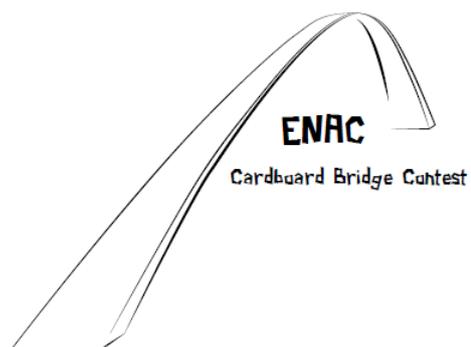


Cardboard Bridge Contest

RULES 2013



ENAC



INTRODUCTION

The ENAC faculty - faculté de l'Environnement Naturel, Architectural et Construit - of the EPFL is organizing a competition in the field of structural design. The competition is opened to students, postgraduate students and employees of all Swiss universities. The challenge is to create a 1 meter long construction made of cardboard. The most resistant, most original and the most aesthetic structures are going to be honored.

CHALLENGE

The structure needs to have a minimum span of 1000 mm and a maximum weight of 100 g. The goal of this challenge is to achieve the highest ratio between resisted load and self weight of the structure.

$$\text{Ratio} = \text{resisted load} / \text{self weight}$$

In case of equal results the originality of the project will decide the winner.

The structure will be supported on two plates located at two different levels and separated by 1 meter (see the sketch). The structure may simply lean on the two plates, which are spaced out by one meter. The structure can be in contact with all the sides of the plates but not with the side of the plates in contact with the basements.

The plates will not be fixed (no anchorage) to the basements.

The weight of each plate is ca. 12,0 kg +/- 0,5 kg.

The coefficient of static friction μ between the basement and the plate is 0,45 +/- 0,20.

There is a horizontal distance of 25 mm between the plate and the basement (see the sketch).

There are no further conditions regarding the structure, except for the loading point of the structure that can be selected by the participants but must be minimum 300 mm from the inner side of each plate support and has not to be lower than 50 mm from the top edge of the lower plate (see the sketch).

LOADING PROCESS

The bridge will be loaded with a bucket that will be attached with one or two hooks to the structure.

The loading point is the highest point of the bucket's handle (see the sketch). How and where the loading point is can be defined by the participant himself, under the conditions mentioned in the CHALLENGE chapter.

As soon as the bucket is positioned, you have 5 minutes to load the structure until it fails; changing the structure or the position of the bucket is not allowed. If the structure doesn't fail in 5 minutes, the loaded weight will be considered as the failure load. The jury has the right to grant an extra time period without penalization.

BUILDING MATERIALS

The allowed building materials are:

- Gray cardboard

- Corrugated cardboard

- Standard printer paper 80gr/m² (uncoated and without extra treatment)

- White glue type Cementit

CONDITIONS OF PARTICIPATION

Every student, postgraduate student and employee of a swiss university is allowed to participate. The registration can be admitted as a individum or as a team. Each participant or team may submit only one proposal. Students, postgraduate students and professors are allowed to join in a same team.

If the number of registered partipicants is too large, the committee will limit the number.

Any violation of the regulation contained in this document will pull the disqualification of the team.

INTERPRETATION OF REGULATIONS

For further questions the following website is provided:

<http://blogs.epfl.ch/concours-enac>

During the execution of the competition the jury is responsible for the interpretation of the regulations. Small changes can be made if necessary.

THE PRIZES

Resistance

Three prizes will be awarded to the best structures based on their resistance (ratio between the maximum load and self weight of the structure):

1. Prize for resistance: CHF 600.-
2. Prize for resistance: CHF 400.-
3. Prize for resistance: CHF 250.-

Innovation

Three Prizes will be awarded by the jury to the most innovative structures. The stuctures must be able to carry 50 times their own weight:

1. Prize for innovation: CHF 600.-
2. Prize for innovation: CHF 400.-
3. Prize for innovation: CHF 250.-

Audience Prize:

One prize will be awarded by the audience:

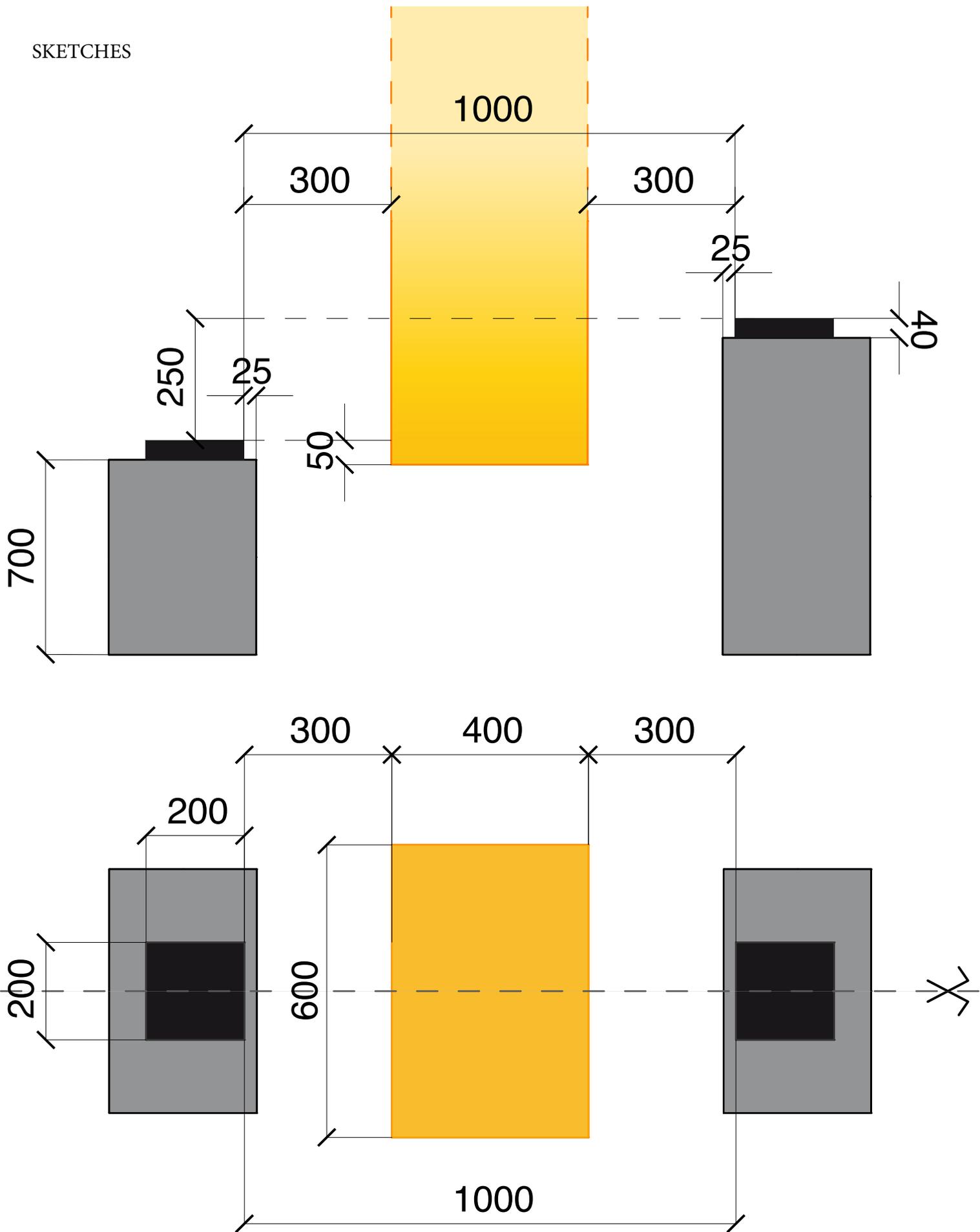
Audience prize: CHF 600.-

Conditions for all prize catagories is the ability for all structures to carry 50 times their own weight.

Example: a bridge of 80 g needs to carry $80 \times 50 = 4000$ g

Organization: Santoni Valerio and Triponez Ken Jun.

