"INNOVATIVE SOLUTIONS TO SERVE YOU BEST!"

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- 10010 – 164 Street, Edmonton, AB
- T5P 4Y3 CANADA
- Phone: (780) 461 - 9234
- Fax : (780) 461 - 9624

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- Contract engineering and management services
- Design concepts to project reality
- Long-time client relationship
- Quality service under demanding project timelines
- Complete solution for modifications to existing equipment
- Design and drafting at competitive prices

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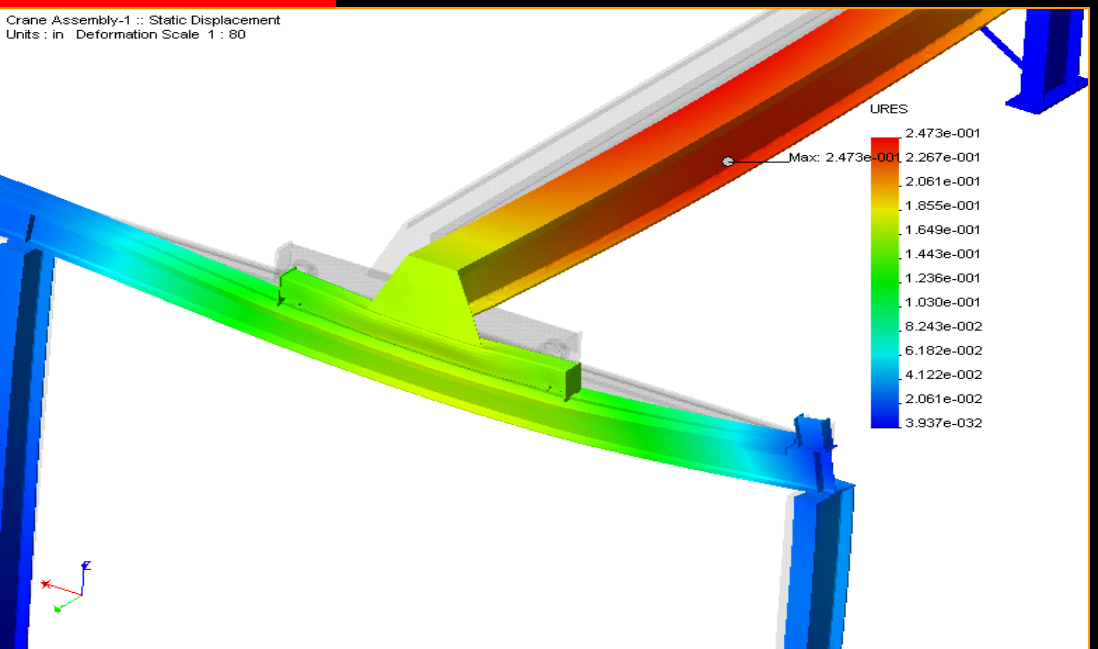

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Engineering design

- Tight timescales, high quality and accuracy
- Latest technology adds value and brings projects to a successful conclusions
- Various services from detailed drafting to customer specifications, to technically challenging projects
- Solid modeling, 2D to 3D conversion, design and structural calculations, FEA, AutoDesk Inventor, SolidWorks
- The future of engineering design is through the development of 3D modelling

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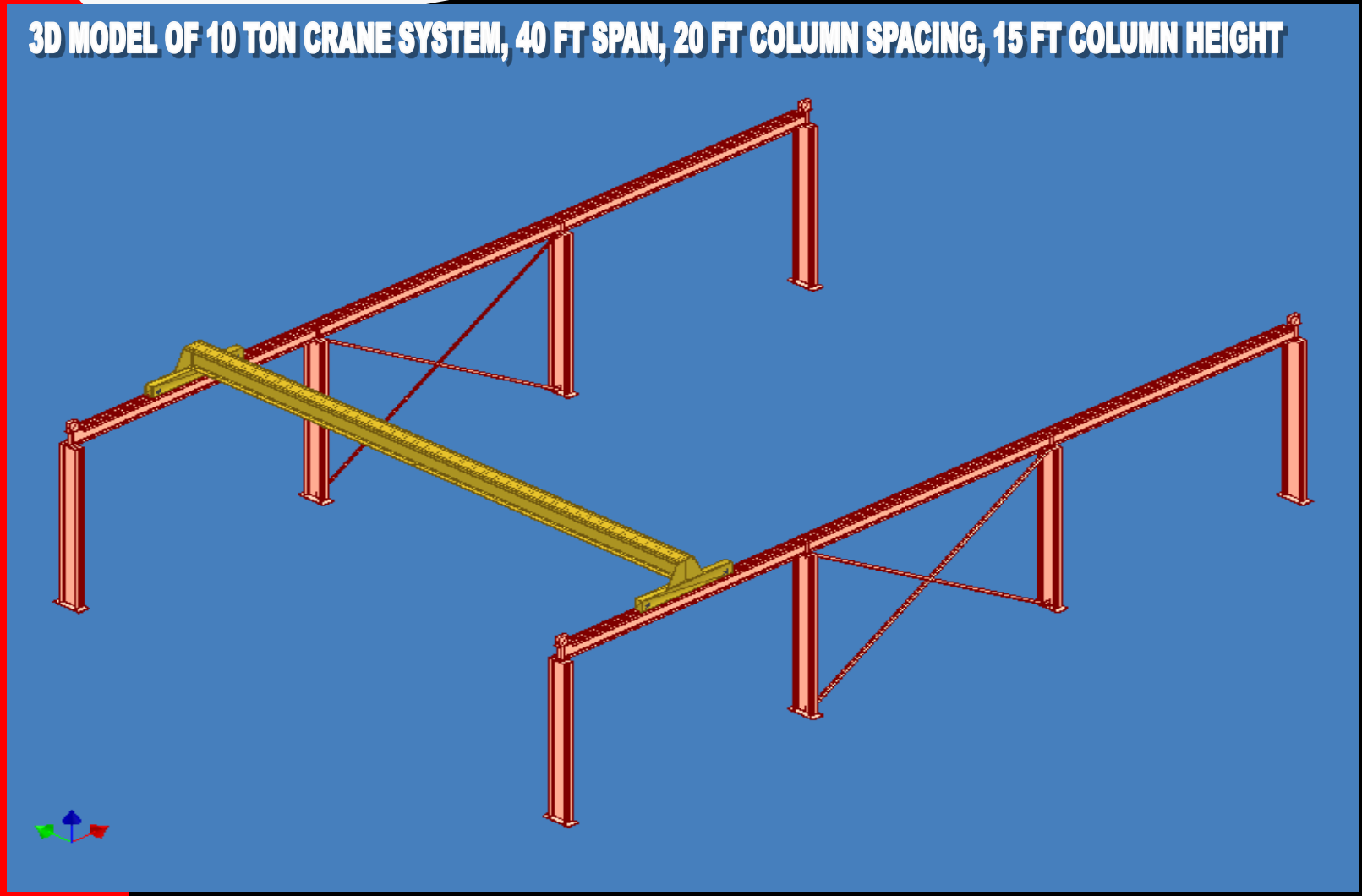
3D MODEL OF 10 TON CRANE SYSTEM, 40 FT SPAN, 20 FT COLUMN SPACING, 15 FT COLUMN HEIGHT



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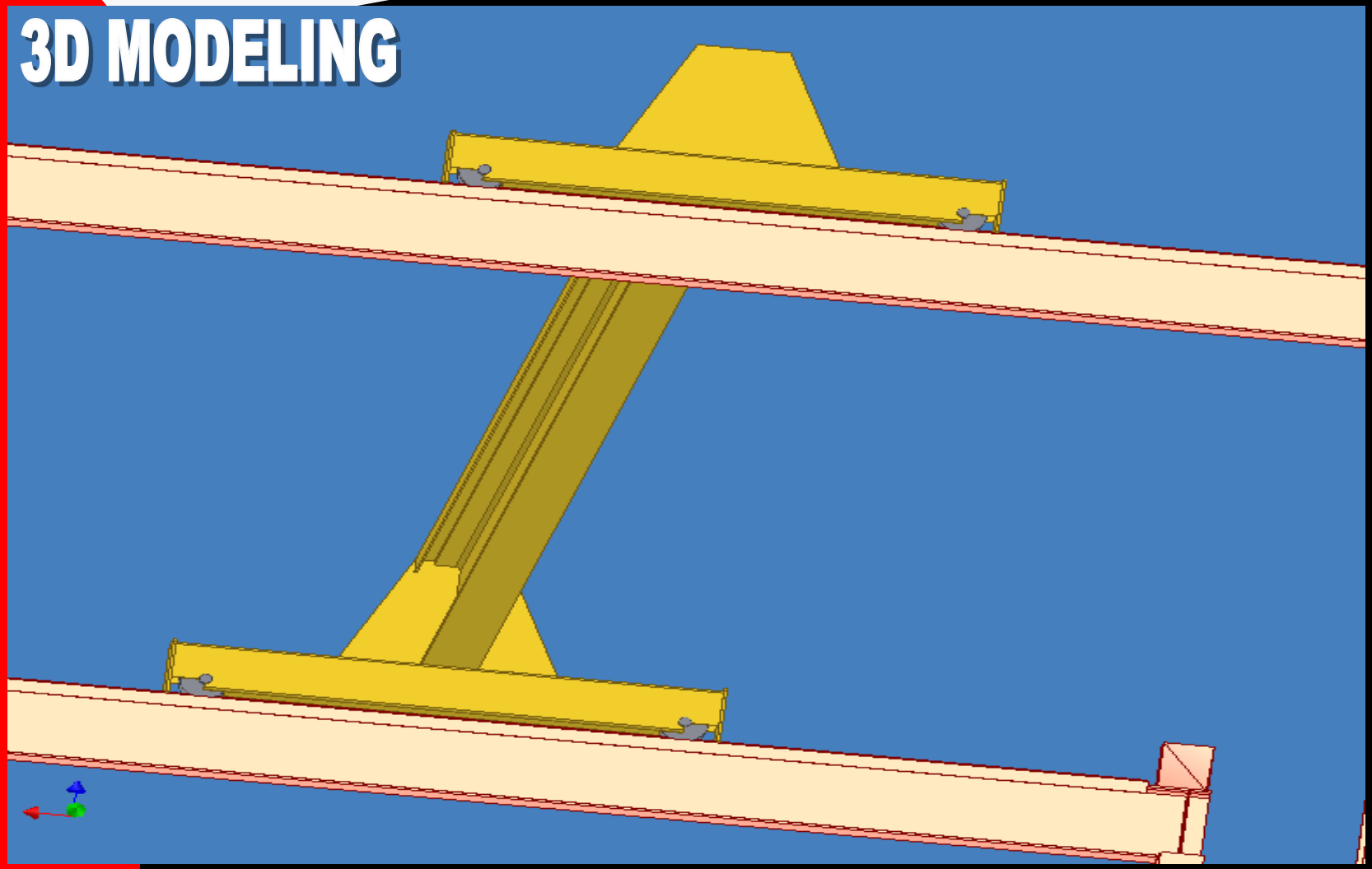

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TOP RUNNING	SINGLE GIRDER CRANE
CUSTOMER NAME	
PO #	
DATE	30/11/2004

Design output

Capacity	10.00	Tons	20.00	Kips	Impact Factor	0.25	
Hoist Weight			2.04	Kips	Deflection Ratio	600.00	
Bridge Span			40.00	Ft	Lateral Factor	0.10	
Weight of one End Truck			0.50	Kips	Minimum Hook Approch	2.00	Ft
No. of Wheels per End Truck			2		Festoon weight	20.00	Lb/Ft
Steel Yield Strength			44.00	Ksi	Walkway	0.00	Lb/Ft
No. of Wheels per Trolley			4		Effective Span Ratio	1.00	
Estimated Girder Weight			147.90	Lb/Ft	Load Factor	0.95	
Simple Static Moment			220.40	Kip.Ft.	Maximum Static Moment	249.98	Kip.Ft.
Simple Impact Moment			270.40	Kip.Ft.	Maximum Impact Moment	299.98	Kip.Ft.
Simple Dead Load Moment			29.58	Kip.Ft.	Maximum Lateral Moment	25.00	Kip.Ft.

REQUIRED MOMENTS OF INERTIA

I_v (required)	2188.95	in^4	I_h (required)	218.90	in^4

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SECTION PROPERTIES OF BEAM AND CHANNEL

BEAM	W24x94		CHANNEL,	C15x33.9	
b	9.060	in	b	3.400	in
d	24.310	in	d	15.000	in
t	0.875	in	t	0.650	in
w	0.515	in	w	0.400	in
A	27.700	in^2	A	9.970	in^2
I_{xx}	2700.000	in^4	I_{xx}	315.000	in^4
I_{yy}	109.000	in^4	I_{yy}	8.240	in^4
d/b	2.683		x_o	0.792	in
Weight	94.0	Lb/Ft	Weight	33.9	Lb/Ft

COMBINED PROPERTIES

y_b	15.268	in
y_t	9.442	in
I_y	3722.655	in^4
$I_{h\,(Tee)}$	369.226	in^4
A_{sec}	37.670	in^2
A_T	19.984	in^2
S_{xb}	243.816	in^3
S_{xt}	394.277	in^3
S_{yt}	49.230	in^3
r_y	5.621	in
r_T	4.298	in

DESIGN STRESS

σ_3	20.432	Ksi	σ_2	8.153	Ksi	σ_1	21.999	Ksi

VERTICAL IMPACT

σ_{xt}	9.130	Ksi	σ_{xt} (permissible)	21.999	Ksi	OK
σ_{xb}	14.764	Ksi	σ_{xb} (permissible)	26.400	Ksi	OK

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MOMENT OF INERTIA

I_v (required)	2188.95	in^4	I_v (provided)	3722.65	in^4	OK
I_h (required)	218.90	in^4	I_h (provided)	369.23	in^4	OK
Deflection (actual)	0.470	in	Deflection (permissible)	0.800	in	OK

WIDE FLANGE BEAM - FLANGE BENDING

S	18.481	Ksi				
σ_{xb}	12.303	Ksi				
V	15.392	Ksi	V (permissible)	17.600	Ksi	OK

STANDARD BEAM - FLANGE BENDING

d (eff.)	1.231	in				
S	9.337	Ksi				
σ_{xb}	12.303	Ksi				
V	10.820	Ksi	V (permissible)	17.600	Ksi	OK

Girder Weight	5244	Lb	Static Wheel Load	12235	Lb
Festoon and Walkway Weight	820	Lb	Impact Wheel Load	14610	Lb
End Truck Total Weight	1000	Lb	Lateral Wheel Load	1102	Lb
Total Bridge Weight	7064	Lb			

