

Dear Principals, Teachers and Parents,

Engineers Week, a formal coalition of more than 70 engineering, education, and cultural societies, and more than 50 corporations and government agencies, was founded in the United States in 1951 by the National Society of Professional Engineers. Dedicated to raising public awareness of engineers' positive contributions to quality of life, Engineers Week promotes recognition among parents, teachers and students of the importance of a technical education and a high level of math, science, and technology literacy, and motivates youth to pursue engineering careers in order to provide a diverse and vigorous engineering workforce. Each year Engineers Week reaches thousands of schools, businesses, and community groups across the United States.

To celebrate Engineers Week, our local chapter of the American Society of Civil Engineers (ASCE) conducts an Index Card Bridge Building Contest at the Peoria Riverfront Museum in Peoria, IL. This contest involves area 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grade students in the building of model bridges out of 3" x 5" index cards. The bridges are judged in various categories such as quality of construction, structural efficiency, aesthetics, and performance under loading.

ASCE would like to extend an invitation to the 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grade students at your school to compete in the **2020 ASCE Bridge Building Contest**. Please make the enclosed information available to your eligible students. Feel free to make additional copies of the rules or contact me and I will send more. Representatives from our local chapter can visit with you and/or your classrooms to discuss the event in more detail.

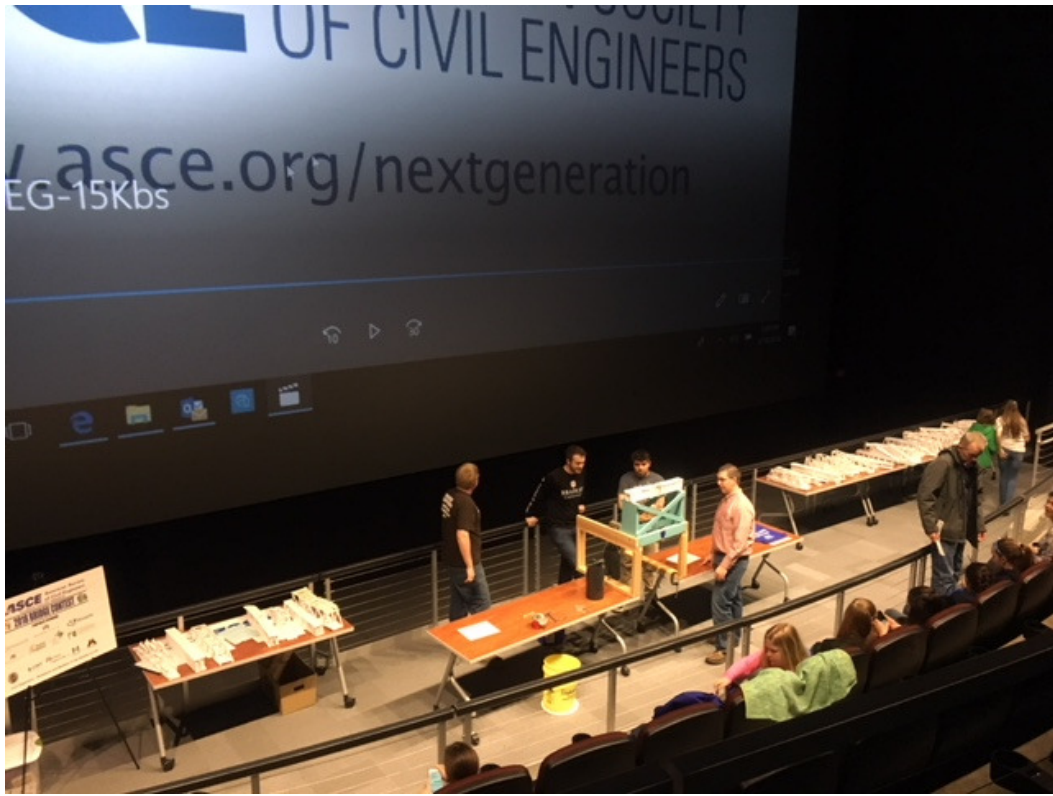
Participation in this contest will introduce the student to one aspect of civil engineering, namely structures. As a member of the design/construction team the student will be exposed to the process of considering alternatives and coming to a consensus on the most efficient structure type. Bridges will be judged on contest criteria as stated in the enclosed set of rules and tested for load carrying capacity with prizes awarded to the highest scoring entries.

