

Simulation of steel

Date: 05 December 2025
Designer: Solidworks
Study name: Static 1
Analysis type: Static



Description

No Data

Table of Contents

Description	1
Assumptions.....	2
Model Information	3
Study Properties.....	6
Units	6
Material Properties	7
Loads and Fixtures	8
Connector Definitions	8
Interaction Information	9
Mesh information.....	10
Sensor Details.....	11
Resultant Forces	11
Beams.....	11
Study Results	12
Conclusion.....	14

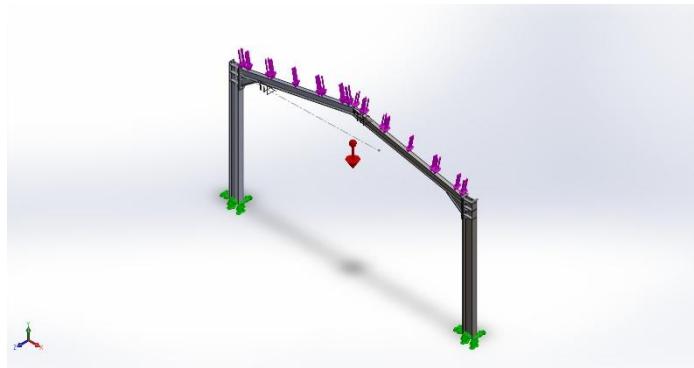


SOLIDWORKS

Analyzed with SOLIDWORKS Simulation

Simulation of steel 1

Assumptions



Original Model



Model Analyzed

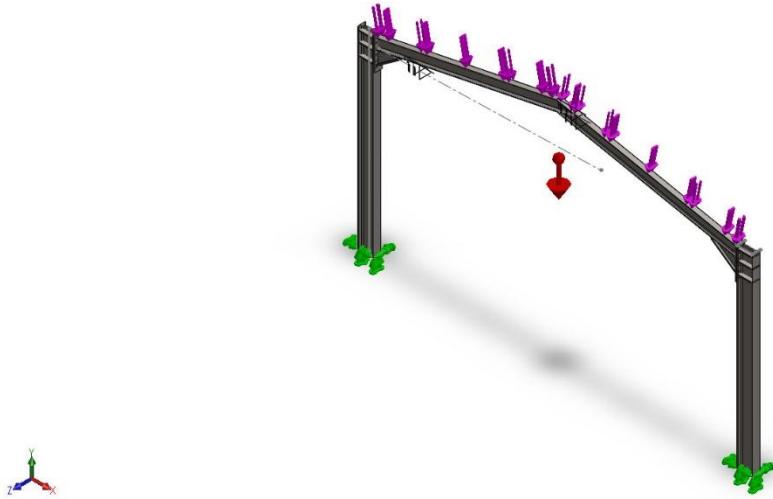
Model Information



Analyzed with SOLIDWORKS Simulation

Simulation of steel

3

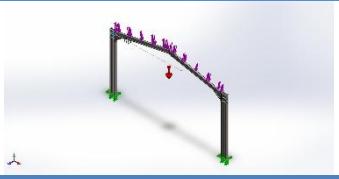
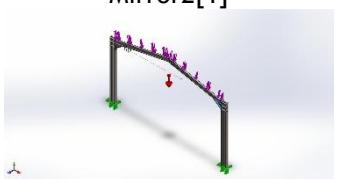
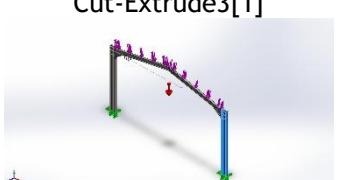
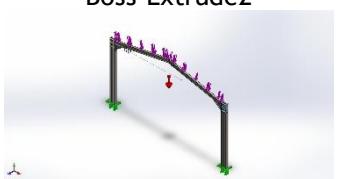
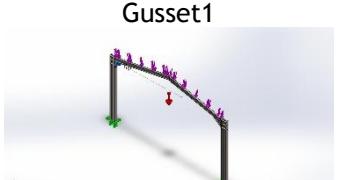


