

# KIHEFO Vocational Center: Kabale, Uganda

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Journeyman International (JI) is a non-profit organization which acts as a platform for bringing together volunteer Architects, Designers, Engineers, and Construction Managers with humanitarian projects around the world. Kigezi Healthcare Foundation (KIHEFO) a non-profit NGO located in Kabale, Uganda is a client seeking to build a vocational center to educate the workforce of Uganda. The center will include multi-purpose class rooms, a dining hall, rabbit farm, carpentry shop, and living complex. The Architect on the project was Courtney Wedel from Cal Poly. As the Construction Manager on the project my responsibilities include; Design Assist, Feasibility Analysis, Scheduling, Estimating, and Managing Risks.

**Key Words:** Vocational Center, Education, Humanitarian, Construction, Non-Profit

## Introduction

This project originated through a non-profit organization located in San Luis Obispo, CA, called Journeyman International (JI). The organization “connects volunteer architects, designers, engineers, and project managers with humanitarian project needs around the world.” One of its current clients is the Kigezi Healthcare Foundation (KIHEFO) located in Kabale Uganda. The Kigezi Healthcare Foundation’s mission is to “fight disease, poverty and ignorance in an integrated and sustainable approach.” In an effort to accomplish this goal KIHEFO has teamed with Journeyman International to design and build a Vocational Center in Kabale, Uganda. The vocational center will provide the local village, of more than 2000 residents, an invaluable education and improve the lives of the community. The vocational center will provide this education to all categories of people and empower them to fight poverty. The Vocational center will have demonstration gardens where students will learn how to grow crops better as well as learn about animal husbandry. In addition, the center will also teach valuable skills such as; computer education, tailoring, carpentry, metalwork fabrication, as well as many other skills. I joined Journeyman International as a volunteer construction management student, and quickly partnered with an architecture student already in the beginning stages of design for the project.

## *Local Information*

The project is located in the pastoral southwest Kabale district of Uganda. Kabale is considered one of Uganda’s highland districts and is comprised of distinct, interlaced, and highly cultivated hills and valleys. Currently, this region does not have adequate access to affordable public education which would allow the people to flourish. The goal of KIHEFO and the vocational center is to reduce the current poverty line of 27%. This accounts for roughly 8 million Ugandans which currently live below the poverty line. This vocational school will ultimately create future job opportunities as well as provide immediate jobs to locals during construction. This education’s goal is to motivate, change the way people think, and allow them to expand their way of thinking.

So far, roughly 25 acres have been purchased and dedicated for the future construction of the vocational center. The deed is currently being processed and fundraising will begin after the design phase has been completed. The project’s site is located on a terraced hill which was previously used for farming at an elevation of 5,400 feet above sea level. The site is divided into an upper section (7 terraces) and a lower section (3 terraces) by a road that splits the site. Another goal of this project will be to provide the vocational center as well as the entire 2000-person community with a clean source of running water. In addition to providing the eventual students with a vocational education, another goal of this project is to provide the community with a model building for future construction.

## Process

I was first introduced to Journeyman International while at Cal Poly during a presentation from the founder of JI Daniel Weins. Daniel inspired me to take a leap and try my hand at one of the projects. After joining Journeyman International my first step was to pick a project. I did this by reaching out to roughly six architects whom already had specific projects. I asked if they would be interested in working with a construction management student. Out of the six architects that I contacted, one of them responded that they were not interested, two of them responded that they already had a construction manager on the project, and three of them responded that they would be interested in partnering with a construction manager. Those three projects included; a Sex Rehabilitation/Eco-Center, a Dairy Education Center in Rwanda, and lastly the KIHFO Vocational Center in Uganda. I felt the closest connection to the vocational center and was quickly introduced to Courtney Wedel the student architect. Courtney had just returned from Uganda where she had met with the client, visited the site, and determined the program requirements for the project.

When I joined up with Courtney she was in the beginning design phase for the project. I was anxious to get involved so I immediately set up a meeting between her and I which included our two department heads. This meeting was aimed at forming a preliminary project plan and to get off on the right foot. After the initial meeting we had a better idea of when specific portions of the project would be due and how to go about collaborating to get those done. We had a number of meetings after that which lasted a few hours each where we discussed project designs and feasibility. One of the largest issues we discussed at the beginning was whether or not to make some of the building two stories. I was concerned that because this project was being built in Uganda, and planned on using unskilled labor, there was the potential for unsafe building practices. Through further research we determined that this area had already successfully build multi-floor buildings and had the labor force and materials available to do so. The second major design issue that we discussed were material options. Most of the buildings in this region are currently built with handmade unreinforced brick. However, Courtney and I wanted to design something more unique while still feasible and functional that could serve as a model for future buildings and construction. To do this we decided that the use of gabion walls would be a great addition to the project. Gabion walls which are essentially large wire/metal cages that hold stone could function as major walls of the building. This stone could be sourced locally and would make the project unique to the area. Another aspect of design that we discussed early on was roofing. Because main areas of education for the vocational center is agriculture we thought it would be a great addition to the project to add green roofs. However, after further discussion we decided that this option would not be feasible due to cost and structural restrictions. We settled on using bamboo thatch for roofing as an affordable, locally sourced, and renewable option rather than the alternative metal panel roof that we were also considering.

## *Deliverables*

Because I was doing this project on behalf of Journeyman International and Cal Poly there were two different sets of deliverables. This became a challenge throughout the process. This was partially because the formats for presenting my findings were different but also because each of them required different submittals. This meant that I had to split my time between working on my Cal Poly deliverables and my Journeyman International deliverables. From the beginning however my focus was on my Journeyman International deliverables. I was mainly focused on my initial collaboration with Courtney and to help design the most feasible, sustainable and cost effective project that we could manage. I found myself for the first time in my young career as a building professional being passionate about my work. This was because I knew that this was the first project I had helped to design that would actually be built and have an impact on thousands of deserving people. My goal after this project is to travel to Uganda and see the project break ground and ultimately be completed. My deliverables for both Journeyman International and Cal Poly were as follows.

### Deliverables for JI:

- Regional, Local, and Client
- Site Utilities / Materials
- Conceptual Estimate
- Final Construction Estimate
- Preliminary Construction Schedule

### Deliverables for Cal Poly Senior Project:

- 2-4 Page Project Based Report
- Reflection on Project
- Completion and Submittal of Project Binder

- Final Construction Schedule
- Site Logistics and Phasing
- Hazard and Risk Mitigation
- Construction Safety Plan

### *Lessoned Learned*

The biggest lesson that I learned on this project is how difficult it can be to translate conventional knowledge of construction, estimating, and scheduling to third world practices. At times I felt as though I was having to learn everything over again because of the unconventional nature of this project. Additionally, I learned that collaboration can be both rewarding and extremely frustrating process. I found it difficult to work under the deadlines of the architect. Early on I attempted to work on other aspects of the project that I could complete without completed designs. However, I soon ran out of things to complete and quickly played a purely supportive role. I finally received a final design of the building on a Rhino file however this was a very different format and program than I had ever worked with during my time at Cal Poly. I was used to using full construction documents and plans rather than rough conceptual 3D designs on a program I had no experience using. This caused me to have to learn how to navigate Rhino to pull the specific data I required off the designs for my deliverables. Because of this time spent teaching myself Rhino I was really beginning to feel the time crunch.

### **New Knowledge**

The new knowledge that this project has provided to the construction industry is that it provides a model building for builders both inside and outside of Uganda. By this I mean that this vocational school will be a model building to the local community of Kabale for what is possible and how to go about building a successful and complex building such as this. It will motivate the community to continue improving their infrastructure while using this project as a basis for that progression. In addition, this project can serve as an example of how to go about successfully designing, scheduling, fundraising, and ultimately building a project like this in a third world country. This project can serve as a bridge between designers and builders in these types of countries which have untypical and often unknown building practices, and challenges.

# **KIHEFO Vocational Center: Kabale, Uganda**

## **Journeyman International**

### **Reflection**

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My senior project with Journeyman International was a rewarding and worthwhile experience. I found the entire process to be both challenging and eye opening. This was the very first project during my very young construction career that will actually be built and impact the lives of many future Ugandans. I was able to implement what I learned during my Cal Poly to produce a successful project. However due to the nature of this project I also was forced to go outside of my comfort zone and learn new building practices, customs, and useful industry knowledge to complete the project. I hope that my efforts here will help the people that it was meant for and that one day I will be able to visit the building knowing that I played a major role in its existence. In addition, I hope that this project will serve others who are attempting the same process and that they can use what I have created to refine the process further. I hope that this will show them not only what to do and how to go about doing it, but also what not to do and how to avoid it.

Looking back, I am very glad that I went out of my comfort zone on this project. Although this senior project was significantly more work than other senior projects it was worth the work and will actually impact people's lives. This was the true driver behind my decision to get involved with Journeyman International. I wanted to make a difference in people's lives using what I have learned to do while at Cal Poly. I view my education as an opportunity to do good in the world and I am happy I got a chance to do this. If given this opportunity again I would definitely say yes.

In the Future I think it would be a great experience for more students to get experience with Journeyman International. It was a trial by fire learning experience that I have now found invaluable. In addition, it provides and gives back to the world more than just educational

projects that are typical for senior projects. Why not combine these requirements on students with a company that allows that work to do good and make a difference in a community?

# KIHEFO VOCATIONAL CENTER



**JASON ANGERER**

**CONSTRUCTION MANAGEMENT PORTFOLIO  
FALL 2016**



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# REGIONAL, LOCAL, CLIENT

## REGIONAL/LOCAL

THE KABALE DISTRICT IS LOCATED IN THE PASTORAL SOUTHWEST PORTION OF UGANDA. IT IS CONSIDERED ONE OF UGANDA'S HIGHLAND DISTRICTS AND IS COMPRISED OF DISTINCT, INTERLACED, AND HIGHLY CULTIVATED HILLS AND VALLEYS.

