FunFest 2025
The Reynold Davenport
Balsa Wood Bridge Competition Rules
High School

Objective: The objective is to design and build a bridge to span a given distance and carry the maximum amount of load with the minimum mass of material given material the following design constraints.

Entries and Judging

Participants: MCS may enter a total of 75 bridges, with 15 bridges being scheduled every 30 minutes starting at 9:30 am and ending with the 11:30 am testing cycle. Participants may include individuals or teams of 2 or more students.

Submission: All submissions must be delivered to Sandhills Community College (by school personnel) on Thursday, March 27th in Little Hall, Room 153. Each bridge must have an identification tag that correlates to a Moore County Schools spreadsheet.

SCC Judges: Michael Sassano, Coordinator, Building Construction Technology and Instructor/Tutoring Coordinator, Engineering and Construction

Judging Location: Sandhills Community College campus at the Outdoor Picnic Shelter

Notes: SCC provides the testing apparatus. SCC judges will find the Mass of each bridge and will supervise MCS student testing until failure.

Determining the winner: The bridges will be tested to determine the maximum load at failure using the sand and bucket method. The bridge with the largest load carrying capacity is the winning bridge. ***Bridge Efficiency will be utilized to determine the FunFest winner.***

Bridge Efficiency = Load Carried @ Failure / Mass of Bridge

Rules Revised/Checked:
Participants & Dates Updated: 07/15/24

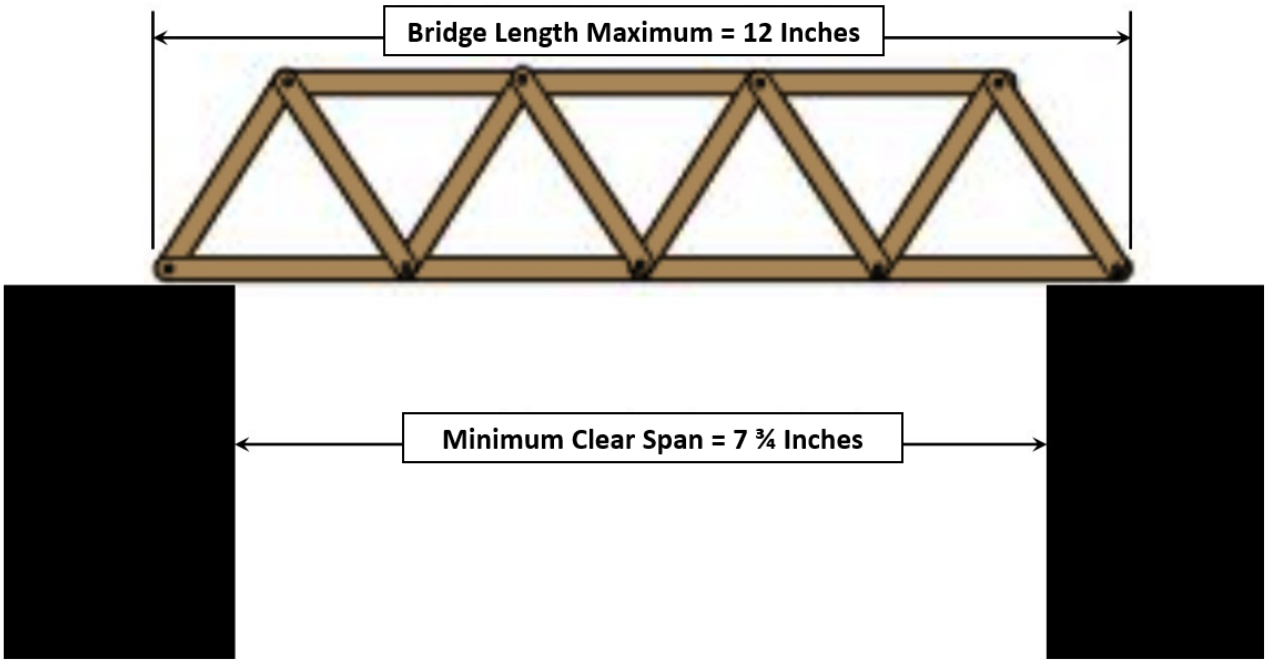
Competition Rules

Design Constraints

Violations of rules will result in disqualification. **

Geometric Design

- ***The bridge must not weigh more than 30g.****
- ***The Maximum bridge length is 12 inches.***
- The bridge deck (AKA: “vehicular roadway”) shall not be curved or arched.
- Gussets, dowels and mitered joint connections are allowed, but only at the joint areas.
- The bridge must be freestanding.



