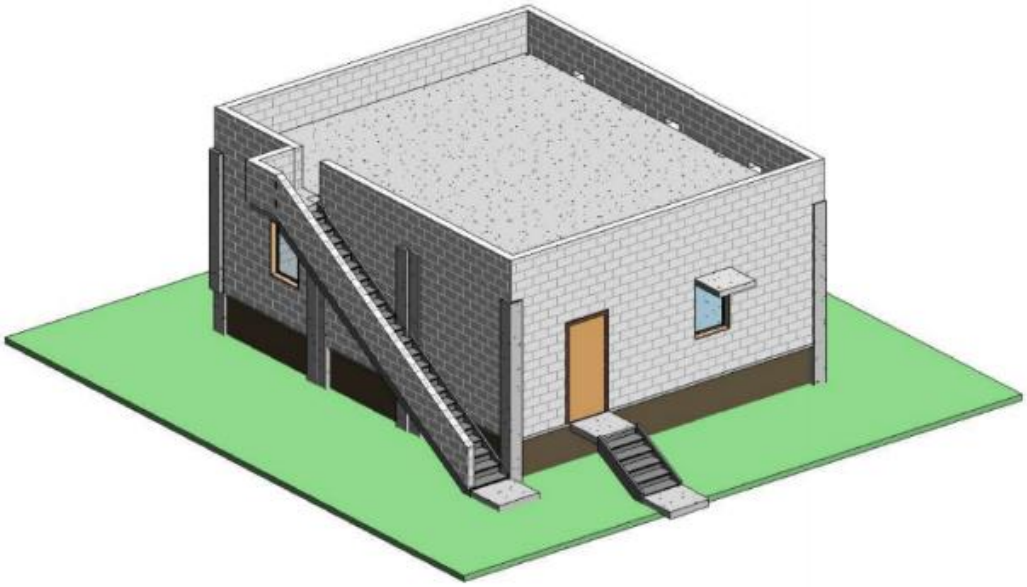
PROJECTS WITH UNDERSERVED COMMUNITIES

Team India 2019-2020
Final Student Report

Multipurpose Community Center
May 2020



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Content

1. Executive Summary

Project Number:	2020-91-01
Project Name:	Multipurpose Community Center
Project Type:	Building (Civil Engineering)
Underserved Community:	Siripudi
Project Location:	Siripudi, Guntur District, Andhra Pradesh, India
NGO Partner (Client):	Church's Auxiliary for Social Action (CASA)
Client Key Contact(s):	Poul Luther, *Project Manager*
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Other(s):	https://www.facebook.com/profile.php?id=100009119734480
PUC Project Manager:	Colin Phillips
Technical Adviser:	Ken Hanks, P.E.

Project Summary & Description:

Projects with Underserved Communities (PUC) is a **humanitarian engineering organization** composed of **engineering and social work** undergraduates at the University of Texas at Austin. Throughout the course of three semesters, teams of students work with underdeveloped communities from across the world to develop engineering projects to address health, social, and economic barriers faced by locals. The teams coordinate alongside non-governmental organizations (NGOs) to fully design, fund, and implement these global projects to make a lasting impact on communities in need. PUC Team India 2019-2020 is undertaking the construction of a Multipurpose Community Center, partnering with the Church's Auxiliary for Social Action and a small village in Andhra Pradesh, India.

The client community, Siripudi, is an impoverished village composed of families from the Scheduled Caste and Tribes, the lowest tier of the Indian caste system. These individuals are socioeconomically ostracized and lack access to basic facilities and infrastructure, including medical treatment. Organizations periodically send doctors and nurses to administer care but they lack a sufficient venue to safely treat villagers. Nightly classes have also recently started for young children but there is no place for schooling besides the residential thatched huts. The proximity to the coast also makes the area highly susceptible to severe flooding during the monsoon season; residents often have to travel 50 kilometers to safety. The goal of this project is to build a raised, **Multipurpose Community Center** that will be a venue for a variety of services, including medical treatment, education, and disaster relief. By building this 806 (26' x 31') square foot structure, some of the major obstacles faced by the community will be mitigated.

The structure is a 31' long by 26' wide building that is 3' off of the finished grade. A compact fill will be used below the floor to raise the building, rather than column supports used by previous teams. Two separate stairs will be constructed, both beginning at finished grade with one going to the doorway and the second going up to the roof for access. To prevent accumulation of water, the roof slab will be sloped away from the stairs for drainage. The building will consist of 8 columns, each with a footer below and beams spanning between them. An interior wall will be created out of brick and will split the space into a 20' by 26' room and a smaller 10' by 26' area for storage.

Construction of the building was slated to begin at the end of May but due to the COVID-19 pandemic, implementation has been delayed by a year. As such, the construction schedule has been pushed back and is subject to change, as implementation will be combined with additions from next

year's project. At a high level, the project will now incorporate this year's designs with additions from next year's India team to be constructed simultaneously during Summer 2021.

Table 1: Anticipated Total Budget

No. of Students Traveling: 9*

STUDENT	Pre-Departure Total Cost per Student Post-Departure Total Cost per Student	$ 3,563.00 $ 250.00
	Total cost per Student	$ 3,813.40
	TOTAL COST OF STUDENTS	**$ 34,320.60**
TECHNICAL ADVISOR	TOTAL COST OF TECHNICAL ADVISOR	**$ 2,500.00**
PROJECT	TOTAL PROJECT COSTS	**$ 24,876.52**
	TOTAL COST	**$ 59,197.12**

** Subject to availability of this year's team and size of next year's cohort*

2. Introduction

Each team in a PUC cohort undergoes three main phases over the course of the fall, spring, and summer semesters: project development, design, and implementation. Beginning with project development, the fall semester consisted of members being assigned to teams and developing project proposals for their selected community. Each team consists of six engineering students from a variety of disciplines and a social work undergraduate. A series of lectures, given by Dr. James O'Connor, were provided as teams formalized their projects' scope and components with their partner NGOs. A focus on project management techniques and practices (e.g. RACI charts, work breakdown structures, etc.) helped teams identify problems within their communities and effectively evaluate their proposed solutions. As the project vision was refined, various seminars on cross-cultural interaction were held to heighten team members' cultural awareness throughout the project life cycle. Teams also began fundraising for the projects through UT's crowdsourcing platform, HornRaiser. The PUC India team raised $20,500.00 in just one month, the most by any PUC team ever.

Spring brought an increased focus on design, as all teams had carefully outlined their project scope. Alongside other professional engineers, Martin Rumbaugh held classes over construction management and design practices to prepare teams for implementation. Preliminary designs and three iterations were created throughout the semester and evaluated by Mr. Rumbaugh to finalize designs for contractors. More detailed community engagement plans were developed with professors from the Steve Hicks School of Social Work alongside thorough construction schedules.

Typically, summer implementation would have started in late May but unforeseen circumstances led to a UT-mandated delay of all PUC projects by one year. Projects will now be implemented alongside next year's team in the same country, with both happening in the village of Siripudi. This year's team will send as many members as possible to next year's implementation, though several have already indicated prior commitments. Despite this, a larger team of students will travel to India than previous years to simultaneous construct both projects.

As part of the PUC program, teams are advised by the Service Learning Advisory Board (SLAB), a committee of professors, professional engineers, and alumni with experience in humanitarian engineering. Teams present their progress in four milestones spread throughout the fall and spring semesters; this report compiles these evaluations in the following sections as well as a transition plan to incorporate next year's team.

Table 2: Team Members and Roles

Name	Discipline	Year	Role(s)
Colin Phillips	Computer Eng. Honors Mathematics	Junior	Project Manager
Ramya Yedatore	Biomedical Eng. Plan II Honors	Junior	Fundraising Manager
Audrey Soltau	Architectural Eng.	Junior	Quality & Safety Manager Technical Lead
Elise Higgins	Civil Eng.	Senior	Cost & Resources Manager Technical Lead
Dain Kasprak	Biomedical Eng.	Senior	Scope & Deliverables Manager
Britta Dalton	Mechanical Eng.	Junior	Logistics Manager Transition Liaison
Jamie Li	Social Work	Sophomore	Communications Manager

2.1 COVID-19 Response & Implementation

In March, the University of Texas cancelled all international activities for students and faculty for the summer due to the COVID-19 pandemic. Projects like PUC were directly affected, as the organization decided to postpone implementation plans for next summer. Obtaining visas for travel and construction preparation was impossible for most teams in their respective countries, including India. The entire country has been in a heavily enforced lockdown since March 25th that is currently slated to last until June 1st. The state of Andhra Pradesh has not been as severely affected relative to other areas, with 3,171 confirmed cases and 57 deaths. However, many communities, including Siripudi, have seen their sources of income dry up as day labor is not permitted due to the lockdown. As a result, villagers have faced shortages in food and are susceptible to the virus due to a lack of hygiene facilities.

PUC Team India has adapted to this unforeseen obstacle by overhauling construction schedules and laying the groundwork for contracting agreements for next summer. Specifically, a contractor has agreed in principle to build the structure for 14 lakhs, or approximately $18,540.00, after a series of negotiations led by Poul Luther, the team's point of contact in India. CASA has yet to send a formalized agreement with this price but other bids have been received, included in Appendix F. A dialogue has also been established with CASA regarding this delayed implementation; the NGO has been very accommodating and is prepared to host a larger group of students in Summer 2021. A transition plan has also been created to integrate next year's team and project for concurrent implementation.

To address the immediate needs of the community, Team India also created a GoFundMe to combat food insecurity and provide sanitation products to Siripudi. A total of $1,656.00 was raised and sent to CASA to purchase supplies and host a hygiene workshop to prevent the spread of COVID-19. Additional campaigns will be conducted over the course of the summer should the lockdown continue.

Figure 1: Photos from the hygiene workshop in Siripudi on April 22, 2019

3. Milestone I: Project Selection

Milestone I provides an overview of the project options identified by the team and the affiliated non-governmental partner, CASA. Additionally, an introduction is given to the client community and an evaluation that led to the selection of the Multipurpose Community Center as the project.

3.1 Summary of Project Selection

Three different projects were identified by CASA and Team India at the beginning of the fall: a community center in Siripudi, a sanitation station in Sirupinayur, and a solar panel project for a village in Andhra Pradesh. Meetings with Poul Luther and the team's technical adviser coupled with project assessment tools helped identify the project that was the most technically challenging yet feasible.

The community center in Siripudi was envisioned to provide a venue for medical treatment, shelter during inclement weather, and general education for the village of Siripudi. A raised structure of considerable size was identified to be crucial for the building to meet the needs of the community. As a result, scope creep was a major risk factor alongside budget and environmental concerns, i.e. poor soil conditions for construction. However, the building would be able to provide infrastructure to a community that solely lives in thatched huts and would directly address some of the issues the community faces.

A sanitation station was conceptualized as a restroom with sinks adjacent to the building constructed by the previous Team India in Sirupinayur. Identified risks included high maintenance costs of the station as well as health and safety of the community. The facilities would be built in a low-lying area that experiences intense annual flooding and poor maintenance could lead to sewage being released in the general area. Funds could be allocated for upkeep but may not be sufficient for long-term viability.

The solar project was slated to provide electrical power for a community in Andhra Pradesh, in addition to possibly being a source of income. If the system was connected to a larger grid, any surplus would mean providers might pay the community for the excess energy. However, insufficient information was available regarding the existence of a greater electrical grid in the local area as well as whether providers would be open to the proposed payment agreement. This created extremely high risk for the project, alongside the high maintenance costs that may be incurred in a region susceptible to intense inclement weather.

Ultimately, the community center for Siripudi was chosen due to the potential for impact as well as feasibility. The sanitation station provided too many unknowns and may have incurred costs that would have exceeded the fundraising abilities of the team. Additionally, the ambiguity regarding the solar project may have had a core objective of the system become obsolete due to external influences (i.e. energy providers). A Project Assessment Tool also yielded the community center to have the highest score for impact. Its potential to help a historically marginalized population was a major influence as the expansion of infrastructure in the village would have lasting effects for social advancement. As a result, the team decided to pursue the Multipurpose Community Center.

3.2 Comments from SLAB

1. Due to concerns regarding scope and properly meeting the needs of the community, it was recommended to explore the possibility of a multi-year project. The foundation could be fully completed by this year's team with next year's project finishing the structure and possibly expanding scope.
2. Ownership needs to be clearly established prior to implementation, as last year's team faced ambiguity that led to some tension. Specifically, who was going to own the building?
3. The team lacked geotechnical data that had to be gathered as soon as possible. The location near the coastline made it highly possible that soil conditions could be unfavorable to construction of a site with the proposed size.

3.3 Responses to SLAB input

1. A "soft wall" was proposed to be erected while completely finishing construction of the building by this year's team to allow for the community to use the structure. This wall would not be load bearing and could be removed during further expansion. Despite this proposal, Poul was not very receptive to the idea, citing his hopes to have projects in as many communities as possible rather than a multi-year venture. As a result, the team ruled out the possibility of expanding scope in the future and restrict scope to a single year.
2. After discussing this concern with Poul and the community, it was made clear that the village sangam, or city council, would own and be in charge of the building. CASA pledged to allocate a budget for 6 months of maintenance following completion of construction and any future incurred costs would be the responsibility of the sangam.
3. An engineer was hired by CASA to obtain the relevant geotechnical data. Despite delays in receiving the report, the soil composition suggested the site was not too sandy and the building could move forward.

4. Milestone II: Project Concept

Milestone II narrowed scope and expectations of the project, while simultaneously organizing project logistics and feasibility for the project.

4.1 Summary of Project Concept

Milestone II refined the project concept consisting of a multipurpose community center for the rural community of Siripudi. As stated previously, the objective of the center is to provide a venue for medical treatment, shelter during inclement weather, and general education for the village. For this milestone, the scope was a 30’ by 25’ concrete structure with a tilted roof and equipped with electricity. With disaster relief a primary objective of the building, stairs will be constructed that give roof access. Additionally, improved facilities would improve accessibility and quality of education to villagers.

Leading up to Milestone II, the team had met with the previous Team India to go over their experiences and questions moving forward with this new project. The theme of the conversation revolved mostly on adaptability and clarity regarding designs and communication with Poul. The discussion was extremely beneficial and in particular, Victor Butcher was a valuable source of information throughout the design process.

In terms of proposed design, the 30’ by 25’ building was set to be raised 3’ in order to prevent flooding. According to the local community, annual flooding does not exceed more than 2’ 6’’ and 3’ was determined to be sufficient based upon recommendations from Ken Hanks. A perimeter grade beam would go around the floor, and the space would be open so it could serve as a community meeting area. The building would be constructed similarly to past Team India projects, with a reinforced roof slab and building system. The brick walls would not be load bearing, and instead would just fill the spaces between the floor slab and the load bearing columns. At the time of the Milestone, the estimated budget of the building construction was around $19,084.25, with project costs at $24,059.53 with a 30% contingency. The team expected the building construction to last about 2.5 months but anticipated only being in-country for approximately 2 weeks.

4.2 Comments from SLAB

1. Based upon the current schedule, it was advised to re-evaluate current travel dates to account for work and rest days. Rather than being in country for two weeks, the emphasis should be placed on two weeks of work days.
2. Though a cultural adviser had not been selected, SLAB encouraged the team to brainstorm more community engagement activities while in-country.
3. Verification that raising the building 3’ above grade is sufficient.
4. Building upon questions of ownership from the previous milestone, the team should initiate a conversation to formalize long term plans between CASA and the community. In particular, a contract should be created to ensure clarity post-implementation.

4.3 Responses to SLAB input

1. The in-country schedule was adjusted to accommodate the SLAB recommendations. Additionally, a buffer was integrated at arrival in anticipation of any delays the team may experience while traveling to India. A rest day was also moved up earlier in the schedule to allow for the team to adjust to the work environment and conditions.
2. Alongside CASA, Jamie Li created a detailed community engagement plan pending approval of the team's cultural adviser.
3. Poul re-confirmed with the community that the maximum flooding did not exceed 2.5' and so raising by 3' will be adequate.
4. Poul had stated that an agreement had been written down between the community and CASA assuring that complete ownership would be handing to the sangam, in addition to CASA providing 6 months' worth of maintenance costs. The tea has yet to receive this contract and will continue to inquire about looking over the agreement.

5. Milestone III: Project Design

Milestone III expanded and improved the design concepts developed in Milestone II, applying engineering designs and architectural layouts.

5.1 Summary of Project Design

After evaluating preliminary designs, the scope of the building was expanded to 31’ x 26’ to simplify spacing of the columns. The team decided to avoid reducing square footage to better meet the needs of the community; fundraising initiatives were expanded to fully fund the project.

The 31’ x 26’ design allowed for an interior wall to be created, which would split the building into 2 spaces. A larger 20’ x 26’ space is used as the main meeting space, and a smaller 10’ x 26’ used for miscellaneous storage. The layout was chosen for easier implementation, with the dimension being whole, round numbers. The building itself is designed to be a concrete structure with brick infill walls. The exterior of the building will be coated in plaster and then painted. The stairs leading up to the roof will be concrete per Team India 2019’s advice.

CASA hired a local engineer to provide geotechnical data of the site and the report indicated that the soil condition was better than anticipated. The foundation was then determined to be a compact fill solution, with the columns going into the ground by 3’ and concrete footers at the bottom. The ground below the building would be built up with compact fill, with the perimeter consisting of random rubble and shaped stone to keep the fill in place.

5.2 Comments from SLAB

1. The team must emphasize to Poul that following project budgets cannot exceed $15,000. The team can, and should, blame the university for this but Poul needs to suggest smaller scale projects for the following PUC India teams.
2. A tourist visa is not sufficient for the team; previous years have faced issues as teams are not technically tourists. The team needs to reach out with CASA to determine the correct visa and receive sponsorship from the organization.
3. When looking at reducing scope, decreasing square footage is obvious but also look explore decreasing or even removing unnecessary items (i.e. number of windows, window shades, wall heights).
4. How are the stairs cantilever to the building?
5. How do the bricks in the parapet stay up? Does further bracing need to be included to ensure it is not ripped off the building by the wind?
6. The start date of the construction schedule needs to be identified.

5.3 Responses to SLAB input

1. The team explained future budget restrictions for projects following the milestone. Poul was understanding and did not press the issue.
2. It was determined that Poul would need to write a letter explaining the team's affiliation with CASA to obtain the correct visa. Unfortunately, visas were no longer being issued following the milestone due to the COVID-19 pandemic. A letter was not created as it was no longer a priority but Poul is prepared and informed to write one when necessary.
3. The team and technical adviser went through designs to identify potential areas to reduce costs.
4. The stairs are cantilevered to the load bearing columns within the wall they are on. The previous team used a similar technique that was adjusted by the contractor; the plan is to provide the selected contractor flexibility in determining the implementation of this component.
5. May 5th was originally identified as the construction start date but was soon scrapped once summer implementation was cancelled. The start date is flexible and will be determined in conjunction with next year's team.

6. Milestone IV: Project Transition Preparation

Milestone IV was the final presentation to outline transition plans and the current project status with delayed implementation.

6.1 Summary of Project Implementation Preparation

At this point, nothing major had changed in the design of the building except for clarifying rebar details. Due to COVID-19, no money had been transferred to CASA and the search for a contractor was halted as India was on lockdown. Instead of in-country preparation, the team had created a transition plan to integrate next year's team and project. This included identifying mentors for next year's team, determining optimal ways to relay project information, and identifying any additions to the current project scope.

6.2 Comments from SLAB

1. If a bathroom is going to be added to next year's project, be sure to plan for that with sleeves or a similar apparatus to account for roof water.
2. Given the size of the site, a wastewater system being added seems very unlikely. A sink would be more doable, and relevant because of COVID-19.
3. The current community center needs to be torn down prior to the beginning of construction.

6.3 Responses to SLAB input

1. While designs are done for the 2019-2020 project, the team will notify next year's team that designs need to be edited to plan for sleeves if they decide to proceed forward with constructing a bathroom facility.
2. In the proposed additions to the current project, SLAB's sentiments towards a wastewater system will be noted.
3. Poul has given verbal confirmation that it will be relatively easy to tear down the old community center. The team will ask for confirmation via pictures to ensure it is torn down at the appropriate time. Specifically, it will be requested that it be torn down as late as possible to minimize the amount of time the community has no meeting center.

7. Transition Plan

The following is an overview of how the team will coordinate and collaborate with the India 2021 team. The goal is for next year's team to hit the ground running and add to the scope of the existing project. A detailed communication plan is included for CASA and the current technical adviser, Ken Hanks, based upon the team's experiences over this past year. Additionally, methods for reaching out to the 2020 team is laid out for the next school year as well as the sharing of relevant information/accounts.

7.1 Project Communications

Communication with CASA

Communicating with CASA has always been an obstacle for India teams due to the time difference, conflicting schedules, and the language barrier. Poul does have a strong accent and it takes some time to understand him, especially when call connections are poor. The vast majority of important discussions occur over video call and it is highly recommended to have someone who knows Tamil or is familiar with the accent during calls to make sure everything is communicated correctly. For these video calls, the team primarily used WhatsApp. It is recommended that next year's team continues to do this as Poul seems to be the most comfortable with the app. He prefers texting and sending pictures over the platform and a group chat with him was found to be the ideal set-up. In addition to WhatsApp, Skype was used during the COVID-19 pandemic to coordinate with team members living in different areas. This went quite smoothly but again, connectivity was an issue with multiple members on the call. As a side note, it is recommended to take notes during the call in a shared Google Drive and send a follow-up email to Poul that summarizes the discussion and explicitly lists outstanding questions.

