Design Parameters

**Scenario:** Shelter designs should meet requirements for response to a specified scenario of an earthquake-induced tsunami in Indonesia. As much as possible, designs should take into account local conditions, culture, materials, etc. The shelters should be considered transitional shelters rather than emergency first response.

**Standards:** Designs should meet Sphere Standards and other appropriate internationally accepted standards (located at [http://www.sphereproject.org/](http://www.sphereproject.org/)).

**Accommodation Requirements:** The shelter design must:

- Accommodate a family of 4 with a minimum allocation of 3.5 square meters of space per person
- Height must allow standing head clearance of 2 meters for at least 70% of the floor space
- Provide dignified accommodation for a family, with adequate flexibility to respond to social, cultural and religious requirements (e.g. the use of spaces by different genders and ages).

**Physical Performance:**

- Versatile and responsive to the scenario environmental conditions that may vary geographically, seasonally and diurnally (from day to night) within the scenario area
- Provide protection from heat and rain
- Ability for floor covering to prevent conductive heat loss
- Perform well structurally against:
  - Wind loads (withstand 75 km/hour wind)
  - Seismic loads, similar to withstand earthquake of same magnitude that devastated Haiti
  - e.g. design according to seismic acceleration factor Ss of 1.24 and S1 of 0.56 - as per use in Haiti according to US earthquake codes ASCE 7-02
- Versatility in design for ability to allow adequate airflow for natural ventilation in hot and humid climates
- Can be erected in a variety of topographical and geological conditions
- Must demonstrate that the structure is reusable (i.e. can be redeployed for another disaster).
- Must be upgradeable to something more permanent by the shelter users, using local materials, techniques, and skills
- Allow for grouping of structures for expansion or use for purposes other than habitation

**Materiality, Cost-Effectiveness, Packaging and Transport:**

- Minimum lifespan of 1 year – more is better
- Cost-effective –$1500 or less to fabricate. Economy of scale during the production phase should be considered as vitally important. Teams must submit documentation to verify the cost of materials used in the shelter. Donated materials not priced will be assigned a cost by the judges.
- A business case analysis should be completed to show the viability of mass manufacture of the shelters. Format for the analysis is provided as a separate attachment.
• Lightweight- Overall weight should be minimized; ideally no more than 200 kg per package to allow handling without equipment.
• Easily stored and transported i.e. manufactured so that it can be flat-packed and fits into a standard 8’ x 40’ shipping container.
• Packable for most efficient use of 8’ x 40’ shipping containers (i.e. packages should be designed to fit in shipping container with minimal wasted space).
• Easy and rapid to assemble without technical experience. Assembly should be straightforward and require minimal manpower, non-electrical tools - that is, simple hand tools that are generally available around the world.
• Shelter should take into account potential cultural considerations or sensitivities.