Model name: steel
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
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\Steel 1.SLDprt Dec 4 08:17:11 2025
Boss-Extrude6	Solid Body	Mass: 0.437691 kg Volume: 5.57569e-05 m^3 Density: 7,850 kg/m^3 Weight: 4.28938 N	C:\Users\HP\Desktop\Steel 1.SLDprt Dec 4 08:17:11 2025
Boss-Extrude1	Solid Body	Mass: 0.437691 kg Volume: 5.57569e-05 m^3 Density: 7,850 kg/m^3 Weight: 4.28938 N	C:\Users\HP\Desktop\Steel 1.SLDprt Dec 4 08:17:11 2025
Trim/Extend1[1]	Solid Body	Mass: 8.65652 kg Volume: 0.00110274 m^3 Density: 7,850 kg/m^3 Weight: 84.8339 N	C:\Users\HP\Desktop\Steel 1.SLDprt Dec 4 08:17:11 2025
Boss-Extrude3	Solid Body	Mass: 0.437691 kg Volume: 5.57569e-05 m^3 Density: 7,850 kg/m^3 Weight: 4.28938 N	C:\Users\HP\Desktop\Steel 1.SLDprt Dec 4 08:17:11 2025
Boss-Extrude5	Solid Body	Mass: 0.437691 kg Volume: 5.57569e-05 m^3 Density: 7,850 kg/m^3	C:\Users\HP\Desktop\Steel 1.SLDprt Dec 4 08:17:11 2025



		Weight:4.28938 N	
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\Steel 1.SLDprt Dec 4 08:17:11 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\Steel 1.SLDprt Dec 4 08:17:11 2025
Trim/Extend1[2]	Solid Body	Mass:8.65652 kg Volume:0.00110274 m^3 Density:7,850 kg/m^3 Weight:84.8339 N	C:\Users\HP\Desktop\Steel 1.SLDprt Dec 4 08:17:11 2025
Boss-Extrude2 	Solid Body	Mass:0.441309 kg Volume:5.62177e-05 m^3 Density:7,850 kg/m^3 Weight:4.32482 N	C:\Users\HP\Desktop\Steel 1.SLDprt Dec 4 08:17:11 2025
Boss-Extrude4 	Solid Body	Mass:0.437691 kg Volume:5.57569e-05 m^3 Density:7,850 kg/m^3 Weight:4.28938 N	C:\Users\HP\Desktop\Steel 1.SLDprt Dec 4 08:17:11 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\Steel 1.SLDprt Dec 4 08:17:11 2025



Study Properties

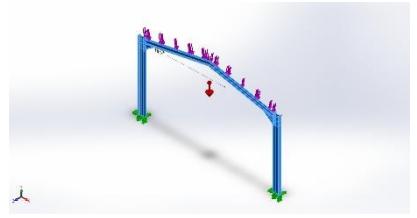
Study name	Static 1
Analysis type	Static
Mesh type	Mixed Mesh
Thermal Effect:	On
Thermal option	Include temperature loads
Zero strain temperature	298 Kelvin
Include fluid pressure effects from SOLIDWORKS Flow Simulation	Off
Solver type	Automatic
Inplane Effect:	Off
Soft Spring:	Off
Inertial Relief:	Off
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)

