

## Prototype Testing:

### Engineering Metric Being Tested: Cost of toilet

#### Purpose:

The cost of the toilet will be examined in this protocol. In addition to considering the cost of the raw materials of the design, the cost of manufacturing will also be considered, as well as any additional cost the customer will ultimately have to pay for a toilet.

#### Goals:

The goal is to keep the cost of the design and the manufacturing under \$27, this is the current cost of the Ekolokay toilet. It is important for our design to be less than \$27 because the customers for this product have limited wealth.

#### Conclusions:

While cost was calculated across three separate methods for toilet construction, RIT, Port Au Prince, and Cap Haitien, it was difficult to determine a comparison between the three simply by the numbers. Our MSD method for construction did not take into account the cost of labor, making the total cost significantly lower than the cost of production in Haiti. At this point, it is difficult to determine the ideal materials and manufacturing methods to produce the lowest cost per toilet.

#### Materials:

- Bill of Materials

#### Procedure:

1. Using the Bill of Materials determine the cost of each component and manufacturing process involved
2. Record the cost of each individual item in the table below
3. Calculate the total cost the customer will have to pay for the toilet by summing each individual item in the table

#### Results:

Material	Base Price (NEW) (USD)	Cost (dola) (OLD - CAP)	Cost (dola) (OLD - PAP)
CEMENT	\$12.80	\$22.50	\$2.28
SAND		\$3.00	\$.56
DRYING AGENT		\$1.50	
SPACKLING FOR CRACKS		\$0.60	

WIRE - 45 CM	\$3.48	\$0.16	
CHICKEN WIRE NET - 110 x 42 CM	\$6.48	\$18.75	\$5.00
DOOR HINGE	\$2.98	\$5.00	\$5.00
WOODEN SLAB	\$5.00	\$5.00	\$25.00
TOILET SEAT	\$5.98	\$195.00	\$620.00
URINE DIVERTER		\$30.00	\$496.00
5 GAL BUCKET	\$4.48		
1 GAL URINE JUG			
NAILS - 1 IN	\$2.64		\$3.00
DRYWALL SCREWS - 5 CM	\$3.28	\$2.00	\$8.00
SANDING PAPER		\$3.00	\$5.00
PAINT (OIL-BASED)		\$31.25	
PAINT (WATER-BASED)		\$16.25	
PAINT - GREEN			\$80.00
PAINT - WHITE			\$150.00
PAINT - YELLOW			\$75.00
SPRAYPAINT		\$3.75	\$26.00
SHEET METAL			\$50.00
LABOR		\$70.00	\$400.00
<b>Total:</b>	\$47.12 USD	\$407.76 dola	\$425.00 dola

**Analysis:**

The table above shows each part necessary to build the toilet with the corresponding price. The price for the model currently being used in Haiti was calculated for both locations of construction, Port Au Prince and Cap Haitien. The price was also calculated for the materials our MSD team used to build the new model of the toilet. Not every material on the list was used for each of the distinct construction methods. The cost of the model we constructed at RIT is significantly lower than the models in Haiti because we did not take into account costs for our labor, we also did not use any paints on the toilet. At this point in the process, it is difficult to determine the exact total cost comparisons between the three methods in question.