For deliverables and additional communication, Poul prefers working through email but does take some time to answer questions and send deliverables. As a project manager for the entire region, he does get very busy but has always delivered. The key is to be patient but persistent, as it does take time for him to get back to the team. Consistency is also crucial; regularly calling Poul on a weekly basis was the most effective way to keep PUC on his mind. That being said, it is recommended to open up other channels of communication with CASA for when Poul is occupied with other projects. The team should reach out to Poul to start a dialogue with Mr. Karuna Yesupadam, the CASA representative that works in Andhra Pradesh and Siripudi specifically. He does speak English and is very enthusiastic about the project; the team has requested his contact information but has yet to receive it. Karuna will be crucial in facilitating communications with the contractor. Poul has stated that the contractor likely won't speak English and so Karuna will have to translate for us once they've been selected, as Poul does not speak Telugu. The hope is to have Karuna help both teams coordinate with the contractor and send updates once construction begins.

The key takeaways here are patience, consistency, and organization. It's crucial to track what is needed from Poul and what to send him, to both keep on schedule and have the team on the same page. As a sidebar, Poul is very helpful and passionate about his work; it's been inspiring to work with him and CASA in helping the community of Siripudi.

Communication with Technical Adviser

An extremely knowledgeable and personable engineer, Ken Hanks has been an invaluable addition to the team. He has extensive knowledge of construction practices in India and the field of structural engineering. The 2020 team met with him approximately once a month, going over design updates and outlining deliverables to the technical leads. These meetings were arranged by the project manager via text and design materials were shared over emails from the PUC account. He is very accommodating and willing to work around the team's schedules; oftentimes, he came in on Fridays during the PUC class after lectures were completed. Ken has also confirmed that he would like to be next year's technical adviser. This'll allow some continuity and give the 2021 team another source with in-depth knowledge of the current project.

Beyond designs, Ken understands the logistics and construction timing that is crucial to the project. He's been a traveling adviser to multiple India teams and knows how best to schedule traveling and more. He is a great resource for logistical questions and the team's logistic lead should work with him, especially when starting to plan.

Inter-team Communication

Audrey Soltau, one of the current technical leads, will be the official transition liaison for Fall 2020. She has intimate knowledge of the designs and has stated she will be available to answer any questions the 2021 team may have. A list of the entire 2020 team's contact information and role descriptions is included in Appendix G for questions outside Audrey's expertise. Meetings can be arranged with Colin Phillips, Ramya Yedatore, and Elise Higgins if necessary; the listed individuals have stated they will be available for mentorship.

To arrange these meetings, the 2020 team would like to create a Slack with a joint channel and two separate ones for each team to encourage regular correspondence. The current team would like to have a joint meeting every month to check progress and directly answer any questions the 2021 team may have, scheduled via slack. Socials would also be a great way for the teams to get to know each other and the 2020 team will also be available to introduce the new members to both Poul and Ken. Particularly with CASA, this may help the transition for Poul and the current team could be on the first video call or more if the 2021 team would like them to be. Additionally, it is requested that emails relevant to both projects CC the 2020 team's email; this'll make sure both groups are on the same page.

Once the spring semester comes, the 2020 team will make efforts to become more integrated in the 2021 team, particularly those that will be traveling for implementation. The team will assist in logistics and help prepare/participate in the Milestone IV presentation.

7.2 Relevant Materials and Resources

Team 2020's Google Account

The Google Drive for this year's project will be shared with next year's team for them to reference; they will be able to view everything but will not be able to edit anything. The Drive hosts all the work conducted throughout the 2019-20 year, compiling logistics, designs, presentations, and video call notes. Additionally, the 2021 team will be granted access to the Gmail correspondences with CASA and Ken should they request it. However, next year's team should create their own Google accounts to distinguish their team and project.

Social Media Accounts

For the team's Facebook and Instagram accounts, a lot of useful information is contained regarding fundraising and marketing strategies. The accounts are used to update friends, followers, families, and donors on the status of the project. A strong base has already been created that has shown incredible support and so the option of using the same social media accounts will be given to the 2021 team. They can alternatively create their own accounts and a pros and cons list is shown below:

Table 3: Pros and Cons of Shared Social Media

	Pros	Cons
Shared Account	• Continuity: followers will be able to witness the progress and expansion of the project • Reach: this would essentially combine the networks of both this years and next years team to reach more friends, families, and potential donors	• Disinterest: followers from the previous team may become disinterested with a new project and another batch of fundraising campaigns • Identity: this would lump the two teams together to the public and limit next year's team from creating their own unique identity
Different Accounts	• Uniqueness: both teams will be able to create their own profiles and reach out to followers in the way they see fit	• Delay: it takes time to establish a following and that may inhibit early campaigns • Lack of continuity

7.3 Available Funds and Combined Budget

The 2020 team raised $22,578 in the fall and spring semesters; $20,505 in the fall and $2,073 in the spring. Despite this, the team is operating at a deficit of $4,709 based upon the detailed contracting bids received from Poul. A high-level breakdown is included below:

Table 4: High-level Budget for Existing Bids

Project Components	Cost
Construction costs	**$20,655**
Contingency (20%)	**$4,131**
Technical Adviser	**$2,500**
TOTAL	**$27,287**

The above budget assumes uses the currently received lowest bid the team has received from Poul. As stated previously, a contractor has already agreed in principle to build the structure for 14 lakhs, or approximately $18,540. With similar technical adviser costs and a 20% contingency, this brings down the total operating budget to $24,748 and a deficit of $2,170. This means that instead of covering the usual $2,500 technical adviser costs, next year's team will only have to raise and additional $2,170 should this contracting agreement be formalized. This is detailed below:

Table 5: High-level Budget for Expected Bid

Project Components	Cost
Construction costs	**$18,540**
Contingency (20%)	**$3,708**
Technical Adviser	**$2,500**
TOTAL	**$24,748**

In addition to this reduced cost, it is highly likely that the materials costs used to generate the 14 lakh estimates are inflated due to COVID-19. A halting in production in India has limited available supplies in rural areas like Siripudi. As a result, it may be possible to see a further reduction in anticipated construction costs. Appendix F contains the current bids/budgets from three contractors.

7.4 Anticipated Deliverables and Timeline

The below table is a general overview of the 2020-2021 year; this accounts for the fall semester ending early at Thanksgiving break. This is just a broad look and it subject to change.

Table 6: Timeline and Deliverables for 2020-2021

Year	Date	Milestone / Deliverables
2020	August 26th	Classes begin
	September 11th	Teams will be assigned and an introductory call will be arranged between the two teams; shared Slack will be created
	September 30th	By this time, meetings will be scheduled by both times for the 2020 team to introduce the 2021 teams to both Poul and Ken
	Early October	Joint team meeting and social
	Early November	Joint team meeting to discuss virtual/winter break communication plan
	November 24th	Last in-person school day, classes move online
	Mid December	Joint team meeting for updates and deliverables for winter break
2021	January 19th	Classes begin again; TBD whether it'll be virtual or on-campus
	Late January	Joint team meeting to sync and social
	February	Joint team meeting; begin visa process through CASA sponsorship; start travel planning and detailing logistics; complete Texas Global paperwork and get relevant immunizations
	March	Joint team meeting; finalize designs and contractor; outline detailed construction schedule; initiate transfer of funds to CASA
	March 15th – 20th	Spring Break
	April	Joint team meeting; finalize logistics, purchase plane tickets
	May	Joint team meeting; address any loose ends
	June	Implementation

7.5 Project Suggestions and Add-Ons

While talking with Poul, it was stressed that a valuable addition to the center would be a restroom facility. The community currently does not have any restrooms and access to a toilet and sink would greatly improve hygiene. During Milestone IV, SLAB was apprehensive to the proposed project due to concerns of creating a safe septic system in a low-lying area susceptible to flooding. Additionally, concerns regarding cost were raised as next year's teams will be limited in the amount they can raise. It is recommended that a sanitation/sink facility similar to previous Thailand teams would be a feasible and impactful addition to the center.

8. Lessons Learned

Table 7: Lessons Learned

Situation/Challenge/ Context	Response of PUC Team	Results / Impacts	Lessons Learned
Not knowing the final cost of the community center	We used previous teams' cost analyses and their unit costs to estimate our total project cost. We also calculated the estimated cost of certain design iterations before completing the designs in order to ensure that we were staying as low in our budget as possible	The COVID-19 pandemic will likely affect the costs of materials in India, so we expect our total project cost to change significantly from our estimations. Currently, our estimated cost is higher than the amount we fundraised, but materials may become cheaper due to the pandemic's impact on the global economy.	Using information from past teams is extremely beneficial since it provides a base point to build off of. However, it is important to prepare for less-than-ideal situations, so in the future, we recommend factoring this into the contingency. In addition, it would be helpful to get general information regarding material unit costs from CASA early on. This might be possible by asking Poul for a contractor's breakdown of material costs for any building project.
Ambiguity regarding who the cultural adviser would until March	We regularly asked Poul for information regarding the cultural advisor, starting in November. This became a "staple topic" in all of our meetings with Poul to demonstrate the need for the cultural advisor and show Poul that we prioritized the issue.	Poul encountered the issue of finding a cultural advisor who could speak both Telugu and English, since the cultural advisors for past teams mostly spoke Tamil. He vaguely confirmed that he found a cultural advisor in January, but did not give us any contact information or names. After we received the name of our cultural advisor (Lavanya), we were not able to connect with her because of COVID-19 related changes. We are not sure that Lavanya will be the cultural advisor for summer 2021.	It would be helpful to create a list early on in the fall semester of all of the information that the team needs from CASA/Poul, including the cultural advisor's name and contact information. Sharing this list with Poul, keeping track of the list, and mentioning items on the list regularly in meetings with Poul will be beneficial to ensure that the team receives the information it needs by the required deadlines. Especially since the community largely doesn't speak English, it's important to prioritize the cultural advisor early on in project planning and hopefully get in touch (and stay in touch) with them throughout the spring semester.
Inability to flesh out a detailed community engagement plan due to no cultural adviser	We tried to plan out general activities and brainstorm ideas for community engagement, but our main issues were that 1) we did not know who our cultural advisor was	Our community engagement plan was largely based on the travel logistics (arrival and departures dates, etc). We narrowed down our ideas to activities/games with children and a community	The community engagement plan was a severely under prioritized deliverable in our team. We did not have continuous discussion with CASA about ways to engage the community (a few back-and-forth questions early on in the

	so we could not use a cultural advisor as a resource, and 2) our logistics and travel plans were very up-in-the-air because of the rapidly changing coronavirus crisis. In addition, there was not much communication between the team and the NGO about community engagement activities.	breakfast provided by the team. We did not have the details planned out, such as how we would get the materials to Siripudi and we didn't have full approval from Poul/CASA since our plans were not concrete.	fall semester) and it was quite thrown together. We definitely would have benefited from being in contact with a cultural advisor (which goes hand-in-hand with the previous item in this section).
Lacking a confirmed contractor for the project	From November and December of fall semester, we began asking Poul about potential contractors. We had a basic understanding of the scope of the community center by then and we had heard from previous teams that finding a contractor was a major issue/delay. We mentioned the contractor issue in every meeting we had with Poul. However, the "bidding process" for a contractor did not seem to begin until February, and we only saw some quotes from contractors by late March and April.	It was difficult to get a grasp on the total cost of our project without quotes from contractors, especially when we were required to present our cost analysis in Milestones 2 and 3. This also made it difficult to review/revise our designs, since we were unsure of exactly how far outside the budgeted scope we were.	As soon as possible, we recommend discussing contractors with Poul. It would also be helpful to inform him very early on in the semester that the team has a deadline to find the contractor in early spring. Lastly, it would have been beneficial to get more accurate cost analyses and have Poul started on the contractor bidding process earlier by sending Poul some more preliminary designs (we did not send designs early on because we were advised against it due to the risk of scope creep).

9. Recommendations

Should we continue to work with the client community?

The village of Siripudi has been extremely supportive of the project. The team has had two calls to date directly with the community for introducing team members and the designs of the structure. The most highly educated woman in the community looked over the designs and gave her enthusiastic approval, a definite highlight of the 2020 team. Though implementation is not possible for this summer, we are confident that the community will be extremely welcoming to a larger PUC and CASA team in summer 2021.

Possible follow-up projects?

A list of potential follow-up projects for this community in particular are included below:

- *Sanitation facilities*: the community lacks any restrooms or sewage system. Especially during the COVID-19 pandemic, this presents challenges in ensuring hygienic conditions for the villagers. Sinks and bathrooms would be a valuable facility that would be used by the community.

- *Solar energy system:* After speaking with the village over the course of the year, it was determined that a grid does in fact exist that provides electricity to the community and surrounding area. This makes it possible for a solar energy system to be constructed that can both provide electricity to the entire village and act as a source of income for the community for energy surpluses. There is available land on the current site to support a separate solar energy system.

Should we continue to work with the NGO?

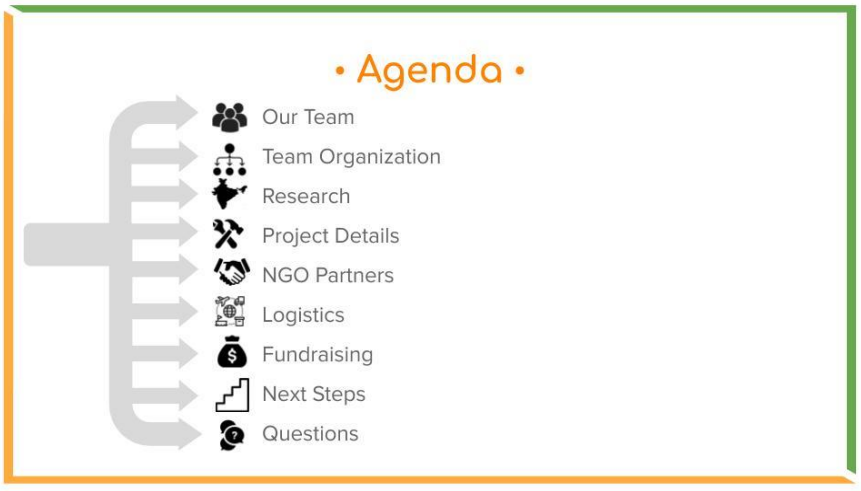
CASA, and in particular Poul, has been very supportive and accommodating to the project despite unforeseen obstacles like COVID-19. With any international project that has significant time zone differences, there are barriers in communication but CASA has done beyond what the team expected from our in-country NGO. Poul has encouraged and facilitated communication with the community and helped assist raising funds for COVID-19 relief for Siripudi. He's very passionate about his work and has been very friendly to the team. He has been a tremendous asset for the team and pointed us in the right direction for many of the questions the team had, especially early on.

As touched on previously, communication does have room for improvement but it's not from a lack of effort from CASA. Poul is a very busy man and does have other priorities. It's recommended to prioritize consistent communication with Poul and ideally have another point of contact in CASA. Mr. Karuna Yesupadam has already been identified as a potential candidate and the team has already spoken with him once before. Like Poul, he is also a very passionate individual and energetic about the project.

The 2020 team is looking to forward to continue working with CASA throughout this next year and foster a stronger relationship with the organization. The NGO has been a crucial part of PUC project success in India and hope this partnership continues in the future.

10. Appendices

Appendix A. Milestone I Presentation



Team Introductions

Project Manager

Colin Phillips
3rd Year
Electrical/Computer Engineering, Mathematics

Fundraising Manager

Ramya Yedatore
3rd Year
Biomedical Engineering, Plan II

Team Introductions

Cost / Resource / Technical Manager

Elise Higgins
4th Year
Civil Engineering

Scope / Change / Deliverables Manager

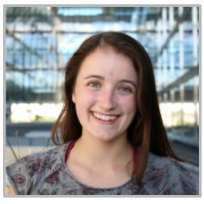
Dain Kasprak
4th Year
Biomedical Engineering

Quality / Safety / Technical Manager

Audrey Soltau
3rd Year
Architectural Engineering

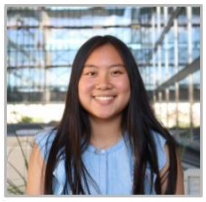
Team Introductions

Logistics Manager

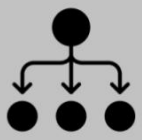


Britta Dalton
3rd Year
Mechanical Engineering

Communications and Relations Manager



Jamie Li
2nd Year
Social Work

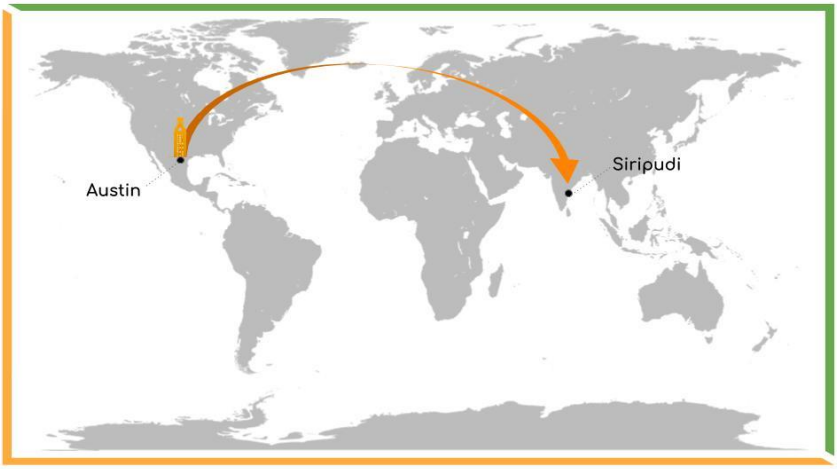


Team Organization

RACI Matrix

Tasks	Colin P. (Project Manager)	Elise H. (Cost/Technical Manager)	Dain K. (Scope/Deliverables Manager)	Britta D. (Logistics Manager)	Jamie L. (Communications Manager)	Audrey S. (Quality/Safety Manager)	Ramya Y. (Fundraising Manager)
Logistics							
Create travel plan and schedule with contingencies	C/I	A	C/I	R	C/I	C/I	C/I
Begin talks with CASA to create contract for accomodations	A	A	I	R	I	I	I
Generate prelimary costs per student in-country	C/I	R	I	A	I	I	I
Fundraising							
Create HornRaiser campaign page and schedule	A	I	I	I	I	I	R
Edit HornRaiser video	I	I	I	R	I	I	A
Maintain ambassador list and fundraising contacts	A	I	I	I	I	I	R
Develop website and update as needed	R	I/C	I/C	I/C	I/C	I/C	A
Manage social media and create content	A	R	I/C	I/C	I/C	I/C	A
Track raised funds and donors	A	A	I	I	I	I	R
Communication							
Handle direct contact with NGO	A	I	I	I	R	I	I
Write follow-up emails to be shared with relevant parties	R	I/C	I/C	I/C	A	I/C	I/C
Record and log meetings with NGO and community	I	I	I	I	A	I	R
Arrange commmunity involvement/activities	A	I/C	I/C	I/C	R	I/C	I/C
Technical Deliverables							
Decide upon a Technical Advisor	I/C	R	I/C	I/C	I/C	A	I/C
Consult with various sources to lock down size of structure	I/C	R	A	I	I	A	I
Create prelimary technical drawings/design of building	I	A	I	I	I	R	I
Analyze geotechnical report and make adjustments to designs	I/C	A	I	I	I	R	I

Country/Client/Region Research



India

- Capital: New Delhi
- Population: 1.339 billion
- Ethnically and culturally diverse
  - Numerous religions and sects
  - Many languages
- Economy: extremely diverse
- **71.03 Rupees = 1 USD**

Andhra Pradesh

- Three physiographic regions
- Climate
  - **March - June: Summer (VERY hot)**
- Population: 84 million (as of 2011)
- Language: **Telugu**
- Economy: Agriculture and industry

Siripudi

- Nagaram Mandal, Guntur, Andhra Pradesh
- **44 tribal families** and **15 Scheduled Caste families**
- Lies on a lowland plain in the Krishna River delta
- Food: No stable diet
- Economy: No stable income source

Project Details

Initial Project Options

Community Center	• Construct building to perform variety of functions for community, including as a place for medical treatment • Shelter during severe weather events
Solar Panels for an Entire Village	• Provide sustainable energy source for local community • Possible source of income if energy surplus
Sanitation Facility	• Add on bathroom and other facilities to last year's project • Potential flooding, ruled out quickly

Project Assessments

Project Assessment Criteria	Community Center	Solar Project
Feasibility	27.3	18.125
Impact on Community	43.75	43.75
Project Risks	- 25.5	- 21.75
Total	45.55	40.125

Our Project

Objective

Establish a **Community Center** in Siripudi village for tribal families to be used for ceremonies, medical treatment, and refuge.

Scope

- 59 families
- **15 ft x 30 ft**
- Raised above ground
- Wiring for electricity

Impact

Provide **shelter** for families during cyclones and place to receive **services** despite being a socially-excluded community

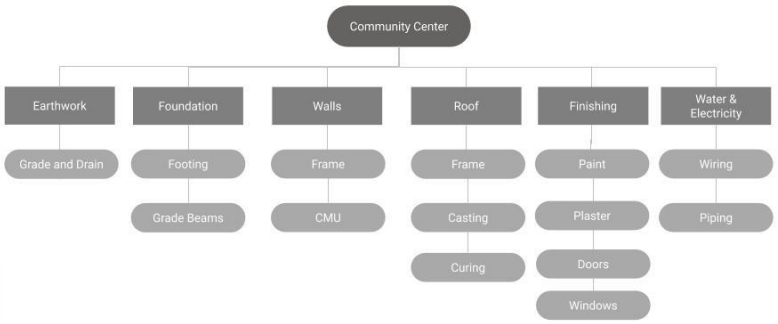
Success Drivers

- Strong relationship with NGO
- AutoCAD and design software capabilities
- Experienced Technical Advisor
- Access to information about previous similar projects

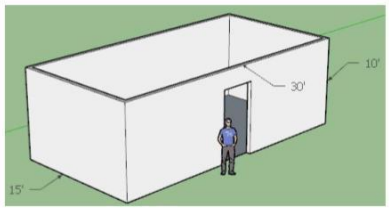
Scoping Challenges

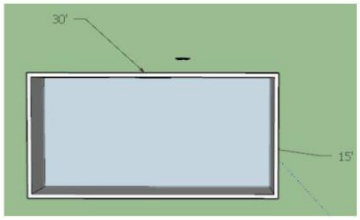
- Limited geotechnical information about the site
- Raised structure
- Flooding at the site due to storms
- Foundation and roofing curing time
- Construction scheduling and planning
- Fundraising/Budgeting
- Monsoon season

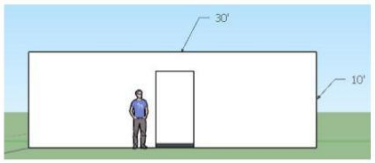
Work Breakdown Structure



Preliminary Design







Site & Design Specifications

- Foundation estimated 3 ft into ground
- Raised 4 ft above ground
  - 2ft high road next to site
  - Flooding / monsoons
- Walls are 10 ft tall
- Corner lot & level ground
- Water pump nearby
- Sandy soil
  - 30 minutes from the coast

Literature Review

- Reinforced concrete beams for columns & raising
  - Primary structural system
- Individual footings for foundation
- Uniform grid for column location
  - Reduces costs with repetitive members
  - Increase speed of construction

https://www.wbdg.org/design-disciplines/structural-engineering

http://www.understandconstruction.com/types-of-foundations.html

India 2019

Materials Breakdown

Reinforced Concrete: Mixed on site, equipment provided by contractor.

