INTRODUCTION:

'Imagination is the seed of the creation and makes us infinite'- George Bernard Shaw.

You must have seen trees swaying in a storm, have you ever seen a building or bridge sway? Nature challenges engineers at each and every point. Bridge it Event provides you a great opportunity to prove to the world your calibre of making bridges as an innovative engineering which doesn't have any fear of damages. Before proceeding with the construction of complex and strong bridges, it is essential to model it and test it performance. Now it’s your time to build your bridge model with creativity, technique and your engineering brains using noodles! So do come and be a part of this extraordinary event which will surely leave you with a marvellous experience.

TASK:

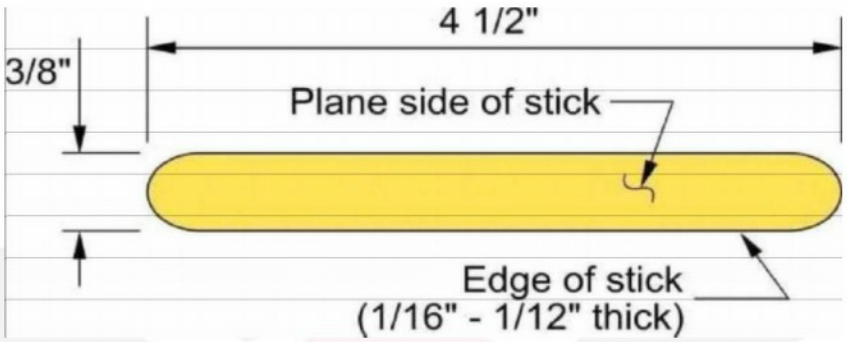
- To build a model bridge using common, easily available materials like Popsicle sticks, glue which can sustain maximum load, satisfying the stated constraints.

SPECIFICATIONS:

Bridge Materials:

- All bridge elements must be made of standard-sized Popsicle sticks.

- Only white all-purpose glue may be used to hold together all bridge elements.

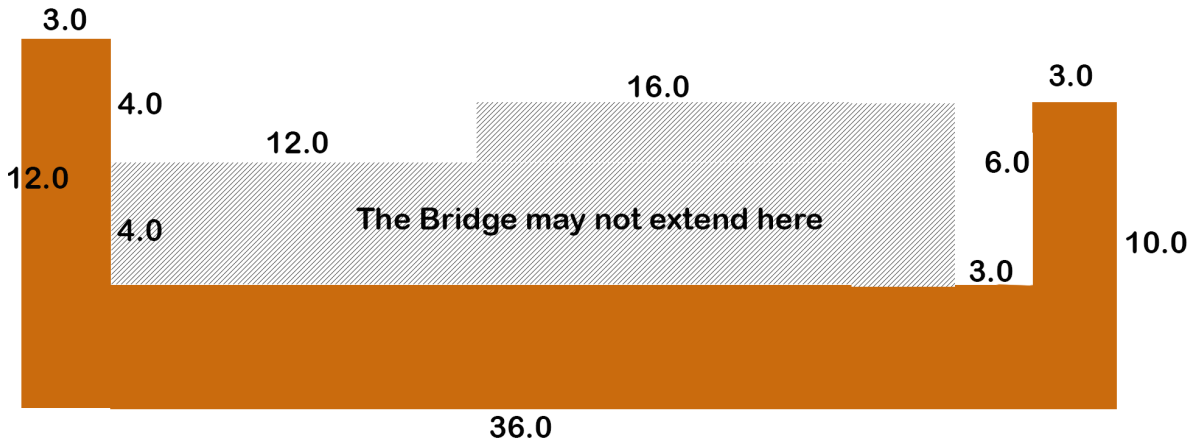


Standard Popsicle Stick

Bridge Design:

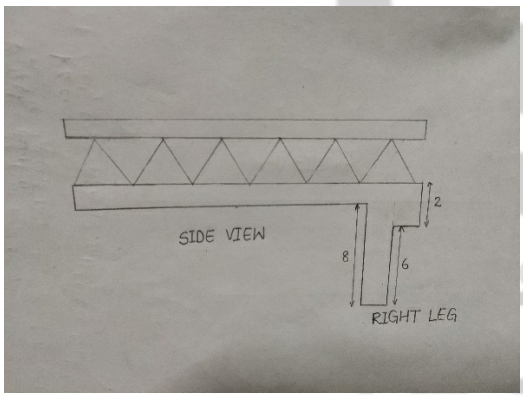
- The entire bridge must fit within a box 36'' long , 8''high and 6'' wide.

