1.2E-17 COMB3	-2.8E-17 BMATI	0.25575 COMB6	-0.23515 COMB4	1.59E-15 COMB4	-1.6E-15 COMB5	5.87954 BMAT
-2.6E-14 COMB7	17.4583 COMB1	1.0764 COMB4	9.99E-17 COMB5	-1.2E-16 COMB4	0.14034 COMB7	-0.15112 COMB5	1.65E-15 COMB7	-1.6E-15 COMB6	13.55802 COMB
-189.379 COMB1	6.9956 COMB7	-1.333 COMB6	5.37 COMB5	-5.1606 COMB7	0.14034 COMB7	-0.01771 COMB7	14.41619 COMB5	-14.3269 COMB7	16.24999 COMB
-69.4953 COMB6	3.8857 COMB4	-0.8343 COMB6	2.3555 COMB5	-2.5455 COMB7	0.21093 COMB5	-0.02321 COMB6	6.37956 COMB7	-5.3618 COMB5	9.05606 COMB
-2.9E-14 COMB4	3.5922 COMB5	-1.8649 COMB7	7.93E-16 COMB5	-8.1E-16 COMB7	0.21093 COMB5	-0.93983 COMB5	2.93E-15 COMB5	-2.9E-15 COMB7	8.94758 COMB
-1.7E-14 COMB1	9.5108 COMB1	-1.2009 COMB5	3.14E-15 COMB4	-3.7E-16 COMB6	0.93672 COMB7	-3.75597 COMB1	7.99E-16 COMB4	-1.2E-14 COMB7	11.60017 COMB
-2.2E-13 COMB5	20.1753 COMB5	-14.988 COMB7	3.14E-15 COMB4	-3.3E-15 COMB6	1.4762 COMB5	-4.93215 COMB7	1.18E-14 COMB5	-1.2E-14 COMB7	80.11673 COMB
-5.1E-14 COMB5	1.5223 COMB6	-3.4377 COMB1	3.4E-16 COMB4	1.27E-17 COMB3	0.20723 COMB4	-0.10787 COMB7	6.25E-16 COMB6	-2E-16 COMB1	3.19777 COMB
-1.6E-15 COMB5	15.1239 COMB1	-2.7228 COMB4	3.4E-16 COMB4	-2.4E-16 COMB6	0.82719 COMB7	-2.67408 COMB1	1.65E-15 COMB7	-1.7E-15 COMB5	16.61534 COMB
-2.9E-15 COMB1	7.535 COMB6	-0.2649 COMB1	8.76E-17 COMB4	-1.1E-16 COMB6	0.49987 COMB1	-1.62961 COMB7	1.65E-15 COMB4	-1.6E-15 COMB7	7.24015 COMB
-1.6E-15 COMB3	2.3547 COMB6	-0.4902 COMB4	8.24E-16 COMB6	-7.7E-16 COMB4	1.12421 COMB7	-0.70337 COMB5	3.15E-15 COMB6	-3.2E-15 COMB7	1.72257 COMB
-1.6E-15 COMB3	32.9299 COMB2	2.0955 COMB7	2.43E-17 COMB3	-7.9E-16 COMB4	1.27433 COMB4	-0.278 COMB1	3.15E-15 COMB6	-3.9E-16 COMB3	37.91646 COMB
-29.4874 COMB1	55.3698 COMB1	-55.9899 COMB1	3.2E-15 COMB5	-0.1051 BMATI	8.39258 COMB7	-8.57893 COMB5	0.36425 COMB1	-0.57551 COMB1	80.37441 COMB
-127.652 COMB6	55.3698 COMB1	-41.8051 COMB2	2.5648 COMB5	-2.6436 COMB7	8.62379 COMB7	-8.77219 COMB5	16.24693 COMB7	-15.9668 COMB5	31.06822 COMB
-1E-13 COMB4	22.2099 COMB5	-27.2399 COMB7	1.65E-15 COMB5	-1.5E-15 COMB7	9.72531 COMB7	-8.19581 COMB5	6.09E-15 COMB6	-6.1E-15 COMB4	111.8187 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 max
-1.9E-14 COMB4	0.4297 COMB1	-11.3479 COMB1	8.06E-16 COMB6	-7.9E-16 COMB4	0.34404 COMB6	-0.32471 COMB4	1.6E-15 COMB5	-1.6E-15 COMB7	11.45985 COMB
