

2015 ARGS Tech Expo Bridge Competition

Rules and Regulations

Overview

The Appomattox Regional Governor's School (ARGS) tech department will be sponsoring a popsicle stick bridge contest this year at the Tech Expo. The competition will occur May 1st, 2015, in the ARGS gymnasium. If you have any questions or concerns, please direct them to Ms. Whittle at kwhittle@args.us or Aaron Patrick at acpatrick@args.us.

Hints, Rules, and Regulations

- Goal: Span a clear distance of 22 inches using a bridge constructed only of standard, craft-variety popsicle sticks and glue.
- Each bridge will be scored in accordance to an Efficiency Rating (ER), which will be calculated by the following equation:

$$\blacksquare \quad ER = \frac{\text{Load carried by the Bridge at Failure (lbs)}}{\text{Weight of the bridge (lbs)}^2}$$

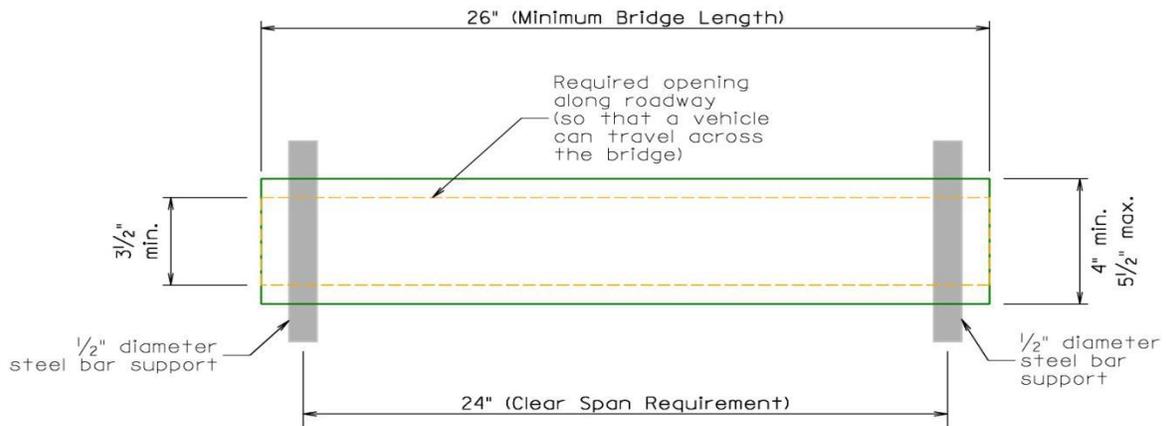
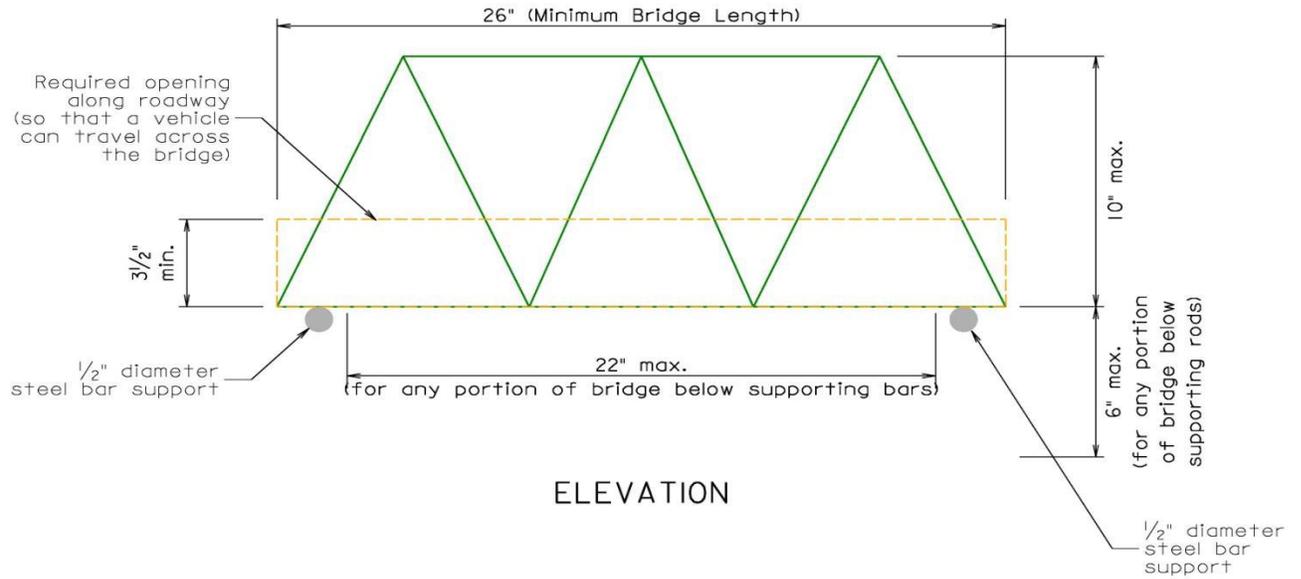
* Note that the score will be very heavily influenced by the weight of the bridge. Try to maximize the strength of the bridge while keeping the weight as low as possible!

