

**"STUDI ALTERNATIF PERENCANAAN STRUKTUR ATAS
JEMBATAN TYPE MENINGKUNG (levitated deck) PADA
JEMBATAN SURABAYA-HATTA KOTA MALANG"**

SKRIPSI



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**PROGRAM STUDI TEKNIK SIPIL 5-1
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
INSTITUT TEKNOLOGI NASIONAL
MALANG
2015**

**“STUDI ALTERNATIF PERENCANAAN STRUKTUR ATAS
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ABSTRAKSI

STUDI ALTERNATIF PERENCANAAN STRUKTUR ATAS JEMBATAN TIPE PELENGKUNG (*lowerdeck*) DENGAN MENGGUNAKAN METODE LRFD PADA JEMBATAN SUKARNO – HATTA KOTA MALANG

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Konstruksi Jembatan Rangka Baja tipe pelengkung merupakan salah satu jenis dari beberapa buah jenis Konstruksi Jembatan Baja yang sangat banyak dibangun untuk kepentingan lalu lintas jalan raya. Seperti halnya Jembatan Sukarno - Hatta merupakan salah satu Konstruksi Jembatan Rangka Baja yang ada di Indonesia yang berfungsi untuk kebutuhan arus lalu lintas khususnya masyarakat kota Malang. Secara umum Jembatan Rangka Baja lebih menguntungkan apabila dibandingkan dengan jembatan lainnya, penyebabnya ialah karena batang-batang utama Rangka Baja memikul gaya aksial tekan atau gaya aksial tarik, konstruksi jembatan jauh lebih ringan, bentang jembatan jauh lebih panjang, pelaksanaan di lapangan jauh lebih mudah. Dengan tinggi rangka sedemikian rupa, kekakuan potongan melintang jembatan rangka lebih besar. Bagian-bagian utama rangka batang dibuat dari komponen-komponen yang tidak terlalu besar maka pengangkutannya ke lokasi jembatan menjadi lebih mudah.

Struktur bangunan atas Jembatan Rangka Baja terdiri atas beberapa bagian batang-batang utama pembentuk rangka batang induk, batang-batang melintang, batang-batang memanjang, batang-batang ikatan angin atas, batang-batang ikatan angin bawah, ikatan-ikatan pengaku, sistem lantai kendaraan yang membentuk suatu konstruksi yang kaku sehingga lalu lintas aman melewatinya.

Adapun tujuan dari Skripsi ini adalah untuk merencanakan Jembatan Rangka Baja Tipe Pelengkung dengan menggunakan profil baja WF dan perhitungan volume bahan yang digunakan. Dalam hal ini perencanaan menggunakan metode Load and Resistance Factor Design (LRFD) serta buku Bridge Management System (BMS 1992) untuk peraturan pembebanannya.

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BAB I

PENDAHULUAN

1.1 Latar Belakang

Jembatan merupakan sarana yang sangat penting untuk menghubungkan antara daerah satu dengan daerah yang lain melalui transportasi darat. Di mana pembangunan jalan dan jembatan sebagai lalu lintas kendaraan sangat perlu pembangunannya sebagai alat penyeberangan yang dapat memberikan rasa aman dan nyaman untuk melalui sungai, danau, tebing dan segala penghalang.

Selain untuk kepentingan ekonomi, jembatan sangat penting pula bagi hubungan antar daerah untuk kepentingan pemerintahan, pertukaran kebudayaan dan lain sebagainya. Terputusnya suatu daerah dari pemerintah pusat atau daerah lainnya menghambat kemajuan daerah tersebut.

Jembatan Sukarno-Hatta kota malang merupakan sarana transportasi yang sangat penting untuk kegiatan keseharian masyarakat kota malang. Menyadari bahwa jembatan Sukarno-Hatta sudah berusia sangat tua dan penggunaannya sudah tidak maksimal lagi maka perlu adanya pembangunan jembatan baru.

Melalui skripsi ini penulis mencoba merencanakan konstruksi jembatan Sukarno-Hatta Kota Malang dengan menggunakan struktur jembatan pelengkung (lowerdeck). Oleh karena itu dilakukan suatu **“STUDI ALTERNATIF PERENCANAAN STRUKTUR ATAS JEMBATAN TYPE PELENGKUNG (lowerdeck) PADA JEMBATAN SUKARNO-HATTA KOTA MALANG”**

Adapun latarbelakang pemilihan tipe jembatan pelengkung (lowerdeck) ini yaitu alternatif lain bagi konstruksi jembatan rangka baja yang sudah ada dan kerena jembatan tipe pelengkung cocok untuk jembatan dengan bentang panjang

dan jembatan pelengkung (lower deck) mempunyai nilai estetika yang menarik dibandingkan dengan jembatan biasa

1.2 Rumusan Masalah

- Berapa dimensi baja WF yang diperlukan untuk memikul beban yang bekerja?
- Berapa dimensi kabel yang diperlukan untuk memikul beban yang bekerja?
- Berapa jumlah baut yang di perlukan untuk sambungan pada struktur?
- Berapa volume kebutuhan bahan pada jembatan?

1.3 Maksud dan Tujuan

Maksud dari penulisan skripsi ini adalah untuk merencanakan suatu tipe konstruksi jembatan berdasarkan data-data yang didapat dari hasil survey (lebar jembatan, panjang jembatan, kontur tanah dan tinggi muka air sungai minimum dan maksimum) dengan menggunakan jembatan tipe pelengkung.

Tujuan dari penulisan skripsi ini adalah sebagai berikut:

- Menentukan dimensi baja WF yang diperlukan untuk memikul beban yang bekerja.
- Menentukan dimensi kabel yang diperlukan untuk memikul beban yang bekerja.
- Menghitung jumlah baut untuk sambungan pada struktur.
- Mencari volume kebutuhan bahan pada jembatan.

1.4 Ruang Lingkup Pembahasan

Mengingat luasnya pembahasan dalam konstruksi jembatan, maka perlu adanya lingkup pembahasan tanpa mengurangi kejelasan dari penulisan skripsi ini. Mengingat pada dasarnya jembatan terdiri dari dua bagian utama, yaitu bangunan atas (Upper Structure) dan bangunan bawah (Sub Structure), maka penulis membatasi pembahasan pada struktur bangunan atas yang meliputi :

1. Perencanaan plat lantai kendaraan
2. Perencanaan gelagar memanjang
3. Perencanaan gelagar melintang
4. Perencanaan gelagar induk
5. Perencanaan kabel
6. Perencanaan Sambungan
7. Perencanaan Peletakan

Sedangkan dalam penyusunan tugas akhir ini, penulis menggunakan metode LRFD dan berpedoman kepada peraturan - peraturan yang ada di Indonesia, Yaitu :

1. SNI 1729 - 2015 tentang Tata Cara Perencanaan Struktur Baja Untuk Bangunan Gedung.
2. Bridge managemen system (BMS) 1992.
3. Metode Load and Resistance Factor Design (LRFD), digunakan dalam perencanaan sambungan.
4. Program bantu STAAD Pro 2004, untuk perhitungan statika jembatan pelengkung dengan perhitungan 3 – D.

5. SNI 2847 - 2013 tentang Tata Cara Perhitungan Struktur Beton Untuk Bangunan Gedung.

BAB II

DASAR TEORI

2.1 Jembatan Secara Umum

Jembatan adalah suatu konstruksi yang berfungsi sebagai lintasan untuk mempermudah dan memperpendek jarak menyeberangi suatu rintangan tanpa menutup rintangan itu sendiri. Lintasan yang dimaksud disini adalah berupa sungai, jurang, rawa, jalan raya, jalan rel, jalan pejalan kaki dan lain – lain. Jembatan sendiri dibedakan menjadi dua macam jenis bangunan yaitu bangunan bawah (*lower structure*) dan bangunan atas (*super structure*).

2.1.1 Macam-macam Jembatan

Secara garis besar, macam-macam jembatan antara lain :

1. Jembatan Kayu

Pada umumnya jembatan kayu adalah jembatan yang sederhana dan dapat dikerjakan tanpa peralatan canggih. Bila dibandingkan dengan bahan lain seperti baja, beton atau lainnya, bahan kayu merupakan bahan yang potensial dan telah cukup lama dikenal manusia. Kalau dimasa lampau untuk menghubungkan sungai, orang cukup dengan menggunakan bamboo atau kayu gelondongan. Namun pada saat ini telah banyak digunakan bahan baja dan beton untuk bahan jembatan, sehingga penggunaan bahan kayu sudah mulai berkurang dan mulai ditinggalkan.

2. Jembatan Beton

Beton telah banyak dikenal dalam dunia konstruksi. Dengan kemajuan teknologi beton, sehingga diperoleh bentuk penampang beton yang

beragam. Dalam kenyataan sekarang, jembatan beton tidak hanya berupa beton bertulang konvensional, tetapi telah dikembangkan berupa jembatan prategang.

3. Jembatan Baja

Dengan semakin majunya teknologi dan demikian banyak tuntutan kegiatan transportasi, manusia mengembangkan baja sebagai bahan dari struktur jembatan. Jembatan baja ini sangat menguntungkan bila digunakan untuk jembatan dengan bentang panjang.

2.1.2 Type-type Jembatan Baja

Konstruksi yang menggunakan bahan baja konstruksinya lebih ringan dari konstruksi jembatan lainnya dan tersedia berbagai macam ukuran dan bentuk. Sedangkan konstruksi jembatan baja terdiri dari berbagai macam antara lain :

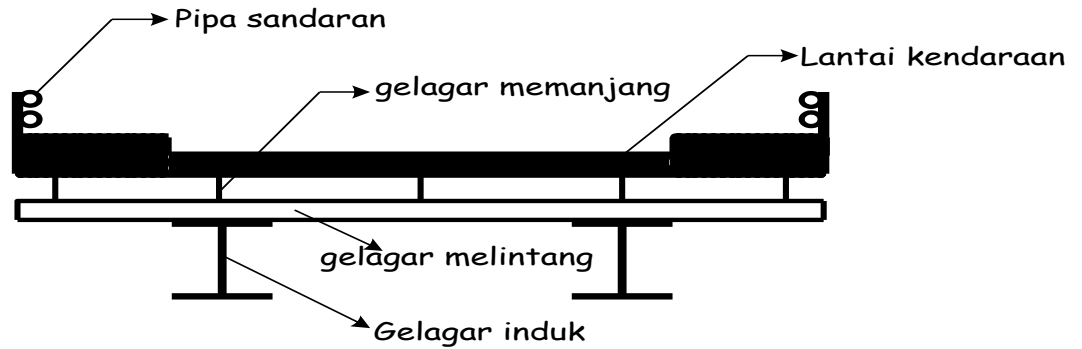
1. Jembatan balok (*The Beam Bridge*)

Jembatan terletak diatas dua tumpuan dan lantai kendaraan langsung berada diatas gelagar memanjang. Pada jembatan jenis ini tidak ada gelagar melintang dan gelagar induk, hanya ada gelagar memanjang. Biasanya digunakan untuk bentang kecil yaitu 50 ft sampai 120 ft.

Ciri utama dari jembatan balok adalah pada beban tegak lurus juga timbul reaksi-reaksi tumpuan tegak lurus.

2. Jembatan baja dinding penuh (*The Plate Girder Bridge*)

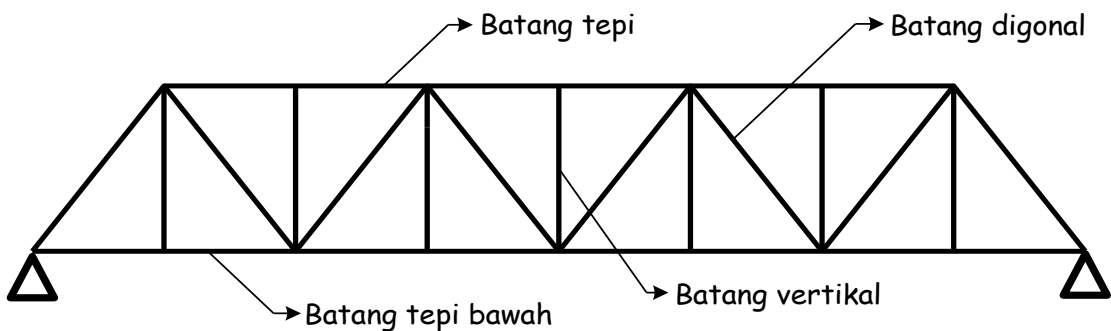
Jembatan ini terdiri dari gelagar memajang, gelagar melintang, dan gelagar induk sedangkan lantai kendaraan umumnya terletak rendah. Biasanya digunakan pada bentang 80 ft sampai 150 ft.



Gambar 2.1. Jembatan dinding penuh

3. Jembatan rangka sederhana (*Simple Truss Bridge*)

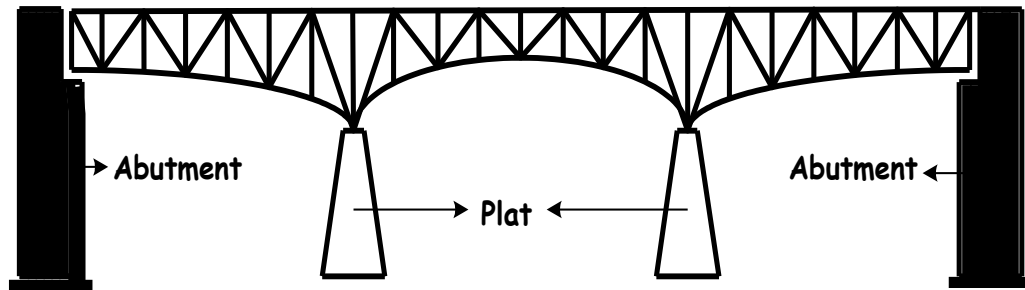
Jembatan ini terdiri dari gelagar induk, gelagar melintang, dan gelagar memanjang biasanya digunakan dalam jembatan menengah yaitu 150 ft sampai dengan 600 ft



Gambar 2.2. Jembatan rangka sederhana

4. Jembatan rangka menerus (*Continuous Bridge Trusses*)

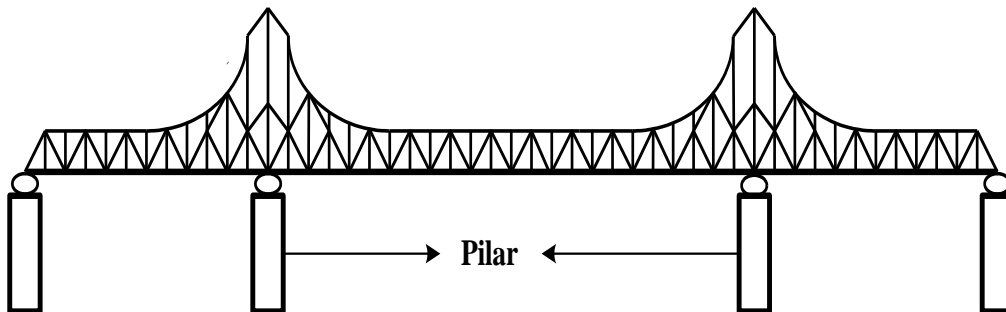
Jembatan ini terdiri dari rangka / truss yang menerus dimana tumpuan berada ditengah bentang yang tidak terpisah, jembatan ini biasanya digunakan pada bentang 150 ft sampai dengan 600 ft.



Gambar 2.3. Jembatan rangka menerus

5. Jembatan kantilever (*Cantilever Bridge*)

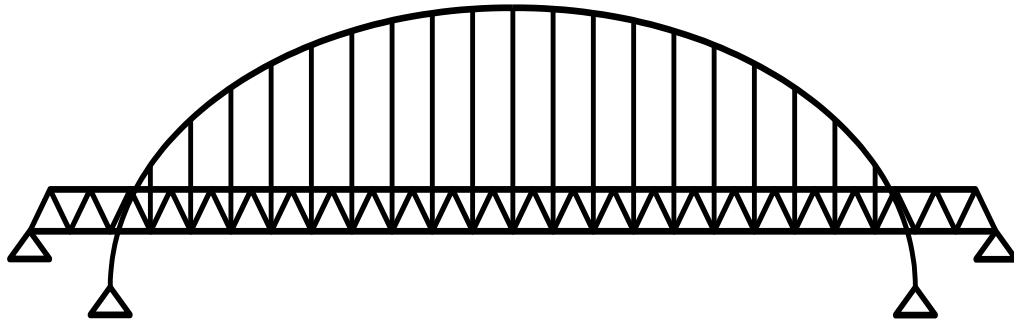
Jembatan ini terdiri dari dua bentang kantilever dengan satu bentang lain diantaranya, dimana bentang tersebut ditumpu pada bentang 250 ft sampai 1800 ft.



Gambar 2.4. Jembatan kantilever

6. Jembatan lengkung (*Steel Arches Bridge*)

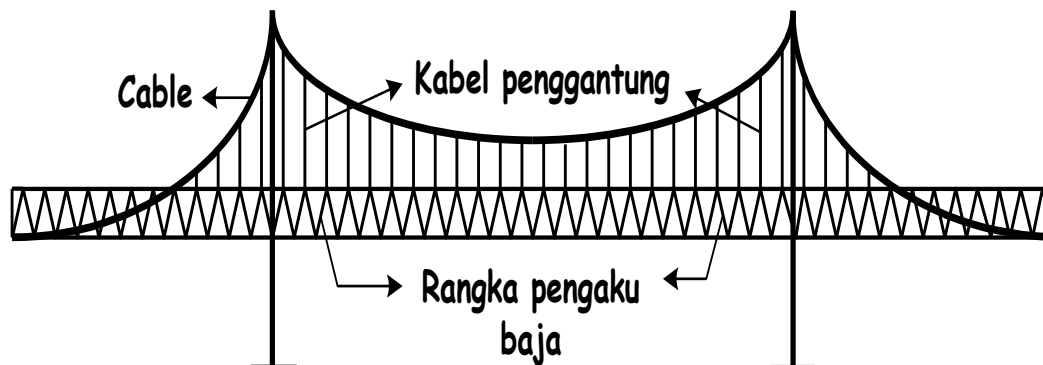
Konstruksi jembatan ini terdiri dari batang penggantung, batang dan gelagar pengaku, jembatan ini biasanya digunakan pada bentang 100 ft sampai dengan 1800 ft. Jembatan ini mengadakan reaksi tumpuan yang searah pada beban tegak lurus.



Gambar 2.5. Jembatan lengkung (arch)

7. Jembatan gantung (*Suspension Bridge*)

Konstruksi utama dari jembatan ini terdiri dari kabel yang terbentang diatas menara atau tiang penegar, kabel penggantung / hanger, balok-balok penegar gelagar, angker, jembatan ini biasanya digunakan pada bentang 400 ft sampai 10000 ft.



Gambar 2.6. Jembatan gantung (suspension bridge)

2.1.3 Bagian-bagian Jembatan

Pada dasarnya semua jembatan terdiri dari dua bagian utama, yaitu struktur bagian atas atau super struktur dan struktur bagian bawah atau sub struktur. Dalam hal ini yang akan dibahas lebih lanjut adalah struktur bagian atas. Struktur bagian atas dari jembatan itu sendiri meliputi :

- a. Lantai trotoir dan kendaraan
- b. Gelagar memanjang
- c. Gelagar melintang
- d. Gelagar induk
- e. Pipa sandaran
- f. Plat simpul
- g. Peletakan / sandaran

2.2 Bagian-bagian Struktur Jembatan Pelengkung

2.2.1 Plat lantai kendaraan

Plat lantai kendaraan merupakan komponen jembatan tempat berpijaknya keadaan. Dalam skripsi ini plat lantai kendaraan direncanakan terbuat dari struktur beton.

Perhitungan pembebanan plat lantai kendaraan meliputi :

1. Pembebanan Plat Lantai
2. Pembebanan totoir

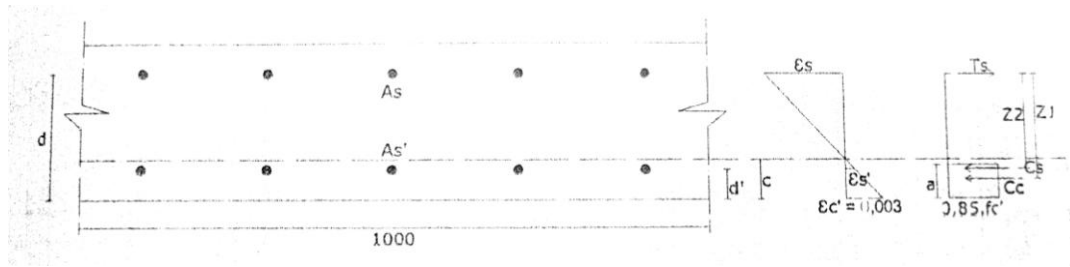
Penulangan plat lantai

Mu didapat dengan menggunakan software STAAD Pro 2004

d = tebal plat lantai – selimut beton – $\frac{1}{2}$ D tulangan

As = $(1/4 \times \pi \times D^2 \times b) /$ jarak yang direncanakan

Untuk perhitungan tulangan rangkap



$$a = \frac{As \cdot fy}{0,85 \cdot fc' \cdot b} \quad (2.1)$$

Tegangan tekan pada serat beton:

$$Cc = 0,85 \cdot fc' \cdot a \cdot b \quad (2.2)$$

Tegangan tekan pada serat baja:

$$Cs = As' (fs' - 0,85 \cdot fc') \quad (2.3)$$

Kekuatan momen yang terjadi:

$$Mn = Cc \cdot Z1 + Cs \cdot Z2 \quad (2.4)$$

Kekuatan momen rencana:

$$Mr = \phi \cdot Mn, \text{ dimana } \phi = 0,8 \quad (2.5)$$

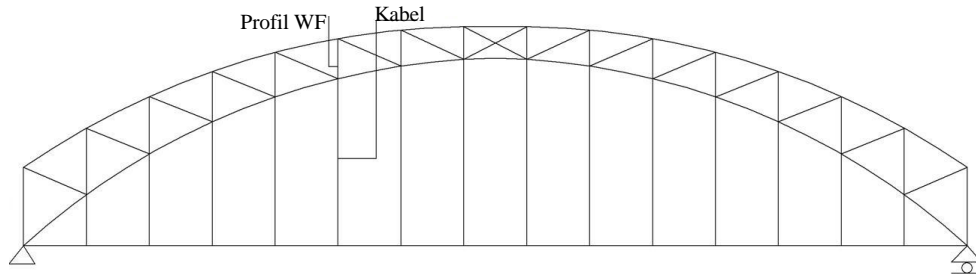
Kekuatan momen rencana ϕMn harus lebih besar atau sama dengan momen luar rencana (Mu).

$$Mr = \phi Mn > Mu \quad (2.6)$$

2.2.2 Steel Arch (Pelengkung)

Steel Arch merupakan gelagar yang di pasang melengkung diatas dua tumpuan. Untuk memperoleh bentuk yang baik dimana lantai kendaraan berada dibawah busur maka ketinggian busur pertama diambil 1/5 sampai 1/8 dari

panjang bentang, dan ketinggian busur kedua terhadap busur pertama diambil sebesar $1/25$ sampai $1/45$ bentang³⁾



Gambar 2.7. Jembatan Busur Berlantai Kendaraan Rendah

2.2.3 Gelagar Induk

Gelagar induk adalah gelagar yang di pasang di kedua sisi jembatan dan terletak kearah memanjang. Gelagar induk berfungsi untuk menerima semua pengaruh beban jembatan melalui gelagar melintang

2.2.4 Kabel

Kabel pada konstruksi ini berfungsi sebagai penggantung yaitu menghubungkan gelagar induk dengan gelagar busur, menurut bentuknya kabel dibedakan menjadi :

1. Wire Ropes

Untuk jembatan dengan bentang lebih pendek. Setiap rope (tali) terdiri dari 7 strand, dan setiap strand berisi 7, 19, 37, atau 61 wire (kawat). Setiap rope tidak boleh berisi lebih dari 250 – 300 wire, agar tidak terlalu kaku pada waktu pemasangan. (Ir. Hannis Burhan, "Suspension Bridge" Hal :)

2. Parallel Wire Cable

Untuk system ini kira-kira 250 – 300 kawat yang sejajar satu dengan yang lain sehingga merupakan sebuah strand. Sebuah cable dapat terdiri dari 7, 9, 37, atau 61 strand yang disatukan. Kawat yang biasa dipakai adalah diameter 5,0 milimeter untuk bentang yang lebih pendek dapat pula dipakai diameter 4,5 mm atau 4,0 mm.

2.2.5 Sockets

Pada dasarnya ada dua tipe alat penyambung yang memungkinkan digunakan untuk memdahkan sambungan kabel ke struktur utama yaitu:

- a. Closed Strand Socket
- b. Open Strand Sockets

2.2.6 Perencanaan Gelagar Memanjang

Gelagar memanjang adalah gelagar yang dipasang arah memanjang jembatan, berfungsi sebagai tumpuan lantai kendaraan dan menyalurkan beban-beban yang diterimanya pada gelagar melintang.

Beban- beban yang bekerja pada gelagar memanjang adalah :

- a. Beban mati lantai kendaraan

Untuk beban mati lantai kendaraan diambil pengaruh beban lantai yang membebani gelagar memanjang.

- b. Beban hidup “D”

Dalam perhitungan kekuatan gelagar-gelagar, beban hidup yang harus dipertimbangkan adalah beban “D” atau beban jalur. Beban “D” terdiri dari

beban terbagi rata “q” tanpa koefisien kejutan dan beban garis “P” yang harus dikalikan dengan koefisien kejutan.

Setelah gelagar memanjang ditentukan, maka harus dikontrol terhadap tegangan dan lendutan yang terjadi. Rumus-rumus yang digunakan untuk kontrol tegangan dan lendutan adalah :

- Lendutan (Buku teknik Sipil, hal 48)

$$f_{ada} = \frac{5.Qu.L^4}{384.E.Ix} + \frac{P.L^3}{48.E.Ix} \quad (2.7)$$

Dimana :

f = besar lendutan yang terjadi

q = beban mati (kg/cm)

L = panjang gelagar (cm)

Ix = momen inersia (cm⁴)

- Besarnya lendutan maksimum akibat beban mati dan beban hidup adalah :

$$\bar{f} = \frac{1}{240} . L \quad (2.8)$$

(Laboratorium mekanika struktur, pusat penelitian antar universitas bidang ilmu rekayasa, institute teknologi bandung, 2000 hal 15 dari 184)

2.2.7 Perencanaan Gelagar Melintang

Gelagar melintang adalah konstruksi jembatan yang melintang dibawah lantai kendaraan. Beban yang bekerja gelagar melintang adalah :

- a. Beban Mati

Terdiri dari berat lantai kendaraan, trotoar dan berat sendiri gelagar melintang.

- b. Beban hidup

Beban yang harus diperhitungkan yaitu beban “D” yang terdiri dari beban terbagi rata “q” tanpa koefisien kejut dan beban garis “P” yang harus dikalikan dengan koefisien kejut.

Setelah gelagar melintang ditentukan, maka harus dikontrol terhadap tegangan dan lendutan yang terjadi. Rumus-rumus yang digunakan untuk kontrol tegangan dan lendutan adalah :

- Lendutan (Buku teknik Sipil, hal 48)

$$f_{ada} = \frac{5.Qu.L^4}{384.E.Ix} + \frac{P.L^3}{48.E.Ix} \quad (2.7)$$

Dimana :

f = besar lendutan yang terjadi

q = beban mati (kg/cm)

L = panjang gelagar (cm)

Ix = momen inersia (cm⁴)

- Besarnya lendutan maksimum akibat beban mati dan beban hidup adalah :

$$\bar{f} = \frac{1}{240}.L \quad (2.8)$$

(Laboratorium mekanika struktur, pusat penelitian antar universitas bidang ilmu rekayasa, institute teknologi bandung, 2000 hal 15 dari 184)

2.2.8 Ikatan Angin

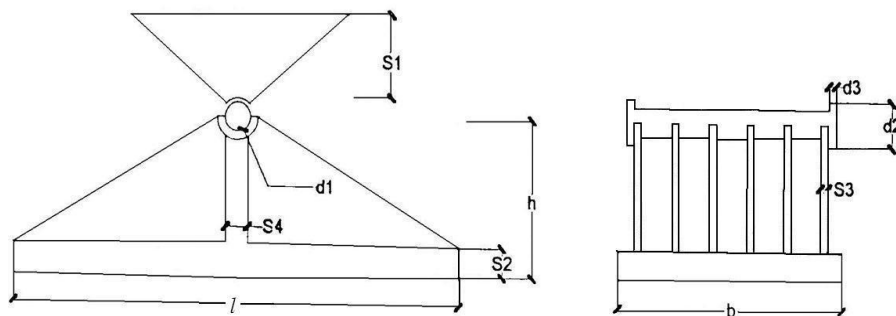
Ikatan angin adalah salah satu sisi komponen jembatan yang fungsi utamanya memberikan kekuatan konstruksi dalam bidang horizontal. Ikatan angin dapat terletak diatas, ditengah atau dibawah. Ikatan angin yang terletak diatas

disebut ikatan angin atas, yang terletak ditengah disebut ikatan angin tengah sedangkan yang terletak dibawah disebut ikatan angin bawah.

2.2.9 Konstruksi Perletakan / Landasan dan Tumpuan

Konstruksi perletakan harus mengalihkan gaya- gaya tegak dan mendatar yang bekerja pada jembatan kepada pangkal jembatan dan pondasi. Untuk mengatasinya kedua macam gaya tersebut dapat dipasang dua macam tumpuan yaitu tumpuan rol atau sendi.

a. Perletakan Sendi



Gambar 2.8 Konstruksi Perletakan Sendi

Untuk menghitung perletakan sendi digunakan rumus- rumus sebagai berikut :

- Panjang empiris dihitung dengan rumus

$$\ell = L+40 \quad (2.9)$$

Dimana :

L = Panjang jembatan (m)

ℓ = Panjang perletakan (cm)

- Tebal bantalan

$$S_1 = \frac{1}{2} \sqrt{\frac{3.Pu.\ell}{b.\phi.fy}} \quad (2.10)$$

Dimana :

P_u = Besar gaya (kg)

b = Lebar perletakan

ϕ = Faktor resistansi untuk sendi rol 0,90

F_y = Mutu baja st 52 = 240 Mpa = 2400 kg/cm²

- Selanjutnya untuk ukuran S_2 , S_3 , h dan W dapat direcanakan dengan melihat tabel Muller Breslaw, sebagai berikut :

Tabel 2.1 Tabel Muller Breslaw

$\frac{h}{S_2}$	$\frac{h}{a \cdot S_3}$	W
3	4	$0,2222 \cdot a \cdot h^2 \cdot S_3$
4	4,2	$0,2251 \cdot a \cdot h^2 \cdot S_3$
5	4,6	$0,2286 \cdot a \cdot h^2 \cdot S_3$
6	5	$0,2315 \cdot a \cdot h^2 \cdot S_3$

Sumber : H.J. Struyk, K.H.C.w. Van Der Veen, Soemargono, Jembatan : 249

- Jumlah rusuk (a), maka S_2 dan S_3 dapat diambil dengan table diatas, dimana W adalah momen tahanan, perbandingan h/ S_2 hendaknya dipilih antara 3 dan 5, tebal S_4 biasanya diambil = $h/6$, dan $S_5 = h/4$

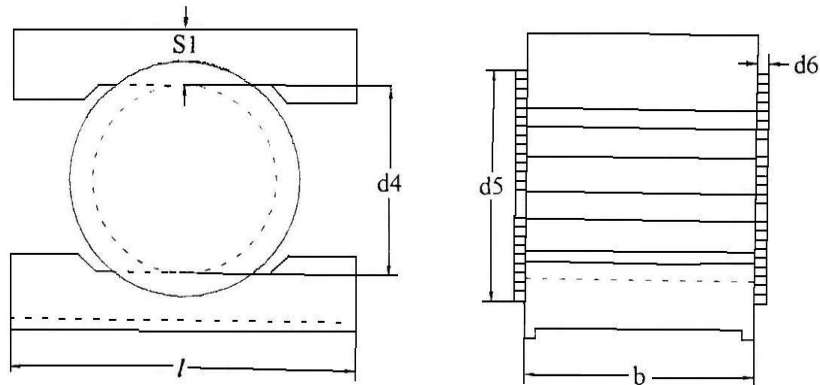
$$M_{\max} = \frac{1}{8} \cdot P_u \cdot \ell \rightarrow W = \frac{M_{\max}}{\phi \cdot f_y} \quad (2.11)$$

- Jari- Jari garis tengah sendi

$$r = \frac{1}{2} \cdot d_1$$

$$= \frac{0,8 \cdot P}{\phi \cdot f_y \ell} \quad (2.12)$$

2.9.2 Perletakan Rol



Gambar 2.9 Konstruksi Perletakan Rol

Untuk menghitung perletakan rol digunakan rumus- rumus sebagai berikut :

- Panjang empiris dihitung dengan rumus

$$\ell = L+40 \quad (2.13)$$

Dimana :

L = Panjang jembatan (m)

ℓ = Panjang perletakan (cm)

- Tebal bantalan

$$S_1 = \frac{1}{2} \sqrt{\frac{3.Pu.\ell}{b.\phi.fy}} \quad (2.14)$$

Dimana :

Pu = Besar gaya (kg)

b = Lebar perletakan

ϕ = Faktor resistansi untuk sendi rol 0,90

Fy = Mutu baja st 52 = 240 Mpa = 2400 kg/cm²

Selanjutnya untuk ukuran d₃, d₄, dan d₅ dapat direncanakan dengan menghitung :

- Jari- Jari garis tengah rol

$$\begin{aligned}
 r &= \frac{1}{2} \cdot d_4 \\
 &= \frac{0,8 \cdot P}{\phi \cdot f_y \cdot l}
 \end{aligned}
 \tag{2.15}$$

- Diameter rol

$$\begin{aligned}
 d_4 &= 0,75 \cdot 10^6 \cdot \frac{P}{l \cdot \phi \cdot \sigma_y} \rightarrow \sigma_y = \text{tegangan tarik putus baja} \\
 &= 8500 \text{ kg/cm}^2 \text{ (Baja A529)}
 \end{aligned}$$

- Tinggi total rol

$$d_5 = d_4 + 2 \cdot d_6 \tag{2.16}$$

- Tebal bibir rol

$$d_6 = \text{diambil sebesar } 2,5 \text{ cm}$$

2.3 Pembebanan

Peraturan khusus untuk pembebanan jembatan di setiap negara kemungkinan akan berbeda antara negara yang satu dengan negara lainnya seperti JIS di Jepang , AASHTO di Amerika Serikat, BI di Inggris. Di Indonesia peraturan tentang pembebanan jembatan jalan raya telah dikemas dalam Bridge Managemen System (BMS) bagian II.

Pada perencanaan jembatan ini, semua beban dan gaya yang bekerja pada konstruksi dihitung berdasarkan : “Bridge Managemen System (BMS) bagian II.”

Beban-beban yang dipakai dalam perhitungan adalah :

2.3.1 Beban Primer

Beban primer adalah beban utama dalam perhitungan tegangan perencanaan jembatan . Beban primer terdiri dari :

a. Beban berat sendiri

Adapun beban yang berasal dari berat sendiri jembatan atau bagian jembatan yang ditinjau, termasuk unsur tambahan dalam perencanaan.

Tabel 2.2. Faktor Beban untuk berat sendiri

Jangka waktu	Load factor / Faktor beban	
	Bahan	K_{MS}^U
Tetap	Baja, Alumunium	1.1
	Beton Pracetak	1.2
	Beton dicor ditempat	1.3
	Kayu	1.4

Sumber : Peraturan Perencanaan Teknik Jembatan; BMS 1992; hal : 2-14

b. Beban mati

Beban mati tambahan adalah berat seluruh badan yang membentuk suatu beban pada jembatan yang merupakan elemen non struktural dan mungkin besarnya berubah selama umur jembatan.

Tabel 2.3. Faktor beban untuk beban mati tambahan

Jangka waktu	Load factor / Faktor beban	
	Keadaan	K_{MA}^U
Tetap	Keadaan Umum	2
	Keadaan Khusus	1.4

Sumber : Peraturan Perencanaan Teknik Jembatan; BMS 1992; hal : 2-16

Rumus-rumus yang akan digunakan untuk menghitung beban-beban tersebut adalah sebagai berikut : (Struyk dan Van Deer Veen, Jembatan, 1990 : 167)

- Gelagar induk

$$G1 = 20+3L \quad (\text{kg/cm}^2) \quad (2.17)$$

Diubah menjadi satuan kg menjadi

$$G1 = (20+3L).L.a \quad (\text{kg}) \quad (2.18)$$

Dimana :

G = berat gelagar induk

L = panjang jembatan

a = lebar jembatan

- Berat sendiri gelagar melintang

$$G2 = n \times L \times g \quad (2.19)$$

Berat sandaran $G = 80 \text{ Kg/m}$ (Struyk dan Van Deer Veen,
Jembatan, 1990 : 167)

$$G3 = (10.a) \quad (\text{kg}) \quad (2.20)$$

- Berat ikatan angin (Struyk dan Van Deer Veen, Jembatan, 1990 : 167)

$$G4 = (10.a) \quad (\text{kg})$$

Dalam satuan menjadi

$$G4 = (10.a).L.a \quad (\text{kg}) \quad (2.21)$$

- Berat lantai kendaraan

$$G5 = 2500 \times L \times a \times t \quad (2.21)$$

- Berat trotoar

$$G6 = 2500 \times L \times a \times t \quad (2.22)$$

Dimana :

G = berat beban dalam kg

n = jumlah gelagar

g = berat profil

L = panjang bentang

a = lebar jembatan

t = tebal plat

c. Beban lajur “D”

Beban lajur “D” terdiri dari beban tersebar merata (UDL) yang digabung dengan beban garis (KEL). Beban terbagi rata UDL mempunyai intensitas q kPa, dimana besarnya q tergantung pada panjang total yang dibebani L sebagai berikut

$$L < 30 \text{ m ; } q = 8.0 \text{ kPa}$$

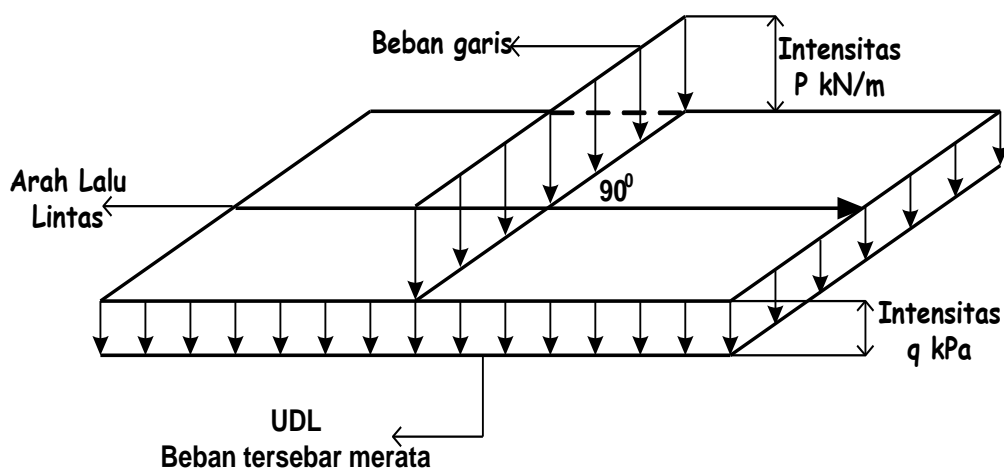
$$L > 30 \text{ m ; } q = 8.0 [0.5 + 15 / L] \text{ kPa} \quad (2.23)$$

Beban garis KEL dengan intensitas p kN/m harus ditempatkan tegak lurus terhadap arah lalu lintas pada jembatan. Besarnya intensitas $P = 44.0$ kN/m. Beban “D” harus ditempatkan pada dua jalur lalu lintas rencana yang berdekatan untuk lebar lebih besar Dari 5,5 m dan bekerja dengan intensitas 100% selebar 5,5 m dan sisa jalan bekerja 50 %.

Tabel 2.4. Faktor Beban lajur “D”

Jangka waktu	Load factor / Faktor beban
Sementara	2

Sumber : Peraturan Perencanaan Teknik Jembatan; BMS 1992; hal : 2-16



Gambar 2.10. Beban Lajur “D”

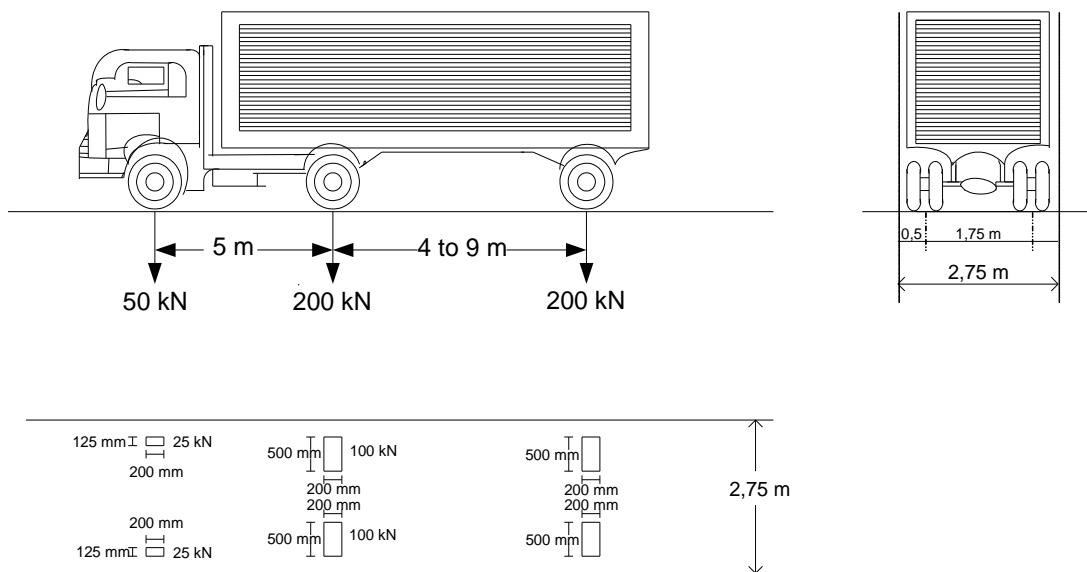
d. Beban truk “T”

Beban truk “T” adalah suatu beban kendaraan berat dengan 3 as yang ditempatkan pada satu lajur lalu lintas rencana. Ukuran-ukuran serta kedudukan seperti pada gambar diatas. Jarak antara 2 as tersebut bisa diubah-ubah antara 4.0 m sampai 9.0 m untuk mendapatkan pengaruh terbesar pada arah memanjang jembatan.

Tabel 2.5. Faktor beban untuk beban truk “T”

Jangka waktu	Load factor / Faktor beban
Sementara	2

Sumber : Peraturan Perencanaan Teknik Jembatan; BMS 1992; hal : 2-27



Gambar 2.11. Pembebanan Truk “T”

Dimana : $a_1 = a_2 = 30 \text{ cm}$

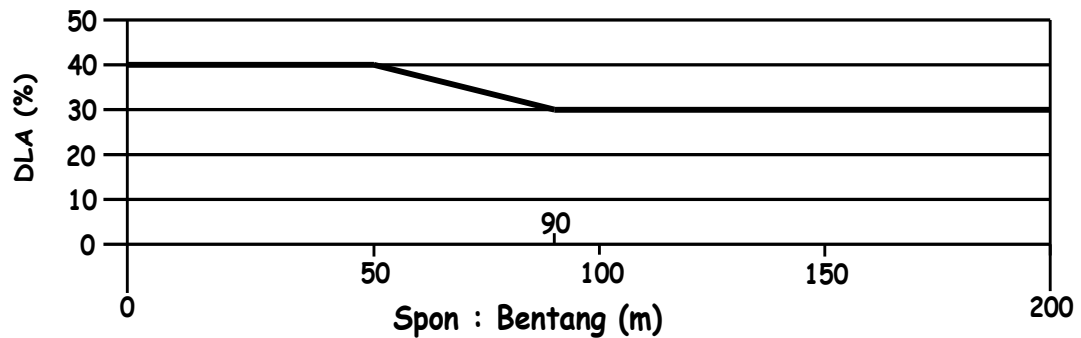
$b_1 = 12,5 \text{ cm}$

$b_2 = 50,00 \text{ cm}$

$m_s = \text{muatan rencana sumbu} = 20 \text{ ton}$

e. Faktor beban dinamis

Faktor beban dinamis (DLA) merupakan iteraksi antara kendaraan yang bergerak dengan jembatan. Untuk truk “T” nilai DLA adalah 0.3. Untuk “KEL” nilai DLA diberikan dalam gambar berikut :



Gambar 2.12. Faktor beban dinamis

f. Beban trotoar

Semua elemen dari trotoar atau jembatan penyebrangan yang langsung memikul pejalan kaki harus direncanakan untuk memikul $5 \text{ kPa} = 500 \text{ kg/m}^2$.

Tabel 2.6. Faktor beban untuk beban trotoar / untuk pejalan kaki

Jangka waktu	Load factor / Faktor beban
Sementara	2

Sumber : Peraturan Perencanaan Teknik Jembatan; BMS 1992; hal : 2-32

2.3.2 Beban Sekunder

Beban sekunder adalah merupakan beban sementara yang selalu diperhitungkan dalam perhitungan tegangan pada setiap perencanaan jembatan. Yang termasuk dalam beban sekunder beban diantaranya adalah :

a. Gaya rem

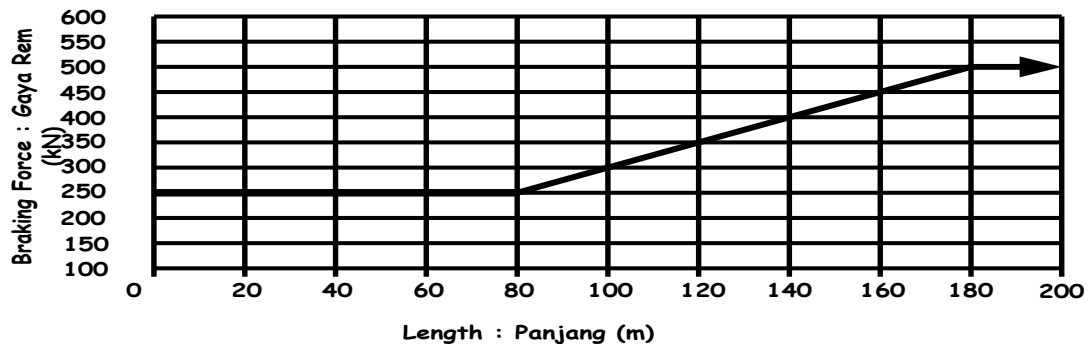
Pengaruh gaya-gaya dalam arah memanjang jembatan akibat gaya rem, harus ditinjau. Pengaruh gaya ini diperhitungkan senilai dengan pengaruh gaya rem sebesar 5% dari beban “D” tanpa koefisien kejut yang memenuhi semua jalur lalu lintas yang ada, dan dalam satu jurusan. Gaya rem tersebut dianggap bekerja horizontal dalam arah sumbu jembatan dengan titik tangkap setinggi 1,80 meter diatas permukaan lantai kendaraan.

Tabel 2.7. Faktor Beban untuk gaya rem

Jangka waktu	Load factor / Faktor beban
Sementara	2

Sumber : Peraturan Perencanaan Teknik Jembatan; BMS 1992; hal : 2-30

Tanpa melihat seberapa besarnya lebar jembatan, gaya memanjang yang bekerja diperhitungkan berdasarkan grafik sebagai berikut :



Gambar 2.10. Grafik Gaya rem

b. Gaya Angin

Gaya nominal ultimate dari gaya layan jembatan akibat angin tergantung kecepatan angin rencana seperti berikut :

$$Tew_2 = 0.0006 \cdot C_w \cdot (V_w)^2 \cdot A_b \quad (2.24)$$

Dimana :

V_w = Kecepatan angin rencana (m/dt) untuk keadaan batas yang ditinjau .

C_w = Koefisien seret (untuk bangunan atas rangka $C_w = 1,2$)

A_b = Luasan koefisien bagian samping jembatan (m^2)

Apabila suatu kendaraan sedang berada diatas jembatan, beban garis merata tambahan arah horizontal harus diterapkan pada permukaan lantai seperti diberikan dengan rumus :

$$T_{ew1} = 0.0012 \cdot C_w \cdot (V_w)^2 \cdot A_b \quad (2.25)$$

Tabel 2.8. Faktor beban untuk beban angin

Jangka waktu	Load factor / Faktor beban
Sementara	1.4

Sumber : Peraturan Perencanaan Teknik Jembatan; BMS 1992; hal : 2-43

c. Kombinasi beban

Kombinasi beban pada keadaan batas ultimate terdiri dari jumlah pengaruh aksi tetap dan satu pengaruh aksi sementara. Sebagai ringkasan dari kombinasi beban yang lazim diberikan dalam tabel dibawah ini :

Tabel 2.9. Kombinasi beban

Aksi	Kombinasi beban						Catatan
	1	2	3	4	5	6	
Aksi Tetap	X	X	X	X	X	X	1
Berat sendiri							
Aksi Transient	X	0	0	0			
Beban Lajur "D"							
Beban Truk "T"							
Gaya Rem	X	0	0	0			2
Beban Trotoar		X					
Beabn Angin	0		0	X		0	

Sumber : Peraturan Perencanaan Teknik Jembatan; BMS 1992; hal : 2-43

Keterangan :

1. Dalam keadaan batas ultimate pada bagian tabel ini, aksi dengan tanda "X" untuk kombinasi tertentu adalah memasukan faktor harga beban

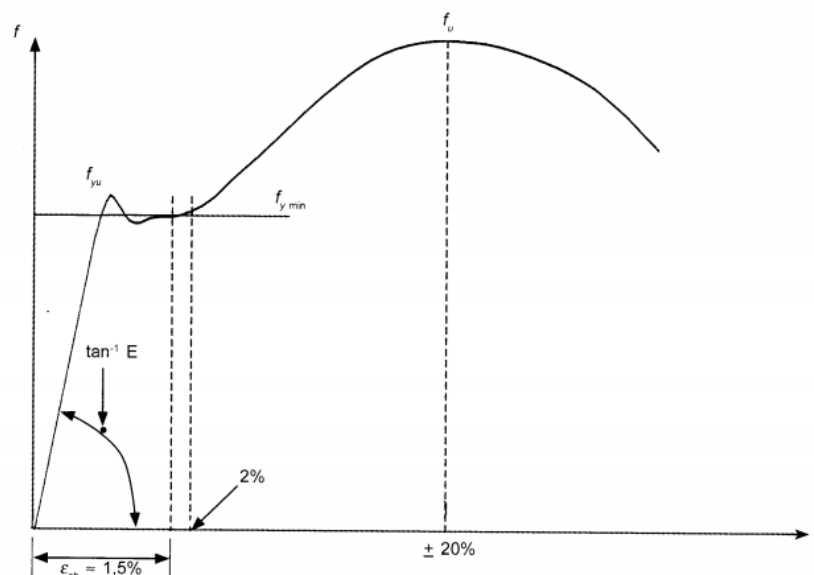
ultimate panuh. Nomor dengan tanda “0” memasukkan harga yang sudah diturunkan besarnya sama dengan beban daya layan.

2. Beberapa aksi tetap berubah menurut waktu secara perlahan-lahan. Kombinasi beban untuk aksi demikian dan minimum untuk menemukan keadaan yang paling berbahaya.

Tingkat keadaan batas dari gaya sentrifugal dan gaya rem tidak terjadi secara bersamaan. Untuk faktor beban ultimate berkurang untuk beban lalu lintas vertikal kombinasi dengan gaya rem.

2.4 Teori Desain Srtuktur Baja Metode LRFD

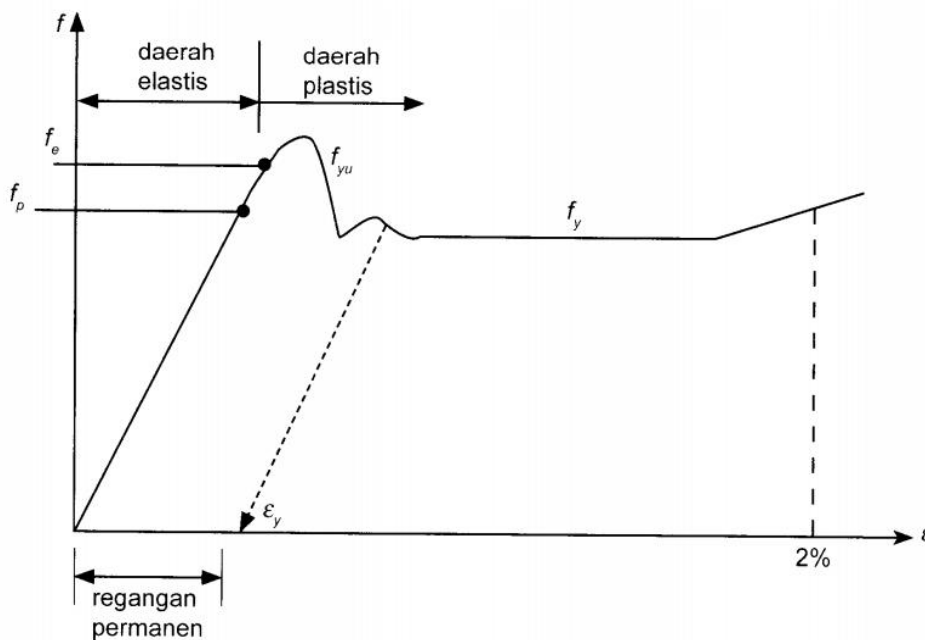
Sifat mekanis baja merupakan yang sangat penting dalam desain konstruksi. Sifat ini di peroleh dari uji tarik baja, uji melibatkan pembebanan tarik sampel baja dan bersama ini dilakukan pembebanan dan panjangnya sehingga diperoleh tegangan dan regangannya.



Gambar 2.12. Diagram Regangan Tegangan

Hasil uji ini di tunjukan dalam diagram regangan dan tegangan. Titik f_y (*Titik Limit Perporcional*) pada diagram hubungan linear antara tegangan dan regangan, apabila dilakukan pembebanan tidak melewati titik ini baja masih bersifat elastis artinya apabila beban dihilangkan maka baja masih dapat kembali keadaan semula, tetapi apa bila dibebankan terus sampai melampaui titik tersebut maka baja tidak bersifat elastis lagi melainkan bersifat plastis sehingga baja tidak dapat kembali ke keadaan sebelum pembebanan.

Ada dua filosofi yang digunakan dalam perencanaan struktur baja yaitu perencanaan berdasarkan tegangan kerja/ *Allowabel Stress Design* (ASD) dan perencanaan konstruksi batas/ *Load And Resistance Factor Design* (LRFD)



Gambar 2.12. Diagram Regangan Tegangan

Berdasarkan grafik tersebut maka ada beberapa hal yang mendasari penulis menerapkan metode LRFD dalam penyelesaian skripsi yaitu :

1. Rasional LRFD selalu menarik perhatian, dan menjadi suatu perangsang yang menjanjikan penggunaan bahan yang lebih ekonomis dan lebih baik

untuk beberapa kombinasi beban dan konfigurasi structural. LRFD juga cenderung memberikan struktur yang lebih aman bila di bandingkan dengan ASD dalam mengkombinasikan beban-beban hidup dan mati dan memperlakukan mereka dengan cara yang sama.

2. LRFD akan memudahkan pemasukan informasi baru mengenai beban-beban dan variasi-variasi bila informasi tersebut telah diperoleh. Pengetahuan kita mengenai beban-beban beserta variasi mereka masih jauh dari mencukupi. Bila dikehendaki, pemisahan pembebanan dari resistensyaa akan memungkinkan pengubahan yang satu tanpa perlu mempengaruhi yang lainnya.
3. Perubahan-perubahan dalam berbagai factor kelebihan beban dan factor resistensi lebih muda dilakukan ketimbang mengubah tegangan ijin dari ASD.
4. LRFD membuat desain dalam segala macam material lebih muda dipertautkan. Variabilitas beban-beban sebenarnya tidak berkaitan dengan material yang digunakan dalam desain.

2.5 Dasar Perencanaan Load Resistance Design LRFD

Suatu desain struktur harus menyediakan cadangan kekuatan yang diperlukan untuk menanggung beban layanan yakni struktur harus memiliki kemampuan terhadap kemungkinan kelebihan beban (*overload*). Kelebihan beban dapat terjadi akibat perubahan fungsi struktur dan dapat juga terjadi akibat terlalu rendahnya taksiran atas efek-efek beban yang mungkin akan terjadi. Di samping

itu, harus ada kemampuan terhadap kemungkinan kekuatan material yang lebih rendah (*under strength*).

Terjadinya penyimpangan dalam dimensi batang, meskipun dapat mengakibatkan suatu batang memiliki kekuatan yang lebih rendah dibanding dengan yang telah diperhitungkan. Secara umum, persamaan untuk persyaratan keamanan dapat ditulis sebagai berikut (Struktur Baja Desain dan Perilaku, CG salmon, JE Johnson, Jilid I, hal. 28) :

$$\phi R_n \geq \sum \gamma_i Q_i \quad (2.26)$$

Dimana :

ϕ = faktor resistensi (factor reduksi kekuatan)

R_n = kekuatan nominal (kekuatan)

Dimana ruas kiri dari persamaan tersebut mewakili resistensi, atau kekuatan dari komponen atau sistem, sedangkan sisi kanan mewakili beban yang diharapkan akan ditanggung. Pada sisi kekuatan, harga nominal resistensi R_n dikalikan dengan faktor resistensi (*reduksi kekuatan*) ϕ untuk mendapatkan kekuatan design. Pada sisi beban dari persamaan diatas, berbagai faktor-faktor kelebihan beban γ ; untuk mendapatkan jumlah $\sum \gamma_i Q_i$ dari beban-beban terfaktor.

Karena struktur jembatan ini secara umum terdiri dari gaya aksial untuk rangka dan gaya lentur untuk gelagar- gelagar lantai kendaraan, maka dapat diuraikan sebagai berikut :

Desain Batang

2.5.1 Pembatasan Kelangsingan Komponen Struktur Tarik

Tidak ada batasan kelangsingan maksimum untuk komponen struktur dalam tarik. Untuk komponen struktur yang dirancang berdasarkan tarik, rasio kelangsingan L/r lebih baik tidak melebihi 300. Saran ini tidak berlaku pada batang atau gantungan dalam gaya tarik. (*SNI 1729-2015 Pasal D*).

2.5.2 Desain Kekuatan Tarik

Perencanaan batang tarik pada hakekatnya menentukan luas penampang lintang yang cukup untuk menahan beban yang diberikan. batang tarik tanpa lubang akan mencapai kekuatan maksimum apabila semua serat penampang lintang batang meleleh, dengan kata lain distribusi tegangan tarik sudah merata pada penampang.

Menurut (*SNI 1729-2015 Pasal B4.3*) desain yang sesuai dengan ketentuan untuk desain faktor beban dan ketahanan (DFBK) memenuhi persyaratan spesifikasi bila kekuatan desain setiap komponen struktural sama atau melebihi kekuatan perlu yang ditentukan berdasarkan kombinasi beban DFBK.

$$R_u \leq \phi R_n \dots\dots\dots (2.27)$$

Dimana :

R_u = Kekuatan perlu menggunakan kombinasi beban DFBK

R_n = Kekuatan nominal, di syatkan dalam bab B sampai Bab K

ϕ = Factor ketahanan, di syatkan dalam bab B sampai Bab K

ϕR_n = Kekuatan desain

Menurut (*SNI 1729-2015 Pasal D2*) Kekuatan tarik desain, $\Phi_t P_n$, dan Kekuatan tarik tersedia, P_n/Ω_t , dari komponen struktur tarik, harus nilai terendah

yang diperoleh sesuai dengan keadaan batas dari leleh tarik pada penampang bruto dan keruntuhan tarik pada penampang netto.

(a.) Menghitung tegangan leleh tarik pada penampang Bruto

$$P_n = F_y \times A_g \dots\dots\dots (2.28)$$

$$\Phi_t = 0,90 \text{ (DFBK)} \qquad \Omega_t = 1,67 \text{ (DKI)}$$

(b.) Untuk keruntuhan Tarik (Putus) pada penampang Netto

$$P_n = F_u \times A_e \dots\dots\dots (2.29)$$

$$\Phi_t = 0,75 \text{ (DFBK)} \qquad \Omega_t = 2,00 \text{ (DKI)}$$

Dimana :

$$A_e = \text{Luas Neto Efektif, in}^2 \text{ (mm}^2\text{)}$$

$$A_g = \text{Luas Bruto dari komponen Struktur, in}^2 \text{ (mm}^2\text{)}$$

$$f_y = \text{Tegangan leleh minimum yang disyaratkan, ksi (MPa)}$$

$$f_u = \text{Kekuatan Tarik Minimum yang disyaratkan, ksi (MPa)}$$

$$P_n = \text{Tegangan nominal aksial, ksi (MPa)}$$

Luas Neto Efektif

Luas bruto A_g , dan luas Neto, A_n , dari komponen struktur tarik harus di tentukan sesuai dengan ketentuan SNI 1729-2015 Pasal B4.3. dimana luas neto A_n , untuk PSB terslot yang di las pada plat buhul, luas neto A_n , adalah luas bruto di kurangi hasil ketebalan dan lebar total material yang dihilangkan untuk membentuk slot tersebut, namun untuk komponen struktur tanpa lubang, luas neto tersebut, A_n adalah sama dengan luas bruto, A_g .

2.5.3 Desain Kekuatan Tekan

Batang tekan jarang sekali mengalami tekanan aksial saja. Namun bila pembebanan ditata sedemikian rupa hingga rotasi ujung dapat diabaikan atau

beban dari batang-batang yang bertemu pada titik simpul bersifat simetris, maka batang tekan dapat direncanakan dengan aman sebagai batang yang dibebani secara konsentris.

Menurut (SNI 1729-2015 Pasal E1) Kekuatan tekan desain, $\phi_c P_n$, dan Kekuatan Tekan tersedia, P_n/Ω_c , di tentukan sebagai berikut : Ketentuan tekan nominal, P_n harus nilai terendah yang di peroleh berdasarkan pada keadaan batas dari tekuk lentur, tekuk torsi-lentur.

$$R_u \leq \phi R_n \quad \dots\dots\dots (2.30)$$

$$\Phi_t = 0,90 \text{ (DFBK)} \quad \quad \quad \Omega_t = 1.67 \text{ (DKI)}$$

Untuk kondisi tekan, penampang di klasifikasikan sebagai elemen nonlangsing atau penampang elemen langsing. Untuk profil elemen nonlangsing, rasio tebal terhadap lebar dari elemen tekan tidak boleh melebihi λ_r . Jika rasio tersebut melebihi λ_r di sebut penampang dengan elemen-langsing.

Untuk kondisi lentur, penampang di klasifikasikan sebagai penampang Kompak, non kompak atau penampang elemen-langsing. Untuk penampang kompak, sayap-sayapnya harus menyatu dengan bagian badan dan rasio tebal-terhadap-lebar dari elemen tekannya tidak boleh melebihi batasnya, λ_p . Jika rasio tebal-terhadap-lebar dari satu atau lebih elemen tekan melebihi λ_p . Tetapi tidak boleh melebihi λ_r , maka penampang tersebut di sebut nonkompak. Jika rasio tebal-terhadap-lebar dari setiap elemen tekan melebihi λ_r , di sebut penampang dengan elemen langsing.

Rasio tebal-terhadap-lebar : Elemen Tekan Komponen Struktur yang menahan Tekan Aksial untuk PSB Bulat:

- Rasio Ketebalan-Terhadap-Lebar D/t

- Batasan Rasio Tebal-terhadap-lebar = $0.11 \times \frac{E}{F_y}$

Rasio tebal-terhadap-lebar : Elemen tekan Komponen Struktur Menahan

Lentur untuk PSB Bulat :

- Rasio Ketebalan-terhadap-lebar D/t

- $\lambda_p = 0.07 \times \frac{E}{F_y} \dots\dots\dots (2.31)$

- $\lambda_r = 0.31 \times \frac{E}{F_y} \dots\dots\dots (2.32)$

Dimana :

E = Modulus elastisitas baja = 29.000 ksi (200.000 Mpa)

F_y = tegangan leleh minimum yang di syaratkan, ksi (Mpa)

Panjang Efektif

Untuk komponen struktur yang dirancang berdasarkan tekan, rasio kelangsingan efektif dapat memenuhi persyaratan sebagai berikut :

$$(K.L)/r < 200 \dots\dots\dots (2.33)$$

Kekuatan tekan nominal, P_n , harus nilai terendah berdasarkan pada keadaan batas dari tekuk lentur, tekuk torsi dan tekuk-lentur yang sesuai.

$$P_n = A_g \times f_{cr} \dots\dots\dots (2.34)$$

Tegangan Kritis, F_{cr} , harus di tentukan sebagai berikut :

a.
$$\text{Bila } \frac{KL}{r} \leq 4.71 \sqrt{\frac{E}{F_y}} \left(\text{atau } \frac{F_y}{F_e} \leq 2.25 \right)$$

$$F_{cr} = \left[0.658 \frac{F_y}{F_e} \right] \cdot F_y \dots\dots\dots (2.35)$$

b.
$$\text{Bila } \frac{KL}{r} > 4.71 \sqrt{\frac{E}{F_y}} \left(\text{atau } \frac{Q \cdot F_y}{F_e} > 2.25 \right)$$

$$F_{cr} = 0.877.F_e \dots\dots\dots (2.36)$$

$$F_e = \frac{\pi^2 \times E}{\left(\frac{K.L}{r}\right)^2} \dots\dots\dots (2.37)$$

Dimana :

F_e = Tegangan tekuk kritis elastis (Mpa)

A_g = Luas penampang bruto

K = Faktor panjang efektif

L = Panjang batang tekuk

r = Radius girasi atau jari – jari girasi

2.6 Perencanaan Sambungan

Sambungan dalam suatu struktur merupakan bagian yang tidak mungkin diabaikan begitu saja, karena kegagalan pada sambungan dapat mengakibatkan kegagalan stuktur secara keseluruhan.

Syarat- syarat sambungan :

1. Harus kuat, aman tetapi cukup hemat.
2. Ditempat yang mudah terlihat, seharusnya dibuat seindah mungkin.
3. Mudah dalam pelaksanaan pemasangan di lapangan.
4. Pada satu titik sambungan sebaiknya dihindari penggunaan alat penyambung yang beda- beda.

Pada perencanaan jembatan rangka tipe pelengkung ini sambungan direncanakan dengan menggunakan baut mutu tinggi (A490).

Persyaratan keamanan yang diberikan LRFD untuk penyambung persamaan menjadi : (CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1, 1992 : 131)

$$\phi R_n \geq P_u \quad (2.38)$$

Dimana :

ϕ = factor resistansi (untuk konektor harga itu berkaitan dengan tipe kejadian, seperti 0,75 untuk retakan dalam tarik, 0,65 untuk geser pada baut berkekuatan tinggi, dan 0,75 untuk tumpu baut pada sisi lubang)

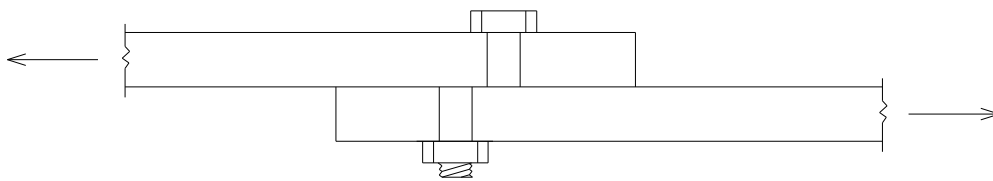
R_n = kekuatan satu penyambung

P_u = Beban terfaktor pada satu penyambung

2.6.1 Kekuatan Geser Desain Tanpa Ulir Bidang Geser

Kekuatan ϕR_n , berdasarkan kekuatan geser penyambung tanpa ada ulir pada bidang geser menurut LRFD (CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1, 1992 : 132) adalah :

$$\begin{aligned} \phi R_n &= \phi \cdot (0,60 \cdot F_u^b) \cdot m \cdot A_b \\ &= 0,65 \cdot (0,60 \cdot F_u^b) \cdot m \cdot A_b \end{aligned} \quad (2.39)$$



Gambar 2.14 Kegagalan geser baut tanpa ulir

Dimana :

ϕ = 0,65, suatu harga yang dipilih untuk mengkalibrasi

F_u^b = kekuatan tarik bahan baut (120 ksi untuk baut A325, 150 ksi untuk baut A490)

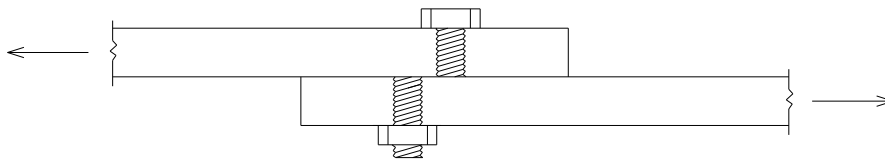
m = banyaknya bidang geser yang terlibat

A_b = luas penampang lintang pada arah melintang tangkai tak berulir dari baut tersebut

2.6.2 Kekuatan Geser Desain Ada Ulir Pada Bidang Geser

Kekuatan desain ϕR_n bila terdapat ulir pada bidang geser menurut LRFD (CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1, 1992 : 132) adalah :

$$\begin{aligned}\phi R_n &= \phi \cdot (0,45 \cdot F_u^b) \cdot m \cdot A_b \\ &= 0,65 \cdot (0,45 \cdot F_u^b) \cdot m \cdot A_b\end{aligned}\quad (2.40)$$



Gambar 2.15 Kegagalan geser baut ada ulir

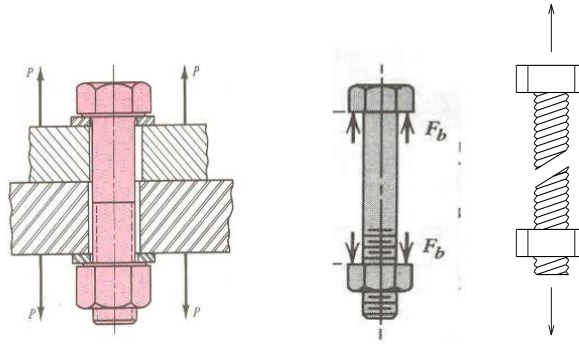
2.6.3 Kekuatan Tarik Desain Untuk Baut

Kekuatan desain ϕR_n , berdasarkan kekuatan tarik penyambung menurut LRFD (CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1, 1992 : 132) adalah :

$$\begin{aligned}\phi R_n &= \phi \cdot F_u^b (0,75 \cdot A_b) \\ &= 0,75 \cdot F_u^b (0,75 \cdot A_b)\end{aligned}$$

Atau :

$$\phi R_n = 0,75 \cdot (0,75 \cdot F_u^b) \cdot A_b \quad (2.41)$$



Gambar 2.16 Kegagalan tarik baut

Dimana :

$\phi = 0,75$, suatu harga untuk bentuk kegagalan tarik

F_u^b = kekuatan tarik bahan baut (120 ksi untuk baut A325, 150 ksi untuk baut A490)

1 ksi = 68.95 kg/cm²

A_b = luas penampang lintang bruto yang melintang pada bagian tangkai baut yang berulir.

2.6.4 Kekuatan Tumpu Desain Untuk Baut

Kekuatan desain ϕR_n , berdasarkan kekuatan tumpu pada lubang baut menurut LRFD (CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1, 1992 : 132) dibagi menjadi beberapa kategori :

1. Untuk kondisi biasa (lubang standar atau lubang beralur pendek, jarak ujung tidak krang dari 1,5 D, dengan jarak baut dari pusat ke pusat tidak kurang dari 3 D, dengan dua atau lebih pada garis gaya), berlaku persamaan :

$$\phi R_n = \phi \cdot (2,4 \cdot d \cdot t \cdot F_u) \quad (2.42)$$

Dimana :

$\phi = 0,75$, harga untuk baut terhadap sisi lubang

d = diameter nominal baut (bukan pada bagian ulir)

t = ketebalan bagian yang disambung (misalnya pelat)

F_u = kekuatan tarik baja untuk membentuk bagian yang disambung

2. Untuk lubang beralur pendek yang tegak lurus terhadap arah transmisi beban, jarak ujung tidak kurang dari $1,5 D$, dengan jarak baut dari pusat ke pusat tidak kurang dari $3 D$, dengan dua atau lebih pada garis gaya, berlaku persamaan :

$$\phi R_n = \phi \cdot (2,0 \cdot d \cdot t \cdot F_u) \quad (2.43)$$

Dimana : $\phi = 0,75$, harga untuk baut terhadap sisi lubang

3. Untuk baut yang paling berdekatan dengan pinggir dimana kondisi 1 dan 2 tidak terpenuhi, berlaku persamaan :

$$\phi R_n = \phi \cdot (L \cdot t \cdot F_u)$$

Dimana :

$\phi = 0,75$, harga untuk baut terhadap sisi lubang

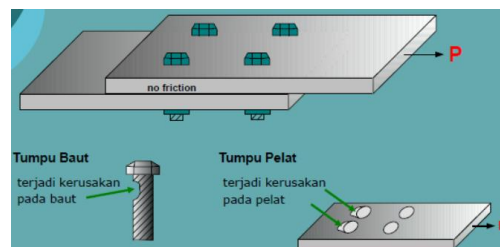
L = jarak ujung pada garis gaya, dari pusat suatu standar atau lubang berukuran lebih, atau dari pertengahan lebar lubang beralur pendek, sampai pinggiran bagian yang disambung

4. Bila perpanjangan lubang lebih besar dari $0,25$ dapat dipergunakan persamaan :

$$\phi R_n = \phi \cdot (3,0 \cdot d \cdot t \cdot F_u) \quad (2.44)$$

Dimana :

$\phi = 0,75$, harga untuk baut terhadap sisi lubang

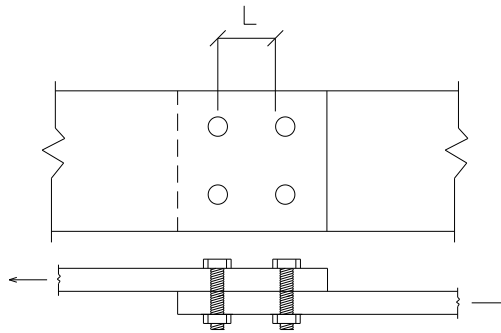


Gambar 2.17 Kegagalan tumpu baut ada ulir

2.6.5 Jarak minimum Baut Pada Garis Transmisi Gaya

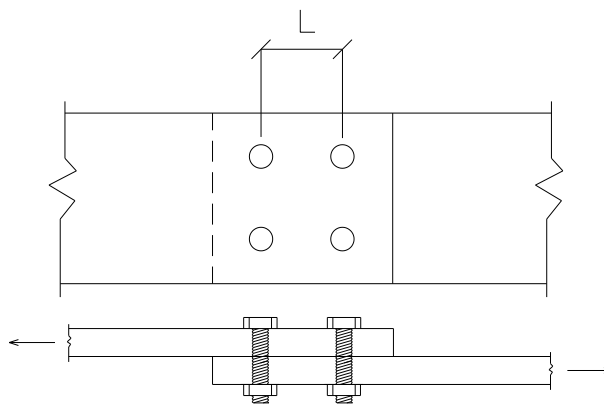
Untuk jarak minimum L dari pusat penyambung sampai kepinggir luas berdekatan (CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1,

1992 : 135) :
$$L \geq \frac{Rn}{Fu.t} \quad (2.45)$$



Gambar 2.18 jarak baut dari pusat penyambung sampai kepinggir luas berdekatan Dan kemudian penambahan radius $db/2$ lubang baut kepersamaan tersebut akan memberikan jarak minimum dari pusat ke pusat :

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2} \quad (2.46)$$



Gambar 2.19 jarak baut dari pusat sampai kepusat

Karena R_n pada persamaan ini merupakan kekuatan nominal yang disyaratkan, yang sama dengan beban factor P , yang bekerja pada satu baut dibagi dengan faktor resistensi ϕ , maka persamaan menjadi :

$$\text{Jarak antar baut} \geq \frac{P}{\phi \cdot Fu.t} + \frac{Db}{2} \quad (2.47)$$

Dimana :

ϕ = 0,75, harga untuk kegagalan tarik atau sisi lubang pada pelat

P = beban terfaktor yang bekerja pada satu baut

F_u = kekuatan tarik dari bahan pelat

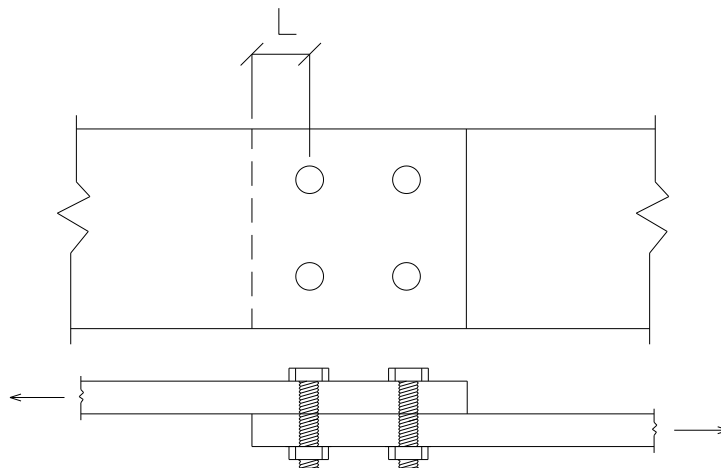
D_b = diameter lubang baut

Jarak minimum baut dalam satu garis lebih disukai sebesar 3 x diameter baut dan tidak boleh kurang dari $2 \frac{2}{3}$ x diameter baut.

