Washkewicz College of Engineering

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# 2022 Student Steel Bridge Competition

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Project Sponsors: ASCE CSU, Great Lakes Construction Co., R.E. Warner & Associates, SGA CSU

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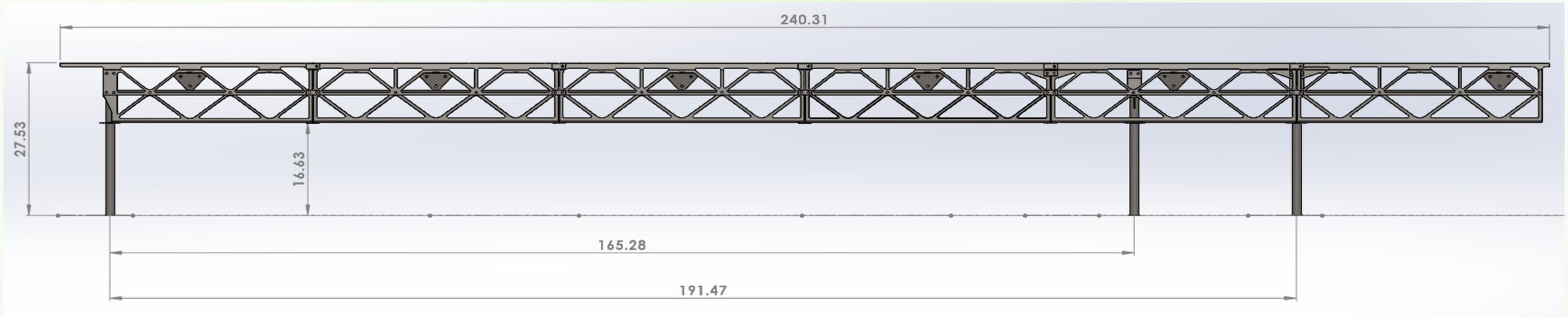
**Cleveland State University**




## Overview and Significance

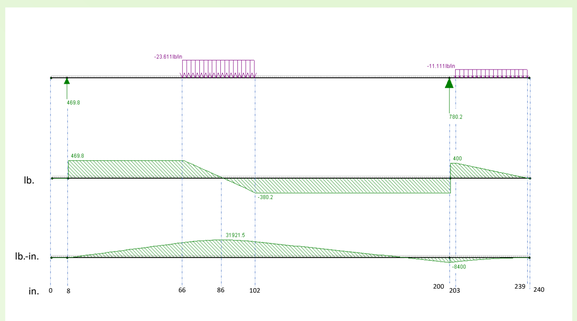
- Competed in 2022 AISC/ASCE Student Steel Bridge Competition at Ohio University
- 1:10 scale model of wildlife overcrossing bridge – requires all components to be below deck-level
- 1:40 scale model 3D printed for display in CSU Civil Engineering Department
- $350 million allocated to wildlife crossings by Infrastructure Investment and Jobs Act (2021)
- Competition demonstrates balance of structural design and construction engineering
- Dynamic design required for cantilevered end and six possible load cases

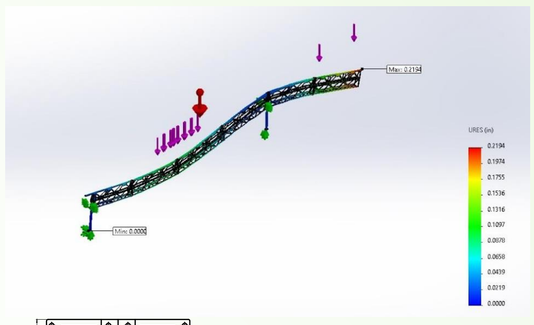
Student Steel Bridge Competition

Smarter. Stronger. Steel. ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS

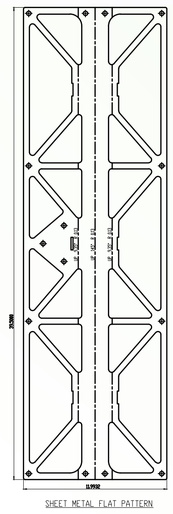
## Design

- Preliminary free body, shear, and moment diagrams created for each loading case
- Used to identify crucial design considerations

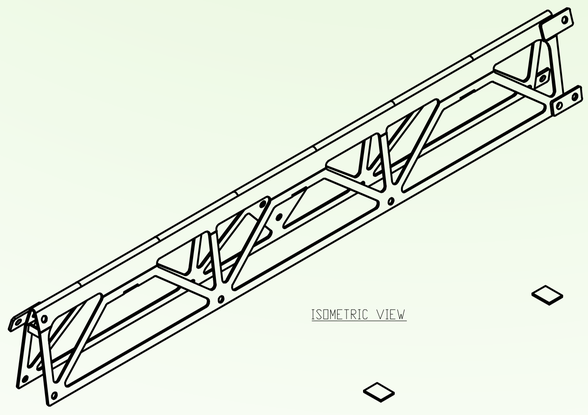



- SolidWorks used to analyze lateral and vertical deflections, stresses, buckling, and stability



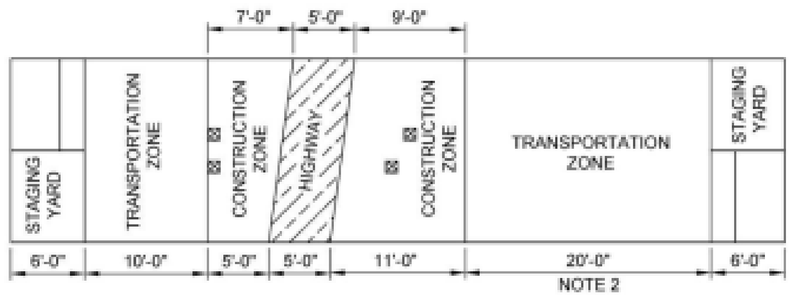

- Bridge model weighs 198 lbs in total
- Design features two layers of Warren trusses
- A36 steel plating laser-cut and bent by fabricator, AH Marty Company




- Priority placed on efficiency of material and ease of fabrication

## Competition

- Awards: Structural Efficiency – 2nd Place, Lightness – 1st Place, Stiffness – 2nd Place
- Total 11 schools competed in event
- Performance based on construction time, vertical and horizontal load testing
- Estimation of material and construction costs required for each load case




CONSTRUCTION SITE PLAN

- Diagram shows competition layout
- No construction allowed within highway zone
- Construction team divided on either side
- Strong communication and coordination required for connections above this zone