

## 2020 Disaster Shelter Competition Sponsored by Samaritan's Purse

Summary of the competition is as follows:

The 2020 Disaster Shelter Competition is designed to encourage consideration of the initial phases of disaster response – the initial phase which requires “emergency” shelters, the second phase which requires “transitional” shelters (1-3 years). The Emergency Shelter Event (see below) addresses the earliest phase, and the main focus of the competition is on the transitional shelter design and prototype.

The Competition design scenario for 2020 for the Transitional (or Core) Shelter is to provide shelter for individuals who have lost their homes in Mozambique during the March 2019 Cyclone Idai. Due to the high winds and rain amounts inland, as well as rain after the cyclone, flooding was a major issue which caused huge issues with transportation, making many roads impassable. The cyclone resulted in damage to 90% of properties in some areas and utilities were also badly damaged. In Mozambique, approximately 602 people died and over 1,600 were injured. Supplies had to be brought upriver in boats or ferried under a helicopter until roadways became passable. Many homes were made of mud and sticks (Wattle and Daub), and due to the wind and rain these structures were washed away. Homes made out of concrete lost roofs and/or were flooded. Traditional dimensional lumber was not available immediately following the storm because it had to be imported. Local wood was either unsuitable or protected.

The shelters you design in response to this disaster should meet Sphere standards in as many areas as possible including cultural accommodation, security, packing, durability, upgradability, etc. (see scoring matrix for grading criteria). Transitional shelters should be able to be mounted onto an existing foundation, anchored into the ground, or mounted to an elevated platform made of wood or concrete. Shelters should take into consideration the logistical and transportation challenges and should address the local climate of Mozambique (heat, ventilation, humidity). Shelters should blend with local architecture and practices as much as possible. Further, water supply and handling of sewage is a significant issue that must be addressed. Since the local water and sewer systems were damaged or compromised, you will need to provide a proposed system for providing fresh water and for dealing with sewage disposal – collection from the individual shelters to some central collection or treatment area/facility. Teams should also include a cost per shelter. Assume that the sites will be cleared and ready, so no costs for site preparation are required. The prototypes will be brought to JBU for presentation and testing (earthquake, ease of handling, time to assemble, weight, habitability, rain, ventilation, and wind/water) in April, 2020.

NOTES:

1. In order to facilitate shelter testing, shelters must be able to be pre-assembled and moved onto the earthquake shake table (16' x 20').
2. Weightings on the scoring matrix have been adjusted based on the changed scenario. Note that there is a maximum weight that will result in disqualification from the competition.

To incorporate consideration by the teams of the shelter considerations during the early stages of a disaster, there will also be an additional Emergency Shelter Event that will be part of the competition but will be scored separately and will have separate awards. This event will address consideration of the initial phase after a disaster during which shelter is created from whatever materials are available at the disaster site. This scenario is the same – the initial phases immediately after the cyclone in Mozambique. The Emergency Shelter will need to withstand potential high winds, and rain. Teams will not need to bring anything for this phase but will each be given a kit at the Competition site with basic materials and tools yet to be determined (e.g. dimension lumber, plastic sheeting, tools, nails, wire, twine, pipe, blocks and/or bricks, tarps, and other materials), some basic standards that must be met (e.g. height, area, wind and water resistance) and will have about 2 hours to construct a usable Emergency Shelter. These shelters will be tested with wind and water. Grading will be on ingenuity, habitability, time required to construct, and performance during wind and water tests. Teams can prepare for this by doing some research beforehand on emergency shelters, but they do not need to bring a design or proto-type.

More detail is provided in the Design Parameters tab on the Competition website.

3. Interested teams of up to 6 undergraduate students should, by Friday, November 15, 2019 submit a Letter of Intent (LOI) due to JBU using the LOI Tab on the Competition Website. This LOI should provide at least a general idea of the design approach of the team. The LOI/Application form can be found on the Competition Website.

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4. The desired specifications and scoring matrix are provided on the Competition Website.
5. Participating teams will be required to register via the Competition Website no later than Friday, January 31, 2020. This will include names of the 6 team members, a coach, and a \$250 entry fee.
6. An initial project report must be submitted to the Competition Judges via the Competition Website no later than March 30, 2020. The report must include design specifications of their proto-type and explanation of how it meets the design parameters. Report should include at least the following: (i) review of existing disaster shelter designs currently in use in recent disasters, (ii) explanation of method of design of the proto-type, (iii) validation that the proto-type meets design criteria (include a chart comparing required specifications to achieved specifications), (iv) discussion of how the shelter is culturally appropriate to the given scenario, v) suggested modifications or improvements to the proto-type that may have been discovered during shelter design and construction but too late to incorporate for the competition, vi) photos or drawings of the proto-type, and vii) a draft plan for water/sewage.
7. Cash Awards will be given for:
  - a. Overall 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place for the Transitional Shelter/Camp Plan (\$1500, \$1000, \$500)
  - b. Individual Category Winners (\$300 each) for Fastest Assembly, Best Wind Resistance, Lightest, Lowest Cost, Best Ventilation, Best Presentation/Report, and Best Water/Sewage Plan.
  - c. 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> Place for Best Emergency Shelter (\$500, \$300, \$200)
8. The on-site judging event will be during April 23-25 at the Balzer Technology Center on the JBU campus. Specific schedule will be as follows:

### Thursday, April 23

8:00 AM – 10:00 AM	Coordination meeting with judges and JBU Reps (BTC CM Conf Rm)
8:00 AM – 10:00 PM	Competition check-in and delivery of structures to testing area (JBU CM High Bay)
10:00 AM – 11:00 AM	All participant meeting to discuss procedures and schedule (BTC 209)
11:00 AM – 12:00 PM	Lunch (BTC 209)
12:00 PM – 6:00 PM	Begin Earthquake Testing (BTC CM High Bay)
1:00 PM – 6:00 PM	Team Presentations (BTC CM Conf Room)
6:00 PM – 7:00 PM	Dinner with Judges (Simmons Great Hall)
7:00 PM – 9:00 PM	Continue Earthquake Testing and Team Presentations

### Friday, April 24

7:30 AM – 9:00 AM	Complete Earthquake Testing (BTC CM High Bay)
9:00 AM – 11:00 AM	Timed Set-Up/Handling Evaluation (Outdoor Set-up Area)
11:00 AM – 2:00 PM	Ventilation Testing (Outdoor Setup Area)
2:00 PM – 4:00 PM	Rain Testing (Outdoor Set-up Area)
4:00 PM – 6:00 PM	Emergency Shelter Construction and testing from SP Kits (Outdoor Set-Up Area)
6:00 PM – 7:30 PM	All Participant Cook Out (Outdoor Set-Up Area)
7:30 PM – 8:30 PM	Light Test (Outdoor Set-Up Area)

### **9 PM – 7 AM Sat.**

### **Shelters occupied by student judges for Habitability Assessment**

### Saturday, April 25

7:00 AM – 10:00 AM	Rain and Wind/Water load assessment (Outdoor Set-Up Area- Architectural Testing Inc.)
10:00 AM - 12:30 PM	Judges complete final evaluations and scoring of prototype shelters
12:30 PM – 2:00 PM	Lunch, awards, closing remarks by SP and JBU (Simmons Great Hall)