

4 Walls Interview: 8/30

Josie Notes:

Met with 4 Walls project cofounder Bonnie Yannie and Sally Kuehl board member

- 4 walls builds houses (\$2000) for poor families with young children, who own land
- Houses are 20' x 20' one room, made of brick, and metal rods with wire covered in cement for corners of house and iron rods for support in front and back of houses, wooden doors, and windows with no glass, but shutters
- kitchen and latrin outside
- One electrical outlet inside (tv), and one water spicket outside
- El Sauce is a poor area, don't have a lot of work there
- Problems in El Sauce: high unemployment and lots of plastic bottle waste
- 4 Walls wants a **PRODUCT to ADD to their houses** like: gutters - collect rainwater
- Want the product to be practical and cheap
- Focused more in getting product than having a small business do it
- 4 Walls would purchase product and implement in the houses they build
- Only need one working machine now that is profitable (4 Walls wants product over business)
- Farther down the line maybe have 1 or 2 people in town have a business to make the product with the machine
- The machine would be sold to the people and be easily repairable (make here most likely)
- Problems with previous design were they couldn't melt the plastic - this will most likely be our biggest challenge
- Previous team decided on the 12" x 12" sheet size

- The plastic has labels and glue removed before being melted into chips
- Find out categories of plastic that are found in El Sauce and which ones the chips are made out of
- Need to know melting properties of plastic we are working with
- The chips used in the design last year were bought in Rochester and didn't have the properties they thought which caused melting issues
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- 4 Walls works with Enlace services, but Enlace focuses more on tourists and education
- Currently political unrest in Nicaragua (bad for tourists)

- For more information Kellan Morgan is great contact and knows more
- Also Sarah Brownell at RIT knows a lot and should be contacted
- Bonnie was going to send an email to Kellan to touch base

Shannon's Notes:

* Emailed Sarah Brownell on 8/30 to set up meeting

Bonnie Yannie: co-founder, started in 2007

Sally Kuehl: board member since start of organization

Have built 146 houses so far!

- Builds houses for families in El Sauce, 20'x20', cost is \$2,000, volunteers raise a couple hundred dollars
- El Sauce, small town, not much happening, around 10,000 people
 - High unemployment and large volume of plastic bottles (mostly from beverages)
- Project manager lives in El Sauce
- Wants to transform plastic bottles into something useful for community
 - Gutters: can be used for water collection in barrel
 - Rods: strengthening rod for structure, rebar is currently used at the corners of the house
 - Brainstorm other ideas that would be useful to residents
- 4 walls would buy sheets/products
 - Could start a profitable small company
- Willing to ship to site, needs minimal repairs/ should be easy to repair if needed
 - Would teach local people how to operate the equipment
- Possible approach
 - Eliminate two step process of melting and then vacuum former
 - Create mold of gutter and pour melted plastic into mold
 - Does our goal need to be sheets of plastic??
 - Harold made it seem that sheets was our goal so other products could potentially be made, not just gutters
 - 4 walls seems like they would want any product available, regardless if it's a mold or a sheet
- Need to get in contact with Kellen Morgan from Enlace, is more knowledgeable about what type of system/ERs
 - Bonnie will contact, hoping to meet next week
- Main problems 4 walls saw last year
 - Lack of EE's, important component of project!
 - Team got stuck, was not making progress
 - Shredder and melter was expensive
 - Did not sort bottles, different thicknesses and material properties, uneven melting
- Need to limit scope of project
 - How else can the sheets be used?
 - Think of end goal

John's notes:

- Bonnie - co-founder
- Sally - on board since the beginning of Four Walls, around 2007
- Four Walls
 - Works in El Sauce to build 20 sq ft houses
 - Made of brick and rebar at the corners
 - \$2000 per house
 - Volunteers raise \$ to go and pay for each house
 - A project manager who lives in El Sauce hires 2 masons to help in construction
 - Zinc roofing
 - Wood doors + windows
- **Main Problem** - unemployment & garbage
 - Four Walls wants our end product ANYWHERE in their housing
 - Structural or aesthetic
 - Ideas:
 - Gutters to collect rainwater
 - Rod to add strength
- Initially Four Walls would just add the product to their houses
 - Long term citizens could purchase and even help make end product, anywhere along the process of bottle -> product

Rachel's Notes

- Bonnie- Cofounder, Sally- Board Member
- 4 Walls Project builds 20 x 20 ft homes with money raised by volunteers (\$2,000/ house)
 - 4 Walls Project started in 2007
 - Have built 146 homes so far
- Enlace project works more with tourists/ community development
- Not much interaction between 4 walls/ Enlace
- Main problems in El Sauce
 - High unemployment
 - Garbage
- Problems with previous team's project
 - Not functional, no end process, dangerous to the user
 - Really struggled with getting the device hot enough to melt the plastic
 - Type of plastic, too much of a mix in the samples?
- Customer requirements
 - End product must be affordable to 4 Walls Project and El Sauce Citizens
 - Gutter, strengthening rods(similar to rebar)
 - Functional
 - Must be easy to operate, maintain, and repair
 - Safe to operate
- Possibly eliminate sheet and go right to gutter
 - The mold could be an attachment, could have more than one potentially
 - 12 x 12 sheet for vacuum forming
 - Gutter/ Rod Support molds to skip extra vacuum step if possible

Sarah Brownell Interview: 9/4

Shannon's Notes:

- Chris Fisher (MSD) → melter location/storing on MSD floor
 - Jack is broken, be careful
 - Partially melts, needs more heaters, power limit was issue, correct pressure
- Not limited to melter sheet, other methods such as screw were expensive
 - 12"x12" sheet is not set, should be able to test in vacuum former
- Can get plastic chips locally, look in old team's stuff for name
- Harbec, mostly injection molding, focused on ren energy
 - Good source to reach out to/learning opportunity
- Cycle time may not be feasible
- FMS contacts for high voltage
- Need to analyze materials and review importance, metals are expensive, budget!!

Josie's Notes:

- For access to device ask Chris (MSD office)
- The jack on the device is broken, it is not meant for compression and is installed backwards, so it can be dangerous
- The problem with the current design is that the plastic was not heated enough, and the electrical aspects need help, have to work with 240v, also process was too slow
- FMS helped with previous electrical aspects
- Could use fan to cool to reduce cycle time, current time is roughly 2 hours a sheet
- Not sure on what pressure to be using, not much information on it, so test out device
- Parts to keep would be the frame
- Chips came from local company, and can be found in MSD 1 of previous groups (free)
- Bob from Harbec is also a helpful resource, knowing a lot about plastics (gives tours)
- Possibility of screw design, but expensive
- Used 12 x 12 to use in RIT vacuum former to test
- Also flat sheet is simple and cheaper than screw design
- The technical aspects of the project are up to the MSD team
- Can combine melting with forming, but last team decided not to because it was too complex and costly
- A major set back is expense - want it to be cheap, but don't use cheap metals to build molds (another issue)
- Main goal is to melt recycled plastic into something usable, while being cheaper than cost of making it
- Possible products - gutters and window blocks
- Open ended project - there are no experts - just trying to see if it is a reasonable project

Rachel's Notes:

- New Jack needed, broken/dangerous
- 12 x 12 size needed to be able to test vacuum forming in the construct
- Cycle time may be too slow to make this project worth implementing.
 - Cooling system could reduce cycle time, fan suggested
- Last years team used compression molding
 - injection/ screw design was too expensive
 - Needs more heat
- FMS was used for help with electrical elements
- Can get PET chips locally
- Contact Chris Fisher to locate melter (basement?)
- Harbec is a good resource for plastics information