

# **Housing and Community Development Project in Siem Reap, Cambodia**

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Habitat for Humanity Global Village is an international organization that gathers materials and volunteers to build homes for less fortunate villages in more than 70 different countries. The team I applied for was chosen to build a house for a family of four in a village near Siem Reap, Cambodia. I chose this as my senior project because it combines my interests in construction and humanitarian work, as well as giving me the opportunity to expand my knowledge of a different country's construction means and methods. I felt that that the best way to showcase the material that I have learned throughout my college career would be a hands-on project, that would people in need. During the trip the team was filled with experiences and knowledge that lead us to better understand the culture of local villagers, as well as place onto a team of members that have never met before.

**Keywords:** Habitat for Humanity, Siem Reap, Global Village, Construction, Means, and Methods

## **Introduction**

Humanitarian work has always sparked my interest. I have been a part of multiple different programs that travel around the world to make a difference. They have all been either hosting religious retreat camps or delivering donations. For my senior project, I wanted to incorporate my passion for construction with a chance to help a community in need. I chose to study Construction Management at Cal Poly San Luis Obispo, not only because of my interest in the subject, but because of the hands-on experience offered. I enjoy seeing a project transition from drawings on a paper to a tangible structure with a purpose. When I heard about Habitat for Humanity Global Village, I knew that it would be the perfect way to use the knowledge I have gained through Cal Poly to build something that would impact a community in need.

Habitat for Humanity Cambodia is a newer branch of the Habitat for Humanity family. It has been around since 2003 and has enabled over 22,000 families to build strength, stability, and self-reliance through shelter. The majority of funding and labor for the project comes from the volunteers. Since the families are not able to pay for resources and materials they are charged with "sweat equity". This means that the

family pays for their home by helping build their house, as well as volunteer on other local builds.

I applied to Habitat for Humanity Global Village program on June 12, 2019. I was accepted into the program, placed on a team, and sent the trip itinerary and project information about a week later. The team was comprised of 13 volunteers from all over the world with different backgrounds. The project was to build a small house on stilts in the village of Angkor Chum, Cambodia. Angkor Chum is a small farming village located on the outskirts of Siem Reap. Habitat for Humanity had already built 19 homes in the village prior to the trip. The overall goal of Habitat is to provide as many safe housing projects as possible. Most of the current housing of villagers in Angkor Chum are single room shacks made of plywood, corrugated metals, and tree branches. Even though the house we build will not seem as luxurious to us, it is a major improvement to what the family is used to.

## Construction Mean and Methods

The first day of the project started with an orientation where we met most of the villagers, the construction superintendent and crew, as well as the family we were building the new house for. After the extensive meet and greet, the Habitat for Humanity Cambodian ambassador talked about the importance of safety on the jobsite. The amount of focus on jobsite safety was surprising, due to the safety methods I saw being practiced in the neighboring city of Siem Reap. Everyone was required to wear hardhats, gloves and safety glasses. Though the safety methods were not up to par with what we have learned in our labs, they were sufficient enough for the work we were performing. There was not one instance where the team felt to be in danger.

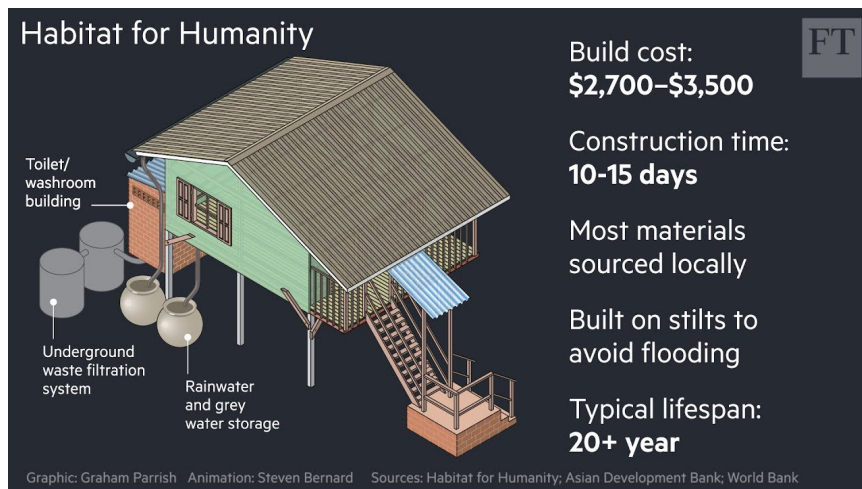


Figure 1: Elevation of Proposed Project

The goal of this trip was complete a 20-foot by 20-foot house on stilts with an exterior grey water storage system, as show in *Figure 1* above, in five days minus the front porch deck. Upon arrival, of the first day, the construction crew already installed the washroom with underground waste filtration system, as well as the excavation and forming for the stilts that will be acting as our structural columns. The stilts will sit the house 10 feet above grade. This is to help keep out wild animals and create seismic stability, but most importantly it will keep the family and their belongings out of water during the flooding season which occurs for six months out of the year. On the first day, after the orientation, our team was put straight to work. They divided us into four groups to mix concrete for the stilts, build window shutters, shuck strips of bamboo, and carve notches in the beams for framing. Since I was the only volunteer with construction experience, the crew gave me the job of running the concrete mixing station. Cement was not of abundance in the village, so we had to be frugal with material given. Each concrete batch consisted of a half bag of quick setting cement, four 5-gallon buckets of course aggregate, five 5-gallon buckets of fine aggregate, and as much water needed to stretch the mix to fill one stilt form. The mix was very running and would definitely not pass a slump test here in California, but the villagers are very resourceful and not wasteful with any materials. We mixed the concrete in a plastic tub with shovels and picks, and transported the concrete with small buckets. Using a concrete mixing machine and wheelbarrow would have made a significant difference on time, but we had to work with the tools and equipment provided to us.



