



## Rules of the Hall of the Year Academic 2023 student competition

The Faculty of Civil Engineering CTU in Prague (hereinafter also referred to as “the Faculty” or “organiser”) announces the 11<sup>th</sup> year of the Hall of the Year ACADEMIC 2023 competition held under the patronage of the Faculty Dean and The Czech Chamber of Chartered Engineers and Technicians (ČKAIT). The competition conceived as an international event is open to students at technical universities (in Bachelor's and Master's degree studies).

The competition is announced in the category of models prepared in advance. The evaluation criterion in the competition is the model effectiveness, i.e. the ratio between the model's load-bearing capacity and weight.

### Competition venue and date:

The competition will be held on Wednesday 19. 4. 2023 from 8:30 a.m. to 4:00 p.m. in the atrium of the building of the Faculty of Civil Engineering CTU in Prague, Thákurova 7, Praha 6 – Dejvice,

### Participation and competition registration

2-3-member teams of students from universities with technical orientation can participate. The applications for the competition can be registered at [www.halarokuakademik.fsv.cvut.cz](http://www.halarokuakademik.fsv.cvut.cz). The organiser of the competition reserves the right not to accept a team or to require a change in team members so that all the members meet the prerequisite of studying at a technical school.

The deadline for submitting registrations is 31. 3. 2023 at 12:00 p.m. After this date, registrations can be accepted only based on an agreement with the organisers. A partial change in the team composition is possible after the deadline, but the registrant's name cannot be changed. The number of teams is limited to 60. In the case of high demand, the maximum number of teams from one school may be limited, in which case, the registration date of individual teams from the same school will decide.

Participation in the competition is conditional on the payment of a registration fee of 300 CZK per team, which must be paid to the account of the Faculty of Civil Engineering CTU in Prague. The fee expresses a binding interest in participating in the competition and is refundable - it will be refunded to the registrant at the competition venue on the competition day. In the case of non-participation, the fee will not be refunded. The fee will be refunded to all teams whose model passes the initial registration.



After registering for the competition, the team registrant will receive an email from the organiser informing them whether their registration is valid (for capacity reasons limiting the number of competing teams) and if so, the account number to which the fee shall be paid. Registered teams are obliged to settle the fee no later than 7. 4. 2023 at the latest. The teams from universities based outside the Czech Republic do not pay any registration fee.

## Prizes and rewards

The top five places will be awarded the following financial amounts:

- 50,000, - CZK for 1<sup>st</sup> place
- 25,000, - CZK for 2<sup>nd</sup> place
- 12,000, - CZK for 3<sup>rd</sup> place
- 6,000, - CZK for 4<sup>th</sup> place
- 3,000, - CZK for 5<sup>th</sup> place

The contestants can also receive special prizes granted by the competition partners. The winners will be selected at the partner's discretion and the awards need not be related to the load test results. The number of awards and their value are not specified in advance. Selected structures will be published on the Faculty website, the Faculty Facebook page and used for other Faculty promotional purposes.

## Amendments and changes to the competition rules

In the event that any ambiguity in the interpretation of the rules is found in the time between the competition announcement and the competition day, the organiser will ensure that the rules are supplemented and an amendment to the rules is published on the competition website in the rules section. The organiser also reserves the right to unilaterally change the competition rules, even without prior notice. Questions about the competition can be submitted solely by e-mail to the organiser's address at: [hala.akademik@fsv.cvut.cz](mailto:hala.akademik@fsv.cvut.cz), and technical questions related to further specifications of the rules (proposed solutions, materials, etc.) can be submitted no later than 15 days before the start of the competition finals. The organiser reserves the right to terminate the competition at any time for technical, commercial or other reasons. In this case, the paid registration fees will be refunded to the account from which they were sent. Participation in the competition does not give rise to a legal claim to a prize and prizes cannot be legally claimed. The organiser will inform about any changes on the competition website.

## Professional jury

The correctness of the results of the competition is guaranteed by the professional jury.



## Consent to personal data processing

By participating in the competition, each contestant:

a) grants the Faculty of Civil Engineering CTU in Prague, ID: 68407700, their consent to the use of their address and e-mail for the purposes of sending information about the course of this competition and information about other events organised by the Faculty of Civil Engineering CTU in Prague, and the handing over of potential prizes; this consent is granted for a period of 3 years.

b) pursuant to Act No. 101/2000 Coll, on Protection of Personal Data as amended, grants the Faculty of Civil Engineering CTU in Prague their consent to the processing of their personal data in the scope of name, surname, address, email, studied school and branch of study, which they will provide to the organiser in connection with their participation in the competition, for the purpose of handing over prizes in the competition, for a period of 3 years; they also agree to their publication in the scope of name, surname, studied school and branch of study in the media and on the organiser's website and Facebook pages, provided such use is related to this competition, in particular, for the purpose of announcing the winners. The provision of personal data is voluntary.

c) pursuant to Act No. 101/2000 Coll, on Protection of Personal Data as amended, grants the Faculty of Civil Engineering CTU in Prague their consent to the creation of photographs and audio/video recordings of the event and the capture of their person and the competition model and their processing and use, in particular: for the Faculty's own use for the purposes of the presentation and promotion of the Faculty of Civil Engineering CTU in Prague and for editorial purposes (i.e. publication in periodicals and other media).

