

## TEST PLANS

### **Frame Durability {S1, S2, S3, S4, S5, S6, S9, S20}**

Load Frame with weight in both point and distributed load manner. Since the max weight that the frame would experience is about 300lbs, the test should exceed a load of 600lbs to keep a safety factor of 2. In addition, there should be some linear force introduced to represent the cot being bumped while a guest is occupying it. Lastly, a load will be applied to one side of the frame to represent a guest sitting on the cot, and test that it will not tip over. As a standard to test for fatigue the weight will be left on for a period of 24 hours, this should take care of any long term concern. The test should be repeated at least once to guarantee the results.

**Result:** The frame was able to withstand up to 1600lbs distributed evenly across its surface without major deformation. The cot frame is more than strong enough to support its intended use.

### **Material Attachment Test {S4, S7, S8, S9, S15, S19, S21}**

With the test fabric pieces purchased, the attachment options will be installed and physically tested for durability and practicality. First, to ensure that the attachment mechanism can withstand the required load, the canvas will be weighted down with at least 500lbs. A visual inspection will ensure that the surface is kept tight enough with a comfortable sleeping surface. Also considered will be complications in installing the given mechanism for replacement canvas keeping it as cheap and easy as possible. The test should be repeated thirty times to imitate a month's worth of wear on the canvas.

**Result:** The canvas successfully withstood a 250lb weight while retaining a comfortable sleeping surface. The chosen attachment mechanism is low cost and easy to install for replacements.

### **Hanging Test {S16, S17, S18, S20}**

Hook up a pair of cots simulating the storage in the shelter to make sure that they fly relatively level. An additional 300lb will be introduced to represent worst case scenario of someone hanging on the stored cots. Since the pulley system is rated for much greater, it is unnecessary to test for cable breaking. Additionally, the hook on the pulley has a safety latch so if it is rigged properly, there will be no chance of it "hopping" off. Due to the safety issues related to a failure in this test, it should be replicated at least three times.

**Result:** Two cots were able to tolerate the additional 250lb weight while hanging without any damage to the cots or the hanging mechanism. The cots should be able to hang safely.

### **Cleaning Test {S7, S8, S9, S10, S11, S12, S13, S14, S15}**

Simulate cleaning of the finished cot as done by shelter if there was an infestation. This is done by wiping down the frame with a cleaning solution, such as alcohol or bleach. Since cleaning occurs regularly, this test should be repeated at least ten times to verify ease of cleaning and material durability.

**Result:** The canvas material is easy to completely wipe down with a cloth in less than a minute and showed no sign of damage from the cleaning agents. The frame is also easy to clean, but takes a slight amount longer. This is acceptable, as the frame should not need to be cleaned as often.

### **Comfort Test {S4, S5, S6}**

The comfort test will be to simply sleep on the finished product and confirm that it is of suitable quality relative to existing cots. Feedback will be collected from users of the cots in order to assess its comfort level.

**Result:** Feedback came from users of the prototypes at St. Joseph's House as well as left from students while the cots were left out in the MSD Center. Feedback from St. Joe's indicated that the cots were about as comfortable as the army cots previously in use. From a comfort standpoint, most users were indifferent between these new cots and the previous cots. Users commented that the sinking effect of the canvas material made it harder for them to roll out accidentally while asleep. Feedback from the users at the MSD Center was generally favorable. Users commented that the cot is "more comfortable than it looks," and that they could "definitely get a good night's sleep on [the cot]."