Units

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



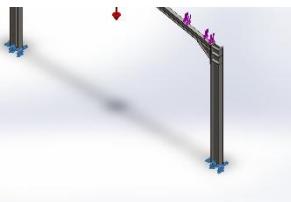
Material Properties

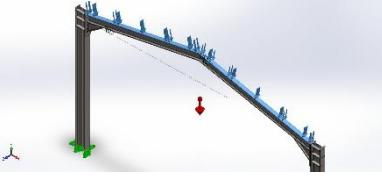
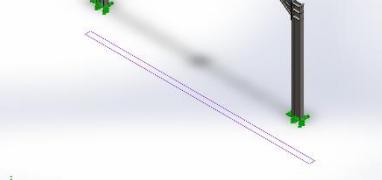
Model Reference	Properties	Components
	<p> Name: ASTM A992 Model type: Linear Elastic Isotropic Default failure criterion: Max von Mises Stress Yield strength: 3.45e+08 N/m² Tensile strength: 4e+08 N/m² Elastic modulus: 2e+11 N/m² Poisson's ratio: 0.26 Mass density: 7,850 kg/m³ Shear modulus: 7.93e+10 N/m² </p>	SolidBody 1(Base-Flange2)(Steel 1-2), SolidBody 2(Cut-Extrude2[1])(Steel 1-2), SolidBody 3(Boss-Extrude6)(Steel 1-2), SolidBody 4(Boss-Extrude1)(Steel 1-2), SolidBody 5(Trim/Extend1[1])(Steel 1-2), SolidBody 6(Boss-Extrude3)(Steel 1-2), SolidBody 7(Boss-Extrude5)(Steel 1-2), SolidBody 8(Base-Flange4)(Steel 1-2), SolidBody 9(Cut-Extrude2[2])(Steel 1-2), SolidBody 10(Mirror2[1])(Steel 1-2), SolidBody 11(Cut-Extrude3[1])(Steel 1-2), SolidBody 12(Trim/Extend1[2])(Steel 1-2), SolidBody 13(Boss-Extrude2)(Steel 1-2), SolidBody 14(Boss-Extrude4)(Steel 1-2), SolidBody 15(Cut-Extrude3[2])(Steel 1-2), SolidBody 16(Gusset1)(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																	
<table border="1"> <thead> <tr> <th>Components</th><th>X</th><th>Y</th><th>Z</th><th>Resultant</th></tr> </thead> <tbody> <tr> <td>Reaction force(N)</td><td>-0.00118256</td><td>20,155.7</td><td>0.000442505</td><td>20,155.7</td></tr> <tr> <td>Reaction Moment(N.m)</td><td>0</td><td>0</td><td>0</td><td>1e-33</td></tr> </tbody> </table>			Components	X	Y	Z	Resultant	Reaction force(N)	-0.00118256	20,155.7	0.000442505	20,155.7	Reaction Moment(N.m)	0	0	0	1e-33
Components	X	Y	Z	Resultant													
Reaction force(N)	-0.00118256	20,155.7	0.000442505	20,155.7													
Reaction Moment(N.m)	0	0	0	1e-33													

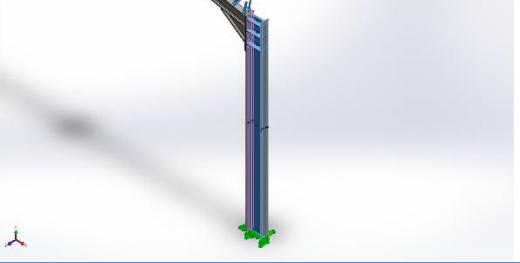
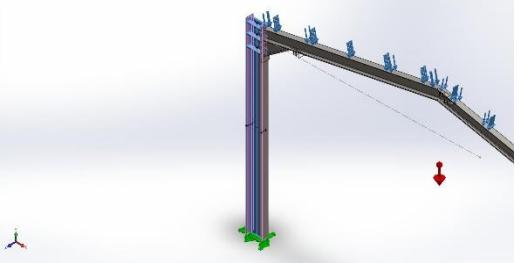
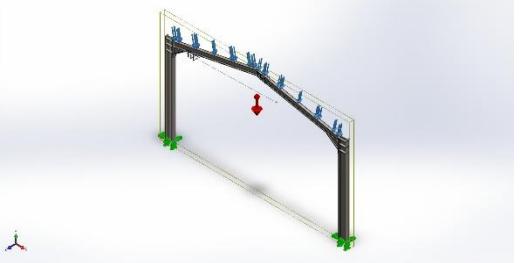
Load name	Load Image	Load Details
Force-1		Entities: 2 face(s) Type: Apply normal force Value: 10,000 N
Gravity-1		Reference: Top Plane Values: 0 0 -9.81 Units: m/s^2

Connector Definitions

No Data



Interaction Information

Interaction	Interaction Image	Interaction Properties
Local Interaction-1		Type: Contact interaction pair Entities: 15 face(s) Advanced: Surface to surface
Local Interaction-2		Type: Contact interaction pair Entities: 15 face(s) Advanced: Surface to surface
Global Interaction		Type: Bonded Components: 1 component(s) Options: Independent mesh