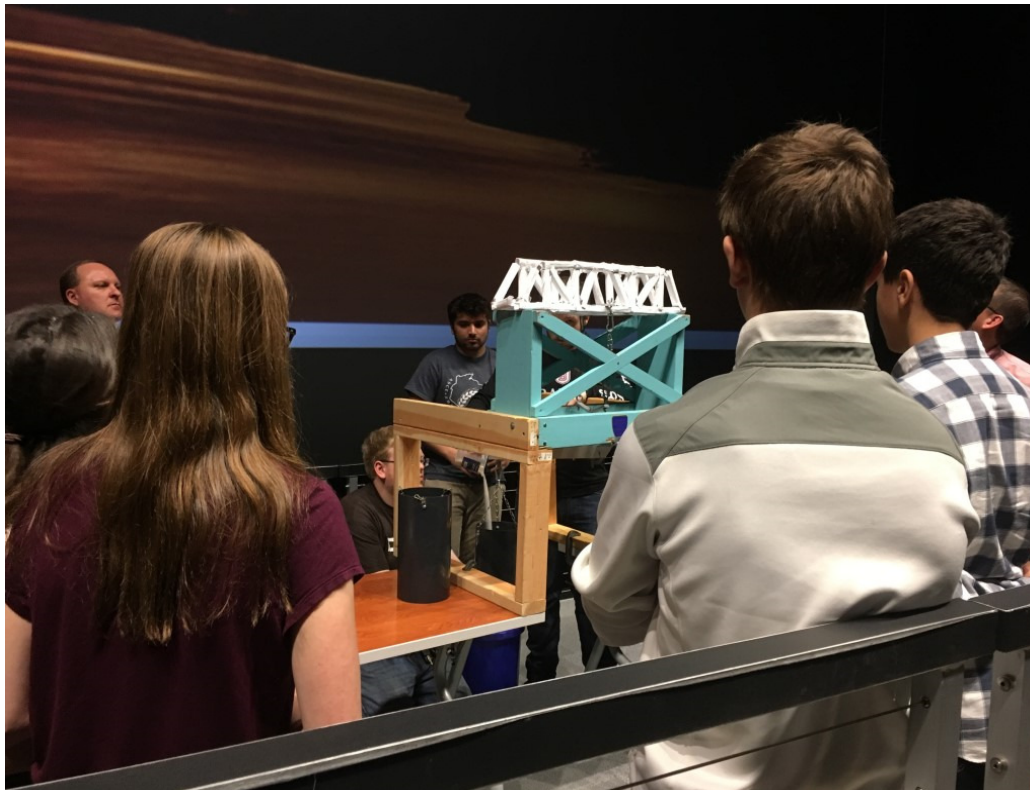
Thank you for taking the time to consider involving your students in this STEM related event. Hope to see you on contest day!

Sincerely,



Keith J. Plavec  
ASCE Bridge Contest Coordinator  
Maurer-Stutz, Inc.  
3116 N. Dries Lane, Suite 100  
Peoria, IL 61604  
kjplavec@mstutz.com  
(309) 693-7615







# 29<sup>TH</sup> ANNUAL ASCE BRIDGE CONTEST

It's time to test your imagination and your technical skill! The Illinois Valley Branch of the American Society of Civil Engineers is sponsoring the 29<sup>th</sup> Annual Bridge Contest.

## THE IMPORTANT INFORMATION

### PREREGISTRATION DEADLINE

Monday, February 3, 2020

### BRIDGE DROP OFF

Where: Peoria Riverfront Museum

Date: Saturday, Feb. 15, 2020

Time: 10 a.m. to 12 noon

### LOADING CONTEST AND AWARDS

Where: Peoria Riverfront Museum

Date: Sunday, Feb. 16, 2020

Time: 1:30 p.m.

### PEORIA RIVERFRONT MUSEUM

222 S.W. Washington St.

Peoria, Illinois, 61602

### Prizes

1<sup>st</sup> Prize: \$100

2<sup>nd</sup> Prize: \$80

3<sup>rd</sup> Prize: \$60

4<sup>th</sup> Prize: \$40

5<sup>th</sup> Prize: \$20



## THE OBJECTIVE:

Design and construct a bridge using standard 3" x 5" (176 mm x 127mm) index cards. The winning team will be judged based on team participation, conformance to the design and construction requirements, a written report, and finally, the performance of the bridge under a dead load.

## ELIGIBILITY:

Students must meet the following requirements:

- 1) **Currently in the 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, or 8<sup>th</sup> grade.**
- 2) Attend a school from the following counties of Illinois:  
Fulton, Hancock, Henderson, Livingston, Marshall, Mason, McDonough, McLean, Peoria, Stark, Tazewell, Warren, and Woodford
- 3) Teams may consist of up to four (4) students, with each student working on one team only.



