

Engineers Without Borders

At the Rose-Hulman Institute of Technology



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What is Engineers Without Borders?

Engineers Without Borders (EWB) is an international student-driven organization that engineers sustainable solutions to health and infrastructure problems in third-world



countries. We envision a world in which the communities we serve have the capacity and knowledge to meet their basic human needs. We make this happen by collaborating with local community partners to design and implement student-designed engineering projects. Lack of access to safe drinking water and reliable sanitation affects half of the world population. More disturbingly, unsafe drinking water and lack of hygiene causes the deaths of 1.6 million children under the age of five each year. Our work is making a direct impact on these sad statistics.



In this Issue

Hello! Welcome to the latest issue of Rose-Hulman Engineers without Borders newsletter! It's been a busy, productive school year for us.

We've paid our final visit to the Dominican Republic and all our projects are complete and in solid working order. Now, we are fully focused on Ghana. After thorough research, we have decided that a twelve-stall ventilated pit latrine is the best option. The calculations regarding slab and wall design are complete and the latrine is ready to be built later this summer!

Earlier this spring, we had the honor of hosting Dr. Bernard Amadei, the founder of EWB-USA from the University of Colorado, Boulder. Members of our chapter enjoyed showing him around campus, giving a presentation of our projects, and hearing him speak on the origins of Engineers Without Borders.

All of this work can't be done without your help. Our partner community of Gomoa Gyama, Ghana is a very difficult community to access. Flights alone cost over two thousand dollars per person. 75% of our funds come from private donors—we rely on generous individuals who believe that engineering has the potential to make the world a better place. Please see "Donating to EWB" on page 4, or visit our website at <http://www.rose-hulman.edu/ewb> if you would like to help us make a difference.

The EWB-RHIT Team

President Jung Fang

Junior Chemical Engineering Major
from Jinan, China

Fundraising Manager Allison Phillips

Freshman Civil Engineering Major
from Mooresville, Indiana

Engineering Manager Sanders Park

Sophomore Civil Engineering Major
from Alpharetta, Georgia

Marketing Manager Amanda Sparks

Sophomore Civil Engineering Major
from Kennebunk, Maine

Treasurer Ross Hunter

Sophomore Applied Biology Major
from Martinsville, Indiana

Secretary Hannah Conover

Freshman Biomedical Engineering Major
from Edina, Minnesota

Dominican Republic Closeout

Our five-year collaboration with our partners in the Dominican Republic culminated this year with a final monitoring trip. The main goals of our trip were to inspect the integrity of our past projects and to talk to the community about the impact of our projects and their continued plans for project ownership. This included discussing maintenance, improvements, expansions, and replications of the projects along with the transfer of the design and construction knowledge between community members.

The first project we inspected was a roof we had constructed on an unused building to double the capacity of the Batey Relief Alliance's medical clinic in Batey Cinco Casas. We focused on monitoring its structural integrity, especially since it has already been hit by the outskirts of multiple hurricanes. Everything was holding up even better than expected – the original building hadn't settled at all due to the new roof and all of the wood and connections were still well-secured. We decided to also add a gutter system to prevent damage to the lower roof which could eventually lead to leaks. The clinic staff and patients were very satisfied with the new roof – it provided good ventilation and kept the building much lighter and cooler than the neighboring main clinic building, which is covered with a flat roof.

Our second project was a piping network and septic system for the building we had renovated so that the



clinic could use it as an outpatient facility. A few months before the trip, the clinic told us that the septic system was flooding back up the system. When we arrived, the clinic had constructed a completely new building behind the one we renovated to serve as a surgery center and redid some of the piping network.

Eventually we determined that the filtration system (a re-injection well) was clogged and that some pipes needed to be rerouted. We hired a driller to clean and deepen the well, and we provided the clinic with a manual describing how the entire system functioned and how it should be maintained. The clinic was confident that they could manage the system as they expanded their services to local communities.

The final project was the set of improved pit latrines we had built in Batey Santa Rosa to im-



prove sanitation. The community, composed of mixed Haitian and Dominican ancestry, had helped construct six latrines over our time together, and the community constructed three more on their own. Again, our main goal was to verify structural integrity and confirm that the community was using them correctly. All nine of the latrines were structurally sound and the community members cleaned them frequently, used them correctly, and had added improvements. Talking with community members, we came up with a further enhanced design. The next latrines that the community will build will have a layer of concrete blocks as the first layer and the rest of the structure will sit on top, which will keep the clay and rainwater out of the latrines and better prevent the wood from rotting. The community is really excited about this prospect and are currently raising funds. They have taken great leadership with this project and have completely taken over the ownership of the latrines. We expect them to be sustained for beyond the upcoming forty years!

