

*****ANNOUNCEMENT*****

**20th Annual
Regional Building Competition
Sponsored by
Stewart-Richey Construction**

Hosted by
Western Kentucky University's
Ogden College of Science
Department of Engineering
SKyTeach Program
And
Green River Regional Educational Cooperative

Date: Saturday - March 12, 2016

Location: WKU Center for Research and Development
2413 Nashville Road, Suite B8
Bowling Green, Kentucky 42101

Rules: See next page or see below links for competition rules and frequently asked questions:

- Rules - http://bridgecontest.phys.iit.edu/public/international/2016/international_rules
- FAQs - <http://bridgecontest.phys.iit.edu/public/faq.php>
- Rules for the Middle School and High School Division will be the same

Materials (wood used must meet specifications – see rule sheet):

- Hobby Town (Hobby Crossing)
- 2345 Russellville Rd in Bowling Green
- ph# 270-904-6100
- Cost is around \$4/kit

Contacts:

- Brian Womack – GRREC Science Consultant – brian.womack@grrec.org
- Rico Tyler – WKU SKyTeach – rico.tyler@wku.edu



2016 International Bridge Building Contest Rules

These rules have been developed by the International Bridge Building Committee for the **Thirty Eighth International Bridge Building Contest** to be held on Saturday, **May 7, 2016** in Chicago, Illinois, USA. If you have a question that is not answered by our [FAQ](#), please direct it to Mr. George Krupa, by e-mail at gekrupa@aol.com.

In order to receive **official** wood and participate in this contest, a High School student must have placed first or second in a Regional Contest and be reported, by the Regional Coordinator, to Prof. John Kallend, MMAE Department, IIT, Chicago, IL 60616 by mail or e-mail: kallend@iit.edu. Students may participate in person, by proxy or by mail entry.

The object of this contest is to see who can design, construct and test the **most efficient** bridge within the specifications. Model bridges are intended to be simplified versions of real-world bridges, which are designed to accept a load in any position and permit the load to travel across the entire bridge. In order to simplify the model bridge design process, the number of loading positions is reduced to three, and to allow the contest to proceed in a reasonable amount of time, only one loading position is actually tested. These simplifications do not negate the requirement that the bridge must be designed to accept a load at any of the three positions. Bridges determined by the judges not to meet this requirement will be disqualified and tested as unofficial bridges.

1. Materials

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

2. Construction

- a. The bridge mass shall be no greater than 25.00 grams.
- b. The bridge (see Figure 1) must span a gap (**S**) of 300. mm, be no longer (**L**) than 400. mm, be no taller (**H**) than 180. mm above the support surfaces, and have a maximum width (**W**) of 70. mm. It must have a horizontal loading plane that is a height (**P**) above the support surfaces where $60. \text{ mm} \leq \mathbf{P} \leq 80. \text{ mm}$. The bridge structure may not project below the support surfaces.
- c. The bridge must be constructed to provide a horizontal support surface for the loading plate and rod at each of the three possible loading positions. These three positions, at the mid-span of the bridge and 60. mm to either side of the center, will be clearly and consecutively labeled "**1, 2, 3**" from either end of the bridge by the participant before submission to the judges (see 3b). The structure of the horizontal loading plane must be a minimum length (**R**) of 160. mm and centered on the mid-span of the bridge. The bridge structure must allow the loading rod (see 3a) to be mounted from below.

- d. The bridge must have a minimum clearance (C) of 60. mm in height above the support surfaces. This clearance also extends 80. mm toward either end of the bridge from the center point of the bridge. No part of the bridge structure may be in this clearance area, and a 60. mm high, by 160. mm long block oriented with its 160. mm dimension parallel to the span of the bridge must pass cleanly under the bridge when the bridge is placed on a flat table top.