Roof: Concrete (must cure for 3 weeks)

Walls: Clay brick & local materials

India 2019

Estimated Project Budget

Phase	Cost
Foundation/Earthwork	$4,000
Walls	$500
Roof	$2,000
Columns	$4,500
Electrical	$300
Contractor Fee	$1,500
Construction Total	$12,800
Technical Advisor Travel Fees	$2,500
Contingency (25%)	$3,200
Total Project Cost	$18,500

Estimated Project Timeline

Community Involvement

Design Phase

- Group call with village of Siripudi
- Support of community

Implementation Phase

- Spend first days greeting and befriending
- Bring games/activities

Termination/transition

- Village Sangam will own and maintain the building
- Provide a sustainability and maintenance plan
- End ceremony

NGO Partner

Church's Auxiliary for Social Action (CASA)

Purpose

- Humanitarian and development arm of 24 Protestant and Orthodox churches
- **Objective**: Strengthen the poor and promote efforts of marginalized groups towards sustainable development

Reach

- 38 sector offices in 20 states
- Operational in 10,500 villages (500 partners)

CASA People Helping People | 70 years in India

CASA / Team India Partnership

	Team India	CASA
Roles	• **Develop scope** of multipurpose center • **Raise funds** for resources for construction • Utilize customer needs and engineering requirements to **design center**	• Analysis of community **needs** • Establishment of **expectations** • **Obtain resources** for construction (materials, contractors, etc.)
Services	• Provide CASA with **monetary support** • Deliver **design** of center • **Construct** center alongside CASA and contractors	• **Inform** Team India about surrounding area, materials, and resources • **Provide decisions** regarding scope and purpose

Scope: Parameters and Expectations

Need	• Provide opportunity for proper marriage • Place of refuge during inclement weather • Empower children through laying foundation of education system • Area suited for providing medical treatment for citizens
Interest	• Transformation of space for multiple functionalities (storage, sustainability) • Fabricating sense of community
Concern	• Defining of scope and communicating scope with NGO • Ensuring that all functions can be incorporated into this space as needed
Expectation	• Complete design and implement multipurpose center • Create sustainability/maintenance plan

Communication with Stakeholders

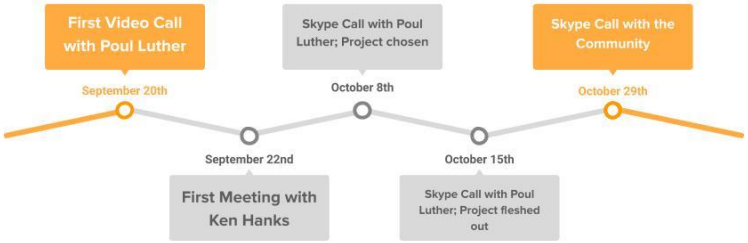
Stakeholders

- Main POC: Poul Luther
- Technical Advisor: Ken Hanks
- Community Members
- CASA Participants
- Contractors
- Team India

Methods of Communication

- Whatsapp
- Email
- Skype / FaceTime

Communication Timeline



Project Logistics

Preliminary Travel Logistics

Travel Dates: May 27th - June 21st

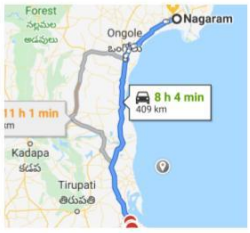
Transportation: Flight from Houston to Chennai, CASA provided vehicle and driver then drive to Siripudi

Lodging: CASA provided housing and meals

Project Location

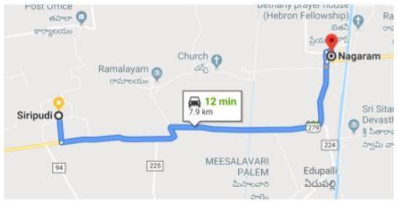
In-Country Travel Logistics

1. Meet in Chennai
2. Stay in Chennai 2 days
3. Drive to Siripudi



Local Accommodations

- CASA will provide lodging and meals in Nagaram
- CASA will provide a vehicle for us to use
- CASA staff member will be with us 24/7



Contingency Plan

- **Travel Delay**
  - Stay in Chennai 2 days before traveling to village (buffer time)
- **Medical**
  - Doctor Babu Hospital → 20 minute drive from Siripudi
- **Emergency Contact**
  - Get SIM cards for phones and Internet cards for laptops

Travel Cost

Student Cost Per Person	Technical Advisor Cost
$3,217	$2,500

Total Cost
$25,019

Schedule

	September - October	November - December	January - February	March - April	May - June
Fundraising					
Project Development					
Design					
Implementation					

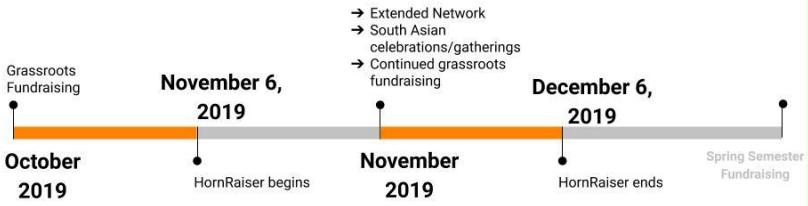
Fundraising

HornRaiser Goal

$17,000

November 6 - December 6

Fundraising Timeline



Fundraising Plans

Upcoming Fundraising Events

- Raised $381 at our first fundraising event
  - Collaborated with Tiff's Treats
  - Reached over 150 students
- Diwali celebrations in Austin
  - November 3rd - Austin Kannada Sangha
  - November 10th - Telugu Cultural Association
- Cultural events at UT Austin
  - November 16th - Jeena

Social Media and Outreach

- Instagram
  - Audience: family, friends, college students, younger populations
  - Regular updates and stories
  - Fundraising events and quick links to donate/get involved
- Facebook
  - Audience: family and extended network, older populations
  - More professional posts regarding our HornRaiser
- YouTube Vlog
  - Audience: family, friends, extended network, strangers!
  - Personal updates about our project
  - Content to be shared on all social media
- Website/blog
  - Audience: PUC alum and UT-affiliated people, family and friends (especially once implementation begins)

Instagram

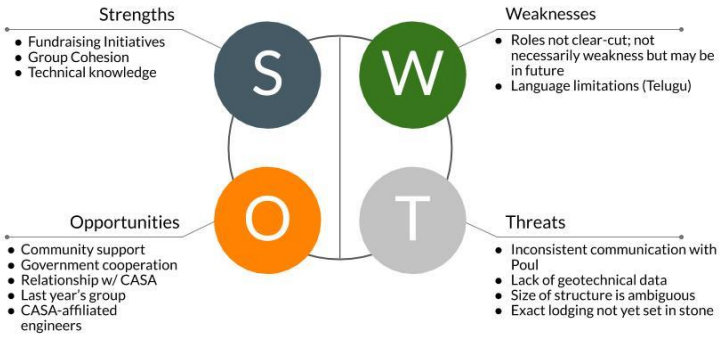
YouTube

facebook

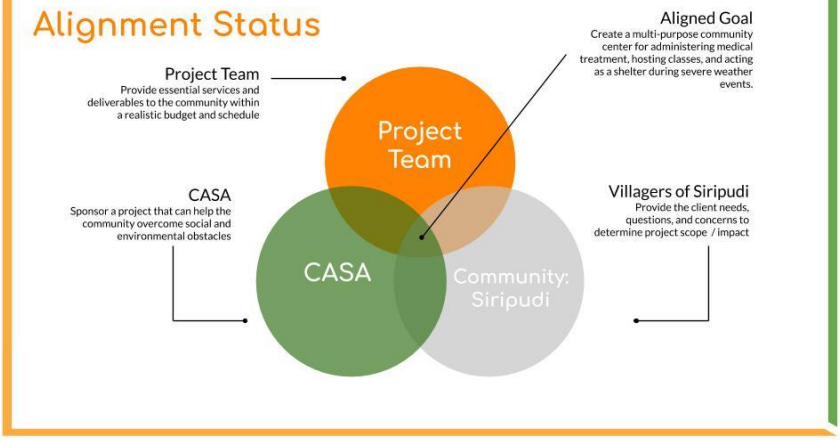
@pucindia2020

Next Steps

S.W.O.T. Analysis



Alignment Status

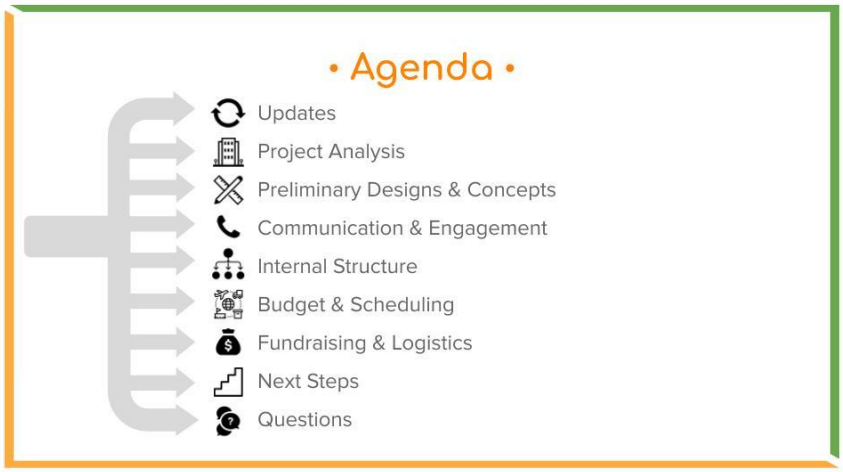


Questions Going Forward

- Questions remaining for
  - Client community
    - Educational/skill development outreach?
    - Construction involvement?
  - CASA
    - Contractor selection/roles
    - Specific material cost and availability
  - Site planning
    - Geological site information
  - Past Team India
    - General advice during design/implementation phase

Questions?

Appendix B. Milestone II Presentation



Updates from Milestone 1

Project Recap

Community	• Village of **Siripudi**, Andhra Pradesh • **59 Families** in the surrounding area • Scheduled Caste and Tribe
Partners	• Church's Auxiliary for Social Action (**CASA**) • Mr. **Ken Hanks**, P.E.
Project	• **Multipurpose Community Center** • Education, medical treatment, cultural events, shelter
Budget	• Preliminary Budget: $18,500 • Design 1 Budget: **$24,059.53** (30' x 25') • Design 2 Budget: **$21,251** (30' x 15')

Summary of SLAB Comments

Possibility of Multi-year Project	• Integrate soft wall • Two project designs currently • Size concerns
Geotechnical Data	• Still lack geotechnical data • Hire surveyor
Ownership	• Village sangam (council) • Government approval • Not an anganwadi

Community Updates

- Village leader: **Mr. Koteswara Rao**
- Weather: Infrequent flooding (**max 2 - 2.5 feet**)
- Soil taken from site; analysis yet to be performed
- Current Community Center
  - **Temporary structure** covered with coconut leaves
  - Floods during even light rain
  - **10' x 15'** structure with low ceiling
  - Demolished after Multipurpose Community Center constructed

Project Analysis

Project Overview

Objective

Establish a **Multipurpose Community Center** in Siripudi village for tribal families to be used for ceremonies, medical treatment, and refuge.

Scope

- 59 families
- **30' x 25' (750 sq. ft)**
- Raised above ground
- Wiring for electricity

Impact

- Provide **shelter** during inclement weather
- Place to administer **medical treatment**
- Lay foundation of an **educational system**
- Establish a **tight-knit community**

Project Assessment Tool

Project Assessment Criteria	Original Assessment	New Assessment
Feasibility	27.5	27.5
Impact on Community	43.75	43.75
Project Risks	- 32	- 25
Total	39.25	46.25

International Project Risk Assessment (IPRA)

Category	Likelihood of Occurrence					Relative Impact						Baseline	Coordinate
	1	2	3	4	5		A	B	C	D	E		
I.Finance / Funding	X										X	E	E1
II. Cultural				X				X				B	B4
III. Political			X					X				B	B3
IV. Legal		X								X	X	D	D1
V. Project Scope		X							X			C	C2
VI. Sourcing and Supply		X							X			C	C2
VII. Design / Engineering	X										E	E	E1
VIII. Construction			X						X			C	C3
IX. Sustainability / Maintenance	X									X		D	D1

Risk Assessment Matrix

Preliminary Designs & Concepts

Scope and Design

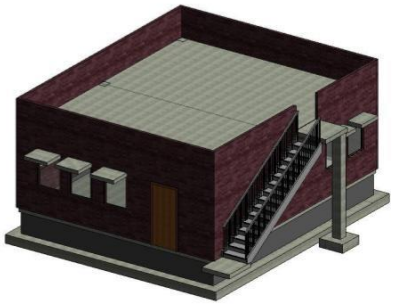
Two Potential One Year Designs:

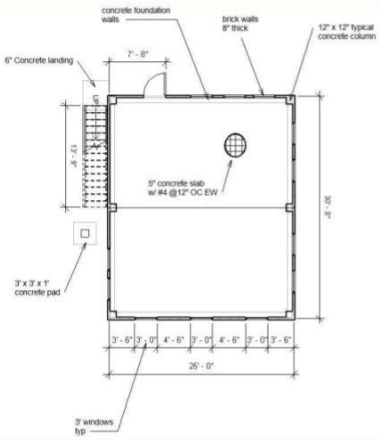
1. 30 ft x 25 ft (750 square feet)
2. 30 ft x 15 ft (450 square feet)

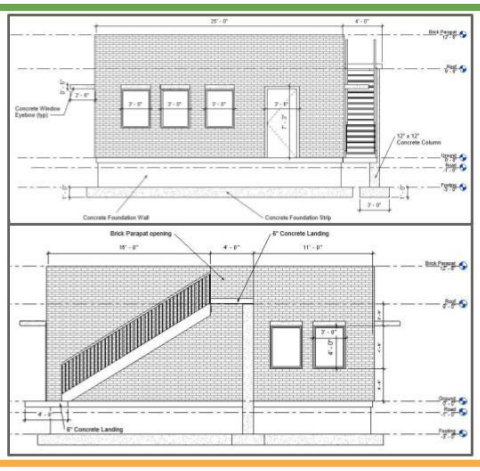
Both raised 1 ft above road & 3 ft above ground

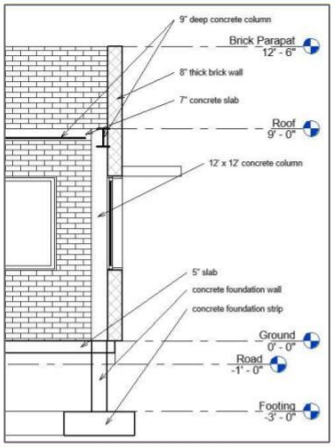
- Area is subject to max 2.5 ft flooding
- Design choice is dependent on future site information

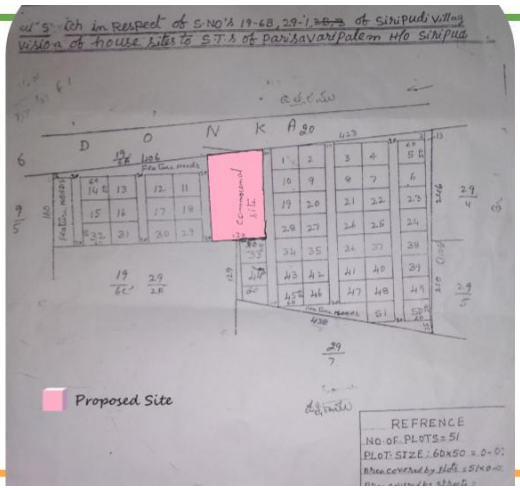
Design 1: 30' x 25'



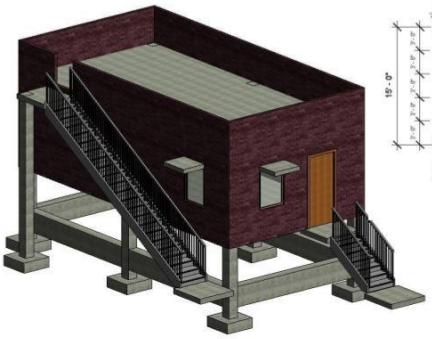


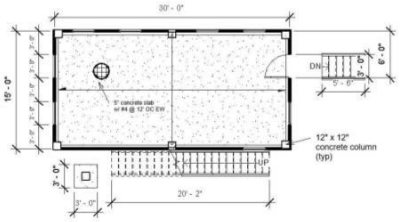

Concrete Window Eyebow (typ)
12" x 12" Concrete Column
Concrete Foundation Wall
Concrete Foundation Strip
Brick Parapat opening
8" Concrete Landing
Brick Parapat
8" Concrete Landing

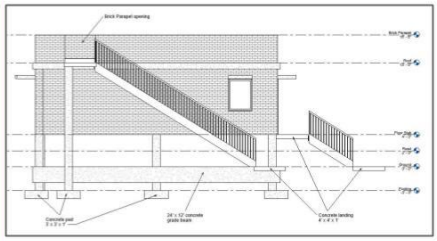

9" deep concrete column
Brick Parapat
12' - 6"
8" thick brick wall
7" concrete slab
Roof
9' - 0"
12' x 12' concrete column
5" slab
concrete foundation wall
concrete foundation strip
Ground
0' - 0"
Road
-1' - 0"
Footing
-3' - 0"

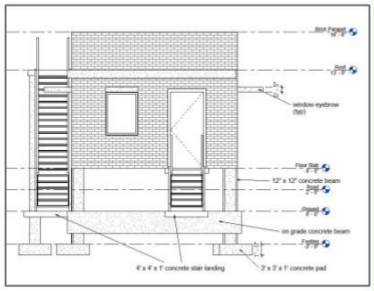

Proposed Site
REFRENCE
NO OF PLOTS = 51

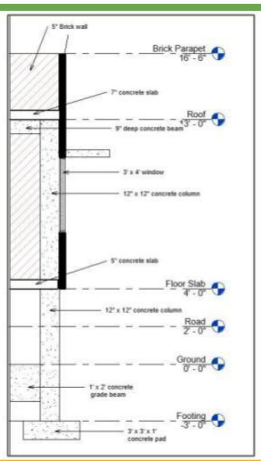
Design 2: 30’ x 15’











Multi-Year Project Possibility

- **Increase dimensions** of Community center
- Build half the center and lay the foundation for the whole structure
  - Use soft wall to close off half of structure
  - Wood, CMU
- Span project over **2 years**
  - Team India 2021 will complete community center
- Preliminary discussions with Poul

Project Design Comparisons

	Pros	Cons
Design 1: 30' x 25'	• Cheaper per square foot • More floor space • Better meets the needs of the community • Fewer technical challenges	• Subject to erosion concerns • More dependent on soil conditions & topography • Possibility of shipping in material for fill
Design 2: 30' x 15'	• Removes issue of erosion • Can withstand higher flood levels • Faster construction time • Lower overall cost	• More expensive per square foot • Smaller • May need to be part of multi-year project

Design and Materials

Foundation:

- Footing depth and dimensions depend on soil properties
- Awaiting soil test results to determine final design

Concrete:

- Mixed on site, costs and type to be further discussed with contractor
- Pro: mixing can be done anywhere
- Con: risks of setting improperly/weaker than expected

Design and Materials

Masonry:

- Brick for walls will be sealed with painted plaster to protect against weathering

Reinforcing Steel:

- Rebar will be used for columns, floor, and roof

India 2019

Literature Review

Building Codes

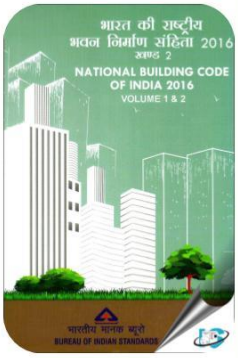
- IBC (International Building Code) - USA
- NBCI (National Building Code of India)
  - Addresses lack of uniformity in different regions

Reference: National Building Code of India and the IBC

- Defines which IBC Spec corresponds with NBCI
- Building regulations/codes for Andhra Pradesh
- Not heavily followed in rural areas or non-metropolitan areas

American Concrete Institute

- Many parts of the IBC refer to the American Concrete Institute's specifications



Technical Limitations & Barriers

Limitations in Knowledge

- Geological, topographic, and survey data of site
- Language barriers in plans

Expertise Needs

- Local contractor
- Certified structural engineer for analysis
- Materials and geotechnical advising

Technical Difficulties

- Methodology to raise structure
- Determining optimal materials to be used (necessary to ship)
- Ventilation/cooling

Budget & Scheduling

Cost Breakdown

No long lead purchases

Phase	Cost for Design 1 (30'x25')	Cost for Design 2 (30'x15')
Concrete	$ 6,134.25	$4,500
Steel Reinforcement	$ 1,350.00	$1,624
Brick Walls	$ 2,000.00	$900
Earthwork	$ 2,000.00	$3,000
Stairs	$ 900.00	$900
Electrical	$ 500.00	$500
Miscellaneous	$ 2,200.00	$1,500
Contractor Fee	$ 1,500.00	$1,500
Technical Advisor Travel	$ 2,500.00	$2,500
Contingency (30%)	$ 4,975.28	$4,327
Total	**$ 24,059.53**	**$21,251**
Price per square foot	$32.08	$47.22

	Project Phasing (Deliverables) Plan	
Month	**From Austin to India**	**From India to Austin**
December	• Send both design options to Poul • Discuss options and potential for a multi-year project.	• Send geotechnical report, topographic map of area, and survey.
January	• Edit designs based off geotech/topographic information received of site • Iterate through various drafts and gain approval from Technical Advisor.	• Get Cultural Advisor information and feedback on initial designs • Send specific wants/needs for the aesthetics and details of the building. • Finalize contractor.
February	• Reach out to contractor, and create a more accurate building costs/rates budget. • Continue design refinement	• Establish line of communication between PUC, Ken Hanks, and the contractor • Finalize housing and transportation logistics.
March	• Finalize designs, budget, travel plan • Get approval from Ken/other tech advisors regarding final building design	• Finalize contract between CASA and the community regarding ownership and timelines
April	• Send Poul and contractors final designs • Establish clear timeline of implementation with partners	• Mobilize labor/materials/etc. to start construction next month.
May	• Site excavation/start of construction; stay in touch with CASA for updates • Get ready to go to India!	• Start construction and site excavation! Stay in contact with to notify us of updates and progress.

Contracting Plan

CASA-Selected:

- Poul finalized 3 engineers - they each need to give quotes, then they'll choose the lowest quote
- Will be done in a couple of weeks and Poul will let us know
  - Definitely will be known in January

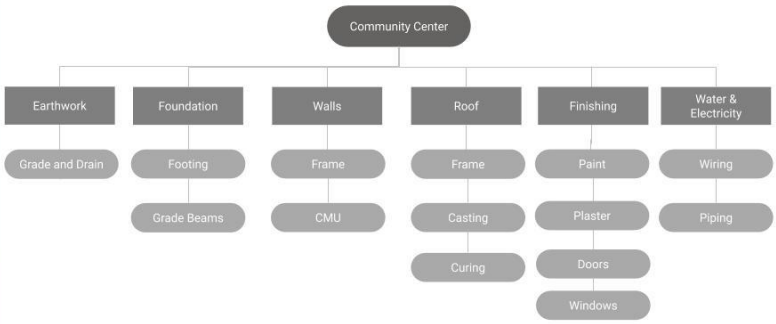
Role:

- Provide construction services, labor, and materials

Contract:

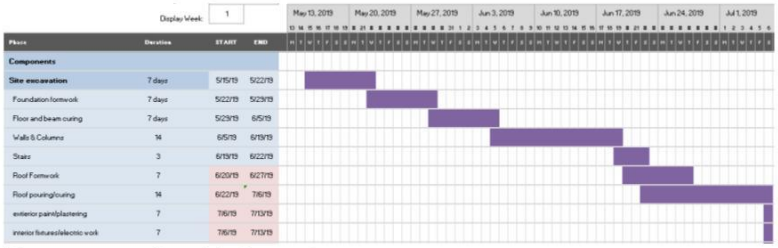
- Not yet developed, will be finalized by January

Work Breakdown Structure



Estimated Project Timeline

Resource-loaded Bar Chart



Phase	Duration	START	END
Components			
Site excavation	7 days	5/15/19	5/22/19
Foundation formwork	7 days	5/22/19	5/29/19
Floor and beam curing	7 days	5/29/19	6/5/19
Walls & Columns	14	6/5/19	6/19/19
Stairs	3	6/19/19	6/22/19
Roof Formwork	7	6/20/19	6/27/19
Roof pouring/curing	14	6/22/19	7/6/19
exterior paint/plastering	7	7/6/19	7/13/19
interior fixtures/electric work	7	7/6/19	7/13/19

Contractor confirmed in January

Team in Country: walls, columns, stairs

Communication & Engagement

Client & Partners Engagement

Sep. 22nd	Video call with Poul (CASA)
Oct. 7th	Video call with Poul (CASA)
Oct. 18th	Meet with Ken (Tech advisor)
Oct. 25th	Video call with Siripudi community members
Nov. 8th	Video call with Poul (CASA)
Nov. 8th	Meet with Ken and past PUC India team
Nov. 18th	Video call with Poul (CASA)
Nov. 25th	Video call with Poul (CASA)

CASA People Helping People | 70 years in India

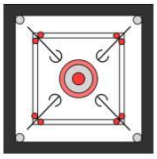
Austin Community Engagement

- Austin Girl Scouts troop interested in collaborating with us and CASA to help village of Siripudi
- Project ideas:
  - Collecting items to donate to village (school supplies, toiletries, toys)
  - Helping to fundraise
  - Booth at Girls Day

Girl Day at UT Austin

Community Engagement Plan

- Ideas for community engagement activities
  - Educational games and activities with children
  - Play Carrom Board and sports with children
  - Cook breakfast for community
- Cultural advisor can offer ideas and give us guidance in planning beneficial and engaging activities



Communications Plan

- Continue video calling with Poul
  - Plan to call **every two weeks**
  - Ramya will directly call Poul, other team members facetime in
- **Email communication** with Ken
  - Plan to call or meet with him at least once
- Phone and email communication with Girl Scouts troop leader
- GroupMe communication with team members
- Waiting to be connected with Cultural Advisor

Roles & Contributions

	Team India	CASA	Community
Roles	• **Develop scope** of multipurpose center • **Raise funds** for resources for construction • Utilize customer needs and engineering requirements to **design center**	• Analysis of community **needs** • Establishment of **expectations** • **Obtain resources** for construction (materials, contractors, etc.)	• **Partner** with CASA and Team India to build community center • **Provide** insight to community lifestyle and culture
Services	• Provide CASA with **monetary support** • Deliver **design** of center • **Construct** center alongside CASA and contractors	• **Inform** Team India about surrounding area, materials, and resources • **Provide decisions** regarding scope and purpose	• **Inform** CASA of needs, desires, concerns, and questions • Tear down old community structure

Internal Structure

RACI Matrix

Tasks	Colin P. Project Manager	Elise H. Cost/Technical Manager	Dain K. Scope/Deliverables Manager	Britta D. Logistics Manager	Jamie L. Communications Manager	Audrey S. Quality/Safety Manager	Ramya Y. Fundraising Manager
Fundraising							
Track HornRaiser Progress and write updates	A	I	I	I	I	I	R
Reach out to companies regarding donations	A	I	R	I	I	I	R
Maintain ambassador list and fundraising contacts	A	I	I	I	I	I	R
Track Venmo donations and profit share revenue	A	I	I	I	I	I	R
Manage social media and send updates	A	R	I/C	I/C	I/C	I/C	A
Reach out to professors and local architects/engineers	R	R	I	I	I	R	A
Communication							
Handle direct contact with NGO	A	I	I	I	R	I	I
Write follow-up emails to be shared with relevant parties	R	I/C	I/C	I/C	A	I/C	I/C
Record and log meetings with NGO and community	I	I	I	I	A	I	R
Collaborate with Girl Scouts for local communtiy involvmenet	I/C	I	I	R	A	I	I
Arrange communnity involvement/activities	A	I/C	I/C	I/C	R	I/C	I/C
Technical Deliverables							
Create Revit sketches of two preliminary designs	A	A	I	I	I	R	I
Consult with various sources to lock down size of structure	I/C	R	A	I	I	A	I
Discuss with Technical Advisor on adjustments	I	A	I	I	I	R	I
Conduct materials and structural analysis	I	R	I	I	I	A	I
Volume calculations and per-unit material costs	I	R	I	I	I	A	I
Analyze geotechnical report and make adjustments to designs	I/C	A	I	I	I	R	I

Lessons from Previous Teams

- **Technical Data Limitations**
  - Be prepared to make designs without usual information
  - Flexibility
- **Clarity**
  - Outline the scope/budget constraints very clearly
  - Be in constant contact with Poul and get another CASA contact information if possible (Mr. Karuna Yesupadam)

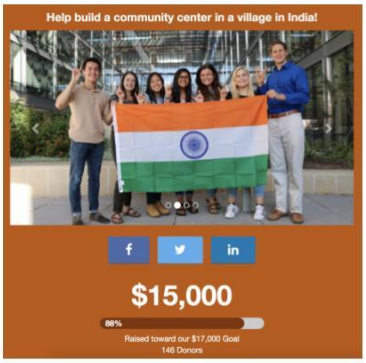
Fundraising & Logistics

Current Status of Fundraising

- $15,000 raised out of $17,000 (**88%**)
- *3.5 days remaining*
- Over 470 people reached
- 2 raffles
  - SoulCycle
  - Kendra Scott earrings

HORN RAISER

venmo



Timeline

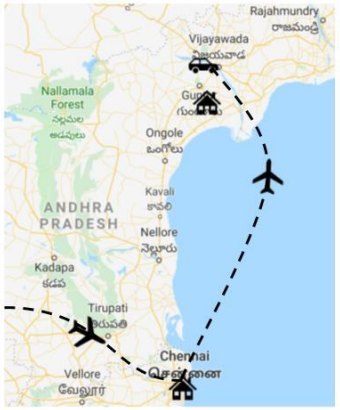
Spring Semester Fundraising Goal: $3,000

Grants & Potential Donors

- **Grant Proposal Next Steps**
  - Proposal written
  - Apply for grants after refining grant and scoping project
- **Potential sponsors targeted**
  - Michael and Susan Dell Foundation
  - Narotam Sekhsaria Foundation
  - Pickle and Pal Awards
  - Procter and Gamble

Updated Travel Plans

1. May 26th - Fly to Chennai
2. Stay in Chennai a couple days
3. May 29th - Fly together to Vijayawada
4. CASA driver picks us up
5. Drive to Nagaram (2 hour drive)
6. Stay in Nagaram
7. Commute to Siripudi (15 minute drive)



In Country Travel Logistics

- **Chennai**
  - **5/27/20 - 5/29/20**
  - CASA Resource Center
  - Driver (Travel Advisor) transports team from airport to CASA center (20 km)
- **Vijayawada**
  - **5/29/20**
  - Fly from Chennai to Vijayawada
  - CASA driver will transport team from Airport to Nagaram (2 hour drive, 70km)

In-Country Travel Logistics

- **Nagaram**
  - **5/29/19 - 6/18/19**
  - CASA provided house (lodging and food)
  - Poul is working to find our host house
  - One CASA staff member will be with us 24/7
- **Siripudi**
  - **5/29/19 - 6/18/19**
  - Location of project
  - We will commute to Siripudi from Nagaram (about a 15 minute drive)

Contingency Plan

- **Travel Delay**
  - Stay in Chennai 2 days before traveling to Siripudi (buffer time)
- **Medical**
  - Doctor Babu Hospital → 20 minute drive from Siripudi
- **Communication**
  - Team has been learning Telugu

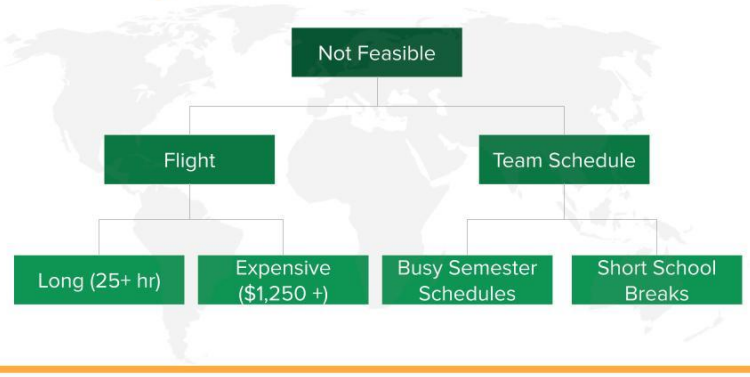
Travel Cost

Student Cost Per Person
$3,217

Technical Advisor Cost
$2,500

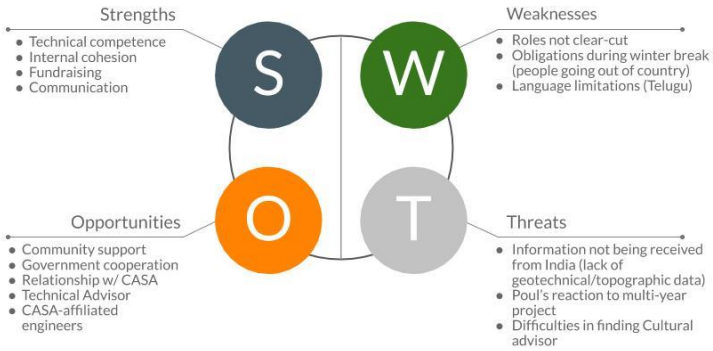
Total Cost
$25,019

Recon Trip

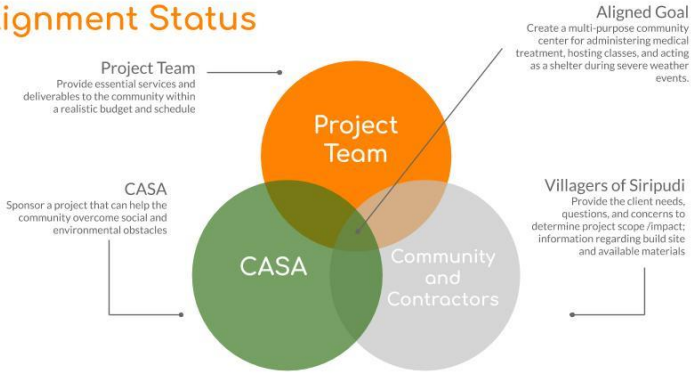


Next Steps

S.W.O.T. Analysis



Alignment Status



Winter Break Work Plan

- **Technical Components**
  - Iterate through several more designs (at least two)
  - Receive geotechnical data from Poul
  - Continued discussion with Ken regarding adjustments
- **Fundraising**
  - Reach out to companies regarding donations for Spring fundraising period
  - Update website and blog posts; additionally vlogs
  - Send out additional grant proposals
- **Logistics**
  - Reach out to Cultural Advisor (if assigned)
  - Track plane ticket prices and work with technical managers to determine most optimal time to arrive
- **Communication**
  - Deliberate with Poul more regarding multi-year plans and the community's preference

Questions Going Forward

- Client community
  - Specific layout of interior, e.g. rooms and closets
  - Desired activities while in country
- CASA
  - Contractor decision timeline
  - Contract agreements (CASA, PUC, Community)
  - Site information (soil tests, hiring of surveyor)
  - Prospect of multi-year project
- Contractor
  - Available materials
  - Reaction to preliminary designs and preferences

Questions?

Appendix C. Milestone III Presentation

Team Introductions

Colin Phillips
Project Manager

Ramya Yedatore
Fundraising Manager

Audrey Soltau
Quality/Safety Manager

Britta Dalton
Logistics Manager

Elise Higgins
Cost/Resource Manager

Dain Kasprak
Scope/Deliverables Manager

Jamie Li
Communications/Relations Manager

3

Project Overview

Project Recap

Community	• Village of **Siripudi**, Andhra Pradesh • **59 Families** in the surrounding area • Scheduled Caste and Tribe
Partners	• Church's Auxiliary for Social Action (**CASA**) • Poul Luther, Project Officer • Mr. **Ken Hanks**, P.E. Structural Engineer
Project	• **31' x 26' Multipurpose Community Center** • Education, medical treatment, cultural events, shelter
Budget	• Operating Budget: $27,203.52 • Construction Estimate: **$20,586.27**

6

Project Overview

Objective

Establish a **Multipurpose Community Center** in Siripudi village for tribal families to be used for ceremonies, medical treatment, and refuge.

Scope

- 59 families
- **31' x 26'***
- Raised above ground
- Wiring for electricity

Impact

- Provide **shelter** during inclement weather
- Place to administer **medical treatment**
- Lay foundation of an **educational system**
- Establish a **tight-knit community**

5

Milestone #2 Comments

Logistics

- Planned our travel dates, accounting for work and off days
- Brainstormed potential activities with the community

Building Elevation

- Verified with NGO that 3' raised above grade is sufficient
- Compact fill solution in designs

Agreements with CASA & Community

- Discussed with CASA and community long term plans
- Contract is under way regarding ownership

7

Project Risk Assessment Tool

Project Assessment Criteria	Original Assessment	New Assessment
Feasibility	27.5	27.5
Impact on Community	43.75	50
Project Risks	- 25	- 22.5
Total	46.25	**55**

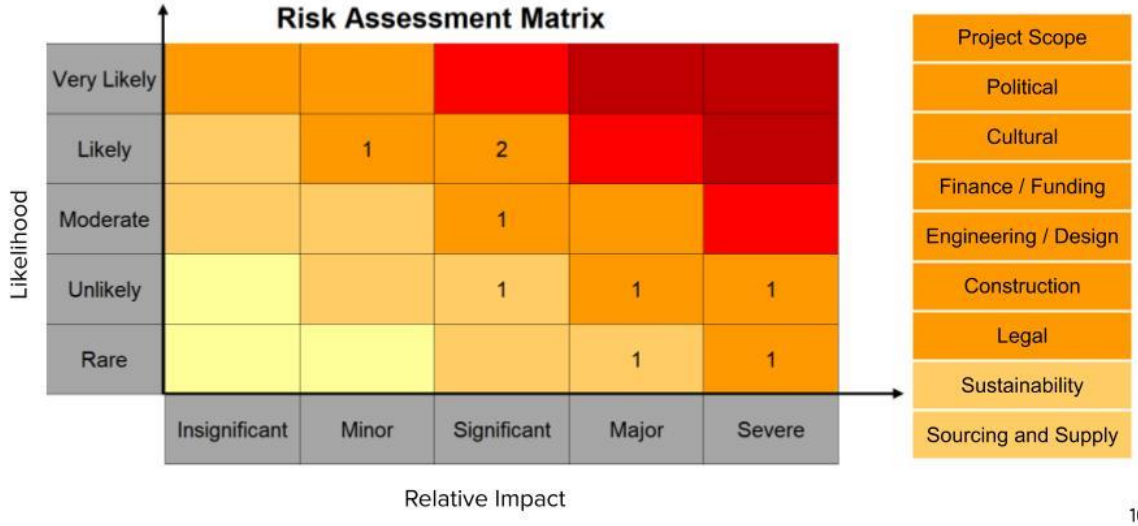
8

⚠ International Project Risk Assessment (IPRA)

Category	Likelihood of Occurrence					Relative Impact						Baseline	Coordinate
	1	2	3	4	5		A	B	C	D	E		
I.Finance / Funding		X									X	E	E2
II. Cultural				X				X				B	B4
III. Political				X					X			C	C4
IV. Legal		X								X		D	D2
V. Project Scope				X					X			C	C4
VI. Sourcing and Supply		X							X			C	C2
VII. Design / Engineering	X										X	E	E1
VIII. Construction			X						X			C	C3
IX. Sustainability / Maintenance	X									X		D	D1

9

⚠ Risk Assessment Matrix



10

Designs & Concepts

Scope and Design

Building Parameters:

1. 31' x 26'
2. Raised 3 ft above ground

Site Information:

- Same site as old community center
- Soil data provided by CASA
  - 98% Sand
  - 130 kN/m^2 safe bearing capacity
- Level site with maximum flood level of 2ft

Image of ground at site

12

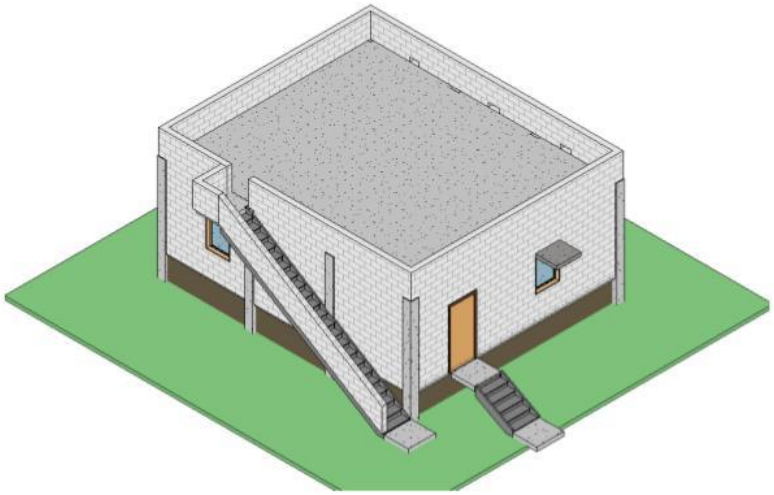
Site Location Relative to Hyderabad

13

Site Location in Siripudi

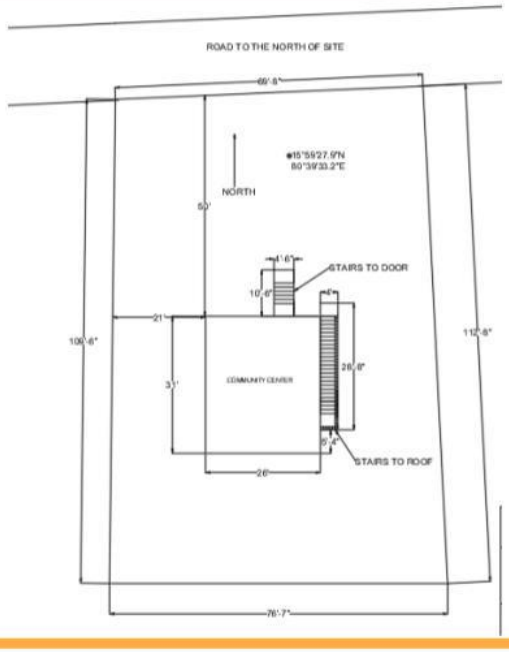
14

Design (31' x 26')



