AguaClara

Prefabrication 1 L/s

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Team Goals

- The goal of our team is to research, test, and provide fabrication methods to be used during a full-scale plant implementation in Honduras
- Novel geometries for low-flow flocculation and sedimentation tanks were designed, and the integration of the dosing, flocculation, sedimentation, and filtration processes will be refined

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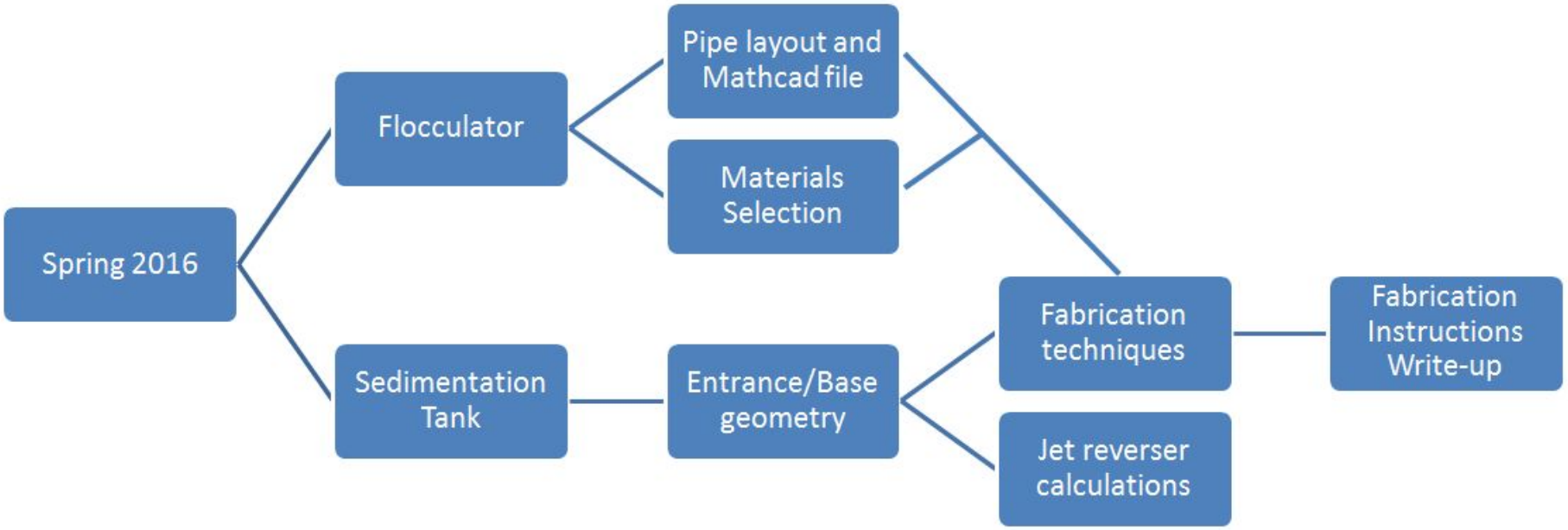
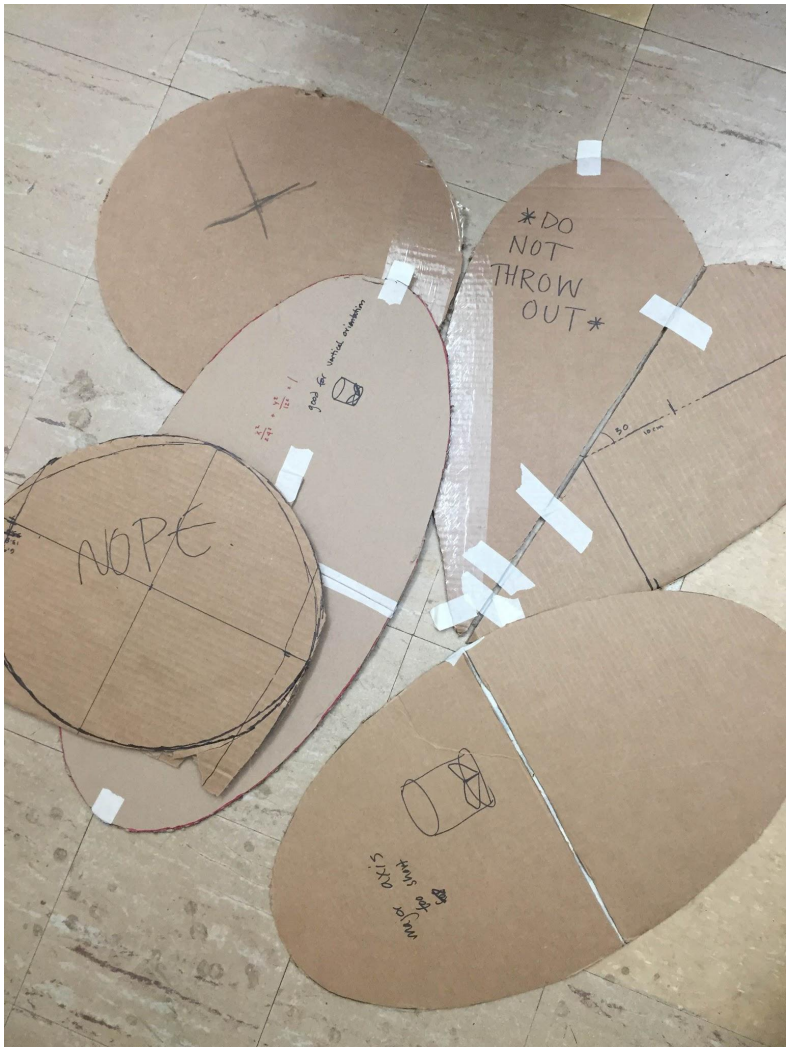
Spring 2016 Task Map

