





**KUESIONER PENELITIAN
PERBANDINGAN
BERPASANGAN
MULTI CRITERIA
DECISION MAKING**

**Dipersiapkan oleh:
AYRAFEDI
(0706174272)**



**PROGRAM STUDI
TEKNIK INDUSTRI
PROGRAM
PASCA SARJANA
BIDANG ILMU TEKNIK
UNIVERSITAS INDONESIA
NOV 2009**

PENGANTAR

Terima kasih Bapak/Ibu telah meluangkan waktu sejenak untuk mengisi kuesioner penelitian yang kami selenggarakan.

Penelitian ini bertujuan untuk membobotkan data atribut kuantitatif kekuatan konstruksi, proses, konsumsi material dan sisa material berdasarkan tingkat pengaruh kepentingannya menjadi data atribut kualitatif menggunakan metode *Analytic Hierarchy Process* sebagai landasan dalam menganalisa *multi criteria decision making*.

Kami berharap bahwa sebagai wakil yang diberi kepercayaan untuk mengisi kuesioner ini, Bapak/Ibu dapat menggambarkan hubungan erat antara data kekuatan konstruksi shell tank, proses dengan konsumsi bahan baku material dan hasil material sisa yang penting untuk perusahaan mengefisiensikan bahan baku dimana anda bekerja.

Dalam pengisian kuesioner ini, Bapak/Ibu tidak perlu khawatir rahasia perusahaan akan terbuka karena pertanyaan yang diajukan tidak berkenaan dengan rahasia perusahaan. Melainkan seputar keilmuan Teknik. Untuk itu, bantuan Bapak/ Ibu berupa jawaban yang tepat sangat kami harapkan.

Atas perhatian dan kerjasama Bapak/ Ibu, Kami ucapkan terima kasih.

Hormat Kami,

AYRAFEDI
(0706174272)



DATA RESPONDEN

1. Nama:

2. Nama Perusahaan:

3. Jabatan Sekarang:

4. Pendidikan Formal Terakhir:

5. Pengalaman Kerja (dalam tahun):

Jakarta,... 2009

Tanda Tangan Responden

(_____)



PETUNJUK PENGISIAN KUESIONER

Dalam kuesioner ini, Bapak/Ibu diminta untuk memberikan pertimbangan terhadap setiap perbandingan berpasangan antara data atribut konstruksi shell tank trafo. Berikut ini adalah skala yang digunakan untuk membandingkan secara berpasangan antara atribut.

Tingkat Kepentingan	Definisi	Penjelasan
1	Kedua kriteria sama penting	Kedua kriteria mempunyai pengaruh yang sama
3	Kriteria yang satu sedikit lebih penting daripada yang lainnya	Penilaian sedikit lebih memihak pada salah satu kriteria dibandingkan pasangannya
5	Kriteria yang satu lebih penting daripada yang lainnya	Penilaian jelas memihak pada salah satu kriteria dibandingkan pasangannya
7	Kriteria yang satu sangat penting daripada yang lainnya	Salah satu kriteria sangat berpengaruh dan dominasinya tampak nyata
9	Kriteria yang satu mutlak sangat penting daripada yang lainnya	Kriteria yang satu mutlak sangat penting dibandingkan pasangannya
2, 4, 6, 8	Nilai tengah di antara dua pertimbangan yang berdekatan	Diberikan jika terdapat keraguan di antara kedua penilaian yang berdekatan
Kebalikan	Jika kriteria X memiliki salah satu nilai di atas pada saat dibandingkan dengan kriteria Y, maka kriteria Y memiliki nilai kebalikan bila dibandingkan dengan kriteria X.	

Bentuk perbandingan berpasangan adalah sebagai berikut:

Kriteria X	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria Y
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Skala bagian kiri dipakai jika kriteria X mempunyai tingkat kepentingan/pengaruh di atas kriteria Y.

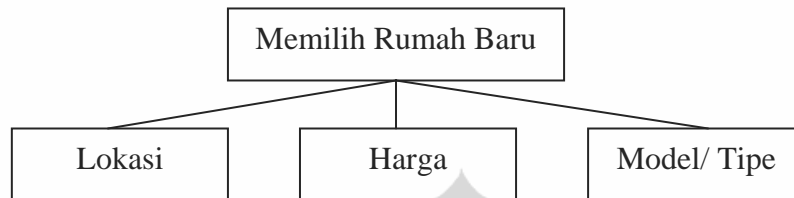
Skala bagian kanan dipakai jika kriteria Y mempunyai tingkat kepentingan/pengaruh di atas kriteria X.



CONTOH PENGISIAN KUESIONER

Berikut ini adalah contoh pengisian kuesioner untuk keputusan memilih rumah baru.

Model hirarki keputusannya adalah sebagai berikut:



Kontrol : Memilih rumah baru

Lokasi

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
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 Harga

Bagaimanakah faktor Lokasi dan Harga, berpengaruh atau dipengaruhi terhadap tujuan Memilih Rumah Baru?

Jika Lokasi dinilai **sama penting** dibandingkan Harga, maka dipilih angka **1**.

Kontrol : Memilih rumah baru

Lokasi

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	--------------	---	---	---	---	---	---	---	---	---	---	---	---

 Model/ Tipe

Bagaimanakah faktor Lokasi dan Model/Tipe, berpengaruh atau dipengaruhi terhadap tujuan Memilih Rumah Baru?

Jika Lokasi dinilai **lebih penting** dibandingkan Model/ Tipe, maka dipilih angka **5 di bagian kiri**.

Kontrol : Memilih rumah baru

Model/ Tipe

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	--------------	---

 Harga

Bagaimanakah faktor Model/Tipe dan Harga, berpengaruh atau dipengaruhi terhadap tujuan Memilih Rumah Baru?

Jika Harga dinilai antara **sangat lebih penting (7)** dan **mutlak sangat lebih penting (9)** dibandingkan Model/ Tipe, maka dipilih angka **8 di bagian kanan**.

Mohon diperhatikan konsistensi Jawaban Bapak/ Ibu, karena akan sangat menentukan validitas jawaban Bapak/ Ibu. Sebagai contoh kondisi konsistensi:

Jika kriteria X lebih penting daripada kriteria Y, dan kriteria Y lebih penting daripada kriteria Z, maka kriteria X sangat lebih penting daripada kriteria Z.



ANALYTIC HIERARCHY PROCESS METAL CONSTRUCTION

<i>Atribut Proses</i>	<i>Keterangan</i>
<i>Penggunaan raw material (kg)</i>	<i>Penggunaan bahan baku lembaran (A1)</i>
<i>Material sisa (kg)</i>	<i>Material sisa pemotongan (A2)</i>
<i>Panjang welding (mm)</i>	<i>Panjang pengelasan atau sambungan (A3)</i>
<i>Panjang Radiographic Test (20%) (mm)</i>	<i>Panjang lasan yang akan di test radiographyc untuk mengurangi kecenderungan bocor (A4)</i>
<i>Panjang Dye Penetrant Test (mm)</i>	<i>Panjang lasan yang akan di test Dye Penetrant untuk mengurangi kecenderungan bocor (A5)</i>
<i>Stress shell tank saat vacuum proses (N/mm²)</i>	<i>Kekuatan shell tank saat vacuum proses (A6)</i>
<i>Stress shell tank saat lifting proses (N/mm²)</i>	<i>Kekuatan shell tank saat lifting proses (A7)</i>
<i>Stress shell saat jacking proses (N/mm²)</i>	<i>Kekuatan shell tank saat jacking proses (A8)</i>
<i>Stress shell tank pada seismic test (N/mm²)</i>	<i>Kekuatan shell tank saat seismic terjadi (A9)</i>

Penilaian data atribut perbandingan ini digunakan mencari nilai prioritas dari dua komponen yang dibandingkan, proses pembobotannya dapat di lihat di petunjuk pengisian kuisisioner. Penilaian yang bapak/ ibu lakukan merupakan penilaian secara menyeluruh untuk sebuah konstruksi metal dengan memperhatikan fungsi dari benda tersebut dan kekuatan metal part.

Fungsi penilaian ini nantinya menjadi rujukan pada proses pengolahan berikutnya sehingga data perbandingan prioritas ini sangat penting konsistensinya untuk menghindari kekeliruan dalam pembobotan atribut berdasarkan pemikiran perusahaan bapak. Variable atribut diatas menjadi harus diterapkan dengan pertimbangan fungsi dan kualitas.



(A1) Penggunaan row material (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A2) Material sisa (kg)

(A1) Penggunaan row material (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A3) Panjang welding (mm)

(A1) Penggunaan row material (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A4) Panjang Radiographic Test (20%) (mm)

(A1) Penggunaan row material (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A5) Panjang Dye Penetrant Test (mm)

(A1) Penggunaan row material (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A6) Stress shell tank saat vacuum proses (N/mm^2)

(A1) Penggunaan row material (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A7) Stress shell tank saat lifting proses (N/mm^2)

(A1) Penggunaan row material (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A8) Stress shell saat jacking proses (N/mm^2)

(A1) Penggunaan row material (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A9) Stress shell tank pada seismic test (N/mm^2)

(A2) Material sisa (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A3) Panjang welding (mm)

(A2) Material sisa (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A4) Panjang Radiographic Test (20%) (mm)

(A2) Material sisa (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A5) Panjang Dye Penetrant Test (mm)



- (A2) Material sisa (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A6) Stress shell tank saat vacuum proses (N/mm^2)
- (A2) Material sisa (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A7) Stress shell tank saat lifting proses (N/mm^2)
- (A2) Material sisa (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A8) Stress shell saat jacking proses (N/mm^2)
- (A2) Material sisa (kg)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A9) Stress shell tank pada seismic test (N/mm^2)
- (A3) Panjang welding (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A4) Panjang Radiographic Test (20%) (mm)
- (A3) Panjang welding (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A5) Panjang Dye Penetrant Test (mm)
- (A3) Panjang welding (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A6) Stress shell tank saat vacuum proses (N/mm^2)
- (A3) Panjang welding (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
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 (A7) Stress shell tank saat lifting proses (N/mm^2)
- (A3) Panjang welding (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A8) Stress shell saat jacking proses (N/mm^2)
- (A3) Panjang welding (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A9) Stress shell tank pada seismic test (N/mm^2)
- (A4) Panjang Radiographic Test (20%) (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
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 (A5) Panjang Dye Penetrant Test (mm)



(A4) Panjang Radiographic Test (20%) (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A6) Stress shell tank saat vacuum proses (N/mm^2)

(A4) Panjang Radiographic Test (20%) (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A7) Stress shell tank saat lifting proses (N/mm^2)

(A4) Panjang Radiographic Test (20%) (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A8) Stress shell saat jacking proses (N/mm^2)

(A4) Panjang Radiographic Test (20%) (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A9) Stress shell tank pada seismic test (N/mm^2)

(A5) Panjang Dye Penetrant Test (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A6) Stress shell tank saat vacuum proses (N/mm^2)

(A5) Panjang Dye Penetrant Test (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A7) Stress shell tank saat lifting proses (N/mm^2)

(A5) Panjang Dye Penetrant Test (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A8) Stress shell saat jacking proses (N/mm^2)

(A5) Panjang Dye Penetrant Test (mm)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A9) Stress shell tank pada seismic test (N/mm^2)

(A6) Stress shell tank saat vacuum proses (N/mm^2)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A7) Stress shell tank saat lifting proses (N/mm^2)

(A6) Stress shell tank saat vacuum proses (N/mm^2)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

 (A8) Stress shell saat jacking proses (N/mm^2)

(A6) Stress shell tank saat vacuum proses (N/mm^2)

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
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 (A9) Stress shell tank pada seismic test (N/mm^2)



(A7) *Stress shell tank
saat lifting proses
(N/mm²)*

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A8) *Stress shell saat
jacking proses (N/mm²)*

(A7) *Stress shell tank
saat lifting proses
(N/mm²)*

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(A9) *Stress shell tank pada
seismic test (N/mm²)*

(A8) *Stress shell saat
jacking proses (N/mm²)*

9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
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(A9) *Stress shell tank pada
seismic test (N/mm²)*

PENUTUP

Terima kasih atas bantuan Bapak/ Ibu dalam pengisian kuesioner ini. Apabila ada pertanyaan mengenai kuesioner ini, dapat menghubungi:

Ayrafedi

(0706174272)

Jl Kp Rawaputat no 158 Cileungsi Kidul Kecamatan Cilengsi

Bogor, Jawa Barat

HP. 081330743424



KUESIONER RESPONDEN 1

Respon 1	A1	A2	A3	A4	A5	A6	A7	A8	A9
A1	1.000	0.125	0.333	0.333	0.333	0.143	0.200	0.200	0.143
A2	8.000	1.000	7.000	4.000	7.000	2.000	4.000	4.000	2.000
A3	3.000	0.143	1.000	0.200	0.200	0.143	0.200	0.200	0.143
A4	3.000	0.250	5.000	1.000	0.333	0.200	0.333	0.333	0.200
A5	3.000	0.143	5.000	3.000	1.000	0.200	0.333	0.333	0.200
A6	7.000	0.500	7.000	5.000	5.000	1.000	5.000	5.000	1.000
A7	5.000	0.250	5.000	3.000	3.000	0.200	1.000	1.000	0.200
A8	5.000	0.250	5.000	3.000	3.000	0.200	1.000	1.000	0.200
A9	7.000	0.500	7.000	5.000	5.000	1.000	5.000	5.000	1.000

KUESIONER RESPONDEN 2

Respon 2	A1	A2	A3	A4	A5	A6	A7	A8	A9
A1	1.000	0.143	0.500	0.250	0.333	0.167	0.250	0.167	0.125
A2	7.000	1.000	6.000	3.000	4.000	3.000	5.000	3.000	2.000
A3	2.000	0.167	1.000	0.167	0.250	0.167	0.250	0.250	0.125
A4	4.000	0.333	6.000	1.000	0.250	0.250	0.500	0.500	0.250
A5	3.000	0.250	4.000	4.000	1.000	0.167	0.333	0.333	0.167
A6	6.000	0.333	6.000	4.000	6.000	1.000	6.000	6.000	1.000
A7	4.000	0.200	4.000	2.000	3.000	0.167	1.000	1.000	0.167
A8	6.000	0.333	4.000	2.000	3.000	0.167	1.000	1.000	0.167
A9	8.000	0.500	8.000	4.000	6.000	1.000	6.000	6.000	1.000

KUESIONER RESPONDEN 3

Respon 3	A1	A2	A3	A4	A5	A6	A7	A8	A9
A1	1.000	0.125	0.500	0.500	0.500	0.125	0.167	0.250	0.167
A2	8.000	1.000	6.000	6.000	4.000	2.000	3.000	3.000	3.000
A3	2.000	0.167	1.000	0.200	0.333	0.167	0.333	0.333	0.167
A4	2.000	0.167	5.000	1.000	0.500	0.250	0.500	0.500	0.250
A5	2.000	0.250	3.000	2.000	1.000	0.200	0.333	0.333	0.200
A6	8.000	0.500	6.000	4.000	5.000	1.000	4.000	4.000	1.000
A7	6.000	0.333	3.000	2.000	3.000	0.250	1.000	1.000	0.250
A8	4.000	0.333	3.000	2.000	3.000	0.250	1.000	1.000	0.200
A9	6.000	0.333	6.000	4.000	5.000	1.000	4.000	5.000	1.000

KUESIONER RESPONDEN 4

Respon 4	A1	A2	A3	A4	A5	A6	A7	A8	A9
A1	1.000	0.143	0.250	0.250	0.500	0.167	0.250	0.167	0.125
A2	7.000	1.000	5.000	3.000	5.000	2.000	4.000	2.000	2.000
A3	4.000	0.200	1.000	0.167	0.250	0.167	0.200	0.250	0.125
A4	4.000	0.333	6.000	1.000	0.250	0.333	0.500	0.500	0.250
A5	2.000	0.200	4.000	4.000	1.000	0.167	0.333	0.500	0.167
A6	6.000	0.500	6.000	3.000	6.000	1.000	4.000	3.000	1.000
A7	4.000	0.250	5.000	2.000	3.000	0.250	1.000	0.500	0.200
A8	6.000	0.500	4.000	2.000	2.000	0.333	2.000	1.000	0.167
A9	8.000	0.500	8.000	4.000	6.000	1.000	5.000	6.000	1.000

KUESIONER RESPONDEN 5

Respon 5	A1	A2	A3	A4	A5	A6	A7	A8	A9
A1	1.000	0.143	0.500	0.250	0.333	0.200	0.250	0.167	0.200
A2	7.000	1.000	3.000	4.000	3.000	1.000	3.000	4.000	2.000
A3	2.000	0.333	1.000	0.167	0.250	0.167	0.250	0.250	0.125
A4	4.000	0.250	6.000	1.000	0.250	0.250	4.000	0.500	0.250
A5	3.000	0.333	4.000	4.000	1.000	0.143	0.333	0.333	0.143
A6	5.000	1.000	6.000	4.000	7.000	1.000	3.000	4.000	2.000
A7	4.000	0.333	4.000	0.250	3.000	0.333	1.000	1.000	0.333
A8	6.000	0.250	4.000	2.000	3.000	0.250	1.000	1.000	0.200
A9	5.000	0.500	8.000	4.000	7.000	0.500	3.000	5.000	1.000

