MISSOURI SOCIETY OF PROFESSIONAL ENGINEERS
OZARK CHAPTER
MODEL BRIDGE CONTEST RULES - 2022

1. MATERIALS

A. The bridge must be constructed only from official basswood provided to the contestant.

B. Contestants may use any commonly available adhesive.

C. The official basswood may be notched, cut, sanded, or laminated in any manner but must still be identifiable as the original official basswood.

D. The bridge may not be stained, painted, or coated in any fashion with any foreign substance.

E. No other materials may be used.

2. CONSTRUCTION (See Pages 3 – 5)

A. The maximum bridge mass is 20.0 grams (0.70 oz).

B. The minimum bridge mass is 5.0 grams (0.18 oz). The right is reserved to not disqualify bridges weighing less than 5.0 grams, however, the weight used to calculate the efficiency will be 5.0 grams.

C. The bridge dimensions (see Pages 3 - 5) must be within the following limits:

		Minimum	Maximum
1.	Bridge length	13.0 inches (331 mm)	14.0 inches (355 mm)
2.	Bridge width	2.0 inches (51 mm)	3.0 inches (76 mm)
3.	Bridge height	N/A	4.0 inches (101 mm)

D. No outriggers will be allowed. Outriggers are any non-structural members added to a bridge mainly to satisfy dimensional constraints.

E. The bridge must be designed and constructed so that the loading block (1.75 in x 1.75 in x 0.75 in (45 mm x 45 mm x 20 mm) will pass through the bridge. Clearance must be provided to place the block and for the loading rod to hang vertically through the bridge below the loading point. This “loading area” need not be continuous across the bridge as its purpose is to act as a location to place the loading block when testing the bridge. If the “loading area” has a solid surface, it must have sufficient openings to allow the test apparatus to be installed properly (i.e. the loading block must be able to be placed on the “loading area” at mid span and the “loading area” must contain an opening large enough for the 5/16 inch (8 mm) diameter loading rod to pass through.) The edges of the loading block will be parallel to the longitudinal axis of the bridge at the time of load application.

F. No portion of the bridge shall extend below the support surfaces.

G. The bridge must be symmetrical with respect to its vertical geometric center line.

3. LOADING

The bridge supports will be 11-13/16” (300mm) apart and the load will be applied as near to the mid-span of the bridge as practical.

The load will be applied downward from below by means of a wooden loading block resting on the loading area. The loading block will be approximately 1.75 in x 1.75 in x 0.75 in (45 mm x 45 mm x 20 mm) and will be placed square to the centerline of the roadway at mid-span of the centerline of the bridge. The load will be applied to the loading block by a 5/16 inch (8 mm) diameter loading rod which will extend downward from the loading block through the bottom of the bridge. There must be a 5/16 inch (8 mm) hole through the center of the bridge for this loading rod.

4. TESTING

A. The bridge will be centered on the support surfaces.

B. A bucket will be attached to the rod and the load will be applied by the judges adding lead shot to the bucket until failure occurs.

C. Bridge failure is defined as the inability of the bridge to carry additional load, including joint failure, and will be decided by the judges. If a bridge deflects under load to the extent that it hits the lower support of the test frame then the bridge will be considered to have failed. This is a deflection of approximately 1.75 inches (45 mm). Also, if the deflection of the bridge causes it to slip off of the testing supports, it shall be considered a bridge failure.

D. The bridge structural efficiency (E) will determine the winners:

$$E = \frac{\text{Maximum Load Supported (grams)}}{\text{Mass of Bridge (grams)}}$$

The bridges with the highest structural efficiencies will be the winners.

5. QUALIFICATION

A. All construction requirements and dimensions will be checked prior to testing by the judges. Bridges that fail to meet these specifications will be disqualified. All decisions of the judges are final. Disqualified bridges may be tested if time permits; however, the results will not be entered into the calculation of efficiency average for the school or class.

B. If, during testing, a condition becomes apparent (e.g., use of ineligible materials, inability to support or place the loading block, too much deflection, etc.) which is a violation of the rules or prevents testing as described above, that bridge will be disqualified.