Material Selection

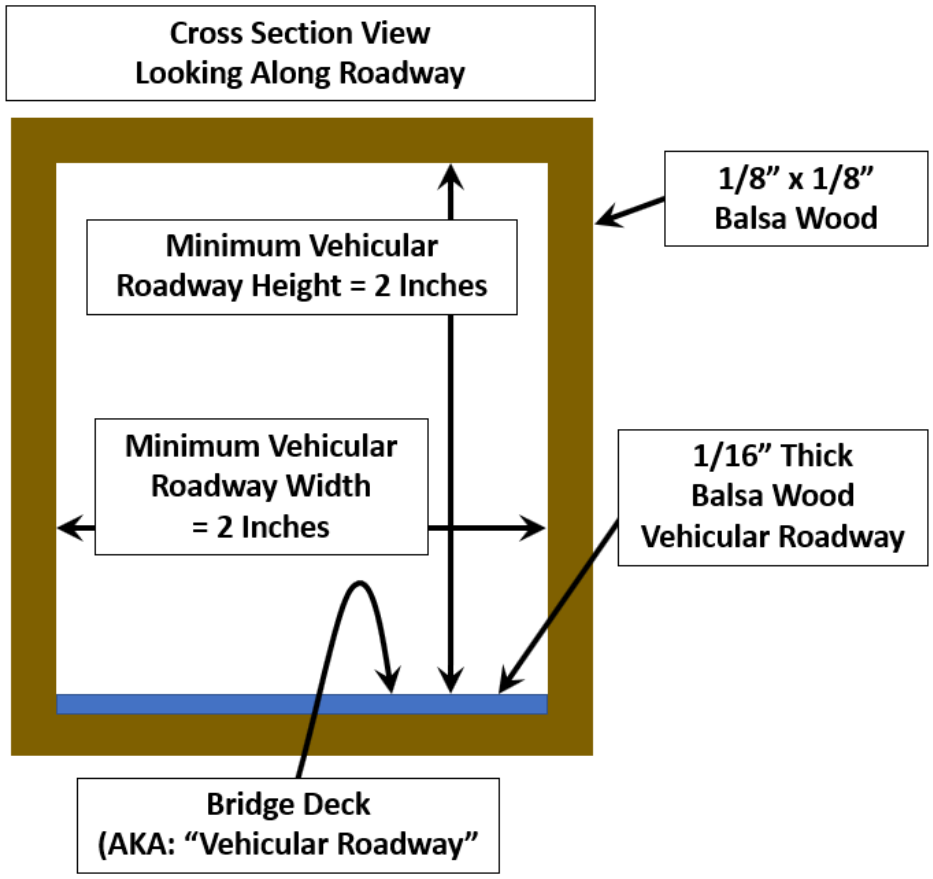
- The materials used in the construction of the bridge shall consist only of commercially available balsa wood and glue. Wood Density choice is up to the teacher and students.
- A bridge may not be coated with any material (i.e. paint, stain, or glue).
- There will be no use of steel bars to elevate the plate above the deck.

Rules Revised/Checked:
Participants & Dates Updated: 07/15/24

- Laminated members are not allowed. The bridge shall contain no member wider than 1/8" nor deeper than 1/8". This member size requirement does not apply at the intersection of members.
- Any type of bonding material (glue) may be used.
- Individual members shall be constructed of a single piece of balsa wood.

The Vehicular Roadway

- The bridge deck must extend the entire length of the bridge and maintain a "vehicular roadway" without any obstruction (2" wide × 2" high). The bridge deck "vehicular roadway" must allow a 2"× 2" cube to be passed along the length of the bridge with no obstructions.



