Simulation of steel

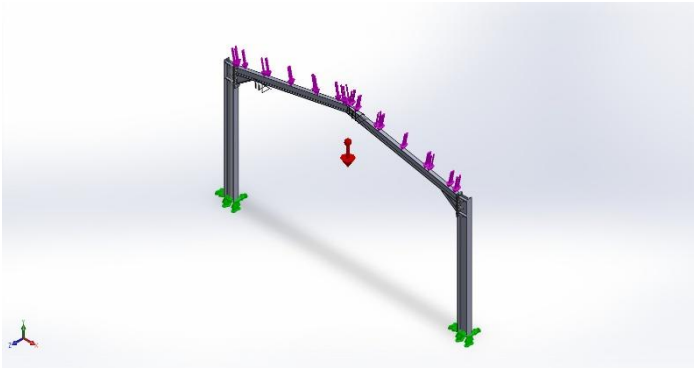
Date: 05 December 2025
Designer: Karthik V S
Study name: Static 1
Analysis type: Static

Table of Contents

Description

No Data

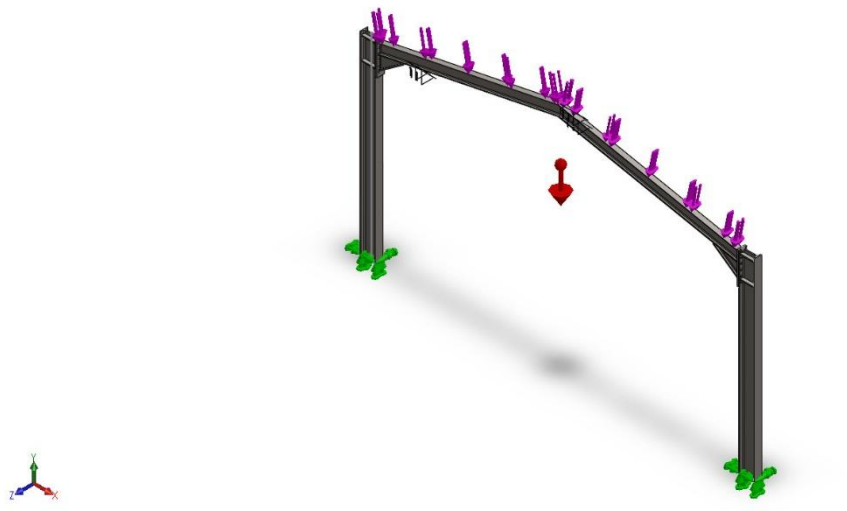
Assumptions



Original Model

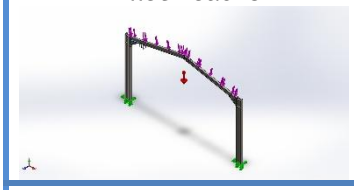
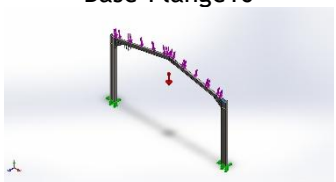
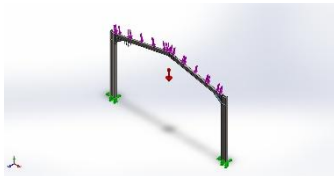
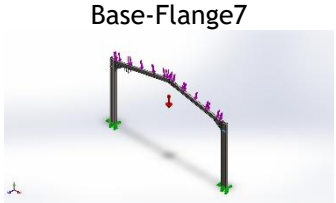
Model Analyzed

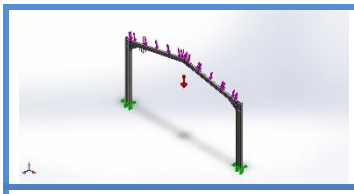
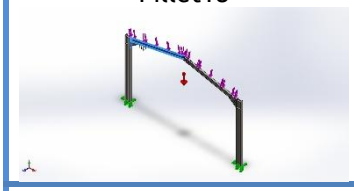
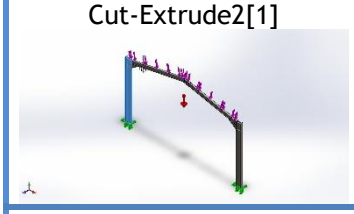
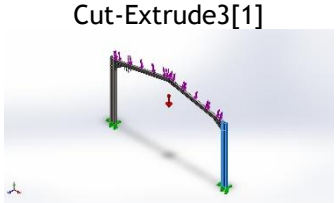
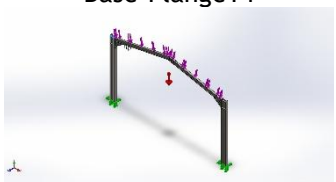
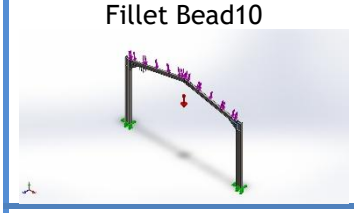
Model Information

