

Bridge Construction Rules (Rev 3.5.15; Courtesy: C. Mehrbach 2010)

To Qualify: It must hold at least 50 lbs_f.

Objective: Highest strength to weight ratio without bending downward more than 1.0 cm from center loader to end of bridge. The bridge's strength will be measured by maximum weight held (before breaking) or until bridge bends downward 1.0 cm. The maximum load to be supported is 57kg (125 lb.). The bridge may be tested to the breaking point, but the efficiency calculation is based on the stated maximum load.

$$\text{Strength/Weight} = \text{Load supported in grams (57000 g maximum)} / \text{Mass of bridge in grams}$$

Materials: 50 grams maximum mass (includes basswood, gussets, and glue). Must span a gap 30 centimeters (11.8 inches), i.e. **the bridge must be built slightly longer than the opening it must span** at least 12 inches recommended, the maximum length is 40 cm 15.8 inches)).

Basswood wood or cardboard can be used as joint gussets, but each gusset must be no larger than 4.0 cm² if used to attach four (4) or fewer beams. However, the gusset area may increase by 1.0 cm² for each additional beam held by the gusset beyond four (4). In other words, if four (5) beams are attached by one gusset the maximum gusset size is 5.0 cm² and six (6) may be attached by a gusset of 6.0 cm².

A substructure which falls a maximum distance of 5.0 centimeters below the simulated road bed is allowed.

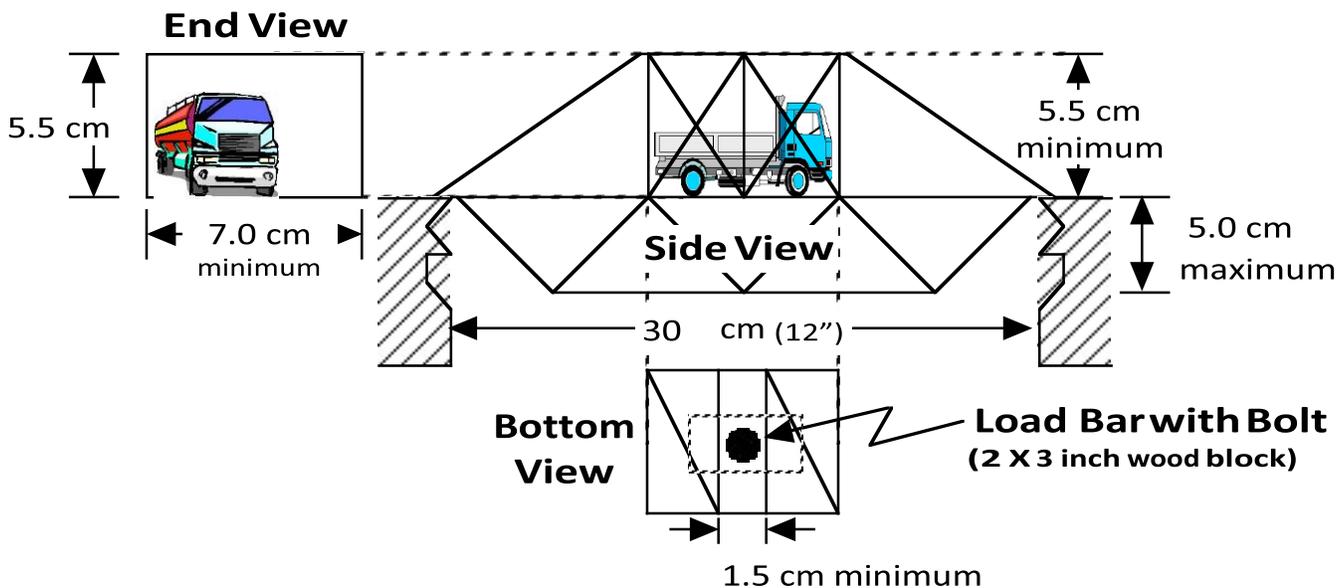
Only the glue provided can be used.

The two roadway beams cannot be reinforced. Other support beams cannot be laminated together.

Roadway: A simulated two lane HO scale (1:87) roadway will be provided. The bridge must be designed to hold a roadway wide enough (7 cm wide) for two HO scale trucks to pass going opposite directions. The vertical opening must be high enough for an HO scale truck to move unrestricted (5.5 cm). (See the schematic illustration, below.)

Load Bar: The two sides of the bridge must be connected by a cross brace system capable of holding the roadway and the 2 X 3 inch testing block used to apply the force to the bridge during testing. .

Testing Requirement: To allow the load bar to fit properly the bridge must be designed with a hole in the center of the beams that would otherwise hold the roadway. The hole must be at least 1.5 cm in diameter. The loader will simulate a truck crossing at the center of the roadway; the load bar will be 8 cm long and 4.6 cm wide (2 x 3 inch block) and the bridge members must be designed to hold the load bar and distribute the force applied to it.



The bridge will be evaluated for quality of construction, holds a minimum weight of 50 lbs, and has a strength to weight ratio of at least $\frac{1}{2}$ of the two best bridges. Credit will be lost if the bridge contains any violation of the rules (e.g. width too narrow, opening too small, overweight.)

Bridge may be tested three (3) times during the period of bridge testing. After each test take note of the reasons for failure and then fix, change, and try again. Take advantage of the retests by having your bridge ready for testing at the start of the testing period. Remember that the glue requires at least overnight to dry.