KUESIONER RESPONDEN 6

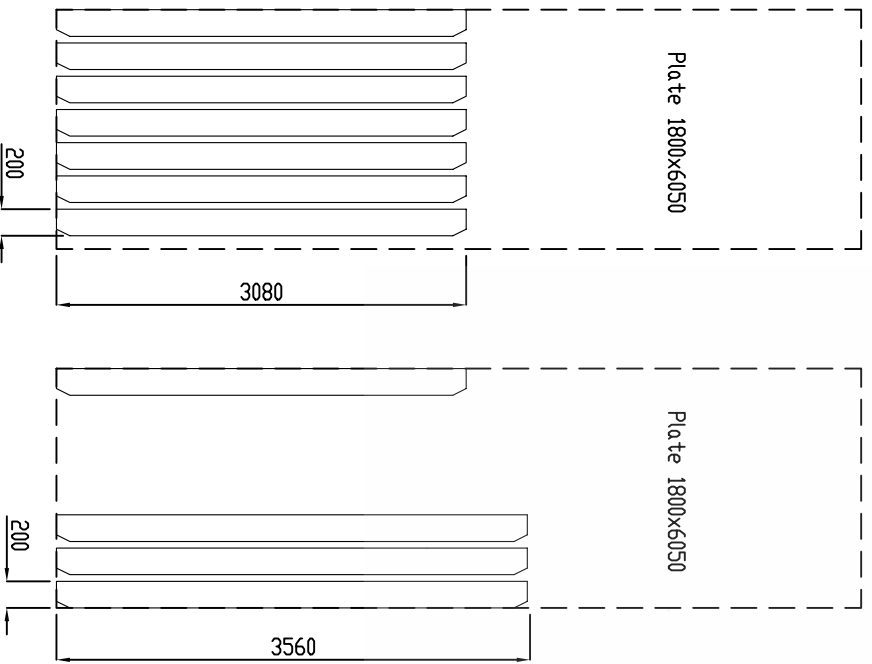
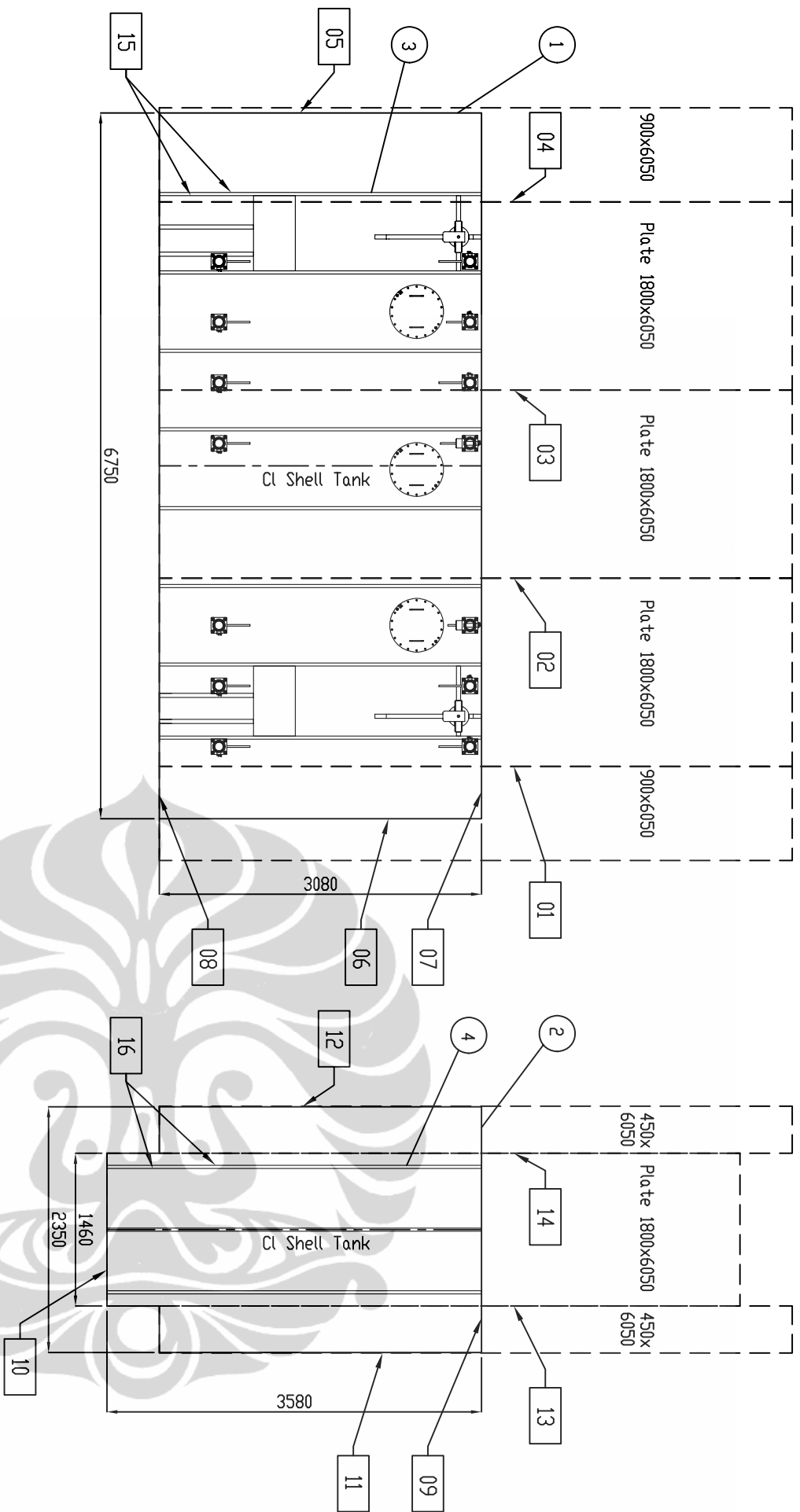
Respon 6	A1	A2	A3	A4	A5	A6	A7	A8	A9
A1	1.000	0.125	0.333	0.333	0.333	0.143	0.200	0.200	0.143
A2	8.000	1.000	3.000	4.000	3.000	0.500	4.000	3.000	1.000
A3	3.000	0.333	1.000	0.200	0.200	0.143	0.200	0.200	0.143
A4	3.000	0.250	5.000	1.000	0.333	0.200	0.250	0.333	0.200
A5	3.000	0.333	5.000	3.000	1.000	0.143	0.333	0.250	0.200
A6	7.000	2.000	7.000	5.000	7.000	1.000	7.000	8.000	2.000
A7	5.000	0.250	5.000	4.000	3.000	0.143	1.000	3.000	0.250
A8	5.000	0.333	5.000	3.000	4.000	0.125	0.333	1.000	0.200
A9	7.000	1.000	7.000	5.000	5.000	0.500	4.000	5.000	1.000



LAMPIRAN 3 :

**GAMBAR VARIASI OBJEKTIF DAN DATA ATRIBUT
A1-A5**

**(Penggunaan raw material, Material sisa, Panjang *welding*, Panjang
radiography test, Panjang *dye penetrant test*)**



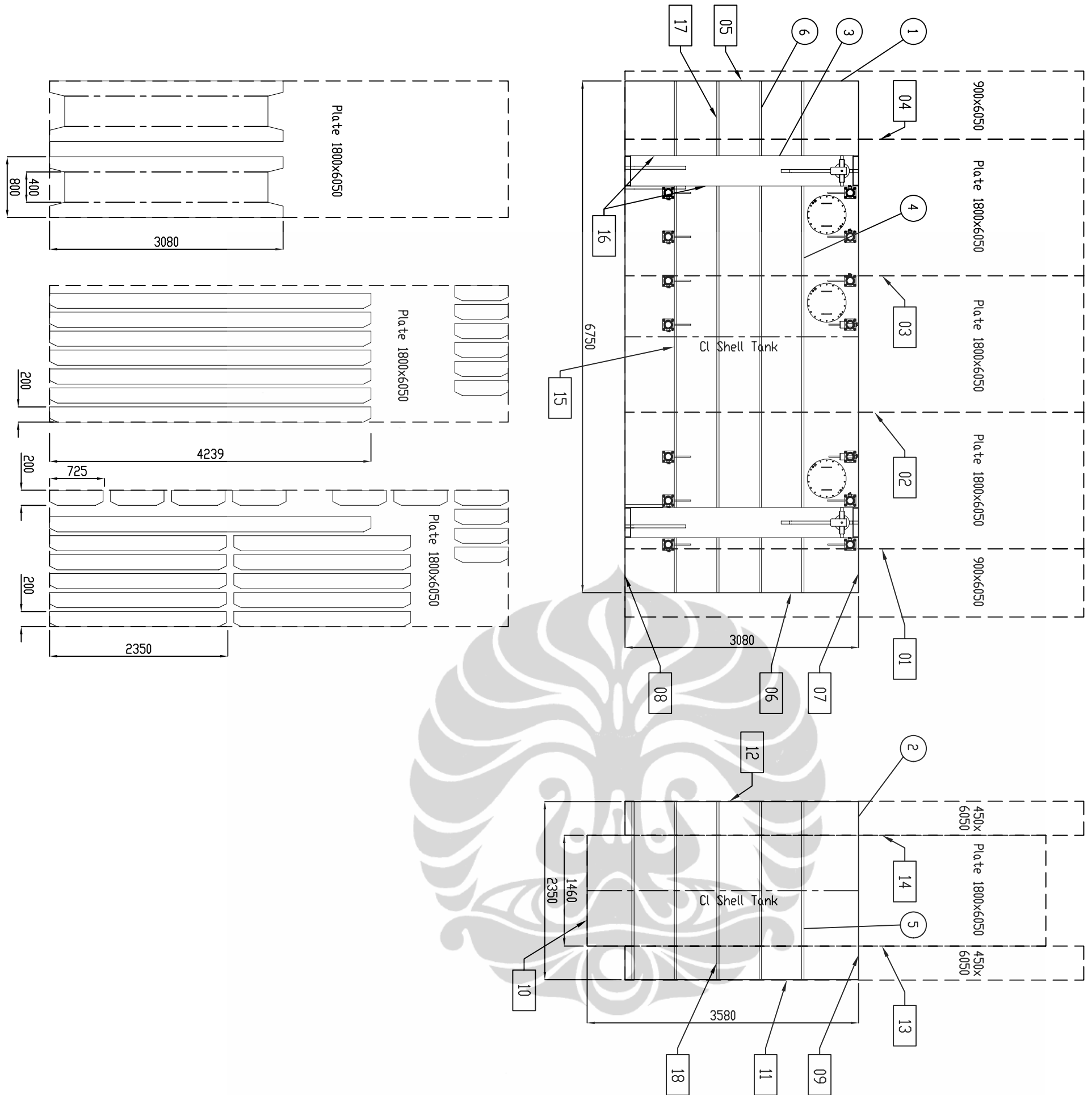
Weld No	Weld	Length	Weld No	Weld	Length	Weld No	Weld	Length
14	△	3080	07	○	6750			
13	△	3080	06	○	3080			
12	○	3080	05	○	3080			
11	○	3080	04	△	3080			
10	○	3250	03	△	3080			
09	○	2250	02	△	3080			
08	○	6750	01	△	3080			
Total Length Radiogw		19450	Total Length Penetrant		32330	Total Length		120760
15	□	49200						

Part name	Qty	Unit	Weight	Weight Residual Mat'l
Reinforcement 02	971	kg	5187	4217
Reinforcement 01	2044	kg	5187	3144
Side Wall Plate	1144	kg	2394	1430
Front Wall Plate	3285	kg	6882	3598

Weight Row Mat'l= 19851

Weight Residual Mat'l= 12408

Rev	Modification	Date	Approved	Checked	Drawn	#1	#2
1	Shell Tank						
2	Vertical Joining Row Material						

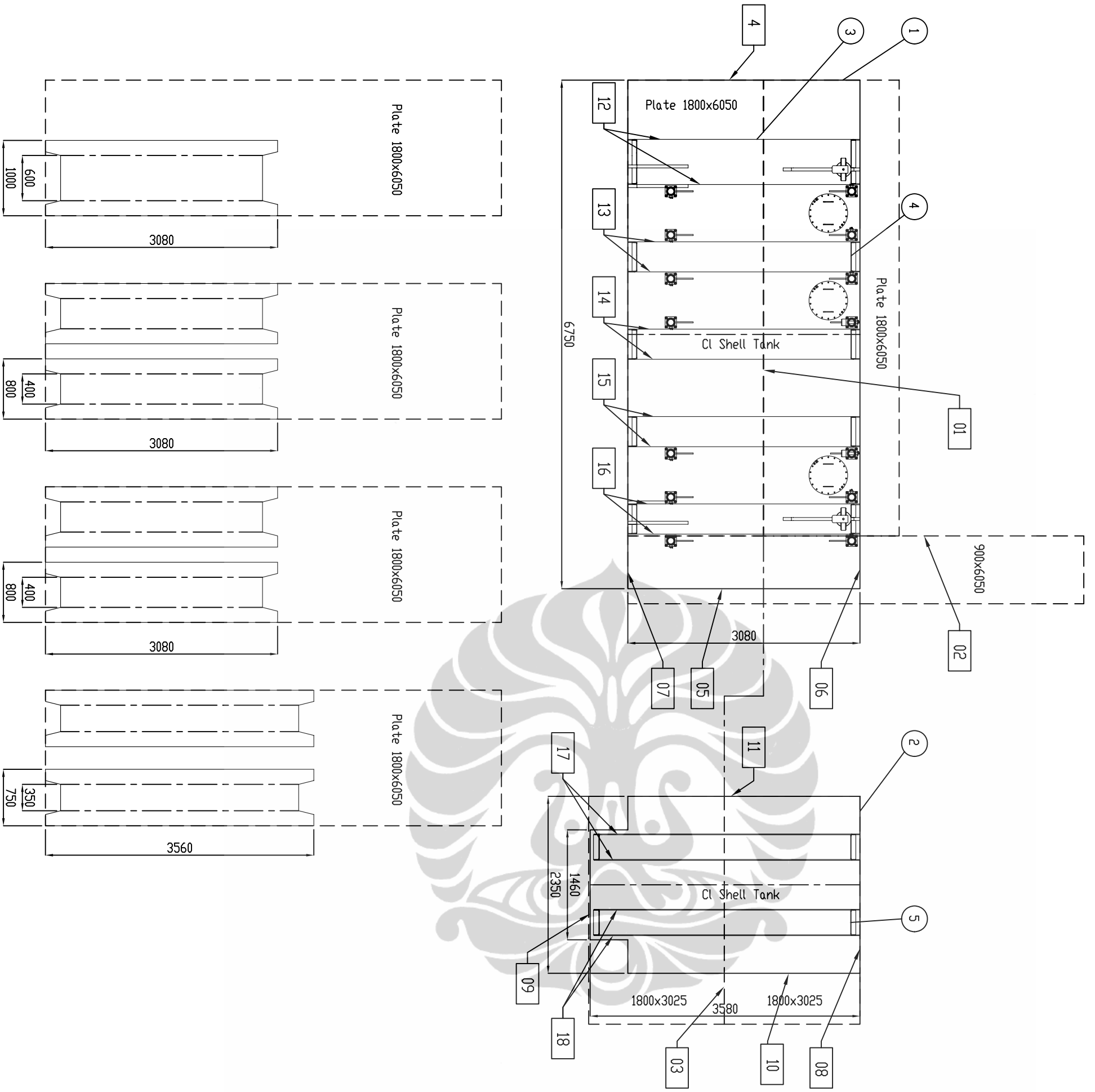


Item No.	Part Name	Quantity	Weight (kg)	Weight Residual (kg)
01	Reinforcement 01	114	2075	1141
02	Side Wall Plate	37	2594	1450
03	Reinforcement 03	994	141	
04	Reinforcement 04	590	5187	1916
05	Reinforcement 05	1114		
06	Reinforcement 06	1607		
07	Reinforcement 07	1114		
08	Reinforcement 08	1607		
09	Side Wall Plate	37	2594	1450
10	Front Wall Plate	3285	6882	3596
11	Reinforcement 11	114		
12	Reinforcement 12	1607		
13	Reinforcement 13	1114		
14	Reinforcement 14	590		
15	Reinforcement 15	1114		
16	Reinforcement 16	1607		
17	Reinforcement 17	1114		
18	Reinforcement 18	1607		
Total Length Reinforcement		32558		15348
Total Length Plate		19728		3880
Total Length				

Item No.	Part Name	Quantity	Weight (kg)	Weight Residual (kg)
01	Reinforcement 01	114	2075	1141
02	Side Wall Plate	37	2594	1450
03	Reinforcement 03	994	141	
04	Reinforcement 04	590	5187	1916
05	Reinforcement 05	1114		
06	Reinforcement 06	1607		
07	Reinforcement 07	1114		
08	Reinforcement 08	1607		
09	Side Wall Plate	37	2594	1450
10	Front Wall Plate	3285	6882	3596
11	Reinforcement 11	114		
12	Reinforcement 12	1607		
13	Reinforcement 13	1114		
14	Reinforcement 14	590		
15	Reinforcement 15	1114		
16	Reinforcement 16	1607		
17	Reinforcement 17	1114		
18	Reinforcement 18	1607		
Total Length Reinforcement		32558		15348
Total Length Plate		19728		3880
Total Length				

Item No.	Part Name	Quantity	Weight (kg)	Weight Residual (kg)
01	Reinforcement 01	114	2075	1141
02	Side Wall Plate	37	2594	1450
03	Reinforcement 03	994	141	
04	Reinforcement 04	590	5187	1916
05	Reinforcement 05	1114		
06	Reinforcement 06	1607		
07	Reinforcement 07	1114		
08	Reinforcement 08	1607		
09	Side Wall Plate	37	2594	1450
10	Front Wall Plate	3285	6882	3596
11	Reinforcement 11	114		
12	Reinforcement 12	1607		
13	Reinforcement 13	1114		
14	Reinforcement 14	590		
15	Reinforcement 15	1114		
16	Reinforcement 16	1607		
17	Reinforcement 17	1114		
18	Reinforcement 18	1607		
Total Length Reinforcement		32558		15348
Total Length Plate		19728		3880
Total Length				

Item No.	Part Name	Quantity	Weight (kg)	Weight Residual (kg)
01	Reinforcement 01	114	2075	1141
02	Side Wall Plate	37	2594	1450
03	Reinforcement 03	994	141	
04	Reinforcement 04	590	5187	1916
05	Reinforcement 05	1114		
06	Reinforcement 06	1607		
07	Reinforcement 07	1114		
08	Reinforcement 08	1607		
09	Side Wall Plate	37	2594	1450
10	Front Wall Plate	3285	6882	3596
11	Reinforcement 11	114		
12	Reinforcement 12	1607		
13	Reinforcement 13	1114		
14	Reinforcement 14	590		
15	Reinforcement 15	1114		
16	Reinforcement 16	1607		
17	Reinforcement 17	1114		
18	Reinforcement 18	1607		
Total Length Reinforcement		32558		15348
Total Length Plate		19728		3880
Total Length				

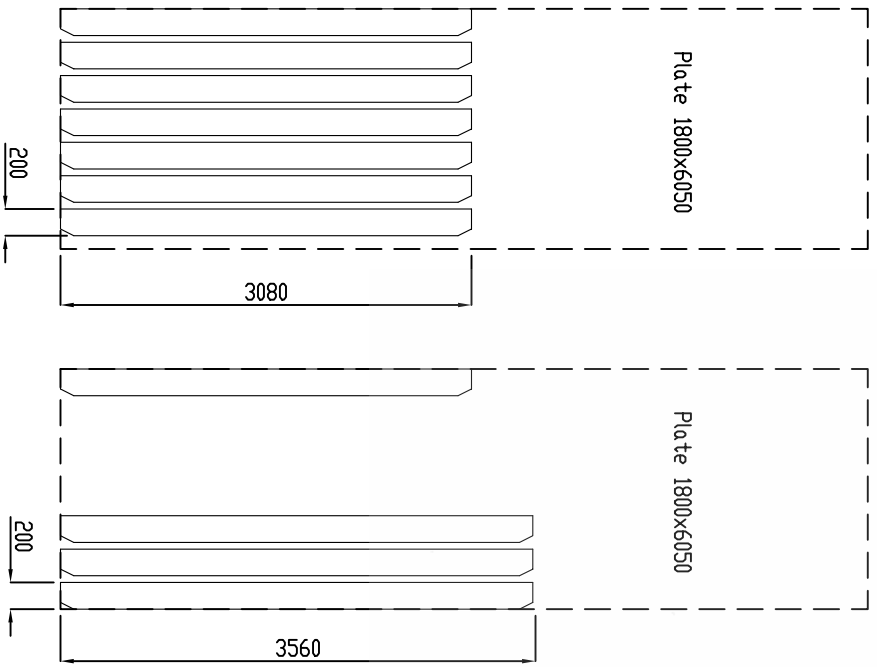
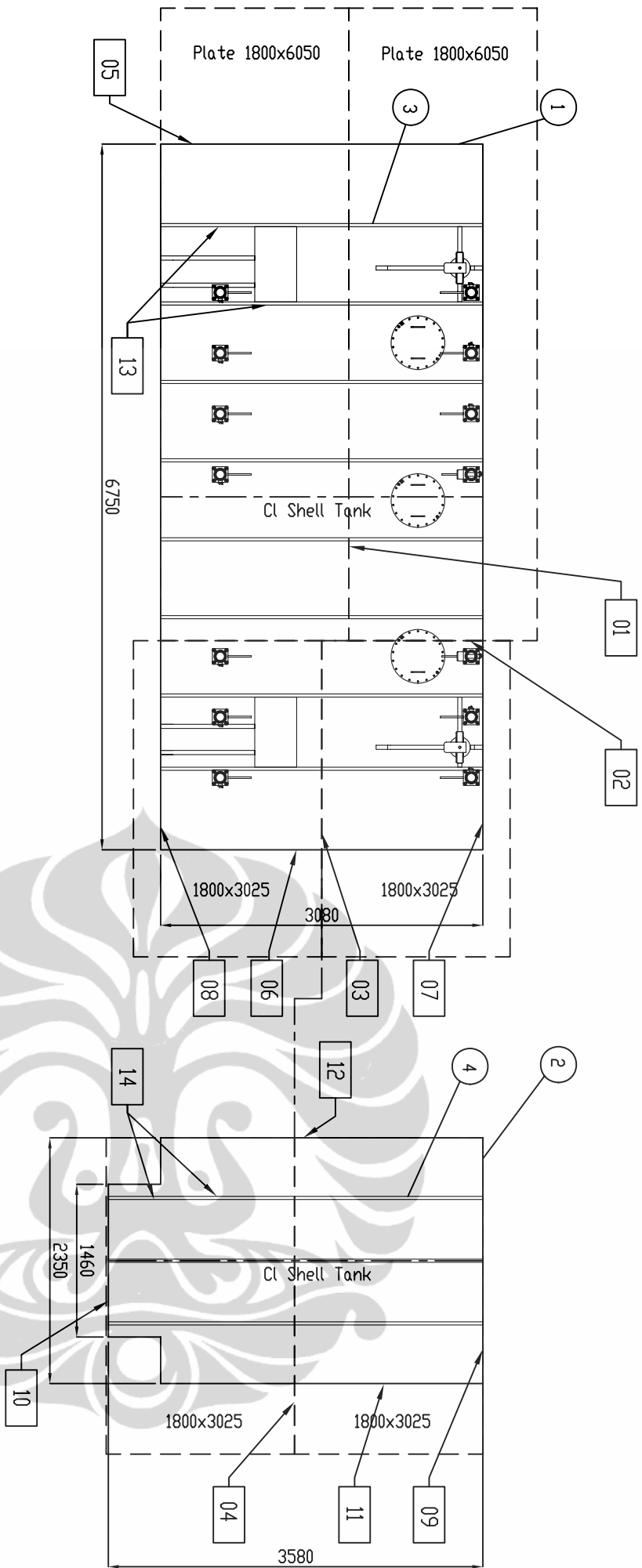


Weld No	NDT	Length	Total Length	Weld No	NDT	Length	Total Length
01	○	6160	6160	06	○	6750	6750
02	○	6160	6160	07	○	6750	6750
03	○	3080	3080	08	○	3080	3080
04	○	3080	3080	09	○	3080	3080
05	○	3080	3080	10	○	3080	3080
06	○	3080	3080	11	○	3080	3080
07	○	3080	3080	12	○	3080	3080
08	○	3080	3080	13	○	3080	3080
09	○	3080	3080	14	○	3080	3080
10	○	3080	3080	15	○	3080	3080
11	○	3080	3080	16	○	3080	3080
12	○	3080	3080	17	○	3080	3080
13	○	3080	3080	18	○	3080	3080
14	○	3080	3080				
15	○	3080	3080				
16	○	3080	3080				
17	○	3080	3080				
18	○	3080	3080				
Total Length Radiogp		13260		Total Length Penetrant		32130	
Total Length			88820	Total Length			88820

Part Name	Qty	Weight	Weight Residual
Reinforcement 03	3560/750x10	844	1729
Reinforcement 02	3080/800x10	1947	3458
Reinforcement 01	3080/1000x10	389	1729
Side Wall Plate	3080x2750x10	1144	596
Front Wall Plate	6750x3080x10	3285	1817

Weight Row	Mat'l	Weight Residual	Mat'l
Weight Row	Mat'l = 12947	Weight Residual	Mat'l = 5339

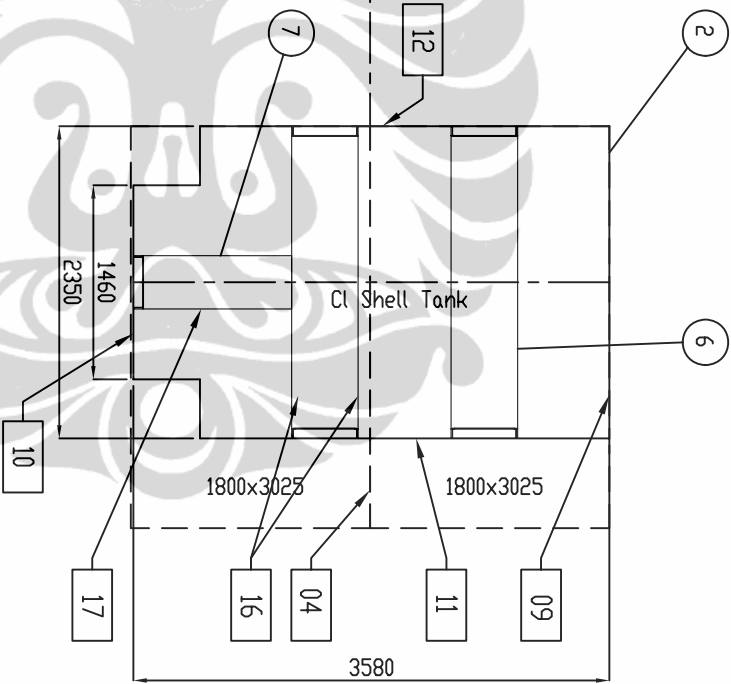
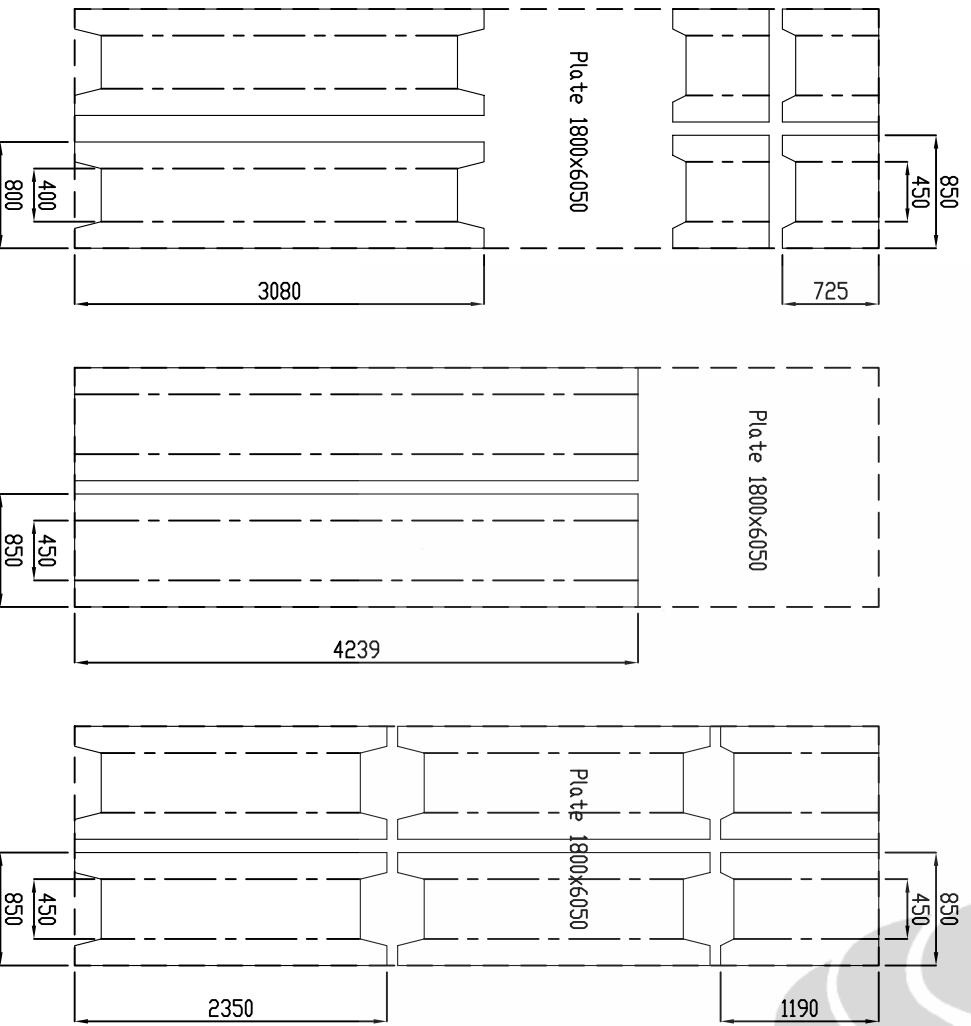
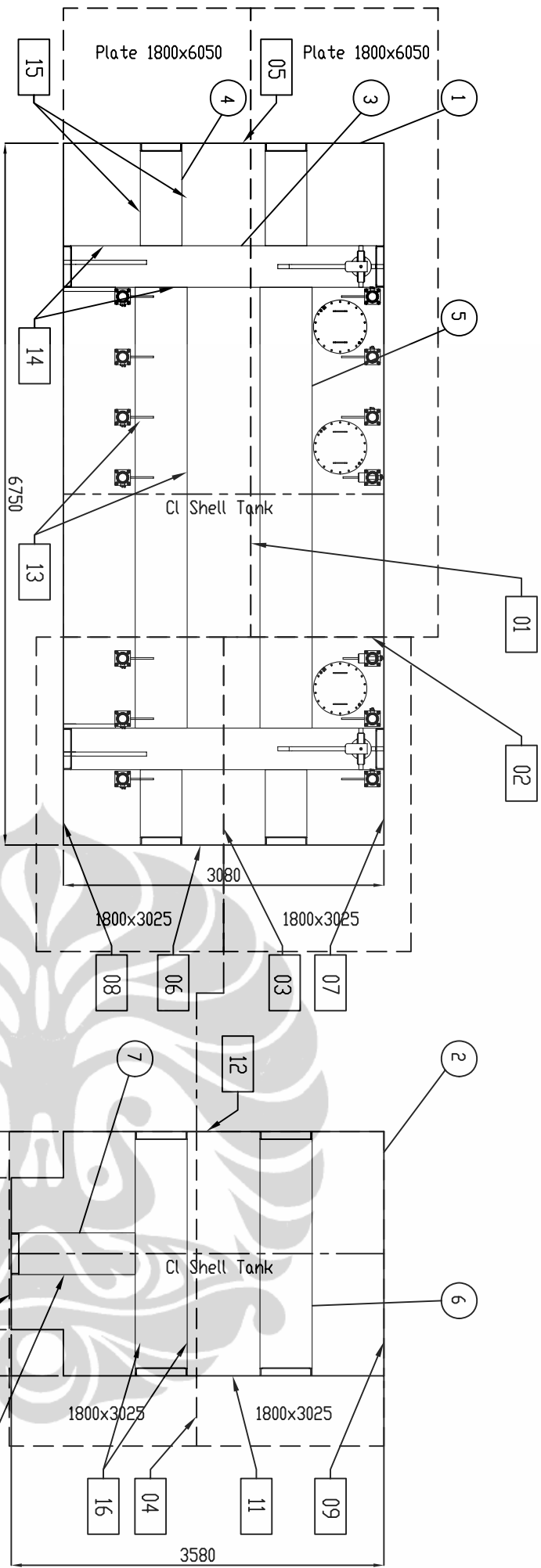
Rev	Modification	Date	Approved	Checked	Scale
1	Shell Tank			3011000050	1 x 1/20
2	Horizontal Joining Row Material			340/E0539/05	1 x 1/20



Callout	Material	Length	Weight	Notes
01	1800x6050	6750	21480	
02	1800x6050	6750	21480	
03	1800x3025	3080	49950	
04	1800x3025	3080	49950	
05	1800x3025	3080	49950	
06	1800x3025	3080	49950	
07	1800x3025	3080	49950	
08	1800x3025	3080	49950	
09	1800x3025	3080	49950	
10	1800x3025	3080	49950	
11	1800x3025	3080	49950	
12	1800x3025	3080	49950	
13	1800x3025	3080	49950	
14	1800x3025	3080	49950	
Total Length Radiogr		12180		
Total Length Penetrant		30800		
Total Length		11440		

Weight Row Mat'l = 16406
Weight Residual Mat'l = 8963

Rev	Modification	Date	Approved	Checked	Drawn	Scale
1	Shell Tank					1 x 150
2	Horizontal Joining Row Material					1/20



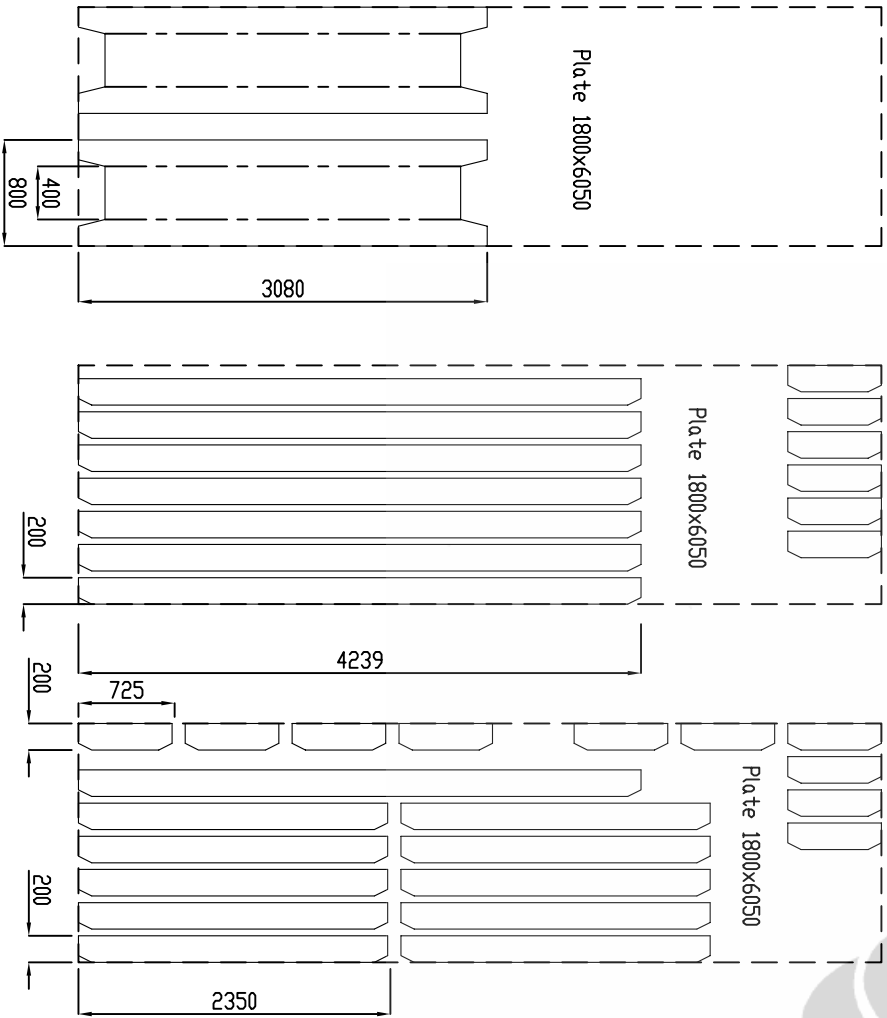
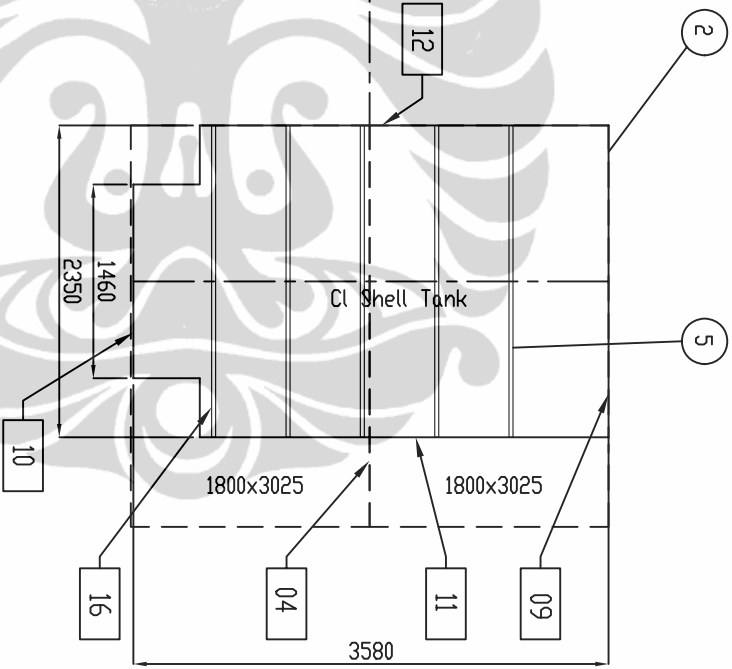
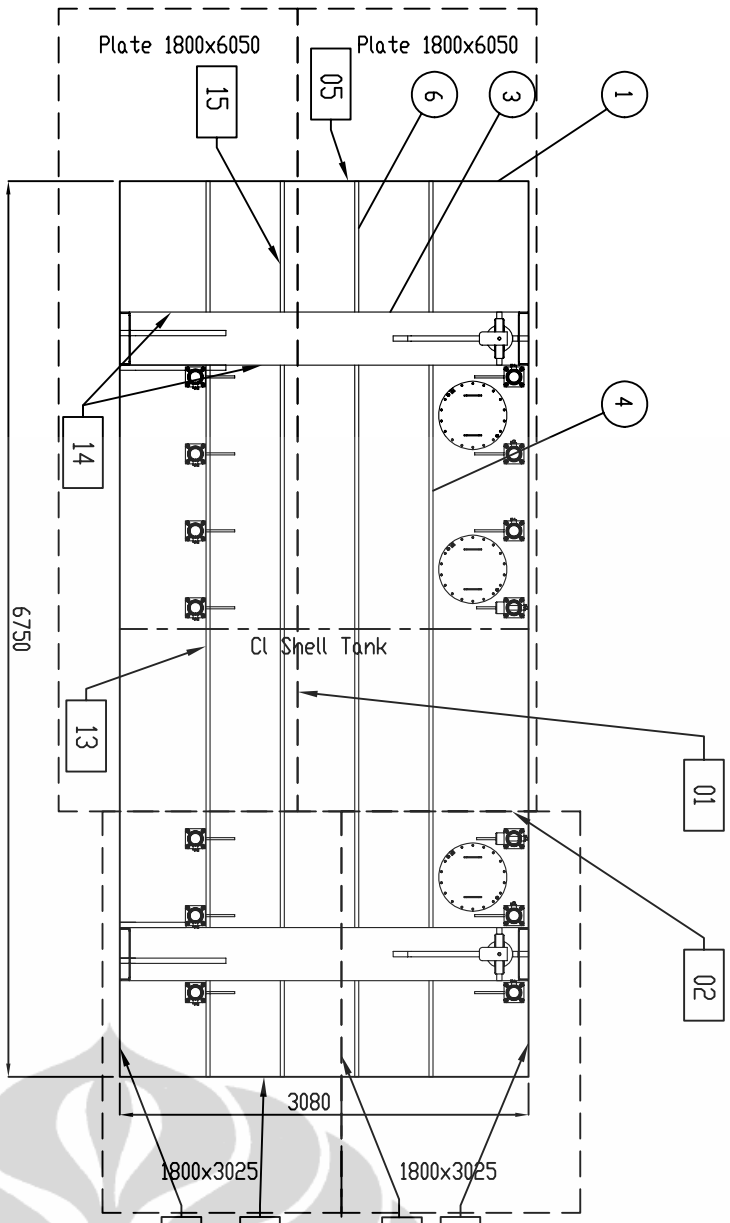
Part No	Part Name	Qty	Unit	Weight	Weight Residual
01	Reinforcement 05	192		11218	
02	Reinforcement 04	727			
03	Reinforcement 03	1366			
04	Reinforcement 02	467			
05	Reinforcement 01	934			
06	Side Wall Plate	1144			
07	Front Wall Plate	3265			
08	Plate 1800x6050	1			
09	Plate 1800x6050	1			
10	Plate 1800x6050	1			
11	Plate 1800x6050	1			
12	Plate 1800x6050	1			
13	Plate 1800x6050	1			
14	Plate 1800x6050	1			
15	Plate 1800x6050	1			
16	Plate 1800x6050	1			
17	Plate 1800x6050	1			
Total Length				11218	3072

Visual Test
 Radiographic Test 20%
 Penetrant Test

Part No	Part Name	Qty	Unit	Weight	Weight Residual
01	Reinforcement 05	192		11218	
02	Reinforcement 04	727			
03	Reinforcement 03	1366			
04	Reinforcement 02	467			
05	Reinforcement 01	934			
06	Side Wall Plate	1144			
07	Front Wall Plate	3265			
08	Plate 1800x6050	1			
09	Plate 1800x6050	1			
10	Plate 1800x6050	1			
11	Plate 1800x6050	1			
12	Plate 1800x6050	1			
13	Plate 1800x6050	1			
14	Plate 1800x6050	1			
15	Plate 1800x6050	1			
16	Plate 1800x6050	1			
17	Plate 1800x6050	1			
Total Length				11218	3072

Weight Row Mat'l = 11218 Weight Residual Mat'l = 3072

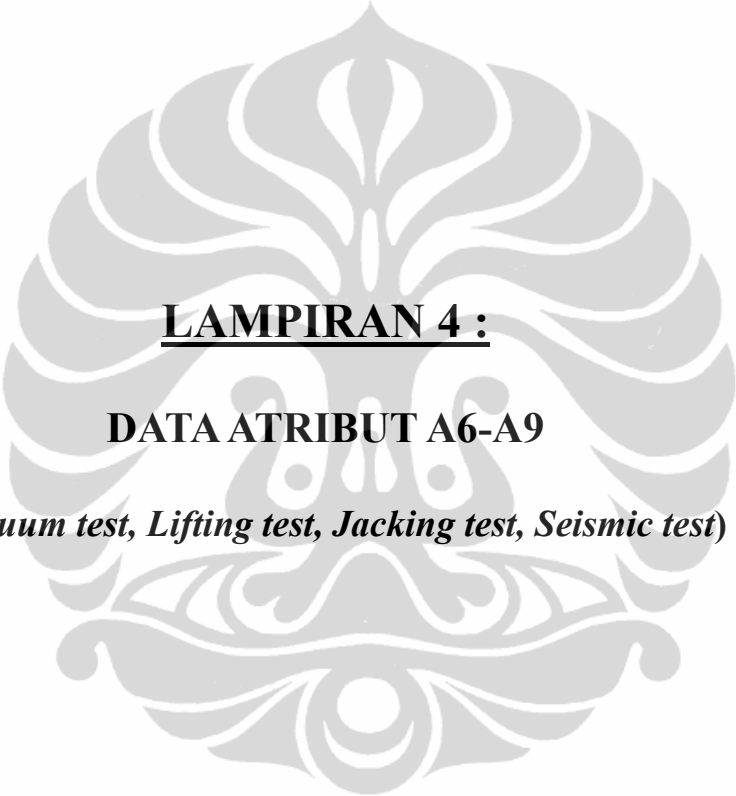
Rev	Modification	Date	Approved	Checked	Scale
1	Shell Tank				1 x 150
2	Horizontal Joining Row Material				1 x 150



Part No	Part Name	Qty	Weight	Material	Standard	Unit	Weight	Residual Weight
01	Shell Tank	1	12280	1800x6050	Mat 1 standard 6x20 Ft	2 / 30	5187	1966
02	Shell Tank	1	28275	1800x6050	Mat 1 standard 6x20 Ft	2 / 30	2075	1141
03	Shell Tank	1	3080	1800x6050	Mat 1 standard 6x20 Ft	2 / 12	1729	586
04	Shell Tank	1	3590	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
05	Shell Tank	1	17863	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
06	Shell Tank	1	13690	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
07	Shell Tank	1	17863	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
08	Shell Tank	1	13690	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
09	Shell Tank	1	17863	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
10	Shell Tank	1	13690	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
11	Shell Tank	1	17863	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
12	Shell Tank	1	13690	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
13	Shell Tank	1	17863	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
14	Shell Tank	1	13690	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
15	Shell Tank	1	17863	1800x6050	Mat 1 standard 6x20 Ft	2 / 10	4382	1017
Total Length Radiography		12280						
Total Length Penetration		32760						
Total Length		45040						

Weight Row Mat'l	Weight Residual Mat'l
13293	4659

Rev	Modification	Date	Approved	Checked	Drawn	Issue	#3
1	Shell Tank						
Drawing title		Horizontal Joining Row Material		340/E0539/D8			



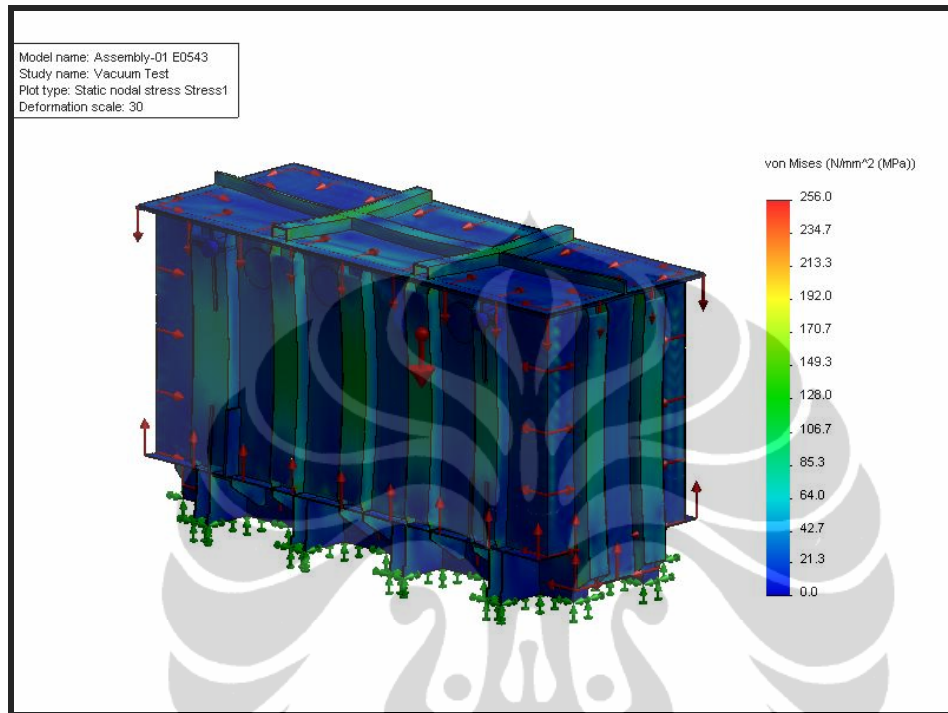
LAMPIRAN 4 :
DATA ATRIBUT A6-A9
(Vacuum test, Lifting test, Jacking test, Seismic test)

Rancangan Konstruksi 1 (Saat ini/ kondisi sekarang)

(Vertical joining wall dengan vertical 'U' bend reinforcement)

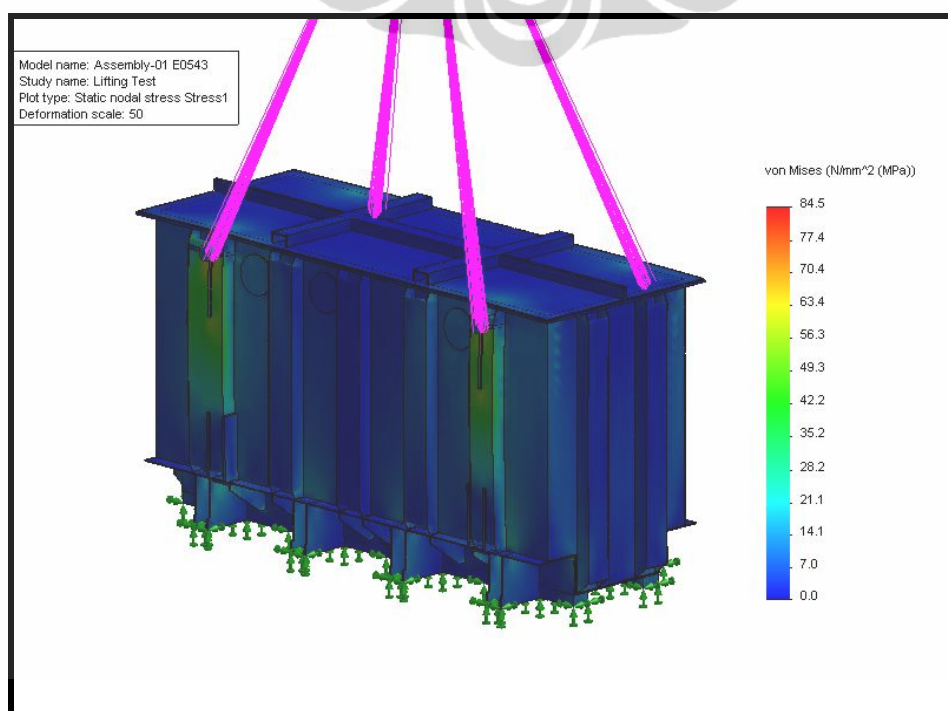
Objektif – 1 (*Vacuum test*)