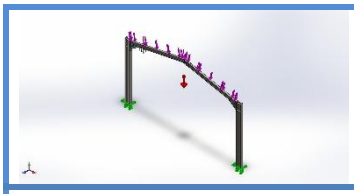
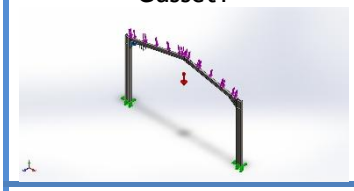
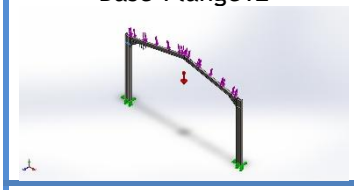
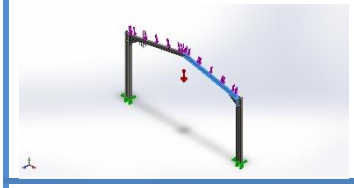


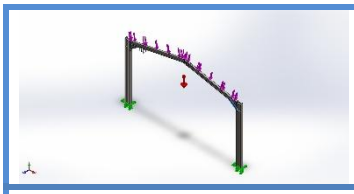
Model name: steel
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
Fillet Bead15 	Solid Body	**Mass:0.0286001 kg** **Volume:3.64333e-06 m^3** **Density:7,850 kg/m^3** **Weight:0.280281 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Base-Flange10 	Solid Body	**Mass:0.156986 kg** **Volume:1.99983e-05 m^3** **Density:7,850 kg/m^3** **Weight:1.53847 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Fillet Bead24 	Solid Body	**Mass:0.0231394 kg** **Volume:2.94769e-06 m^3** **Density:7,850 kg/m^3** **Weight:0.226766 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Base-Flange7 	Solid Body	**Mass:0.156986 kg** **Volume:1.99983e-05 m^3** **Density:7,850 kg/m^3** **Weight:1.53847 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Fillet Bead22	Solid Body	**Mass:0.0286001 kg** **Volume:3.64333e-06 m^3** **Density:7,850 kg/m^3**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025

		**Weight:0.280281 N**	
Fillet18 	Solid Body	**Mass:9.90897 kg** **Volume:0.00126229 m^3** **Density:7,850 kg/m^3** **Weight:97.1079 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Base-Flange11 	Solid Body	**Mass:0.156986 kg** **Volume:1.99983e-05 m^3** **Density:7,850 kg/m^3** **Weight:1.53847 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Cut-Extrude2[1] 	Solid Body	**Mass:17.1584 kg** **Volume:0.00218578 m^3** **Density:7,850 kg/m^3** **Weight:168.152 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Cut-Extrude3[1] 	Solid Body	**Mass:17.1355 kg** **Volume:0.00218286 m^3** **Density:7,850 kg/m^3** **Weight:167.928 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Base-Flange8 	Solid Body	**Mass:0.156986 kg** **Volume:1.99983e-05 m^3** **Density:7,850 kg/m^3** **Weight:1.53847 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Base-Flange14 	Solid Body	**Mass:0.156986 kg** **Volume:1.99983e-05 m^3** **Density:7,850 kg/m^3** **Weight:1.53847 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Fillet Bead10 	Solid Body	**Mass:0.0286001 kg** **Volume:3.64333e-06 m^3** **Density:7,850 kg/m^3** **Weight:0.280281 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Fillet Bead17	Solid Body	**Mass:0.0231394 kg** **Volume:2.94769e-06 m^3**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT**

		**Density:7,850 kg/m^3 Weight:0.226766 N**	Dec 1 22:43:37 2025
Gusset1 	Solid Body	**Mass:0.615448 kg Volume:7.8401e-05 m^3 Density:7,850 kg/m^3 Weight:6.03139 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Mirror2[1] 	Solid Body	**Mass:0.615448 kg Volume:7.8401e-05 m^3 Density:7,850 kg/m^3 Weight:6.03139 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Fillet Bead16 	Solid Body	**Mass:0.0231394 kg Volume:2.94769e-06 m^3 Density:7,850 kg/m^3 Weight:0.226766 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Base-Flange12 	Solid Body	**Mass:0.156986 kg Volume:1.99983e-05 m^3 Density:7,850 kg/m^3 Weight:1.53847 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Base-Flange2 	Solid Body	**Mass:0.604748 kg Volume:7.7038e-05 m^3 Density:7,850 kg/m^3 Weight:5.92653 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Base-Flange9 	Solid Body	**Mass:0.156986 kg Volume:1.99983e-05 m^3 Density:7,850 kg/m^3 Weight:1.53847 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Fillet13 	Solid Body	**Mass:9.9117 kg Volume:0.00126264 m^3 Density:7,850 kg/m^3 Weight:97.1347 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Base-Flange4	Solid Body	**Mass:0.604748 kg Volume:7.7038e-05 m^3**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT**