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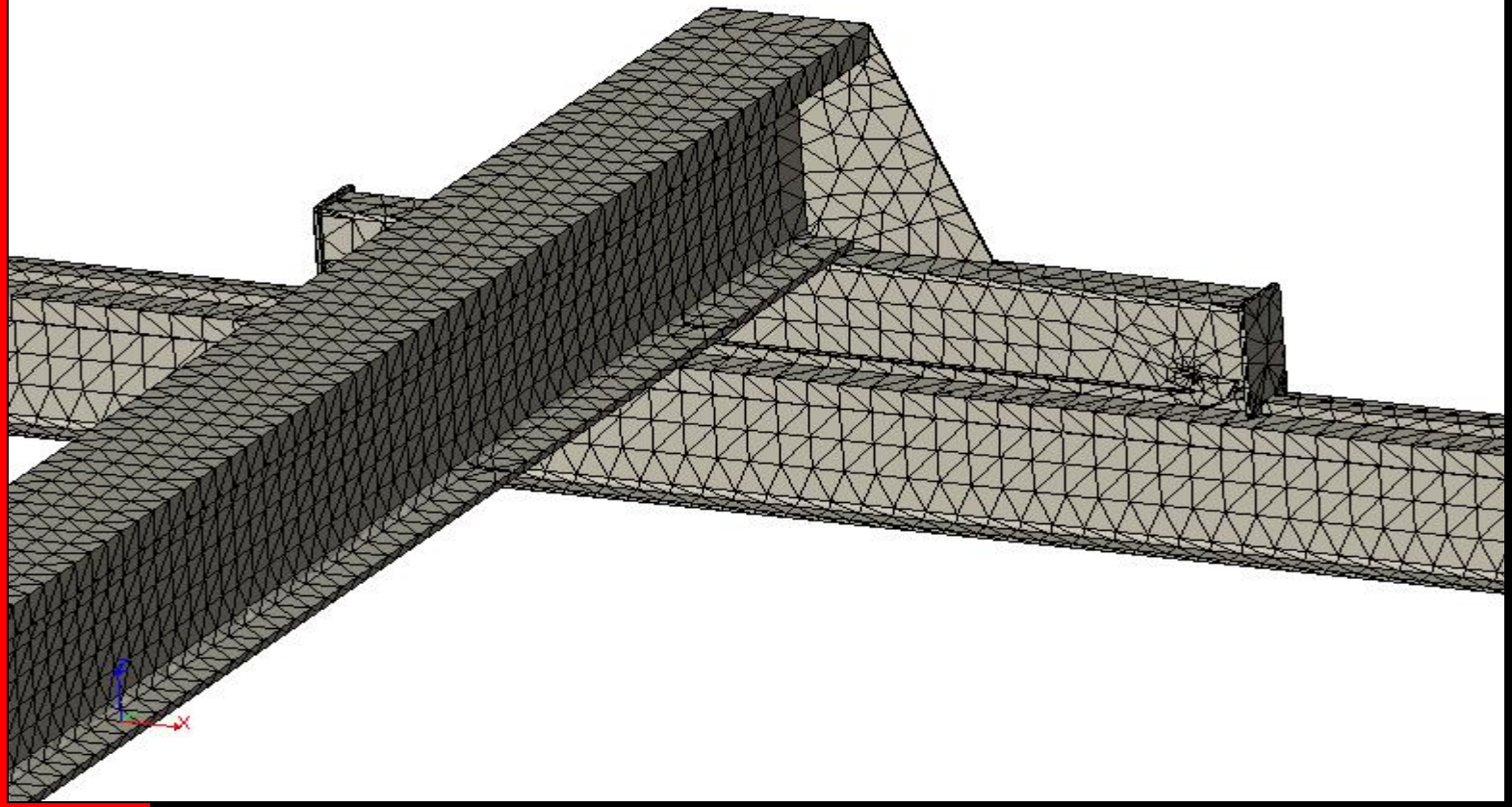
PREPARATION FOR FINITE ELEMENT ANALYSIS (FEA) - MESHING



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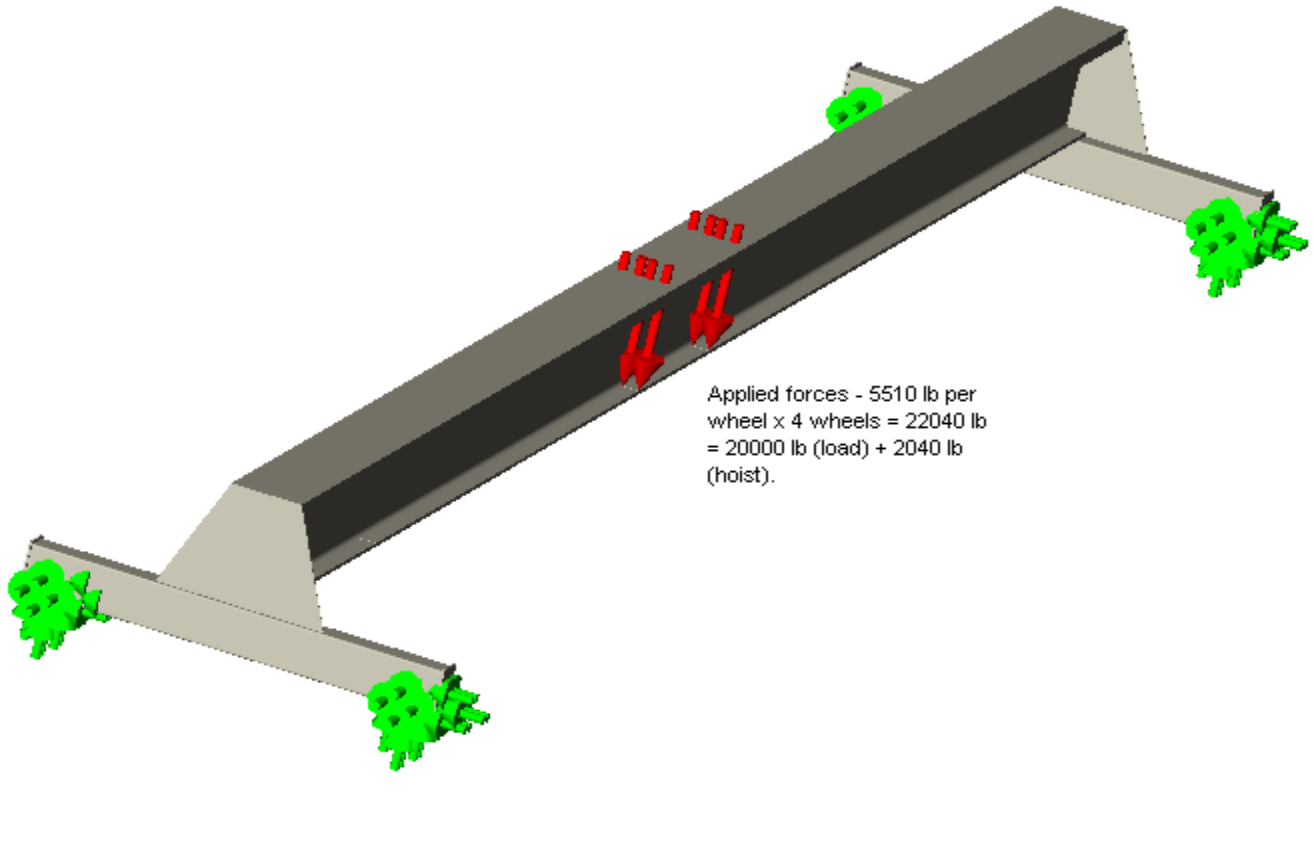
GENERAL ARRANGEMENT.
CRANE TEST.



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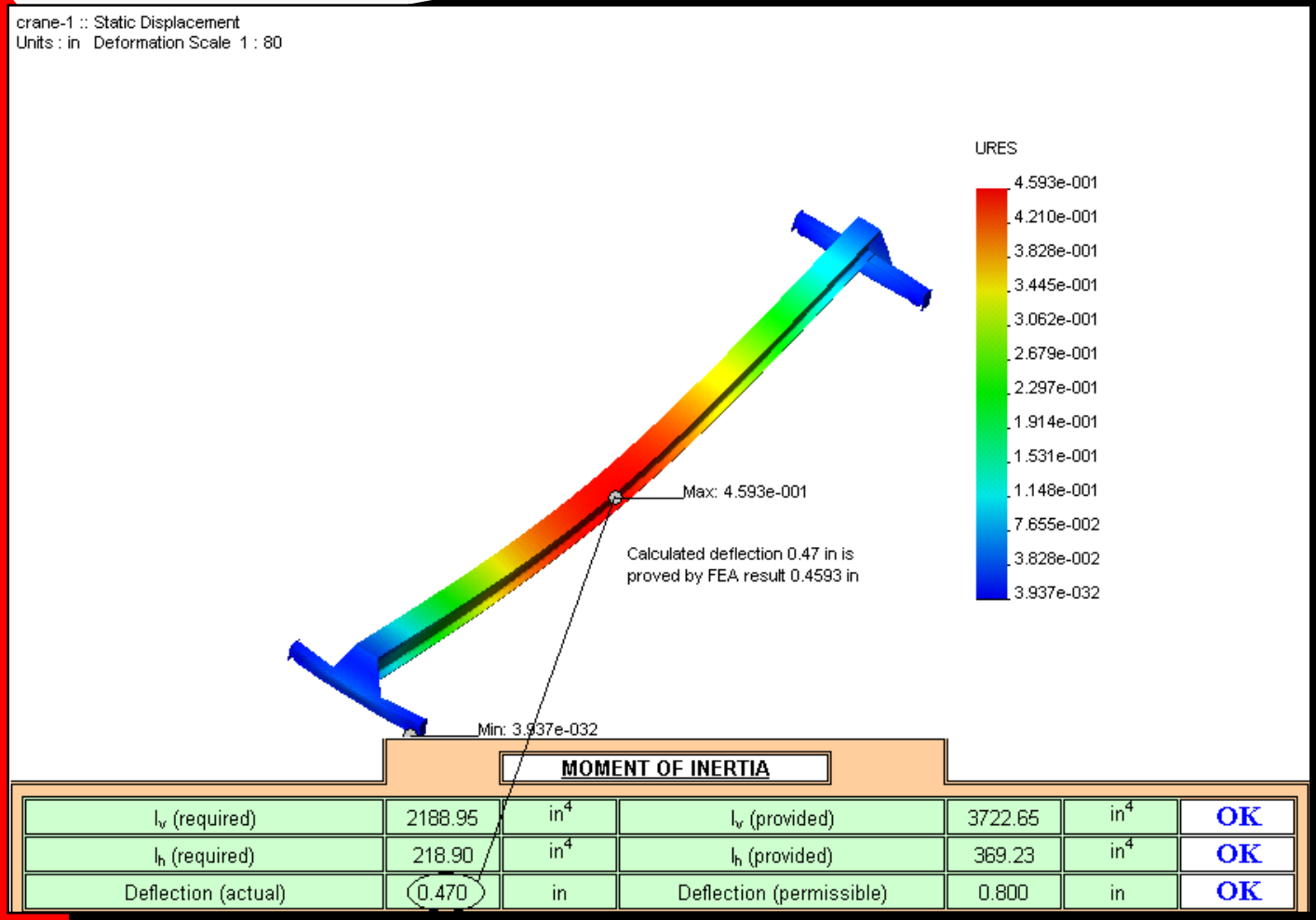

MOMENT OF INERTIA

I_v (required)	2188.95	in^4	I_v (provided)	3722.65	in^4	OK
I_h (required)	218.90	in^4	I_h (provided)	369.23	in^4	OK
Deflection (actual)	0.470	in	Deflection (permissible)	0.800	in	OK

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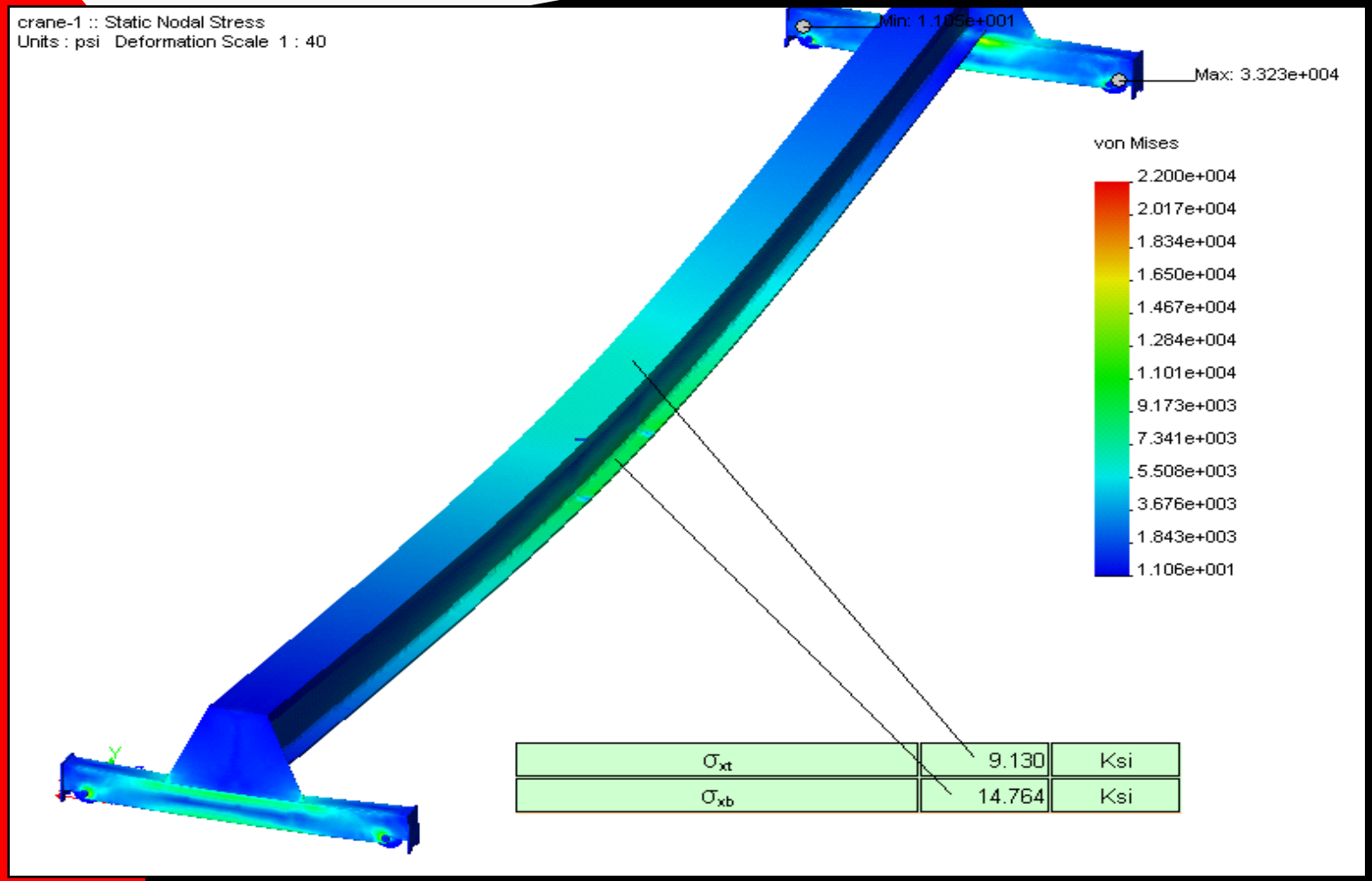