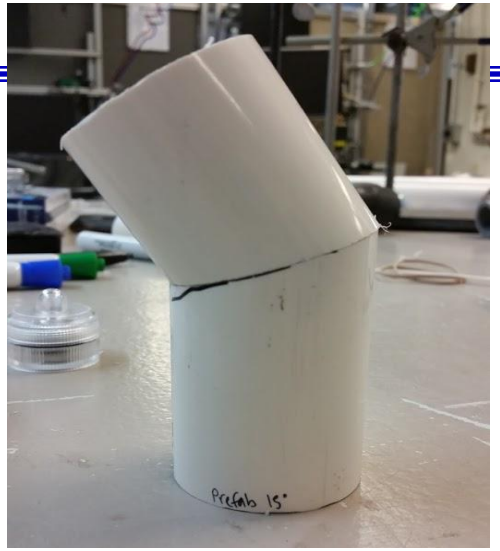


Low Flow Plant

- Our plant uses current design parameters for upflow velocities, collision potential, minimum spacings, and other well-researched AguaClara standards
- Materials must be portable and durable
- Traditional concrete tanks have been transferred to PVC pipes

Fabrication





Sedimentation Tank

- First time implementing PVC welding!
- Our model is 1’ in diameter and roughly 3’ tall
- Corrugations on 1’ model are a good representative of kind of pipes that are available in Honduras
- 3’ diameter pipe achieves an upflow velocity right on target with traditional plants - 1.055 mm/s

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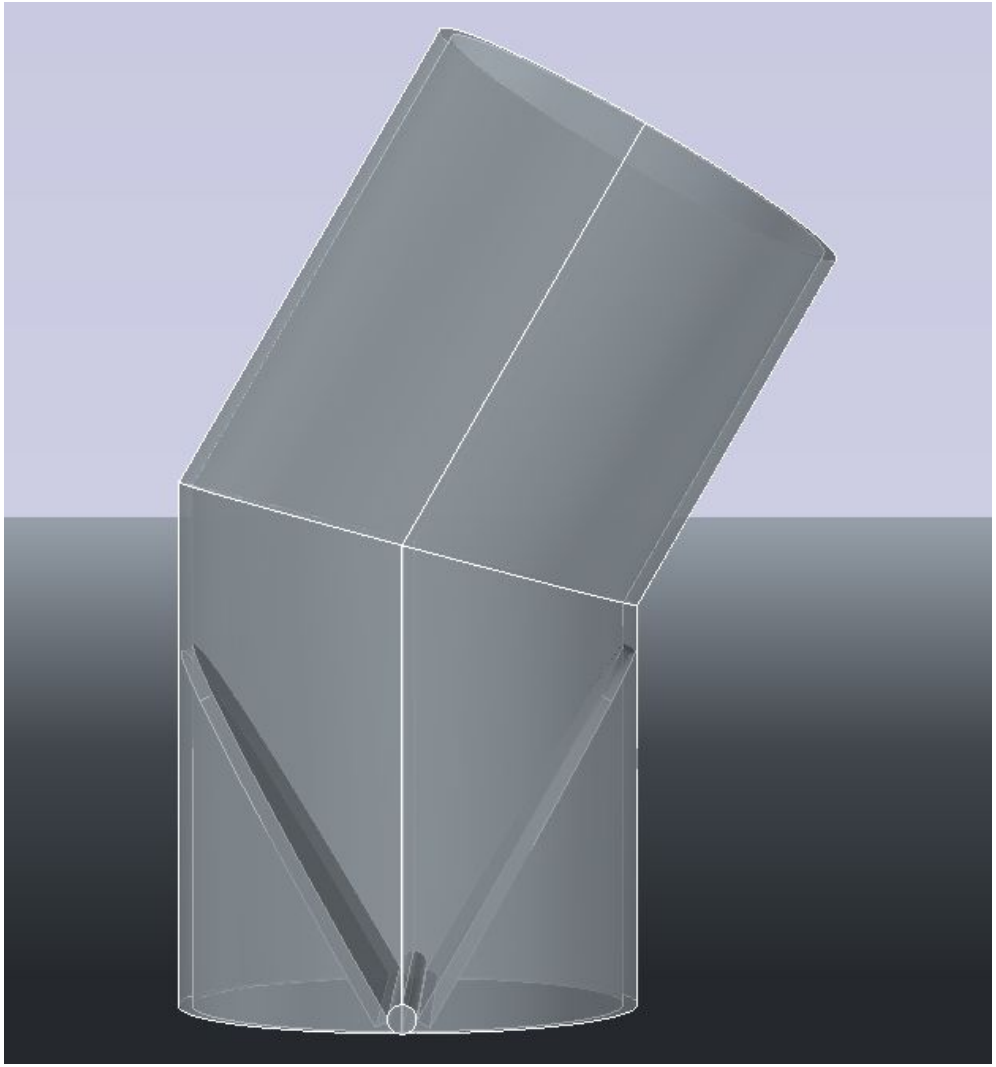
Sed Tank Designs