If you have questions about the contest or if your school would like to be contacted by ASCE concerning career guidance information or a speaker to visit your class, please contact:

Keith Plavec  
Bridge Contest Coordinator  
Maurer-Stutz, Inc.  
3116 N. Dries Lane  
Suite 100  
Peoria, IL 61604  
Ph: 309-693-7615  
kjplavec@mstutz.com

Curtis Lynn  
Education/Speaker Info  
Maurer-Stutz, Inc.  
3116 N. Dries Lane  
Suite 100  
Peoria, IL 61604  
Ph: 309-693-7615  
cjlynn@mstutz.com

Civil engineering is a team effort! Students are encouraged to work in groups. There is a maximum entry of one bridge per team. A pre-registration form and \$10 per team entry fee (non-refundable) is required by the deadline in order to participate in the contest. If a school does not choose to officially participate, students are permitted by ASCE to enter as individuals or teams.



## **MATERIALS:**

Only the following items are acceptable:

- Index Cards – 3” x 5” (76mm x 127mm)
- Glue – only school glue “Elmer’s Brand” or similar brand
- Tape – only “Scotch Tape” or similar brand tape – standard ½” or ¾” wide transparent tape
- Markers, crayons, and colored pencils are permitted for creativity but NO PAINT will be permitted.

## **CONSTRUCTION:**

- Three (3) cards maximum may be layered directly together when forming members or components. **IMPORTANT!** All folded, closed shape members must be able to be examined visually. A paper punch size hole would be adequate for judges to check layer thickness and construction of closed members
- Where layered members meet at a connection, the sum of all layers may exceed three (3) at the connection only.
- It is not permissible to coat or cover a large area of any surface or edge, of layered or single card bridge members, with tape or glue. Tape and glue must not be a major contributor to the strength of a member but rather act only as an aid in maintaining the member’s shape.
- Tape and glue may be used to provide strength at the connections of members by coating or covering. Bridges will not be awarded full points if the judges determine the connections are of such a size as to provide strength as a member rather than just a connection of members.
- Rolled members may not exceed three layers to the center of the roll.
- Cards may be cut, bent, rolled, etc., to form members of the bridge making use of the above materials only.



## **JUDGING:**

### **TEAM (10 POINTS MAXIMUM)**

- Group participation is encouraged and awarded with 2.5 points per participant up to a maximum of four (4) participants

### **BRIDGE CONSTRUCTION (25 POINTS MAXIMUM)**

- Conformance to the material and member formation requirements
- Conformance to dimension requirements (length, width, and height)
- Efficient use of members to achieve structural strength
- Feasibility of construction if actual bridge were built
- Sufficient and clearly designated passageway and loading area with pen, pencil, or marker

### **AESTHETICS (15 POINTS MAXIMUM)**



- Pleasing lines and continuity of structure
- Drivability of bridge
- Uniformity, ingenuity, and originality

## REPORT (20 POINTS MAXIMUM)

- A brief written report on the planning, design concepts, cost, materials, sketches, resources on bridges, and overall completeness of the report. There is a two-page maximum, with sketches and the cover sheet not included.

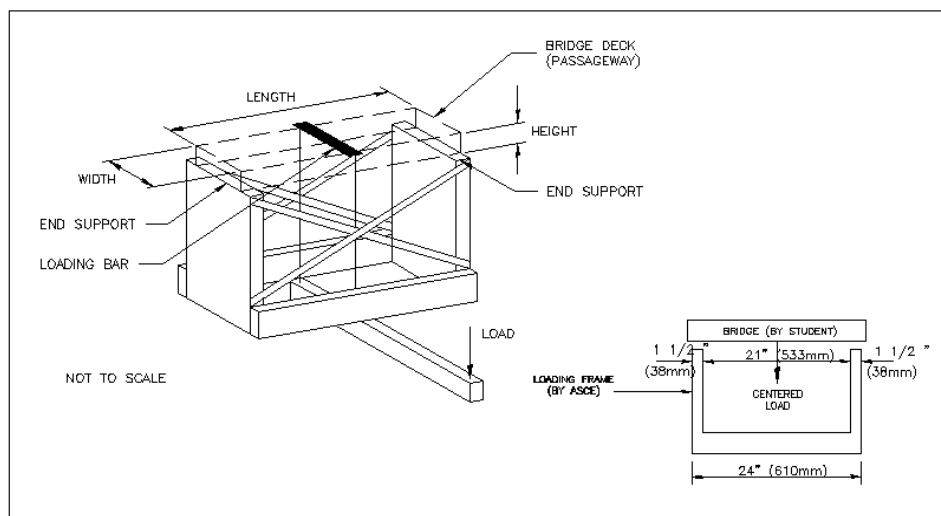
## PERFORMANCE (30 POINTS MAXIMUM)

- Loading scores will be based on a 30 point maximum, escalating curve based on the ratio of load carried to bridge weight that an individual entry attains. Remember that it is the ratio that is scored and not the total load carried. Efficient use of material (i.e. minimizing weight) is rewarded. By cutting the bridge weight in half you would double your ratio!! (ratio = load/weight)
- Bridges will be loaded to failure or the point of deflection deemed to be intolerable by the judges.
- Judges will be civil and structural engineers familiar with bridges. Greatest cumulative maximum points will win the competition. In the case of a tie in overall scoring, the bridge with the greater load to weight ration will be declared the winner.