		**Density:7,850 kg/m^3** **Weight:5.92653 N**	Dec 1 22:43:37 2025
Base-Flange13 	Solid Body	**Mass:0.156986 kg** **Volume:1.99983e-05 m^3** **Density:7,850 kg/m^3** **Weight:1.53847 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025
Fillet Bead18 	Solid Body	**Mass:0.0286001 kg** **Volume:3.64333e-06 m^3** **Density:7,850 kg/m^3** **Weight:0.280281 N**	**C:\Users\HP\Desktop\Test cad\Steel 1.SLDPRT** Dec 1 22:43:37 2025

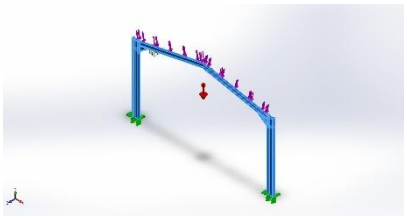
Study Properties

Study name	Static 1
Analysis type	Static
Mesh type	Solid Mesh
Thermal Effect:	On
Thermal option	Include temperature loads
Zero strain temperature	298 Kelvin
Include fluid pressure effects from SOLIDWORKS Flow Simulation	Off
Solver type	Automatic
Inplane Effect:	Off
Soft Spring:	Off
Inertial Relief:	Off
Incompatible bonding options	Automatic
Large displacement	Off
Compute free body forces	On
Friction	Off
Use Adaptive Method:	Off
Result folder	SOLIDWORKS document (C:\Users\HP\Desktop\Test cad)

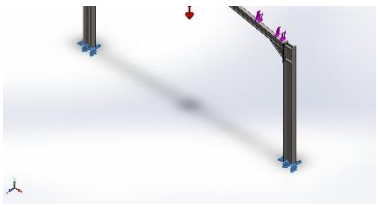
Units

Unit system:	SI (MKS)
Length/Displacement	mm
Temperature	Kelvin
Angular velocity	Rad/sec
Pressure/Stress	N/m^2

Material Properties

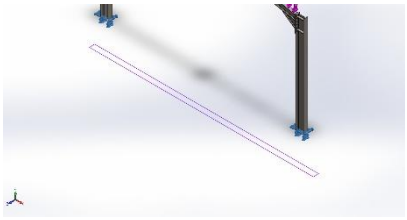
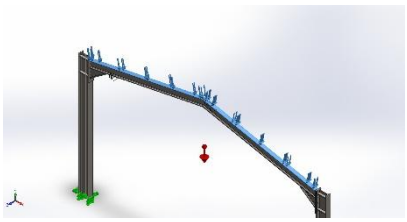
Model Reference	Properties	Components
	**Name:** ASTM A992 **Model type:** Linear Elastic Isotropic **Default failure criterion:** Max von Mises Stress **Yield strength:** 3.45e+08 N/m^2 **Tensile strength:** 4e+08 N/m^2 **Elastic modulus:** 2e+11 N/m^2 **Poisson's ratio:** 0.26 **Mass density:** 7,850 kg/m^3 **Shear modulus:** 7.93e+10 N/m^2	SolidBody 1(Fillet Bead15)(Steel 1-2), SolidBody 2(Base-Flange10)(Steel 1-2), SolidBody 3(Fillet Bead24)(Steel 1-2), SolidBody 4(Base-Flange7)(Steel 1-2), SolidBody 5(Fillet Bead22)(Steel 1-2), SolidBody 6(Fillet18)(Steel 1-2), SolidBody 7(Base-Flange11)(Steel 1-2), SolidBody 8(Cut-Extrude2[1])(Steel 1-2), SolidBody 9(Cut-Extrude3[1])(Steel 1-2), SolidBody 10(Base-Flange8)(Steel 1-2), SolidBody 11(Base-Flange14)(Steel 1-2), SolidBody 12(Fillet Bead10)(Steel 1-2), SolidBody 13(Fillet Bead17)(Steel 1-2), SolidBody 14(Gusset1)(Steel 1-2), SolidBody 15(Mirror2[1])(Steel 1-2), SolidBody 16(Fillet Bead16)(Steel 1-2), SolidBody 17(Base-Flange12)(Steel 1-2), SolidBody 18(Base-Flange2)(Steel 1-2), SolidBody 19(Base-Flange9)(Steel 1-2), SolidBody 20(Fillet13)(Steel 1-2), SolidBody 21(Base-Flange4)(Steel 1-2), SolidBody 22(Base-Flange13)(Steel 1-2), SolidBody 23(Fillet Bead18)(Steel 1-2)
Curve Data:N/A		

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-1		**Entities:** 2 face(s) **Type:** Fixed Geometry

Resultant Forces

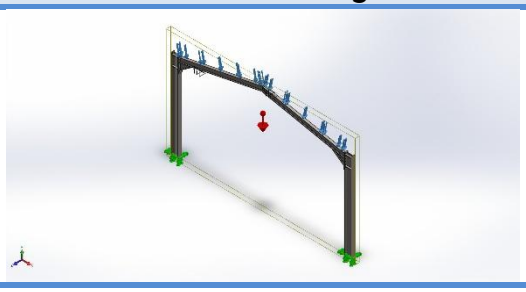
Components	X	Y	Z	Resultant
Reaction force(N)	0.129459	20,168.7	-0.447311	20,168.7
Reaction Moment(N.m)	0	0	0	0