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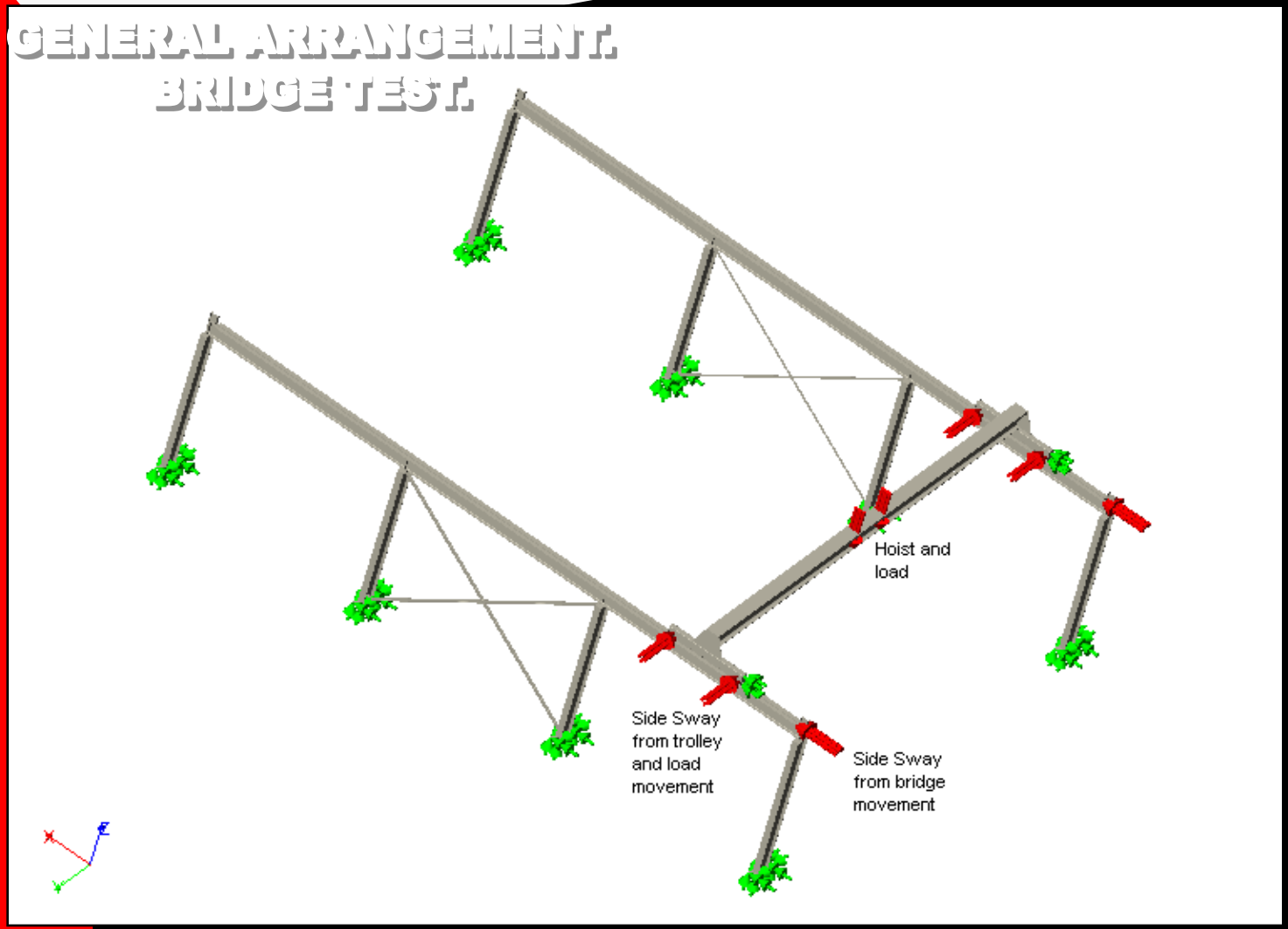
GENERAL ARRANGEMENT:
BRIDGE TEST.



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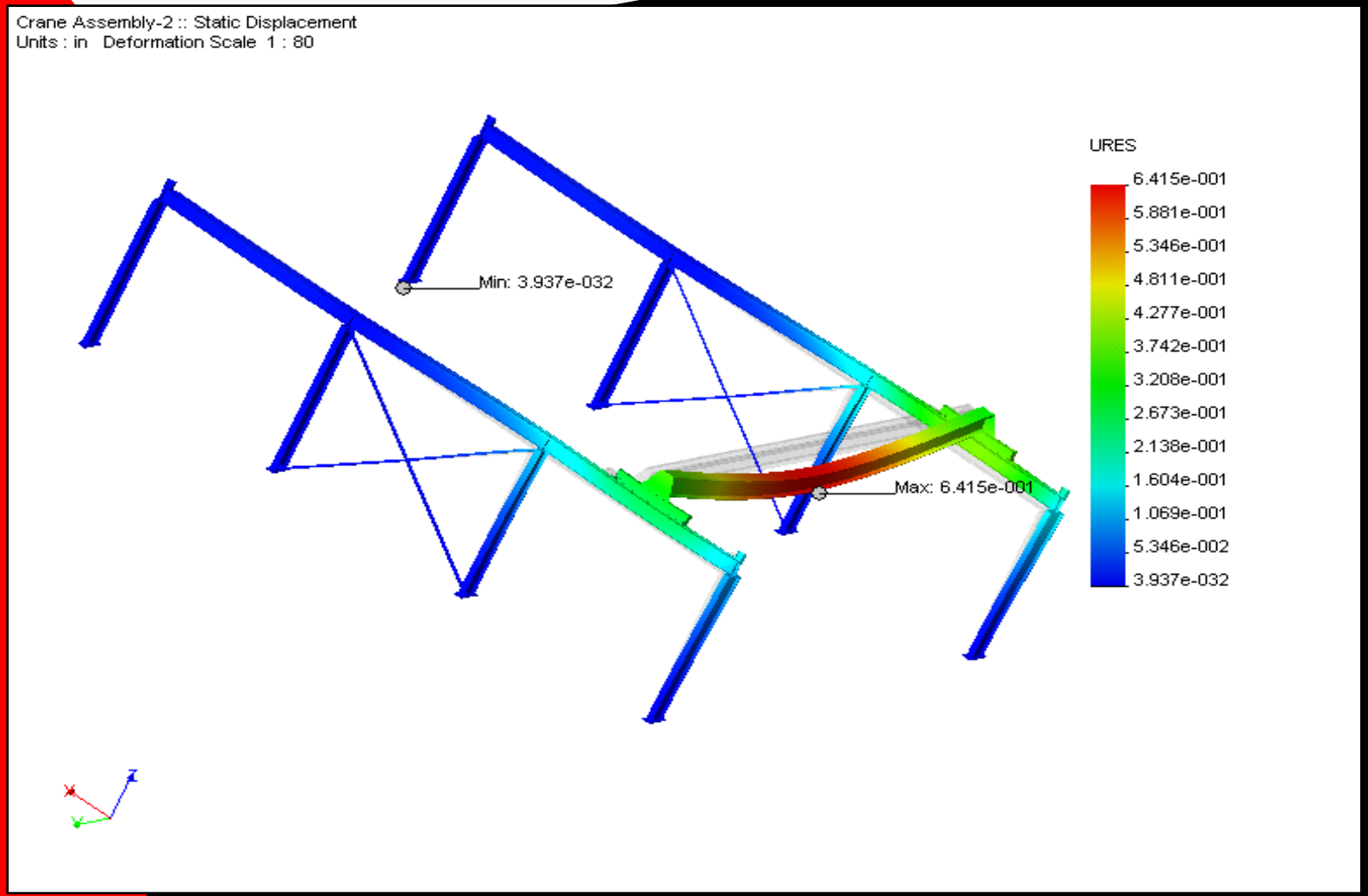

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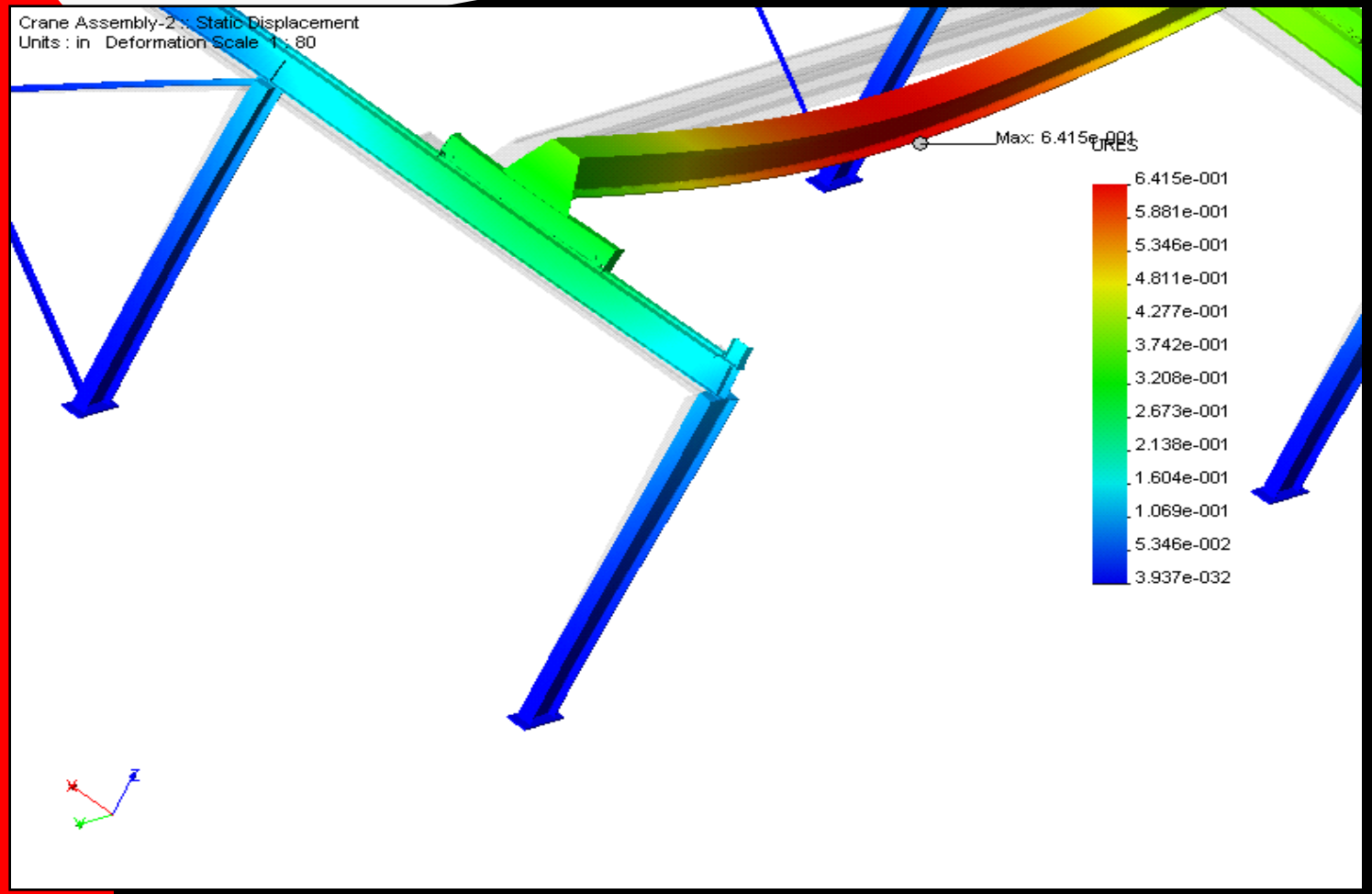

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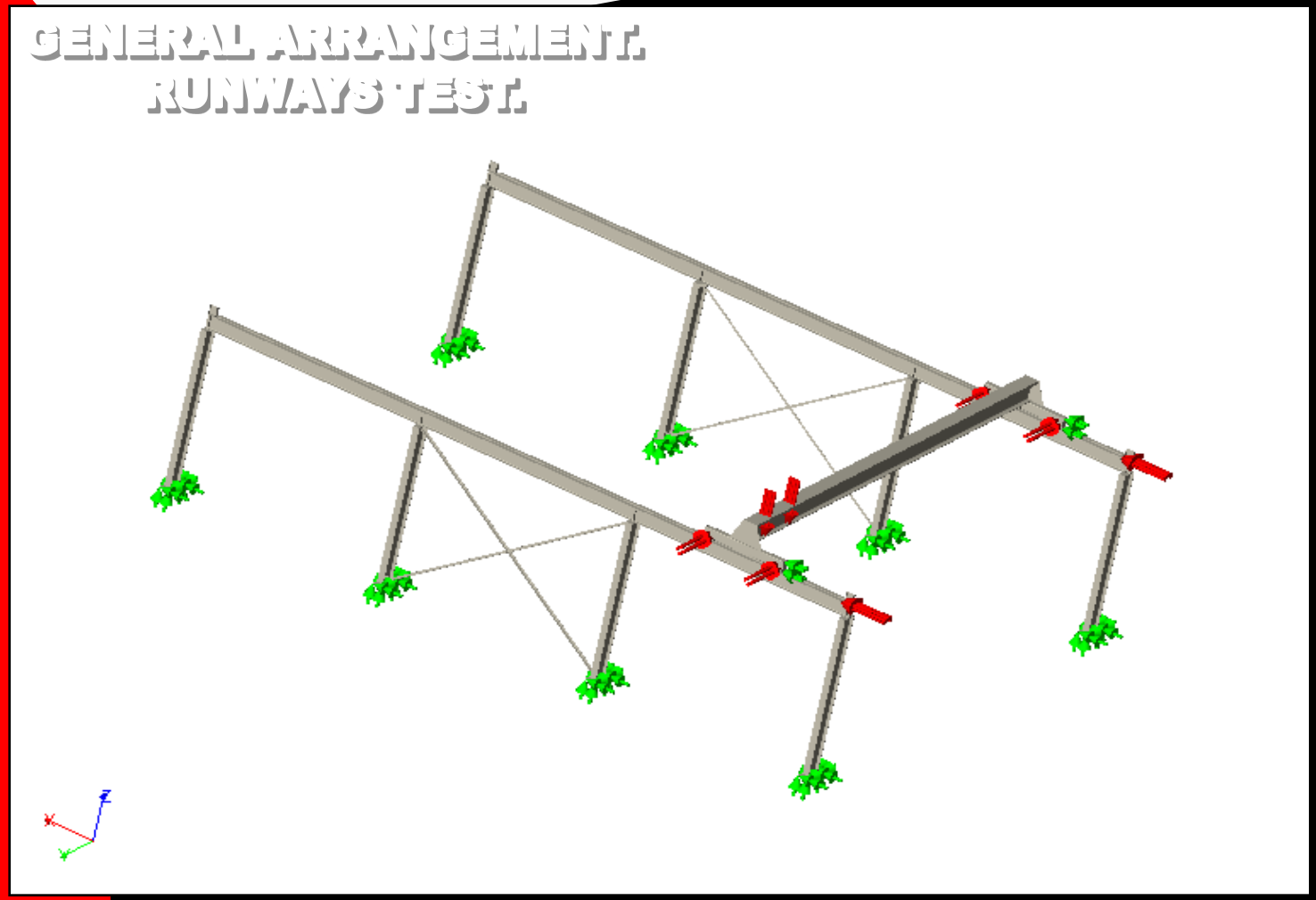
GENERAL ARRANGEMENT.
RUNWAYS TEST.