THE ALTITUDE OF THE DISTRICT RANGES FROM 1,219 METERS TO 2,347 METERS ABOVE SEA LEVEL. BECAUSE OF THIS, THE TEMPERATURES ARE TYPICALLY COLDER THAN THE REST OF UGANDA AND RANGE FROM 18 °C (64 °F) DURING THE DAY TO ABOUT 10 °C (50 °F) AT NIGHT. THE YEAR ROUND RELATIVE HUMIDITY TYPICALLY RANGES FROM (90% -100%) IN THE MORNING AND USUALLY DECREASES TO BETWEEN (42% - 75%) IN THE AFTERNOON.

THE 2012 NATIONAL CENSUS ESTIMATED THE POPULATION OF KABALE TO BE APPROXIMATELY 498,300 WHICH MAKES IT MORE DENSELY POPULATED THAN OTHER DISTRICTS IN UGANDA WITH AN AREA OF ONLY 1,679 SQUARE KILOMETERS (648 SQ MI).

THE PROJECT SITE IS LOCATED IN A VILLAGE WITH A POPULATION OF OVER 2,000. SO FAR, ROUGHLY 25 ACRES HAVE BEEN PURCHASED FOR THE FUTURE CONSTRUCTION OF THE KIHEFO VOCATIONAL CENTER AND THE DEED IS CURRENTLY BEING PROCESSED. THE PROJECT SITE IS LOCATED ON A TERRACED HILL WHICH WAS PREVIOUSLY USED FOR FARMING AT AN ELEVATION OF 5,400 FEET ABOVE SEA LEVEL. THE SITE IS DIVIDED INTO AN UPPER SECTION (7 TERRACES) AND A LOWER SECTION (3 TERRACES) BY A ROAD RUNNING THROUGH THE SITE. THE ROAD WILL BE HIGHLY BENEFICIAL FOR PROVIDING ACCESS TO THE SITE. IN ADDITION, THERE IS A RIVER AT THE BOTTOM OF THE SITE WHICH CURRENTLY PROVIDES THE COMMUNITY WITH WATER AND MAY ALSO BE BENEFICIAL TO THE PROJECT FOR SUPPLYING WATER.



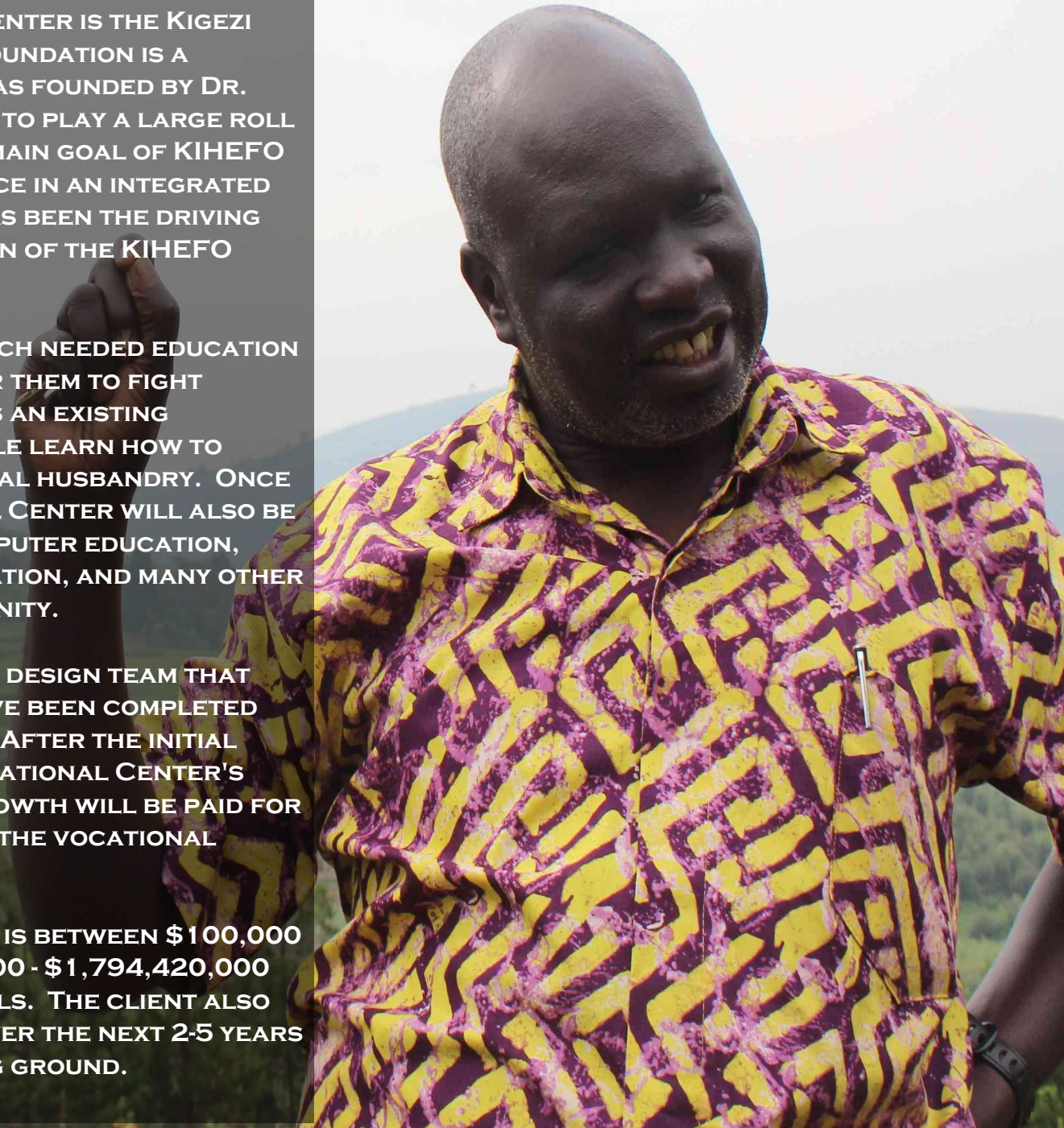
## CLIENT

THE CLIENT FOR THE KIHEFO VOCATIONAL CENTER IS THE KIGEZI HEALTHCARE FOUNDATION (KIHEFO). THE FOUNDATION IS A NON-PROFIT NGO LOCATED IN KABALE AND WAS FOUNDED BY DR. GEOFFREY (PICTURED RIGHT) WHO CONTINUES TO PLAY A LARGE ROLL IN THE SUCCESS OF THE ORGANIZATION. THE MAIN GOAL OF KIHEFO IS TO "FIGHT DISEASE, POVERTY AND IGNORANCE IN AN INTEGRATED AND SUSTAINABLE APPROACH." THIS GOAL HAS BEEN THE DRIVING FORCE BEHIND THE DESIGN AND CONSTRUCTION OF THE KIHEFO VOCATIONAL CENTER.

THE VOCATIONAL SCHOOL WILL PROVIDE A MUCH NEEDED EDUCATION TO ALL CATEGORIES OF PEOPLE AND EMPOWER THEM TO FIGHT POVERTY. CURRENTLY, THE SITE ALREADY HAS AN EXISTING DEMONSTRATION GARDEN WHERE MANY PEOPLE LEARN HOW TO GROW CROPS BETTER AND LEARN ABOUT ANIMAL HUSBANDRY. ONCE THE PROJECT IS COMPLETED, THE VOCATIONAL CENTER WILL ALSO BE ABLE TO PROVIDE VALUABLE SKILLS LIKE; COMPUTER EDUCATION, TAILORING, CARPENTRY, METALWORK FABRICATION, AND MANY OTHER VALUABLE SKILL SETS TO BENEFIT THE COMMUNITY.

THE CLIENT (DR. GEOFFREY) HAS ADVISED THE DESIGN TEAM THAT FUND RAISING WILL BEGIN AFTER DESIGNS HAVE BEEN COMPLETED AND AN EXACT COST HAS BEEN ESTABLISHED. AFTER THE INITIAL FUND RAISING HAS BEEN COMPLETED THE VOCATIONAL CENTER'S PROGRAM, MAINTENANCE AND CONTINUED GROWTH WILL BE PAID FOR BY FEES COLLECTED FROM PARTICIPANTS FOR THE VOCATIONAL TRAINING.

THE CLIENTS TOTAL BUDGET FOR THE PROJECT IS BETWEEN \$100,000 AND \$500,000 US DOLLARS OR \$358,500,000 - \$1,794,420,000 UGANDAN SHILLINGS DEPENDING ON MATERIALS. THE CLIENT ALSO PREFERS TO BUILD THE PROJECT IN PHASES OVER THE NEXT 2-5 YEARS TO AID FUNDING AND TO EXPEDITE BREAKING GROUND.