2.6.6 Jarak Ujung minimum Pada Arah Transmisi Gaya

Jarak minimum L dari pusat penyambung sampai kepinggir luas

berdekatan : $L \geq \frac{R_n}{Fu.t}$ (2.48)



Gambar 2.20 jarak ujung baut

Bila kekuatan nominal yang disyaratkan adalah beban terfaktor dibagi dengan faktor resistensi ϕ , maka persamaan menjadi :

$$L \geq \frac{P}{\phi \cdot Fu \cdot t} \quad (2.49)$$

Dimana :

ϕ = 0,75, harga untuk kegagalan tarik atau sisi lubang pada pelat

P = beban terfaktor yang bekerja pada satu baut

Fu = kekuatan tarik dari bahan pelat

t = ketebalan pelat

2.6.7 Menentukan tebal plat simpul (t)

Untuk menghitung tebal plat simpul digunakan rumus :

$$t = \frac{P}{\phi \cdot Fu \cdot L} \quad (2.50)$$

Dimana:

P = beban terfaktor (cm)

ϕ = factor retesistensi (0,75)

Fu = kekuatan tarik dari bahan pelat (kg/cm^2)

L = jarak ujung minimum (cm)

t = tebal plat simpul (cm)

Kontrol pelat simpul LRFD

Menghitung kekuatan nominal pelat :

$$\phi T_n = \phi \cdot F_y \cdot A_g \Rightarrow \phi = 0,90 \quad (2.51)$$

$$\phi T_n = \phi \cdot F_y \cdot A_g \Rightarrow \phi = 0,75 \quad (2.52)$$

(Struktur Baja Desain dan Prilaku I, Charles G.Salmon & John E.Johnson ; hal :40)

diambil yang terkecil – menentukan : $\phi \cdot T_n \geq T_u$

Dimana :

ϕ = factor resistensi untuk jarak tepi baut = 0,75

F_u = kekuatan tarik dari bahan pelat (kg/cm^2)

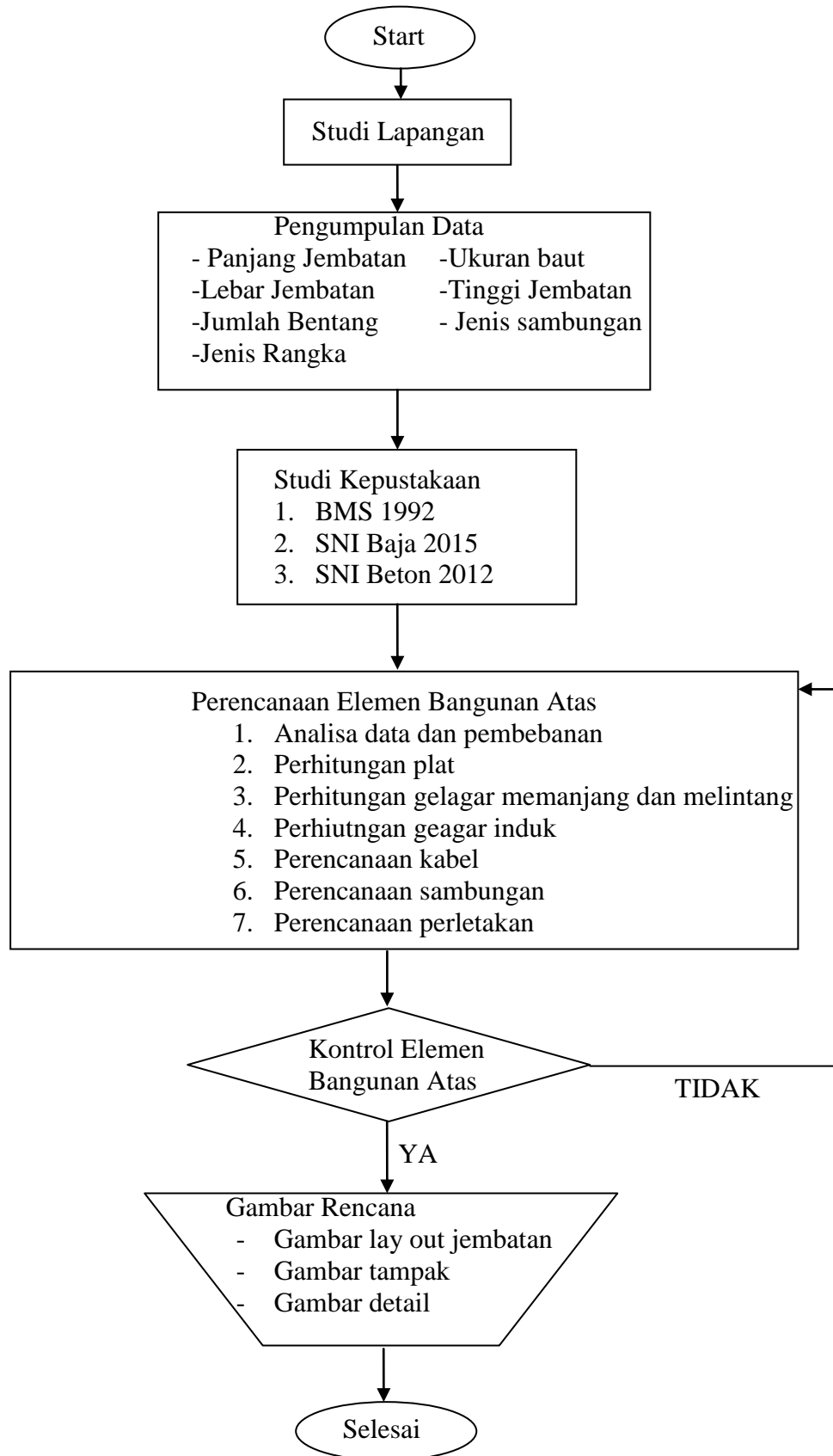
A_g = luas bruto penampang lintang (cm^2)

A_e = luas efektif antara batang tarik (cm^2)

T_n = kekuatan nominal batang tarik (kg)

F_u = kekuatan tarik Dari bahan pelat (kg/cm^2)

2.7 Diagram Alir Perencanaan



BAB III

DATA PERENCANAAN

3.1 Data Perencanaan

Data perencanaan struktur atas Jembatan Sukarno-Hatta Kota Malang :

1. Kelas Jembatan : I (satu)
2. Panjang Jembatan : 60,00 meter
3. Lebar Lantai Kendaraan : 7,00 meter
4. Lebar Trotoir : 2 x 0.80 meter
5. Tipe Jembatan : Pelengkung
6. Jarak antar Gelagar Melintang : 4,00 meter
7. Jarak antar Gelagar Memanjang : 1,40 meter
8. Mutu Baja Tulangan :
Mutu baja tulangan polos (f_y) : 240 Mpa
: $240 \times 10^5 \text{ kg/m}^2$
Mutu baja tulangan ulir (f_y) : 350 Mpa
: $350 \times 10^5 \text{ kg/m}^2$
9. Mutu Beton (f_c') : 25 Mpa
: $25 \times 10^5 \text{ kg/m}^2$
 $E = 4700 \sqrt{f_c'}$: $4700 \sqrt{25}$
: 23500 Mpa
: $23500 \times 10^5 \text{ kg/m}^2$
12. Mutu baja : St 52
: 360 Mpa : 3600 kg/cm^2

3.2 Data Pembebanan

Lapisan aspal lantai kendaraan :

1. Tebal Lapisan Aspal : 0,05 meter (tepi)
: 0,08 meter (tengah)

Diambil $(0.05 + 0.08) / 2$: 0.065 meter

2. Berat Jenis Aspal : 2200 kg/m³

Pelat beton trotoir :

1. Tebal Plat Beton : 0,55 meter
2. Tegel + Spesi : 0,05 meter
3. Berat Jenis Beton Bertulang : 2500 kg/m³

Pelat Beton lantai kendaraan :

1. Tebal Plat Beton : 0,25 meter
2. Berat Jenis Beton Bertulang : 2500 kg/m³

Air Hujan :

1. Tinggi Air Hujan (diasumsikan) : 0,05 meter
2. Berat Air Hujan : 1000 kg/m³

Perhitungan Koordinat Steel Arch

Gelagar Steel Arch di letakan sejajar dengan gelagar induk dihitung dengan menggunakan rumus :

$$f = 1/5 L \text{ sampai dengan } 1/8 L \\ = 1/5 \cdot 60 = 12 \text{ m s/d } 1/8 \cdot 60 = 7.5 \text{ m}$$

$$\text{Diambil } f = 10$$

$$b = 1/25 L \text{ sampai dengan } 1/45 L \\ = 1/25 \cdot 60 = 2.4 \text{ m s/d } 1/45 \cdot 60 = 1.33 \text{ m}$$

$$\text{Diambil } b = 2 \text{ m}$$

$$H = 1/12 L = 1/12 \cdot 60 = 5 \text{ m}$$

Jarak minimum ≥ 5.5 , diambil jarak 5.5 m

(*Struyk H. J. Ir Van Deer Veen . H. C. W. Ir, Prof, Smoemargono Hal : 194*)

Rumus Parabola

$$Y = \frac{4 \cdot f \cdot X (L - X)}{L^2}$$

Keterangan :

Y = Koordinat batang sumbu Y

x = Koordinat batang sumbu x

f = Ketinggian busur

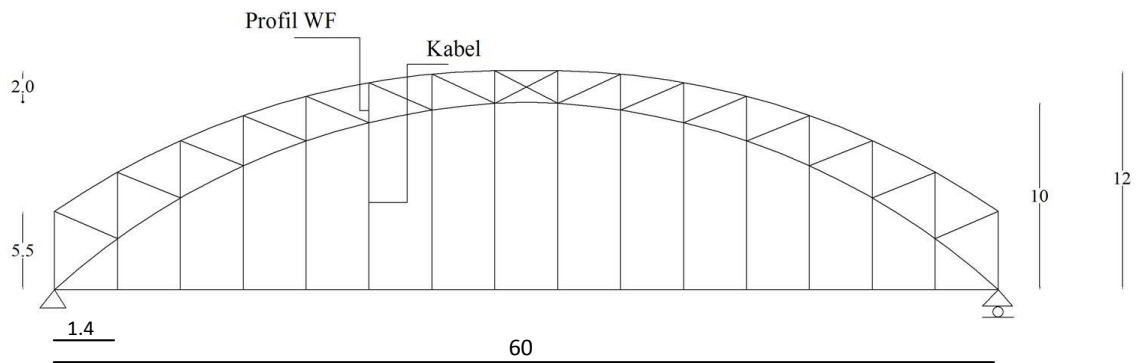
L = Bentang Jembatan

Tabel 3.1 Koordinat**Pelengkung Pertama**

x	f (m)	L (m)	Y (m)
0	10	60	0.00
4	10	60	2.49
8	10	60	4.62
12	10	60	6.40
16	10	60	7.82
20	10	60	8.89
24	10	60	9.60
28	10	60	9.96
32	10	60	9.96
36	10	60	9.60
40	10	60	8.89
44	10	60	7.82
48	10	60	6.40
52	10	60	4.62
56	10	60	2.49
60	10	60	0.00

Tabel 3.2 Koordinat**Pelengkung Kedua**

x	f (m)	L (m)	Y (m)
0	12	60	5.50
4	12	60	7.12
8	12	60	8.50
12	12	60	9.66
16	12	60	10.58
20	12	60	11.28
24	12	60	11.74
28	12	60	11.97
32	12	60	11.97
36	12	60	11.74
40	12	60	11.28
44	12	60	10.58
48	12	60	9.66
52	12	60	8.50
56	12	60	7.12
60	12	60	5.50

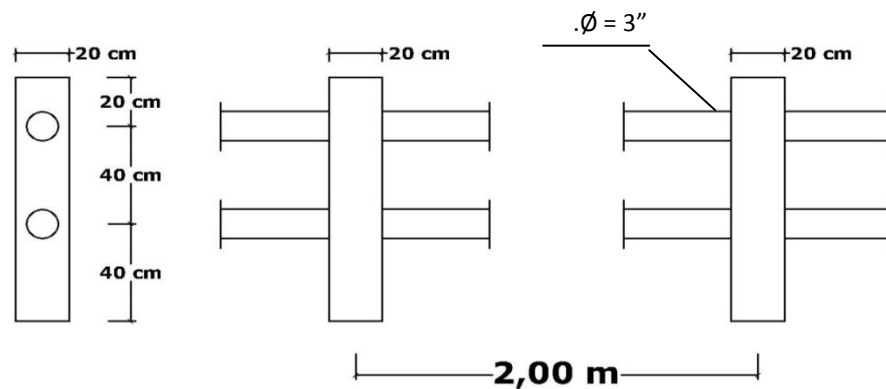


Gambar3.1 Perencanaan Konstruksi Jembatan

3.3 Perencanaan Tiang sandaran Jembatan

3.3.1 Pembebanan Pada Tiang Sandaran

Sandaran pada jembatan terdiri dari tiang sandaran dan pipa sandaran. Untuk pipa sandaran menahan beban yang bekerja horizontal sebesar $(q) = 75 \text{ kg/m}$, dan untuk tiang sandaran direncanakan menahan beban $(P) = q \times l$, dimana l merupakan jarak antar tiang sandaran dalam satuan panjang meter. ¹



Gambar 3.2. Tiang Sandaran Jembatan

➤ Pipa Sandaran

Dari tabel baja halaman 68 untuk pipa $\phi = 3''$ diperoleh data sebagai berikut :

$$D = 76,3 \text{ mm} \qquad g = 5,08 \text{ kg/m}$$

$$t = 2,8 \text{ mm}$$

$$\text{Jarak antar tiang sandaran} = 2,00 \text{ m}$$

$$\text{Tinggi tiang sandaran} = 1,00 \text{ m}$$

➤ Beban hidup tiang sandaran

$$q = 75 \text{ kg/m}$$

3.3.2 Pembebanan Pada Tiang Sandaran

➤ Perhitungan Pipa Sandaran

Digunakan pipa baja dengan $\phi = 76,3 \text{ mm}$

$$t = 2,8 \text{ mm} \qquad I = 43,7 \text{ cm}^4$$

$$G = 5,08 \text{ kg/m} \qquad w = 11,5 \text{ cm}$$

$$\begin{aligned} q_{u_y} &= 1,4 \times q_d \\ &= 1,4 \times 5,08 \\ &= 7,112 \text{ kg/m} \end{aligned}$$



$$\begin{aligned} q_{u_x} &= 1,2 \cdot q_d + 1,6 \times q_l \\ &= 1,2 \cdot 0 + 1,6 \cdot 75 \\ &= 120 \text{ kg/m} \end{aligned}$$

$$\begin{aligned} M_{u_y} &= \frac{1}{8} \times q_{u_y} \times l^2 \\ &= \frac{1}{8} \times 7,112 \times 2^2 = 3,556 \text{ kg.m} = 355,6 \text{ kg.cm} \end{aligned}$$

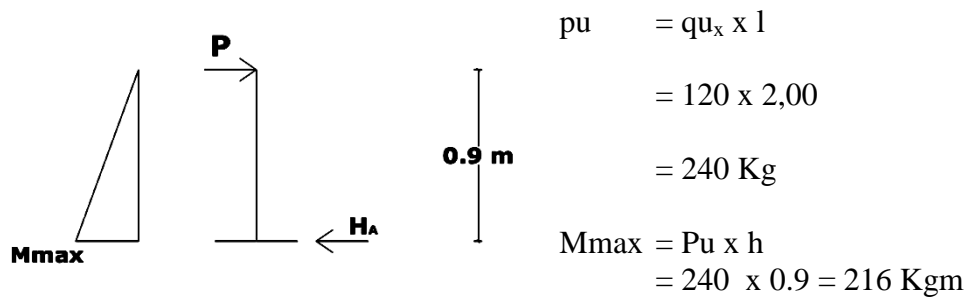
$$\begin{aligned} M_{u_x} &= \frac{1}{8} \times q_{u_x} \times l^2 \\ &= \frac{1}{8} \times 120 \times 2^2 = 60 \text{ kg.m} = 600 \text{ kg.cm} \end{aligned}$$

Kontrol kekuatan penampang :

$$\phi b \times Mn \geq M_{u_y}$$

$$0,9 \times (11,5 \times 3600) \geq 355,6 \text{ kg.cm}$$

$$37260 \text{ kg.m} \geq 355,6 \text{ kg.cm} \dots\dots\dots \text{OK}$$



3.3.3 Penulangan Tiang sandaran

Direncanakan :

$b = 200 \text{ mm} \quad h = 200 \text{ mm}$

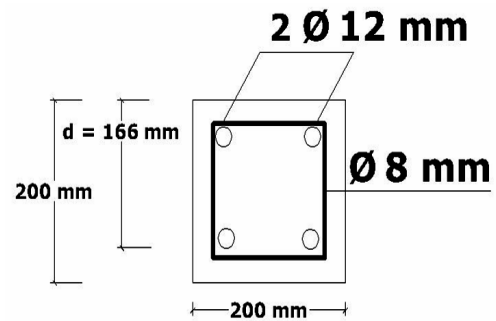
$d = h - \text{selimut beton} - \varnothing \text{ sengkang} - \frac{1}{2} D \text{ tulangan tarik}$

$= 200 - 20 - 8 - (\frac{1}{2} \times 12)$

$= 166 \text{ mm}$

$d'' = 200 - 166$

$= 34 \text{ mm}$



$V_u = \text{berat sendiri tiang sandaran} + \text{beban sendiri pipan sandaran}$

$= [(0,2 \times 0,2 \times 1,0 \times 2400) + (2 \times (2 \times 5,08))] \times 1,4$

$= 162,848 \text{ Kg}$

$M_u = M_{max} = 216 \text{ kg.m} = 2160 \text{ N.m}$

$M_n = \varnothing \times b \times d^2 \times k$

$M_u = M_n \text{ maka diperoleh nilai } K = \frac{M_u}{\varnothing \times b \times d^2}$

$K = \frac{2160 \times 10^3}{0.8 \times 200 \times 166^2} = 0.490 \text{ Mpa}$

$$\rho \text{ perlu} = \frac{0.85 f_c'}{f_y} \left[1 - \sqrt{1 - \frac{2K}{0.85 f_c'}} \right]$$

$$= \frac{0.85 \times 25}{240} \left[1 - \sqrt{1 - \frac{2 \times 0.490}{0.85 \times 25}} \right] = 0,00207$$

$$\rho \text{ min} = \frac{1,4}{f_y} = \frac{1,4}{240} = 0,00583$$

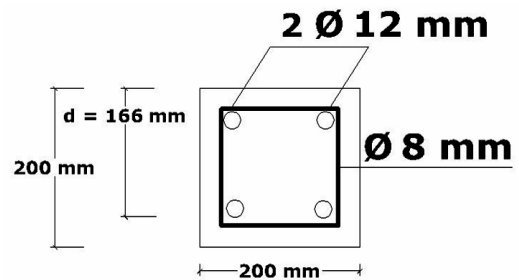
$\rho \text{ perlu} = 0.00207 < \rho \text{ min} = 0.00583$ maka, dipakai $\rho \text{ min} = 0.00583$

$$A_s = \rho \text{ min} \times b \times d$$

$$= 0.00583 \times 200 \times 166$$

$$= 193,556 \text{ mm}^2$$

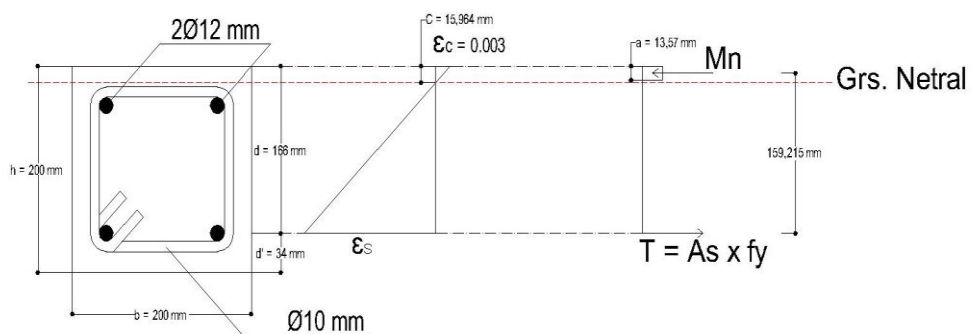
Dipakai tulangan 2 Ø 12 mm



$$A_{sada} = \left(\frac{1}{4} \cdot \pi \cdot 12^2 \right) \cdot 2 = 226,195 \text{ mm}^2 > A_s \text{ perlu} = 193,556 \text{ mm}^2 \dots$$

ok

Kontrol Momen Kapasitas



Dianggap baja tulangan telah mencapai leleh saat beton mulai terak ($\epsilon_c = 0.003$) dan $f_s = f_y$ maka

$$N_T = N_D$$

$$a = \frac{A_s \times f_y}{0.85 \times b \times f_c} = \frac{226,195 \times 240}{0.85 \times 200 \times 25} = 12,773 \text{ mm}$$

$$c = \frac{a}{\beta_1} = \frac{12,773}{0,85} = 15,027 \text{ mm}$$

$$f_s = 600 \times \left(\frac{c}{d-c} \right) = 600 \times \left(\frac{15,027}{166-15,027} \right) = 59,721 \text{ Mpa} < f_y = 240$$

Mpaok

$$M_n = A_s \times f_y \times \left(d - \frac{a}{2} \right) = 226,195 \times 240 \times \left(166 - \frac{12,773}{2} \right) =$$

$$8664906,152 \text{ Nmm}$$

$$= 8664,906152 \text{ KNmm}$$

$$\frac{M_n}{M_u} = \frac{8664,906152}{1350} = 6,418 \quad \dots \text{Ok}$$

Perencanaan Tulangan Geser

$$V_u = 162,848 \text{ Kg} = 1628,48 \text{ N}$$

$$V_c = \frac{1}{3} \sqrt{f_c} \times b \times d$$

$$= \frac{1}{3} \sqrt{25} \times 200 \times 166 = 55333,333 \text{ N}$$

$$\frac{1}{2} \phi V_c = \frac{1}{2} \times 0,6 \times 55333,333 = 16600 \text{ N}$$

Karena $\frac{1}{2} \phi V_c = 16600 \text{ N} > V_u = 1628,48 \text{ N}$ secara teoritis tidak perlu menggunakan tulangan geser maka dipasang tulangan geser praktis $\phi 8 - 120 \text{ mm}$.

3.4 Perhitungan Plat lantai kendaraan

3.4.1 Perhitungan Pembebanan

a. Plat lantai kendaraan (diambil pias 1 meter)

Beban Mati (qd)

- Berat sendiri lantai kendaraan = $0,20 \times 1 \times 2500 = 500 \text{ kg/m}$
 - Berat aspal = $0,065 \times 1 \times 2200 = 143 \text{ kg/m}$
 - Berat air hujan = $0,05 \times 1 \times 1000 = \underline{50 \text{ kg/m}}$ +
- qd = 693 kg/m

Beban Hidup (ql)

Beban lantai kendaraan untuk jembatan kelas I BM/standart truck

$$10 \text{ ton} = 100\% \times 10 \text{ ton} = 10000 \text{ kg}$$

Beban terfaktor

$$\begin{aligned} Q_u &= 1,2 \times q_d \\ &= 1,2 \times 693 \text{ kg/m} \\ &= 831.6 \text{ kg/m} \end{aligned}$$

b. Trotoar

Beban Mati (qd)

- Berat sendiri lantai trotoar = $0,55 \times 0,8 \times 2500 = 1100 \text{ kg/m}$
 - Berat tegel + spesi = $0,05 \times 0,8 \times 2200 = 88 \text{ kg/m}$
 - Berat air hujan = $0,05 \times 0,8 \times 1000 = \underline{40 \text{ kg/m}}$ +
- qd = 1228 kg/m

Beban akibat tiang sandaran

$$P_1 = \text{berat sendiri tiang sandaran} + \text{beban sendiri pipan sandaran}$$

$$= [(0,2 \times 0,2 \times 1,0 \times 2400) + (2 \times (2 \times 5,08))] \times 1,4$$

$$= 162,848 \text{ Kg}$$

Beban hidup (ql)

Yaitu beban guna sebesar = 500 kg/m²

$$Qd = 500 \times 0.8$$

$$= 400 \text{ kg/m}$$

Beban hidup tiang sandaran¹ bekerja secara horizontal setinggi 90 cm diatas permukaan lantai trotoir sebesar = 75 kg/m maka,

$$Pu_2 = 2 \times (\frac{1}{2} \times 2) \times 75 = 150 \text{ kg.}$$

Beban terfaktor trotoir

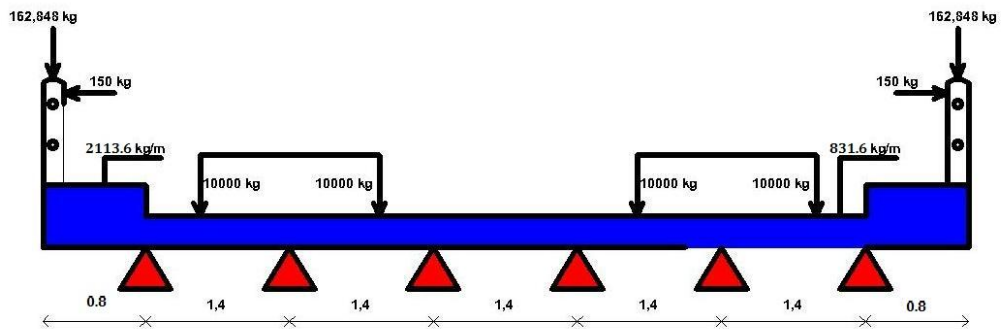
$$Qu = 1,2 \times qd + 1,6 \times ql$$

$$= 1,2 \times 1228 + 1,6 \times 400$$

$$= 2113.6 \text{ kg/m}$$

3.4.2 Perhitungan statika

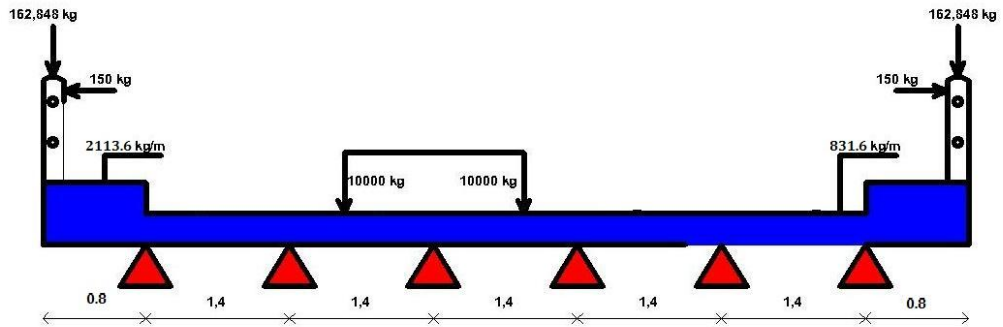
Kondisi I



Gambar 3.3. Kondisi pembebanan pada lantai kendaraan

untuk gaya Momen dan gaya lintang : (Lihat Lampiran Perhitungan Statika STAAD Pro 2004).

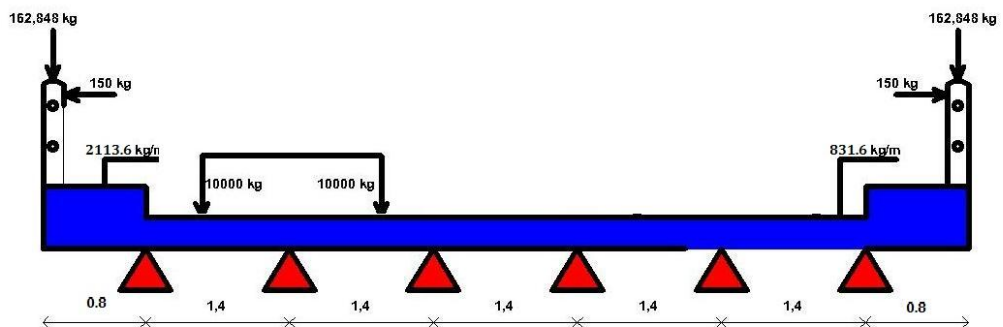
Kondisi II



Gambar 3.4. Kondisi pembebanan pada lantai kendaraan

untuk gaya Momen dan gaya lintang : (Lihat Lampiran Perhitungan Statika STAAD Pro 2004).

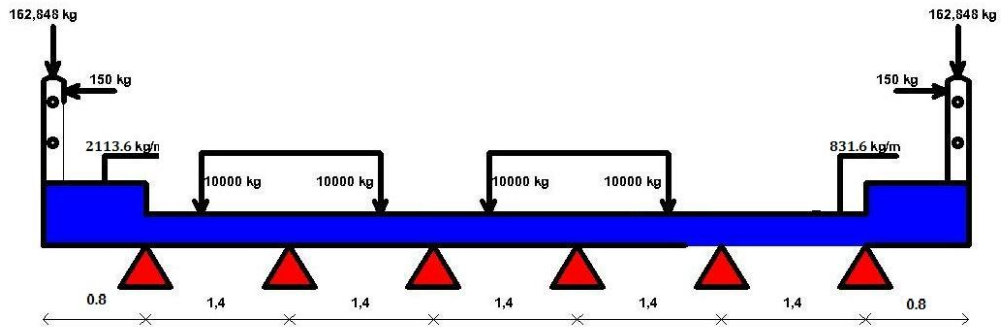
Kondisi III



Gambar 3.5. Kondisi pembebanan pada lantai kendaraan

untuk gaya Momen dan gaya lintang : (Lihat Lampiran Perhitungan Statika STAAD Pro 2004).

Kondisi IV



Gambar 3.6. Kondisi pembebanan pada lantai kendaraan

untuk gaya Momen dan gaya lintang : (Lihat Lampiran Perhitungan Statika STAAD Pro 2004).

3.4.3. Penulangan Pelat Lantai

Dengan penulangan statika menggunakan software STAAD PRO 2004 didapat momen maximum pada kondisi IV

Kontrol momen negatif (-)

$$M_{max} = 7.7860 \text{ kN.m}$$

$$\text{Jadi, } M_u = 7786000 \text{ Nmm}$$

$$d = 200 - 40 - \frac{1}{2} \cdot 16 = 152 \text{ mm}$$

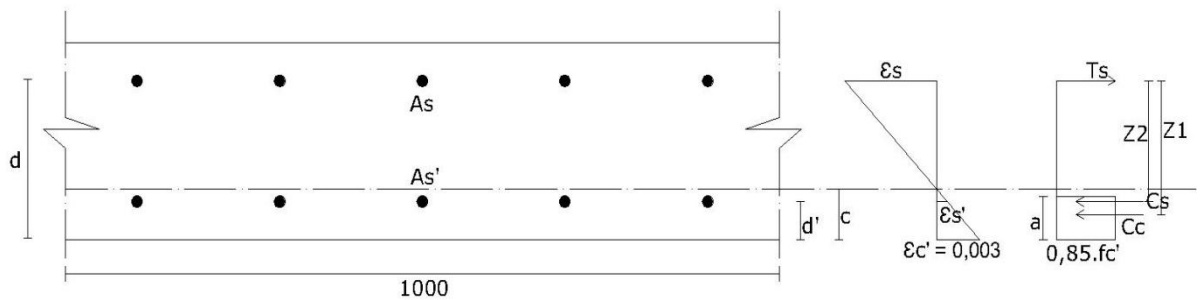
$$d' = 200 - 152 = 48 \text{ mm}$$

Diambil D16 dengan jarak 200 mm

$$A_s = (1/4 \times \pi \times 16^2 \times 1000) / 200 = 1005,71 \text{ mm}^2$$

Mencari letal garis netral:

Dimisalkan garis netral $> d'$:



$$f_s' = \frac{c-d'}{c} \times \varepsilon c' \times E_s = \frac{c-d'}{c} \times 0,003 \times 200000 = \frac{c-d'}{c} \times 600$$

$$f_s = \frac{d-c}{c} \times \varepsilon c' \times E_s = \frac{d-c}{c} \times 0,003 \times 200000 = \frac{d-c}{c} \times 600$$

$$\sum H = 0$$

$$C_c + C_s - T_s = 0$$

$$0,85 \cdot f_c' \cdot \beta_1 \cdot c \cdot b + A_s' \cdot (f_s' - 0,85 \cdot f_c') - A_s \cdot f_s = 0$$

$$(0,85 \cdot 25 \cdot 0,85 \cdot 1000)c + 1005,309 \cdot \left(\frac{c-48}{c} \times 600 - 0,85 \cdot f_c'\right) - 1005,71 \cdot$$

$$\frac{d-c}{c} \times 600 = 0$$

$$18062,5 \cdot c + 1005,309 \cdot \left(\frac{c-48}{c} \times 600 - 0,85 \cdot 25\right) - 1005,71 \cdot \frac{152-c}{c} \times 600 = 0$$

$$18062,5 \cdot c^2 + 581822,58 \cdot (c - 48) - 603185 (152 - c) = 0$$

$$18062,5 \cdot c^2 + 581822,58 \cdot c - 27930363,84 - 121843370 + 603185 \cdot c = 0$$

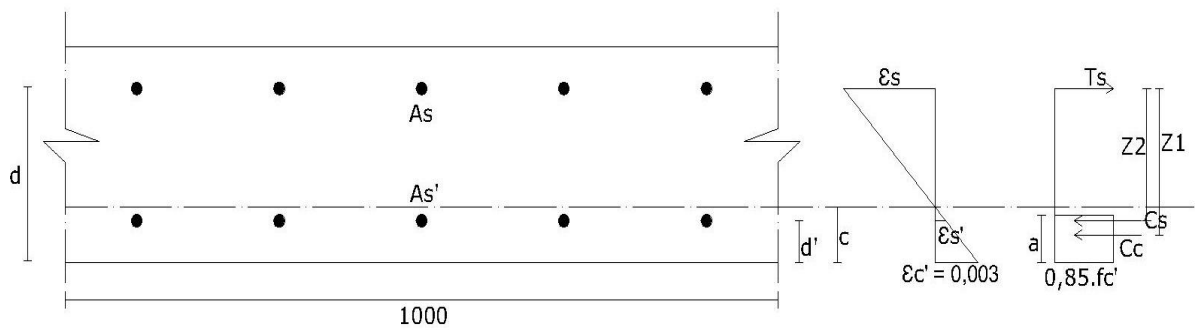
$$18062,5 \cdot c^2 + 1185007,58 \cdot c - 149773733,8 = 0$$

Dengan menggunakan kalkulator program didapat :

$$c_1 = 63,985 \text{ mm}$$

$$c_2 = -129,591 \text{ mm}$$

$$a = \beta_1 \cdot c = 0,85 \cdot 63,985 = 54,387 \text{ mm}$$



Selanjutnya dihitung nilai-nilai :

$$f_s' = \frac{c-d'}{c} \times 600 = \frac{63,985-48}{63,985} \times 600 = 149,895 \text{ Mpa} < f_y = 350 \text{ Mpa}$$

karena $f_s' < f_y$, maka dipakai $f_s' = 149,895 \text{ Mpa}$

$$f_s = \frac{d-c}{c} \times 600 = \frac{202-63,985}{63,985} \times 600 = 1294,193 \text{ Mpa} > f_y = 350 \text{ Mpa}$$

karena $f_s > f_y$, maka dipakai $f_y = 350 \text{ Mpa}$

$$\begin{aligned} T_s &= A_s \times f_s \\ &= 1005,7 \times 350 \\ &= 391872 \text{ Nmm} \end{aligned}$$

$$\begin{aligned} C_c &= 0,85f_c' \times a \times b \\ &= 0,85 \times 25 \times 54,4 \times 1000 \\ &= 1155729,1 \text{ Nmm} \end{aligned}$$

$$\begin{aligned} C_s &= A_s' \times (f_s' - 0,85f_c') \\ &= 1005,71 \times (350 - 0,85 \times 25) \\ &= 330628,57 \text{ N} \end{aligned}$$

$$\begin{aligned} Z_1 &= d - (1/2 \times 54,387) \\ &= 152 - (1/2 \times 54,387) \\ &= 124,8065 \text{ mm} \end{aligned}$$

$$Z_2 = 152 - 48$$

$$= 104 \text{ mm}$$

Karena $a < d$ maka

$$M_n = C_c \times Z_1 + C_s \times Z_2$$

$$= 144242499 + 12979.876$$

$$= 144255479.1 \text{ Nmm}$$

$$M_r = \phi \cdot M_n$$

$$= 0.85 \times 144255479.1$$

$$= 122617157.2 \text{ Nmm}$$

$$= 122.6171572 \text{ kNm}$$

$$\phi \cdot M_n > M_u$$

$$122.6171572 \text{ Nmm} > 77.86 \text{ Nmm} \dots\dots\dots\text{OK}$$

Jadi dipakai tulangan rangkap : D16 – 200 mm (untuk tulangan tarik)

D16 – 200 mm (untuk tulangan tekan)

Direncanakan menggunakan tulangan bagi Ø 12 mm

$$A_{S_{\text{bagi}}} = 20\% \cdot A_{S_{\text{perlu}}}$$

$$= 0,2 \cdot 1005,71 = 201,062 \text{ mm}^2$$

Jumlah tulangan bagi tiap meter (n)

$$n = \frac{A_{S_{\text{bagi}}}}{A_{S_{\text{ada}}}} = \frac{201,062}{\frac{1}{4} \cdot \pi \cdot 12^2} = 1,77 \sim 4 \text{ tulangan}$$

$$S = \frac{b \text{ ditinjau}}{n} = \frac{1000}{4} = 250 \text{ mm}$$

Dipakai tulangan : Ø12 – 250 mm

Kontrol momen positif (+)

$$M_{\text{max}} = 19.427 \text{ kN.m}$$

Jadi, $M_u = 19427000 \text{ Nmm}$

$d = 200 - 40 - \frac{1}{2} \cdot 16 = 152 \text{ mm}$

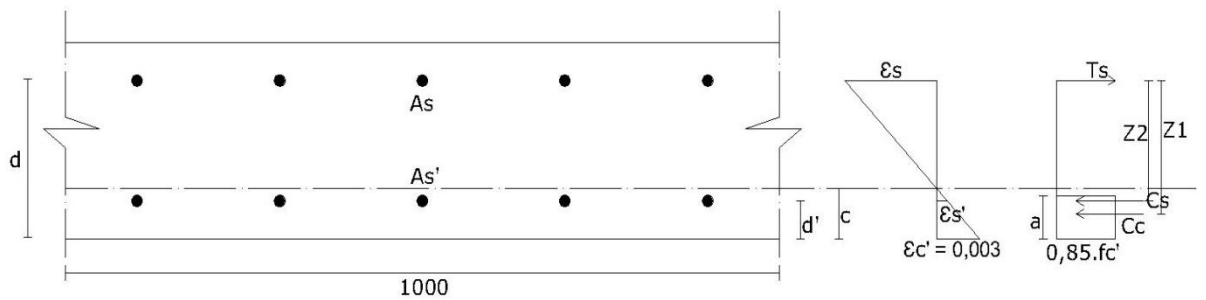
$d' = 200 - 152 = 48 \text{ mm}$

Diambil D16 dengan jarak 200 mm

$A_s = (1/4 \times \pi \times 16^2 \times 1000)/200 = 1005,71 \text{ mm}^2$

Mencari letak garis netral:

Dimisalkan garis netral $> d'$:



$$f_{s'} = \frac{c-d'}{c} \times \epsilon_{c'} \times E_s = \frac{c-d'}{c} \times 0,003 \times 200000 = \frac{c-d'}{c} \times 600$$

$$f_s = \frac{d-c}{c} \times \epsilon_{c'} \times E_s = \frac{d-c}{c} \times 0,003 \times 200000 = \frac{d-c}{c} \times 600$$

$$\sum H = 0$$

$$C_c + C_s - T_s = 0$$

$$0,85 \cdot f_{c'} \cdot \beta_1 \cdot c \cdot b + A_{s'} \cdot (f_{s'} - 0,85 \cdot f_{c'}) - A_s \cdot f_s = 0$$

$$(0,85 \cdot 25 \cdot 0,85 \cdot 1000)c + 1005,309 \cdot \left(\frac{c-48}{c} \times 600 - 0,85 \cdot f_{c'}\right) - 1005,71 \cdot \frac{d-c}{c} \cdot 600 = 0$$

$$\frac{d-c}{c} \times 600 = 0$$

$$18062,5 \cdot c + 1005,309 \cdot \left(\frac{c-48}{c} \times 600 - 0,85 \cdot 25\right) - 1005,71 \cdot \frac{152-c}{c} \times 600 = 0$$

$$18062,5 \cdot c^2 + 581822,58 \cdot (c - 48) - 603185 (152 - c) = 0$$

$$18062,5 \cdot c^2 + 581822,58 \cdot c - 27930363,84 - 121843370 + 603185 \cdot c = 0$$

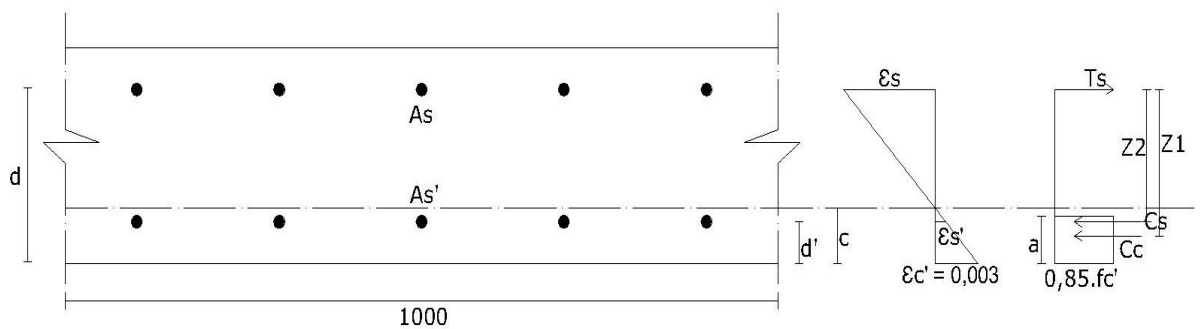
$$18062,5 \cdot c^2 + 1185007,58 \cdot c - 149773733,8 = 0$$

Dengan menggunakan kalkulator program didapat :

$$c1 = 63,985 \text{ mm}$$

$$c2 = -129,591 \text{ mm}$$

$$a = \beta_1 \cdot c = 0,85 \cdot 63,985 = 54,387 \text{ mm}$$



Selanjutnya dihitung nilai-nilai :

$$f_s' = \frac{c-d'}{c} \times 600 = \frac{63,985-48}{63,985} \times 600 = 149,895 \text{ Mpa} < f_y = 350 \text{ Mpa}$$

karena $f_s' < f_y$, maka dipakai $f_s' = 149,895 \text{ Mpa}$

$$f_s = \frac{d-c}{c} \times 600 = \frac{202-63,985}{63,985} \times 600 = 1294,193 \text{ Mpa} > f_y = 350 \text{ Mpa}$$

karena $f_s > f_y$, maka dipakai $f_y = 350 \text{ Mpa}$

$$\begin{aligned}
T_s &= A_s \times f_s \\
&= 1005.7 \times 350 \\
&= 391872 \text{ Nmm}
\end{aligned}$$

$$\begin{aligned}
C_c &= 0.85f_c' \times a \times b \\
&= 0.85 \times 25 \times 54.4 \times 1000 \\
&= 1155729.1 \text{ Nmm}
\end{aligned}$$

$$\begin{aligned}
C_s &= A_s' (f_s' - 0.85 f_c') \\
&= 1005.71 \times (350 - 0.85 \times 25) \\
&= 330628.57 \text{ N}
\end{aligned}$$

$$\begin{aligned}
Z_1 &= d - (1/2 \times 54.387) \\
&= 152 - (1/2 \times 54.387) \\
&= 124.8065 \text{ mm}
\end{aligned}$$

$$\begin{aligned}
Z_2 &= 152 - 48 \\
&= 104 \text{ mm}
\end{aligned}$$

Karena $a < d$ maka

$$\begin{aligned}
M_n &= C_c \times Z_1 + C_s \times Z_2 \\
&= 144242499 + 12979.876 \\
&= 144255479.1 \text{ Nmm}
\end{aligned}$$

$$\begin{aligned}
M_r &= \phi \cdot M_n \\
&= 0.85 \times 144255479.1 \\
&= 122617157.2 \text{ Nmm}
\end{aligned}$$

Jadi dipakai tulangan rangkap : D16 – 200 mm (untuk tulangan tarik)

D16 – 200 mm (untuk tulangan tekan)

Direncanakan menggunakan tulangan bagi Ø 12 mm

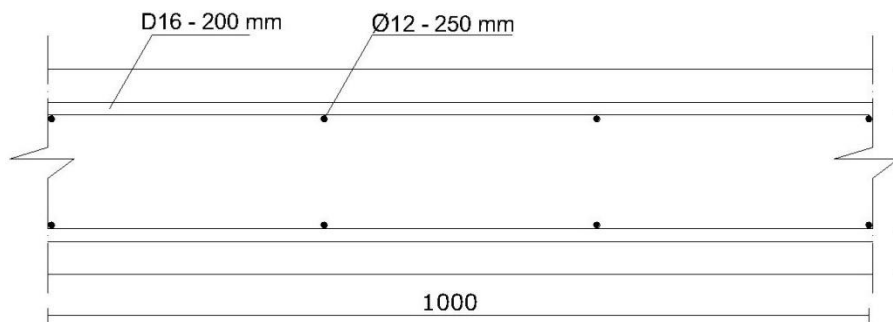
$$\begin{aligned}
A_{S_{\text{bagi}}} &= 20\% \cdot A_{S_{\text{perlu}}} \\
&= 0,2 \cdot 1005,7 = 201,062 \text{ mm}^2
\end{aligned}$$

Jumlah tulangan bagi tiap meter (n)

$$n = \frac{A_{s_{\text{bagi}}}}{A_{s_{\text{ada}}}} = \frac{201,062}{\frac{1}{4} \cdot \pi \cdot 12^2} = 1,77 \sim 4 \text{ tulangan}$$

$$S = \frac{b \text{ ditinjau}}{n} = \frac{1000}{4} = 250 \text{ mm}$$

Dipakai tulangan : Ø12 – 250 mm



3.4.3. Penulangan Trotoir

Kontrol momen negatif (-)

$$M_{\text{max}} = 23.540 \text{ kN.m}$$

$$\text{Jadi, } M_u = 2354000 \text{ N.mm}$$

Nmm

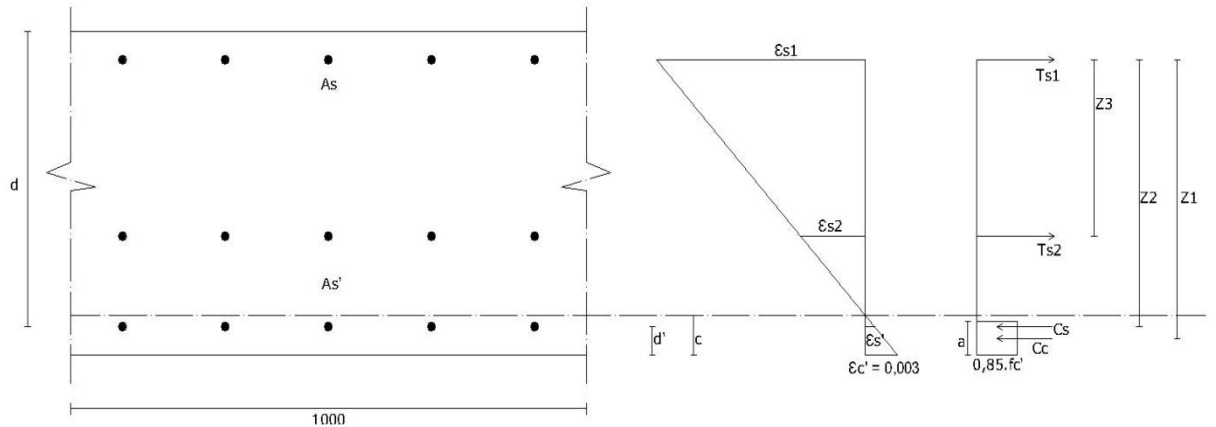
$$d = 550 - 40 - \frac{1}{2} \cdot 16 = 502 \text{ mm}$$

Diambil D16 dengan jarak 200 mm

$$A_s = (1/4 \times \pi \times 16^2 \times 1000) / 200 = 1005,71 \text{ mm}^2$$

Mencari letal garis netral:

Dimisalkan garis netral $> d'$:



$$f_{s'} = \frac{c-d'}{c} \times \varepsilon_{c'} \times E_s = \frac{c-d'}{c} \times 0,003 \times 200000 = \frac{c-d'}{c} \times 600$$

$$f_s = \frac{d-c}{c} \times \varepsilon_{c'} \times E_s = \frac{d-c}{c} \times 0,003 \times 200000 = \frac{d-c}{c} \times 600$$

$$\sum H = 0$$

$$C_c + C_s - T_{s2} - T_{s1} = 0$$

$$0,85 \cdot f_c' \cdot \beta_1 \cdot c \cdot b + A_{s'} \cdot (f_{s'} - 0,85 \cdot f_c') - A_{s2} \cdot f_{s2} - A_{s1} \cdot f_{s1} = 0$$

$$(0,85 \cdot 25 \cdot 0,85 \cdot 1000)c + 1005,309 \cdot \left(\frac{c-48}{c} \times 600 - 0,85 \cdot f_c'\right) - 1005,309 \cdot$$

$$\frac{d-c}{c} \times 600$$

$$- 1005,309 \cdot \frac{d-c}{c} \times 600 = 0$$

$$18062,5 \cdot c + 1005,309 \cdot \left(\frac{c-48}{c} \times 600 - 0,85 \cdot 25\right) - 1005,71 \cdot \frac{502-c}{c} \times 600 -$$

$$1005,71 \cdot \frac{502-c}{c} \times 600 = 0$$

$$18062,5 \cdot c^2 + 581822,58 \cdot (c - 48) - 603185 (502 - c) - 603185 (502 - c) = 0$$

$$18062,5 \cdot c^2 + 581822,58 \cdot c - 27930363,84 - 302799071 + 603185 \cdot c -$$

$$302799071 + 603185 \cdot c = 0$$

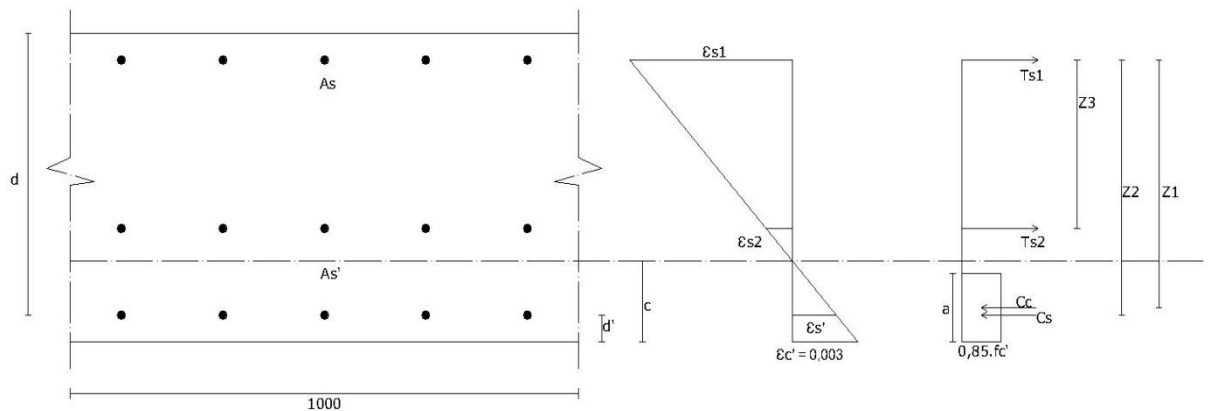
$$18062,5 \cdot c^2 + 1788192,58 \cdot c - 633528505,8 = 0$$

Dengan menggunakan kalkulator program didapat :

$$c1 = 144,212 \text{ mm}$$

$$c2 = -243,213 \text{ mm}$$

$$a = \beta_1 \cdot c = 0,85 \cdot 144,212 = 122,508 \text{ mm}$$



Selanjutnya dihitung nilai-nilai :

$$f_s' = \frac{c-d'}{c} \times 600 = \frac{122,508-48}{122,508} \times 600 = 364,913 \text{ Mpa} < f_y = 350 \text{ Mpa}$$

karena $f_s' > f_y$, maka dipakai $f_y = 350 \text{ Mpa}$

$$f_s = \frac{d-c}{c} \times 600 = \frac{502-122,508}{122,508} \times 600 = 1858,615 \text{ Mpa} > f_y = 350 \text{ Mpa}$$

karena $f_s > f_y$, maka dipakai $f_y = 350 \text{ Mpa}$

$$\begin{aligned} C_c &= 0,85 \cdot f_c' \cdot a \cdot b \\ &= 0,85 \cdot 25 \cdot 122,508 \cdot 1000 \\ &= 2603295 \text{ N} \end{aligned}$$

$$\begin{aligned} C_s &= A_s' \cdot (f_s' - 0,85 \cdot f_c') \\ &= 1005,71 (350 - 0,85 \cdot 25) \end{aligned}$$

$$= 330495,334 \text{ N}$$

$$T_{s2} = A_s \cdot f_s$$

$$= 1005,71 \cdot 350$$

$$= 351858,15 \text{ N}$$

$$Z_1 = d - (1/2 \cdot a)$$

$$= 502 - (1/2 \cdot 122,508)$$

$$= 440,746 \text{ mm}$$

$$Z_2 = d - d'$$

$$= 502 - 48$$

$$= 454 \text{ mm}$$

$$Z_3 = d - d' - Z_{\text{plat lantai}}$$

$$= 502 - 48 - 154$$

$$= 300 \text{ mm}$$

$$M_n = C_c \cdot Z_1 + C_s \cdot Z_2 - T_s \cdot Z_3$$

$$= (2603295 \cdot 440,746) + (330495,334 \cdot 454) - (351858,15 \cdot 300)$$

$$= 1402994185 \text{ N.mm}$$

$$= 140,2994185 \text{ kN.m}$$

$$M_r = \phi \cdot M_n = 0,8 \cdot 140,2994185 = 112,240 \text{ kN.m}$$

$$M_r = 112,240 \text{ kN.m} > M_u = 2,354 \text{ kN.m} \dots \dots \dots \text{OK!!}$$

Jadi dipakai tulangan rangkap : D16 – 200 mm (untuk tulangan tarik)

D16 – 200 mm (untuk tulangan tekan)

Direncanakan menggunakan tulangan bagi Ø 12 mm

$$A_{S_{\text{bagi}}} = 20\% \cdot A_{S_{\text{perlu}}}$$

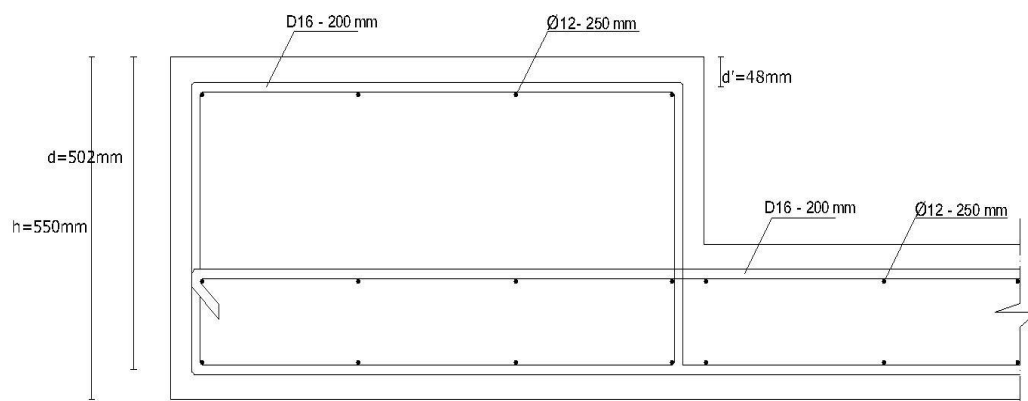
$$= 0,2 \cdot 1005,71 = 201,062 \text{ mm}^2$$

Jumlah tulangan bagi tiap meter (n)

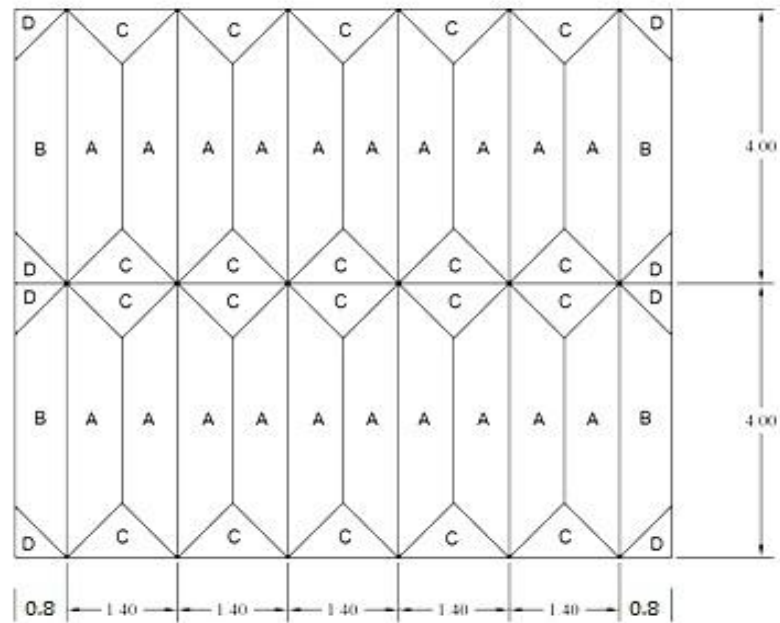
$$n = \frac{A_{s_{\text{bagi}}}}{A_{s_{\text{ada}}}} = \frac{201,062}{\frac{1}{4} \cdot \pi \cdot 12^2} = 1,77 \sim 4 \text{ tulangan}$$

$$S = \frac{b \text{ ditinjau}}{n} = \frac{1000}{4} = 250 \text{ mm}$$

Dipakai tulangan : Ø12 – 250 mm

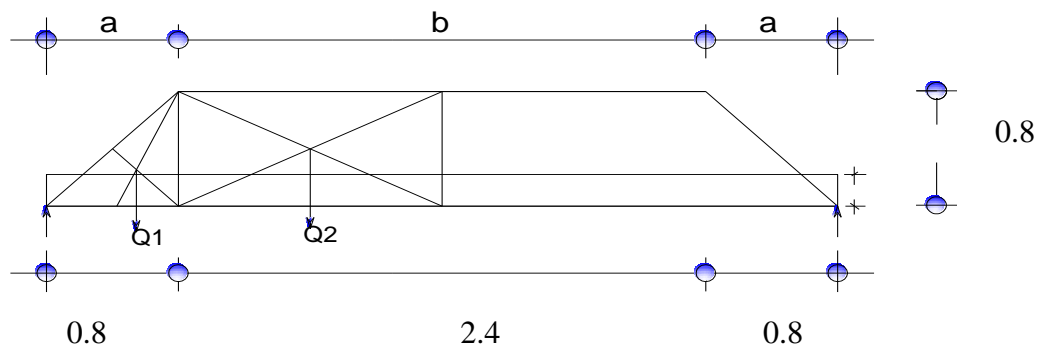


3.5 Perhitungan Perataan Beban



Gambar 3.5 Perataan Beban Plat Lantai dan Trotoir

1. Perataan Beban Tipe B



$$Q1 = \frac{1}{2} \times 0.8 \times 0.8 = 0.64$$

$$Q2 = 2.4 \times 0.8 = 1.92$$

$$R_A = R_B = 1/2x (Q1 + Q2)$$

$$= 1/2. 0.64 + 1.92 = 1.28$$

$$M_1 = (R_A x 2) - [(Q1 x ((1/3) x a + 1/2 x b)) + (Q2 x 1/2 x 1/2 x b)]$$

$$M_1 = (1.28 x 2) - [(0,64 x (1/3 + (0.5x 2.4)) + 1.92 x 0,5 x 0,5 x 2,4)]$$

$$= 0.4693333$$

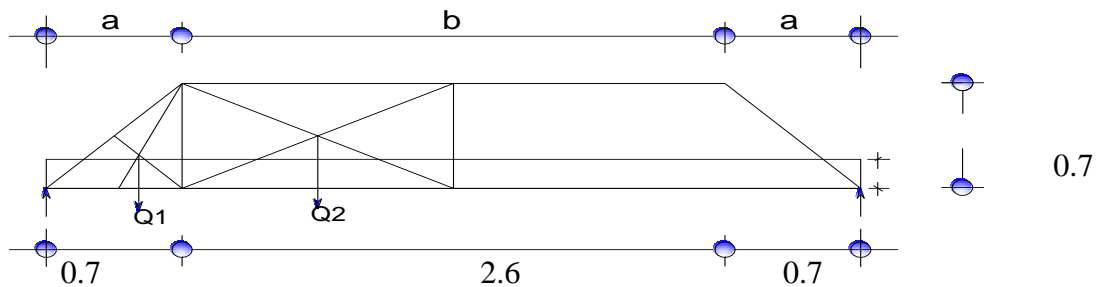
$$M_{II} = \frac{1}{8} x h x L^2 = \frac{1}{8} x h x 4^2 = 2$$

$$M_{II} = M_1$$

$$0.4693 = 2$$

$$h = 0.2346667 \text{ m}$$

2. Perataan Beban Tipe A



$$Q1 = \frac{1}{2} x 0.7 x 0.7 = 0.49$$

$$Q2 = 2.6 x 0.7 = 1.82$$

$$R_A = R_B = 1/2x (Q1 + Q2)$$

$$= 1/2. 0.49 + 1.82 = 1.155$$

$$\begin{aligned}
 M1 &= (R_A \times 2) - [(Q1 \times ((1/3) \times a + \frac{1}{2} \times b)) + (Q2 \times \frac{1}{2} \times \frac{1}{2} \times b)] \\
 &= (1.155 \times 2) - [(0,49 \times (1/3 + (0.5 \times 2.6))) + 1.82 \times 0,5 \times 0,5 \times 2,6] \\
 &= 0.375666667
 \end{aligned}$$

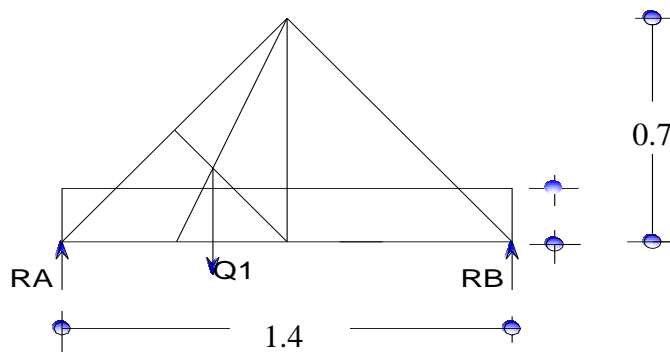
$$M1I = \frac{1}{8} \times h \times L^2 = \frac{1}{8} \times h \times 4^2 = 2$$

$$M1I = M_1$$

$$0.3757 = 2$$

$$h = 0.1878333 \text{ m}$$

3. Perataan Beban Tipe C



$$Q1 = \frac{1}{2} \times 1.4 \times 0.7 = 0.49$$

$$R_A = R_B = 0.245$$

$$M1 = (R_A \cdot \frac{1}{2} \cdot 1,4) - (Q \cdot \frac{1}{3} \cdot \frac{1}{2} \cdot 1,4)$$

$$= (0,245 \cdot 0,5 \cdot 1,4) - (0,49 \cdot \frac{1}{3} \cdot 1,4)$$

$$= 0.057167$$

$$M_{II} = \frac{1}{8} \times h \times L^2 = \frac{1}{8} \times h \times 1.4^2 = 0.245$$

$$M_{II} = M_1$$

$$0.0572 = 0.245$$

$$h = 0.2333333 \text{ m}$$

4. Perataan Beban Tipe D

$$R_A \qquad \qquad \qquad R_B \qquad \qquad \qquad 0.8$$

$$\qquad \qquad \qquad 0.8 \qquad \qquad \qquad Q_1 = \frac{1}{2} \times 0.8 \times 0.8 = 0.32$$

$$R_A = 1/3Q = 0.10667$$

$$R_B = 2/3Q = 0.21333$$

$$M_1 = Q \cdot (2/3 \cdot 0.8)$$

$$= 0.32 \cdot (2/3 \cdot 0.8)$$

$$= 0.171$$

$$M_{II} = \frac{1}{2} \times h \times L^2 = \frac{1}{2} \times h \times 0.8^2 = 0.32$$

$$M_{II} = M_1$$

$$0.1707 = 0.32$$

$$h = 0.5333333$$

3.6. Perencanaan Gelagar Memanjang

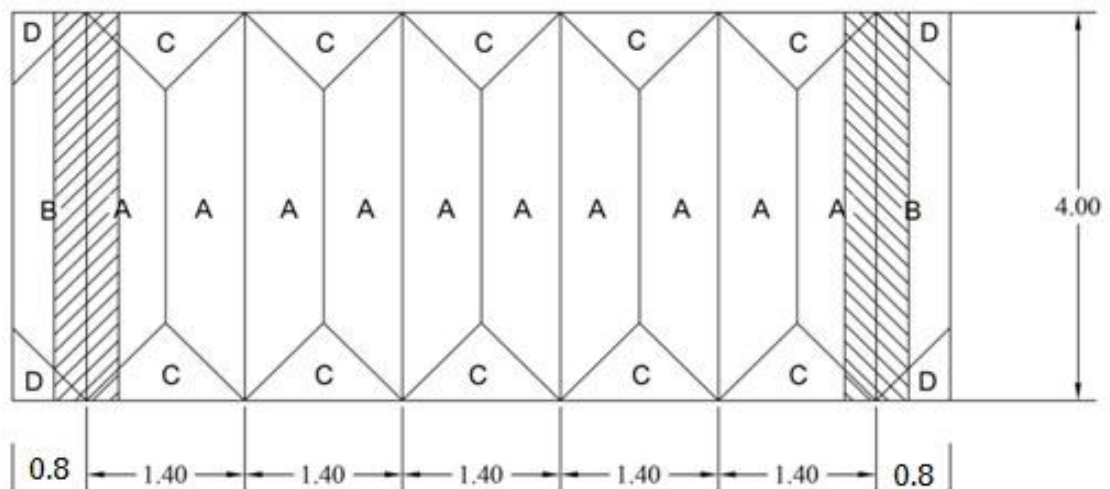
3.6.1 Perencanaan Gelagar memanjang

- >> Jarak gelagar memanjang = 1.4 m
- >> Jarak gelagar melintang = 4 m
- >> q trotoir = 2113.6 kg/m
- >> q pelat lantai = 831.6 kg/m

3.6.2 Perhitungan pembebanan

A. Beban Mati

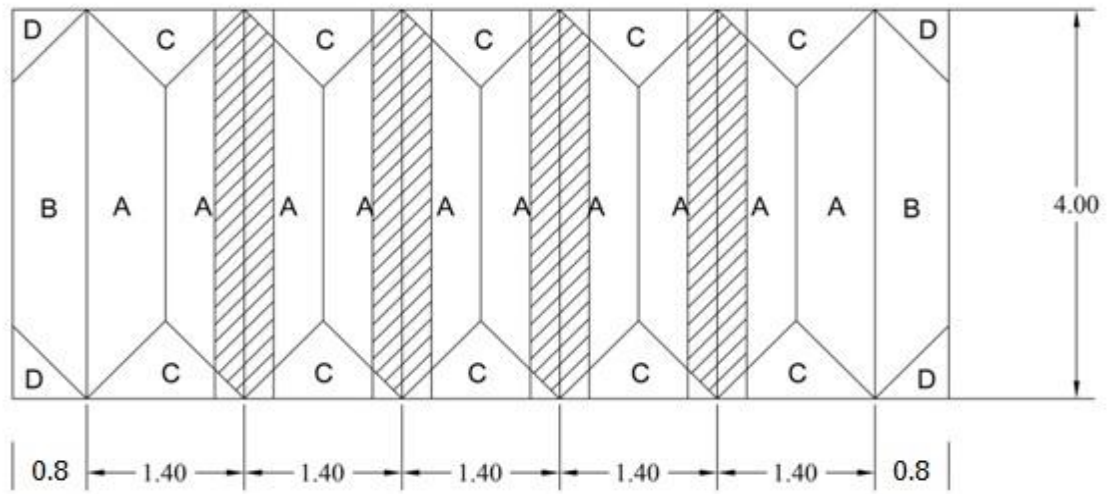
* Akibat berat lantai kendaraan (untuk gelagar tepi)



$$q_u = (\text{peretaan bbn. tipe B} \times q \text{ plat tr}) + (\text{peretaan bbn. tipe A} \times q \text{ lantai kend.})$$

$$q_u = 0.234667 \times 2113.6 + 0.18783 \times 831.6$$

$$= 652.1936667 \text{ kg/m}$$



$q_u =$ (peretaan beban tipe A x q plat lantai kendaraan)

$$q_u = 2 \times 0.1878333 \times 831.6$$

$$= 312.4044 \text{ kg/m}$$

B. Beban Hidup "D"

Secara umum beban D akan menentukan dalam perhitungan mulai dari gelagar memanjang bentang sedang sampai bentang panjang dan lebar melintang 1 lajur kendaraan sebesar 2,75 m.

(Buku BMS Bag 2, 1992 : 2-24)

$$L = 60 \text{ m} \longrightarrow L \geq 30 \text{ m (Buku BMS Bag 2, 1992 : 2-22)}$$

$$q = 8 \times \left(0,5 + \frac{15}{L} \right)$$

$$= 8 \times \left[0.5 + \frac{15}{60} \right] \text{ Kpa}$$

$$= 6 \text{ Kpa} = 600 \text{ kg/m}^2$$

* Muatan terbagi rata ; factor beban 2,0

$$q = 600 \text{ kg/m}^2$$

* Akibat beban garis $P = 44 \text{ kN/m} = 4400 \text{ kg/m}$; factor beban = 2
 (Buku BMS Bag 2, 1992 : 2-22)

$$P_u = 4400 \times 2 = 8800 \text{ kg/m}$$

* Faktor beban dinamis / koefisien kejut

Dari gambar 2.8 hal. 2-29 buku BMS, untuk bentang 60 m didapat nilai

$$DLA = (0.525 - 0.0025 \times 60) = 0.375$$

Table 2.12 - Dynamic Allowance for "D" Lane KEL

Equivalent Span L_E (m)	DLA (for both limit states)
$L_E \leq 50$	0.4
$50 < L_E < 90$	$0.525 - 0.0025 L_E$
$L_E \geq 90$	0.3

Notes :

1. For Simple Spans $L_E = \text{Actual Span Length}$
2. For Continuous Spans $L_E = \sqrt{L_{av} \cdot L_{max}}$

where:

L_{av} = Average span length of continuous spans.
 L_{max} = Maximum span length of continuous spans.

$$k = 1 + DLA = 1 + 0.375 = 1.375$$

* Perbandingan beban hidup gelagar :

1) Gelagar tepi

$$q_u = (\text{beban hidup trotoir} \times \text{tinggi perataan tipe B} \times \text{factor beban}) = 1000 \times 0.2346667 \times 2 = 469.3333 \text{ kg/m}$$

2) Gelagar tengah

$$q_u = \frac{600}{2.75} \times (2 \times \text{perataan beban tipe A}) \times 2$$

$$= 163.92727 \text{ kg/m}$$

$$p_u = \frac{8800}{2.75}$$

$$= 3200 \text{ kg}$$

3.6.3 Perhitungan statika

Merupakan perhitungan momen yang terjadi ditengah-tengah gelagar memanjang.

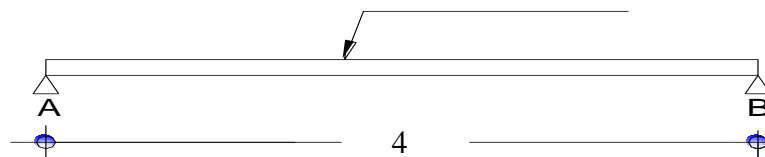
a. Gelagar tepi

* Akibat beban mati

q_u = beban mati akibat berat lantai kendaraan untuk gelagar tepi

$$q_u = 652.1936667 \text{ kg/m}$$

$$652.1936667$$



$$R_A = R_B = \frac{1}{2} \times 652.1937 \times 4$$

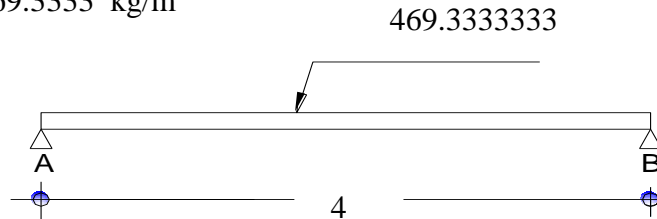
$$= 1304.3873 \text{ kg}$$

$$M_u = \frac{1}{8} \times q_u \times L^2 = \frac{1}{8} \times 652.194 \times 4^2 = 1304.38733 \text{ kgm}$$

* Akibat beban hidup

q_u = beban hidup akibat berat rantai kendaraan untuk gelagar tepi

$$q_u = 469.3333 \text{ kg/m}$$



$$R_A = R_B = \frac{1}{2} \times 469.3333 \times 4$$

$$= 938.66667 \text{ kg}$$

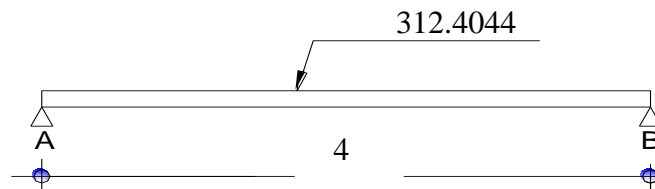
$$M_u = \frac{1}{8} \times q_u \times L^2 = \frac{1}{8} \times 469.333 \times 4^2 = 938.667 \text{ kgm}$$

b. Gelagar tengah

* Akibat beban mati

q_u = beban mati akibat berat rantai kendaraan untuk gelagar tengah

$$q_u = 312.4044 \text{ kg/m}$$



$$R_A = R_B = \frac{1}{2} \times 312.4044 \times 4$$

$$= 624.8088 \text{ kg}$$

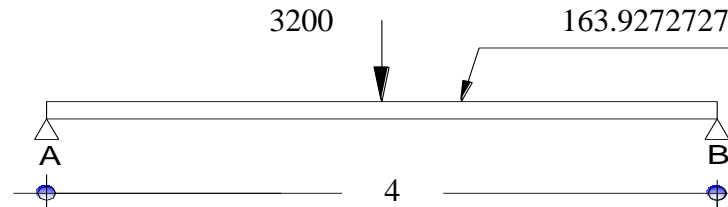
$$M_u = \frac{1}{8} \times q_u \times L^2 = \frac{1}{8} \times 312.404 \times 4^2 = 624.8088 \text{ kgm}$$

* Akibat beban (D) atau jalur

b. gelagar tengah

$$P_u = 3200 \text{ kg}$$

$$q_u = 163.92727 \text{ kg/m}$$



$$R_A = R_B = \frac{1}{2} \times \left[163.9273 \times 4 + 3200 \right]$$

$$= 1927.8545 \text{ kg}$$

$$M_u = \left[\frac{1}{8} \times q_u \times L^2 \right] + \left[\frac{1}{4} \times P \times L \right]$$

$$= \left[\frac{1}{8} \times 163.92727 \times 4 \right] + \left[\frac{1}{4} \times 3200 \times 4 \right]$$

$$= 3527.854545 \text{ kgm}$$

Momen total

$$\text{- gelagar tepi} = 1304.39 + 938.6667 = 2243.054 \text{ Kgm}$$

$$\text{- gelagar tengah} = 624.809 + 3527.855 = 4152.663345 \text{ Kgm}$$

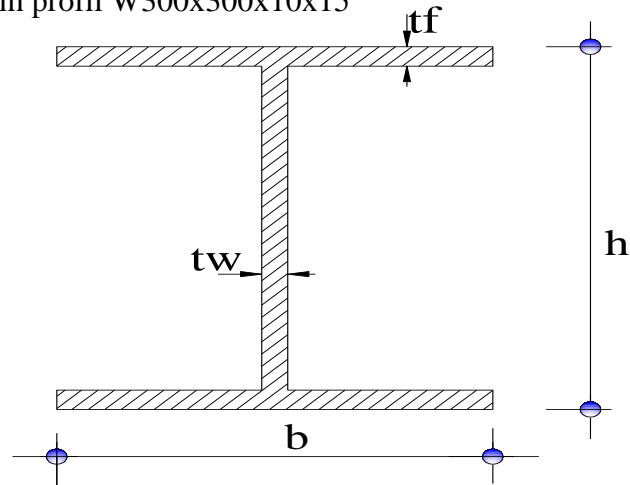
Gaya geser total

$$\text{- gelagar tepi} = 1304.39 + 938.6667 = 2243.054 \text{ Kg}$$

$$\text{- gelagar tengah} = 624.809 + 3527.855 = 4152.663345 \text{ Kg}$$

3.6.4 Perencanaan dimensi gelagar memanjang

Dipilih profil W300x300x10x15



$$G = 94 \quad \text{kg/m}^2$$

$$A = 119.8 \quad \text{cm}^2 \qquad b = 300 \quad \text{mm}$$

$$I_x = 20400 \quad \text{cm}^4 \qquad t_f = 15 \quad \text{mm}$$

$$I_y = 6750 \quad \text{cm}^4 \qquad h = 300 \quad \text{mm}$$

$$t_w = 10 \quad \text{mm} \qquad L = 4 \quad \text{m}$$

$$M_u \text{ total} = 4152.663345 \quad \text{kgm} = 4.15266 \quad \text{ton.m}$$

Syarat Pemilihan Profil

Tahanan balok dalam desain LRFD harus memenuhi persamaan sebagai berikut :

$$\phi M_n > M_u$$

Dengan : $\phi = 0,90$

M_n = tahanan momen nominal

M_u = momen lentur akibat beban terfaktor

(Setiawan, Agus. 2008 .Perencanaan struktur baja dengan metode LRFD. Penerbit Erlangga hal.85)

$$\begin{aligned} \text{Mu} &= 1/8 \cdot q_u \cdot L^2 = 1/8 \times 94 \times 4^2 \times 1.1 \\ &= 206.8 \text{ kg.m} \end{aligned}$$

$$\begin{aligned} \text{Mu total} &= 206.8 + 4152.66335 \\ &= 4359.463345 \text{ kg.m} \end{aligned}$$

$$\begin{aligned} &4.359463 \text{ ton.m} \\ \text{Mu/ } \emptyset &= 4.843848 \text{ ton.m} \end{aligned}$$

$$\begin{aligned} \lambda_f &= \frac{b}{2 \cdot t_f} = \frac{300}{2 \times 15} = 10 < \lambda_f = \frac{170}{\sqrt{F_y}} = 8.96 \\ \lambda_w &= \frac{b}{2 \cdot t_w} = \frac{300}{2 \times 10} = 15 < \lambda_f = \frac{1680}{\sqrt{F_y}} = 88.5 \end{aligned}$$

Penampang kompak !

$$Z_x = b \cdot t_f \cdot (h - t_f) + \frac{1}{4} \cdot t_w \cdot (h - 2 \cdot t_f)^2$$

$$Z_x = 300 \cdot 15 (300 - 15) + \frac{1}{4} \cdot 10 (300 - 2 \cdot 15)^2 = 1281000 \text{ mm}^2$$

$$M_n = Z_x \cdot f_y$$

$$\begin{aligned} &= 1281000 \times 360 \\ &= 461160000 \text{ N/mm} \\ &= 46.116 \text{ ton/m} \end{aligned}$$

$$M_n (= 46.116 \text{ ton/m}) > (\text{Mu/ } \emptyset = 4.844 \text{ ton/m}) \quad \dots \text{ (OK)}$$

> Kontrol Lendutan

$$f_{ijin} = \frac{1}{240} \cdot L \quad (L = 4 \text{ m} = 400 \text{ cm})$$

$$= \frac{1}{240} \times 400 \text{ cm}$$

$$= 1.6666667 \text{ cm}$$

$$f_{ada} = \frac{5 \cdot Q_u \cdot L^4}{384 \cdot E \cdot I_x} = \frac{5 \cdot M \cdot L^2}{48 \cdot E \cdot I_x}$$

(Setiawan, Agus. 2008 .Perencanaan struktur baja dengan metode LRFD. Penerbit Erlangga hal.89)

$$= \frac{5 \times 435946.33 \times 400^2}{48 \times 2100000 \times 20400}$$

$$= 0.1696025 \text{ cm}$$

$$f_{ijin} > f_{ada}$$

$$1.66666667 \text{ cm} > 0.16960253 \text{ cm} \dots\dots\dots(\text{OK})$$

> Perhitungan beff

$$L = 400 \text{ cm}$$

$$be \leq \frac{1}{4} \cdot L$$

$$< \frac{1}{4} \times 400$$

$$< 100$$

$$be \leq s \quad \quad \quad s = \text{jarak antar gelagar memanjang}$$

$$< 140 \text{ cm}$$

$$be \leq \frac{1}{2} \cdot skiri + \frac{1}{2} \cdot skanan$$

$$< \frac{1}{2} \cdot 140 + \frac{1}{2} \cdot 140$$

$$< 140$$

Jadi b_{eff} diambil sebesar 140 cm = 1400 mm

Misalkan sumbu netral plastis jatuh di pelat beton, maka tinggi tegangan tekan

pada balok beton adalah :

$$a = \frac{A \cdot f_s}{0,85 \cdot f'c \cdot be}$$

$$= \frac{119.8 \cdot 360}{0,85 \cdot 30 \cdot 1000}$$

$$= 1.6912941 \text{ mm} < 200 \text{ mm}$$

Karena nilai $a <$ tebal Pelat maka sumbu netral plastis jatuh pada pelat beton, dan sesuai dengan asumsi semula.

Kuat lentur nominal balok komposit :

$$\begin{aligned}M_n &= A_s \cdot F_y \left(\frac{d}{2} + t - \frac{a}{2} \right) \\&= 11980 \times 360 \left(\frac{150}{2} + 200 - \frac{0.846}{2} \right) \\&= 1505832893 \text{ Nmm} \\&= 150.58329 \text{ ton.m}\end{aligned}$$

$$M_n \left(= 150.5832893 \text{ ton.m} \right) > \left(\frac{M_u}{\phi} = 4.153 \text{ ton.m} \right) \quad \dots \text{ (OK)}$$

> Perhitungan Jumlah Stud

Karena kuat lentur balok komposit cukup besar dibandingkan momen lentur akibat beban, maka akan lebih menguntungkan jika digunakan aksi komposit parsial. Terlebih dahulu dihitung jumlah penghubung geser yang diperlukan untuk menimbulkan aksi komposit penuh.

Untuk komposit penuh:

$$C = V_h = A_s \cdot f_y = 38336 \text{ N}$$

Dipakai stud $\Phi = 25 \text{ mm}$, $A_{sc} = 490 \text{ mm}^2$, $f_u = 350 \text{ Mpa}$, $h = 100 \text{ mm}$

$$\begin{aligned}E_c &= 4700 \cdot \sqrt{f'_c} \\&= 4700 \cdot \sqrt{30} \\&= 25742.96 \text{ Mpa}\end{aligned}$$

$$\begin{aligned}Q_n &= \text{kekuatan geser 1 stud} \\&= 0,5 \times A_{sc} \times \sqrt{f'_c \cdot E_c} \\&= 0,5 \times 490 \times \sqrt{30 \cdot 25742,960} \\&= 125228.95 \text{ N}\end{aligned}$$

▪ Jumlah Stud

$$\begin{aligned}
 n &= \frac{Vh}{Qn} \\
 &= \frac{38336}{125228.9481} = \\
 &= 0.3061 \approx 8 \text{ buah}
 \end{aligned}$$

▪ Jarak antar stud arah memanjang

Untuk keseluruhan bentang dipasang 16 buah stud, jika pada tiap penampang melintang dipasang 2 buah stud maka jarak antar stud adalah :

$$\frac{400}{8} = 50 \text{ cm}$$

$$\sum Qn = 8 \times 125228.9 = 1001831.58 \text{ N}$$

Karena $A_s \cdot f_y = 4312800 > \sum Qn$ maka ada bagian dari profil baja yang ada dalam tekan.

Keseimbangan gaya yang terjadi:

$$\sum Qn + C_f = T_{\max} - C_f$$

$$1001831.6 + C_f = 38336 - C_f$$

$$2 \cdot C_f = 963495.6$$

$$C_f = 481747.8 \text{ N}$$

Letak sumbu netral plastis dihitung dari sebelah atas flens tekan adalah :

$$\frac{C_f}{b_f \cdot x \cdot f_y} = \frac{481747.7924}{300 \times 360} = 4.46063 \text{ mm } (< t_f = 15)$$

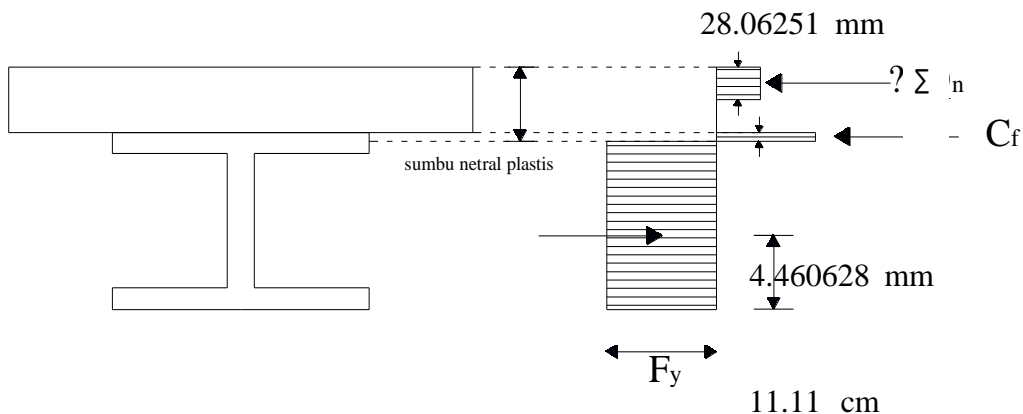
Maka dari hitungan tersebut dapat dikatakan bahwa sumbu netral plastis jatuh pada flens tekan.

