

# 2014 Regional Bridge Building Championship

Saturday, March 1, 2014

At WKU Center for Research & Development Commons Area

2413 Nashville Rd, Bowling Green, KY

## 1. Materials

- The bridge must be constructed only from the official 3/32-inch square cross-section basswood and any commonly available adhesive.
- The official basswood may be notched, cut, sanded or laminated in any manner, but must still be identifiable as the original wood.
- No other materials may be used. The bridge may not be stained, painted or coated in any fashion with any foreign substance.

## 2. Construction

- The bridge mass shall be no greater than 25.00 grams.
- The bridge (see Figure 1, below) must span a gap (**S**) of 300. mm, be no longer (**L**) than 400. mm, have a maximum width (**W**) of 80. mm, be no taller (**H**) than 200. mm above the support surfaces.
- No portion of the bridge may extend below the top of the support surfaces.
- The loading plane (**P**) shall be horizontal and shall lie on the physical top of the bridge between 100. mm and 200. mm above the support surfaces.
- The bridge must be constructed to provide support so that the loading plane (see section 3 below) without rod attached can be pushed smoothly along the loading plane from one loading point to the other. At each of the two loading points, clearance must be provided for the loading rod to be attached to the plate and hang down vertically through the bridge below the loading point.

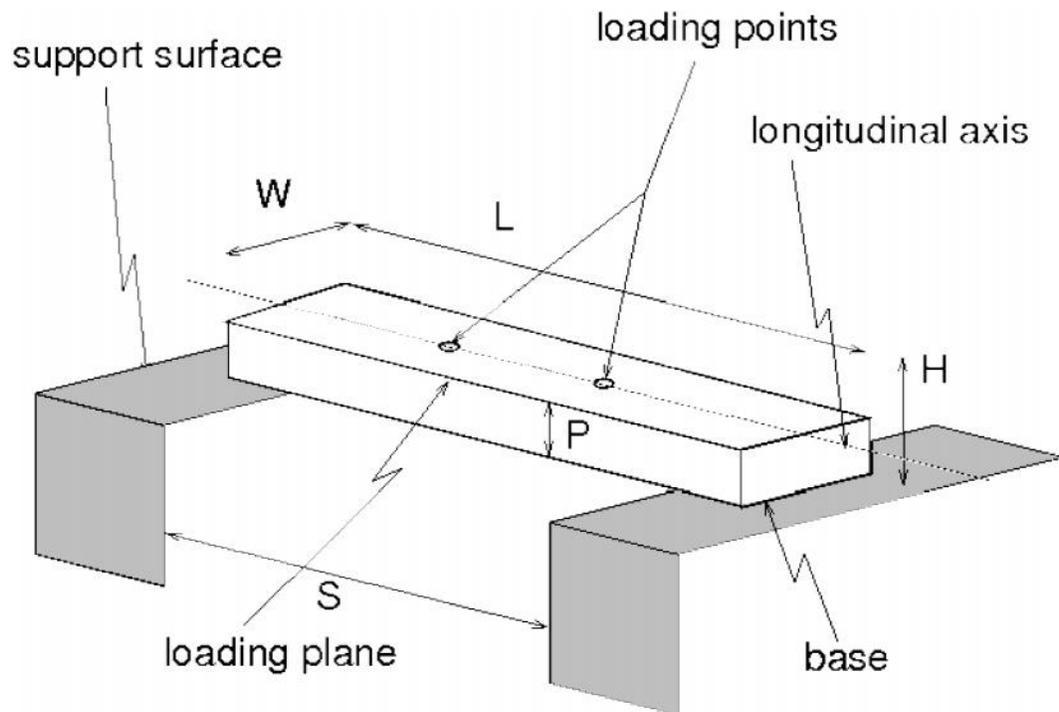


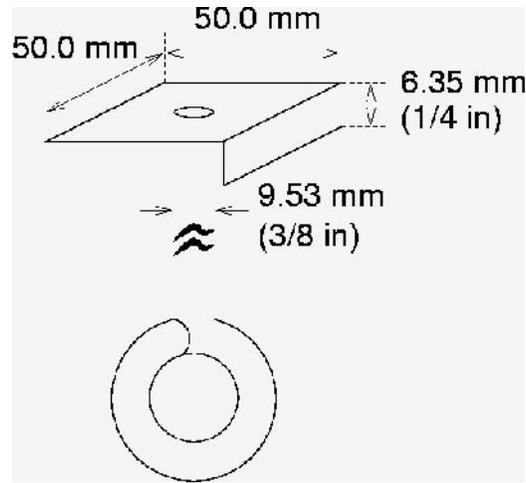
Figure 1: Bridge Schematic (not to scale)

## 3. Loading

- The load will be applied downward, from below, by means of a 50.0 mm square plate (see Figure 2, below) resting on the loading plane of the bridge. The plate will be 6.35 mm (1/4 inch) thick

and will have a 9.53 mm (3/8 inch) diameter eyebolt attached from below at its center. Masses will be supported on a vertical loading rod suspended from the eyebolt.

- b. The two edges of the loading plate will be parallel to the longitudinal axis of the bridge at the time of load application.
- c. The load will be applied on the longitudinal axis of the bridge at one of two loading points, 50. mm on either side of the center of the 300. mm span.



**Figure 2: Loading Plate Detail (not to scale). The square loading plate is 50 mm wide and deep and 6.35 mm (1/4 inch) thick. A 9.53 mm (3/8 inch) thick diameter eyebolt is attached from below to the center of the plate. The loading rod will hang from the eyebolt.**

#### 4. Testing

- a. On the day of the contest, judges will decide which loading location is to be used. It will be the same for all bridges.
- b. The bridge will be centered on the support surfaces.
- c. The loading plate will be placed on the bridge at the specified loading location and the load will be applied from below, as described in section 3 above.
- d. Competition loading will stop at 50. kg. However, loading will continue until bridge failure.
- e. Bridge failure is defined as the inability of the bridge to carry additional load, or a load deflection of 25. mm under the loading location, whichever occurs first.
- f. The bridge with the highest structural efficiency,  $E$ , will be declared the winner. Bridges failing above 50. kg will be considered to have held 50. kg for efficiency calculation.

$$E = \text{Load supported in grams (50,000g maximum)} / \text{Mass of bridge in grams}$$

#### 5. Qualification

- a. All construction and material requirements will be checked prior to testing. Bridges failing to meet these requirements will be disqualified. If physically possible, disqualified bridges may be tested as exhibition bridges at the discretion of the builder and the contest directors.
- b. If, during testing, a condition becomes apparent (i.e., use of ineligible materials, inability to support the loading plate, bridge optimized for a single loading point, etc.) which is a violation of the rules or prevents testing as described above in Section 4, that bridge shall be disqualified.
- c. Decisions of the judges are final.