# SITE UTILITIES

## WATER

BELOW THE SITE ON THE EAST SIDE THERE IS A RIVER WHICH CURRENTLY PROVIDES THE COMMUNITY WITH 80% OF THEIR WATER. THE REMAINING 20% BEING DRAWN FROM SHALLOW WELLS. THIS MEANS NO LOCAL TIE-IN OR CITY WATER IS AVAILABLE. DURING THE RAINY SEASON THE RIVER BECOMES CONTAMINATED WITH POLLUTANTS WHICH RENDERS THE WATER NOT SUITABLE FOR HUMAN CONSUMPTION. WHAT THIS MEANS FOR THE PROJECT IS THAT A WATER TREATMENT CENTER OR A WELL WILL BE REQUIRED TO PROVIDE CLEAN RUNNING WATER. STANFORD UNIVERSITY, WHICH HAS COLLABORATED ON THE PROJECT, HAS CREATED A PLAN TO BRINGING WATER TO THE SITE AND SURROUNDING COMMUNITY. THE PROPOSED PLAN IS TO DRILL A WELL AT THE BASE OF THE SITE AND PUMP THE WATER INTO THREE 10,000 LITER STORAGE TANKS AT THE TOP OF THE SITE. THIS WILL PROVIDE WATER TO THE 24 ACRE DEMONSTRATION FARM, VOCATIONAL CENTER, AND THE SURROUNDING VILLAGE. THE REQUIRED DEPTH OF THE WELL HAS BEEN ESTIMATED AT 90 METERS WITH A FLOW RATE OF 3.5 CUBIC METERS PER HOUR. BECAUSE OF THE SHEAR SIZE AND WEIGHT OF EACH TANK (10,000 KG) THEY WILL REQUIRE STRONG REINFORCED FOUNDATIONS. THE ESTIMATED TOTAL COST FOR THIS SYSTEM IS \$66,377 US DOLLARS OR \$238,423,100 UGANDAN SHILLINGS

## WASTE-WATER

BECAUSE THERE IS NO EXISTING SEWAGE SYSTEM ON SITE, OR LOCAL COMMUNITY TIE-IN NEAR BY, WE HAVE SUGGESTED SEPTIC TANKS OR COMPOSTABLE TOILETS.

ONCE THE WELL HAS BEEN DRILLED, SEPTIC TANKS AND FLUSHABLE TOILETS BECOME POSSIBLE FOR WASTE WATER. IF WE DECIDE TO GO THIS ROUTE WE WOULD NEED ONE OF THE LARGEST PRE-MANUFACTURED TANKS AVAILABLE AT 3,525 GALLONS. BECAUSE THEY WOULD NEED TO BE PUMPED OCCASIONALLY, AND THERE IS NO EXISTING SYSTEM TO HANDLE THIS, OUR OPTIONS ARE LIMITED. THERE IS THE POSSIBILITY OF USING A LEECH FIELD FOR THIS PURPOSE HOWEVER IT WILL NEED TO BE LOCATED FAR ENOUGH AWAY FROM THE WELL AND DEMONSTRATION FIELDS TO PREVENT CONTAMINATION.

IF WE DECIDE TO GO WITH COMPOSTABLE TOILETS THERE WILL BE NO NEED FOR PUMPING OR RUNNING WATER BECAUSE IT IS A DRY SYSTEM. HOWEVER THEY WILL NEED TO BE EMPTIED OF SOIL OCCASIONALLY. THIS SYSTEM MAY NOT BE AS NICE IN THE LONG RUN FOR THE CLIENT AND THE NUMBER OF PEOPLE THAT WILL BE USING THESE FACILITIES DAILY. EACH COMPOSTABLE TOILET IS ESTIMATED TO COST ROUGHLY \$1,500 US DOLLARS.

## **ELECTRICITY**

**THE SITE DOES CURRENTLY HAVE ACCESS TO LOCAL ELECTRICITY TIE-INS THANKS TO POWER LINES WHICH RUN PARALLEL TO THE ROAD THAT RUNS THROUGH THE SITE. BECAUSE OF THIS THE PROJECT WILL BE ABLE TO UTILIZE POWER TOOLS AND HAVE ACCESS TO TEMPORARY POWER DURING CONSTRUCTION. THIS WILL ALSO PROVIDE ELECTRICITY TO THE SCHOOL IN THE LONG RUN.**

**IN ORDER TO PULL POWER FROM THESE LINES WE WILL NEED TO CONTACT THE LOCAL SERVICE PROVIDERS TO GET SOMEONE ON SITE WHEN WE ARE READY TO TIE-IN. IN ORDER TO MINIMIZE THE NUMBER OF OVERHEAD POLES THROUGHOUT THE PROJECT WE HAVE SUGGESTED RUNNING ALL ELECTRICAL LINES IN UNDERGROUND CONDUIT. THE LINES WILL ORIGINATE FROM THE MAIN SERVICE PANEL AND BRANCH OFF TO THE VARIOUS BUILDINGS.**

## **GAS**

**THIS PROJECT WILL NOT BE USING GAS DUE TO THE INFREQUENT USE OF GAS STOVES AND OTHER GAS POWERED EQUIPMENT. THOSE WHO DO USE GAS FREQUENTLY USE PORTABLE AND REFILLABLE GAS TANKS. HOWEVER IF GAS IS ULTIMATELY REQUIRED AN ABOVE GROUND REFILLABLE TANK IS STILL AN OPTION.**

**FOR USE IN THE DINNING HALL AND KITCHEN, FIREWOOD IS PLANNED ON BEING USED.**

## **LOCAL CONSTRUCTION MATERIALS**

**THIS PROJECT WILL UTILIZE MANY LOCALLY SOURCED MATERIALS FOR CONSTRUCTION**

**THE FIRST LOCALLY SOURCED MATERIAL THAT WE WILL BE USING IS VOLCANIC ROCK. IT WILL BE SOURCED FROM LAKE BUNYONYI WHICH IS ROUGHLY 30KM FROM THE JOB SITE. THE ROCK WILL PREDOMINATELY BE USED TO BUILD THE LARGE GABION WALLS WHICH FORM THE EXTERIOR WALLS OF MANY OF THE BUILDINGS. THIS ROCK WILL HAVE TO BE QUARRIED AND TRUCKED IN TO THE SITE. UTILIZING THIS LOCAL MATERIAL WILL HELP REDUCE COSTS WHILE ALSO PROVIDE LOCAL JOBS.**

**THE SECOND LOCALLY SOURCED MATERIAL THAT WE WILL BE UTILIZING ON THIS PROJECT IS BAMBOO. THE BAMBOO WILL BE SOURCED FROM A BAMBOO FARM IN THE ECHUYA FOREST ROUGHLY 35KM FROM THE JOB SITE. THE BAMBOO WILL BE USED AS THE ROOFING MATERIAL FOR THE BUILDINGS AS WELL AS HANDRAILS AND A NUMBER OF OTHER USES. THE REASON WE CHOSE TO USE THIS MATERIAL WAS BECAUSE IT WAS LOCAL AS WELL AS BEING VERY RENEWABLE AND FAST GROWING. ADDITIONALLY, BAMBOO HAS A NATURAL ABILITY TO WICK WATER SO IT WAS THE PERFECT CHOICE FOR A ROOFING MATERIAL.**

**THE LAST SEMI-LOCAL MATERIAL WE WILL BE USING IS STEEL. ALTHOUGH THE STEEL IS NOT LOCALLY PRODUCED, IT IS CURRENTLY ALREADY BEING IMPORTED FOR ROAD CONSTRUCTION. BECAUSE OF THIS WE WILL BE ABLE TO PURCHASE THE STEEL FROM THE CAPITAL KAMPALA.**

# LOCAL CONSTRUCTION MATERIALS

VOLCANIC ROCK  
GABION WALLS



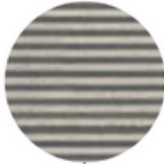
BAMBOO WEAVING



PERMABLE PAVEMENT



TIN ROOF



BRICK & PLASTER



# CONCEPTUAL ESTIMATE

KIHEFO VOCATIONAL CENTER, KABALE, UGANDA  
 UPDATED 12/16/2016

DIVISIONS	Main Classrooms		Dining Hall		Classroom & Rabbit Farm		Carpentry Shop		Living Complex	
	Target US Price/ SF	\$35		\$30		\$25		\$25		\$20
	Square Meters	534		225		191		100		533
	Square Footage	4,805		2,025		1,720		900		4,800
Total Price	\$168,175		\$60,750		\$43,000		\$22,500		\$96,000	
DIVISION 1	Scope % Breakdown	Price	Scope % Breakdown	Price	Scope % Breakdown	Price	Scope % Breakdown	Price	Scope % Breakdown	Price
<b>GENERAL CONDITIONS</b>	<b>17.00%</b>	<b>\$28,590</b>	<b>17.00%</b>	<b>\$10,328</b>	<b>17.00%</b>	<b>\$7,310</b>	<b>17.00%</b>	<b>\$3,825</b>	<b>17.00%</b>	<b>\$16,320</b>
General Contractor	3.00%	\$5,045	3.00%	\$1,823	3.00%	\$1,290	3.00%	\$675	3.00%	\$2,880
Owner Project Overhead	2.00%	\$3,364	2.00%	\$1,215	2.00%	\$860	2.00%	\$450	2.00%	\$1,920
Permit	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
Engineers and Subconsultants	3.00%	\$5,045	3.00%	\$1,823	3.00%	\$1,290	3.00%	\$675	3.00%	\$2,880
Design and Architecture Fees	3.00%	\$5,045	3.00%	\$1,823	3.00%	\$1,290	3.00%	\$675	3.00%	\$2,880
Inspection/Testing	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
Misc Gen. Condition	5.00%	\$8,409	5.00%	\$3,038	5.00%	\$2,150	5.00%	\$1,125	5.00%	\$4,800
DIVISION 2	Scope % Breakdown	Price	Scope % Breakdown	Price	Scope % Breakdown	Price	Scope % Breakdown	Price	Scope % Breakdown	Price
<b>SITE WORK</b>	<b>10.50%</b>	<b>\$17,658</b>	<b>6.00%</b>	<b>\$3,645</b>	<b>11.50%</b>	<b>\$4,945</b>	<b>10.50%</b>	<b>\$2,363</b>	<b>10.50%</b>	<b>\$10,080</b>
General Sitework	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
Traffic Control	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
Demolition	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
Surveying	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
Rough Grading	2.00%	\$3,364	2.00%	\$1,215	2.00%	\$860	2.00%	\$450	2.00%	\$1,920
Fine Grading	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
Trench/Backfill Utilities	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
Stormwater Drainage	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
Sewer connection	0.00%	\$0	1.00%	\$608	1.00%	\$430	0.00%	\$0	0.00%	\$0
Gas connection	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
Water connection	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	0.00%	\$0
Undrground Elect connection	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	2.00%	\$1,920
Rainwater catchment system	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
Asphalt and Concrete Paving	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
Site Concrete	0.50%	\$841	0.50%	\$304	0.50%	\$215	0.50%	\$113	0.50%	\$480
Landscape/Irrigation	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
DIVISION 3	Scope % Breakdown	Price	Scope % Breakdown	Price	Scope % Breakdown	Price	Scope % Breakdown	Price	Scope % Breakdown	Price
<b>CONCRETE</b>	<b>7.00%</b>	<b>\$11,772</b>	<b>7.00%</b>	<b>\$4,253</b>	<b>7.00%</b>	<b>\$3,010</b>	<b>7.00%</b>	<b>\$1,575</b>	<b>7.00%</b>	<b>\$6,720</b>
Sub Base	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
Forms & Accessories	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
Form Liners (for asthetics)	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
Reinforcement (rebar)	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
Cast-In-Place Conc	2.00%	\$3,364	2.00%	\$1,215	2.00%	\$860	2.00%	\$450	2.00%	\$1,920
Tree Grates	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
Caissons	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
Curing & Sealers	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960

