



Rules of The Hall of the Year ACADEMIC 2025 student competition

The Faculty of Civil Engineering CTU in Prague (hereinafter also referred to as “the Faculty” or “Organiser”) announces the 13th year of the Hall of the Year ACADEMIC 2025 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 contestants’ task is to design and build a model of a tower crane structure that will safely carry the loads. The model must meet the specified geometric, material and structural requirements.

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

Competition venue and date

The competition will be held in the atrium of the building of the Faculty of Civil Engineering CTU in Prague, Thákurova 7, Praha 6 – Dejvice on Tuesday **8. 4. 2025 from 7:30 a.m. to 4:30 p.m.**

Competition participation and registration

2-3-member teams of students from universities with technical orientation can participate. The competition Organiser 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 this type of school.

The applications for the competition can be registered at: <https://halarokuakademik.fsv.cvut.cz>.

The registration for the competition opens on **31. 1. 2025 at 12:00 a.m.**
The deadline for submitting registrations is **17. 3. 2025 at 12:00 a.m.**

The number of teams is limited to 60.

Participation in the competition is free of charge, the costs associated with participation in the competition are not covered by the Organiser.



Prizes and rewards

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

- 1st prize – 100,000 CZK
- 2nd prize – 40,000 CZK
- 3rd prize – 15,000 CZK
- 4th prize – 5,000 CZK
- 5th prize – 3,000 CZK

The contestants can also receive special rewards granted by the competition partners. The winners will be selected at the partner's discretion and the rewards need not be related to the load test results. The number of rewards and their value are not specified in advance.

The payment of prizes is governed by the tax laws of the Czech Republic.

Selected structures will be published on the Faculty's website, the Faculty's social networks and used for other Faculty promotional purposes.

Amendments and changes to the competition rules

Should any ambiguity in the interpretation of the rules be 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 related to the competition can be submitted solely via the official competition application. Technical questions related to further specifications of the rules (proposed solutions, materials, etc.) can be submitted no later than **26. 3. 2025 by 12:00 a.m.**

The Organiser reserves the right to terminate the competition at any time for technical, commercial or other reasons.

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 competition results 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 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 social networks, 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 through a letter sent 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.

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. All registered models must comply with the geometric conditions (see the diagram below) and the material conditions. At the acceptance, compliance with the material conditions will be checked and the models will be weighed. The registered models will be displayed in the Faculty atrium after acceptance.

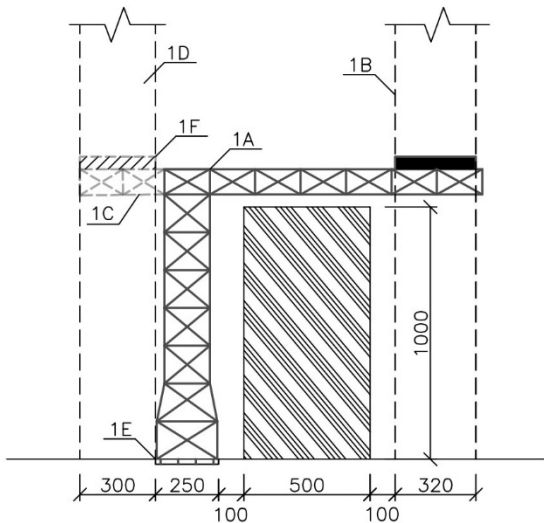
The loading of models will start at 11.30 a.m.

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

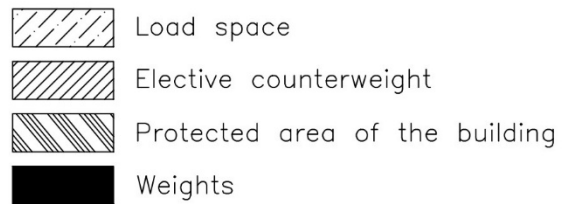
The model of the crane must span the "Protected area of the structure", which is a building 500 mm in width and 1000 mm in height. The protected area must not be intruded into by the model structure, neither in its initial state nor during load tests (the only exception is at the moment of the model's destruction).

Crane elevation (Fig. 1)

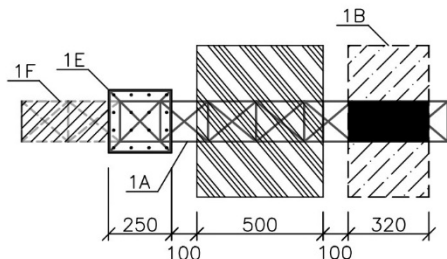


Legend

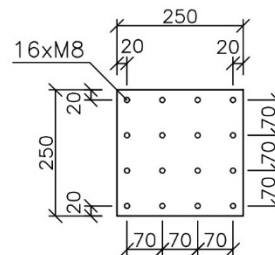
- 1A – Potential shape of the structure
- 1B – Load space
- 1C – Potential support by counterweight
- 1D – Potential space for counterweight
- 1E – Anchor plate with threads
- 1F – Elective counterweight



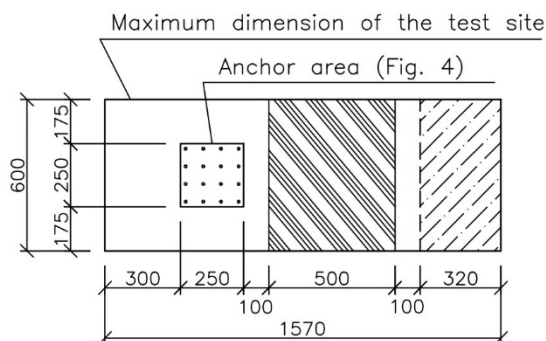
Crane plan view (Fig. 2)



Anchor area detail (Fig. 4)



Test site (Fig. 3)



Scheme of the structure



The model structure will be supported only in the anchor area of the metal anchor plate attached to the podium (1E). Elsewhere, the model must not touch anything. The model may also be anchored to the anchor plate in the prescribed manner.