*Figure 2: Day 1 Work Activities*



The second day, prior to the arrival of the team, the construction crew striped the stilt footings, placed the girders, and started to frame the notched beams from the previous day. The team was split into four groups again and our tasks consisted of framing up the sides of the house, painting the windows and shutters, installing the floor bamboo strips, and starting the landing for the stairs leading to the house. I was placed on the stair landing crew for this work day. The crew used sap lines to lay out the perimeter of the landing, and we started right away with excavation of the footings. The footings consisted of a thin layer of concrete and layer bricks. We then proceeded to layer more bricks until the landing was two feet high. Then we laid more bricks to create steps and a platform on the right side of the landing as shown below in *Figure 3*. Building the landing took the whole day and there was still much to do. It was difficult to lay the brick because most of the trowels were wooden and broken. On the third day we backfilled the landing and steps with sand, and poured a thin layer of concrete around the sides to create a nice finished look.



*Figure 3: Construction of Stair Landing*

By the fourth day our team fully framed and installed the corrugated metal panels on the roof. The walls were mostly framed, and windows were installed. Our objectives for the fourth day was to finish up the bamboo flooring and wall framing, install stairs and railings, and hang cement board for the exterior siding. My job for the

fourth day was to hold up the cement board while other crew members fastened it to the wall. This process took a while, due to there being no power saws. We had to cut and fit each piece by hand. By the time we were done siding the house, the stairs and railings were closed to being finished. We mixed more concrete to cover and finish the backfilled stair landing and initial steps. This top layer of concrete also helped secure the stairs to the landing.



*Figure 4: Day 4 Work Activities*

The fifth, and final, day was my favorite day throughout the whole trip. The structure was basically done, besides some interior blocking for reinforcement. The majority of the team, including myself, were left to paint the house and sand all the railings and steps. The house was painted white and we used rollers attached to long branches or bamboo sticks. Once everything was painted and sanded we held a ribbon cutting ceremony for the family. Most of the villagers came to the ribbon cutting ceremony, and surprised us with a party to thank us for our help throughout the week. They provided a cooked meal and the children put together a couple of dance routines.



*Figure 5: Finishing Touches*

## Deliverables

The final deliverable for our team was to complete an entire livable house in five days for a family in the village of Angkor Chum. Our construction team, of thirteen Habitat for Humanity volunteers and four Cambodian construction laborers, accomplished a large amount of work in a limited period of time. This included pouring the silts, painting, and everything in between. On the last day I could see the feeling of accomplishment in every team member's eyes.

Besides the final deliverable, I had to complete another deliverable prior to leaving for Cambodia. I set out to fund raise \$3,500 for program fees and airfare. Habitat for Humanity requires each volunteer to raise \$2,084 to join the team and take part on the trip. The addition \$1,500 was raised to fund my flight tickets and meals throughout the trip. To complete this deliverable, I created a GoFundMe page to accept donations and raise money. I reached out to companies that I have interned with, as well as companies that visited campus for info sessions and the Fall career fair, for a sponsorship. That method raised about 50% of the money need for my trip. I raised the other half from posting my GoFundMe page on Facebook and from reaching out to friends and family.



*Figure 6: Final Deliverable*

## Lessons Learned/ Reflections

Over the course of our build in Angkor Chum, Cambodia the team would hold a light reflection session every night during dinner. Each person had a chance to talk about their experience from that particular day. We would talk about aspects of the day that we enjoyed or disliked. We would also express our thoughts about the importance of our build, and the affects the project will have on the village.



I felt lucky that I was selected to be a part of this team. Most of the members were veteran Habitat for Humanity volunteers. They were all enthusiastic and very motivated to complete the house on schedule. Most of the Habitat for Humanity Global village projects are not completed on schedule, and usually take more than one group to finish the whole structure. All of the previous builds, that my team members have been a part of, have been the construction of a certain portion of the house. For example, Habitat for Humanity would have one group of volunteers excavate and pour footings for three separate houses, and then have another volunteer group come the next week to pour the slab and so on. This Cambodia build was unique in the fact that we had the chance to be a part of the entire construction process for the house. There were times where we felt tired and discouraged that we would not finish in time, but the team worked well with each other and kept a positive attitude. I felt that the biggest motivation for the team was wanting to see the family's reaction when we presented them with a new home.

I left this project with new perspective on how different countries operate, especially underdeveloped areas. It has helped me recognize all of the benefits and luxuries that most Americans take for granted. I have also gained a new appreciation for the education that I am receiving. I believed it is important for people to use their knowledge and talents to help communities with that lack education and resources.

Overall, our build in the village of Angkor Chum was very emotional and impactful. I was able to work alongside the homeowners, village construction labors, and volunteers from all around the world. We all had to interact and work with each other to complete a common goal. Outside of building together, we ate lunch every day and swapped cultural traditions. On the last day of the build we held a ribbon cutting ceremony and most of the village attended. The ceremony consisted of many Cambodian traditions and blessings. Watching the emotional reactions of the family was so fulfilling that I have signed up for another build this December in Guatemala.



*Figure 6: Closing Ceremony*