	Precast Concrete	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Floor Toppings (apoxy over concrete floors)	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	CMU Grout	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
<b>DIVISION 4</b>	<b>MASONRY</b>	<b>11.00%</b>	<b>\$18,499</b>	<b>11.00%</b>	<b>\$6,683</b>	<b>11.00%</b>	<b>\$4,730</b>	<b>12.00%</b>	<b>\$2,700</b>	<b>7.00%</b>	<b>\$6,720</b>
	Concrete Masonry Units or Brick	4.00%	\$6,727	4.00%	\$2,430	5.00%	\$2,150	5.00%	\$1,125	7.00%	\$6,720
	Stone	7.00%	\$11,772	7.00%	\$4,253	6.00%	\$2,580	7.00%	\$1,575	0.00%	\$0
<b>DIVISION 5</b>	<b>METALS</b>	<b>7.00%</b>	<b>\$11,772</b>	<b>7.00%</b>	<b>\$4,253</b>	<b>7.00%</b>	<b>\$3,010</b>	<b>7.00%</b>	<b>\$1,575</b>	<b>4.00%</b>	<b>\$3,840</b>
	Structural Steel	2.00%	\$3,364	2.00%	\$1,215	2.00%	\$860	2.00%	\$450	0.00%	\$0
	Metal roof or thatch roof	3.00%	\$5,045	3.00%	\$1,823	3.00%	\$1,290	3.00%	\$675	3.00%	\$2,880
	Crane & Hoisting	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Misc Metal Fab	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
	Prefabricated Stairs	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Handrails & Railings	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	0.00%	\$0
	Gratings	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
<b>DIVISION 6</b>	<b>CARPENTRY</b>	<b>3.50%</b>	<b>\$5,886</b>	<b>3.50%</b>	<b>\$2,126</b>	<b>3.50%</b>	<b>\$1,505</b>	<b>3.50%</b>	<b>\$788</b>	<b>3.50%</b>	<b>\$3,360</b>
	Rough Carpentry	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
	Glu Lams/Trusses	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Finish Carpentry	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
	Cabinets and Countertops	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
	Architectural Mill Work	0.50%	\$841	0.50%	\$304	0.50%	\$215	0.50%	\$113	0.50%	\$480
<b>DIVISION 7</b>	<b>THERM.&amp;MOIST.PROTECT</b>	<b>2.50%</b>	<b>\$4,204</b>	<b>2.50%</b>	<b>\$1,519</b>	<b>2.50%</b>	<b>\$1,075</b>	<b>2.50%</b>	<b>\$563</b>	<b>4.50%</b>	<b>\$4,320</b>
	Waterproofing	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
	Insulation	0.50%	\$841	0.50%	\$304	0.50%	\$215	0.50%	\$113	0.50%	\$480
	Roofing	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Roof Accessories	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Metal Siding	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	2.00%	\$1,920
	Deck Coatings	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Flashing & Sheet Metal	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
	Downspouts/Gutters	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Joint Sealants/Caulk	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
<b>DIVISION 8</b>	<b>DOORS &amp; WINDOWS</b>	<b>4.00%</b>	<b>\$6,727</b>	<b>4.00%</b>	<b>\$2,430</b>	<b>4.00%</b>	<b>\$1,720</b>	<b>4.00%</b>	<b>\$900</b>	<b>4.00%</b>	<b>\$3,840</b>
	Doors/Windows/Frames	4.00%	\$6,727	4.00%	\$2,430	4.00%	\$1,720	4.00%	\$900	4.00%	\$3,840
	Access Covers/Panels	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Overhead Door Systems	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Skylights	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
<b>DIVISION 9</b>	<b>FINISHES</b>	<b>8.50%</b>	<b>\$14,295</b>	<b>8.50%</b>	<b>\$5,164</b>	<b>8.50%</b>	<b>\$3,655</b>	<b>8.50%</b>	<b>\$1,913</b>	<b>8.50%</b>	<b>\$8,160</b>
	Light Gauge Metal Frame	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Lath & Plaster (stucco)	4.00%	\$6,727	4.00%	\$2,430	4.00%	\$1,720	4.00%	\$900	4.00%	\$3,840
	Drywall (green board, x-board, gypsum)	2.00%	\$3,364	2.00%	\$1,215	2.00%	\$860	2.00%	\$450	2.00%	\$1,920
	Tile	2.00%	\$3,364	2.00%	\$1,215	2.00%	\$860	2.00%	\$450	2.00%	\$1,920
	Carpet/ hardwood	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Painting	0.50%	\$841	0.50%	\$304	0.50%	\$215	0.50%	\$113	0.50%	\$480
<b>DIVISION 10</b>	<b>SPECIALTIES</b>	<b>4.00%</b>	<b>\$6,727</b>	<b>4.50%</b>	<b>\$2,734</b>	<b>4.50%</b>	<b>\$1,935</b>	<b>5.00%</b>	<b>\$1,125</b>	<b>3.50%</b>	<b>\$3,360</b>
	Blackboards, Bulletin/Tack Boards	0.50%	\$841	0.00%	\$0	1.00%	\$430	0.50%	\$113	0.00%	\$0
	Toilet partitions and Accessories	0.00%	\$0	1.00%	\$608	0.00%	\$0	1.00%	\$225	0.00%	\$0
	Signage	0.50%	\$841	0.50%	\$304	0.50%	\$215	0.50%	\$113	0.50%	\$480
	Fire Extinguishers and Cabinets	0.50%	\$841	0.50%	\$304	0.50%	\$215	0.50%	\$113	0.50%	\$480
	Awning System	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
	Mail Boxes, FRP, Shelving, & Misc. Specialties	1.50%	\$2,523	1.50%	\$911	1.50%	\$645	1.50%	\$338	1.50%	\$1,440
<b>DIVISION 11</b>	<b>EQUIPMENT</b>	<b>3.50%</b>	<b>\$5,886</b>	<b>9.50%</b>	<b>\$5,771</b>	<b>3.00%</b>	<b>\$1,290</b>	<b>2.50%</b>	<b>\$563</b>	<b>1.00%</b>	<b>\$960</b>
	Audio Video Screens/TV's	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Coax/Antenna/BTS	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Food/Kitchen Service	0.00%	\$0	4.00%	\$2,430	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Appliances	2.00%	\$3,364	4.00%	\$2,430	2.00%	\$860	2.00%	\$450	1.00%	\$960

	Sports Equipment	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Hood/Vent Systems	0.00%	\$0	1.00%	\$608	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Office Furnishings	1.50%	\$2,523	0.50%	\$304	1.00%	\$430	0.50%	\$113	0.00%	\$0
<b>DIVISION 12</b>	<b>FURNISHINGS</b>	<b>2.50%</b>	<b>\$4,204</b>	<b>1.50%</b>	<b>\$911</b>	<b>2.50%</b>	<b>\$1,075</b>	<b>2.50%</b>	<b>\$563</b>	<b>2.50%</b>	<b>\$2,400</b>
	Window Coverings	0.50%	\$841	0.50%	\$304	0.50%	\$215	0.50%	\$113	0.50%	\$480
	Bunk beds	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	2.00%	\$1,920
	Art work	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Office Furniture	2.00%	\$3,364	1.00%	\$608	2.00%	\$860	2.00%	\$450	0.00%	\$0
<b>DIVISION 13</b>	<b>SPECIAL CONSTRUCTION</b>	<b>0.00%</b>	<b>\$0</b>	<b>0.00%</b>	<b>\$0</b>	<b>0.00%</b>	<b>\$0</b>	<b>0.00%</b>	<b>\$0</b>	<b>0.00%</b>	<b>\$0</b>
	Fire/Security System	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
<b>DIVISION 14</b>	<b>CONVEYING SYSTEMS</b>	<b>1.00%</b>	<b>\$1,682</b>	<b>1.00%</b>	<b>\$608</b>	<b>1.00%</b>	<b>\$430</b>	<b>1.00%</b>	<b>\$225</b>	<b>1.00%</b>	<b>\$960</b>
	Scaffolding	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	1.00%	\$225	1.00%	\$960
<b>DIVISION 15</b>	<b>MECHANICAL WORK</b>	<b>7.00%</b>	<b>\$11,772</b>	<b>7.00%</b>	<b>\$4,253</b>	<b>6.00%</b>	<b>\$2,580</b>	<b>7.00%</b>	<b>\$1,575</b>	<b>7.00%</b>	<b>\$6,720</b>
	Fire Protection sprinklers	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Plumbing	7.00%	\$11,772	7.00%	\$4,253	6.00%	\$2,580	7.00%	\$1,575	7.00%	\$6,720
	HVAC	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
<b>DIVISION 16</b>	<b>ELECTRICAL</b>	<b>11.00%</b>	<b>\$18,499</b>	<b>10.00%</b>	<b>\$6,075</b>	<b>11.00%</b>	<b>\$4,730</b>	<b>10.00%</b>	<b>\$2,250</b>	<b>10.00%</b>	<b>\$9,600</b>
	Electrical	8.00%	\$13,454	8.00%	\$4,860	8.00%	\$3,440	8.00%	\$1,800	9.00%	\$8,640
	Telecom	1.00%	\$1,682	1.00%	\$608	1.00%	\$430	0.00%	\$0	0.00%	\$0
	Generators	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
	Data & Communication	2.00%	\$3,364	1.00%	\$608	2.00%	\$860	2.00%	\$450	1.00%	\$960
	Fire Alarm	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0
<b>Total US Dollars</b>		<b>100.00%</b>	<b>\$168,175</b>	<b>100.00%</b>	<b>\$60,750</b>	<b>100.00%</b>	<b>\$43,000</b>	<b>100.00%</b>	<b>\$22,500</b>	<b>91.00%</b>	<b>\$87,360</b>
<b>Total Ugandan Shillings</b>			<b>\$604,076,191</b>		<b>\$373,005</b>		<b>\$264,020</b>		<b>\$138,150</b>		<b>\$536,390</b>
<b>US \$/ SF</b>			<b>\$35</b>		<b>\$30</b>		<b>\$25</b>		<b>\$25</b>		<b>\$20</b>
<b>Ugandan Shillings/SM</b>			<b>\$1,131,464</b>		<b>\$1,658</b>		<b>\$1,382</b>		<b>\$1,382</b>		<b>\$1,006</b>