- *Vacuum test* 0.11 MPa



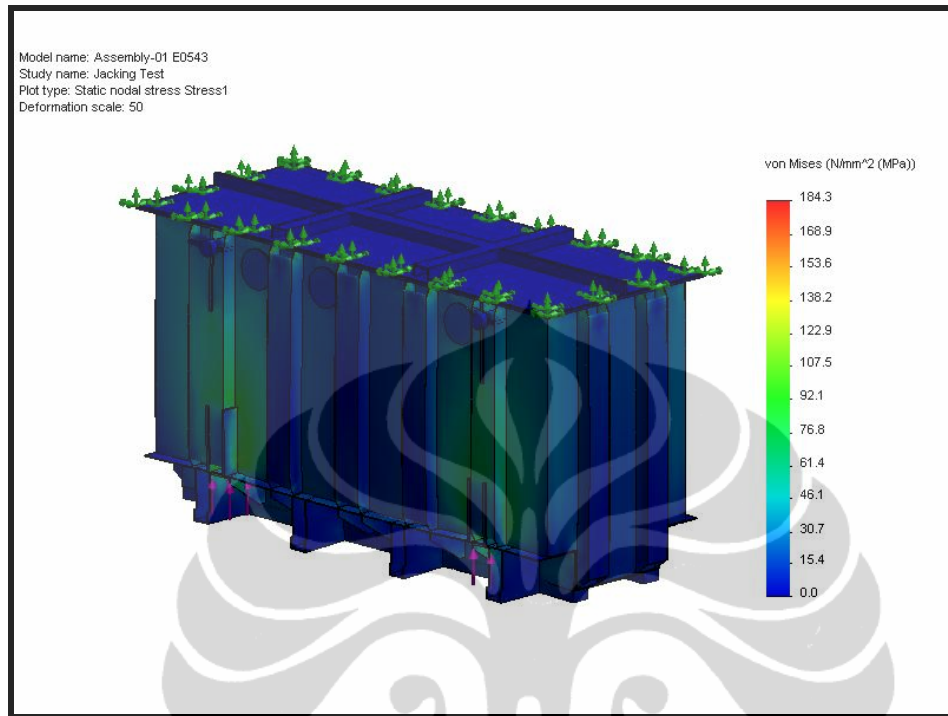
Objektif – 1 (*Lifting test*)

- *Lifting test* 1913 kN
- Estimasi berat trafo 195 Ton



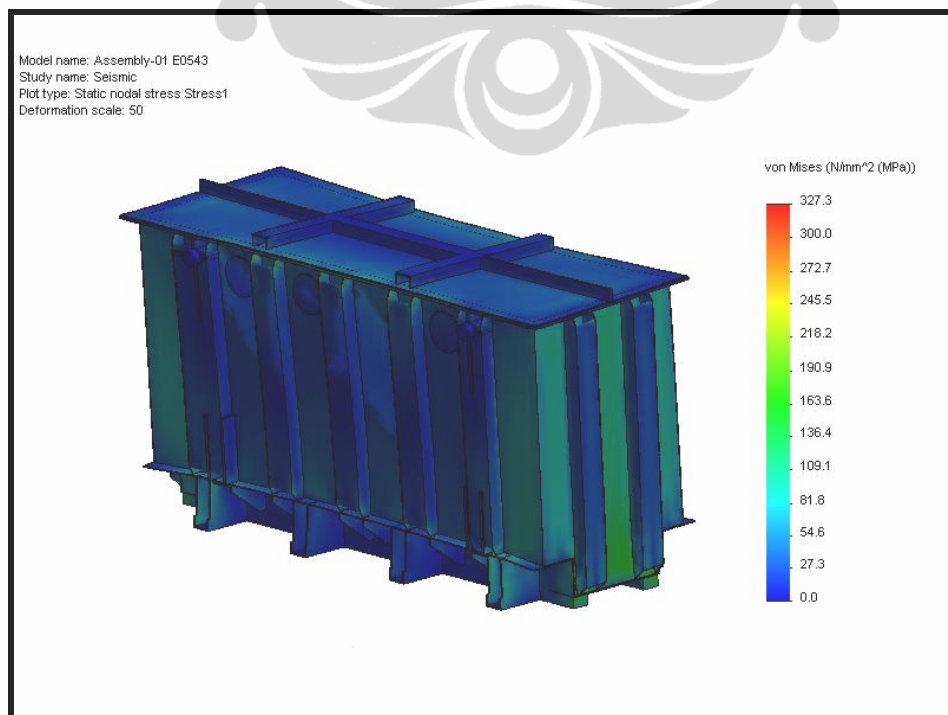
Objektif – 1 (*Jacking test*)

- *Jacking test* 1913 kN
- Estimasi berat trafo 195 Ton



Objektif – 1 (*Seismic test*)

- *Seismic test* pada sumbu 'Z' 6695.5 kN dan sumbu 'Y' 3443.5 kN
- Estimasi berat trafo 195 Ton

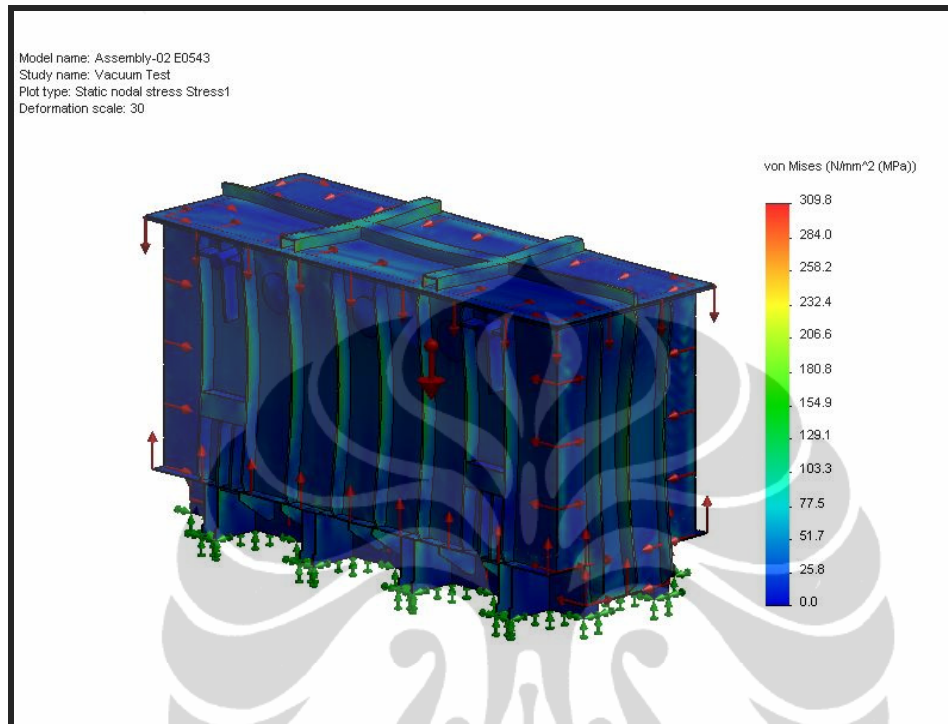


Rancangan Konstruksi 2

(Vertical joining wall dengan vertica 'I' plate reinforcement)

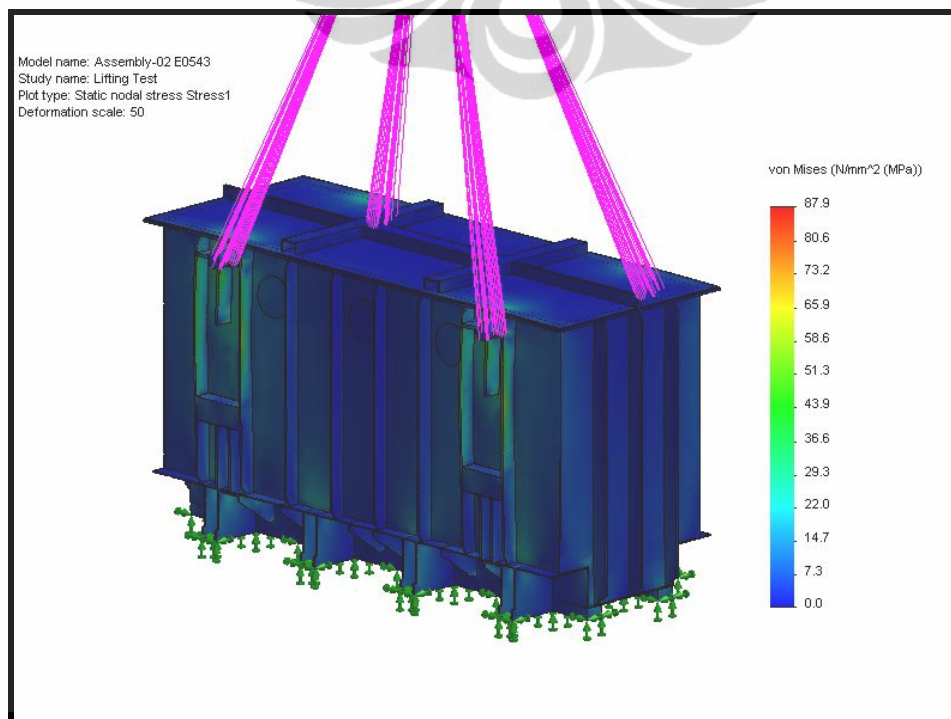
Objektif – 2 (Vacuum test)

- Vacuum test 0.11 MPa



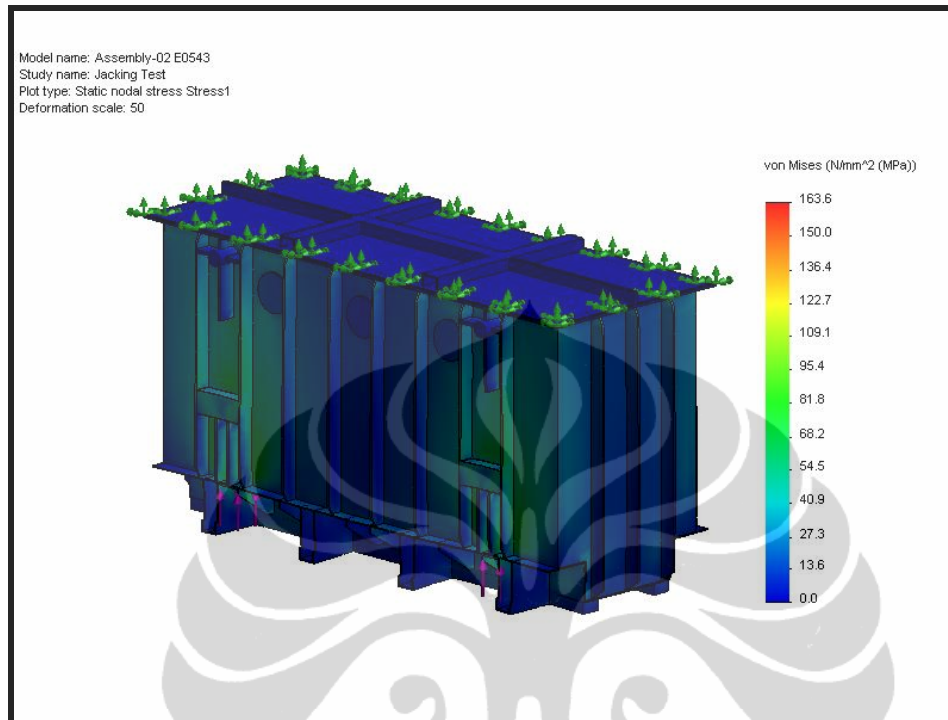
Objektif – 2 (Lifting test)

- Lifting test 1913 kN
- Estimasi berat trafo 195 Ton



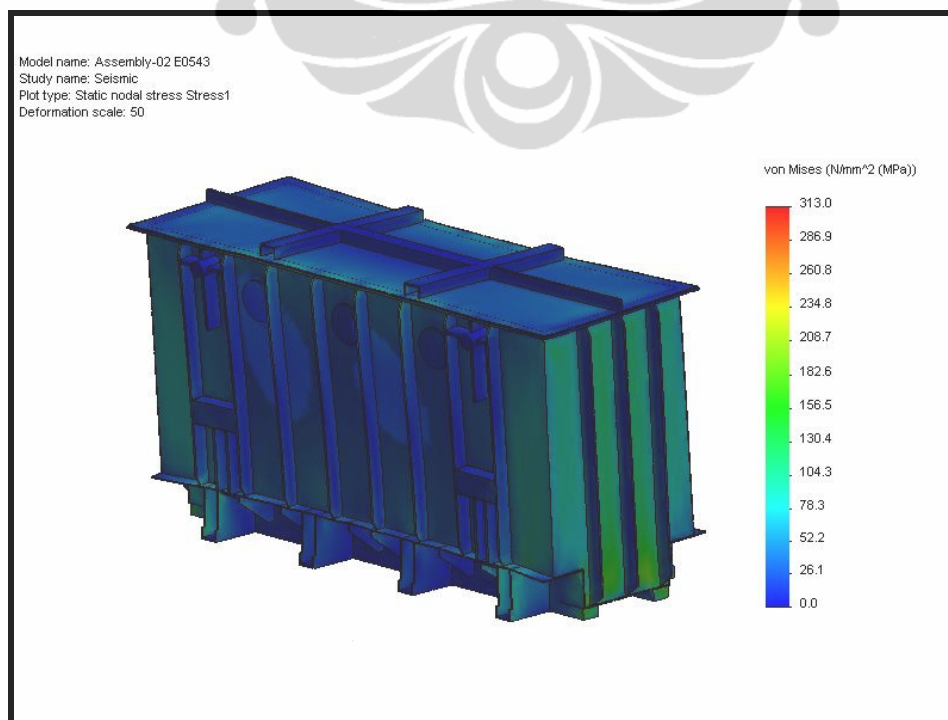
Objektif – 2 (*Jacking test*)

- *Jacking test* 1913 kN
- Estimasi berat trafo 195 Ton



Objektif – 2 (*Seismic test*)

- *Seismic test* pada sumbu 'Z' 6695.5 kN dan sumbu 'Y' 3443.5 kN
- Estimasi berat trafo 195 Ton

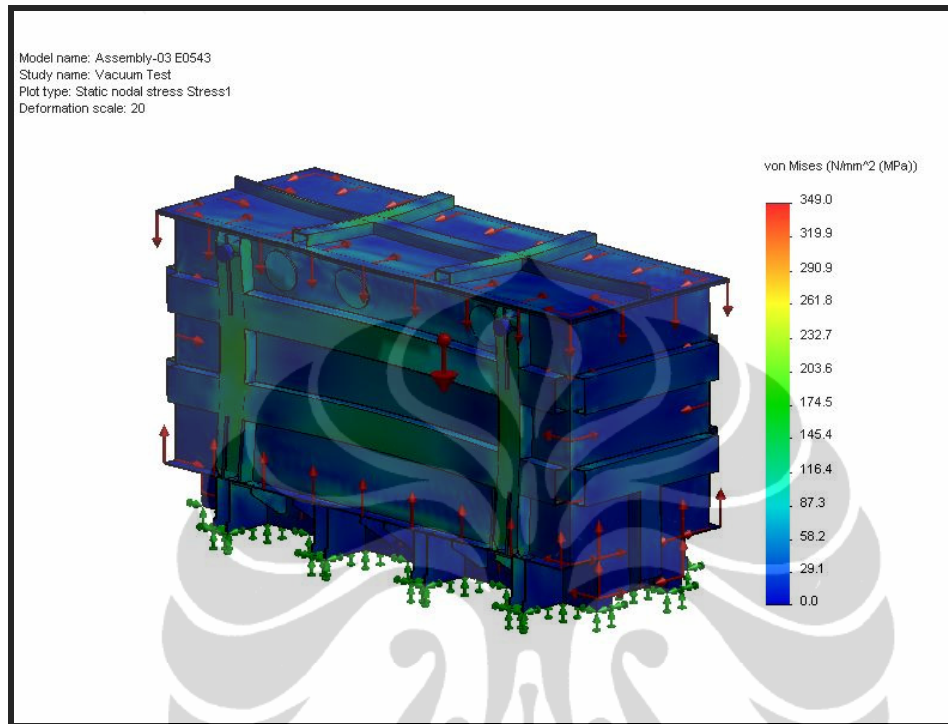


Rancangan Konstruksi 3

(Vertical joining wall dengan horizontal 'U' bend reinforcement)

