SPAGHETTI BRIDGE CONSTRUCTION COMPETITION „ STiKS 8”

REGULATION

1. Description

Spaghetti bridge construction competition is Riga Technical university Faculty of Mechanical Engineering, Transport and Aeronautics student councils (RTU FMETA SC) and Riga Technical university Student parliament (RTU SP) jointly developed measure, in which the goal is to make the strongest bridge out of spaghetti and hot glue.

2. Goal

Develop engineering students abilities in resolving technical problems by building bridges out of spaghetti.
To draw public attention to the engineering profession and contribute to its rising prestige.

3. Organizers, time and place

3.1. Organizers

Amanda Brizga, +37128390935, amanda.brizga@gmail.com, RTU FMETA SC representative;
Lauris Ostrovskis, +37128656253, lauris.ostrovskis96@gmail.com RTU FMETA SC representative;
Dace Signija Mice, +37129244581, signija1232@gmail.com, RTU FMETA SC representative;
Anda Barkāne, +37128206498, barkaneanda@gmail.com, RTU SP Head of Science department;
Kristaps Boķis, +37129481565, kristaps.bokis@gmail.com, RTU FMETA SC representative.

The judges and jury – announced on the day of the event.

3.2. Time and place

The competition takes place in Riga, RTU Faculty of Architecture and Urban Planning.

4. Participants

Teams with no more than 3 people are eligible, every participant can only register in 1 team in every category. **Teams are divided in 4 categories:**

1. Small bridges – high school students (team consists of 2-3 people; construction on site)
2. Small bridges – students (team consists of 2-3 students or team in which at least 1 person is a student; construction on site);
3. Big bridges - (team consists of 2-3 people, in which at least 1 person is a student; construction takes place in advance);
4. Design bridges (team consists of 2-3 people or team in which at least 1 person is a student; construction takes place in advance).

5. Application

Participation in the competition is applied by filling in a form at least 5 days before the event takes place, on the website www.stiks.lv section Registration.
Maximum amount of teams is 60, from which 20 are for high school students and 30 for students, but 10 teams are mixed ones. If high school student teams are less than 20, then student category team count is increased and other way around.

If by any means taking part in competition is canceled – COMPULSORY notification has to

be made to organizers by sending an email to stiks2017rtu@gmail.com or by calling the following number +371 29481565 (Kristaps Boķis – participants coordinator).
Advance registration is mandatory. When applying for the competition, it is mandatory that you read the competition regulation.

6. Registration

Registration takes place when teams arrive on site and agree to the regulation. 1., 2., 3. and 4. categories team members may be asked to show a valid student id or student licence. After registration, teams are lead to their workplaces.

7. Event program

Time	Activity
08.00	Registration for 1., 2. and 4. categories teams
08.40	Opening event (topic notification for design categories bridges)
09.00 – 12.30	Bridge construction
12.30 – 13.30	Lunch break
13.30 – 16.00	Bridge construction is continued
16.00 – 17.00*	Bridge technical inspection for 1. and 2. categories teams. Registration and technical inspection for 3. category teams. Jury evaluates design category bridges.
17.00 – 19.00*	Bridge load durability test
19.15*	Awards ceremony

* - possible shift to a later time

8. Competition process

1., 2. and 4. category team allocated building time is 6 hours . After that, 1. and 2. category bridges are placed in the shown area for technical inspection. In case of exceeding the size, weight or permitted materials are used, team is disqualified, in which case team may be given extra time to fix their creation. After technical inspection, every team's bridge inspection results are announced to them personally . Teams have rights to dispute the judge's decision. In another case – teams are allowed for the testing process.
After technical inspection is done, the next up is – bridge load durability test. Bridges are tested in the order of when they registered, starting from the teams that registered first .
4. category team bridges are evaluated by jury while 1. and 2. categories bridges are in technical inspection.
3. category team bridges are inspected right after they are registered. Testing of 3. category team bridges takes place after 1. and 2. category bridge testing.

