



# High School Bridge Design

## Event Coordinator:

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## Description:

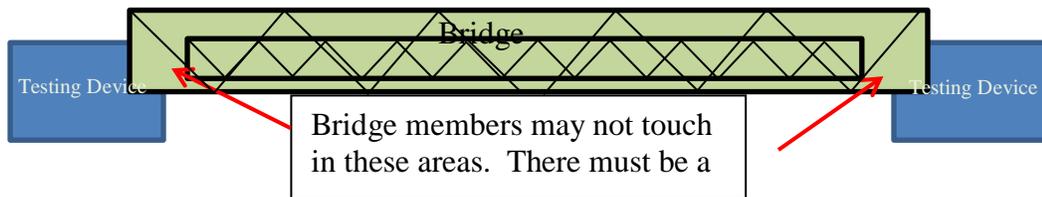
Build a wooden bridge out of 1/2" or smaller pine material. This bridge will be tested using a single point testing apparatus to failure. Maximum of 3 bridges teams per school.

## Rules:

- **Bridge must be a truss bridge built of entirely 1/2" or smaller pine material.**
- **Size Requirements -**
  - 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".
  - No plywood or solid surface roadway allowed on the bridge deck.
- **Glueing –**
  - Yellow wood glue is the only type of glue allowed.
  - Glue can only be in the joints.
  - Glue must not be running out of joints or coating any part of the bridge.
- **Joints –**
  - No gusset plates are allowed in bridge construction.
  - Joints should be fit tightly together without any type of fillers or epoxy used in any openings or cracks that may exist.
  - Joints may be reinforced with wood or metal pins no larger than 1/8".
  - Common woodworking joinery such as lap is allowed.
- **No Lamination allowed anywhere** in bridge construction. Anywhere that wood is offset, or doubled up there must be a minimum of 1/8" between the members. A "Go-No-Go" gauge will be used on site to validate tolerance.
- **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)/Mass of Bridge (grams).



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