C. Only one bridge per contestant will be tested.

D. Contestants will not be allowed to test their own bridge.

E. Participants must reside within or attend school within the service area of the Ozarks Chapter of the Missouri Society of Professional Engineers.

F. To be eligible, contestants must meet the criteria for one of the following contest divisions:

Division	Description	Prizes	International Contest Eligible	Rules
Middle School (Grades 5 – 8)	Students currently enrolled in grades 5 – 8, or home school equivalent	1st place - $30 2nd place - $20 3rd place - $10	Not Eligible	Current published rules with the exception that the winners will be determined by maximum failure load; not by efficiency
High School (Grades 9 – 12)	Students currently enrolled in grades 9 – 12, or home school equivalent, or 8th grade students enrolled in a high school accredited science or math class for high school credit	1st place - $125 2nd place - $100 3rd place - $75	1st and 2nd Place are eligible for International Contest	Full current published rules, no modifications
Teachers & Sponsors	Teacher or Sponsor with a student competing in either the Middle School or High School Division	1st - $50 Restaurant gift card	Not Eligible	Full current published rules, no modifications
College Engineering Students & Teachers	Students enrolled at a college with an engineering major declared & teachers at colleges with classes leading to an engineering degree	1st place - $75	Not Eligible	Full current published rules, no modifications
Engineers	Members of the Missouri Society of Professional Engineers	PRIDE	Not Eligible	Full current published rules, no modifications

6. SAFETY

We ask all students and observers to stand clear and remain in the seating area at all time, including while their bridge is being tested.

7. ENTRY FEE

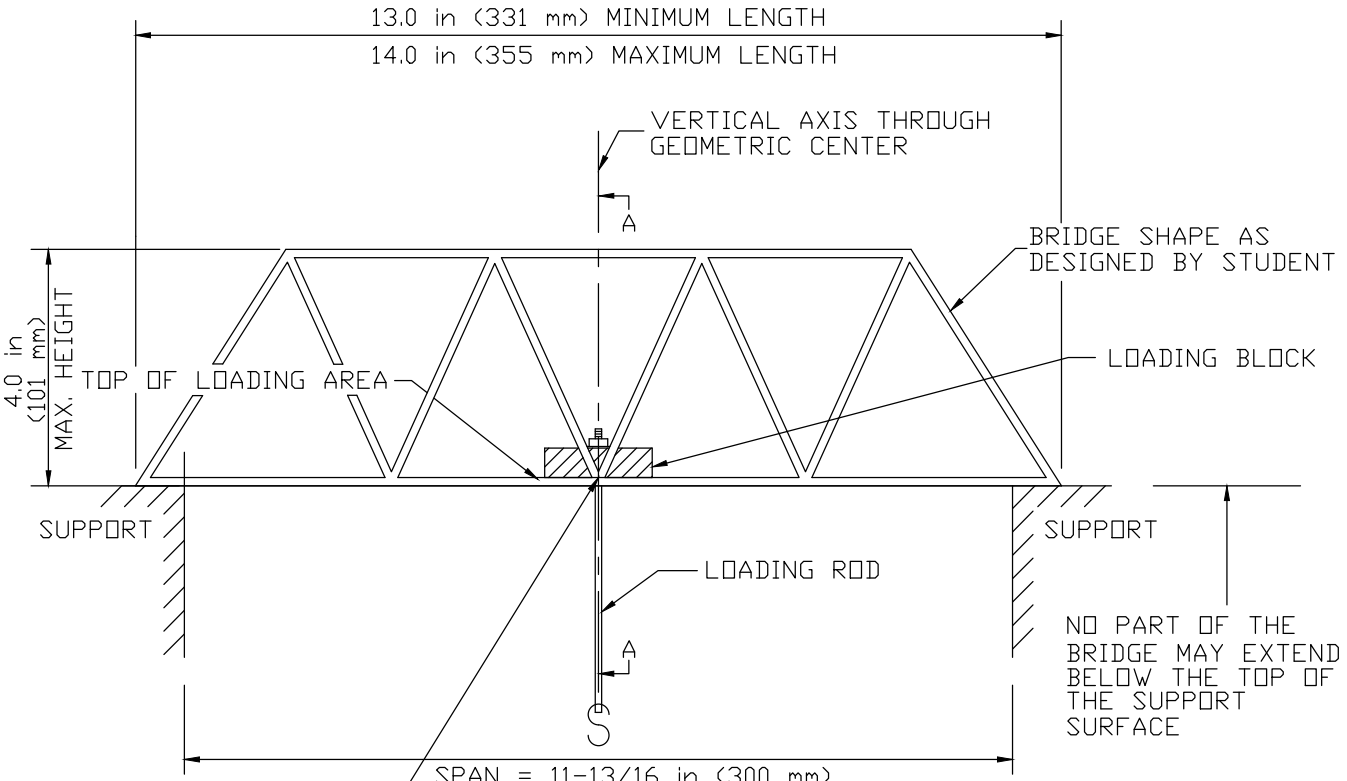
A $5.00 entry fee will be charged for each bridge kit ordered to cover the cost of materials and prizes. Each kit will contain 15 - 3/32" x 3/32" x 2'-0" long sticks of basswood. Only one bridge may be entered per entry fee, even though there may be enough material for more than one bridge.