Load name	Load Image	Load Details
Gravity-1		**Reference:** Top Plane **Values:** 0 0 -9.81 **Units:** m/s^2
Force-1		**Entities:** 2 face(s) **Type:** Apply normal force **Value:** 10,000 N

Connector Definitions

No Data

Interaction Information

Interaction	Interaction Image	Interaction Properties
Global Interaction		**Type:** Bonded **Components:** 1 component(s) **Options:** Independent mesh

Mesh information

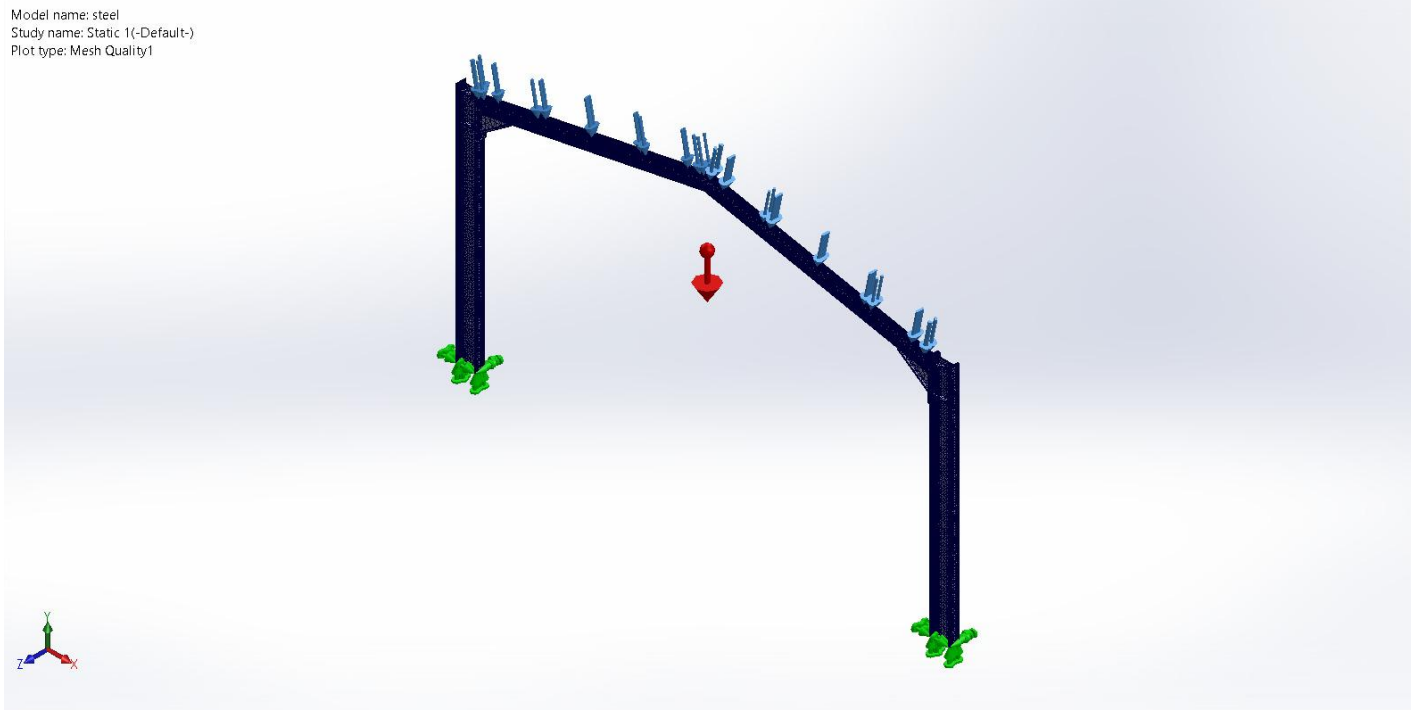
Mesh type	Solid Mesh
Mesher Used:	Blended curvature-based mesh
Jacobian points for High quality mesh	16 Points
Maximum element size	31.1061 mm
Minimum element size	1.5553 mm
Mesh Quality	High
Remesh failed parts independently	Off
Reuse mesh for identical parts in an assembly (Blended curvature-based mesher only)	Off

Mesh information - Details

Total Nodes	705930
Total Elements	388199
Maximum Aspect Ratio	36.916
% of elements with Aspect Ratio < 3	98.1
Percentage of elements with Aspect Ratio > 10	0.00206
Percentage of distorted elements	0
Time to complete mesh(hh;mm;ss):	00:00:18
Computer name:	

Mesh Quality Plots

Name	Type	Min	Max
Quality1	Mesh	-	-



steel-Static 1-Quality-Quality1

Sensor Details

No Data

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	0.129459	20,168.7	-0.447311	20,168.7

Reaction Moments

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	0

Free body forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	9.33306	422.145	18.9509	422.673

