STRAW BRIDGE CHALLENGE

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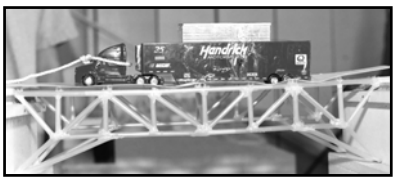

Age/Grade: Grades Six through Eight
Team Size: Two to Four Challengers

Challenge:
Design and construct a model road bridge made exclusively from soda straws, hotmelt glue and plastic tabs. The roadbed of the bridge must be at least 6 but no more than 7 inches wide. Additionally the bridge must provide a vertical clearance of at least 3.5 inches. The bridge must span a 20-inch wide hazard with the only support being the 0.5 and 1 inch ledges available at 0.75 and 4.75 inches down from the level of the roadbed as well as the vertical wall above the uppermost ledge and between the ledges. The total depth of the hazard is 9 inches. The bridge should be as light at possible while being able to support a load, represented as a model truck weighing 6.5 pounds for one minute.

Specifications and Challenge Judging Guidelines:
All Middle School age competitions involve four main components, a written report, an oral report, the design and construction of the entry and finally the entry's performance under competition conditions. An outline of what is required for each of these, and guidance on preparing for the competition is given in the Engineering Challenge's "Guide to Entry", which should be read in connection with this document.

A detailed "Design Guide" giving further information and tips specific to this challenge is available from the organizers or can be downloaded from The Baltimore Museum of Industry website. (www.thebmi.org) or by emailing paul.borthwick@teledynees.com

The challenge consists of four parts:

1.	Written Report and Drawings	30 Points
2.	Oral Presentation	10 Points
3.	Design and Fabrication	25 Points
4.	Performance Demonstration	35 Points

The "Performance Demonstration" is the part that is most unique to each challenge. For the **Straw Bridge Challenge** the Performance Demonstration will follow these general guidelines:

- Prior to load testing the bridge will be weighed, typically to within 1/10 an ounce, on a postal scale.
- The bridge will be placed in the hazard and a competition provided cardboard roadbed installed.
- The bridge will be load tested using an "Eighteen Wheeler" model truck that has been weighted to approximately 6.5 pounds.
    - The truck will be towed onto the bridge by means of a string attached to the tractor.

- When the truck is stopped in the middle of the bridge the timer will be started.
- The truck will be left on the bridge for a period of one minute.

- All bridges successfully completing the one minute load test will receive a performance score based on overall weight, with the lightest bridge receiving maximum points.

Additional Points:

- The bridge must conform to the specifications in this paper however, credit and awards are also given for creativity.
- The bridge must hold a 6 inch wide cardboard "roadway" made from light cardboard. While instructors are encouraged to build their own hazards and roadbeds for testing, on the day of the competition the judges will provide the hazard and roadway. **The roadway must not be attached to the bridge in any way**.
- The bridge may have any height above the roadway or any descent below the roadway, provided the bridge structure does not touch down between the designated support points within the hazard.

Materials:

- Drinking Straws: Sweetheart "JUMBO" straws, 7-1/4 or 10 inches long by 15/64 inches diameter. (contact the organizers paul.borthwick@teledynees.com or (410) 891-2255)
- Hot Melt Glue, (low temp recommended)
- Plastic tabs, at the joints only. (typically from plastic soda bottle or milk jug)

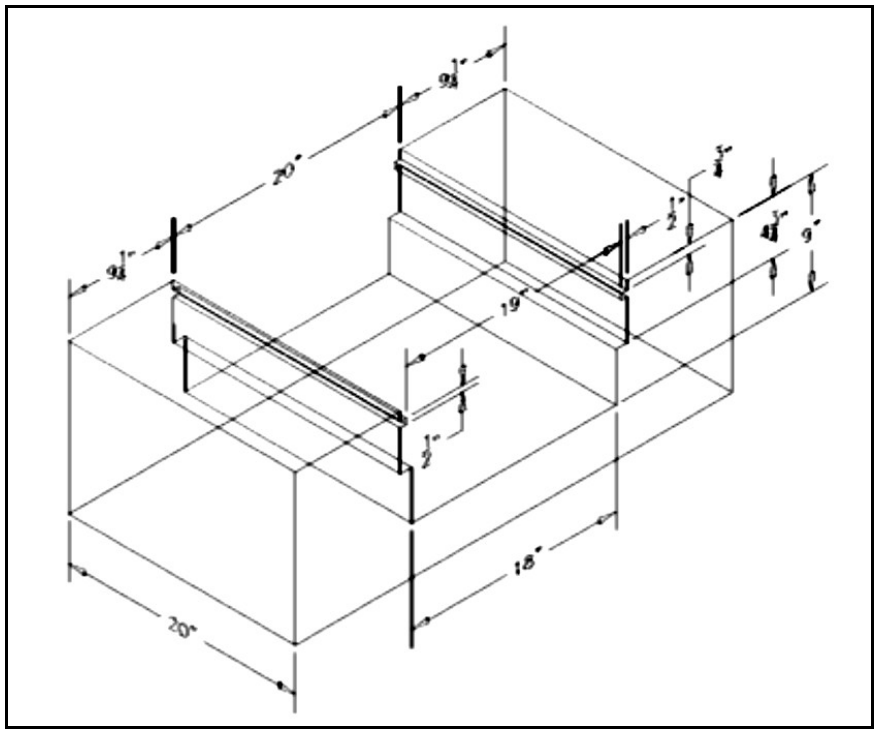

Figure { SEQ Figure * ARABIC }. Line Drawing showing the pertinent dimensions of the straw bridge hazard. (prepared by Jesse Cromer, Teledyne Energy Systems, Inc.)