Gomoa Gyaman, Ghana

Gomoa Gyaman is a community with a population of approximately 2,500 residents. Stable jobs are scarce in the community, and most residents are self-sufficient farmers. Residents lack clean, usable restroom facilities. For this reason, some residents



defecate in open spaces and trails just outside the community, which exposes the community to disease as well as putting their wells at risk for water-borne diseases. In addition, due to the lack of public latrines, some villagers actually risk being arrested



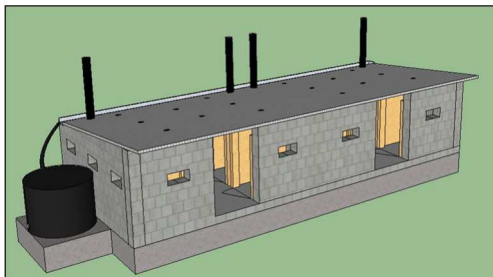
for using government-built latrines intended for use by the local public school. There are also a few public latrines which are simply holes dug to about 20' to 30' deep that have 2" by 8" boards across to squat on. These latrines have many problems. They are

not able to be drained properly and are filling quickly as well, which means they take up valuable living space when the old latrines are full. When they fill, the community will simply dig new holes and repeat the process. The introduction of long-lasting, sustainable, and eco-friendly latrines has become essential for the community. As a step toward providing these latrines, RHIT-EWB has developed a



working relationship with the community. All of the locals surveyed are supportive of our presence and the engineering insight we can provide. In addition, the community has capable workers who will be able to provide their knowledge of masonry and concrete work.

A preview of our design is as follows:



Student Spotlight: Allison Phillips

Q: How will your experience working with a different culture affect you as an engineer?



A: As a civil engineering major in a world rapidly becoming more globalized, I realize that once I have graduated I will have to work side by side with people with views and lifestyles very different than my own. In March, I had the opportunity to travel to the Dominican Republic and learned how to use a coa, a sort of vertical hoe used to break down the sides of trench walls. This tool worked much better than my clumsy shovel-jabbing, illustrating the benefits of utilizing local techniques. As a professional engineer, therefore, I will need to keep in mind how different worldviews affect labor, design constraints, possibly even how I am looked upon as a woman in a technical field.

EWB-RHIT Mentors

Technical Mentor Wil Painter

Professional Civil Engineer
from EWB-Indianapolis

Technical Mentor Mike Cline

Professional Civil Engineer
from EWB-Indianapolis

Cultural Mentor & Translator John Gardner

Associate Spanish Professor
from Rose-Hulman

Faculty Mentor John Aidoo

Assistant Civil Engineering Professor
from Rose-Hulman

Fundraising

Fundraising is vital to our ability to continue using our Rose-Hulman education to impact developing communities worldwide. The cost of travel and construction materials is extremely high, but both are necessary for our chapter.

Through school organizations (such as the Student Government Association and the Humanities and Social Sciences Department) we are able to raise some funds for our projects.

This only covers a fraction of the total amount needed to complete our projects—especially for international air travel. We rely on private donors like you to support our projects and make a difference in third-world communities.

Donating to EWB

Contributions can be made to
"Rose-Hulman Institute
of Technology",
directed to
"Engineers Without Borders"
in the memo.

For more information, contact
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Contact Us

Please contact us at
fangz@rose-hulman.edu if you
have any questions or would like
to become more involved.

More information can also be
found on our website at:

www.rose-hulman.edu/ewb

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A Day with the Founder

Dr. Bernard Amadei, the founder of Engineers Without Borders USA and a civil engineering professor at the University of Colorado at Boulder, was invited as a Rose-Hulman Leadership Advancement Program guest speaker to present on his experience and vision as a global engineering leader. His speech took place on March 18, 2014.

While on campus prior to his speech, two EWB officers, Amanda Sparks and Allison Phillips, presented our chapter's past and ongoing projects in the Dominican Republic and Ghana to Dr. Amadei and highlighted our chapter's on-campus involvements. Dr. Amadei gave positive comments on our chapter's efforts and accomplishments. Following the presentation, eight EWB officers and members attended a dinner with Dr. Amadei; this was a great opportunity for the members to learn more about how to be an effective global engineering leader.

A total of more than 50 students, faculty, staff, and local Terre Haute residents were drawn to Dr. Amadei's presentation the evening of his stay. He started his presentation with the story of a community in Belize that inspired him to found Engineers Without Borders-USA in 2002. EWB-USA has since grown to more than 300 chapters with over 13,000 passionate members whose projects span 47 countries on five continents and have impacted more than 2.5 million lives across the globe.



New Funding Opportunities

Frequent Flyer? Willing to donate some of your air miles? Great! We're currently setting up accounts with Delta and United Airlines to enable people to donate airline miles. Be sure to check our website, located at www.rose-hulman.edu/ewb for more information as this opportunity becomes available.

In addition, we're planning a 5K/10K race for October 2014. If you like running, walking, or just being outside, come join us in Hawthorn Park (behind Rose-Hulman campus). More information is soon to follow on our website.