Free body moments

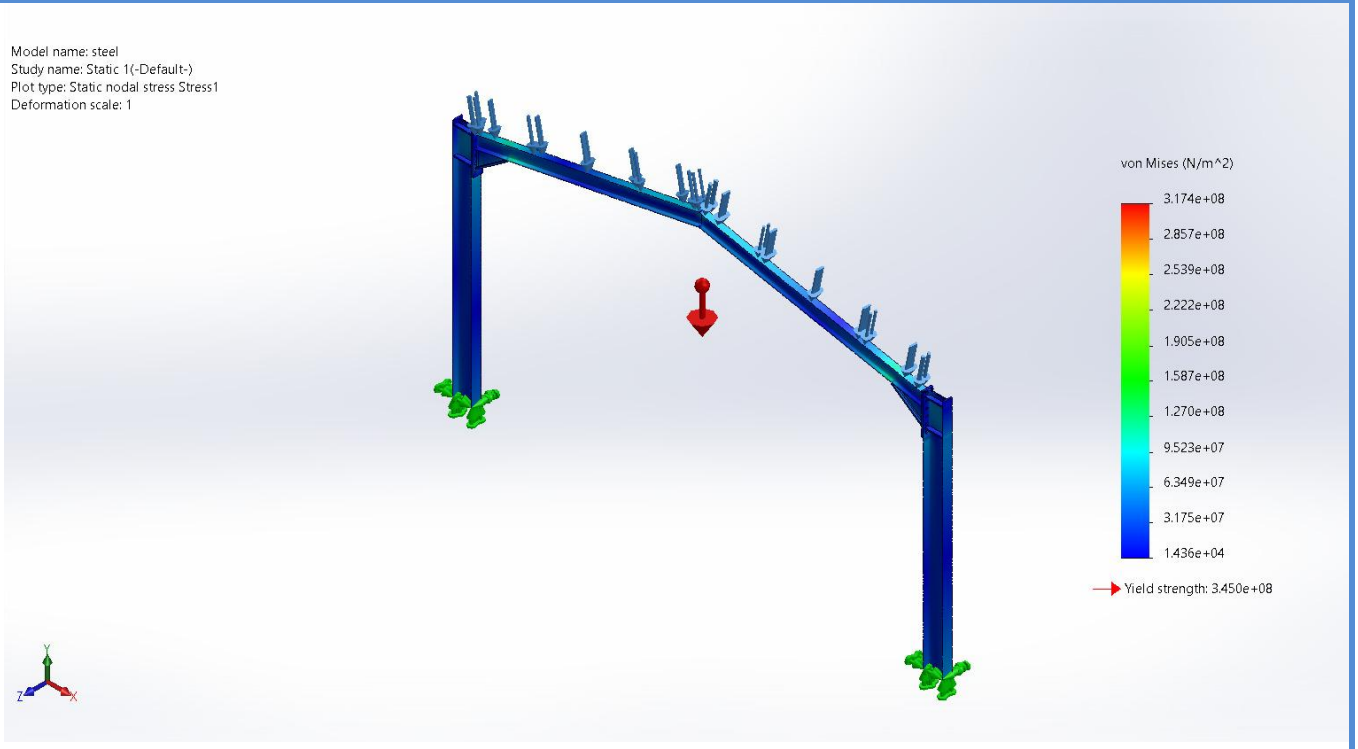
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	1e-33

