

STUDENT MODEL BRIDGE BUILDING RULES AND SPECIFICATIONS
2024 SOUTHERN NEVADA REGIONAL CONTEST
HIGH SCHOOL DIVISION

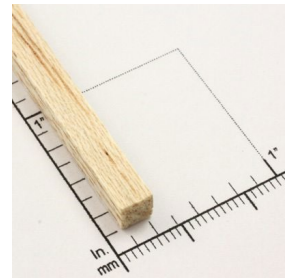
The following rules and specifications will be followed for the **High School Division** of the Southern Nevada Regional Model Bridge Building Contest, to be held on **Saturday, March 2, 2024** at the campus of the University of Nevada Las Vegas, Thomas T. Beam Engineering Complex. Contact Casey Collins at casey.collins@snwa.com or Rich Eastland at reastland@usbr.gov if you have questions. For more information on the contest, visit our website at: <http://www.modelbridgecomp.com/>

Please read the specifications carefully! The specifications for the High School Division have changed from past years and they differ SIGNIFICANTLY from those of the Middle and Elementary School Divisions.

The objective of this contest is to see who can design and construct the **most efficient bridge** within the following specifications. The High School Division is open to all students in 9th through 12th grades.

1. Materials:

- a. The bridge must be constructed only from the 3/32-inch square cross-section basswood included in the kit, which may be notched, cut, or laminated in any manner.
- b. Any commonly available adhesive may be used.
- c. No other materials may be used. Do not paint or stain the bridge.



3/32-in. basswood

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 wider (W) than 80. mm, and be no taller (H) than 110. mm above the support surfaces. The bridge structure may not project below the support surfaces.
- c. The loading plane (P) shall be horizontal and shall lie on the physical top of the bridge between 100. mm and 110. mm above the support surfaces.
- d. The bridge must be constructed to provide a horizontal support surface so that the loading plate (see section 3 below) without rod attached can be pushed smoothly along the loading plane from one loading point to the other: 30. mm and 50. mm on either side of the center of the 300. mm span along the longitudinal axis of the bridge.

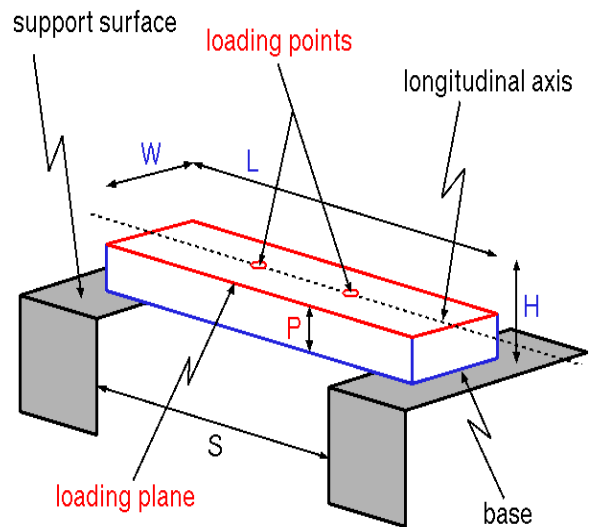


Figure 1

3. Loading:

- The load will be applied to the Loading Plane **from above** with the loading plate centered over one of the loading points.
- The load will be applied from above by means of a 40. mm square by 6. mm to 13. mm thick plate. A 10. mm to 15. mm diameter loading rod will be attached to the center of the plate (**see Figure 2**). The plate will be horizontal, have a flat bottom and will not pivot on the loading rod.
- The load will be applied with the center of the plate at one of two possible locations on the longitudinal axis of the bridge: either 30. mm or 50. mm to either side of the center of the 300. mm span (see Figure 1). Competition loading will stop at 50 kilograms. However, loading will continue until bridge failure.
- On the day of the competition, the judges will randomly select one of the loading positions to be used; it will be the same for all bridges tested.

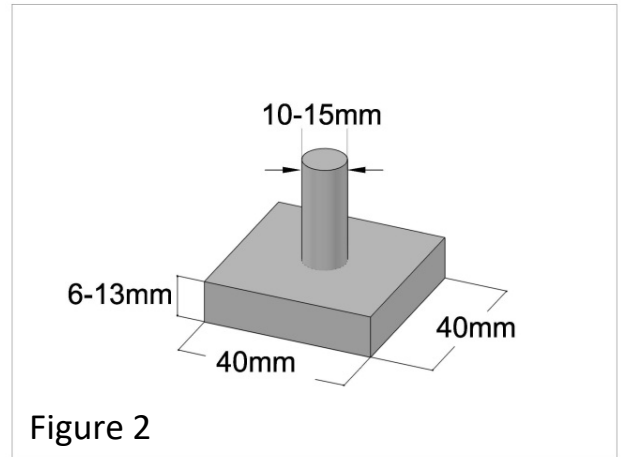


Figure 2

4. Testing:

- The bridge will be centered on the support surfaces.
- The loading plate will be placed on the bridge at one of the two specified loading locations (see 3c).
- The load will be steadily applied from above, as described in section 3a. (**hint: the loading plate must be able to extend down from above onto the loading plane, be sure to provide a minimum of 40 mm clearance**)
- Bridge failure is defined as the inability of the bridge to carry additional load, or a deflection of 25.4 mm (1 inch) under the loading point, whichever occurs first.
- The bridge with the **highest structural efficiency, E** , will be the winner.

$$E = \text{Load supported in grams} / \text{weight of bridge in grams}$$

5. Qualification:

- All specifications will be checked prior to testing. Bridges that do not meet the specifications at the conclusion of the allowable time for check-in (5 minutes prior to your school's scheduled testing time) will be disqualified. If physically possible, disqualified bridges will be tested unofficially and scored for the builder.
- If, during testing of a bridge, a condition becomes apparent which prevents testing as described in section 4 above, that bridge will be disqualified. If the disqualified bridge can accommodate loading, it may still be tested unofficially as stated above.
- For the purposes of individual scoring, only one bridge is allowed per student. No exceptions. For the team scoring competition, a maximum of ten bridges are allowed to be tested from each school. If a school has less than five bridges, (constructed from five different students and representing five different designs) at the time of testing, then one additional bridge from one of the students may be tested and accepted for the team's average score provided that this additional bridge is of a different design than the student's first bridge.
- ALL BRIDGES SUBMITTED MUST APPEAR TO HAVE A UNIQUE DESIGN. Schools submitting bridges designed from a template will face disqualification.
- Decisions of the judges are final.**

A **Teacher's Workshop** is scheduled at UNLV in the B building of the Thomas Beam Engineering Complex, on **January 10, 2024 from 4:30 – 6:00 pm**. At the workshop, we will discuss the specifications, bridge design, and ideas for presenting this program in the classroom. Bridge Kits will be available at the workshop.

Do you have a question? Check out our frequently asked questions page located here:

<http://www.modelbridgecomp.com/help/faq/>.

Still have questions? Please reach out to us at casey.collins@snwa.com or reastland@usbr.gov.

Have fun!