8. PHOTO & INFORMATION RELEASE

The Media Waiver Form, included with the Entry Form, **must** be completed, signed, and provided with the Entry Form at the contest. ***Failure to provide the completed and signed Media Waiver Form may result in disqualification from the contest.***

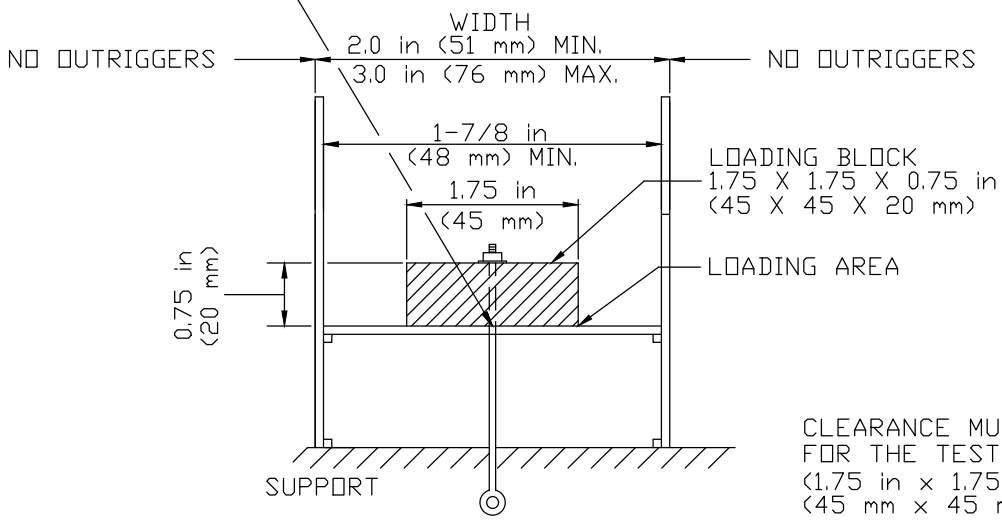
By entering the contest, you are granting full permission to any model bridge contest organizer, competition staff, promoter, volunteer, sponsor or agent authorized by said persons and entities, to use photographs, video tapes, or any other records of model bridge contest competitions, including your name, likeness, or voice for any legitimate purpose without compensation or remuneration to yourself, your heirs, executors, administrators, or assigns. Information solicited on the contest forms are in no way collected or used for commercial purposes and will not be sold or distributed to any third party, other than to announce the winners' name and high school.

THROUGH TRUSS TYPE BRIDGE
(BOTTOM LOADING)



ELEVATION
NO SCALE

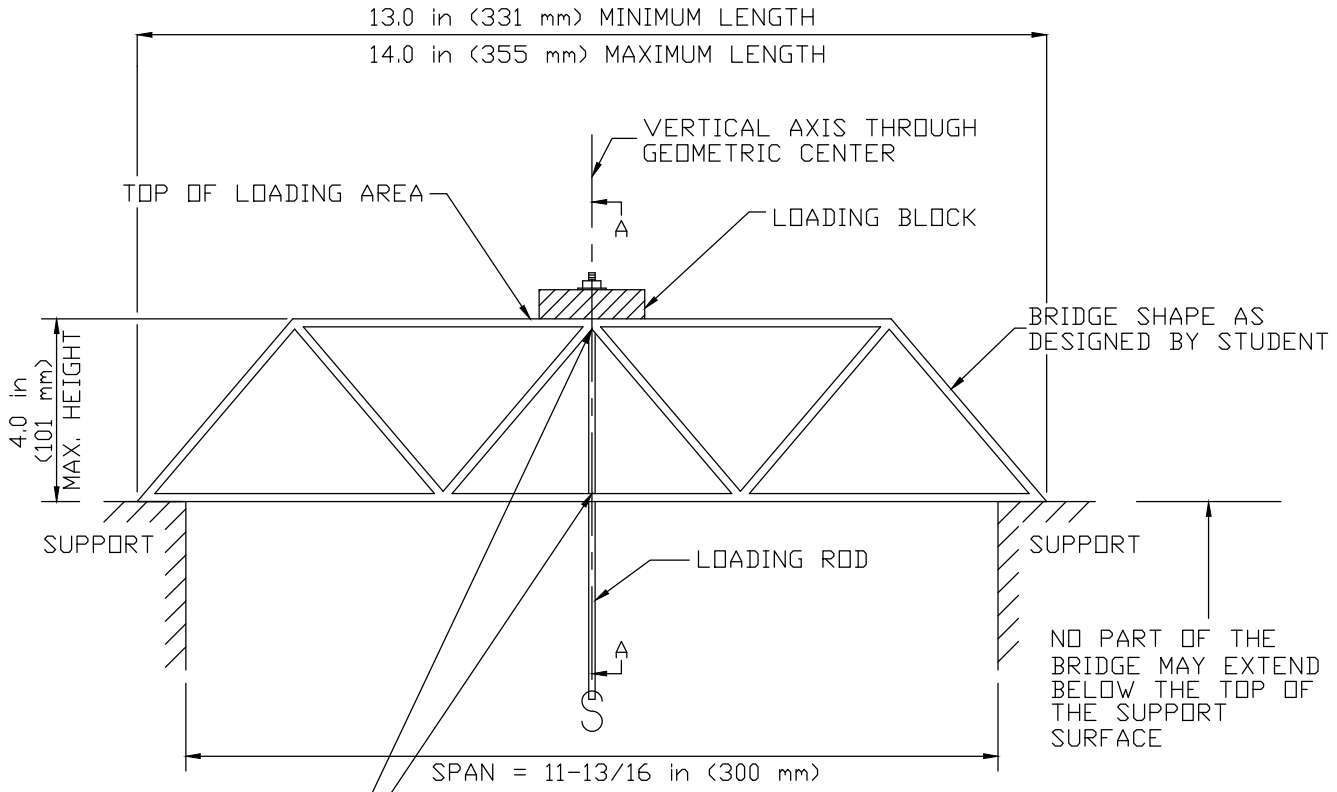
LOADING AREA MUST HAVE OPENING FOR 5/16 in (8 mm) DIAMETER LOADING ROD



