

WOW! CHALLENGE 2015

WALL OF WIND CHALLENGE

Physical Test Guidelines

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1. Design Objective

1.1 The objective for the 2015 WOW Challenge is to design a wind mitigation barrier that will provide the best wind mitigation for a Miami Beach hotel property. Imagine a six-story hotel situated along the beach, and between the hotel and the beach is an area that hotel management wants to be protected from wind off the Atlantic Ocean. Theoretically, this area could include a pool and or restaurant seating area. Figure 1 illustrates the Challenge scaled down by about a factor of 25.

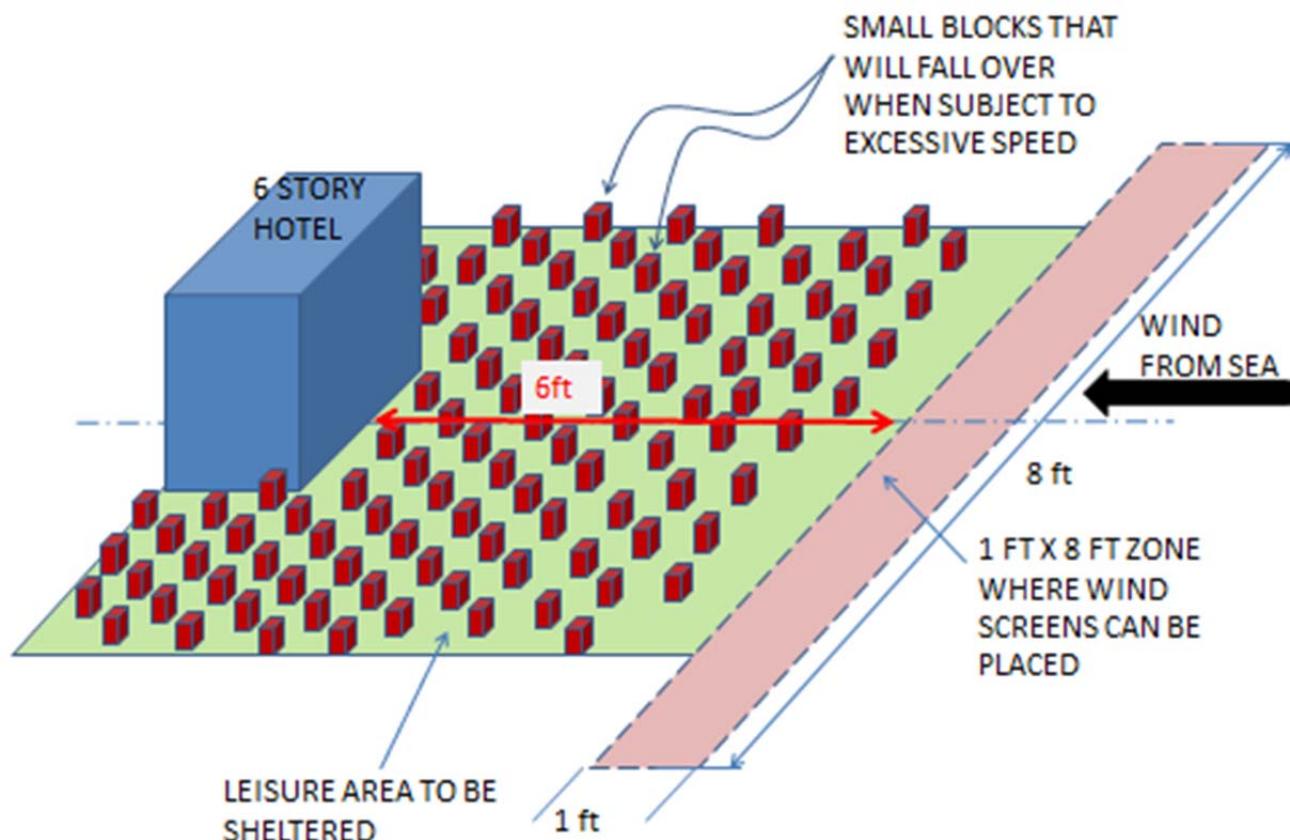


Figure 1. Scale model of beachfront hotel with area for wind mitigation.

