

## Construction Competition (Design/Build)

### 1.0 Introduction

Although it is sometimes not emphasized enough in the classroom, design engineers must take into consideration the constructability of their designs just as much as the construction engineers must take into consideration the design of the structures they construct. This awareness is the origin of this competition. The objective of this competition is to design and construct a building. It is also intended to implement problem solving skills, teamwork, and creativity. Preparatory work is encouraged.

### 2.0 Teams

- 2.1 Only one team from each school will be allowed to compete. Each team will consist of three groups and will be allowed one communicator. Each group will have at least one (1) and no more than three (3) members. Each team must have three (3) total members and no more than (10) total members. The groups will not be allowed to have any contact between them during the competition except via the communicator. The duties of each group and communicator are listed below. Group members will be required to stay in a classroom during the competition. Each group will only be allowed in the competition room during their allotted time.
- 2.2 “Design Group”: The first group will be allowed 30 minutes to work in the competition room. During this time, the members of this group will be allowed to see and handle the building materials. They are not allowed to alter the building materials in any way (mark on them, bend them, cut or break them, etc.). It is this group’s job to design the structure to specified dimensions. The group is allowed to bring any materials into the competition room that may be needed except computers and communication devices. All materials brought into the competition room by this group must be taken out of the competition room by this group when the allotted time is up except for the design, any written instructions, and any item on the list of “Suggested Tools”. The design and written instruction must be on paper.
- 2.3 “Materials Manufacturing Group”: The second group will be allowed 30 minutes to work in the competition room. During this time, the members of this group will be allowed to see, handle, and alter the building materials. The members of this group are not allowed to connect or attach the building materials in any way. This group may stack and/or arrange the materials. The materials are to be altered in guidance with the design and written instructions provided by the Design Group. Further written instructions are allowed to be left for the next group. Only tools left in the construction room by the Design Group and the provided building materials are allowed to be used. At the end of the allotted working time, this group must remove all asterisked (starred) items on the list of “Suggested Tools”.
- 2.4 “Contractor Group”: The third group will be allowed 30 minutes to work in the competition room. During this time, the members of this group will be allowed to see, handle, and alter

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the building materials. This group may attach and/or connect the building materials in guidance with the design and written instructions provided by the Design Group and Materials Manufacturing Group. Only tools left in the construction room by the Materials Manufacturing Group (all items without an asterisk on the list of “Suggested Materials”) and the provided building materials are allowed to be used. At the end of the construction time, this group will be required to move their final structure from their work space to the judging table. No materials will be allowed to be reattached or added during or after transportation. They are also required to submit the original design created by the Design Group. Instructions are not required to be submitted.

- 2.5 Communicator: This is an optional team member. No team is required to have a communicator. Each team will be allowed to ask up to five (5) questions via the communicator. No question are required to be asked, and no more than five (5) will be allowed. The questions will be asked to the communicator by the group that is in the construction room and directed at either group that is not in the construction room. The communicator will then go the room where the group that the question is directed at is waiting. The communicator will ask the question to this group and relay the answer to the group that is in the construction room. The communicator is not allowed to handle or used any building materials or tools. The communicator is not allowed to make any notes.

### 3.0 Materials

- 3.1 All construction material that are to make up the final structure will be provided by Auburn University at the time of the competition. They will be located in the construction room and are not allowed to be removed from this room during construction. No materials other than the ones provided are allowed to be a part of the final structure. The use of all of the provided materials in the final structure is not required.
- 3.2 Tools supplied by the individual teams are allowed to be used during the construction process, but are not allowed to be a part of the final structure. Only tools listed in the “Suggested Tools” list will be allowed to be used by the Materials Manufacturing Group. Only tools not asterisked on the list of “Suggested Tools” will be allowed to be used by the Contractor Group. The “Suggested Tools” are only suggested tools to be used. None of these tools are required, but they may aid in the construction of the final structure.

### 4.0 Design Specifications for the Final Structure

- 4.1 Minimum height: 60 cm (There is no maximum height.)
- 4.2 Minimum base dimensions: 10 cm by 10 cm square (These are the dimensions of what is in contact with the judging table.)
- 4.3 Maximum base dimensions: 70 cm by 70 cm square (These are the dimensions of what is in contact with the judging table.)

### 5.0 Judging and scoring

- 5.1 Each judge will have a separate score sheet for each team. The average score between the judges for each team will be the final score for the team. Participating teams will get a

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- minimum of 4 points for participating and a maximum of 30 points. The team with the most points will be awarded with first place.
- 5.2 Following all rules: 5 points will be allotted to each team that meets all criterion specified in the rules for this competition.
  - 5.3 Difficulty of design: 1 to 5 points will be allotted to each team based on the difficulty of the design created and executed. The difficulty of the design and the final structure will be considered.
  - 5.4 Following the design: 1 to 10 points will be allotted to each team based on how closely the final structure follows the design specified by the Design Group in the design submitted.
  - 5.5 Aesthetics: 1 to 5 points will be allotted to each team based on the appearance of their final structure.
  - 5.6 Creativity: 1 to 5 points will be allotted to each team based on the creativity and ingenuity of their design and use of the building materials.

## Suggested Tools:

The following tools are suggested. Only tools on this list will be allowed to be used (as specified in the rules). Judges will be inspecting the tools left in the construction room between groups to insure that all tools used are on this list. There is no limit on the number of each tool that is allowed. No tool on this list will be provided by Auburn University for use.

\*Pencils

\*Pens

\*Markers

\*Scissors

Empty office

stapler

Empty tape dispenser

Metric ruler or meter stick

Metal ruler

Paper

\*Compass

Protractor

\*X-acto knife and spare blades (or similar other-brand knife and blades)

\*Utility knife and spare blades

Paper clips

Copy of the rules