9. Rules for bridge construction on site

9.1. Materials and instruments

1. and 2. category teams are given the following materials :

- 1 spaghetti package;
- If necessary, 3 hot glue sticks (11 mm diameter);
- Wood part, to merge in the construction (dimensions att. 2);
- If necessary, ruler, scissors, and utility knife.

4. category teams are given the following materials :

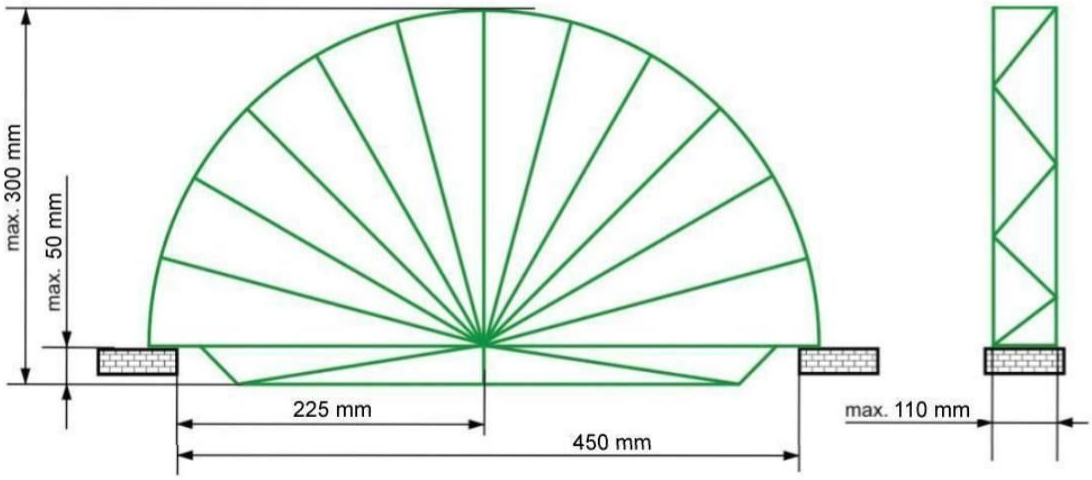
- 1 spaghetti package;
- If necessary, 3 hot glue sticks (11 mm diameter);
- If necessary, ruler, scissors, and utility knife.

Attention! Hot glue guns are limited, advisable to take your own hot glue guns.

Teams are allowed to bring different equipment that may help them in construction of the bridge (rulers, scissors, scotch tape, utility knifes, rope, string, cords etc).
Few different electrical equipment (hairdryer, teapot, bulb etc.) in case of using the following items, the fact must be notified to the organizers before the start of the design process. The organizers have the right to prohibit the use of some accessories. Used at the same time, electronic device total electrical power must not exceed 1kW. In the bridge construction only organizer provided spaghetti pasta and any commercially available hot glue is eligible. In case of suspicion, the team must be prepared to demonstrate that the adhesive is commercially available. If unauthorized materials are used, team is disqualified. Teams are not allowed to paint the bridges, build in a sheet of paper, add some decorative elements etc. Glue may only be used in the bridge joints. Spaghetti, which are parallel, gluing together is prohibited and covering different pasta with glue and creating braces from glue is not allowed. Glue must not extend more than 10% of the whole surface and adhesive may only cover the joints up no more than 10 mm in radius. Bridge weight should not exceed 600 grams along with the built-in wooden part. Wood part and screw-in hook dimensions are given below in pictures 1. and 2. Wooden part must be built in the middle of the bridge and clear room should be left for the hook and nut to be screwed in.

9.2. Dimensions

- The distance between the highest and lowest part of the bridge must not exceed 300mm.
- Bridge lowest point shall not be less than 50mm from the test equipment support level.
- The distance between the supports of the test equipment is 450mm, so the bridge must be longer than that, but not exceed 550mm.



