



**National
Transportation
Safety Board**

Volunteering Internationally: How a Materials Engineer Can Make a Difference

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Outline

- Motivation
- Ways One Can Volunteer
- Importance of Giving Back
- My Experiences
- Final Thoughts

Quick Biography

- Attended University of Florida
 - BSMSE: 2000
 - MS: 2003
 - Ph.D.: 2007
- Employment
 - American Technical Ceramics
 - NAVAIR
 - National Transportation Safety Board
- Certifications, FBPE:
 - P.E. (Metallurgical): 2012



Motivation

- Had I accomplished everything I thought I would?
- Had I done everything I thought I could?
- In what ways could I give back to others?



Importance of Giving Back

- People need your help
 - Make a difference in someone's life
- Variety of Levels
 - Local
 - National
 - International
- Variety of Fields
 - Environmental
 - Medical
 - Construction
 - Educational
 - Athletic
 - Occupational



Why Volunteer?

- Learn and develop “soft skills”
 - Project management
 - Communication
 - Networking
- Enhance your resume
 - Gain work experience
 - Broaden horizons
- Build self-esteem and self-confidence
 - Feel needed and valued
 - Improve your health
- Be an ambassador for science and engineering



Why Are Materials Engineers Needed?

- Critical thinking skills
- Organizing skills
- Communication skills
- Understand engineering and construction concepts
- Materials knowledge base unique to our experience

Why Are Materials Engineers Needed?



My Experience: EWB

- International NGO to provide
 - Clean water
 - Sanitation
 - Community infrastructure
- Synergy between
 - Professional engineers
 - Academics
 - Students
- All engineering disciplines



My Experience: EWB

- 5 year commitment to region
- Promote sustainable development
- Train engineers and locals in designing for future development



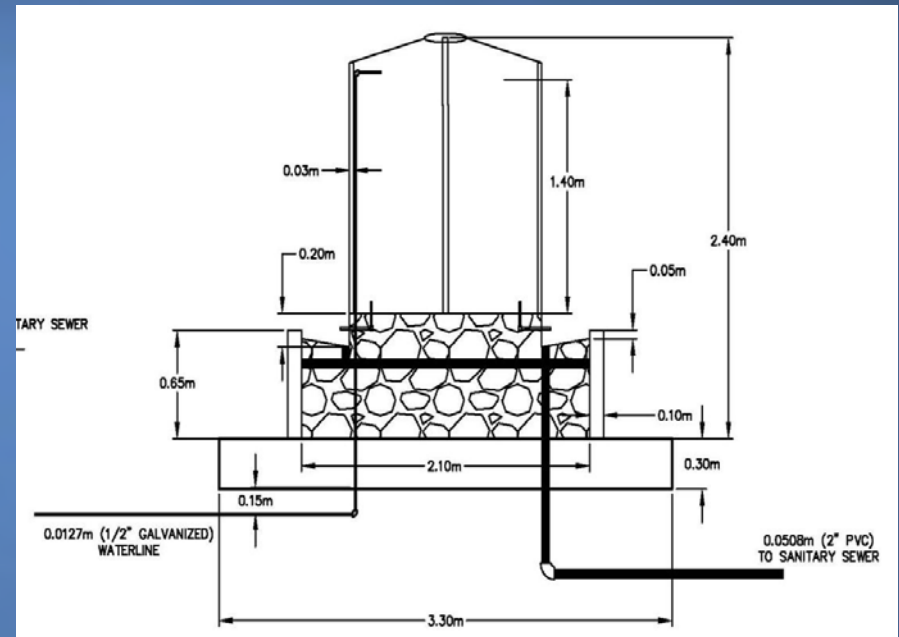
My Experience: Civil/Structural Engineering

- Concrete knowledge
 - Curing rates
 - Mixing parameters
 - Rebar design
- Soil knowledge
 - Soil strength
 - Foundation design
 - Drainage design
- Water distribution knowledge
 - Piping design
 - Delivery systems
 - Sanitation