	Luas	Lengan	A x y (cm ²)
Profil WF	119.8	15	1797
Flens	45	0.75	33.75
	164.8		1830.75

$$y = \frac{1830.75}{164.8} = 11.11 \text{ cm}$$

besarnya α dihitung dengan persamaan

$$\alpha = \frac{\sum Q_n}{0.85 \cdot f'c \cdot b_e} = \frac{1001831.585}{0.85 \times 30 \times 1400} = 28.06 \text{ mm}$$



Menentukan Momen internal :

$$\begin{aligned} \sum Q_n (M_{ni}) &= \sum Q_n (d-147 + t_s - a/2) \\ &= 1001831.6 (300 - 147 + 200 - 28.06 / 2) \\ &= 339589595.3 \text{ Nmm} \end{aligned}$$

$$\begin{aligned} \sum Q_n (M_{ni}) &= \sum Q_n (d-147 + 0.98/2) \\ &= 1001831.6 (300 - 147 - 4.461 / 2) \\ &= 151045833.6 \text{ Nmm} \end{aligned}$$

$$\begin{aligned} M_n &= M_{n1} + M_{n2} = 490635429 \quad N_{mm} = 49.0635429 \text{ ton.m} \\ \emptyset b.M_n &= 0.85 \times 49.063543 = 41.704 \text{ ton.m} > M_u = 4.152663 \text{ ton.m} \dots \textbf{(OK)} \end{aligned}$$

3.7 Perencanaan Gelagar Melintang

3.7.1 Perhitungan Pembebanan

A) Beban mati

* Berat lantai kendaraan

$$\begin{aligned}q_u &= (\text{perataan beban C} \times 2) \times q_u \text{ lantai kendaraan} \\ &= 0.057166667 \times 2 \quad \times \quad 831.6 \\ &= 95.0796 \text{ kg/m}\end{aligned}$$

* Berat lantai trotoir

$$\begin{aligned}q_u &= (\text{perataan beban D} \times 2) \times q_u \text{ trotoir} \\ &= 0.533333333 \times 2 \quad \times \quad 2113.6 \\ &= 2254.507 \text{ kg/m}\end{aligned}$$

* Berat gelagar memanjang (WF 300 x 300) + Plat + Aspal

Faktor beban 1,1 ; BMS bagian 2, 1992 : 2-14)

$$G = 94 \text{ kg/m}$$

$$L = 4 \text{ m}$$

$$\begin{aligned}P_u &= G \times 4 \times 1.1 \\ &= 94 \times 4 \times 1.1 = 413.6\end{aligned}$$

$$\begin{aligned}P_u \text{ (tengah) total} &= \frac{P_u}{2} + 624.809 = \frac{413.6}{2} + 624.8088 \\ &= 831.6088 \text{ kg}\end{aligned}$$

$$\begin{aligned}P_u \text{ (tepi) total} &= \frac{P_u}{2} + 1304.39 = \frac{413.6}{2} + 1304.387 \\ &= 1511.187333 \text{ kg}\end{aligned}$$

B) Beban hidup

Dari gambar 2.8 hal. 2-29 buku BMS, untuk bentang 60 m didapat nilai

$$DLA = (0.525 - 0.0025 \times 50) = 0.375$$

$$k = 1 + DLA$$

$$= 1 + 0.375 = 1.375$$

Table 2.12 - Dynamic Allowance for "D" Lane KEL

Equivalent Span L_E (m)	DLA (for both limit states)
$L_E \leq 50$	0.4
$50 < L_E < 90$	$0.525 - 0.0025 L_E$
$L_E \geq 90$	0.3

Notes :

1. For Simple Spans $L_E =$ Actual Span Length
2. For Continuous Spans $L_E = \sqrt{L_{av} \cdot L_{max}}$

where:

L_{av} = Average span length of continuous spans.
 L_{max} = Maximum span length of continuous spans.

* Beban terbagi rata

$$L = 60 \text{ m} \quad L \geq 30 \text{ m (Buku BMS Bag 2, 1992 : 2-22)}$$

$$q = 8 \times \left(0.5 + \frac{15}{L} \right)$$

$$= 8 \times 0.5 + \frac{15}{60} \text{ Kpa}$$

$$= 6 \text{ Kpa} = 600 \text{ kg/m}^2$$

$$q_{100\%} = \frac{600}{2.75} \times 0.2333333 \times 2 \times 1 \times 2 = 203.636364 \text{ kg/m}$$

$$q_{50\%} = \frac{600}{2.75} \times 0.2333333 \times 2 \times 0.5 \times 2 = 101.818182 \text{ kg/m}$$

* Beban Garis, $p = 44 \text{ KN/m} = 4400 \text{ kg/m}$ (BMS bagian 2, Hal. 2-14)

$$P_{100\%} = \frac{4400}{\frac{170}{\sqrt{fy}} \times 2.75} \times k \times 2 \times 1$$

$$= \frac{4400}{2.75} \times 1.375 \times 2 \times 1 = 4400 \text{ kg/m}$$

$$P_{50\%} = \frac{4400}{2.75} \times k \times 2 \times 0.5$$

$$= \frac{4400}{2.75} \times 1.375 \times 2 \times 0.5 = 2200 \text{ kg/m}$$

* Beban Hidup “D”, factor beban = 2,0, lalu lintas rencana harus mempunyai lebar 2,75 (BMS bagian 2, Hal. 2-14)

$$D_{100\%} = 203.6363636 + 4400 = 4603.63636 \text{ kg/m}$$

$$D_{50\%} = 101.8181818 + 2200 = 2301.81818 \text{ kg/m}$$

* Beban Truk “T” (Beban Gandar)

Beban truk diambil sebesar $T = 7 \text{ ton}$, Faktor beban = 2,0 (lebar gandar = 1,75 m), (BMS bagian 2 hal 27)

$$T_u = 10 \times 2$$

$$= 20 \text{ t} = 20000 \text{ kg}$$

* Beban hidup trotoir, factor beban = 2

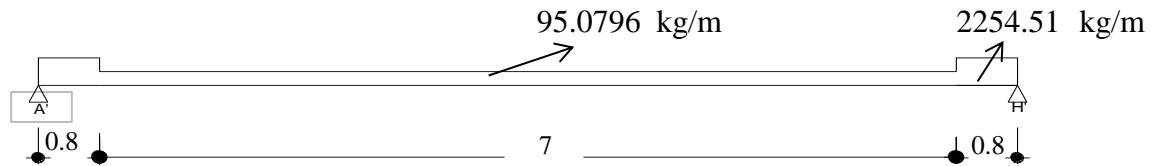
$$q = 5 \text{ Kpa} = 500 \text{ kg/m}^2$$

$$q_u = 500 \times 2 \times 0.5 \times 2$$

$$= 1000 \text{ kg/m}$$

3.7.2 Perhitungan Statika

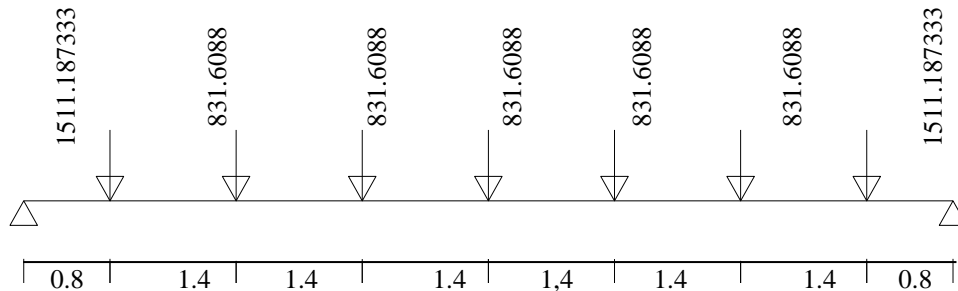
* Momen akibat berat lantai kendaraan, lantai trotoir.



$$\begin{aligned}
 R_A &= 2254.5067 \times 0.8 + 95.0796 \times 3.5 \\
 &= 2136.383933 \text{ kg}
 \end{aligned}$$

$$\begin{aligned}
 M_{u1} &= 2136.383933 \times 3.9 - (2254.51 \times 0.5 \times 3.9) - (95.0796 \times 4.3 \times 2.15) \\
 &= 3056.598438 \text{ kgm}
 \end{aligned}$$

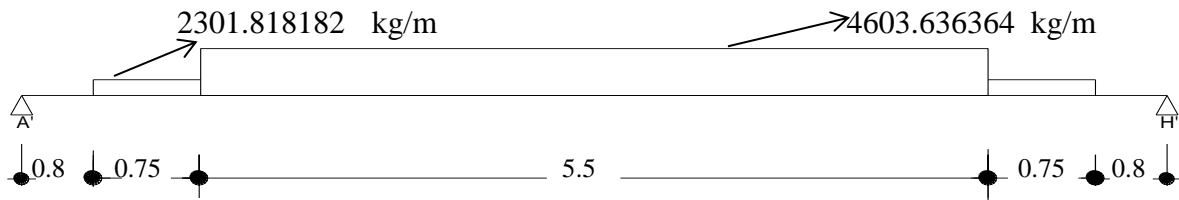
* Momen akibat pembebanan gelagar memanjang (mati)



$$\begin{aligned}
 R_A &= \frac{1}{2} \times 831.6088 \times 7 + 1511.19 \times 1.6 \\
 &= 4119.580667 \text{ kg}
 \end{aligned}$$

$$\begin{aligned}
 M_{u2} &= 4119.580667 \times 5 - (831.609 \times 4.2 - (831.609 \times 2.8)) \\
 &\quad - (831.6088 \times 1.4) \\
 &= 15940.89405 \text{ kgm}
 \end{aligned}$$

* Momen akibat beban hidup "D"



$$RA = (2301.8182 \times 0.75) + (4603.63636 \times 2.75)$$

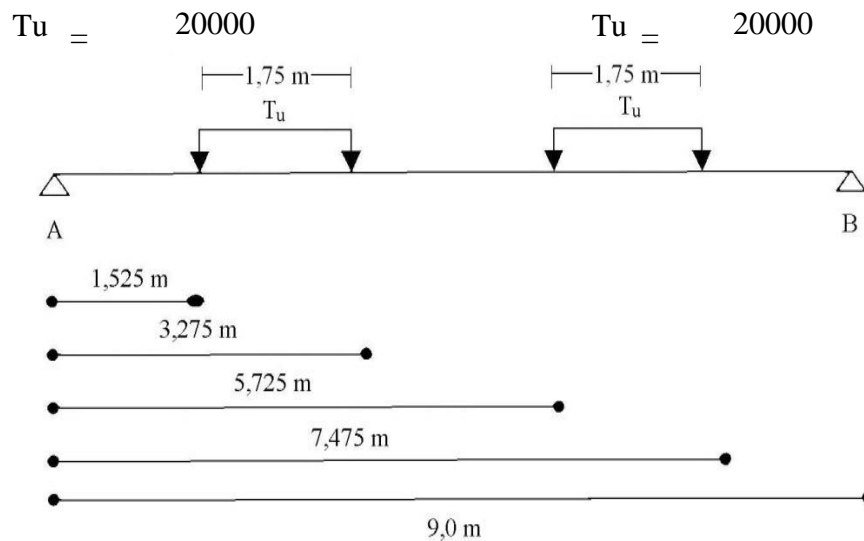
$$= 14386.36364 \text{ kg}$$

$$M_{u3} = (14386.364 \times 4.3) - (2301.81818 \times 0.75 \times 3.125)$$

$$- (4603.636364 \times 2.75 \times 1.38)$$

$$= 39058.97727 \text{ kgm}$$

* Momen akibat beban truk "T"



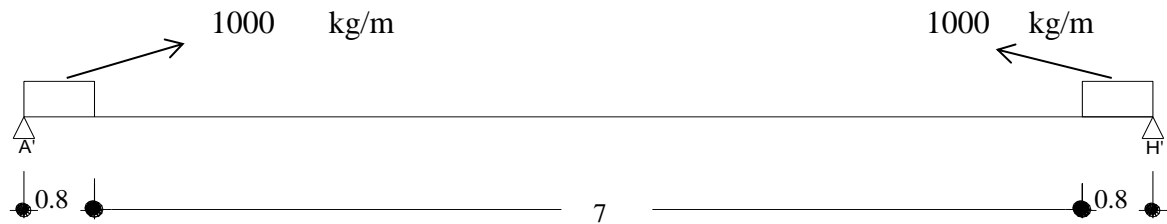
$$RA = \frac{1}{2} \times (Tu \times 4) = \frac{1}{2} \times (20000 \times 4)$$

$$= 40000$$

$$M_{u4} = (40000 \times 4.5) - (20000 \times 2.975) - (20000 \times 1.225)$$

$$= 96000 \text{ kgm}$$

* Momen akibat beban hidup trotoir



$$R_A = \frac{1}{2} \times (1000 \times 0.8 \times 2)$$

$$= 800$$

$$M_{u5} = (800 \times 4.3) - (1000 \times 0.8 \times 3.9)$$

$$= 320 \text{ kgm}$$

Karena momen akibat beban truk > momen akibat beban hidup “D”, maka diambil momen akibat beban truk.

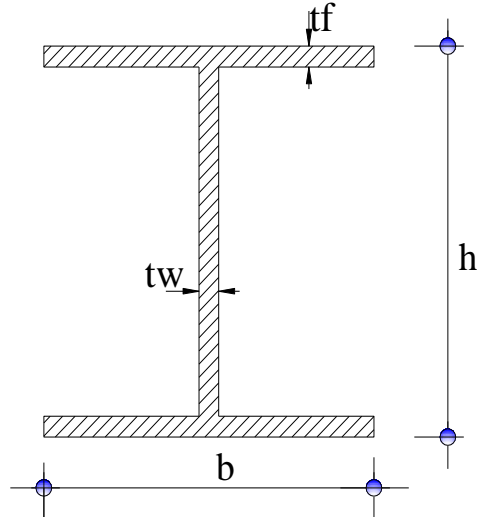
Jadi momen yang terjadi pada gelagar melintang :

$$\begin{aligned} M_{u \text{ total}} &= M_{u1} + M_{u2} + M_{u4} + M_{u5} \\ &= 3056.5984 + 15940.8941 + 96000 + 320 \\ &= 115317.4925 \text{ kgm} \end{aligned}$$

$$\begin{aligned} V_{u \text{ total}} &= R_{a1} + R_{a2} + R_{a4} + R_{a5} \\ &= 2136.3839 + 4119.58067 + 40000 + 320 \\ &= 46575.965 \text{ kg} \end{aligned}$$

3.7.3 Perencanaan dimensi gelagar melintang

Dipilih profil Wf 700x300x13x24



$$G = 185 \quad \text{kg/cm}^2$$

$$A = 235.5 \quad \text{cm}^2$$

$$I_x = 201000 \quad \text{cm}^4$$

$$I_y = 10800 \quad \text{cm}^4$$

$$tw = 13 \quad \text{mm}$$

$$b = 300 \quad \text{mm}$$

$$tf = 24 \quad \text{mm}$$

$$h = 700 \quad \text{mm}$$

$$L = 9 \quad \text{mm}$$

$$Mu \text{ total} = 115317.4925 \quad \text{kgm} = 115.317 \quad \text{ton.m}$$

Syarat Pemilihan Profil

Tahanan balok dalam desain LRFD harus memenuhi persamaan sebagai berikut :

$$\phi Mn > Mu$$

Dengan : $\phi = 0,90$

Mn = tahanan momen nominal

Mu = momen lentur akibat beban terfaktor

(Setiawan, Agus. 2008 .Perencanaan struktur baja dengan metode LRFD. Penerbit

Erlangga hal.85)

$$\begin{aligned}
MBS &= 1/8 \cdot qu \cdot L^2 = 1/8 \times 185 \times 9^2 \\
&= 1873.125 \text{ kg.m} \\
Mu \text{ total} &= 115317.4925 + 1873.125 \\
&= 117190.6175 \text{ kg.m} \\
&= 117.1906 \text{ ton.m} \\
Mu/\emptyset &= 130.2118 \text{ ton.m}
\end{aligned}$$

$$\begin{aligned}
\lambda_f &= \frac{b}{2 \cdot t_f} = \frac{300}{2 \times 24} = 6.25 < \lambda_f = \frac{170}{\sqrt{F_y}} = 8.96 \\
\lambda_w &= \frac{b}{2 \cdot t_w} = \frac{300}{2 \times 13} = 11.5 < \lambda_f = \frac{1680}{\sqrt{F_y}} = 88.5
\end{aligned}$$

Penampang kompak !

$$Z_x = b \cdot t_f \cdot (h - t_f) + \frac{1}{4} \cdot t_w \cdot (h - 2 \cdot t_f)^2$$

$$Z_x = 300 \cdot 60 (700 - 24) + \frac{1}{4} \cdot 13 (300 - 2 \cdot 24)^2 = 4860687 \text{ mm}^2$$

$$M_n = Z_x \cdot f_y$$

$$= 4860687 \times 360$$

$$= 1749847320 \text{ N/mm}$$

$$= 174.984732 \text{ ton/m}$$

$$M_n (= 174.984732 \text{ ton/m}) > (Mu/\emptyset = 130.2 \text{ ton/m}) \dots \text{ (OK)}$$

>Kontrol Lendutan

$$f_{ijin} = \frac{1}{240} \cdot L \quad (L = 9 \text{ m} = 900 \text{ cm})$$

$$= \frac{1}{240} \times 900$$

$$= 3.75 \text{ cm}$$

$$f_{ada} = \frac{5 \cdot Qu \cdot L^4}{384 \cdot E \cdot I_x} = \frac{5 \cdot M \cdot L^2}{48 \cdot E \cdot I_x} \quad (\text{Setiawan, Agus. 2008. Perencanaan struktur baja dengan metode LRFD. Penerbit Erlangga hal.89})$$

$$= \frac{5 \times 13021180 \times 900^2}{48 \times 2100000 \times 201000}$$

$$= 2.6028478 \text{ cm}$$

$$f_{ijin} > f_{ada}$$

$$3.75 \text{ cm} > 2.60284776 \text{ cm} \quad \dots\dots\dots(\text{OK})$$

> Perhitungan beff

$$L = 900 \text{ cm}$$

$$beff < \frac{1}{4} \cdot L$$

$$< \frac{1}{4} \times 900 \text{ cm}$$

$$< 225 \text{ cm}$$

Misalkan sumbu netral plastis jatuh di pelat beton, maka tinggi tegangan tekak

pada balok beton adalah :

$$a = \frac{A \cdot f_s}{0,85 \cdot f'_{c.be}}$$

$$= \frac{235.5 \times 360}{0.85 \times 30 \times 225}$$

$$= 14.776471 \text{ mm} < 200 \text{ mm}$$

Karena nilai $a <$ tebal Pelat maka sumbu netral plastis jatuh pada pelat beton, dan sesuai dengan asumsi semula.

Kuat lentur nominal balok komposit :

$$M_n = A_s \cdot F_y (d/2 + t - a/2)$$

$$= 23550 \times 360 (350 + 200 - 7.388)$$

$$= 4600262541 \text{ Nmm}$$

$$= 460.02625 \text{ ton.m}$$

$$M_n (= 460.0262541 \text{ ton/m}) > (M_u / \phi = 115.3 \text{ ton/m}) \dots \text{(OK)}$$

Perhitungan Jumlah Stud

Karena kuat lentur balok komposit cukup besar dibandingkan momen lentur akibat beban, maka akan lebih menguntungkan jika digunakan aksi komposit parsial. Terlebih dahulu dihitung jumlah penghubung geser yang diperlukan untuk menimbulkan aksi komposit penuh.

Untuk komposit penuh:

$$C = V_h = A_s \cdot f_y = .360 = 75360 \text{ N}$$

Dipakai stud $\Phi = 25 \text{ mm}$, $A_{sc} = 490 \text{ mm}^2$, $f_u = 350 \text{ Mpa}$, $h = 100 \text{ mm}$

$$E_c = 4700 \cdot \sqrt{f'_c}$$

$$= 4700 \cdot \sqrt{30}$$

$$= 25742.96 \text{ Mpa}$$

Q_n = kekuatan geser 1 stud

$$= 0,5 \times A_{sc} \times \sqrt{f'_c \cdot E_c}$$

$$= 0,5 \times 490 \times \sqrt{30 \cdot 25742,960}$$

$$= 215305.91 \text{ N}$$

▪ Jumlah Stud

$$n = \frac{V_h}{Q_n}$$

$$= \frac{75360}{215305.9108}$$

$$= 0.35 \approx 20 \text{ buah} \quad (\text{untuk setengah bentang})$$

▪ Jarak antar stud arah memanjang

Untuk keseluruhan bentang dipasang 40 buah stud, jika pada tiap penampang melintang dipasang 2 buah stud maka jarak antar stud adalah :

$$\frac{900}{20} = 45 \text{ cm}$$

$$\sum Q_n = 20 \times 215305.9 = 4306118.22 \text{ N}$$

Karena $A_s \cdot f_y = 7536000 > \sum Q_n$ maka ada bagian dari profil baja yang ada dalam tekan.

Keseimbangan gaya yang terjadi:

$$\sum Q_n + C_f = T_{\max} - C_f$$

$$4306118.2 + C_f = 7536000 - C_f$$

$$2 \cdot C_f = 4230758$$

$$C_f = 2115379 \text{ N}$$

Letak sumbu netral plastis dihitung dari sebelah atas flens tekan adalah :

$$\frac{C_f}{b_f \cdot x \cdot f_y} = \frac{2115379 \cdot 108}{300 \cdot x \cdot 320} = 22.0352 \text{ mm} \quad (< t_f = 24 \text{ mm})$$

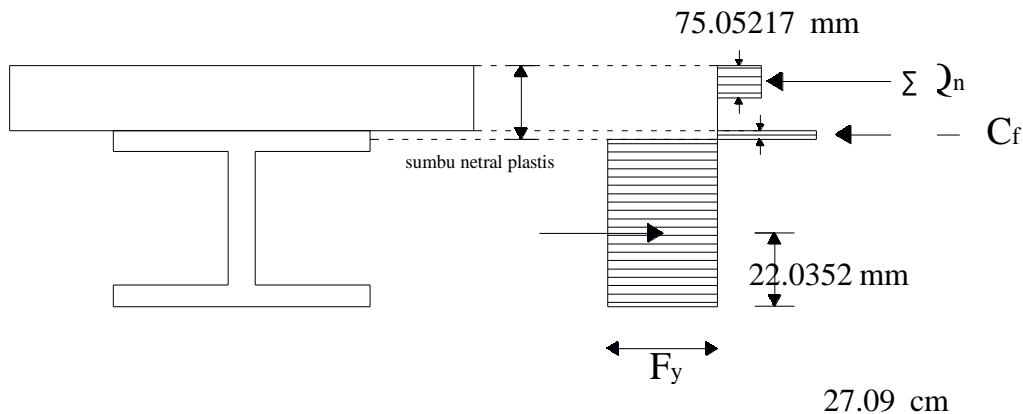
Maka dari hitungan tersebut dapat dikatakan bahwa sumbu netral plastis jatuh pada flens tekan.

	Luas	Lengan	A x y (cm ²)
Profil WF	235.5	35	8242.5
Flens	72	1.2	86.4
	307.5		8328.9

$$y = \frac{8328.9}{307.5} = 27.09 \text{ cm}$$

besarnya α dihitung dengan persamaan

$$\alpha = \frac{\sum Q_n}{0.85 \cdot f'_{c.be}} = \frac{4306118.216}{0.85 \times 30 \times 2250} = 75.05 \text{ mm}$$



Menentukan Momen internal :

$$\begin{aligned} \sum Q_n (M_{nl}) &= \sum Q_n (d-147 + t_s - a/2) \\ &= 4306118.2 (300 - 147 + 200 - 75.05 / 2) \\ &= 1358467973 \text{ Nmm} \end{aligned}$$

$$\sum Q_n (M_{nl}) = \sum Q_n (d-147 + 0.98/2)$$

$$= 4306118.2 \left(300 - 147 - \frac{22.04}{2} \right)$$

$$= 611393001 \text{ Nmm}$$

$$M_n = M_{n1} + M_{n2} = 1969860974 \text{ Nmm} = 196.9860974 \text{ ton.m}$$

$$\phi_b.M_n = 0.85 \times 196.9861 = 167.438 \text{ ton.m} > M_u = 115.3175 \text{ ton.m} \dots \textbf{(OK)}$$

3.8 Perencanaan Gelagar Induk

Untuk perhitungan gelagar induk direncanakan menggunakan profil baja WF dan untuk ikatan angin menggunakan profil baja siku.

3.8.1 Perhitungan Pembebanan

a. Beban mati (faktor beban 1)

Didalam menghitung berat gelagar memanjang, gelagar melintang, ikatan angin dan gelagar induk penyusun tidak menggunakan rumus pendekatan, tetapi menggunakan bantuan komputer untuk menghitung berat sendiri (STAAD PRO 2004 → self weight).

1 Berat lantai kendaraan (G1)

$$\begin{aligned}G_1^u &= (q \times a \times L) & a &= \text{lebar lantai kendaraan} \\ &= 831.6 \times 7 \times 60 & &= 7 \\ &= 349272 \text{ kg}\end{aligned}$$

2 Berat trotoir (G2)

$$\begin{aligned}G_2^u &= 2 \times (q \times a \times L) & a &= \text{lebar lantai trotoir} = 0.8 \\ &= 2 \times 2113.6 \times 0.80 \times 60 \\ &= 202905.6 \text{ kg}\end{aligned}$$

3 Berat tiang sandaran (G3) 76 mm t = 5.08 Kg/m (G6)

Berat tiang sandaran :

$$g = 0.2 \times 0.2 \times 2400 = 96 \text{ kg/m}$$

Berat pipa sandaran \varnothing 76,3 mm

$$g = 5.08 \text{ kg}$$

$$\begin{aligned}G_3^u &= (n \cdot L \cdot g \text{ pipa}) + (n \cdot qt.s) \\ &= (2 \times 60 \times 5.08) + (31 \times 96) \\ &= 3585.6 \text{ kg}\end{aligned}$$

* Total beban mati yang bekerja

$$\begin{aligned}&= 349272 + 202905.6 + 3585.6 \\ &= 555763.2 \text{ kg}\end{aligned}$$

* Beban mati yang dipikul oleh tiap gelagar induk

$$G = \frac{555763.2}{2} = 277368.5 \text{ kg}$$

* Beban mati yang diterima tiap titik buhul tengah

$$P_{\text{tengah}} = \frac{G}{14} = \frac{277368.5}{14} = 19812.03571 \text{ kg}$$

* Beban mati yang diterima tiap titik buhul tepi

$$P_{\text{tepi}} = \frac{P_{\text{tengah}}}{2} = \frac{19812.03571}{2} = 9906.017857 \text{ kg}$$

b. Beban Hidup

1. Koefisien kejut

Diketahui panjang bentang jembatan = 60 m

Dari gambar 2.8 hal. 2-29 buku BMS bag 2, didapat nilai koefisien kejut (DLA)

sebesar $DLA = (0.525 - 0.0025 \times 60) = 0.375$

$k = 1 + DLA$

$$= 1 + 0.375 = 1.375$$

2. Beban terbagi rata

Berdasarkan buku BMS bag 2 hal. 2 – 22, untuk jembatan dengan panjang

$L = 60,0 \text{ m} > 30 \text{ m}$, maka :

$$\begin{aligned} q &= 8 \times \left(0.5 + \frac{15}{60} \right) \text{ Kpa} \\ &= 8 \times \left(0.5 + \frac{15}{60} \right) \text{ Kpa} \\ &= 6.0 \text{ Kpa} = 600 \text{ kg/m}^2 \end{aligned}$$

$$q_1 = \frac{q}{2.75} \times 5.5 \times 100\% = \frac{600}{2.75} \times 5.5 \times 100\%$$

$$= 1200 \text{ kg/m}$$

$$q_2 = \frac{q}{2.75} \times 2 \times 0.75 \times 50\% = \frac{600}{2.75} \times 2 \times 0.75$$

$$\times 50\%$$

$$= 163.6364 \text{ kg/m}$$

** Beban yang diterima tiap gelagar induk

$$G = \frac{q_{\text{total}} \times L}{2} = \frac{1200 + 163.63636}{2} \times 60$$

$$= 40909.09091 \text{ kg}$$

** Beban yang diterima tiap titik buhul tengah

$$P_{\text{tengah}} = \frac{G}{14} = \frac{40909.09}{14} = 2922.078 \text{ kg}$$

** Beban yang diterima tiap titik buhul tepi

$$P_{\text{tepi}} = \frac{P}{2} = \frac{2922.08}{2} = 1461.039 \text{ kg}$$

3. Beban garis

Berdasarkan buku BMS bag 2 hal. 2 – 22, beban garis diambil sebesar $P = 44 \text{ kN/m} = 4400 \text{ kg/m}$, dengan lebar lantai kendaraan 7 m dibagi menjadi 2 jalur.

$$P = \frac{4400}{2.75} \times 5.5 \times 100\% \times k$$

$$= \frac{4400}{2.75} \times 5.5 \times 100\% \times 1.375 = 12100 \text{ kg/m}$$

$$P = \frac{4400}{2.75} \times (2 \times 0.75) \times 50\% \times k$$

$$= \frac{4400}{2.75} \times (2 \times 0.75) \times 50\% \times 1.375 = 1650.0 \text{ kg/m}$$

** Beban yang diterima tiap gelagar induk

$$P = \frac{p1 + p2}{2} = \frac{12100 + 1650.0}{2} = 6875 \text{ kg}$$

** Beban yang diterima tiap titik buhul

$$p = 6875 \text{ kg}$$

c. Beban Hidup Trotoir

Berdasarkan buku BMS bag 2 hal. 2 – 31, beban hidup trotoir diambil sebesar

$$p = 5 \text{ kpa} = 500 \text{ kg/m}^2 \text{ dengan lebar lantai trotoir } 0.8 \text{ m}$$

$$p = 500 \times 0.8 \times 60 \times 2$$

$$= 48000 \text{ kg}$$

** Beban yang diterima tiap gelagar induk

$$P = \frac{p}{2} = \frac{48000}{2} = 24000 \text{ kg}$$

** Beban yang diterima tiap titik buhul tengah

$$P_{\text{tengah}} = \frac{P}{14} = \frac{24000.00}{15} = 1600.0 \text{ kg}$$

** Beban yang diterima tiap titik buhul tepi

$$P_{\text{tepi}} = \frac{P}{2} = \frac{1600.00}{2} = 800.0 \text{ kg}$$

d. Gaya Rem

Diketahui :

Panjang jembatan = 60 m

Berdasarkan gambar 2.9 buku BMS bag 2 hal. 2 – 31 didapatkan gaya rem sebesar

$$(G) = 250 \text{ kN} = 25000 \text{ kg}$$

$$P = \frac{G}{2} = \frac{25000}{2} = 12500 \text{ kg}$$

** Gaya rem yang dipikul tiap titik buhul tengah

$$P_{\text{tengah}} = \frac{P}{14} = \frac{12500.00}{14} = 892.857 \text{ kg}$$

** Beban yang diterima tiap titik buhul tepi

$$P_{\text{tepi}} = \frac{P}{2} = \frac{892.86}{2} = 446.429 \text{ kg}$$

e. Beban Angin

Pada sisi rangka yang terkena angin

$$T_{EW2} = 0.0006 \times cw \times (Vw)^2 \times Ab \times 30\%$$

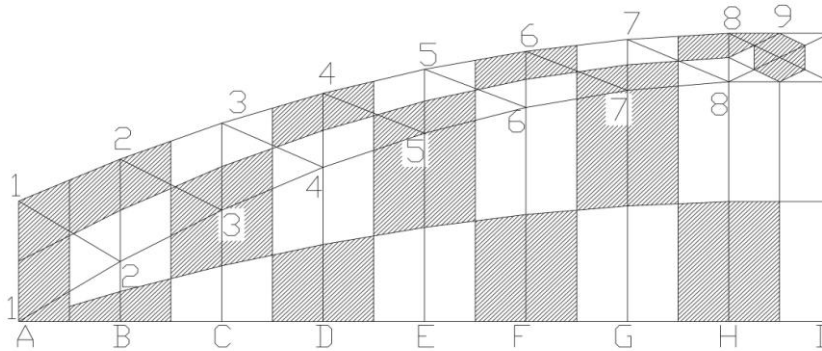
Dimana :

Vw = Kecepatan angin rencana (25 m/dt)

cw = Koefisien seret = 1.2 (untuk bangunan rangka)

Ab = Luas koefisien bagian samping jembatan, luas ekuivalen bagian samping jembatan adalah luas total bagian yang masih dalam arah tegak lurus sumbu memanjang, karena jembatan rangka luasan ekuivalen dianggap 30% dari luas yang dibatasi oleh batang-batang yang terluar.

Luas beban yang terkena angin



AREA	LUAS m ²	AREA	LUAS m ²	AREA	LUAS m ²
1	4.813	1'	6.058	B	4.980
2	8.680	2'	13.420	C	9.153
3	7.263	3'	16.415	D	12.710
4	6.190	4'	18.900	E	15.782
5	5.343	5'	20.983	F	17.513
6	4.690	6'	22.470	G	19.113
7	4.265	7'	23.318	H	19.881
8	3.043	8'	19.881		
9	3.015				

Total luas bidang yang terkena angin adalah = 287.874 m² (Ab)

$$\begin{aligned}
 T_{EW2} &= 0.0006 \times cw \times (Vw)^2 \times Ab \times 30\% \\
 &= 0.0006 \times 1.2 \times 625 \times 287.874 \times 0.3 \\
 &= 38.863 \text{ kN} \\
 &= 3886.294 \text{ kg}
 \end{aligned}$$

Tabel 1

AREA	LUAS m ²	cw	Vw ² 25 m/s	Tew (kg)
1	4.813	1.2	625	64.969
2	8.680	1.2	625	117.180
3	7.263	1.2	625	98.044
4	6.190	1.2	625	83.565
5	5.343	1.2	625	72.124
6	4.690	1.2	625	63.315
7	4.265	1.2	625	57.578
8	3.043	1.2	625	41.074
9	3.015	1.2	625	40.703

Tabel 2

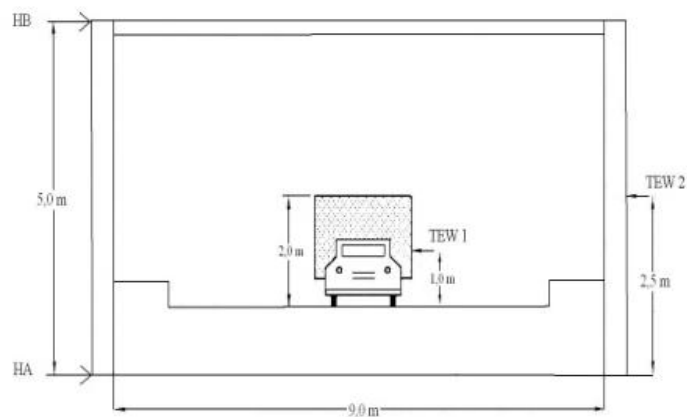
AREA	LUAS m ²	cw	Vw ² 25 m/s	Tew (kg)
1'	6.058	1.2	625	81.776
2'	13.420	1.2	625	181.170
3'	16.415	1.2	625	221.603
4'	18.900	1.2	625	255.150
5'	20.983	1.2	625	283.264
6'	22.470	1.2	625	303.345
7'	23.318	1.2	625	314.786
8'	19.881	1.2	625	268.394

Tabel 3

AREA	LUAS m ²	cw	Vw ² 25 m/s	Tew (kg)
B	4.980	1.2	625	67.230
C	9.153	1.2	625	123.559
D	12.710	1.2	625	171.585
E	15.782	1.2	625	213.052
F	17.513	1.2	625	236.419
G	19.113	1.2	625	258.019
H	19.881	1.2	625	268.394

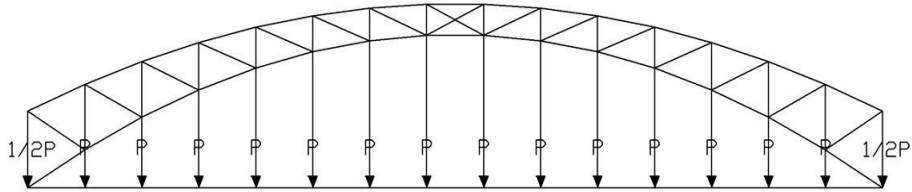
Pada sisi kendaraan terkena angin :

$$\begin{aligned}
 T_{EW1} &= 0.0012 \times cw \times (Vw)^2 \\
 &= 0.0012 \times 1.2 \times 625 \\
 &= 0.9 \text{ kN} \\
 &= 90 \text{ kg}
 \end{aligned}$$



3.8.2 Statika

A Skema pembebanan akibat beban mati

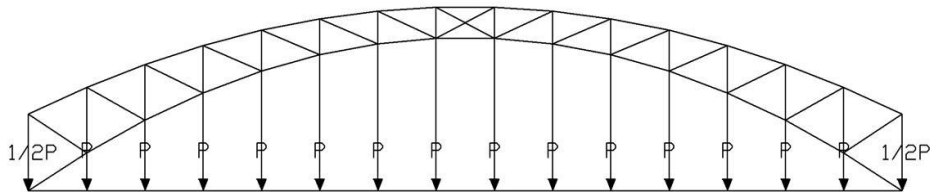


Gambar 3.10 Pembebanan akibat beban mati

$$P_{tepi} = 9906.018 \text{ kg}$$

$$P_{tengah} = 19812.036 \text{ kg}$$

B. Skema pembebanan akibat beban terbagi rata

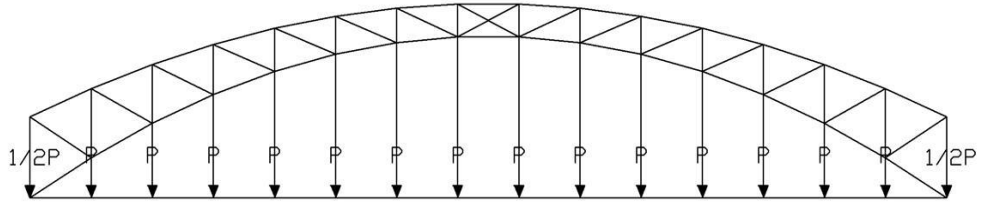


Gambar 3.11 Pembebanan akibat beban terbagi rata

$$P_{tepi} = 1461.039 \text{ kg}$$

$$P_{tengah} = 2922.078 \text{ kg}$$

C. Skema pembebanan akibat beban trotoir

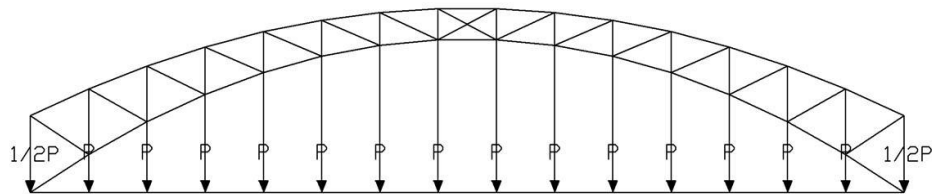


Gambar 3.12 Pembebanan akibat beban trotoir

$$P_{\text{tepi}} = 800.000 \text{ kg}$$

$$P_{\text{tengah}} = 1600.000 \text{ kg}$$

D. Skema pembebanan akibat beban rem

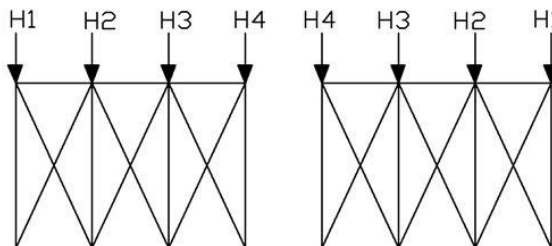


Gambar 3.13 Pembebanan akibat beban rem

$$P_{\text{tepi}} = 446.429 \text{ kg}$$

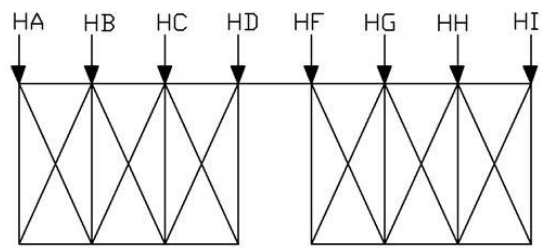
$$P_{\text{tengah}} = 892.857 \text{ kg}$$

E. Skema pembebanan akibat beban angin atas



Gambar 3.14 Pembebanan akibat beban angin atas

F. Skema pembebanan akibat beban angin tengah

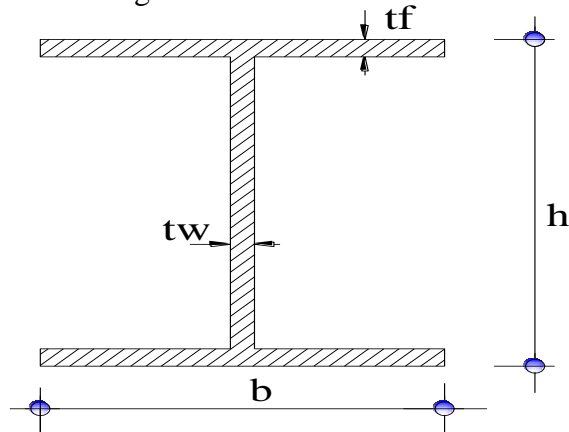


Gambar 3.15 Pembebanan akibat beban angin bawah

3.9 Perencanaan Dimensi Profil Gelagar Induk

Perencanaan Dimensi Batang Tarik (Batang no . 171)

Dimensi Batang Profil WF 400x400



$t_w =$	18 mm	$b =$	405 mm
$A =$	295.4 cm ²	$t_f =$	28 mm
$I_x =$	92800 cm ⁴	$h =$	414 mm
$I_y =$	31000 cm ⁴		
$L =$	4.0 m = 400 cm		

Dari hasil analisa STAAD PRO 2004 didapat gaya aksial terfaktor P_u : 248124.39 kg

Syarat ketentuan untuk desain faktor beban dan ketahanan (DFBK) harus memenuhi persyaratan spesifikasi kekuatan desain sebagai berikut :

$$R_u \leq \phi R_n$$

Luas Neto Efektif

$$\begin{aligned} A_n &= A_g - 4 \cdot [(\text{lebar lubang baut}) \times (\text{tebal flens})] \\ &= 295.4 - 2 (2 \times 2.80) \\ &= 284.2 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} A_e = \text{luas efektif penampang} &: 0.85 \times A_n \\ &: 241.57 \text{ cm}^2 \end{aligned}$$

Batas Leleh Tarik pada Penampang Bruto

$$\begin{aligned} P_n &= F_y \cdot A_g && (2.4.2-2) \\ &= 360.00 \times 29540.000 \\ &= 10634400.00 \text{ N} \\ &= \mathbf{1063440.000 \text{ Kg}} \end{aligned}$$

Kontrol batas leleh tarik pada penampang bruto.

$$\begin{aligned} R_u &\leq \phi R_n \\ P_u &\leq 0.9 \times P_n \\ 248124.390 \text{ Kg} &\leq 0.9 \times 1063440.000 \text{ Kg} \\ 248124.390 \text{ Kg} &\leq 957096.000 \text{ Kg} \text{ ----- Ok} \end{aligned}$$

Batas Keruntuhan Tarik pada Penampang Neto

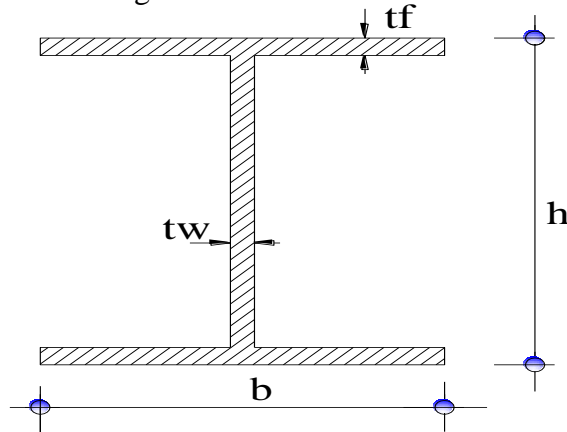
$$\begin{aligned} P_n &= F_u \cdot A_e \\ &= 520.00 \times 24157.000 \\ &= 12561640.00 \text{ N} \\ &= \mathbf{1256164.000 \text{ Kg}} \end{aligned}$$

Kontrol batas leleh tarik pada penampang bruto.

$$\begin{aligned} R_u &\leq \phi R_n \\ P_u &\leq 0.9 \times P_n \\ 248124.390 \text{ Kg} &\leq 0.9 \times 1256164.000 \text{ Kg} \\ 248124.390 \text{ Kg} &\leq 1130547.600 \text{ Kg} \text{ ----- Ok} \end{aligned}$$

Perencanaan Dimensi Batang Tekan (Batang no . 79)

Dimensi Batang Profil WF 400x400



$t_w =$	18 mm	$b =$	405 mm
$A =$	295.4 cm ²	$t_f =$	28 mm
$I_x =$	92800 cm ⁴	$h =$	414 mm
$I_y =$	31000 cm ⁴		
$L =$	5.5 m = 550 cm		

Dari hasil analisa STAAD PRO 2004 didapat gaya aksial terfaktor $P_u = 43530.4$ kg

Syarat ketentuan untuk desain faktor beban dan ketahanan (DFBK) harus memenuhi persyaratan spesifikasi kekuatan desai sebagai berikut :

$$R_u \leq \phi R_n$$

Klasifikasi Penampang untuk tekuk lokal

Untuk kondisi tekan, penampang diklasifikasikan sebagai elemen nonlangsing atau penampang elemen-langsing. Untuk profil elemen nonlangsing, rasio tebal terhadap lebar dari elemen tekan tidak boleh melebihi λ_r . Jika rasio tersebut melebihi λ_r , di sebut penampang dengan elemen langsing.

$$D/t \geq 0.11 \times \frac{E}{F_y} \text{----- Langsing}$$

Diketahui :

- Modulus Elastisitas (E) = 210000 MPa
- Tegangan Leleh (Fy) = 360 Mpa

$$D/t \geq 0.11 \times \frac{E}{F_y}$$

$$\frac{414.00}{18.00} \geq 0.11 \times \frac{210000.00}{360.00}$$

$$23.000 \leq 64.166667 \text{ Non Langsing}$$

Panjang Efektif

- Faktor Panjang Efektif (K) = 1
- Panjang Batang (L) = 5.500 m
- Radius Girasi (r) = $\sqrt{\frac{I}{A}}$

Maka Radius girasi/Jari-Jari Girasi :

$$r_x = \sqrt{\frac{I}{A}}$$

$$= \sqrt{\frac{92800.000}{295.400}}$$

$$= 17.72 \text{ cm}$$

$$r_y = \sqrt{\frac{I}{A}}$$

$$= \sqrt{\frac{31000.000}{295.400}}$$

$$= 10.24 \text{ cm}$$

$$\frac{K \times L}{r} < 200$$

$$\frac{550.000}{10.244} < 200$$

$$53.689 < 200 \text{ Ok}$$

Tekuk Lentur dari Komponen Struktur Tanpa Elemen Langsing

Kekuatan tekan nominal, Pn, harus di tentukan berdasarkan keadaan batas dari tekuk lentur.

$$P_n = F_{cr} \cdot A_g$$

Untuk menentukan tegangan kritis, F_{cr} , di tentukan sebagai berikut :

$$\frac{KL}{r} \leq 4.71 \times \sqrt{\frac{E}{F_y}} \quad \text{Fcr} = \left(0.658^{\frac{F_y/F_e}{e}} \right)$$

$$\frac{KL}{r} \leq 4.71 \times \sqrt{\frac{E}{F_y}} \quad \text{Fcr} = 0.877 \cdot F_e$$

Maka :

$$\frac{KL}{r} \leq 4.71 \times \sqrt{\frac{E}{F_y}}$$

$$\frac{550}{10.244} \leq 4.71 \times \sqrt{\frac{210000 \text{ MPa}}{360 \text{ Mpa}}}$$

$$53.6892 \leq 113.757 \quad \text{Maka Digunakan} \quad \text{Fcr} = \left(0.658^{\frac{F_y/F_e}{e}} \right) \times F_y$$

Tegangan Tekuk Kritis elastis di tentukan Sebagai Berikut :

$$F_e = \frac{\pi^2 \times E}{\left(\frac{KL}{r} \right)^2}$$

$$= \frac{3.14^2 \times 210000 \text{ MPa}}{53.689^2}$$

$$= 718.298 \text{ MPa}$$

Tegangan Kritis di tentukan Sebagai Berikut :

$$F_{cr} = \left(0.658^{\frac{F_y/F_e}{e}} \right) \times F_y$$

$$= \left(0.658^{\frac{360 \text{ Mpa}}{718.298}} \right) \times 360 \text{ Mpa}$$

$$= 291.88$$

Kuat Tekan Nominal

$$P_n = F_{cr} \cdot A_g$$

$$= 291.877 \times 29540.000$$

$$= 8622049.894 \text{ N}$$

$$= 862204.989 \text{ Kg}$$

Kontrol Kekuatan tekan

$$R_u \leq \phi R_n$$

$$P_u \leq 0.9 \times P_n$$

$$43530.352 \text{ Kg} \leq 0.9 \times 862204.989 \text{ Kg}$$

$$43530.352 \text{ Kg} \leq 775984.4905 \text{ Kg} \text{ ----- Ok}$$

3.10 Perencanaan Ikatan Angin

Perencanaan Dimensi Batang Tekan (Batang no . 5550)

Dimensi batang Profil LD L90.90.9 :

$$t_w = 9 \text{ mm} \qquad b = 90 \text{ mm}$$

$$A = 15.5 \text{ cm}^2 \qquad t_f = 9 \text{ mm}$$

$$I_x = 116 \text{ cm}^4 \qquad h = 90 \text{ mm}$$

$$I_y = 116 \text{ cm}^4$$

$$L = 4.95 \text{ m} = 495 \text{ cm}$$

Dari hasil analisa STAAD PRO 2004 didapat gaya aksial terfaktor $P_u = 3267.57 \text{ kg}$

Syarat ketentuan untuk desain faktor beban dan ketahanan (DFBK) harus memenuhi persyaratan spesifikasi kekuatan desai sebagai berikut :

$$R_u \leq \phi R_n$$

Klasifikasi Penampang untuk tekuk lokal

Untuk kondisi tekan, penampang diklasifikasikan sebagai elemen nonlangsing atau penampang elemen-langsing. Untuk profil elemen nonlangsing, rasio tebal terhadap lebar dari elemen tekan tidak boleh melebihi λ_r . Jika rasio tersebut melebihi λ_r , di sebut penampang dengan elemen langsing.

$$D/t \geq 0.11 \times \frac{E}{F_y} \text{ ----- Langsing}$$

Diketahui :

- Modulus Elastisitas (E) = 210000 MPa
- Tegangan Leleh (Fy) = 360 Mpa

$$D/t \geq 0.11 \times \frac{E}{F_y}$$

$$\frac{90.00}{9.00} \geq 0.11 \times \frac{210000.00}{360.00}$$

$$10.000 \leq 64.166667 \text{ ----- Non Langsing}$$

Panjang Efektif

- Faktor Panjang Efektif (K) = 1
- Panjang Batang (L) = 4.953 m
- Radius Girasi (r) = $\sqrt{\frac{I}{A}}$

Maka Radius girasi/Jari-Jari Girasi :

$$\begin{aligned} r_x &= \sqrt{\frac{I}{A}} \\ &= \sqrt{\frac{116.000}{15.500}} \\ &= 2.74 \text{ cm} \end{aligned}$$

$$\begin{aligned} r_y &= \sqrt{\frac{I}{A}} \\ &= \sqrt{\frac{116.000}{15.500}} \\ &= 2.74 \text{ cm} \end{aligned}$$

$$\frac{K \times L}{r} < 200$$

$$\frac{495.341}{2.736} < 200$$

$$181.068 < 200 \text{ ----- Ok}$$

Tekuk Lentur dari Komponen Struktur Tanpa Elemen Langsing

Kekuatan tekan nominal, Pn, harus di tentukan berdasarkan keadaan batas dari tekuk lentur.

$$P_n = F_{cr} \cdot A_g$$

Untuk menentukan tegangan kritis, Fcr, di tentukan sebagai berikut :

$$\frac{KL}{r} \leq 4.71 \times \sqrt{\frac{E}{F_y}} \text{ ----- } F_{cr} = \left[0.658^{\frac{F_y}{F_c}} \right]$$

$$\frac{KL}{r} \leq 4.71 \times \sqrt{\frac{E}{F_y}} \text{ ----- } F_{cr} = 0.877 \cdot F_e$$

Maka :

$$\frac{KL}{r} \leq 4.71 \times \sqrt{\frac{E}{F_y}}$$

$$\frac{495.341}{2.736} \leq 4.71 \times \sqrt{\frac{210000 \text{ MPa}}{360 \text{ Mpa}}}$$

$$181.068 \leq 113.757 \quad \text{Maka Digunakan} \quad F_{cr} = \left(0.658^{\frac{F_y/F_e}{e}} \right) \times F_y$$

Tegangan Tekuk Kritis elastis di tentukan Sebagai Berikut :

$$F_e = \frac{\pi^2 \times E}{\left(\frac{KL}{r} \right)^2}$$

$$= \frac{3.14^2 \times 210000 \text{ MPa}}{181.068^2}$$

$$= 63.153 \text{ MPa}$$

Tegangan Kritis di tentukan Sebagai Berikut :

$$F_{cr} = \left(0.658^{\frac{F_y/F_e}{e}} \right) \times F_y$$

$$= \left(0.658^{\frac{360 \text{ Mpa}}{63.153}} \right) \times 360 \text{ Mpa}$$

$$= 33.12$$

Kuat Tekan Nominal

$$P_n = F_{cr} \cdot A_g$$

$$= 33.122 \times 1550.000$$

$$= 51338.961 \text{ N}$$

$$= 5133.896 \text{ Kg}$$

Kontrol Kekuatan tekan

$$R_u \leq \phi R_n$$

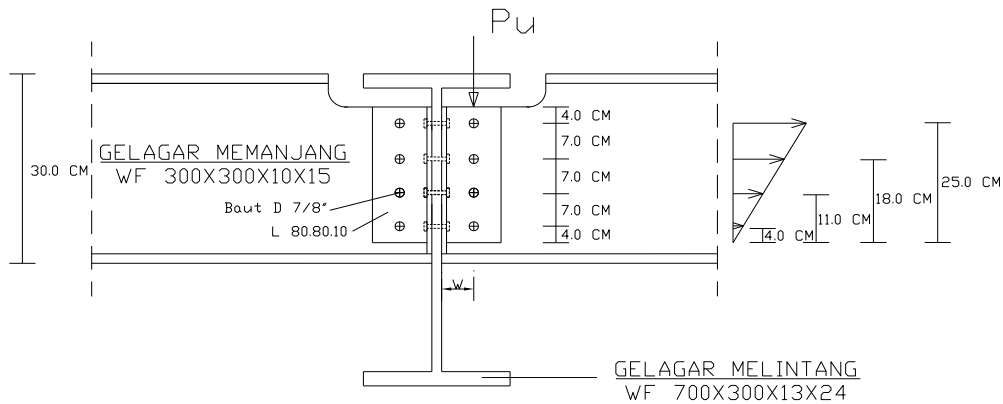
$$P_u \leq 0.9 \times P_n$$

$$3267.570 \text{ Kg} \leq 0.9 \times 5133.896 \text{ Kg}$$

$$3267.570 \text{ Kg} \leq 4620.5065 \text{ Kg} \quad \text{----- Ok}$$

3.11 Perencanaan Sambungan

3.11.1 Sambungan Gelagar Memanjang dan Melintang



Gambar 3.19 Sambungan Gelagar Memanjang dan Gelagar Melintang

Direncanakan baut A490 dengan diameter $D = 7/8 \text{ inch} = 2.22 \text{ cm}$

kekuatan tarik baut, $F_u^b = 150 \text{ ksi} = 10342.5 \text{ kg/cm}^2$

Catatan = $1 \text{ ksi} = 68.95 \text{ kg/cm}^2$

** Besarnya gaya geser yang bekerja pada gelagar memanjang akibat berat sendiri maupun akibat beban luar adalah

$P_u = 5672.6749 \text{ kg}$ (gaya yang bekerja pada gelagar memanjang)

** Luas Baut :

$$\begin{aligned} A_b &= \frac{1}{4} \cdot \pi \cdot D^2 \\ &= 0.25 \times 3.14 \times 2.22^2 \\ &= 3.869 \text{ cm}^2 \end{aligned}$$

** Sambungan irisan tunggal (pada gelagar melintang)

* Kekuatan tarik desain :

$$\begin{aligned}\phi R_n &= \phi \times (0.75 \times F_u^b) \times A_b \\ &= 0.75 \times (0.75 \times 10342.5) \times 3.869 \\ &= 22507.31 \text{ kg}\end{aligned}$$

* Kekuatan geser desain :

Banyaknya bidang geser yang terlibat adalah 1 karena merupakan sambungan irisan tunggal, sehingga $m = 1$

$$\begin{aligned}\phi R_n &= \phi \times (0.60 \times F_u^b) \times m \times A_b \\ &= 0.65 \times (0.6 \times 10342.5) \times 1 \times 3.869 \\ &= 15605.1 \text{ kg}\end{aligned}$$

* Kekuatan tumpu desain

Perhitungan kekuatan tumpu desain pada perumusannya mempertimbangkan ketebalan plat yang akan disambung. Dalam hal ini ketebalan plat yang

diperhitungkan adalah ketebalan gelagar melintang yaitu 1.3 cm

$$\begin{aligned}\phi R_n &= \phi \cdot (2.4 \cdot d \cdot t \cdot F_u) \\ &= 0.75 \times (2.4 \times 2.22 \times 1.30 \times 5200) \\ &= 27012.96 \text{ kg}\end{aligned}$$

* Kekuatan nominal :

$$\begin{aligned}T_n &= 0.6 \times F_y \times A \\ &= 0.6 \times 3600 \times (1.3 \times (70 - 2 \times 2.4)) \\ &= 183081.60 \text{ kg} > P_u = 5672.67 \text{ kg} \dots\dots\dots \text{Ok}\end{aligned}$$

* Momen ultimate :

$$\begin{aligned} Mu &= Pu \cdot W && (w = \text{titik perlemahan}) = 4.5 \text{ cm} \\ &= 5672.67 \times 4.5 \\ &= 25527.0369 \end{aligned}$$

* Jumlah baut : (CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1, 1992 : 201)

$$n = \sqrt{\frac{6 \cdot Mu}{R \cdot P}}$$

dimana : Mu = Momen Ultimate

R = ϕ Rn (kekuatan geser desain yang menentukan)

P = Jarak minimum sumbu baut = 7 cm

$$n = \sqrt{\frac{6 \cdot Mu}{R \cdot P}} = \sqrt{\frac{6 \times 25527.037}{15605.07 \times 7}} = 1.18 \text{ buah} \approx 4 \text{ buah}$$

* Ketebalan plat yang digunakan adalah :

$$t = \frac{P}{\phi \cdot Fu \cdot L} = \frac{5672.6749 / 4}{0.75 \times 3600 \times 4} = 0.13 \text{ cm}$$

Maka digunakan plat penyambung siku L 80 x 80 x 10

dengan tebal 1 cm

* Kekuatan geser desain > beban geser terfaktor baut

$$\phi \cdot Rn > Ru_t$$

$$\begin{aligned} Ru_t &= \frac{Pu}{n} \\ &= \frac{5672.67}{4} \end{aligned}$$

$$= 1418.1687 \text{ kg} < \phi \cdot R_n = 15605.07 \text{ kg} \dots\dots\dots \text{ Ok}$$

** Sambungan irisan ganda (pada gelagar memanjang)

* Kekuatan tarik desain (LRFD, hal : 100) :

$$\begin{aligned} \phi R_n &= \phi \cdot (0,75 \cdot F_u^b) \cdot A_b \\ &= 0,75 \cdot (0,75 \cdot 10342,5) \cdot 3,869 \\ &= 22507,31 \text{ kg} \end{aligned}$$

* Kekuatan geser desain :

Banyaknya bidang geser yang terlibat adalah 2 karena merupakan sambungan irisan ganda, sehingga $m = 2$

$$\begin{aligned} \phi R_n &= \phi \cdot (0,6 \cdot F_u^b) \cdot m \cdot A_b \\ &= 0,65 \cdot (0,6 \cdot 10342,5) \cdot 2 \cdot 3,869 \\ &= 31210,14 \text{ kg} \end{aligned}$$

* Kekuatan tumpu desain :

Perhitungan kekuatan tumpu desain pada perumusannya mempertimbangkan ketebalan plat yang akan disambung. Dalam hal ini ketebalan plat yang diperhitungkan adalah ketebalan gelagar memanjang yaitu 1,0 cm (Salmon : 134)

$$\begin{aligned} \phi R_n &= \phi \cdot (2,4 \cdot d \cdot t \cdot F_u) \\ &= 0,75 \cdot (2,4 \cdot 2,22 \cdot 1 \cdot 5200) \\ &= 20779,20 \text{ kg} \end{aligned}$$

$$F_u = \text{Tegangan tarik putus} = 5200 \text{ kg/cm}^2$$

* Kekuatan nominal :

$$\begin{aligned} T_n &= 0,6 \cdot F_y \cdot A \\ &= 0,6 \cdot 3600 \cdot 1,0 \cdot (30 - 2 \cdot 1,5) \end{aligned}$$

$$= 58320.00 \text{ kg} > T_u = 5672.67 \text{ kg} \dots\dots\dots \text{Ok}$$

* Momen ultimate :

$$\begin{aligned} M_u &= P_u \cdot W && (w = \text{titik perlemahan}) \\ &= 5672.67 \times 4.5 \\ &= 25527.0369 \text{ kg} \end{aligned}$$

* Jumlah baut :

$$n = \sqrt{\frac{6 \cdot M_u}{R \cdot P}} \quad (\text{CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1, 1992 : 201})$$

dimana : M_u = Momen Ultimate

$R = \phi R_n$ (kekuatan desain yang menentukan)

P = Jarak minimum sumbu baut = 4 cm

$$n = \sqrt{\frac{6 \cdot M_u}{R \cdot P}} = \sqrt{\frac{6 \times 25527.037}{22057.31 \times}} = 2.64 \text{ buah} \approx 4 \text{ buah}$$

* Ketebalan plat yang digunakan adalah :

$$t = \frac{P}{\phi \cdot F_u \cdot L} = \frac{5672.6749 / 4}{0.75 \times 5200 \times 4} = 0.09091 \text{ cm}$$

Maka digunakan plat penyambung siku L 80 x 80 x 10

dengan tebal 1 cm

* Kekuatan geser desain > beban geser terfaktor baut

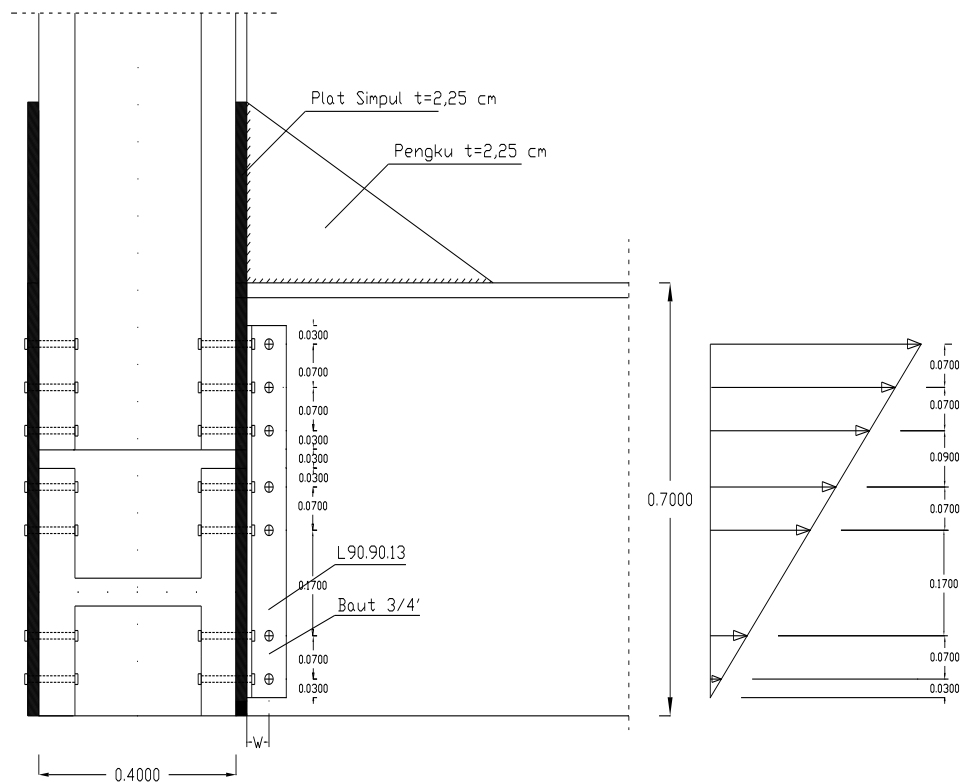
$$\phi \cdot R_n > R_{ut}$$

$$R_{ut} = \frac{P_u}{n}$$

$$= \frac{5672.67}{4}$$

$$= 1418.1687 \text{ kg} > \phi \cdot R_n = 15605.07 \text{ kg} \dots\dots \text{ Ok}$$

3.11.2 Sambungan Gelagar Melintang dan Gelagar Induk



Gambar 3.20 Sambungan Gelagar Melintang dan Gelagar Induk

Direncanakan baut A490 dengan diameter $D = 7/8 \text{ inch} = 2.22 \text{ cm}$
 kekuatan tarik baut, $F_u^b = 120 \text{ ksi} = 10342.5 \text{ N/mm}^2$

* Gaya geser yang bekerja pada gelagar melintang

$$D_{max} = 55783.75535 \text{ kg}$$

**Luas Baut :

$$\begin{aligned} A_b &= \frac{1}{4} \cdot \pi \cdot D^2 \\ &= 0.25 \times 3.14 \times 2.22^2 \\ &= 3.878 \text{ cm}^2 \end{aligned}$$

** Sambungan irisan tunggal (pada gelagar Induk)

* Kekuatan tarik desain :

$$\begin{aligned} \phi R_n &= \phi \times (0.75 \times F_u^b) \times A_b \\ &= 0.75 \times (0.75 \times 10342.5) \times 3.878 \\ &= 22558.03 \text{ kg} \end{aligned}$$

* Kekuatan geser desain :

Banyaknya bidang geser yang terlibat adalah 1 karena merupakan sambungan irisan tunggal, sehingga $m = 1$

$$\begin{aligned} \phi R_n &= \phi \times (0.75 \times F_u^b) \times m \times A_b \\ &= 0.65 \times (0.6 \times 10342.5) \times 1 \times 3.878 \\ &= 15640.24 \text{ kg} \end{aligned}$$

* Kekuatan tumpu desain

Perhitungan kekuatan tumpu desain pada perumusannya mempertimbangkan ketebalan plat yang akan disambung. Dalam hal ini ketebalan plat yang

diperhitungkan adalah ketebalan gelagar melintang yaitu 7.5 cm

$$\begin{aligned} \phi R_n &= \phi \cdot (2.4 \cdot d \cdot t \cdot F_u) \\ &= 0.75 \times (2.4 \times 2.22 \times 7.50 \times 5200) \\ &= 156019.50 \text{ kg} \end{aligned}$$

* Kekuatan nominal :

$$\begin{aligned}
 T_n &= 0.6 \times F_y \times A \\
 &= 0.6 \times 3600 \times 280 \\
 &= 604800.00 \text{ kg} > P_u = 55783.76 \text{ kg} \dots\dots\dots \text{ Ok}
 \end{aligned}$$

Aug adalah luas badan gelagar yang bersangkutan

* Momen ultimate :

$$\begin{aligned}
 M_u &= P_u \cdot W && (w = \text{titik perlemahan}) \\
 &= 55783.76 \times 5 \\
 &= 278918.7767
 \end{aligned}$$

* Jumlah baut :

$$n = \sqrt{\frac{6 \cdot M_u}{R \cdot P}} \quad (\text{CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1, 1992 : 201})$$

dimana : M_u = Momen Ultimate

$R = \phi R_n$ (kekuatan desain yang menentukan)

P = Jarak minimum sumbu baut = 7 cm

$$n = \sqrt{\frac{6 \cdot M_u}{R \cdot P}} = \sqrt{\frac{6 \times 278918.78}{22558.03 \times 7}} = 3.26 \text{ buah} \approx 7 \text{ buah}$$

* Ketebalan plat yang digunakan adalah :

$$t = \frac{P}{\phi \cdot F_u \cdot L} = \frac{55783.755 / 7}{0.75 \times 5200 \times 4} = 0.51084 \text{ cm}$$

Maka digunakan plat penyambung siku L 90 x 90 x 10
dengan tebal 1.6 cm

** Kontrol terhadap kekuatan desain antara geser dan tarik :

* Kekuatan tarik desain > beban tarik terfaktor baut

* Kekuatan geser desain > beban geser terfaktor baut

$$\phi \cdot R_n > R_{ut}$$

$$R_{ut} = \frac{P_u}{n}$$
$$= \frac{55783.76}{7}$$

$$= 7969.1079 \text{ kg} < \phi \cdot R_n = 15640.24 \text{ kg} \dots\dots\dots (\text{Ok})$$

** Sambungan irisan ganda (pada gelagar melintang)

* Kekuatan tarik desain:

$$\phi R_n = \phi \cdot (0,75 \cdot F_u^b) \cdot A_b$$
$$= 0,75 \times (0,75 \times 10342,5) \times 3,878$$
$$= 22558,03 \text{ kg}$$

* Kekuatan geser desain :

Banyaknya bidang geser yang terlibat adalah 2 karena merupakan sambungan irisan ganda, sehingga $m = 2$

$$\phi R_n = \phi \times (0,75 \times F_u^b) \times m \times A_b$$
$$= 0,65 \times (0,6 \times 10342,5) \times 2 \times 3,878$$
$$= 31280,47 \text{ kg}$$

* Kekuatan tumpu desain :

Perhitungan kekuatan tumpu desain pada perumusannya mempertimbangkan ketebalan plat yang akan disambung. Dalam hal ini ketebalan plat yang diperhitungkan adalah ketebalan gelagar memanjang yaitu 1.3 cm

$$\begin{aligned}\phi R_n &= \phi \cdot (2,4 \cdot d \cdot t \cdot F_u) \\ &= 0,75 \cdot (2,4 \cdot 3,88 \cdot 3,2 \cdot 5200) \\ &= 116139,25 \text{ kg}\end{aligned}$$

F_u = Tegangan tarik putus = 5200 kg/cm²

* Kekuatan nominal :

$$\begin{aligned}T_n &= 0,6 \cdot F_y \cdot A \\ &= 0,6 \cdot 3600 \cdot 84,76 \\ &= 183082 \text{ kg} > P_u = 55783,76 \text{ kg} \dots\dots\dots \text{ Ok}\end{aligned}$$

* Momen ultimate :

$$\begin{aligned}M_u &= P_u \cdot W \quad (w = \text{titik perlemahan}) = 5 \text{ cm} \\ &= 55783,76 \cdot 5 \\ &= 278918,7767 \text{ kg}\end{aligned}$$

* Jumlah baut :

$$n = \sqrt{\frac{6 \cdot M_u}{R \cdot P}} \quad (\text{CG. Salmon, JE. Jhonson. Struktur Baja Desain dan Perilaku, Jilid 1, 1992 : 201})$$

dimana : M_u = Momen Ultimate

$R = \phi R_n$ (kekuatan desain yang menentukan)

P = Jarak minimum sumbu baut = 7 cm

$$n = \sqrt{\frac{6 \cdot M_u}{R \cdot P}} = \sqrt{\frac{6 \cdot 278918,78}{22558,03 \cdot 7}} = 3,26 \text{ buah} \approx 7 \text{ buah}$$

* Ketebalan plat yang digunakan adalah :

$$t = \frac{P}{\phi \cdot F_u \cdot L} = \frac{55783,755 / 7}{0,75 \cdot 5200 \cdot 7} = 0,29191 \text{ cm} \approx 1,6$$

Maka digunakan plat penyambung siku L 90 x 90 x 13

** Kontrol terhadap kekuatan desain antara geser dan tarik :

* Kekuatan geser desain > beban geser terfaktor baut

$$\phi \cdot R_n > R_{ut}$$

$$R_{ut} = \frac{P_u}{n}$$

$$= \frac{55783.76}{7}$$

$$= 7969.1079 \text{ kg} < \phi \cdot R_n = 31280.47 \text{ kg} \dots\dots\dots \text{Ok}$$

3.11.3 Sambungan Batang Gelagar Induk WF 400X400

* Perhitungan kekuatan Baut

Digunakan baut A325 dengan diameter, $d = 3/4$ inch 19.1 mm Kekuatan
kekuatan tarik baut, $F_u^b = 120$ ksi = 8274 kg/cm²

**Luas Baut :

$$\begin{aligned} A_b &= \frac{1}{4} \cdot \pi \cdot D^2 \\ &= 0.25 \times 3.14 \times 1.91^2 \\ &= 2.849 \text{ cm}^2 \end{aligned}$$

* Kekuatan geser desain :

Banyaknya bidang geser yang terlibat adalah 1 karena merupakan sambungan
iris tunggal, sehingga $m = 1$

$$\begin{aligned} \phi R_n &= \phi \times (0.75 \times F_u^b) \times m \times A_b \\ &= 0.65 \times (0.75 \times 8274) \times 1 \times 2.849 \\ &= 11490.79 \text{ kg} \end{aligned}$$

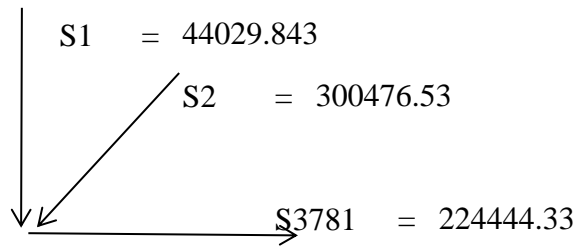
* Kekuatan tumpu desain

Tebal plat simpul = 2.8 cm

$$\begin{aligned} \text{Diameter lubang} &= 1.91 + 0.1 \\ &= 2.01 \text{ cm} \end{aligned}$$

$$\begin{aligned} \phi R_n &= \phi \cdot (2.4 \cdot d \cdot t \cdot F_u) \quad (\phi = 0.75 \quad F_u = 5200 \text{ kg/cm}^2) \\ &= 0.75 \times (2.4 \times 2.01 \times 2.80 \times 5200) \\ &= 52547.04 \text{ kg} \end{aligned}$$

**** Joint 33**



****Jumlah baut yang diperlukan pada simpul S1**

$$NS_1 = \frac{44029.84}{11490.79} = 3.83 \approx \text{dipasang} = 36 \text{ buah}$$

**** Jarak tepi baut**

Syarat jarak baut tepi ke plat :

$$1,5..d \text{ s/d } 3d$$

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{44029.843 / 36}{0.75 \times 5200 \times 5} = 0.06272 \text{ cm}$$

$$t \geq 0.06272 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\begin{aligned} \text{Jarak antar baut} &\geq \frac{Rn}{Fu.t} + \frac{Db}{2} \\ &\geq \frac{44029.843 / 36}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2} \\ &\geq 0.2 \text{ cm} \end{aligned}$$

**** Jarak antar baut**

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 9 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S2**

$$NS2 = \frac{300476.53}{11490.79} = 26.1 \approx \text{dipasang} = 36 \text{ buah}$$

**** Jarak tepi baut**

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{300476.53 / 36}{0.75 \times 5200 \times 5} = 0.42803 \text{ cm}$$

$$t \geq 0.42803 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\begin{aligned} \text{Jarak antar baut} &\geq \frac{Rn}{Fu.t} + \frac{Db}{2} \\ &\geq \frac{300476.53 / 36}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2} \\ &\geq 0.809 \text{ cm} \end{aligned}$$

**** Jarak antar baut**

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 13 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S3781**

$$NS = \frac{224444.33}{11490.79} = 19.5 \approx \text{dipasang} = 20 \text{ buah}$$

**** Jarak tepi baut**

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{224444.33 / 20}{0.75 \times 5200 \times 5} = 0.5755 \text{ cm}$$

$$t \geq 0.5755 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\begin{aligned} \text{Jarak antar baut} &\geq \frac{Rn}{Fu.t} + \frac{Db}{2} \\ &\geq \frac{224444.33 / 20}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2} \\ &\geq 1.054 \text{ cm} \end{aligned}$$

**** Jarak antar baut**

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\begin{aligned} \text{Jadi : } 3.d &= 3 \times 1.91 = 5.7 \\ 7.d &= 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 13 \text{ cm} \end{aligned}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\begin{aligned} \text{Jadi : } 3.d &= 3 \times 1.91 = 5.7 \\ 7.d &= 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 13 \text{ cm} \end{aligned}$$

* Kontrol Plat simpul

Luas plat

$$\text{Diameter lubang } \frac{3}{4} = 1.9 + 0.2 = 2.11 \text{ cm}$$

Luas penampang plat

- Luas pelat kotor :

$$\begin{aligned} A_g &= t \times b \\ &= 3 \times 167.19 \\ &= 501.57 \text{ cm}^2 \end{aligned}$$

- Luas bersih plat (A_n)

$$A_n = A_g - n \times d \times t$$

Dimana : t = tebal plat simpul 3 cm

A_g = Luas penampang (cm^2)

d = Diameter lubang (cm)

n = Banyak lubang dalam satu potongan

$$A_n = 501.57 - 4 \times 2.11 \times 3$$

$$A_n = 455.255 \text{ cm}^2$$

Cek kekuatan potongan I-I terhadap gaya tarik aksial yang bekerja

(salmon.G.Carles dan Johson.J.E, Hal : 40)

Mencari nilai Tn

$$\begin{aligned} S1 &= 44029.843 \times \sin 90^\circ = 44029.843 \text{ kg} \\ &= 44029.843 \times \cos 90^\circ = 0 \text{ kg} \\ S2 &= 300476.53 \times \sin 30^\circ = 150238.27 \text{ kg} \\ &= 300476.53 \times \cos 30^\circ = 260220.31 \text{ kg} \end{aligned}$$

Resultan (R)

$$\begin{aligned} R &= \sqrt{S1^2 + S2^2} \\ &= \sqrt{44029.843^2 + 300476.53^2} \\ &= 303685.32 \text{ kg} \end{aligned}$$

Menghitung kekuatan nominal plat :

$$\begin{aligned} \phi \times Tn &= \phi \times fy \times Ag = 0.9 \times 3600 \times 354 \\ &= 1146960 \text{ kg} \end{aligned}$$

$$\begin{aligned} \phi \times Tn &= \phi \times Fu \times Ag = 0.9 \times 5200 \times 307.685 \\ &= 1439965.8 \text{ kg} \end{aligned}$$

Dari nilai diatas diambil yang terkecil yaitu : 1146960 kg

(kekuatan terhadap leleh bahan plat), sehingga

$$\phi \times Tn \geq Tn$$

$$1146960 \geq 303685.318$$

Potongan II-II

Luas plat

$$\text{Diameter lubang } \frac{3}{4} = 1.91 + 0.2 = 2.11 \text{ cm}$$

Luas penampang plat

- Luas pelat kotor :

$$\begin{aligned} A_g &= t \times b \\ &= 3 \times 118 \\ &= 354 \text{ cm}^2 \end{aligned}$$

- Luas bersih plat (A_n)

$$A_n = A_g - n \times d \times t$$

Dimana : t = tebal plat simpul 3 cm

A_g = Luas penampang (cm^2)

d = Diameter lubang (cm)

n = Banyak lubang dalam satu potongan

$$A_n = 354 - 4 \times 2.11 \times 3$$

$$A_n = 307.685 \text{ cm}^2$$

Cek kekuatan potongan II-II terhadap gaya tarik aksial yang bekerja

(salmon.G.Carles dan Johson.J.E, Hal : 40)

Mencari nilai T_n

$$S_2 = 300476.53 \times \sin 74^\circ = 288836.58 \text{ kg}$$

$$= 300476.53 \times \cos 74^\circ = 288836.58 \text{ kg}$$

$$S_{3781} = 224444.33 \times \sin 74^\circ = 215749.74 \text{ kg}$$

$$= 224444.33 \times \cos 74^\circ = 61865.241 \text{ kg}$$

Resultan (R)

$$R = \sqrt{S_2^2 + S_{3781}^2}$$

$$= \sqrt{300476.53^2 + 224444.33^2}$$

$$= 375048.53 \text{ kg}$$

Menghitung kekuatan nominal plat :

$$\begin{aligned}\phi \times T_n &= \phi \times f_y \times A_g = 0.9 \times 3600 \times 354 \\ &= 1146960 \text{ kg}\end{aligned}$$

$$\begin{aligned}\phi \times T_n &= \phi \times F_u \times A_g = 0.9 \times 5200 \times 354 \\ &= 1656720 \text{ kg}\end{aligned}$$

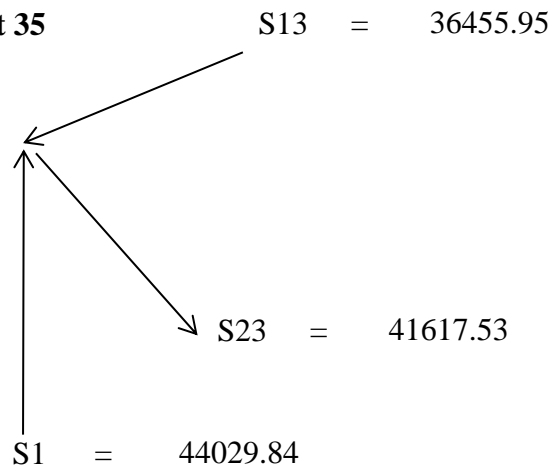
Dari nilai diatas diambil yang terkecil yaitu : 1146960 kg

(kekuatan terhadap leleh bahan plat), sehingga

$$\phi \times T_n \geq T_n$$

$$1146960 \geq 375048.532 \text{ kg}$$

**** Joint 35**



****Jumlah baut yang diperlukan pada simpul S1**

$$NS = \frac{44029.84}{11490.79} = 3.83 \approx \text{dipasang} = 28 \text{ buah}$$

**** Jarak tepi baut**

Syarat jarak baut tepi ke plat :

$$1,5..d \text{ s/d } 3d$$

$$\text{Jadi : } 1,5.d = 1,5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{44029.84 / 28}{0.75 \times 5200 \times 5} = 0.08064 \text{ cm}$$

$$t \geq 0.08064 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{44029.84 / 28}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 0.23 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 9 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S13**

$$NS = \frac{36455.95}{11490.79} = 3.17 \approx \text{dipasang} = 16 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{36455.95 / 16}{0.75 \times 5200 \times 5} = 0.11685 \text{ cm}$$

$$t \geq 0.11685 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$> \frac{36455.95 / 16}{0.75 \times 5200 \times 5} + \frac{0.19}{2}$$

$$\leq \frac{\quad}{0.75 \times 5200 \times 3.00} + \frac{\quad}{2}$$

$$\geq 0.29 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 13 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S23**

$$NS = \frac{41617.53}{11490.79} = 3.62 \approx \text{dipasang} = 12 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{41617.53 / 12}{0.75 \times 5200 \times 5} = 0.17785 \text{ cm}$$

$$t \geq 0.17785 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{41617.53 / 12}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 0.392 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{ diambil } L = 13 \text{ cm}$$

* Kontrol Plat simpul

Luas plat

$$\text{Diameter lubang } \frac{3}{4} = 1.9 + 0.2 = 2.11 \text{ cm}$$

Luas penampang plat

- Luas pelat kotor :

$$\begin{aligned} A_g &= t \times b \\ &= 3 \times 102.44 \\ &= 307.32 \text{ cm}^2 \end{aligned}$$

