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Engineering2Empower: Sustainable Housing in Post-Earthquake Haiti
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The framework of human development is founded on the basic right of all people to attain secure and sustainable livelihoods. One of the most obvious means to this realization is through the basic human right to shelter. The Universal Declaration of Human Rights states that “everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing and medical care and necessary social services, and the right to security [...]” Despite this, as of 2009, 70.1% of Haiti’s urban population has lived in urban slums. Only one year after this statistic was published, Haiti was devastated by one of the most destructive natural disasters in history.

Haiti was struck on January 12, 2010, by a 7.0 magnitude earthquake near Léogâne, Haiti, just 25 kilometers west of the capital of Port-au-Prince. Although the earthquake does not rank on the list of greatest magnitude earthquakes, the disaster does rank as the second deadliest earthquake of all time, claiming around 250,000 lives and displacing more than 1.5 million Haitians from their homes. Goal 7, Target 7.D of the United Nations Millennium Development Goals is to have “achieved a significant improvement in the lives of at least 100 million slum dwellers” by 2020. Yet, this goal was determined in 2000, far prior to the earthquake of 2010, and represents many miles of ground which must be recovered.

Many families in the developing world are not able to afford properly-engineered housing to ensure protection from natural hazards such as earthquakes. E2E provides a methodology that advances the traditional, vulnerable techniques in order to provide safe shelters that are additionally a source of pride for families. The opportunity to work on this project has provided me with so much more perspective of the world, and of the effects of how we live every single day. Over the years of my education, spanning from my primary schooling all the way through to my university education, I have sat through classes wondering how the proportioning of concrete mixes and the matrix analysis of structural frames relates to my life as a Christian. Furthermore, I have been uncertain about how my faith applies to my career as a Civil Engineer in International Development. Working on this project has allowed me to realize this potential by granting me the opportunity to combine engineering with service, an integral combination in the field of civil engineering research and international development.

By doing research with E2E at the University of Notre Dame, I was able to combine the elements of civil engineering with business, ethics, economics, and service. Working alongside Dr. Alex Taflanidis and graduate student Dustin Mix was also an amazing learning experience, both in earthquake engineering and beyond. I spent my time on the project finalizing the designs for the construction of an on-campus prototype of the E2E housing model, including material schedules and AutoCAD renderings. I also began construction of this prototype, including the concrete formwork and steel reinforcement bars. The physical construction of the model provided an unsurpassable learning experience in which I was able to create something out of nothing using the time-honored skills of hard work and sweat. It is necessary to get your hands dirty if you expect to see results. This will continue to benefit me throughout my career, through the experience of seeing both sides of civil engineering: design and construction. The construction of the prototype was also necessary in perfecting the designs and also in testing the feasibility of the construction methods which will be implemented in Haiti beginning in the fall of 2013.

The earthquake which shook the foundation of Haiti shook with it the morale of the entire population. Yet, the problem now faced is not the drive to rebuild the nation, but instead a means of action. It was an honor for me to participate and contribute to this action. Engineering2Empower, at the University of Notre Dame, provides a means for Haitians to rebuild their nation, beginning with their homes, as durable as the families which they shelter.