IPRO 327

Sustainable Water Distribution System for Pignon, Haiti
Needs of Pignon, Haiti

- A water distribution system to supply 20 gallons per person per day to the town
- Technical support to design the system
- Easier access to the system
  - more public fountains
  - more private household connections
- Ability for future growth of the system
Goals of the IPRO

- Update the digital map of Pignon, Haiti
- Analyze survey data and update population estimate
- Update EPANET
- Size pipes, create AutoCAD plan
- Design water kiosk
- Design 15,000 gallon, reinforced concrete rectangle storage tank
- Design disinfection system
Organization of the Team

IPRO Teams

Team 1
Pump Design
- Team 1 Tasks
  Pump selection, Pump design

Team 2
Kiosk Design
- Team 2 Tasks
  Construction Materials, Water Kiosks

Team 3
Storage Tank Design
- Team 3a Tasks
  Storage Tank Design
- Team 3b Tasks
  Piping System

Team 4
IPRO Deliverables
- Team 4 Tasks
  IPRO Deliverables

Team 5
Feasibility
- Team 5 Tasks
  Project feasibility
Pipe Design

- Analyze and design the pipeline through use of EPANET
- Created models for present and future periods of operation
- Demand and design parameters based on standards developed by SNEP
- Use maps and surveys to predict locations of kiosks and private connections
- Use the results of the analysis to properly size pipelines and pumps used
Kiosk Design

- Design based of similar kiosks throughout Haiti
- Concrete Masonry Unit (CMUs) contain piping and valve necessary to control water distribution
Tank Design

- Size of the tank will be as follows:
  - 17 ft x 17 ft x 5 ft
  - Made from Reinforced Concrete
  - Need a tank to store 15,000 gallons of water
Pump Design

CAPPED SOURCE
Q > 100 GPM (380 liters/min)

Buffer Tank

PUMP HOUSE

CISTERN
About 170 m³ (45000 Gal)

DISTRIBUTION SYSTEM
- 2 hours of water every 2 to 3 days
- About 200 subscribers and 7 public fountains

Clean water wasted
Flow rate?
% of the source?

Clean water wasted
Flow rate?
% of the incoming flow?

Clean water wasted
80 to 85% of the incoming flow at the Ram pump
Ethical Issues / Obstacles

- Using AutoCAD and EPANET to accurately design systems
- Working effectively - project management
  - Splitting in groups for optimal performance
  - Groups splitting into subgroups for efficiency
- Professional approval for design
Ethical Issues / Obstacles

- Lack of design experience - Design needs professional approval
- Design Standards - Water distribution system based on US standards
  - No guarantee for quality construction materials in Haiti
  - Availability of proper materials pending
Results

• Major designs completed
  • Kiosk
  • Cistern / Tank
  • Pipe / Pump Systems

• Next step: professional approval
Any questions?