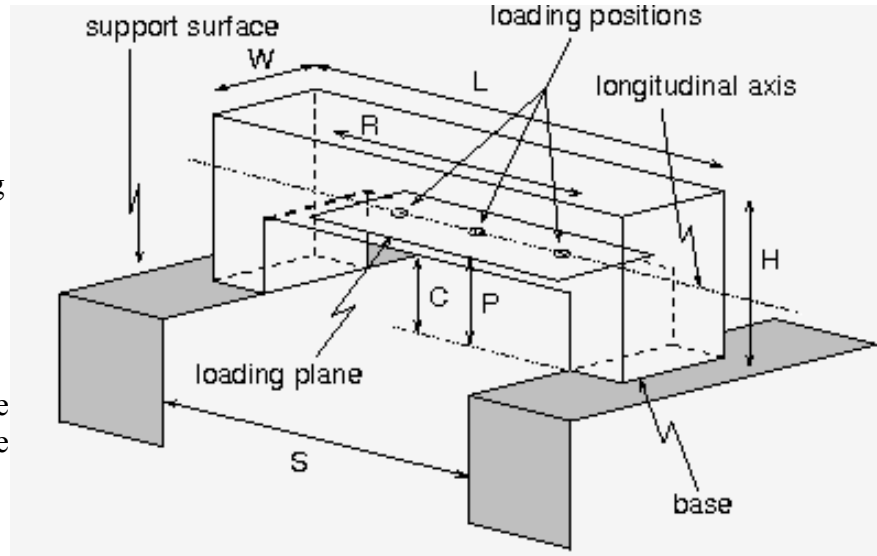


Figure 1. Schematic of Bridge (not to scale)

3. Loading

- The load will be applied by means of a 40. mm square plate that is 6.35 mm (1/4 inch) in thickness. A 9.53 mm (3/8 inch) diameter loading rod is attached from below to the center of the plate (see Figure 2). The plate will be horizontal, it will not pivot on the loading rod, and the sides of the plate will be parallel to the longitudinal axis of the bridge.
- The three loading positions will be located on the horizontal loading plane. The center loading position (numbered "2") will be located at the center point of the bridge. The other two loading positions (numbered "1" and "3") will be located 60. mm toward either end of the bridge from the center.
- On the day of the competition, the judges will randomly draw the number of the loading position to be used; it will be the same for all bridges tested.

4. Testing

- On the day of the contest, participants will center their bridge on the loading surfaces. They will have previously located the loading plate and 3/8 inch eye bolt to the selected loading position. The load will be applied by the participant. The maximum scoring load supported by any bridge will be 50 kg. Any amount over this quantity will not count in the calculation of the bridge's efficiency.

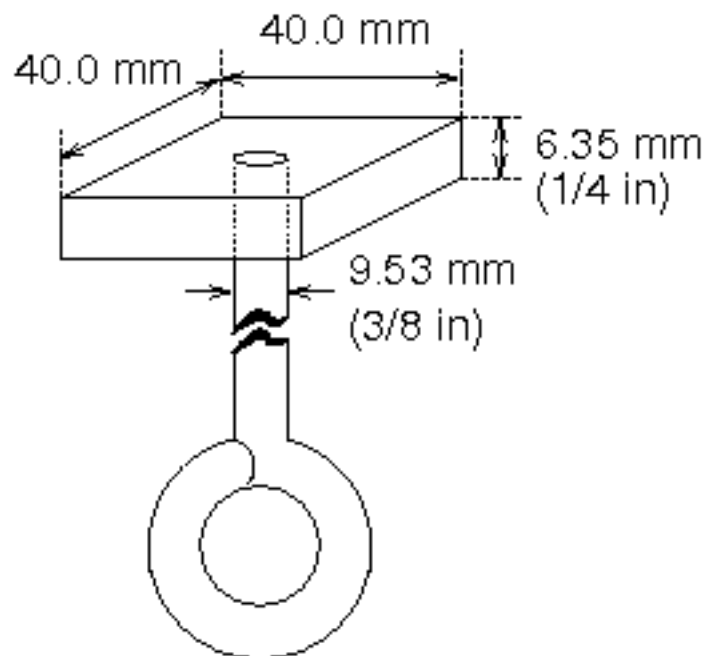


Figure 2. Loading Plate Detail

- b. Bridge failure is defined as the inability of the bridge to carry additional load, or a load deflection of 25 mm, whichever occurs first.
- c. 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 by the judges. Bridges that fail to meet these specifications at the conclusion of the allowable time for checking will be disqualified. Bridges disqualified prior to the start of the contest may be tested as unofficial 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 unofficial bridge as stated above.
- c. Decisions of the judges are final; these rules may be revised as experience shows the need. (Please check our web site, <http://bridgecontest.phys.iit.edu>, after January 15, 2016, to learn whether any changes have been made.)