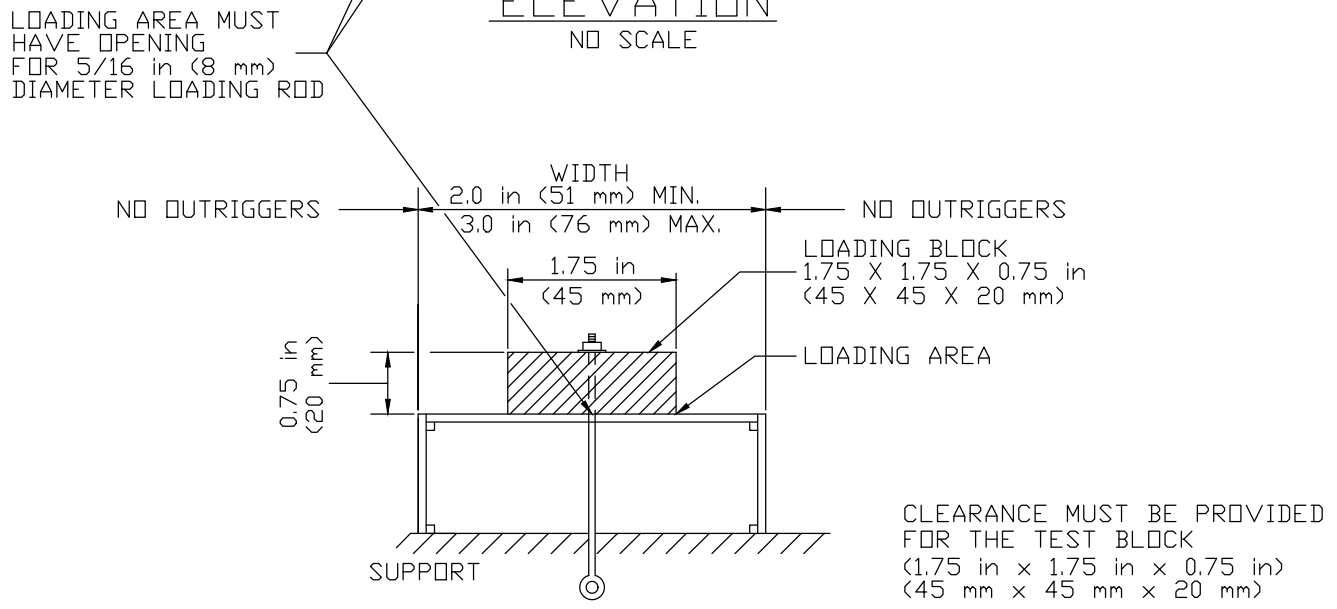
SECTION AA
NO SCALE

FIGURE 1A

THROUGH TRUSS TYPE BRIDGE
(TOP LOADING)