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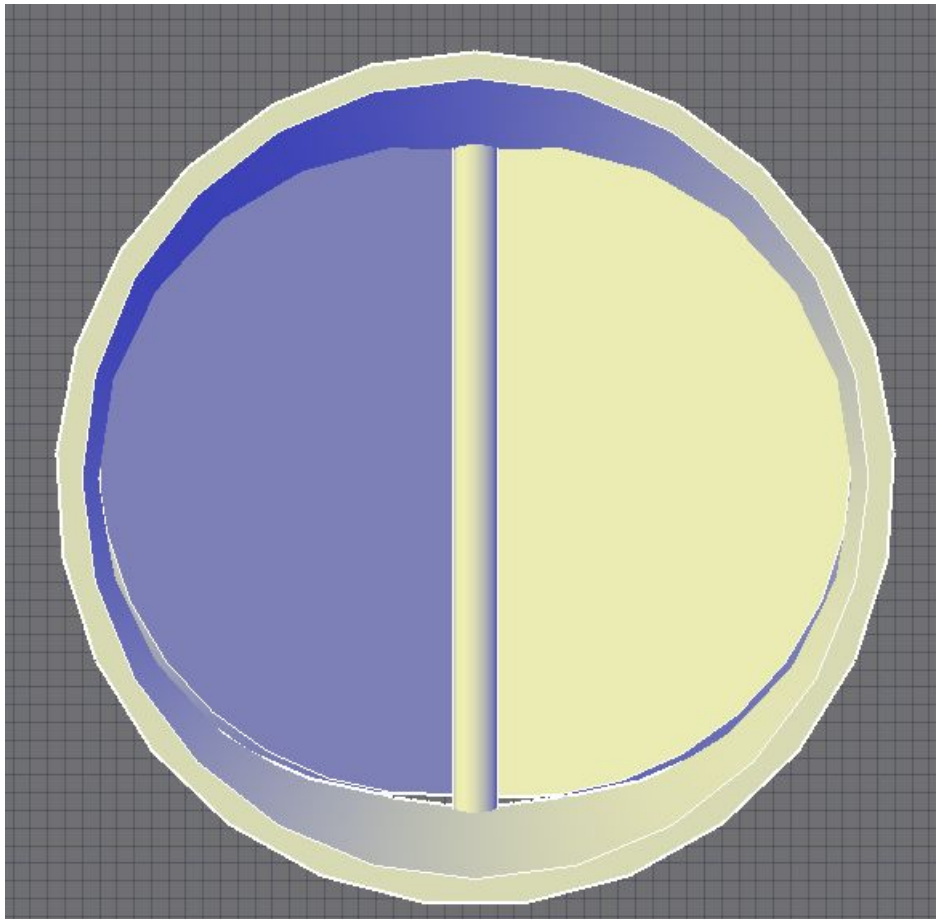
Sed Tank Designs



Design Considerations

- Corrugations vs Smooth Pipe
  - What material will be available, cost, construction
- Angle in pipe vs Straight pipe
  - Difficulty of plastic welding, cost, weld strength, tank stability
- Tank Base
  - Concrete vs fiberglass vs plastic sheet welding
- HDPE vs. PVC
  - We believe the pipes in Honduras will be PVC but we received a free(!) HDPE pipe for testing