- Luas bersih plat (An)

$$A_n = A_g - n \times d \times t$$

Dimana : t = tebal plat simpul 3 cm

A_g = Luas penampang (cm³)

d = Diameter lubang (cm)

n = Banyak lubang dalam satu potongan

$$A_n = 307.32 - 4 \times 2.11 \times 3$$

$$A_n = 261.005 \text{ cm}^2$$

Cek kekuatan potongan I-I terhadap gaya tarik aksial yang bekerja

(salmon.G.Carles dan Johson.J.E, Hal : 40)

Mencari nilai Tn

$$\begin{aligned}
S1 &= 44029.84 \times \sin 72^\circ = 41874.866 \text{ kg} \\
&= 44029.84 \times \cos 72^\circ = 41874.866 \\
S23 &= 41617.53 \times \sin 71^\circ = 39350.148 \text{ kg} \\
&= 41617.53 \times \cos 71^\circ = 13549.342 \text{ kg}
\end{aligned}$$

Resultan (R)

$$\begin{aligned}
R &= \sqrt{S1^2 + S23^2} \\
&= \sqrt{44029.84^2 + 41617.53^2} \\
&= 60585.853 \text{ kg}
\end{aligned}$$

Menghitung kekuatan nominal plat :

$$\begin{aligned}
\phi \times T_n &= \phi \times f_y \times A_g = 0.9 \times 3600 \times 307.32 \\
&= 995716.8 \text{ kg}
\end{aligned}$$

$$\begin{aligned}
\phi \times T_n &= \phi \times F_u \times A_g = 0.9 \times 5200 \times 261.005 \\
&= 1221503.4 \text{ kg}
\end{aligned}$$

Dari nilai diatas diambil yang terkecil yaitu : 995716.8 kg

(kekuatan terhadap leleh bahan plat), sehingga

$$\phi \times T_n \geq T_n$$

$$995716.8 \geq 60585.8532$$

Potongan II-II

Luas plat

$$\text{Diameter lubang } \frac{3}{4} = 1.91 + 0.2 = 2.11 \text{ cm}$$

Luas penampang plat

- Luas pelat kotor :

$$A_g = t \times b$$

$$= 3 \times 140.21$$

$$= 420.63 \text{ cm}^2$$

- Luas bersih plat (A_n)

$$A_n = A_g - n \times d \times t$$

Dimana : t = tebal plat simpul 3 cm

A_g = Luas penampang (cm^2)

d = Diameter lubang (cm)

n = Banyak lubang dalam satu potongan

$$A_n = 420.63 - 4 \times 2.11 \times 3$$

$$A_n = 374.315 \text{ cm}^2$$

Cek kekuatan potongan II-II terhadap gaya tarik aksial yang bekerja

(salmon.G.Carles dan Johson.J.E, Hal : 40)

Mencari nilai T_n

$$S_{23} = 41617.53 \times \sin 47^\circ = 30437.135 \text{ kg}$$

$$= 41617.53 \times \cos 47^\circ = 30437.135 \text{ kg}$$

$$S_{13} = 36455.95 \times \sin 65^\circ = 33040.311 \text{ kg}$$

$$= 36455.95 \times \cos 65^\circ = 15406.95 \text{ kg}$$

Resultan (R)

$$R = \sqrt{S_{23}^2 + S_{12}^2}$$

$$= \sqrt{41617.53^2 + 36455.95^2}$$

$$= 55326.803 \text{ kg}$$

Menghitung kekuatan nominal plat :

$$\phi \times T_n = \phi \times f_y \times A_g = 0.9 \times 3600 \times 420.63$$

$$= 1362841.2 \text{ kg}$$

$$\phi \times T_n = \phi \times F_u \times A_g = 0.9 \times 5200 \times 374.315$$

$$= 1751794.2 \text{ kg}$$

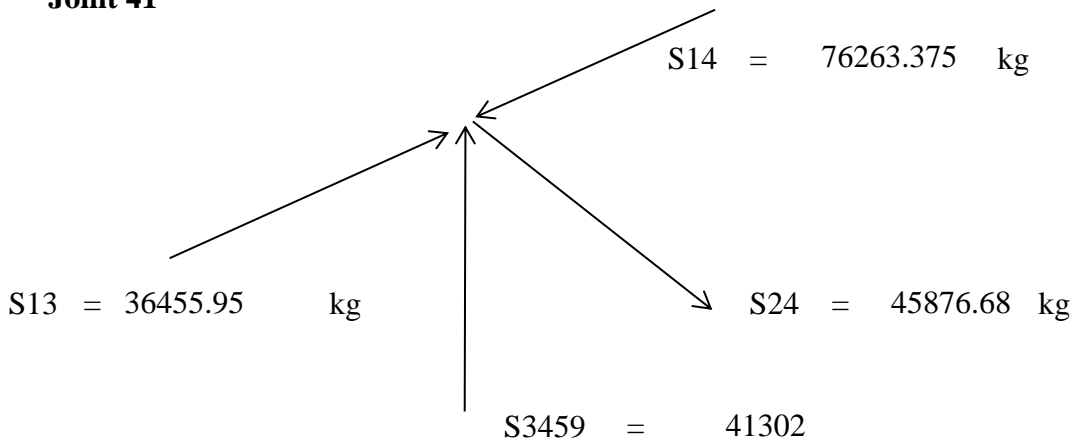
Dari nilai diatas diambil yang terkecil yaitu : 1362841.2 kg

(kekuatan terhadap leleh bahan plat), sehingga

$$\phi \times T_n \geq T_n$$

$$1362841.2 \geq 55326.8027 \text{ kg}$$

**** Joint 41**



****Jumlah baut yang diperlukan pada simpul S13**

$$NS = \frac{36455.95}{11490.79} = 3.17 \approx \text{dipasang} = 20 \text{ buah}$$

**** Jarak tepi baut**

Syarat jarak baut tepi ke plat :

$$1,5..d \text{ s/d } 3d$$

$$\text{Jadi : } 1,5.d = 1,5 \times 1,91 = 2,9$$

$$3,d = 3 \times 1,91 = 5,7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{36455.95 / 20}{0.75 \times 5200 \times 5} = 0.09348 \text{ cm}$$

$$t \geq 0.09348 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{36455.95 / 20}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 0.251 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 9 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S14**

$$NS = \frac{76263.38}{11490.79} = 6.64 \approx \text{dipasang} = 20 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{76263.375 / 20}{0.75 \times 5200 \times 5} = 0.19555 \text{ cm}$$

$$t \geq 0.19555 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{76263.375 / 20}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 0.421 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 13 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S24**

$$NS = \frac{86450.70}{11490.79} = 7.52 \approx \text{dipasang} = 8 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{86450.703 / 8}{0.75 \times 5200 \times 5} = 0.55417 \text{ cm}$$

$$t \geq 0.55417 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{86450.703 / 8}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 1.019 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 13 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S3459**

$$NS = \frac{41302.47}{76263.38} = 0.54 \approx \text{dipasang} = 8 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{41302.47 / 8}{0.75 \times 5200 \times 5} = 0.26476 \text{ cm}$$

$$t \geq 0.26476 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{41302.47 / 8}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 0.537 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 13 \text{ cm}$$

* Kontrol Plat simpul

Luas plat

$$\text{Diameter lubang } \frac{3}{4} = 1.9 + 0.2 = 2.11 \text{ cm}$$

Luas penampang plat

- Luas pelat kotor :

$$\begin{aligned} A_g &= t \times b \\ &= 3 \times 116.1 \\ &= 348.3 \text{ cm}^2 \end{aligned}$$

- Luas bersih plat (An)

$$A_n = A_g - n \times d \times t$$

Dimana : t = tebal plat simpul 3 cm

A_g = Luas penampang (cm³)

d = Diameter lubang (cm)

n = Banyak lubang dalam satu potongan

$$A_n = 348.3 - 4 \times 2.11 \times 3$$

$$A_n = 301.985 \text{ cm}^2$$

Cek kekuatan potongan I-I terhadap gaya tarik aksial yang bekerja

(salmon.G.Carles dan Johson.J.E, Hal : 40)

Mencari nilai Tn

$$\begin{aligned} S_{13} &= 36455.95 \times \sin 29^\circ = 17674.195 \text{ kg} \\ &= 36455.95 \times \cos 29^\circ = 17674.195 \\ S_{3459} &= 41302.47 / \times \sin 42^\circ = 27636.747 \text{ kg} \\ &= 41302.47 \times \cos 42^\circ = 30693.717 \text{ kg} \end{aligned}$$

Resultan (R)

$$\begin{aligned} R &= \sqrt{S_{13}^2 + S_{3459}^2} \\ &= \sqrt{36455.95^2 + 41302.47^2} \\ &= 55090.202 \text{ kg} \end{aligned}$$

Menghitung kekuatan nominal plat :

$$\begin{aligned} \phi \times T_n &= \phi \times f_y \times A_g = 0.9 \times 3600 \times 348.3 \\ &= 1128492 \text{ kg} \end{aligned}$$

$$\begin{aligned} \phi \times T_n &= \phi \times F_u \times A_g = 0.9 \times 5200 \times 301.985 \\ &= 1413289.8 \text{ kg} \end{aligned}$$

Dari nilai diatas diambil yang terkecil yaitu : 1128492 kg

(kekuatan terhadap leleh bahan plat), sehingga

$$\phi \times T_n \geq T_n$$

$$1128492 \geq 55090.2017$$

Potongan II-II

Luas plat

$$\text{Diameter lubang } \frac{3}{4} = 1.91 + 0.2 = 2.11 \text{ cm}$$

Luas penampang plat

- Luas pelat kotor :

$$\begin{aligned} A_g &= t \times b \\ &= 3 \times 111.26 \\ &= 333.78 \text{ cm}^2 \end{aligned}$$

- Luas bersih plat (A_n)

$$A_n = A_g - n \times d \times t$$

Dimana : t = tebal plat simpul 3 cm

A_g = Luas penampang (cm^3)

d = Diameter lubang (cm)

n = Banyak lubang dalam satu potongan

$$A_n = 333.78 - 4 \times 2.11 \times 3$$

$$A_n = 287.465 \text{ cm}^2$$

Cek kekuatan potongan II-II terhadap gaya tarik aksial yang bekerja

(salmon.G.Carles dan Johson.J.E, Hal : 40)

Mencari nilai T_n

$$S_{14} = 76263.375 \times \sin 25^\circ = 32230.295 \text{ kg}$$

$$= 76263.375 \times \cos 25^\circ = 32230.295 \text{ kg}$$

$$S_{24} = 45876.68 \times \sin 40^\circ = 29488.961 \text{ kg}$$

$$= 45876.68 \times \cos 40^\circ = 35143.576 \text{ kg}$$

Resultan (R)

$$R = \sqrt{S_{14}^2 + S_{24}^2}$$

$$= \sqrt{76263.375^2 + 45876.68^2}$$

$$= 88998.72 \text{ kg}$$

Menghitung kekuatan nominal plat :

$$\begin{aligned}\phi \times T_n &= \phi \times f_y \times A_g = 0.9 \times 3600 \times 333.78 \\ &= 1081447.2 \text{ kg}\end{aligned}$$

$$\begin{aligned}\phi \times T_n &= \phi \times F_u \times A_g = 0.9 \times 5200 \times 287.465 \\ &= 1345336.2 \text{ kg}\end{aligned}$$

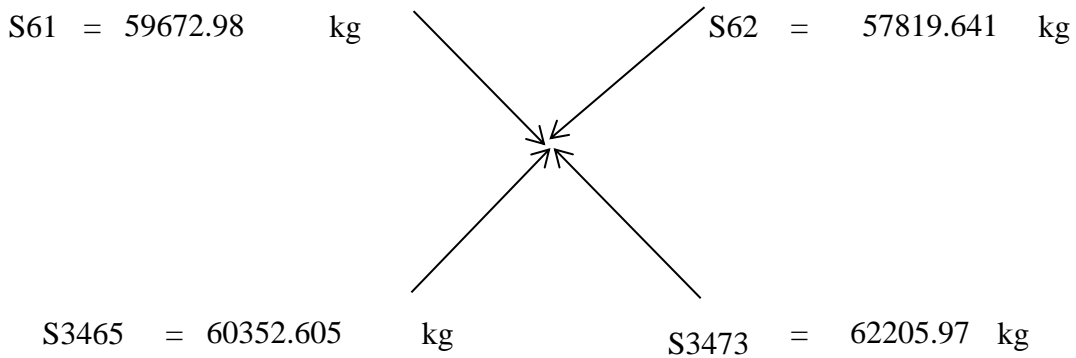
Dari nilai diatas diambil yang terkecil yaitu : 1081447.2 kg

(kekuatan terhadap leleh bahan plat), sehingga

$$\phi \times T_n \geq T_n$$

$$1081447.2 \geq 88998.7198 \text{ kg}$$

**** Joint 1392**



****Jumlah baut yang diperlukan pada simpul S61**

$$NS = \frac{59672.98}{11490.79} = 5.19 \approx \text{dipasang} = 8 \text{ buah}$$

**** Jarak tepi baut**

Syarat jarak baut tepi ke plat :

$$1,5..d \text{ s/d } 3d$$

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \text{ diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{59672.98 / 8}{0.75 \times 5200 \times 5} = 0.38252 \text{ cm}$$

$$t \geq 0.38252 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{59672.98 / 8}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 0.733 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 9 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S3465**

$$NS2 = \frac{57819.64}{11490.79} = 5.03 \approx \text{dipasang} = 8 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{57819.641 / 8}{0.75 \times 5200 \times 5} = 0.37064 \text{ cm}$$

$$t \geq 0.37064 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{57819.641 / 8}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 0.713 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 13 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S62**

$$NS = \frac{86450.70}{11490.79} = 7.52 \approx \text{dipasang} = 8 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{86450.703 / 8}{0.75 \times 5200 \times 5} = 0.55417 \text{ cm}$$

$$t \geq 0.55417 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{86450.703 / 8}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 1.019 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \dots\dots\dots \text{diambil } L = 13 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S1392**

$$NS = \frac{60352.61}{57819.64} = 1.04 \approx \text{dipasang} = 8 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.91 = 2.9$$

$$3,d = 3 \times 1.91 = 5.7 \dots\dots\dots \text{diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{60352.605 / 8}{0.75 \times 5200 \times 5} = 0.38688 \text{ cm}$$

$$t \geq 0.38688 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{60352.605 / 8}{0.75 \times 5200 \times 3.00} + \frac{0.19}{2}$$

$$\geq 0.74 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.91 = 5.7$$

$$7.d = 7 \times 1.91 = 13.3 \text{ diambil } L = 13 \text{ cm}$$

* Kontrol Plat simpul

Luas plat

$$\text{Diameter lubang } \frac{3}{4} = 1.9 + 0.2 = 2.11 \text{ cm}$$

Luas penampang plat

- Luas pelat kotor :

$$\begin{aligned} A_g &= t \times b \\ &= 3 \times 116.1 \\ &= 348.3 \text{ cm}^2 \end{aligned}$$

- Luas bersih plat (A_n)

$$A_n = A_g - n \times d \times t$$

Dimana : t = tebal plat simpul 3 cm

A_g = Luas penampang (cm^2)

d = Diameter lubang (cm)

n = Banyak lubang dalam satu potongan

$$A_n = 348.3 - 4 \times 2.11 \times 3$$

$$A_n = 301.985 \text{ cm}^2$$

Cek kekuatan potongan I-I terhadap gaya tarik aksial yang bekerja

(salmon.G.Carles dan Johson.J.E, Hal : 40)

Mencari nilai Tn

$$S_{61} = 59672.98 \times \sin 37^\circ = 35912.096 \text{ kg}$$

$$= 59672.98 \times \cos 37^\circ = 35912.096$$

$$S_{3465} = 60352.61 / \sin 37^\circ = 36321.104 \text{ kg}$$

$$= 60352.605 \times \cos 37^\circ = 48199.733 \text{ kg}$$

Resultan (R)

$$R = \sqrt{S_{13}^2 + S_{3459}^2}$$

$$= \sqrt{59672.98^2 + 60352.605^2}$$

$$= 84872.266 \text{ kg}$$

Menghitung kekuatan nominal plat :

$$\phi \times T_n = \phi \times f_y \times A_g = 0.9 \times 3600 \times 348.3$$

$$= 1128492 \text{ kg}$$

$$\phi \times T_n = \phi \times F_u \times A_g = 0.9 \times 5200 \times 301.985$$

$$= 1413289.8 \text{ kg}$$

Dari nilai diatas diambil yang terkecil yaitu : 1128492 kg

(kekuatan terhadap leleh bahan plat), sehingga

$$\phi \times T_n \geq T_n$$

$$1128492 \geq 84872.2656$$

3.11.4 Perhitungan Sambungan Ikatan Angin

Sambungan pada ikatan angin menggunakan baut mutu tinggi A 325 dengan data sebagai berikut :

- Kekuatan bahan tarik (F_u^b) = 120 Ksi = 8274 kg/cm²
- Kekuatan geser = 35.1 Ksi = 2420.145 kg/cm²
- Diameter baut ϕ 1/2" = 1.27 cm
- Diameter lubang baut = 1.27 + 0.2 = 14.7 cm
- Luas baut (A_b) = $1/4 \cdot \pi \cdot 1,27^2$ = 1.26613 cm²

* Kekuatan geser desain :

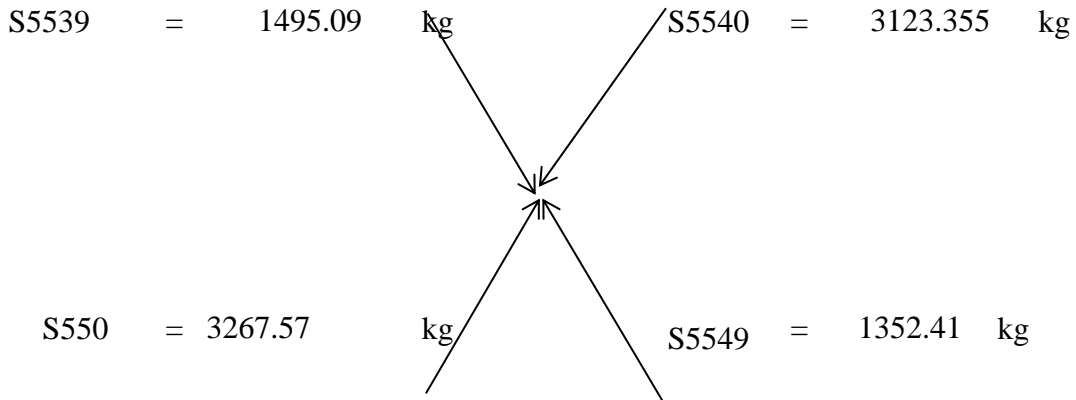
Banyaknya bidang geser yang terlibat adalah 1 karena merupakan sambungan irisan tunggal, sehingga $m = 1$

$$\begin{aligned}\phi R_n &= \phi \times (0.75 \times F_u^b) \times m \times A_b \\ &= 0.65 \times (0.75 \times 8274) \times 1 \times 1.266 \\ &= 5107.02 \text{ kg}\end{aligned}$$

* Kekuatan tumpu desain

$$\begin{aligned}\phi R_n &= \phi \cdot (2.4 \cdot d \cdot t \cdot F_u) \quad (\phi = 0.75 \quad F_u = 5200 \text{ kg/cm}^2) \\ &= 0.75 \times (2.4 \times 1.27 \times 3.00 \times 5200) \\ &= 35661.60 \text{ kg}\end{aligned}$$

**** Joint 2430**



****Jumlah baut yang diperlukan pada simpul S5539**

$$NS = \frac{1495.09}{5107.02} = 0.29 \approx \text{dipasang} = 4 \text{ buah}$$

**** Jarak tepi baut**

Syarat jarak baut tepi ke plat :

$$1,5..d \text{ s/d } 3d$$

$$\text{Jadi : } 1,5.d = 1.5 \times 1.27 = 1.9$$

$$3,d = 3 \times 1.27 = 3.8 \dots\dots\dots \text{diambil } L = 3 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{1495.09 / 4}{0.75 \times 5200 \times 3} = 0.03195 \text{ cm}$$

$$t \geq 0.03195 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{1495.09 / 4}{0.75 \times 5200 \times 3.00} + \frac{0.13}{2}$$

$$\geq 0.095 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.27 = 3.8$$

$$7.d = 7 \times 1.27 = 8.9 \dots\dots\dots \text{diambil } L = 6 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S5550**

$$NS2 = \frac{3267.57}{5107.02} = 0.64 \approx \text{dipasang} = 4 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.27 = 1.9$$

$$3,d = 3 \times 1.27 = 3.8 \dots\dots\dots \text{diambil } L = 3 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{3267.57 / 4}{0.75 \times 5200 \times 3} = 0.06982 \text{ cm}$$

$$t \geq 0.06982 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{3267.57 / 4}{0.75 \times 5200 \times 3.00} + \frac{0.13}{2}$$

$$\geq 0.133 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.27 = 3.8$$

$$7.d = 7 \times 1.27 = 8.9 \text{ diambil } L = 6 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S5540**

$$NS = \frac{3123.36}{5107.02} = 0.61 \approx \text{dipasang} = 4 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.27 = 1.9$$

$$3,d = 3 \times 1.27 = 3.8 \text{ diambil } L = 3 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{3123.355 / 4}{0.75 \times 5200 \times 3} = 0.06674 \text{ cm}$$

$$t \geq 0.06674 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{3123.355 / 4}{0.75 \times 5200 \times 3.00} + \frac{0.13}{2}$$

$$\geq 0.13 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.27 = 3.8$$

$$7.d = 7 \times 1.27 = 8.9 \text{ diambil } L = 6 \text{ cm}$$

****Jumlah baut yang diperlukan pada simpul S5549**

$$NS = \frac{1352.41}{3267.57} = 0.41 \approx \text{dipasang} = 4 \text{ buah}$$

** Jarak tepi baut

Syarat jarak baut tepi ke plat :

1,5..d s/d 3d

$$\text{Jadi : } 1,5.d = 1.5 \times 1.27 = 1.9$$

$$3,d = 3 \times 1.27 = 3.8 \text{ diambil } L = 5 \text{ cm}$$

Ketebalan plat yang diperlukan adalah :

$$t = \frac{P}{\phi.Fu.L} = \frac{1352.41 / 4}{0.75 \times 5200 \times 5} = 0.01734 \text{ cm}$$

$$t \geq 0.01734 \text{ cm}$$

Dalam perencanaan digunakan plat dengan ketebalan = 3 cm

$$\text{Jarak antar baut} \geq \frac{Rn}{Fu.t} + \frac{Db}{2}$$

$$\geq \frac{1352.41 / 4}{0.75 \times 5200 \times 3.00} + \frac{0.13}{2}$$

$$\geq 0.092 \text{ cm}$$

** Jarak antar baut

Syarat jarak baut tepi ke plat :

3.d s/d 7.d

$$\text{Jadi : } 3.d = 3 \times 1.27 = 3.8$$

$$7.d = 7 \times 1.27 = 8.9 \text{ diambil } L = 6 \text{ cm}$$

* Kontrol Plat simpul

Luas plat

$$\text{Diameter lubang } 1/2 = 1.27 + 0.2 = 1.47 \text{ cm}$$

Luas penampang plat

- Luas pelat kotor :

$$\begin{aligned} A_g &= t \times b \\ &= 3 \times 47.42 \\ &= 142.26 \text{ cm}^2 \end{aligned}$$

- Luas bersih plat (A_n)

$$A_n = A_g - n \times d \times t$$

Dimana : t = tebal plat simpul 3 cm

A_g = Luas penampang (cm^2)

d = Diameter lubang (cm)

n = Banyak lubang dalam satu potongan

$$A_n = 142.26 - 2 \times 1.47 \times 3$$

$$A_n = 117.85 \text{ cm}^2$$

Cek kekuatan potongan I-I terhadap gaya tarik aksial yang bekerja

(salmon.G.Carles dan Johson.J.E, Hal : 40)

Mencari nilai Tn

$$S5320 = 1495.09 \times \sin 24^\circ = 608.10789 \text{ kg}$$

$$= 1495.09 \times \cos 24^\circ = 608.10789$$

$$S5334 = 3123.355 \times \sin 24^\circ = 1270.3829 \text{ kg}$$

$$= 3123.355 \times \cos 24^\circ = 2853.3268 \text{ kg}$$

Resultan (R)

$$R = \sqrt{S5320^2 + S5334^2}$$

$$= \sqrt{1495.09^2 + 3123.355^2}$$

$$= 3462.7504 \text{ kg}$$

Menghitung kekuatan nominal plat :

$$\phi \times T_n = \phi \times f_y \times A_g = 0.9 \times 3600 \times 142.26$$

$$= 460922.4 \text{ kg}$$

$$\phi \times T_n = \phi \times F_u \times A_g = 0.9 \times 5200 \times 117.85$$

$$= 551538 \text{ kg}$$

Dari nilai diatas diambil yang terkecil yaitu : 460922.4 kg

(kekuatan terhadap leleh bahan plat), sehingga

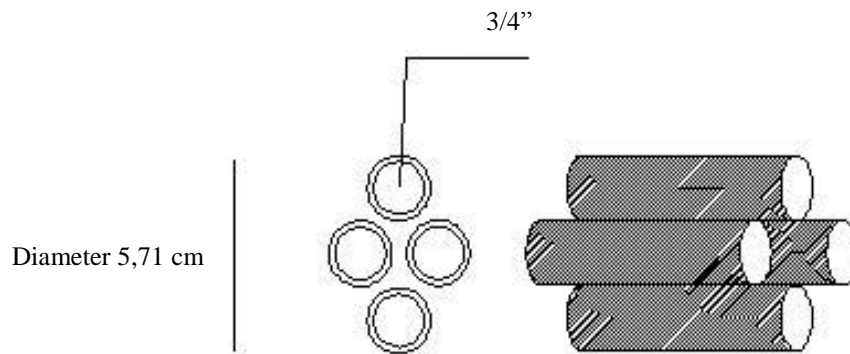
$$\phi \times T_n \geq T_n$$

$$460922.4 \geq 3462.75043$$

3.12 Perhitungan Dimensi Penampang Kabel

Data dimensi kabel yang digunakan (lihat *Cabel Roof Structur hal : 58*).

Direncanakan menggunakan cabel sebagai berikut :



$$\text{Diameter} = 3/4'' \cdot 3 \text{ lapis} = 5,71 \text{ cm} = 0,057 \text{ m}$$

$$\text{Berat} = 1,18 \text{ lb/ft} = 1,756 \text{ kg/m}$$

$$= 1,756 \text{ kg/m} \times 4 \text{ strand}$$

$$= 7,024 \text{ kg/m}$$

$$\text{Breaking Strength} = 31 \text{ Ton} = 34000 \text{ Kg}$$

$$= 34000 \times 4 \text{ strand}$$

$$= 81600 \text{ Kg}$$

Akibat rongga – rongga pada saat menyatukan kabel maka breaking strength total mengalami penurunan sebesar 20% menjadi

$$= 81600 - (20\% \times 81600)$$

$$= 65280 \text{ Kg}$$

$$\text{Modulus elastisitas (E)} = 24000000 \text{ Psi (untuk } 1/2'' \text{ to } 2 \ 9/6'')$$

$$= 16548000000 \text{ Kg/m}^2$$

Dari output Staad Pro diperoleh gaya axial cabel hanger (batang 85)

$$P_u = 52772,91 \text{ Kg.}$$

Kontrol tension kabel :

$$T_{\max} \leq \text{Breaking Strength}$$

$$(\text{Axial Kabel} + \text{Berat Kabel}) \leq \text{Breaking Strength}$$

$$52772,91 \text{ Kg} \leq 65280 \text{ Kg} \dots\dots\dots (\text{aman})$$

3.13 Sambungan Pada Kabel

3.13.1 Sambungan Antara Socket Dengan Gelagar Induk

- Kekuatan baut A 325 :

- kekuatan bahan tarik (F_u^b) = 120 ksi = 827,371 MPa

- diameter baut $\varnothing 3/4''$ = 1,905 cm

- diameter lubang baut = 1,905 + 0,2 = 2,105 cm

- luas baut (A_b) = 3,478 cm²

- Kekuatan tarik desain :

$$\begin{aligned} \phi R_n &= \phi \cdot (0,75 \cdot F_u^b) \cdot A_b \\ &= 0,75 \cdot (0,75 \cdot 827,371) \cdot 3,478 \\ &= 161864,79 \text{ kg} \end{aligned}$$

- Kekuatan geser desain :

Banyaknya bidang geser yang terlibat adalah 1 karena merupakan sambungan

iris tunggal, sehingga $m = 1$

$$\begin{aligned} \phi R_n &= \phi \cdot (0,60 \cdot F_u^b) \cdot m \cdot A_b \\ &= 0,65 \cdot (0,60 \cdot 827,371) \cdot 1 \cdot 3,478 \\ &= 11222,626 \text{ kg/baut} \end{aligned}$$

- Kekuatan tumpu desain :

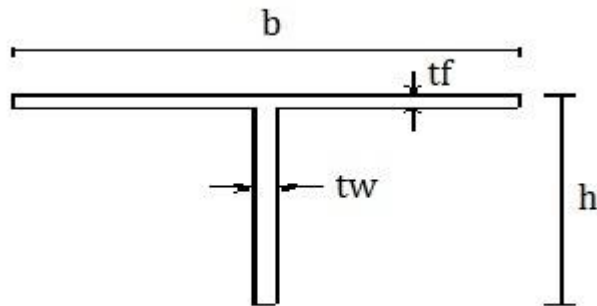
Perhitungan kekuatan tumpu desain pada perumusannya mempertimbangkan ketebalan plat yang akan disambung. Dalam hal ini ketebalan plat yang diperhitungkan adalah ketebalan badan gelagar pengaku yaitu 2,1 cm.

$$\begin{aligned}\phi R_n &= \phi \cdot (2,4 \cdot d \cdot t \cdot F_u) \\ &= 0,75 \cdot (2,4 \cdot 19,05 \cdot 2,1 \cdot 5200) \\ &= 37444,68 \text{ kg}\end{aligned}$$

Diambil ϕR_n yang terkecil untuk menghitung jumlah baut yaitu ϕR_n penyambung geser = 11222,626 kg.

- Menentukan jumlah baut

Sambungan direncanakan menggunakan profil Tees ST 350 x 250 dengan data sebagai berikut :



$$b = 250 \text{ mm}$$

$$h = 170 \text{ mm}$$

$$tw = 9 \text{ mm}$$

$$tf = 14 \text{ mm}$$

$$n = \frac{Pu}{\phi \cdot R_n}$$

dimana:

n = jumlah baut

Pu = gaya aksial yang bekerja (kg) = 31400 kg (batang 370)

Ø. Rn = factor kekuatan yang menentukan (kg)

$$n = \frac{52772,91}{11222,626}$$

$$= 4,702 \sim 16 \text{ baut}$$

- Menentukan jarak minimum baut

a. Jarak baut ke tepi plat

$$1,5 d - 3d = 1,5 \cdot 1,905 - 3 \cdot 1,905$$

$$= 2,86 \text{ cm} - 5,72 \text{ cm}$$

diambil jarak baut ke tepi plat = 5 cm

b. Jarak antar baut

$$3 d - 7d = 2,5 \cdot 1,905 - 7 \cdot 1,905$$

$$= 5,72 \text{ cm} - 13,34 \text{ cm}$$

diambil jarak antar baut 8 cm

- Perhitungan aksial unkit

T = Gaya tarik terfaktor yang bekerja per baut

$$T = 52772,91/16$$

$$= 3298,307 \text{ kg}$$

$$2T = 2 \times 3298,307$$

$$= 6596,614 \text{ kg}$$

$$b = \frac{g}{2} - \frac{tw}{2} = \frac{10,26}{2} - \frac{0,9}{2} = 4,68 \text{ cm}$$

Nb : Estimasi ukuran g umum sebagai 4 inci (4 .2,54 = 10,26 cm)

a = jarak baut ke tepi plat = 3 cm

$$\delta = \frac{(w-d)}{w}$$

dimana : w = panjang penampang T

d = diameter baut

$$\delta = \frac{(250-19,05)}{250} = 0,924$$

$$\beta = \left(\frac{B}{T} - 1\right) \frac{a'}{b'}$$

$$a' = a + \frac{d}{2} = 30 + \frac{19,05}{2} = 39,53mm$$

$$a' = b + \frac{d}{2} = 46,8 + \frac{19,05}{2} = 37,29mm$$

$$\beta = \left(\frac{161846,479}{6596,614} - 1\right) \frac{29,53}{37,29} = 5,956$$

$$\beta = 5,956 \geq 1, \text{ digunakan } \alpha = 1$$

- Menghitung Prying Force

$$Q = T \left(\frac{\alpha \delta}{1 + \alpha \delta} \right) \left(\frac{b}{a} \right)$$
$$= 2445,159 \left(\frac{1,0,924}{1 + 1,0,924} \right) \left(\frac{4,68}{3} \right)$$

$$= 1832,336 \text{ kg}$$

$$M1 = \frac{Qa}{\alpha \delta} = \frac{183,336}{1,0,924} = 5949,145 \text{ kg.cm}$$

$$M2 = \alpha \cdot \delta \cdot M1 = 1 \cdot 0,924 \cdot 5949,154 = 5497,001 \text{ kg.cm}$$

- Syarat desain untuk tebal flens

$$t_f \geq \sqrt{\frac{4Tb}{\phi_b w F_y (1 + \alpha \delta)}}$$

$$1,4 \text{ cm} \geq 0,250 \text{ cm} \dots\dots\dots \text{Ok}$$

- Dua syarat desain yang harus dipenuhi :

1. Kontrol kekuatan momen flans penampang T

$$\phi M_n \geq M_1$$

$$\phi \frac{w t_f^2}{4} F_y \geq 15505,534 \text{ kg.cm}$$

$$0,9 \cdot \frac{25 \cdot 1,4^2}{4} 3600 \geq 5949,145 \text{ kg.cm}$$

$$9690 \text{ kg.cm} \geq 5949,145 \text{ kg.cm} \dots\dots\dots \text{Ok}$$

2. Kontrol kekuatan Tarik baut

$$\phi R_n \geq B$$

Dimana, B adalah gaya beban terfaktor pada satu baut

$$\begin{aligned} B &= T \left[1 + \left(\frac{\alpha \delta}{1 + \alpha \delta} \right) \left(\frac{b}{a} \right) \right] \\ &= 2445,759 \left[1 + \left(\frac{1,0,924}{1 + 1,0,924} \right) \left(\frac{4,68}{3} \right) \right] \\ &= 4278,095 \text{ kg} \end{aligned}$$

$$\phi R_n \geq B$$

$$16186,479 \text{ kg} \geq 4278,095 \text{ kg} \dots\dots\dots \text{Ok}$$

3.14 Perencanaan perletakan

A. Perletakan Sendi

1. Tebal Bantalan (S_1)

Direncanakan :

$$\begin{aligned}l &= L + 40 \\ &= 60 + 40 \\ &= 100 \text{ cm}\end{aligned}$$

$$b = 50 \text{ cm}$$

$$P_u = 406043,31 \text{ kg}$$

$$F_y = 3600 \text{ kg/cm}^2 \text{ (Mutu Baja Bj 52, Buku Nova Hal. 211)}$$

$$S_1 = \frac{1}{2} x \sqrt{\frac{3 \cdot P_u \cdot l}{b \cdot \phi \cdot f_y}} \quad \text{(Struyk H.,J,Ir., van der Veen K.H.C.W,$$

Ir. Prof., hal 249)

$$= \frac{1}{2} x \sqrt{\frac{3 \cdot 406043,31 \cdot 100}{50 \cdot 0,90 \cdot 3600}}$$

$$= 13,71 \approx 14 \text{ cm}$$

2. Tebal Bantalan (S_2)

$$M_u = \frac{1}{8} \cdot P_u \cdot l$$

$$= \frac{1}{8} \cdot 406043,31 \cdot 100$$

$$= 5075541,375 \text{ kg cm}$$

$$W = \frac{M_u}{\phi \cdot f_y}$$

$$= \frac{5075541,375}{0,9 \cdot 3600}$$

$$= 1566,53 \text{ cm}^3$$

Untuk harga S_2 , S_3 , S_4 , dipakai tabel Muller Breslaw :

Tabel Muller Breslaw

$\frac{h}{S_2}$	$\frac{h}{a \cdot S_3}$	W
3	4	$0,2222 \cdot a \cdot h^2 \cdot S_3$
4	4,2	$0,2251 \cdot a \cdot h^2 \cdot S_3$
5	4,6	$0,2286 \cdot a \cdot h^2 \cdot S_3$
6	5	$0,2315 \cdot a \cdot h^2 \cdot S_3$

Sumber : H.J. Struyk, K.H.C.w. Van Der Veen, Soemargono, Jembatan : 249

$$\text{Diambil } \frac{h}{S_2} = 4; \frac{b}{a \cdot S_2} = 4,2$$

Dipakai jumlah rusuk (a) = 4 buah

$$\frac{h}{S_2} = 4$$

$$\frac{h}{a \cdot S_3} = 4,2$$

$$S_3 = \frac{b}{4,2 \cdot a} = \frac{50}{4,2 \cdot 4} = 2,976 \text{ cm} = 3 \text{ cm}$$

Mencari nilai h dipakai rumus :

$$W = 0,2251 \cdot a \cdot h^2 \cdot S_3$$

$$= 0,2251 \cdot 4 \cdot h^2 \cdot 3$$

$$W = 0,2701 \cdot h^2$$

$$1566,53 \text{ cm}^3 = 0,2701 \cdot h^2$$

$$h^2 = \frac{1566,53}{0,2701} = 579,98$$

$$h = \sqrt{579,98} = 24,08 \approx 24,5 \text{ cm}$$

Maka :

$$\frac{h}{S_2} = 4 \rightarrow S_2 = \frac{25}{4} = 6,25 \sim 6,5 \text{ cm}$$

$$S_4 = \frac{h}{6} = \frac{25}{6} = 4,17 \sim 5 \text{ cm}$$

$$S_5 = \frac{h}{9} = \frac{25}{9} = 2,78 \approx 3 \text{ cm}$$

3. Garis Tengah Sumbu Sendi

$$\frac{1}{2} d_1 = \frac{0,8.P}{\phi.fy.L} \quad (\text{Struyk H., J, Ir., van der Veen K. H. C. W,}$$

Ir. Prof., hal 250)

$$= \frac{0,8.406043,31}{0,90.3600.100}$$

$$\frac{1}{2} d_1 = 1,003 \text{ cm}$$

$$d_1 = 0,501 \text{ cm} \approx 1 \text{ cm}$$

untuk d_1 minimum diambil 7 cm

$$d_3 = \frac{1}{4} x d_1$$

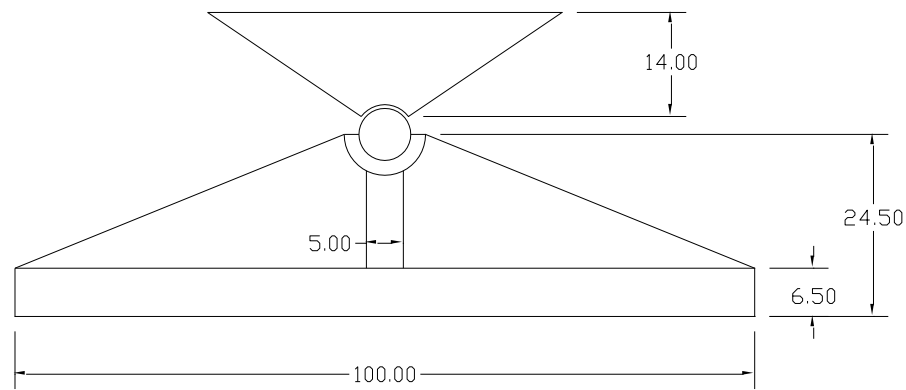
$$= \frac{1}{4} x 7$$

$$= 1,75 \approx 2 \text{ cm}$$

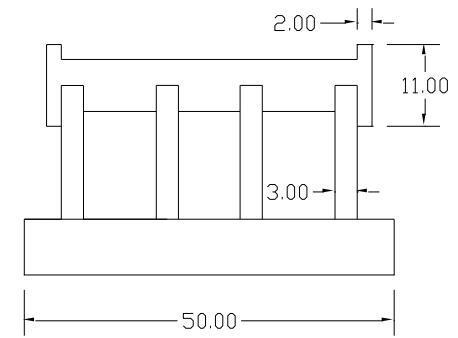
$$d_2 = d_1 + (2 \times d_3)$$

$$= 7 + (2 \times 2)$$

$$= 11 \text{ cm}$$



Penumpuan Engsel



Kursi Dari Penumpuan Engsel

PERLETAKAN SENDI

B. Perletakan Rol

- Panjang empiris dihitung dengan rumus :

$$\begin{aligned}l &= L + 40 \\ &= 60 + 40 \\ &= 100 \text{ cm}\end{aligned}$$

$$b = 50 \text{ cm}$$

$$P_u = 406001,09 \text{ kg}$$

- Tebal bantalan :

$$S_1 = \frac{1}{2} \sqrt{\frac{3 \cdot P_u \cdot \ell}{b \cdot \phi \cdot f_y}} \quad (\text{Struyk H.,J.,Ir., van der Veen K.H.C.W, Ir.}$$

Prof., hal 250)

$$= \frac{1}{2} \sqrt{\frac{3 \cdot 406001,09 \cdot 100}{50 \cdot 0,90 \cdot 3600}}$$

$$= 13,71 \approx 14 \text{ cm}$$

- Diameter rol :

$$d_4 = 0,75 \cdot 10^6 \cdot \frac{P}{l \cdot (\phi \cdot f_u)^2} \quad (\text{Struyk H.,J.,Ir., van der Veen K.H.C.W, Ir.}$$

Prof., hal 250)

$$f_u = 8500 \text{ kg/cm}^2 \text{ tegangan putus untuk A529}$$

$$d_4 = 0,75 \cdot 10^6 \cdot \frac{406001,09}{100 \cdot (0,9 \cdot 8500)^2}$$

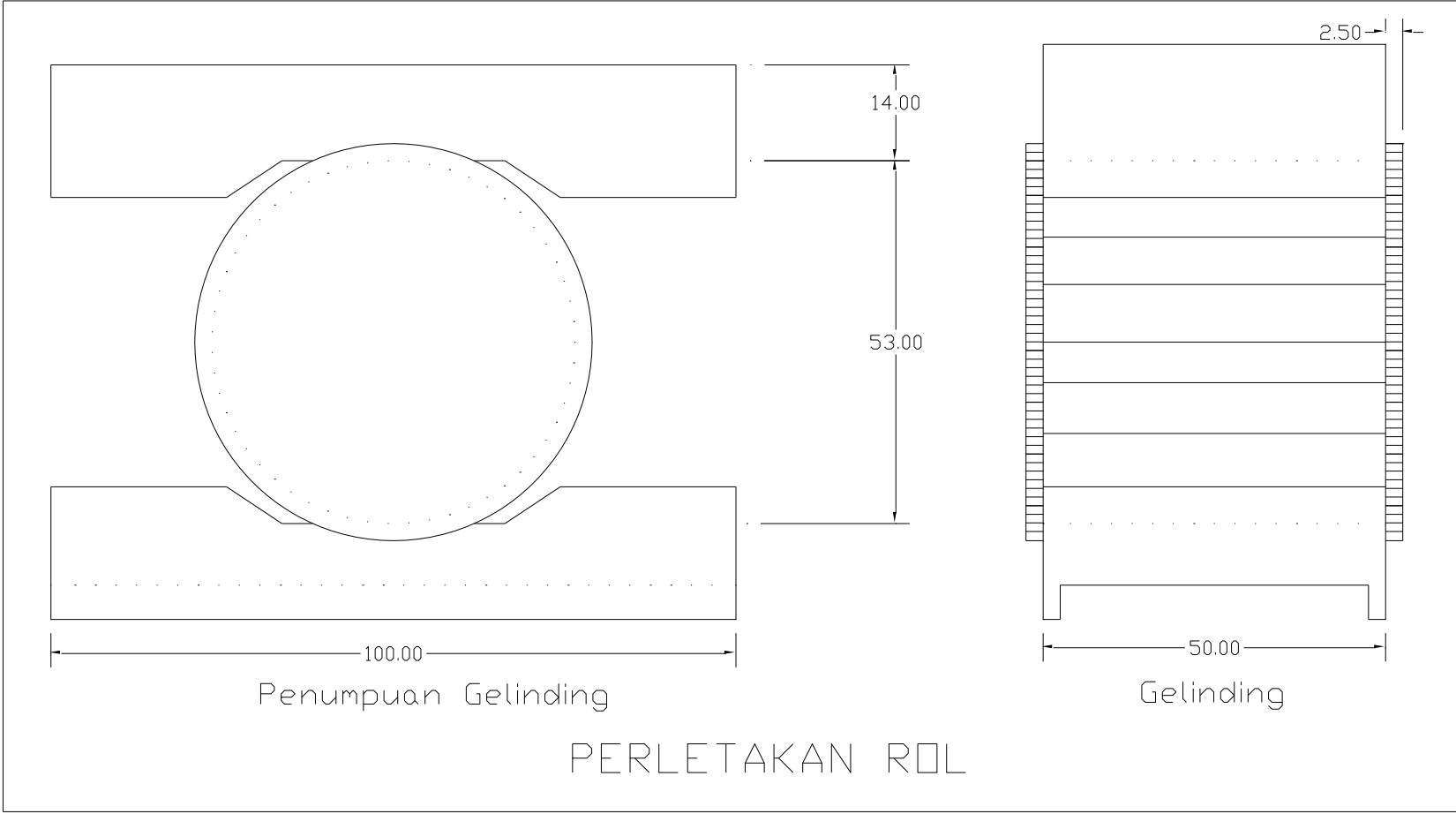
$$= 52,03 \text{ cm} \approx 53 \text{ cm}$$

- Tebal bibir rol :

$$d_6 = \text{diambil sebesar } 2,5 \text{ cm}$$

- Tinggi total rol :

$$\begin{aligned}d_5 &= d_4 + 2 \cdot d_6 \\ &= 53 + 2 \cdot 2,5 \\ &= 58 \text{ cm}\end{aligned}$$



BAB IV
KEBUTUHAN BAHAN

4.1 Profil Baja

Nama	Jenis Profil / Diameter	Berat Profil (kg)	Panjang Batang (m)	Berat Gelagar (kg)
Gelagar Memanjang	WF300x300x10x15	94	360	33840
Gelagar Melintang	WF700x300x13x24	185	144	26640
Gelegar Induk	WF400x400x18x28	232	506.32	117466.24
Ikatan Angin Atas dan Bawah	LD90x90x9	24.4	514.8	12561.12
Gelagar Melintang Atas	WF250x250x14x14	82.2	234	19234.8
Pipa Sandaran	Φ7.63	5.08	128	650.24
Kabel	Φ7.6	12.5	199.12	2489
Berat Total				212881.4

4.2 Kebutuhan Beton

a. Volume Beton

- Lantai kendaraan = $0.2 \times 7 \times 60 = 84 \text{ m}^2$
- Trotoir = $0.55 \times 0.8 \times 60 \times 2 = 52.8 \text{ m}^2$
- Tiang sandaran = $1 \times 0.04 \times 14 \times 2 = 1.12 \text{ m}^2$
- Tegel dan spesi = $2 \times 0.05 \times 0.8 \times 60 = 4.8 \text{ m}^2$
- Aspal = $0.65 \times 7 \times 60 = 273 \text{ m}^2$

b. Kebutuhan Tulangan

- Tulangan Lantai kendaraan dan trotoir

Tulangan pokok $\Phi 16-200$

$$\begin{aligned}\text{Panjang total tulangan} &= \left[\left(\frac{60}{0.2} \times 7 \right) + \left(\frac{60}{0.2} \times 8.6 \right) + \left(\frac{60}{0.2} \times 1.6 \right) \right] \\ &= 5160 \text{ meter}\end{aligned}$$

$$\text{Kebutuhan tulangan} = \frac{5160}{12} = 430 \text{ Lonjor}$$

Tulangan bagi $\Phi 16-250$

$$\begin{aligned}\text{Panjang total tulangan} &= \left[\left(\frac{60}{0.25} \times 7 \right) + \left(\frac{60}{0.25} \times 8.6 \right) + \left(\frac{60}{0.25} \times 1.6 \right) \right] \\ &= 4128 \text{ meter}\end{aligned}$$

$$\text{Kebutuhan tulangan} = \frac{4128}{12} = 344 \text{ Lonjor}$$

- Tulangan untuk tiang sandaran

Tulangan $2\Phi 12$

$$\begin{aligned}\text{Panjang total tulangan} &= 1 \times 4 \times 16 \times 2 \\ &= 128 \text{ meter}\end{aligned}$$

$$\text{Kebutuhan tulangan} = \frac{128}{12} = 10.6667 \text{ Lonjor} \approx 11 \text{ Lonjor}$$

Tulangan geser $\Phi 8-120$

$$\begin{aligned}\text{Panjang total tulangan} &= \left(\frac{1}{1.2} \right) \times 8 \times 16 \times 2 \\ &= 213 \text{ meter}\end{aligned}$$

$$\text{Kebutuhan tulangan} = \frac{213.333}{12} = 17.7778 \text{ Lonjor} \approx 18 \text{ Lonjor}$$

BAB V

PENUTUP

5.1 Kesimpulan

Dari hasil perencanaan dan analisa pada bab sebelumnya, maka penulis dapat mengambil kesimpulan sebagai berikut :

1. Pada perencanaan tiang sandaran menggunakan mutu beton $f'c = 25$ Mpa (250 kg/cm^2) dengan dimensi 20×20 mm dan di pakai tulangan dengan tegangan lelehnya = 240 Mpa.
2. Pada perencanaan plat lantai kendaraan dan trotoir mutu beton $f'c = 25$ Mpa (250 kg/cm^2) dan di pakai tulangan dengan tegangan lelehnya = 240 Mpa (2400 kg/cm^2).
3. Jenis-jenis profil yang digunakan dalam perencanaan jembatan pelengkung tersebut antara lain :
 - Profil WF 300 x 300 x 10 x 15 di pakai sebagai gelagar memanjang.
 - Profil WF 700 x 300 x 13 x 24 di pakai sebagai gelagar melintang.
 - Profil WF 400 x 400 x 18 x 28 di pakai sebagai gelagar induk.
 - Profil LD L 90 x 90 x 9 di pakai sebagai ikatan angin.
4. Kabel yang digunakan sebagai penggantung (yang menghubungkan antara gelagar induk bawah dengan gelagar pelengkung) adalah kabel dengan diameter 7,62 cm yang terdiri dari beberapa kawat/strand dengan Breaking strength = 195200 kg .
5. Sambungan antara profil baja dengan kabel menggunakan Open strand sockets dengan diameter 7/8 inch.

5.2 Saran

Saran penulis adalah sebagai berikut :

1. Sebelum merencanakan suatu struktur jembatan sebaiknya memperhatikan model-model struktur yang akan dipilih.
2. Analisa dengan menggunakan program bantu STAAD Pro 2004 sangat tepat dalam menganalisa suatu struktur jembatan rangka baja tipe pelengkung, sebab waktu yang diperlukan akan lebih singkat dengan tingkat kesalahan yang relative sangat kecil dari perhitungan secara manual.
3. Profil yang dipakai sebaiknya menggunakan profil yang sejenis supaya tidak menimbulkan eksentrisitas yang ekstrim

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LEMBAR PERSETUJUAN

STUDI ALTERNATIF PERENCANAAN STRUKTUR ATAS JEMBATAN TYPE PELENGKUNG (*lowerdeck*) PADA JEMBATAN SUKARNO-HATTA KOTA MALANG

Diajukan Untuk Memenuhi Salah Satu Persyaratan Dalam Memperoleh Gelar
Sarjana Teknik Pada Jurusan Teknik Sipil Fakultas Teknik Sipil Dan Perencanaan
INSTITUT TEKNOLOGI NASIONAL MALANG

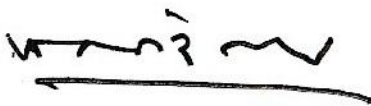
Disusun oleh :

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Mengetahui

Ketua Program Studi Teknik Sipil S-1



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**JURUSAN TEKNIK SIPIL
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
INSTITUT TEKNOLOGI NASIONAL MALANG**

2015

LEMBAR PENGESAHAN

STUDI ALTERNATIF PERENCANAAN STRUKTUR ATAS JEMBATAN TYPE PELENGKUNG (*lowerdeck*) PADA JEMBATAN SUKARNO-HATTA KOTA MALANG

Dipertahankan Di Hadapan Dewan Penguji Tugas Akhir Jenjang Strata Satu (S-1)
Dan Diterima Untuk Memenuhi Satu Syarat Guna Memperoleh Gelar
Sarjana Teknik

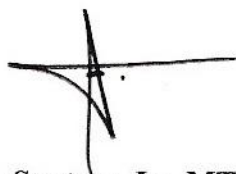
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Sekretaris

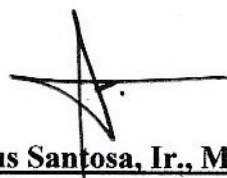


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JURUSAN TEKNIK SIPIL S-1

FAKULTAS TEKNIK SIPIL DAN PERENCANAAN

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SKRIPSI JEMBATAN

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File	Date/Time	
Jembatan Pelengkung.stc	27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 1 Check 1

```

-----
*****
MEMBER 1 * |=====| Y
* | | | PROPERTIES
* | | | IN CMS UNIT
DESIGN CODE * | | | AX=0.5897E+3
LRFD 1994 * | | | AY=0.1557E+3
* | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 5.50 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 28.1 (KNS-METRE)
IN KNS CMS |L34 CAPACITIES
+ L34 L34 IN KNS METRE
+ L34 L34
KL/R-Y= 51.59 | L34 PNC=0.1457E+5
KL/R-Z= 31.46 + pnc=0.4318E+3
UNL = 550.00 | L34 PNT=0.1829E+5
CB = 1.00 + L34 pnt=0.0000E+0
PHIC = 0.85 | L34 MNZ=0.3105E+4
PHIB = 0.90 + L34 mnz=0.2804E+2
FYLD = 35.30 | L25 L18 MNY=0.1549E+4
NSF = 1.00 +-----| mny=0.2782E+2
DFE = 0.00 6.3 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.4149E+1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 431.8 4.2 9.1 28.1 28.1
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 27 34 18 18 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.042 27
431.77 C -27.82 -28.04 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 3	Rev
Part		
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File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3 Check 1

```

-----
*****
MEMBER 3 * |=====| Y |====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | | --Z | AY=0.1557E+3
LRFD 1994 * |=====| | | AZ=0.3155E+3
* | | | | PY=0.4982E+4
* | <---LENGTH (M)= 4.53 ---> | | | PZ=0.9881E+4
***** | | | RY=0.1066E+2
| | | RZ=0.1748E+2
PARAMETER 28.8 (KNS-METRE)
IN KNS CMS | L26 CAPACITIES
IN KNS CMS | L26 IN KNS METRE
-----+-----
KL/R-Y= 42.51 | L26 PNC=0.1551E+5
KL/R-Z= 25.92 + L26 L14 pnc=0.2541E+4
UNL = 453.18 | L26 L14 PNT=0.1829E+5
CB = 1.00 + MNZ=0.3139E+4
PHIC = 0.85 | L14 mnz=0.2862E+2
PHIB = 0.90 + L26 L14 MNY=0.1549E+4
FYLD = 35.30 | L30 mny=0.1950E+2
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
DFE = 0.00 3.5 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.8998E+1
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2581.0 10.0 11.9 19.7 28.8
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 25 14 19 25 26
*****
* DESIGN SUMMARY (KNS-METRE) *
*-----*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/ *
* FX MY MZ LOCATION *
*-----*
PASS LRFD-H1-1B-C 0.104 34
2540.90 C 19.50 -28.62 0.00
*-----*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 4	Rev
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Client	Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc Date/Time 27-Jul-2015 08:43

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 4 Check 1

```

-----
*****
MEMBER 4 * |=====| ==|==
* |      ST W14X311      | | --Z
DESIGN CODE * |=====| ==|==
LRFD 1994 *
* |<---LENGTH (M)= 4.38 --->|
*****
                    52.2 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 41.07 |          L14          | L14 CAPACITIES
KL/R-Z= 25.04 +          L14 L14 | IN KNS METRE
UNL = 437.82 |          L14          | -----
CB = 1.00 +          L14          | PNC=0.1564E+5
PHIC = 0.85 |          L14          | pnc=0.2098E+4
PHIB = 0.90 + L14          | PNT=0.1829E+5
FYLD = 35.30 |L14          | pnt=0.0000E+0
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
DFE = 0.00 16.1          |          | MNZ=0.3140E+4
dff = 0.00          |          | mnz=0.4116E+2
                    |          | MNY=0.1549E+4
                    |          | mny=0.1124E+2
                    |          | VN =0.2969E+4
                    |          | vn =0.6608E+1
                    |          |
                    |          | ABSOLUTE MZ ENVELOPE
                    |          | (WITH LOAD NO.)
                    |          |
                    |          | MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                    |          | -----
                    |          | AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
                    |          |-----|-----|-----|-----|-----|
                    |          | VALUE     2146.6      7.8        10.5       11.9       52.2
                    |          | LOCATION   0.0        0.0        0.0        0.0        4.4
                    |          | LOADING    25         14         29         25         14
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-C    0.087      34
2097.57 C    11.24      41.16      4.38
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 6	Rev
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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 13 Check 1

```

-----
*****
MEMBER 13 * |=====| ==|==
* |          |   |
* |          |   |
DESIGN CODE * |          |   |
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.32 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2
-----
PARAMETER          7.2 (KNS-METRE)
IN KNS CMS
-----+
KL/R-Y= 40.48 |          L18
KL/R-Z= 24.69 +          L18 L18
UNL = 431.56 |          L18 L18
CB = 1.00 +
PHIC = 0.85 |          L18
PHIB = 0.90 + L25 L18
FYLD = 35.30 |L25
NSF = 1.00 +-----+
DFE = 0.00 0.9
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
-----
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      362.1          1.4          12.5          21.4          7.2
LOCATION     0.0            0.0            0.0            0.0            4.3
LOADING     27             18             18             18             18
-----
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY          MZ        LOCATION
*
*  PASS      LRFD-H1-1B-C    0.026     18
* 357.49 C   21.40          -1.21     0.00
*
*
*****
-----

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 14 Check 1

```

-----
*****
MEMBER 14 * |=====| Y
* | | | PROPERTIES
* | | | IN CMS UNIT
DESIGN CODE * | | | AX=0.5897E+3
LRFD 1994 * | | | AY=0.1557E+3
* | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.23 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 7.1 (KNS-METRE)
IN KNS CMS |L18 CAPACITIES
+ L18 L19 IN KNS METRE
+ L19 L19
KL/R-Y= 39.69 | L19 PNC=0.1577E+5
KL/R-Z= 24.20 + pnc=0.7479E+3
UNL = 423.14 | L19 L19 PNT=0.1829E+5
CB = 1.00 + pnt=0.0000E+0
PHIC = 0.85 | L19 MNZ=0.3140E+4
PHIB = 0.90 + L19 L19 mnz=0.6802E+1
FYLD = 35.30 | L19 MNY=0.1549E+4
NSF = 1.00 +-----| mny=0.1089E+2
DFE = 0.00 6.8 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.8748E-1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 747.9 0.1 10.2 12.3 7.1
LOCATION 0.0 0.0 4.2 4.2 0.0
LOADING 28 27 18 25 18

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.033 28
* 747.85 C 10.89 -6.80 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 8	Rev
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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 15 Check 1

```

*****
MEMBER 15 * |=====| ==|==
* |      ST W14X311      | | --Z
DESIGN CODE * |=====| ==|==
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.16 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

8.2 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
KL/R-Y= 39.07 | L20
KL/R-Z= 23.82 +
UNL = 416.48 | L20 L20
CB = 1.00 +
PHIC = 0.85 | L20
PHIB = 0.90 + L19 L20
FYLD = 35.30 |L19
NSF = 1.00 +-----+
DFE = 0.00 6.9
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1161.8 0.3 10.9 12.3 8.2
LOCATION 0.0 0.0 0.0 0.0 4.2
LOADING 29 21 20 25 20

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.046 29
1161.76 C 11.20 -6.73 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 16 Check 1

```

*****
MEMBER 16 * |=====| Y |=====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | | AY=0.1557E+3
LRFD 1994 * | | | | AZ=0.3155E+3
* | | | | PY=0.4982E+4
* | | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.10 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 8.4 (KNS-METRE)
IN KNS CMS |L20 CAPACITIES
+-----+ | L20 IN KNS METRE
+-----+ | L21 L21
KL/R-Y= 38.50 | | L21 PNC=0.1588E+5
KL/R-Z= 23.48 + | | pnc=0.1594E+4
UNL = 410.44 | | L21 L21 PNT=0.1829E+5
CB = 1.00 + | | pnt=0.0000E+0
PHIC = 0.85 | | L21 MNZ=0.3140E+4
PHIB = 0.90 + | | L21 L21 mnz=0.8181E+1
FYLD = 35.30 | | L21 MNY=0.1549E+4
NSF = 1.00 +-----+ | | mny=0.8336E+1
DFE = 0.00 7.3 | | VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE | | vn =0.2573E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1594.1 0.3 11.2 9.5 8.4
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 30 29 21 25 20

*****
* DESIGN SUMMARY (KNS-METRE) *
*-----*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/ *
* FX MY MZ LOCATION *
*-----*
PASS LRFD-H1-1B-C 0.058 30
1594.12 C 8.34 -8.18 0.00
*-----*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 17 Check 1

```

*****
MEMBER 17 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.06 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 8.7 (KNS-METRE)
IN KNS CMS
+-----+
| KL/R-Y= 38.09 |
| KL/R-Z= 23.23 |
| UNL = 406.08 |
| CB = 1.00 |
| PHIC = 0.85 |
| PHIB = 0.90 |
| FYLD = 35.30 |
| NSF = 1.00 |
| DFF = 0.00 |
| dff = 0.00 |
+-----+

L22 CAPACITIES
IN KNS METRE
+-----+
| PNC=0.1592E+5 |
| pnc=0.2001E+4 |
| PNT=0.1829E+5 |
| pnt=0.0000E+0 |
| MNZ=0.3140E+4 |
| mnz=0.8036E+1 |
| MNY=0.1549E+4 |
| mny=0.8806E+1 |
| VN =0.2969E+4 |
| vn =0.2571E+0 |
+-----+

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2002.8 0.3 11.6 8.8 8.7
LOCATION 0.0 0.0 0.0 2.4 4.1
LOADING 31 32 22 31 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.071 31
* 2000.76 C -8.81 -8.04 2.37
*
*****

```



SKRIPSI JEMBATAN

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keraf	22-May-15	
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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 18 Check 1

```

*****
MEMBER 18 * |=====| Y
* | | | PROPERTIES
* | | | IN CMS UNIT
DESIGN CODE * | | | AX=0.5897E+3
LRFD 1994 * | | | AY=0.1557E+3
* | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.03 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 8.9 (KNS-METRE)
IN KNS CMS |L22 CAPACITIES
+ L23 L23 IN KNS METRE
+ L23 L23
KL/R-Y= 37.77 | L23 PNC=0.1594E+5
KL/R-Z= 23.03 + pnc=0.2348E+4
UNL = 402.64 | L23 L23 PNT=0.1829E+5
CB = 1.00 + pnt=0.0000E+0
PHIC = 0.85 | L23 MNZ=0.3140E+4
PHIB = 0.90 + L23 L24 mnz=0.8694E+1
FYLD = 35.30 | L24 MNY=0.1549E+4
NSF = 1.00 +-----+ mny=0.1318E+2
DFE = 0.00 8.6 +-----+ VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.7647E-1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2349.7 0.1 11.5 13.2 8.9
LOCATION 0.0 0.0 0.0 2.3 0.0
LOADING 23 22 23 23 22

*****
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.085 23
* 2348.32 C -13.18 -8.69 2.35
*
*****

```



SKRIPSI JEMBATAN

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keraf	22-May-15	
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 19 Check 1

```

*****
MEMBER 19 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.01 --->|
*****
Y
PROPERTIES
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

8.7 (KNS-METRE)
PARAMETER |L24
IN KNS CMS | L24
+ L24 L24
KL/R-Y= 37.58 | L24
KL/R-Z= 22.92 +
UNL = 400.66 | L24 L24
CB = 1.00 +
PHIC = 0.85 | L24 L24
PHIB = 0.90 + L24
FYLD = 35.30 | L24
NSF = 1.00 +-----+
DFE = 0.00 8.3 |
dff = 0.00 ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
CAPACITIES
IN KNS METRE
PNC=0.1596E+5
pnc=0.2540E+4
PNT=0.1829E+5
pnt=0.0000E+0
MNZ=0.3140E+4
mnz=0.8453E+1
MNY=0.1549E+4
mny=0.2251E+2
VN =0.2969E+4
vn =0.1060E+0

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2540.6 0.1 13.6 22.5 8.7
LOCATION 0.0 0.0 0.0 2.7 0.0
LOADING 24 23 24 24 24
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.097 24
* 2539.88 C -22.51 -8.45 2.67
*
*****

```



SKRIPSI JEMBATAN

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keraf	22-May-15	
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 20 Check 1

```

-----
*****
MEMBER 20 * |=====| Y |====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * |=====| | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.14 --->| | RY=0.1066E+2
***** | RZ=0.1748E+2

PARAMETER 12.4 (KNS-METRE)
IN KNS CMS |L34 CAPACITIES
-----+----- IN KNS METRE
-----+-----
KL/R-Y= 38.84 | L34 PNC=0.1585E+5
KL/R-Z= 23.68 + L34 pnc=0.1192E+4
UNL = 414.06 | PNT=0.1829E+5
CB = 1.00 + L34 pnt=0.0000E+0
PHIC = 0.85 | MNZ=0.3140E+4
PHIB = 0.90 + mnz=0.1236E+2
FYLD = 35.30 | L33 L23 L23 MNY=0.1549E+4
NSF = 1.00 +-----+-----+-----+-----+-----+-----| mny=0.6818E+1
DFE = 0.00 11.4 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.4313E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1201.0 0.5 11.8 8.5 12.4
LOCATION 0.0 0.0 0.0 2.4 0.0
LOADING 25 14 22 31 34

*****
* DESIGN SUMMARY (KNS-METRE) *
*-----*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/ *
* FX MY MZ LOCATION *
*-----*
PASS LRFD-H1-1B-C 0.046 34
1192.09 C 6.82 -12.36 0.00
*-----*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 14	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 21 Check 1

```

-----
*****
MEMBER 21 * |=====| Y
* |-----| |=====| PROPERTIES
* |          | |          | IN CMS UNIT
DESIGN CODE * |          | |          | AX=0.5897E+3
* |          | |          | --Z AY=0.1557E+3
LRFD 1994 * |          | |          | AZ=0.3155E+3
* |          | |          | PY=0.4982E+4
* |          | |          | PZ=0.9881E+4
* |<---LENGTH (M)= 4.06 --->| |          | RY=0.1066E+2
***** |          | |          | RZ=0.1748E+2

PARAMETER 11.9 (KNS-METRE)
IN KNS CMS | L25 CAPACITIES
-----+-----+-----+-----+-----+-----+-----+
| KL/R-Y= 38.11 | L25 L25 | IN KNS METRE |
| KL/R-Z= 23.24 | L25 L25 | PNC=0.1591E+5 |
| UNL = 406.25 | L25 L25 | pnc=0.7329E+3 |
| CB = 1.00 | L25 L25 | PNT=0.1829E+5 |
| PHIC = 0.85 | L19 | pnt=0.0000E+0 |
| PHIB = 0.90 | L19 L19 | MNZ=0.3140E+4 |
| FYLD = 35.30 | L23 | mnz=0.1174E+2 |
| NSF = 1.00 |-----+-----+-----+-----+-----+-----+ | MNY=0.1549E+4 |
| DFF = 0.00 11.5 | | mny=0.1060E+2 |
| dff = 0.00 | ABSOLUTE MZ ENVELOPE | VN =0.2969E+4 |
| | (WITH LOAD NO.) | vn =0.7998E-1 |

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 737.9 0.1 11.4 12.8 11.9
LOCATION 0.0 0.0 0.0 2.4 4.1
LOADING 34 25 23 23 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.034 25
* 732.88 C -10.60 -11.74 2.37
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 15	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 22 Check 1

```

*****
MEMBER 22 * |=====| ==|==
* |          ST W14X311          | | --Z
DESIGN CODE * |          | |
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.02 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 12.0 (KNS-METRE)
IN KNS CMS |
+-----+
KL/R-Y= 37.67 |
KL/R-Z= 22.97 +
UNL = 401.62 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 11.8
dff = 0.00

L15 CAPACITIES
IN KNS METRE
-----
PNC=0.1595E+5
pnc=0.3342E+3
PNT=0.1829E+5
pnt=0.0000E+0
MNZ=0.3140E+4
mnz=0.1102E+2
MNY=0.1549E+4
mny=0.2192E+2
VN =0.2969E+4
vn =0.1672E-1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 335.4 0.1 14.2 23.2 12.0
LOCATION 0.0 0.0 0.0 3.0 4.0
LOADING 34 1 24 24 15

*****
DESIGN SUMMARY (KNS-METRE)
-----
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.028 34
334.22 C -21.92 -11.02 2.68
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 16	Rev
Part		
Ref		
By	Date	Chd
keraf	22-May-15	
File	Date/Time	
Jembatan Pelengkung.stc	27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 23 Check 1

```

*****
MEMBER 23 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 5.01 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 46.96 |L0
KL/R-Z= 28.63 +L0
UNL = 500.60 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -408.1 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 27 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.022 27
* 408.11 T 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 18	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 25 Check 1

```

*****
MEMBER 25 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.52 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 42.38 |L0
KL/R-Z= 25.84 +L0
UNL = 451.77 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -486.6 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 20 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.027 20
* 486.61 T 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 20	Rev
Part		
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By keraf	Date 22-May-15	Chd
File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 27 Check 1

```

*****
MEMBER 27 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.34 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 40.73 |L0
KL/R-Z= 24.84 +L0
UNL = 434.24 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -512.5 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 22 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.028 22
* 512.50 T 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 25	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 32 Check 1

```

-----
*****
MEMBER 32 * |=====| Y
* | | | | PROPERTIES
* | | | | IN CMS UNIT
DESIGN CODE * | | | | AX=0.5897E+3
LRFD 1994 * | | | | AY=0.1557E+3
* | | | | AZ=0.3155E+3
* | | | | PY=0.4982E+4
* | | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.53 --->| RY=0.1066E+2
***** RZ=0.1748E+2

PARAMETER 25.6 (KNS-METRE)
IN KNS CMS | L14 CAPACITIES
-----+-----+-----+-----+-----+-----+
KL/R-Y= 42.51 | L33 L14 PNC=0.1551E+5
KL/R-Z= 25.92 + pnc=0.2601E+4
UNL = 453.18 | L33 L14 PNT=0.1829E+5
CB = 1.00 + L14 pnt=0.0000E+0
PHIC = 0.85 | L33 MNZ=0.3139E+4
PHIB = 0.90 + L24 L24 mnz=0.2136E+2
FYLD = 35.30 | L24 MNY=0.1549E+4
NSF = 1.00 +-----+-----+-----+-----+ mny=0.1993E+2
DFE = 0.00 9.5 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.9541E+1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2606.5 9.5 11.7 20.0 25.6
LOCATION 0.0 0.0 0.0 0.0 4.5
LOADING 24 33 26 31 14

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.104 33
* 2601.30 C 19.93 21.36 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 26	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 33 Check 1

```

*****
MEMBER 33 * |=====| Y
* | | | PROPERTIES
* | | | IN CMS UNIT
DESIGN CODE * | | | AX=0.5897E+3
LRFD 1994 * | | | AY=0.1557E+3
* | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.38 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 53.2 (KNS-METRE)
IN KNS CMS | L33 CAPACITIES
+ | L33 IN KNS METRE
+ | L33
KL/R-Y= 41.07 | L33 L33 PNC=0.1564E+5
KL/R-Z= 25.04 + pnc=0.2165E+4
UNL = 437.82 | L33 PNT=0.1829E+5
CB = 1.00 + L32 pnt=0.0000E+0
PHIC = 0.85 | L14 MNZ=0.3140E+4
PHIB = 0.90 + L14 L14 mnz=0.5320E+2
FYLD = 35.30 |L14 MNY=0.1549E+4
NSF = 1.00 +-----| mny=0.1171E+2
DFE = 0.00 24.0 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.7146E+1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2175.7 7.2 10.1 12.1 53.2
LOCATION 0.0 0.0 0.0 0.0 4.4
LOADING 23 33 25 23 33

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.094 32
2165.27 C 11.71 -53.20 4.38
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 28	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [L20]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 42 Check 1

```

-----
*****
MEMBER 42 * |=====| Y
* | | | PROPERTIES
* | | | IN CMS UNIT
DESIGN CODE * | | | AX=0.5897E+3
LRFD 1994 * | | | AY=0.1557E+3
* | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.32 --->| RY=0.1066E+2
***** RZ=0.1748E+2

PARAMETER 7.6 (KNS-METRE)
IN KNS CMS | L15 CAPACITIES
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 40.48 | | | L15 | IN KNS METRE
KL/R-Z= 24.69 + | | | L18 | -----
UNL = 431.56 | | | L21 | PNC=0.1570E+5
CB = 1.00 + | | | L22 | pnc=0.3000E+3
PHIC = 0.85 | | | L23 L23 | PNT=0.1829E+5
PHIB = 0.90 + | | | L1 | pnt=0.0000E+0
FYLD = 35.30 |L14L14 L1 | | MNZ=0.3140E+4
NSF = 1.00 +-----+-----+-----+-----+-----+ | mnz=0.1759E+1
DFD = 0.00 1.3 | | | MNY=0.1549E+4
dff = 0.00 | | | vn =0.2969E+4
ABSOLUTE MZ ENVELOPE | | | vn =0.2083E+1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 300.8 2.1 12.0 20.5 7.6
LOCATION 0.0 0.0 0.0 0.0 4.3
LOADING 15 26 26 33 15

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.023 26
* 299.95 C 20.43 -1.76 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 30	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 44 Check 1

```

-----
*****
MEMBER 44 * |=====| Y
* |-----| | PROPERTIES
* | ST W14X311 | | IN CMS UNIT
DESIGN CODE * | | AX=0.5897E+3
LRFD 1994 * | | AY=0.1557E+3
* | | AZ=0.3155E+3
* | | PY=0.4982E+4
* | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.16 --->| | RY=0.1066E+2
***** | | RZ=0.1748E+2

PARAMETER 8.4 (KNS-METRE)
IN KNS CMS | L15 L15 CAPACITIES
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 39.07 | | PNC=0.1583E+5
KL/R-Z= 23.82 + | | pnc=0.1002E+4
UNL = 416.48 | | PNT=0.1829E+5
CB = 1.00 + | | pnt=0.0000E+0
PHIC = 0.85 | | MNZ=0.3140E+4
PHIB = 0.90 + | L15 L15 mnz=0.6944E+1
FYLD = 35.30 | L15 MNY=0.1549E+4
NSF = 1.00 +-----+-----+-----+-----+-----+ mny=0.1233E+2
DFE = 0.00 6.9 | | VN =0.2969E+4
dff = 0.00 | | vn =0.3432E+0
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1002.7 0.3 10.6 12.4 8.4
LOCATION 0.0 0.0 0.0 0.0 4.2
LOADING 15 15 15 23 15
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.042 25
1002.29 C 12.33 6.94 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 32	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 46 Check 1

```

*****
MEMBER 46 * |=====| ==|==
* |      ST W14X311      | | --Z
DESIGN CODE * |=====| ==|==
LRFD 1994 *
* |<---LENGTH (M)= 4.06 --->|
*****
      8.8 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
KL/R-Y= 38.09 |
KL/R-Z= 23.23 +
UNL = 406.08 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 7.6
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE 1874.5      0.3      11.2      7.0      8.8
LOCATION 0.0      0.0      0.0      2.4      4.1
LOADING 25      34      25      15      15
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX      MY      MZ      LOCATION
=====
PASS      LRFD-H1-1B-C      0.066      25
1872.50 C      -6.91      8.32      2.37
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 33	Rev
Part		
Ref		
By	Date	Chd
keraf	22-May-15	
File	Date/Time	
Jembatan Pelengkung.stc	27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 47 Check 1

```

-----
*****
MEMBER 47 * |=====| Y |====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.03 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 8.8 (KNS-METRE)
IN KNS CMS |L15 CAPACITIES
-----+-----+-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 37.77 | L15 L25 PNC=0.1594E+5
KL/R-Z= 23.03 + pnc=0.2283E+4
UNL = 402.64 | L25 PNT=0.1829E+5
CB = 1.00 + L25 pnt=0.0000E+0
PHIC = 0.85 | L25 MNZ=0.3140E+4
PHIB = 0.90 + L25 L25 mnz=0.8757E+1
FYLD = 35.30 | L25 MNY=0.1549E+4
NSF = 1.00 +-----+-----+-----+-----+-----+-----+ mny=0.1152E+2
DFE = 0.00 8.7 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.3094E-1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2284.2 0.1 11.1 11.5 8.8
LOCATION 0.0 0.0 0.0 2.3 0.0
LOADING 25 1 25 25 15
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.082 25
* 2282.88 C -11.52 8.76 2.35
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 37	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 51 Check 1

```

*****
MEMBER 51 * |=====| Y
* | | | PROPERTIES
* | | | IN CMS UNIT
DESIGN CODE * | | | AX=0.5897E+3
LRFD 1994 * | | | AY=0.1557E+3
* | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.02 --->| RY=0.1066E+2
***** RZ=0.1748E+2

PARAMETER 11.9 (KNS-METRE)
IN KNS CMS | L23 CAPACITIES
+ | L23 L23 IN KNS METRE
+ | L23 L23
KL/R-Y= 37.67 | L23 PNC=0.1595E+5
KL/R-Z= 22.97 + pnc=0.4186E+3
UNL = 401.62 | L23 L23 PNT=0.1829E+5
CB = 1.00 + pnt=0.0000E+0
PHIC = 0.85 | L23 MNZ=0.3140E+4
PHIB = 0.90 + L24 L23 mnz=0.1090E+2
FYLD = 35.30 |L24 MNY=0.1549E+4
NSF = 1.00 +-----| mny=0.2115E+2
DFE = 0.00 11.7 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.8755E-1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 420.8 0.1 14.3 23.2 11.9
LOCATION 0.0 0.0 0.0 3.0 4.0
LOADING 30 26 34 25 23

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.030 31
* 418.58 C -21.15 10.90 3.01
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 40	Rev
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keraf	22-May-15	
File	Date/Time	
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 54 Check 1

```

*****
MEMBER 54 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.52 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 42.38 |L0
KL/R-Z= 25.84 +L0
UNL = 451.77 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -432.1 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 25 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.024 25
* 432.15 T 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 42	Rev
Part		
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 56 Check 1

```

*****
MEMBER 56 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.34 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 40.73 |L0
KL/R-Z= 24.84 +L0
UNL = 434.24 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -497.3 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 25 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.027 25
* 497.32 T 0.00 0.00 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 43	Rev
Part		
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 57 Check 1

```

*****
MEMBER 57 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.34 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 40.70 |L0
KL/R-Z= 24.82 +L0
UNL = 433.85 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -466.9 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 25 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.026 25
* 466.91 T 0.00 0.00 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 44	Rev
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keraf	22-May-15	
File	Date/Time	
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Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 58 Check 1

```

-----
*****
MEMBER 58 * |=====| Y |=====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.38 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0 L0 CAPACITIES
|L0 L0 IN KNS METRE
-----+L0 -----
KL/R-Y= 41.07 |L0 L0 PNC=0.1564E+5
KL/R-Z= 25.04 +L0 L0 pnc=0.0000E+0
UNL = 437.82 |L0 L0 PNT=0.1829E+5
CB = 0.00 +L0 L0 pnt=0.3034E+3
PHIC = 0.85 |L0 L0 MNZ=0.0000E+0
PHIB = 0.90 +L0 L0 mnz=0.0000E+0
FYLD = 35.30 |L0 L0 MNY=0.0000E+0
NSF = 1.00 +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
DFE = 0.00 0.0 | | | vn =0.0000E+0
dff = 0.00 ABSOLUTE MZ ENVELOPE | | | vn =0.0000E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -303.4 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 33 0 0 0 0
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS TENSION 0.017 33
303.44 T 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 46	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 60 Check 1

```

-----
*****
MEMBER 60 * |=====| ---|===
* |          | |          |
* |          | |          |
DESIGN CODE * |          | |          |
* |          | |          |
LRFD 1994 * |=====| ---|===
* |          | |          |
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 12.0 (KNS-METRE)
IN KNS CMS |L23
-----+
KL/R-Y= 37.52 | L22
KL/R-Z= 22.88 + L22
UNL = 400.00 |
CB = 1.00 + L22
PHIC = 0.85 | L22
PHIB = 0.90 + L15
FYLD = 35.30 | L22
NSF = 1.00 +-----+
DFE = 0.00 12.0
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -467.1 0.0 10.3 29.4 12.0
LOCATION 0.0 0.0 4.0 2.0 0.0
LOADING 25 34 34 25 23

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.036 25
467.06 T -29.35 11.92 2.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 47	Rev
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keraf	22-May-15	
File	Date/Time	
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 61 Check 1

```

*****
MEMBER 61 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 2.24 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 21.00 |L0
KL/R-Z= 12.80 +L0
UNL = 223.83 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 585.2 0.0 0.0 0.0 0.0
LOCATION 2.2 0.0 0.0 0.0 0.0
LOADING 32 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.034 32
* 585.16 C 0.00 0.00 2.24
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 48	Rev
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keraf	22-May-15	
File	Date/Time	
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 62 Check 1

```

*****
MEMBER 62 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 2.24 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 21.00 |L0
KL/R-Z= 12.80 +L0
UNL = 223.83 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 567.0 0.0 0.0 0.0 0.0
LOCATION 2.2 0.0 0.0 0.0 0.0
LOADING 34 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.033 34
* 566.99 C 0.00 0.00 2.24
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 49	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 63 Check 1