Beams

No Data

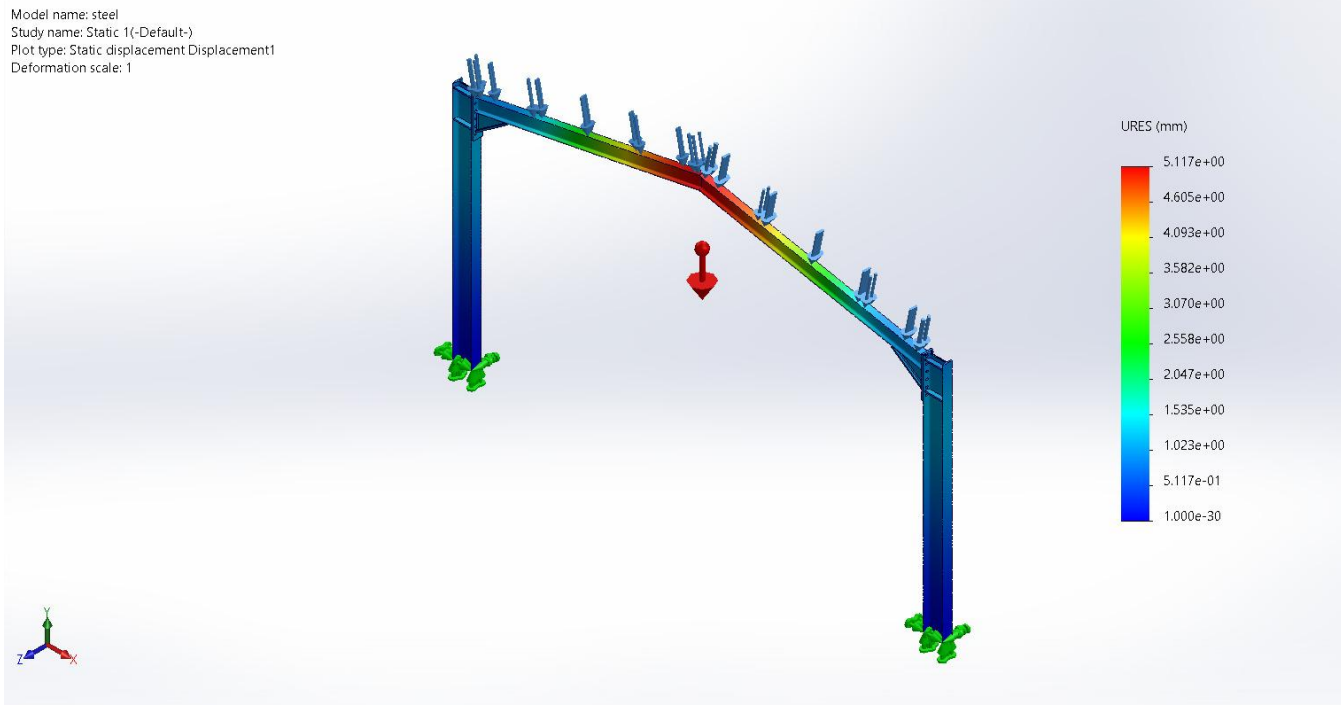
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	1.436e+04N/m^2 Node: 395964	3.174e+08N/m^2 Node: 699800



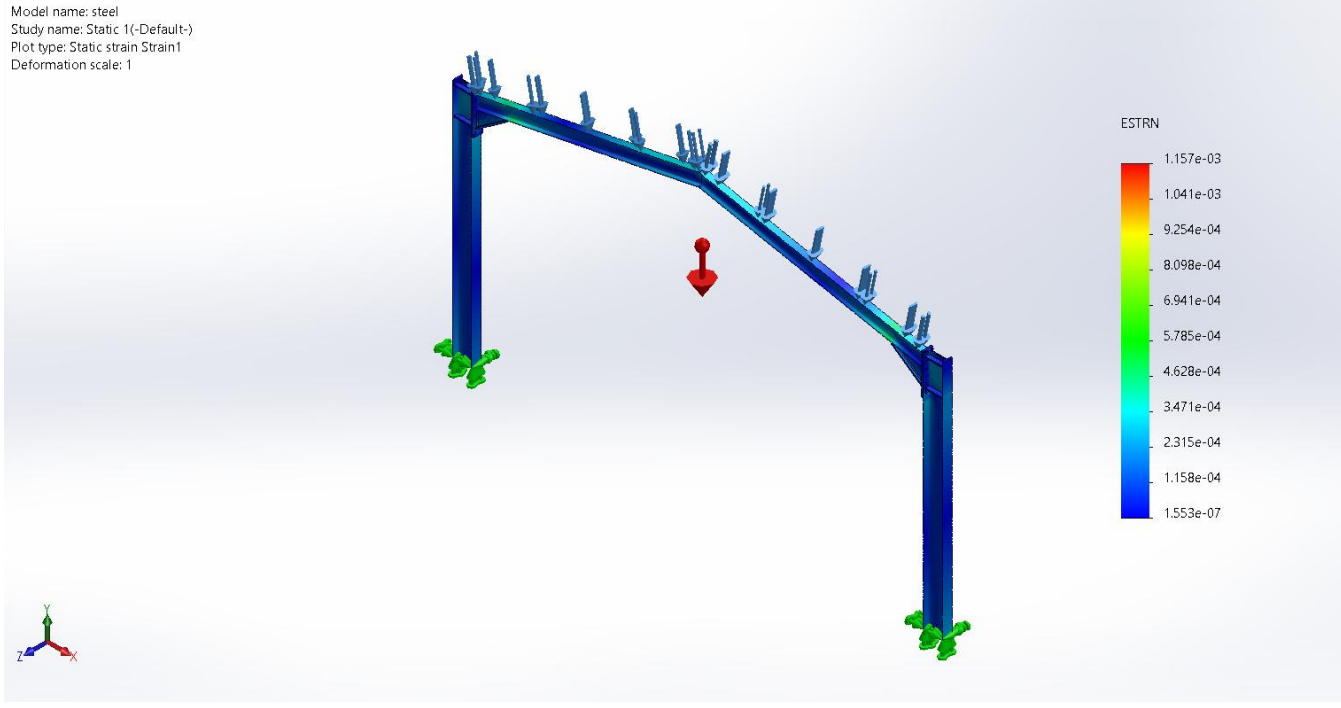
steel-Static 1-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0.000e+00mm Node: 197260	5.117e+00mm Node: 2165



steel-Static 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	1.553e-07 Element: 197499	1.157e-03 Element: 2776