-1.6E-15 COMB5	4.0269 COMB1	-0.9314 COMB4	1.59E-15 COMB6	-1.6E-15 COMB4	0.644 COMB7	-0.56442 COMB5	3.2E-15 COMB5	-3.2E-15 COMB7	8.2699 COMB
-1.3E-14 COMB4	3.1895 COMB4	-1.5895 COMB6	1.59E-15 COMB5	-3.5E-16 COMB6	2.26507 COMB5	-2.25569 COMB7	1.7E-15 COMB6	-4.8E-15 COMB7	3.10067 COMB
-1E-13 COMB7	1.494 COMB5	-3.7432 COMB7	8.12E-16 COMB6	-7.9E-16 COMB6	0.21093 COMB5	-2.25569 COMB7	2.09E-15 COMB6	-2.2E-15 COMB4	2.54651 COMB
-1.1E-13 COMB7	0.1432 COMB4	-3.2886 COMB7	4E-16 COMB1	-4E-16 COMB7	0.93672 COMB7	-0.93983 COMB5	1.4E-15 COMB5	-1.4E-15 COMB7	6.34758 COMB
-1.1E-13 COMB7	0.7562 COMB7	-11.8904 COMB1	4E-16 COMB5	1.99E-19 COMB4	3.97559 COMB1	0.57251 COMB4	1.35E-16 BMATI	-1.6E-15 COMB7	11.09679 COMB
0 BMATI	10.5174 COMB5	-20.6194 COMB7	1.61E-15 COMB6	-1.9E-15 COMB4	7.17432 COMB4	-1.63334 COMB6	5.7E-15 COMB5	-5.9E-15 COMB7	16.24408 COMB
0 BMATI	3.4221 COMB1	-0.6681 COMB1	7.99E-16 COMB6	-8E-16 COMB7	0.11004 COMB1	-0.07762 COMB7	1.62E-15 COMB4	-1.6E-15 COMB7	2.64869 COMB
0 BMATI	2.1027 COMB1	-0.816 COMB4	-7.6E-18 COMB1	-1.5E-17 COMB1	0.11004 COMB1	-0.76238 COMB5	9.91E-17 COMB4	-7.81E-19 COMB3	1.97624 COMB
-1.4E-14 COMB4	11.4837 COMB1	-0.5734 COMB5	8.06E-16 COMB6	-7.9E-16 COMB4	0.47687 COMB7	-0.21956 COMB6	1.6E-15 COMB5	-1.6E-15 COMB7	13.92267 COMB
-1.4E-14 COMB4	6.3479 COMB1	-5.1934 COMB5	3.2E-15 COMB5	-1.3E-16 COMB7	1.11569 COMB1	-0.03782 COMB5	6.4E-15 COMB5	-6.4E-15 COMB5	5.76882 COMB
-145.149 COMB1	10.413 COMB4	-10.0213 COMB4	8.795 COMB5	-4.9319 COMB7	6.9229 COMB7	-6.03782 COMB5	23.76174 COMB3	-23.1942 COMB7	35.08493 COMB
-130.404 COMB1	7.9741 COMB1	-25.3574 COMB5	24.1319 COMB5	-8.9721 COMB5	0.14912 COMB5	-0.05732 COMB6	28.4307 COMB5	-28.016 COMB5	42.35159 COMB
-170.494 COMB6	55.3574 COMB1	-56.0023 COMB1	6.9204 COMB6	-24.1824 COMB7	1.5732 COMB5	-2.53462 COMB1	87.00101 COMB7	-90.0096 COMB7	41.83005 COMB
-5.1E-14 COMB4	-0.2434 BMATI	-10.7554 COMB1	8.12E-16 COMB1	-7.9E-14 COMB6	0.21711 COMB7	-2.53462 COMB1	3.2E-15 COMB6	-3.2E-15 COMB4	16.39298 COMB
0 BMATI	1.0722 COMB5	-3.1414 COMB6	9.99E-17 COMB3	-1E-16 COMB4	1.66964 COMB5	-0.60154 COMB4	9.91E-17 COMB4	-4E-16 COMB4	3.23762 COMB
-5.3E-16 COMB2	9.5124 COMB1	-3.2967 COMB5	0 BMATI	-1E-14 COMB4	0.27709 COMB6	-1.9941 COMB7	3.99E-16 COMB6	-8.3E-17 COMB1	7.07881 COMB
-2.1E-13 COMB7	12.9284 COMB5	-8.1104 COMB7	1.6E-15 COMB5	-1.3E-13 COMB7	14.46593 COMB5	-16.0606 COMB7	3.2E-15 COMB1	-3.2E-15 COMB6	59.44081 COMB