# KIHEFO FINAL CONSTRUCTION ESTIMATE

PREPARED BY: JI

UPDATED:

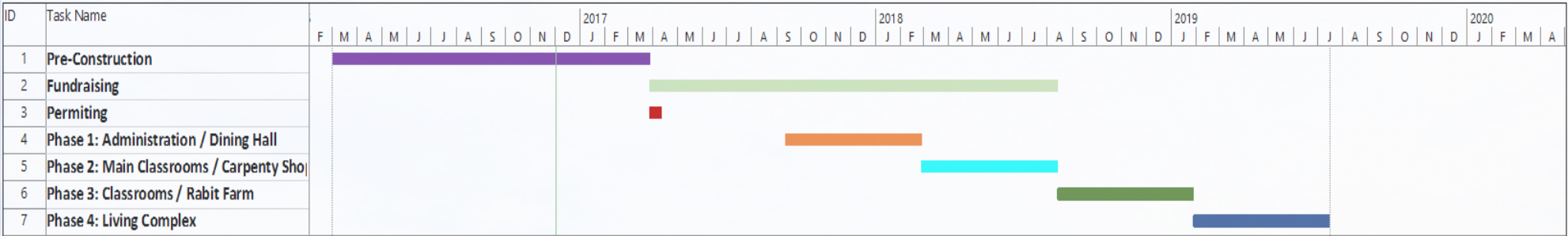
12/16/2016

COST CODE	DESCRIPTION OF WORK	Resource	QUANTITY	UNIT	UNIT PRICE USD	TOTAL PRICE UGX	SubTotal USD	TOTAL UGX	NOTES
<b>DIVISION 1</b>	<b>GENERAL CONDITIONS</b>	\$ 12,600.00					\$ 64,585.00	\$ 231,924,735.00	
	Field Supervision	Allowance	1	Each	\$11,500	\$41,296,500			
	Office Project Mng	NA	1	LS	\$14,960	\$53,721,360			
	General Labor	Estimate	1	LS	\$23,000	\$82,593,000			
	Permit	Allowance	1	each	\$500	\$1,795,500			
	Equipment Fuel	Allowance	1	LS	\$2,000	\$7,182,000			
	Plan Reproduction	with misc. GC			\$300	\$1,077,300			
	Travel	NA			\$0	\$0			
	Subsistance	NA			\$0	\$0			
	Design and Architecture Fees	by owner	1	Each	\$2,300	\$8,259,300			
	Inspection/Testing	with permit			\$0	\$0			
	Clean-Up	Included w/misc. GC			\$1,200	\$4,309,200			
	Final Clean-Up	Included w/misc. GC			\$500	\$1,795,500			
	Small Tools	Included w/misc. GC			\$175	\$628,425			
	Misc Gen Condition	Allowanc	1	GC	\$5,000	\$17,955,000			
	Trailor/Storage	Included w/misc. GC			\$700	\$2,513,700			
	Temporary Utilities	Included w/misc. GC			\$1,200	\$4,309,200			
	Bonds	by owner			\$250	\$897,750			
	All Risk Insurance	by owner			\$250	\$897,750			
	Temporary Fencing	Included w/misc. GC			\$575	\$2,064,825			
	Project Closeout	Included w/misc. GC			\$175	\$628,425			
<b>DIVISION 2</b>	<b>SITE WORK</b>	\$ 3,600.00					\$ 38,650.00	\$ 138,792,150.00	
	Equip Move In/Out	with previous sitework			\$1,500	\$5,386,500			
	Traffic Control	NA			\$0	\$0			
	Demolition	NA			\$0	\$0			
	Driven Piles	NA			\$0	\$0			
	Surveying	Allowance			\$1,000	\$3,591,000			
	Construction Water (dust control)	NA			\$1,000	\$3,591,000			
	Dewatering (flood control)	NA			\$0	\$0			
	Shoring	Allowance			\$4,000	\$14,364,000			
	Rough Grading	Allowance			\$1,000	\$3,591,000			
	Fine Grading	Allowance			\$1,500	\$5,386,500			
	Trench/Backfill	Allowance			\$2,500	\$8,977,500			
	Soil Treatment	Allowance			\$500	\$1,795,500			
	Erosion Control (SWPPP)	Allowance			\$1,500	\$5,386,500			
	Stormwater Drainage	Allowance			\$1,000	\$3,591,000			
	Sewer connection	Allowance			\$3,500	\$12,568,500			
	Water connection	Allowance			\$3,900	\$14,004,900			

	Undrground Elect connection	Allowance			\$3,850	\$13,825,350		
	Base Rock	Allowance			\$3,000	\$10,773,000		
	Site Concrete (stairs, courtyards, etc.)	Allowance			\$2,000	\$7,182,000		
	Site Furnishings (benches, bridges, tables, etc.)	Allowance			\$2,000	\$7,182,000		
	Perimeter fencing	Allowance			\$500	\$1,795,500		
	Interior fencing	Allowance			\$500	\$1,795,500		
	Landscape/Irrigation	Allowance			\$3,900	\$14,004,900		
<b>DIVISION 3</b>	<b>CONCRETE</b>						\$ 27,300.00	\$ 98,034,300.00
	Sub Base	Estimate			\$3,600	\$12,927,600		
	Forms & Accessories	Estimate			\$3,900	\$14,004,900		
	Form Liners (for asthetics)	NA			\$1,100	\$3,950,100		
	Reinforcement (rebar)	Estimate			\$4,200	\$15,082,200		
	Cast-In-Place Conc	Estimate			\$8,800	\$31,600,800		
	Tree Grates	NA			\$0	\$0		
	Curing & Sealers	Estimate			\$2,600	\$9,336,600		
	CMU Grout	Estimate			\$3,100	\$11,132,100		
<b>DIVISION 4</b>	<b>MASONRY</b>						\$ 39,300.00	\$ 141,126,300.00
	Brick	Estimate			\$19,150	\$68,767,650		
	Stone	Estimate			\$20,150	\$72,358,650		
<b>DIVISION 5</b>	<b>METALS</b>						\$ 24,454.00	\$ 87,814,314.00
	Structural Steel	Estimate			\$5,900	\$21,186,900		
	Metal roof	Estimate			\$10,100	\$36,269,100		
	Crane & Hoisting	Allowance			\$1,600	\$5,745,600		
	Misc Metal Fab	Estimate			\$3,950	\$14,184,450		
	Prefabricated Stairs	NA			\$0	\$0		
	Handrails & Railings	Estimate			\$2,904	\$10,428,264		
<b>DIVISION 6</b>	<b>CARPENTRY</b>						\$ 13,700.00	\$ 49,196,700.00
	Rough Carpentry	Estimate			\$3,000	\$10,773,000		
	Finish Carpentry	Allowance			\$3,900	\$14,004,900		
	Cabinets	Allowance			\$3,000	\$10,773,000		
	Counter Tops	Estimate			\$1,950	\$7,002,450		
	Architectural Mill Work	Estimate			\$1,850	\$6,643,350		
<b>DIVISION 7</b>	<b>THERM.&amp;MOIST.PROTECT</b>						\$ 10,770.00	\$ 38,675,070.00
	Waterproofing	Allowance			\$3,900	\$14,004,900		
	Roof Accessories	Allowance			\$500	\$1,795,500		
	Metal Siding	Estimate			\$1,920	\$6,894,720		
	Flashing & Sheet Metal	Allowance			\$3,950	\$14,184,450		
	Downspouts/Gutters	Estimate			\$300	\$1,077,300		
	Joint Sealants/Caulk	Estimate			\$200	\$718,200		
<b>DIVISION 8</b>	<b>DOORS &amp; WINDOWS</b>						\$ 15,617.00	\$ 56,080,647.00
	Doors/Windows/Frames	Estimate			\$ 15,617.00	\$ 56,080,647.00		
<b>DIVISION 9</b>	<b>FINISHES</b>						\$ 33,181.00	\$ 119,152,971.00
	Light Guage Metal Frame	NA			\$0	\$0		
	Lath & Plaster (stucco)	Estimate			\$15,620	\$56,091,420		
	Drywall (green board, x-board, gypsum)	Estimate			\$7,800	\$28,009,800		
	Tile	Estimate			\$7,809	\$28,042,119		
	Carpet/ hardwood	NA			\$0	\$0		
	Wall Coverings	NA			\$0	\$0		
	Painting	Estimate			\$1,952	\$7,009,632		