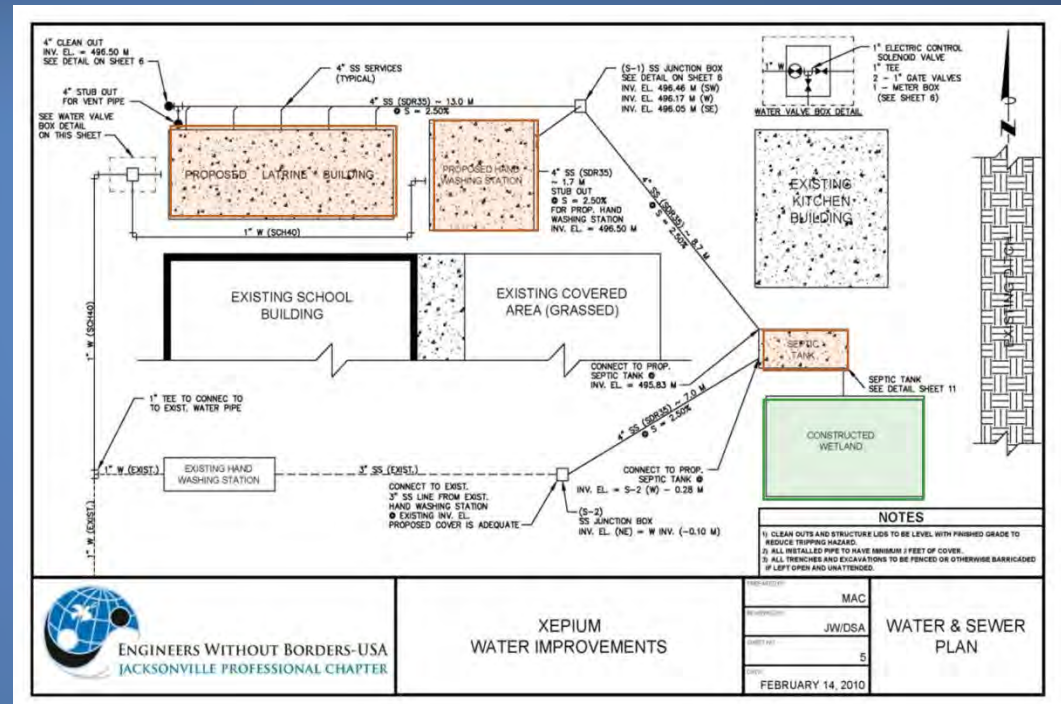
My Experience: Planning

- Contact area and identify needs
- Look for funding sources
- Develop engineering plans and drawings
- Present to EWB National Committees
- Correct issues and finalize
- Implementation



My Experience: Planning

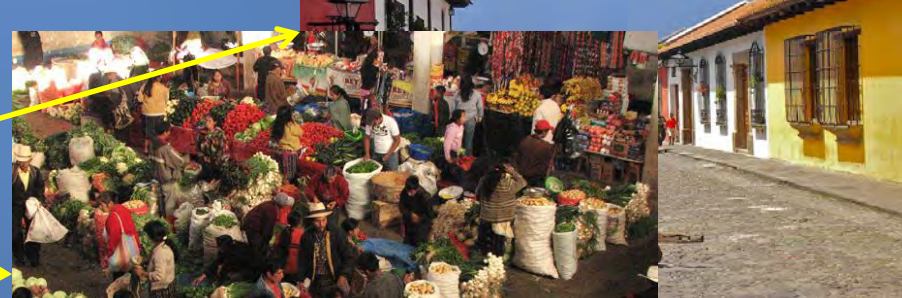
- Design and planning phase:
 - 6-8 months
- Implementation phase:
 - 14 days