-2.1E-13 COMB7	2.192 COMB1	-6.4112 COMB7	1.27E-13 COMB1	-4.7E-19 COMB3	0.17796 COMB1	-16.0606 COMB7	7.87E-16 COMB5	-1.7E-17 COMB1	69.96405 COMB
-1.1E-14 COMB1	3.6229 COMB5	-1.9946 COMB7	2E-16 COMB7	-2E-16 COMB5	0.02587 COMB7	-0.09524 COMB5	7.87E-16 COMB5	-8.1E-16 COMB5	3.3334 COMB
-4.2E-14 COMB4	10.1988 COMB1	-1.7332 COMB5	4.12E-16 COMB7	-3.9E-16 COMB5	0.69995 COMB5	-3.75706 COMB1	1.62E-15 COMB4	-1.6E-15 COMB4	10.69077 COMB
-31.1787 COMB1	55.789 COMB1	-55.5706 COMB1	0.0144 COMB3	-0.2495 COMB4	8.9316 COMB7	-12.3062 COMB5	1.50696 COMB4	-0.72439 COMB4	42.38571 COMB
-127.772 COMB6	28.5896 COMB4	-28.4604 COMB6	3.1191 COMB5	-3.1272 COMB7	10.24417 COMB7	-10.1814 COMB5	19.23773 COMB7	-19.2402 COMB5	27.38929 COMB
-1E-13 COMB4	24.6163 COMB5	-4.5987 COMB6	8.12E-16 COMB4	-3.4E-15 COMB5	10.22997 COMB5	-1.04763 COMB4	7.64E-15 COMB5	-3.2E-15 COMB4	6.29778 COMB
-117.868 COMB6	55.7456 COMB1	-55.6141 COMB1	0.8878 COMB7	-0.8387 COMB5	10.22997 COMB5	-10.6507 COMB7	4.46379 COMB5	-4.62614 COMB7	42.47031 COMB
-1.4E-14 COMB4	1.7246 COMB5	-3.8929 COMB7	1.61E-15 COMB4	-1.6E-15 COMB6	0.22587 COMB7	-0.09524 COMB5	5.04E-15 COMB6	-5.1E-15 COMB4	5.2869 COMB
-1E-13 COMB4	1.1619 COMB7	-3.6315 COMB5	7.99E-16 COMB4	-8E-16 COMB6	0.69995 COMB5	-0.72288 COMB7	1.6E-15 COMB5	-1.6E-15 COMB7	10.31692 COMB
-4.1E-13 COMB7	15.3616 COMB5	-21.6842 COMB7	8.49E-16 COMB4	-7.5E-16 COMB6	5.52252 COMB5	-2.20841 COMB7	6.5E-15 COMB4	-6.5E-15 COMB6	89.7999 COMB
-4.1E-13 COMB7	8.1904 COMB4	-20.0391 COMB7	3.2E-15 COMB5	-1.2E-15 COMB7	0.33945 COMB4	-2.69852 COMB1	1.21E-14 COMB6	-1.2E-14 COMB4	22.50855 COMB
-1E-13 COMB4	-0.4629 COMB6	-13.507 COMB1	7.99E-16 COMB5	-1.9E-19 COMB3	2.75023 COMB1	-1.10644 COMB7	1.6E-15 COMB6	-1.6E-15 COMB7	38.69157 COMB
0 BMATI	0.2789 COMB4	-5.7254 COMB7	2.99E-16 COMB4	-1.6E-15 COMB7	1.39329 COMB7	-0.70337 COMB5	3.2E-15 COMB5	-3.2E-15 COMB4	7.18915 COMB
-136.001 COMB1	6.8639 COMB4	-4.6314 COMB6	3.3456 COMB5	-1.7145 COMB7	1.12421 COMB7	-0.04375 COMB7	14.95008 COMB5	-12.7248 COMB7	29.63999 COMB
-119.109 COMB1	20.492 COMB4	-17.3691 COMB6	28.134 COMB5	-23.9413 COMB7	0.0437 COMB4	-0.05732 COMB6	78.229 COMB7	-81.5303 COMB5	68.19376 COMB
-118.352 COMB4	117.1224 COMB6	-118.036 COMB4	129.3922 COMB7	-129.751 COMB5	0.14902 COMB5	-0.19005 COMB7	410.4902 COMB5	-411.808 COMB7	379.8751 COMB
-20.2155 COMB7	69.2054 COMB4	-67.9762 COMB6	100.8802 COMB5	-101.094 COMB7	0.34364 COMB6	-0.88091 COMB1	605.2813 COMB5	-606.565 COMB7	415.2321 COMB