<b>DIVISION 10</b>	<b>SPECIALTIES</b>							\$ 15,737.00	\$ 56,511,567.00	
	Blackboards (classrooms)	Estimate			\$1,383	\$4,966,353				
	Bulletin/Tack Boards (classrooms)	Estimate			\$1,000	\$3,591,000				
	School desks and chairs	Estimate			\$2,500	\$8,977,500				
	Toilet partitions	Estimate			\$500	\$1,795,500				
	Exterior Signage	Allowance			\$1,000	\$3,591,000				
	Fire Extinguishers	Allowance			\$500	\$1,795,500				
	Fire Extinguisher Cabinets	Estimate			\$800	\$2,872,800				
	Prefab Awnings	Estimate			\$3,904	\$14,019,264				
	Metal Shelving	Estimate			\$2,000	\$7,182,000				
	Wood Shelving	Estimate			\$1,800	\$6,463,800				
	Toilet Accessories	Allowance			\$350	\$1,256,850				
<b>DIVISION 11</b>	<b>EQUIPMENT</b>							\$ 14,869.00	\$ 53,394,579.00	
	Oven/Stove	Estimate			\$1,400	\$5,027,400				
	Refrigerator	Estimate			\$1,000	\$3,591,000				
	Food/Kitchen Service	Estimate			\$500	\$1,795,500				
	Appliances	Estimate			\$8,000	\$28,728,000				
	Hood/Vent Systems	Estimate			\$600	\$2,154,600				
	Office Furnishings	Estimate			\$3,369	\$12,098,079				
<b>DIVISION 12</b>	<b>FURNISHINGS</b>							\$ 9,153.00	\$ 32,868,423.00	
	Window Coverings	Estimate			\$1,952	\$7,009,632				
	Bunk beds	Estimate			\$1,920	\$6,894,720				
	Art work	NA			\$0	\$0				
	Office Furniture	Estimate			\$5,281	\$18,964,071				
<b>DIVISION 13</b>	<b>SPECIAL CONSTRUCTION</b>							\$ 200.00	\$ 718,200.00	
	Fire/Security System (smoke detectors)	Allowance			\$200	\$718,200				
<b>DIVISION 14</b>	<b>CONVEYING SYSTEMS</b>							\$ 3,900.00	\$ 14,004,900.00	
	Scaffolding	Allowance			\$3,900	\$14,004,900				
<b>DIVISION 15</b>	<b>MECHANICAL WORK</b>							\$ 26,900.00	\$ 96,597,900.00	
	Plumbing	Estimate			\$26,900	\$96,597,900				
<b>DIVISION 16</b>	<b>ELECTRICAL</b>							\$ 42,910.00	\$ 154,089,810.00	
	Electrical	Allowance			\$32,950	\$118,323,450				
	Telecom	Estimate			\$2,719	\$9,763,929				
	Generators	NA			\$0	\$0				
	Lighting	Estimate			\$1,000	\$3,591,000				
	Data & Communication	Estimate			\$6,241	\$22,411,431				
<b>SUBTOTAL</b>					<b>\$ 381,226.00</b>	<b>\$ 1,368,982,566</b>				
<b>O.H. AND PROFIT</b>					2.00%	2.00%				
<b>TOTAL</b>					<b>\$ 388,850.52</b>	<b>\$ 1,396,362,217</b>				

# PRELIMINARY CONSTRUCTION SCHEDULE



**TOTAL DURATION: 40.5 MONTHS (3 YEARS 4.5 MONTHS)**



# FINAL CONSTRUCTION SCHEDULE



# FINAL CONSTRUCTION SCHEDULE

2		<b>Pre-Construction</b>	<b>310 days</b>	<b>Thu 12/1/16</b>	<b>Wed 2/7/18</b>
3		Complete Schematic Design	10 days	Thu 12/1/16	Wed 12/14/16
4		Grant Writing and Fundraising	140 days	Thu 12/15/16	Wed 6/28/17
5		Attain Construction Approval From Local Jurisdiction	7 days	Thu 6/29/17	Fri 7/7/17
6		Recruit Project Management Team	25 days	Thu 6/29/17	Wed 8/2/17
7		Begin Construction Documents	100 days	Thu 6/29/17	Wed 11/15/17
8		Local Plan Review	20 days	Thu 11/16/17	Wed 12/13/17
9		Bid Construction	40 days	Thu 12/14/17	Wed 2/7/18

10		<b>Site Work + Underground Utilities</b>	<b>153 days</b>	<b>Thu 2/8/18</b>	<b>Mon 9/10/18</b>
11		Upgrade Road to Site	15 days	Thu 2/8/18	Wed 2/28/18
12		Install Security Fencing/Entrance	8 days	Thu 3/1/18	Mon 3/12/18
13		Install SWPPP	5 days	Tue 3/13/18	Mon 3/19/18
14		Install Temporary Construction Utilities	20 days	Tue 3/20/18	Mon 4/16/18
15		Install Concrete Mix Zone	1 day	Tue 4/17/18	Tue 4/17/18
16		Move in Earthwork and Grub Site	25 days	Tue 4/17/18	Mon 5/21/18
17		Rough Grade	30 days	Tue 5/22/18	Mon 7/2/18
18		Install Water Tanks and Storage System	50 days	Tue 7/3/18	Mon 9/10/18
19		Install Greywater Treatment/Sewage System	20 days	Tue 7/3/18	Mon 7/30/18
20		Install Underground Electrical System	15 days	Tue 7/3/18	Mon 7/23/18
21		Install Underground Plumbing System	18 days	Tue 7/31/18	Thu 8/23/18
22		Fine Grade for Building Pads and Site Flatwork	30 days	Tue 7/31/18	Mon 9/10/18

23		<b>Site Finishes</b>	<b>28 days</b>	<b>Tue 9/11/18</b>	<b>Thu 10/18/18</b>
24		Prepare Slabs for Flatwork	5 days	Tue 9/11/18	Mon 9/17/18
25		Pour Flatwork	8 days	Tue 9/18/18	Thu 9/27/18
26		Install Retaining walls (Stairs)	10 days	Fri 9/28/18	Thu 10/11/18
27		Finish Site MEP's	5 days	Fri 10/12/18	Thu 10/18/18

28		<b>Phase 1</b>	<b>237 days</b>	<b>Tue 9/11/18</b>	<b>Wed 8/7/19</b>
29		Compact and Prepare Slabs for Foundation	15 days	Tue 9/11/18	Mon 10/1/18
30		Excavate Footings for Slabs and Retaining Walls	5 days	Tue 10/2/18	Mon 10/8/18
31		Install Rebar and Pour Footings	10 days	Tue 10/9/18	Mon 10/22/18
32		Install Rebar and Pour Slabs	15 days	Tue 10/23/18	Mon 11/12/18
33		Install Gabion, Brick Walls and Mud	30 days	Tue 11/13/18	Mon 12/24/18
34		Install Concrete Beams and Trusses	20 days	Tue 12/25/18	Mon 1/21/19
35		Install Concrete Pan Decks	8 days	Tue 1/22/19	Thu 1/31/19
36		Install Rebar for Elevated Concrete Slabs and Pour	20 days	Fri 2/1/19	Thu 2/28/19
37		Install Brick Walls and Mud (2nd Floor)	20 days	Fri 3/1/19	Thu 3/28/19
38		Install metal roofing and Bamboo Thatch	10 days	Fri 3/29/19	Thu 4/11/19
39		Construction Interior Demising Walls	10 days	Fri 4/12/19	Thu 4/25/19
40		MEP Rough-in	25 days	Fri 4/26/19	Thu 5/30/19
41		Install Stairs	8 days	Fri 5/31/19	Tue 6/11/19
42		Install Windows and Doors	7 days	Wed 6/12/19	Thu 6/20/19
43		Install Interior Finishes	20 days	Fri 6/21/19	Thu 7/18/19
44		Finish MEP	14 days	Fri 7/19/19	Wed 8/7/19