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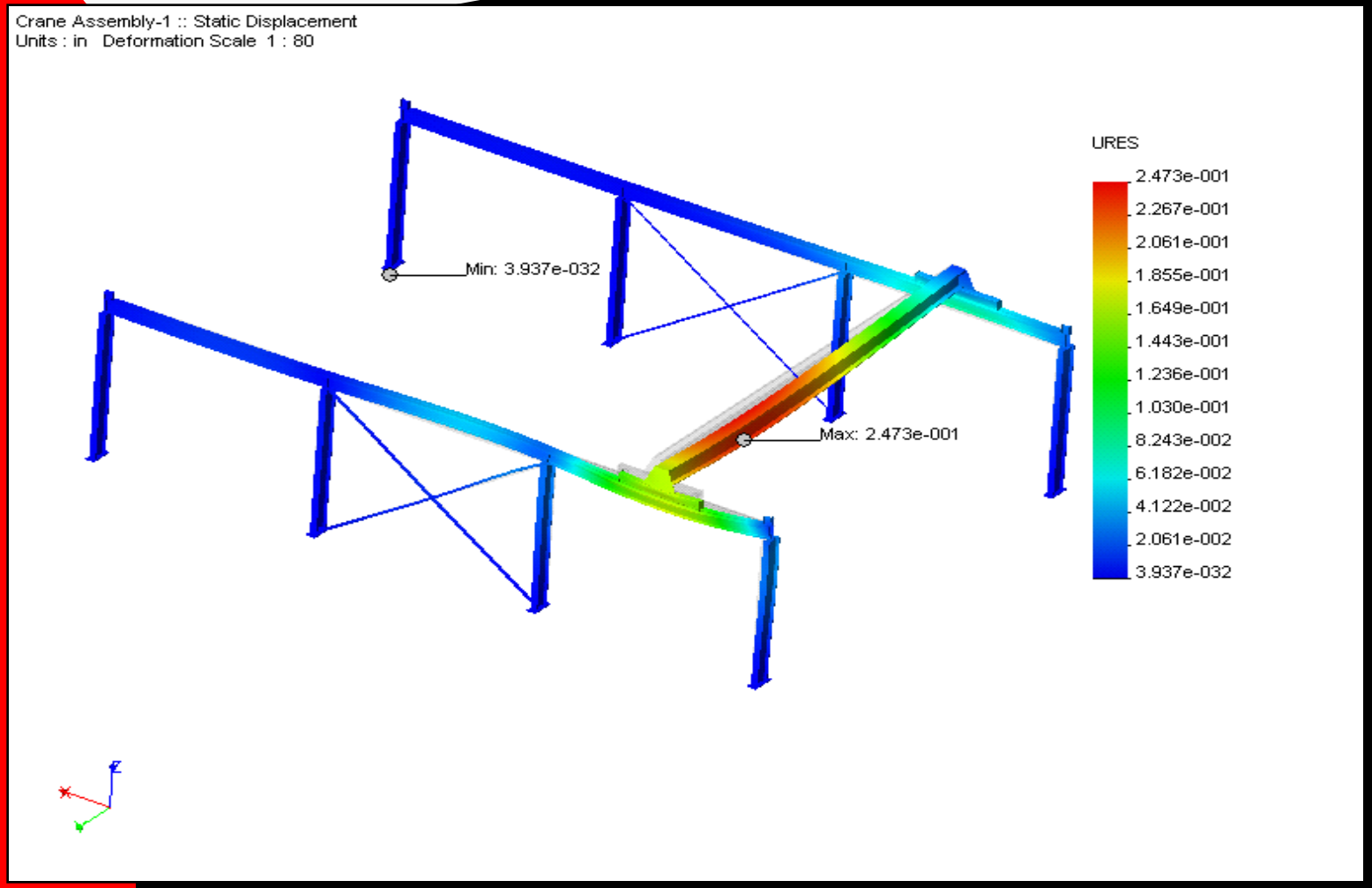

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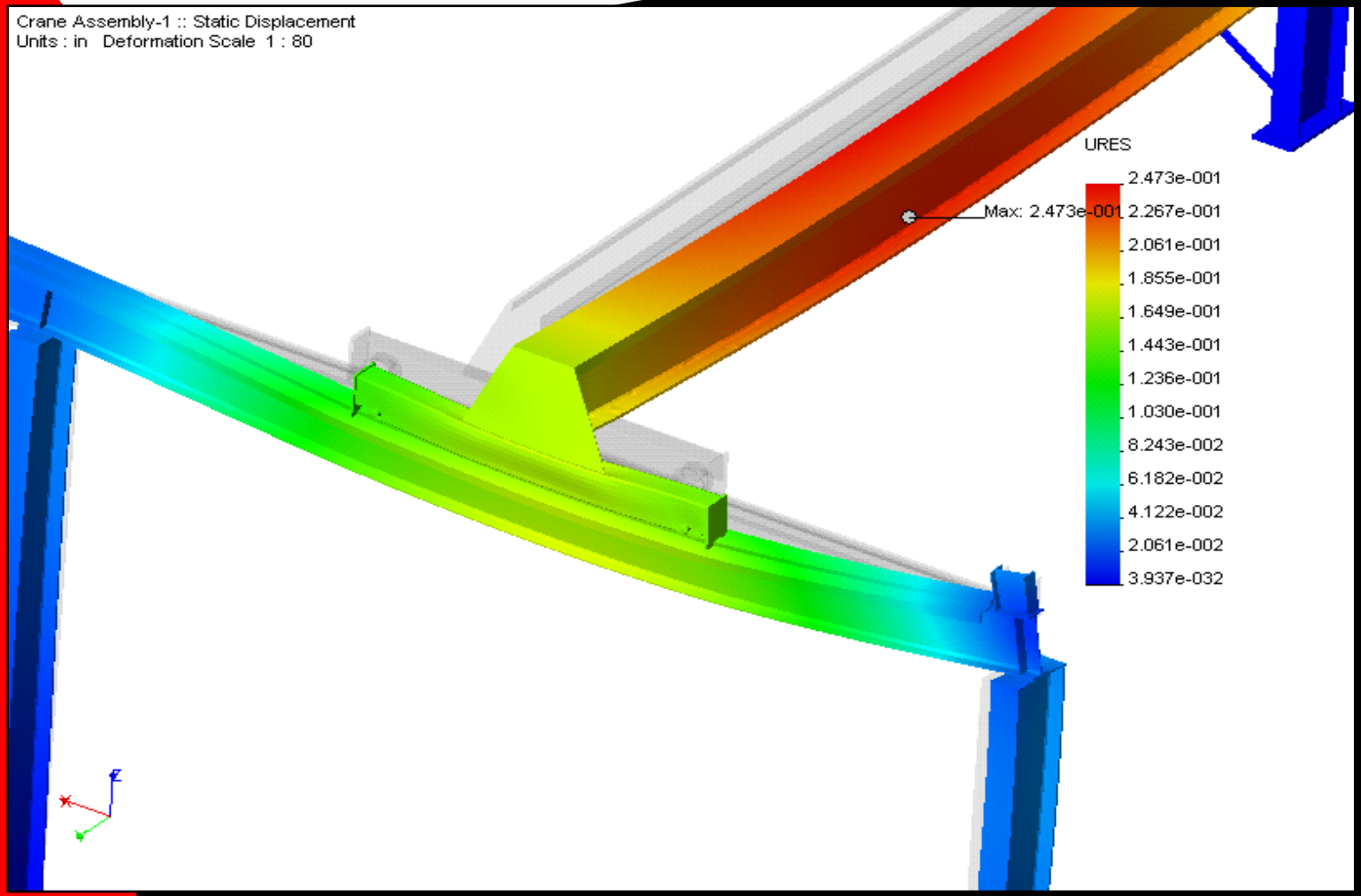

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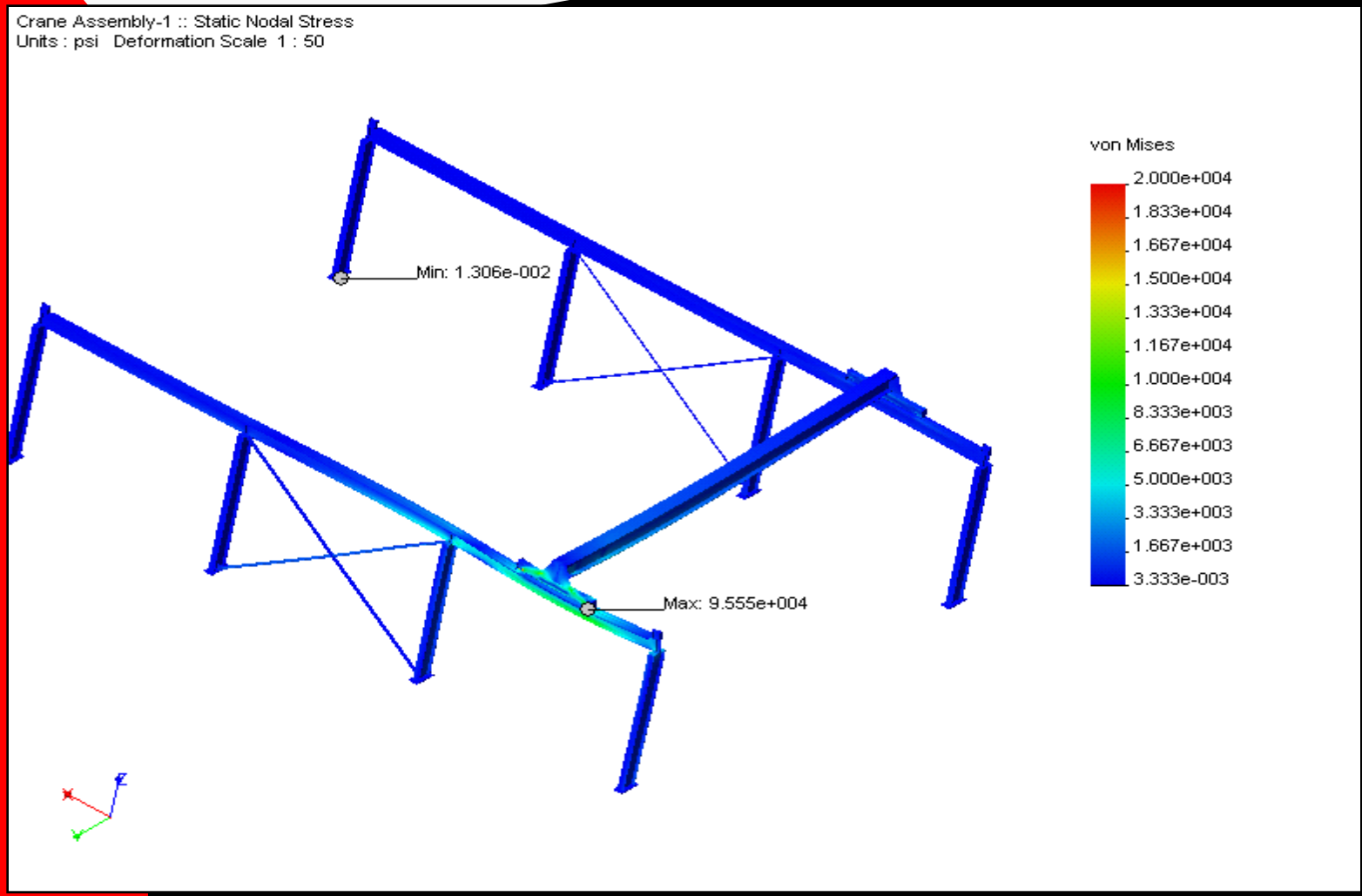

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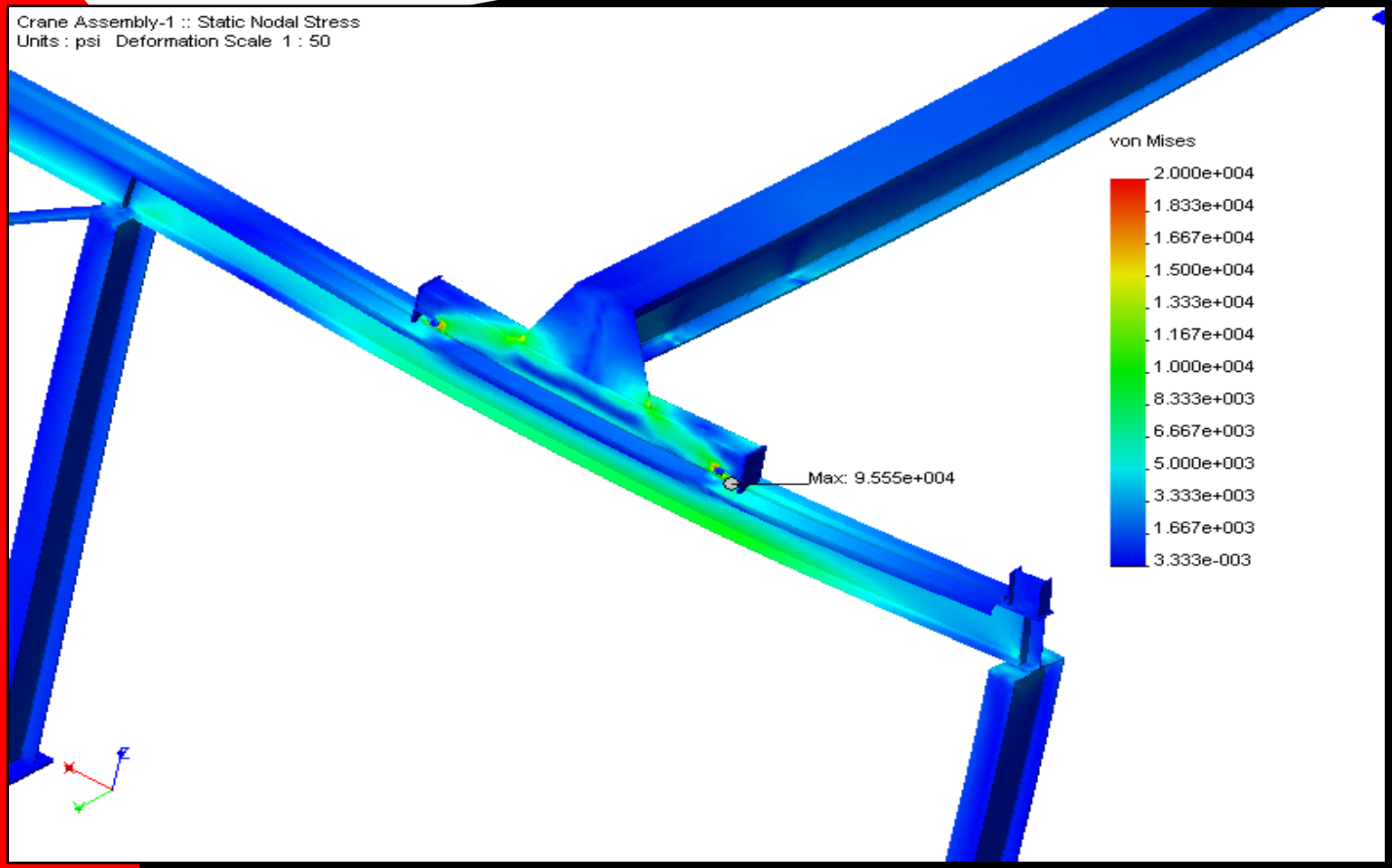