- The bridge deck shall be the full width of the "vehicular roadway" and extend the entire length of the bridge's **longest** dimension.
- The bridge deck (vehicular roadway) shall be level (or flat).
- The bridge deck (vehicular roadway) shall be constructed using a single solid balsa wood sheet. The balsa wood sheet used for the deck must be 1/16" thick.

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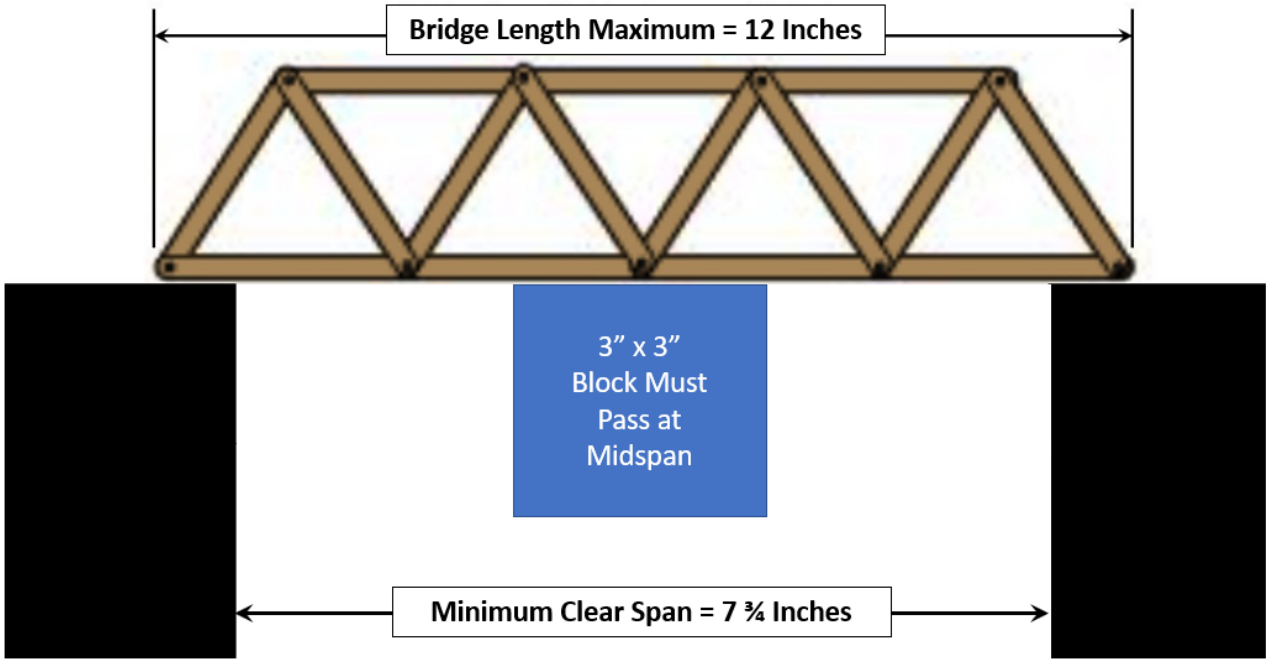
Testing Requirements

- The bridge must allow a 3"×3" cube to be passed beneath it at mid-span, measured while the end supports are resting on a flat surface.



- There must be a 1/2" hole at mid-span in the bridge deck to allow for testing. There must be no obstructions below the hole that would prevent the passage of the testing rod.
- A 1 ½ " wide × 3" long × 1/2" thick loading plate will be positioned over the hole in the deck at midspan and placed directly on the balsa wood deck.
- A testing rod will fit through the 1/2” hole in the balsa wood deck and attach to the loading plate.
- Bridges will be loaded initially with only the bucket and testing apparatus. Dry sand will be added after the initial loading until the bridge collapses.

The Sandhills Community College scales will be the official scales for the competition.

****Decisions made by competition judges are final. There is no dispute resolution; however, input for future process improvement is always encouraged.***

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