Design Project 2

Waste Stream Reuse and Recycling

Our task was to create a method for the company, ArcelorMittal, to recycle materials that are currently wasted from the production of steel through this company. The four types of waste we reused and recycled were wooden pallets, metal drums used for liquid delivery, plastic totes and refractory brick. Our solution is for the company to create a recycled garden in their surrounding communities. This will be achieved by turning wooden pallets into woodchips/mulch; the drums into wiring for fences; the plastic totes into watering apparatuses for the garden and the refractory brick into pathways in the garden. Our main goal was to use all the materials ArcelorMittal desired to be recycled in our solution. This “recycled garden” idea allows for economic, social, and environmental sustainability.

Flow Charts:

Wooden Pallets:

1. Step 1: Wooden Pallets taken from factory and cleaned of chemicals.
2. Step 2: Clean pallets taken to grinding and shredding operations within Arcelor Mittal.
3. Step 3: Shredded pallets are then collected within Arcelor Mittal and treated for outdoor elements and mulch.
4. Step 4: Prepared chips then sent to garden sites AM sets up within communities.
5. Step 5: AM employees then lay mulch in garden sites.
Refractory Bricks:

Step 1: Bricks taken from factory and cleaned/stripped of chemicals

Cleaned bricks then treated to withstand outdoor elements

Irregular shaped bricks grind into gravel or chiseled to meet appropriate shape
  • Gravel layed down before bricks and used as space filler

AM lays brick at sites

Bricks can be offered to community members to get names/memos engraved to be in garden
Metal Drums:

Step 1: Empty drums cleaned of chemicals

Step 2: AM welds and reworks drums to be flattened
- Some drums can be saved to be used as garbage cans in garden

Step 3: Welded drums stretched and thinned into wiring

Step 4: Wire cut appropriately for fencing

Step 5: Finished Wire sent to garden for fencing

Plastic Totes:

Step 1: Clean plastic totes of chemicals

Step 2: Treat totes to be outdoor friendly and water resistant

Install spickets on bottom side of totes for water release

Totes colored to be earth-toned/neutral for garden

Finished totes sent to garden site to be used as watering apparatuses
Concept Tree

Reduce waste production

Max Profit

Provide Community with land and garden space

- Wooden pallets are turned into wood chips/mulch (cleaning and processing plant)
- Plastic totes turned into water storage and watering apparatuses (cleaning of the totes)
- Refractory brick used as paths (cleaning of bricks)
- Metal drums formed into fences (welding and forming/assembly)
- Uses all the material in one location
- More jobs (making the stuff for the garden and maintaining)
- Sell the lots to the community
- Sell excess processed recycled material
- Get full potential from materials
- Sell the raw material, before processing
- Community can use the garden for produce for selves
- Garden’s produce can be donated to food banks
- Community members that do not have land for a garden can buy lots
- Make area more aesthetically pleasing/increase land value
- Have a safe place for people to hang around
Final Sketch