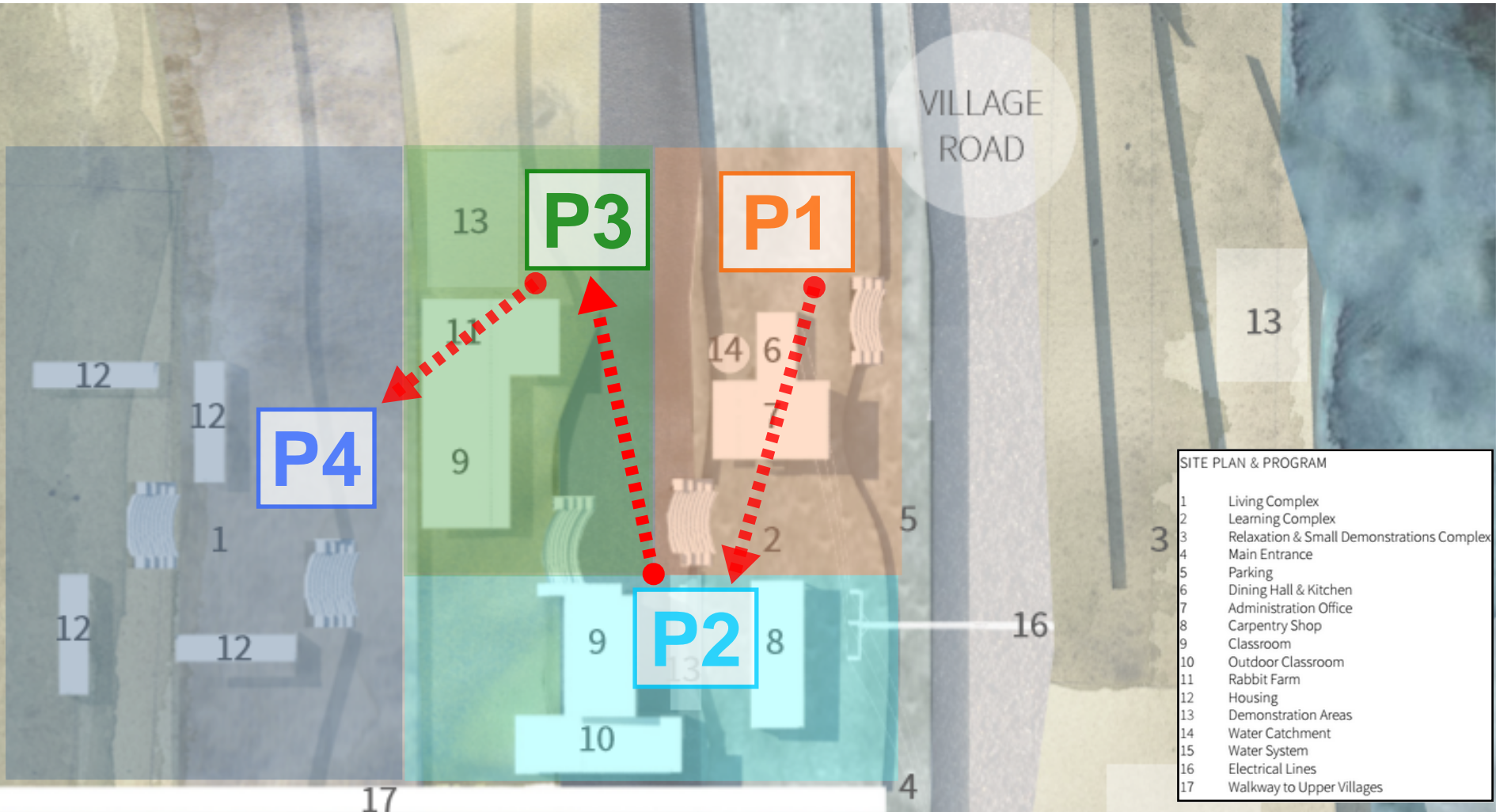
45		<b>Phase 2</b>	<b>237 days</b>	<b>Thu 8/8/19</b>	<b>Fri 7/3/20</b>
46		Compact and Prepare Slabs for Foundation	15 days	Thu 8/8/19	Wed 8/28/19
47		Excavate Footings for Slabs and Retaining Walls	5 days	Thu 8/29/19	Wed 9/4/19
48		Install Rebar and Pour Footings	10 days	Thu 9/5/19	Wed 9/18/19
49		Install Rebar and Pour Slabs	15 days	Thu 9/19/19	Wed 10/9/19
50		Install Gabion, Brick Walls	30 days	Thu 10/10/19	Wed 11/20/19
51		Install Concrete Beams and Trusses	20 days	Thu 11/21/19	Wed 12/18/19
52		Install Concrete Pan Decks	8 days	Thu 12/19/19	Mon 12/30/19
53		Install Rebar for Elevated Concrete Slabs and Pour	20 days	Tue 12/31/19	Mon 1/27/20
54		Install Gabion, Brick Walls (2nd Floor)	20 days	Tue 1/28/20	Mon 2/24/20
55		Install metal roofing and Bamboo Thatch	10 days	Tue 2/25/20	Mon 3/9/20
56		Construction Interior Demising Walls	10 days	Tue 3/10/20	Mon 3/23/20
57		MEP Rough-in	25 days	Tue 3/24/20	Mon 4/27/20
58		Install Stairs	8 days	Tue 4/28/20	Thu 5/7/20
59		Install Windows and Doors	7 days	Fri 5/8/20	Mon 5/18/20
60		Install Interior Finishes	20 days	Tue 5/19/20	Mon 6/15/20
61		Finish MEP	14 days	Tue 6/16/20	Fri 7/3/20

62		<b>Phase 3</b>	<b>237 days</b>	<b>Mon 7/6/20</b>	<b>Tue 6/1/21</b>
63		Compact and Prepare Slabs for Foundation	15 days	Mon 7/6/20	Fri 7/24/20
64		Excavate Footings for Slabs and Retaining Walls	5 days	Mon 7/27/20	Fri 7/31/20
65		Install Rebar and Pour Footings	10 days	Mon 8/3/20	Fri 8/14/20
66		Install Rebar and Pour Slabs	15 days	Mon 8/17/20	Fri 9/4/20
67		Install Gabion, Brick Walls	30 days	Mon 9/7/20	Fri 10/16/20
68		Install Concrete Beams and Trusses	20 days	Mon 10/19/20	Fri 11/13/20
69		Install Concrete Pan Decks	8 days	Mon 11/16/20	Wed 11/25/20
70		Install Rebar for Elevated Concrete Slabs and Pour	20 days	Thu 11/26/20	Wed 12/23/20
71		Install Gabion, Brick Walls (2nd Floor)	20 days	Thu 12/24/20	Wed 1/20/21
72		Install metal roofing and Bamboo Thatch	10 days	Thu 1/21/21	Wed 2/3/21
73		Construction Interior Demising Walls	10 days	Thu 2/4/21	Wed 2/17/21
74		MEP Rough-in	25 days	Thu 2/18/21	Wed 3/24/21
75		Install Stairs	8 days	Thu 3/25/21	Mon 4/5/21
76		Install Windows and Doors	7 days	Tue 4/6/21	Wed 4/14/21
77		Install Interior Finishes	20 days	Thu 4/15/21	Wed 5/12/21
78		Finish MEP	14 days	Thu 5/13/21	Tue 6/1/21

79		<b>Phase 4</b>	<b>135 days</b>	<b>Wed 6/2/21</b>	<b>Tue 12/7/21</b>
80		Compact and Prepare Slabs for Foundation	15 days	Wed 6/2/21	Tue 6/22/21
81		Excavate Footings for Slabs	5 days	Wed 6/23/21	Tue 6/29/21
82		Install Rebar and Pour Footings	10 days	Wed 6/30/21	Tue 7/13/21
83		Install Rebar and Pour Slabs	15 days	Wed 7/14/21	Tue 8/3/21
84		Rough Carpentry	40 days	Wed 8/4/21	Tue 9/28/21
85		Install metal roofing and Bamboo Thatch	20 days	Wed 9/29/21	Tue 10/26/21
86		Install Windows and Doors	15 days	Wed 10/27/21	Tue 11/16/21
87		Install Interior Finishes	15 days	Wed 11/17/21	Tue 12/7/21