By participating in the competition, each contestant agrees that the photographs and audio/video materials can be altered, used as part of a collective work, or used only in part. They may also be accompanied by a commentary or another accompanying text.

The person who provided the data:

a) is entitled to withdraw the above consent to the processing of personal data at any time by form of a letter send to the following address: Faculty of Civil Engineering CTU in Prague, PR and Marketing Department, Thákurova 7, 166 29 Praha 6; or by e-mail at: [pr@fsv.cvut.cz](mailto:pr@fsv.cvut.cz).

b) has the right to access the personal data provided;

c) has the right to request the update, correction, complementation and erasure of the personal data provided.



## Course of the competition

The acceptance of models will take place at the Faculty of Civil Engineering CTU in Prague from 8.30 to 10.30 a.m. on the competition day. At the acceptance, compliance with the material conditions will be checked and the models will be weighed. All registered models must comply with the geometric conditions of the protected area that must not be intruded (see diagram) and must be made using only the specified materials. The registered models will be displayed in the Faculty atrium after acceptance.

The loading of the models will start at 12.00. The order in the load tests will be published before the start of loading. The organiser reserves the right to change the competition time schedule.

## Geometric requirements

The model represents a section of a landfill structure with a conveyor belt, intended for the storage of loose materials. The landfill does not have a roof and the load-bearing structure has the function of supporting the conveyor belt.

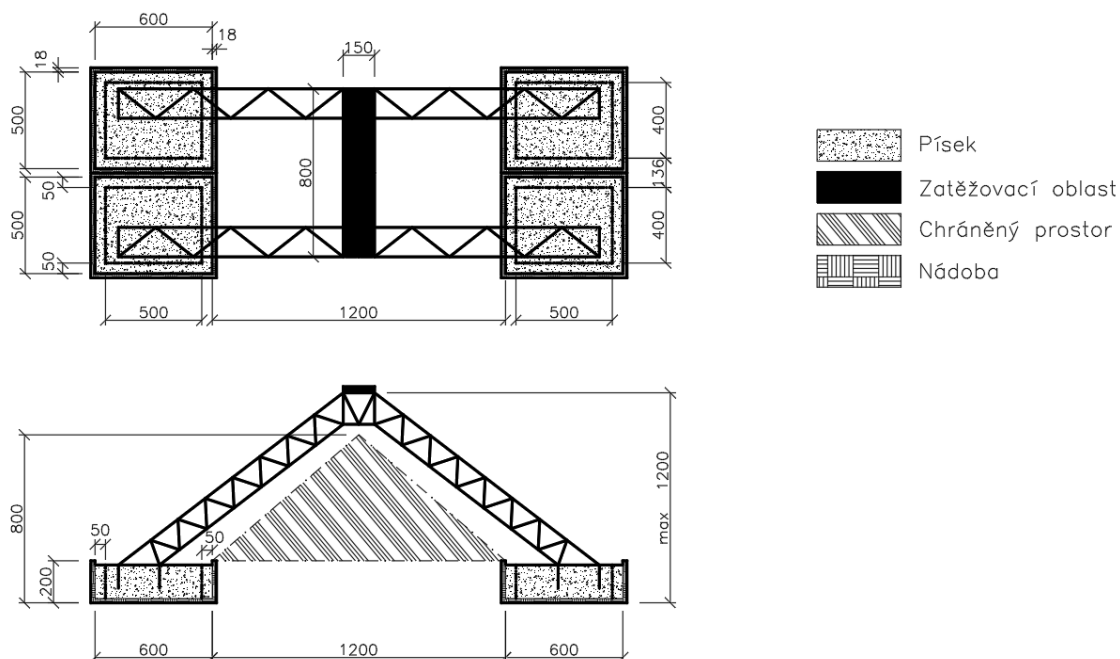
The required shape of the model is displayed in the diagram.

The stored material represents a protected area which must not be hit by the model's load-bearing structure under any circumstances, even during loading. The shape of the protected area section is indicated in diagram (2) by hatching.

The model must allow for the application of a continuous load in the load area (conveyor), exerted by steel weights that will be placed on the model during the load tests. The minimum plan dimensions of the load area are 150 x 800 mm.

The model will be positioned on the test site to perform the load tests.