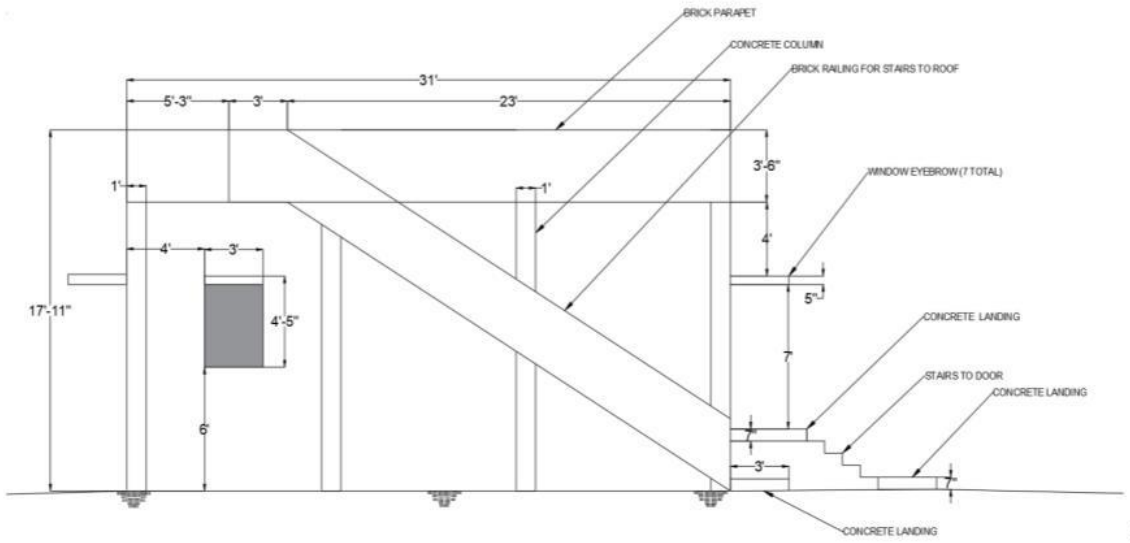
16

Site Plan



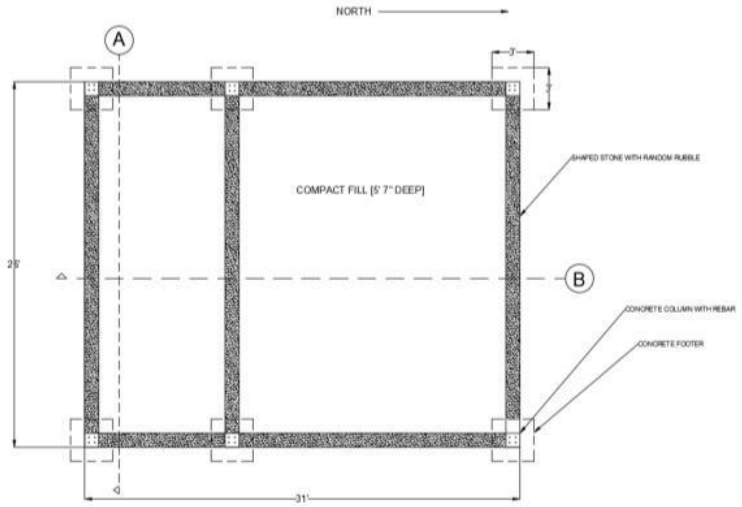
17

East Elevation



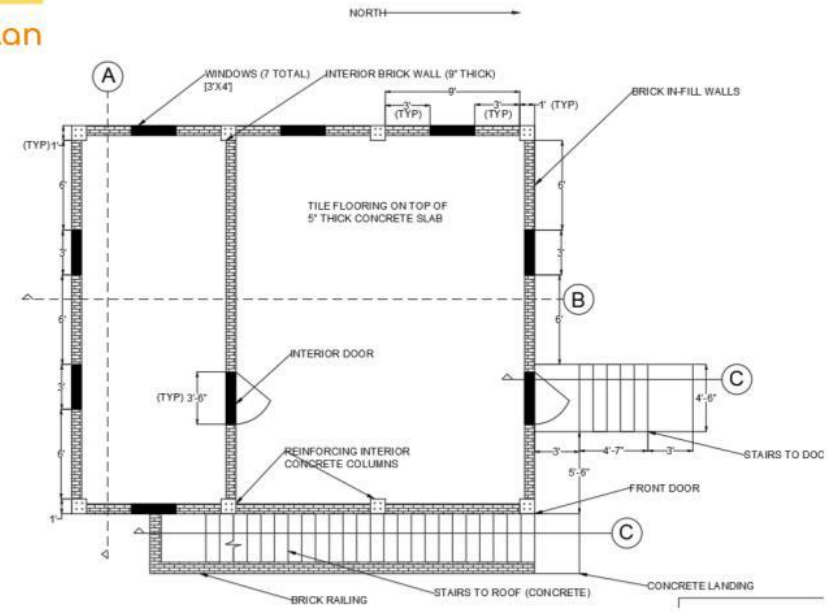
18

Below Grade Foundation Plan



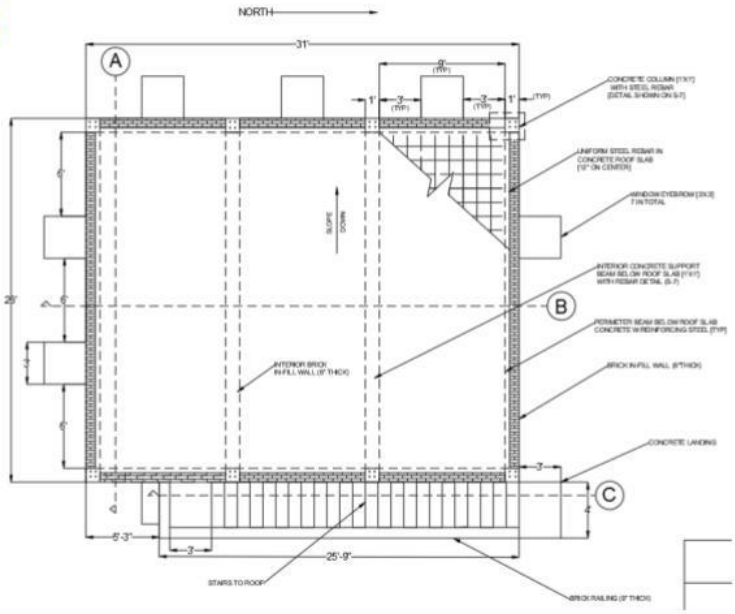
19

Floor Plan



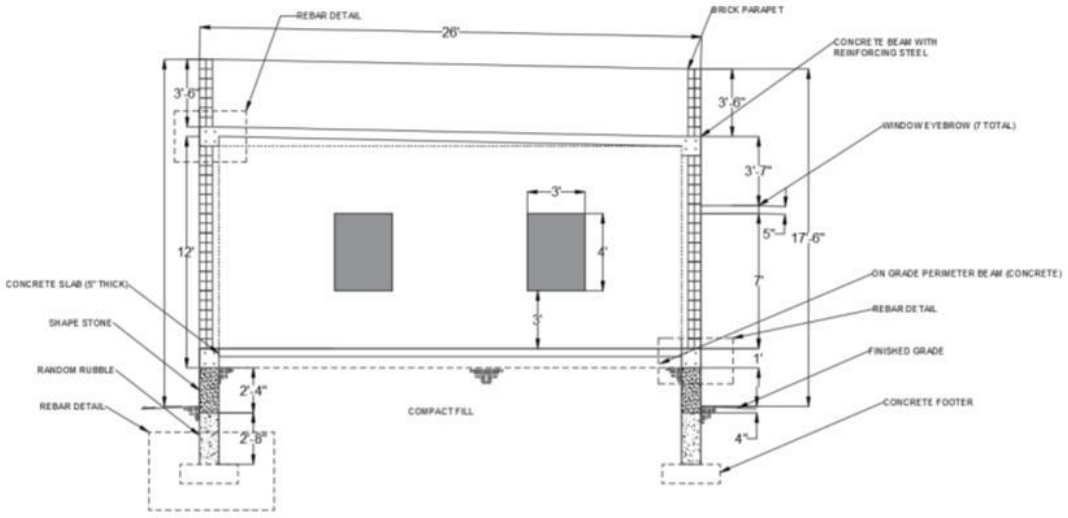
20

Roof Plan



21

South Building Section



22

Materials and Specifications

	Concrete	Clay Brick	Other (Rebar, Fill, Plaster/Paint)
Floor	24'x29' 5" floor slab 2 (1'x1'x26') perimeter beams 2 (1'x1'x31') perimeter beams 1 (1'x1') interior beam	N/A	Tiling Rebar in beams -(4 - #5 w/#2 stirrups & 12" spacing)
Walls	8 [1'x1'] concrete columns	Brick in-fill 4 exterior and 1 interior	Plaster & Paint Rebar in columns -(4 - #5 w/#2 stirrups at 12" spacing)
Roof	24'x29' 5" sloped roof slab 2 (1'x1'x26') perimeter beams 2 (1'x1'x31') perimeter beams 2 (1'x1'x26') interior beams	Parapet [3'-6"]	Plaster & Paint Rebar in roof slab Rebar in beams -(4 - #5 w/#2 stirrups & 12" spacing)
Foundation	8 (1'x3'x3') footers	N/A	5'-7" compact fill Shape stone and random rubble around perimeter [2'-6" deep each] Rebar in footers -(5 - #4 at equal spacing each way, top and bottom)
Stairs	To the roof: 3'-3" wide (7"x11") -24 in total: 72 sqrft To the door: 4'-6" wide (7"x11") -5 in total: 20 sqrft 4 landings (total)	3'-6" railing (roof stairs)	Plaster & Paint

23

Design Safety (pre-implementation)

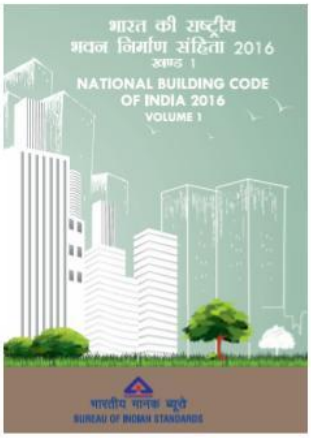
- Parapet walls on roof must be between 3.2 and 4 feet in height.
- Interior spaces where occupants will be need to be at least 9 feet tall.
- Obtaining an Occupancy Certificate from the Sanctioning Authority is optional based off of our square footage.

Sl. No.	Plot Size (in Sqm) Above – Up to	Parking provision	Height (in m) Permissible Up to	Building Line or Minimum Front Setback to be left (in m) Abutting Road Width					Minimum setbacks on remaining sides (in m)
				Up to 12 m	Above 12m & up to 18m	Above 18m & up to 24 m	Above 24m & up to 30m	Above 30m	
1	2	3	4	5	6	7	8	9	10
1	Less than 50		7	1.5	1.5	3	3	3	-
2	50-100	-	7	1.5	1.5	3	3	3	-
			10	1.5	1.5	3	3	3	0.5
3	100 - 200	-	10	1.5	1.5	3	3	3	1.0

Resources: Andhra Pradesh Building Rules, National Building Code of India

24

Construction Safety (implementation)



Common construction violations to be aware of while working in-country:

- Improper storage of materials
  - Specifically cement
- Unsafe use of ladders
- Using broken/bad tools
- Children access to building site
- Working at height above 4'

Resources:
Safety Control in the Construction Industry in India
National Building Code of India

25

Budget & Scheduling

Contracting Plan

Selection Process:

- Contractor selected by CASA - waiting for quotation and proposed schedule
- CASA is forming two contingency plans for contractor

Contractor Role:

- Provide labor, materials, and lead construction process
- Collaborate to create construction schedule

Contract:

- Has not been received - still in the selection process
- Must establish materials procurement schedule, construction timeline, contract creation

27

Estimated Construction Budget

Construction Phase/Material	Total Cost
Foundation (random rubble, shape stone, & compact fill)	$2,877
Concrete	$6,856
Masonry - Brick	$3,158
Rebar	$3,200
Finishings (flooring, plaster, & paint)	$2,796
Other (windows, doors, electrical)	$1,700
Total	**$20,587**

Notes: All costs include cost of labor; quotas from India 2019 team used to determine final costs. Materials and equipment provided by contractor, no anticipated long-lead purchases.

28

60% Budget

*Please reference handout provided

Construction Total	$20,586.27
Advisor/Administration Fees	$2,500.00
Contingency (20%)	$4,117.25
TOTAL COST	$27,203.52

Team India 2020 60% Design Plans Budget (Revised)

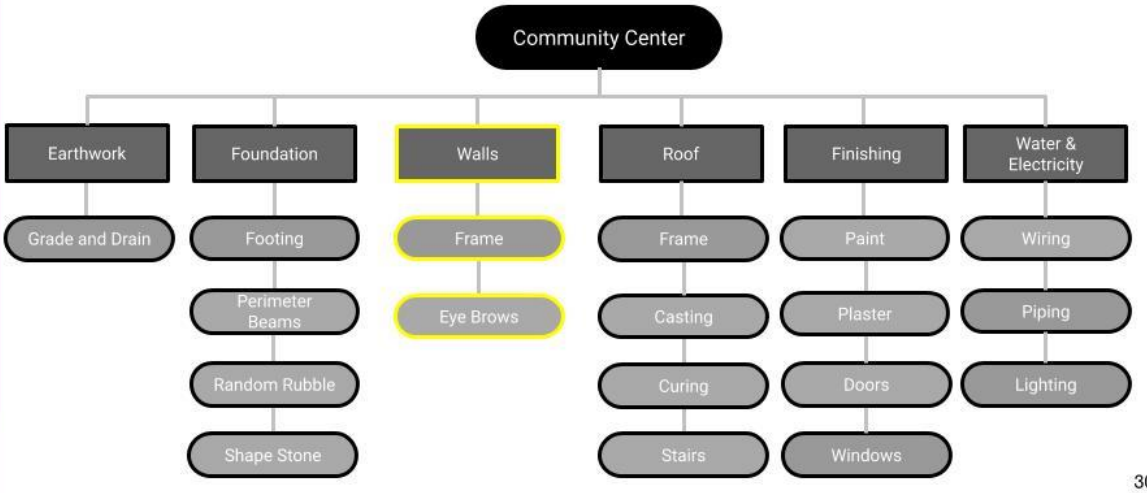
UNIT COSTS DETERMINED FROM INDIA 2019 PROJECT (ALL PRICES ARE ESTIMATES), ALL PER UNIT COSTS INCLUDE COST OF LABOR

Unit Cost and Quatities

Foundation	Description	Quantity	Unit Type	Unit Price	Price (USD)	Comments
	Earth Work Excavation	2418	ft^3	$0.17	$411.06	
	Compact Fill (sand & gravel)	1795.68	ft^3	$1.00	$1,795.68	
	Shaped Stone Fill	335	ft^3	$1.00	$335.00	
	Random Rubble Fill	335	ft^3	$1.00	$335.00	
				TOTAL	$2,876.74	
Concrete	**Description**	**Quantity**	**Unit Type**	**Unit Price**	**Price (USD)**	**Comments**
	perimeter floor beams	110	ft^3	$5.50	$605.00	
	roof span beams	134	ft^3	$5.50	$737.00	
	columns	137.68	ft^3	$5.50	$757.24	
	footers	72	ft^3	$5.50	$396.00	
	roof slab	335.83	ft^3	$5.50	$1,847.08	
	window covers	26.25	ft^3	$5.50	$144.38	
	stairs to roof	52.1	ft^3	$5.50	$286.74	
	stairs to door	15.0	ft^3	$5.50	$82.71	
	landings	27.8	ft^3	$5.50	$153.12	
	floor slab	335.8	ft^3	$5.50	$1,847.08	
				TOTAL	$6,856.36	
Masonry - Brick	**Description**	**Quantity**	**Unit Type**	**Unit Price**	**Price (USD)**	**Comments**
	interior wall	160.8	ft^3	$3.00	$482.40	does not take into account change in wall height
	in-fill outside walls	602.4	ft^3	$3.00	$1,807.08	
	stair railing	68.25	ft^3	$3.00	$204.75	
	roof parapet	221.1	ft^3	$3.00	$663.30	
				TOTAL	$3,157.53	
Finishings	**Description**	**Quantity**	**Unit Type**	**Unit Price**	**Price (USD)**	**Comments**
	flooring (tiles)	696	ft^2	$1.07	$744.72	
	wall plaster (interior + exterior)	3850.04	ft^2	$0.26	$1,001.01	
	painting (interior + exterior)	3850.04	ft^2	$0.11	$423.50	
	ceiling plaster	696	ft^2	$0.90	$626.40	
				TOTAL	$2,795.63	
Other	**Description**	**Quantity**	**Unit Type**	**Unit Price**	**Price (USD)**	**Comments**
	steel reinforcement	5,000	per kg	$0.64	$3,200.00	
	doors	2	per door	$250.00	$500.00	
	windows	7	per window	$100.00	$700.00	
	electrical	1	1	$500.00	$500.00	
				TOTAL	$4,900.00	

29

Work Breakdown Structure



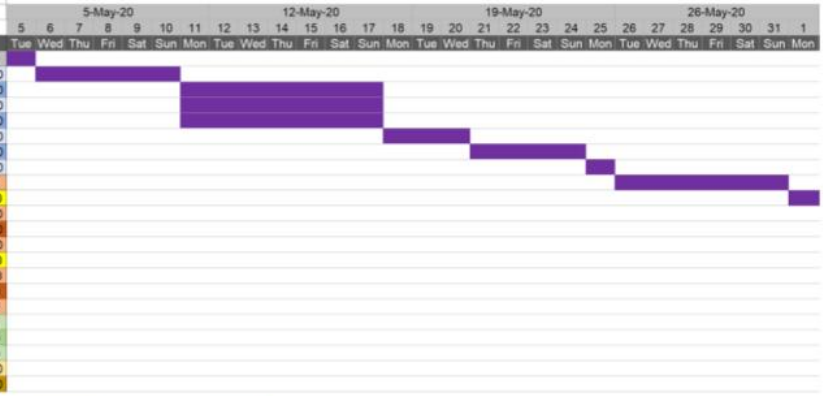
30

Construction Timeline: May

Construction Timeline

Project Start: Tue, 5-May-2020
Display Week: 1

TASK	START	END
Site Clearing	5-May-20	6-May-20
Column Pads	6-May-20	11-May-20
Random Rubble	11-May-20	18-May-20
Shape Stone	11-May-20	18-May-20
Lower Columns	11-May-20	18-May-20
Perimeter Beam	18-May-20	21-May-20
Interior Fill	21-May-20	25-May-20
PCC Floor	25-May-20	26-May-20
Columns	26-May-20	1-Jun-20
Brick Walls	1-Jun-20	17-Jun-20
Windows*	12-Aug-20	17-Aug-20
Doors*	12-Aug-20	17-Aug-20
Electrical*	12-Aug-20	17-Aug-20
Eye Brows	17-Jun-20	19-Jun-20
Entry Stairs	19-Jun-20	24-Jun-20
Roof Stairs*	25-Jul-20	31-Jul-20
Floor / Tile*	25-Jul-20	5-Aug-20
Roof Beams / Slab Setup	24-Jun-20	3-Jul-20
Roof Beams / Slab Curing	3-Jul-20	25-Jul-20
Parapet Bricks*	25-Jul-20	31-Jul-20
Paint*	5-Aug-20	12-Aug-20
Plaster*	5-Aug-20	12-Aug-20



*Occurs after PUC Team India leaves, so timeline is determined by contractor

Foundation
Main Floor
Team In-Country
Roof Level
Finishing

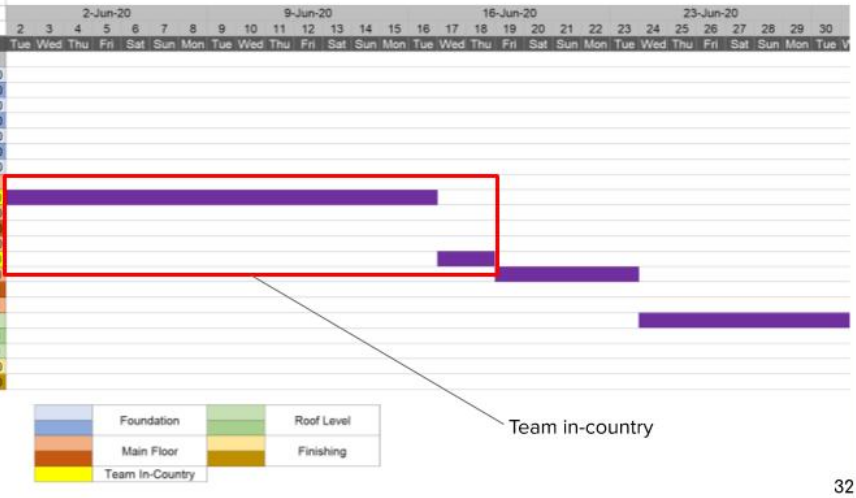
31

Construction Timeline: June

Construction Timeline

Project Start: Tue, 5-May-2020
Display Week: 5

TASK	START	END
Site Clearing	5-May-20	6-May-20
Column Pads	6-May-20	11-May-20
Random Rubble	11-May-20	18-May-20
Shape Stone	11-May-20	18-May-20
Lower Columns	11-May-20	18-May-20
Perimeter Beam	18-May-20	21-May-20
Interior Fill	21-May-20	25-May-20
PCC Floor	25-May-20	26-May-20
Columns	26-May-20	1-Jun-20
Brick Walls	1-Jun-20	17-Jun-20
Windows*	12-Aug-20	17-Aug-20
Doors*	12-Aug-20	17-Aug-20
Electrical*	12-Aug-20	17-Aug-20
Eye Brows	17-Jun-20	19-Jun-20
Entry Stairs	19-Jun-20	24-Jun-20
Roof Stairs*	25-Jul-20	31-Jul-20
Floor / Tile*	25-Jul-20	5-Aug-20
Roof Beams / Slab Setup	24-Jun-20	3-Jul-20
Roof Beams / Slab Curing	3-Jul-20	25-Jul-20
Parapet Bricks*	25-Jul-20	31-Jul-20
Paint*	5-Aug-20	12-Aug-20
Plaster*	5-Aug-20	12-Aug-20