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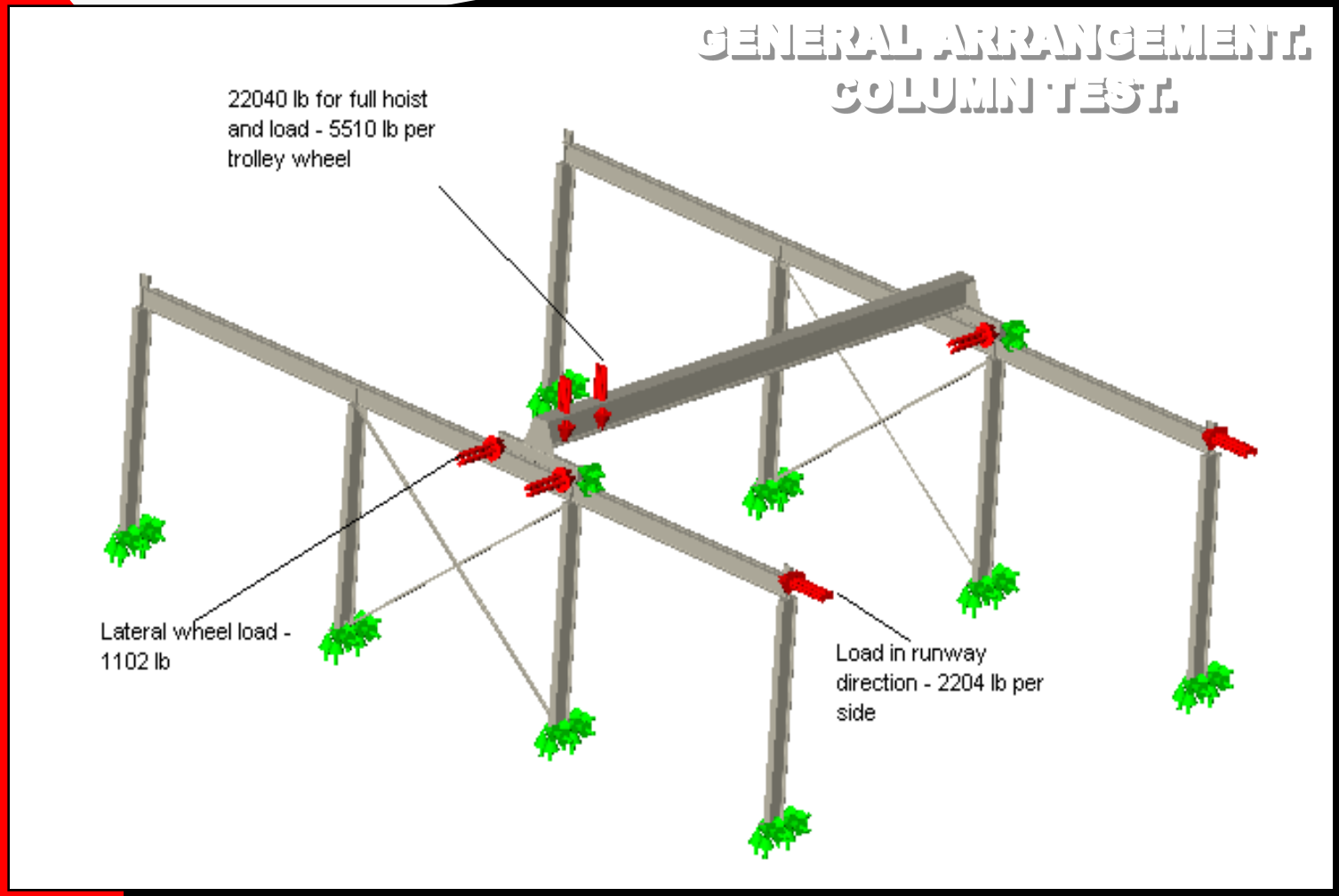

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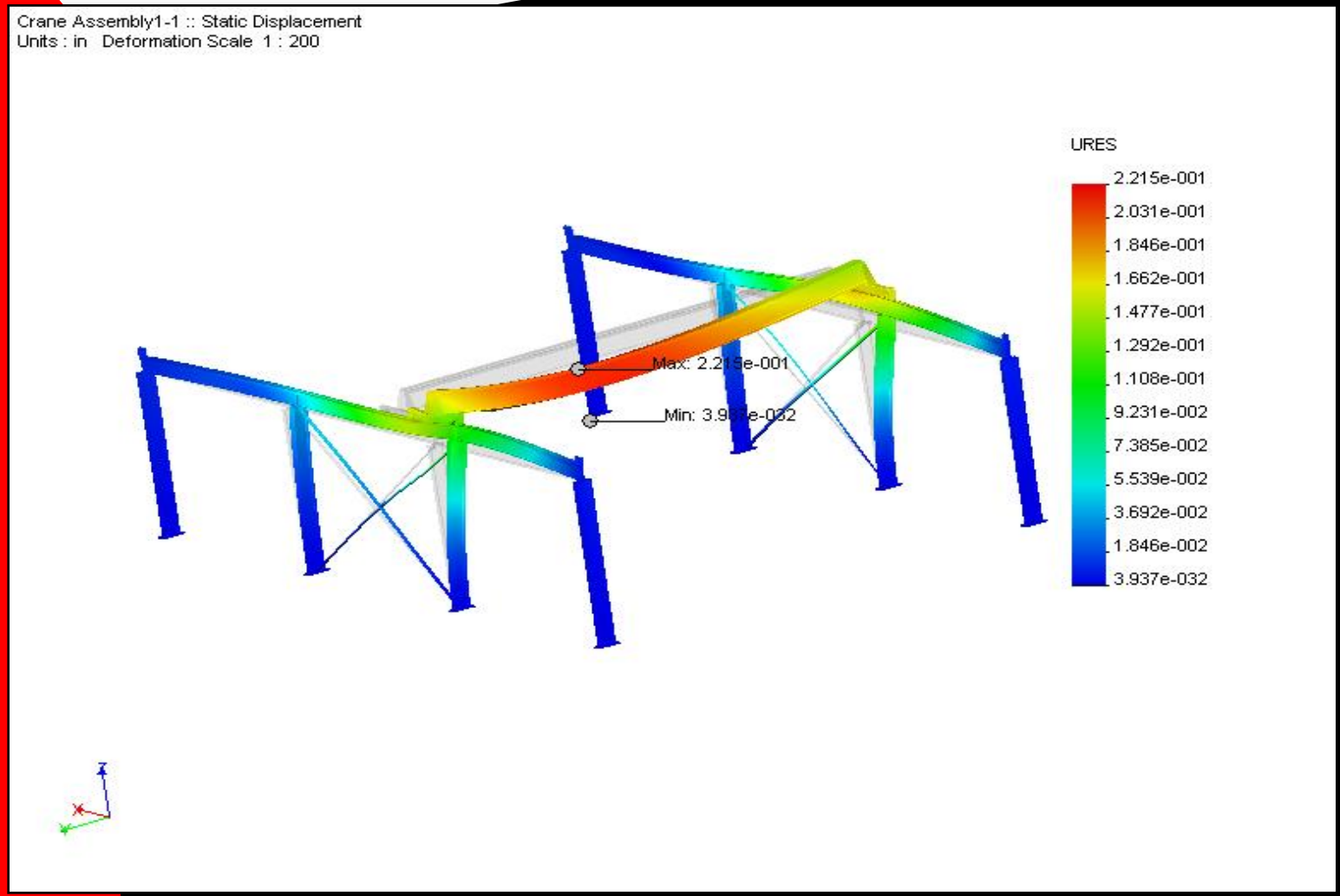

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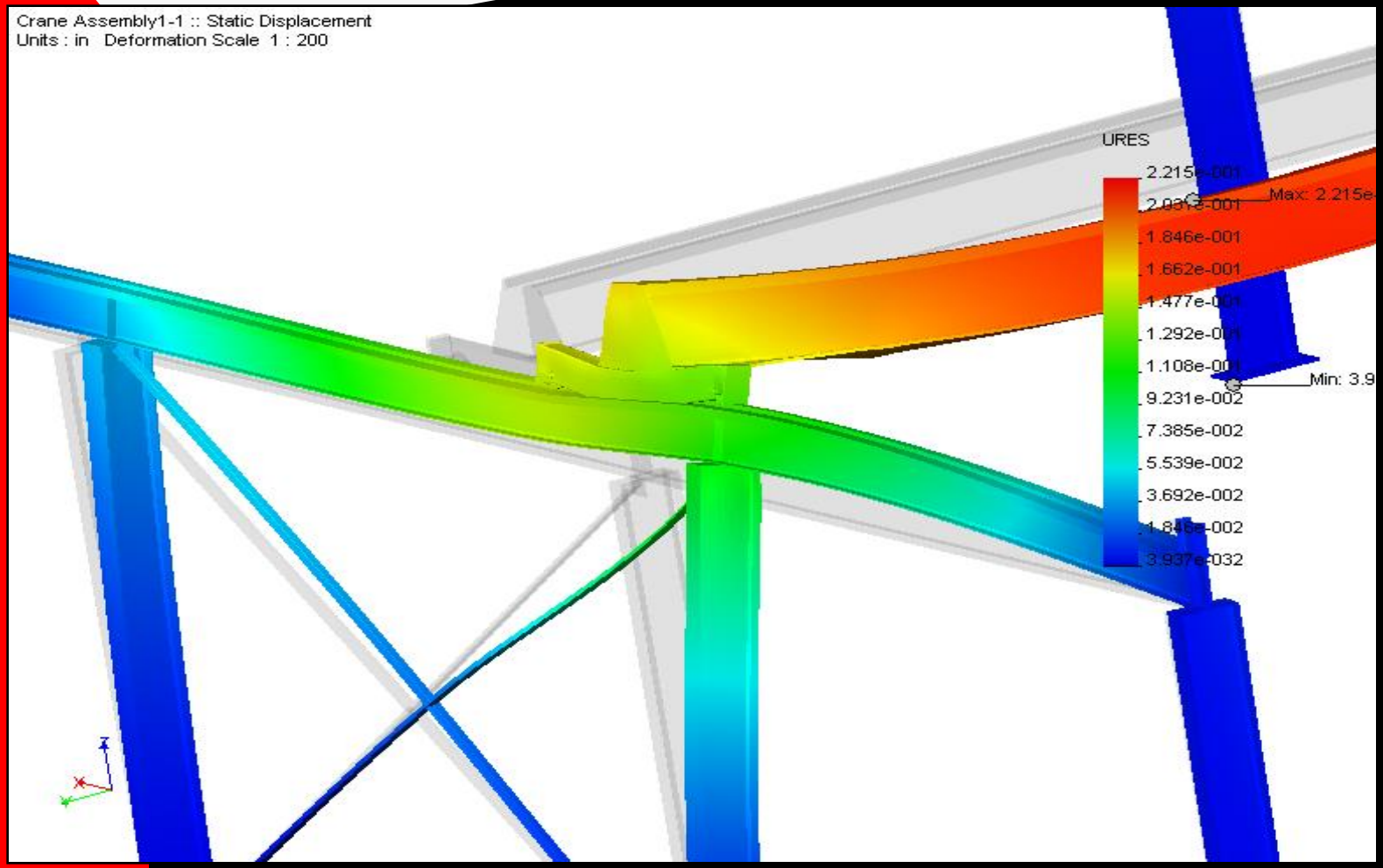

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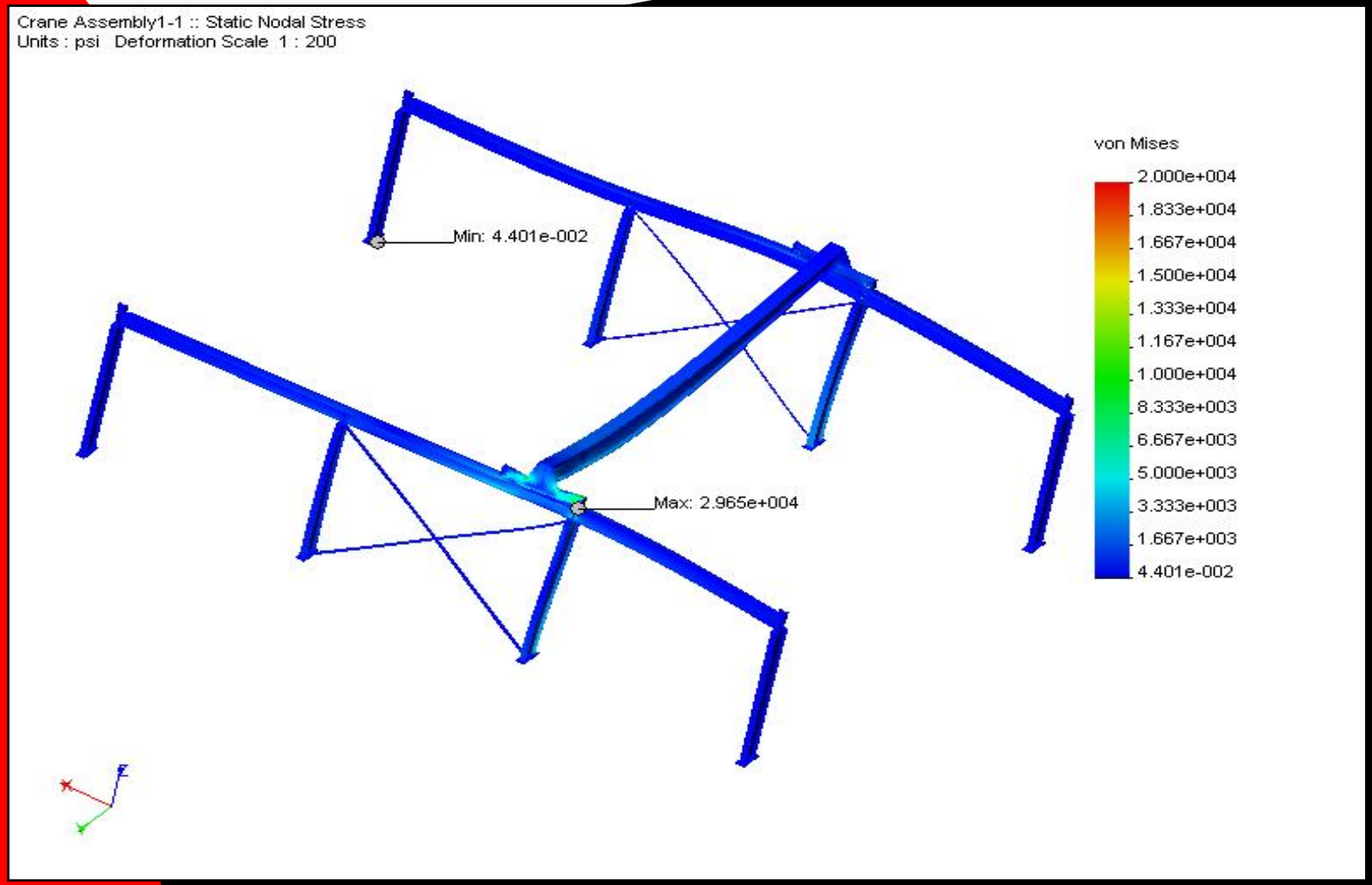

