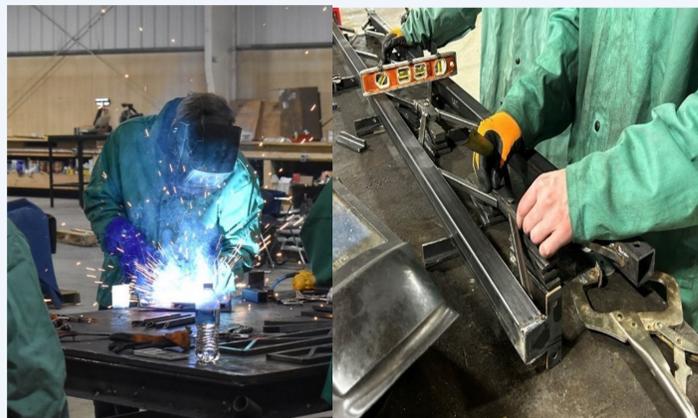
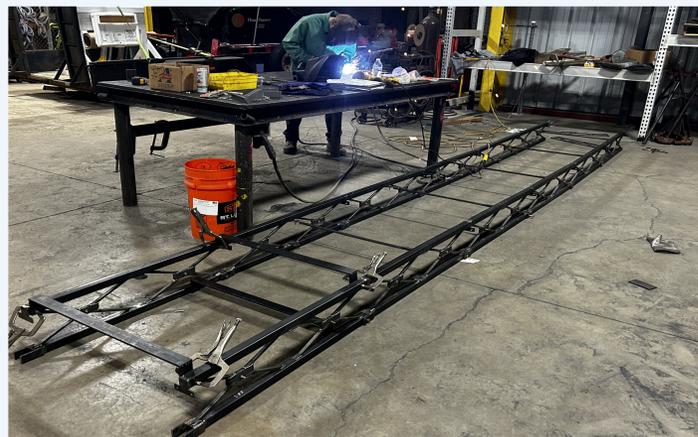




## Fabrication Process



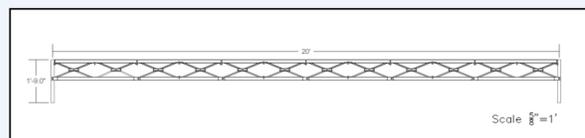
## Design Background

The 2024 Steel Bridge Team opted for the long truss design style after conducting research of various truss types. Their research showed that this design would have the least deflection compared to alternative truss types while remaining inside competition criteria. Additionally the team chose this design to reduce the number of bolts needed to minimize construction time.

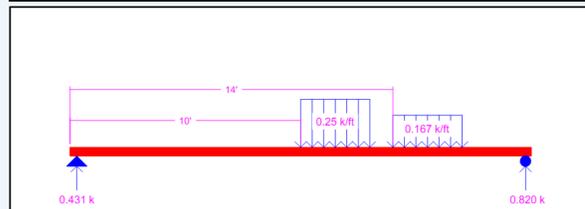
## Structural Design and Analysis

During the design phase, load analysis was performed using RISA 3-D to evaluate all lateral and vertical load combinations. Using this program, the optimal sizes and dimensions of steel members were determined to meet compliance and can handle the required applied loads. ANSYS was used to perform finite element analysis to verify that each connection type could withstand anticipated loads, ensuring that each member had a minimum safety factor of 1.5.

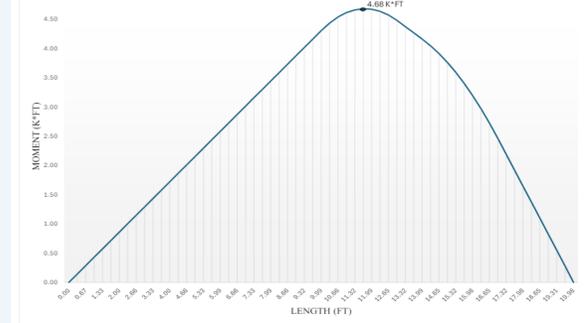
### Side Profile



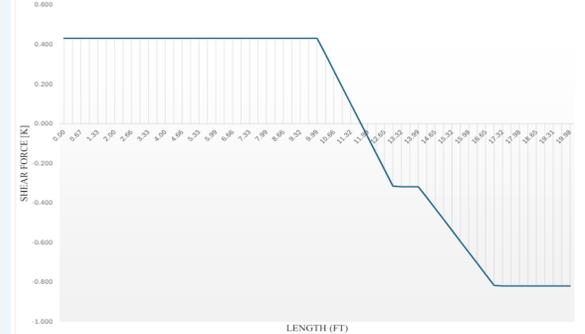
### Loading Diagram



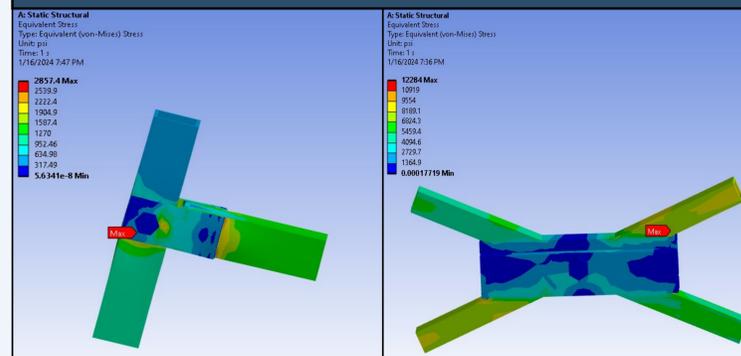
### MOMENT DIAGRAM



### SHEAR DIAGRAM



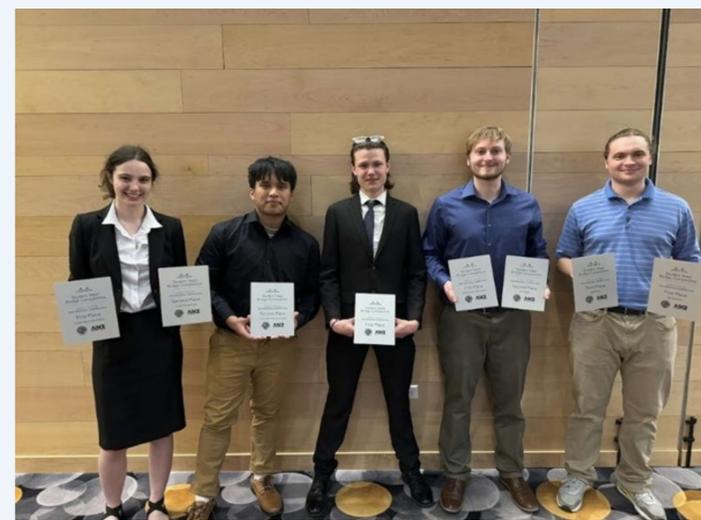
### ANSYS Results



### 2024 Steel Bridge Team



## Competition Results



## Acknowledgment

The Steel Bridge Team is immensely grateful to AISC, Nucor, JICI and Industrial Contracting and Engineering (ICE) for sponsoring this year's bridge. A special recognition to ICE for their support in assisting us during the fabrication of the bridge. We extend our appreciation to Dr. Gary Greene and Professor T.J. Murphy for their guidance and support throughout the whole process. Their expertise played a crucial role and inspired us to thrive for success.

## Sponsors