```

*****
MEMBER 63 * |=====| ---|---
* |      ST H250X255X14      | | ---Z
DESIGN CODE * |-----| ---|---
LRFD 1994 * |=====| ---|---
* |<---LENGTH (M)= 9.00 --->|
*****
          9.0 (KNS-METRE)
PARAMETER |-----|
IN KNS   CMS   |-----|
-----+-----+
KL/R-Y= 147.28 |-----|
KL/R-Z= 85.92  +-----+
UNL = 900.00 |L18
CB = 1.00 +-----+
PHIC = 0.85 |-----+
PHIB = 0.90 +-----+
FYLD = 35.30 |-----+
NSF = 1.00 +-----+
DFE = 0.00 0.4
dff = 0.00
          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -1.7      4.7      0.1      0.3      9.0
LOCATION     0.0      9.0      0.0      0.0      9.0
LOADING    18      34      34      28      27

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
-----
PASS          LRFD-H1-1B-T      0.042      27
1.43 T      -0.18      9.02      9.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 50	Rev
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 64 Check 1

```

*****
MEMBER 64 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****

          9.7 (KNS-METRE)
PARAMETER | L34 L34 L25
IN KNS CMS |
-----+-----+-----+-----+
KL/R-Y= 147.28 |
KL/R-Z= 85.92 + L34 L25
UNL = 900.00 |
CB = 1.00 + L34 L25
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L34 L25
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 0.2
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -4.2        4.0         0.0         1.0         9.7
LOCATION     0.0        9.0         0.0         9.0         4.5
LOADING    19         34          34          29          34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.052     19
*  4.21 T    0.87              -9.70     4.50
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 52	Rev
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 66 Check 1

```

*****
MEMBER 66 * |=====| |====|====|
* | | | | |
* | ST H250X255X14 | | --Z |
DESIGN CODE * | | | | |
LRFD 1994 * |=====| |====|====|
* |<---LENGTH (M)= 9.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

11.0 (KNS-METRE)
PARAMETER | L34 L25 L25
IN KNS CMS |
+ L34 L25
KL/R-Y= 147.28 |
KL/R-Z= 85.92 + L34 L25
UNL = 900.00 |
CB = 1.00 + L34 L25
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L34 L25
NSF = 1.00 +-----+
DFE = 0.00 1.6
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -12.4 4.0 0.0 0.9 11.0
LOCATION 0.0 9.0 0.0 9.0 4.5
LOADING 21 26 34 31 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.058 21
12.44 T 0.72 -11.04 4.50
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 54	Rev
Part		
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By keraf	Date 22-May-15	Chd
File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 68 Check 1

```

*****
MEMBER 68 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

PARAMETER 11.2 (KNS-METRE)
IN KNS CMS L34 L25 L25
+ L34 L25
KL/R-Y= 147.28 |
KL/R-Z= 85.92 + L34 L25
UNL = 900.00 |
CB = 1.00 + L34 L25
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L34 L25
NSF = 1.00 +-----+
DFE = 0.00 1.8
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -19.8 4.0 0.0 0.5 11.2
LOCATION 0.0 9.0 0.0 9.0 4.5
LOADING 22 26 34 33 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.056 22
* 19.82 T 0.41 -11.15 4.50
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 56	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 70 Check 1

```

*****
MEMBER 70 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

11.2 (KNS-METRE)
PARAMETER | L20 L20 L30
IN KNS CMS |
-----+-----+-----+-----+
KL/R-Y= 147.28 | L20 L30
KL/R-Z= 85.92 + L20 L30
UNL = 900.00 |
CB = 1.00 + L20 L30
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L20 L30
NSF = 1.00 +-----+
DFE = 0.00 1.8
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -21.0 4.0 0.0 0.2 11.2
LOCATION 0.0 0.0 0.0 9.0 4.5
LOADING 24 33 34 34 20

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.053 24
20.97 T 0.08 -11.22 4.50
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 57	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 71 Check 1

```

*****
MEMBER 71 * |=====| |====|====|
* | | | | |
* | ST H250X255X14 | | --Z |
DESIGN CODE * | | | | |
LRFD 1994 * |=====| |====|====|
* |<---LENGTH (M)= 9.00 --->|
*****
                21.7 (KNS-METRE)
PARAMETER | | | | |
IN KNS CMS | | | | |
-----+-----+
KL/R-Y= 147.28 | | | | |
KL/R-Z= 85.92 + | | | | |
UNL = 900.00 | | | | |
CB = 1.00 +L34L34 L34 L34 | | | | |
PHIC = 0.85 | | | | |
PHIB = 0.90 + | | | | |
FYLD = 35.30 | | | | |
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 2.1 | | | | |
dff = 0.00 | | | | |
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.2          7.5          0.5          2.2          21.7
LOCATION     0.0          9.0          0.0          0.0          9.0
LOADING    14           34           34           34           34
*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
=====
PASS          LRFD-H1-1B-T          0.117          34
1.65 T        2.07          21.71          9.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 59	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 73 Check 1

```

*****
MEMBER 73 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2
PARAMETER 10.9 (KNS-METRE)
IN KNS CMS L32 L32 L23
CAPACITIES
IN KNS METRE
PNC=0.7224E+3
pnc=0.0000E+0
PNT=0.3223E+4
pnt=0.8509E+1
MNZ=0.2282E+3
mnz=0.1086E+2
MNY=0.9659E+2
mny=0.8578E+0
VN =0.6672E+3
vn =0.0000E+0
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -8.5 4.0 0.0 0.9 10.9
LOCATION 0.0 9.0 0.0 0.0 4.5
LOADING 15 33 25 25 32
*****
DESIGN SUMMARY (KNS-METRE)
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
PASS LRFD-H1-1B-T 0.058 17
8.51 T -0.86 -10.86 4.50
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 60	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 74 Check 1

```

*****
MEMBER 74 * |=====| |====|====|
* | | | |
* | ST H250X255X14 | | --Z |
DESIGN CODE * | | | |
LRFD 1994 * |=====| |====|====|
* | | | |
* |<---LENGTH (M)= 9.00 --->| | | |
*****
PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

PARAMETER 11.0 (KNS-METRE)
IN KNS CMS | L32 L32 L23
+ L32 L23
CAPACITIES
IN KNS METRE
PNC=0.7224E+3
pnc=0.0000E+0
PNT=0.3223E+4
pnt=0.1124E+2
MNZ=0.2282E+3
mnz=0.1105E+2
MNY=0.9659E+2
mny=0.7190E+0
VN =0.6672E+3
vn =0.6415E-2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -11.2 4.0 0.0 0.8 11.0
LOCATION 0.0 0.0 0.0 0.0 4.5
LOADING 25 15 25 25 32

*****
DESIGN SUMMARY (KNS-METRE)
-----
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.058 25
11.24 T -0.72 -11.05 4.50
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 61	Rev
Part		
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By keraf	Date 22-May-15	Chd
File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 75 Check 1

```

*****
MEMBER 75 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

PARAMETER 11.2 (KNS-METRE)
IN KNS CMS L31 L31 L22
+ L31 L22
KL/R-Y= 147.28 |
KL/R-Z= 85.92 + L31 L22
UNL = 900.00 |
CB = 1.00 + L31 L22
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L31 L22
NSF = 1.00 +-----|
DFE = 0.00 1.8
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -16.2 4.0 0.0 0.6 11.2
LOCATION 0.0 0.0 0.0 0.0 4.5
LOADING 25 15 25 25 31

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LFRD-H1-1B-T 0.057 25
* 16.22 T -0.57 -11.17 4.50
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 62	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 76 Check 1

```

*****
MEMBER 76 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

PARAMETER 11.2 (KNS-METRE)
IN KNS CMS L22 L22 L31
+ L22 L31
KL/R-Y= 147.28 |
KL/R-Z= 85.92 + L22 L31
UNL = 900.00 |
CB = 1.00 + L22 L31
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L22 L31
NSF = 1.00 +-----+
DFE = 0.00 1.8
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -19.2 4.0 0.0 0.5 11.2
LOCATION 0.0 0.0 0.0 0.0 4.5
LOADING 25 34 25 25 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LFRD-H1-1B-T 0.056 25
* 19.18 T -0.41 -11.16 4.50
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 65	Rev
Part		
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 79 Check 1

```

-----
*****
MEMBER 79 * |=====| Y
* |-----| | PROPERTIES
* |          | | IN CMS UNIT
DESIGN CODE * |          | | AX=0.5897E+3
* |          | | --Z | AY=0.1557E+3
LRFD 1994 * |          | | AZ=0.3155E+3
* |          | | PY=0.4982E+4
* |          | | PZ=0.9881E+4
* |<---LENGTH (M)= 5.50 --->| | RY=0.1066E+2
***** | | RZ=0.1748E+2

PARAMETER 36.3 (KNS-METRE)
IN KNS CMS |L27 CAPACITIES
-----+----- IN KNS METRE
KL/R-Y= 51.59 | L27 PNC=0.1457E+5
KL/R-Z= 31.46 + L27 pnc=0.4268E+3
UNL = 550.00 | L27 PNT=0.1829E+5
CB = 1.00 + L27 pnt=0.0000E+0
PHIC = 0.85 | L27 MNZ=0.3105E+4
PHIB = 0.90 + L27 L15 L26 mnz=0.3634E+2
FYLD = 35.30 | L1 MNY=0.1549E+4
NSF = 1.00 +-----+-----| mny=0.2807E+2
DFE = 0.00 2.0 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.8880E+1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 430.0 8.9 9.2 28.1 36.3
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 18 27 27 18 27
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.044 27
426.84 C -28.07 -36.34 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 66	Rev
Part		
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By	Date	Chd
keraf	22-May-15	
File	Date/Time	
Jembatan Pelengkung.stc	27-Jul-2015 08:43	

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 80 Check 1

```

*****
MEMBER 80 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.71 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 76.2 (KNS-METRE)
IN KNS CMS | L26
+ L26 L26
+ L26
+ L14 L14
+ L14 L14
+ L14
+ L14 L14
+ L14
+
+-----+-----+-----+-----+-----+
dfF = 0.00 27.0 ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 3044.7 10.2 14.9 19.9 76.2
LOCATION 0.0 0.0 4.7 4.7 0.0
LOADING 33 26 27 34 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.124 34
* 3044.59 C -1.60 -75.82 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 67	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 81 Check 1

```

-----
*****
MEMBER 81 * |=====| Y
* | | | PROPERTIES
* | | | IN CMS UNIT
DESIGN CODE * | | | AX=0.5897E+3
LRFD 1994 * | | | AY=0.1557E+3
* | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.53 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 29.6 (KNS-METRE)
IN KNS CMS | L14 CAPACITIES
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 42.51 | L14 PNC=0.1551E+5
KL/R-Z= 25.92 + L14 L26 pnc=0.2642E+4
UNL = 453.18 | L14 PNT=0.1829E+5
CB = 1.00 + L26 pnt=0.0000E+0
PHIC = 0.85 | L26 MNZ=0.3139E+4
PHIB = 0.90 + L14 L26 mnz=0.2825E+2
FYLD = 35.30 | L14 MNY=0.1549E+4
NSF = 1.00 +-----+-----+-----+-----+-----+ mny=0.1994E+2
DFE = 0.00 2.5 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.1010E+2
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2641.5 10.2 11.9 19.9 29.6
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 26 19 34 14

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.107 34
* 2641.53 C 19.94 -28.25 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 68	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 82 Check 1

```

-----
*****
MEMBER 82 * |=====| Y |====| PROPERTIES
* | | | | IN CMS UNIT
* | ST W14X311 | | | | AX=0.5897E+3
DESIGN CODE * | | | | --Z | | AY=0.1557E+3
LRFD 1994 * |=====| | | | AZ=0.3155E+3
* | | | | PY=0.4982E+4
* | | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.38 --->| | | | RY=0.1066E+2
***** | | | | RZ=0.1748E+2

PARAMETER 62.1 (KNS-METRE)
IN KNS CMS | | | | L26 CAPACITIES
+-----+ | | | | L26 IN KNS METRE
+ | | | | L26 L26
KL/R-Y= 41.07 | | | | PNC=0.1564E+5
KL/R-Z= 25.04 + | | | | pnc=0.2197E+4
UNL = 437.82 | | | | PNT=0.1829E+5
CB = 1.00 + | | | | pnt=0.0000E+0
PHIC = 0.85 | | | | L26 MNZ=0.3140E+4
PHIB = 0.90 + | | | | L26 L26 mnz=0.6174E+2
FYLD = 35.30 |L26 | | | | MNY=0.1549E+4
NSF = 1.00 +-----+ | | | | mny=0.1173E+2
DFE = 0.00 15.2 | | | | VN =0.2969E+4
dff = 0.00 | | | | vn =0.1010E+2
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2205.7 10.2 10.5 12.2 62.1
LOCATION 0.0 0.0 0.0 0.0 4.4
LOADING 34 26 20 34 26
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.097 34
2196.81 C 11.73 61.74 4.38
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 70	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 91 Check 1

```

-----
*****
MEMBER 91 * |=====| Y |=====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.32 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 7.7 (KNS-METRE)
IN KNS CMS | L27 CAPACITIES
+-----+ | L27 L27 IN KNS METRE
+-----+ | L27 L27
| KL/R-Y= 40.48 | | PNC=0.1570E+5
| KL/R-Z= 24.69 + | pnc=0.3554E+3
| UNL = 431.56 | L27 L27 PNT=0.1829E+5
| CB = 1.00 + | pnt=0.0000E+0
| PHIC = 0.85 | L27 MNZ=0.3140E+4
| PHIB = 0.90 + L27 L27 mnz=0.1445E+1
| FYLD = 35.30 |L26 MNY=0.1549E+4
| NSF = 1.00 +-----+ mny=0.2147E+2
| DFF = 0.00 1.3 | VN =0.2969E+4
| dff = 0.00 ABSOLUTE MZ ENVELOPE | vn =0.1350E+1
| | (WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 355.4 1.4 12.5 21.5 7.7
LOCATION 0.0 0.0 0.0 0.0 4.3
LOADING 18 27 18 27 27

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.026 18
* 355.38 C 21.47 1.45 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 71	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 92 Check 1

```

*****
MEMBER 92 * |=====| Y |=====| PROPERTIES
DESIGN CODE * | ST W14X311 | | | IN CMS UNIT
LRFD 1994 * |=====| | | AX=0.5897E+3
* |<---LENGTH (M)= 4.23 --->| | | AY=0.1557E+3
***** | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* | | | RY=0.1066E+2
* | | | RZ=0.1748E+2
*****

PARAMETER 7.3 (KNS-METRE)
IN KNS CMS | L28 CAPACITIES
+-----+ | L28 L28 | IN KNS METRE
| KL/R-Y= 39.69 | L28 | PNC=0.1577E+5
| KL/R-Z= 24.20 + | | pnc=0.7328E+3
| UNL = 423.14 | L28 L28 | PNT=0.1829E+5
| CB = 1.00 + | | pnt=0.0000E+0
| PHIC = 0.85 | L28 | MNZ=0.3140E+4
| PHIB = 0.90 + L27 L27 | mnz=0.6909E+1
| FYLD = 35.30 |L27 | MNY=0.1549E+4
| NSF = 1.00 +-----+ | mny=0.1109E+2
| DFF = 0.00 7.1 | | VN =0.2969E+4
| dff = 0.00 | | vn =0.1094E-1
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 732.8 0.1 10.3 12.5 7.3
LOCATION 0.0 0.0 4.2 4.2 4.2
LOADING 19 29 27 34 28

*****
* DESIGN SUMMARY (KNS-METRE) *
*-----*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/ *
* FX MY MZ LOCATION *
*-----*
* PASS LRFD-H1-1B-C 0.033 19 *
* 732.81 C 11.09 6.91 0.00 *
*-----*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 72	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 93 Check 1

```

*****
MEMBER 93 * |=====| ==|==
* |          ST W14X311          | | --Z
DESIGN CODE * |          | |
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.16 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER      8.7 (KNS-METRE)
IN KNS CMS    +-----+
+-----+      L29 L29
KL/R-Y= 39.07 |          L29          |
KL/R-Z= 23.82 +-----+          |
UNL = 416.48 |          L29 L29      |
CB = 1.00 +-----+          |
PHIC = 0.85 |          L29          |
PHIB = 0.90 +-----+ L28 L29      |
FYLD = 35.30 |L28                    |
NSF = 1.00 +-----+          |
DFE = 0.00 7.2          ABSOLUTE MZ ENVELOPE
dff = 0.00          (WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      1144.5         0.3          10.9          12.5          8.7
LOCATION     0.0           0.0           0.0           0.0           4.2
LOADING    20            30            29            34            29

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-C    0.046      20
1144.46 C    11.48          6.96       0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 73	Rev
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keraf	22-May-15	
File	Date/Time	
Jembatan Pelengkung.stc	27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 94 Check 1

```

*****
MEMBER 94 * |=====| Y |=====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * |=====| | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.10 --->| | RY=0.1066E+2
***** | RZ=0.1748E+2

PARAMETER 8.6 (KNS-METRE)
IN KNS CMS |L29 CAPACITIES
+ L29 IN KNS METRE
+ L30 L30
KL/R-Y= 38.50 | L30 PNC=0.1588E+5
KL/R-Z= 23.48 + pnc=0.1581E+4
UNL = 410.44 | L30 L30 PNT=0.1829E+5
CB = 1.00 + pnt=0.0000E+0
PHIC = 0.85 | L30 MNZ=0.3140E+4
PHIB = 0.90 + L30 L30 mnz=0.8385E+1
FYLD = 35.30 | L30 MNY=0.1549E+4
NSF = 1.00 +-----| mny=0.8591E+1
DFE = 0.00 7.7 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.2111E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1580.5 0.2 11.2 9.7 8.6
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 21 20 30 34 29

*****
* DESIGN SUMMARY (KNS-METRE) *
*-----*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/ *
* FX MY MZ LOCATION *
*-----*
PASS LRFD-H1-1B-C 0.058 21
1580.51 C 8.59 8.38 0.00
*-----*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 74	Rev
Part		
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 95 Check 1

```

*****
MEMBER 95 * |=====| ==|==
DESIGN CODE * |          ST W14X311          | --Z
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.06 --->|
*****
          9.0 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
KL/R-Y= 38.09 |          L31          |
KL/R-Z= 23.23 +          L31 L31          |
UNL = 406.08 |          L31 L31          |
CB = 1.00 +          L31 L31          |
PHIC = 0.85 |          L31          |
PHIB = 0.90 +          L30 L31          |
FYLD = 35.30 |L30          |
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
DFE = 0.00 7.7
dff = 0.00
          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE 1998.8        0.3          11.6         8.7           9.0
LOCATION 0.0          0.0          0.0          2.4           4.1
LOADING 22          23          31          22           31
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/          CRITICAL COND/          RATIO/          LOADING/
FX          MY          MZ          LOCATION
=====
PASS          LRFD-H1-1B-C          0.071          22
1996.74 C          -8.69          8.26          2.37
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 75	Rev
Part		
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keraf	22-May-15	
File	Date/Time	
Jembatan Pelengkung.stc	27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 96 Check 1

```

*****
MEMBER 96 * |=====| Y |=====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * |=====| | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.03 --->| | RY=0.1066E+2
***** | RZ=0.1748E+2

PARAMETER 8.9 (KNS-METRE)
IN KNS CMS |L31 CAPACITIES
+ L31 L32 IN KNS METRE
+ L32 L32
KL/R-Y= 37.77 | L32 PNC=0.1594E+5
KL/R-Z= 23.03 + pnc=0.2357E+4
UNL = 402.64 | L32 L32 PNT=0.1829E+5
CB = 1.00 + pnt=0.0000E+0
PHIC = 0.85 | L32 MNZ=0.3140E+4
PHIB = 0.90 + L32 L33 mnz=0.8807E+1
FYLD = 35.30 | L33 MNY=0.1549E+4
NSF = 1.00 +-----+ mny=0.1319E+2
DFE = 0.00 8.7 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.4925E-1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2358.7 0.1 11.5 13.2 8.9
LOCATION 0.0 0.0 0.0 2.3 0.0
LOADING 32 1 32 32 31

*****
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.085 32
* 2357.37 C -13.19 8.81 2.35
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 76	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 97 Check 1

```

*****
MEMBER 97 * |=====| Y |=====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * |=====| | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.01 --->| | RY=0.1066E+2
***** | | RZ=0.1748E+2

PARAMETER 8.7 (KNS-METRE)
IN KNS CMS |L33 CAPACITIES
+ L33 L33 IN KNS METRE
+ L33 L33
KL/R-Y= 37.58 | L33 PNC=0.1596E+5
KL/R-Z= 22.92 + L33 pnc=0.2565E+4
UNL = 400.66 | L33 L33 PNT=0.1829E+5
CB = 1.00 + L33 L33 pnt=0.0000E+0
PHIC = 0.85 | L33 L33 MNZ=0.3140E+4
PHIB = 0.90 + L33 L33 mnz=0.8456E+1
FYLD = 35.30 | L33 MNY=0.1549E+4
NSF = 1.00 +-----+ mny=0.2292E+2
DFE = 0.00 8.3 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.8116E-1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2565.4 0.1 13.8 22.9 8.7
LOCATION 0.0 0.0 0.0 2.7 0.0
LOADING 33 32 33 33 33
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.098 33
2564.61 C -22.92 8.46 2.67
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 79	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 100 Check 1

```

*****
MEMBER 100 * |=====| ==|==
* |          ST W14X311          | | --Z
DESIGN CODE * |          | |
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.02 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER          12.9 (KNS-METRE)
IN KNS CMS        +
KL/R-Y= 37.67 |          L26 L26          L26 CAPACITIES
KL/R-Z= 22.97 +          L26          IN KNS METRE
UNL = 401.62 |          L34          PNC=0.1595E+5
CB = 1.00 +          L34          pnc=0.3041E+3
PHIC = 0.85 |          L34          PNT=0.1829E+5
PHIB = 0.90 +          L34 L34          pnt=0.0000E+0
FYLD = 35.30 |L34          MNZ=0.3140E+4
NSF = 1.00 +          mnz=0.1286E+2
DFE = 0.00 12.7          MNY=0.1549E+4
dff = 0.00          mny=0.2256E+2
ABSOLUTE MZ ENVELOPE          VN =0.2969E+4
(WITH LOAD NO.)          vn =0.4874E-1

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      318.7          0.1          14.3          23.6          12.9
LOCATION     0.0          0.0          0.0          3.0          4.0
LOADING    25          31          33          33          26

*****
DESIGN SUMMARY (KNS-METRE)
-----
RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX           MY           MZ           LOCATION
=====
PASS         LRFD-H1-1B-C         0.028         34
304.11 C    -22.56         12.86         3.01
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 81	Rev
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keraf	22-May-15	
File	Date/Time	
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 102 Check 1

```

-----
*****
MEMBER 102 * |=====| Y
* | | | PROPERTIES
* | | | IN CMS UNIT
DESIGN CODE * | | | AX=0.5897E+3
LRFD 1994 * | | | AY=0.1557E+3
* | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.72 --->| RY=0.1066E+2
***** RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0 L0 CAPACITIES
+L0 L0 IN KNS METRE
KL/R-Y= 44.25 |L0 L0 PNC=0.1534E+5
KL/R-Z= 26.98 +L0 L0 pnc=0.0000E+0
UNL = 471.70 |L0 L0 PNT=0.1829E+5
CB = 0.00 +L0 L0 pnt=0.4493E+3
PHIC = 0.85 |L0 L0 MNZ=0.0000E+0
PHIB = 0.90 +L0 L0 mnz=0.0000E+0
FYLD = 35.30 |L0 L0 MNY=0.0000E+0
NSF = 1.00 +-----+ mny=0.0000E+0
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -449.3 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 19 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.025 19
* 449.30 T 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 84	Rev
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 105 Check 1

```

-----
*****
MEMBER 105 * |=====| Y |=====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * |=====| | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.34 --->| | RY=0.1066E+2
***** | RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0 L0 CAPACITIES
|L0 L0 IN KNS METRE
-----+L0 -----
KL/R-Y= 40.73 |L0 L0 PNC=0.1567E+5
KL/R-Z= 24.84 +L0 L0 pnc=0.0000E+0
UNL = 434.24 |L0 L0 PNT=0.1829E+5
CB = 0.00 +L0 L0 pnt=0.5291E+3
PHIC = 0.85 |L0 L0 MNZ=0.0000E+0
PHIB = 0.90 +L0 L0 mnz=0.0000E+0
FYLD = 35.30 |L0 L0 MNY=0.0000E+0
NSF = 1.00 +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
DFE = 0.00 0.0 | VN =0.0000E+0
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.0000E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -529.1 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 31 0 0 0 0
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS TENSION 0.029 31
529.06 T 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 87	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 108 Check 1

```

-----
*****
MEMBER 108 * |=====| ---|---
* |          | |          |
* |          | |          |
DESIGN CODE * |          | |          |
LRFD 1994 * |=====| ---|---
* |          | |          |
* |<---LENGTH (M)= 5.50 --->|
*****
                27.3 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 51.59 |          |          |          |          |
KL/R-Z= 31.46 +          |          |          |          |
UNL = 550.00 |          |          |          |          |
CB = 1.00 +          |          |          |          |
PHIC = 0.85 |          |          |          |          |
PHIB = 0.90 +          |          |          |          |
FYLD = 35.30 |L33    |          |          |          |
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 17.7
dff = 0.00
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      382.5          3.2          8.4          25.2          27.3
LOCATION     0.0           0.0           0.0           0.0           5.5
LOADING    26            15            29            26            34
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-C    0.035    26
382.50 C    25.24    18.12    0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 88	Rev
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By	Date	Chd
keraf	22-May-15	
File	Date/Time	
Jembatan Pelengkung.stc	27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 109 Check 1

```

-----
*****
MEMBER 109 * |=====| Y
* | | | PROPERTIES
* | | | IN CMS UNIT
DESIGN CODE * | | | AX=0.5897E+3
LRFD 1994 * | | | AY=0.1557E+3
* | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* | | | RY=0.1066E+2
* | | | RZ=0.1748E+2
*****
|<---LENGTH (M) = 4.71 --->|
-----
PARAMETER 34.9 (KNS-METRE)
IN KNS CMS |L33 CAPACITIES
+-----+ | L33 L33 IN KNS METRE
+-----+ | L33 L33
KL/R-Y= 44.20 | | PNC=0.1534E+5
KL/R-Z= 26.95 + | | pnc=0.2975E+4
UNL = 471.17 | | PNT=0.1829E+5
CB = 1.00 + | | pnt=0.0000E+0
PHIC = 0.85 | | MNZ=0.3133E+4
PHIB = 0.90 + | | mnz=0.2425E+1
FYLD = 35.30 | | MNY=0.1549E+4
NSF = 1.00 +-----+ | | mny=0.1973E+2
DFE = 0.00 1.2 | | VN =0.2969E+4
dff = 0.00 | | vn =0.6882E+1
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2987.7 6.9 14.7 19.8 34.9
LOCATION 0.0 0.0 4.7 4.7 0.0
LOADING 34 34 30 31 33
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.110 33
2975.17 C 19.73 2.43 4.71
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 89	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 110 Check 1

```

-----
*****
MEMBER 110 * |=====| ==|==
* |          |   |
* |          |   |
DESIGN CODE * |          |   |
LRFD 1994 * |=====| ==|==
* |          |   |
* |<---LENGTH (M)= 4.53 --->|   |
*****
                28.9 (KNS-METRE)
PARAMETER    |
IN KNS  CMS  |
-----+-----
KL/R-Y= 42.51 |          L26 L26
KL/R-Z= 25.92 +          L26
UNL = 453.18 |          L26
CB = 1.00 +          L26
PHIC = 0.85 |
PHIB = 0.90 +L14 L26 L26
FYLD = 35.30 | L15
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 -0.3
dff = 0.00
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2577.3         6.9         11.7         19.8         28.9
LOCATION     0.0           0.0           0.0           0.0           4.5
LOADING    33            34            26            31            26
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS      LRFD-H1-1B-C      0.100      33
*          2566.71 C      11.89      -28.76      4.53
*
*****
-----

```



SKRIPSI JEMBATAN

Job No	Sheet No 90	Rev
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Software licensed to Snow Panther [L20]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 111 Check 1

```

*****
MEMBER 111 * |=====| ==|==
* |          ST W14X311          | | --Z
DESIGN CODE * |          | |
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.38 --->|
*****
                    58.9 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 41.07 |          L26 L26
KL/R-Z= 25.04 +          L26
UNL = 437.82 |          L26
CB = 1.00 +
PHIC = 0.85 |          L26
PHIB = 0.90 + L26 L26
FYLD = 35.30 |L26
NSF = 1.00 +-----+
DFE = 0.00 27.2
dff = 0.00
                    ABSOLUTE MZ ENVELOPE
                    (WITH LOAD NO.)

                    MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                    -----
                    AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2140.6           6.9           10.1           11.9           58.9
LOCATION     0.0             0.0           0.0           0.0           4.4
LOADING    32              34            34            23            26
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-C          0.094       32
2131.78 C    11.39                  -58.83      4.38
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 92	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 120 Check 1

```

-----
*****
MEMBER 120 * |=====| Y
* |-----| |=====| PROPERTIES
* |          ST W14X311 | |-----| IN CMS UNIT
DESIGN CODE * |          | |-----| AX=0.5897E+3
* |          | |-----| AY=0.1557E+3
LRFD 1994 * |          | |-----| AZ=0.3155E+3
* |          | |-----| PY=0.4982E+4
* |          | |-----| PZ=0.9881E+4
* |<---LENGTH (M)= 4.32 --->| |-----| RY=0.1066E+2
***** |-----| RZ=0.1748E+2

PARAMETER 7.1 (KNS-METRE)
IN KNS CMS |-----| L15 CAPACITIES
+-----+ |-----| IN KNS METRE
+-----+ |-----|
KL/R-Y= 40.48 |-----| L26 L26 PNC=0.1570E+5
KL/R-Z= 24.69 +-----| pnc=0.3094E+3
UNL = 431.56 |-----| L26 L26 PNT=0.1829E+5
CB = 1.00 +-----| pnt=0.0000E+0
PHIC = 0.85 |-----| L32 MNZ=0.3140E+4
PHIB = 0.90 +-----| L34 L32 mnz=0.4767E+1
FYLD = 35.30 |-----| L34 MNY=0.1549E+4
NSF = 1.00 +-----| mny=0.2029E+2
DFE = 0.00 4.6 +-----| VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.5275E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 309.4 1.0 12.0 20.4 7.1
LOCATION 0.0 0.0 0.0 0.0 4.3
LOADING 26 1 26 33 15
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.024 26
309.42 C 20.29 -4.77 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 93	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 121 Check 1

```

*****
MEMBER 121 * |=====| ==|==
* |          ST W14X311          | | --Z
DESIGN CODE * |          | |
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.23 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER          7.0 (KNS-METRE)
IN KNS CMS          L26 CAPACITIES
KL/R-Y= 39.69      |          L26          |
KL/R-Z= 24.20      +          L26          |
UNL = 423.14      |          L26          |
CB = 1.00          +          L26          |
PHIC = 0.85       |          L26          |
PHIB = 0.90       +L15L15 L15          L26
FYLD = 35.30      |          L15 L15          |
NSF = 1.00        +-----+-----+-----+-----+
DFE = 0.00        6.8
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      647.2          0.1          10.1          12.3          7.0
LOCATION     0.0            0.0           4.2           4.2           4.2
LOADING    26             14            30            32            26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY              MZ          LOCATION
=====
PASS          LRFD-H1-1B-C          0.030          26
640.36 C      11.80              -7.03          4.23
*
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 124 Check 1

```

*****
MEMBER 124 * |=====| ==|==
* |          ST W14X311          | | --Z
DESIGN CODE * |          | |
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.06 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER      8.6 (KNS-METRE)
IN KNS CMS    |
+-----+
| KL/R-Y= 38.09 | | L26 L26
| KL/R-Z= 23.23 | | L26 L26
| UNL = 406.08 | | L26
| CB = 1.00 | | L26
| PHIC = 0.85 | | L26 L26
| PHIB = 0.90 | | L26
| FYLD = 35.30 | | L26
| NSF = 1.00 | |
| DFF = 0.00 | 7.6
| dff = 0.00 |
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    1916.5        0.2         11.2         7.5         8.6
LOCATION   0.0            0.0         0.0         2.4         4.1
LOADING  34             15          34          26          26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-C    0.068      34
1914.44 C    -7.44          -8.21      2.37
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 125 Check 1

```

*****
MEMBER 125 * |=====| Y |====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * |=====| | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.03 --->| | RY=0.1066E+2
***** | RZ=0.1748E+2

PARAMETER 8.8 (KNS-METRE)
IN KNS CMS |L26 CAPACITIES
+ L26 L26 IN KNS METRE
+ L26 L26
KL/R-Y= 37.77 | L34 PNC=0.1594E+5
KL/R-Z= 23.03 + pnc=0.2324E+4
UNL = 402.64 | L34 L34 PNT=0.1829E+5
CB = 1.00 + pnt=0.0000E+0
PHIC = 0.85 | L34 MNZ=0.3140E+4
PHIB = 0.90 + L34 L34 mnz=0.8648E+1
FYLD = 35.30 | L34 MNY=0.1549E+4
NSF = 1.00 +-----+ mny=0.1218E+2
DFE = 0.00 8.5 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.7681E-1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2325.3 0.1 11.1 12.2 8.8
LOCATION 0.0 0.0 0.0 2.3 0.0
LOADING 34 26 34 34 26

*****
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.083 34
* 2323.95 C -12.18 -8.65 2.35
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 127 Check 1

```

*****
MEMBER 127 * |=====| Y |====| PROPERTIES
* | | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | | --Z | AY=0.1557E+3
LRFD 1994 * |=====| | | AZ=0.3155E+3
* | | | | PY=0.4982E+4
* | <---LENGTH (M)= 4.14 ---> | | | PZ=0.9881E+4
***** | | | | RY=0.1066E+2
| | | | RZ=0.1748E+2

12.7 (KNS-METRE)
PARAMETER | L34 CAPACITIES
IN KNS CMS | L34 IN KNS METRE
-----+-----
KL/R-Y= 38.84 | L34 PNC=0.1585E+5
KL/R-Z= 23.68 + L34 pnc=0.1202E+4
UNL = 414.06 | L34 PNT=0.1829E+5
CB = 1.00 + L34 pnt=0.0000E+0
PHIC = 0.85 |L24 MNZ=0.3140E+4
PHIB = 0.90 + L24 L24 mnz=0.1204E+2
FYLD = 35.30 | L24 L24 L34 MNY=0.1549E+4
NSF = 1.00 +-----+-----+-----+-----+-----+-----| mny=0.6952E+1
DFE = 0.00 11.9 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.1018E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1202.3 0.4 11.4 7.2 12.7
LOCATION 0.0 0.0 0.0 2.4 4.1
LOADING 22 14 34 26 34

*****
* DESIGN SUMMARY (KNS-METRE) *
*-----*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/ *
* FX MY MZ LOCATION *
*-----*
PASS LRFD-H1-1B-C 0.046 22
1202.30 C 6.95 -12.04 0.00
*-----*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 128 Check 1

```

-----
*****
MEMBER 128 * |=====| ==|==
* |      ST W14X311      | | --Z
DESIGN CODE * |=====| ==|==
LRFD 1994 *
* |<---LENGTH (M)= 4.06 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 13.0 (KNS-METRE)
IN KNS CMS | L33 CAPACITIES
+-----+ L33 L33 IN KNS METRE
+-----+
KL/R-Y= 38.11 | L33 PNC=0.1591E+5
KL/R-Z= 23.24 + pnc=0.7472E+3
UNL = 406.25 | L33 L33 PNT=0.1829E+5
CB = 1.00 + pnt=0.0000E+0
PHIC = 0.85 | L33 MNZ=0.3140E+4
PHIB = 0.90 + L34 L34 mnz=0.1180E+2
FYLD = 35.30 |L26 MNY=0.1549E+4
NSF = 1.00 +-----+ mny=0.1032E+2
DFE = 0.00 12.6 VN =0.2969E+4
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.8213E-1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 748.9 0.1 10.9 11.6 13.0
LOCATION 0.0 0.0 0.0 2.4 4.1
LOADING 22 33 34 34 33

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.034 22
747.18 C -10.32 -11.80 2.03
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 129 Check 1

```

*****
MEMBER 129 * |=====| ==|==
* |      ST W14X311      | | --Z
DESIGN CODE * |=====| ==|==
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.02 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER      13.0 (KNS-METRE)
IN KNS CMS    +
L32 CAPACITIES
KL/R-Y= 37.67 |          L32 L32          PNC=0.1595E+5
KL/R-Z= 22.97 +          L32          pnc=0.3504E+3
UNL = 401.62 |          L32          PNT=0.1829E+5
CB = 1.00 +          L32          pnt=0.0000E+0
PHIC = 0.85 |          L32          MNZ=0.3140E+4
PHIB = 0.90 +          L32          mnz=0.1206E+2
FYLD = 35.30 |L33L33 L32          MNY=0.1549E+4
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
DFD = 0.00 13.0          VN =0.2969E+4
dff = 0.00          ABSOLUTE MZ ENVELOPE          vn =0.4484E-1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      352.5          0.1          14.2          23.6          13.0
LOCATION     0.0          0.0          0.0          3.0          4.0
LOADING    21          1          25          34          32

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-C      0.029      22
350.40 C      -21.59      -12.06      2.68
*
*****

```



SKRIPSI JEMBATAN

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Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 130 Check 1

```

-----
|*****|
|MEMBER 130 *|=====|
|DESIGN CODE *|
|LRFD 1994 *|=====|
|*****|
|<---LENGTH (M)= 5.01 --->|
|*****|
|
|PARAMETER 0.0 (KNS-METRE)
|IN KNS CMS |L0
|-----+L0
|KL/R-Y= 46.96 |L0
|KL/R-Z= 28.63 +L0
|UNL = 500.60 |L0
|CB = 0.00 +L0
|PHIC = 0.85 |L0
|PHIB = 0.90 +L0
|FYLD = 35.30 |L0
|NSF = 1.00 +-----+
|DFE = 0.00 0.0
|dff = 0.00
|
|ABSOLUTE MZ ENVELOPE
|(WITH LOAD NO.)
|
|MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
|-----
|
|AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
|
|VALUE -350.7 0.0 0.0 0.0 0.0
|LOCATION 0.0 0.0 0.0 0.0 0.0
|LOADING 26 0 0 0 0
|
|*****|
|*
|* DESIGN SUMMARY (KNS-METRE)
|*
|*
|* RESULT/ CRITICAL COND/ RATIO/ LOADING/
|* FX MY MZ LOCATION
|*
|* PASS TENSION 0.019 26
|* 350.69 T 0.00 0.00 0.00
|*
|*****|
-----

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 131 Check 1

```

*****
MEMBER 131 * |=====| Y |=====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * | | | AZ=0.3155E+3
* |=====| PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.72 --->| RY=0.1066E+2
*****
* | RZ=0.1748E+2
PARAMETER 0.0 (KNS-METRE)
| I0 CAPACITIES
IN KNS CMS | I0 IN KNS METRE
| I0
-----+I0 -----
| KL/R-Y= 44.25 | I0 L0 PNC=0.1534E+5
| KL/R-Z= 26.98 +I0 L0 pnc=0.0000E+0
| UNL = 471.70 | I0 L0 PNT=0.1829E+5
| CB = 0.00 +I0 L0 pnt=0.3915E+3
| PHIC = 0.85 | I0 L0 MNZ=0.0000E+0
| PHIB = 0.90 +I0 L0 mnz=0.0000E+0
| FYLD = 35.30 | I0 L0 mny=0.0000E+0
| NSF = 1.00 +-----+-----+-----+-----+-----+-----+
| DFF = 0.00 0.0 VN =0.0000E+0
| dff = 0.00 vn =0.0000E+0
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -391.5 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 26 0 0 0 0
*****
* |
* | DESIGN SUMMARY (KNS-METRE) |
* |-----| |
* | | | | |
* | RESULT/ CRITICAL COND/ RATIO/ LOADING/ |
* | FX MY MZ LOCATION |
* |-----| |
* | PASS TENSION 0.021 26 |
* | 391.52 T 0.00 0.00 0.00 |
* | | | | |
*****

```




SKRIPSI JEMBATAN

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Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 132 Check 1

```

-----
*****
MEMBER 132 * |=====| Y |=====| PROPERTIES
* | | | IN CMS UNIT
* | ST W14X311 | | | AX=0.5897E+3
DESIGN CODE * | | | --Z | AY=0.1557E+3
LRFD 1994 * | | | AZ=0.3155E+3
* | | | PY=0.4982E+4
* | | | PZ=0.9881E+4
* |<---LENGTH (M)= 4.52 --->| | | RY=0.1066E+2
***** | | | RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0 L0 CAPACITIES
|L0 L0 IN KNS METRE
-----+L0 -----
KL/R-Y= 42.38 |L0 L0 PNC=0.1552E+5
KL/R-Z= 25.84 +L0 L0 pnc=0.0000E+0
UNL = 451.77 |L0 L0 PNT=0.1829E+5
CB = 0.00 +L0 L0 pnt=0.4398E+3
PHIC = 0.85 |L0 L0 MNZ=0.0000E+0
PHIB = 0.90 +L0 L0 mnz=0.0000E+0
FYLD = 35.30 |L0 L0 MNY=0.0000E+0
NSF = 1.00 +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
DFE = 0.00 0.0 | VN =0.0000E+0
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.0000E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -439.8 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 0 0 0 0
*****
* DESIGN SUMMARY (KNS-METRE) *
* ----- *
* RESULT/ CRITICAL COND/ RATIO/ LOADING/ *
* FX MY MZ LOCATION *
=====
PASS TENSION 0.024 34
439.79 T 0.00 0.00 0.00
*
*****

```



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keraf	22-May-15	
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 133 Check 1

```

*****
MEMBER 133 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.40 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 41.30 |L0
KL/R-Z= 25.18 +L0
UNL = 440.29 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 |
dff = 0.00 ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -491.1 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.027 34
* 491.12 T 0.00 0.00 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 134 Check 1

```

*****
MEMBER 134 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.34 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 40.73 |L0
KL/R-Z= 24.84 +L0
UNL = 434.24 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -498.5 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.027 34
* 498.52 T 0.00 0.00 0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 135 Check 1

```

*****
MEMBER 135 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.34 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 40.70 |L0
KL/R-Z= 24.82 +L0
UNL = 433.85 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -461.3 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.025 34
* 461.33 T 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 137 Check 1

```

*****
MEMBER 137 * |=====| ==|==
DESIGN CODE * |          ST W14X311          | --Z
LRFD 1994 * |=====| ==|==
* |<---LENGTH (M)= 4.00 --->|
*****
PARAMETER      8.3 (KNS-METRE)
IN KNS  CMS   +
KL/R-Y= 37.52 |          L34 L34          |
KL/R-Z= 22.88 +
UNL = 400.00 |          L34          |
CB = 1.00 +          L33
PHIC = 0.85 |          L33
PHIB = 0.90 + L33 L33
FYLD = 35.30 |L33
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 8.3
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2060.8         0.0          10.2          28.5          8.3
LOCATION     0.0           0.0           4.0           2.0           4.0
LOADING     34            32            33            34            34
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.086     34
*  2060.80 C  -28.54                   8.30     2.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 139 Check 1

```

*****
MEMBER 139 *
DESIGN CODE *
LRFD 1994 *
*****
|<---LENGTH (M) = 2.24 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2
*****
PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 21.00 |L0
KL/R-Z= 12.80 +L0
UNL = 223.83 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0
*****
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
*****
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*****
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 570.2 0.0 0.0 0.0 0.0
LOCATION 2.2 0.0 0.0 0.0 0.0
LOADING 23 0 0 0 0
*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS COMPRESSION 0.033 23
570.19 C 0.00 0.00 2.24
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 140 Check 1

```

*****
MEMBER 140 *
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 2.24 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 21.00 |L0
KL/R-Z= 12.80 +L0
UNL = 223.83 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 573.9 0.0 0.0 0.0 0.0
LOCATION 2.2 0.0 0.0 0.0 0.0
LOADING 25 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.033 25
* 573.85 C 0.00 0.00 2.24
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 155 Check 1

```

*****
MEMBER 155 * |=====| ==||==
* |          | ||
* |          | || --Z
DESIGN CODE * |          | ||
LRFD 1994 * |-----| ||
* |          | ||
* |<---LENGTH (M)= 4.92 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER      1.5 (KNS-METRE)
IN KNS CMS     |L29
CAPACITIES
IN KNS METRE
-----+
KL/R-Y= 134.18 | L29
KL/R-Z= 176.78 +
UNL = 492.44 | L29
CB = 1.00 + L24 L24 L25
PHIC = 0.85 | L29
PHIB = 0.90 + L24
FYLD = 35.30 | L28
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    7.0          1.0          0.0          0.1          1.5
LOCATION   0.0          0.0          0.0          0.0          0.0
LOADING  24          32          24          24          29

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS        LRFD-H1-1B-C    0.203      25
6.98 C      0.08          1.54       0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]
 Job Title Jembatan Pelengkung
 Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 156 Check 1

```

*****
MEMBER 156 * |=====| ==||==
* | | |
* | LD L90X90X9 | | | --Z
DESIGN CODE * | | |
LRFD 1994 * | | |
* |-----|
* |<---LENGTH (M)= 4.92 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L15
-----+
KL/R-Y= 134.18 | L15
KL/R-Z= 176.78 + | L34 L34 L33
UNL = 492.44 | L15 L34
CB = 1.00 + | L34
PHIC = 0.85 | L15
PHIB = 0.90 + | L34
FYLD = 35.30 | L15
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 13.4 1.0 0.0 0.1 1.5
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 33 34 34 15

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*-----*
* PASS LRFD-H1-1B-C 0.231 33
* 13.43 C -0.09 1.54 0.00
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 180 Check 1

```

-----
*****
MEMBER 180 * |=====| ---|---
* |      ST H300X300X10      | | ---Z
DESIGN CODE * |-----| ---|---
LRFD 1994 * |-----| ---|---
* |<---LENGTH (M)= 4.00 --->|
*****
Y
PROPERTIES
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

19.3 (KNS-METRE)
PARAMETER | L27 L27 L27 L19 CAPACITIES
IN KNS CMS | L27 L27 L27 IN KNS METRE
-----+-----+-----+-----+-----
KL/R-Y= 52.98 | L27 | PNC=0.2894E+4
KL/R-Z= 30.62 + | | pnc=0.0000E+0
UNL = 400.00 | | PNT=0.3673E+4
CB = 1.00 + L27 | L27 L19 | pnt=0.2492E+3
PHIC = 0.85 | | MNZ=0.4178E+3
PHIB = 0.90 + | L19 | mnz=0.1811E+2
FYLD = 35.30 | L19 | MNY=0.1430E+3
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 -0.7 | | vN =0.5719E+3
dff = 0.00 | | vn =0.3081E+2
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -251.9 31.1 16.4 34.9 19.3
LOCATION 0.0 4.0 0.0 0.0 4.0
LOADING 24 19 33 33 19
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.292 34
249.16 T -30.73 18.11 4.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 182 Check 1

```

*****
MEMBER 182 * |=====| ---|---
* |          ST H300X300X10 | | --Z
DESIGN CODE * |          | |
LRFD 1994 * |=====| ---|---
* |<---LENGTH (M)= 4.00 --->|
*****
                20.8 (KNS-METRE)
PARAMETER      |          |          |          |          |
IN KNS  CMS    |          |          |          |          |
-----+-----+-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 52.98  |          |          |          |          |
KL/R-Z= 30.62  +          L27          L27          |          |
UNL   = 400.00 |          |          |          |          |
CB    = 1.00   +          L27          |          |
PHIC  = 0.85   |          |          |          |          |
PHIB  = 0.90   +          |          |          |          |
FYLD  = 35.30 |L19          |          |          |          |
NSF   = 1.00  +-----+-----+-----+-----+-----+-----+-----+
DFE   = 0.00  -0.6          |          |          |          |          |
dff   = 0.00          |          |          |          |          |
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)
                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -112.7        31.5         16.8         34.0         20.8
LOCATION     0.0          4.0          0.0          0.0          4.0
LOADING    34           19           25           25           19
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS      LRFD-H1-1B-T      0.296      25
*          111.30 T      33.36      19.75      4.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 190 Check 1

```

*****
MEMBER 190 * |=====| ---|---|
* |      ST H300X300X10      | | |
DESIGN CODE * |-----| | |
LRFD 1994 * |=====| ---|---|
* |<---LENGTH (M)= 4.00 --->| | |
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

12.1 (KNS-METRE)
PARAMETER | L27 L27 L27
IN KNS CMS |
-----+-----+-----+
KL/R-Y= 52.98 | L27 | PNC=0.2894E+4
KL/R-Z= 30.62 + L27 | pnc=0.0000E+0
UNL = 400.00 | | PNT=0.3673E+4
CB = 1.00 + L27 | pnt=0.1824E+2
PHIC = 0.85 | L27 | MNZ=0.4178E+3
PHIB = 0.90 + | L20 mnz=0.5840E+0
FYLD = 35.30 |L19 | MNY=0.1430E+3
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.0 | | vny=0.2397E+2
dfc = 0.00 | | VN =0.5719E+3
ABSOLUTE MZ ENVELOPE | | vn =0.1221E+2
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -18.2 12.5 10.9 24.0 12.1
LOCATION 0.0 4.0 0.0 0.0 2.0
LOADING 33 20 33 33 27

*****
DESIGN SUMMARY (KNS-METRE)
-----
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.172 34
18.24 T 23.97 0.58 0.00
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 192 Check 1

```

*****
MEMBER 192 * |=====| ---|---
* |      ST H300X300X10      | |  --Z
DESIGN CODE * |-----| ---|---
LRFD 1994 * |-----| ---|---
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

12.9 (KNS-METRE)
PARAMETER | L27 L27 L27
IN KNS CMS |
-----+-----+-----+
KL/R-Y= 52.98 | L27 L27
KL/R-Z= 30.62 + L27 L27
UNL = 400.00 |
CB = 1.00 + L27
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L19
NSF = 1.00 +-----+
DFE = 0.00 -0.7
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 17.6 12.6 1.2 2.6 12.9
LOCATION 0.0 0.0 0.0 4.0 2.0
LOADING 25 27 25 25 27

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.038 18
17.14 C 1.03 -11.72 2.67
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 194 Check 1

```

-----
*****
MEMBER 194 * |=====| ==|==
* |      ST H300X300X10      | | --Z
DESIGN CODE * |=====| ==|==
LRFD 1994 *
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTIES
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

11.2 (KNS-METRE)
PARAMETER | L27 L27 L27
IN KNS CMS |
-----+
KL/R-Y= 52.98 | L27
KL/R-Z= 30.62 + L27
UNL = 400.00 | L27
CB = 1.00 +
PHIC = 0.85 | L27
PHIB = 0.90 +
FYLD = 35.30 |L19
NSF = 1.00 +-----+
DFE = 0.00 -0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -5.0 13.0 8.7 19.3 11.2
LOCATION 0.0 4.0 0.0 0.0 2.0
LOADING 34 20 25 25 27

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
-----
PASS LRFD-H1-1B-T 0.137 25
4.93 T -19.34 0.46 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 1779 Check 1

```

*****
MEMBER 1779*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.99 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L18
CAPACITIES
IN KNS METRE
PNC=0.1148E+3
pnc=0.1025E+0
PNT=0.7582E+3
CB = 1.00 + pnt=0.0000E+0
PHIC = 0.85 | L18 L28 L28 MNZ=0.9251E+1
PHIB = 0.90 + mnz=0.1492E+1
FYLD = 35.30 | L18 L26 MNY=0.1346E+2
NSF = 1.00 +-----+ mny=0.8001E+0
DFE = 0.00 0.1 VN =0.2402E+3
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.9298E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -4.3 0.9 0.3 0.8 1.5
LOCATION 5.0 0.0 0.0 0.0 0.0
LOADING 34 18 25 25 18

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.221 18
* 0.10 C -0.80 1.49 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 123	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1780 Check 1

```

*****
MEMBER 1780*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.99 --->|
*****

PARAMETER          1.6 (KNS-METRE)
IN KNS  CMS        |L27
-----+-----+
KL/R-Y= 127.05 |
KL/R-Z= 179.15 +
UNL   = 499.06 |          L27
CB    = 1.00 +
PHIC  = 0.85 |          L27          L19 L19
PHIB  = 0.90 +          L27
FYLD  = 35.30 |          L15
NSF   = 1.00 +-----+-----+-----+-----+
DFE   = 0.00 0.1
dff   = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+-----+-----+-----+
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      9.9        0.9        0.3         0.8         1.6
LOCATION     0.0        0.0        0.0         0.0         0.0
LOADING    27        27         34         34         27

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS        LRFD-H1-1B-C    0.274     27
9.91 C     0.83          1.56     0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 124	Rev
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By keraf	Date 22-May-15	Chd
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Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 1781 Check 1

```

*****
MEMBER 1781*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.97 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS |L28
CAPACITIES
IN KNS METRE
PNC=0.1157E+3
pnc=0.1106E+2
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1407E+1
MNY=0.1346E+2
mny=0.5786E+0
VN =0.2402E+3
vn =0.9399E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 11.1 0.9 0.3 0.7 1.4
LOCATION 0.0 0.0 0.0 5.0 0.0
LOADING 28 28 25 34 28

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.243 28
* 11.06 C 0.58 1.41 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 125	Rev
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keraf	22-May-15	
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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 1782 Check 1

```

*****
MEMBER 1782*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.97 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS |L19
CAPACITIES
IN KNS METRE
PNC=0.1157E+3
pnc=0.2082E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1401E+1
MNY=0.1346E+2
mny=0.5950E+0
VN =0.2402E+3
vn =0.9384E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -2.8 0.9 0.3 0.7 1.4
LOCATION 0.0 0.0 0.0 5.0 0.0
LOADING 14 19 34 25 19

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.205 19
* 2.08 C -0.59 1.40 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 1783 Check 1

```

*****
MEMBER 1783*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.96 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS |L29
CAPACITIES
IN KNS METRE
PNC=0.1163E+3
pnc=0.1245E+2
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1425E+1
MNY=0.1346E+2
mny=0.4744E+0
VN =0.2402E+3
vn =0.9578E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 12.5 1.0 0.2 0.6 1.4
LOCATION 0.0 0.0 0.0 5.0 0.0
LOADING 29 29 25 34 29

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.243 29
* 12.45 C 0.47 1.43 0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 128	Rev
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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1785 Check 1

```

*****
MEMBER 1785*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.95 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS        |L30
-----+-----+
KL/R-Y= 125.99 | L30
KL/R-Z= 177.55 +
UNL = 494.59 | L32 L21
CB = 1.00 + L20
PHIC = 0.85 | L34
PHIB = 0.90 + L20
FYLD = 35.30 | L34
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    6.1        1.0        0.2        0.5        1.5
LOCATION   0.0        0.0        0.0        4.9        0.0
LOADING  21        21        34        25        30

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.214    21
*  6.09 C    -0.38              1.47    0.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 130	Rev
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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1787 Check 1

```

*****
MEMBER 1787*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.94 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L31
CAPACITIES
IN KNS METRE
KL/R-Y= 125.78 | L33
KL/R-Z= 177.23 +
UNL = 493.69 | L34 L21 L22 L22
CB = 1.00 + L21
PHIC = 0.85 | L34
PHIB = 0.90 + L21
FYLD = 35.30 | L34
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 8.0 1.0 0.1 0.4 1.5
LOCATION 0.0 0.0 0.0 4.9 0.0
LOADING 22 22 26 15 31

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.217 22
* 7.97 C -0.27 1.50 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 131	Rev
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 1788 Check 1

```

*****
MEMBER 1788*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.94 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L22
CAPACITIES
IN KNS METRE
KL/R-Y= 125.78 | L24
KL/R-Z= 177.23 +
UNL = 493.69 | L25 L30
CB = 1.00 + L30
PHIC = 0.85 | L25
PHIB = 0.90 + L30
FYLD = 35.30 | L25
NSF = 1.00 +
DFE = 0.00 0.1
dfc = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 15.4 1.0 0.1 0.4 1.5
LOCATION 0.0 0.0 0.0 4.9 0.0
LOADING 31 31 15 26 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.247 31
* 15.42 C 0.26 1.50 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 1789 Check 1

```

*****
MEMBER 1789*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.93 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L34
CAPACITIES
IN KNS METRE
PNC=0.1177E+3
pnc=0.9539E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1534E+1
MNY=0.1346E+2
mny=0.1443E+0
VN =0.2402E+3
vn =0.1009E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 9.5 1.0 0.1 0.2 1.5
LOCATION 0.0 0.0 0.0 4.9 0.0
LOADING 23 23 26 26 34

*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
PASS LRFD-H1-1B-C 0.217 23
9.54 C -0.14 1.53 0.00
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1790 Check 1

```

*****
MEMBER 1790*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L25
CAPACITIES
IN KNS METRE
PNC=0.1177E+3
pnc=0.1661E+2
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1532E+1
MNY=0.1346E+2
mny=0.1275E+0
VN =0.2402E+3
vn =0.1009E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 16.6 1.0 0.1 0.2 1.5
LOCATION 0.0 0.0 0.0 4.9 0.0
LOADING 32 32 1 15 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.246 32
16.61 C 0.13 1.53 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1791 Check 1

```

*****
MEMBER 1791*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L34
CAPACITIES
IN KNS METRE
KL/R-Y= 134.21 | L34
KL/R-Z= 176.83 + L23 L23 L24
UNL = 492.58 | L34 L23
CB = 1.00 + L23
PHIC = 0.85 | L34
PHIB = 0.90 + L23
FYLD = 35.30 | L26
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 10.5 1.0 0.0 0.1 1.5
LOCATION 0.0 0.0 0.0 4.9 0.0
LOADING 24 24 1 1 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.213 24
* 10.47 C -0.02 1.55 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 135	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1792 Check 1

```

*****
MEMBER 1792*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS        |L25
-----+-----+
KL/R-Y= 134.21 | L25
KL/R-Z= 176.83 +
UNL = 492.58 | L25 L32
CB = 1.00 + L32
PHIC = 0.85 | L25
PHIB = 0.90 + L32
FYLD = 35.30 | L15
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    17.2        1.0         0.0         0.1         1.5
LOCATION   0.0         0.0         0.0         4.9         0.0
LOADING  33         24         1          1          25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.240    33
*  17.20 C   0.00              1.55     0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 1793 Check 1

```

*****
MEMBER 1793*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.93 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L26
CAPACITIES
IN KNS METRE
PNC=0.1179E+3
pnc=0.1021E+2
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1534E+1
MNY=0.1216E+2
mny=0.1974E+0
VN =0.2402E+3
vn =0.1012E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 10.2 1.0 0.1 0.2 1.5
LOCATION 4.9 0.0 0.0 4.9 0.0
LOADING 25 26 25 25 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.225 25
* 10.21 C 0.20 1.53 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1794 Check 1

```

*****
MEMBER 1794*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L15
CAPACITIES
IN KNS METRE
KL/R-Y= 134.21 | L15
KL/R-Z= 176.83 + L34 L34 L34
UNL = 492.58 | L15 L34
CB = 1.00 + L34
PHIC = 0.85 | L18
PHIB = 0.90 + L34
FYLD = 35.30 | L18
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 16.4 1.0 0.1 0.2 1.5
LOCATION 4.9 0.0 0.0 4.9 0.0
LOADING 34 15 34 34 15

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.252 34
* 16.41 C -0.21 1.53 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 138	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1795 Check 1

```

*****
MEMBER 1795*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS        |L30
-----+-----+
KL/R-Y= 125.61 | L30
KL/R-Z= 176.97 +
UNL = 492.98 | L30
CB = 1.00 +
PHIC = 0.85 | L30
PHIB = 0.90 +
FYLD = 35.30 | L21
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    8.7        1.0        0.1        0.4        1.5
LOCATION   4.9        0.0        0.0        4.9        0.0
LOADING  25        29        25        25        30

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.226    25
*  8.63 C    0.34                1.52    0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 139	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1796 Check 1

```

*****
MEMBER 1796* |=====| ==||==
* | | |
* | LD L90X90X9 | | --Z
DESIGN CODE * | |
LRFD 1994 * | |
* |-----|
* |<---LENGTH (M)= 4.93 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L21
CAPACITIES
IN KNS METRE
-----+
KL/R-Y= 125.61 | L21 PNC=0.1177E+3
KL/R-Z= 176.97 + pnc=0.1452E+2
UNL = 492.98 | L21 L15 PNT=0.7582E+3
CB = 1.00 + L25 pnt=0.0000E+0
PHIC = 0.85 | L21 MNZ=0.9251E+1
PHIB = 0.90 + L25 mnz=0.1516E+1
FYLD = 35.30 | L30 MNY=0.1346E+2
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 0.1 VN =0.2402E+3
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.1002E+1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 14.6 1.0 0.2 0.4 1.5
LOCATION 4.9 0.0 0.0 4.9 0.0
LOADING 34 20 34 34 21

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.252 34
14.52 C -0.36 1.52 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1797 Check 1

```

*****
MEMBER 1797* |=====| ==||==
* | | |
* | LD L90X90X9 | | | --Z
DESIGN CODE * | | |
LRFD 1994 * | | |
* |-----|
* |<---LENGTH (M)= 4.94 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L21
+-----+
KL/R-Y= 125.78 | L21
KL/R-Z= 177.23 + | L26 L26 L26
UNL = 493.69 | L21 L26
CB = 1.00 + | L26
PHIC = 0.85 | L22
PHIB = 0.90 + | L26
FYLD = 35.30 | L22
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 6.8 1.0 0.2 0.5 1.5
LOCATION 4.9 0.0 0.0 4.9 0.0
LOADING 34 30 25 25 21

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.222 34
6.77 C 0.44 1.49 0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 1798 Check 1

```

*****
MEMBER 1798*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.94 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L30
CAPACITIES
IN KNS METRE
PNC=0.1174E+3
pnc=0.1219E+2
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1485E+1
MNY=0.1346E+2
mny=0.4559E+0
VN =0.2402E+3
vn =0.9869E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 12.3 1.0 0.2 0.5 1.5
LOCATION 4.9 0.0 0.0 4.9 0.0
LOADING 25 21 34 34 30

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.246 25
* 12.19 C -0.46 1.49 0.00
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 1800 Check 1

```

*****
MEMBER 1800*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.95 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS |L22
CAPACITIES
IN KNS METRE
PNC=0.1169E+3
pnc=0.4945E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1446E+1
MNY=0.1346E+2
mny=0.5215E+0
VN =0.2402E+3
vn =0.9695E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 5.0 1.0 0.2 0.6 1.4
LOCATION 4.9 0.0 0.0 4.9 0.0
LOADING 34 30 25 25 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.216 34
* 4.94 C 0.52 1.45 0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1801 Check 1

```

*****
MEMBER 1801* |=====| ==||==
* | | |
* | LD L90X90X9 | | --Z
DESIGN CODE * | |
LRFD 1994 * | |
* |-----|
* |<---LENGTH (M)= 4.96 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS |L31
-----+
KL/R-Y= 126.29 | L31
KL/R-Z= 178.00 + L15 L20 L21
UNL = 495.85 | L31 L15
CB = 1.00 + L15
PHIC = 0.85 | L31
PHIB = 0.90 + L15
FYLD = 35.30 | L15
NSF = 1.00 +-----+
DFE = 0.00 0.0
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 7.8 0.9 0.3 0.7 1.4
LOCATION 5.0 0.0 0.0 5.0 0.0
LOADING 15 22 25 15 31

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.230 25
7.67 C -0.61 1.40 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 1802 Check 1

```

*****
MEMBER 1802*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.96 --->|
*****

PARAMETER          1.4 (KNS-METRE)
IN KNS  CMS        |L22
-----+-----+
KL/R-Y= 126.29 | L22
KL/R-Z= 178.00 +
UNL = 495.85 | L22
CB = 1.00 + L26
PHIC = 0.85 | L22
PHIB = 0.90 + L26
FYLD = 35.30 | L26
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    3.3        0.9        0.3        0.7        1.4
LOCATION   5.0        0.0        0.0        5.0        0.0
LOADING  26        31        34        26        22

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.209    26
*  3.19 C    0.60              1.40    0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 1804 Check 1

```

*****
MEMBER 1804*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.97 --->|
*****

PARAMETER          1.3 (KNS-METRE)
IN KNS  CMS        |L22
-----+-----+
KL/R-Y= 126.62 | L22
KL/R-Z= 178.51 +
UNL = 497.25 | L23
CB = 1.00 + L26
PHIC = 0.85 | L23
PHIB = 0.90 + L26
FYLD = 35.30 | L26
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    1.8         0.9         0.3         0.8         1.3
LOCATION   5.0         0.0         0.0         5.0         0.0
LOADING  26         31         26         26         22

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.200    26
*  1.65 C    0.65              1.34     0.00
*
*****

```



SKRIPSI JEMBATAN

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 Job Title Jembatan Pelengkung
 Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 1805 Check 1

```

*****
MEMBER 1805*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.99 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.2 (KNS-METRE)
IN KNS CMS |L23
CAPACITIES
IN KNS METRE
PNC=0.1148E+3
pnc=0.3801E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1218E+1
MNY=0.1346E+2
mny=0.6482E+0
VN =0.2402E+3
vn =0.8659E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 4.0 0.9 0.3 0.8 1.2
LOCATION 5.0 0.0 0.0 5.0 0.0
LOADING 15 21 15 15 23

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.196 17
* 3.80 C -0.65 1.22 0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3460 Check 1

```

*****
MEMBER 3460*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 3.88 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 36.40 |L0
KL/R-Z= 22.19 +L0
UNL = 388.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 368.5 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 20 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.023 20
* 368.49 C 0.00 0.00 0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3461 Check 1

```

*****
MEMBER 3461*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 3.26 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 30.58 |L0
KL/R-Z= 18.65 +L0
UNL = 326.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 315.2 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 21 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.019 21
* 315.21 C 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3462 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3462*  |=====|  ===|===  -----
*                                     |      |
DESIGN CODE *  |          ST  W14X311  |  --Z  |
LRFD 1994 *  |=====|  ===|===  PY=0.4982E+4
*                                     |      |
*  |<---LENGTH (M)=  2.76 --->|      |      RZ=0.1748E+2
*****

PARAMETER          0.0 (KNS-METRE)
IN KNS  CMS        |L0
+L0
KL/R-Y=  25.89    |L0
KL/R-Z=  15.79    +L0
UNL   = 276.00    |L0
CB    =  0.00     +L0
PHIC  =  0.85     |L0
PHIB  =  0.90     +L0
FYLD  = 35.30    |L0
NSF   =  1.00    +-----+
DFE   =  0.00    0.0
dff   =  0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      248.8      0.0        0.0         0.0        0.0
LOCATION     0.0        0.0        0.0         0.0        0.0
LOADING    23         0          0           0          0

*****
*                                     *
*                                     *
*          DESIGN SUMMARY (KNS-METRE)  *
*          -----                    *
*          RESULT/      CRITICAL COND/  RATIO/      LOADING/
*          FX           MY              MZ          LOCATION
*          =====
*          PASS        COMPRESSION      0.015      23
*          248.82 C    0.00             0.00       0.00
*                                     *
*****

```



SKRIPSI JEMBATAN

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keraf	22-May-15	
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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3463 Check 1

```

*****
MEMBER 3463*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 2.39 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 22.42 |L0
KL/R-Z= 13.67 +L0
UNL = 239.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 159.9 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 24 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.009 24
* 159.93 C 0.00 0.00 0.00
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3465 Check 1

```

*****
MEMBER 3465*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 2.01 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 18.85 |L0
KL/R-Z= 11.50 +L0
UNL = 201.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -377.5 0.0 0.0 0.0 0.0
LOCATION 2.0 0.0 0.0 0.0 0.0
LOADING 33 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.021 33
* 377.51 T 0.00 0.00 2.01
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3466 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3466* |=====| ===|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      |      --Z  AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
LRFD 1994 * |=====| ===|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.63 --->| |      PZ=0.9881E+4
***** |      |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2

PARAMETER          0.0 (KNS-METRE)
|PARAMETER          |L0
|IN KNS  CMS        |L0
|-----|
|KL/R-Y= 43.43     |L0
|KL/R-Z= 26.48     +L0
|UNL = 463.00     |L0
|CB = 0.00         +L0
|PHIC = 0.85      |L0
|PHIB = 0.90      +L0
|FYLD = 35.30     |L0
|NSF = 1.00       +-----+
|DFE = 0.00       0.0
|dff = 0.00
|df = 0.00
|
|ABSOLUTE MZ ENVELOPE
|      (WITH LOAD NO.)
|
|MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
|-----|
|      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
|
|VALUE      354.0      0.0      0.0      0.0      0.0
|LOCATION     0.0      0.0      0.0      0.0      0.0
|LOADING    15      0      0      0      0
|
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS      COMPRESSION      0.023      17
*          354.02 C      0.00      0.00      0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3467 Check 1

```

*****
MEMBER 3467*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 3.88 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 36.40 |L0
KL/R-Z= 22.19 +L0
UNL = 388.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 334.2 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 25 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.021 25
* 334.18 C 0.00 0.00 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3468 Check 1

```

*****
MEMBER 3468*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 3.26 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 30.58 |L0
KL/R-Z= 18.65 +L0
UNL = 326.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 297.9 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 25 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.018 25
* 297.95 C 0.00 0.00 0.00
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3470 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
MEMBER 3470* |=====| ===|===
*                                     |      AX=0.5897E+3
*          ST W14X311 |      |      AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
LRFD 1994 * |=====| ===|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 2.39 --->| |      PZ=0.9881E+4
***** |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2

PARAMETER          0.0 (KNS-METRE)
IN KNS CMS         |L0
KL/R-Y= 22.42      |L0
KL/R-Z= 13.67      +L0
UNL = 239.00      |L0
CB = 0.00          +L0
PHIC = 0.85       |L0
PHIB = 0.90       +L0
FYLD = 35.30      |L0
NSF = 1.00        +-----+
DFE = 0.00        0.0
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      166.1      0.0        0.0         0.0         0.0
LOCATION     0.0        0.0        0.0         0.0         0.0
LOADING    25         0          0           0           0

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX           MY           MZ           LOCATION
*          =====
*          PASS        COMPRESSION    0.010      25
*          166.09 C    0.00        0.00      0.00
*          *****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3471 Check 1

```

-----
*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3471* |=====| ---|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      |      AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
*          LRFD 1994 * |=====| ---|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 2.14 --->| |      PZ=0.9881E+4
***** |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
*                                     |
PARAMETER      0.0 (KNS-METRE)
|PARAMETER     |L0
|IN KNS  CMS   |L0
|-----|L0
|KL/R-Y= 20.07 |L0
|KL/R-Z= 12.24 +L0
|UNL  = 214.00 |L0
|CB   = 0.00   +L0
|PHIC = 0.85   |L0
|PHIB = 0.90   +L0
|FYLD = 35.30 |L0
|NSF  = 1.00   +-----+
|DFE  = 0.00   0.0
|dff  = 0.00
|
|          ABSOLUTE MZ ENVELOPE
|          (WITH LOAD NO.)
|
|          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
|          -----
|          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
|          VALUE      61.1          0.0          0.0          0.0          0.0
|          LOCATION   0.0          0.0          0.0          0.0          0.0
|          LOADING    33          0          0          0          0
|
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/    CRITICAL COND/    RATIO/    LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS        COMPRESSION    0.004    33
*          61.12 C     0.00          0.00    0.00
*
*****
-----

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3472 Check 1

```

*****
MEMBER 3472*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 2.01 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 18.85 |L0
KL/R-Z= 11.50 +L0
UNL = 201.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -371.7 0.0 0.0 0.0 0.0
LOCATION 2.0 0.0 0.0 0.0 0.0
LOADING 25 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.020 25
* 371.71 T 0.00 0.00 2.01
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3473 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3473* |=====|====|====|-----|
*                                     |      |      |      |
DESIGN CODE * |      ST  W14X311      |      |      |      |
*                                     |      |      |      |
LRFD 1994 * |=====|====|====|-----|
*                                     |      |      |      |
* |<---LENGTH (M)= 2.24 --->|      |      |      |
*****
*                                     |      |      |      |
PARAMETER      0.0 (KNS-METRE)      |      |      |      |
* |L0 CAPACITIES
IN KNS  CMS    |L0 IN KNS METRE
* |L0
-----+L0-----
* |L0 PNC=0.1713E+5
KL/R-Y= 21.00 |L0 pnc=0.6100E+3
* |L0
KL/R-Z= 12.80 +L0 PNT=0.1829E+5
* |L0
UNL = 223.83 |L0 pnt=0.0000E+0
* |L0
CB = 0.00 +L0 MNZ=0.0000E+0
* |L0
PHIC = 0.85 |L0 mnz=0.0000E+0
* |L0
PHIB = 0.90 +L0 MNY=0.0000E+0
* |L0
FYLD = 35.30 |L0 mny=0.0000E+0
* |L0
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
* |L0 VN =0.0000E+0
DFE = 0.00 0.0 vn =0.0000E+0
* |L0
dff = 0.00
*
*                                     ABSOLUTE MZ ENVELOPE
*                                     (WITH LOAD NO.)
*
*                                     MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*                                     -----
*
*                                     AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*                                     VALUE      610.0      0.0      0.0      0.0      0.0
* LOCATION      2.2      0.0      0.0      0.0      0.0
* LOADING      32      0      0      0      0
*
*****
*
*                                     DESIGN SUMMARY (KNS-METRE)
*                                     -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
* FX          MY          MZ          LOCATION
*
*=====
* PASS      COMPRESSION      0.036      32
* 610.00 C      0.00      0.00      2.24
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3474 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3474* |=====| ===|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      |      --Z  AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
LRFD 1994 * |=====| ===|===
*                                     PY=0.4982E+4
*          |<---LENGTH (M)= 2.24 --->|      PZ=0.9881E+4
*****                                     RY=0.1066E+2
*                                     RZ=0.1748E+2

PARAMETER          0.0 (KNS-METRE)
IN KNS  CMS        |L0
+L0
KL/R-Y= 21.00 |L0
KL/R-Z= 12.80 +L0
UNL = 223.83 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      591.8      0.0        0.0          0.0          0.0
LOCATION     2.2        0.0        0.0          0.0          0.0
LOADING    34         0          0            0            0

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX           MY           MZ           LOCATION
*          =====
*          PASS        COMPRESSION    0.035        34
*          591.83 C    0.00        0.00        2.24
*          *
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3475 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3475* |=====| ===|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      |      AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
*          LRFD 1994 * |=====| ===|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.63 --->| |      PZ=0.9881E+4
***** |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
*                                     |
PARAMETER      0.0 (KNS-METRE)
* IN KNS  CMS |L0      L0 CAPACITIES
*          |L0      L0 IN KNS METRE
*          +L0      L0
* KL/R-Y= 43.43 |L0      L0 PNC=0.1542E+5
* KL/R-Z= 26.48 +L0      L0 pnc=0.4052E+3
* UNL = 463.00 |L0      L0 PNT=0.1829E+5
* CB = 0.00 +L0      L0 pnt=0.0000E+0
* PHIC = 0.85 |L0      L0 MNZ=0.0000E+0
* PHIB = 0.90 +L0      L0 mnz=0.0000E+0
* FYLD = 35.30 |L0      L0 MNY=0.0000E+0
* NSF = 1.00 +-----+-----+-----+-----+-----+-----+
* DFF = 0.00 0.0 |      VN =0.0000E+0
* dff = 0.00 |      vn =0.0000E+0
*
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*          VALUE      405.2      0.0      0.0      0.0      0.0
*          LOCATION      0.0      0.0      0.0      0.0      0.0
*          LOADING      19      0      0      0      0
*
*****
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX      MY      MZ      LOCATION
*          =====
*          PASS      COMPRESSION      0.026      19
*          405.19 C      0.00      0.00      0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3476 Check 1

```

*****
MEMBER 3476*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 3.88 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 36.40 |L0
KL/R-Z= 22.19 +L0
UNL = 388.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 373.1 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 29 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.023 29
* 373.06 C 0.00 0.00 0.00
*
*****

```



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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3477 Check 1

```

*****
MEMBER 3477*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 3.26 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 30.58 |L0
KL/R-Z= 18.65 +L0
UNL = 326.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 323.1 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 30 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.020 30
* 323.13 C 0.00 0.00 0.00
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3478 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
MEMBER 3478* |=====| ===|===
*                                     |      --Z
DESIGN CODE * |      ST W14X311
*                                     |
LRFD 1994 * |=====| ===|===
*                                     |
* |<---LENGTH (M)= 2.76 --->|
*****
*                                     |
*                                     |L0 CAPACITIES
PARAMETER |L0
IN KNS CMS |L0 IN KNS METRE
-----+L0
| KL/R-Y= 25.89 |L0 PNC=0.1685E+5
| KL/R-Z= 15.79 +L0 pnc=0.2589E+3
| UNL = 276.00 |L0 PNT=0.1829E+5
| CB = 0.00 +L0 pnt=0.0000E+0
| PHIC = 0.85 |L0 MNZ=0.0000E+0
| PHIB = 0.90 +L0 mnz=0.0000E+0
| FYLD = 35.30 |L0 MNY=0.0000E+0
| NSF = 1.00 +-----+
| DFF = 0.00 0.0 VN =0.0000E+0
| dff = 0.00 vn =0.0000E+0
*
* ABSOLUTE MZ ENVELOPE
* (WITH LOAD NO.)
*
* MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*
* AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
*
* VALUE 258.9 0.0 0.0 0.0 0.0
* LOCATION 0.0 0.0 0.0 0.0 0.0
* LOADING 32 0 0 0 0
*
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.015 32
* 258.90 C 0.00 0.00 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3479 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
MEMBER 3479* |=====| ---|===
*                                     |      AX=0.5897E+3
*          ST W14X311 |      |      AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
*          LRFD 1994 * |=====| ---|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 2.39 --->| |      PZ=0.9881E+4
***** |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
*
PARAMETER          0.0 (KNS-METRE)
|PARAMETER          |L0
|IN KNS CMS         |L0
|-----|
|KL/R-Y= 22.42     |L0
|KL/R-Z= 13.67     +L0
|UNL = 239.00     |L0
|CB = 0.00         +L0
|PHIC = 0.85      |L0
|PHIB = 0.90      +L0
|FYLD = 35.30     |L0
|NSF = 1.00       +-----+
|DFE = 0.00       0.0
|dff = 0.00
|
|ABSOLUTE MZ ENVELOPE
| (WITH LOAD NO.)
|
|MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
|-----|
|          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
|
|VALUE      171.1      0.0          0.0          0.0          0.0
|LOCATION     0.0        0.0          0.0          0.0          0.0
|LOADING    33         0            0            0            0
|
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS        COMPRESSION      0.010      33
*          171.07 C    0.00          0.00          0.00
*
*****

```




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Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3481 Check 1

```

*****
MEMBER 3481*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 2.01 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 18.85 |L0
KL/R-Z= 11.50 +L0
UNL = 201.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -372.3 0.0 0.0 0.0 0.0
LOCATION 2.0 0.0 0.0 0.0 0.0
LOADING 24 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS TENSION 0.020 24
* 372.34 T 0.00 0.00 2.01
*
*****

```



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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3482 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER 3482* |=====| ===|===
*                                     |      --Z
DESIGN CODE * |      ST  W14X311
*                                     |
LRFD 1994 * |=====| ===|===
*                                     |
* |<---LENGTH (M) = 4.63 --->|
*****
*                                     |
PARAMETER      0.0 (KNS-METRE)
* |L0 CAPACITIES
IN KNS  CMS   |L0 IN KNS METRE
* |L0
-----+L0 -----
* |L0 PNC=0.1542E+5
KL/R-Y= 43.43 |L0
* |L0 pnc=0.3600E+3
KL/R-Z= 26.48 +L0
* |L0 PNT=0.1829E+5
UNL = 463.00 |L0
* |L0 pnt=0.0000E+0
CB = 0.00 +L0
* |L0 MNZ=0.0000E+0
PHIC = 0.85 |L0
* |L0 mnz=0.0000E+0
PHIB = 0.90 +L0
* |L0 MNY=0.0000E+0
FYLD = 35.30 |L0
* |L0 mny=0.0000E+0
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
* |VN =0.0000E+0
DFE = 0.00 0.0
* |vn =0.0000E+0
dff = 0.00
*
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*          VALUE      360.0          0.0          0.0          0.0          0.0
*          LOCATION    0.0          0.0          0.0          0.0          0.0
*          LOADING      26          0          0          0          0
*
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS          COMPRESSION          0.023          26
*          359.96 C          0.00          0.00          0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3483 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3483*  |=====|  ===|===  -----
*                                     |      |
DESIGN CODE *  |          ST  W14X311  |  --Z  |
LRFD 1994 *  |=====|  ===|===  PY=0.4982E+4
*                                     |      |
*  |<---LENGTH (M)=  3.88 --->|      |      RZ=0.1748E+2
*****

PARAMETER          0.0 (KNS-METRE)
IN KNS  CMS        |L0          L0  CAPACITIES
+L0                |L0          L0  IN KNS METRE
KL/R-Y=  36.40    |L0          L0  PNC=0.1606E+5
KL/R-Z=  22.19    +L0         L0  pnc=0.3387E+3
UNL   = 388.00    |L0          L0  PNT=0.1829E+5
CB    =  0.00     +L0         L0  pnt=0.0000E+0
PHIC  =  0.85     |L0          L0  MNZ=0.0000E+0
PHIB  =  0.90     +L0         L0  mnz=0.0000E+0
FYLD  = 35.30    |L0          L0  MNY=0.0000E+0
NSF   =  1.00     +-----+
DFE   =  0.00     0.0          VN  =0.0000E+0
dff   =  0.00
                                vn  =0.0000E+0

                                ABSOLUTE MZ ENVELOPE
                                (WITH LOAD NO.)

                                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                                -----
                                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE    338.7          0.0          0.0          0.0          0.0
LOCATION   0.0            0.0          0.0          0.0          0.0
LOADING  34              0            0            0            0

*****
*                                     *
*                                     *
*          DESIGN SUMMARY (KNS-METRE)  *
*          -----                    *
*          RESULT/      CRITICAL COND/  RATIO/      LOADING/
*          FX            MY              MZ          LOCATION
*          =====
*          PASS          COMPRESSION     0.021        34
*          338.73 C      0.00            0.00         0.00
*                                     *
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung
Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3484 Check 1

```

*****
MEMBER 3484*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 3.26 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 30.58 |L0
KL/R-Z= 18.65 +L0
UNL = 326.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 299.6 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 0 0 0 0