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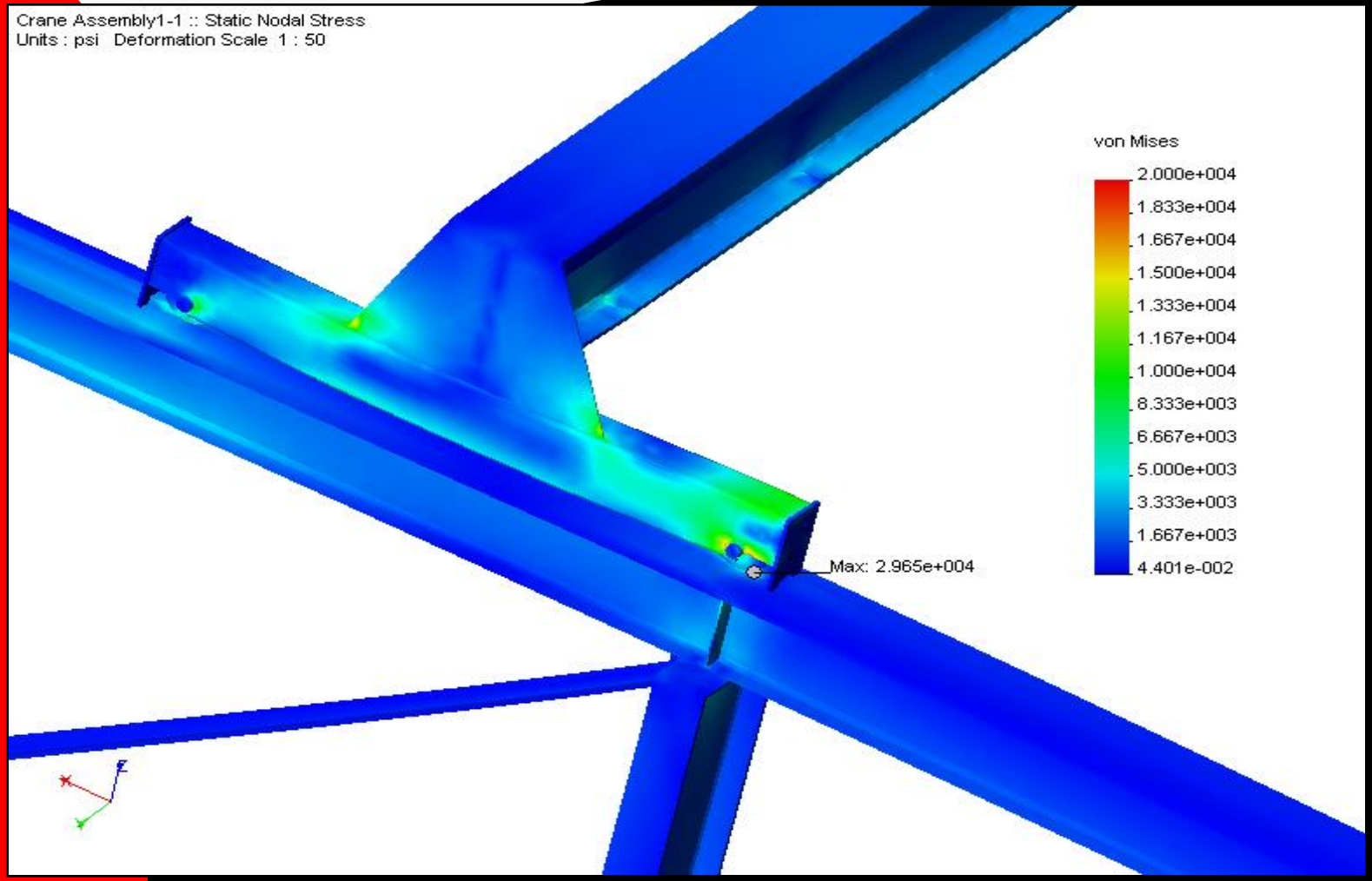

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3D modeling

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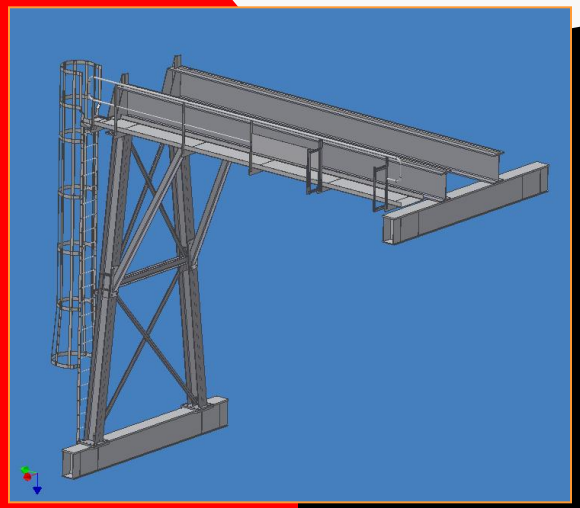

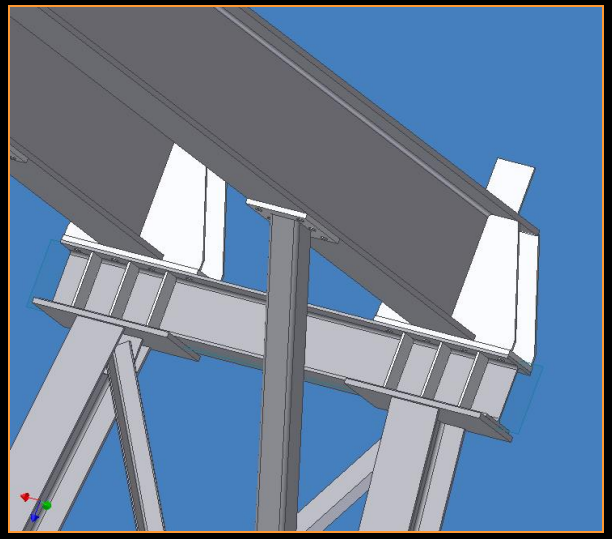

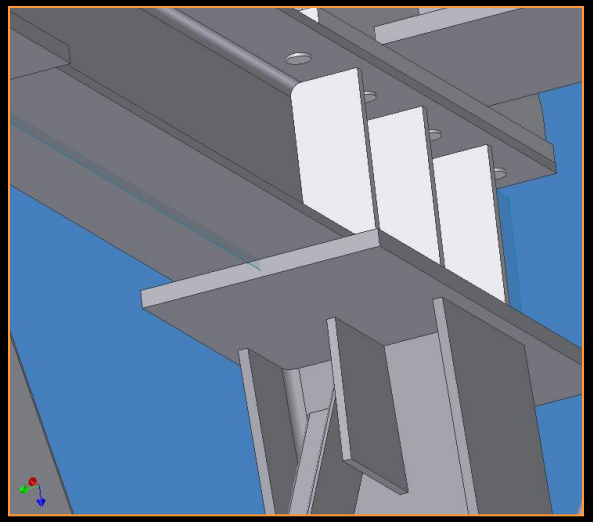

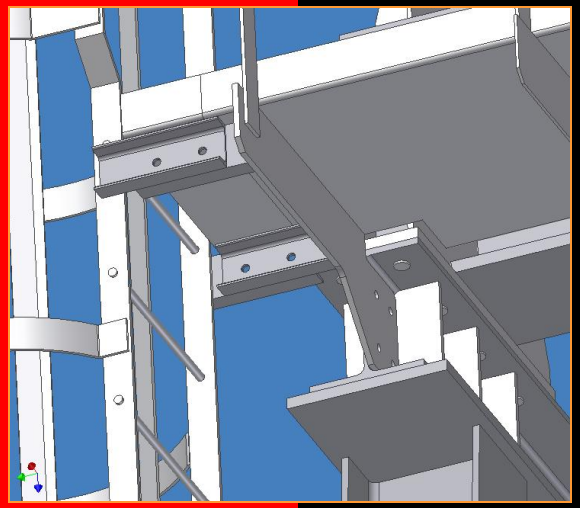

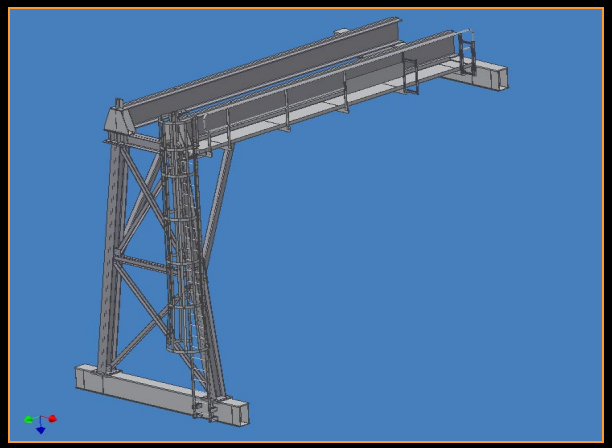

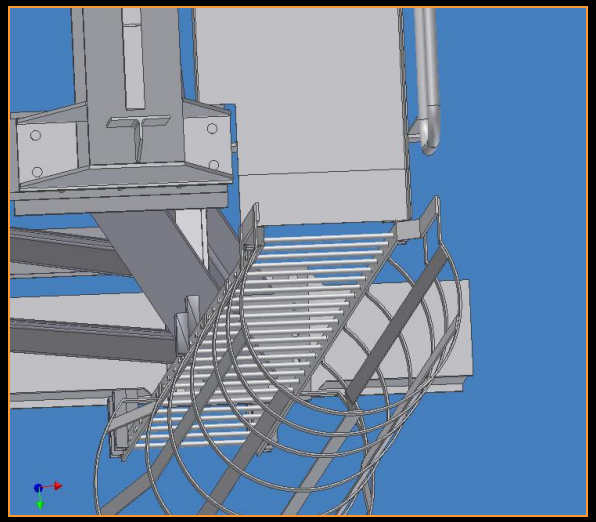

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F.E.A. on crane structure

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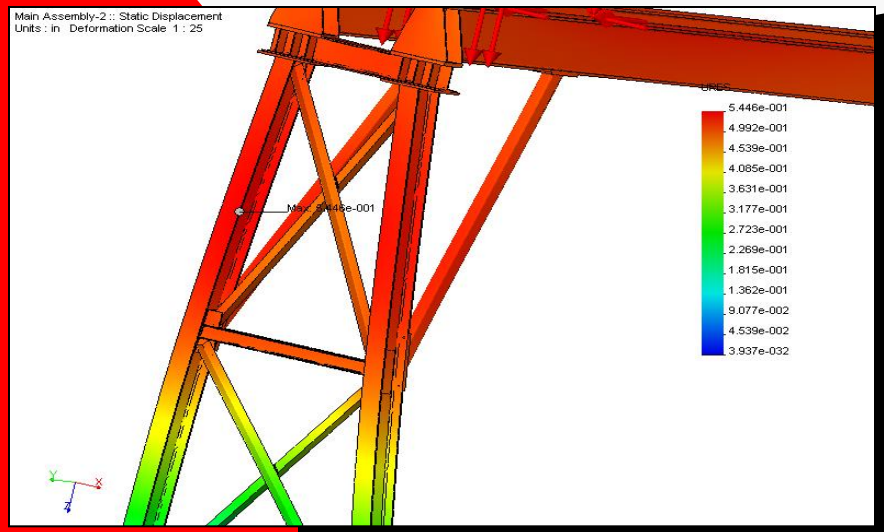

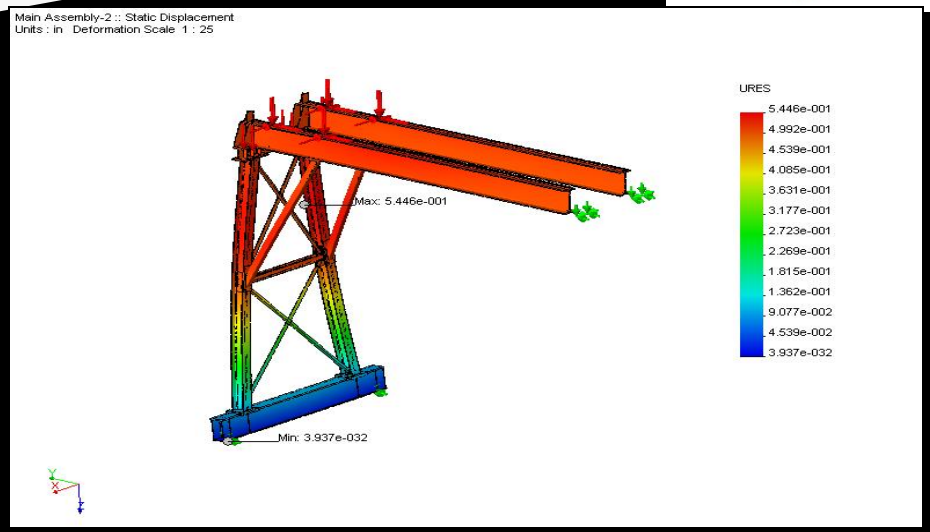

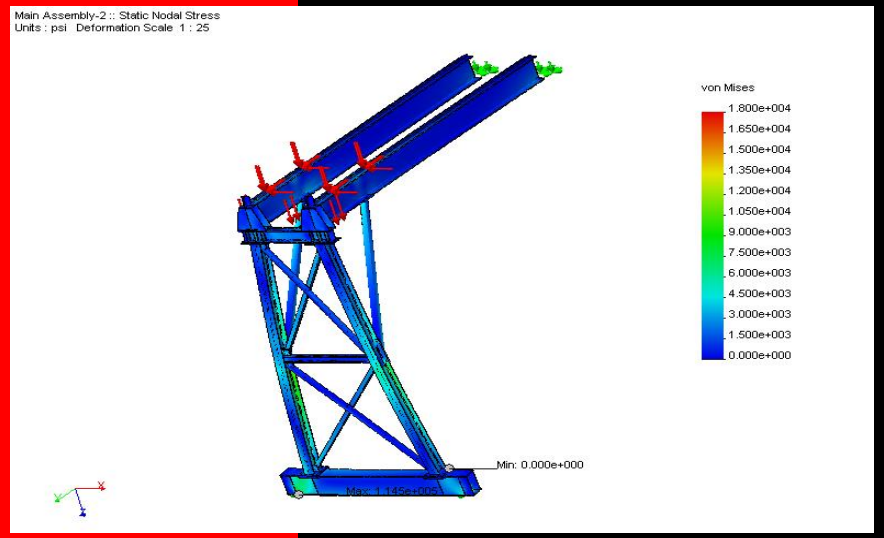

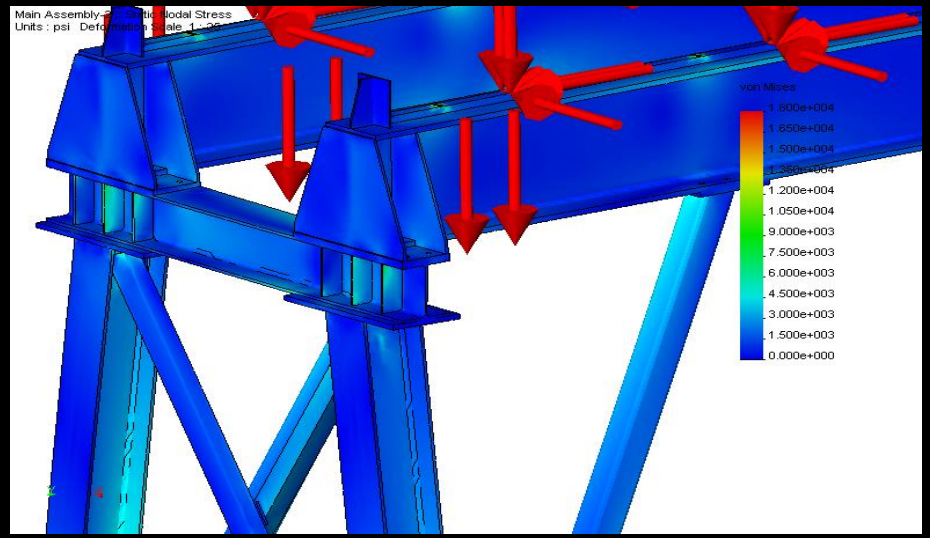

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Crane drawing (sample)

