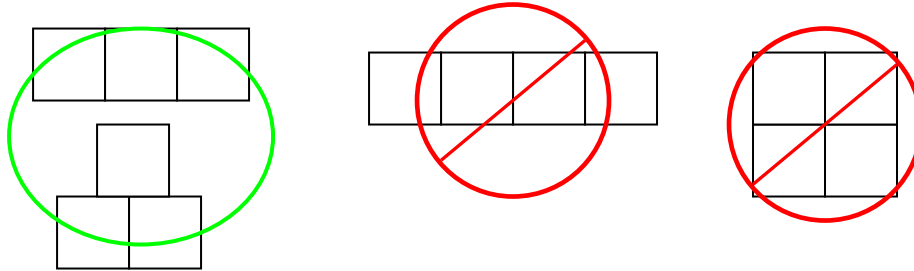


MVHS Bridge Competition 2010

Problem: to create an efficient bridge to span the distance of 13”

Portfolio (125pts)

- Research (25pts): Include internet research and observations from the truss exploration project.
 - Include sites, pictures, information on your bridge design
- Sketch – Design(25pts.): a scale drawing of your design
 - May use paper (tape two pieces together) or Solidworks/Sketchup
- Build (25pts.): A scale prototype of your bridge out of wood and glue.
 - May use gussets up to the size of a dime to support joints
 - May not laminate more than three beam together



- Analyze (50pts): present your bridge and predictions to the class.
 - May use prezi or other to get point across or just a show and tell with your bridge.

Competition (100pts)

Compete in the bridge competition based on the following equation:

Efficiency is determined by the failure weight x 4.54, divided by the weight of the structure in grams

- Span = 13”, Height = 3” over abutments – 2.5” under, Width = 3” max – 1” min
- Failure weight – the greatest weight recorded during testing before failure of the structure. Any structure that does not hold forty-five (45) pounds is not listed among the finalists.
- Failure to comply – if a structure fails to comply with any regulation, a penalty reduction of twenty (20) percent of the greatest weight held in the contest is subtracted from the team’s failure weight.
- Gusset – a panel or bracket attached to corners or intersections of truss components to add strength or stiffness. Note cards may be cut and used as gussets to strengthen the joints of truss structures. Note card gussets on trusses are to be no larger than the diameter of an American dime (\$.10) coin. They may not touch another note card gusset or overlap other

trusses. They may not be sandwiched between two (2) laminated members.

- The structure may reach one (2) inches beyond the abutments, plus or minus $\frac{1}{8}$ "; therefore the structure must be two (4) inches greater than the span, plus or minus $\frac{1}{4}$ ".
- The span of the structure is the opening between the abutments and is a randomly selected even number.
- The height of the structure above the plane of the abutment must be two (3) inches (see diagram below).
- The width of the structure must support the three (3) inch square load platform. The 3" x 3" load platform is centered in the length of the structure. The load platform is prepared from $\frac{1}{4}$ " plywood/particle board.

Evaluation

- The structure is weighed before testing and the weight is recorded on the evaluation form.
- An increasing load is applied to the structure via the test block until the structure fails.
- The failure weight is recorded on the evaluation form.
- The efficiency is determined by the failure weight x 4.54, divided by the weight of the structure in grams.
- The efficiency is rounded off to three (3) decimal places and recorded on the evaluation form.
- The highest numeric efficiency is the winner. In case of an efficiency tie, the greatest weight held by the tied entries will be declared the winner.
- Structures that violate guidelines receive a deduction of twenty percent (20%) of the greatest weight held for the first violation.
- Structures are not to be tested if:
 1. There are two (2) or more rules violations.
 2. The structure cannot be placed on the tester.
 3. The testing hook cannot be placed in the center of the structure.
 4. Straight pins are left in the structure.

1st – 100 pts

2nd – 97pts

3rd – 94 pts

4th – 91 pts

5th – 88 pts

6th – 85 pts

7th – 82 pts

8th- 15th – 79 pts