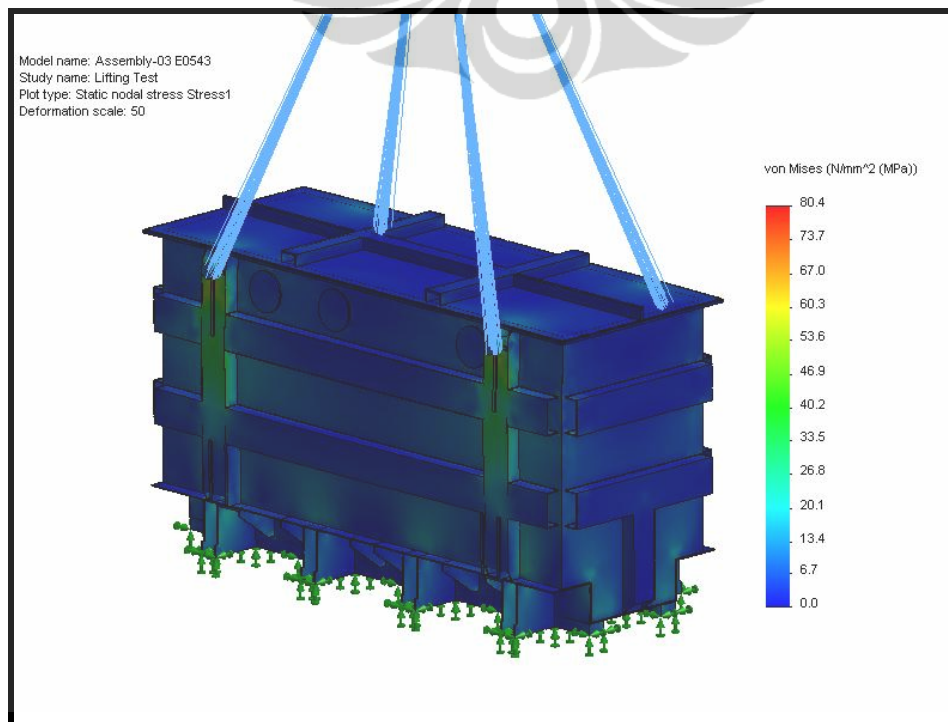
Objektif – 3 (Vacuum test)

- Vacuum test 0.11 MPa



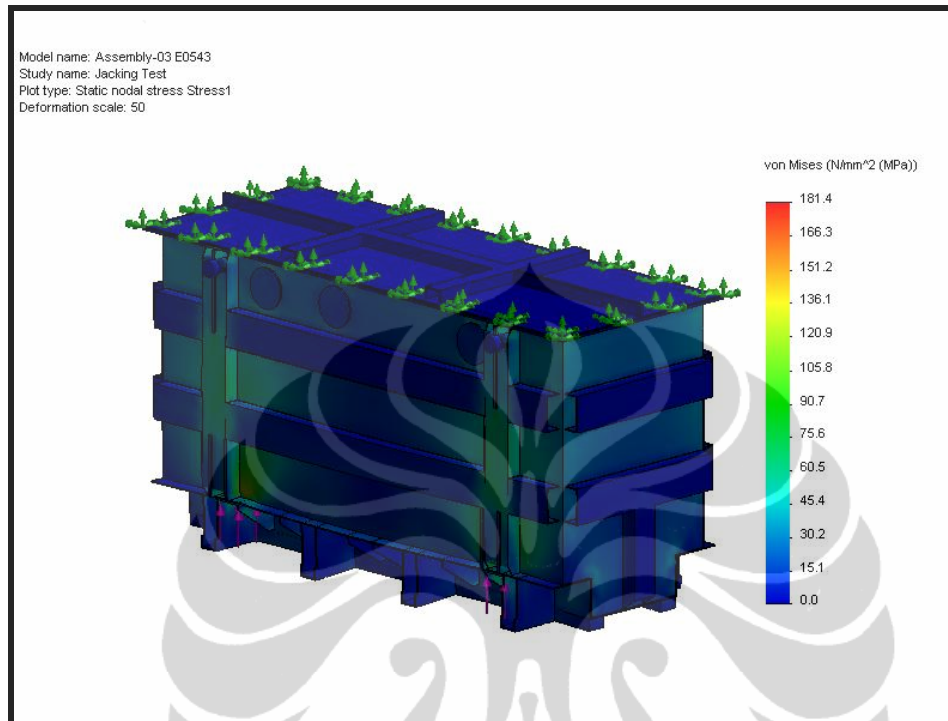
Objektif – 3 (Lifting test)

- Lifting test 1913 kN
- Estimasi berat trafo 195 Ton



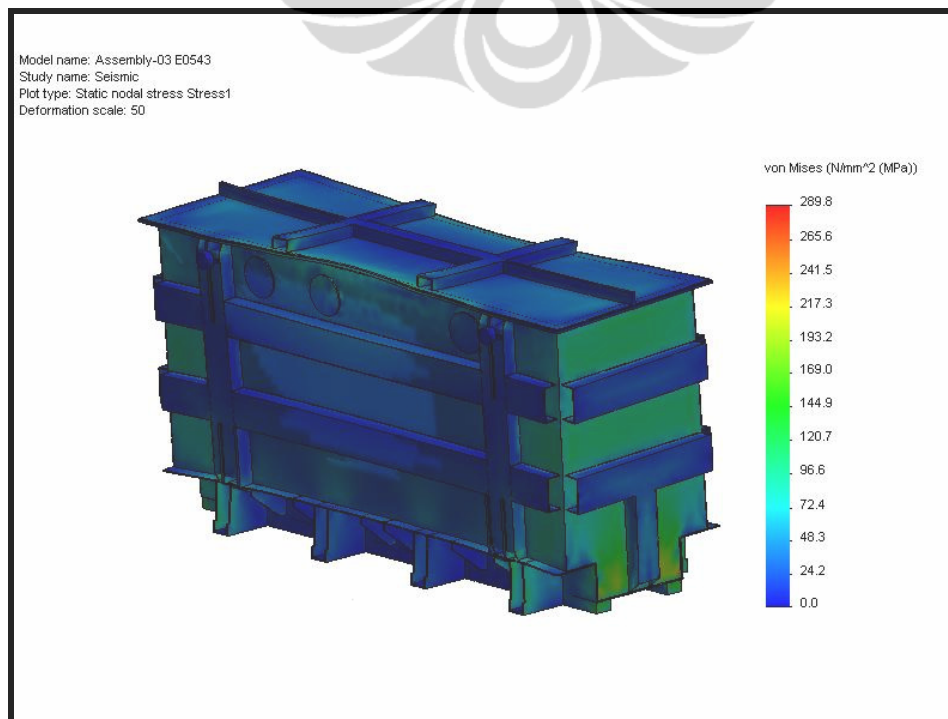
Objektif – 3 (*Jacking test*)

- *Jacking test* 1913 kN
- Estimasi berat trafo 195 Ton



Objektif – 3 (*Seismic test*)

- *Seismic test* pada sumbu 'Z' 6695.5 kN dan sumbu 'Y' 3443.5 kN
- Estimasi berat trafo 195 Ton

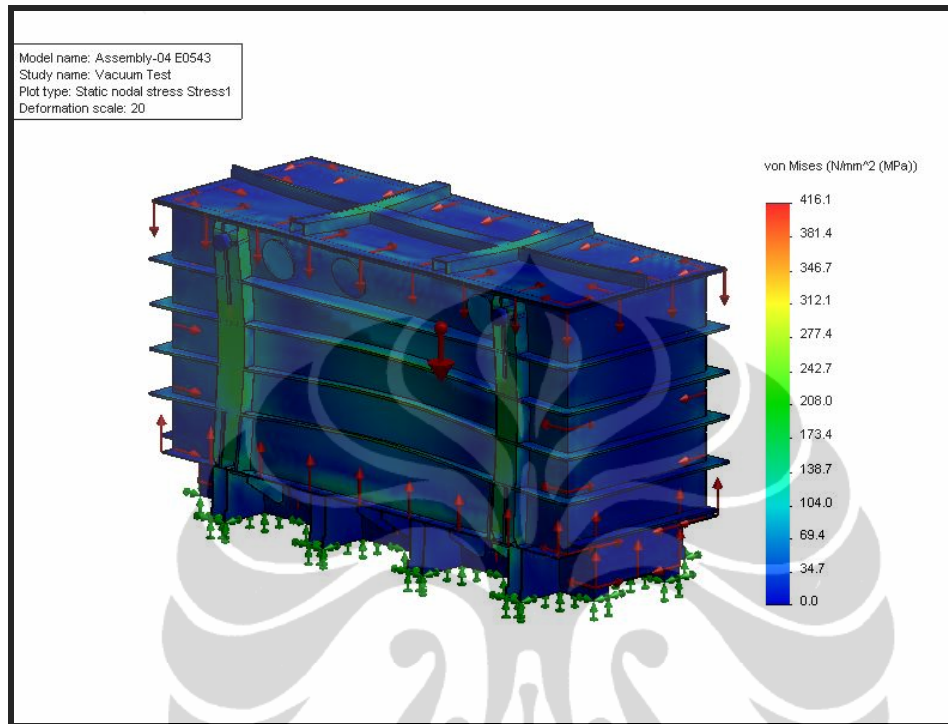


Rancangan Konstruksi 4

(Vertical joining wall dengan horizontal 'I' bend reinforcement)

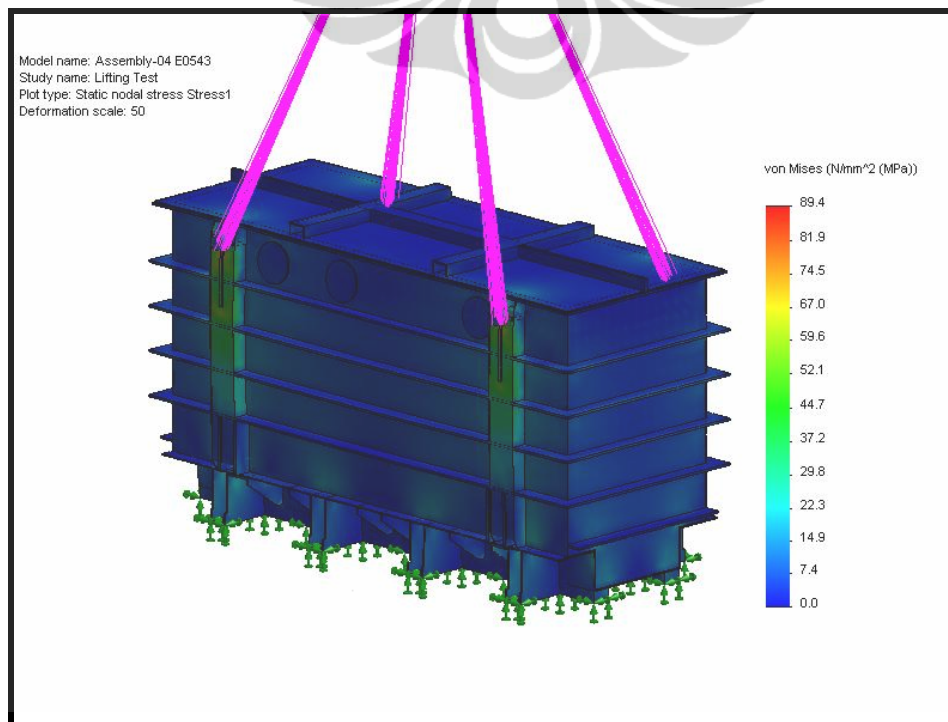
Objektif – 4 (Vacuum test)

- Vacuum test 0.11 MPa



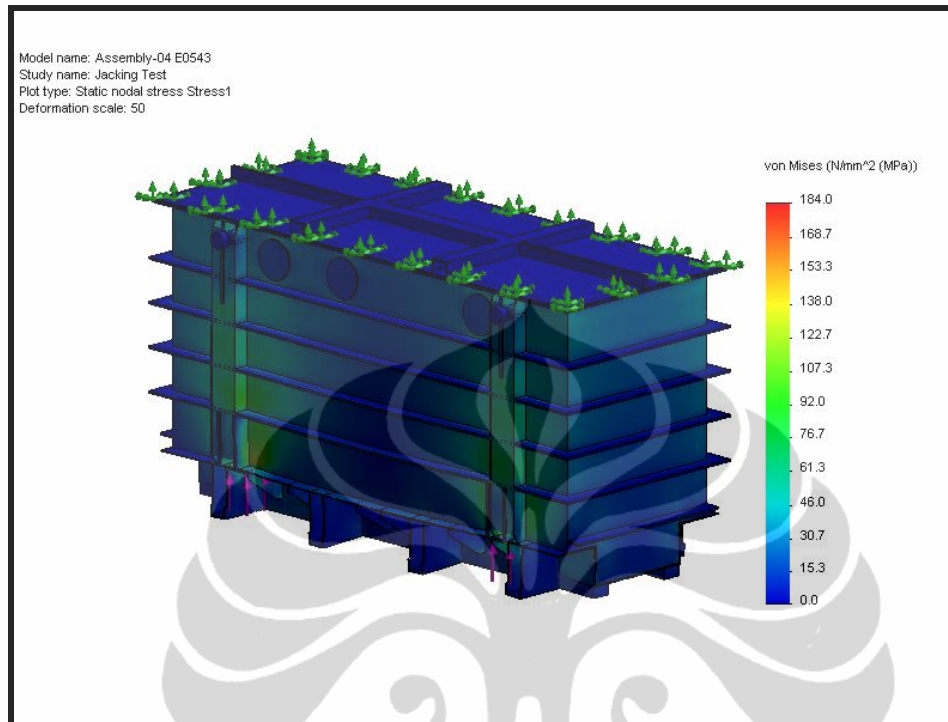
Objektif – 4 (Lifting test)

- Lifting test 1913 kN
- Estimasi berat trafo 195 Ton



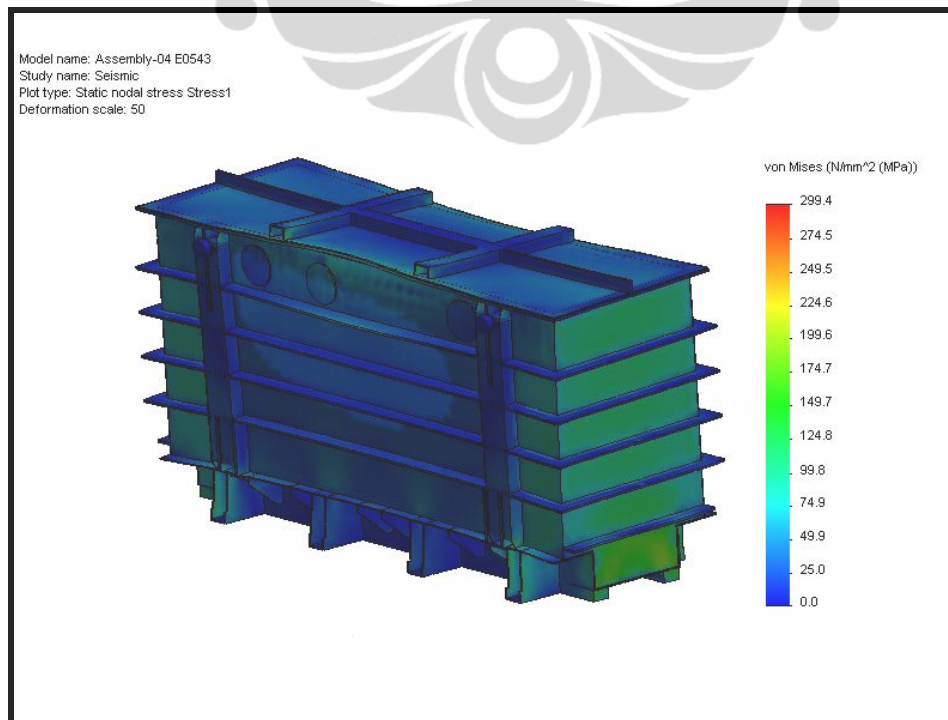
Objektif – 4 (*Jacking test*)

- *Jacking test* 1913 kN
- Estimasi berat trafo 195 Ton



Objektif – 4 (*Seismic test*)

- *Seismic test* pada sumbu 'Z' 6695.5 kN dan sumbu 'Y' 3443.5 kN
- Estimasi berat trafo 195 Ton