# SITE LOGISTICS AND PHASING



**PHASE 1: DINING HALL, KITCHEN, ADMINISTRATION**

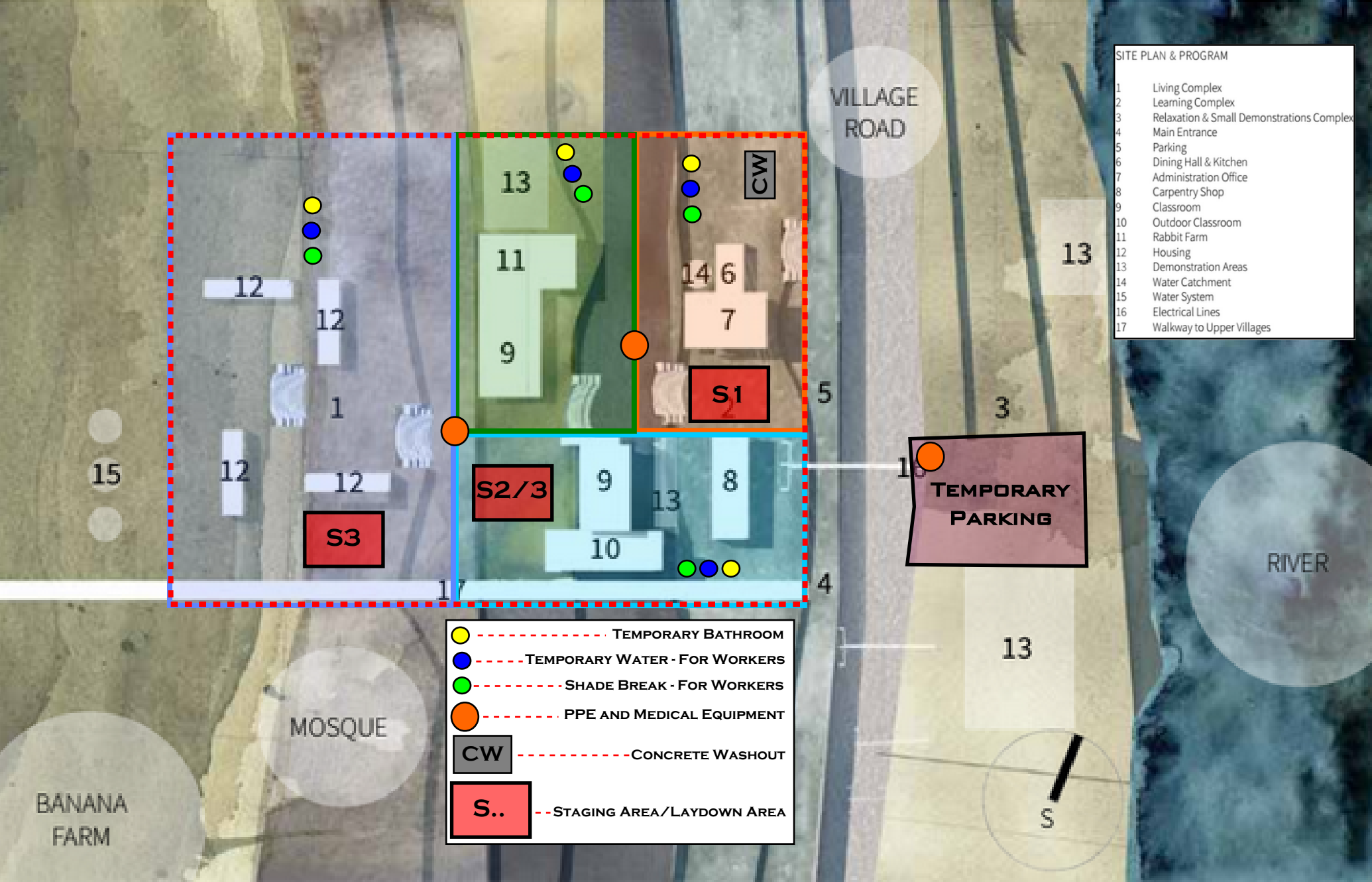
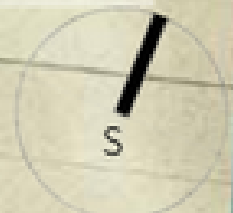
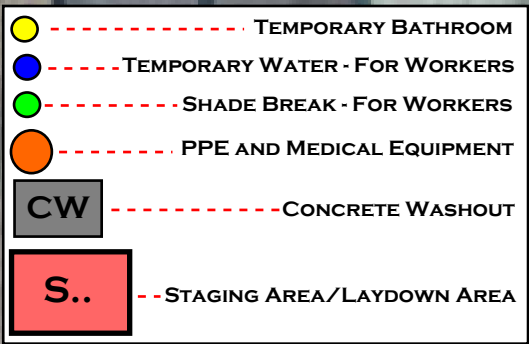
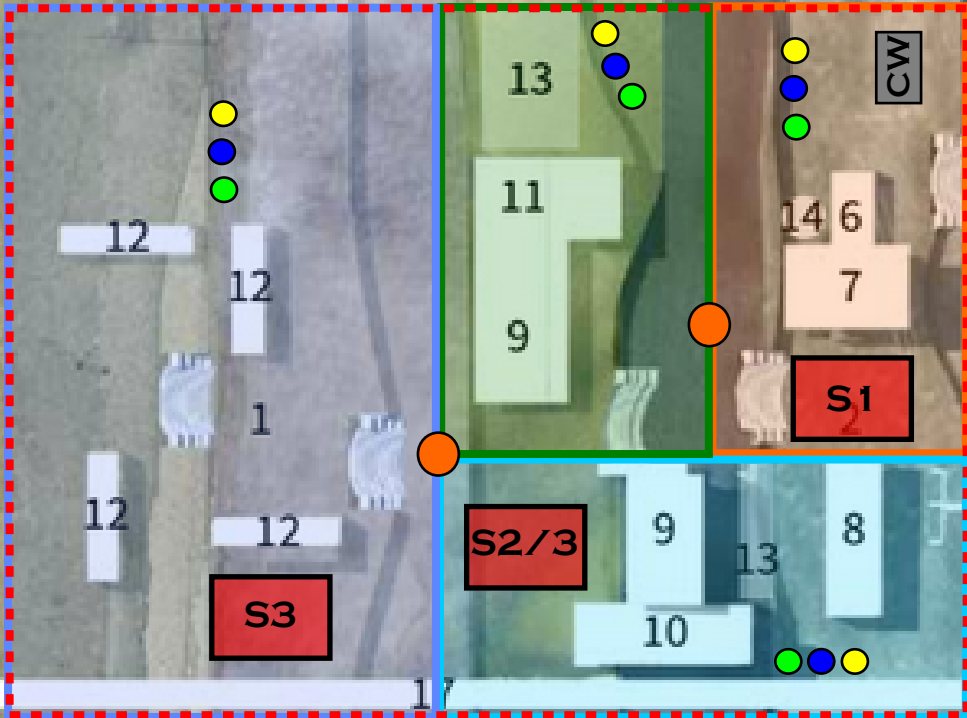
**PHASE 3: CLASSROOMS, RABBIT FARM**

**PHASE 2: MAIN CLASSROOMS, CARPENTRY SHOP**

**PHASE 4: HOUSING**

# SITE LOGISTICS AND PHASING

SITE PLAN & PROGRAM	
1	Living Complex
2	Learning Complex
3	Relaxation & Small Demonstrations Complex
4	Main Entrance
5	Parking
6	Dining Hall & Kitchen
7	Administration Office
8	Carpentry Shop
9	Classroom
10	Outdoor Classroom
11	Rabbit Farm
12	Housing
13	Demonstration Areas
14	Water Catchment
15	Water System
16	Electrical Lines
17	Walkway to Upper Villages





# HAZARD AND RISK MITIGATION

## HAZARD:

### JOBSITE INJURY

DUE TO THE RELAXED NATURE OF SAFETY REGULATION IN UGANDA IT IS COMMON FOR LABORERS TO NOT WEAR PPE. IN ORDER TO PREVENT INJURIES FROM OCCURRING ON THIS PROJECT IT WILL BE IMPORTANT TO STRESS THE IMPORTANCE OF WEARING PPE. IN ADDITION WE WILL BE PROVIDING PPE STATIONS THROUGHOUT THE JOBSITE. THERE WILL ALSO BE MARKED SHADE STATIONS FOR WORKERS TO REST AND PREVENT HEAT STROKE OR DEHYDRATION. IN ADDITION THE WORKERS WILL ALSO HAVE ACCESS TO EMERGENCY MEDICAL EQUIPMENT IN CASE OF INJURY.

### CORRUPTION

DUE TO SOCIAL UNREST AND POLITICAL ISSUES GOING ON IN UGANDA CURRENTLY, IT WILL BE VERY IMPORTANT HAVE A FALL BACK PLAN IF SOMETHING WERE TO HAPPEN. IN CASE OF A MAJOR SOCIAL ISSUE OR CORRUPTION THE PROJECT MIGHT NEED TO BE PUT ON HOLD. THIS IS THE BENEFIT OF BUILDING IN STAGES.

### LOCAL LABOR/QUALITY

BECAUSE THIS PROJECT WILL HAVE 2-STORY BUILDINGS AND BE UTILIZED BY A LARGE PORTION OF THE PUBLIC IT WILL BE CRITICAL THAT THE CONSTRUCTION QUALITY IS ADEQUATE. IN ORDER TO ENSURE THIS IT WILL BE IMPORTANT TO PERFORM REGULAR QUALITY ASSURANCE INSPECTIONS. IN ADDITION IT WILL BE IMPORTANT TO ONLY HIRE EXPERIENCED LABORERS FOR CRITICAL ASPECTS OF THE BUILDING.

### CRIME

DUE TO THE POTENTIAL FOR PETTY CRIME IN THIS AREA IT WILL BE IMPORTANT TO LOCK UP ALL VALUABLES BEFORE LEAVING THE JOBSITE. THINGS LIKE POWER TOOLS, MATERIALS, AND OTHER EQUIPMENT MUST BE LOCKED UP AT NIGHT OR IN A SECURED LOCATION. THIS WILL HELP MINIMIZE THE POTENTIAL FOR FINANCIAL LOSS

# CONSTRUCTION SAFETY PLAN

## GENERAL SAFETY REQUIREMENTS:

1. HEAD PROTECTION SHALL BE PROVIDED AND WORN AT ALL TIMES BY ANYONE LOCATED IN ONE OF THE PROJECTS CONSTRUCTION ZONES.
2. EYE PROTECTION MUST BE WHEN THERE IS A RISK OF ANY AIR-BORN HAZARD OR FLYING OBJECT SUCH AS DUST, CHEMICALS, OR ARCING.
3. PROTECTIVE FOOTWEAR SHALL BE WORN AT ALL TIMES TO PROTECT FROM FALLING OBJECTS
4. GLOVES OR HAND PROTECTION SHALL BE WORN WHEN REQUIRED TO PROTECT AGAINST A HAZARD
5. WHEN CONSTRUCTING THE SECOND FLOOR OR MORE THAN 7' OFF THE GROUND A LANYARD OR HARNESS SHALL BE WORN.
6. ALL WORKERS MUST GO THROUGH JOBSITE SAFETY TRAINING BEFORE COMING ON BOARD
7. NO HORSEPLAY WILL BE TOLERATED
8. TO MINIMIZE THE RISK OF FIRE, SMOKING ON SITE WILL NOT BE ALLOWED UNLESS IN DESIGNATED LOCATIONS.
9. NO WORKER WILL BE ALLOWED TO BE UNDER THE INFLUENCE OF DRUGS OR ALCOHOL AT ANY TIME AND DRUG TESTS WILL BE ADMINISTERED.
10. FIRE EQUIPMENT SUCH AS FIRE EXTINGUISHERS SHALL BE CLEARLY MARKED AND ACCESSIBLE AT ALL TIMES IN CASE OF FIRE.
11. KEEPING THE JOBSITE CLEAN WILL LEAD A SAFER JOBSITE BY MINIMIZING TRIPPING HAZARDS OR FIRE HAZARDS.
12. ONLY TRAINED PERSONS WILL BE ALLOWED TO OPERATE ANY FORM OF EQUIPMENT.
13. WORKERS SHALL BE PROVIDED SHADE LOCATIONS TO PREVENT HEATSTROKE AND SUNBURN
14. SANITATION LOCATIONS MUST BE PROVIDED FOR THE WORKERS
15. DO NOT DISTRACT OTHER WORKERS FROM WHAT THEY ARE DOING, THIS IS UNSAFE.
16. LIFT CORRECTLY WITH YOUR LEGS NOT YOUR BACK.
17. PROTRUDING REBAR MUST BE CAPPED DO TO IMPALING HAZARDS.







