TEAM 8
Andrew Draskovics
Aaron Lacombe
Molham Shallal
Logan Vaverek

October 16, 2014
Test Date: Sep. 22, 2014
Test time: 8:00am
Test Location: Outside Hammond

Prototype 1 Results:

User Need/ Feature/ Requirement	Describe Test	What is “pass”?	Materials to run tests	Results
Intuitive Test	Have random middle-aged people assemble the square template.	Assembly of the template in under 45 seconds.	Components of our template.	Pass
Durable Material	Research online and through questions with DEM seniors in regards to PVC	Stand the stress we deem fit for multiple use.	Water, heat, 5 lbs of weight hung in the center or PVC pipe.	Fail
Time Frame	Time Trial: see how long it take to put the template together and mark out a 3ftX3ft grid	Under 7 minutes to assemble the template and mark out the grid.	Prototype template	Pass 5:57:13
Cost	Research if it it feasible for citizens in Mozambique to afford the flat coast of a PVC template	Under $10.00 or Mozambique equivalent.	Research income	Pass $9.40
Compact Design	Design should be compact enough, that when collapsed, be stored in an area not greater than a 3ftX3ft bag/ area.	Does indeed fit inside a bag thats 2ftX2ft.	Dufflebag	Pass
Introduction of New Material	Research if PVC is available or if it needs to be shipped into the country and regions of operation.	Available in major cities near the region.	Research material	Fail CPVC not available

Figure 1: (Outside Hammond) Andrew and Aaron at the beginning of the scale time trial test to mark out the 1mX1m grid, with cross section lines, on the pavement. This test took them just under 1:30:00.

Figure 2: (Outside Hammond)A worker at the Pennsylvania State University volunteered to participate in our intuitive test. He assembled the template in 18 seconds. He was one of three middle-aged adults to participate and assemble the template in under 45 seconds.

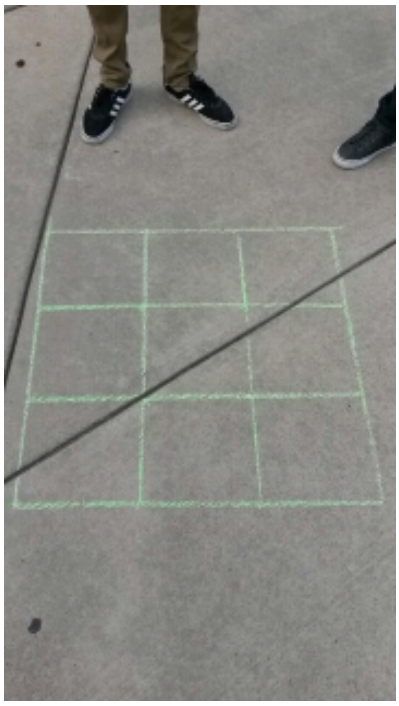


Figure 3: (Outside Hammond) A wide view picture our our 3ftX3ft template. Although at a relatively small scale, it was used to shed light onto our prototype flaws.

Figure 4: (Outside Hammond) We mapped out the grid 3 consecutive times and found some common flaws shared by all. If you look closely, the lines on all three squares are either bigger than or less than the target length of 36 inches, or 1 meter.

Prototype 2 results:
Test Date: October 6, 2014
Test Location: Hammond Building
Test Time: 8:00am

User Need/ Feature/ Requirement	Describe Test	What is “pass”?	Materials to run tests	Results
Intuitive Test	Have at least 3 random middle-aged people assemble the square template and mark off the grid.	Assembly of the template in under 45 seconds and grid is marked in under 10:00:00.	Components of our template.	Pass
Materials function as needed	Research online and through questions with DEM seniors in regards to CPVC and the stress it withstands.	Stand the stress we deem fit for multiple uses in a rural country.	Water, heat, stress of transporting template.	Pass
Time Frame	Time Trial: see how long it take to put the template together and mark out a 3 meter X 3meter grid. 3 different trials.	Under 10 minutes to assemble the template and mark out the grid.	Prototype template	Pass
Inexpensive	Research if it it feasible for citizens in Mozambique to afford the flat coast of a CPVC template and place-holding stakes.	Under $10.00 or Mozambique equivalent.	Research income	Pass
Compact Storage Size	Design should be compact enough, that when collapsed, be stored in an area not greater than a 3ftX3ft bag/ area.	Does indeed fit inside a bag thats 2ftX2ft.	Dufflebag	Pass
Accuracy	Test if our CPVC template is accurate enough to meet the requirement of 1 cm margin or error.	Does indeed meet our criteria of under or equal to 1 cm error.	Measure accuracy of laid out grid.	Pass

Figure 1: Testing the accuracy test of prototype two on the park outside the back of Hammond. This image shows the precise measurements we obtained of 39.4 inches, or 1 meter.

Figure 2: (Outside Hammond) Recording the time trial test and concluding it would pass the time requirements of under 10:00:00. Here, Andrew Draskovics is smoothly flying through the test at only 1:52:87.

(ABOVE) Figure 3:(Outside Hammond) A complete view of all the pieces in our full scale prototype template. It clearly shows the minimal space needed that out design project occupies.

