

# Bridge Building Contest 2018

## Swiss SAMPE chapter



### Invitation

Swiss SAMPE Chapter has the great pleasure to announce the 2018 Bridge Building Contest: an exercise in design and construction of a scaled bridge model. The contest duration is one semester and could be performed within a project framework in which students will have to use their knowledge and creativity to design a bridge. Students will be introduced into the entire structural design process from the development of the bridge concept, the preliminary design calculations and the material selection to the final bridge fabrication and testing.

Prizes will be awarded to the most resistant structures and the most surprising designs. The contest competition will be hosted by Marengo Swisshelicopter AG and will take place in Wetzikon or Näfels.

Important Dates:

Deadline for inscriptions:  
Monday, 16<sup>th</sup> October 2017

Bridge Building Contest:  
Thursday, 25<sup>th</sup> January 2018

Organizing committee:

Gion A. Barandun (HSR-IWK)  
Gregor Peikert (ZHAW-IMPE)  
Clemens Dransfeld (FHNW-IKT)  
Jörg Dold (Marengo Swisshelicopter AG)

### Participants

Bachelor, Master and PhD students from Switzerland can apply to this contest. Students participating in the contest will have to establish teams. Each team will design and fabricate a scaled bridge model. Teams consist of 1 to 5 students. Bachelor, Master and PhD students can cooperate and get together in one team.

Teams will apply for the competition formally with names of the team, students, coach and affiliation. Each registered team must arrive to the challenge at Marengo Swisshelicopter AG with its bridge and poster describing the performed work, and give a short summary before the test takes place.

### Technical rules

#### Materials

A limited set of materials is provided for all teams. It includes the following elements:

- Glass and carbon fibre tubes (inner Ø2.5mm, outer-Ø4mm), 6m each
- Carbon fibre profiles 4 x 1.1mm, 10m
- Glass fiber plate (0.3mm, 600 x 100mm for driving surface)
- Aramid cord (1m)
- Epoxy 2K adhesive (10min, 480g)



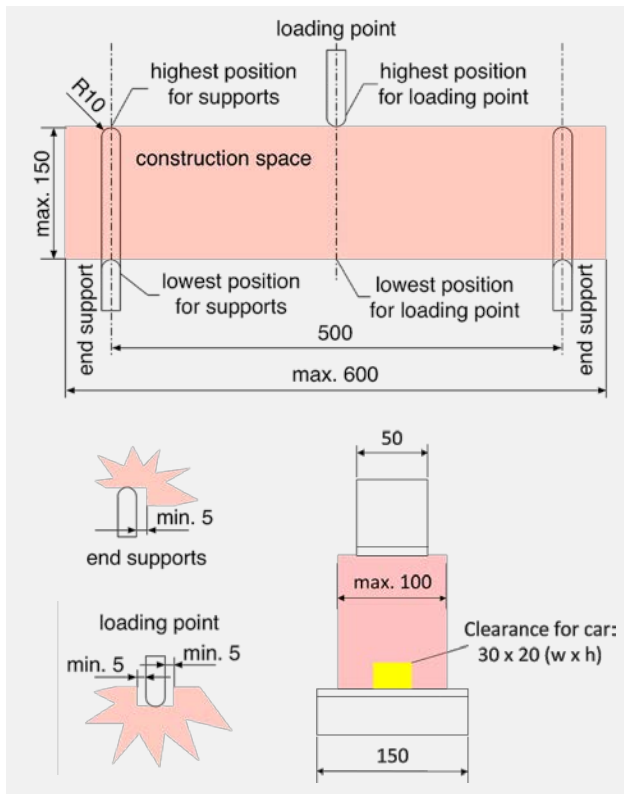
The set is sponsored by SAMPE and will be available end October. The use of other materials for the bridge is not allowed. Teams are free to use additional auxiliary materials or tools during manufacture (but not for the tests). A wide field of combinations is therefore given to build the final bridge.

#### Weight

The maximum accepted weight of the bridge will be 150g (ultra-lightweight bridge). Competitors that exceed this limit will have the chance to remove material from the bridge until the target is met.

#### Dimensions

The distance between the supports of the bridge will be 500mm. See attached figure for details.



The supports and the loading points contacts have to be rigid parts of the bridge (e.g. not pre-stressed cords or similar).

#### Loading

The bridges will be tested in 3-point-bending as per the attached figure. At mid-span the loading force will be applied to the deck surface of the bridge. No horizontal forces shall be absorbed by the bridge at the support points (the bridge will be simply supported).

The bridge must have a flat street made from the provided glass plate, where a matchbox car with dimensions 30x50x20mm (width x length x height) is able to cross freely. The plate can be adapted; however the street has to be provided as noted.

#### Awards

Awards will be granted to the most resistant bridges (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> resistance) and prizes will be given for:

- Aesthetic
- Innovation
- Design
- Poster

#### Scores

Resistance category: the score of each team will be the maximum load resisted by their bridge before failure.

**IMPORTANT:** The failure load will be the lower load between:

- maximum load resisted by the bridge before failure
- load which produces a vertical deflection in the bridge equal to 30mm

Aesthetic, Innovation, Design, Poster categories: 5 jury members composed by SAMPE and Marengo Swisshelicopter AG engineers will evaluate the works of all the teams and will decide the winners of each category. A two years SAMPE membership is offered to all participants.

#### Application

Send an e-mail to [gionandrea.barandun@hsr.ch](mailto:gionandrea.barandun@hsr.ch) providing the following information:

- Team name
- Team members
- Team point of contact e-mail
- Team coach name
- Team coach email
- Affiliation(s)

The Swiss SAMPE Chapter homepage

[www.sampe.ch](http://www.sampe.ch) offers tools to form

interdisciplinary teams across different institutions.

#### Agenda

The day at Marengo Swisshelicopter AG will start with the bridge building contest. All the teams will expose their bridges and their posters in the hall of the laboratory. The jury will then determine the winners of the contest.

After lunch, presentations and a guided tour of Marengo Swisshelicopter AG are planned.

For more details: [www.sampe.ch](http://www.sampe.ch)

Swiss SAMPE Chapter

Marengo  
Swisshelicopter AG



#### Contact

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