14

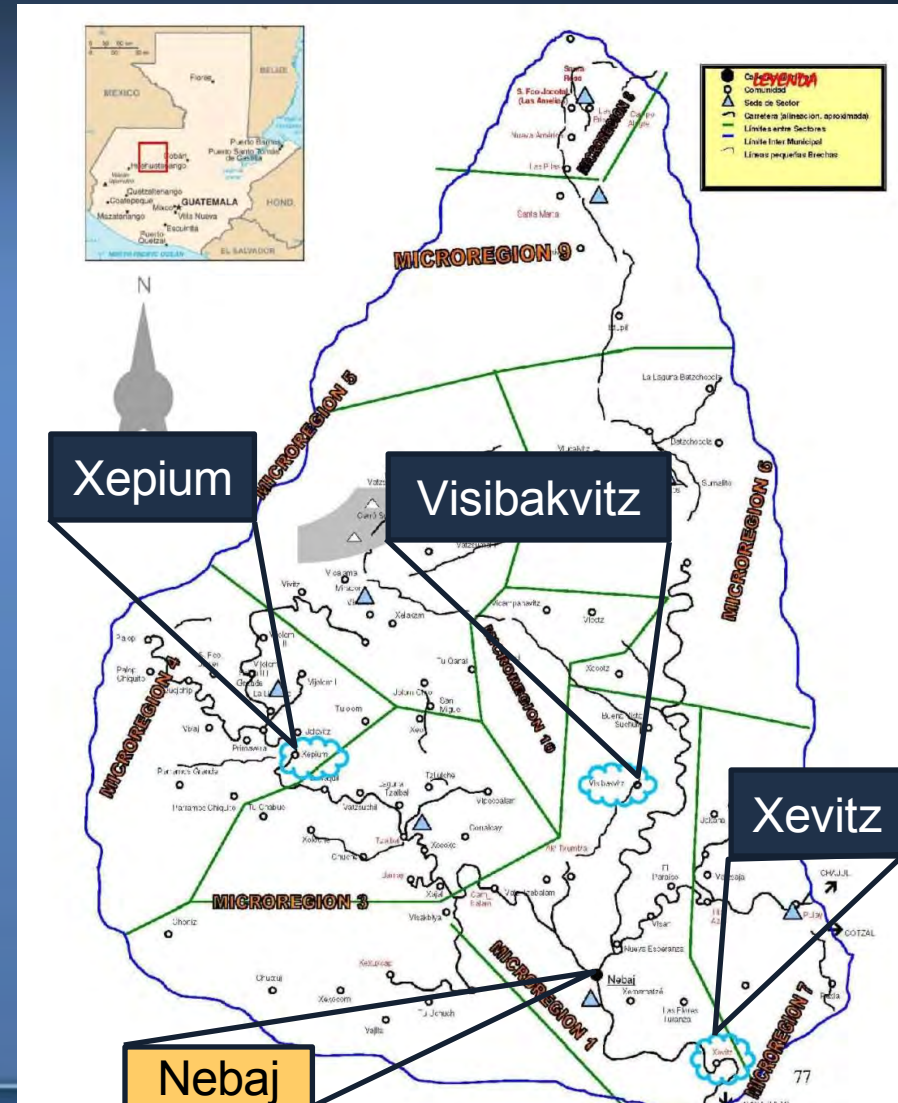


My Experience: Guatemala



My Experience: Nebaj

- Advantages:
 - Arable land and water
 - Receptive villagers
 - Skilled artisans
 - Available supplies
 - Local NGO and Peace Corps
- Challenges:
 - Language barriers
 - Cultural differences
 - Transportation
 - Poverty



Before and After: Xepium



Before and After: Xevitz



Before and After: Visibakvitz



Sustainability: Structures

- Structures
 - Facilities must be durable and easily maintainable
 - Materials must be available
- Personnel
 - Local skilled workers must be available
 - All parties must understand roles and responsibility



Sustainability: Education

- Health and Hygiene Education
 - Proper hand washing
 - Proper teeth brushing
 - Safe drinking water
 - Cough/sneeze into hands/elbows
- Overcoming cultural biases and superstition



Experience in volunteering applied to work experience - EWB

- Communication and Management Experience
 - Implemented on-site design changes
 - Collaborated with local leaders and contractors
 - Developed construction certification reports
 - Learned a new language
- Design Experience
 - Collected survey and water data
 - Developed design calculations, drawings, cost and schedule estimates

Experience in volunteering applied to work experience - EWB

- Proposal and Grant Experience
 - Underwent peer review
 - Obtained approval from governing authority
 - Submitted grants and collected project funds
- Teaching Experience
 - Mentored other engineers
 - Marketed future projects, provided education for public

What Should My Steps Be?

- Evaluate Yourself
- Explore Organizations
- Take the Plunge
- Don't be Afraid to Say 'No'

Questions?