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS COMPRESSION 0.018 34
* 299.64 C 0.00 0.00 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3485 Check 1

```

*****
MEMBER 3485*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 2.76 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 0.0 (KNS-METRE)
IN KNS CMS |L0
+L0
KL/R-Y= 25.89 |L0
KL/R-Z= 15.79 +L0
UNL = 276.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0 VN =0.0000E+0
dff = 0.00 vn =0.0000E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 244.5 0.0 0.0 0.0 0.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 0 0 0 0

*****
DESIGN SUMMARY (KNS-METRE)
-----
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS COMPRESSION 0.015 34
244.46 C 0.00 0.00 0.00
*****

```




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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3487 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER 3487* |=====| ===|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      --Z    AY=0.1557E+3
DESIGN CODE * |      AZ=0.3155E+3
LRFD 1994 * |=====| ===|===
*                                     PY=0.4982E+4
*          |<---LENGTH (M)= 2.14 --->|      PZ=0.9881E+4
*****                                     RY=0.1066E+2
*                                     RZ=0.1748E+2

PARAMETER          0.0 (KNS-METRE)
IN KNS  CMS        |L0
+L0
KL/R-Y= 20.07 |L0
KL/R-Z= 12.24 +L0
UNL = 214.00 |L0
CB = 0.00 +L0
PHIC = 0.85 |L0
PHIB = 0.90 +L0
FYLD = 35.30 |L0
NSF = 1.00 +-----+
DFE = 0.00 0.0
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      52.5        0.0        0.0        0.0        0.0
LOCATION     0.0        0.0        0.0        0.0        0.0
LOADING    24         0         0         0         0

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/    CRITICAL COND/    RATIO/    LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS        COMPRESSION    0.003    24
*          52.51 C        0.00        0.00        0.00
*          *
*****

```



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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3488 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
MEMBER 3488* |=====| ---|===
*                                     |      --Z
DESIGN CODE * |      ST W14X311
*                                     |
LRFD 1994 * |=====| ---|===
*                                     |
* |<---LENGTH (M)= 2.01 --->|
*****
*                                     |
*                                     |L0 CAPACITIES
PARAMETER |L0
IN KNS CMS |L0 IN KNS METRE
*-----+L0
* KL/R-Y= 18.85 |L0 PNC=0.1724E+5
* KL/R-Z= 11.50 +L0 pnc=0.0000E+0
* UNL = 201.00 |L0 PNT=0.1829E+5
* CB = 0.00 +L0 pnt=0.3767E+3
* PHIC = 0.85 |L0 MNZ=0.0000E+0
* PHIB = 0.90 +L0 mnz=0.0000E+0
* FYLD = 35.30 |L0 MNY=0.0000E+0
* NSF = 1.00 +-----+
* DFF = 0.00 0.0 VN =0.0000E+0
* dff = 0.00 vn =0.0000E+0
*
* ABSOLUTE MZ ENVELOPE
* (WITH LOAD NO.)
*
* MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*-----
* AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
*
* VALUE -376.7 0.0 0.0 0.0 0.0
* LOCATION 2.0 0.0 0.0 0.0 0.0
* LOADING 34 0 0 0 0
*
*****
*
* DESIGN SUMMARY (KNS-METRE)
*-----
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*-----
* PASS TENSION 0.021 34
* 376.71 T 0.00 0.00 2.01
*
*****

```



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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3489 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3489*  |=====|  ===|===  -----
*                                     |      |      AX=0.5897E+3
*          ST  W14X311  |      |      --Z  AY=0.1557E+3
DESIGN CODE *  |      |      AZ=0.3155E+3
LRFD 1994 *  |=====|  ===|===  PY=0.4982E+4
*                                     |      |      PZ=0.9881E+4
*          |<---LENGTH (M)=  2.24 --->|  RY=0.1066E+2
*****
*                                     RZ=0.1748E+2
*
*          0.0 (KNS-METRE)
PARAMETER  |L0
IN KNS  CMS  |L0
-----+L0
| KL/R-Y=  21.00  |L0
| KL/R-Z=  12.80  +L0
| UNL   = 223.83  |L0
| CB    =  0.00  +L0
| PHIC  =  0.85  |L0
| PHIB  =  0.90  +L0
| FYLD  = 35.30  |L0
| NSF   =  1.00  +-----+
| DFF   =  0.00  0.0
| dff   =  0.00
*
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY  (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*          VALUE     595.0          0.0          0.0          0.0          0.0
*          LOCATION   2.2            0.0          0.0          0.0          0.0
*          LOADING    23              0            0            0            0
*
*****
*
*          DESIGN SUMMARY  (KNS-METRE)
*          -----
*
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX           MY           MZ           LOCATION
*          =====
*          PASS         COMPRESSION      0.035       23
*          595.03 C     0.00          0.00       2.24
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3491 Check 1

```

*****
MEMBER 3491*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.92 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 134.18 |
KL/R-Z= 176.78 +L24L25 L25
UNL = 492.44 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    7.0          1.0          0.0          0.1          1.5
LOCATION   0.0          4.9          0.0          4.9          4.9
LOADING  24           24           25           25           26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX          MY          MZ          LOCATION
*  =====
*  PASS        LRFD-H1-1B-C    0.203      24
*  6.99 C      -0.08          1.54       4.92
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3492 Check 1

```

*****
MEMBER 3492*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.92 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 134.18 |
KL/R-Z= 176.78 +L34L33 L33
UNL = 492.44 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      13.4         1.0         0.0         0.1         1.5
LOCATION     0.0         4.9         0.0         4.9         4.9
LOADING    34          23          33          33          20

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C        0.231     34
*  13.44 C   0.09                1.54     4.92
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3493 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3493* |=====| ===|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      |      --Z  AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
*          LRFD 1994 * |=====| ===|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.00 --->|      PZ=0.9881E+4
*****
*                                     |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
PARAMETER          30.8 (KNS-METRE)
IN KNS  CMS      |L25
+-----+-----+
| KL/R-Y= 37.52 | L25
| KL/R-Z= 22.88 |
| UNL = 400.00 | L25
| CB = 1.00 +
| PHIC = 0.85 | L25 L14 L14
| PHIB = 0.90 +
| FYLD = 35.30 | L14
| NSF = 1.00 +-----+-----+-----+-----+
| DFF = 0.00 14.5
| dff = 0.00
CAPACITIES
L33 IN KNS METRE
-----
PNC=0.1597E+5
pnc=0.0000E+0
PNT=0.1829E+5
pnt=0.2474E+4
MNZ=0.3140E+4
mnz=0.2920E+2
MNY=0.1549E+4
mny=0.2715E+2
VN =0.2969E+4
vn =0.1318E+2
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE *****      13.2      14.8      27.6      30.8
LOCATION      0.0      0.0      4.0      4.0      0.0
LOADING      34      33      26      29      25
*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS      LRFD-H1-1B-T      0.094      32
*          2473.81 T      27.15      29.20      4.00
*          *
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3494 Check 1

```

*****
MEMBER 3494*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 30.8 (KNS-METRE)
IN KNS CMS
+-----+
| KL/R-Y= 37.52 |
| KL/R-Z= 22.88 |
| UNL = 400.00 |
| CB = 1.00 |
| PHIC = 0.85 |
| PHIB = 0.90 |
| FYLD = 35.30 |
| NSF = 1.00 |
| DFF = 0.00 |
| dff = 0.00 |
+-----+

L25 L25
L25
L25
L25 L25
L25
L25

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE ***** 6.2 10.9 11.9 30.8
LOCATION 0.0 0.0 0.0 0.0 4.0
LOADING 34 25 34 34 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.081 24
* 2383.80 T 9.75 -30.78 4.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3495 Check 1

```

*****
MEMBER 3495*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PARAMETER          5.8 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 37.52 |
KL/R-Z= 22.88 +
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L14L14 L14
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 4.3
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+-----+-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    *****    0.7        10.7        11.9        5.8
LOCATION   0.0        0.0        4.0        4.0        4.0
LOADING  34        25        15        34        25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.073    25
*  2331.60 T    11.84      -5.78    4.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3496 Check 1

```

*****
MEMBER 3496*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 4.7 (KNS-METRE)
IN KNS CMS | L14
+ L14 L14
+ L14 L14
+ L14
+ L14 L14
+ L14 L14
+ L14
+ L14 L14
+ L14
+-----+-----+-----+-----+-----+
DFD = 0.00 4.4 ABSOLUTE MZ ENVELOPE
dff = 0.00 (WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE ***** 0.5 10.9 9.7 4.7
LOCATION 0.0 0.0 4.0 4.0 0.0
LOADING 34 34 26 34 14

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.071 34
* 2332.97 T 9.65 1.94 4.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3497 Check 1

```

*****
MEMBER 3497*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 5.1 (KNS-METRE)
IN KNS CMS |L26
CAPACITIES
IN KNS METRE
KL/R-Y= 37.52 | L26
KL/R-Z= 22.88 + L14
UNL = 400.00 | L14
CB = 1.00 + L14 L14
PHIC = 0.85 | L14
PHIB = 0.90 + L14 L14
FYLD = 35.30 | L14
NSF = 1.00 +-----+
DFE = 0.00 4.7
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE ***** 0.2 11.1 7.8 5.1
LOCATION 0.0 0.0 4.0 1.7 0.0
LOADING 34 34 26 15 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.069 31
2298.44 T -6.95 4.70 1.67
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3498 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3498* |=====| ---|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      |      AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
*          LRFD 1994 * |=====| ---|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.00 --->| |      PZ=0.9881E+4
***** |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
*                                     |
PARAMETER      5.6 (KNS-METRE)
*          |L26
IN KNS  CMS   |L26
*          +-----+
*          |          L26 L26
KL/R-Y= 37.52 |          L26
*          |          L26
KL/R-Z= 22.88 +          L26
*          |          L26 L26
UNL = 400.00 |
*          |          L26
CB = 1.00 +
*          |          L26
PHIC = 0.85 |          L26 L26
*          |          L26 L26
PHIB = 0.90 +
*          |          L26
FYLD = 35.30 |          L26
*          |          L26
NSF = 1.00 +-----+
*          |          L26
DFE = 0.00 5.1
*          |          L26
dff = 0.00
*          |          L26
*          |          ABSOLUTE MZ ENVELOPE
*          |          (WITH LOAD NO.)
*          |
*          |          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          |          -----
*          |          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*          |          VALUE *****
*          |          LOCATION 0.0      0.0      4.0      1.7      0.0
*          |          LOADING 34      34      26      15      26
*****
*          |
*          |          DESIGN SUMMARY (KNS-METRE)
*          |          -----
*          |          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          |          FX          MY          MZ          LOCATION
*          |          =====
*          |          PASS          LRFD-H1-1B-T          0.072          31
*          |          2282.10 T          -11.70          5.38          1.67
*          |
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3499 Check 1

```

*****
MEMBER 3499*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 6.0 (KNS-METRE)
IN KNS CMS | L26
+ L26 L26
+ L26
+ L26 L26
+ L26 L26
+ L26
+ L26 L26
+ L26
+-----+-----+-----+-----+-----+
dfF = 0.00 5.6
dfdf = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE ***** 0.1 18.9 36.0 6.0
LOCATION 0.0 0.0 4.0 0.3 0.0
LOADING 34 34 34 25 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.087 34
* 2282.73 T -35.89 5.93 0.33
*
*****

```




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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3501 Check 1

```

-----
*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
MEMBER 3501* |=====| ---|===
*                                     |      AX=0.5897E+3
*          ST W14X311 |      |      --Z  AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
LRFD 1994 * |=====| ---|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.00 --->| |      PZ=0.9881E+4
***** |      |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
*                                     |
*          6.0 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
| KL/R-Y= 37.52 | L26 CAPACITIES
| KL/R-Z= 22.88 | L26 IN KNS METRE
| UNL = 400.00 | L26 PNC=0.1597E+5
| CB = 1.00 | L26 pnc=0.0000E+0
| PHIC = 0.85 | L26 PNT=0.1829E+5
| PHIB = 0.90 | L26 pnt=0.2285E+4
| FYLD = 35.30 | L26 MNZ=0.3140E+4
| NSF = 1.00 | L26 mnz=0.5942E+1
| DFF = 0.00 | L26 MNY=0.1549E+4
| dff = 0.00 | L26 mny=0.3593E+2
|          5.6 | VN =0.2969E+4
|          ABSOLUTE MZ ENVELOPE | vn =0.9093E-1
|          (WITH LOAD NO.)
|
|          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
|          -----
|          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
|          VALUE *****      0.1      19.0      36.0      6.0
|          LOCATION      0.0      0.0      0.0      3.7      4.0
|          LOADING      34      33      24      24      26
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS          LRFD-H1-1B-T          0.088          33
*          2284.70 T          -35.93          5.94          3.67
*
*****
-----

```




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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3502 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
MEMBER 3502* |=====|====|====|-----
*                                     |      AX=0.5897E+3
*          ST W14X311 |      |      AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
*          LRFD 1994 * |====|====|====|-----
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.00 --->|      PZ=0.9881E+4
*****                                     RY=0.1066E+2
*                                     RZ=0.1748E+2
*
*          5.6 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+-----+-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 37.52 |
KL/R-Z= 22.88 +
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 5.1
dff = 0.00
*
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*          VALUE *****      0.1      17.2      24.3      5.6
*          LOCATION      0.0      0.0      0.0      3.3      4.0
*          LOADING      34      33      23      23      26
*
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX      MY      MZ      LOCATION
*          =====
*          PASS      LRFD-H1-1B-T      0.080      32
*          2292.43 T      -24.19      5.54      3.33
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3503 Check 1

```

*****
MEMBER 3503*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PARAMETER          5.2 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 37.52 |
KL/R-Z= 22.88 +
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 4.2
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE *****      0.2      16.9      18.3      5.2
LOCATION     0.0      0.0      0.0      3.3      4.0
LOADING    34      34      22      22      26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX          MY          MZ          LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.076      31
*  2304.35 T      -18.25      5.02      3.33
*
*****

```



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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3504 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  3504* |=====| ---|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      |      --Z  AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
LRFD 1994 * |=====| ---|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.00 --->|      |      PZ=0.9881E+4
*****                                     |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
*                                     |
PARAMETER          4.3 (KNS-METRE)
IN KNS  CMS      |
+-----+
| KL/R-Y= 37.52 |          L26 L26
| KL/R-Z= 22.88 |          L26 L26
| UNL  = 400.00 |          L26 L26
| CB   = 1.00   |
| PHIC = 0.85   |          L26
| PHIB = 0.90   |          L26 L26
| FYLD = 35.30 |          L26
| NSF  = 1.00   |
| DFF  = 0.00   |          2.4
| dff  = 0.00   |
+-----+
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE *****      0.4          16.3          14.5          4.3
LOCATION      0.0          0.0          0.0          4.0          4.0
LOADING      34          26          21          9          26

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS      LRFD-H1-1B-T      0.073      30
*          2321.96 T      14.16      2.51      0.00
*          *
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3505 Check 1

```

*****
MEMBER 3505*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

                2.5 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 37.52  |
KL/R-Z= 22.88  +
UNL  = 400.00 |L33
CB   = 1.00   +
PHIC = 0.85   | L33
PHIB = 0.90   + L33
FYLD = 35.30 | L33
NSF  = 1.00  +-----+
DFE  = 0.00  0.1
dff  = 0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE *****          0.9          15.5          17.1          2.5
LOCATION          0.0          0.0          0.0          0.0          4.0
LOADING          34          26          20          29          26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
*  =====
*  PASS          LRFD-H1-1B-T          0.076          29
*  2347.30 T          17.06          -1.12          0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3605 Check 1

```

*****
MEMBER 3605*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.99 --->|
*****

PARAMETER          1.2 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 127.05 |
KL/R-Z= 179.16 +
UNL = 499.06 |L15L15 L15 L15
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+-----+-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    -5.8        0.9         0.3         0.8         1.2
LOCATION   5.0         5.0         0.0         0.0         5.0
LOADING  34         25         18         18         25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.184    34
*  5.80 T    -0.63                1.23    4.99
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3606 Check 1

```

*****
MEMBER 3606*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.99 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.2 (KNS-METRE)
IN KNS CMS
+-----+
| KL/R-Y= 127.05 |
| KL/R-Z= 179.16 |
| UNL = 499.06 |
| CB = 1.00 |
| PHIC = 0.85 |
| PHIB = 0.90 |
| FYLD = 35.30 |
| NSF = 1.00 |
| DFF = 0.00 |
| dff = 0.00 |
+-----+
L34 CAPACITIES
IN KNS METRE
+-----+
| PNC=0.1148E+3 |
| pnc=0.8219E+1 |
| PNT=0.7582E+3 |
| pnt=0.0000E+0 |
| MNZ=0.9251E+1 |
| mnz=0.1231E+1 |
| MNY=0.1346E+2 |
| mny=0.6660E+0 |
| VN =0.2402E+3 |
| vn =0.8791E+0 |
+-----+
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 8.4 0.9 0.3 0.8 1.2
LOCATION 0.0 5.0 0.0 0.0 5.0
LOADING 27 34 27 27 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.218 27
* 8.22 C 0.67 1.23 4.99
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3607 Check 1

```

*****
*                               Y          PROPERTIES
*                               |          IN CMS UNIT
MEMBER 3607* |=====| ==||==
*                               |          AX=0.2444E+2
*          LD L90X90X9          |          AY=0.8400E+1
DESIGN CODE * |          AZ=0.8400E+1
*          LRFD 1994          * |          PY=0.7626E+2
*                               |          PZ=0.5241E+2
* |<---LENGTH (M)= 4.97 --->|          RY=0.4047E+1
*****                               RZ=0.2786E+1

PARAMETER          1.3 (KNS-METRE)
IN KNS CMS          L25 CAPACITIES
-----+-----+
KL/R-Y= 126.62 |          L25          PNC=0.1157E+3
KL/R-Z= 178.51 + L26          pnc=0.9541E+1
UNL = 497.25 |L26 L26 L26          L25          PNT=0.7582E+3
CB = 1.00 +          L27          pnt=0.0000E+0
PHIC = 0.85 |          L25          MNZ=0.9251E+1
PHIB = 0.90 +          L28          mnz=0.1340E+1
FYLD = 35.30 |          L28          MNY=0.1346E+2
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 0.1          VN =0.2402E+3
dff = 0.00          vn =0.9224E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+-----+-----+-----+
AXIAL          SHEAR-Y          SHEAR-Z          MOMENT-Y          MOMENT-Z
VALUE          9.7          0.9          0.3          0.8          1.3
LOCATION          0.0          5.0          0.0          0.0          5.0
LOADING          28          34          28          28          25

*****
*                               *
*          DESIGN SUMMARY (KNS-METRE)          *
*          -----          *
*          RESULT/          CRITICAL COND/          RATIO/          LOADING/          *
*          FX          MY          MZ          LOCATION          *
*          =====          *
*          PASS          LRFD-H1-1B-C          0.236          28          *
*          9.54 C          0.67          1.34          4.97          *
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3608 Check 1

```

*****
MEMBER 3608*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.97 --->|
*****

PARAMETER          1.3 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 126.62 |
KL/R-Z= 178.51 + L15
UNL = 497.25 |L15 L15 L15
CB = 1.00 + L15
PHIC = 0.85 |
PHIB = 0.90 + L19
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+-----+-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    -3.2        0.9         0.3         0.8         1.3
LOCATION   5.0         5.0         0.0         0.0         5.0
LOADING  34         34         19         19         34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.196     19
*  0.56 C    -0.65             1.34     4.97
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3609 Check 1

```

*****
MEMBER 3609*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.96 --->|
*****

PARAMETER          1.4 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 126.29 |
KL/R-Z= 178.00 +L26L26 L26
UNL = 495.85 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    11.2         0.9         0.3         0.7         1.4
LOCATION   0.0         5.0         0.0         0.0         5.0
LOADING  29         25         29         29         25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX          MY          MZ          LOCATION
*  =====
*  PASS      LRFD-H1-1B-C    0.245      29
*  11.12 C    0.62      1.40      4.96
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3610 Check 1

```

*****
*                               Y          PROPERTIES
*                               |          IN CMS UNIT
MEMBER 3610* |=====| ==||==
*                               |          AX=0.2444E+2
*           LD L90X90X9         |          AY=0.8400E+1
DESIGN CODE * |          AZ=0.8400E+1
LRFD 1994 * |          PY=0.7626E+2
*                               |          PZ=0.5241E+2
* |<---LENGTH (M)= 4.96 --->|          RY=0.4047E+1
*****                               |          RZ=0.2786E+1

PARAMETER          1.4 (KNS-METRE)
IN KNS CMS          |          L34 CAPACITIES
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 126.29 |          L34          PNC=0.1163E+3
KL/R-Z= 178.00 +L15L15 L15          pnc=0.2713E+1
UNL = 495.85 |          L15          L34          PNT=0.7582E+3
CB = 1.00 +          L20          pnt=0.0000E+0
PHIC = 0.85 |          L34          MNZ=0.9251E+1
PHIB = 0.90 +          L20          mnz=0.1399E+1
FYLD = 35.30 |          L20          MNY=0.1346E+2
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.0          VN =0.2402E+3
dff = 0.00          vn =0.9473E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+-----+-----+-----+-----+
AXIAL          SHEAR-Y          SHEAR-Z          MOMENT-Y          MOMENT-Z
VALUE          2.8          0.9          0.3          0.7          1.4
LOCATION          0.0          5.0          0.0          0.0          5.0
LOADING          20          34          20          20          34

*****
*                               *
*           DESIGN SUMMARY (KNS-METRE)          *
*-----*-----*-----*-----*-----*-----*
* RESULT/          CRITICAL COND/          RATIO/          LOADING/          *
*   FX          MY          MZ          LOCATION          *
*-----*-----*-----*-----*-----*-----*
*   PASS          LRFD-H1-1B-C          0.208          20          *
*   2.71 C          -0.60          1.40          4.96          *
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3611 Check 1

```

*****
MEMBER 3611*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.95 --->|
*****

PARAMETER          1.4 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 125.99 |
KL/R-Z= 177.55 +L15L15 L15
UNL = 494.59 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      5.1         1.0         0.2         0.6         1.4
LOCATION     0.0         4.9         0.0         0.0         4.9
LOADING    21         34         21         21         34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.217    21
*  4.98 C    -0.53              1.45     4.95
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3612 Check 1

```

*****
MEMBER 3612*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.95 --->|
*****

PARAMETER          1.4 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 125.99 |
KL/R-Z= 177.55 +L26L26 L26
UNL = 494.59 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      13.0        1.0         0.2          0.6          1.4
LOCATION     0.0         4.9         0.0          0.0          4.9
LOADING    30         25         30           30           25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.251     30
*  12.87 C   0.54              1.44     4.95
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3613 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
*                                     ==||==
MEMBER 3613* |=====| | |
*          |          LD L90X90X9 | | --Z
DESIGN CODE * |          | |
LRFD 1994 * |          | |
*          |          | |
*          |<---LENGTH (M)= 4.94 --->| |
*****
*                                     RZ=0.2786E+1
*
*          1.5 (KNS-METRE)
PARAMETER |
IN KNS  CMS |
-----+
KL/R-Y= 125.78 |
KL/R-Z= 177.23 +L15L21 L21
UNL = 493.69 |          L22          L34
CB = 1.00 +          L22
PHIC = 0.85 |          L34
PHIB = 0.90 +          L22
FYLD = 35.30 |          L34
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*          VALUE      7.2          1.0          0.2          0.5          1.5
*          LOCATION    0.0          4.9          0.0          0.0          4.9
*          LOADING     22          26          22          22          34
*
*****
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS          LRFD-H1-1B-C          0.224          22
*          7.10 C          -0.45          1.48          4.94
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3614 Check 1

```

*****
MEMBER 3614*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.94 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 125.78 |
KL/R-Z= 177.23 +L30L30 L30
UNL = 493.69 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      14.6         1.0         0.2         0.5         1.5
LOCATION     0.0         4.9         0.0         0.0         4.9
LOADING    31          15          31          31          25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.256     31
*  14.55 C   0.46              1.48     4.94
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3615 Check 1

```

-----
*****
MEMBER 3615* |=====| ==||==
* | | |
* | LD L90X90X9 | | | --Z
DESIGN CODE * | | |
LRFD 1994 * | | |
* | | |
* |<---LENGTH (M)= 4.93 --->| | |
*****
PROPERTIES
IN CMS UNIT
-----
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS | L26 CAPACITIES
-----+-----
KL/R-Y= 125.61 | L26 PNC=0.1177E+3
KL/R-Z= 176.97 +L22L22 L22 pnc=0.8951E+1
UNL = 492.98 | L23 L26 PNT=0.7582E+3
CB = 1.00 + L23 pnt=0.0000E+0
PHIC = 0.85 | L34 MNZ=0.9251E+1
PHIB = 0.90 + L23 mnz=0.1516E+1
FYLD = 35.30 | L34 MNY=0.1346E+2
NSF = 1.00 +-----+-----| mny=0.3430E+0
DFE = 0.00 0.1 VN =0.2402E+3
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.1002E+1
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 9.0 1.0 0.1 0.4 1.5
LOCATION 0.0 4.9 0.0 0.0 4.9
LOADING 23 15 23 32 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
*====*
* PASS LRFD-H1-1B-C 0.227 23
* 8.95 C -0.34 1.52 4.93
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3616 Check 1

```

*****
MEMBER 3616*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 125.61 |
KL/R-Z= 176.97 +L31L31 L31
UNL = 492.98 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      16.1        1.0         0.2         0.4         1.5
LOCATION     0.0         4.9         0.0         0.0         4.9
LOADING    32          26          32          23          15

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.258     32
*  16.02 C   0.36              1.51     4.93
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3617 Check 1

```

*****
MEMBER 3617*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 134.21 |
KL/R-Z= 176.83 +L23L24 L24
UNL = 492.58 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      10.2         1.0         0.1         0.2         1.5
LOCATION     0.0         4.9         0.0         0.0         4.9
LOADING    24         23         24         33         28

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.225    24
*  10.21 C   -0.20                1.53    4.93
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3618 Check 1

```

*****
MEMBER 3618*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 134.21 |
KL/R-Z= 176.83 +L32L33 L33
UNL = 492.58 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    17.0         1.0         0.1         0.2         1.5
LOCATION   0.0         4.9         0.0         0.0         4.9
LOADING  33         32         33         24         19

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.255    33
*  16.93 C   0.21              1.53     4.93
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3619 Check 1

```

*****
MEMBER 3619*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 134.21 |
KL/R-Z= 176.83 +L25L25 L25
UNL = 492.58 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      10.5        1.0        0.0         0.1         1.5
LOCATION     4.9         4.9        0.0         0.0         4.9
LOADING    25          25         1           1           22

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.213     25
*  10.47 C   0.02              1.55     4.93
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3620 Check 1

```

*****
MEMBER 3620*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 134.21 |
KL/R-Z= 176.83 +L34L34 L34
UNL = 492.58 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      16.7         1.0         0.0         0.1         1.5
LOCATION     4.9         4.9         0.0         0.0         4.9
LOADING    34          34          1           1           31

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C        0.238     34
*  16.67 C   0.00                1.55     4.93
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3621 Check 1

```

*****
MEMBER 3621*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 125.61 |
KL/R-Z= 176.97 +L34L34 L34
UNL = 492.98 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      9.2         1.0         0.1         0.2         1.5
LOCATION     4.9         4.9         0.0         0.0         4.9
LOADING    25          25          20          20          23

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY              MZ        LOCATION
=====
PASS        LRFD-H1-1B-C    0.216    25
9.22 C     0.15          1.53     4.93
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3622 Check 1

```

*****
MEMBER 3622*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 125.61 |
KL/R-Z= 176.97 +L25L25 L25
UNL = 492.98 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    15.1         1.0         0.1         0.2         1.5
LOCATION   4.9         4.9         0.0         0.0         4.9
LOADING  34         34         29         29         32

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.240     34
*  15.11 C   -0.13                1.53     4.93
*
*****

```



SKRIPSI JEMBATAN

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Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3623 Check 1

```

*****
MEMBER 3623*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.94 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 125.78 |
KL/R-Z= 177.23 +L34L34 L34
UNL = 493.69 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      7.6         1.0         0.1         0.4         1.5
LOCATION     4.9         4.9         0.0         0.0         4.9
LOADING    34         25         21         21         25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.215    34
*  7.64 C    0.28                1.50    4.94
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3625 Check 1

```

*****
MEMBER 3625*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.95 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 125.99 |
KL/R-Z= 177.55 +L15L15 L15
UNL = 494.59 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      11.0        1.0         0.2         0.5         1.5
LOCATION     4.9         4.9         0.0         0.0         4.9
LOADING     25          25          30          30          34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.234     25
*  11.04 C   -0.38                1.47     4.95
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3626 Check 1

```

*****
MEMBER 3626*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.95 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 125.99 |
KL/R-Z= 177.55 +L26L26 L26
UNL = 494.59 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      6.1         1.0         0.2         0.5         1.5
LOCATION     4.9         4.9         0.0         0.0         4.9
LOADING    34         34         21         21         25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.213    34
*  6.05 C    0.39                1.47    4.95
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3628 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
*                                     ==||==
MEMBER 3628* |=====| | |
*          |          LD  L90X90X9 | |  --Z
DESIGN CODE * |          | |
LRFD 1994 * |-----| |
*          |<---LENGTH (M)= 4.96 --->| |
*****
*                                     RZ=0.2786E+1
*
*          1.4 (KNS-METRE)
PARAMETER |
IN KNS  CMS |
-----+
KL/R-Y= 126.29 |
KL/R-Z= 178.00 +L26L26 L26
UNL = 495.85 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+
DFE = 0.00 0.0
dff = 0.00
*
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*          VALUE      4.5          1.0          0.2          0.6          1.4
*          LOCATION    5.0          5.0          0.0          0.0          5.0
*          LOADING     26          26          22          31          25
*
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS      LRFD-H1-1B-C      0.210      26
*          4.53 C      0.49      1.42      4.96
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3629 Check 1

```

*****
MEMBER 3629*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.97 --->|
*****

PARAMETER          1.4 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 126.62 |
KL/R-Z= 178.51 +
UNL = 497.25 |L15L15 L15 L15
CB = 1.00 + L26
PHIC = 0.85 |
PHIB = 0.90 + L26
FYLD = 35.30 | L24
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    7.3         0.9         0.3         0.7         1.4
LOCATION   5.0         5.0         0.0         0.0         5.0
LOADING  15          15          22          22          25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-C    0.226      17
7.28 C    -0.58            1.40      4.97
*
*****

```



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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3630 Check 1

```

*****
*                               Y          PROPERTIES
*                               |          IN CMS UNIT
MEMBER 3630* |=====| ==||==
*                               |          AX=0.2444E+2
*           LD L90X90X9         |          AY=0.8400E+1
DESIGN CODE * |          AZ=0.8400E+1
*           LRFD 1994         |          PY=0.7626E+2
*                               |          PZ=0.5241E+2
* |<---LENGTH (M)= 4.97 --->|          RY=0.4047E+1
*****                               |          RZ=0.2786E+1
*
*           1.4 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
| KL/R-Y= 126.62 |
| KL/R-Z= 178.51 +
| UNL = 497.25 |L26L26 L26 L26          L34
| CB = 1.00 +
| PHIC = 0.85 |
| PHIB = 0.90 +
| FYLD = 35.30 |
| NSF = 1.00 +
| DFF = 0.00 0.1
| dff = 0.00
*
*           ABSOLUTE MZ ENVELOPE
*           (WITH LOAD NO.)
*
*           MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*           -----
*           AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*           VALUE      3.2          0.9          0.3          0.7          1.4
*           LOCATION    5.0          5.0          0.0          0.0          5.0
*           LOADING     26          26          31          31          34
*
*****
*
*           DESIGN SUMMARY (KNS-METRE)
*           -----
*
*           RESULT/      CRITICAL COND/      RATIO/      LOADING/
*           FX          MY          MZ          LOCATION
*           =====
*           PASS        LRFD-H1-1B-C      0.212        26
*           3.17 C      0.61          1.42        4.97
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3631 Check 1

```

*****
MEMBER 3631*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

122.5 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
KL/R-Y= 14.64 |
KL/R-Z= 3.43 +
UNL = 100.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 -6.8
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -2.6 125.7 39.2 39.2 122.5
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 14 19 33 33 19

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.238 34
* 0.84 T 39.20 -120.28 1.00
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3637 Check 1

```

*****
MEMBER 3637*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 126.3 (KNS-METRE)
IN KNS CMS
KL/R-Y= 14.64
KL/R-Z= 3.43
UNL = 100.00
CB = 1.00
PHIC = 0.85
PHIB = 0.90
FYLD = 35.30
NSF = 1.00
DFE = 0.00
dff = 0.00

L29 CAPACITIES
IN KNS METRE
PNC=0.6451E+4
pnc=0.2855E+0
PNT=0.7182E+4
pnt=0.0000E+0
MNZ=0.1792E+4
mnz=0.1243E+3
MNY=0.2291E+3
mny=0.3361E+2
VN =0.1735E+4
vn =0.1211E+3

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 0.3 129.5 33.6 33.6 126.3
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 14 29 33 33 29

*****
DESIGN SUMMARY (KNS-METRE)
-----
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.216 33
0.29 C 33.61 -124.35 1.00
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3643 Check 1

```

*****
MEMBER 3643*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

123.3 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
KL/R-Y= 14.64 |
KL/R-Z= 3.43 +
UNL = 100.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 -6.8
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1.7 126.5 27.7 27.7 123.3
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 33 30 33 33 30

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.189 30
* 1.66 C 27.47 -123.28 1.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 226	Rev
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Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3649 Check 1

```

*****
MEMBER 3649*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.00 --->|
*****

122.0 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
| KL/R-Y= 14.64 |
| KL/R-Z= 3.43 +
| UNL = 100.00 |
| CB = 1.00 +
| PHIC = 0.85 |
| PHIB = 0.90 +
| FYLD = 35.30 |
| NSF = 1.00 +
| DFF = 0.00 -6.8
| dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2.3 125.2 21.3 21.3 122.0
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 33 31 33 33 31

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.161 31
* 2.30 C 21.25 -122.05 1.00
*
*****

```



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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3655 Check 1

```

*****
MEMBER 3655*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

122.4 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
| KL/R-Y= 14.64 |
| KL/R-Z= 3.43 +
| UNL = 100.00 |
| CB = 1.00 +
| PHIC = 0.85 |
| PHIB = 0.90 +
| FYLD = 35.30 |
| NSF = 1.00 +
| DFF = 0.00 -6.8
| dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2.6 125.6 14.9 14.9 122.4
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 26 23 33 33 23

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.133 32
* 2.65 C 14.86 -122.41 1.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3661 Check 1

```

*****
MEMBER 3661*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

122.5 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
| KL/R-Y= 14.64 |
| KL/R-Z= 3.43 +
| UNL = 100.00 |
| CB = 1.00 +
| PHIC = 0.85 |
| PHIB = 0.90 +
| FYLD = 35.30 |
| NSF = 1.00 +
| DFF = 0.00 -6.8
| dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2.8 125.7 8.4 8.4 122.5
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 26 33 33 33 33

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.105 33
* 2.77 C 8.42 -122.53 1.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3667 Check 1

```

*****
MEMBER 3667*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

119.8 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
KL/R-Y= 14.64 |
KL/R-Z= 3.43 +
UNL = 100.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 -6.7
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 3.0 123.0 2.0 2.0 119.8
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 26 34 33 33 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.076 34
* 3.01 C 1.96 -119.82 1.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3673 Check 1

```

*****
MEMBER 3673*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 119.8 (KNS-METRE)
IN KNS CMS
+-----+
| KL/R-Y= 14.64 |
| KL/R-Z= 3.43 |
| UNL = 100.00 |
| CB = 1.00 |
| PHIC = 0.85 |
| PHIB = 0.90 |
| FYLD = 35.30 |
| NSF = 1.00 |
| DFF = 0.00 |
| dff = 0.00 |
+-----+
L24 L24
L24
L24
L24 L24
L0
-6.7
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 3.0 123.0 5.0 5.0 119.8
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 26 24 25 25 24

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.089 24
* 0.02 T -5.04 -119.80 1.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3679 Check 1

```

*****
MEMBER 3679*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 122.5 (KNS-METRE)
IN KNS CMS
KL/R-Y= 14.64
KL/R-Z= 3.43
UNL = 100.00
CB = 1.00
PHIC = 0.85
PHIB = 0.90
FYLD = 35.30
NSF = 1.00
DFE = 0.00
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2.8 125.7 11.0 11.0 122.5
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 26 25 34 34 25

*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
PASS LRFD-H1-1B-C 0.117 34
2.77 C -11.00 -122.55 1.00
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3691 Check 1

```

*****
MEMBER 3691*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.00 --->|
*****

120.1 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
| KL/R-Y= 14.64 |
| KL/R-Z= 3.43 +
| UNL = 100.00 |
| CB = 1.00 +
| PHIC = 0.85 |
| PHIB = 0.90 +
| FYLD = 35.30 |
| NSF = 1.00 +
| DFF = 0.00 -6.7
| dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2.3 123.3 24.1 24.1 120.1
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 26 31 34 34 31

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.172 33
* 2.32 C -24.07 -120.09 1.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3697 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER 3697* |=====| ---|===
*                                     |      AX=0.2315E+3
*          ST  H700X300X13          |      --Z  AY=0.9100E+2
DESIGN CODE * |      AZ=0.9600E+2
LRFD 1994 *  =====| ---|===
*                                     |      PY=0.7210E+3
*          |<---LENGTH (M)= 1.00 --->| |      PZ=0.5640E+4
*****                                     |      RY=0.6830E+1
*                                     |      RZ=0.2917E+2
*                                     |
PARAMETER          121.0 (KNS-METRE)
IN KNS  CMS      |
-----+-----+-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 14.64    |
KL/R-Z=  3.43    +
UNL  = 100.00    |
CB    =  1.00    +
PHIC  =  0.85    |
PHIB  =  0.90    +
FYLD  = 35.30    |L0
NSF   =  1.00    +-----+-----+-----+-----+-----+-----+-----+
DFE   =  0.00    -6.7
dff   =  0.00

                                ABSOLUTE MZ ENVELOPE
                                (WITH LOAD NO.)

                                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                                -----
                                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
                                VALUE      LOCATION      LOADING

                                VALUE      LOCATION      LOADING
                                2.0         0.0         14
                                124.2        0.0         23
                                30.5         0.0         34
                                30.5         1.0         34
                                121.0        1.0         23

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX           MY           MZ           LOCATION
*          =====
*          PASS         LRFD-H1-1B-C      0.201        33
*          1.06 C       -30.53      -120.93      1.00
*          *
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3703 Check 1

```

*****
MEMBER 3703*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

122.9 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
KL/R-Y= 14.64 |
KL/R-Z= 3.43 +
UNL = 100.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 -6.8
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 3.9 126.1 36.7 36.7 122.9
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 33 15 34 34 15

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.229 34
* 3.87 C -36.68 -122.30 1.00
*
*****

```



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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3709 Check 1

```

*****
MEMBER 3709*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 125.6 (KNS-METRE)
IN KNS CMS
L29 CAPACITIES
IN KNS METRE
KL/R-Y= 14.64 |
KL/R-Z= 3.43 +
UNL = 100.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L0
NSF = 1.00 +
DFE = 0.00 -7.0
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -26.8 128.8 42.3 42.3 125.6
LOCATION 0.0 0.0 0.0 1.0 1.0
LOADING 25 29 34 34 29

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.256 33
* 23.62 T -42.29 -125.49 1.00
*
*****

```




SKRIPSI JEMBATAN

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keraf	22-May-15	
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3781 Check 1

```

*****
MEMBER 3781*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 30.1 (KNS-METRE)
IN KNS CMS |L14
+ L14 L14
+ L14 L14
+ L14 L26
+ L26
+-----+-----+-----+-----+-----+
dfF = 0.00 8.3 ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE ***** 5.4 17.2 32.0 30.1
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 24 14 18 18 14

*****
DESIGN SUMMARY (KNS-METRE)
-----
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.088 27
2200.94 T 31.44 -25.30 0.00
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 3782 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
MEMBER 3782* |=====| ===|===
*                                     |      AX=0.5897E+3
*          ST W14X311 |      |      AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
LRFD 1994 * |=====| ===|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.00 --->| |      PZ=0.9881E+4
***** |      |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
*                                     |
PARAMETER      115.3 (KNS-METRE)
IN KNS CMS    |
+-----+
| KL/R-Y= 37.52 | |
| KL/R-Z= 22.88 | +
| UNL = 400.00 | | L25
| CB = 1.00 | +
| PHIC = 0.85 | | L25
| PHIB = 0.90 | + L25
| FYLD = 35.30 | | L25
| NSF = 1.00 | +-----+
| DFF = 0.00 | 2.5
| dff = 0.00 |
*
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*          VALUE *****      26.7      14.8      27.5      115.3
*          LOCATION      0.0      0.0      4.0      4.0      4.0
*          LOADING      24      25      28      29      25
*
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS          LRFD-H1-1B-T          0.117          24
*          2320.00 T          26.38          -115.26          4.00
*
*****

```




SKRIPSI JEMBATAN

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keraf	22-May-15	
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3783 Check 1

```

*****
MEMBER 3783*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

      8.7 (KNS-METRE)
PARAMETER |L25
IN KNS CMS | L25
-----+-----
KL/R-Y= 37.52 |
KL/R-Z= 22.88 +
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 8.5
dff = 0.00

      ABSOLUTE MZ ENVELOPE
      (WITH LOAD NO.)

      MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
      -----
      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE *****      0.9      11.1      12.6      8.7
LOCATION      0.0      0.0      0.0      0.0      0.0
LOADING      24      33      34      34      25

*****
*
*      DESIGN SUMMARY (KNS-METRE)
*      -----
*
*      RESULT/      CRITICAL COND/      RATIO/      LOADING/
*      FX      MY      MZ      LOCATION
*      =====
*      PASS      LRFD-H1-1B-T      0.073      25
*      2279.91 T      11.98      -8.72      0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3786 Check 1

```

*****
MEMBER 3786*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 5.1 (KNS-METRE)
IN KNS CMS |L26
+ L26
KL/R-Y= 37.52 | L26
KL/R-Z= 22.88 + L14
UNL = 400.00 | L14
CB = 1.00 + L14 L14
PHIC = 0.85 | L14
PHIB = 0.90 + L14 L14
FYLD = 35.30 | L14
NSF = 1.00 +-----+
DFE = 0.00 4.7
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE ***** 0.3 11.1 7.5 5.1
LOCATION 0.0 0.0 4.0 1.7 0.0
LOADING 24 34 26 15 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.064 25
* 2193.65 T 6.37 -1.05 4.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3788 Check 1

```

*****
MEMBER 3788*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 6.0 (KNS-METRE)
IN KNS CMS |L26
+ L26 L26
+ L26 L26
+ L26
+ L26
+ L26 L26
+ L26 L26
+ L26
+-----+-----+-----+-----+-----+
dfF = 0.00 5.6 ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE ***** 0.1 19.0 35.8 6.0
LOCATION 0.0 0.0 4.0 0.3 0.0
LOADING 24 34 34 25 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.083 34
* 2112.88 T -35.54 5.94 0.33
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3789 Check 1

```

*****
MEMBER 3789*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.5897E+3
AY=0.1557E+3
AZ=0.3155E+3
PY=0.4982E+4
PZ=0.9881E+4
RY=0.1066E+2
RZ=0.1748E+2

PARAMETER 6.0 (KNS-METRE)
IN KNS CMS |L26
+ L26 L26
+ L26 L26
+ L26
+ L26 L26
+ L26 L26
+ L26 L26
+ L26
+-----+-----+-----+-----+-----+
dfb = 0.00 6.0 ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE ***** 0.0 15.8 37.4 6.0
LOCATION 0.0 0.0 0.0 3.3 0.0
LOADING 24 25 25 25 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.084 33
* 2108.37 T -37.15 5.98 0.67
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3790 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER 3790* |=====| ===|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      |      AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
*          LRFD 1994 * |=====| ===|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.00 --->|      PZ=0.9881E+4
*****
*                                     |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
*                                     |
*          6.0 (KNS-METRE)
PARAMETER |
IN KNS  CMS |
-----+
| KL/R-Y= 37.52 |          L26 L26
| KL/R-Z= 22.88 +          L26 L26
| UNL = 400.00 |          L26
| CB = 1.00 +
| PHIC = 0.85 |          L26
| PHIB = 0.90 + L26 L26
| FYLD = 35.30 |L26
| NSF = 1.00 +-----+
| DFF = 0.00 5.6
| dff = 0.00
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*          VALUE *****      0.1      18.9      35.8      6.0
*          LOCATION 0.0      0.0      0.0      3.7      4.0
*          LOADING 24      33      24      24      26
*
*****
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS          LRFD-H1-1B-T      0.083          33
*          2110.33 T      -35.60          5.95          3.67
*
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3791 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER 3791* |=====| ===|===
*                                     |      AX=0.5897E+3
*          ST  W14X311 |      |      --Z  AY=0.1557E+3
DESIGN CODE * |      |      AZ=0.3155E+3
LRFD 1994 * |=====| ===|===
*                                     |      PY=0.4982E+4
*          |<---LENGTH (M)= 4.00 --->|      |      PZ=0.9881E+4
*****                                     |      RY=0.1066E+2
*                                     |      RZ=0.1748E+2
*                                     |
*          5.6 (KNS-METRE)
PARAMETER |
IN KNS  CMS |
-----+
| KL/R-Y= 37.52 |          L26
| KL/R-Z= 22.88 |          L26 L26
| UNL = 400.00 |          L26 L26
| CB = 1.00 |
| PHIC = 0.85 |          L26
| PHIB = 0.90 |          L26 L26
| FYLD = 35.30 |L26
| NSF = 1.00 |-----+-----+-----+-----+-----+-----+-----+-----+-----+
| DFF = 0.00 |          5.2
| dff = 0.00 |
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*          VALUE *****      0.1      17.2      24.2      5.6
*          LOCATION      0.0      0.0      0.0      3.3      4.0
*          LOADING      24      33      23      23      26
*
*****
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX      MY      MZ      LOCATION
*          =====
*          PASS      LRFD-H1-1B-T      0.075      32
*          2115.46 T      -24.16      5.53      3.33
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3792 Check 1

```

*****
MEMBER 3792*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PARAMETER          5.2 (KNS-METRE)
IN KNS  CMS
-----+-----+
KL/R-Y= 37.52 |
KL/R-Z= 22.88 +
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 4.2
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    *****    0.2        16.9        18.4        5.2
LOCATION   0.0        0.0        0.0        3.3        4.0
LOADING  24        34        22        22        26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.072    31
*  2124.05 T  -18.36                    5.03    3.33
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3793 Check 1

```

*****
MEMBER 3793*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PARAMETER          4.3 (KNS-METRE)
IN KNS  CMS
-----+-----+
KL/R-Y= 37.52 |
KL/R-Z= 22.88 +
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 2.4
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+-----+-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    *****    0.4        16.3        14.5        4.3
LOCATION   0.0        0.0        0.0        4.0        4.0
LOADING  24        34        21        9         26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.069    21
*  2179.18 T  14.12                    -0.10    0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 3946 Check 1

```

*****
MEMBER 3946*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.99 --->|
*****

PARAMETER          1.4 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 127.05 |
KL/R-Z= 179.16 +
UNL = 499.06 |
CB = 1.00 +L15L15 L15 L26 L26
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      5.5         0.9         0.3         0.8         1.4
LOCATION     5.0         5.0         0.0         0.0         5.0
LOADING    15          15          20          21          15

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.227    17
*  5.50 C    -0.71                1.39     4.99
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 3947 Check 1

```

*****
MEMBER 3947*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.99 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.2 (KNS-METRE)
IN KNS CMS |L32
CAPACITIES
IN KNS METRE
PNC=0.1148E+3
pnc=0.1447E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1248E+1
MNY=0.1346E+2
mny=0.6597E+0
VN =0.2402E+3
vn =0.8941E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2.4 0.9 0.3 0.9 1.2
LOCATION 0.0 0.0 0.0 5.0 0.0
LOADING 14 32 26 26 32

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.190 26
* 1.45 C 0.66 1.25 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 3948 Check 1

```

*****
MEMBER 3948* |=====| ==||==
* | | |
* | LD L90X90X9 | | --Z
DESIGN CODE * | |
LRFD 1994 * | |
* |-----|
* |<---LENGTH (M)= 4.99 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER | 1.8 (KNS-METRE)
IN KNS CMS |
-----+-----
KL/R-Y= 127.05 |
KL/R-Z= 179.16 +
UNL = 499.06 |
CB = 1.00 +L34L26 L26 |
PHIC = 0.85 | L15 L15
PHIB = 0.90 + L34
FYLD = 35.30 | L1
NSF = 1.00 +-----+
DFE = 0.00 0.1 |
dff = 0.00 |
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 3.1 1.0 0.4 1.0 1.8
LOCATION 5.0 5.0 0.0 5.0 5.0
LOADING 26 34 32 32 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.278 26
3.12 C 0.99 1.76 4.99
*
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5318 Check 1

```

*****
MEMBER 5318*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

PARAMETER          10.3 (KNS-METRE)
IN KNS  CMS        L20 L29 L29
+-----+-----+
KL/R-Y= 147.28    |
KL/R-Z= 85.92    + L20          L29
UNL = 900.00    |
CB = 1.00      + L20          L29
PHIC = 0.85    |
PHIB = 0.90    +
FYLD = 35.30   |L20          L29
NSF = 1.00    +-----+-----+
DFE = 0.00    0.9
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      -14.1        4.0         0.0         0.9         10.3
LOCATION     0.0          0.0         0.0         0.0         4.5
LOADING    25           26          14          26          29

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY              MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.055     25
*  14.12 T   -0.78          -10.30    4.50
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5319 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5319* |=====| ---|---|
*                                     |      AX=0.1039E+3
*          ST  H250X255X14          |      --Z  AY=0.3500E+2
DESIGN CODE * |-----|      AZ=0.4760E+2
*          LRFD 1994          *      PY=0.3040E+3
*                                     *      PZ=0.9120E+3
*          |<---LENGTH (M)= 9.00 --->|      RY=0.6111E+1
*****                                     *      RZ=0.1047E+2

PARAMETER          10.3 (KNS-METRE)
IN KNS  CMS      |      L15 L26 L26      CAPACITIES
+-----+-----+-----+-----+-----+-----+
| KL/R-Y= 147.28 |      L15          L26          PNC=0.7224E+3
| KL/R-Z= 85.92  |      L15          L26          pnc=0.0000E+0
| UNL  = 900.00  |      L15          L26          PNT=0.3223E+4
| CB    = 1.00   |      L15          L26          pnt=0.1283E+2
| PHIC  = 0.85   |      L15          L26          MNZ=0.2282E+3
| PHIB  = 0.90   |      L15          L26          mnz=0.1028E+2
| FYLD  = 35.30  |      L15          L26          MNY=0.9659E+2
| NSF   = 1.00   |      L15          L26          mny=0.7855E+0
| DFF   = 0.00   |      L15          L26          VN  =0.6672E+3
| dff   = 0.00   |      L15          L26          vn  =0.6758E-2
+-----+-----+-----+-----+-----+-----+
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -12.8         4.0           0.0           0.9           10.3
LOCATION     0.0           0.0           0.0           0.0           4.5
LOADING    23           26           33           33           26

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)          *
*          -----          *
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/      *
*          FX          MY          MZ          LOCATION          *
*          =====          *
*          PASS          LRFD-H1-1B-T          0.055          23          *
*          12.83 T          0.79          -10.28          4.50          *
*          *          *          *          *          *
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 258	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5320 Check 1

```

*****
MEMBER 5320*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.95 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L25
CAPACITIES
IN KNS METRE
KL/R-Y= 126.17 | L25
KL/R-Z= 177.82 +
UNL = 495.34 | L25 L21 L22
CB = 1.00 + L21
PHIC = 0.85 | L25
PHIB = 0.90 + L30
FYLD = 35.30 | L25
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 8.4 1.0 0.2 0.6 1.5
LOCATION 0.0 0.0 0.0 5.0 0.0
LOADING 25 25 30 21 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.226 25
* 8.42 C -0.44 1.45 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 259	Rev
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By keraf	Date 22-May-15	Chd
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5321 Check 1

```

*****
MEMBER 5321*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.94 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L34
CAPACITIES
IN KNS METRE
KL/R-Y= 134.50 | L34
KL/R-Z= 177.24 + L31 L32 L32
UNL = 493.72 | L34 L31
CB = 1.00 + L31
PHIC = 0.85 | L25
PHIB = 0.90 + L31
FYLD = 35.30 | L25
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00 ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 8.6 1.0 0.1 0.4 1.5
LOCATION 0.0 0.0 0.0 4.9 0.0
LOADING 34 34 22 22 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.221 34
* 8.56 C 0.25 1.51 0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5322 Check 1

```

*****
MEMBER 5322*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.93 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L25
CAPACITIES
IN KNS METRE
PNC=0.1178E+3
pnc=0.3452E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1547E+1
MNY=0.1216E+2
mny=0.1187E+0
VN =0.2402E+3
vn =0.1012E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 3.5 1.0 0.1 0.2 1.5
LOCATION 0.0 0.0 0.0 4.9 0.0
LOADING 25 25 32 32 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.192 25
* 3.45 C -0.12 1.55 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 261	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5323 Check 1

```

*****
MEMBER 5323*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.92 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.6 (KNS-METRE)
IN KNS CMS |L29
CAPACITIES
IN KNS METRE
PNC=0.1179E+3
pnc=0.0000E+0
PNT=0.7582E+3
pnt=0.4396E+1
MNZ=0.9251E+1
mnz=0.1550E+1
MNY=0.1216E+2
mny=0.2164E-1
VN =0.2402E+3
vn =0.1017E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -4.4 1.0 0.0 0.0 1.6
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 25 34 29 29 29

*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
PASS LRFD-H1-1B-T 0.172 25
4.40 T -0.02 1.55 0.00
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 262	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5324 Check 1

```

*****
MEMBER 5324*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L15
CAPACITIES
IN KNS METRE
PNC=0.1178E+3
pnc=0.3282E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1536E+1
MNY=0.1216E+2
mny=0.2163E+0
VN =0.2402E+3
vn =0.1009E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 3.3 1.0 0.1 0.2 1.5
LOCATION 4.9 0.0 0.0 4.9 0.0
LOADING 22 15 21 21 15

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.198 22
3.28 C 0.22 1.54 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 263	Rev
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5325 Check 1

```

*****
MEMBER 5325*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.94 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS        |L30
-----+-----+
KL/R-Y= 134.50    | L30
KL/R-Z= 177.24    +
UNL = 493.72     | L30
CB = 1.00        +
PHIC = 0.85      | L31
PHIB = 0.90      +
FYLD = 35.30     | L31
NSF = 1.00      +
DFE = 0.00      0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    2.2        1.0        0.2        0.4        1.5
LOCATION   4.9        0.0        0.0        4.9        0.0
LOADING  22         26         31         31         30

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.202    22
*  2.14 C    -0.37             1.50     0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5327 Check 1

```

*****
MEMBER 5327*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.95 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L22
CAPACITIES
IN KNS METRE
PNC=0.1166E+3
pnc=0.5934E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1453E+1
MNY=0.1346E+2
mny=0.4412E+0
VN =0.2402E+3
vn =0.9671E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 5.9 1.0 0.2 0.6 1.5
LOCATION 0.0 0.0 0.0 5.0 0.0
LOADING 22 23 26 15 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.215 22
* 5.93 C 0.44 1.45 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5328 Check 1

```

*****
MEMBER 5328*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.94 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L31
CAPACITIES
IN KNS METRE
KL/R-Y= 134.50 | L31
KL/R-Z= 177.24 + L34 L34 L34
UNL = 493.72 | L31 L34
CB = 1.00 + L34
PHIC = 0.85 | L31
PHIB = 0.90 + L25
FYLD = 35.30 | L31
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 7.2 1.0 0.1 0.3 1.5
LOCATION 0.0 0.0 0.0 4.9 0.0
LOADING 31 31 15 15 31

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.216 31
* 7.24 C -0.26 1.51 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5329 Check 1

```

*****
MEMBER 5329*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L22
CAPACITIES
IN KNS METRE
KL/R-Y= 134.26 | L22
KL/R-Z= 176.90 +
UNL = 492.77 | L21 L34 L34 L34
CB = 1.00 +
PHIC = 0.85 | L21 L34
PHIB = 0.90 +
FYLD = 35.30 | L21
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1.6 1.0 0.1 0.2 1.5
LOCATION 0.0 0.0 0.0 4.9 0.0
LOADING 30 23 34 34 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.184 30
* 1.65 C 0.12 1.55 0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5330 Check 1

```

*****
MEMBER 5330*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.92 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.6 (KNS-METRE)
IN KNS CMS |L26
CAPACITIES
IN KNS METRE
PNC=0.1179E+3
pnc=0.0000E+0
PNT=0.7582E+3
pnt=0.3469E+1
MNZ=0.9251E+1
mnz=0.1552E+1
MNY=0.1216E+2
mny=0.2502E-1
VN =0.2402E+3
vn =0.1017E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -3.5 1.0 0.0 0.0 1.6
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 33 1 20 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.172 33
3.47 T 0.03 1.55 0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5331 Check 1

```

*****
MEMBER 5331*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS        |L21
-----+-----+
KL/R-Y= 134.26    | L20
KL/R-Z= 176.90    +
UNL = 492.77      | L20
CB = 1.00         +
PHIC = 0.85       | L19
PHIB = 0.90       +
FYLD = 35.30     | L19
NSF = 1.00       +
DFE = 0.00       +
dff = 0.00       +
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----+-----+
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    4.2        1.0        0.1        0.2        1.5
LOCATION   4.9        0.0        0.0        4.9        0.0
LOADING  34        23        34        25        21

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY                MZ        LOCATION
-----+-----+
PASS       LRFD-H1-1B-C       0.201     34
4.16 C    -0.21                1.53     0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5332 Check 1

```

*****
MEMBER 5332*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.94 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS |L26
CAPACITIES
IN KNS METRE
PNC=0.1173E+3
pnc=0.4812E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1502E+1
MNY=0.1216E+2
mny=0.3783E+0
VN =0.2402E+3
vn =0.9914E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 4.9 1.0 0.2 0.4 1.5
LOCATION 4.9 0.0 0.0 4.9 0.0
LOADING 25 31 25 34 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.214 25
* 4.81 C 0.38 1.50 0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5333 Check 1

```

*****
MEMBER 5333*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.95 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.7626E+2
PZ=0.5241E+2
RY=0.4047E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS |L21
CAPACITIES
IN KNS METRE
PNC=0.1166E+3
pnc=0.1144E+2
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1418E+1
MNY=0.1346E+2
mny=0.6012E+0
VN =0.2402E+3
vn =0.9551E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 11.6 1.0 0.3 0.7 1.4
LOCATION 5.0 0.0 0.0 5.0 0.0
LOADING 34 21 34 34 21

*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.247 34
11.44 C -0.60 1.42 0.00
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5334 Check 1

```

*****
MEMBER 5334*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.95 --->|
*****

PARAMETER          1.4 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 126.17 |
KL/R-Z= 177.82 +L21L21
UNL = 495.34 | L21 L21
CB = 1.00 + L22
PHIC = 0.85 | L26
PHIB = 0.90 + L22
FYLD = 35.30 | L34
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    7.3          1.0          0.3          0.7          1.4
LOCATION   0.0          5.0          0.0          0.0          5.0
LOADING  25           30           25           25           30

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.229    25
*  7.18 C    -0.60                1.42    4.95
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 273	Rev
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5335 Check 1

```

*****
MEMBER 5335* |=====| ==||==
* | | |
* | LD L90X90X9 | | --Z
DESIGN CODE * | |
LRFD 1994 * | |
* |-----|
* |<---LENGTH (M)= 4.94 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6891E+2
PZ=0.5241E+2
RY=0.3764E+1
RZ=0.2786E+1

PARAMETER 1.5 (KNS-METRE)
IN KNS CMS | L15 CAPACITIES
-----+-----
KL/R-Y= 134.50 | L15 PNC=0.1173E+3
KL/R-Z= 177.24 +L31L31 L31 pnc=0.7776E+1
UNL = 493.72 | L31 L25 PNT=0.7582E+3
CB = 1.00 + L32 pnt=0.0000E+0
PHIC = 0.85 | L25 MNZ=0.9251E+1
PHIB = 0.90 + L32 mnz=0.1498E+1
FYLD = 35.30 | L25 MNY=0.1216E+2
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1 VN =0.2402E+3
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.9912E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 7.8 1.0 0.2 0.4 1.5
LOCATION 0.0 4.9 0.0 0.0 4.9
LOADING 34 22 34 25 15

*****
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.226 34
* 7.78 C 0.38 1.50 4.94
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 275	Rev
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5337 Check 1

```

*****
MEMBER 5337*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.92 --->|
*****

PARAMETER          1.6 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 134.18 |
KL/R-Z= 176.78 +L33L34 L34
UNL = 492.44 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    -4.4         1.0         0.0         0.0         1.6
LOCATION   0.0         4.9         0.0         4.9         4.9
LOADING  24         24         1          29         15

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.172     24
*  4.40 T    0.02                 1.55     4.92
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5338 Check 1

```

*****
MEMBER 5338*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 134.26 |
KL/R-Z= 176.90 |
UNL = 492.77 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      3.7         1.0         0.1         0.2         1.5
LOCATION     4.9         4.9         0.0         0.0         4.9
LOADING    22          32          25          25          31

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C        0.193     22
*  3.69 C    0.12                1.55     4.93
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 277	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5339 Check 1

```

*****
MEMBER 5339*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.94 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 134.50 |
KL/R-Z= 177.24 +L25L25 L25
UNL = 493.72 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      2.9         1.0         0.1         0.3         1.5
LOCATION     4.9         4.9         0.0         0.0         4.9
LOADING    22         22         26         26         22

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX          MY              MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C    0.198      22
*  2.93 C    -0.26             1.51      4.94
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5340 Check 1

```

*****
MEMBER 5340*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.95 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 126.17 |
KL/R-Z= 177.82 +L32L32
UNL = 495.34 | L33 L34
CB = 1.00 + L34
PHIC = 0.85 | L31
PHIB = 0.90 + L15
FYLD = 35.30 | L31
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      11.4         1.0         0.2         0.6         1.5
LOCATION     5.0         5.0         0.0         0.0         5.0
LOADING     32          32          15          26          31

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY              MZ        LOCATION
=====
PASS       LRFD-H1-1B-C    0.239     32
11.45 C   0.43          1.45     4.95
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5341 Check 1

```

*****
MEMBER 5341*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.95 --->|
*****

PARAMETER          1.4 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 126.17 |
KL/R-Z= 177.82 +L15L15
UNL = 495.34 | L15 L15
CB = 1.00 + L15
PHIC = 0.85 | L30
PHIB = 0.90 + L15
FYLD = 35.30 | L31
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    4.8         1.0         0.3         0.7         1.4
LOCATION   0.0         5.0         0.0         0.0         5.0
LOADING  22         26         22         22         26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.218     22
*  4.68 C    0.59              1.42     4.95
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 280	Rev
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keraf	22-May-15	
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5342 Check 1

```

*****
MEMBER 5342*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.94 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 134.50 |
KL/R-Z= 177.24 +L34L34 L34
UNL = 493.72 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      6.5         1.0         0.2         0.4         1.5
LOCATION     0.0         4.9         0.0         0.0         4.9
LOADING    31         15         22         22         21

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.221     31
*  6.46 C    -0.38              1.50     4.94
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5343 Check 1

```

*****
MEMBER 5343*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 134.26 |
KL/R-Z= 176.90 +L34L34 L34
UNL = 492.77 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      1.3         1.0         0.1         0.2         1.5
LOCATION     0.0         4.9         0.0         0.0         4.9
LOADING    30          26          30          30          26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.189     30
*  1.24 C    0.21              1.54     4.93
*
*****

```




SKRIPSI JEMBATAN

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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5345 Check 1

```

*****
MEMBER 5345*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.93 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 134.26 |
KL/R-Z= 176.90 +L33L32 L32
UNL = 492.77 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      4.6         1.0         0.1         0.2         1.5
LOCATION     4.9         4.9         0.0         0.0         4.9
LOADING     34         34         23         23         34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.196     34
*  4.57 C    -0.11                1.55     4.93
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 284	Rev
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5346 Check 1

```

*****
MEMBER 5346*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.94 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 134.50 |
KL/R-Z= 177.24 |
UNL = 493.72 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      5.6         1.0         0.1         0.4         1.5
LOCATION     4.9         4.9         0.0         0.0         4.9
LOADING    25          25          31          31          25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.209    25
*  5.60 C    0.26                1.51     4.94
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 285	Rev
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By keraf	Date 22-May-15	Chd
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5347 Check 1

```

*****
MEMBER 5347*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.95 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 126.17 |
KL/R-Z= 177.82 +L34L31
UNL = 495.34 | L31 L30
CB = 1.00 + L30
PHIC = 0.85 | L34
PHIB = 0.90 + L30
FYLD = 35.30 | L34
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      12.7         1.0         0.2         0.6         1.5
LOCATION     5.0         5.0         0.0         0.0         5.0
LOADING    34          34          21          30          34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.243     34
*  12.69 C   -0.43                1.45     4.95
*
*****

```




SKRIPSI JEMBATAN

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keraf	22-May-15	
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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 5350 Check 1

```

*****
MEMBER 5350*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

                20.6 (KNS-METRE)
PARAMETER      |
IN KNS  CMS   |L34
-----+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L34
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 | L34
PHIB = 0.90 +
FYLD = 35.30 | L15 L14
NSF = 1.00 +-----+
DFE = 0.00 -0.7
dff = 0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -246.0        26.8         14.3         29.5         20.6
LOCATION      0.0          4.0          0.0          4.0          4.0
LOADING      33          26           34           34           30

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
=====
PASS          LRFD-H1-1B-T          0.289          33
246.03 T      29.51          20.57          4.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 288	Rev
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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5351 Check 1

```

*****
MEMBER 5351*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
PARAMETER 18.9 (KNS-METRE)
IN KNS CMS |L34
+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L34
UNL = 400.00 |
CB = 1.00 + L15 L15 L15
PHIC = 0.85 |
PHIB = 0.90 + L34 L34
FYLD = 35.30 | L15 L15
NSF = 1.00 +-----+
DFE = 0.00 0.4
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -249.0 26.3 12.3 25.3 18.9
LOCATION 0.0 0.0 0.0 4.0 0.0
LOADING 33 34 34 34 34
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.255 34
* 248.97 T 25.29 18.33 4.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5352 Check 1

```

*****
MEMBER 5352*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PARAMETER          18.9 (KNS-METRE)
IN KNS  CMS        |L34
-----+
KL/R-Y= 52.98      |
KL/R-Z= 30.62      +
UNL = 400.00      | L34          L15
CB = 1.00          +          L15  L15
PHIC = 0.85        |
PHIB = 0.90        +          L34          L34
FYLD = 35.30      |          L15          L15
NSF = 1.00         +-----+-----+
DFE = 0.00         0.7
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      -252.7      26.6       10.0        20.7        18.9
LOCATION     0.0         4.0        0.0         4.0         4.0
LOADING    24         26         34          34          34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T        0.224     34
*  251.55 T  20.66                18.87     4.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5353 Check 1

```

-----
*****
MEMBER 5353* |=====| Y |====| PROPERTIES
* | | | | IN CMS UNIT
* | ST H300X300X10 | | | AX=0.1184E+3
DESIGN CODE * | | | | --Z | AY=0.3000E+2
LRFD 1994 * |=====| | | AZ=0.6000E+2
* | | | | PY=0.4500E+3
* | | | | PZ=0.1350E+4
* |<---LENGTH (M)= 4.00 --->| | | RY=0.7551E+1
***** | | | RZ=0.1306E+2

PARAMETER 17.5 (KNS-METRE)
IN KNS CMS | L34 L34 CAPACITIES
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 52.98 | | | | | PNC=0.2894E+4
KL/R-Z= 30.62 + | | | | | pnc=0.0000E+0
UNL = 400.00 | L34 L15 L15 L15 L34 PNT=0.3673E+4
CB = 1.00 + | | | | | pnt=0.2536E+3
PHIC = 0.85 | | | | | MNZ=0.4178E+3
PHIB = 0.90 + | L15 L15 | | | mnz=0.1752E+2
FYLD = 35.30 | L34 L34 | | | MNY=0.1430E+3
NSF = 1.00 +-----+-----+-----+-----+-----+ mny=0.1589E+2
DFE = 0.00 1.1 | | | | | VN =0.5719E+3
dff = 0.00 ABSOLUTE MZ ENVELOPE | | | | | vn =0.2649E+2
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -257.3 26.5 7.6 15.9 17.5
LOCATION 0.0 4.0 0.0 4.0 4.0
LOADING 24 26 34 34 34
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.188 34
253.64 T 15.89 17.52 4.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5354 Check 1

```

-----
*****
MEMBER 5354*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
-----
PARAMETER 16.4 (KNS-METRE)
IN KNS CMS |L34
-----+
KL/R-Y= 52.98 | L15 L15 L15
KL/R-Z= 30.62 +
UNL = 400.00 | L34
CB = 1.00 + L34 L15
PHIC = 0.85 | L15
PHIB = 0.90 +
FYLD = 35.30 | L1 L34
NSF = 1.00 +-----+
DFE = 0.00 -0.2
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
-----
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -260.5 26.7 5.3 11.1 16.4
LOCATION 0.0 4.0 0.0 4.0 4.0
LOADING 24 34 34 34 34
-----
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.152 34
* 255.17 T 11.11 16.36 4.00
*
*
*****
-----

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5355 Check 1

```

*****
MEMBER 5355*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 15.9 (KNS-METRE)
IN KNS CMS | L25 L25
+
KL/R-Y= 52.98 | L32 L25
KL/R-Z= 30.62 +
UNL = 400.00 | L25
CB = 1.00 + L25 L33
PHIC = 0.85 |
PHIB = 0.90 + L13
FYLD = 35.30 | L25
NSF = 1.00 +-----+
DFE = 0.00 0.7
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -262.6 28.2 2.9 6.4 15.9
LOCATION 0.0 4.0 0.0 4.0 2.0
LOADING 24 34 34 34 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.114 34
* 256.09 T 6.35 14.48 4.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5357 Check 1

```

-----
*****
MEMBER 5357*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
Y
PROPERTIES
IN CMS UNIT
-----
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
-----
PARAMETER 15.9 (KNS-METRE)
IN KNS CMS |L33 L23 L24
-----+
KL/R-Y= 52.98 | L24 L34
KL/R-Z= 30.62 + L23
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 | L34 L24
PHIB = 0.90 + L23
FYLD = 35.30 | L12
NSF = 1.00 +-----+
DFE = 0.00 2.9
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
-----
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -263.5 28.2 1.9 4.3 15.9
LOCATION 0.0 0.0 0.0 0.0 2.0
LOADING 24 24 33 33 23
-----
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.100 33
* 256.18 T 4.33 14.38 0.00
*
*
*****
-----

```



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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5358 Check 1

```

*****
MEMBER 5358*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 16.2 (KNS-METRE)
IN KNS CMS |L32
+-----+
| KL/R-Y= 52.98 |
| KL/R-Z= 30.62 +
| UNL = 400.00 |
| CB = 1.00 + L33 L22
| PHIC = 0.85 |
| PHIB = 0.90 + L23
| FYLD = 35.30 |
| NSF = 1.00 +-----+
| DFF = 0.00 2.2
| dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -262.5 27.9 4.2 9.1 16.2
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 24 23 33 33 32

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.137 33
* 255.39 T 9.07 16.20 0.00
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5359 Check 1

```

*****
MEMBER 5359*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 17.7 (KNS-METRE)
IN KNS CMS |L22
+-----+
| KL/R-Y= 52.98 |
| KL/R-Z= 30.62 |
| UNL = 400.00 | L23
| CB = 1.00 +
| PHIC = 0.85 | L30 L22
| PHIB = 0.90 +
| FYLD = 35.30 | L23 L10
| NSF = 1.00 +-----+
| DFF = 0.00 2.0
| dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -260.6 27.7 6.6 13.8 17.7
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 24 22 33 33 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.173 32
* 253.69 T 13.82 17.59 0.00
*
*****

```



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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5360 Check 1

```

*****
MEMBER 5360*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 19.3 (KNS-METRE)
IN KNS CMS |L21
CAPACITIES
L22 IN KNS METRE
PNC=0.2894E+4
pnc=0.0000E+0
PNT=0.3673E+4
pnt=0.2512E+3
MNZ=0.4178E+3
mnz=0.1906E+2
MNY=0.1430E+3
mny=0.1853E+2
VN =0.5719E+3
vn =0.2654E+2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -258.0 27.7 9.0 18.6 19.3
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 24 21 33 33 21

*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.209 31
251.25 T 18.53 19.06 0.00
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5361 Check 1

```

*****
MEMBER 5361*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 19.3 (KNS-METRE)
IN KNS CMS |L20
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L21
CB = 1.00 + L28 L28 L29
PHIC = 0.85 |
PHIB = 0.90 + L21
FYLD = 35.30 | L21 L28 L29
NSF = 1.00 +-----+
DFE = 0.00 2.5
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -254.9 27.1 11.3 23.3 19.3
LOCATION 0.0 0.0 0.0 0.0 4.0
LOADING 24 20 33 33 21

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.240 33
* 250.50 T 23.27 18.07 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5362 Check 1

```

*****
MEMBER 5362*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
Y
PROPERTIES
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

19.2 (KNS-METRE)
PARAMETER |L19
IN KNS CMS |
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L19
CB = 1.00 + L27 L27 L28
PHIC = 0.85 |
PHIB = 0.90 + L20
FYLD = 35.30 | L27 L28
NSF = 1.00 +-----+
DFE = 0.00 1.8
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -252.0 27.1 13.3 27.5 19.2
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 24 19 33 33 19

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.269 34
* 248.78 T 27.47 18.06 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5363 Check 1

```

*****
MEMBER 5363*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

                20.5 (KNS-METRE)
PARAMETER      |L21
IN KNS  CMS    |
-----+-----+
KL/R-Y= 52.98  |          L25 L25
KL/R-Z= 30.62  +   L30          L25
UNL   = 400.00 |
CB    = 1.00   +
PHIC  = 0.85   |          L25
PHIB  = 0.90   +   L30
FYLD  = 35.30 |
NSF   = 1.00  +-----+-----+-----+-----+-----+-----+
DFE   = 0.00  -0.9
dff   = 0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -111.9        31.4         19.5         39.5         20.5
LOCATION     0.0          0.0          0.0          4.0          0.0
LOADING    34           21           25           25           21

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.334     24
*  108.34 T  38.67             20.43     0.00
*
*****

```



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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5364 Check 1

```

*****
MEMBER 5364*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

                20.4 (KNS-METRE)
PARAMETER      |
IN KNS  CMS   |L34
-----+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L34
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 | L34
PHIB = 0.90 +
FYLD = 35.30 | L15 L2
NSF = 1.00 +-----+
DFE = 0.00 -0.8
dff = 0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -159.3        26.8         15.2         31.3         20.4
LOCATION      0.0          4.0          0.0          4.0          4.0
LOADING      34          15           25           25           30

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.289          24
154.09 T      -31.32          20.39          4.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5365 Check 1

```

*****
MEMBER 5365*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
PARAMETER 18.7 (KNS-METRE)
IN KNS CMS |L34
+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L34
UNL = 400.00 |
CB = 1.00 + L15 L15 L15
PHIC = 0.85 |
PHIB = 0.90 + L34 L34
FYLD = 35.30 | L15 L15
NSF = 1.00 +-----+
DFE = 0.00 0.4
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -193.1 26.3 11.7 24.3 18.7
LOCATION 0.0 0.0 0.0 4.0 0.0
LOADING 34 25 24 24 34
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.239 25
* 186.82 T -24.29 18.12 4.00
*
*****

```



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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 5366 Check 1

```

*****
MEMBER 5366*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
18.7 (KNS-METRE)
PARAMETER | L34
IN KNS CMS |
+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L34 L15
CB = 1.00 + L15 L15
PHIC = 0.85 |
PHIB = 0.90 + L34 L34
FYLD = 35.30 | L15 L15
NSF = 1.00 +-----+
DFE = 0.00 0.7
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -216.2 26.6 8.9 18.7 18.7
LOCATION 0.0 4.0 0.0 4.0 4.0
LOADING 34 26 24 24 34
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.204 25
209.03 T -18.69 18.67 4.00
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [L20]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5367 Check 1

```

*****
MEMBER 5367*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 17.4 (KNS-METRE)
IN KNS CMS |L34
+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L34 L15 L15 L34
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 | L34 L15 L15 L34
NSF = 1.00 +
DFE = 0.00 1.0
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -231.8 26.5 6.4 13.6 17.4
LOCATION 0.0 4.0 0.0 4.0 4.0
LOADING 34 26 24 24 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.167 25
* 223.92 T -13.63 17.32 4.00
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5369 Check 1

```

-----
*****
MEMBER 5369*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
Y
PROPERTIES
IN CMS UNIT
-----
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
-----
15.9 (KNS-METRE)
PARAMETER | L25 L25
IN KNS CMS | L25 L34 IN KNS METRE
-----+-----
KL/R-Y= 52.98 | L32 L25 PNC=0.2894E+4
KL/R-Z= 30.62 + pnc=0.0000E+0
UNL = 400.00 | L25 PNT=0.3673E+4
CB = 1.00 + L33 pnt=0.2388E+3
PHIC = 0.85 | MNZ=0.4178E+3
PHIB = 0.90 + L13 mnz=0.1430E+2
FYLD = 35.30 | L25 MNY=0.1430E+3
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.8 VN =0.5719E+3
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.2822E+2
(WITH LOAD NO.)
-----
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -247.5 28.2 1.8 4.4 15.9
LOCATION 0.0 4.0 0.0 4.0 2.0
LOADING 34 34 24 24 25
-----
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.097 25
* 238.82 T -4.36 14.30 4.00
*
*
*****
-----

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5370 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
*                                     |      -----
MEMBER  5370* |=====| |====|
*                                     |      |
DESIGN CODE * |      ST  H300X300X10      | |      --Z
*                                     |      |
LRFD 1994 * |=====| |====|
*                                     |      |
* |<---LENGTH (M)=      4.00 --->| |      RY=0.7551E+1
*****
*                                     |      RZ=0.1306E+2
*                                     |
*                                     |      17.6 (KNS-METRE)
PARAMETER    |      L24 L25 L25      |      CAPACITIES
IN KNS  CMS  |      |      |      |      |      IN KNS  METRE
-----+-----+-----+-----+-----+-----+-----+-----
KL/R-Y=  52.98 |      L24      L25      |      PNC=0.2894E+4
KL/R-Z=  30.62 +L34      |      |      |      |      pnc=0.0000E+0
UNL   = 400.00 |      |      |      |      |      PNT=0.3673E+4
CB    =  1.00 +      L24      L25      |      pnt=0.2494E+3
PHIC  =  0.85 |      |      |      |      |      MNZ=0.4178E+3
PHIB  =  0.90 +      |      |      |      |      mnz=0.1721E+2
FYLD  = 35.30 |      L12      L13      |      MNY=0.1430E+3
NSF   =  1.00 +-----+-----+-----+-----+-----+-----+
DFE   =  0.00 2.8      |      |      |      |      mny=0.9557E+0
dff   =  0.00      |      |      |      |      VN  =0.5719E+3
*                                     |      vn  =0.3153E+1
*                                     |
*                                     |      ABSOLUTE MZ ENVELOPE
*                                     |      (WITH LOAD NO.)
*                                     |
*                                     |      MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*                                     |      -----
*                                     |
*                                     |      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*                                     |
*      VALUE      -249.4      27.4      0.4      1.7      17.6
*      LOCATION      0.0      4.0      0.0      0.0      2.0
*      LOADING      34      33      34      34      25
*****
*
*                                     DESIGN SUMMARY (KNS-METRE)
*                                     -----
*
*      RESULT/      CRITICAL COND/      RATIO/      LOADING/
*      FX      MY      MZ      LOCATION
*      =====
*      PASS      LRFD-H1-1B-T      0.082      33
*      249.42 T      -0.96      -17.21      1.67
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5371 Check 1

```

*****
MEMBER 5371*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
*****
PARAMETER 16.0 (KNS-METRE)
IN KNS CMS |L33 L23 L24
+-----+
KL/R-Y= 52.98 | L24
KL/R-Z= 30.62 + L23 L34
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 | L34 L24
PHIB = 0.90 + L23
FYLD = 35.30 | L12
NSF = 1.00 +-----+
DFE = 0.00 2.9
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -247.7 28.2 2.6 6.0 16.0
LOCATION 0.0 0.0 0.0 0.0 2.0
LOADING 34 24 25 25 23
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.109 24
* 239.31 T -6.04 14.34 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5372 Check 1

```

*****
MEMBER 5372*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
PARAMETER 16.3 (KNS-METRE)
IN KNS CMS |L32
+ L22 L22 L23
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L23
CB = 1.00 + L33 L22
PHIC = 0.85 | L33
PHIB = 0.90 + L23
FYLD = 35.30 | L10
NSF = 1.00 +-----+
DFE = 0.00 2.2 ABSOLUTE MZ ENVELOPE
dff = 0.00 (WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -242.3 27.9 4.9 10.6 16.3
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 23 25 25 32
*****
DESIGN SUMMARY (KNS-METRE)
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.145 24
234.46 T -10.56 16.22 0.00
*****

```



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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 5373 Check 1

```

*****
MEMBER 5373*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 17.7 (KNS-METRE)
IN KNS CMS |L31
CAPACITIES
L32 IN KNS METRE
PNC=0.2894E+4
pnc=0.0000E+0
PNT=0.3673E+4
pnt=0.2252E+3
MNZ=0.4178E+3
mnz=0.1763E+2
MNY=0.1430E+3
mny=0.1521E+2
VN =0.5719E+3
vn =0.2655E+2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -232.5 27.8 7.2 15.2 17.7
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 22 25 25 31

*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.179 23
225.20 T -15.21 17.63 0.00
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5374 Check 1

```

*****
MEMBER 5374*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 19.3 (KNS-METRE)
IN KNS CMS |L30
CAPACITIES
L31 IN KNS METRE
PNC=0.2894E+4
pnc=0.0000E+0
PNT=0.3673E+4
pnt=0.2104E+3
MNZ=0.4178E+3
mnz=0.1914E+2
MNY=0.1430E+3
mny=0.2004E+2
VN =0.5719E+3
vn =0.2656E+2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -217.0 27.7 9.6 20.1 19.3
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 34 21 25 25 30

