

**STUDENT MODEL BRIDGE BUILDING RULES AND SPECIFICATIONS**  
**2015 SOUTHERN NEVADA REGIONAL CONTEST**  
**ELEMENTARY SCHOOL SPECIFICATIONS**

The following rules and specifications will be followed for the **Elementary School Division** of the Southern Nevada Regional Model Bridge Building Contest, to be held on **Saturday, March 7, 2015** at the campus of the University of Nevada Las Vegas, Thomas T. Beam Engineering Complex. Contact Casey Collins at [casey.collins@snwa.com](mailto:casey.collins@snwa.com) or Rich Eastland at [reastland@usbr.gov](mailto:reastland@usbr.gov) if you have questions. For more information on the contest, visit our website at: [www.usbr.gov/lc/region/programs/bridgebuilding.html](http://www.usbr.gov/lc/region/programs/bridgebuilding.html)

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

The objective of this contest is to see who can construct the **most efficient bridge** of their own design within the following specifications. The focus of participating students should be on developing their creativity, ingenuity, and craftsmanship skills by producing an original product, and not adopt others work as their own.

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**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.

**2. Construction:**

- a. The bridge must weigh no more than 35 grams.
- b. The bridge must span a gap (**S**) of 300 mm (**hint: bridge must be longer than 300 mm**), be no longer (**L**) than 400 mm, be no taller (**H**) than 100 mm above the support surface. The bridge width (**W**) must be at least 40 mm and be no wider than 80 mm. No part of the bridge may extend below the support surface (**see Figure 1**).
- c. The bridge must be constructed to include a horizontal loading plane (**P**) providing support for

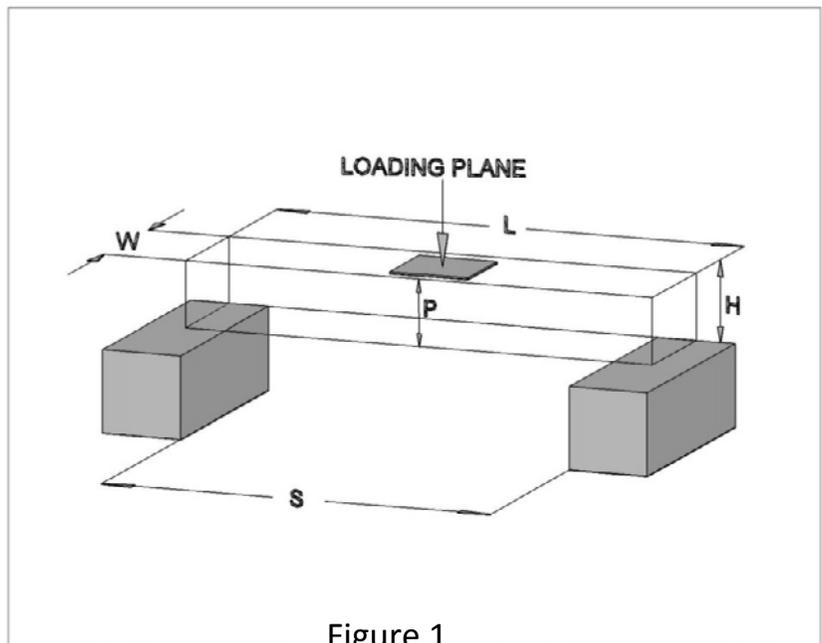


Figure 1

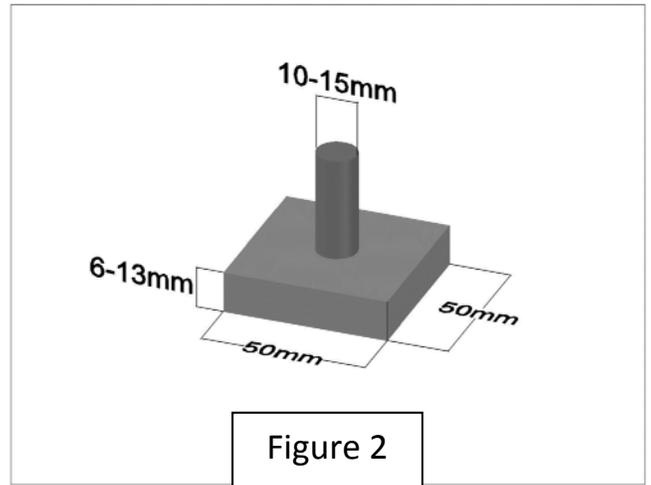
two possible loading locations to be positioned 50 mm to the right and 50 mm to the left of the center of the bridge. The loading plane (**P**) shall be horizontal and shall lie on the physical top of the bridge between 50 mm and 100 mm above the support surfaces (**hint: top of the bridge must be taller than 50 mm but no taller than 100 mm**) (**see Figure 1**).

### 3. Loading:

- The load will be applied from above with the loading plate (**Figure 2**) centered over one of the loading locations.
- The load will be applied from above by means of a 50 mm square by 6-13 mm thick plate. A 10-15 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.
- During competition, loading will continue until the bridge experiences failure (see section 4d).

### 4. Testing:

- The bridge will be centered on the support surfaces.
- The loading plate will be placed on the bridge at one of the specified loading locations.
- The load will be steadily applied from above, as described in section 3a.
- Bridge failure is defined as the inability of the bridge to carry additional load, or a deflection of 38.1 mm (1.5 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.
- All the participating bridges from a single school must appear to be of different design. Any bridge that appears to be a duplicate design will be disqualified.
- Decisions of the judges are final.

A **Teacher's Workshop** will be held at UNLV in the B building of the Thomas Beam Engineering Complex, on January 14<sup>th</sup>, 2015 from 4:00 – 5:30 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. Directional signs to the room will be posted on the day of the workshop.

The **School Competition** traveling trophy in the Elementary School Division will be awarded to the school with the highest average efficiency for its best **three** bridges.  
Have fun and we'll see you on March 7<sup>th</sup>!