

INTRODUCTION

Creating a prototype for a building located in a high storm activity area is highly valuable, as it allows for the testing of structural integrity specific to the region's challenges like hurricanes and tropical storms. Prototyping enables the evaluation of innovative materials and designs, ensuring they meet local environmental and safety regulations effectively. This process also helps in identifying potential costly errors early, before full-scale construction.

CHALLENGE

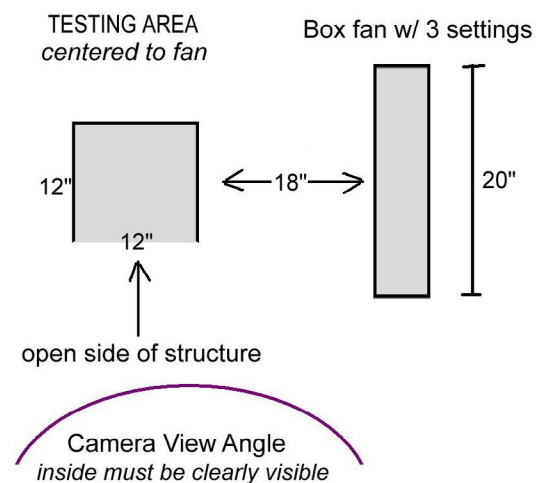
Construct a stilt dwelling capable of withstanding hurricane-force winds for the longest duration.

PROTOTYPE CRITERIA

- The structure must have length, width, and height no less than 10 inches and no more than 12 inches (not counting the stilts).
- The structure must have three solid walls, one roof, and one floor.
 - The structure (walls, roof, floor) may not contain any openings, such as windows or doors.
- The fourth side of the structure must remain open. The open side must face the video recording device during testing.
- The structure must be built on stilts so that the floor of the structure is a minimum of 6 inches above the testing surface. The stilts must rest on the testing surface during testing.
 - The stilts may not be attached in any way to the testing surface.
- One side of the structure must face the box fan, as shown below, during testing.

TESTING CRITERIA

- Your prototype structure must be tested on a smooth floor (no carpet). If a smooth floor is not available, a table with minimum dimensions of 20 inches wide x 30 inches long may be used. The structure must be placed 18 inches in front of the box fan. No member of the team may touch the structure once testing begins.
 - The box fan must be on the same plane as the stilts.
 - Measure and record the distance from the testing surface to the floor of the structure, showing the height of the stilts.
- The time starts and testing begins as soon as the fan is turned on.
- Each setting remains for 10 seconds; 10 sec. (Low), 10 sec. (Med), 10 sec. (High)
 - With a proctor present, one designated team member must adjust the fan setting at 10 second increments.
- Measure and record time until the structure fails. Failure is either or both of the following conditions:
 - If the structure moves location (if the supports change their location: slide, scoot, or slip)
 - If any required part of the structure falls off of the structure (any part of a wall, floor, roof, or stilt)
- The testing ends at 30 seconds.





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PHOTO CRITERIA

- A total of four photos must be submitted.
- Photos must be taken after construction is complete, but before the prototype is tested.
- Each photo must show one side of the structure and be labeled #1 (facing fan), #2, #3, #4.
- The purpose of the photos is to show that all components meet the criteria such as structure height and width.

TIMING

15 MINUTES: BRAINSTORM

Once the challenge instructions are distributed, teams have 15 minutes to brainstorm ideas. Materials may not be touched or used in any way during the brainstorming period. Sketches and shared discussions are encouraged.

90 MINUTES: DESIGN, BUILD, TEST, RECORD

At the designated start time, design, build, and test the prototype using only approved materials. Prior to the end of this period, one prototype from each team must be tested at least once. Teams may test twice within the allotted time period. Photos of the prototype and video of the test must be taken during this time.

15 MINUTES: SUBMIT

Teams must complete the honor statement, and upload photos and recorded video, per the instructions and submission link provided.

SUBMISSION REQUIREMENTS

- The TEAMS honor statement signed by each member of the team.
- Four images of the structure (one from each side).
- Datasheet with testing values of the structure:
 - Time until failure (up to 30 seconds).
 - Height (from the test surface to the floor of your structure).
- A 35 second, unedited video of the testing process (including 30 seconds for testing).