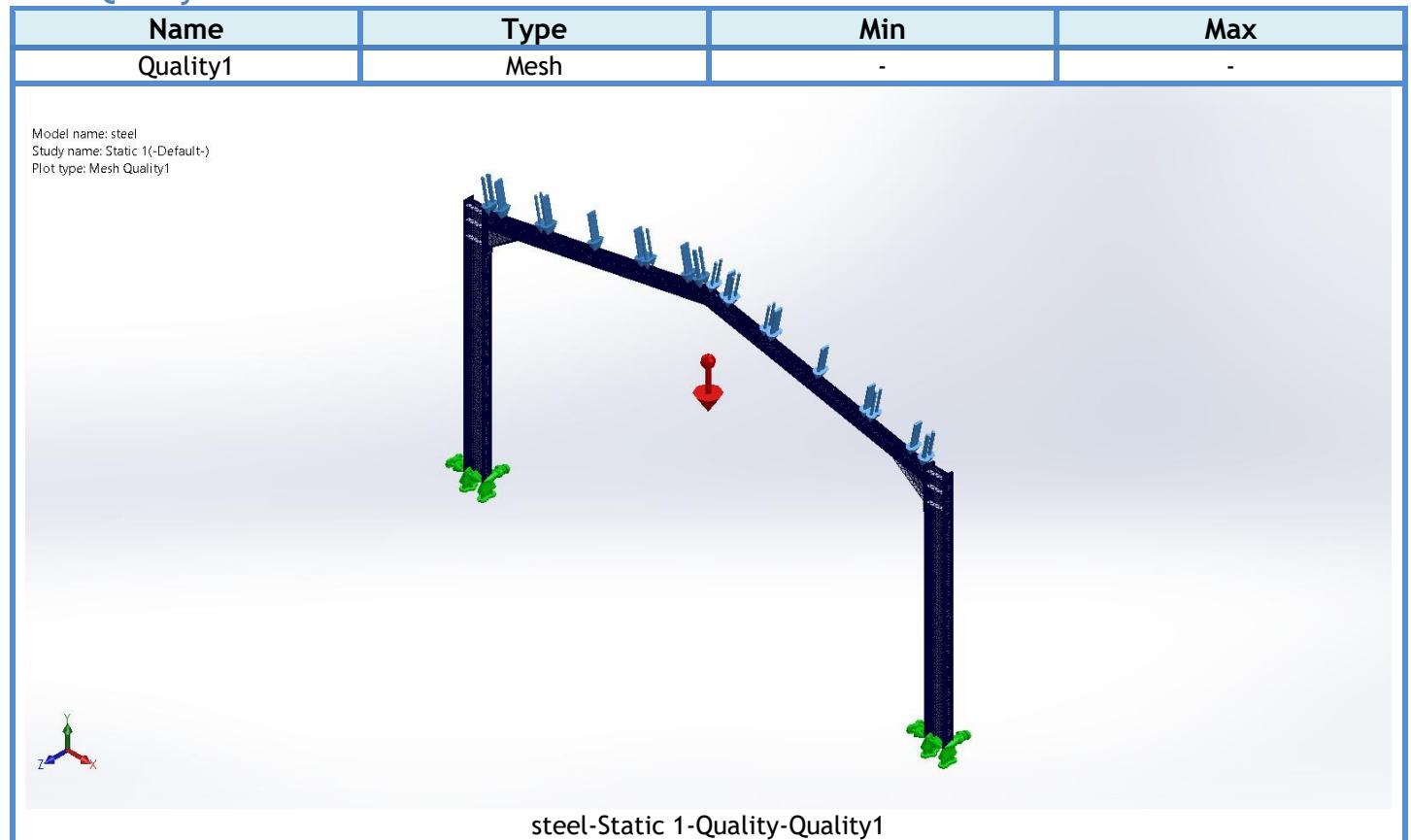
Mesh information

Mesh type	Mixed Mesh
Mesher Used:	Blended curvature-based mesh
Jacobian points for High quality mesh	16 Points
Jacobian check for shell	On
Maximum element size	30.8238 mm
Minimum element size	1.54119 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	682215
Total Elements	374164
Time to complete mesh(hh:mm:ss):	00:00:39
Computer name:	