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.215 22
* 210.45 T -20.04 19.14 0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5375 Check 1

```

*****
MEMBER 5375*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
PARAMETER 19.3 (KNS-METRE)
IN KNS CMS |L20
+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L21
CB = 1.00 + L28 L28 L29
PHIC = 0.85 |
PHIB = 0.90 + L21
FYLD = 35.30 | L21 L28 L29
NSF = 1.00 +-----+
DFE = 0.00 2.6
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -194.1 27.0 12.2 25.3 19.3
LOCATION 0.0 0.0 0.0 0.0 4.0
LOADING 34 20 25 25 21
*****
DESIGN SUMMARY (KNS-METRE)
-----
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.246 24
189.92 T -25.30 17.87 0.00
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5376 Check 1

```

*****
MEMBER 5376*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

                20.8 (KNS-METRE)
PARAMETER      |L19
IN KNS  CMS    |
-----+-----+
KL/R-Y= 52.98  |
KL/R-Z= 30.62  + L19
UNL = 400.00  |
CB = 1.00     +
PHIC = 0.85   | L20
PHIB = 0.90   +
FYLD = 35.30  |
NSF = 1.00    +-----+-----+-----+-----+-----+
DFE = 0.00    0.4
dff = 0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -160.3        27.6         15.0         31.1         20.8
LOCATION     0.0          0.0          0.0          0.0          0.0
LOADING    34           19           25           25           19

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.286       25
157.80 T     -31.07          19.69       0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5377 Check 1

```

*****
MEMBER 5377*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

11.1 (KNS-METRE)
PARAMETER | L15 L15 L15
IN KNS CMS |
+-----+
| KL/R-Y= 52.98 | L15 |
| KL/R-Z= 30.62 + | L15 |
| UNL = 400.00 | L15 |
| CB = 1.00 +L30 | L15 |
| PHIC = 0.85 | |
| PHIB = 0.90 + L15 |
| FYLD = 35.30 | L15 |
| NSF = 1.00 +-----+
| DFF = 0.00 -0.6 |
| dff = 0.00 |
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 17.3 13.2 3.6 7.2 11.1
LOCATION 0.0 0.0 0.0 4.0 2.0
LOADING 33 30 14 14 15

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.053 26
* 16.78 C -5.88 3.78 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5378 Check 1

```

*****
MEMBER 5378*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.1 (KNS-METRE)
IN KNS CMS |L34
CAPACITIES
IN KNS METRE
PNC=0.2894E+4
pnc=0.9199E+1
PNT=0.3673E+4
pnt=0.0000E+0
MNZ=0.4178E+3
mnz=0.1008E+2
MNY=0.1430E+3
mny=0.8549E+1
VN =0.5719E+3
vn =0.1385E+2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 9.2 14.2 4.4 8.9 10.1
LOCATION 0.0 0.0 0.0 4.0 0.0
LOADING 34 25 34 34 34

*****
DESIGN SUMMARY (KNS-METRE)
-----
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.085 34
9.20 C -8.55 10.08 0.00
*****

```



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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5379 Check 1

```

*****
MEMBER 5379*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.1 (KNS-METRE)
IN KNS CMS |L34
+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L34
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 | L34 L15 L15 L15
PHIB = 0.90 +
FYLD = 35.30 | L34 L34
NSF = 1.00 +-----+
DFE = 0.00 -0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1.7 12.5 4.3 8.7 10.1
LOCATION 0.0 4.0 0.0 4.0 4.0
LOADING 25 26 34 34 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.085 34
* 1.47 C 8.66 10.07 4.00
*
*****

```



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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5380 Check 1

```

*****
MEMBER 5380*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

          9.5 (KNS-METRE)
PARAMETER |
IN KNS CMS |L34
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L34
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 + L34 L15
FYLD = 35.30 | L15
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 -0.1
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -5.5        12.6         3.8          7.7           9.5
LOCATION     0.0         4.0          0.0          4.0           4.0
LOADING    33         15           34           34            34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.077        34
5.53 T        7.71                9.53         4.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 318	Rev
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Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5381 Check 1

```

-----
*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
*                                     |      -----
MEMBER  5381*                       |      AX=0.1184E+3
*                                     |      AY=0.3000E+2
DESIGN CODE *                       |      AZ=0.6000E+2
*                                     |      PY=0.4500E+3
LRFD 1994 *                           |      PZ=0.1350E+4
*                                     |      RY=0.7551E+1
*                                     |      RZ=0.1306E+2
*****
*                                     |
*                                     |      8.4 (KNS-METRE)
PARAMETER |
IN KNS  CMS | L34
-----+-----
KL/R-Y=  52.98 |
KL/R-Z=  30.62 +
UNL   = 400.00 |
CB    =  1.00 + L34
PHIC  =  0.85 |
PHIB  =  0.90 +
FYLD  = 35.30 |
NSF   =  1.00 +
DFE   =  0.00 +
dff   =  0.00 +
*                                     |
*                                     |      ABSOLUTE MZ ENVELOPE
*                                     |      (WITH LOAD NO.)
*                                     |
*                                     |      MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*                                     |      -----
*                                     |
*                                     |      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*                                     |
*                                     |      VALUE      -11.3      12.7      3.1      6.3      8.4
*                                     |      LOCATION    0.0      4.0      0.0      4.0      4.0
*                                     |      LOADING     33      26      34      34      34
*                                     |
*****
*                                     *
*                                     *      DESIGN SUMMARY (KNS-METRE)
*                                     *      -----
*                                     *
*                                     *
*                                     *      RESULT/      CRITICAL COND/      RATIO/      LOADING/
*                                     *      FX          MY          MZ          LOCATION
*                                     *      -----
*                                     *      PASS      LRFD-H1-1B-T      0.065      34
*                                     *      11.29 T      6.27      8.39      4.00
*                                     *
*****
-----

```



SKRIPSI JEMBATAN

Job No	Sheet No 319	Rev
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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5382 Check 1

```

-----
*****
MEMBER 5382* |=====| Y |====| PROPERTIES
* | | | | IN CMS UNIT
* | ST H300X300X10 | | | AX=0.1184E+3
DESIGN CODE * | | | | --Z | AY=0.3000E+2
LRFD 1994 * |=====| | | AZ=0.6000E+2
* | | | | PY=0.4500E+3
* | | | | PZ=0.1350E+4
* |<---LENGTH (M)= 4.00 --->| | | RY=0.7551E+1
***** | | | RZ=0.1306E+2

PARAMETER 7.2 (KNS-METRE)
IN KNS CMS | L15 L15 L34 CAPACITIES
-----+-----+-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 52.98 | L33 L25 | PNC=0.2894E+4
KL/R-Z= 30.62 + | | pnc=0.0000E+0
UNL = 400.00 | | L15 | PNT=0.3673E+4
CB = 1.00 + | L25 L34 | pnt=0.1554E+2
PHIC = 0.85 | | MNZ=0.4178E+3
PHIB = 0.90 + | L33 | mnz=0.7172E+1
FYLD = 35.30 | | L15 | MNY=0.1430E+3
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
DFE = 0.00 0.6 | | VN =0.5719E+3
dff = 0.00 | | vn =0.1317E+2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -15.5 13.2 2.2 4.6 7.2
LOCATION 0.0 4.0 0.0 4.0 4.0
LOADING 33 34 34 34 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.051 34
* 15.54 T 4.60 7.17 4.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5384 Check 1

```

*****
MEMBER 5384*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

12.2 (KNS-METRE)
PARAMETER | L24 L24 L25
IN KNS CMS |
+ L24 L25
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L24 L25
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 | L24 L25
PHIB = 0.90 +
FYLD = 35.30 |L12 L32
NSF = 1.00 +-----|
DFE = 0.00 1.7
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -19.0 12.7 0.5 1.1 12.2
LOCATION 0.0 4.0 0.0 4.0 2.0
LOADING 33 33 25 25 24

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.033 25
18.75 T 0.30 -12.04 2.33
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5387 Check 1

```

*****
MEMBER 5387*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

      8.7 (KNS-METRE)
PARAMETER |L23
IN KNS CMS |
-----+-----
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L23
CB = 1.00 +
PHIC = 0.85 | L21
PHIB = 0.90 +
FYLD = 35.30 | L9
NSF = 1.00 +-----+
DFE = 0.00 1.3
dff = 0.00

      ABSOLUTE MZ ENVELOPE
      (WITH LOAD NO.)

      MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
      -----
      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE -11.4      13.2      2.3      4.7      8.7
LOCATION 0.0      0.0      0.0      0.0      0.0
LOADING 33      22      33      33      23

*****
*
*      DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX      MY      MZ      LOCATION
=====
PASS      LRFD-H1-1B-T      0.055      32
11.40 T      4.69      8.65      0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5388 Check 1

```

*****
MEMBER 5388*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PARAMETER          10.2 (KNS-METRE)
IN KNS  CMS        |L22
-----+-----+
KL/R-Y= 52.98      |
KL/R-Z= 30.62     + L22
UNL   = 400.00    |
CB    = 1.00      +          L29 L29 L30          L23
PHIC  = 0.85     |
PHIB  = 0.90     +          L22          L30
FYLD  = 35.30    |          L29          L23
NSF   = 1.00    +-----+-----+-----+-----+
DFE   = 0.00    1.2
dff   = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -5.7         13.1         3.0           6.2           10.2
LOCATION     0.0          0.0          0.0           0.0           0.0
LOADING    33          21           33            33            22

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.068     31
*  5.65 T    6.15              10.17     0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5389 Check 1

```

*****
MEMBER 5389*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.2 (KNS-METRE)
IN KNS CMS |L21
+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L21
UNL = 400.00 |
CB = 1.00 + L28 L28 L29
PHIC = 0.85 | L21
PHIB = 0.90 +
FYLD = 35.30 | L28 L29
NSF = 1.00 +-----+
DFE = 0.00 0.5
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1.4 12.7 3.6 7.2 10.2
LOCATION 0.0 0.0 0.0 0.0 4.0
LOADING 25 20 33 33 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.074 30
* 1.32 C 7.17 10.02 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5390 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
*                                     |      -----
MEMBER  5390* |=====| |====|
*                                     |      |
DESIGN CODE * |      ST  H300X300X10      | |      --Z
*                                     |      |
LRFD 1994 * |=====| |====|
*                                     |      |
* |<---LENGTH (M)=      4.00 --->| |      RY=0.7551E+1
*****                                     |      RZ=0.1306E+2

10.1 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| KL/R-Y=  52.98 | |      L27      L27      L28      | |      L21 CAPACITIES
| KL/R-Z=  30.62 | |      L27      L27      L28      | |      IN KNS METRE
| UNL   = 400.00 | |      L27      L27      L28      | |      -----
| CB    =  1.00  | |      L27      L27      L28      | |      PNC=0.2894E+4
| PHIC  =  0.85  | |      L27      L27      L28      | |      pnc=0.8970E+1
| PHIB  =  0.90  | |      L27      L27      L28      | |      PNT=0.3673E+4
| FYLD  = 35.30  | |      L27      L27      L28      | |      pnt=0.0000E+0
| NSF   =  1.00  | |      L27      L27      L28      | |      MNZ=0.4178E+3
| DFF   =  0.00  | |      L27      L27      L28      | |      mnz=0.1002E+2
| dff   =  0.00  | |      L27      L27      L28      | |      MNY=0.1430E+3
|                                     | |      mny=0.7244E+1
|                                     | |      VN  =0.5719E+3
|                                     | |      vn  =0.1499E+2
|                                     |
|                                     |      ABSOLUTE MZ ENVELOPE
|                                     |      (WITH LOAD NO.)
|                                     |
|                                     |      MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
|                                     |      -----
|                                     |
|      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
|
|      VALUE      9.1          15.0          3.7          7.6          10.1
|      LOCATION   0.0          4.0          0.0          0.0          4.0
|      LOADING    24          27          33          33          21
|
*****
*
*      DESIGN SUMMARY (KNS-METRE)
*      -----
*
*      RESULT/      CRITICAL COND/      RATIO/      LOADING/
*      FX          MY          MZ          LOCATION
*      -----
*      PASS      LRFD-H1-1B-C      0.076      30
*      8.97 C      -7.24          10.02      4.00
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5391 Check 1

```

*****
MEMBER 5391*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.0 (KNS-METRE)
IN KNS CMS L25 L25
+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +L30 L15 L25
UNL = 400.00 |
CB = 1.00 + L15 L34
PHIC = 0.85 |
PHIB = 0.90 + L30
FYLD = 35.30 |
NSF = 1.00 +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
DFE = 0.00 -0.3
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -18.0 13.7 11.3 24.8 10.0
LOCATION 0.0 0.0 0.0 4.0 2.3
LOADING 33 30 33 33 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.176 33
* 17.98 T 24.81 0.03 4.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5392 Check 1

```

*****
MEMBER 5392*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

          9.9 (KNS-METRE)
PARAMETER |L34
IN KNS CMS |
-----+
| KL/R-Y= 52.98 |
| KL/R-Z= 30.62 + L34
| UNL = 400.00 | L15 L15 L15
| CB = 1.00 + L15
| PHIC = 0.85 | L34
| PHIB = 0.90 + L15 L30
| FYLD = 35.30 | L15
| NSF = 1.00 +-----+
| DFF = 0.00 0.4
| dff = 0.00
          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -45.4      13.6      9.1      18.5      9.9
LOCATION     0.0      0.0      0.0      4.0      0.0
LOADING    33      25      33      33      34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
-----
PASS          LRFD-H1-1B-T      0.154      34
45.44 T      -17.71      9.93      0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5393 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
MEMBER 5393* |=====| ---|===
*                                     |      --Z
DESIGN CODE * |      ST H300X300X10      |
*                                     |      PY=0.4500E+3
LRFD 1994 * |=====| ---|===
*                                     |      PZ=0.1350E+4
* |<---LENGTH (M)= 4.00 --->|      |      RY=0.7551E+1
*****                                     |      RZ=0.1306E+2

          9.9 (KNS-METRE)
PARAMETER |L34                                     L34 CAPACITIES
IN KNS CMS |-----+-----+-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 52.98 |      |      |      |      |      |      |      |      |      |      |
KL/R-Z= 30.62 + L34                                     L34
UNL = 400.00 |      |      |      |      |      |      |      |      |      |
CB = 1.00 +-----+-----+-----+-----+-----+-----+-----+-----+
PHIC = 0.85 |      L34      L15 L15 L15      L34
PHIB = 0.90 +-----+-----+-----+-----+-----+-----+-----+-----+
FYLD = 35.30 |      L34                                     L34
NSF = 1.00 +-----+-----+-----+-----+-----+-----+-----+-----+
DFE = 0.00 -0.1
dff = 0.00
          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -64.4      12.4      8.2      16.7      9.9
LOCATION      0.0      4.0      0.0      4.0      4.0
LOADING      33      26      34      34      34

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)          *
*          -----          *
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/      *
*          FX      MY      MZ      LOCATION          *
*          =====          *
*          PASS      LRFD-H1-1B-T      0.149      34          *
*          64.35 T      16.72      9.92      4.00          *
*          *          *          *          *          *
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [L20]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5394 Check 1

```

*****
MEMBER 5394*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

          9.5 (KNS-METRE)
PARAMETER |
IN KNS CMS |L34
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L34
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 + L34 L15
FYLD = 35.30 | L15
NSF = 1.00 +-----+
DFE = 0.00 0.0
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -78.0      12.6      6.8      14.0      9.5
LOCATION     0.0      4.0      0.0      4.0      4.0
LOADING    33      15      34      34      34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
-----
PASS          LRFD-H1-1B-T      0.131      34
78.00 T      14.00      9.51      4.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5395 Check 1

```

*****
MEMBER 5395*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

      8.4 (KNS-METRE)
PARAMETER |
IN KNS CMS |L34
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 |
CB = 1.00 + L34
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.3
dff = 0.00

      ABSOLUTE MZ ENVELOPE
      (WITH LOAD NO.)

      MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
      -----
      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE -87.7      12.6      5.3      11.0      8.4
LOCATION 0.0      4.0      0.0      4.0      4.0
LOADING 33      26      34      34      34

*****
*
*      DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX      MY      MZ      LOCATION
-----
PASS      LRFD-H1-1B-T      0.109      34
87.66 T      10.96      8.36      4.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 333	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5396 Check 1

```

*****
MEMBER 5396*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

```

PARAMETER	IN KNS	CMS	L15	L15	L15	L34	CAPACITIES
KL/R-Y=	52.98		L33				PNC=0.2894E+4
KL/R-Z=	30.62			L15			pnc=0.0000E+0
UNL =	400.00				L15		PNT=0.3673E+4
CB =	1.00					L34	pnt=0.9412E+2
PHIC =	0.85			L15			MNZ=0.4178E+3
PHIB =	0.90			L33			mnz=0.7154E+1
FYLD =	35.30				L15		MNY=0.1430E+3
NSF =	1.00						mny=0.7770E+1
DFE =	0.00	0.6					VN =0.5719E+3
dfc =	0.00						vn =0.1303E+2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

	AXIAL	SHEAR-Y	SHEAR-Z	MOMENT-Y	MOMENT-Z
VALUE	-94.3	13.0	3.7	7.8	7.2
LOCATION	0.0	4.0	0.0	4.0	4.0
LOADING	24	34	34	34	34

```

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX          MY              MZ          LOCATION
*  =====
*  PASS        LRFD-H1-1B-T    0.084      34
*  94.12 T     7.77            7.15      4.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 334	Rev
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keraf	22-May-15	
File	Date/Time	
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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5397 Check 1

```

*****
MEMBER 5397*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

11.2 (KNS-METRE)
PARAMETER | L25 L25
IN KNS CMS | L25 L25
-----+-----
KL/R-Y= 52.98 | L25
KL/R-Z= 30.62 + L25
UNL = 400.00 | L33
CB = 1.00 + L25
PHIC = 0.85 | L13 L25
PHIB = 0.90 +
FYLD = 35.30 | L33
NSF = 1.00 +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
DFE = 0.00 0.4
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -98.8 13.7 2.1 4.5 11.2
LOCATION 0.0 4.0 0.0 4.0 1.7
LOADING 24 34 34 34 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.057 33
* 97.87 T 4.51 4.99 4.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5398 Check 1

```

*****
MEMBER 5398*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 12.4 (KNS-METRE)
IN KNS CMS L24 L24 L25
+ L24 L25
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L24 L25
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 | L24 L25
PHIB = 0.90 +
FYLD = 35.30 |L12 L13
NSF = 1.00 +-----|
DFE = 0.00 2.3
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -100.6 13.0 0.6 1.6 12.4
LOCATION 0.0 4.0 0.0 4.0 2.0
LOADING 24 33 25 25 24

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.047 25
100.55 T 0.59 -12.35 2.33
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5400 Check 1

```

*****
MEMBER 5400*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER      8.7 (KNS-METRE)
IN KNS  CMS    L22 L22 L23
+L33
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 2.2
dff = 0.00

CAPACITIES
IN KNS METRE
PNC=0.2894E+4
pnc=0.0000E+0
PNT=0.3673E+4
pnt=0.9451E+2
MNZ=0.4178E+3
mnz=0.7034E+1
MNY=0.1430E+3
mny=0.6055E+1
VN =0.5719E+3
vn =0.1302E+2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -96.3      13.5      2.9      6.1      8.7
LOCATION     0.0      0.0      0.0      0.0      2.3
LOADING    24      23      33      33      23

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY              MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.072      33
*  94.51 T      6.05      7.03      0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5401 Check 1

```

-----
*****
MEMBER 5401*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
-----
PARAMETER 8.6 (KNS-METRE)
IN KNS CMS |L23
-----+-----
KL/R-Y= 52.98 | L21 L22 L33
KL/R-Z= 30.62 +
UNL = 400.00 | L23 L22
CB = 1.00 + L30
PHIC = 0.85 | L33
PHIB = 0.90 + L22
FYLD = 35.30 | L9
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
DFE = 0.00 1.6
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
-----
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -89.9 13.4 4.5 9.3 8.6
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 24 22 33 33 23
-----
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.097 32
* 88.10 T 9.25 8.55 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5402 Check 1

```

*****
MEMBER 5402*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.0 (KNS-METRE)
IN KNS CMS |L22
+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L22
UNL = 400.00 |
CB = 1.00 + L29 L30 L23
PHIC = 0.85 |
PHIB = 0.90 + L22 L30
FYLD = 35.30 | L29 L9
NSF = 1.00 +-----+
DFE = 0.00 1.5
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -80.2 13.3 6.0 12.3 10.0
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 24 21 33 33 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.121 31
* 78.39 T 12.30 9.95 0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5403 Check 1

```

*****
MEMBER 5403*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.2 (KNS-METRE)
IN KNS CMS |L21
+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L21
UNL = 400.00 |
CB = 1.00 + L28 L28 L29
PHIC = 0.85 | L21
PHIB = 0.90 +
FYLD = 35.30 | L28 L29
NSF = 1.00 +-----+
DFE = 0.00 0.7
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -66.3 13.0 7.4 15.2 10.2
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 24 20 33 33 21

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.138 30
* 64.63 T 15.07 10.13 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5404 Check 1

```

-----
*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
*                                     |      -----
MEMBER 5404* |=====| |====|
*                                     |      |
DESIGN CODE * |      ST H300X300X10 |      --Z
*                                     |      |
LRFD 1994 * |=====| |====|
*                                     |      |
* |<---LENGTH (M)= 4.00 --->|      RY=0.7551E+1
*****
*                                     |      RZ=0.1306E+2
*
*                                     10.2 (KNS-METRE)
PARAMETER | |
IN KNS CMS | |
-----+-----
| KL/R-Y= 52.98 | | L27 L27 |
| KL/R-Z= 30.62 | | L28 |
| UNL = 400.00 | | L27 | L21
| CB = 1.00 | | |
| PHIC = 0.85 | | L27 | L28
| PHIB = 0.90 | | |
| FYLD = 35.30 | | L20 | L21
| NSF = 1.00 | | |
| DFF = 0.00 | 1.1 |
| dff = 0.00 | |
*
*                                     ABSOLUTE MZ ENVELOPE
*                                     (WITH LOAD NO.)
*
*                                     MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*                                     -----
*
*                                     AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*                                     VALUE      -46.8      14.6      8.4      17.1      10.2
*                                     LOCATION      0.0      4.0      0.0      0.0      4.0
*                                     LOADING      24      27      33      33      21
*
*****
*
*                                     DESIGN SUMMARY (KNS-METRE)
*                                     -----
*
*                                     RESULT/      CRITICAL COND/      RATIO/      LOADING/
*                                     FX      MY      MZ      LOCATION
*
*                                     =====
*                                     PASS      LRFD-H1-1B-T      0.144      30
*                                     45.83 T      -16.21      10.14      4.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5405 Check 1

```

*****
MEMBER 5405*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 11.0 (KNS-METRE)
IN KNS CMS L15 L15 L15
+
KL/R-Y= 52.98 | L15
KL/R-Z= 30.62 + L15
UNL = 400.00 | L15
CB = 1.00 +L30
PHIC = 0.85 |
PHIB = 0.90 + L15
FYLD = 35.30 | L15
NSF = 1.00 +-----+
DFE = 0.00 -0.6
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 17.9 13.2 3.9 8.0 11.0
LOCATION 0.0 0.0 0.0 0.0 2.0
LOADING 25 30 25 25 15

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.065 24
* 17.87 C 8.03 2.56 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 343	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5406 Check 1

```

*****
MEMBER 5406*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.1 (KNS-METRE)
IN KNS CMS |L34
CAPACITIES
IN KNS METRE
PNC=0.2894E+4
pnc=0.1168E+2
PNT=0.3673E+4
pnt=0.0000E+0
MNZ=0.4178E+3
mnz=0.9856E+1
MNY=0.1430E+3
mny=0.3752E+1
VN =0.5719E+3
vn =0.1410E+2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 11.7 14.1 2.5 5.1 10.1
LOCATION 0.0 0.0 0.0 0.0 0.0
LOADING 25 25 14 14 34

*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.052 25
11.68 C 3.75 9.86 0.00
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [L20]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5407 Check 1

```

-----
*****
MEMBER 5407*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
Y
PROPERTIES
IN CMS UNIT
-----
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
-----
10.1 (KNS-METRE)
PARAMETER |
IN KNS CMS |L34
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L34
UNL = 400.00 |
CB = 1.00 + L34
PHIC = 0.85 | L34 L15 L15 L15
PHIB = 0.90 +
FYLD = 35.30 | L34 L34
NSF = 1.00 +-----+
DFE = 0.00 -0.1
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
-----
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 6.8 12.5 2.1 4.2 10.1
LOCATION 0.0 4.0 0.0 0.0 4.0
LOADING 25 26 14 14 34
-----
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.044 26
* 6.24 C 2.70 9.92 4.00
*
*
*****
-----

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5408 Check 1

```

*****
MEMBER 5408*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

          9.5 (KNS-METRE)
PARAMETER |
IN KNS CMS |L34
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L34
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 -0.1
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2.1        12.6         1.7           3.5           9.5
LOCATION     0.0        4.0          0.0           0.0           4.0
LOADING    24         15           14            14            34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
*  =====
*  PASS        LRFD-H1-1B-C      0.041       34
*  1.59 C      2.56          9.50        4.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 346	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5409 Check 1

```

*****
MEMBER 5409*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

      8.4 (KNS-METRE)
PARAMETER | L34
IN KNS CMS |
-----+-----
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 |
CB = 1.00 + L34
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.3
dff = 0.00

      ABSOLUTE MZ ENVELOPE
      (WITH LOAD NO.)

      MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
      -----
      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.8      12.7      1.3      2.7      8.4
LOCATION      0.0      4.0      0.0      0.0      4.0
LOADING      34      26      14      14      34

*****
*
*      DESIGN SUMMARY (KNS-METRE)
*      -----
*
*      RESULT/      CRITICAL COND/      RATIO/      LOADING/
*      FX      MY      MZ      LOCATION
*      -----
*      PASS      LRFD-H1-1B-T      0.036      34
*      2.77 T      2.22      8.36      4.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 347	Rev
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By	keraf	Date 22-May-15 Chd
Client	Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5410 Check 1

```

*****
MEMBER 5410*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
Y
PROPERTIES
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

7.1 (KNS-METRE)
PARAMETER | L15 L15 L34 CAPACITIES
IN KNS CMS | L15
+-----+
KL/R-Y= 52.98 | L33 L25 PNC=0.2894E+4
KL/R-Z= 30.62 + pnc=0.0000E+0
UNL = 400.00 | L15 PNT=0.3673E+4
CB = 1.00 + L25 L34 pnt=0.6219E+1
PHIC = 0.85 | MNZ=0.4178E+3
PHIB = 0.90 + mnz=0.7141E+1
FYLD = 35.30 | L33 L15 MNY=0.1430E+3
NSF = 1.00 +-----+ vn=0.5719E+3
DFE = 0.00 0.6 vn =0.1317E+2
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -6.2 13.2 0.9 2.0 7.1
LOCATION 0.0 4.0 0.0 0.0 4.0
LOADING 34 34 26 26 34
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.030 34
6.22 T 1.75 7.14 4.00
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 349	Rev
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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5412 Check 1

```

*****
MEMBER 5412*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

12.2 (KNS-METRE)
PARAMETER | L24 L24 L25
IN KNS CMS |
+-----+
| KL/R-Y= 52.98 | L24 L25
| KL/R-Z= 30.62 + L24 L25
| UNL = 400.00 |
| CB = 1.00 +
| PHIC = 0.85 | L24 L25
| PHIB = 0.90 +
| FYLD = 35.30 | L12 L32
| NSF = 1.00 +-----+
| DFF = 0.00 1.7
| dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -9.2 12.7 0.4 0.9 12.2
LOCATION 0.0 4.0 0.0 0.0 2.0
LOADING 34 33 25 25 24

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.032 33
* 9.18 T -0.26 -12.01 1.67
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 350	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5413 Check 1

```

*****
MEMBER 5413*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 11.0 (KNS-METRE)
IN KNS CMS L23 L23 L24
+
KL/R-Y= 52.98 | L23
KL/R-Z= 30.62 + L24
UNL = 400.00 |
CB = 1.00 +L34 L23
PHIC = 0.85 | L24
PHIB = 0.90 +
FYLD = 35.30 | L23
NSF = 1.00 +-----+
DFE = 0.00 1.7
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -8.4 13.4 0.7 1.4 11.0
LOCATION 0.0 0.0 0.0 0.0 2.0
LOADING 34 24 25 25 23

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.028 23
* 7.42 T -0.29 -10.60 1.67
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 351	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5414 Check 1

```

-----
*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
*                                     |      -----
MEMBER 5414* |=====| |====|
*                                     |      |
DESIGN CODE * |      ST H300X300X10      | |      --Z
*                                     |      |
LRFD 1994 *  |=====| |====|
*                                     |      |
* |<---LENGTH (M)= 4.00 --->|      |      RY=0.7551E+1
*****
*                                     |      RZ=0.1306E+2
*                                     |
*                                     |      CAPACITIES
PARAMETER      |      8.6 (KNS-METRE)      |      IN KNS METRE
IN KNS CMS      |      L22 L23      |      -----
+L33            |      L22      |
KL/R-Y= 52.98   |      L23      |      PNC=0.2894E+4
KL/R-Z= 30.62   +      L22      |      pnc=0.0000E+0
UNL = 400.00    |      L34      |      PNT=0.3673E+4
CB = 1.00       +      L23      |      pnt=0.5283E+1
PHIC = 0.85     |      L33 L22   |      MNZ=0.4178E+3
PHIB = 0.90     +      L11      |      mnz=0.7080E+1
FYLD = 35.30    |      +-----+ |      MNY=0.1430E+3
NSF = 1.00      +-----+ |      mny=0.1829E+1
DFE = 0.00      1.7      |      VN =0.5719E+3
dff = 0.00      |      |      vn =0.1317E+2
*                                     |
*                                     |      ABSOLUTE MZ ENVELOPE
*                                     |      (WITH LOAD NO.)
*                                     |
*                                     |      MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*                                     |      -----
*                                     |
*                                     |      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*                                     |
*      VALUE      -6.2      13.3      0.9      1.9      8.6
*      LOCATION      0.0      0.0      0.0      4.0      2.0
*      LOADING      34      23      14      14      22
*
*****
*                                     *
*                                     *      DESIGN SUMMARY (KNS-METRE)
*                                     *      -----
*                                     *
*      RESULT/      CRITICAL COND/      RATIO/      LOADING/
*      FX      MY      MZ      LOCATION
*      =====
*      PASS      LRFD-H1-1B-T      0.030      24
*      5.28 T      -1.83      7.08      0.00
*
*****
-----

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5415 Check 1

```

-----
*****
MEMBER 5415*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
Y
PROPERTIES
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 8.7 (KNS-METRE)
IN KNS CMS |L32
CAPACITIES
IN KNS METRE
L33
+-----+
KL/R-Y= 52.98 | L21 L21 L22 PNC=0.2894E+4
KL/R-Z= 30.62 + pnc=0.0000E+0
UNL = 400.00 | L32 L22 PNT=0.3673E+4
CB = 1.00 + pnt=0.1933E+1
PHIC = 0.85 | L21 L33 MNZ=0.4178E+3
PHIB = 0.90 + L22 mnz=0.8658E+1
FYLD = 35.30 | L9 MNY=0.1430E+3
NSF = 1.00 +-----+ mny=0.2236E+1
DFE = 0.00 1.3 VN =0.5719E+3
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.1300E+2
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -2.7 13.2 1.3 2.7 8.7
LOCATION 0.0 0.0 0.0 4.0 0.0
LOADING 34 22 14 14 32

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.037 23
1.93 T -2.24 8.66 0.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5416 Check 1

```

*****
MEMBER 5416*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.2 (KNS-METRE)
IN KNS CMS |L22
+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L22
UNL = 400.00 |
CB = 1.00 + L29 L29 L30
PHIC = 0.85 |
PHIB = 0.90 + L22 L30
FYLD = 35.30 | L29 L23
NSF = 1.00 +-----+
DFE = 0.00 1.2
dff = 0.00 ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2.3 13.1 1.7 3.4 10.2
LOCATION 0.0 0.0 0.0 4.0 0.0
LOADING 25 21 14 14 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.043 22
* 2.28 C -2.60 10.21 0.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 354	Rev
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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5417 Check 1

```

*****
MEMBER 5417*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.2 (KNS-METRE)
IN KNS CMS |L21
+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L21
UNL = 400.00 |
CB = 1.00 + L28 L28 L29
PHIC = 0.85 | L21 L22
PHIB = 0.90 +
FYLD = 35.30 | L28 L29
NSF = 1.00 +-----+
DFE = 0.00 0.6
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 7.0 12.6 1.9 3.7 10.2
LOCATION 0.0 0.0 0.0 4.0 4.0
LOADING 25 20 14 14 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.045 22
* 6.96 C 2.80 10.21 4.00
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5418 Check 1

```

*****
MEMBER 5418*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

          9.9 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+-----
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.8
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      11.7      14.8      1.7      3.5      9.9
LOCATION     0.0      4.0      0.0      0.0      4.0
LOADING    25      27      14      14      21

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
-----
PASS          LRFD-H1-1B-C          0.048          21
11.63 C      3.11          9.94          4.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 356	Rev
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Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5419 Check 1

```

*****
MEMBER 5419*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

          9.9 (KNS-METRE)
PARAMETER |          L25 L25
IN KNS CMS |          L25
-----+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +L30          L25          L34
UNL = 400.00 |
CB = 1.00 +          L34
PHIC = 0.85 |          L25
PHIB = 0.90 +          L30
FYLD = 35.30 |          L1
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
DFE = 0.00 -0.4
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -6.2      13.7      11.5      24.9      9.9
LOCATION     0.0      0.0      0.0      4.0      2.3
LOADING    25      30      25      25      25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
-----
PASS          LRFD-H1-1B-T      0.175      24
6.19 T      -24.87      0.14      4.00
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 357	Rev
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5420 Check 1

```

*****
MEMBER 5420*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

          9.9 (KNS-METRE)
PARAMETER |L34
IN KNS CMS |
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L34
UNL = 400.00 | L15 L15 L15
CB = 1.00 +
PHIC = 0.85 | L15
PHIB = 0.90 + L34 L30
FYLD = 35.30 | L15 L15
NSF = 1.00 +-----+
DFE = 0.00 0.3
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -19.4      13.5      6.2      12.4      9.9
LOCATION     0.0      0.0      0.0      0.0      0.0
LOADING    34      25      25      25      34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
* FX          MY          MZ          LOCATION
* -----
* PASS          LRFD-H1-1B-T          0.113          25
* 19.27 T          12.43          9.72          0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5421 Check 1

```

*****
MEMBER 5421*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.00 --->|
*****

          9.9 (KNS-METRE)
PARAMETER |L34
IN KNS CMS |
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L34
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 | L34 L15 L15 L15
PHIB = 0.90 +
FYLD = 35.30 | L34 L34
NSF = 1.00 +-----+
DFE = 0.00 -0.2
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -34.9      12.4      4.9      10.1      9.9
LOCATION     0.0      4.0      0.0      4.0      4.0
LOADING    34      26      24      24      34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
=====
PASS          LRFD-H1-1B-T          0.099          25
33.56 T      -10.12          9.71          4.00
*
*****

```



SKRIPSI JEMBATAN

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keraf	22-May-15	
File	Date/Time	
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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5422 Check 1

```

*****
MEMBER 5422*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

          9.4 (KNS-METRE)
PARAMETER |
IN KNS CMS |L34
-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 | L34
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 0.0
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -48.8        12.6         3.8           8.0           9.4
LOCATION     0.0         4.0         0.0           4.0           4.0
LOADING    34         15         24           24           34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
*  =====
*  PASS        LRFD-H1-1B-T      0.084        25
*  46.59 T     -7.96         9.38         4.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5423 Check 1

```

-----
*****
MEMBER 5423*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****
Y
PROPERTIES
IN CMS UNIT
-----
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2
-----
8.3 (KNS-METRE)
PARAMETER | L34
IN KNS CMS |
-----+
KL/R-Y= 52.98 | L15
KL/R-Z= 30.62 + L15 L15
UNL = 400.00 | L34
CB = 1.00 +
PHIC = 0.85 | L15
PHIB = 0.90 + L15 L34
FYLD = 35.30 | L13
NSF = 1.00 +-----+
DFE = 0.00 0.3
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
-----
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -60.0 12.6 2.8 5.9 8.3
LOCATION 0.0 4.0 0.0 4.0 4.0
LOADING 34 26 24 24 34
-----
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.069 25
* 57.26 T -5.90 8.20 4.00
*
*
*****
-----

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5425 Check 1

```

*****
MEMBER 5425*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

11.2 (KNS-METRE)
PARAMETER | L25 L25
IN KNS CMS | L25 L25
+
KL/R-Y= 52.98 | L25
KL/R-Z= 30.62 + L25
UNL = 400.00 | L25 L33
CB = 1.00 + L25
PHIC = 0.85 | L13
PHIB = 0.90 +
FYLD = 35.30 | L33
NSF = 1.00 +-----+
DFE = 0.00 0.3
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -73.2 13.7 0.7 1.7 11.2
LOCATION 0.0 4.0 0.0 4.0 1.7
LOADING 34 34 24 24 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-T 0.039 34
73.25 T -0.42 -11.04 2.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title	Jembatan Pelengkung
Client	Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5426 Check 1

```

*****
MEMBER 5426*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 12.5 (KNS-METRE)
IN KNS CMS L24 L24 L25 CAPACITIES
IN KNS METRE
+ L24 L25
KL/R-Y= 52.98 | PNC=0.2894E+4
KL/R-Z= 30.62 + L24 L25 pnc=0.0000E+0
UNL = 400.00 | PNT=0.3673E+4
CB = 1.00 + pnt=0.7492E+2
PHIC = 0.85 | L24 L25 MNZ=0.4178E+3
PHIB = 0.90 + mnz=0.1234E+2
FYLD = 35.30 | L12 L13 MNY=0.1430E+3
NSF = 1.00 +-----| mny=0.5565E+0
DFE = 0.00 2.3 VN =0.5719E+3
dff = 0.00 vn =0.1326E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -74.9 13.0 0.4 1.2 12.5
LOCATION 0.0 4.0 0.0 0.0 2.0
LOADING 34 33 25 34 24

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.044 33
* 74.92 T -0.56 -12.34 1.67
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5427 Check 1

```

-----
*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
*                                     |      -----
MEMBER  5427* |=====| |====|
*                                     |      |
DESIGN CODE * |      ST  H300X300X10      | |      --Z
*                                     |      |
LRFD 1994 * |=====| |====|
*                                     |      |
* |<---LENGTH (M)= 4.00 --->|      |      RY=0.7551E+1
*****
*                                     |      RZ=0.1306E+2
*
*                                     11.2 (KNS-METRE)
PARAMETER    |      L23 L23 L24      CAPACITIES
IN KNS  CMS  |      L24      IN KNS METRE
-----+-----+-----+-----+-----+-----+-----
KL/R-Y= 52.98 |      L23      PNC=0.2894E+4
KL/R-Z= 30.62 +      L24      pnc=0.0000E+0
UNL = 400.00 |      L23      PNT=0.3673E+4
CB = 1.00 +      L24      pnt=0.6993E+2
PHIC = 0.85 |L34      MNZ=0.4178E+3
PHIB = 0.90 +      mnz=0.4878E+1
FYLD = 35.30 |      L23      L12 MNY=0.1430E+3
NSF = 1.00 +-----+-----+-----+-----+-----+-----+
DFE = 0.00 2.1      VN =0.5719E+3
dff = 0.00      vn =0.1319E+2
*
*                                     ABSOLUTE MZ ENVELOPE
*                                     (WITH LOAD NO.)
*
*                                     MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*                                     -----
*
*                                     AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*                                     VALUE      -73.3      13.7      1.5      3.3      11.2
*                                     LOCATION      0.0      0.0      0.0      0.0      2.3
*                                     LOADING      34      24      25      25      24
*
*****
*
*                                     DESIGN SUMMARY (KNS-METRE)
*                                     -----
*
*                                     RESULT/      CRITICAL COND/      RATIO/      LOADING/
*                                     FX      MY      MZ      LOCATION
*                                     =====
*                                     PASS      LRFD-H1-1B-T      0.045      25
*                                     69.93 T      -3.34      4.88      0.00
*
*****
-----

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5428 Check 1

```

*****
MEMBER 5428*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER      8.7 (KNS-METRE)
IN KNS  CMS    L22 L22 L23
+L33
KL/R-Y= 52.98 |
KL/R-Z= 30.62 +
UNL = 400.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 2.2
dff = 0.00

CAPACITIES
IN KNS METRE
PNC=0.2894E+4
pnc=0.0000E+0
PNT=0.3673E+4
pnt=0.6528E+2
MNZ=0.4178E+3
mnz=0.7036E+1
MNY=0.1430E+3
mny=0.5458E+1
VN =0.5719E+3
vn =0.1302E+2

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -68.4      13.5      2.6      5.5      8.7
LOCATION     0.0      0.0      0.0      0.0      2.3
LOADING    34      23      25      25      23

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY              MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.064      24
*  65.28 T   -5.46              7.04      0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 5430 Check 1

```

*****
MEMBER 5430*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PARAMETER          10.0 (KNS-METRE)
IN KNS  CMS        |L22
+-----+
KL/R-Y= 52.98      |
KL/R-Z= 30.62     + L22
UNL   = 400.00    |
CB    = 1.00      +          L29 L29 L30          L32
PHIC  = 0.85      |
PHIB  = 0.90      +          L22          L21
FYLD  = 35.30    |          L29          L32
NSF   = 1.00     +-----+-----+-----+-----+
DFE   = 0.00     1.5
dff   = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -48.9         13.3         4.5           9.4           10.0
LOCATION     0.0           0.0           0.0           0.0           0.0
LOADING    34            21            25            25            22

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.096     22
*  46.58 T   -9.37             10.03     0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5431 Check 1

```

*****
MEMBER 5431*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1184E+3
AY=0.3000E+2
AZ=0.6000E+2
PY=0.4500E+3
PZ=0.1350E+4
RY=0.7551E+1
RZ=0.1306E+2

PARAMETER 10.0 (KNS-METRE)
IN KNS CMS |L21
+-----+
KL/R-Y= 52.98 |
KL/R-Z= 30.62 + L21
UNL = 400.00 |
CB = 1.00 + L28 L28 L29
PHIC = 0.85 | L21
PHIB = 0.90 +
FYLD = 35.30 | L28 L29
NSF = 1.00 +-----+
DFE = 0.00 0.9
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -35.0 12.9 5.4 11.1 10.0
LOCATION 0.0 0.0 0.0 0.0 4.0
LOADING 34 20 25 25 22

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.105 21
* 33.24 T -11.04 9.87 0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5433 Check 1

```

*****
MEMBER 5433*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.00 --->|
*****

          68.4 (KNS-METRE)
PARAMETER |L34
IN KNS CMS | L34 L34
-----+-----
KL/R-Y= 14.64 | L34
KL/R-Z= 3.43 + L34
UNL = 100.00 | L34
CB = 1.00 +
PHIC = 0.85 | L34 L34
PHIB = 0.90 + L34
FYLD = 35.30 | L0
NSF = 1.00 +-----+
DFE = 0.00 -3.8
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -25.2      71.6      101.0      101.0      68.4
LOCATION     0.0      1.0      0.0      0.0      0.0
LOADING    25      34      25      25      34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
=====
PASS          LRFD-H1-1B-T          0.478          25
25.25 T      -101.01          -62.81          0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5436 Check 1

```

*****
MEMBER 5436*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 155.0 (KNS-METRE)
IN KNS CMS |L34L34 L34 L34 L34
+
KL/R-Y= 20.50 |
KL/R-Z= 4.80 +
UNL = 140.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 151.6
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 9.6 7.2 5.3 6.1 155.0
LOCATION 0.0 0.0 0.0 0.0 0.2
LOADING 33 15 14 25 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.104 34
* 9.64 C -4.15 -151.77 1.40
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [L20]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5437 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5437*  |=====|  ===|===  -----
*                                     |      |
DESIGN CODE *  |          ST  H700X300X13  |  --Z  |
*                                     |      |
LRFD 1994 *  |=====|  ===|===  PY=0.7210E+3
*                                     |      |
*  |<---LENGTH (M)= 1.40 --->|      |      RZ=0.2917E+2
*****
*                                     |
*                                     |      154.9 (KNS-METRE)
PARAMETER  |
IN KNS  CMS  |
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 20.50 |          |          |          |          |          |
KL/R-Z= 4.80  +          |          |          |          |          |
UNL = 140.00 |          |          |          |          |          |
CB = 1.00    +          |          |          |          |          |
PHIC = 0.85  |          |          |          |          |          |
PHIB = 0.90  +          |          |          |          |          |
FYLD = 35.30 |L34     |          |          |          |          |
NSF = 1.00   +-----+-----+-----+-----+-----+
DFE = 0.00  131.8
dff = 0.00
*                                     |
*                                     |          ABSOLUTE MZ ENVELOPE
*                                     |          (WITH LOAD NO.)
*                                     |
*                                     |          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*                                     |          -----
*                                     |          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*                                     |          VALUE      LOCATION      LOADING
*                                     |          10.7      0.0      25
*                                     |          25.4      0.0      15
*                                     |          21.1      0.0      25
*                                     |          33.1      0.0      24
*                                     |          154.9      1.4      34
*****
*                                     *
*                                     *          DESIGN SUMMARY (KNS-METRE)
*                                     *          -----
*                                     *
*                                     *          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*                                     *          FX          MY          MZ          LOCATION
*                                     *          =====
*                                     *          PASS      LRFD-H1-1B-C      0.205      34
*                                     *          6.81 C      -29.75      -132.97      0.00
*                                     *
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5440 Check 1

```

*****
MEMBER 5440*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                206.1 (KNS-METRE)
PARAMETER      |L19
IN KNS  CMS   |  L19 L19
-----+-----+
KL/R-Y= 20.50 |          L19
KL/R-Z=  4.80 +          L19
UNL  = 140.00 |          L19
CB   =  1.00 +
PHIC =  0.85 |          L19 L19
PHIB =  0.90 +          L19
FYLD = 35.30 |          L19
NSF  =  1.00 +-----+
DFE  =  0.00 119.1
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.4          61.4          20.1          30.2          206.1
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    24            19            25            25            19

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/   CRITICAL COND/   RATIO/   LOADING/
*  FX      MY      MZ      LOCATION
*  =====
*  PASS    LRFD-H1-1B-T    0.245    25
*  3.40 T   30.19         -202.55  0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5441 Check 1

```

*****
MEMBER 5441*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

                245.8 (KNS-METRE)
PARAMETER      |L19
IN KNS  CMS   | L19 L19
-----+-----+
KL/R-Y= 20.50 |          L19
KL/R-Z=  4.80 +          L19
UNL  = 140.00 |          L19
CB   =  1.00 +
PHIC =  0.85 |          L19 L19
PHIB =  0.90 +          L19
FYLD = 35.30 |          L19
NSF  =  1.00 +-----+
DFE  =  0.00 203.8
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -6.1          31.7          6.2          11.3          245.8
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    24            20            25            25            19

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
=====
PASS          LRFD-H1-1B-T      0.186          19
6.04 T        11.05          -245.84        0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5442 Check 1

```

*****
MEMBER 5442*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                246.6 (KNS-METRE)
PARAMETER      |          L19 L19
IN KNS CMS    |          L19 L19
-----+-----+
KL/R-Y= 20.50 |          L19          L19
KL/R-Z= 4.80  +
UNL = 140.00 |          L19          L19
CB = 1.00 +
PHIC = 0.85 | L19
PHIB = 0.90 +
FYLD = 35.30 |L19
NSF = 1.00 +-----+
DFE = 0.00 245.0
dff = 0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -5.7          3.8          3.7          8.3          246.6
LOCATION     0.0          0.0          0.0          1.4          0.8
LOADING    24          27          14          33          19

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS     LRFD-H1-1B-T        0.173     28
*  5.14 T   8.16              -245.74   1.40
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5443 Check 1

```

*****
MEMBER 5443*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

                245.1 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL   = 140.00 |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |L19
NSF   =  1.00  +-----+
DFE   =  0.00  202.0
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -6.5          32.4          11.6          15.9          245.1
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    33            19            33            33            19

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.205          28
6.36 T        15.65          -244.96          1.40
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5445 Check 1

```

*****
MEMBER 5445*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 125.6 (KNS-METRE)
IN KNS CMS | L20
+ L20 L20
+ L20
+ L20
+ L20 L20
+ L20
+ L0
+-----+-----+-----+-----+-----+-----+
dfF = 0.00 -7.0
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 1.1 128.8 52.2 52.2 125.6
LOCATION 0.0 1.0 0.0 0.0 0.0
LOADING 14 20 25 25 20

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.297 25
* 0.13 T 52.22 -123.61 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5446 Check 1

```

*****
MEMBER 5446*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                219.2 (KNS-METRE)
PARAMETER      |L20
IN KNS  CMS    | L20 L20
-----+-----+
KL/R-Y= 20.50  |          L20
KL/R-Z=  4.80  +          L20
UNL   = 140.00 |          L20
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |
NSF   =  1.00  +-----+-----+-----+-----+-----+
DFE   =  0.00  | 120.4
dff   =  0.00  |
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.0          69.5          20.1          26.0          219.2
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    25            20            25            25            20

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.235     20
*  2.91 T    25.70            -219.24   0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5447 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5447*  |=====|  ===|===  -----
*                                     |      |
DESIGN CODE *  |          ST  H700X300X13  |  --Z  |
LRFD 1994 *  |=====|  ===|===  PY=0.7210E+3
*                                     |      |
*  |<---LENGTH (M)= 1.40 --->|      |      RZ=0.2917E+2
*****

266.8 (KNS-METRE)
PARAMETER      |L20
IN KNS  CMS    |  L20 L20
-----+-----+
KL/R-Y= 20.50  |          L20
KL/R-Z=  4.80  +          L20
UNL  = 140.00  |          L20
CB   =  1.00  +
PHIC =  0.85  |          L20 L20
PHIB =  0.90  +          L20
FYLD = 35.30  |          L20
NSF  =  1.00  +-----+
DFE  =  0.00  216.6
dff  =  0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.5        37.4         5.3         10.5         266.8
LOCATION      0.0         1.4         0.0         0.0         0.0
LOADING      25         21         25         25         20

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)          *
*          -----          *
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/      *
*          FX          MY          MZ          LOCATION          *
*          =====          *
*          PASS      LRFD-H1-1B-T      0.194      20          *
*          3.47 T      10.34      -266.80      0.00          *
*          *          *          *          *          *
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5448 Check 1

```

*****
MEMBER 5448*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                268.2 (KNS-METRE)
PARAMETER      |          L20 L20 L20
IN KNS  CMS    |          L20
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 20.50  |          L20
KL/R-Z=  4.80  +   L20
UNL  = 140.00  |
CB   =  1.00   +L20
PHIC =  0.85   |
PHIB =  0.90   +
FYLD = 35.30   |          L20
NSF  =  1.00   +-----+-----+-----+-----+-----+-----+
DFE  =  0.00   |          266.7
dff  =  0.00   |
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.7          3.6          5.3          8.5          268.2
LOCATION     0.0          1.4          0.0          1.4          0.6
LOADING    24           27           14           33           20

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-T      0.186      29
2.86 T      8.49      -266.79      1.40
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5449 Check 1

```

*****
MEMBER 5449*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                267.3 (KNS-METRE)
PARAMETER      |
IN KNS  CMS   |
-----+-----+
KL/R-Y= 20.50 |
KL/R-Z=  4.80 +
UNL  = 140.00 |
CB   =  1.00  +
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30 |L29
NSF  =  1.00  +-----+
DFE  =  0.00  217.7
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.4          37.0          12.9          15.7          267.3
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    24            21            33            33            20

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.217          29
2.71 T        15.57          -267.25          1.40
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5450 Check 1

```

*****
MEMBER 5450*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****
                220.3 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00 |
CB   =  1.00  +
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30  |L29
NSF  =  1.00  +-----+
DFE  =  0.00  121.1
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.3          69.7          31.9          29.1          220.3
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    24            20            33            33            29
*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS         LRFD-H1-1B-T          0.249          29
1.75 T       28.79                -220.27        1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5451 Check 1

```

*****
MEMBER 5451*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 123.4 (KNS-METRE)
IN KNS CMS | L30
+ L30 L30
+ L30
+ L30
+ L30
+ L30 L30
+ L30
+ L0
+-----+-----+-----+-----+-----+-----+
dfF = 0.00 -6.9
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 0.5 126.6 39.9 39.9 123.4
LOCATION 0.0 1.0 0.0 0.0 0.0
LOADING 26 30 25 25 30

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.242 25
* 0.00 T 39.88 -121.45 0.00
*
*****

```



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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5452 Check 1

```

*****
MEMBER 5452*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                212.2 (KNS-METRE)
PARAMETER      |L30
IN KNS  CMS   | L30 L30
-----+-----+
KL/R-Y= 20.50 |          L30
KL/R-Z=  4.80 +          L30
UNL   = 140.00 |          L30
CB    =  1.00 +
PHIC  =  0.85 |          L30 L30
PHIB  =  0.90 +          L30
FYLD  = 35.30 |          L30
NSF   =  1.00 +-----+
DFE   =  0.00 118.5
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.6          66.1          18.4          22.0          212.2
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    25            30            25            25            30

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-T    0.214      21
2.55 T    21.87          -212.22    0.00
*
*****

```



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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5453 Check 1

```

*****
MEMBER 5453*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                256.6 (KNS-METRE)
PARAMETER      |L30
IN KNS  CMS    | L30 L30
-----+-----+
KL/R-Y= 20.50  |          L30
KL/R-Z=  4.80  +          L30
UNL   = 140.00 |          L30
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |
NSF   =  1.00  +-----+-----+-----+-----+-----+
DFE   =  0.00  209.8
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.4          35.2          5.2           9.3           256.6
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    25            31            25            25            30

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS      LRFD-H1-1B-T      0.184      21
*  3.41 T      9.23      -256.58      0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5454 Check 1

```

*****
MEMBER 5454*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****
Y
PROPERTIES
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

257.7 (KNS-METRE)
PARAMETER | L30 L30 L30
IN KNS CMS |
-----+-----+-----+-----+
KL/R-Y= 20.50 | L30 L30
KL/R-Z= 4.80 + L30 L30
UNL = 140.00 |
CB = 1.00 + L30
PHIC = 0.85 |
PHIB = 0.90 + L30
FYLD = 35.30 |L30
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 256.4
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -3.6 3.3 5.2 7.9 257.7
LOCATION 0.0 0.0 0.0 1.4 0.7
LOADING 24 27 26 33 30

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.178 30
* 2.53 T 7.89 -256.59 1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5455 Check 1

```

*****
MEMBER 5455*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

                256.5 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00  |
CB   =  1.00   +
PHIC =  0.85   |
PHIB =  0.90   +
FYLD = 35.30  |L30
NSF  =  1.00  +-----+
DFE  =  0.00  209.6
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.3          35.2          12.2          13.8          256.5
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    24            31            33            33            30

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS      LRFD-H1-1B-T      0.203      30
*  2.02 T      13.71      -256.51      1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5456 Check 1

```

*****
MEMBER 5456*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

                212.0 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00 |
CB   =  1.00  +
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30  |L30
NSF  =  1.00  +-----+
DFE  =  0.00  118.3
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.1          66.0          25.8          23.4          212.0
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    24            30            33            33            30

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
*  =====
*  PASS        LRFD-H1-1B-T      0.220        30
*  0.63 T      23.20      -212.05      1.40
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5458 Check 1

```

*****
MEMBER 5458*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                209.7 (KNS-METRE)
PARAMETER      |L31
IN KNS  CMS    | L31 L31
-----+-----+
KL/R-Y= 20.50 |          L31
KL/R-Z=  4.80 +          L31
UNL   = 140.00 |          L31
CB    =  1.00 +
PHIC  =  0.85 |          L31 L31
PHIB  =  0.90 +          L31
FYLD  = 35.30 |          L31
NSF   =  1.00 +-----+-----+-----+-----+-----+
DFE   =  0.00 117.2
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.4          65.2          15.4          17.5          209.7
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    25            31            25            25            31

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.193      22
*  2.43 T    17.43             -209.73    0.00
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5460 Check 1

```

*****
MEMBER 5460*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                254.7 (KNS-METRE)
PARAMETER      |          L31 L31 L31
IN KNS  CMS    |
-----+-----+-----+-----+
KL/R-Y= 20.50  |          L31          L31
KL/R-Z=  4.80  +          L31          L31
UNL  = 140.00  |
CB   =  1.00  +          L31
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30  |L31
NSF  =  1.00  +-----+-----+-----+-----+-----+
DFE  =  0.00  253.5
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.6          3.3          4.4          6.5          254.7
LOCATION     0.0          1.4          0.0          1.4          0.7
LOADING    25          27          14          33          31

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-T      0.170      31
2.31 T      6.50      -253.52      1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5461 Check 1

```

*****
MEMBER 5461*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                253.5 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL   = 140.00 |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |L31
NSF   =  1.00  +-----+
DFE   =  0.00  207.3
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.2          34.8          10.1          11.0          253.5
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    24            23            33            33            31

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS        LRFD-H1-1B-T      0.190        31
*  1.58 T      11.01      -253.52      1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5462 Check 1

```

*****
MEMBER 5462*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

                209.7 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00  |
CB   =  1.00   +
PHIC =  0.85   |
PHIB =  0.90   +
FYLD = 35.30  |L31
NSF  =  1.00  +-----+
DFE  =  0.00  117.2
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.0          65.2          19.6          17.7          209.7
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    24            31            33            33            31

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS      LRFD-H1-1B-T      0.194      31
*  0.06 T      17.64      -209.74      1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5463 Check 1

```

*****
MEMBER 5463*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****
Y
PROPERTIES
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

122.4 (KNS-METRE)
PARAMETER |L23
IN KNS CMS | L23 L23
-----+-----
KL/R-Y= 14.64 | L23
KL/R-Z= 3.43 + L23
UNL = 100.00 | L23
CB = 1.00 +
PHIC = 0.85 | L23 L23
PHIB = 0.90 + L23
FYLD = 35.30 | L0
NSF = 1.00 +-----+
DFE = 0.00 -6.8
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 0.1 125.6 20.6 20.6 122.4
LOCATION 0.0 1.0 0.0 0.0 0.0
LOADING 34 23 25 25 23

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.158 23
* 0.00 C 20.58 -122.43 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5464 Check 1

```

*****
MEMBER 5464*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                210.4 (KNS-METRE)
PARAMETER      |L23
IN KNS  CMS   | L23 L23
-----+-----+
KL/R-Y= 20.50 |          L23
KL/R-Z=  4.80 +          L23
UNL   = 140.00 |          L23
CB    =  1.00 +
PHIC  =  0.85 |          L23 L23
PHIB  =  0.90 +          L23
FYLD  = 35.30 |          L23
NSF   =  1.00 +-----+-----+-----+-----+
DFE   =  0.00 117.5
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.3          65.5          11.7          12.8          210.4
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    25            24            25            25            23

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS        LRFD-H1-1B-T      0.173        23
*  2.32 T      12.76          -210.44      0.00
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5465 Check 1

```

*****
MEMBER 5465*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                254.4 (KNS-METRE)
PARAMETER      |L23
IN KNS  CMS    | L23 L23
-----+-----+
KL/R-Y= 20.50  |          L23
KL/R-Z=  4.80  +          L23
UNL   = 140.00 |          L23
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |
NSF   =  1.00  +-----+-----+
DFE   =  0.00  208.0
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.3          34.9          3.9           6.0           254.4
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    25            24            25            25            23

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.168       23
3.34 T        5.99                 -254.40     0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5466 Check 1

```

*****
MEMBER 5466*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                255.5 (KNS-METRE)
PARAMETER      |          L23 L23 L23
IN KNS  CMS    |
-----+-----+-----+-----
KL/R-Y= 20.50  |          L23          L23
KL/R-Z=  4.80  +          L23          L23
UNL  = 140.00  |
CB   =  1.00  +          L23
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30  |L23
NSF  =  1.00  +-----+-----+-----+-----+-----+-----+
DFE  =  0.00  254.3
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.6          3.3          3.3          4.7          255.5
LOCATION     0.0          0.0          0.0          1.4          0.7
LOADING    25          18          14          33          23

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-T      0.163      32
2.16 T      4.68      -254.40      1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5467 Check 1

```

*****
MEMBER 5467*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                254.4 (KNS-METRE)
PARAMETER      |
IN KNS  CMS   |
-----+-----+
KL/R-Y= 20.50 |
KL/R-Z=  4.80 +
UNL  = 140.00 |
CB    =  1.00 +
PHIC  =  0.85 |
PHIB  =  0.90 +
FYLD  = 35.30 |
NSF   =  1.00 +
DFE   =  0.00 208.0
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.2          34.9          7.3           7.9           254.4
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    24            24            33            33            23

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.176          32
1.32 T        7.86                 -254.39        1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5468 Check 1

```

*****
MEMBER 5468*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                210.4 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00  |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |L23
NSF   =  1.00  +-----+
DFE   =  0.00  117.5
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2.0           65.5           13.6           12.2           210.4
LOCATION     0.0           0.0            0.0            1.4            1.4
LOADING    14            24             33             33             23

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS        LRFD-H1-1B-C      0.171      32
*  0.28 C      12.23      -210.43      1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5469 Check 1

```

*****
MEMBER 5469*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 122.5 (KNS-METRE)
IN KNS CMS | L24
+ L24 L24
+ L24
+ L24
+ L24 L24
+ L24
+ L24
+ L0
+-----+-----+-----+-----+-----+
dfF = 0.00 -6.8
dfdf = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 0.0 125.7 12.4 12.4 122.5
LOCATION 0.0 1.0 0.0 0.0 0.0
LOADING 34 24 25 25 24

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.123 24
* 0.00 C 12.43 -122.55 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5470 Check 1

```

*****
MEMBER 5470*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                210.4 (KNS-METRE)
PARAMETER      |L24
IN KNS  CMS    | L24 L24
-----+-----+
KL/R-Y= 20.50  |          L24
KL/R-Z=  4.80  +          L24
UNL   = 140.00 |          L24
CB    =  1.00  +
PHIC  =  0.85  |          L24 L24
PHIB  =  0.90  +          L24
FYLD  = 35.30  |          L24
NSF   =  1.00  +-----+-----+-----+-----+-----+
DFE   =  0.00  117.7
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
                VALUE      LOCATION      LOADING
                -2.2        0.0        25          8.0          210.4
                65.4        1.4        25          0.0          0.0
                7.6        0.0        25          25          24

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.152     24
*  2.25 T    8.00             -210.43   0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5471 Check 1

```

*****
MEMBER 5471*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****
Y
PROPERTIES
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

254.2 (KNS-METRE)
PARAMETER |L24
IN KNS CMS | L24 L24
-----+-----
KL/R-Y= 20.50 | L24
KL/R-Z= 4.80 + L24
UNL = 140.00 | L33
CB = 1.00 +
PHIC = 0.85 | L33 L33
PHIB = 0.90 + L33
FYLD = 35.30 | L33
NSF = 1.00 +-----+
DFE = 0.00 208.0
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -3.3 34.8 2.9 4.0 254.2
LOCATION 0.0 1.4 0.0 0.0 0.0
LOADING 25 25 25 25 24

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.160 24
* 3.31 T 4.00 -254.23 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5472 Check 1

```

*****
MEMBER 5472*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                255.4 (KNS-METRE)
PARAMETER      |          L24 L24 L24          CAPACITIES
IN KNS  CMS    |          L24          L24    IN KNS METRE
-----+-----+-----+-----+-----+-----+-----
KL/R-Y= 20.50  |          L24          L24    PNC=0.6370E+4
KL/R-Z=  4.80  +          L24          L24    pnc=0.0000E+0
UNL  = 140.00  |          L24          L24    PNT=0.7182E+4
CB   =  1.00  +          L24          L24    pnt=0.2129E+1
PHIC =  0.85  |          L24          L24    MNZ=0.1792E+4
PHIB =  0.90  +          L24          L24    mnz=0.2542E+3
FYLD = 35.30  |L24          L24          MNY=0.2291E+3
NSF  =  1.00  +-----+-----+-----+-----+-----+-----| mny=0.2593E+1
DFE  =  0.00  254.2
dff  =  0.00
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.5          3.3          2.1          2.6          255.4
LOCATION     0.0          0.0          0.0          1.4          0.7
LOADING    25          31          14          33          24

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
=====
PASS          LRFD-H1-1B-T          0.153          33
2.13 T          2.59          -254.23          1.40
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5473 Check 1

```

*****
MEMBER 5473*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                254.2 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00  |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |
NSF   =  1.00  +
DFE   =  0.00  208.0
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.1          34.8          4.1          4.5          254.2
LOCATION     0.0           0.0           0.0          1.4          1.4
LOADING    24            34            33           33           24

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
*  =====
*  PASS        LRFD-H1-1B-T      0.161        33
*  1.22 T      4.46          -254.23      1.40
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 409	Rev
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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5474 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5474*  |=====|  ===|===  -----
*                                     |      |      AX=0.2315E+3
*          ST  H700X300X13          |      |      AY=0.9100E+2
DESIGN CODE *  |      |      AZ=0.9600E+2
LRFD 1994 *  |=====|  ===|===  PY=0.7210E+3
*                                     |      |      PZ=0.5640E+4
*          |<---LENGTH (M)=  1.40 --->|      |      RY=0.6830E+1
*****                                     |      |      RZ=0.2917E+2
                                     |
PARAMETER          210.4 (KNS-METRE)
IN KNS  CMS      |
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y=  20.50  |          L33          L33  CAPACITIES
KL/R-Z=   4.80  +          L33          L33  IN KNS METRE
UNL   = 140.00 |          L33          PNC=0.6370E+4
CB    =  1.00  +          L33          pnc=0.4092E+0
PHIC  =  0.85  |          L33 L33      PNT=0.7182E+4
PHIB  =  0.90  +          L33          pnt=0.0000E+0
FYLD  = 35.30 |L33          MNZ=0.1792E+4
NSF   =  1.00 +          mnz=0.2104E+3
DFE   =  0.00 117.6          MNY=0.2291E+3
dff   =  0.00          mny=0.6909E+1
                                     |      |      VN  =0.1735E+4
                                     |      |      vn  =0.5979E+2
                                     |
                                     ABSOLUTE MZ ENVELOPE
                                     (WITH LOAD NO.)
                                     |
                                     MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                                     -----
                                     |
                                     AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
                                     |
VALUE      2.1      65.4      7.6      6.9      210.4
LOCATION    0.0      0.0      0.0      1.4      1.4
LOADING    14      25      33      33      33
*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)          *
*          -----          *
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/      *
*          FX          MY          MZ          LOCATION          *
*          =====          *
*          PASS      LRFD-H1-1B-C      0.148      33          *
*          0.41 C      6.91      -210.41      1.40          *
*          *          *          *          *          *
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 5476 Check 1

```

*****
MEMBER 5476*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                205.5 (KNS-METRE)
PARAMETER      |L34
IN KNS  CMS    | L34 L34
-----+-----+
KL/R-Y= 20.50  |          L34
KL/R-Z=  4.80  +          L34
UNL   = 140.00 |          L34
CB    =  1.00  +
PHIC  =  0.85  |          L34 L34
PHIB  =  0.90  +          L34
FYLD  = 35.30  |          L34
NSF   =  1.00  +-----+-----+-----+-----+-----+
DFE   =  0.00  115.0
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.2          63.8          3.3          3.2          205.5
LOCATION     0.0           1.4           0.0          0.0           0.0
LOADING    25            31            25            25            34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.129     25
*  2.21 T    3.20             -205.50   0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5477 Check 1

```

*****
MEMBER 5477*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                248.3 (KNS-METRE)
PARAMETER      |L34
IN KNS CMS     | L34 L34
-----+-----+
KL/R-Y= 20.50 |          L34
KL/R-Z= 4.80  +          L34
UNL = 140.00 |          L34
CB = 1.00    +
PHIC = 0.85  |          L34 L34
PHIB = 0.90  +          L34
FYLD = 35.30 |          L34
NSF = 1.00   +-----+-----+-----+-----+-----+-----+
DFE = 0.00   |          L34
dff = 0.00   |          L34
                203.1
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.3          34.1          1.8          1.9          248.3
LOCATION     0.0          1.4          0.0          0.0          0.0
LOADING    25           31           25           25           34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.147    25
*  3.29 T    1.89             -248.32  0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5478 Check 1

```

*****
MEMBER 5478*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                249.5 (KNS-METRE)
PARAMETER      |          L34 L34 L34
IN KNS  CMS    |
-----+-----+-----+-----
KL/R-Y= 20.50  |          L34          L34
KL/R-Z=  4.80  +          L34          L34
UNL  = 140.00  |
CB   =  1.00  +          L34
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30  |L34
NSF  =  1.00  +-----+-----+-----+-----+-----+-----+
DFE  =  0.00  248.3
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.5          3.3          1.0          1.2          249.5
LOCATION     0.0          1.4          0.0          0.0          0.7
LOADING    25           25           25           25           34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T        0.144      25
*  3.52 T    1.19                -248.33   0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5479 Check 1

```

*****
MEMBER 5479*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

                248.3 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00 |
CB   =  1.00  +
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30  |L34
NSF  =  1.00  +-----+
DFE  =  0.00  203.1
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.1          34.1          0.8          0.9          248.3
LOCATION     0.0           0.0           0.0          1.4          1.4
LOADING    24            31            14           33           34

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.143          34
1.01 T        0.94          -248.33          1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5480 Check 1

```

*****
MEMBER 5480*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                205.5 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL   = 140.00 |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |L34
NSF   =  1.00  +-----+
DFE   =  0.00  115.1
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2.3           63.8           1.7           1.6           205.5
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    14            31            33            33            34

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/          CRITICAL COND/          RATIO/          LOADING/
FX              MY              MZ              LOCATION
=====
PASS            LRFD-H1-1B-C          0.122           34
0.64 C          1.65          -205.51         1.40
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5481 Check 1

```

*****
MEMBER 5481*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2
*****
PARAMETER 119.8 (KNS-METRE)
IN KNS CMS | L24
+ L24 L24
+ L24
+ L24
+ L24 L24
+ L24
+ L24
+ L0
+-----+-----+-----+-----+-----+
dfF = 0.00 -6.7
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
*****
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*****
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 0.1 123.0 2.9 2.9 119.8
LOCATION 0.0 1.0 0.0 0.0 0.0
LOADING 34 24 24 24 24
*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.080 24
0.02 C -2.91 -119.83 0.00
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5482 Check 1

```

*****
MEMBER 5482*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                205.5 (KNS-METRE)
PARAMETER      |L24
IN KNS  CMS    | L24 L24
-----+-----+
KL/R-Y= 20.50  |          L24
KL/R-Z=  4.80  +          L24
UNL   = 140.00 |          L24
CB    =  1.00  +
PHIC  =  0.85  |          L24 L24
PHIB  =  0.90  +          L24
FYLD  = 35.30  |          L24
NSF   =  1.00  +-----+
DFE   =  0.00  115.1
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.2          63.9          1.0          1.6          205.5
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    25            23            24            24            24

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS      LRFD-H1-1B-T      0.122      24
*  2.21 T      -1.59      -205.51      0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5483 Check 1

```

*****
MEMBER 5483*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                248.3 (KNS-METRE)
PARAMETER      |L24
IN KNS  CMS   | L24 L24
-----+-----+
KL/R-Y= 20.50 |          L24
KL/R-Z=  4.80 +          L24
UNL   = 140.00 |          L24
CB    =  1.00 +
PHIC  =  0.85 |          L24 L24
PHIB  =  0.90 +          L24
FYLD  = 35.30 |          L24
NSF   =  1.00 +-----+-----+-----+-----+-----+
DFE   =  0.00 203.1
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.3          34.1          1.2          1.5          248.3
LOCATION     0.0           1.4           0.0          1.4           0.0
LOADING    25            23            34            34            24

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T        0.140      24
*  3.28 T    -0.26              -248.32   0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5484 Check 1

```

*****
MEMBER 5484*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****
Y
PROPERTIES
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

249.5 (KNS-METRE)
PARAMETER | L24 L24 L24
IN KNS CMS |
-----+-----+-----+-----+
KL/R-Y= 20.50 | L24 L24
KL/R-Z= 4.80 + L24 L24
UNL = 140.00 |
CB = 1.00 + L24
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L24
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 248.3
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -3.5 3.3 2.0 1.9 249.5
LOCATION 0.0 0.0 0.0 1.4 0.7
LOADING 25 33 34 34 24

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.147 33
* 1.96 T -1.93 -248.32 1.40
*
*****

```



SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5485 Check 1

```

*****
MEMBER 5485*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                248.3 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00  |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |
NSF   =  1.00  +
DFE   =  0.00  203.1
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.1          34.1          2.9           2.6           248.3
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    24            23            34            34            24

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.150       33
1.02 T        -2.62                -248.31     1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5486 Check 1

```

*****
MEMBER 5486*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                205.5 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL   = 140.00 |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30 |L24
NSF   =  1.00 +-----+
DFE   =  0.00 115.0
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2.3          63.9          4.2          3.8          205.5
LOCATION     0.0          0.0          0.0          1.4          1.4
LOADING    14           23           34           25           24

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/   CRITICAL COND/   RATIO/   LOADING/
*  FX      MY      MZ      LOCATION
*  =====
*  PASS    LRFD-H1-1B-T    0.131    24
*  1.94 T   -3.77         -205.49  1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5487 Check 1

```

*****
MEMBER 5487*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

122.5 (KNS-METRE)
PARAMETER |L25
IN KNS CMS | L25 L25
-----+-----
KL/R-Y= 14.64 | L25
KL/R-Z= 3.43 + L25
UNL = 100.00 | L25
CB = 1.00 +
PHIC = 0.85 | L25 L25
PHIB = 0.90 + L25
FYLD = 35.30 | L0
NSF = 1.00 +-----+
DFE = 0.00 -6.8
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 0.0 125.7 10.7 10.7 122.5
LOCATION 0.0 1.0 0.0 0.0 0.0
LOADING 25 25 24 24 25

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-C 0.115 25
* 0.04 C -10.68 -122.54 0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 5489 Check 1

```

*****
MEMBER 5489*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                254.2 (KNS-METRE)
PARAMETER      |L25
IN KNS  CMS   | L25 L25
-----+-----+
KL/R-Y= 20.50 |          L25
KL/R-Z=  4.80 +          L25
UNL   = 140.00 |          L25
CB    =  1.00 +
PHIC  =  0.85 |          L25 L25
PHIB  =  0.90 +          L25
FYLD  = 35.30 |          L25
NSF   =  1.00 +-----+
DFE   =  0.00 208.0
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.3          34.8          1.9           3.1           254.2
LOCATION     0.0           1.4           0.0           1.4           0.0
LOADING    25            24            14            34            25

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS      LRFD-H1-1B-T      0.152      25
*  3.29 T      -2.37      -254.24      0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5490 Check 1

```

*****
MEMBER 5490*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                255.4 (KNS-METRE)
PARAMETER      |          L25 L25 L25
IN KNS  CMS    |
-----+-----+-----+-----+
KL/R-Y= 20.50  |          L25          L25
KL/R-Z=  4.80  +          L25          L25
UNL  = 140.00  |
CB   =  1.00  +          L25
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30  |L25
NSF  =  1.00  +-----+-----+-----+-----+-----+
DFE  =  0.00  254.2
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.5          3.3          3.7          4.2          255.4
LOCATION     0.0          1.4          0.0          1.4          0.7
LOADING    25          23          34          34          25

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
=====
PASS      LRFD-H1-1B-T      0.160      34
2.13 T      -4.16      -254.24      1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5491 Check 1

```

*****
MEMBER 5491*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****
                254.2 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00  |
CB   =  1.00   +
PHIC =  0.85   |
PHIB =  0.90   +
FYLD = 35.30  |L25
NSF  =  1.00  +-----+-----+-----+-----+-----+
DFE  =  0.00  208.0
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
                VALUE      -3.1          34.8           6.3            6.1            254.2
                LOCATION    0.0          0.0            0.0            1.4            1.4
                LOADING     24           24             34             34             25
*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
*                RESULT/      CRITICAL COND/      RATIO/      LOADING/
*                FX          MY          MZ          LOCATION
*                =====
*                PASS      LRFD-H1-1B-T      0.169      34
*                1.22 T      -6.14      -254.24      1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5492 Check 1

```

*****
MEMBER 5492*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                210.4 (KNS-METRE)
PARAMETER      |
IN KNS  CMS   |
-----+-----+
KL/R-Y= 20.50 |
KL/R-Z=  4.80 +
UNL  = 140.00 |
CB   =  1.00  +
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30  |
NSF  =  1.00  +
DFE  =  0.00  |
dff  =  0.00  |
                117.7
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2.2           65.4           10.1           8.9           210.4
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    14            24            34            34            25

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS      LRFD-H1-1B-C      0.156      34
*  0.40 C      -8.86      -210.43      1.40
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5494 Check 1

```

*****
MEMBER 5494*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                209.4 (KNS-METRE)
PARAMETER      |L34
IN KNS  CMS   | L34 L34
-----+-----+
KL/R-Y= 20.50 |          L34
KL/R-Z=  4.80 +          L34
UNL  = 140.00 |          L34
CB   =  1.00 +
PHIC =  0.85 |          L34 L34
PHIB =  0.90 +          L34
FYLD = 35.30 |          L34
NSF  =  1.00 +-----+-----+-----+-----+-----+-----+
DFE  =  0.00 116.4
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.3          65.5          9.4          11.2          209.4
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    25            34            24            24            34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.166     25
*  2.26 T    -11.19           -209.40   0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5495 Check 1

```

*****
MEMBER 5495*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                253.7 (KNS-METRE)
PARAMETER      |L34
IN KNS CMS    | L34 L34
-----+-----+
KL/R-Y= 20.50 |          L34
KL/R-Z= 4.80  +          L34
UNL = 140.00 |          L34
CB = 1.00    +
PHIC = 0.85  |          L34 L34
PHIB = 0.90  +          L34
FYLD = 35.30 |          L34
NSF = 1.00   +-----+
DFE = 0.00   |          L34
dff = 0.00   |          L34
                206.9
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.3          34.9          3.1          4.6          253.7
LOCATION      0.0          1.4          0.0          1.4          0.0
LOADING      25          34          14          34          34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX          MY          MZ          LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.161      25
*  3.31 T      -4.40      -253.73      0.00
*
*****

```




SKRIPSI JEMBATAN

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Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5497 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5497* |=====| ---|===
*                                     |      AX=0.2315E+3
*          ST  H700X300X13          |      --Z  AY=0.9100E+2
DESIGN CODE * |-----|      AZ=0.9600E+2
LRFD 1994 *  =====|      PY=0.7210E+3
*                                     |      PZ=0.5640E+4
*          |<---LENGTH (M)=  1.40 --->|      RY=0.6830E+1
*****                                     RZ=0.2917E+2

                253.7 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+-----+-----+-----+-----+-----+-----+-----+
KL/R-Y=  20.50 |          L34          L34 CAPACITIES
KL/R-Z=   4.80 +          L34          IN KNS METRE
UNL   = 140.00 |          L34          PNC=0.6370E+4
CB    =  1.00 +          L34          pnc=0.0000E+0
PHIC  =  0.85 |          L34 L34          PNT=0.7182E+4
PHIB  =  0.90 +          L34          pnt=0.1336E+1
FYLD  = 35.30 |L34          MNZ=0.1792E+4
NSF   =  1.00 +          L34          mnz=0.2537E+3
DFE   =  0.00 +          L34          MNY=0.2291E+3
dfF   =  0.00 +          L34          mny=0.9520E+1
                206.9          VN  =0.1735E+4
                ABSOLUTE MZ ENVELOPE          vn  =0.2841E+2
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.2          34.9          9.5          9.5          253.7
LOCATION     0.0          0.0          0.0          1.4          1.4
LOADING    25           34           34           34           34
*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)          *
*          -----          *
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/      *
*          FX          MY          MZ          LOCATION          *
*          =====          *
*          PASS          LRFD-H1-1B-T          0.183          34          *
*          1.34 T          -9.52          -253.75          1.40          *
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5498 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5498*  |=====|  ===|===  -----
*                                     |      |      AX=0.2315E+3
*          ST  H700X300X13          |      --Z  AY=0.9100E+2
DESIGN CODE *  |=====|  ===|===  AZ=0.9600E+2
LRFD 1994 *  |=====|  ===|===  PY=0.7210E+3
*                                     |      |      PZ=0.5640E+4
*          |<---LENGTH (M)=  1.40 --->|  RY=0.6830E+1
*****                                     RZ=0.2917E+2

                209.4 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y=  20.50 |          L34          L34 CAPACITIES
KL/R-Z=   4.80 +          L34          IN KNS METRE
UNL  = 140.00 |          L34          -----
CB   =  1.00 +          L34          PNC=0.6370E+4
PHIC =  0.85 |          L34 L34          pnc=0.2536E+0
PHIB =  0.90 +          L34          PNT=0.7182E+4
FYLD = 35.30 |L34          MNZ=0.1792E+4
NSF  =  1.00 +          mnz=0.2094E+3
DFE  =  0.00 116.4          MNY=0.2291E+3
dff  =  0.00          mny=0.1419E+2
                ABSOLUTE MZ ENVELOPE          VN =0.1735E+4
                (WITH LOAD NO.)          vn =0.5994E+2

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2.1           65.5           16.0           14.2           209.4
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    14            34            34            34            34

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)          *
*          -----          *
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/      *
*          FX           MY           MZ           LOCATION          *
*          =====          *
*          PASS      LRFD-H1-1B-C      0.179      34          *
*          0.25 C      -14.19      -209.40      1.40          *
*          *          *          *          *          *
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5500 Check 1

```

*****
MEMBER 5500*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                206.9 (KNS-METRE)
PARAMETER      |L31
IN KNS  CMS   | L31 L31
-----+-----+
KL/R-Y= 20.50 |          L31
KL/R-Z=  4.80 +          L31
UNL   = 140.00 |          L31
CB    =  1.00 +
PHIC  =  0.85 |          L31 L31
PHIB  =  0.90 +          L31
FYLD  = 35.30 |          L31
NSF   =  1.00 +-----+
DFE   =  0.00 115.3
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.2          64.6          13.2          16.0          206.9
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    24            31            24            24            31

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.185     25
*  2.20 T    -15.99           -206.74   0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5501 Check 1

```

*****
MEMBER 5501*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                250.4 (KNS-METRE)
PARAMETER      |L31
IN KNS  CMS    | L31 L31
-----+-----+
KL/R-Y= 20.50  |          L31
KL/R-Z=  4.80  +          L31
UNL   = 140.00 |          L31
CB    =  1.00  +
PHIC  =  0.85  |          L31 L31
PHIB  =  0.90  +          L31
FYLD  = 35.30  |          L31
NSF   =  1.00  +-----+
DFE   =  0.00  204.5
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.2          34.4          4.3           6.3           250.4
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    24            31            14            24            31