-2.1E-13 COMB4	7.5107 COMB5	-5.8734 COMB7	6.4E-15 COMB5	-6.4E-15 COMB7	3.68622 COMB4	-4.41026 COMB6	1.24E-14 COMB7	-1.3E-14 COMB5	11.14002 COMB
-5.1E-14 COMB6	8.3494 COMB1	-0.2101 BMATI	8.06E-16 COMB6	-7.9E-16 COMB4	3.30644 COMB1	-0.00585 BMATI	1.6E-15 COMB5	-1.6E-15 COMB7	13.47933 COMB
-2.6E-14 COMB7	3.1459 BMATI	-1.5178 COMB5	7.99E-16 COMB4	-8E-16 COMB6	0.73129 COMB6	-2.11546 BMATI	2.92E-15 COMB4	-2.9E-15 COMB5	10.4183 COMB
-2E-13 COMB5	21.9259 COMB5	-16.7363 COMB7	1.39E-17 BMATI	-6.1E-18 COMB3	2.20261 COMB5	-5.57012 COMB7	3.3E-15 COMB6	-3.1E-15 COMB4	94.01332 COMB
-5.1E-14 COMB4	1.9044 COMB6	-13.3863 COMB7	8.12E-16 COMB4	-7.9E-16 COMB6	0.569 COMB7	-5.57012 COMB7	2.41E-15 COMB7	-3.2E-15 COMB4	94.01332 COMB
-1.2E-14 COMB7	1.1136 COMB4	-3.6654 COMB6	3.75E-16 COMB5	-7.9E-16 COMB6	2.26507 COMB5	+2.25569 COMB7	3.2E-15 COMB4	-1.6E-15 COMB5	3.86217 COMB
-2.1E-13 COMB7	22.7607 COMB5	-19.3966 COMB7	2.33E-17 COMB1	-2.5E-17 COMB3	5.29213 COMB7	-2.80479 COMB5	3.1E-15 COMB7	-3.3E-15 COMB5	45.8582 COMB
-2.1E-13 COMB7	1.4894 COMB6	-18.527 COMB7	1E-16 COMB4	-1E-16 COMB6	5.29213 COMB7	-0.07762 COMB7	2.25E-16 COMB6	-1.8E-16 COMB4	25.92939 COMB
0 BMATI	0.303 COMB7	-3.4329 COMB1	1.95E-19 COMB4	-6.7E-17 COMB1	0.11004 COMB1	-0.07762 COMB7	1.67E-16 BMATI	-1.1E-16 COMB1	2.32975 COMB
0 BMATI	-0.0136 COMB6	-4.8798 BMATI	6.04E-18 BMATI	-5E-17 COMB4	0.87657 COMB7	-1.45688 BMATI	1.51E-16 COMB6	-5.1E-17 COMB4	1.97391 COMB
-1.6E-14 COMB4	-2.4212 COMB4	-8.9015 COMB1	1.1E-17 COMB1	-7.9E-16 COMB4	-1.31882 COMB3	-3.39115 COMB1	3.7E-15 COMB4	-3.5E-17 COMB1	13.52764 COMB
-5.1E-14 COMB4	-0.2101 BMATI	-6.2284 COMB7	8.06E-16 COMB6	-7.9E-16 COMB4	-0.00041 COMB1	-1.76651 COMB4	3.7E-15 COMB4	-3.7E-15 COMB6	7.37968 COMB
-9.6E-15 COMB4	1.0959 COMB7	-11.4829 COMB1	8.12E-16 COMB4	-7.9E-14 COMB6	3.80597 COMB1	-0.72825 COMB4	2.93E-15 COMB6	-2.9E-15 COMB6	8.20723 COMB
-2E-13 COMB5	20.942 COMB5	-28.0033 COMB7	6.59E-17 COMB1	-2.2E-16 COMB1	8.24785 COMB4	-4.79373 COMB6	3.2E-15 COMB4	-3.4E-15 COMB4	43.86703 COMB
-166.151 COMB1	32.5829 COMB2	0.5125 COMB3	-1.6E-16 COMB2	-1.2972 COMB1	10.48494 COMB7	-10.6504 COMB5	1.76352 BMATI	-2.5281 COMB1	57.51306 COMB
-161.827 COMB1	11.6476 COMB4	-8.6515 COMB6	9.0195 COMB5	-11.4044 COMB5	0.0437 COMB4	-0.05732 COMB6	32.63658 COMB5	-26.4269 COMB7	37.33545 COMB