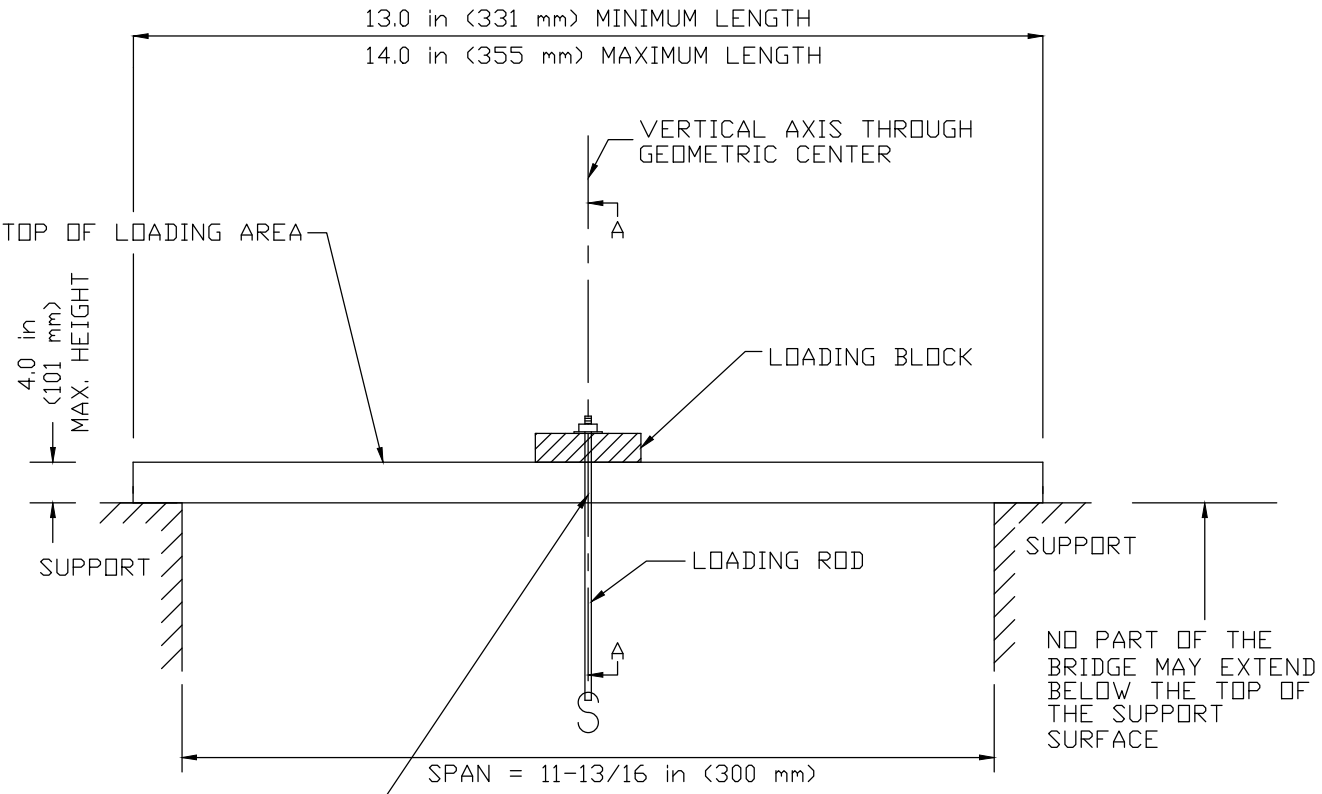
ELEVATION
NO SCALE



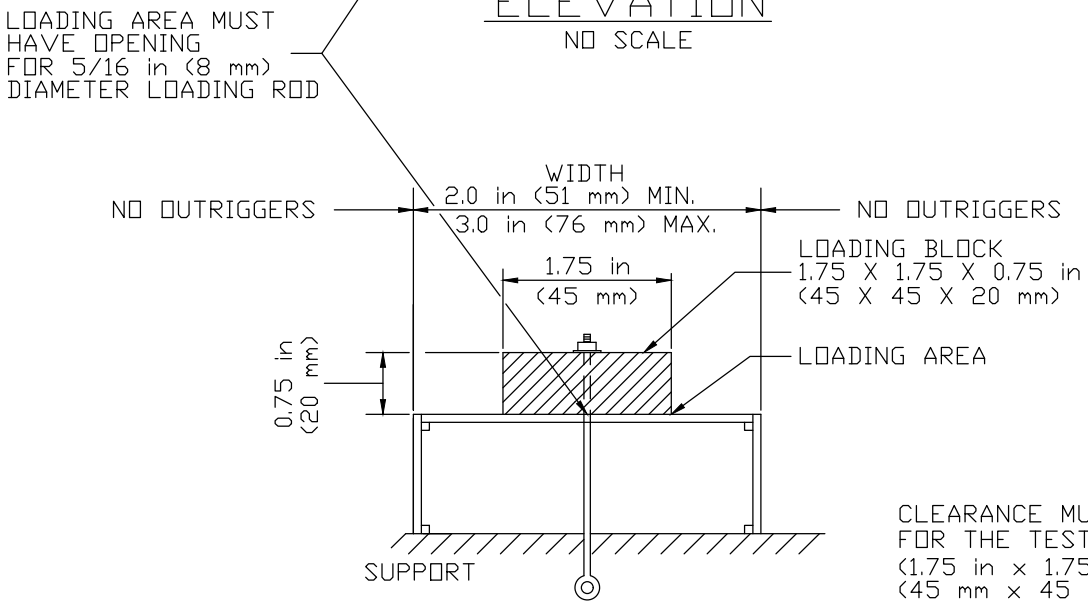
SECTION AA
NO SCALE

FIGURE 1B

BEAM OR BOX TRUSS TYPE BRIDGE



ELEVATION
NO SCALE



CLEARANCE MUST BE PROVIDED FOR THE TEST BLOCK (1.75 in x 1.75 in x 0.75 in) (45 mm x 45 mm x 20 mm)

SECTION AA
NO SCALE

FIGURE 2