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS      LRFD-H1-1B-T      0.167      23
*  3.24 T      -6.30      -250.36      0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 5502 Check 1

```

*****
MEMBER 5502*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 251.6 (KNS-METRE)
IN KNS CMS L31 L31 L31
CAPACITIES
IN KNS METRE
PNC=0.6370E+4
pnc=0.0000E+0
PNT=0.7182E+4
pnt=0.2267E+1
MNZ=0.1792E+4
mnz=0.2504E+3
MNY=0.2291E+3
mny=0.8040E+1
VN =0.1735E+4
vn =0.3263E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -3.5 3.3 6.6 8.0 251.6
LOCATION 0.0 0.0 0.0 1.4 0.7
LOADING 24 33 34 34 31

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.175 32
* 2.27 T -8.04 -250.42 1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5503 Check 1

```

*****
MEMBER 5503*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****
                250.4 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL   = 140.00 |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |L31
NSF   =  1.00  +-----+
DFE   =  0.00  204.4
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.3          34.4          12.3          12.7          250.4
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    25            31            34            34            31
*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.195          34
1.55 T        -12.66          -250.34          1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5504 Check 1

```

-----
*****
MEMBER 5504*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2
-----
PARAMETER 206.9 (KNS-METRE)
IN KNS CMS
-----
+
KL/R-Y= 20.50 |
KL/R-Z= 4.80 +
UNL = 140.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 115.3
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)
-----
MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -2.2 64.6 22.0 19.6 206.9
LOCATION 0.0 0.0 0.0 1.4 1.4
LOADING 25 31 34 34 31
-----
*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.201 34
* 0.04 T -19.63 -206.78 1.40
*
*****

```




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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 5506 Check 1

```

*****
MEMBER 5506*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                208.3 (KNS-METRE)
PARAMETER      |L23
IN KNS  CMS   | L23 L23
-----+-----+
KL/R-Y= 20.50 |          L23
KL/R-Z=  4.80 +          L23
UNL   = 140.00 |          L23
CB    =  1.00 +
PHIC  =  0.85 |          L23 L23
PHIB  =  0.90 +          L23
FYLD  = 35.30 |          L23
NSF   =  1.00 +-----+-----+-----+-----+-----+
DFE   =  0.00 116.2
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -2.5          64.9          16.6          20.8          208.3
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    24            23            24            24            23

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.207     24
*  2.53 T    -20.78            -208.27   0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5507 Check 1

```

*****
MEMBER 5507*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                252.1 (KNS-METRE)
PARAMETER      |L23
IN KNS  CMS   | L23 L23
-----+-----+
KL/R-Y= 20.50 |          L23
KL/R-Z=  4.80 +          L23
UNL  = 140.00 |          L23
CB   =  1.00 +
PHIC =  0.85 |          L23 L23
PHIB =  0.90 +          L23
FYLD = 35.30 |          L23
NSF  =  1.00 +-----+
DFE  =  0.00 205.8
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.6          34.6          5.5          8.2          252.1
LOCATION     0.0           1.4           0.0          0.0           0.0
LOADING    25            24            14           24            23

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS      LRFD-H1-1B-T      0.177      24
*  3.64 T      -8.16      -252.09      0.00
*
*****

```



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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5508 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5508* |=====| ---|===
*                                     |      |
*          ST  H700X300X13          |      --Z
DESIGN CODE * |=====| ---|===
*          LRFD 1994 *
*                                     |      |
* |<---LENGTH (M)= 1.40 --->|      RY=0.6830E+1
*****
*                                     RZ=0.2917E+2
*
*          253.2 (KNS-METRE)
PARAMETER   |          L23 L23 L23          CAPACITIES
IN KNS  CMS |          L23          L23    IN KNS METRE
-----+-----+-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 20.50 |          L23          L23    PNC=0.6370E+4
KL/R-Z= 4.80  +          L23          L23    pnc=0.0000E+0
UNL  = 140.00 |          L23          L23    PNT=0.7182E+4
CB   = 1.00  +          L23          L23    pnt=0.3044E+1
PHIC = 0.85  |          L23          L23    MNZ=0.1792E+4
PHIB = 0.90  +          L23          L23    mnz=0.2518E+3
FYLD = 35.30 |L23          L23          MNY=0.2291E+3
NSF  = 1.00  +-----+-----+-----+-----+-----+
DFE  = 0.00  252.0          vn  =0.1735E+4
dff  = 0.00          ABSOLUTE MZ ENVELOPE          vn  =0.3271E+1
                        (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*          VALUE      LOCATION      LOADING
*          -4.1        0.0          25
*          3.3         0.0          15
*          7.3         0.0          34
*          9.4         1.4          34
*          253.2       0.7          23
*
*****
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/    CRITICAL COND/    RATIO/    LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS      LRFD-H1-1B-T      0.182      33
*          3.04 T      -9.39      -251.84    1.40
*
*****

```



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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5509 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5509* |=====| ===|===
*                                     |      AX=0.2315E+3
*          ST  H700X300X13           |      --Z  AY=0.9100E+2
DESIGN CODE * |=====|      AZ=0.9600E+2
LRFD 1994 *   |=====|      PY=0.7210E+3
*                                     |      PZ=0.5640E+4
*          |<---LENGTH (M)= 1.40 --->|      RY=0.6830E+1
*****                                     RZ=0.2917E+2

                252.1 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+-----+-----+-----+-----+-----+
KL/R-Y= 20.50 |          L23          L23 CAPACITIES
KL/R-Z=  4.80 |          L23          IN KNS METRE
UNL  = 140.00 |          L23          -----+-----+-----+
CB   =  1.00  +          L23          PNC=0.6370E+4
PHIC =  0.85 |          L23 L23          pnc=0.0000E+0
PHIB =  0.90 +          L23          PNT=0.7182E+4
FYLD = 35.30 |L23          MNZ=0.1792E+4
NSF  =  1.00 +          L23          mnz=0.2518E+3
DFE  =  0.00 +          L23          MNY=0.2291E+3
dff  =  0.00 +          L23          mny=0.1533E+2
                205.8          VN  =0.1735E+4
                ABSOLUTE MZ ENVELOPE          vn  =0.2799E+2
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----+-----+-----+-----+-----+
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -4.0          34.6          14.3          15.3          252.1
LOCATION     0.0          0.0          0.0          1.4          1.4
LOADING    25          24          34          34          23

*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)          *
*          -----+-----+-----+-----+          *
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/          *
*          FX          MY          MZ          LOCATION          *
*          =====+=====+=====+=====+          *
*          PASS          LRFD-H1-1B-T          0.208          33          *
*          2.57 T          -15.33          -251.85          1.40          *
*          *          *          *          *          *
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5510 Check 1

```

*****
MEMBER 5510*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                208.2 (KNS-METRE)
PARAMETER      |
IN KNS  CMS   |
-----+-----+
KL/R-Y= 20.50 |
KL/R-Z=  4.80 +
UNL  = 140.00 |
CB   =  1.00  +
PHIC =  0.85  |
PHIB =  0.90  +
FYLD = 35.30  |
NSF  =  1.00  +
DFE  =  0.00  116.1
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -3.1          64.9          28.0          25.2          208.2
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    25            23            34            34            23

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.226          33
1.22 T        -25.21          -208.09          1.40
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5512 Check 1

```

*****
MEMBER 5512*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                214.0 (KNS-METRE)
PARAMETER      |L15
IN KNS  CMS   |  L15 L15
-----+-----+
KL/R-Y= 20.50 |          L15
KL/R-Z=  4.80 +          L15
UNL   = 140.00 |          L15
CB    =  1.00 +
PHIC  =  0.85 |          L15 L24
PHIB  =  0.90 +          L24
FYLD  = 35.30 |          L24
NSF   =  1.00 +-----+-----+-----+-----+-----+
DFE   =  0.00 117.7
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      2.1          67.8          19.5          25.6          214.0
LOCATION     0.0          1.4          0.0          0.0          0.0
LOADING    34          15          24          25          15

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LFRD-H1-1B-C      0.231      24
*  2.02 C    -25.61            -214.02    0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5513 Check 1

```

*****
MEMBER 5513*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                260.4 (KNS-METRE)
PARAMETER      |L15
IN KNS  CMS   |  L15 L15
-----+-----+
| KL/R-Y= 20.50 |          L15
| KL/R-Z=  4.80 |          L15
| UNL  = 140.00 |          L15
| CB   =  1.00  +
| PHIC =  0.85  |
| PHIB =  0.90  +
| FYLD = 35.30  |
| NSF  =  1.00  +-----+-----+-----+-----+
| DFF  =  0.00  211.5
| dff  =  0.00
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
                VALUE      LOCATION      LOADING
                1.2        0.0          34
                36.4       1.4          15
                6.7        0.0          14
                10.3       0.0          24
                260.4      0.0          15

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/   CRITICAL COND/   RATIO/   LOADING/
*  FX      MY      MZ      LOCATION
*  =====
*  PASS    LRFD-H1-1B-C    0.190    24
*  0.76 C  -10.33         -260.34  0.00
*
*****

```



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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5514 Check 1

```

*****
MEMBER 5514*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

                261.5 (KNS-METRE)
PARAMETER      |          L15 L15 L15
IN KNS  CMS    |
-----+-----+-----+
KL/R-Y= 20.50  |          L15          L15
KL/R-Z=  4.80  +          L15          L15
UNL  = 140.00  |
CB   =  1.00  +          L15
PHIC =  0.85  |
PHIB =  0.90  +L15
FYLD = 35.30  |          L15
NSF  =  1.00  +-----+-----+-----+-----+
DFE  =  0.00  260.3
dff  =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      0.9           3.3           7.1           9.9           261.5
LOCATION     0.0           1.4           0.0           1.4           0.7
LOADING    14            15            26            34            15

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/   CRITICAL COND/   RATIO/   LOADING/
FX          MY              MZ        LOCATION
=====
PASS       LRFD-H1-1B-C     0.188     33
0.83 C     -9.87            -259.00   1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5515 Check 1

```

*****
MEMBER 5515*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                260.5 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL   = 140.00 |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |
NSF   =  1.00  +
DFE   =  0.00  211.7
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      1.3           36.3           14.8           17.1           260.5
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    14            20            34            34            15

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-C          0.219          33
0.90 C       -17.14          -258.96          1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5516 Check 1

```

*****
MEMBER 5516*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.40 --->|
*****

                214.3 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL  = 140.00  |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30  |
NSF   =  1.00  +
DFE   =  0.00  117.8
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      1.8          67.9          33.7          30.8          214.3
LOCATION     0.0          0.0          0.0          1.4          1.4
LOADING    26           15           33           33           15

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
*  FX          MY          MZ          LOCATION
* -----
*  PASS        LRFD-H1-1B-C      0.253        33
*  1.80 C      -30.80      -213.00      1.40
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5517 Check 1

```

*****
MEMBER 5517*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 125.5 (KNS-METRE)
IN KNS CMS | L29
+ L29 L29
+ L29
+ L29
+ L29 L29
+ L29
+ L0
+-----+
dfF = 0.00 -7.0
dfdf = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -19.0 128.7 69.5 69.5 125.5
LOCATION 0.0 1.0 0.0 0.0 0.0
LOADING 34 29 25 25 29

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.374 24
* 14.62 T -69.48 -124.45 0.00
*
*****

```



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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5518 Check 1

```

*****
MEMBER 5518*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                211.8 (KNS-METRE)
PARAMETER      |L29
IN KNS  CMS   | L29 L29
-----+-----+
KL/R-Y= 20.50 |          L29
KL/R-Z=  4.80 +          L29
UNL  = 140.00 |          L29
CB   =  1.00 +
PHIC =  0.85 |          L29 L29
PHIB =  0.90 +          L29
FYLD = 35.30 |          L29
NSF  =  1.00 +-----+
DFE  =  0.00 | 120.7
dff  =  0.00 |
                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -22.0         64.2         23.7         32.7         211.8
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    34            29            25            25            29

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-T      0.261     24
*  18.93 T   -32.70            -209.16   0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5519 Check 1

```

*****
MEMBER 5519*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                254.4 (KNS-METRE)
PARAMETER      |L29
IN KNS  CMS   | L29 L29
-----+-----+
KL/R-Y= 20.50 |          L29
KL/R-Z=  4.80 +          L29
UNL   = 140.00 |          L29
CB    =  1.00 +
PHIC  =  0.85 |          L29 L29
PHIB  =  0.90 +          L29
FYLD  = 35.30 |          L29
NSF   =  1.00 +-----+
DFE   =  0.00 209.4
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -26.1         33.8         10.6         14.2         254.4
LOCATION     0.0           1.4           0.0           0.0           0.0
LOADING    34            29            25            25            29

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS          LRFD-H1-1B-T          0.204       24
24.20 T      -14.23                 -250.83     0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5521 Check 1

```

*****
MEMBER 5521*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                254.5 (KNS-METRE)
PARAMETER      |
IN KNS  CMS    |
-----+-----+
KL/R-Y= 20.50  |
KL/R-Z=  4.80  +
UNL   = 140.00 |
CB    =  1.00  +
PHIC  =  0.85  |
PHIB  =  0.90  +
FYLD  = 35.30 |L29
NSF   =  1.00 +-----+
DFE   =  0.00 209.5
dff   =  0.00

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -28.9         33.7         13.0         16.9         254.5
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    25            29             33            33            29

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY                    MZ          LOCATION
=====
PASS         LRFD-H1-1B-T           0.218       33
28.52 T      -16.94                  -254.32     1.40
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5522 Check 1

```

*****
MEMBER 5522*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

                211.9 (KNS-METRE)
PARAMETER      |
IN KNS  CMS   |
-----+-----+
KL/R-Y= 20.50 |
KL/R-Z=  4.80 +
UNL  = 140.00 |
CB   =  1.00 +
PHIC =  0.85 |
PHIB =  0.90 +
FYLD = 35.30 |
NSF  =  1.00 +
DFE  =  0.00 |
dff  =  0.00 |
                120.8

                ABSOLUTE MZ ENVELOPE
                (WITH LOAD NO.)

                MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
                -----
                AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -27.9         64.3         40.5         37.6         211.9
LOCATION     0.0           0.0           0.0           1.4           1.4
LOADING    25            29            33            33            29

*****
*
*                DESIGN SUMMARY (KNS-METRE)
*                -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX            MY            MZ            LOCATION
=====
PASS          LRFD-H1-1B-T      0.284         33
26.27 T      -37.57      -211.73      1.40
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5525 Check 1

```

*****
MEMBER 5525*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2315E+3
AY=0.9100E+2
AZ=0.9600E+2
PY=0.7210E+3
PZ=0.5640E+4
RY=0.6830E+1
RZ=0.2917E+2

PARAMETER 86.5 (KNS-METRE)
IN KNS CMS |L27L27 L27 L27 L27
+
KL/R-Y= 20.50 |
KL/R-Z= 4.80 +
UNL = 140.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 83.2
dff = 0.00

CAPACITIES
IN KNS METRE
PNC=0.6370E+4
pnc=0.9302E+1
PNT=0.7182E+4
pnt=0.0000E+0
MNZ=0.1792E+4
mnz=0.8237E+2
MNY=0.2291E+3
mny=0.2988E+2
VN =0.1735E+4
vn =0.5375E+1

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 9.3 5.4 18.4 29.9 86.5
LOCATION 0.0 1.4 0.0 1.4 0.2
LOADING 33 28 34 34 27

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.177 33
* 9.30 C 29.88 -82.37 1.40
*
*****

```




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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5527 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5527* |=====| ---|===
*                                     |      AX=0.2315E+3
*          ST  H700X300X13           |      --Z  AY=0.9100E+2
DESIGN CODE * |      AZ=0.9600E+2
*          LRFD 1994 * |=====| ---|===
*                                     |      PY=0.7210E+3
*          |<---LENGTH (M)= 1.40 --->| |      PZ=0.5640E+4
*****                                     |      RY=0.6830E+1
*                                     |      RZ=0.2917E+2
*                                     |
PARAMETER      62.5 (KNS-METRE)
IN KNS  CMS   |
+-----+
| KL/R-Y= 20.50 | |
| KL/R-Z= 4.80  | |
| UNL = 140.00 | |
| CB = 1.00     | |
| PHIC = 0.85   | |
| PHIB = 0.90   | |
| FYLD = 35.30 | |
| NSF = 1.00    | |
| DFF = 0.00    | |
| dff = 0.00    | |
+-----+
*
*          ABSOLUTE MZ ENVELOPE
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*          VALUE      LOCATION      LOADING
*          7.9        0.0          25
*          39.6       0.0          27
*          17.4       0.0          24
*          30.7       0.0          24
*          62.5       1.4          27
*
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS      LRFD-H1-1B-C      0.141      24
*          7.94 C      30.74      -11.51      0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Client **Teknik Sipil ITN Malang**

Steel Design (Track 2) Beam 5534 Check 1

```

*****
MEMBER 5534*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

68.4 (KNS-METRE)
PARAMETER |L27
IN KNS CMS | L27
-----+-----
KL/R-Y= 13.13 | L27
KL/R-Z= 8.01 + L27
UNL = 140.00 |
CB = 1.00 + L27 L27
PHIC = 0.85 |
PHIB = 0.90 + L18 L27 L27
FYLD = 35.30 | L19
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 -3.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -3.7 61.9 2.2 53.7 68.4
LOCATION 0.0 0.0 0.0 1.4 0.0
LOADING 33 27 33 33 27

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.055 24
* 2.16 T 51.93 67.55 0.00
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5536 Check 1

```

*****
MEMBER 5536*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 1.40 --->|
*****

133.0 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
KL/R-Y= 13.13 |
KL/R-Z= 8.01 +
UNL = 140.00 |
CB = 1.00 +
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |
NSF = 1.00 +
DFE = 0.00 81.4
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -7.2 46.5 7.5 58.2 133.0
LOCATION 0.0 0.0 0.0 0.0 1.4
LOADING 14 15 14 25 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* =====
* PASS LRFD-H1-1B-T 0.078 34
* 4.50 T -54.56 -132.96 1.40
*
*****

```




SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5538 Check 1

```

*****
MEMBER 5538*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 1.00 --->|
*****

84.1 (KNS-METRE)
PARAMETER |
IN KNS CMS |
-----+
| KL/R-Y= 14.64 |
| KL/R-Z= 3.43 +
| UNL = 100.00 |
| CB = 1.00 +
| PHIC = 0.85 |
| PHIB = 0.90 +L14
| FYLD = 35.30 | L14 L14 L14 L14
| NSF = 1.00 +-----+
| DFF = 0.00 46.3
| dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -21.5 74.1 246.4 158.8 84.1
LOCATION 0.0 0.0 0.0 0.0 1.0
LOADING 33 15 33 33 34

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.706 33
* 21.49 T 158.83 -20.23 0.00
*
*****

```




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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5540 Check 1

```

*****
MEMBER 5540*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.98 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6822E+2
PZ=0.5241E+2
RY=0.3737E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS |L29
CAPACITIES
IN KNS METRE
PNC=0.1155E+3
pnc=0.3063E+2
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1363E+1
MNY=0.1204E+2
mny=0.6089E+0
VN =0.2402E+3
vn =0.9311E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 30.8 0.9 0.3 0.7 1.4
LOCATION 5.0 0.0 0.0 5.0 0.0
LOADING 34 29 25 25 29

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1A-C 0.441 34
* 30.63 C -0.61 1.36 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5541 Check 1

```

*****
MEMBER 5541* |=====| ==||==
* | | |
* | LD L90X90X9 | | --Z
DESIGN CODE * | |
LRFD 1994 * | |
* |-----|
* |<---LENGTH (M)= 4.98 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6822E+2
PZ=0.5241E+2
RY=0.3737E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS |L26
CAPACITIES
IN KNS METRE
KL/R-Y= 136.40 | L26 PNC=0.1155E+3
KL/R-Z= 178.61 + pnc=0.3003E+2
UNL = 497.53 | L30 L26 L26 PNT=0.7582E+3
CB = 1.00 + L26 pnt=0.0000E+0
PHIC = 0.85 | L31 MNZ=0.9251E+1
PHIB = 0.90 + L26 mnz=0.1370E+1
FYLD = 35.30 | L26 MNY=0.1204E+2
NSF = 1.00 +-----| mny=0.6034E+0
DFE = 0.00 0.1 VN =0.2402E+3
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.9343E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 30.2 0.9 0.3 0.7 1.4
LOCATION 5.0 0.0 0.0 5.0 0.0
LOADING 32 26 23 23 26

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1A-C 0.436 32
30.03 C 0.60 1.37 0.00
*
*****

```



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5542 Check 1

```

*****
MEMBER 5542*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.98 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6822E+2
PZ=0.5241E+2
RY=0.3737E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS |L23
CAPACITIES
IN KNS METRE
PNC=0.1155E+3
pnc=0.8466E+1
PNT=0.7582E+3
pnt=0.0000E+0
MNZ=0.9251E+1
mnz=0.1425E+1
MNY=0.1204E+2
mny=0.5221E+0
VN =0.2402E+3
vn =0.9458E+0

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)

AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -15.8 0.9 0.3 0.6 1.4
LOCATION 0.0 0.0 0.0 5.0 0.0
LOADING 14 23 26 26 23

*****
DESIGN SUMMARY (KNS-METRE)
*****
RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
PASS LRFD-H1-1B-C 0.234 23
8.47 C 0.52 1.42 0.00
*****

```



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Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5543 Check 1

```

*****
MEMBER 5543*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

PARAMETER 10.6 (KNS-METRE)
IN KNS CMS | L30 L30 L21
+ L30 L21
KL/R-Y= 147.28 |
KL/R-Z= 85.92 + L31 L20
UNL = 900.00 |
CB = 1.00 + L31 L20
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L31 L20
NSF = 1.00 +-----|
DFE = 0.00 1.2
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -9.6 4.0 0.0 0.7 10.6
LOCATION 0.0 9.0 0.0 9.0 4.5
LOADING 22 34 33 32 30

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.054 22
* 9.63 T -0.57 -10.56 4.50
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 472	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5544 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5544*  |=====|  ===|===  -----
*                                     |      |      AX=0.1039E+3
*          ST  H250X255X14  |      |      --Z  AY=0.3500E+2
DESIGN CODE *  |      |      AZ=0.4760E+2
*          LRFD 1994 *  |=====|  ===|===  PY=0.3040E+3
*                                     |      |      PZ=0.9120E+3
*          |<---LENGTH (M)=  9.00 --->|  |      |      RY=0.6111E+1
*****                                     |      |      RZ=0.1047E+2
*                                     |      |
PARAMETER      10.7 (KNS-METRE)
IN KNS  CMS    |      |      L26 L26 L15  CAPACITIES
-----+-----+-----+-----+-----+-----+-----
| KL/R-Y= 147.28 |      |      L26          L15  IN KNS METRE
| KL/R-Z=  85.92 +      |      |      L15  PNC=0.7224E+3
| UNL  = 900.00 |      |      L26          L15  pnc=0.0000E+0
| CB    =  1.00 +      |      |      L15  PNT=0.3223E+4
| PHIC  =  0.85 |      |      L26          L15  pnt=0.5277E+1
| PHIB  =  0.90 +      |      |      L15  MNZ=0.2282E+3
| FYLD  = 35.30 |L26      |      L15  mnz=0.1065E+2
| NSF   =  1.00 +-----+-----+-----+-----+-----+-----+
| DFF   =  0.00 1.3      |      |      MNY=0.9659E+2
| dff   =  0.00      |      |      mny=0.3445E+0
|                                     |      |      VN =0.6672E+3
|                                     |      |      vn =0.2596E-2
|                                     |      |
|                                     |      |      ABSOLUTE MZ ENVELOPE
|                                     |      |      (WITH LOAD NO.)
|                                     |      |
|                                     |      |      MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
|                                     |      |      -----
|                                     |      |      AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
|                                     |      |      VALUE      LOCATION      LOADING
|                                     |      |      -5.3      0.0      22
|                                     |      |      4.0      9.0      34
|                                     |      |      0.0      0.0      33
|                                     |      |      0.4      9.0      32
|                                     |      |      10.7     4.5      26
*****
*                                     *
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS      LRFD-H1-1B-T      0.051      22
*          5.28 T      -0.34      -10.65      4.50
*          -----
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 473	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5545 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN  CMS UNIT
MEMBER  5545* |=====|====|====|-----|
*                                     |      |      |      |
*          ST  H250X255X14           |      |      |      |
DESIGN CODE * |=====|====|====|-----|
*          LRFD 1994                 |      |      |      |
*                                     |      |      |      |
*          |<---LENGTH (M) =      9.00 --->|      |      |      |
*****
*                                     |      |      |      |
*          10.6 (KNS-METRE)           |      |      |      |
PARAMETER  |      |      |      |      |      |      |
IN KNS  CMS |      |      |      |      |      |      |
-----+-----+-----+-----+-----+-----+-----|
*          +          L34          L25          PNC=0.7224E+3|
*          |      |      |      |      |      |      |
*          KL/R-Y= 147.28 |      |      |      |      |      |
*          KL/R-Z= 85.92 +          L34          L25          pnc=0.2600E+1|
*          UNL = 900.00 |      |      |      |      |      |
*          CB = 1.00 +          L34          L25          PNT=0.3223E+4|
*          PHIC = 0.85 |      |      |      |      |      |
*          PHIB = 0.90 +          L34          L25          pnt=0.0000E+0|
*          FYLD = 35.30 |L34          L25          MNZ=0.2282E+3|
*          NSF = 1.00 +-----+-----+-----+-----+-----+-----|
*          DFF = 0.00 1.3          MNY=0.9659E+2|
*          dff = 0.00          vn =0.6672E+3|
*          ABSOLUTE MZ ENVELOPE          vn =0.1796E-1|
*          (WITH LOAD NO.)
*
*          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*          -----
*          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*          VALUE      2.6          4.0          0.0          0.2          10.6
*          LOCATION    0.0          9.0          0.0          9.0          4.5
*          LOADING     34          34          24          25          25
*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
*          RESULT/      CRITICAL COND/      RATIO/      LOADING/
*          FX          MY          MZ          LOCATION
*          =====
*          PASS          LRFD-H1-1B-C          0.050          34
*          2.60 C          -0.12          -10.65          4.50
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 474	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5546 Check 1

```

*****
MEMBER 5546*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

PARAMETER 10.6 (KNS-METRE)
IN KNS CMS L32 L23 L23
+ L32 L23
KL/R-Y= 147.28 |
KL/R-Z= 85.92 + L32 L23
UNL = 900.00 |
CB = 1.00 + L32 L23
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L32 L23
NSF = 1.00 +-----+
DFE = 0.00 1.3
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE 2.7 4.0 0.0 0.2 10.6
LOCATION 0.0 9.0 0.0 9.0 4.5
LOADING 32 31 14 26 23

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-C 0.050 32
* 2.67 C 0.12 -10.65 4.50
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 475	Rev
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By keraf	Date 22-May-15	Chd
File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5547 Check 1

```

*****
MEMBER 5547*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

PARAMETER 10.7 (KNS-METRE)
IN KNS CMS L31 L31 L22
+ L31 L22
KL/R-Y= 147.28 |
KL/R-Z= 85.92 + L31 L22
UNL = 900.00 |
CB = 1.00 + L31 L22
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L31 L22
NSF = 1.00 +-----|
DFE = 0.00 1.3
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -4.9 4.0 0.0 0.4 10.7
LOCATION 0.0 9.0 0.0 9.0 4.5
LOADING 25 26 14 26 31

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.051 25
* 4.91 T 0.34 -10.65 4.50
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 476	Rev
Part		
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By keraf	Date 22-May-15	Chd
File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5548 Check 1

```

*****
MEMBER 5548*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 9.00 --->|
*****

PROPERTY
IN CMS UNIT
AX=0.1039E+3
AY=0.3500E+2
AZ=0.4760E+2
PY=0.3040E+3
PZ=0.9120E+3
RY=0.6111E+1
RZ=0.1047E+2

PARAMETER 10.6 (KNS-METRE)
IN KNS CMS L30 L30 L21
CAPACITIES
IN KNS METRE
KL/R-Y= 147.28 | L30 L21
KL/R-Z= 85.92 + L30 L21
UNL = 900.00 |
CB = 1.00 + L30 L21
PHIC = 0.85 |
PHIB = 0.90 +
FYLD = 35.30 |L30 L21
NSF = 1.00 +-----+
DFE = 0.00 1.2
dff = 0.00
ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -9.2 4.0 0.0 0.7 10.6
LOCATION 0.0 9.0 0.0 9.0 4.5
LOADING 25 26 14 26 30

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
* FX MY MZ LOCATION
*
* PASS LRFD-H1-1B-T 0.054 25
* 9.17 T 0.57 -10.56 4.50
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 477	Rev
Part		
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By keraf	Date 22-May-15	Chd
File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Steel Design (Track 2) Beam 5549 Check 1

```

*****
MEMBER 5549*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.98 --->|
*****

PARAMETER          1.4 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 136.40 |
KL/R-Z= 178.61 + L20
UNL = 497.53 |L20 L20 L20
CB = 1.00 + L21
PHIC = 0.85 |
PHIB = 0.90 + L21
FYLD = 35.30 |
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE     -21.8         0.9         0.3         0.8         1.4
LOCATION    0.0           5.0         0.0         0.0         5.0
LOADING   14           20          34          34          20

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1B-C      0.256     25
*  13.26 C   -0.62                    1.36     4.98
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 478	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title **Jembatan Pelengkung**

Steel Design (Track 2) Beam 5550 Check 1

```

*****
MEMBER 5550*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 4.98 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+
KL/R-Y= 136.40 |
KL/R-Z= 178.61 +
UNL = 497.53 |L34L34 L34
CB = 1.00 + L21 L20
PHIC = 0.85 | L34
PHIB = 0.90 + L20
FYLD = 35.30 | L34
NSF = 1.00 +-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL    SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE    32.0         1.0         0.2         0.6         1.5
LOCATION   5.0         5.0         0.0         0.0         5.0
LOADING  34         34         20         20         34

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
FX          MY          MZ          LOCATION
-----
PASS      LRFD-H1-1A-C    0.452      34
32.04 C   -0.40             1.51      4.98
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 479	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5551 Check 1

```

*****
MEMBER 5551*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M) = 4.98 --->|
*****

PARAMETER          1.5 (KNS-METRE)
IN KNS  CMS
-----+-----
KL/R-Y= 136.40 |
KL/R-Z= 178.61 +
UNL = 497.54 |L32L32 L33
CB = 1.00 + L24 L25
PHIC = 0.85 |
PHIB = 0.90 + L25
FYLD = 35.30 | L31
NSF = 1.00 +-----+-----+-----+-----+-----+
DFE = 0.00 0.1
dff = 0.00

ABSOLUTE MZ ENVELOPE
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z
VALUE      31.5        1.0        0.2         0.6         1.5
LOCATION     5.0          5.0         0.0         0.0         5.0
LOADING    32           32          15          15          31

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/    CRITICAL COND/    RATIO/    LOADING/
*  FX        MY                MZ        LOCATION
*  =====
*  PASS      LRFD-H1-1A-C      0.449     32
*  31.45 C   0.41              1.52     4.98
*
*****

```




SKRIPSI JEMBATAN

Job No	Sheet No 480	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5552 Check 1

```

*****
MEMBER 5552* |=====| ==||==
* | | |
* | LD L90X90X9 | | --Z
DESIGN CODE * | |
LRFD 1994 * | |
* |-----|
* |<---LENGTH (M)= 4.98 --->|
*****
PROPERTY
IN CMS UNIT
AX=0.2444E+2
AY=0.8400E+1
AZ=0.8400E+1
PY=0.6822E+2
PZ=0.5241E+2
RY=0.3737E+1
RZ=0.2786E+1

PARAMETER 1.4 (KNS-METRE)
IN KNS CMS | L15 CAPACITIES
-----+-----+
KL/R-Y= 136.40 | L15 PNC=0.1155E+3
KL/R-Z= 178.61 + pnc=0.7069E+1
UNL = 497.53 |L15L15 L15 L15 L21 PNT=0.7582E+3
CB = 1.00 + L15 pnt=0.0000E+0
PHIC = 0.85 | L22 MNZ=0.9251E+1
PHIB = 0.90 + L15 mnz=0.1360E+1
FYLD = 35.30 | L15 MNY=0.1204E+2
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 0.1 VN =0.2402E+3
dff = 0.00 ABSOLUTE MZ ENVELOPE vn =0.9261E+0
(WITH LOAD NO.)

MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
-----
AXIAL SHEAR-Y SHEAR-Z MOMENT-Y MOMENT-Z
VALUE -15.8 0.9 0.3 0.7 1.4
LOCATION 0.0 5.0 0.0 0.0 5.0
LOADING 14 15 32 32 15

*****
*
* DESIGN SUMMARY (KNS-METRE)
*
*
* RESULT/ CRITICAL COND/ RATIO/ LOADING/
FX MY MZ LOCATION
=====
PASS LRFD-H1-1B-C 0.229 23
7.07 C 0.62 1.36 4.98
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 481	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5553 Check 1

```

*****
MEMBER 5553*
DESIGN CODE *
LRFD 1994 *
*
* |<---LENGTH (M)= 9.00 --->|
*****

          9.4 (KNS-METRE)
PARAMETER |          L26
IN KNS CMS |          L26 L25 L25
-----+-----+
KL/R-Y= 147.28 |
KL/R-Z= 85.92 +          L25
UNL = 900.00 |          L26
CB = 1.00 +          L25
PHIC = 0.85 |
PHIB = 0.90 +L14
FYLD = 35.30 |          L14
NSF = 1.00 +-----+-----+-----+-----+
DFE = 0.00 3.7
dff = 0.00

          ABSOLUTE MZ ENVELOPE
          (WITH LOAD NO.)

          MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
          -----
          AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
VALUE      -10.3      4.9      0.3      2.0      9.4
LOCATION      0.0      9.0      0.0      9.0      3.0
LOADING      25      26      14      26      26

*****
*
*          DESIGN SUMMARY (KNS-METRE)
*          -----
*
* RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX      MY      MZ      LOCATION
=====
PASS      LRFD-H1-1B-T      0.049      25
10.35 T      0.82      -8.98      4.50
*
*****

```



SKRIPSI JEMBATAN

Job No	Sheet No 482	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Steel Design (Track 2) Beam 5554 Check 1

```

*****
*                                     Y      PROPERTIES
*                                     |      IN CMS UNIT
MEMBER 5554* |=====| ---|===
*                                     |      --Z
DESIGN CODE * |      ST H250X255X14      |
*                                     |      PY=0.3040E+3
LRFD 1994 * |=====| ---|===
*                                     |      PZ=0.9120E+3
* |<---LENGTH (M)= 9.00 --->|      RY=0.6111E+1
*****
*                                     |      RZ=0.1047E+2
*
PARAMETER      10.2 (KNS-METRE)
IN KNS CMS    |      L33 L33      CAPACITIES
+-----+    |      L33      L33      IN KNS METRE
+-----+    |      L24
KL/R-Y= 147.28 |      L33      PNC=0.7224E+3
KL/R-Z= 85.92  +      pnc=0.0000E+0
UNL = 900.00   |      L24      PNT=0.3223E+4
CB = 1.00      +L33      pnt=0.1129E+2
PHIC = 0.85    |      L26 MNZ=0.2282E+3
PHIB = 0.90    +      mnz=0.9962E+1
FYLD = 35.30   |      L24      MNY=0.9659E+2
NSF = 1.00     +-----+-----+-----+-----+-----+
DFE = 0.00     3.8      |      mny=0.6396E+0
dff = 0.00     |      VN =0.6672E+3
*                                     |      vn =0.6597E+0
*
*                                     ABSOLUTE MZ ENVELOPE
*                                     (WITH LOAD NO.)
*
*                                     MAX FORCE/ MOMENT SUMMARY (KNS-METRE)
*
*                                     AXIAL      SHEAR-Y      SHEAR-Z      MOMENT-Y      MOMENT-Z
*
*                                     VALUE      -12.8      5.3      0.2      1.8      10.2
*                                     LOCATION 0.0      9.0      0.0      9.0      3.0
*                                     LOADING 23      26      33      33      33
*****
*
*                                     DESIGN SUMMARY (KNS-METRE)
*
*
*
*
*
*
RESULT/      CRITICAL COND/      RATIO/      LOADING/
FX           MY           MZ           LOCATION
=====
PASS        LRFD-H1-1B-T      0.052      32
11.29 T     -0.64      -9.96      3.75
*
*****

```

START JOB INFORMATION

JOB NAME Jembatan Pelengkung
JOB CLIENT Teknik Sipil ITN Malang
ENGINEER NAME keraf
ENGINEER DATE 22-May-15
END JOB INFORMATION

INPUT WIDTH 79
SET ITERLIM 20
UNIT METER KG

JOINT COORDINATES

33 12.4092 19.7309 0; 34 72.4092 19.7309 0; 35 12.4092 25.2309 0;
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MEMBER INCIDENCES

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DEFINE MATERIAL START
ISOTROPIC STEEL
E 2.09042e+010
POISSON 0.3
DENSITY 7833.41
ALPHA 1.2e-005
DAMP 0.03
ISOTROPIC CONCRETE
E 2.21467e+009
POISSON 0.17
DENSITY 2402.62
ALPHA 1e-005
DAMP 0.05
END DEFINE MATERIAL
CONSTANTS
BETA 90 MEMB 1 TO 5 13 TO 34 42 TO 60 79 TO 83 91 TO 112 120 TO 138 171 3493 -
3494 TO 3506 3781 TO 3795
MATERIAL STEEL MEMB 1 TO 5 13 TO 34 42 TO 60 63 TO 83 91 TO 112 120 TO 138
MATERIAL STEEL MEMB 61 62 84 TO 90 113 TO 119 139 140 155 156 171 180 182 -
188 190 192 194 1779 TO 1805 3459 TO 3506 3605 TO 3631 3637 3643 3649 3655 -
3661 3667 3673 3679 3685 3691 3697 3703 3709 3721 3781 TO 3795 3879 TO 3892 -
3946 TO 3948 5318 TO 5347 5349 TO 5433 5435 TO 5437 5439 TO 5523 -
5525 TO 5527 5534 TO 5554
MEMBER PROPERTY JAPANESE
3631 3637 3643 3649 3655 3661 3667 3673 3679 3685 3691 3697 3703 3709 3721 -
5433 5435 TO 5437 5439 TO 5523 5525 TO 5527 TABLE ST H700X300X13
180 182 188 190 192 194 5349 TO 5432 TABLE ST H300X300X10
MEMBER PROPERTY AMERICAN
171 3493 TO 3506 3781 TO 3795 TABLE ST W14X311
MEMBER PROPERTY KOREAN
1779 TO 1790 1795 TO 1805 3605 TO 3616 3621 TO 3630 3946 TO 3947 -
3948 TABLE LD L90X90X9 SP 0.009
MEMBER PROPERTY JAPANESE
63 TO 68 71 TO 76 TABLE ST H250X255X14
MEMBER PROPERTY AMERICAN
1 TO 5 13 TO 34 42 TO 62 79 TO 83 91 TO 112 120 TO 140 3459 TO 3489 -
3490 TABLE ST W14X311
MEMBER PROPERTY JAPANESE
5318 5319 TABLE ST H250X255X14
UNIT CM KG
MEMBER PROPERTY KOREAN
5320 5326 5327 5333 5334 5340 5341 5347 TABLE LD L90X90X9 SP 0.9
UNIT METER KG
MEMBER PROPERTY KOREAN
84 TO 90 113 TO 119 3879 TO 3892 PRIS YD 0.076
MEMBER PROPERTY AMERICAN
5534 TO 5537 TABLE ST W14X311
UNIT CM KG
MEMBER PROPERTY JAPANESE
5538 TABLE ST H700X300X13
5543 TO 5548 5553 5554 TABLE ST H250X255X14
MEMBER PROPERTY KOREAN
5539 TO 5542 5549 TO 5552 TABLE LD L90X90X9 SP 0.009
MEMBER PROPERTY KOREAN
155 156 1791 TO 1794 3491 3492 3617 TO 3620 5321 TO 5325 5328 TO 5332 5335 -
5336 TO 5339 5342 TO 5346 TABLE LD L90X90X9 SP 0.09
MEMBER PROPERTY JAPANESE
69 70 77 78 TABLE ST H250X255X14
UNIT METER KG
SUPPORTS
34 81 PINNED
33 80 FIXED BUT FX MZ
MEMBER TRUSS
23 TO 29 52 TO 58 61 62 101 TO 107 130 TO 136 139 140 3459 TO 3490
MEMBER RELEASE
3631 START MX MY MZ
3637 3643 3649 3655 3661 3667 3673 3679 3685 3691 3697 3703 3709 START MX MY MZ
5433 5439 5445 5451 5457 5463 5469 5475 5481 5487 5493 5499 5505 5511 5517 -
5523 END MX MY MZ
UNIT CM KG
MEMBER TENSION
84 TO 90 113 TO 119 3879 TO 3892
UNIT METER KG
LOAD 1 BEBAN MATI

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SELFWEIGHT Y -1
MEMBER LOAD
188 190 192 194 5377 TO 5432 UNI GY -312.404
MEMBER LOAD
180 182 5349 TO 5376 UNI GY -652.193
3631 3637 3643 3649 3655 3661 3667 3673 3679 3685 3691 3697 3703 3709 3721 -
5433 5439 5445 5451 5457 5463 5469 5475 5481 5487 5493 5499 5505 5511 5517 -
5523 5538 UNI GY -411.887
5435 TO 5437 5440 TO 5444 5446 TO 5450 5452 TO 5456 5458 TO 5462 5464 TO 5468 -
5470 TO 5474 5476 TO 5480 5482 TO 5486 5488 TO 5492 5494 TO 5498 -
5500 TO 5504 5506 TO 5510 5512 TO 5516 5518 TO 5522 5525 TO 5527 -
5534 TO 5537 UNI GY -47.54
LOAD 2 BEBAN TERBAGI RATA
MEMBER LOAD
188 190 192 194 5377 TO 5432 UNI GY -163.927
180 182 5349 TO 5376 UNI GY -469.555
5444 5450 5456 5462 5468 5474 5480 5486 5492 5498 5504 5510 5516 5522 5534 -
5536 UNI GY -101.82 0 0.64
5444 5450 5456 5462 5468 5474 5480 5486 5492 5498 5504 5510 5516 5522 5534 -
5536 UNI GY -203.636 0.75
5440 5446 5452 5458 5464 5470 5476 5482 5488 5494 5500 5506 5512 5518 5535 -
5537 UNI GY -101.818 0.75
5440 5446 5452 5458 5464 5470 5476 5482 5488 5494 5500 5506 5512 5518 5535 -
5537 UNI GY -203.636 0 0.65
5435 TO 5437 5441 TO 5443 5447 TO 5449 5453 TO 5455 5459 TO 5461 5465 TO 5467 -
5471 TO 5473 5477 TO 5479 5483 TO 5485 5489 TO 5491 5495 TO 5497 -
5501 TO 5503 5507 TO 5509 5513 TO 5515 5519 TO 5521 5525 TO 5526 -
5527 UNI GY -203.636
LOAD 3 BEBAN TROTOIR
JOINT LOAD
33 34 80 81 FY -800
52 87 89 91 93 95 97 99 104 110 112 114 116 118 120 1424 TO 1436 FY -1600
LOAD 4 BEBAN REM
JOINT LOAD
33 34 80 81 FY -446.429
52 87 89 91 93 95 97 99 104 110 112 114 116 118 120 1424 TO 1436 FY -892.857
LOAD 5 BEBAN GARIS 1
JOINT LOAD
33 80 FY -6875
LOAD 6 BEBAN GARIS 2
JOINT LOAD
87 1424 FY -6875
LOAD 7 BEBAN GARIS 3
JOINT LOAD
89 1425 FY -6875
LOAD 8 BEBAN GARIS 4
JOINT LOAD
91 1426 FY -6875
LOAD 9 BEBAN GARIS 5
JOINT LOAD
93 1427 FY -6875
LOAD 10 BEBAN GARIS 6
JOINT LOAD
95 1428 FY -6875
LOAD 11 BEBAN GARIS 7
JOINT LOAD
97 1429 FY -6875
LOAD 12 BEBAN GARIS 8
JOINT LOAD
52 99 FY -6875
LOAD 13 BEBAN GARIS 9
JOINT LOAD
104 1430 FY -6875
LOAD 14 BEBAN ANGIN
JOINT LOAD
35 58 FZ 64.96
41 64 FZ 117.18
43 66 FZ 98.04
45 68 FZ 83.565
47 70 FZ 72.124
49 72 FZ 63.315
51 74 FZ 57.578
53 75 FZ 41.703
1392 FZ 40.703
33 34 FZ 91.9
36 59 FZ 181.17
37 60 FZ 221.6
38 61 FZ 255.15
39 62 FZ 283.264
54 76 FZ 303.345
55 77 FZ 314.786
56 78 FZ 268.39
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1426 1433 FZ 191.835
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1428 1435 FZ 256.669
1429 1436 FZ 258.019
52 1430 FZ 288.644
1431 FZ 80.47
LOAD COMB 15 KOMBINASI 1. MATI+TERBAGI RATA+TEROTOIR+REM
1 1.1 2 1.1 3 1.1 4 1.1
LOAD COMB 17 KOMBINASI 2. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 1
1 1.1 2 1.1 3 1.1 4 1.1 5 1.1
LOAD COMB 18 KOMBINASI 3. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 2
1 1.1 2 1.1 3 1.1 4 1.1 6 1.1
LOAD COMB 19 KOMBINASI 4. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 3
1 1.1 2 1.1 3 1.1 4 1.1 7 1.1
LOAD COMB 20 KOMBINASI 5. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 4
1 1.1 2 1.1 3 1.1 4 1.1 8 1.1
LOAD COMB 21 KOMBINASI 6. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 5
1 1.1 2 1.1 3 1.1 4 1.1 9 1.1
LOAD COMB 22 KOMBINASI 7. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 6
1 1.1 2 1.1 3 1.1 4 1.1 10 1.1
LOAD COMB 23 KOMBINASI 8. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 7
1 1.1 2 1.1 3 1.1 4 1.1 11 1.1
LOAD COMB 24 KOMBINASI 9. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 8
1 1.1 2 1.1 3 1.1 4 1.1 12 1.1
LOAD COMB 25 KOMBINASI 10. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 9
1 1.1 2 1.1 3 1.1 4 1.1 13 1.1
LOAD COMB 26 KOMBINASI 11. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 1+ANGIN
1 1.1 2 1.1 3 1.1 4 1.1 5 1.1 14 1.1
LOAD COMB 27 KOMBINASI 12. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 2+ANGIN
1 1.1 2 1.1 3 1.1 4 1.1 6 1.1 14 1.1
LOAD COMB 28 KOMBINASI 13. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 3+ANGIN
1 1.1 2 1.1 3 1.1 4 1.1 7 1.1 14 1.1
LOAD COMB 29 KOMBINASI 14. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 4+ANGIN
1 1.1 2 1.1 3 1.1 4 1.1 8 1.1 14 1.1
LOAD COMB 30 KOMBINASI 15. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 5+ANGIN
1 1.1 2 1.1 3 1.1 4 1.1 9 1.1 14 1.1
LOAD COMB 31 KOMBINASI 16. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 6+ANGIN
1 1.1 2 1.1 3 1.1 4 1.1 10 1.1 14 1.1
LOAD COMB 32 KOMBINASI 17. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 7+ANGIN
1 1.1 2 1.1 3 1.1 4 1.1 11 1.1 14 1.1
LOAD COMB 33 KOMBINASI 18. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 8+ANGIN
1 1.1 2 1.1 3 1.1 4 1.1 12 1.1 14 1.1
LOAD COMB 34 KOMBINASI 19. MATI+TERBAGI RATA+TROTOIR+REM+GARIS 9+ANGIN
1 1.1 2 1.1 3 1.1 4 1.1 13 1.1 14 1.1
PERFORM ANALYSIS
PRINT MEMBER FORCES LIST 84 TO 90 113 TO 119 3879 TO 3892
PRINT SUPPORT REACTION LIST 33 34 80 81
UNIT CM KG
PARAMETER
CODE LRFD
FYLD 3600 MEMB 1 TO 5 13 TO 34 42 TO 83 91 TO 112 120 TO 140 155 156 171 180 -
182 188 190 192 194 1779 TO 1805 3459 TO 3506 3605 TO 3631 3637 3643 3649 -
3655 3661 3667 3673 3679 3685 3691 3697 3703 3709 3721 3781 TO 3795 3946 -
3947 TO 3948 5318 TO 5347 5349 TO 5433 5435 TO 5437 5439 TO 5523 5525 TO 5527 -
5534 TO 5554
CHECK CODE MEMB 1 TO 5 13 TO 34 42 TO 83 91 TO 112 120 TO 140 155 156 171 -
180 182 188 190 192 194 1779 TO 1805 3459 TO 3506 3605 TO 3631 3637 3643 -
3649 3655 3661 3667 3673 3679 3685 3691 3697 3703 3709 3721 3781 TO 3795 -
3946 TO 3948 5318 TO 5347 5349 TO 5433 5435 TO 5437 5439 TO 5523 -
5525 TO 5527 5534 TO 5554
FINISH

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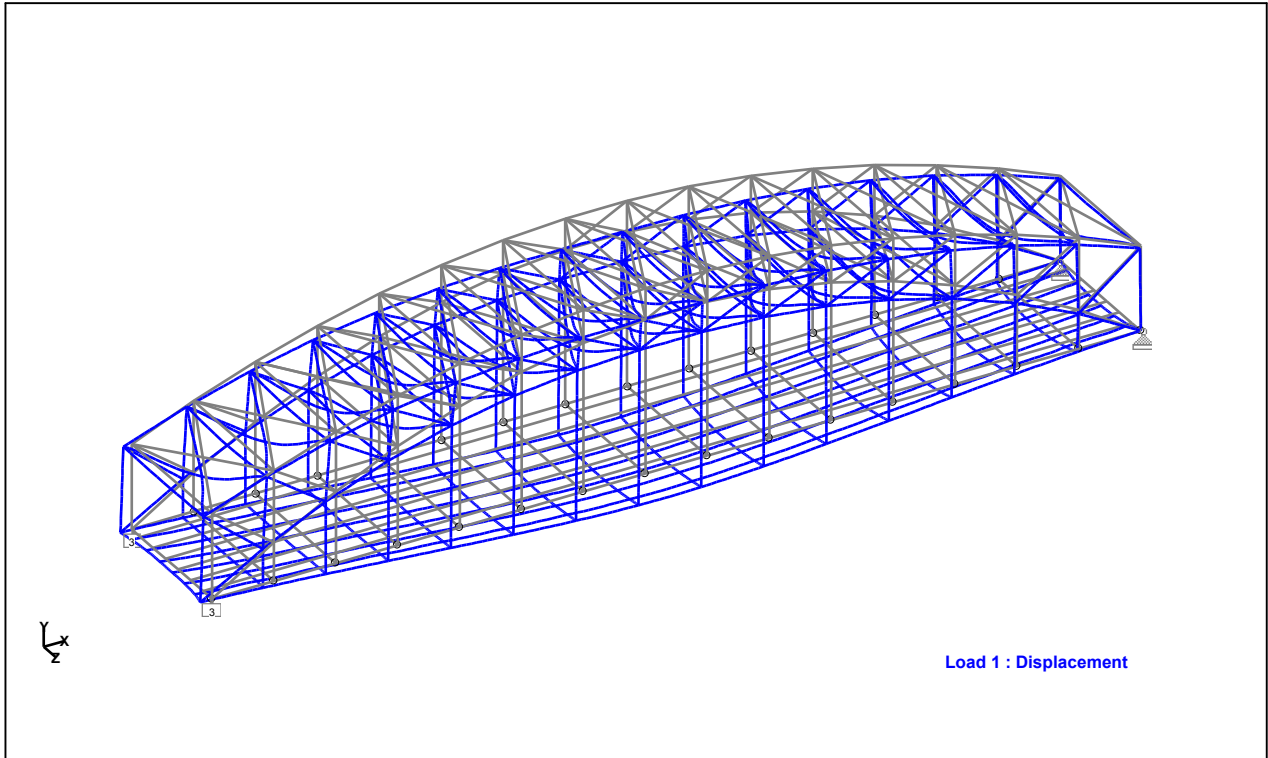

SKRIPSI JEMBATAN

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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

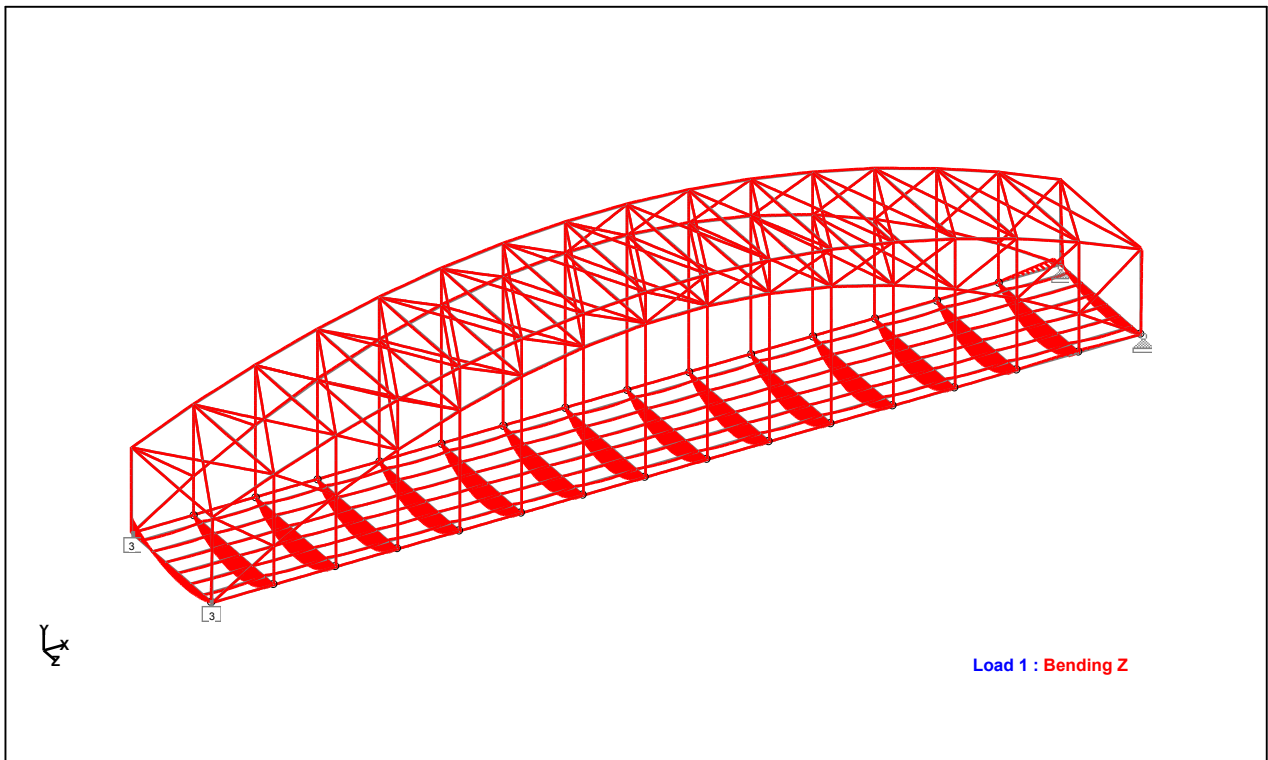
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang



Whole Structure Displacements 0.1mm:1cm 1 BEBAN MATI



Whole Structure Mz 1kNm:1cm 1 BEBAN MATI



SKRIPSI JEMBATAN

Job No

Sheet No

2

Rev

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Part

Job Title Jembatan Pelengkung

Ref

By keraf

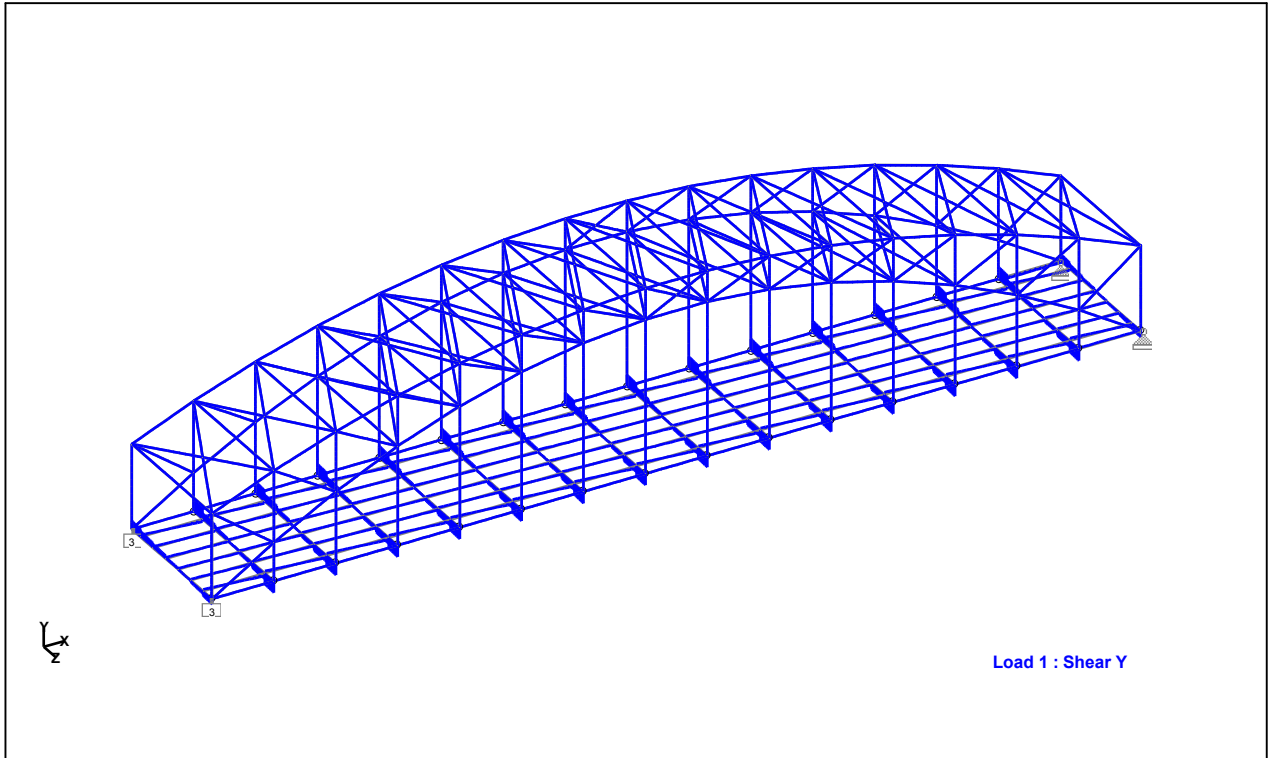
Date 22-May-15

Chd

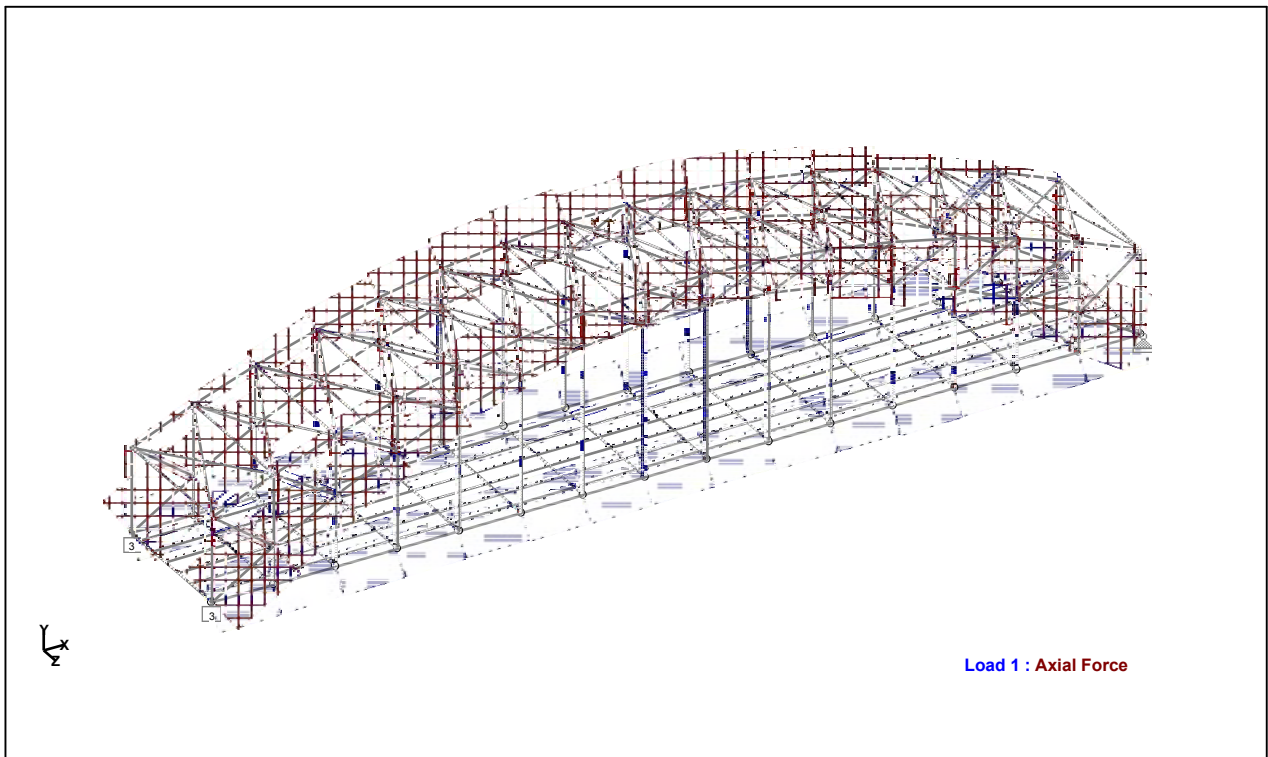
Client Teknik Sipil ITN Malang

File Jembatan Pelengkung.str

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Whole Structure Fy 101.972kg:1cm 1 BEBAN MATI



Whole Structure Fx 900kg:1cm 1 BEBAN MATI



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Job No	Sheet No 1	Rev
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By keraf	Date 22-May-15	Chd
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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Failure Ratio

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
1	W14X311	0.042	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
2	W14X311	0.123	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3	W14X311	0.104	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
4	W14X311	0.087	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
5	W14X311	0.072	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
13	W14X311	0.026	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
14	W14X311	0.033	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
15	W14X311	0.046	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
16	W14X311	0.058	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
17	W14X311	0.071	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
18	W14X311	0.085	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
19	W14X311	0.097	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
20	W14X311	0.046	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
21	W14X311	0.034	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
22	W14X311	0.028	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
23	W14X311	0.022	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
24	W14X311	0.025	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
25	W14X311	0.027	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
26	W14X311	0.029	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
27	W14X311	0.028	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
28	W14X311	0.025	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
29	W14X311	0.016	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
30	W14X311	0.044	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
31	W14X311	0.123	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
32	W14X311	0.104	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
33	W14X311	0.094	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
34	W14X311	0.078	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
42	W14X311	0.023	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
43	W14X311	0.030	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
44	W14X311	0.042	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
45	W14X311	0.054	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
46	W14X311	0.066	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
47	W14X311	0.082	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
48	W14X311	0.097	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
49	W14X311	0.049	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
50	W14X311	0.035	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
51	W14X311	0.030	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
52	W14X311	0.019	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
53	W14X311	0.021	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
54	W14X311	0.024	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
55	W14X311	0.027	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
56	W14X311	0.027	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
57	W14X311	0.026	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
58	W14X311	0.017	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
59	W14X311	0.084	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
60	W14X311	0.036	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
61	W14X311	0.034	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
62	W14X311	0.033	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
63	H250X255X14	0.042	35.000	47.599	103.900	25.000	25.500	11.4E 3	1.88E 3	67.000



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
64	H250X255X14	0.052	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
65	H250X255X14	0.058	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
66	H250X255X14	0.058	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
67	H250X255X14	0.058	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
68	H250X255X14	0.056	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
69	H250X255X14	0.055	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
70	H250X255X14	0.053	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
71	H250X255X14	0.117	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
72	H250X255X14	0.052	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
73	H250X255X14	0.058	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
74	H250X255X14	0.058	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
75	H250X255X14	0.057	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
76	H250X255X14	0.056	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
77	H250X255X14	0.055	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
78	H250X255X14	0.053	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
79	W14X311	0.044	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
80	W14X311	0.124	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
81	W14X311	0.107	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
82	W14X311	0.097	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
83	W14X311	0.080	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
84	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
85	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
86	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
87	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
88	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
89	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
90	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
91	W14X311	0.026	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
92	W14X311	0.033	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
93	W14X311	0.046	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
94	W14X311	0.058	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
95	W14X311	0.071	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
96	W14X311	0.085	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
97	W14X311	0.098	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
98	W14X311	0.047	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
99	W14X311	0.034	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
100	W14X311	0.028	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
101	W14X311	0.022	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
102	W14X311	0.025	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
103	W14X311	0.027	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
104	W14X311	0.029	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
105	W14X311	0.029	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
106	W14X311	0.026	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
107	W14X311	0.017	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
108	W14X311	0.035	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
109	W14X311	0.110	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
110	W14X311	0.100	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
111	W14X311	0.094	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
112	W14X311	0.077	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3



SKRIPSI JEMBATAN

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Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
113	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
114	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
115	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
116	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
117	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
118	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
119	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
120	W14X311	0.024	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
121	W14X311	0.030	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
122	W14X311	0.043	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
123	W14X311	0.055	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
124	W14X311	0.068	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
125	W14X311	0.083	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
126	W14X311	0.098	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
127	W14X311	0.046	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
128	W14X311	0.034	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
129	W14X311	0.029	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
130	W14X311	0.019	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
131	W14X311	0.021	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
132	W14X311	0.024	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
133	W14X311	0.027	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
134	W14X311	0.027	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
135	W14X311	0.025	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
136	W14X311	0.016	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
137	W14X311	0.086	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
138	W14X311	0.037	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
139	W14X311	0.033	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
140	W14X311	0.033	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
155	L90X90X9	0.203	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
156	L90X90X9	0.231	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
171	W14X311	0.095	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
180	H300X300X10	0.292	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
182	H300X300X10	0.296	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
188	H300X300X10	0.047	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
190	H300X300X10	0.172	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
192	H300X300X10	0.038	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
194	H300X300X10	0.137	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
1779	L90X90X9	0.221	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1780	L90X90X9	0.274	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1781	L90X90X9	0.243	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1782	L90X90X9	0.205	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1783	L90X90X9	0.243	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1784	L90X90X9	0.208	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1785	L90X90X9	0.214	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1786	L90X90X9	0.246	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1787	L90X90X9	0.217	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1788	L90X90X9	0.247	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1789	L90X90X9	0.217	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
1790	L90X90X9	0.246	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992



SKRIPSI JEMBATAN

Job No	Sheet No 4	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
1791	L90X90X9	0.213	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
1792	L90X90X9	0.240	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
1793	L90X90X9	0.225	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
1794	L90X90X9	0.252	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
1795	L90X90X9	0.226	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1796	L90X90X9	0.252	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1797	L90X90X9	0.222	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1798	L90X90X9	0.246	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1799	L90X90X9	0.239	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1800	L90X90X9	0.216	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1801	L90X90X9	0.230	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1802	L90X90X9	0.209	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1803	L90X90X9	0.219	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1804	L90X90X9	0.200	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
1805	L90X90X9	0.196	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
3459	W14X311	0.026	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3460	W14X311	0.023	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3461	W14X311	0.019	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3462	W14X311	0.015	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3463	W14X311	0.009	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3464	W14X311	0.003	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3465	W14X311	0.021	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3466	W14X311	0.023	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3467	W14X311	0.021	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3468	W14X311	0.018	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3469	W14X311	0.015	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3470	W14X311	0.010	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3471	W14X311	0.004	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3472	W14X311	0.020	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3473	W14X311	0.036	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3474	W14X311	0.035	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3475	W14X311	0.026	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3476	W14X311	0.023	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3477	W14X311	0.020	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3478	W14X311	0.015	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3479	W14X311	0.010	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3480	W14X311	0.004	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3481	W14X311	0.020	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3482	W14X311	0.023	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3483	W14X311	0.021	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3484	W14X311	0.018	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3485	W14X311	0.015	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3486	W14X311	0.009	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3487	W14X311	0.003	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3488	W14X311	0.021	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3489	W14X311	0.035	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3490	W14X311	0.035	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3491	L90X90X9	0.203	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
3492	L90X90X9	0.231	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992



SKRIPSI JEMBATAN

Job No	Sheet No 5	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
3493	W14X311	0.094	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3494	W14X311	0.081	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3495	W14X311	0.073	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3496	W14X311	0.071	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3497	W14X311	0.069	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3498	W14X311	0.072	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3499	W14X311	0.087	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3500	W14X311	0.088	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3501	W14X311	0.088	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3502	W14X311	0.080	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3503	W14X311	0.076	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3504	W14X311	0.073	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3505	W14X311	0.076	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3506	W14X311	0.078	155.736	155.517	589.676	43.485	41.224	180E 3	67E 3	i.66E 3
3605	L90X90X9	0.184	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3606	L90X90X9	0.218	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3607	L90X90X9	0.236	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3608	L90X90X9	0.196	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3609	L90X90X9	0.245	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3610	L90X90X9	0.208	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3611	L90X90X9	0.217	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3612	L90X90X9	0.251	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3613	L90X90X9	0.224	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3614	L90X90X9	0.256	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3615	L90X90X9	0.227	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3616	L90X90X9	0.258	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3617	L90X90X9	0.225	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
3618	L90X90X9	0.255	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
3619	L90X90X9	0.213	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
3620	L90X90X9	0.238	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
3621	L90X90X9	0.216	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3622	L90X90X9	0.240	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3623	L90X90X9	0.215	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3624	L90X90X9	0.238	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3625	L90X90X9	0.234	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3626	L90X90X9	0.213	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3627	L90X90X9	0.229	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3628	L90X90X9	0.210	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3629	L90X90X9	0.226	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3630	L90X90X9	0.212	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3631	H700X300X13	0.238	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3637	H700X300X13	0.216	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3643	H700X300X13	0.189	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3649	H700X300X13	0.161	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3655	H700X300X13	0.133	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3661	H700X300X13	0.105	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3667	H700X300X13	0.076	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3673	H700X300X13	0.089	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3679	H700X300X13	0.117	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200



SKRIPSI JEMBATAN

Job No	Sheet No 6	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
3685	H700X300X13	0.144	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3691	H700X300X13	0.172	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3697	H700X300X13	0.201	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3703	H700X300X13	0.229	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3709	H700X300X13	0.256	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3721	H700X300X13	0.818	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
3781	W14X311	0.088	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3782	W14X311	0.117	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3783	W14X311	0.073	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3784	W14X311	0.072	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3785	W14X311	0.068	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3786	W14X311	0.064	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3787	W14X311	0.067	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3788	W14X311	0.083	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3789	W14X311	0.084	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3790	W14X311	0.083	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3791	W14X311	0.075	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3792	W14X311	0.072	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3793	W14X311	0.069	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3794	W14X311	0.071	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3795	W14X311	0.073	155.736	115.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
3879	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3880	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3881	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3882	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3883	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3884	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3885	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3886	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3887	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3888	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3889	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3890	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3891	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3892	OX 76	0.000	40.374	40.374	45.365	7.600	0.000	163.766	163.766	327.532
3946	L90X90X9	0.227	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3947	L90X90X9	0.190	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
3948	L90X90X9	0.278	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
5318	H250X255X14	0.055	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
5319	H250X255X14	0.055	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
5320	L90X90X9	0.226	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
5321	L90X90X9	0.221	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5322	L90X90X9	0.192	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5323	L90X90X9	0.172	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5324	L90X90X9	0.198	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5325	L90X90X9	0.202	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5326	L90X90X9	0.242	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
5327	L90X90X9	0.215	8.400	8.400	24.440	9.000	9.000	189.648	100.377	3.992
5328	L90X90X9	0.216	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992



SKRIPSI JEMBATAN

Job No	Sheet No 7	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
5329	L90X90X9	0.184	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5330	L90X90X9	0.172	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5331	L90X90X9	0.201	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5332	L90X90X9	0.214	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5333	L90X90X9	0.247	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
5334	L90X90X9	0.229	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
5335	L90X90X9	0.226	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5336	L90X90X9	0.197	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5337	L90X90X9	0.172	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5338	L90X90X9	0.193	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5339	L90X90X9	0.198	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5340	L90X90X9	0.239	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
5341	L90X90X9	0.218	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
5342	L90X90X9	0.221	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5343	L90X90X9	0.189	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5344	L90X90X9	0.172	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5345	L90X90X9	0.196	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5346	L90X90X9	0.209	8.400	8.400	24.440	9.000	9.000	189.648	346.256	3.992
5347	L90X90X9	0.243	8.400	8.400	24.440	9.000	9.000	189.648	400.377	3.992
5349	H300X300X10	0.306	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5350	H300X300X10	0.289	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5351	H300X300X10	0.255	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5352	H300X300X10	0.224	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5353	H300X300X10	0.188	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5354	H300X300X10	0.152	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5355	H300X300X10	0.114	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5356	H300X300X10	0.083	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5357	H300X300X10	0.100	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5358	H300X300X10	0.137	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5359	H300X300X10	0.173	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5360	H300X300X10	0.209	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5361	H300X300X10	0.240	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5362	H300X300X10	0.269	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5363	H300X300X10	0.334	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5364	H300X300X10	0.289	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5365	H300X300X10	0.239	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5366	H300X300X10	0.204	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5367	H300X300X10	0.167	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5368	H300X300X10	0.133	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5369	H300X300X10	0.097	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5370	H300X300X10	0.082	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5371	H300X300X10	0.109	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5372	H300X300X10	0.145	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5373	H300X300X10	0.179	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5374	H300X300X10	0.215	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5375	H300X300X10	0.246	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5376	H300X300X10	0.286	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5377	H300X300X10	0.053	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500
5378	H300X300X10	0.085	30.000	59.999	118.400	30.000	30.000	0.2E 3	1.75E 3	76.500



SKRIPSI JEMBATAN

Job No	Sheet No 8	Rev
Part		
Ref		
By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
5379	H300X300X10	0.085	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5380	H300X300X10	0.077	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5381	H300X300X10	0.065	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5382	H300X300X10	0.051	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5383	H300X300X10	0.034	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5384	H300X300X10	0.033	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5385	H300X300X10	0.030	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5386	H300X300X10	0.040	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5387	H300X300X10	0.055	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5388	H300X300X10	0.068	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5389	H300X300X10	0.074	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5390	H300X300X10	0.076	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5391	H300X300X10	0.176	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5392	H300X300X10	0.154	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5393	H300X300X10	0.149	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5394	H300X300X10	0.131	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5395	H300X300X10	0.109	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5396	H300X300X10	0.084	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5397	H300X300X10	0.057	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5398	H300X300X10	0.047	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5399	H300X300X10	0.045	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5400	H300X300X10	0.072	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5401	H300X300X10	0.097	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5402	H300X300X10	0.121	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5403	H300X300X10	0.138	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5404	H300X300X10	0.144	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5405	H300X300X10	0.065	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5406	H300X300X10	0.052	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5407	H300X300X10	0.044	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5408	H300X300X10	0.041	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5409	H300X300X10	0.036	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5410	H300X300X10	0.030	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5411	H300X300X10	0.030	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5412	H300X300X10	0.032	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5413	H300X300X10	0.028	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5414	H300X300X10	0.030	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5415	H300X300X10	0.037	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5416	H300X300X10	0.043	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5417	H300X300X10	0.045	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5418	H300X300X10	0.048	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5419	H300X300X10	0.175	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5420	H300X300X10	0.113	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5421	H300X300X10	0.099	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5422	H300X300X10	0.084	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5423	H300X300X10	0.069	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5424	H300X300X10	0.052	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5425	H300X300X10	0.039	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5426	H300X300X10	0.044	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5427	H300X300X10	0.045	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500



SKRIPSI JEMBATAN

Job No	Sheet No 9	Rev
Part		
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By keraf	Date 22-May-15	Chd
Client Teknik Sipil ITN Malang	File Jembatan Pelengkung.stc	Date/Time 27-Jul-2015 08:43

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
5428	H300X300X10	0.064	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5429	H300X300X10	0.081	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5430	H300X300X10	0.096	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5431	H300X300X10	0.105	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5432	H300X300X10	0.108	30.000	59.999	118.400	30.000	30.000	10.2E 3	1.75E 3	76.500
5433	H700X300X13	0.478	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5435	H700X300X13	0.200	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5436	H700X300X13	0.104	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5437	H700X300X13	0.205	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5439	H700X300X13	0.358	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5440	H700X300X13	0.245	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5441	H700X300X13	0.186	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5442	H700X300X13	0.173	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5443	H700X300X13	0.205	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5444	H700X300X13	0.271	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5445	H700X300X13	0.297	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5446	H700X300X13	0.235	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5447	H700X300X13	0.194	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5448	H700X300X13	0.186	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5449	H700X300X13	0.217	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5450	H700X300X13	0.249	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5451	H700X300X13	0.242	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5452	H700X300X13	0.214	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5453	H700X300X13	0.184	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5454	H700X300X13	0.178	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5455	H700X300X13	0.203	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5456	H700X300X13	0.220	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5457	H700X300X13	0.197	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5458	H700X300X13	0.193	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5459	H700X300X13	0.176	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5460	H700X300X13	0.170	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5461	H700X300X13	0.190	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5462	H700X300X13	0.194	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5463	H700X300X13	0.158	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5464	H700X300X13	0.173	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5465	H700X300X13	0.168	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5466	H700X300X13	0.163	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5467	H700X300X13	0.176	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5468	H700X300X13	0.171	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5469	H700X300X13	0.123	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5470	H700X300X13	0.152	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5471	H700X300X13	0.160	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5472	H700X300X13	0.153	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5473	H700X300X13	0.161	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5474	H700X300X13	0.148	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5475	H700X300X13	0.087	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5476	H700X300X13	0.129	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5477	H700X300X13	0.147	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5478	H700X300X13	0.144	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200



SKRIPSI JEMBATAN

Job No

Sheet No

10

Rev

Software licensed to Snow Panther [LZ0]

Part

Job Title Jembatan Pelengkung

Ref

By keraf

Date 22-May-15

Chd

Client Teknik Sipil ITN Malang

File Jembatan Pelengkung.str

Date/Time 27-Jul-2015 08:43

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
5479	H700X300X13	0.143	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5480	H700X300X13	0.122	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5481	H700X300X13	0.080	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5482	H700X300X13	0.122	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5483	H700X300X13	0.140	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5484	H700X300X13	0.147	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5485	H700X300X13	0.150	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5486	H700X300X13	0.131	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5487	H700X300X13	0.115	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5488	H700X300X13	0.145	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5489	H700X300X13	0.152	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5490	H700X300X13	0.160	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5491	H700X300X13	0.169	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5492	H700X300X13	0.156	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5493	H700X300X13	0.150	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5494	H700X300X13	0.166	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5495	H700X300X13	0.161	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5496	H700X300X13	0.169	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5497	H700X300X13	0.183	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5498	H700X300X13	0.179	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5499	H700X300X13	0.190	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5500	H700X300X13	0.185	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5501	H700X300X13	0.167	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5502	H700X300X13	0.175	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5503	H700X300X13	0.195	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5504	H700X300X13	0.201	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5505	H700X300X13	0.237	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5506	H700X300X13	0.207	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5507	H700X300X13	0.177	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5508	H700X300X13	0.182	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5509	H700X300X13	0.208	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5510	H700X300X13	0.226	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5511	H700X300X13	0.297	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5512	H700X300X13	0.231	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5513	H700X300X13	0.190	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5514	H700X300X13	0.188	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5515	H700X300X13	0.219	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5516	H700X300X13	0.253	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5517	H700X300X13	0.374	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5518	H700X300X13	0.261	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5519	H700X300X13	0.204	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5520	H700X300X13	0.184	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5521	H700X300X13	0.218	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5522	H700X300X13	0.284	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5523	H700X300X13	0.463	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5525	H700X300X13	0.177	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5526	H700X300X13	0.065	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5527	H700X300X13	0.141	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5534	W14X311	0.055	155.736	315.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3



SKRIPSI JEMBATAN

Job No	Sheet No 11	Rev
Part		
Ref		
By	Date	Chd
keraf	22-May-15	
File	Date/Time	
Jembatan Pelengkung.stc	27-Jul-2015 08:43	

Software licensed to Snow Panther [LZ0]

Job Title Jembatan Pelengkung

Client Teknik Sipil ITN Malang

Failure Ratio Cont...

Beam	New Property	Ratio	Ay (cm ²)	Az (cm ²)	Ax (cm ²)	Dw (cm)	Bf (cm)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
5535	W14X311	0.059	155.736	15.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
5536	W14X311	0.078	155.736	15.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
5537	W14X311	0.070	155.736	15.517	589.676	43.485	41.224	180E 3	67E 3	1.66E 3
5538	H700X300X13	0.706	91.000	95.998	231.500	70.000	30.000	197E 3	0.8E 3	324.200
5539	L90X90X9	0.261	8.400	8.400	24.440	9.000	9.000	189.648	341.285	3.992
5540	L90X90X9	0.441	8.400	8.400	24.440	9.000	9.000	189.648	341.285	3.992
5541	L90X90X9	0.436	8.400	8.400	24.440	9.000	9.000	189.648	341.285	3.992
5542	L90X90X9	0.234	8.400	8.400	24.440	9.000	9.000	189.648	341.285	3.992
5543	H250X255X14	0.054	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
5544	H250X255X14	0.051	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
5545	H250X255X14	0.050	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
5546	H250X255X14	0.050	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
5547	H250X255X14	0.051	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
5548	H250X255X14	0.054	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
5549	L90X90X9	0.256	8.400	8.400	24.440	9.000	9.000	189.648	341.285	3.992
5550	L90X90X9	0.452	8.400	8.400	24.440	9.000	9.000	189.648	341.285	3.992
5551	L90X90X9	0.449	8.400	8.400	24.440	9.000	9.000	189.648	341.285	3.992
5552	L90X90X9	0.229	8.400	8.400	24.440	9.000	9.000	189.648	341.285	3.992
5553	H250X255X14	0.049	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000
5554	H250X255X14	0.052	35.000	47.599	103.900	25.000	25.500	1.4E 3	1.88E 3	67.000