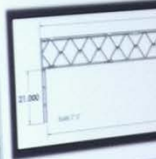







NEW MEXICO STATE UNIVERSITY

NEW



This Double Warren truss configuration was designed to support all of the train members. Additional

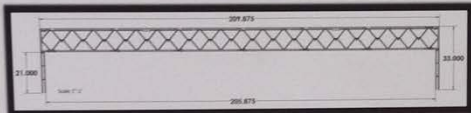


Some of the possible load cases, their and were developed using AISC 360. The provided identified critical areas for use in a design for

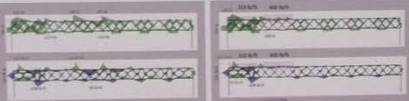
Lateral

Special bracing was designed to provide equal strength for both applied to either side. The bracing was designed to accommodate the temporary members perpendicular to the truss in the event of an event were braced to provide the members in case of possible lateral deflection and interaction between the two trusses.

NEW MEXICO STATE UNIVERSITY



This double Warren truss configuration was selected because the repetition of the 90° angles distribute the applied loads equally amongst all of the truss members. Additionally all of the connections could be designed uniformly across the top and bottom chords.

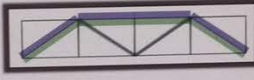


Given all of the possible load cases, shear and moment diagrams were developed using RISA 2D. The plotted maximum values and identified critical areas to use as a baseline for design of members.

Based on the analysis, it was found that load case 1 caused the greatest stresses in shear and moment. The load case produced the highest concentration of applied load and was therefore used to check the adequacy of the design.

Lateral Bracing

Lateral bracing was designed to provide equal strength for loads applied to either train. The lateral load resistance demonstrates the necessary bracing perpendicular to the chord in the plane of the deck were installed on the final design showing their being nearly equal bracing members in order to provide greater stiffness and protection between the two trusses.



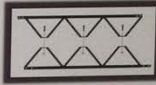
Team Members

Eric Winkler, Matt Jeyaraj, Caleb Salski, Gunnar Apudala, Suman Bhatt, Shoban Saha, Caden Martin, Brenton McDonald, Cary McElroy, Daniel Montoya, Heather Pedersen, Yashwanth Prabhu, Adam Williams, Dan Wolford, Stefan Zlotnik

Designing Critical Connection



Accelerated Bridge Construction Connections



When the deck is loaded, one diagonal at the web will get into tension and the other into compression. This produces an unbalanced stress on the web connection that must be carried by the plates and bolts. The direction of the plates were designed based on the maximum load applied to a connection of this web from the shear analysis. Based on the dimensions of the plate in plate type, the material and properties of the steel, it was determined that a 3/16" thickness of 3-200" would be required to carry the stresses.

The stresses of this design is in the tension of the plate of the members. All members along the top half of the truss are identical in size and half of the truss are also. The compression members decrease load time and stiffen the assembly.

Acknowledgments

We would like to thank the following people and companies for their contributions: Faculty Advisors: Brad Hoenig, Brad Winkler, and Charlie Park; Engineering Advisors: Stables Engineering, Inc; Manufacturer and Donor: Alameda Valley Steel; Manufacturer and Donor: Alameda Valley Steel; Supplier: Metal and Supply Co. and: K&N Industries.

$$F_u = 58 \text{ ksi}$$

$$F_y = 43 \text{ ksi}$$

$$M_u = 22.2 \text{ ft-kips} = 260 \text{ ft-lb}$$

$$M_y = 732 \text{ ft-lb} = 61 \text{ kip-ft}$$

$$P_u = 10 \text{ kips}$$

$$P_y = 10 \text{ kips}$$

$$P_x = 10 \text{ kips}$$

$$P_z = 10 \text{ kips}$$

$$P = 2 \times 10 \text{ kips in plane}$$







