

University of South Alabama
Civil Engineering Department

Rules and Regulations

For

Balsa Wood Tower



Presented by the Student Chapter of the American Society of Civil
Engineers at the University of South Alabama
for the USA-ASCE High School Competition

Rules Updated October 2025

Rules adapted from the University of Tennessee Balsa Wood Tower competition
Rules subject to change

Balsa Wood Tower

Requirements

Teams will create balsa wood towers to be used in a compressive strength versus weight competition.

Specifications

1. The structure shall have 4 floors (including the ground floor and excluding the roof)
2. A minimum width of 2.5 in.
3. A maximum width of 4 in.
4. A minimum height of each floor of 2 in.
5. A minimum height of 12 in. for the whole tower (including floor and roof).
6. A maximum height of 16 in. for the whole tower (including floor and roof).

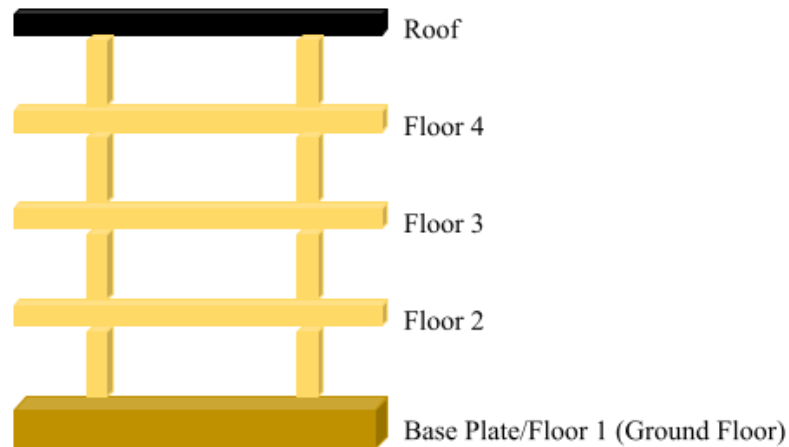


Figure 1: Example of what is considered a floor.

Components

Base plate

- The base plate dimensions shall be 5 in. x 5 in. and no larger than 3/4 in. thick
- The base plate shall be made of plywood.
- The bottom face of the base plate shall be flat.
- Holes may be drilled in the base plate to anchor columns, but connection specifications will still apply.

Roof plate

- The roof plate shall be square.

- The roof plate face dimensions shall exceed 3 in. x 3 in. and shall not exceed 4 in. x 4 in. and not be thicker than 3/4 in.
- The roof plate shall be made of plywood.
- The top face of the roof plate shall be flat.
- Holes may be drilled in the roof plate to anchor columns, but connection specifications will still apply.
- Names and/or logos of the represented team or high school must be displayed on the roof plate.

Structural members

- Structural members shall be made of balsa wood.
- Structural members include frame members.
- A floor consists of horizontal frame members and should not include a sheet.
- Structural and frame member dimensions shall not exceed 0.35 in. x 0.35 in. x 16 in.
- Balsa wood sheets are prohibited.
- Columns - vertical, load-bearing members - shall not be placed within 0.5 in. of the base plate edge.

Connections

- Connections, *including those to the base and roof plates*, shall be made using glue or adhesives.
- Connections may include *any type* of glue or adhesives, however, use of excessive glue or adhesive that appears to provide reinforcement of the members will be considered a violation. These violations will be at the discretion of the judges.
- Connections shall not include mechanical fasteners (nails, tacks, or screws).

Testing

- Towers will be ranked by strength to weight ratio.
- The strength of the tower will be measured by loading of the tower axially until failure.
- The height will be measured from the bottom of the base plate to the top of the roof plate.
- Failure during strength testing will be defined as the maximum load measured as it is applied axially.
- The team with the highest strength to weight ratio will receive the most points in this section.
- Any violations of the tower or component specifications will result in a 25% decrease to the team's score within the violated section.

Balsa Tower Rubric

School Name: _____

Group Name/Number: _____

Category	Measurements	Requirements	Points
Strength to Weight Ratio	Wt (g): _____ Max Load (lb): _____ Ratio: _____	- First Place (40 points) - Second Place (36 points) - Third Place (32 points) - Nth Place (40-4(N-1) points)	
Overall Dimensions and Specifications	4 floors, 12" to 16" high, 2" high floors	- Meets Specs (20 Points) - Each violation (-5 Points)	
Base Plate	5" x 5", 3/4" or less thick	- Meets Requirements (10 points) - Each violation (-2.5 points)	
Roof Plate	3 to 4" x 3 to 4", 3/4" or less thick	- Meets Requirements (10 points) - Each violation (-2.5 points)	
Structural Members	0.35" x 0.35" x 16" max	- Meets Requirements (10 points) - Each violation (-2.5 points)	
Connections	Excessive glue?	- Meets Requirements (10 points) - Each violation (-2.5 points)	

Total: _____