-117.298 COMB1	19.082 COMB7	-14.385 COMB5	32.886 COMB5	-33.8543 COMB7	0.14902 COMB5	-0.19005 COMB7	97.43979 COMB7	-95.8029 COMB5	46.8978 COMB

P min	V2 max	V2 min	V3 max	V3 min	T max	T min	M2 max	M2 min	M3 max
0 BMAT1	4.0031 COMB7	-1.9758 COMB7	6.23E-16 COMB1	[illegible] COMB1	0.15695 COMB6	-0.25165 COMB4	1.97E-17 COMB1	-1E-17 BMAT1	2.95474 COMB
-2.3E-14 COMB4	2.3179 COMB4	-1.2701 COMB5	1.13E-14 COMB3	[illegible] COMB1	0.88983 COMB4	-0.95412 COMB6	1.13E-14 COMB3	-4E-14 COMB7	1.97849 COMB
-1.4E-14 BMAT1	10.2474 COMB1	3.2894 COMB6	0 BMAT1	-5.6E-17 BMAT1	-0.27461 COMB7	-3.69934 COMB1	4E-16 COMB5	-1.1E-16 BMAT1	10.65797 COMB
-9E-14 COMB6	30.1269 COMB5	-24.9182 COMB7	-3E-17 COMB3	-3.4E-17 COMB3	5.80212 COMB7	-9.03927 COMB5	3.24E-15 COMB4	-3.3E-15 COMB5	45.966 COMB
-2E-13 COMB5	23.2851 COMB5	-25.4485 COMB7	1.6E-15 COMB1	-1.4E-15 COMB7	8.87905 COMB5	-7.27484 COMB4	3.1E-15 COMB6	-3.3E-15 COMB4	125.4211 COMB
-2E-13 COMB5	8.4353 COMB1	-24.4485 COMB7	6.06E-16 COMB6	-1.9E-16 COMB7	4.98611 COMB7	-6.00265 COMB5	8.9E-16 COMB5	-1.4E-15 COMB4	5.5325 COMB
-2E-13 COMB5	7.917 COMB7	-2.3688 COMB1	6.06E-16 COMB4	-4E-16 COMB5	4.9442 COMB7	-3.26145 COMB4	1.46E-15 COMB7	-1.4E-15 COMB4	11.96949 COMB
-4.3E-15 COMB2	0.8136 COMB4	-4.0484 COMB5	7.79E-16 COMB1	-8E-16 COMB7	0.88983 COMB4	-0.95412 COMB6	1.6E-15 COMB5	-1.6E-15 COMB7	2.14523 COMB
-2.6E-14 COMB4	17.449 COMB5	-10.7211 COMB1	3.49E-16 COMB1	-9E-16 COMB7	6.12861 COMB5	-0.85412 COMB6	6.44E-15 COMB4	-1.6E-15 COMB7	107.3534 COMB
-176.776 COMB1	18.6864 COMB5	-24.7886 COMB7	1.7358 COMB1	-1.9097 COMB7	6.12861 COMB5	-2.91496 COMB7	12.36132 COMB5	-11.2858 COMB7	77.98836 COMB
-181.886 COMB1	23.5358 COMB4	-131.163 COMB1	28.7433 COMB5	-135.724 COMB1	0.14902 COMB5	-0.05710 COMB6	172.8328 COMB5	-126.819 COMB5	435.5626 COMB
-83.6976 COMB5	124.9644 COMB4	-94.8452 COMB6	149.1944 COMB7	-149.724 COMB5	0.37543 COMB7	-0.40641 COMB5	704.1944 COMB5	-559.341 COMB7	473.1507 COMB
-1E-13 COMB4	3.9245 COMB5	-2.0149 COMB7	8.06E-16 COMB6	-7.9E-16 COMB4	0.14708 COMB4	-0.14196 COMB6	1.4E-15 COMB4	-1.4E-15 COMB6	7.40369 COMB
-8.9E-17 COMB1	4.1008 COMB7	-2.6935 COMB5	0 BMAT1	-1.4E-17 BMAT1	0.93656 COMB6	-1.12303 BMAT1	5.04E-17 BMAT1	0 BMAT1	14.70456 COMB
-2E-13 COMB5	23.4137 COMB5	-20.3437 COMB7	1.6E-15 COMB1	-1.4E-15 COMB7	1.5683 COMB5	-4.36217 COMB7	5.41E-15 COMB4	-5.6E-15 COMB6	111.1537 COMB

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