## Diagram



## Test site

During the load test, the model structure will be positioned on a test site consisting of four boxes with the external dimensions of 636 x 536 x 218 mm (box wall thickness of 18 mm). The boxes will contain sand moistened to the consistency to form sand cakes. The box will be filled with sand up to 10 mm below the top edge of the box.

The distance between the boxes will be 1200 mm. The boxes will be placed on benches on the podium. The layout plan of the boxes is shown in diagram (1).

## Loading

The dimensions and mass of the steel weights that can be used for loading are:

- small weights: dimensions of 150 x 40 x 5 mm (mass of 235.8 g)
- medium weights: dimensions of 150 x 30 x 30 mm (mass of 1059.7 g)
- large weights: dimensions of 150 x 40 x 40 mm (mass of 1886.4 g)

The weights will be provided by the organiser.



## Material requirements

The models must be made using only the following materials:

- wooden profiles (square and round beams, veneer, plywood) from wood species commonly growing in the Czech Republic
- string made of natural materials
- all types of glue are permitted

No other materials can be used. Among others, the use of balsa, fishing lines, silon, metal, etc. is not allowed. To check the materials, the contestant shall submit samples of all the competing materials used to make the model in their raw state. The glue used need not be documented.

The maximum weight of the complete structure is not limited. The total weight of the model also includes the anchoring or foundation structure.

The materials can be worked with conventional hand tools, the use of a laser or waterjet, CNC machining, etc. is not allowed.

Should a contestant be in doubt about the suitability of a selected material or the method of its tooling, they need to contact the organiser in advance.

## Model weight

No minimum or maximum weight of the model is specified.

The minimum weight of the model is indirectly limited by the minimum load-bearing capacity requirement for the model (1<sup>st</sup> load test).

The maximum weight of the model is indirectly limited by the maximum load considered for reaching the ultimate load-bearing capacity (2<sup>nd</sup> load test).

## Structural requirements

Minimum load = 4.48 kg (uniform load). The model of the structure must be able to carry the basic uniform load (see load case 1) with weights placed along the entire length of the test space (a total of 19 small weights with a total mass of 4480.2 g) without hitting the protected area.



## Positioning of the structure on the test site

After the timer is started, the contestant places the model on the test site.

The model may be resting on the sand surface, or it may be anchored in the sand, but it must not touch the box edges, not even during the load tests. The minimum distance between the model and the box side walls is 50 mm. The model may rest on the box bottom.

The sand cannot be used as part of the model, or as a filler material or passive load and must not extend above the top edge of the load box.

After the structure has been placed on the test site, the geometric requirements will be checked by the test inspector. The timer will be paused during this time.

## Load test No. 1

In load test No. 1, the model's ability to carry the minimum required load will be verified. In this test, the structure will be loaded with small weights with dimensions of 150 x 40 x 5 mm (mass of 235.8 g).

The weights will be placed flat in the load area, with the longer side perpendicular to its longitudinal axis, so that the distance between each weight is max. 1 mm (butt joint).

Load test No. 1 is successful if the model can carry a uniform load of small weights placed along the entire length of the test space (a total of 19 small weights with a total mass of 4480.2 g) and the model does not intrude into the protected area.

The loading procedure is arbitrary. No temporary support structure can be used during loading. The load must be placed freely on the structure so that it does not become a substantial structural part of the model.

## Load test No. 2

Load test No. 2 will identify the limit load at which the model collapses or hits the protected area due to its deformation.

In this test, the model will be additionally loaded with small, medium and large weights evenly spaced along the entire length of the load area.

The following weights are available for the test:

- small weights: dimensions of 150 x 40 x 5 mm (mass of 235.8 g)
- medium weights: dimensions of 150 x 30 x 30 mm (mass of 1059.7 g)
- large weights: dimensions of 150 x 40 x 40 mm (mass of 1886.4 g)

The loading procedure must be chosen so that the loads are placed evenly along the entire length of the load area during the test.



The weights must be placed one at a time, the last weight placed before the limit load is reached will not be counted in the total load-bearing capacity.

The weight must be placed on the model so that it does not become a substantial part of the model. If the contestant has any doubts about the load placement, they should contact the organiser in advance.

Each model will be loaded until its collapse, if possible. The limit load will be identified as the lowest load of the following states

- reaching ultimate deformation (the model hits the protected space)
- reaching ultimate load by the collapse of the structure
- reaching maximum load at a weight mass of 100 kg

If sufficient load is not available to cause the model to collapse, the test may be terminated prematurely after the maximum load has been reached.

## Time limit

The competing team places the model on the test site and carries out both load tests under the test inspector's supervision. The competing team has a time limit of 12 minutes to put the model in place and perform the load tests. In the case of the test inspector's intervention in the course of the test, the timer will be paused.

## Ranking of models

The final model ranking will reflect the model's effectiveness, i.e., the ratio between the total mass of the ultimate load and the total weight of the model.

Those models meeting geometric, structural and material requirements will be evaluated.