The required shape of the model, its mounting method and the position of the load are shown in the Scheme of the structure.

Test site and placement of the model

During the load test, the model structure will be placed on the test site designated by the Organiser.

The test site (Fig. 3) consists of an anchor plate (1E) with dimensions of 1570 x 600 x 6 mm attached to the podium. The anchor plate will be fitted with 16 threaded anchor holes in the anchor area for anchoring the model. The bolts will be anchored by 1.25 mm pitch M8 thread nuts welded under the holes of the plate. The layout of the holes is shown in (Fig. 4). The position of the anchor holes has a tolerance of +/- 2 mm. To anchor the models, the use of spreader washers allowing to eliminate the anchoring tolerance is recommended.

The shape of the anchor bolt head is not prescribed, only the bolt head height is limited, its top face must not be higher than 35 mm above the top face of the anchor plate. The contestants may bring their own bolts and washers meeting the requirements (including tools).

Hexagonal headed anchor bolts and a 13 mm side wrench will be provided by the Organiser.

Material requirements

The models must be made using only the following materials:

- wood profiles (square and round beams) from the following coniferous wood species: spruce (*picea* spp.), pine (*pinus* spp.), fir (*abies* spp.) and larch (*larix* spp.), commonly growing in the temperate geographical zone is permitted
- plywood only from wood species commonly growing in the temperate geographical zone. The use of spruce (*picea* spp.), pine (*pinus* spp.), poplar (*populus* spp.), birch (*betula* spp.) is permitted
- string made of natural materials
- any glue

No other materials can be used. To check the materials, the contestants shall submit samples of all materials used to make the model in their raw state. The used glue need not be documented.



The materials can be machined with common hand tools. By conventional hand tools we also mean tools powered by electricity, such as a hand drill, a circular saw, a hand milling machine or a jig saw.

The use of laser or waterjet is not permitted, nor is CNC machining (milling, drilling, cutting, etc.).

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.

In the case that a contestant uses a machining technology whose result could be interchangeable with CNC machining technologies, the manufacturing process must be documented with a video.

The compliance of the materials and machining technologies used shall be confirmed by the competing team by means of an affidavit.

Model weight

The minimum weight of the model is not specified.

The maximum weight of the model is 2000 g.

The total weight of the model does not include anchor bolts or washers.

Loading

The load must be placed only above the designated load space (1B). If the load moves above the protected area of the building during the load test, the test will be terminated.

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

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

The weights will be provided by the Organiser.



Counterweight

The contestants may use a counterweight to balance the model. The counterweight must be entirely positioned in the designated space before the load tests are performed.

The maximum counterweight mass is 2000 g. As for the counterweight, the contestants must use standard weights marked with red tape (marked weights will be provided by the Organiser).

The counterweight mass is not included in the model load.

The counterweight mass is not included in the total weight of the model.

Structural requirements for load tests

The model of the crane must be able to carry the basic loading with small weights of a total mass of 1886.4 g placed along the whole length of the test space.

During the test, the structure of the model must not protrude into the protected area, and the load must not shift above the protected area.

For load test No. 1 (minimum loading)

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.

The weights will be placed flat, next to each other, in the load space, with the longer side perpendicular to its longitudinal axis.

Load test No. 1 will be successful if the model can carry the minimum loading, if the model does not protrude into the protected area, and does not shift above the protected area.

For load test No. 2 (total loading)

In load test 2, the model will be further overloaded with small, medium and large weights placed in the load space until the ultimate load is reached.

The ultimate load will be determined as the smallest load at which:

- the model will collapse, or



- the model will hit the protected area by its deformation, or
- the model load is shifted above the designated protected area, or
- the maximum load will be reached at a mass of the weight of 100 kg

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

Model test

The test of the model includes

- model placement on the test site
- performance of load test No. 1
- performance of load test No. 2

The placement of the model on the test site and performance of the two load tests is done by the competing team under the supervision of the juror.

Health and Safety

All team members must be wearing safety goggles at all times during the test. Failure to do so may be the reason for the disqualification of the entire team.

While loading the model team members must move so that they are protected from the hazard of a falling load.

Time limit

The maximum total time for placing the structure and performing both load tests is 10 minutes. If necessary, the juror may pause the timer for no longer than is strictly necessary (measurement of model deformation, organizational reasons, safety of participants).



Placement of the structure on the test site

After the timer is started, the contestants place the model on the test site and, if necessary, anchor it to the anchor pad with bolts. The anchorage can be made using bolts provided by the Organiser or contestants' own bolts and washers.

After the structure is placed on the test site, the meeting of geometric requirements will be checked by the juror. During this time, the timer may be paused.

Load test No. 1

After the structure is placed, the contestants start to load the model on the juror's instruction. After placing the load, the juror checks the geometric and structural requirements, during which time the timer may be paused.

A detailed description of load test No.1 is specified in the section "Structural requirements for load tests".

The loading procedure is arbitrary. No temporary supporting structure shall be used during loading. The load shall be placed loosely on the structure so that it does not become its substantial part.

Load test No. 2

On the completion of load test No. 1, following the juror's instruction, the contestants shall proceed to loading the model within load test No. 2.

The juror continuously checks that the model construction does not intrude into the protected area.

The weights shall 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.

A detailed description of load test No. 2 is specified in the section "Structural requirements for load tests".

In the instance that load test No. 2 is completed without destruction of the model due to exceeding the time limit, geometric requirements, etc., the models will be loaded ("out of competition") until the collapse is reached if possible.



Determination of final ranking of models in the competition

The final 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.

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