- Maximum Weight of Bridge = 450 g (about 1 pound, or approximately 250 sticks plus glue)
- Required Sticks: Standard, 4½" x 3/8" x 1/12" craft-type Popsicle sticks (readily available at all craft and department stores).
- Required Glue: Elmer's® Glue-All Multi-Purpose Glue (This is the white, craft variety of glue. Please don't use any other glue such as wood glue, super glue, epoxy, or any other type of adhesive or the bridge will be disqualified).
- Sticks can be cut, sanded, trimmed or colored with colored pencils but all sticks must be visible to inspection and may not be painted or stained in anyway.
- No modifications will be allowed once teams have been checked in on the day of the event.

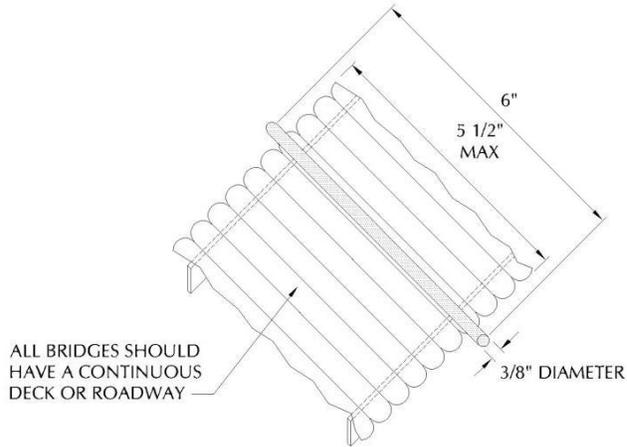
- The bridges must be able to stand freely on the supporting bars. No hooking, gluing or otherwise fastening the bridges to the supports will be allowed.
 - Bridge must contain a continuous roadway capable of allowing a “matchbox” type car to roll completely across the bridge without stopping or falling through.
 - Bridges will be loaded using a 1/2” diameter steel rod placed on top of the roadway at the center of the bridge. All bridges must be able to accommodate this rod (refer to the figures and photos shown on the following pages).
 - Bridges must meet the additional requirements shown on the following pages for connection and geometric limitations. Please note the minimum bridge length of 24 inches to be supported on the
 - supporting bars. Also note that any portion of the bridge below the supports must not be longer than 20 inches.
 - Disqualification: Bridges not meeting the requirements listed in these rules will be subject to disqualification. Disqualified bridges will still be eligible for the innovation or aesthetic awards but will not be considered for the efficiency score awards. Disqualified bridges will be tested until failure as long as it remains safe to do so. The decision of the judges at the time of the event is final.
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Geometric Constraints

The bridge must bear on the top surface of the bridge a horizontal $\frac{1}{2}$ " diameter steel bar

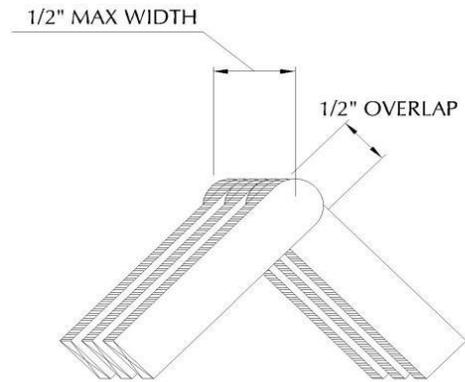


PLAN



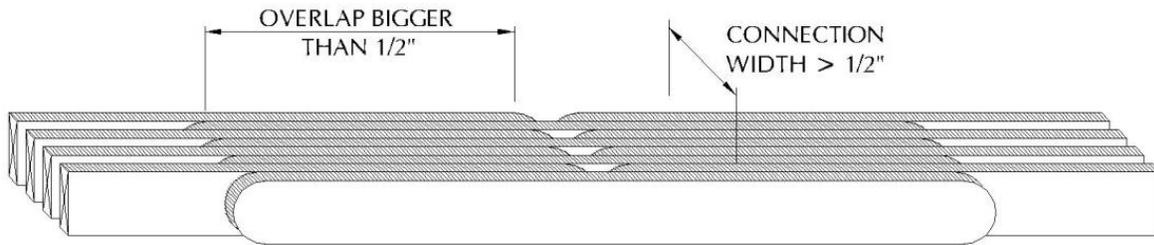
STEEL LOADING ROD (PROVIDED BY ASCE)

- A STEEL BAR WILL BE PLACED AT THE CENTER OF EACH BRIDGE ON TOP OF THE DECK. THIS WILL BE PULLED DOWNWARDS UNTIL THE BRIDGE BREAKS



ACCEPTABLE CONNECTION

- 1/2" MAXIMUM WIDE FOR ANY CONNECTION
- OPEN GAPS BETWEEN ADJACENT PIECES
- 1/2" MAX. OVERLAP



UNACCEPTABLE CONNECTION

- CONNECTION IS GREATER THAN 1/2" WIDE
- TOO MUCH OVERLAP (> 1/2")

Additional Information:



BRIDGE TESTING APPARATUS

* Note how bridge will be loaded and supported.



BRIDGE TESTING APPARATUS

*Note how load will be applied with 1/2" diameter steel rod at center of bridge. All bridges must be able to accommodate this rod.

Special thanks to the ASCE Richmond branch for allowing us to borrow their testing apparatus and providing the framework for the rules and regulations