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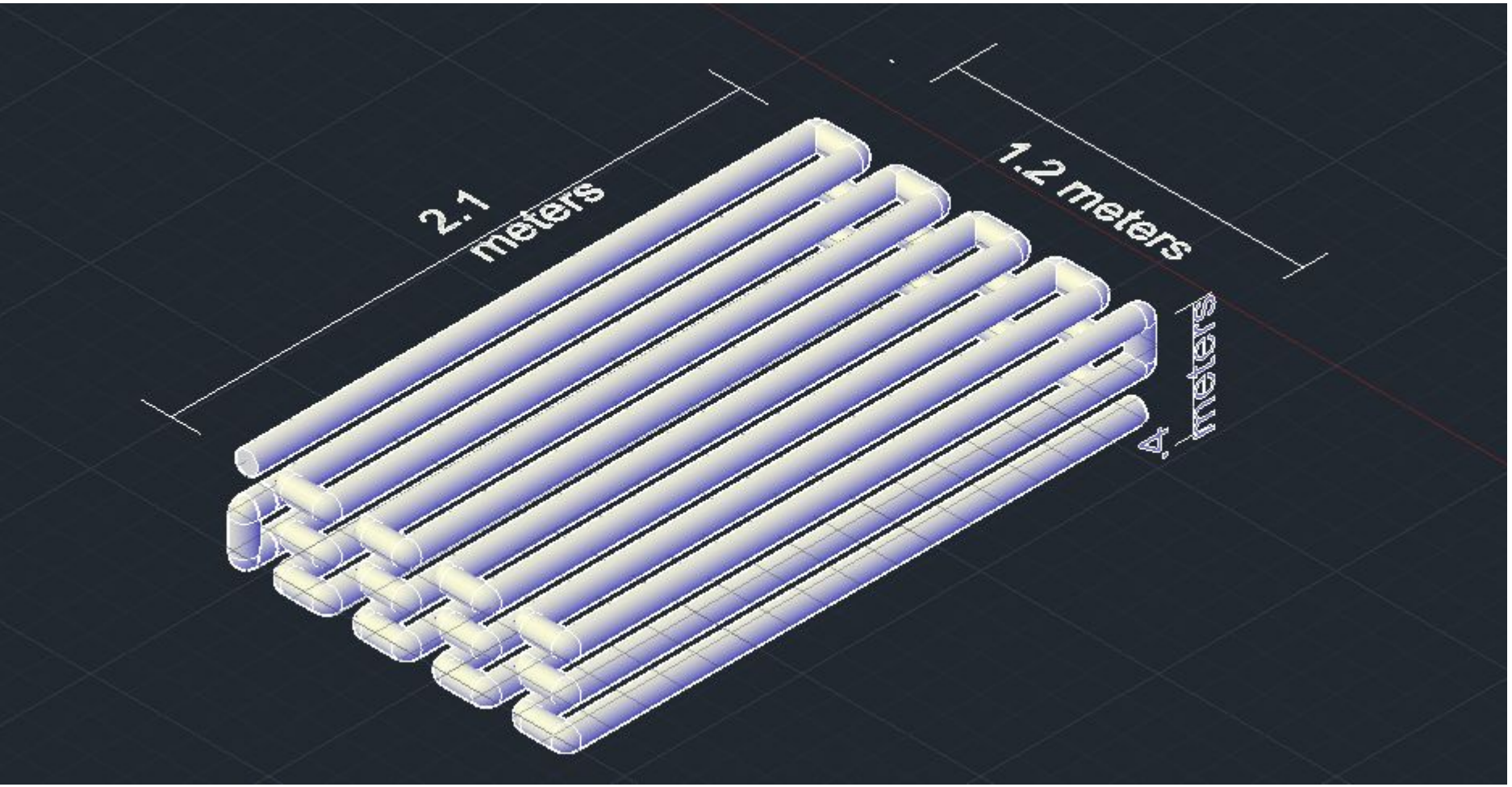
Flocculator



Flocculator

- Flocculation will occur in 2” diameter PVC pipes
- 30 straight sections, each 2 meters in length, and connected by pairs of 90° elbows
  - Major losses caused by friction and minor losses due to expansions
- The “packed" geometry allows the flocculator to meet the desired collision potential while minimizing the area occupied

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Next Steps

- Sed Tank
  - WELD THE PIPE!
  - Weld the tank base cap
  - Design inflow/outflows
  - Fabricate plate settlers
- Flocculator
  - Determine constraint equation
  - Decide on a geometry
- Plant
  - Determine total geometry

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Questions?