Miniature Parking Garage

Overview/Purpose

The objective of the competition is to design, construct, and demonstrate a multi-level structure (i.e. parking garage) that can load a specific amount of weight on each level and then unload said weight without breaking.

Engineering Concepts

Engineering practice concepts such as engineering design, material processing, quantitative analysis, and professionalism will be demonstrated through this project. As well as engineering knowledge concepts such as engineering sciences, engineering mathematics, and engineering technical applications that students will have the opportunity to hone and improve. To design, build, and demonstrate a multi-level structure capable with withstanding a certain weight load at each level and overall.

Socially Relevant Issue/ Challenge/ Problem

Being conscience of space limitations and making the best use of provided resources.

Purpose of parking garages is to optimize space for cars and cities.

There is an increase of cars in cities and consequently an increase in the need for sustainable parking structures.

Constraints

- No use of wood or steel
- Build in a 4x5 ft\(^2\) base zone

Guidelines/ Criteria

- The structure must be made of safe materials.
- The structure must be a minimum of 3 levels.
  - First level is ground level
- The structure must hold a minimum weight of 3 pounds on each level at on given time.
- The points will be equally awarded in each level, meaning it does not matter if there is more weight on the top level than the ground level.
- Weight must be placed on each level and then safely removed.
  - Place weight onto structure with hand, step away from structure, time for 1 minute then remove weight from the structure.

Judging Requirements

Initial scoring will be based on a formula of height of the structure and weight that it supports.

Possible bonus for every additional level after the 4\(^{th}\) level.

Possible bonus points for no use of hardware like nails and screws.

Video Submission Requirements

To be considered for judging, the video submission must show the following:

- Must explain the structure and explain design choices.
- Must show what is being loaded onto garage and how much it weighs.
- Must demonstrate the loading or unloading of shown weight on the parking garage.
Materials Provided

No materials will be provided by the University of Oklahoma or the Gallogly College of Engineering.

Helpful Hints

3-pound examples

- 12 sticks of butter
- 3-pound bag of potatoes
- Standard bag of apples
- 300 sheets of paper
- 3 bunches of bananas (make sure you weight them)
- 3-pound bag of sugar or flour
- Container with water
- 3-pound bag of rice or beans

★ (If 3-pound object used is outside of the suggestions listed above, then participant must include photo of materials used on scale showing 3-pound measurement between .2 pound of determined weight.)

Suggested materials

- Styrofoam
- Cardboard
- Construction Paper
- PBC pipes
- Tape
- Wire
- Cork Materials
- Popsicle Sticks
- Used Books