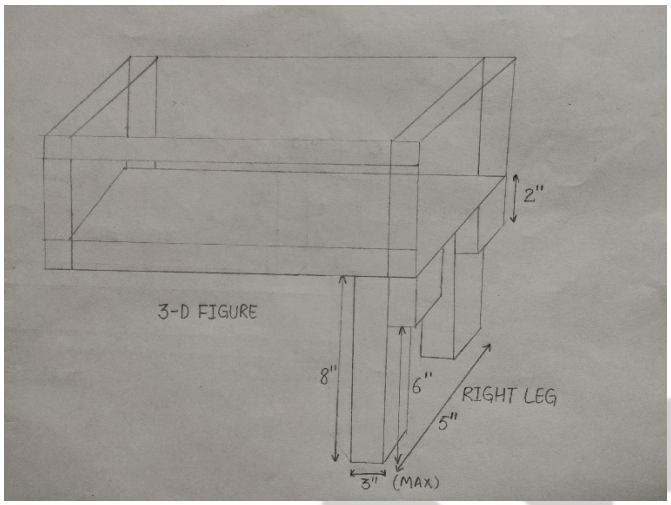
- Prior to loading,no part of the bridge may extend into the shaded areas shown in the loading diagram below.



- The bridge may only rest on or brace against the inner surfaces of the testing jig.
- The bridge will not be clamped on the right side. It must rest on a support made using popsicle sticks (pillar-like support).
- Each pillar of the support should not be with more than 5 popsicle sticks joined together.

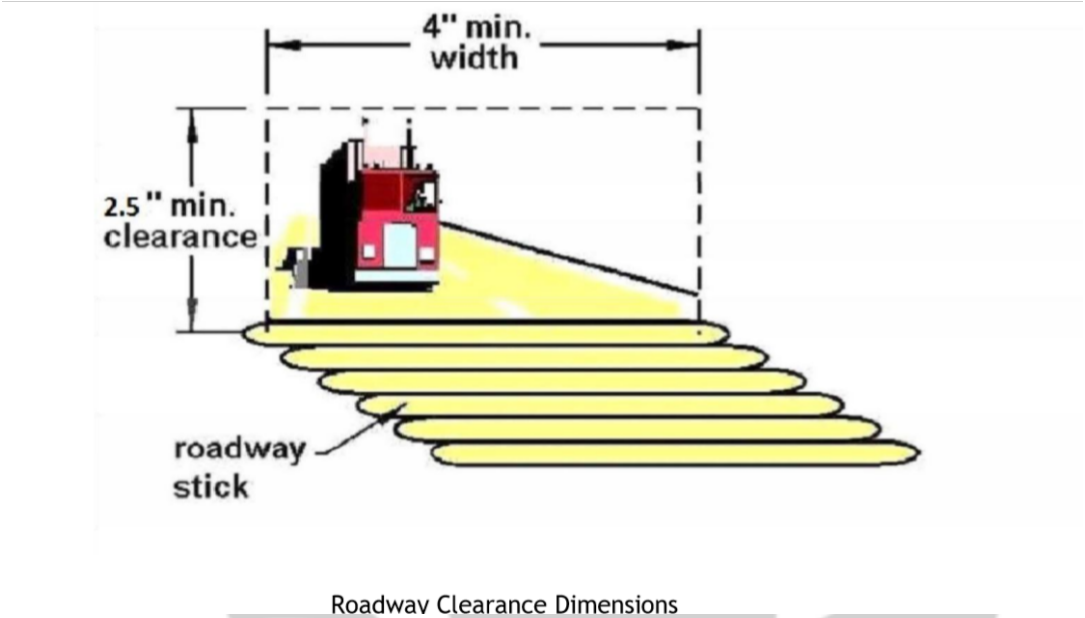
- The entire support (on the right leg) must not be more than 3" in length, 5" in width and 8" in height.





Testing Jig Geometry and Dimensions:

- Bridge structure must be able to rest securely on the testing jig on its own, without any load being applied.
- The length of way span should be equal to 36''. A roadway is defined as a flat surface upon which traffic can travel unimpeded.
- The roadway must be continuous, flat, and level. There should be no gaps between roadway sticks nor any obstructions along the roadway.
- Road way must have minimum 4''width and 2.5'' height clearance at all points to accommodate traffic.
- The bridge must weigh 1 kg or less.



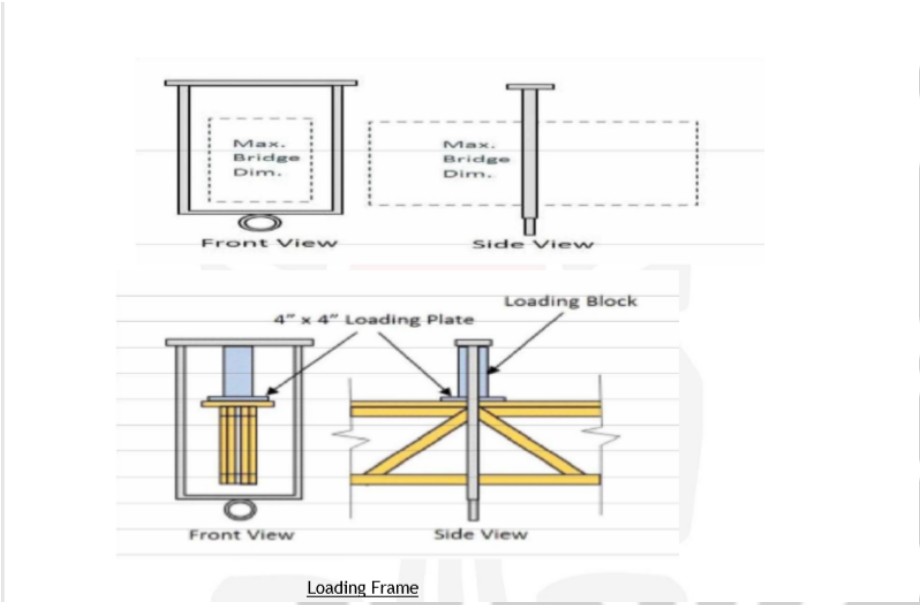
Roadway Clearance Dimensions

Rule violations:

