Lincoln Chapter
Pennsylvania Society of Professional Engineers
Annual Bridge Building Competition

Specifications and Competition Rules

1. Eligibility

a. The contest is open to students in grades 9 through 12. Students in earlier grades may enter but are not eligible for prizes.

2. Materials

a. The bridge shall be constructed from basswood sticks with 3/32 inch square cross section, which may be notched, cut or laminated in any manner.

b. The bridge shall be constructed using the basswood sticks and glue. Any commonly available glue may be used, but the basswood sticks must very obviously be the major component. (Bridges built primarily of epoxy or other glue with sticks as secondary members are not permitted. Wood bridges encased in epoxy or glue are also not permitted.)

c. **No** materials other than glue or basswood may be used. **DO NOT paint the bridge.**

d. To ensure fairness, it is encouraged that only the materials distributed by the competition director be used to construct the bridge. However, kits that have been obtained from any source and meet the requirements of paragraphs ‘a’ and ‘b’ above are acceptable.

3. Construction – See Figure 1

a. The bridge mass may not be greater than 30 grams (Four quarters plus 3 dimes give a mass of about 30 grams).

b. The bridge must span a gap of 300 mm (11-13/16 in).

c. The maximum allowable bridge dimensions are:
   i. Length: 450 mm (17-11/16 in)
   ii. Width: 80 mm (3-1/8 in)
   iii. Overall Height: 140mm (5-1/2 in)
   iv. Height from Supports to Deck (Load Point): 40mm (1-9/16 in)

d. No part of the bridge may extend below the support surfaces.

e. The bridge must allow for mid-span loading as described in section 4.

f. A "go/no-go" gage will be used the day of the competition to determine conformance of a contestant's bridge to the dimensional criteria. Bridges not initially meeting the criteria may be altered for conformance prior to the start of the competition at the student's risk.

4. Loading

a. The test load will be applied by means of a 40 mm square plate that is at least 6 mm but no more than 13 mm thick. A 9.53 mm (3/8 inch) diameter loading rod will be attached from below to the center of the loading plate. The loading plate will be horizontal and will not pivot on the loading rod.

b. The test load will be applied with the plate at the center of the bridge. The bridge builder shall provide a horizontal loading deck or cross members of sufficient dimensions to support the loading plate and allow clearance for the vertical rod to extend below the bridge as described above. **The top of loading deck shall be no more than 40 mm above the base of the bridge.**

5. Qualifications

a. All bridges will be checked for adherence to construction and material requirements prior to testing. Bridges failing to meet the dimensional requirements will be disqualified. Disqualified bridges may still be tested but are not eligible for prizes.

b. If during the conformance check of a bridge a condition becomes apparent which prevents testing as described in section 6 and the competitor is unable to modify the bridge prior to the end of the competition, that bridge will be disqualified.

c. Decisions of the judges and competition director are final.

6. Testing

On the day of the contest, each student shall load to failure his/her bridge as follows:

a. The loading plate and loading rod shall be placed at the specified location.

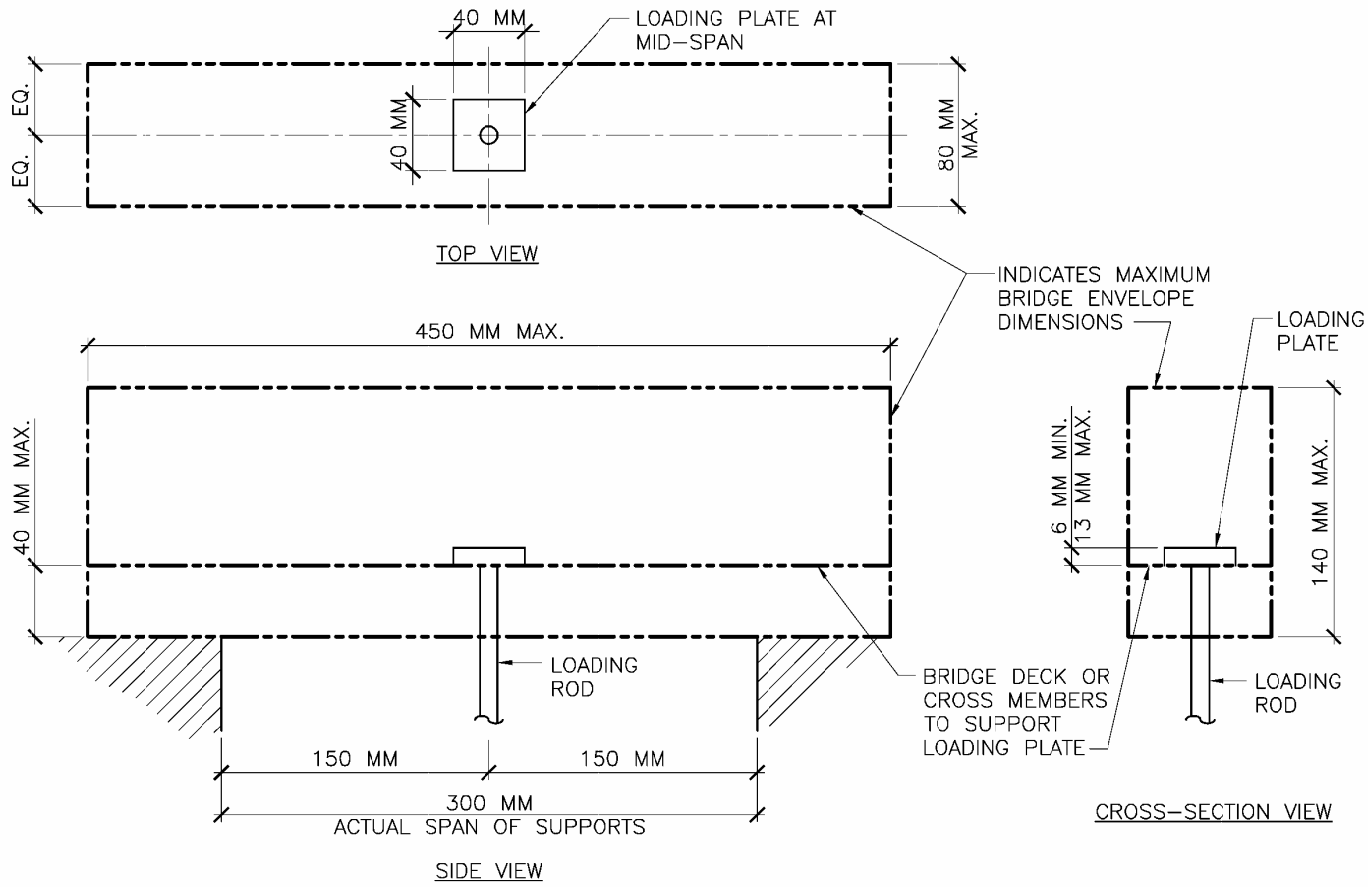
b. The bridge shall be placed in the test stand.

c. The load shall be applied to the loading rod from below as described in section 4.

d. Failure is defined as the inability of the bridge to carry additional load.

e. The bridge with the highest structural efficiency, E, will be the winner. E=Load Supported (grams) / Mass of Bridge (grams)

Attachment: Figure 1



Jan 2013 DATE	DRAWING INTENT IS TO INDICATE GENERAL ARRANGEMENT, DESIGN AND INTENT OF WORK AND IS PARTLY DIAGRAMMATIC. DRAWING SHALL NOT BE SCALED.	SCALE: NONE	LINCOLN CHAPTER PSPE BRIDGE BUILDING COMPETITION	FIGURE 1 –BRIDGE CRITERIA DRAWING NO.