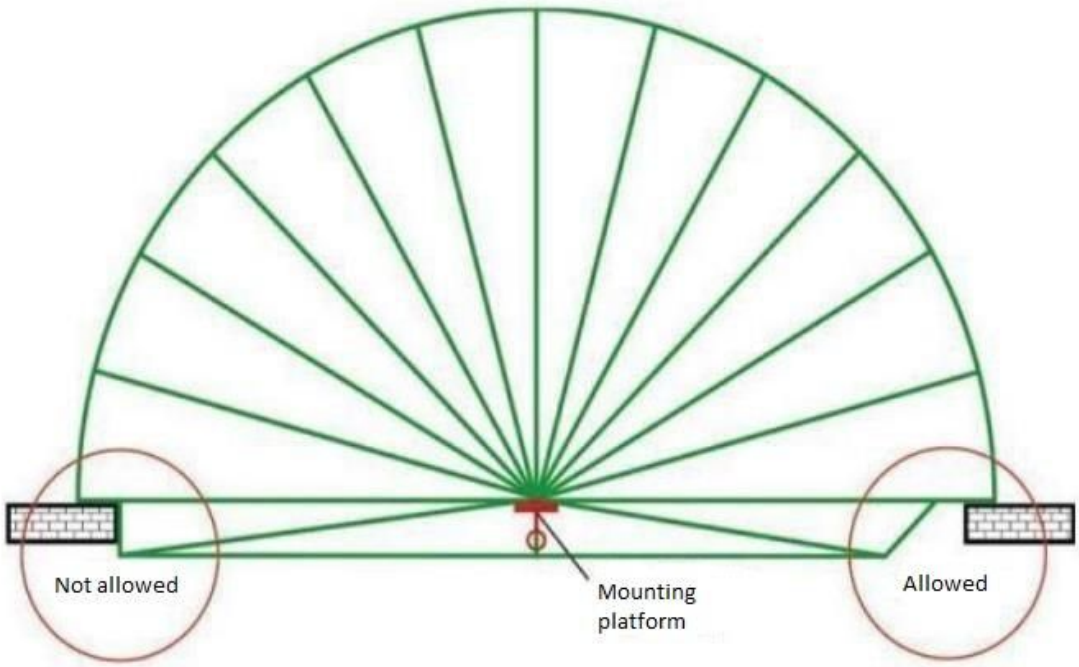
Picture nr. 1. Bridge allowed dimensions

Picture nr. 2. Wooden part

Picture nr 3. Wooden part and possible mounting element

9.3. Applying load

The design of the bridge should be constructed so that when testing, it is not leaning against the test equipments support side.



Picture nr. 4. Bridge permissible construction regarding to the position against the testing equipments support sides.
Load is applied through mounting platform and is increasing in the vertical direction.
Load is continuously increased until the bridge has collapsed.

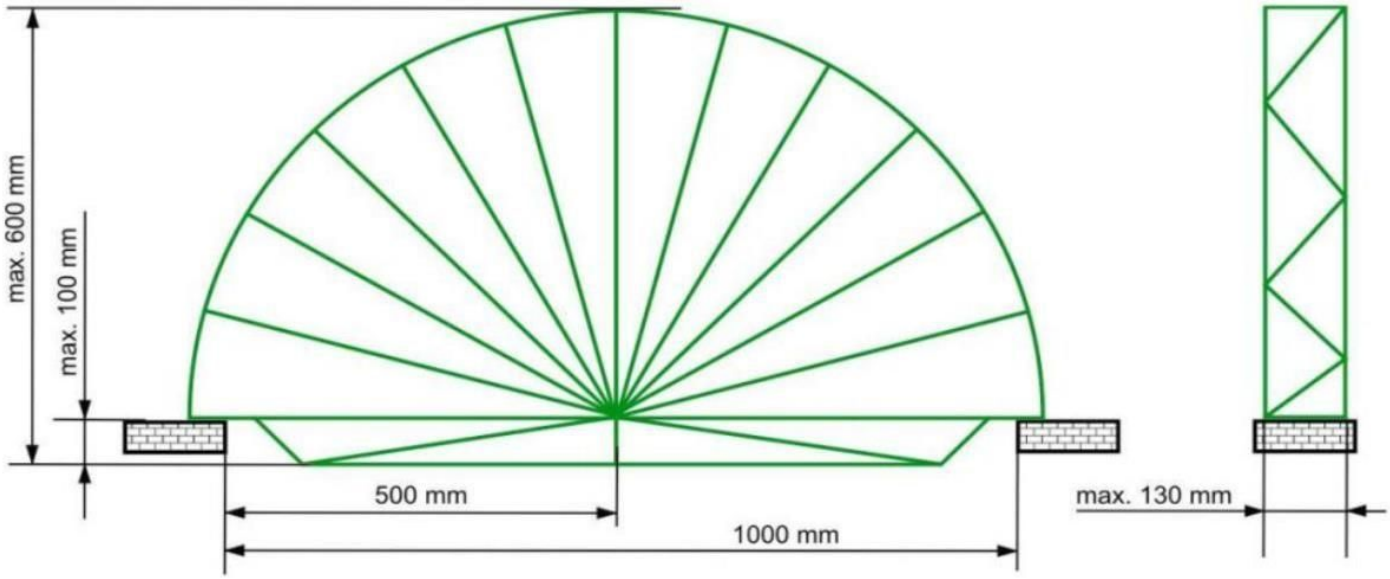
10. Rules for „Big bridge" construction

10.1. Construction rules

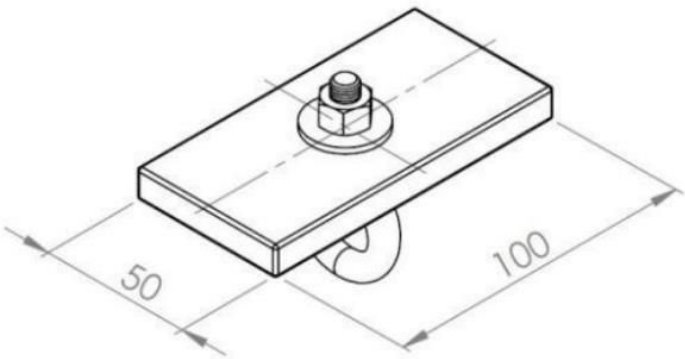
In the bridge construction any kind of commercially available pasta and any commercially available glue is allowed. In case of suspicion teams need to demonstrate that either pasta and/or glue is commercially available to anyone. If unauthorized materials are used, team is disqualified. Teams are not allowed to paint the bridges, build in a sheet of paper, add some decorative elements etc. Glue may only be used in the bridge joints. Spaghetti, which are parallel, gluing together is prohibited and covering different pasta with glue and creating braces from glue is not allowed. Glue must not extend more than 10% of the whole surface and adhesive may only cover the joints up no more than 10 mm in radius. Bridge weight should not exceed 1000 grams along with the built-in wooden part. Wooden part and screw-in hook dimensions are shown in pictures nr. 6 and 7. Wooden part must be built in the middle of the bridge and clear room should be left for the hook and nut to be screwed in.

10.2. Dimensions

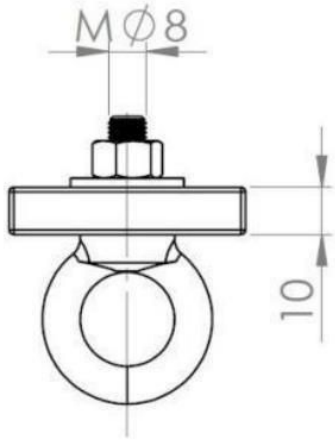
- The distance between the highest and lowest part of the bridge must not exceed 600mm.
- Bridge lowest point shall not be less than 100mm from the test equipment support level.
- The distance between the supports of the test equipment is 1000mm, so the bridge must be longer than that, but not exceed 1300mm.



Picture nr. 5. Alloweed „Big bridge” dimensions



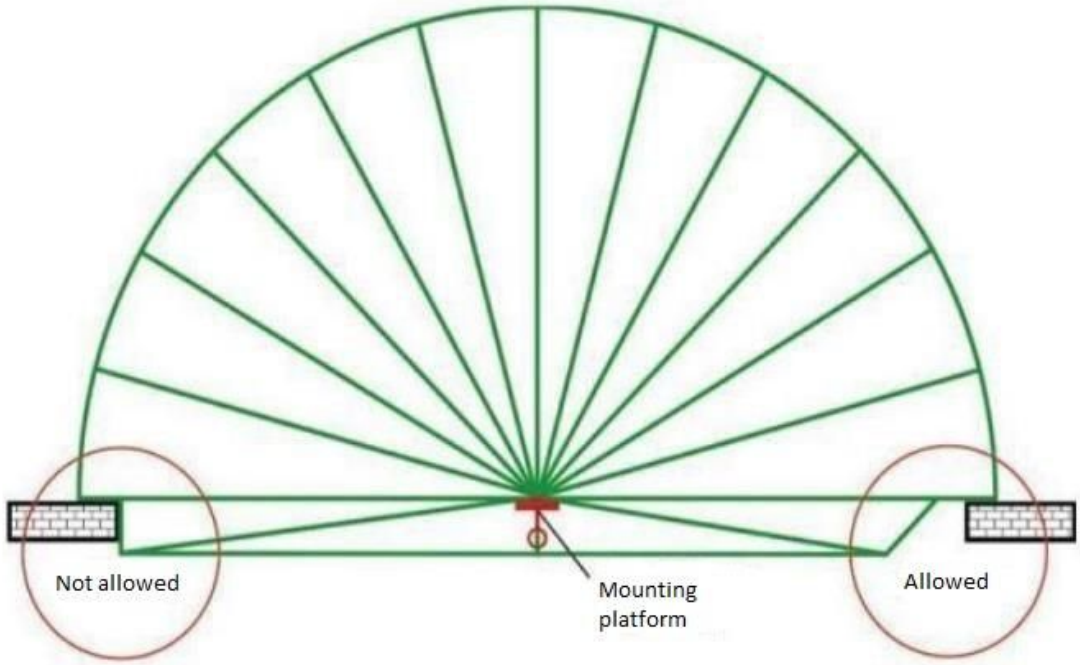
Picture nr. 6. wooden part



Picture nr. 7. Wooden part and possible mounting element

10.3. Applying load

- The design of the bridge should be constructed so that when testing, it is not leaning against the test equipments support side.



Picture nr. 8. Bridge permissible construction regarding to the position against the testing equipments support sides

- Load is applied through mounting platform and is increasing in the vertical direction.
- Load is continuously increased until the bridge has collapsed.

11. Evaluation

Teams are ranked according to their performance result of the testing process, starting with the highest score . The winning team is the one with the highest score. In the event that two or more team bridges have the same results due to the limit of the testing equipment, the winning bridge is determined by its weight, the first place is awarded to the bridge with less weight. Bridge weight is recorded before the testing process.

12. Result disputing

Participants have the right to dispute the results of the competition, by notifying the organizers within 20 minutes after result publication. Organizers look into the protest and make the decision regarding the results.

13. Awards ceremony

The winner team in design category and Top 3 teams from other category are awarded. First place winners from categories 2 and 3 obtains voucher to go to the World spaghetti bridge construction competition, which is held in Hungary, Budapest.
Crush awards may be awarded to some teams from organizers or supporters.

- During the event, participants themselves are responsible for their own safety and health.
- Judges reserve the right to change any of the regulation points according to the situation and disqualify a team if regulation is violated.