*Occurs after PUC Team India leaves, so timeline is determined by contractor

Foundation | Roof Level | Main Floor | Finishing | Team In-Country

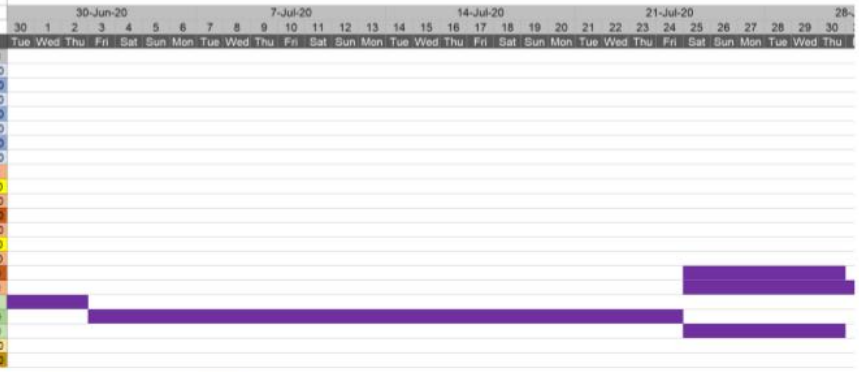
32

Construction Timeline: July

Construction Timeline

Project Start: Tue, 5-May-2020
Display Week: 9

TASK	START	END
Site Clearing	5-May-20	6-May-20
Column Pads	6-May-20	11-May-20
Random Rubble	11-May-20	18-May-20
Shape Stone	11-May-20	18-May-20
Lower Columns	11-May-20	18-May-20
Perimeter Beam	18-May-20	21-May-20
Interior Fill	21-May-20	25-May-20
PCC Floor	25-May-20	26-May-20
Columns	26-May-20	1-Jun-20
Brick Walls	1-Jun-20	17-Jun-20
Windows*	12-Aug-20	17-Aug-20
Doors*	12-Aug-20	17-Aug-20
Electrical*	12-Aug-20	17-Aug-20
Eye Brows	17-Jun-20	19-Jun-20
Entry Stairs	19-Jun-20	24-Jun-20
Roof Stairs*	25-Jul-20	31-Jul-20
Floor / Tile*	25-Jul-20	5-Aug-20
Roof Beams / Slab Setup	24-Jun-20	3-Jul-20
Roof Beams / Slab Curing	3-Jul-20	25-Jul-20
Parapet Bricks*	25-Jul-20	31-Jul-20
Paint*	5-Aug-20	12-Aug-20
Plaster*	5-Aug-20	12-Aug-20



*Occurs after PUC Team India leaves, so timeline is determined by contractor

Foundation | Roof Level | Main Floor | Finishing | Team In-Country

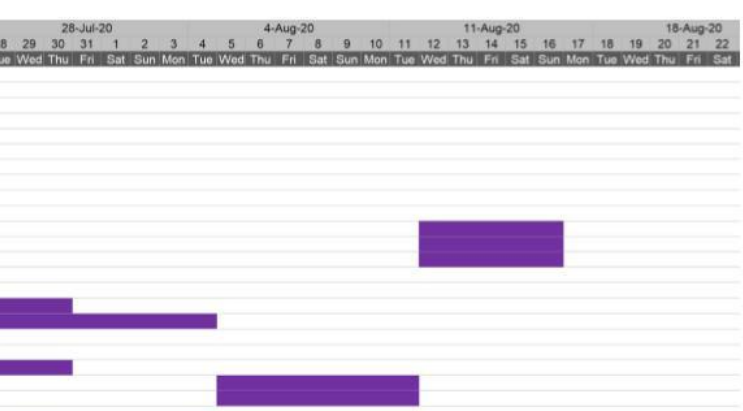
33

Construction Timeline: August

Construction Timeline

Project Start: Tue, 5-May-2020
Display Week: 13

TASK	START	END
Site Clearing	5-May-20	6-May-20
Column Pads	6-May-20	11-May-20
Random Rubble	11-May-20	18-May-20
Shape Stone	11-May-20	18-May-20
Lower Columns	11-May-20	18-May-20
Perimeter Beam	18-May-20	21-May-20
Interior Fill	21-May-20	25-May-20
PCC Floor	25-May-20	26-May-20
Columns	26-May-20	1-Jun-20
Brick Walls	1-Jun-20	17-Jun-20
Windows*	12-Aug-20	17-Aug-20
Doors*	12-Aug-20	17-Aug-20
Electrical*	12-Aug-20	17-Aug-20
Eye Brows	17-Jun-20	19-Jun-20
Entry Stairs	19-Jun-20	24-Jun-20
Roof Stairs*	25-Jul-20	31-Jul-20
Floor / Tile*	25-Jul-20	5-Aug-20
Roof Beams / Slab Setup	24-Jun-20	3-Jul-20
Roof Beams / Slab Curing	3-Jul-20	25-Jul-20
Parapet Bricks*	25-Jul-20	31-Jul-20
Paint*	5-Aug-20	12-Aug-20
Plaster*	5-Aug-20	12-Aug-20



*Occurs after PUC Team India leaves, so timeline is determined by contractor

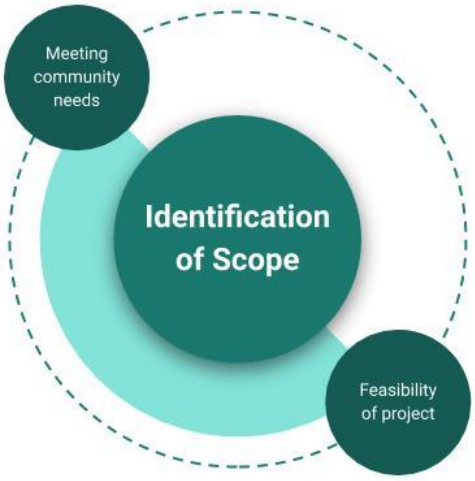
Foundation
Main Floor
Team In-Country
Roof Level
Finishing

34

Scope

Scope Description

- Site Dimension:
  - ~73’ x 112’
- Elevation above sea level:
  - ~0’
- Dimensions of Community Center:
  - 31’ x 26’



36

Multi-year Project Phasing

Extended Community Center

- Proposed two-year project to NGO
  - Establish foundation and soft walls for larger community center
  - Complete community center upon 2nd year
- Determined not feasible by NGO
  - CASA focuses on 1 year projects

Solar Panels

- Implementing solar panels on roof of building
  - Alternatively in the surrounding area
- Would provide source of income if surplus

37

Sacrificial Scope

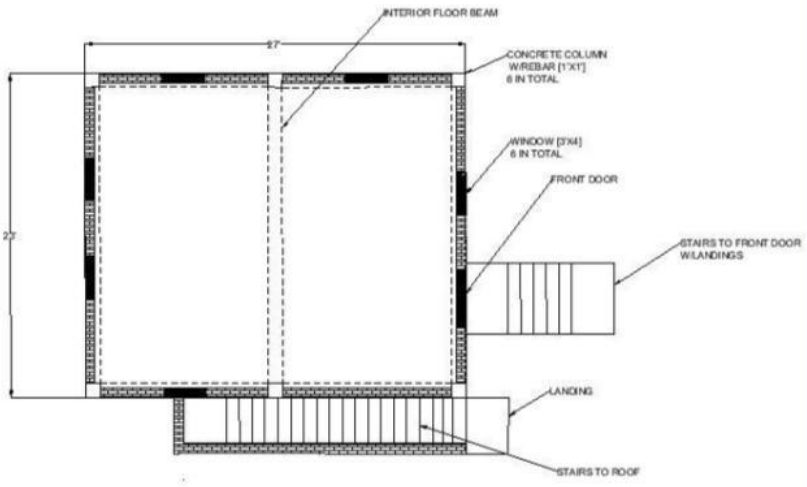
- Current available funds: **$22,578**
- Cost estimates of current design exceed the amount fundraised
  - Total Cost Estimate of 31' x 26' building: **$27,203.52**
  - Status: DEFICIT of **$4,625.52**
  - Ambiguity regarding contractor quotes
- Working on cost estimates and updated designs for a smaller building
  - Dimensions: 27' x 23'
  - Total Cost Estimate: **$22,526.65**
  - Status: FUNDED

38

Alternate Design

Differentiating Features:

- Reduced square footage (27' x 23')
- Reduced to 6 columns
- Reduced beams to 3



Alternate Budget

*Please reference handout provided

Construction Total	$16,688.87
Advisor/Administration Fees	$2,500.00
Contingency (20%)	$3,337.77
TOTAL COST	**$22,526.65**

Team India 2020 60% Design Plans Budget (Revised)

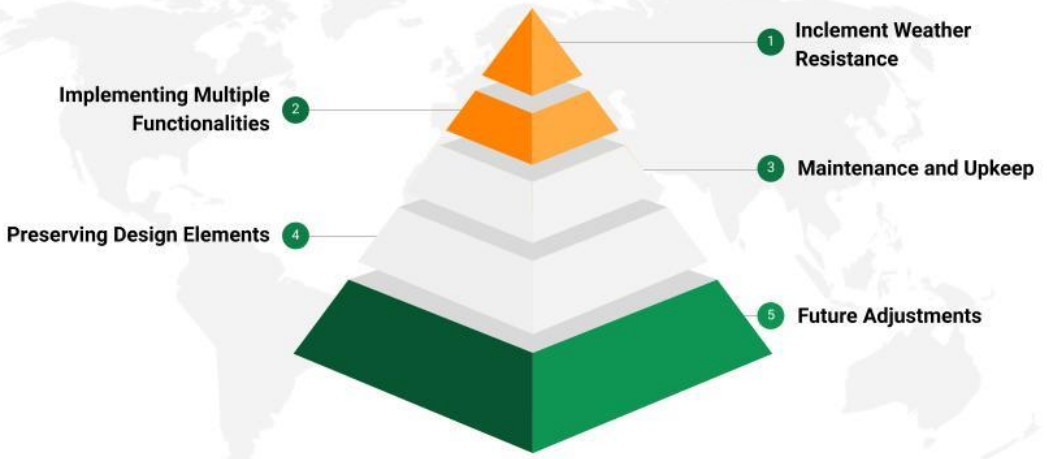
UNIT COSTS DETERMINED FROM INDIA 2019 PROJECT (ALL PRICES ARE ESTIMATES). ALL PER UNIT COSTS INCLUDE COST OF LABOR

Unit Cost and Quatities

Foundation	Description	Quantity	Unit Type	Unit Price	Price (USD)	Comments
	Earth Work Excavation	1863	ft^3	$0.17	$316.71	
	Compact Fill (sand & gravel)	1354.5	ft^3	$1.00	$1,354.50	
	Shaped Stone Fill	240	ft^3	$1.00	$240.00	
	Random Rubble Fill	240	ft^3	$1.00	$240.00	
				TOTAL	$2,151.21	
Concrete	**Description**	**Quantity**	**Unit Type**	**Unit Price**	**Price (USD)**	**Comments**
	perimeter floor beams	96	ft^3	$5.50	$528.00	
	roof span beams	117	ft^3	$5.50	$643.50	
	columns	103.26	ft^3	$5.50	$567.93	
	footers	54	ft^3	$5.50	$297.00	
	roof slab	258.75	ft^3	$5.50	$1,423.13	
	window covers	22.5	ft^3	$5.50	$123.75	
	stairs to roof	47.8	ft^3	$5.50	$262.85	
	stairs to door	15.0	ft^3	$5.50	$82.71	
	landings	27.8	ft^3	$5.50	$153.12	
	floor slab	258.8	ft^3	$5.50	$1,423.13	
				TOTAL	$5,505.11	
Masonry - Brick	**Description**	**Quantity**	**Unit Type**	**Unit Price**	**Price (USD)**	**Comments**
	interior wall	0	ft^3	$3.00	$0.00	
	in-fill outside walls	519.4	ft^3	$3.00	$1,558.31	
	stair railing	63	ft^3	$3.00	$189.00	
	roof parapet	192.96	ft^3	$3.00	$578.88	
				TOTAL	$2,326.19	
Finishings	**Description**	**Quantity**	**Unit Type**	**Unit Price**	**Price (USD)**	**Comments**
	flooring (tiles)	525	ft^2	$1.07	$561.75	
	wall plaster (interior + exterior)	3378.68	ft^2	$0.26	$878.46	
	painting (interior + exterior)	3378.68	ft^2	$0.11	$371.65	
	ceiling plaster	525	ft^2	$0.90	$472.50	
				TOTAL	$2,284.36	
Other	**Description**	**Quantity**	**Unit Type**	**Unit Price**	**Price (USD)**	**Comments**
	steel reinforcement	4,800	per kg	$0.64	$3,072.00	
	doors	1	per door	$250.00	$250.00	
	windows	6	per window	$100.00	$600.00	
	electrical	1	1	$500.00	$500.00	
				TOTAL	$4,422.00	

40

Sustainability



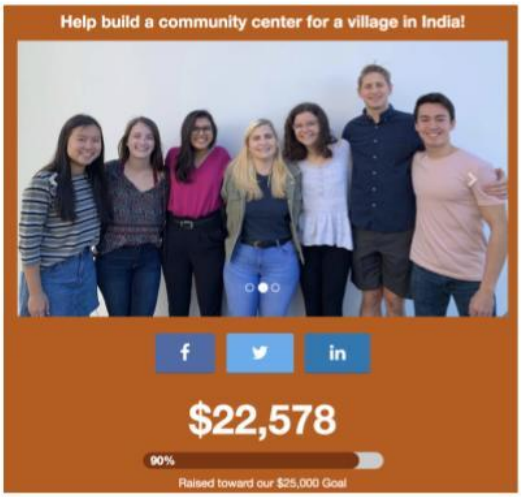
41

Fundraising & Logistics

Current Status of Fundraising

- $22,578 raised
- Focus on fundraising events rather than our own extended networks
  - Bucketing at basketball games
  - Girl Day
  - Kendra Scott Raffle

HORN RAISER



43

Grants & Potential Sponsors

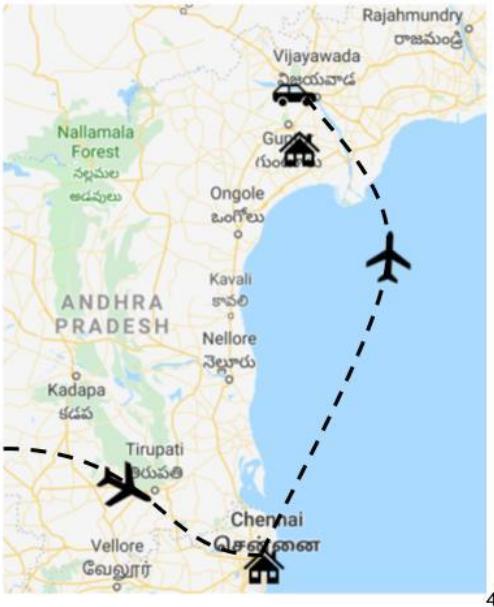
- **Status of Grant Proposals**
  - Pending responses
  - Rejections due to lack of 501(c)(3) status

- **Potential sponsors targeted**
  - Michael and Susan Dell Foundation
  - Narotam Sekhsaria Foundation
  - Pickle and Pal Awards
  - Procter and Gamble

44

Travel Plans

1. May 26th - Fly to Chennai
2. Stay in Chennai a couple days
3. May 29th - Fly together to Vijayawada
4. CASA driver picks us up
5. Drive to Nagaram (2 hour drive)
6. Stay in Nagaram
7. Commute to Siripudi (15 minute drive)



45

Travel Logistics

- **Chennai**
  - **5/28/20 - 5/30/20**
  - CASA Resource Center
  - Driver (Travel Advisor) transports team from airport to CASA center (20 km)
- **Vijayawada**
  - **5/30/20**
  - Fly from Chennai to Vijayawada
  - CASA driver will transport team from Airport to Nagaram (2 hour drive, 70km)

46

In-Country Accommodations & Travel

- **Nagaram**
  - **5/30/20 - 6/19/20**
  - CASA provided house (lodging and food)
  - Poul is working to find our host house
  - One CASA staff member will be with us 24/7
- **Siripudi**
  - **5/30/19 - 6/19/20**
  - Location of project
  - We will commute to Siripudi from Nagaram (about a 15 minute drive)

47

Day-to-Day Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		5/26 Depart	**5/27**	**5/28** Arrive	**5/29** Relax	**5/30** Fly to Vijayawada
5/31 Community day	**6/1** Work Day	**6/2** Work Day	**6/3** Work Day	**6/4** Work Day	**6/5** Relax/ Excursion	**6/6** Relax/ Excursion
6/7 Relax/ Excursion	**6/8** Work Day	**6/9** Work Day	**6/10** Work Day	**6/11** Work Day	**6/12** Work Day	**6/13** Relax/ Excursion
6/14 Relax/ Excursion	**6/15** Work Day	**6/16** Work Day	**6/17** Work Day	**6/18** Workday/ Celebration	**6/19** Depart	

48

Travel Preparations

- **Group preparation**
  - Submitted all necessary forms to Texas Global
    - SAPSSA, ERP, and Travel Application
- **Individual preparation**
  - Visa Application (online process)
  - Health clearance in progress
  - MySAO modules in progress
  - ISOS Access in progress for the team
  - Researching health precautions

49

Health Preparation

- **International SOS**
  - Worldwide emergency assistance service
  - Process of making accounts and completing the emergency record.
- **UT Overseas Health Insurance**
  - Mandatory, <$500 costs reimbursed once back in US, >$500 costs insurance will cover
  - Personal US Health Insurance will be continued as recommended
- **Health Clearance**
  - Vaccines: Japanese Encephalitis, Rabies, Hepatitis A and B, and typhoid
  - Preventative: Mosquito net, mosquito repellent lotion, sun screen, food and water safety

50

Contingencies

- **Travel Delay**
  - Stay in Chennai 2 days before traveling to Siripudi (buffer time)
- **Medical**
  - Two nearby hospitals
    - Government hospital in Nagaram
    - Chinnamatlapudi PHC 8 minute drive South from Siripudi

51

Emergency Response Plan

- 24/7 driver provided
- Small first aid kit on hand for minor injuries
- Government nurse visiting during the daytime
  - Contact information of local doctors
- CASA office in Nagaram (1.25 miles from project site)
- Cultural advisor and CASA staff member available 24/7

52

Coronavirus (COVID-19) in India

- **No reported cases in Andhra Pradesh**
  - 40 cases throughout India
- **International SOS**
  - Advisory notice on India warning; possible short notice travel changes
  - India has "reported limited human-to-human transmission of COVID-19."
- **Center for Disease Control (CDC)**
  - Risk of limited community transmission (lowest risk possible)

53

Travel Cost Breakdown

Student Costs	
Administrative Fee	$400.00
Portal Fee	$75.00
Health Insurance	$57.00
Immunizations	$700.00
Health Clearance	$100.00
Visa Fees	$100.00
Program Fee	$1,396.40
Airfare	$1,400.00
Sum	$4,228.40

Tech Advisor	
Program Fee	$1,123.00
Flight	$1,400.00
Sum	$2,523.00

Total Cost: $32,122

54

Communication & Internal Structure

RACI Matrix

Tasks	Project Manager: Colin P.	Cost/Technical Manager: Elise H.	Scope/Deliverables Manager: Dain K.	Logistics Manager: Britta D.	Communications Manager: Jamie L.	Quality/Safety Manager: Audrey S.	Fundraising Manager: Ramya Y.
Fundraising							
Track HornRaiser Progress and write updates	A	I	I	I	I	I	R
Reach out to companies regarding donations	A	I	R	I	I	I	R
Maintain ambassador list and fundraising contacts	A	I	I	I	I	I	R
Track Venmo donations and profit share revenue	A	I	I	I	I	I	R
Manage social media and send updates	A	R	I/C	I/C	I/C	I/C	A
Reach out to professors and local architects/engineers	R	R	I	I	I	R	A
Communication							
Handle direct contact with NGO	A	I	I	I	R	I	I
Write follow-up emails to be shared with relevant parties	R	I/C	I/C	I/C	A	I/C	I/C
Record and log meetings with NGO and community	I	I	I	I	A	I	R
Collaborate with Girl Scouts for local communtly involvmenet	I/C	I	I	R	A	I	I
Arrange commmunity involvement/activities	A	I/C	I/C	I/C	R	I/C	I/C
Technical Deliverables							
Create Revit sketches of two preliminary designs	A	A	I	I	I	R	I
Consult with various sources to lock down size of structure	I/C	R	A	I	I	A	I
Discuss with Technical Advisor on adjustments	I	A	I	I	I	R	I
Conduct materials and structural analysis	I	R	I	I	I	A	I
Volume calculations and per-unit material costs	I	R	I	I	I	A	I
Analyze geotechnical report and make adjustments to designs	I/C	A	I	I	I	R	I

56

Lessons from Previous Teams

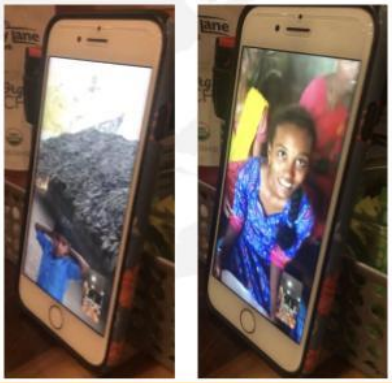
- **Clarity in Communication**
  - Outline the scope/budget constraints very clearly
  - Be in constant contact with Poul and get another CASA contact information if possible (Mr. Karuna Yesupadam)
- **Patience & Persistence**
  - Communication with CASA can be difficult due to Mr. Poul's schedule
- **Travel Preparation**
  - Handle logistics before traveling
  - Ensure that air conditioning and other necessities will be provided