steel-Static 1-Strain-Strain1

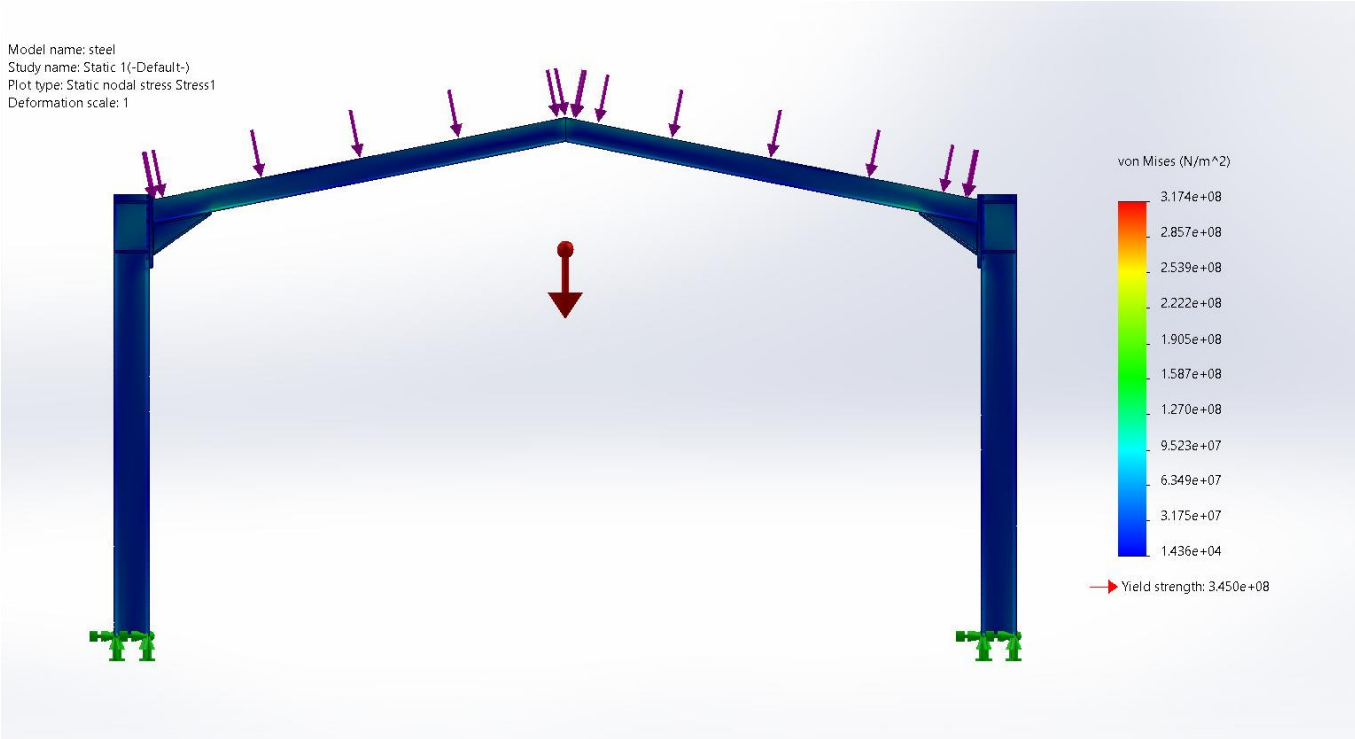


Image-1