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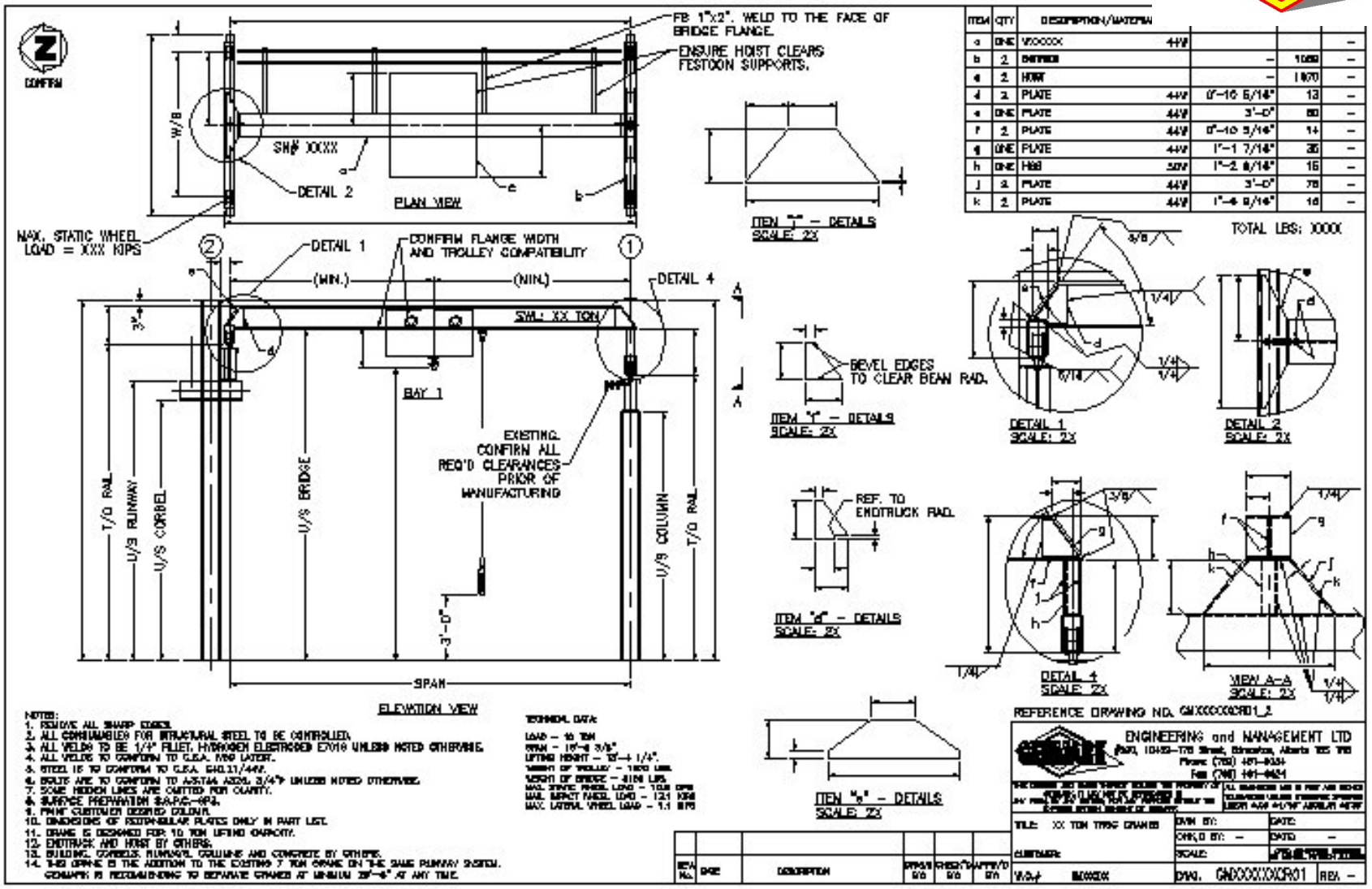

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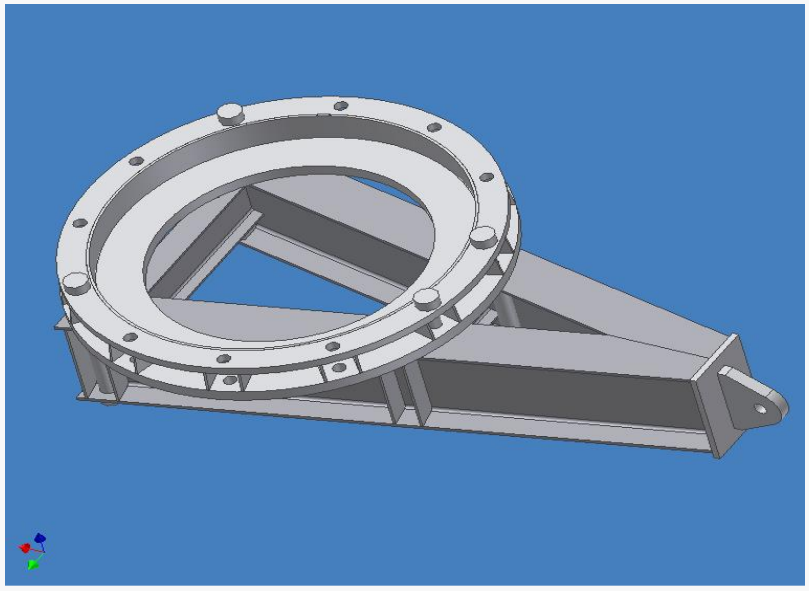
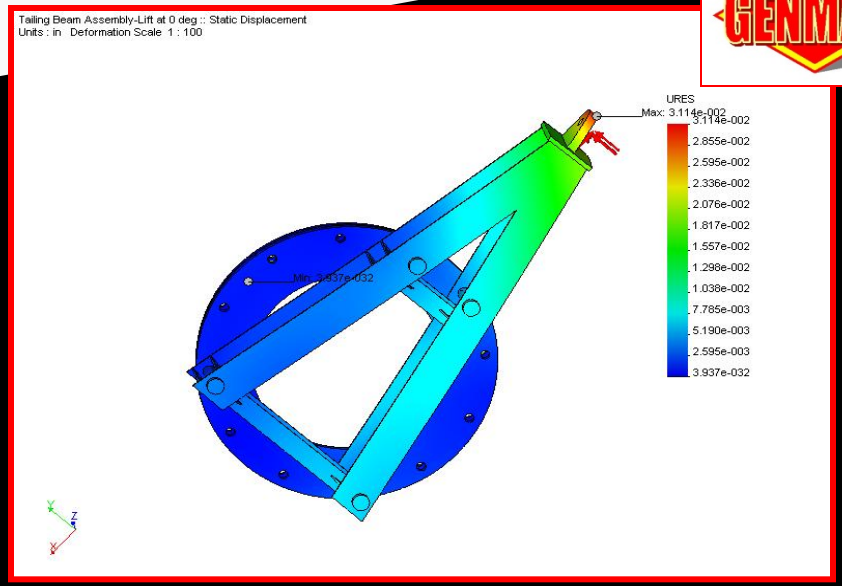
Tailing beam for 185,000 lbs tank





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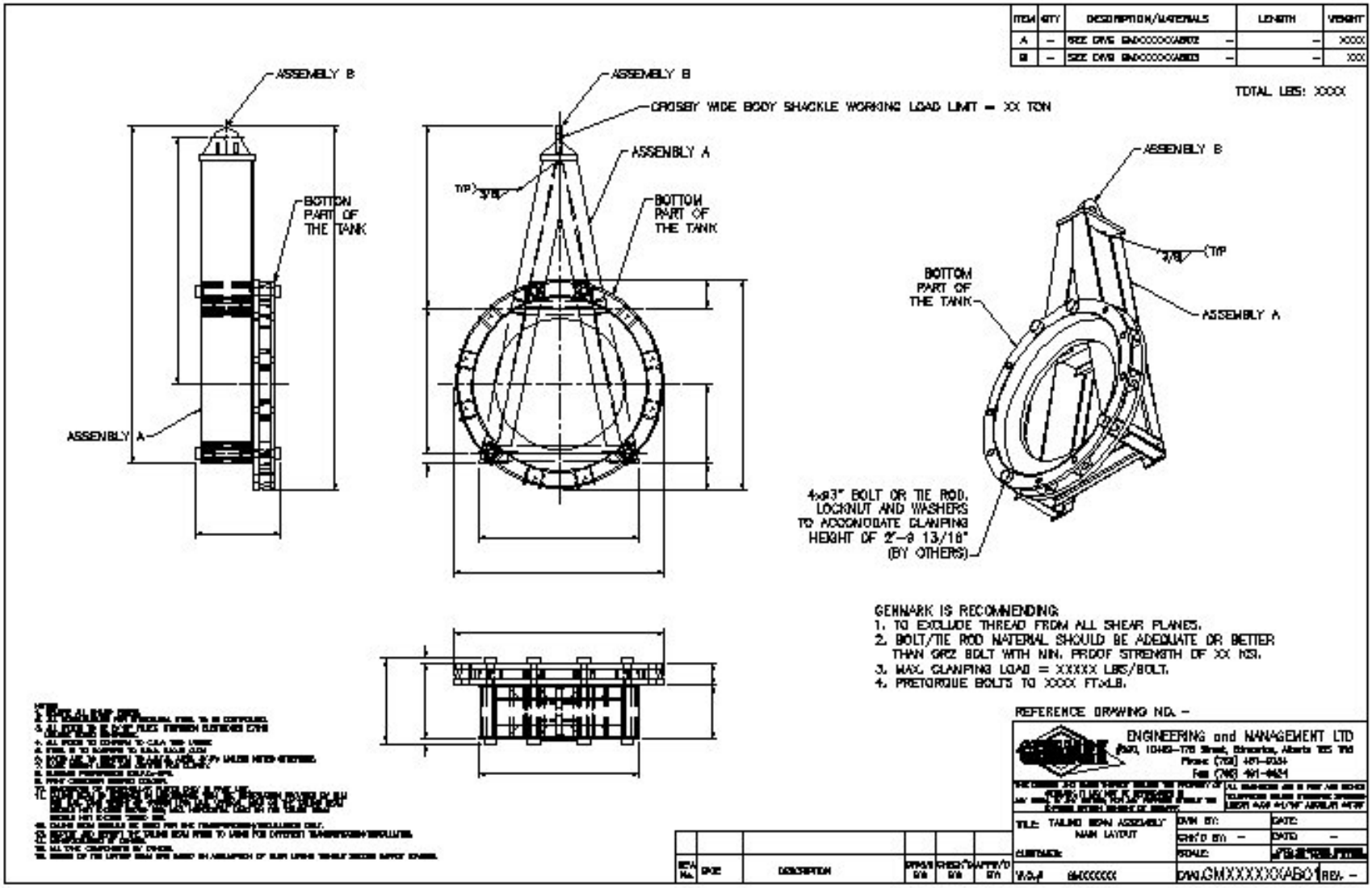
Tailing beam for 185,000 lbs tank



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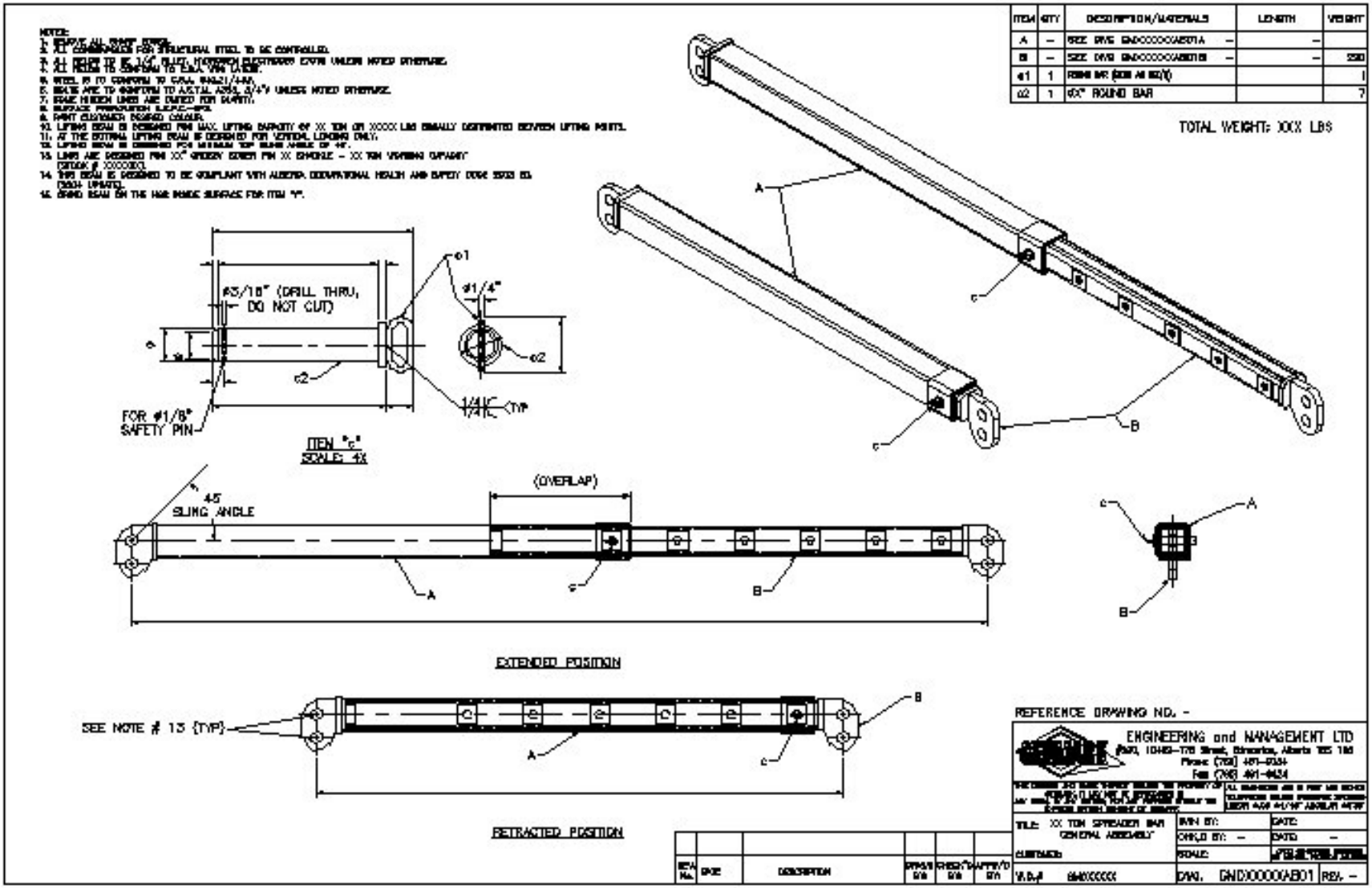
Telescopic lifting beam