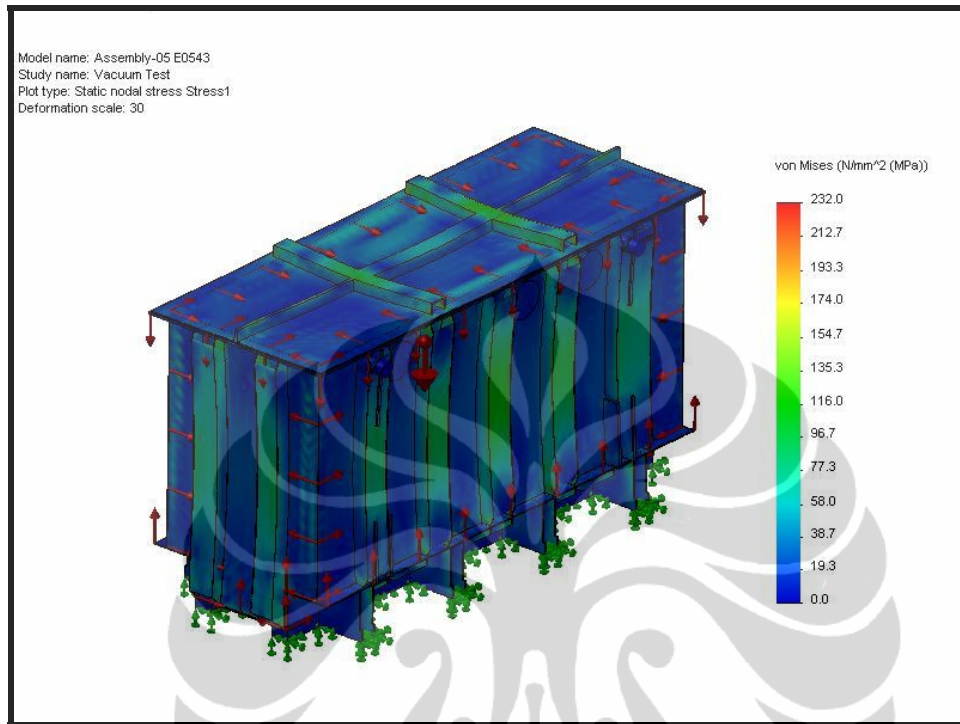


Rancangan Konstruksi 5

(Horizontal joining wall dengan vertical 'U' bend reinforcement)

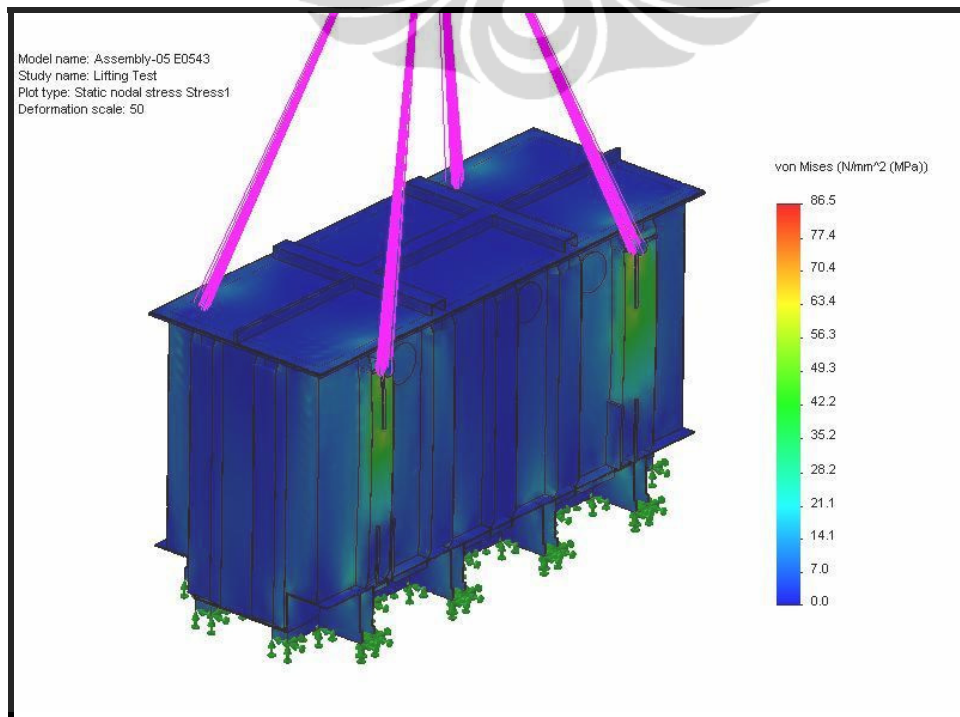
Objektif – 5 (Vacuum test)

- Vacuum test 0.11 MPa



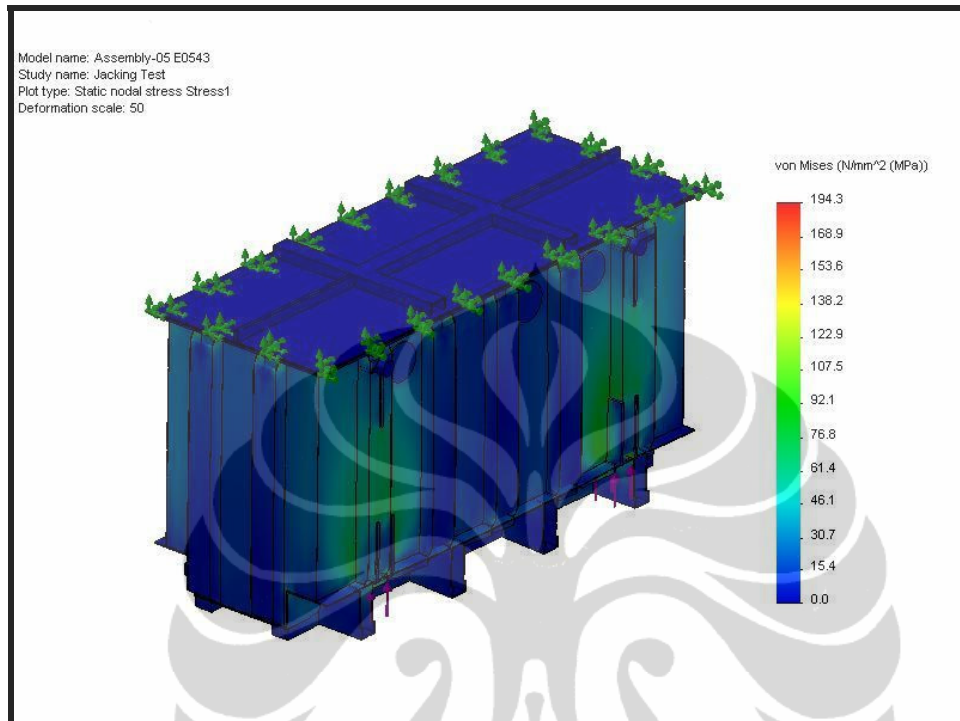
Objektif – 5 (Lifting test)

- Lifting test 1913 kN
- Estimasi berat trafo 195 Ton



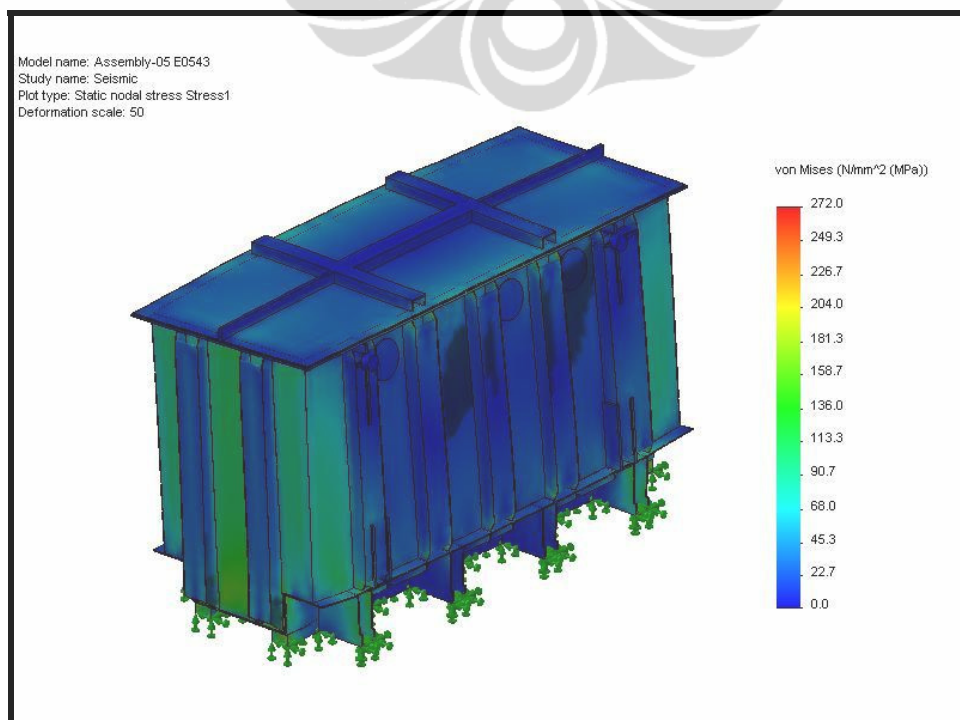
Objektif – 5 (*Jacking test*)

- *Jacking test* 1913 kN
- Estimasi berat trafo 195 Ton



Objektif – 5 (*Seismic test*)

- *Seismic test* pada sumbu 'Z' 6695.5 kN dan sumbu 'Y' 3443.5 kN
- Estimasi berat trafo 195 Ton

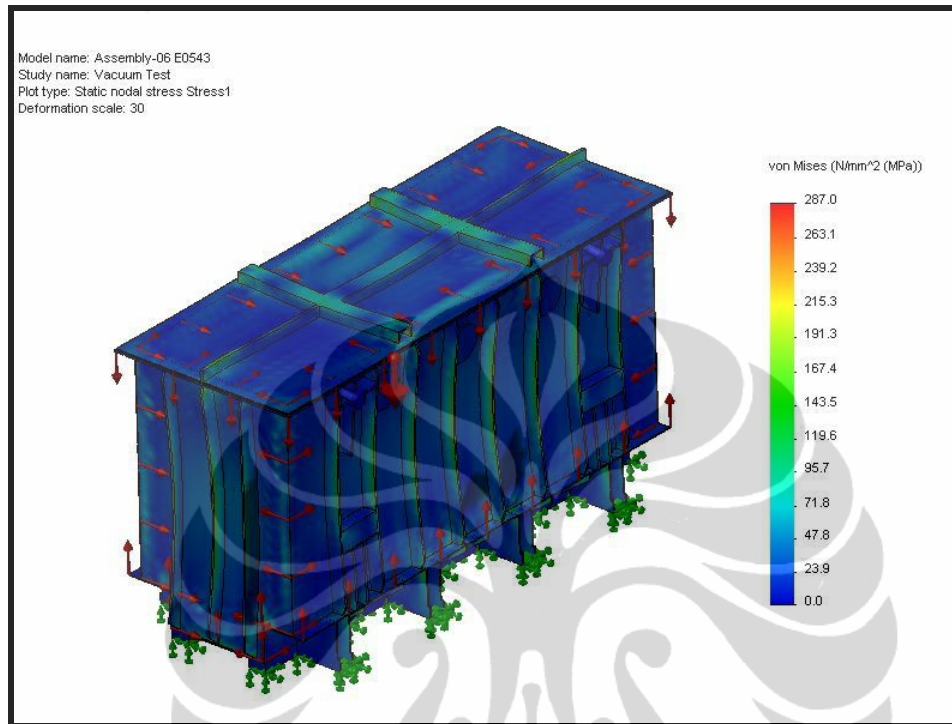


Rancangan Konstruksi 6

(Horizontal joining wall dengan vertica 'T' plate reinforcement)

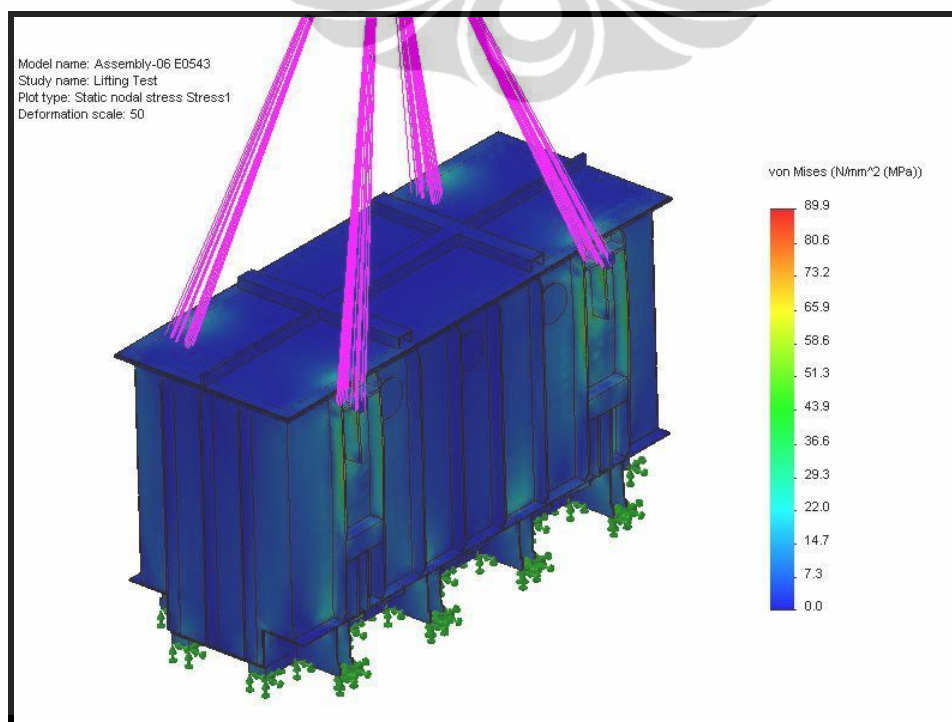
Objektif – 6 (Vacuum test)

- Vacuum test 0.11 MPa



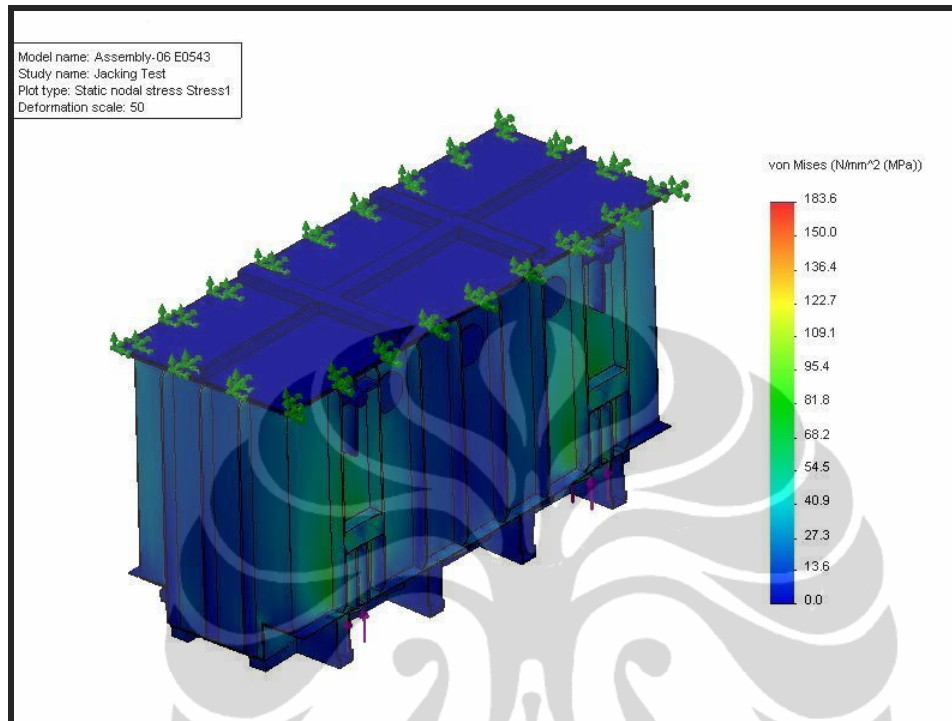
Objektif – 6 (Lifting test)

- Lifting test 1913 kN
- Estimasi berat trafo 195 Ton



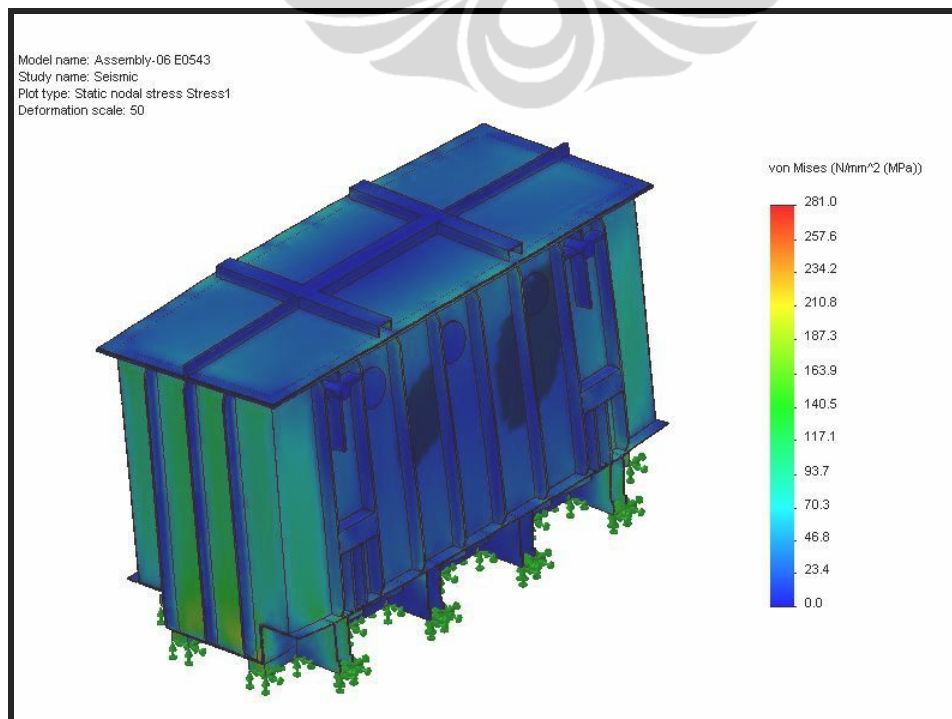
Objektif – 6(*Jacking test*)