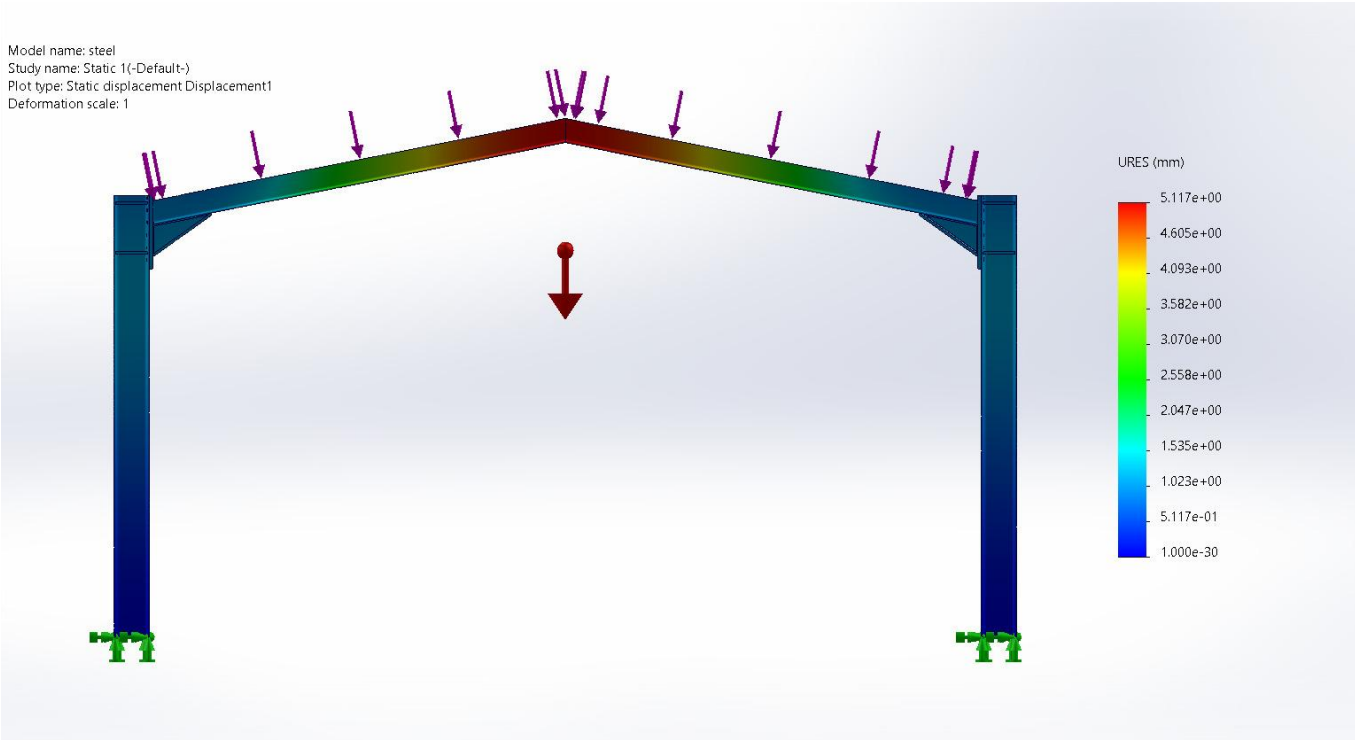


Image-2

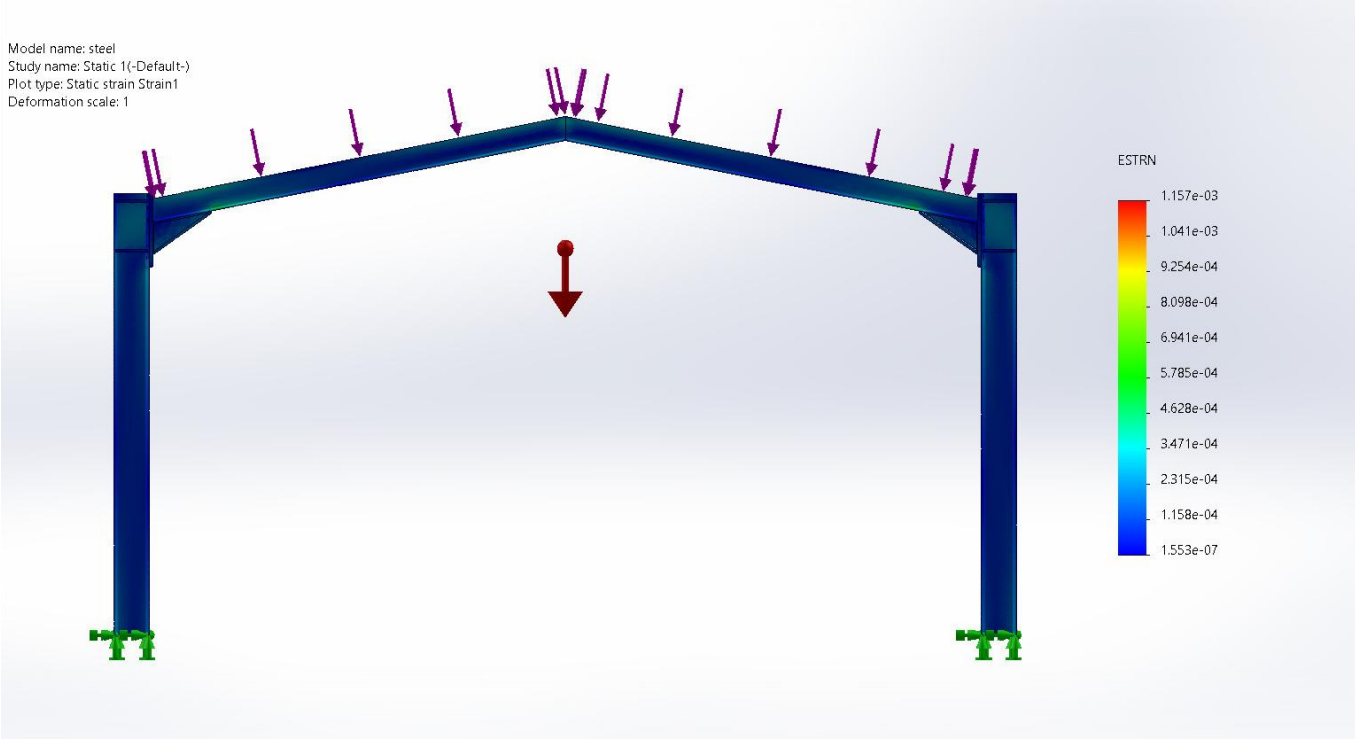


Image-3

Conclusion