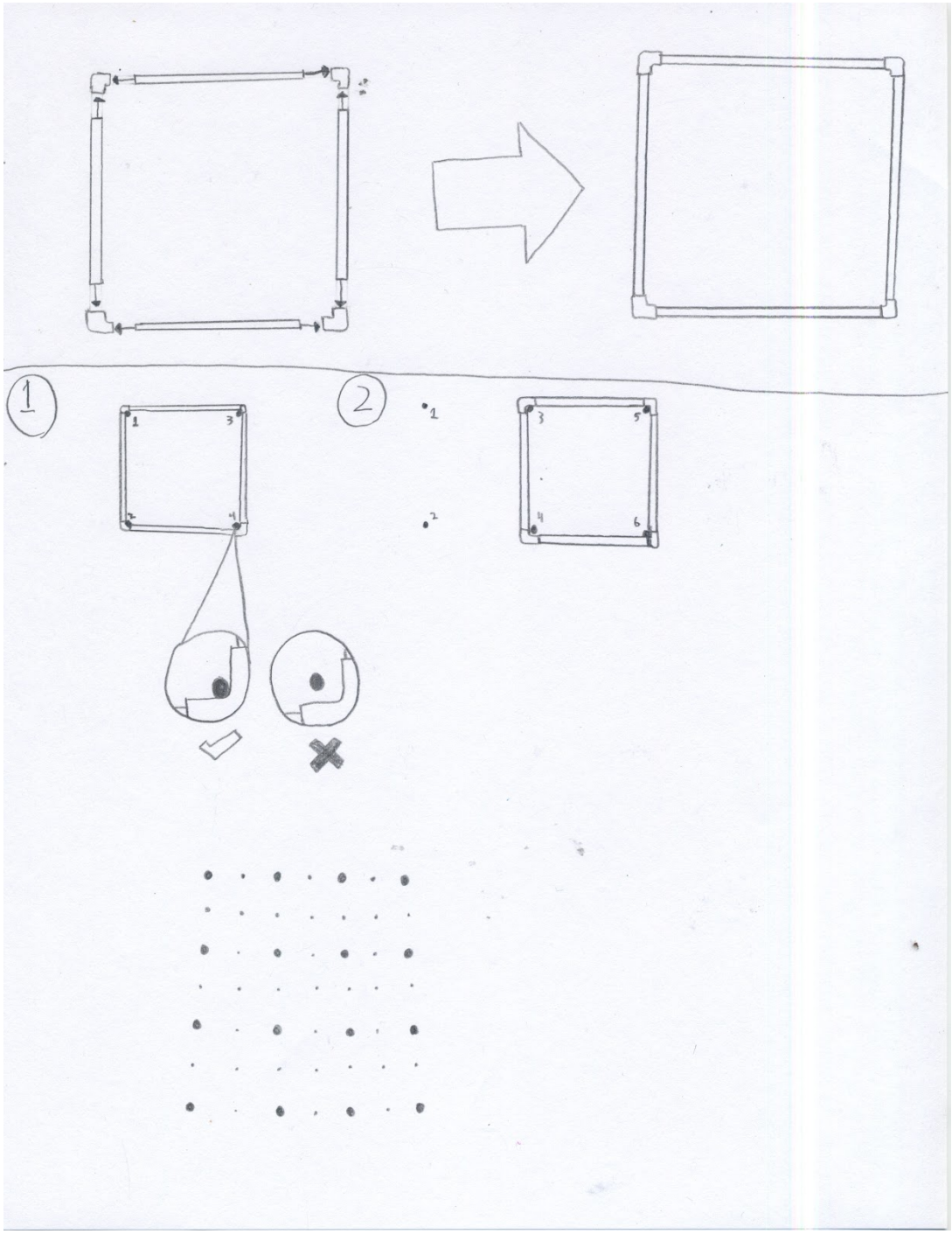
(ABOVE) Figure 4: (Outside Hammond)
During our final prototype testing. Andrew drives the place-holding stakes into the corner, making sure we obtain the exact specifications of less than or equal to 1 cm margin of error.

Cost analysis:
Our prototype #2 design consists of 4 1-meter long CPVC pipes, 4 CPVC L-joints, and 49 wooden spools markers (used for marking the grid). These pieces, combined, are just under $10. This can be seen from a price quote from a common store like the Home Depot website.

URL: http://www.homedepot.com

Price Quote:
2 EverTUFF ½ in. x 10ft CPVC Pipe ($2.28 each)
4 NIBCO ½ in. CPVC CTS 90-Degree Slip x Slip Elbow ($.31 each)
5 48 in. ¼ in. Hardwood Round Dowel ($.72 each)

Total Cost:
$9.40

Re-design ideas/thoughts:
One idea that was brought forth, if a third prototype was allowed, was the possibility of doubling the sides so that the template becomes 2m x 2m. We fiddled with this idea but we were unsure how stable the template would be if it was that large. Mrs. Kisenwether suggested that we could possibly increase the thickness of the CPVC to counter this issue. Overall, we felt it would be quite interesting to see how much the cost would change and how much of an impact it would have on the accuracy, speed, and compactness of the template. Would the increase in cost outweigh the increase in area of the template or will the usefulness of the template diminish as we exceed 1 meter? How much harder would it be to transport a template that is twice the size of our second prototype? Would an increase in warping exist from these changes? These are questions we would pose looking forward towards a third prototype.

User Guide: