Background:

Newton's first law of motion states that an object in motion will stay in motion unless acted upon by an equal and opposite force. An athlete performing the long jump will exert force to propel their bodies into the air to maximize their horizontal distance. To prevent injury, the athletes land in a sand pit which produces a force in the opposite direction of the athlete, absorbing the energy. The objective of this challenge is to design and construct a safe landing zone, minimized in height, for two water balloons dropped one at a time from a height of 30 ± 5 ft.

Specifications: (*Any project not meeting specifications will not be allowed to compete.*)

1. Each school may have an unlimited number of teams (max 2 per team) or individuals participating. Each design must be unique and clearly labeled with the names of each team member and school. A student may only participate once. At least one team member must be present for their team's drops.
2. The competitors may use any inexpensive and readily available materials to build a landing zone. No titanium shafts, gases, motors, purchased kits, etc. may be used.
3. Materials which are not allowed in the construction include gels, pastes, potentially explosive/ combustive/dangerous/hazardous materials, anything that can house a gas other than air, and packaging materials (bubble-wrap, soft Styrofoam, peanuts, etc.). Examples of other restricted materials include those that will leave residue. A team member must be able to easily remove each water balloon from the landing zone for the judges' inspection.
4. The landing zone must remain intact after impact and may not have components that "fly out."
5. The landing zone must sit freely on the ground and must not exceed a footprint of 2 ft x 2 ft.
6. All contestants and observers must remain outside of landing area during drops for safety reasons.
7. The water balloons will be "Bunch O Balloons" by ZURU and filled following package specifications.

The Competition:

1. Landing zones must be brought to the competition fully assembled. Water balloons will be provided at the event and dropped one at a time, where the first will remain in place while the second is dropped.
2. The height of the ground to the highest point of the landing zone and the largest width will be measured prior to the competition. The winning team will have a device which has the smallest height and capable of protecting two balloons. Those with surviving water balloons will be ranked above those with damaged water balloons, regardless of the height. A surviving balloon is classified as one that does not pop or leak.
3. The team will have 1 minute to place the landing zone in the drop area. Two water balloons will be dropped, one at a time, from a bucket truck equipped with a weighted guide-line to predict the landing site. Disqualification will occur if a vessel is not set once the time has elapsed.
4. Once the team indicates they are ready for the drops, the team must exit the landing area and no modifications may be made. If elements such as wind, movement of the platform, etc. cause a water balloon to miss the projected target, another water balloon will be dropped at no penalty. If the re-dropped water balloon misses the vessel the team will score 0 points; the goal is to create a robust design. No practice drops will be allowed.
5. In the event of a tie, a first tie break of shortest length of vessel at largest width will be used. If a tie still stands, the second tie break will be a coin toss.