Mesh Quality Plots



Sensor Details

No Data

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	-0.00118256	20,155.7	0.000442505	20,155.7

Reaction Moments

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

Free body forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	0.0162354	383.786	-0.0570679	383.786

Free body moments

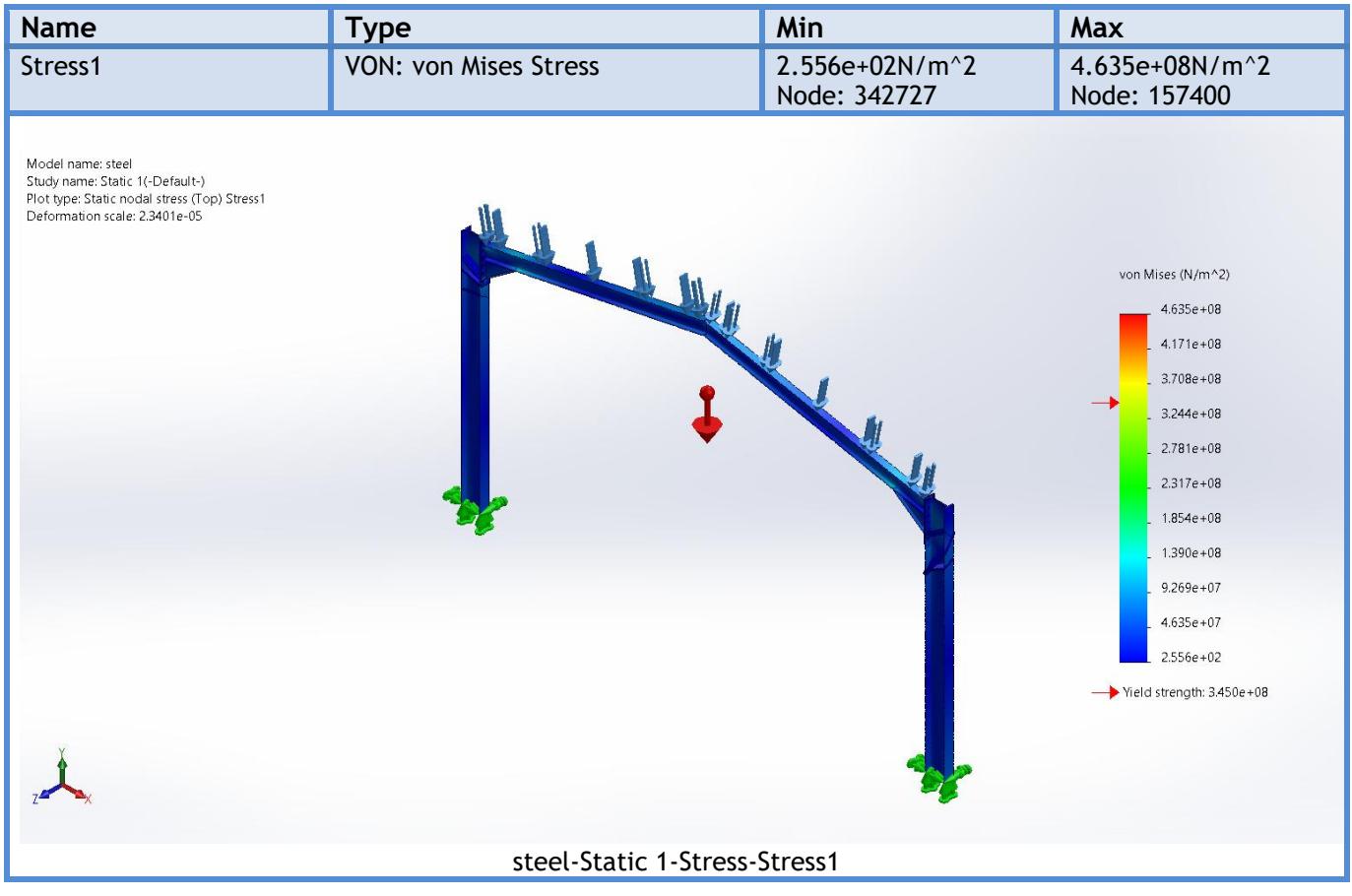
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0.0189691	-0.059974	-0.0746169	0.097593

