|  |  |  |  |
| --- | --- | --- | --- |
|  | |  | | --- | | **Simulation of Main Frame**  **Date: Wednesday, January 22, 2014 Designer: Carter Mealey, Ben Holleran**  **Study name: Bridge**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc378115444)  [Assumptions 2](#_Toc378115445)  [Model Information 2](#_Toc378115446)  [Study Properties 5](#_Toc378115447)  [Units 5](#_Toc378115448)  [Material Properties 6](#_Toc378115449)  [Loads and Fixtures 7](#_Toc378115450)  [Connector Definitions 7](#_Toc378115451)  [Contact Information 7](#_Toc378115452)  [Mesh Information 8](#_Toc378115453)  [Sensor Details 9](#_Toc378115454)  [Resultant Forces 9](#_Toc378115455)  [Beams 10](#_Toc378115456)  [Study Results 12](#_Toc378115457)  [Conclusion 15](#_Toc378115458) | |
| Description No Data |

|  |
| --- |
| Assumptions |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Main Frame**  ****Current Configuration:** Default<As Machined>** | | | | | ****Beam Bodies:**** | | | | | ****Document Name and Reference**** | ****Formulation**** | ****Properties**** | ****Document Path/Date Modified**** | | **Beam-1(Truss Trim[2])** | **Beam – Uniform C/S** | ****Section Standard-****  ****Section Area: 544.265in^2****  ****Length:636.35mm****  ****Volume:0.000346335m^3****  ****Mass Density:7800kg/m^3****  ****Mass:2.70141kg****  ****Weight:26.4738N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | | **Beam-2(Bottom miter 2[2])** | **Beam – Uniform C/S** | ****Section Standard-ansi inch/square tube/3 x 3 x 0.25****  ****Section Area: 866.845in^2****  ****Length:1828.8mm****  ****Volume:0.00158529m^3****  ****Mass Density:7800kg/m^3****  ****Mass:12.3652kg****  ****Weight:121.179N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | | **Beam-3(Bottom miter 2[1])** | **Beam – Uniform C/S** | ****Section Standard-ansi inch/square tube/3 x 3 x 0.25****  ****Section Area: 1670.35in^2****  ****Length:1524mm****  ****Volume:0.00254566m^3****  ****Mass Density:7800kg/m^3****  ****Mass:19.8561kg****  ****Weight:194.59N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | | **Beam-4(Deck trim)** | **Beam – Uniform C/S** | ****Section Standard-ansi inch/rectangular tube/3 x 2 x 0.25****  ****Section Area: 1350.71in^2****  ****Length:1447.8mm****  ****Volume:0.00195556m^3****  ****Mass Density:7800kg/m^3****  ****Mass:15.2534kg****  ****Weight:149.483N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | | **Beam-5(Truss Trim[5])** | **Beam – Uniform C/S** | ****Section Standard-****  ****Section Area: 544.265in^2****  ****Length:636.35mm****  ****Volume:0.000346335m^3****  ****Mass Density:7800kg/m^3****  ****Mass:2.70141kg****  ****Weight:26.4738N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | | **Beam-6(Truss Trim[3])** | **Beam – Uniform C/S** | ****Section Standard-****  ****Section Area: 544.265in^2****  ****Length:636.35mm****  ****Volume:0.000346335m^3****  ****Mass Density:7800kg/m^3****  ****Mass:2.70141kg****  ****Weight:26.4738N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | | **Beam-7(Truss Trim[1])** | **Beam – Uniform C/S** | ****Section Standard-****  ****Section Area: 544.265in^2****  ****Length:638.672mm****  ****Volume:0.000347599m^3****  ****Mass Density:7800kg/m^3****  ****Mass:2.71127kg****  ****Weight:26.5704N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | | **Beam-8(Truss Trim[6])** | **Beam – Uniform C/S** | ****Section Standard-****  ****Section Area: 544.265in^2****  ****Length:638.672mm****  ****Volume:0.000347599m^3****  ****Mass Density:7800kg/m^3****  ****Mass:2.71127kg****  ****Weight:26.5704N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | | **Beam-9(Truss Trim[4])** | **Beam – Uniform C/S** | ****Section Standard-****  ****Section Area: 544.265in^2****  ****Length:636.35mm****  ****Volume:0.000346335m^3****  ****Mass Density:7800kg/m^3****  ****Mass:2.70141kg****  ****Weight:26.4738N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | | **Beam-10(Bottom miter 1[2])** | **Beam – Uniform C/S** | ****Section Standard-ansi inch/square tube/3 x 3 x 0.25****  ****Section Area: 866.845in^2****  ****Length:1828.8mm****  ****Volume:0.00158529m^3****  ****Mass Density:7800kg/m^3****  ****Mass:12.3652kg****  ****Weight:121.179N**** | ****\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2\Main Frame.SLDPRT****  **Jan 22 00:54:07 2014** | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study Properties  |  |  | | --- | --- | | Study name | Bridge | | Analysis type | Static | | Mesh type | Beam Mesh | | Solver type | Direct sparse solver | | Inplane Effect: | Off | | Soft Spring: | Off | | Inertial Relief: | Off | | Incompatible bonding options | Automatic | | Large displacement | Off | | Compute free body forces | On | | Result folder | SolidWorks document (\\vtcfiles\shared\ELM\ELM4701\Bridge Tester\Design\Solidworks Models\Frame Optimization REV 2) | |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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:**** | **Plain Carbon Steel** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Unknown** | | ****Yield strength:**** | **2.20594e+008 N/m^2** | | ****Tensile strength:**** | **3.99826e+008 N/m^2** | | ****Elastic modulus:**** | **2.1e+011 N/m^2** | | ****Poisson's ratio:**** | **0.28** | | ****Mass density:**** | **7800 kg/m^3** | | ****Shear modulus:**** | **7.9e+010 N/m^2** | | ****Thermal expansion coefficient:**** | **1.3e-005 /Kelvin** | | **SolidBody 1(Truss Trim[2])(Main Frame),**  **SolidBody 2(Bottom miter 2[2])(Main Frame),**  **SolidBody 3(Bottom miter 2[1])(Main Frame),**  **SolidBody 4(Deck trim)(Main Frame),**  **SolidBody 5(Truss Trim[5])(Main Frame),**  **SolidBody 6(Truss Trim[3])(Main Frame),**  **SolidBody 7(Truss Trim[1])(Main Frame),**  **SolidBody 8(Truss Trim[6])(Main Frame),**  **SolidBody 9(Truss Trim[4])(Main Frame),**  **SolidBody 10(Bottom miter 1[2])(Main Frame)** | | **Curve Data:N/A** | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-1** |  | |  |  | | --- | --- | | Entities: | **2 Joint(s)** | | Type: | **Fixed Geometry** | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-1** |  | |  |  | | --- | --- | | Entities: | **2 Joint(s)** | | Reference: | **Face< 1 >** | | Type: | **Apply force** | | Values: | **---, ---, 10000 lbf** | | Moments: | **---, ---, --- lbf·in** | | |

|  |
| --- |
| Connector Definitions No Data |

|  |
| --- |
| Contact Information No Data |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mesh Information  |  |  | | --- | --- | | Mesh type | Beam Mesh |  Mesh Information - Details  |  |  | | --- | --- | | Total Nodes | 247 | | Total Elements | 243 | | Time to complete mesh(hh;mm;ss): | 00:00:02 | | Computer name: | DRACOLYTH | |  | | |