## SIZING AND LOADING:

- Exact construction within the dimensions permitted will receive full points. Remember, bridges that are too short will not fit properly on the loading machine and **cannot be tested!**
- Overall Length: 24" (610mm) minimum - 27" (686mm) maximum
- Overall Width: 3" (75mm) minimum - 4.5" (114mm) maximum
- Overall Height (or Depth): 8" (203mm) maximum
- Bridge must be constructed such that the load bearing points of the bridge rest on the end supports of the loading frame.
- The bridge must be a freestanding structure.
- Solid, one-piece construction will not be allowed. Bridge cannot be a solid beam or a block, but must consist of beams or group of beams at a minimum.
- Bridge shall be constructed so that a 1" (25mm) wide loading bar (approx. 1/4" (6mm) in thickness) may be placed across the bridge width (bridge's short dimension) on the designated pathway at the midspan of the structure



**Please Note: Bridges cannot be returned unless the contestant is present after the loading competition on Sunday, February 16, 2020. Prizes will be awarded to winners regardless of attendance on Sunday, February 16, 2020. Judge's decisions will be considered final.**

**PRE-REGISTRATION FORM FOR THE 2020 ASCE  
ENGINEERS WEEK BRIDGE CONTEST**

*(5<sup>th</sup> Grade through 8<sup>th</sup> Grade)*

**Dear Team Contact Person:**

Please help ASCE plan for the contest by returning this completed form and the \$10.00 team entry fee to the address below before Monday, February 3, 2020. You must be preregistered to drop off entries on Saturday, February 15, 2020, and have bridge loaded at the Peoria Riverfront Museum on Sunday, February 16, 2020. Entry fees are non-refundable. Make sure back page is included with your registration form.

**TEAM CONTACT'S NAME:**

**TIME YOU CAN BEST BE REACHED DURING THE DAY:**

**SCHOOL NAME:**

**SCHOOL / HOME ADDRESS:**

(circle one)

**SCHOOL / HOME PHONE:**

(circle one)

**TEAM MEMBERS: (FOUR MAX.)**

(please print clearly)

NAME	SCHOOL
1.	
2.	
3.	
4.	

**PLEASE RETURN TO:** Maurer-Stutz, Inc.  
3116 N. Dries Lane, Suite 100  
Peoria, IL 61604

**PLEASE MAKE CHECKS PAYABLE TO: Illinois Valley Branch ASCE**

(COPY AS REQUIRED – BE SURE TO INCLUDE BACK PAGE)

**PRE-JUDGING**

- A. Team 10 pts
  - 1. 2.5 points/member, maximum of four (4) members
  
- B. Construction 25 pts
  - 1. Conformance with bridge dimension requirements (length, width, and height)
    - a. Length: 24" minimum – 27" maximum
    - b. Width: 3" minimum – 4.5" maximum
    - c. Height (or Depth): 8" maximum
  - 2. Compliance with member formation requirements
  - 3. Passageway – clearly marked pathway with pen or marker
  - 4. Loading bar – bridge has 1" by 0.5" opening at midspan
  - 5. Efficient use of members to achieve structural strength
  
- C. Aesthetics/Design 15 pts
  - 1. Pleasing lines and continuity of structure
  - 2. Drivability of the bridge
  - 3. Uniformity, ingenuity, and originality
  
- D. Report 20 pts
  - 1. A brief written report on the planning, cost, materials, sketches, resources on bridges, etc.  
There is a two page maximum, with sketches and the cover sheet not included.

	Judge No. 1	Judge No. 2	Judge No. 3	Average Points
Team	----- -	----- -	----- -	
Construction				
Aesthetics/Design				
Report				

**Comments:**

**BRIDGE LOADING**

- A. Performance 30 pts
  - 1. Escalating scale based on load to weight ratio

Weight of Bridge	Load Carried	Load/Weight Ratio	Performance Points

**TOTAL POINTS**

<b>TOTAL (100 POSSIBLE)</b>	
<b>PLACE</b>	