VIDEO SUBMISSION

The team must select one video to submit (select the best recording). A team member must state and/or show the school's name and participant ID at the beginning of the video recording. The submitted video must be continuous (not edited). Videos must not exceed 35 seconds.

Videos must be uploaded to a hosting platform which generates a URL link. The URL link must be "unlisted" and must be submitted to TSA for judging.

Videos that are not able to be viewed for judging will result in disqualification. Videos submitted via email will not be accepted.



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VIDEO CRITERIA

- The total video length, including the introduction and testing, should not exceed 35 seconds.
- The video introduction must include the team announcing and/or showing their school and team participant ID number.
- The video must display a timing device in the same frame.
 - The timing device must not block the structure view in any way.

EVALUATION CRITERIA

CRITERIA	10	9.5	8.5	7.5	6.5	0
DOCUMENTATION (10 points)	Submitted all the required components		Missing 1 of the criteria.	Missing 2 of the criteria.	Missing 3 or more of the criteria.	Failed to submit any of the required components.
1. Honor Statement 2. Testing values (time to failure and height) 3. Four photos of completed structure 4. Video of testing						
VIDEO SUBMISSION (10 points)	Exceeds expectations.	Includes all the criteria.	Missing 1 of the criteria.	Missing 2 of the criteria.	Missing 3 or more of the criteria.	Fails to address any of the required criteria or contains rule violations.
1. The camera was positioned to view the internal structure inclusive of the fan. 2. The camera displayed a measure of time, and it was accurate to the testing requirements. 3. The video is recorded continuously in the submission. 4. The video displays the structure complying with the testing setup.						
STRUCTURE (10 points)	Exceeds expectations.	Includes all the criteria.	Minor issues with build or after test.	Issues before and after test.	Serious violation of criteria/ required elements before and/or after test	Fails to address any of the required criteria.
1. The structure met design specifications before testing. 2. The structure showed no evidence of shear fracture after testing.						
TIME TO FAILURE (25 points)	Score will range from: 0 seconds = 0 points >> 30 seconds = 25 points					
HEIGHT (25 points)	Score will vary from: 6 inches = 10 points to max height = 25 points					

TIME TO FAILURE AND HEIGHT MUST BE RECORDED ON THE DATASHEET.

Any dangerous, illegal, or immoral activity in the video will result in disqualification. All videos become the property of TSA.



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MATERIALS

Each team must have one set of the required materials listed below. The solution must be constructed out of the specified materials – no extra materials are allowed. The scissors, ruler, and writing utensil may not be used in the design; they may only be used as tools.

QUANTITY	SIZE	DESCRIPTION
5	8½" x 11"	Sheets of paper
25	4" x 6"	Index Cards
20	2"	Large or jumbo paper clips
20	8.5" L (max.); .20" - .25" dia.	Drinking Straws (paper, compostable, or plastic)
6 feet	0.94" wide	Blue Painters Tape – (Must be blue)
20	Standard	Wooden Craft Sticks
Tools (not to be used as materials)		
1	Standard	Ruler
1	Standard	Scissors
1	Misc.	Writing Utensil

TESTING STATION(S)

- One 20 inch wide standard box fan with three speeds. A minimum of one fan per eight teams is recommended.
- Smooth floor (no carpet) on which to test your structure.
 - If a smooth floor is not available, a table with minimum dimensions of 20 inches wide x 30 inches long may be used.
- The structure must be placed 18 inches in front of the box fan.
- The box fan must be on the same plane as the stilts.

BOX FAN SAFETY PRECAUTIONS

Participants must not:

- put anything into the fan (fingers, pencils, objects, etc.).
- move the fan, specifically near or in water.
- pour water or any other substance into the fan.
- yell or talk into the fan.
- be near the fan without a proctor present.



2025 TEAMS Design/Build Challenge

Datasheet

Complete the information below and submit the completed form to the proctor. Verify the information is written clearly and accurately. One datasheet per team must also be submitted to TSA along with the video URL, structure images, and the TEAMS Honor Statement using the instructions and submission link provided.

Participant ID Number: _____

School: _____

Coach Name: _____

Coach Email Address: _____

STRUCTURE DATA

Record the testing values for time until failure (up to 30 seconds) and height (from the testing surface to the floor of your structure).

Time until failure: _____

Height: _____