|  |
| --- |
| Sensor Details No Data |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Resultant ForcesReaction Forces  | Selection set | Units | Sum X | Sum Y | Sum Z | Resultant | | --- | --- | --- | --- | --- | --- | | Entire Model | N | 0 | 88964.4 | 4.38451e-016 | 88964.4 |  Reaction Moments  | Selection set | Units | Sum X | Sum Y | Sum Z | Resultant | | --- | --- | --- | --- | --- | --- | | Entire Model | N·m | -1.54772e-013 | 7.4997e-012 | 9.06491 | 9.06491 | |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| BeamsBeam Forces  | Beam Name | Joints | Axial(N) | Shear1(N) | Shear2(N) | Moment1(N·m) | Moment2(N·m) | Torque(N·m) | | --- | --- | --- | --- | --- | --- | --- | --- | | Beam-1(Truss Trim[2]) | 1 | 5504.27 | 0.00138841 | -559.878 | -160.011 | -0.000396805 | -1.46155e-013 | | 2 | -5504.27 | -0.000956741 | 559.881 | -218.535 | -0.00037344 | 1.46153e-013 | | Beam-2(Bottom miter 2[2]) | 1 | 44488.2 | -4.91304e-012 | -786.007 | -284.243 | 3.04103e-012 | 3.80117e-012 | | 2 | -28586.1 | -9.50966e-013 | 2739.79 | -933.427 | -7.68225e-013 | -3.02452e-014 | | 3 | 28586.1 | 9.50966e-013 | -2739.79 | -1049.9 | 7.9821e-014 | 3.02453e-014 | | Beam-3(Bottom miter 2[1]) | 1 | 12499.6 | -230.882 | -4.82211e-013 | -3.8713e-013 | 326.435 | 6.70304e-013 | | 2 | -12499.6 | 230.882 | -8.06557e-012 | -1.70118e-012 | -220.413 | -5.54059e-013 | | 3 | 16330.9 | -22.2372 | -2.2299e-013 | -1.09055e-013 | 308.642 | 5.57374e-013 | | 4 | 12502.8 | 141.669 | -1.85641e-013 | 6.03742e-014 | 282.03 | 1.82823e-013 | | Beam-4(Deck trim) | 1 | -1953.78 | -15902 | 4.46363e-012 | -2.35418e-012 | 2950.9 | 2.58243e-012 | | 2 | 1953.78 | 15902 | -4.46363e-012 | 3.47111e-012 | 1028.25 | -2.58243e-012 | | 3 | -13822.2 | -5278.18 | 4.70448e-012 | 2.24511e-012 | 2625.31 | 2.08829e-012 | | 4 | -13829 | 5337.22 | 5.65953e-012 | 4.13361e-013 | 147.18 | 1.81326e-012 | | 5 | -1839.42 | 15563.5 | 5.32308e-012 | 3.39428e-012 | -1571.08 | 1.30878e-012 | | Beam-5(Truss Trim[5]) | 1 | -5518.91 | -0.00366016 | 544.99 | -154.805 | -0.00103967 | 1.00083e-014 | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | | Beam-6(Truss Trim[3]) | 1 | 5589.51 | -0.00063585 | -117.228 | 57.8102 | -0.000313564 | 1.39206e-013 | | 2 | -5589.51 | -0.000419664 | 117.23 | 26.1154 | 9.34892e-005 | -1.39204e-013 | | Beam-7(Truss Trim[1]) | 1 | -29975.6 | -0.00194658 | 857.857 | 273.025 | 0.000619527 | -9.09229e-014 | | 2 | 29975.6 | 0.000763378 | -857.871 | 274.871 | 0.000244594 | 9.09231e-014 | | Beam-8(Truss Trim[6]) | 1 | -30407.6 | -1.02897e-014 | 846.037 | 271.294 | 1.57306e-013 | -1.57159e-013 | | 2 | 30407.6 | 0.000182593 | -846.037 | 269.046 | 5.80658e-005 | 1.57159e-013 | | Beam-9(Truss Trim[4]) | 1 | -5566.14 | -0.000188081 | 131.381 | 59.3665 | 8.49869e-005 | -2.4356e-013 | | 2 | 5566.14 | 0.00115671 | -131.388 | 24.2387 | 0.000213391 | 2.4356e-013 | | Beam-10(Bottom miter 1[2]) | 1 | -28912.8 | 4.80964e-013 | -2625.44 | 904.625 | -6.34336e-013 | -3.04245e-013 | | 2 | 44476.3 | 0.0166265 | 785.892 | 293.308 | -0.00620528 | 3.69852e-012 | | 3 | 28912.8 | -4.80964e-013 | 2625.44 | 877.148 | 9.60745e-013 | 3.04245e-013 |  Beam Stresses  | Beam Name | Joints | Axial(N/m^2) | Bending Dir1(N/m^2) | Bending Dir2(N/m^2) | Torsional (N/m^2) | Worst Case(N/m^2) | | --- | --- | --- | --- | --- | --- | --- | | Beam-1(Truss Trim[2]) | 1 | 1.01132e+007 | -2.13806e+007 | 53.0208 | -7.77954e-009 | 3.14939e+007 | | 2 | 1.01132e+007 | 2.92006e+007 | -49.8988 | 7.77945e-009 | 3.93138e+007 | | Beam-2(Bottom miter 2[2]) | 1 | 5.1322e+007 | -1.46963e+007 | -1.57232e-007 | 8.22346e-008 | 6.60183e+007 | | 2 | 3.29772e+007 | 4.82614e+007 | -3.97199e-008 | -6.54326e-010 | 8.12386e+007 | | 3 | 3.29772e+007 | -5.42837e+007 | -4.12702e-009 | 6.54327e-010 | 8.72609e+007 | | Beam-3(Bottom miter 2[1]) | 1 | 7.48321e+006 | -1.12285e-008 | -9.4681e+006 | 1.45014e-008 | 1.69513e+007 | | 2 | 7.48321e+006 | 4.93421e-008 | -6.39299e+006 | -1.19865e-008 | 1.38762e+007 | | 3 | 9.77695e+006 | -3.1631e-009 | -8.95204e+006 | 1.20582e-008 | 1.8729e+007 | | 4 | 7.48514e+006 | 1.75113e-009 | -8.18017e+006 | 3.95519e-009 | 1.56653e+007 | | Beam-4(Deck trim) | 1 | -1.44648e+006 | -6.4884e-008 | -5.63782e+007 | 3.31982e-008 | 5.78247e+007 | | 2 | -1.44648e+006 | -9.56679e-008 | 1.96452e+007 | -3.31982e-008 | 2.10917e+007 | | 3 | -1.02332e+007 | 6.1878e-008 | -5.01576e+007 | 2.68459e-008 | 6.03908e+007 | | 4 | -1.02383e+007 | 1.13927e-008 | -2.81194e+006 | 2.33102e-008 | 1.30503e+007 | | 5 | -1.36181e+006 | 9.35504e-008 | 3.00162e+007 | 1.6825e-008 | 3.1378e+007 | | Beam-5(Truss Trim[5]) | 1 | 1.01401e+007 | 2.06849e+007 | -138.92 | 5.32722e-010 | 3.08252e+007 | | 2 | 0 | 0 | 0 | 0 | 0 | | Beam-6(Truss Trim[3]) | 1 | -1.02698e+007 | -7.72456e+006 | -41.8982 | 7.40965e-009 | 1.79944e+007 | | 2 | -1.02698e+007 | 3.48953e+006 | -12.492 | -7.40958e-009 | 1.37594e+007 | | Beam-7(Truss Trim[1]) | 1 | -5.50755e+007 | 3.64814e+007 | -82.7808 | -4.83965e-009 | 9.1557e+007 | | 2 | -5.50755e+007 | -3.67281e+007 | 32.6826 | 4.83966e-009 | 9.18036e+007 | | Beam-8(Truss Trim[6]) | 1 | -5.58692e+007 | 3.62501e+007 | -2.10191e-008 | -8.36525e-009 | 9.21193e+007 | | 2 | -5.58692e+007 | -3.59498e+007 | 7.75872 | 8.36525e-009 | 9.1819e+007 | | Beam-9(Truss Trim[4]) | 1 | -1.02269e+007 | 7.93251e+006 | -11.3559 | -1.29643e-008 | 1.81594e+007 | | 2 | -1.02269e+007 | -3.23876e+006 | 28.5132 | 1.29642e-008 | 1.34657e+007 | | Beam-10(Bottom miter 1[2]) | 1 | 3.33541e+007 | -4.67722e+007 | -3.27974e-008 | -6.58205e-009 | 8.01263e+007 | | 2 | 5.13082e+007 | 1.5165e+007 | 320.834 | 8.00139e-008 | 6.64736e+007 | | 3 | 3.33541e+007 | 4.53516e+007 | -4.96739e-008 | 6.58205e-009 | 7.87057e+007 | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study Results  | Name | Type | Min | Max | | --- | --- | --- | --- | | Stress1 | TXY: Shear in Y Dir. on YZ Plane | 0 ksi  Element: 233 | 13.3608 ksi  Element: 178 | | **Main Frame-Bridge-Stress-Stress1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement1 | URES: Resultant Displacement | 0 in  Node: 57 | 0.0285959 in  Node: 107 | | **Main Frame-Bridge-Displacement-Displacement1** | | | |  | Name | Type | | --- | --- | | Displacement1{1} | Deformed Shape | | **Main Frame-Bridge-Displacement-Displacement1{1}** | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Factor of Safety1 | Automatic | 2.39465  Node: 181 | 20.0803  Node: 148 | | **Main Frame-Bridge-Factor of Safety-Factor of Safety1** | | | | |

|  |
| --- |
| Conclusion |