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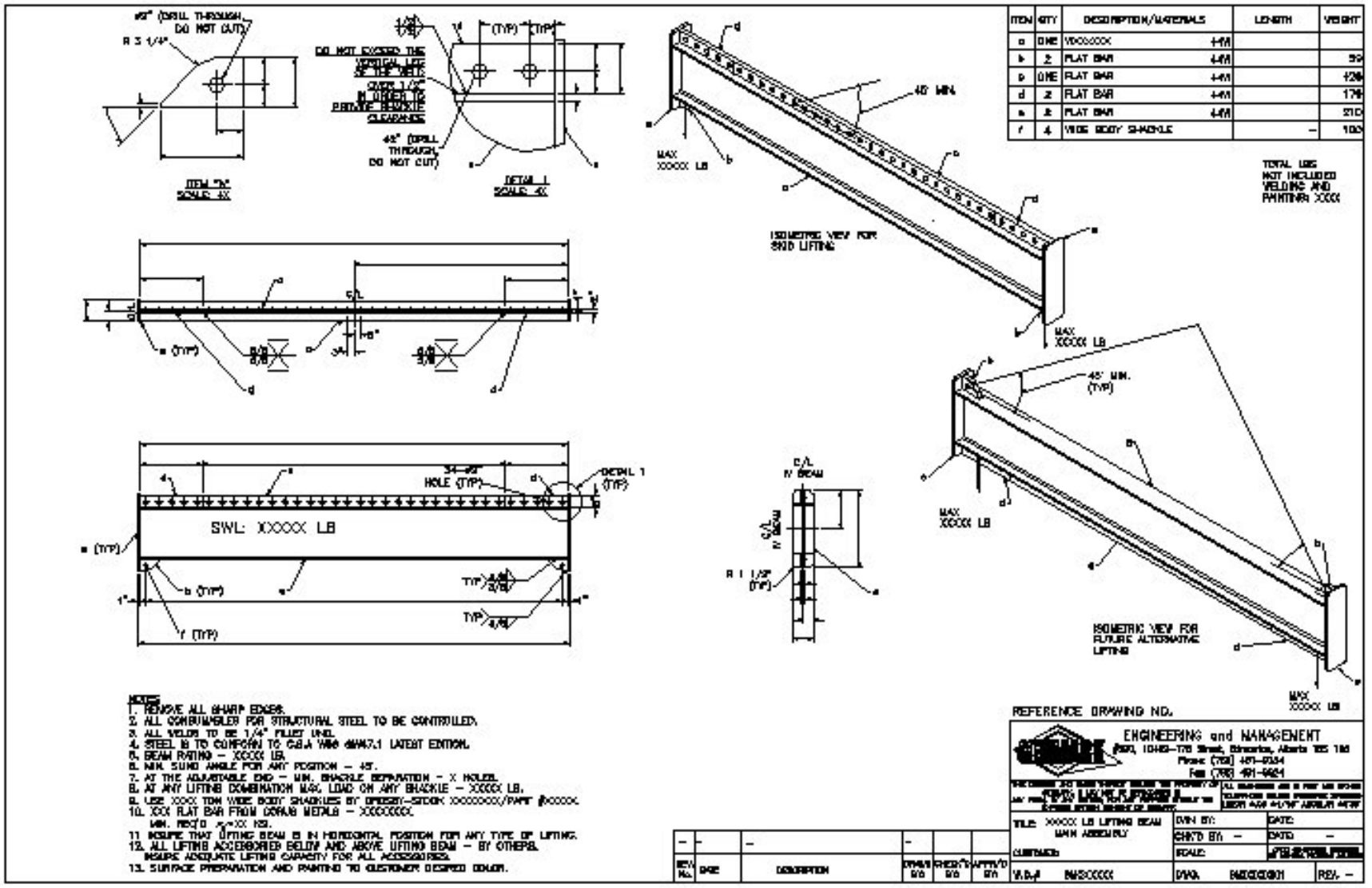
Standard lifting beam



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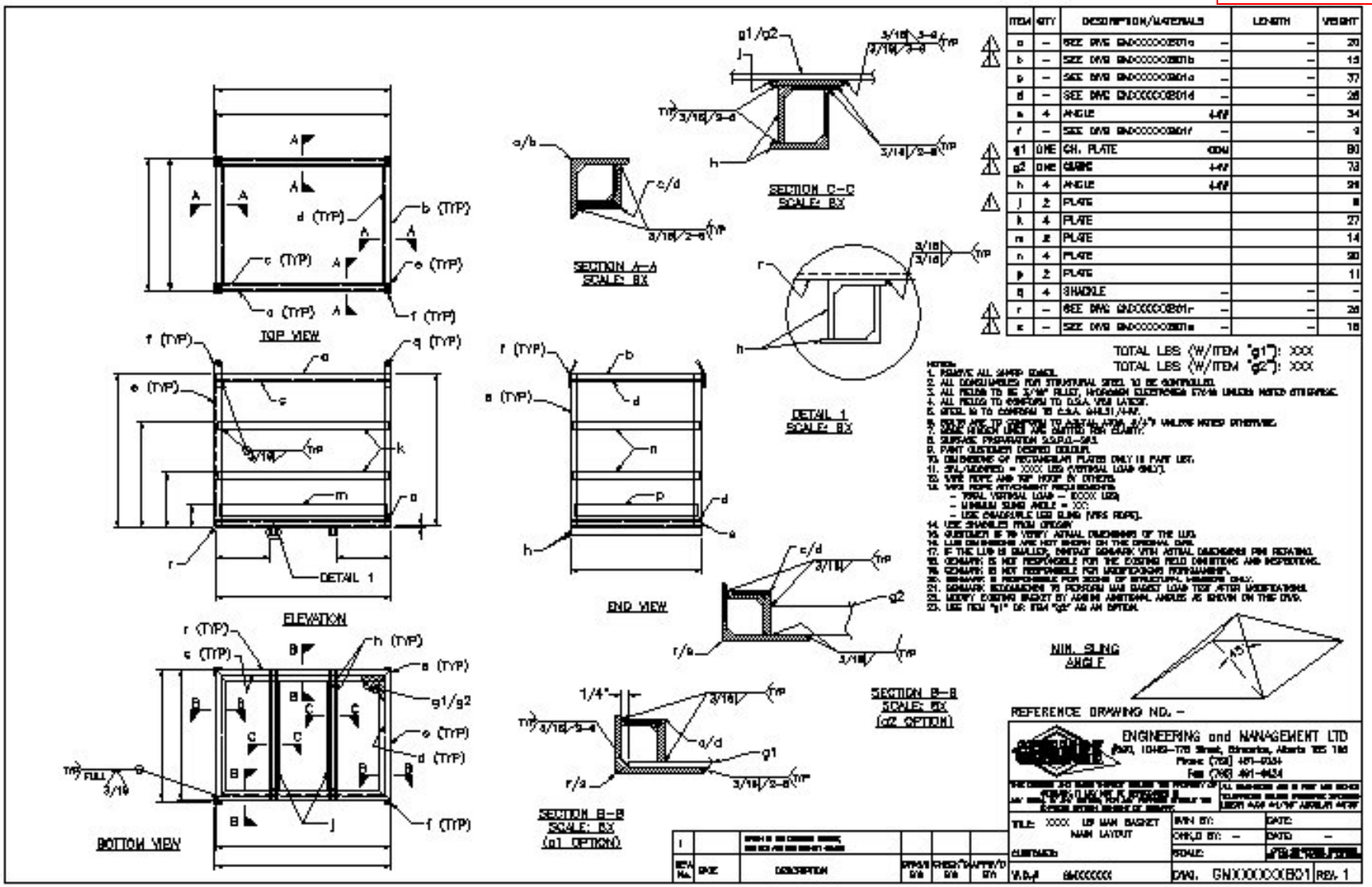
Man basket



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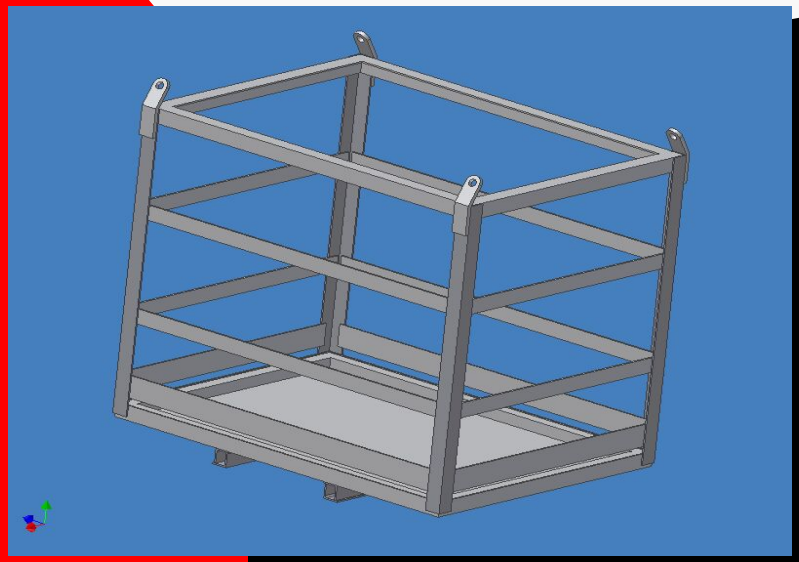
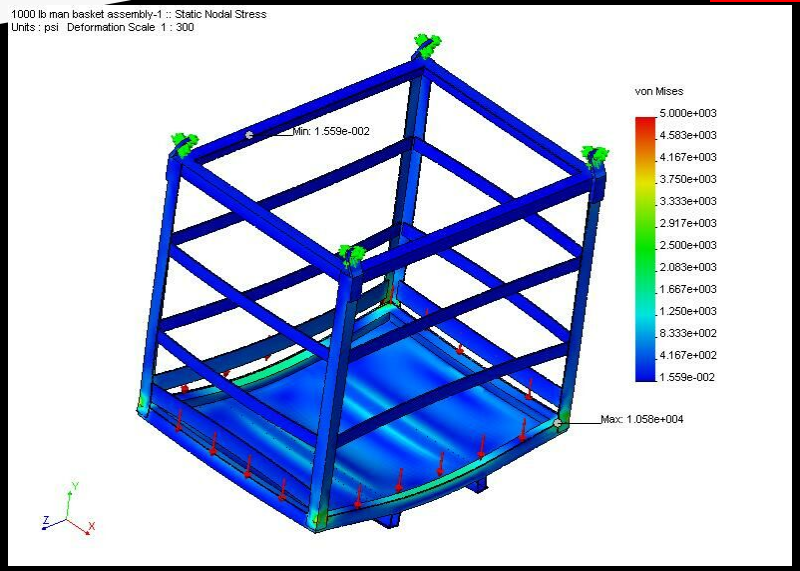
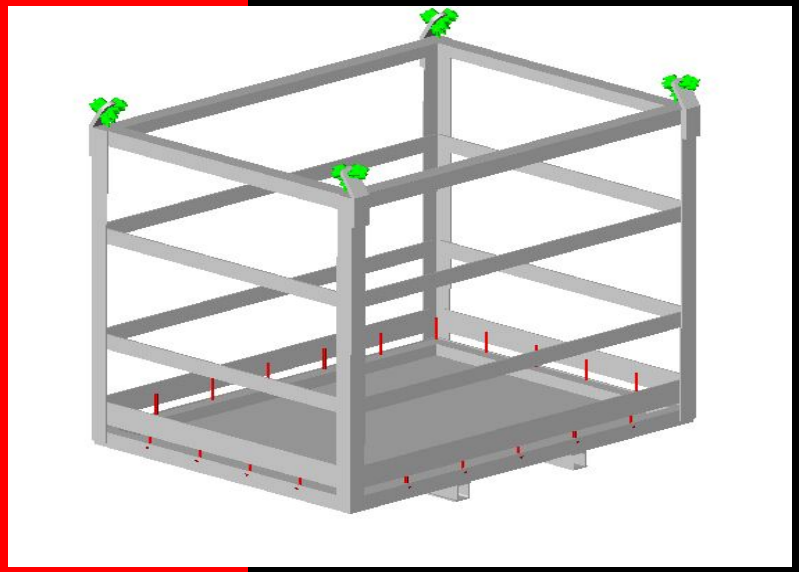
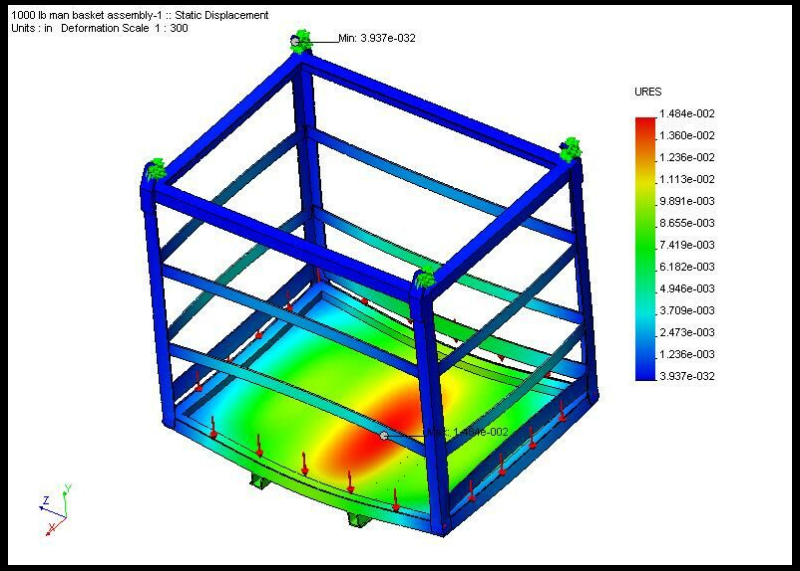
Man basket









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GENMARK is ready to provide our CUSTOMER with the following:

- The latest engineering design technology
- Over 25 years of engineering experience
- Availability and capability to successfully complete any engineering task
- Experience and knowledge for new products
- High quality and accuracy
- Excellent value for your money