SKETCHES

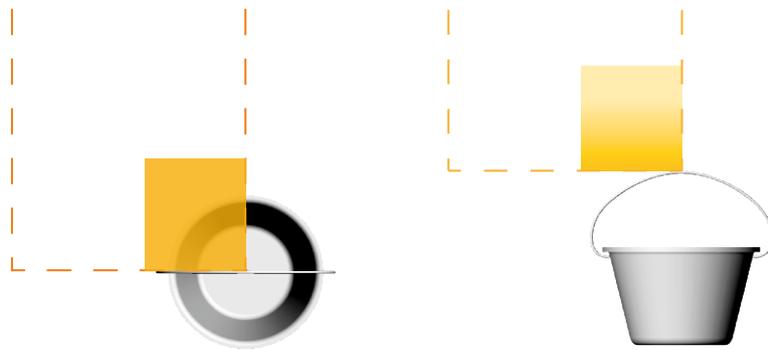
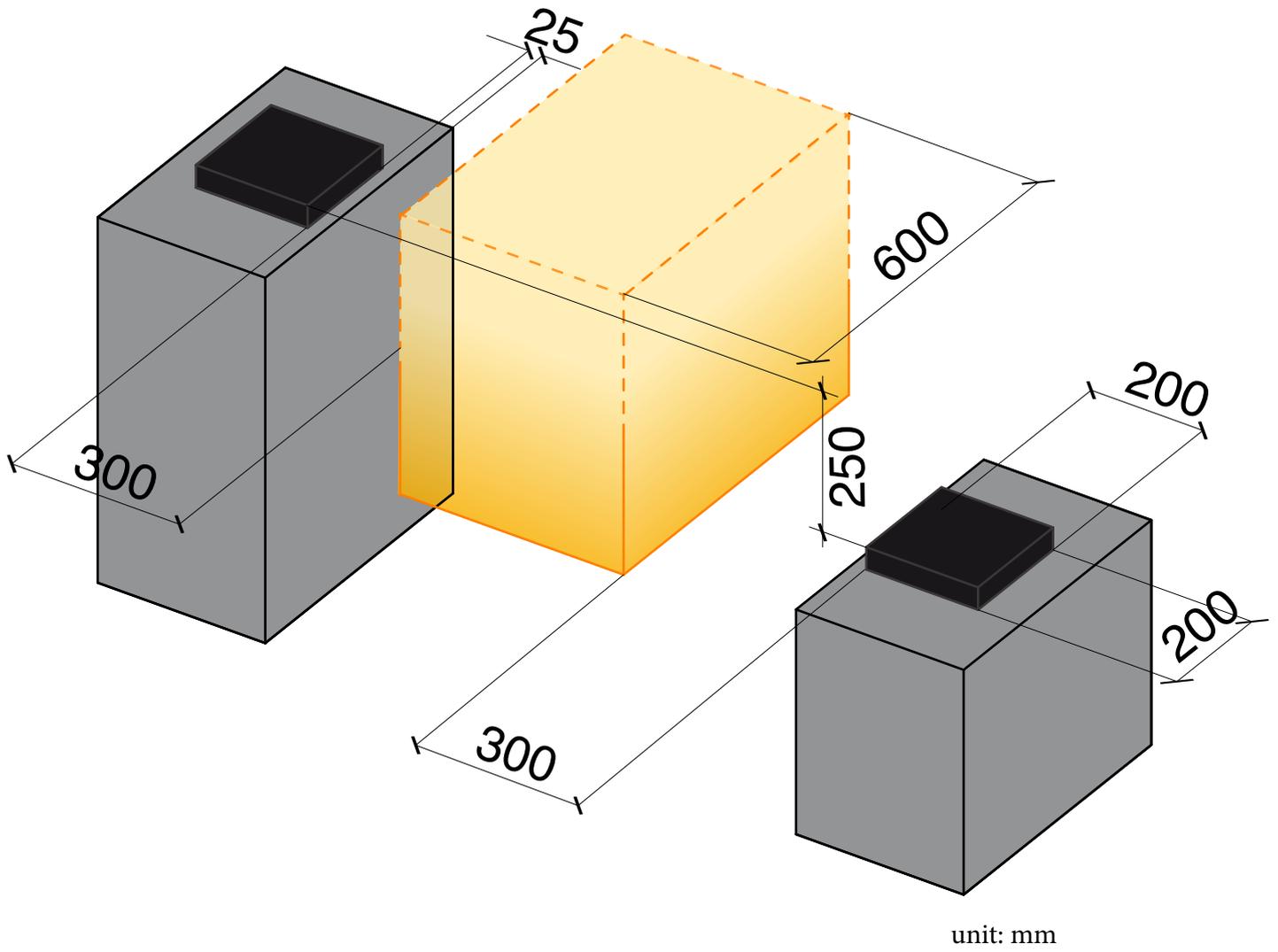


unit: mm

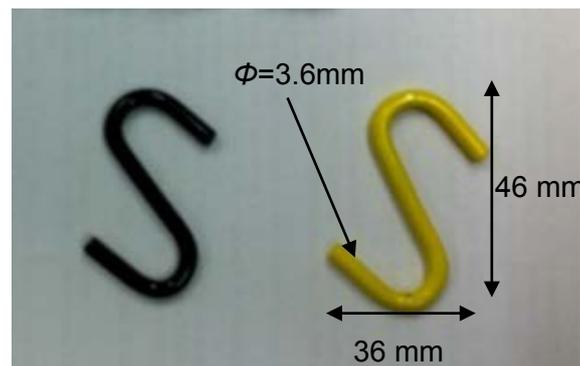
 Weight point of suspension

 Plates

 Basements



Weight point of suspension



Hook dimension