- There will be a deduction of 5 points (out of 60) for each dimension not met (i.e., if the bridge is too narrow in width AND too short in length, these are two separate deductions totalling 10 points). Bridges Which do not fit on the testing jig and/or cannot be loaded safely will not be loaded and will be awarded 0 points for Strength/Efficiency.
- Deduction of 5 marks on each 100 grams increment in weight. (i.e., if the bridge weighs 1170 gms, 5*2=10 marks will be deducted.)

Bridge Loading:

The load will be applied at the mid of the span with the help of loading frame.



Loading Frame

Material Constraints:

- Popsicle sticks (maximum length 110 mm, width 13 mm and thickness 3 mm), wooden toothpicks (maximum diameter 2 mm, length 65 mm and noncolored) and adhesives (Synthetic white adhesive or fevicol) can only be used to build the structure. **Bridges constructed out of any materials not listed above will be disqualified from the competition**.

- Popsicle sticks may not be altered or modified in any way, with the following exceptions:

a) Sticks may be sanded slightly to remove waxy film prior to gluing.

b) Roadway sticks may be cut and/or sanded (but roadway must adhere to all dimension requirements). Roadway sticks are defined as those which would come in contact with the wheels of any traffic crossing over the bridge.

- Adhesive can only be used to join Popsicle sticks and Toothpicks together; however, adhesives cannot be applied on the free surface of a member made of Popsicle sticks to increase its strength (Adhesives such as MSeal®, Feviquick or Superglue or commonly called Cyanoacrylate are not allowed).

TESTING AND JUDGING CRITERIA:

- Teams will be awarded points based on their bridges' performance in four different categories of the bridge competition (Structural Efficiency, Economic Efficiency, Aesthetics and Technical Report). At the end of the competition, all points will be tallied and compared to the scores of all the competing teams. There is a maximum of 100 points in this competition.

- Structural Efficiency:

  I.Vertical load: Awarded based on the maximum load supported by

the bridge divided by its weight prior to failure. The bridge that supports the greatest load-to-weight ratio prior to failure, will be awarded 60 points. All other bridges will be awarded points based on the percentage of this maximum load-to-weight ratio that they achieve.

II. Horizontal pull: Bridge should take a minimum horizontal load of 150 N at the mid of the span without deflecting more than 1". 10 points will be awarded if the bridge passes these criteria.

- Economic Efficiency: The economic efficiency will be calculated based upon the fact that the cost of a bridge is depending on it's weight . 10 points will be awarded to the team with the highest score in this category, and all others will be awarded points based on their economic efficiency as a fraction of the highest score.

- Aesthetics: Awarded based on the level of craftsmanship, cleanliness, and artistry of the bridges' design and construction. 10 points will be awarded to the team with highest score in this category, and all other teams will be awarded points based on their subsequent rankings in this category.

- Technical Report: Awarded based on the quality of the written report describing the design and construction phases of the bridge. This section carries points equal to 10 with the same rules applicable as above .

RULES:

Teams:

- Each team can consist a maximum of 3 members. Members of a team may belong to the different institutions.
- Students may not be members of more than one team.
- Each team may only submit one bridge for competition.

Rule violations:

Teams that do not adhere to these rules will be disqualified from the competition.

General:

- Bridges, reports found in violation of any of the aforementioned rules will be assigned a penalty as described in the rules above. If there are egregious violations of the rules, the judges reserve the right to disqualify a team, or award zero points in any category.
- All conflicts will be resolved by the Head Judge.
- Head Judge's decision will be final.

REGISTRATION:

- Teams have to submit a drawing of the model on a graph sheet with appropriate scale.

- The typed technical report should not exceed 250 words. The abstract should be concise and to the point.

  a. Must have a title sheet clearly identifying the school and the team members.

  b. Report shall be 2-4 pages long, not including illustrations or photographs.

  c. Must include a drawing with dimensions of the bridge.

  d. It must include photographs of bridge .

- Once the abstract is submitted then the participants will not be able to make any change to the design, but still if they wish to change they will have to reapply and submit the new design.
- Abstract should be mailed to events@technex.in with subject of the mail 'Bridge-it: <Team name >: 'Abstract'
- Last date of submission of abstract is 16 January, 2020.

CERTIFICATE POLICY:

- Certificate of Excellence will be given to all the winners.
- Certificate of Participation will be awarded to the teams who are able to withstand minimum vertical load of 15 kg.

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