

High School Bridge Design 2018 - 2019

Event Coordinator:

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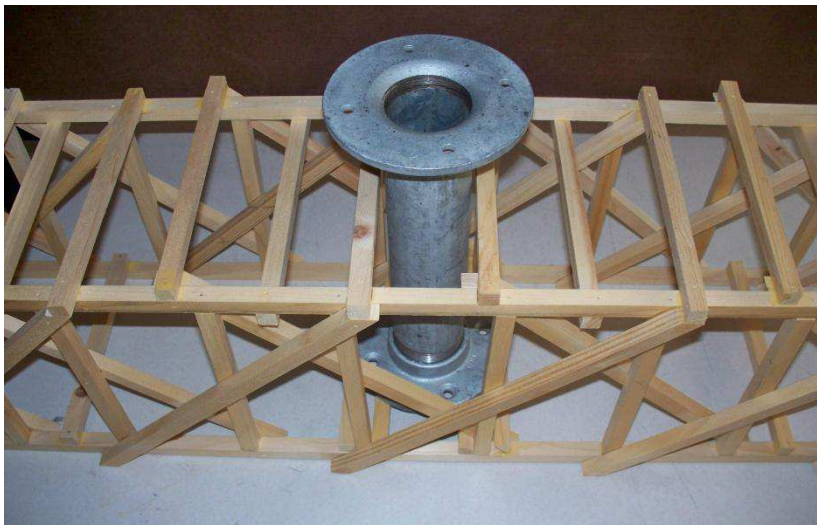
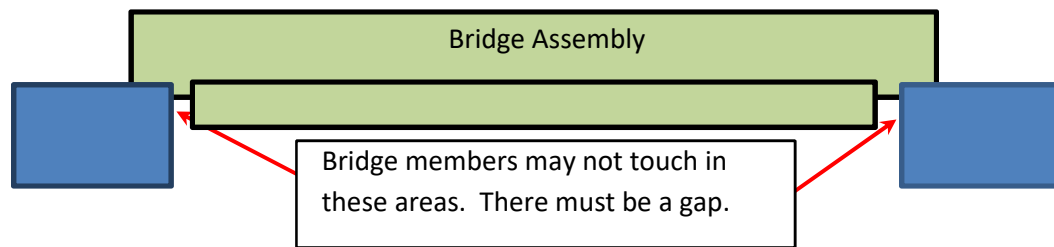
Description:

Build a wood bridge out of 1/2" or smaller material. This bridge will be tested using a single point testing apparatus to failure. Maximum of 3 bridges teams per school.

Design Parameters:

- **Bridge must be a truss bridge built of entirely 1/2" or smaller wood material.**
- **Size Requirements -**
 - Any type of wood material no larger than 1/2" will be allowed (*New 2019 Tech Wars*)
 - Bridge must be a minimum of 60" long in order to be tested.
 - Bridge must be between 6" and 10" in both overall width and height in order to be tested.
 - Any substructure may hang no further than 4" below the top surface of the abutments.
 - Any substructure may not touch the abutments on the bridge tester which are 56" apart.
 - The bridge must have nothing obstructing the interior. In other words, a scaled toy vehicle should be able to pass through your bridge like a real one. No X bracing on bridge openings or throughout the center.
 - The minimum opening throughout the entire bridge for both height and width is 5".
- **Glueing -**
 - Use whatever type of glue you would like!!!
- **Joints -**
 - Joints should be fit tightly together for a stronger bridge. Common woodworking joinery such as laps, miters, pins, nails, and gussets are all allowed and encouraged.
 - Please do not cover the entire side of the bridge with anything. (ex. Giant side covering gusset plates) Please keep any gussets or joint strengthening ideas focused to the bridge joints. Remember, good bridges are always lightweight and efficient.
- **NO ON SITE CHANGES TO ANY BRIDGES WILL BE ALLOWED**
 - Any changes to bridges after they arrive for check in will result in automatic disqualification.
- **Testing Requirements (see [diagram attached](#)):**
 - The center of the bridge must support a **5" round metal flange** connected to a 2" metal pipe that slides over a 1-1/2" safety pipe during testing.
 - Bridge must have a minimum 2-1/2" diameter hole for the safety pipe to pass through in the center of the bridge span.

- The ends of the bridge will rest on the abutments which are 56" apart. No part of the bridge may touch the bottom of the testing structure. The bridge will only be allowed to be supported at the "Tops" of the support platforms (abutments) of the testing device. See diagram below.
- **Bridge Testing:**
 - All members must wear safety glasses during testing.
 - All bridges must be weighed in at the beginning of the competition.
 - Bridge will be tested to failure.
 - A maximum weight will be 400 lbs.
 - For a weight to be counted, the bridge must support it for 3 seconds.
 - Bridge winners will be based on structural efficiency of design.
 - Structural Efficiency = Load supported (grams)or(lbs.)/Mass of Bridge (grams)or(lbs).



**Support flange placed inside of bridge shown above.
Support flange placed on top of bridge shown below.**