- 1.2 Each team will design a wind mitigation barrier and each entry will be tested in FIU's Wall of Wind research facility.
- 1.3 The test will consist of gradually increasing the wind speed until small blocks (provided by FIU and spread around the area to be protected) start to fall over due to the wind speed they experience.
- 1.4 Teams are tasked with developing a wind mitigation barrier that will provide the best wind mitigation, which will be measured by how many of the small blocks fall over as the wind speed is increased. Teams must develop and construct their chosen wind mitigation barrier in compliance with the requirements and restrictions described below.
- 1.5 The video of the February 27th informational workshop is available on the WOW Challenge web page. The PowerPoint used for the workshop is also available on the PowerPoint section. **Please review technical questions covered in the FAQ Document in the Documents section of the web page.**

2. Scale Building Model Requirements and Restrictions

- 2.1 The wind mitigation barrier must be placed on a $\frac{3}{4}$ inch plywood board 1 ft. wide by 8 ft. long. This 8 ft. long piece of plywood will be delivered to each Team in two 4 ft. lengths. Plywood boards of these dimensions will be supplied by FIU, for experimentation, and the others, which will be painted FIU Gold, for the live competition on May 20th. Other components of the scale model hotel property will be created by FIU.
- 2.2 The wind mitigation barrier can be no more than 9 inches high and multiple barriers (e.g. one behind the other or overlapping) are permitted just so long as they remain within the 1 ft. by 8 ft. area shown in Figure 1. The wind mitigation barriers can be straight or curved, porous or solid.
- 2.3 There must be a 4 inch wide passageway within 1 ft. of the center of the barrier(s) which allows hotel guests to have access to the beach (4 inches at 1:25 model scale represents an 8 ft. 4 in. wide passageway at full scale).
- 2.4 Wind speeds will be measured by FIU and Teams will be able to watch the tests from the WOW Operations & Control Center.
- 2.5 The number of small blocks that are blown over will be counted by FIU.
- 2.6 Each Team will be supplied with \$50 cash. Students are permitted to spend more than the provided \$50, but any additional cost incurred shall be at the expense of the Team.
- 2.7 Any type of non-hazardous material shall be allowed and considered acceptable for designing the wind mitigation barriers, given that the solution complies with the construction guidelines described in sections 2.1-2.3. Some common examples of acceptable materials include (but are not limited to) wood, foam, bug screen, plastic, metal, white glue, super glue, and epoxy.

3. Physical Test Requirements and Restrictions

- 3.1 Teams will bring their wind mitigation models to FIU on May 20th. During the competition, each team's wind mitigation model will be placed in the Wall of Wind test section and tested by gradually increasing wind speeds.
- 3.2 Only one wind mitigation model will be accepted from each Team for wind testing.
- 3.3 All wind mitigation models will be tested for one wind direction at 90 degrees to the line of the wind mitigation barrier.
- 3.4 Safety is paramount during competition and testing. The WOW's technical team will be responsible for attaching the wind mitigation models in the test section of the Wall of Wind.
- 3.5 NO ONE is allowed in the WOW test area during testing.
- 3.6 Prior to wind testing, Judges will inspect the wind mitigation models to verify that the design is in compliance with the requirements and restrictions listed in Section 2; the Judges reserve the right to disqualify from competition any wind mitigation model that is found to be in violation of the rules and regulations listed in Section 2.

4.0 Scoring

- 4.1 The score for each team for the blow over tests will be calculated as follows. For each team the speeds at which the first 5 blocks fall over will be recorded. The average of these 5 speeds will be calculated and will serve as the score for that team for the experimental part of the competition. (Subject to change before the start of competition.)