Beams

No Data



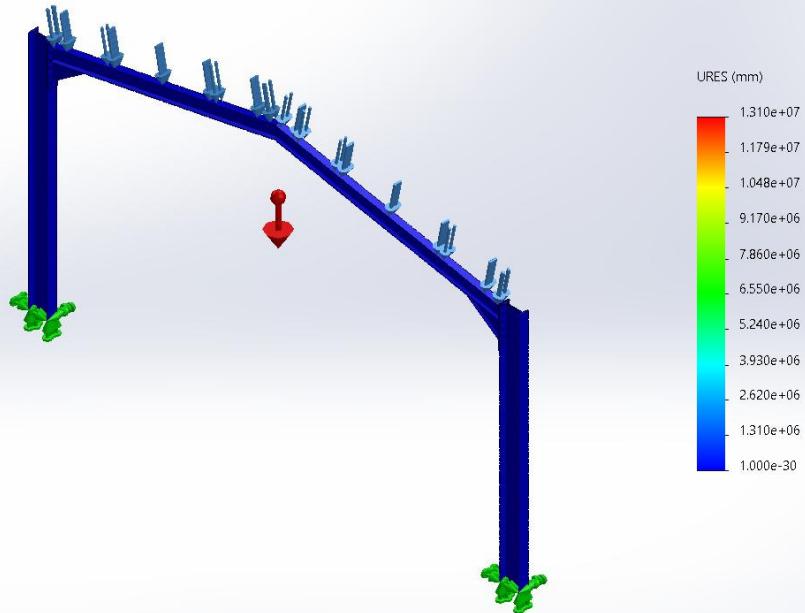
Study Results



Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0.000e+00mm Node: 5125	1.310e+07mm Node: 681714



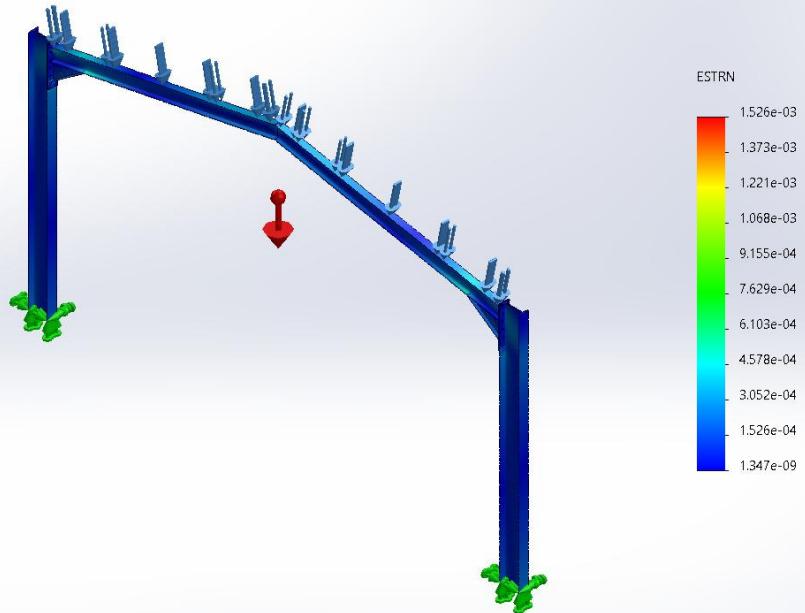
Model name: steel
Study name: Static 1(-Default-)
Plot type: Static displacement Displacement1
Deformation scale: 1



steel-Static 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	1.347e-09 Element: 187698	1.526e-03 Element: 367439

Model name: steel
Study name: Static 1(-Default-)
Plot type: Static strain Strain1
Deformation scale: 1



steel-Static 1-Strain-Strain1



Conclusion



SOLIDWORKS Analyzed with SOLIDWORKS Simulation

Simulation of steel 14