- *Jacking test* 1913 kN
- Estimasi berat trafo 195 Ton



Objektif – 6 (*Seismic test*)

- *Seismic test* pada sumbu 'Z' 6695.5 kN dan sumbu 'Y' 3443.5 kN
- Estimasi berat trafo 195 Ton

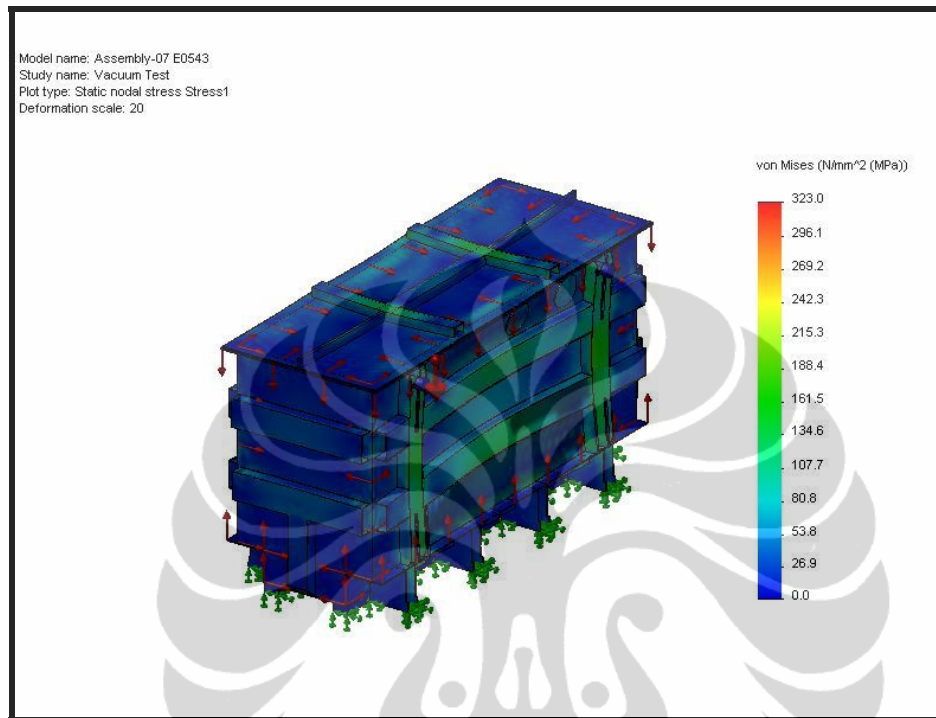


Rancangan Konstruksi 7

(Horizontal joining wall dengan horizontal 'U' bend reinforcement)

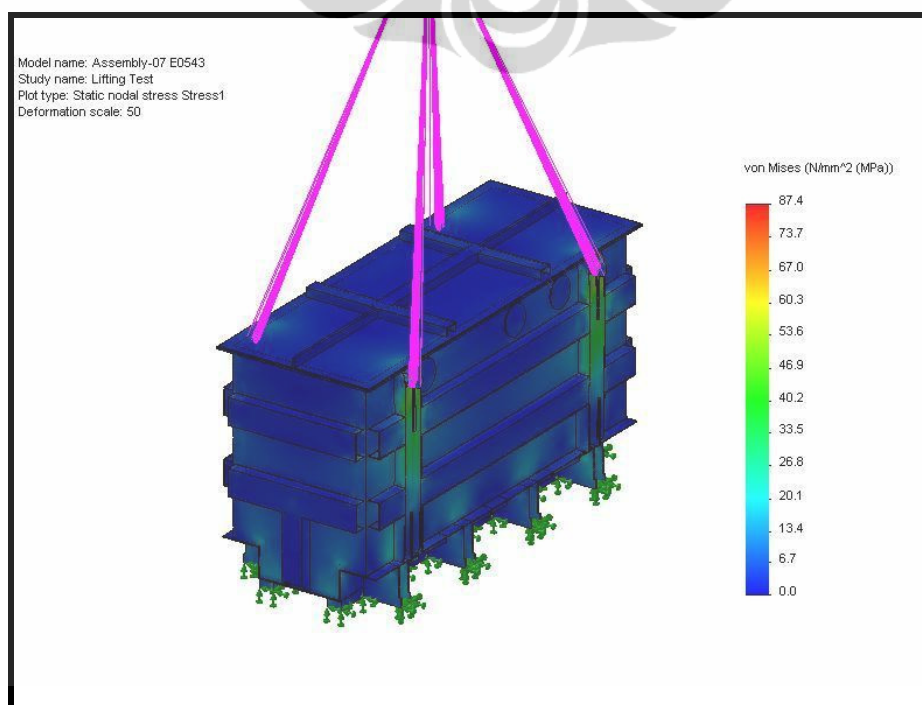
Objektif – 7 (Vacuum test)

- Vacuum test 0.11 MPa



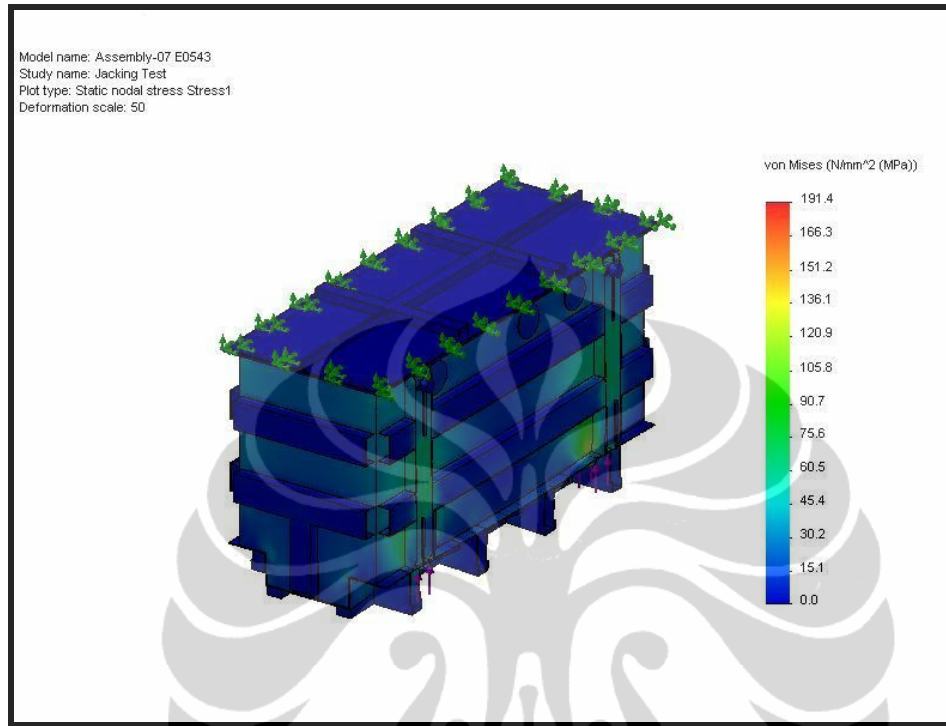
Objektif – 7 (Lifting test)

- Lifting test 1913 kN
- Estimasi berat trafo 195 Ton



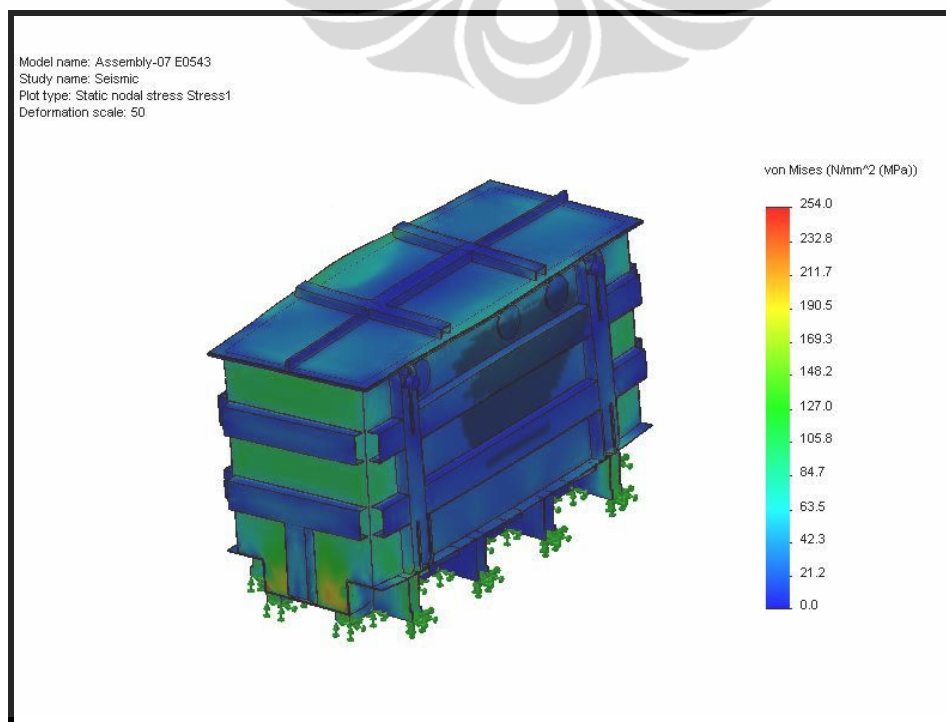
Objektif – 7 (*Jacking test*)

- *Jacking test* 1913 kN
- Estimasi berat trafo 195 Ton



Objektif – 7 (*Seismic test*)

- *Seismic test* pada sumbu 'Z' 6695.5 kN dan sumbu 'Y' 3443.5 kN
- Estimasi berat trafo 195 Ton

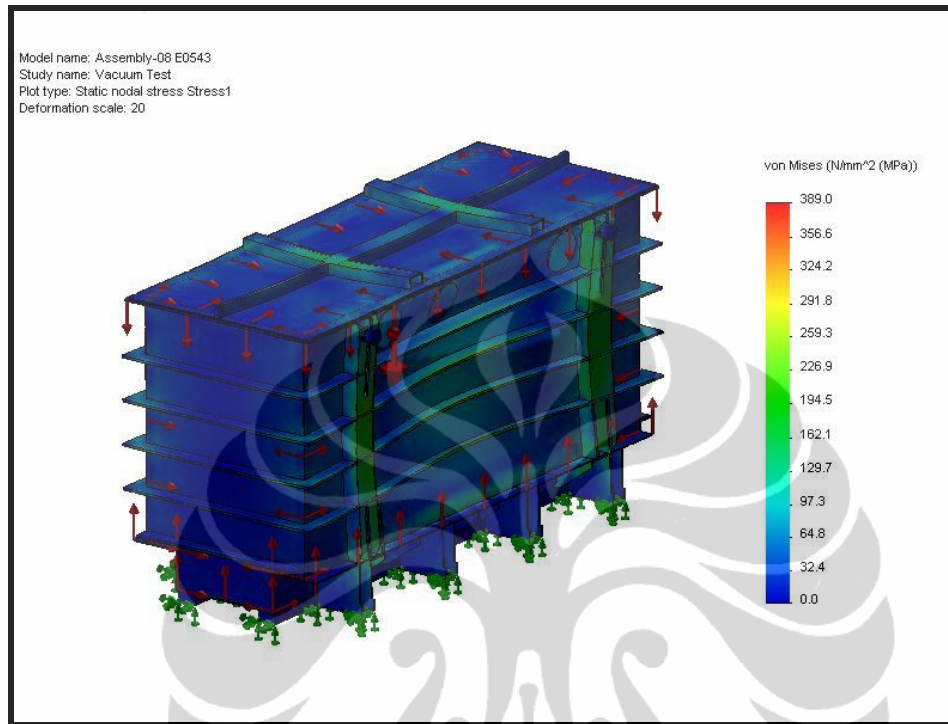


Rancangan Konstruksi 8

(Horizontal joining wall dengan horizontal 'T' bend reinforcement)

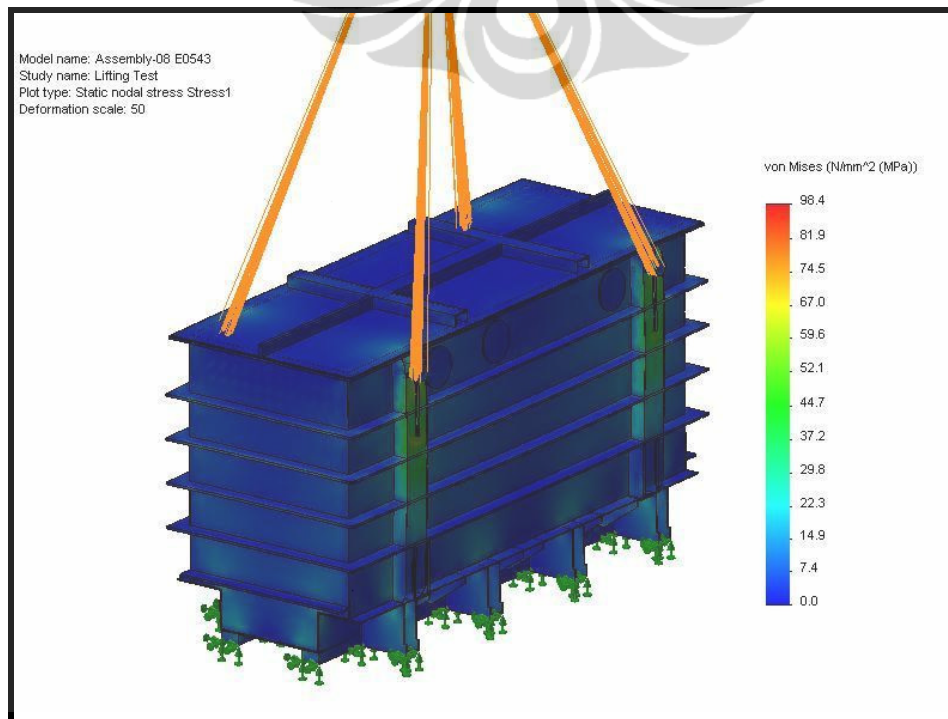
Objektif – 8 (Vacuum test)

- Vacuum test 0.11 MPa



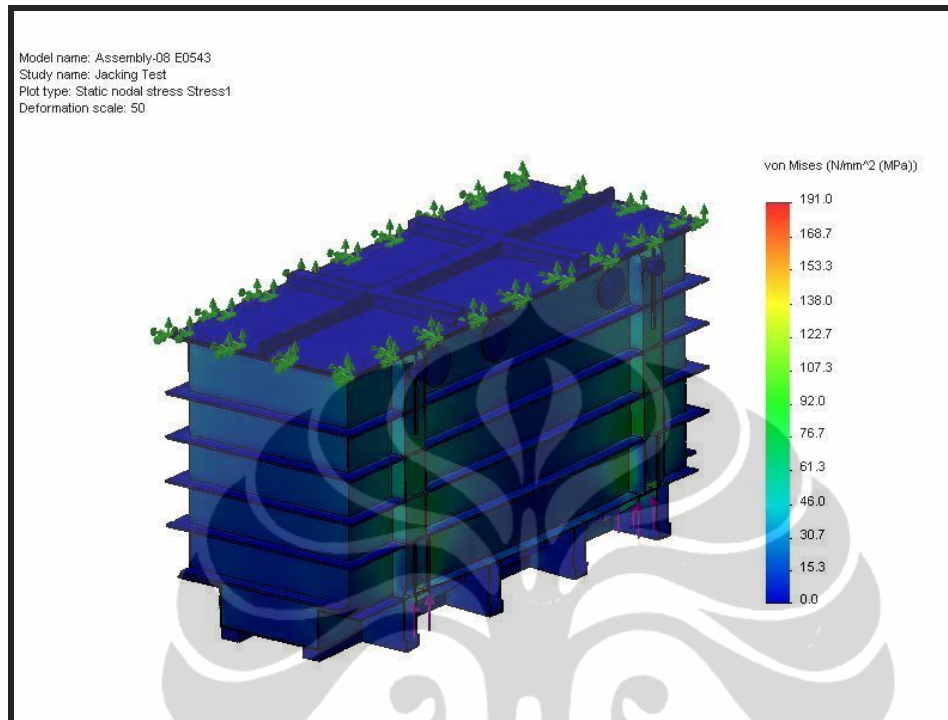
Objektif – 8 (Lifting test)

- Lifting test 1913 kN
- Estimasi berat trafo 195 Ton



Objektif – 8 (*Jacking test*)

- *Jacking test* 1913 kN
- Estimasi berat trafo 195 Ton



Objektif – 8 (*Seismic test*)

- *Seismic test* pada sumbu 'Z' 6695.5 kN dan sumbu 'Y' 3443.5 kN
- Estimasi berat trafo 195 Ton

