

2012 BRIMS Regional Bridge Building Championship

sponsored by Scott & Murphy, Inc. and Stupp Bridge Company

Saturday, March 10, 2012

At Stupp Bridge Company, 445 Century St., Bowling Green, KY

2012 High School Rules

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.
- 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) must span a gap (S) of 300 mm, have a minimum clearance (C) of 50 mm above the support surface at mid-span, be no longer (L) than 400 mm, be no taller (H) than 200 mm above the support surfaces, no wider (W) than 80 mm and no narrower than 25 mm at the loading surface.
- The bridge must be constructed to provide a horizontal support for the loading plate at the three loading locations described in 2d. Any portion of the structure above the loading surface must provide clearance for the loading plate to be lowered into position from above.
- The load will be applied with the center of the plate at one of the three (3) loading locations on the longitudinal axis of the bridge: the center, 25 mm to the right of center, and 45 mm to the left of center (see Figure 1). The three loading locations must lie in the same horizontal plane. The loading plane must be located on the roadbed and lie no more than a distance (P) of 100 mm above the base of the bridge (support surface).
- The bridge must be constructed to allow a standard Ping-Pong ball, 38.1 mm diameter to be rolled along the roadbed, from end to end, without falling off or through the bridge. To test this requirement, the bridge will be placed at a 20 degree angle (from horizontal) and the ball will be placed on one end of the roadbed then released. The ball must roll freely from one end to the other. The roadbed must be continuous, horizontal, and at least 250 mm (R) in length.
- The bridge structure may not project below the support surfaces (see Figure 1).

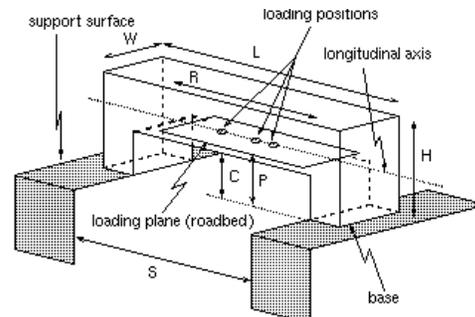


Figure 1. Schematic of Bridge (not to scale)

3. Loading

- a. The load will be applied downward, from below, by means of a 35 mm square plate that is at least 6 mm but less than 13 mm thick. A 9.53 mm (3/8 inch) diameter eyebolt is attached from below to the center of the plate (see Figure 2). The plate will be horizontal with the sides of the plate placed parallel to the longitudinal axis of the bridge.
- b. The load will be applied with the loading plate centered at one of the three positions described in section 2d.

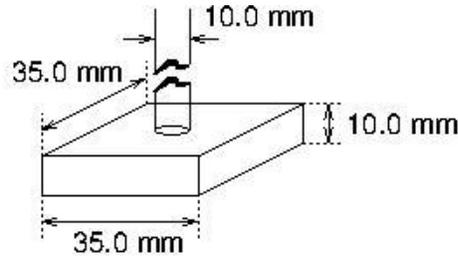


Figure 2. Loading Plate Detail

4. Testing

- a. On the day of the competition, the judges will decide which one of the three loading locations will be used for the competition; it will be the same for all bridges.
- b. The loading plate will be located on the bridge at the specified loading location. The load will be applied as described in section 3a above.
- c. Competition loading will stop at 50. kg (approx. 110 lbs). However, loading will continue until the bridge experiences failure. Bridges failing above 50. kg will be considered to have held 50. kg for efficiency calculation.
- d. 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.
- e. The bridge with the highest structural efficiency, E , will be declared the winner.

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

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. If the disqualified bridge can accommodate loading, it may still be tested as an exhibition bridge as stated above.
- c. Decisions of the judges are final.

Questions about these rules should be directed to Greg Mills at 270-745-5850 or Doug Jenkins at 270-781-1922