57

Client and Partner Engagement

Jan. 6th	Video call with Poul (CASA)
Jan. 13th	Video call with Poul (CASA)
Jan. 21st	Video call with Poul (CASA)
Jan. 24th	Meeting with Ken Hanks (Technical Advisor)
Jan. 26th	Video call with Poul (CASA)
Feb. 2nd	Video call with Poul (CASA)
Feb. 17th	Video call with Poul (CASA)
Feb. 19th	Meeting with Ken Hanks (Technical Advisor)
Feb. 24th	Video call with Poul (CASA)
March 3rd	Video call with Poul (CASA) and community members
March 5th	Meeting with Ken Hanks (Technical Advisor)

CASA People Helping People | 70 years in India



58

Community Engagement Plan

- Community engagement activities
  - Educational activities with children
    - Arts and crafts (bead bracelet, coloring books)
  - Play games with children
    - Interested in skipping (jump rope), playing catch (throw ball), and carrom board
  - Cook breakfast for community
- Cultural advisor selected by CASA
  - Lavanya, MA English

59

Community Engagement Plan

	Day	Estimated Costs	Who	Why
Breakfast	June 8 - 8AM	~$50	Members of Siripudi ~20 people	To talk/interact with community members
Craft Day	June 15 - 2PM	~$63	Children of Siripudi ~ 20-30	To interact with kids and offer fun activities
Daytime Activities (Carrom Board, Soccer, Jacks)	During free time	~$25	Children ~ 20-30	To play with kids and get comfortable with them; girls & boys can play/work together

60

Roles and Contributions

	Team India	CASA	Cultural Advisor	Community
Roles	• **Develop scope** of multipurpose center • **Raise funds** for resources for construction • Utilize customer needs and engineering requirements to **design center**	• Analysis of community **needs** • Establishment of **expectations** • **Obtain resources** for construction (materials, contractors, etc.)	• **Provide** social worker with guidance to create community engagement plan • **Assist** with communicating between Team India and community members on site	• **Partner** with CASA and Team India to build community center • **Provide** insight to community lifestyle and culture
Services	• Provide CASA with **monetary support** • Deliver **design** of center • **Construct** center alongside CASA and contractors	• **Inform** Team India about surrounding area, materials, and resources • **Provide decisions** regarding scope and purpose	• **Translate** Telugu and English between Team India and Siripudi • **Inform** Team India on culture, language, and community	• **Inform** CASA of needs, desires, concerns, and questions • Tear down old community structure

61

Next Steps

Project Phasing

	Project Phasing (Deliverables) Plan	
Month	**Austin**	**India**
March	• Finalize designs (31' x 26') • Continue with sacrificial scope development, based upon Poul's responsiveness • Additional Fundraising • Finalize travel plans • Begin visa applications • Work with contractor to create construction timeline	• Finalize contract between CASA and the community regarding ownership • **Finalize contractor** • Determine budget with provided quotas
April	• Collaborate with Cultural adviser to refine community engagement plan • Complete health clearance forms • Begin money transfer process to CASA • Send visa/passport information to CASA	• Secure housing accommodations for the team • Complete all contracts and secure hotel accommodations for stay in Hyderabad • Send finalized plans to CASA
May	• Finish off all administrative paperwork • Milestone #4 • Begin packing and ensuring in-country travel is what was agreed upon	• Contractor procurement • Begin site excavation and construction • Stay in contact with to notify us of updates and progress.

63

Contracts

CASA and UT Austin

- CASA working with Texas Global to ensure that project can occur and students can travel
- Progress: **Both parties signed agreement**

CASA and Contractor

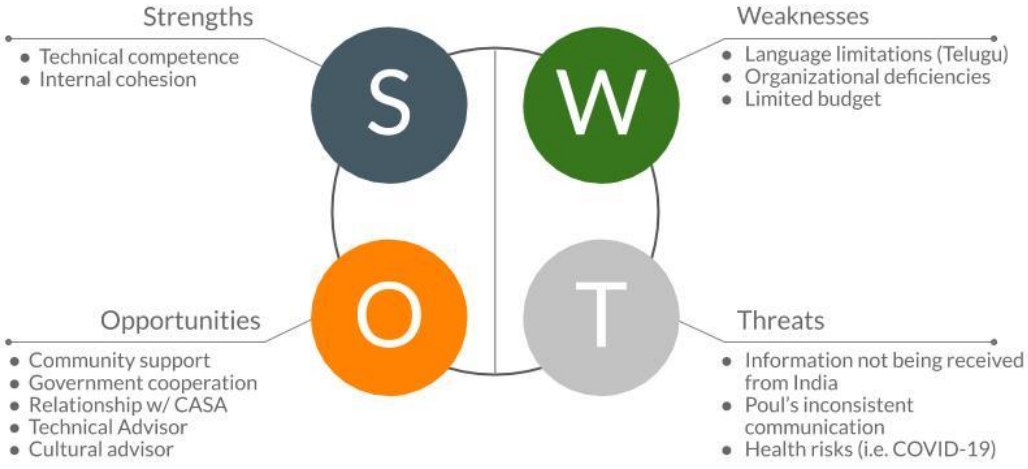
- CASA finding contractor to work on project within budget and under certain timeline
- Progress: **Receiving quotations, contract not signed**

CASA and Community

- Ensuring that community center is maintained after construction
- Progress: **Agreement formed, not signed**

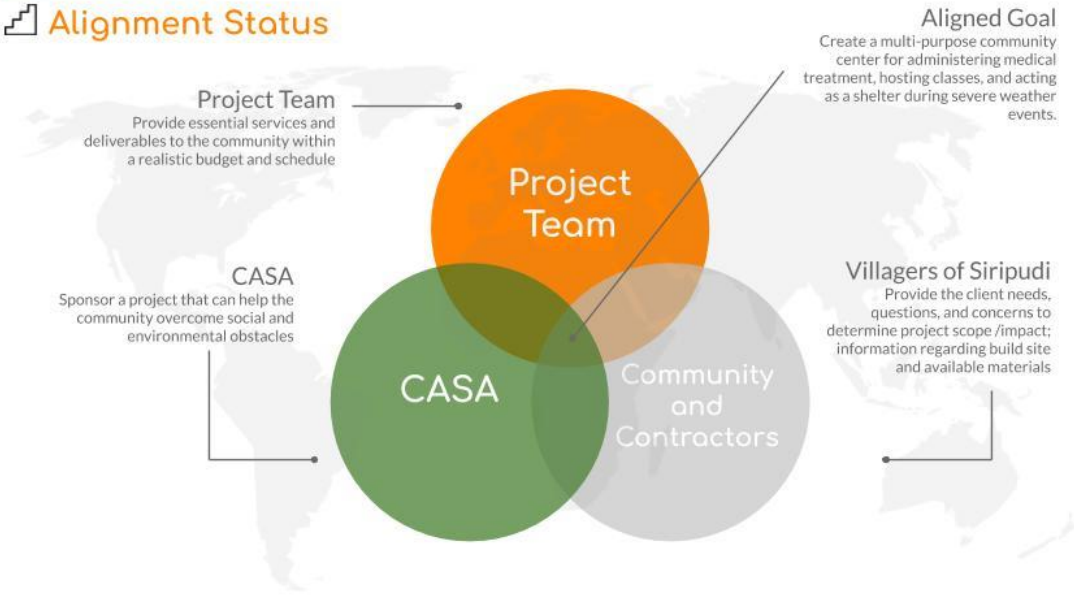
64

S.W.O.T. Analysis



65

Alignment Status



66

Team Education Needs

General and Safety

- Safety and best practices on construction sites
- Language - Telugu
- Continued cultural awareness training
- Traveling tips

Technical

- Training in concrete mixing
- Tool use

67

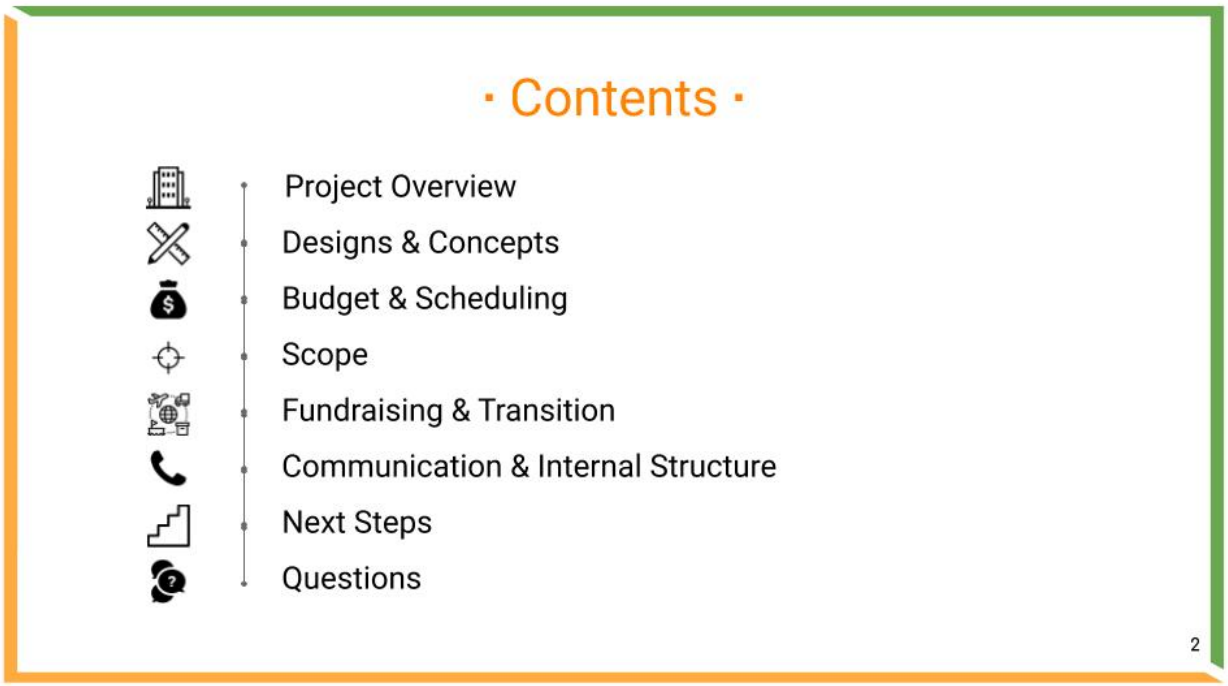
Barriers Moving Forward

- Finalizing scope
  - Waiting on cost estimate from the contractor before changing scope
- Scope creep
  - Funds available are not currently sufficient
- Client community
  - Specific layout of interior, e.g. rooms and closets
  - Desired activities while in country
- CASA
  - Poul has been inconsistent with communication
- Health obstacles
  - Unknown health risks in a couple of months due to spread of COVID-19
  - Obtaining recommended vaccinations (according to the CDC)

68

Questions?

Appendix D. Milestone IV Presentation



Team Introductions

Colin Phillips
Project Manager

Ramya Yedatore
Fundraising Manager

Audrey Soltau
Quality/Safety Manager

Britta Dalton
Transition Liaison

Elise Higgins
Cost/Resource Manager

Dain Kasprak
Scope/Deliverables Manager

Jamie Li
Communications Manager

3

Project Overview

Project Overview

Objective

Establish a permanent **Multipurpose Community Center** in the village of Siripudi of Andhra Pradesh, India

Scope

- 84 families
- **31' x 26'***
- Elevated foundation
- Wiring for electricity

Impact

- Provide **shelter** during inclement weather
- Place to administer **medical treatment**
- Lay foundation for an **educational system**
- Establish a **tight-knit community**

5

Project Recap

Community	• Village of **Siripudi**, Andhra Pradesh • **84 families** in the surrounding area • Scheduled Caste and Tribe
Partners	• Church's Auxiliary for Social Action (**CASA**) • Poul Luther, Project Officer • Mr. **Ken Hanks**, P.E. Structural Engineer
Project	• **31' x 26' Multipurpose Community Center** • Education, medical treatment, cultural events, shelter
Budget	• Operating Budget: $27,286.52 • Construction Estimate: **$20,655.00**

6

Community Updates

COVID-19 Impacts

Siripudi village has been severely impacted with the ongoing lockdown in India, which is scheduled to last until **May 17th**. With most workers being day laborers, **sources of income have dried up** and the community has struggled with the **insufficient rations** provided by the government.

Responses

CASA has taken the lead to ensure that sanitary conditions and sufficient food is available in the community. With the team personally fundraising over **$1,656,** Poul and CASA have held workshops in Siripudi to ensure safe sanitary conditions and are in the process of purchasing supplies in bulk to address food insecurity caused by the epidemic.

Moving Forward

As the project prepares to extend into next year, potential add-ons have been discussed, including:

- Sanitation stations (i.e. sinks)
- Restrooms
- Solar panels (different community)

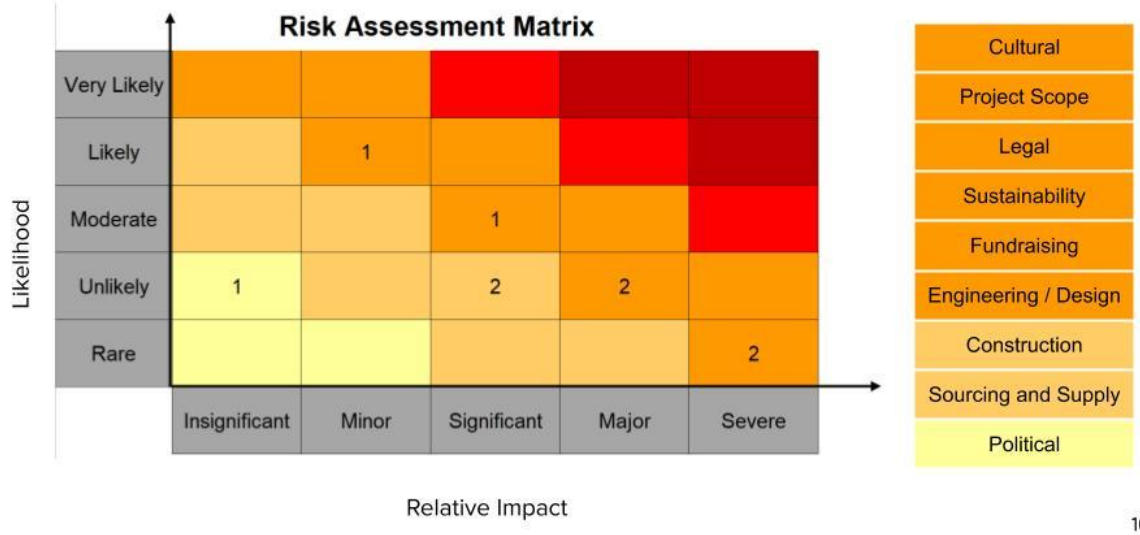
8

⚠ International Project Risk Assessment (IPRA): 2020 - 2021

Category	Likelihood of Occurrence					Relative Impact					Baseline	Coordinate
	1	2	3	4	5		A	B	C	D	E		
I.Finance / Funding	X										X	E	E1
II. Cultural				X				X				B	B4
III. Political		X					X					A	A2
IV. Legal		X								X		D	D2
V. Project Scope			X						X			C	C3
VI. Sourcing and Supply		X							X			C	C2
VII. Design / Engineering	X										X	E	E1
VIII. Construction		X							X			C	C2
IX. Sustainability / Maintenance		X								X		D	D2

9

⚠ Risk Assessment Matrix



10

Designs & Concepts

Detailed Project Description

Building Parameters

- 31' x 26'
- Raised 3 ft above ground

Site Information

- Same site as old community center
- Soil data provided by CASA
  - 98% Sand
  - 130 kN/m^2 safe bearing capacity
- Level site with maximum flood level of 2ft

Next Steps for 2021

- Structural connections (stairs, window shades, etc.)
- Rebar design in concrete members wherever necessary

Site detail

Image of ground at site

12

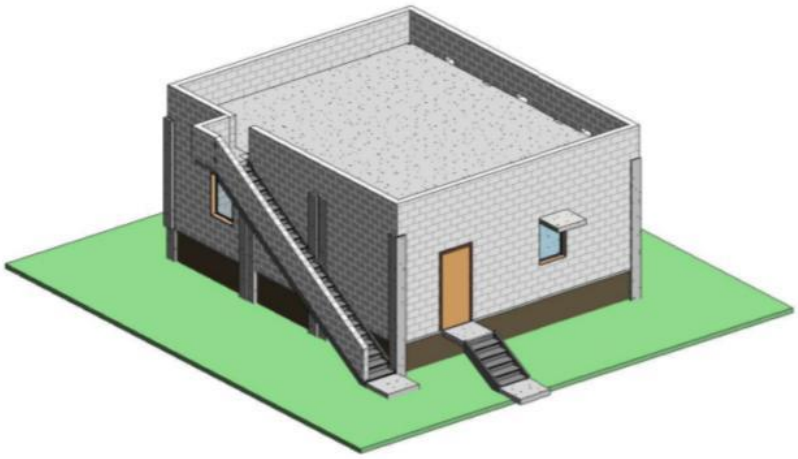
Site Location Relative to Hyderabad

13

Site Location in Siripudi

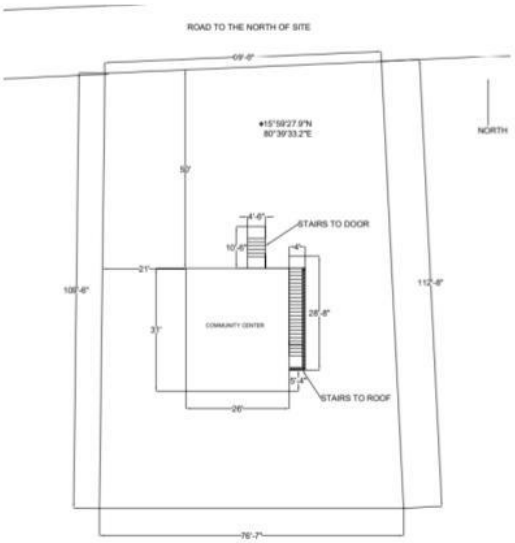
14

Design (31' x 26')



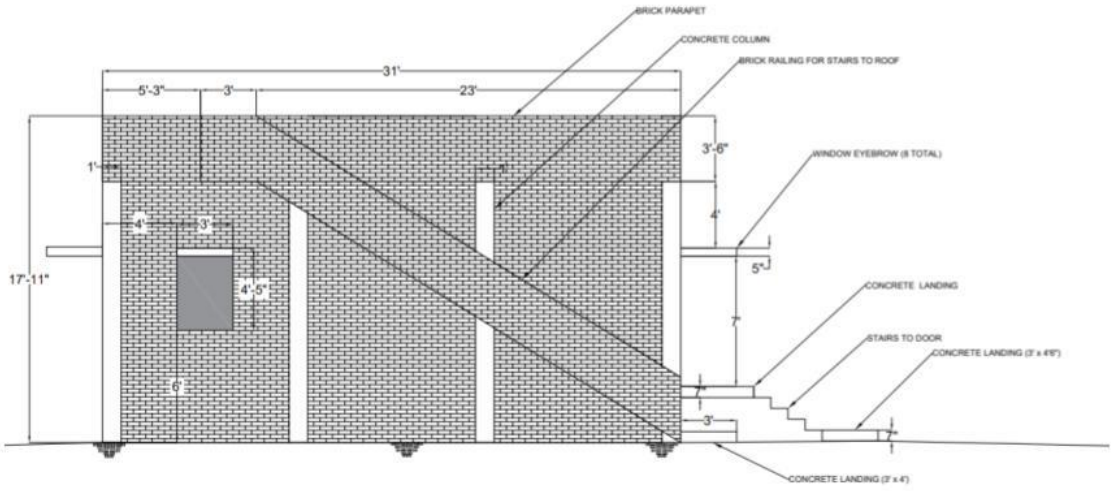
15

Site Plan



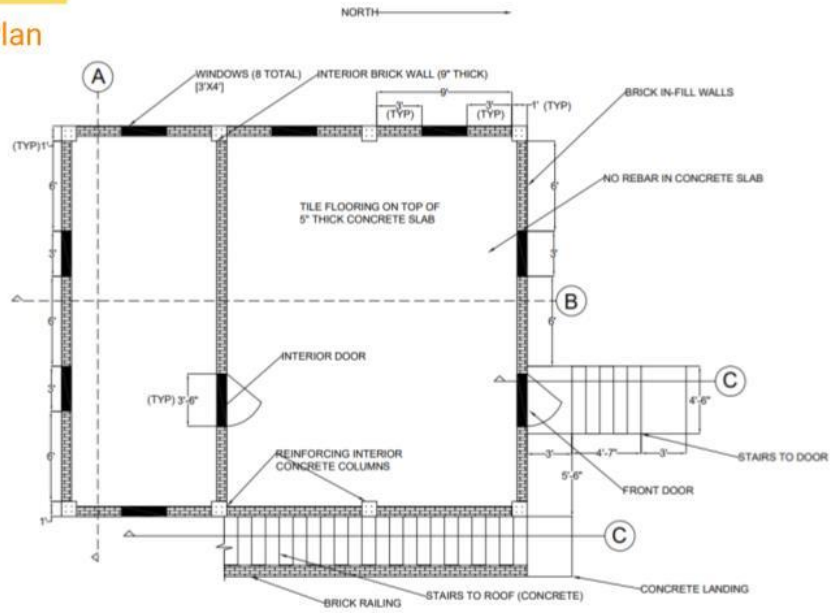
16

East Elevation



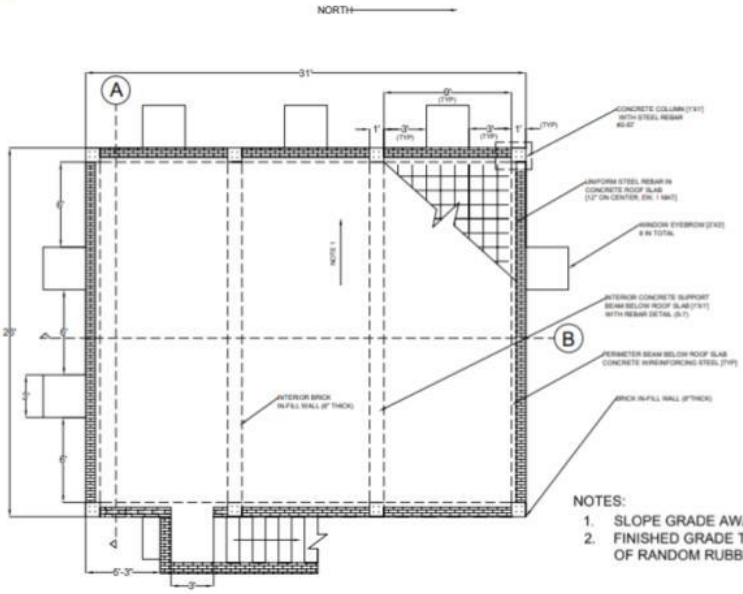
17

Floor Plan



18

Roof Plan

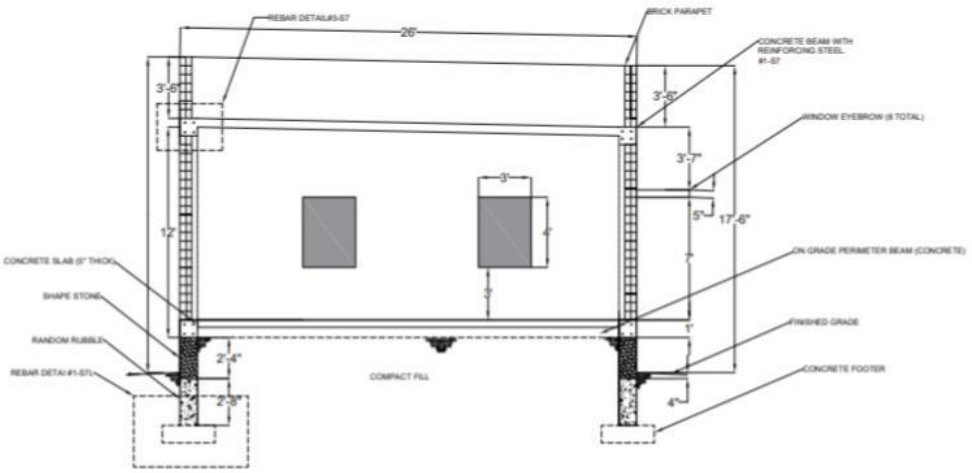


NOTES:

1. SLOPE GRADE AWAY FROM BUILDING $\frac{1}{4}$"/1'
2. FINISHED GRADE TO BE MINIMUM 4" ABOVE TOP OF RANDOM RUBBLE

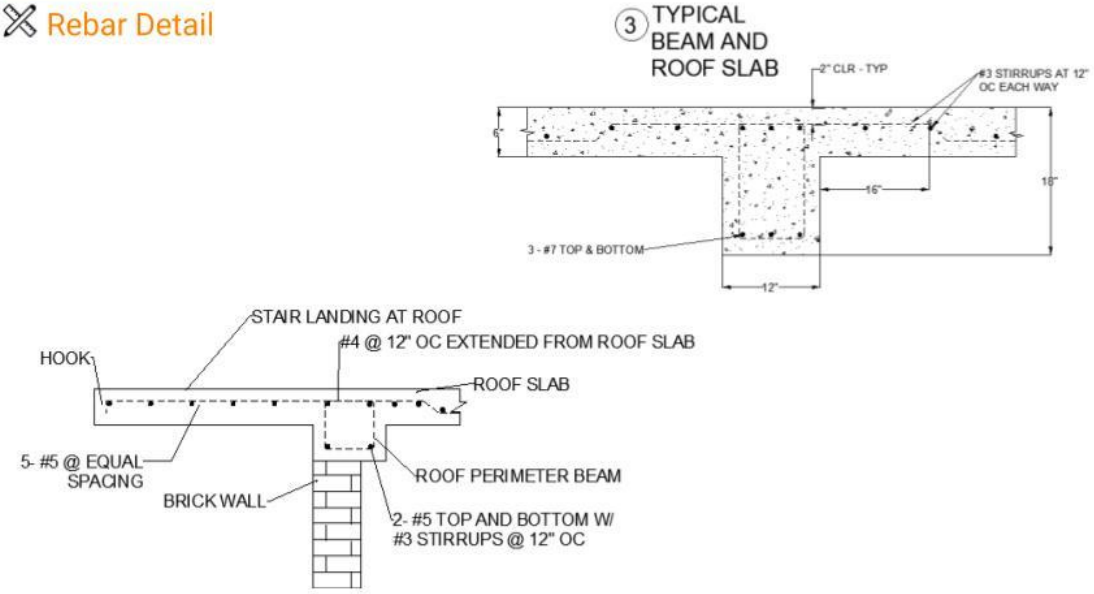
19

South Building Section



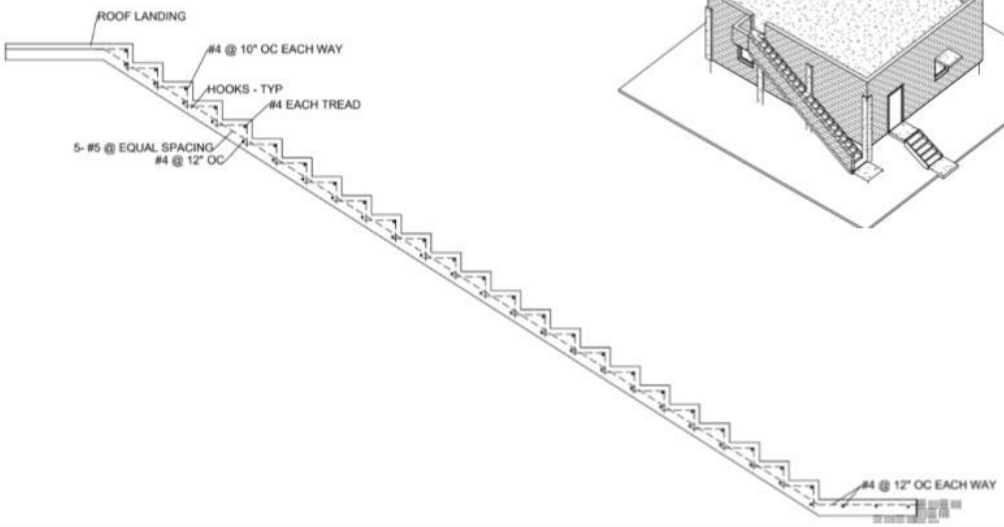
20

Rebar Detail



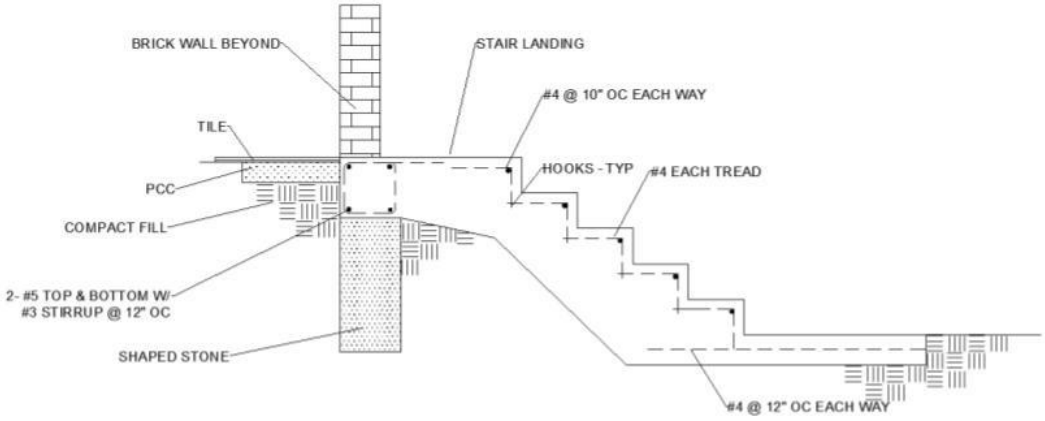
21

Rebar & Stair Detail



22

Rebar & Stair Detail



23

Materials and Specifications

90% Additional Specifications & Quantities		
Foundation	**Quantity**	**Unit Type**
Earth Work Excavation	2418.00	ft^3
Compact Fill (sand & gravel)	2465.68	ft^3
TOTAL	**4883.68**	**ft^3**
Finishings	**Quantity**	**Unit Type**
Flooring (tiles)	696.00	ft^2
Wall plaster (interior + exterior)	3850.04	ft^2
Painting (interior + exterior)	3850.04	ft^2
Ceiling plaster	696.00	ft^2
TOTAL	**9092.08**	**ft^2**
Other	**Quantity**	**Unit Type**
Steel reinforcement	7,365	Kgs
Doors	2	
Windows	7	
Electrical	1	

MATERIAL	
RCC Specifications: All RCC works are 1:2:4 mix with 20 mm chips using cement mortar	**Total Volume (ft^3)**
Grade Beams (short side)	78
Roof Beams (short side)	104
Grade Beams (long side)	62
Roof Beams (long side)	62
Columns (west side)	68
Columns (east side)	70
Footers	24
Roof Slab	339
Concrete	**Total Volume (ft^3))**
Floor Slab	292
Window Covers	26
Stairs to Roof	42
Stairs to Door	9
Door Steps Landing	16
Roof Stairs Bottom Landing	7
Roof Stairs Top Landing	5
Brick Specifications with 1:6 mix using cement mortar	**Total Volume (ft^3))**
Interior Wall	153
In-Fill Outside Walls (short side)	209
In-Fill Outside Wall (west side)	324
In-Fill Outside Wall (east side)	170
Stair Railing (longways)	75
Stair Railing (sideways)	9
Parapet (short side)	96
Parapet (long side)	117

24

Expertise Required Moving Forward

Technical Authorities and Advisors	Team Member Education/Training Needs
Contacts and references for next year's project: • Ken Hanks, P.E. • Naman Agrawal, M.S. Candidate • Marty Rumbaugh, P.E. • Dr. James O'Connor	For Team India 2020's current scope: • Knowledge of Revit and/or AutoCAD • Structural analysis • Concrete & steel rebar design For Team India 2021's potential additions: • Hydraulics/waste water treatment if doing sanitation addition • Electrical engineering/wiring for solar panel additions

25

Design Safety (pre-implementation)

Relevant Codes and Regulations

- Parapet walls on roof must be between 3.2 and 4 feet in height
- Interior spaces where occupants will be need to be at least 9 feet tall
- Obtaining an Occupancy Certificate from the Sanctioning Authority is optional based off square footage
- Building setbacks for building square footage:
  - Setbacks from the road (north side) must be > 9.8 feet
  - Setbacks on all other sides must be > 5 feet

Resources

- Andhra Pradesh Building Rules
- Safety Control in the Construction Industry in India
- National Building Code of India

26

Design Updates from Milestone #3

Designs and Scope

- There are no changes in designs or concepts
- Budget has been updated since receiving quotas from CASA
- Plans have been revised to be more detailed
  - More rebar specs are included

Purchases and Payments

- Payment for contractor will most likely happen next spring
- No estimated long lead purchases for community center
- Project not decided for next year's team, possibility of long-lead purchases (i.e. solar panels)

27

Budget & Scheduling

Contracting Plan

Selection Process

- Contractor selected by CASA - still in the bidding process
- CASA is negotiating to find the best bid with the lowest cost
- Received cost estimates for 4 bids
- Contractor has agreed in principle to construct the building for 14 lakhs, approx. $18,540

Contractor Role

- Provide labor, materials, and lead construction process
- Collaborate to create construction schedule

Contract

- Has not been received - still in the selection process
- Must establish materials procurement schedule, construction timeline, contract creation

29

Estimated Construction Budget

Construction Phase	Total Cost
Foundation (random rubble, shape stone, & compact fill)	$1,403
Ground Floor	$4,189
Reinforcing Steel	$6,223
Finishings (flooring, plaster, & paint)	$5,271
Elevation Work and Railings	$975
Tiling and Miscellaneous	$514
Electrical	$910
Sanitary Arrangements	$1,170
TOTAL	**$20,655**

Notes: All costs include cost of labor
Materials and equipment provided by contractor, no anticipated long-lead purchases.

30

90% Budget

Foundation	Description	Cost (Rs)	Cost (USD)	Comments
	Earthwork Excavation	9457	$123	In foundation trenches
	Gravel Filling	44616	$580	(Qty = Plinth area x 0.75)
	Footers	39171	$509	RCC, Trapezoidal and Square footings. For Trapezoidal footings (Qty = 45% of Square footings Qty)
	Mass Concrete Bed	14735	$192	1:4:8 mix with 40mm HBG metal stones
Total		107979	$1,404	
Ground Floor	**Description**	**Cost (Rs)**	**Cost (USD)**	**Comments**
	Plinth Beams, RCC	22770	$296	(Total length is taken)
	Slab Beams, RCC	37269	$484	(Total length is taken)
	Lintel Beams, RCC	12406	$161	(Total length is taken)
	Columns, RCC	36221	$471	
	Slab with Extensions, RCC	97347	$1,266	
	Brick Masonry Walls	116204	$1,511	1:6 mix using cement mortar
	Reinforcing Steel	478696	$6,223	including fabrication charges
Total		800904	$10,412	
Finishings	**Description**	**Cost (Rs)**	**Cost (USD)**	**Comments**
	Plaster	72512	$943	1:5 mix using cement mortar with 0.012m thickness
	Flooring	119624	$1,555	(Plinth area is taken)
	Windows	101621	$1,321	with carving & polishing work
	Doors	63406	$824	Using Teakwood with carving & polishing work
	Ventilators	13176	$171	
	Paint	35157	$457	Altech paints. (Qty = Total plastering area)
Total		405496	$5,271	
General Cost Breakdown	**Description**	**Cost (Rs)**	**Cost (USD)**	**Comments**
Cost for foundation, ground floor, and finishings		513475	$17,087	
Provision for Sanitary Arrangements		90000	$1,170	
Provision for Electrical Work		70000	$910	
Provision for Elevation Work & Railings		75000	$975	
Provision for Tiling		35000	$455	
Miscellaneous		4501	$59	
TOTAL		787975	$20,655	
Contingency (20%)		157595.016	$4,131.09	
TOTAL COST OF PROJECT		**945570.096**	**$24,786.52**	

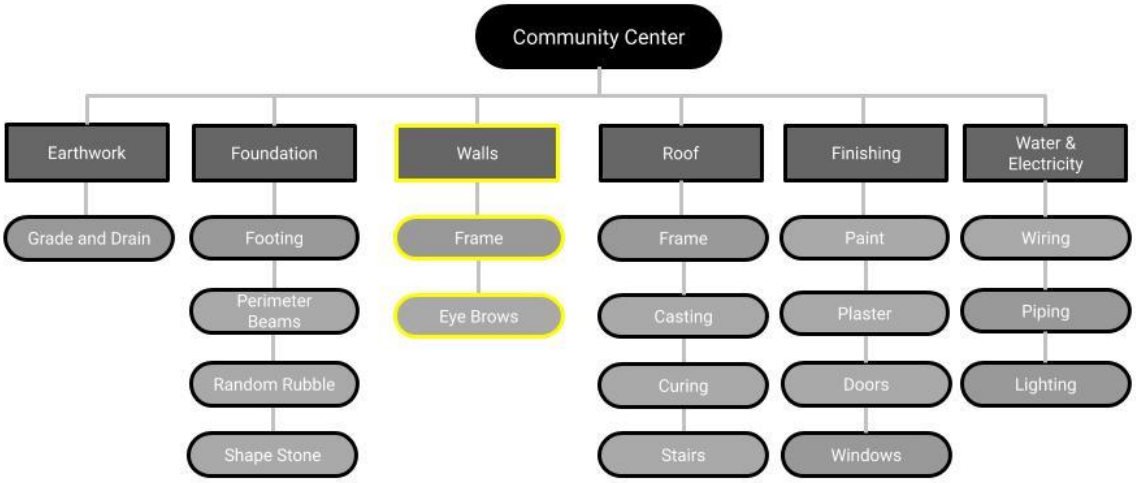
31

Total Cost Estimate

Project Components	Cost
Construction Costs	$20,655
Contingency (20%)	$4,131
Technical Advisor	$2,500
TOTAL COST	**$27,287**

32

Work Breakdown Structure



33

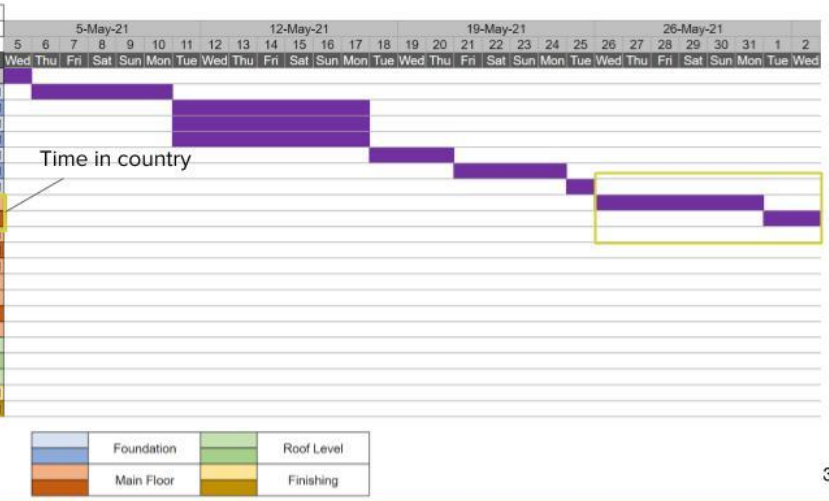
Construction Timeline: May

* Whenever "Project Start" and start/end dates of each task are updated, the construction timeline updates accordingly

Construction Timeline

Project Start: Wed, 5-May-2021
Display Week: 1

TASK	START	END
Site Clearing	5-May-21	6-May-21
Column Pads	6-May-21	11-May-21
Random Rubble	11-May-21	18-May-21
Shape Stone	11-May-21	18-May-21
Lower Columns	11-May-21	18-May-21
Perimeter Beam	18-May-21	21-May-21
Interior Fill	21-May-21	25-May-21
PCC Floor	25-May-21	26-May-21
Columns	26-May-21	1-Jun-21
Brick Walls	1-Jun-21	17-Jun-21
Windows	12-Aug-21	17-Aug-21
Doors	12-Aug-21	17-Aug-21
Electrical	12-Aug-21	17-Aug-21
Eye Brows	17-Jun-21	19-Jun-21
Entry Stairs	19-Jun-21	24-Jun-21
Roof Stairs	25-Jul-21	31-Jul-21
Floor / Tile	25-Jul-21	5-Aug-21
Roof Beams / Slab Setup	24-Jun-21	3-Jul-21
Roof Beams / Slab Curing	3-Jul-21	25-Jul-21
Parapet Bricks	25-Jul-21	31-Jul-21
Paint	5-Aug-21	12-Aug-21
Plaster	5-Aug-21	12-Aug-21



34

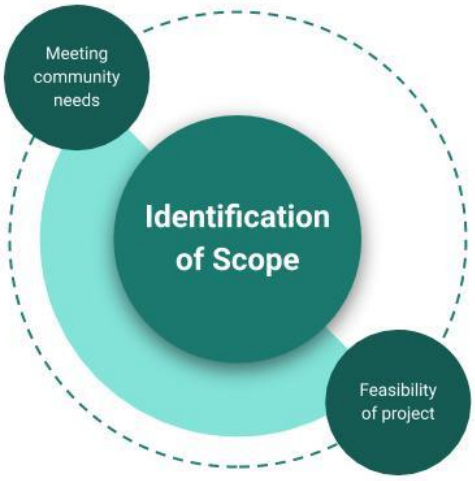
Scope

Scope Description

Site Dimension:
- ~73' x 112'

Elevation above sea level:
- ~0'

Dimensions of Community Center:
- 31' x 26'



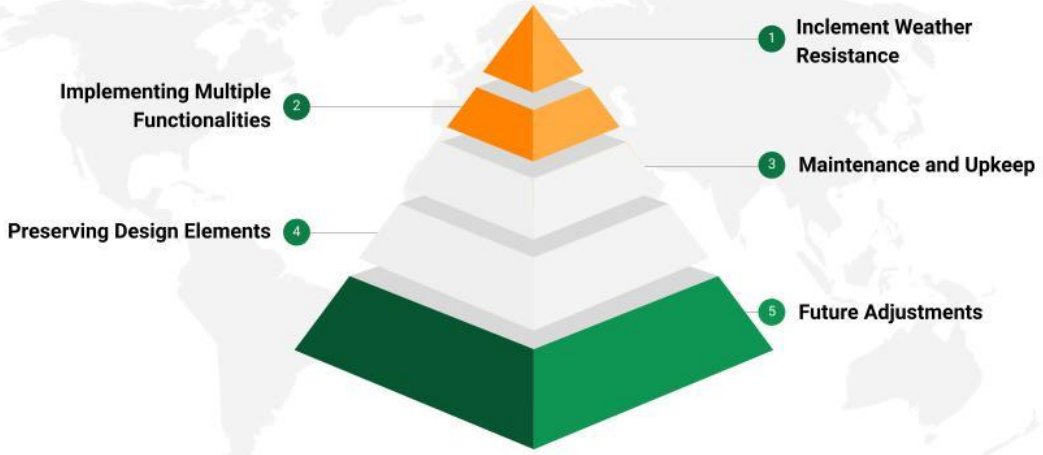
36

Sacrificial Scope

- Current available funds: **$22,578**
- Cost estimates of current design meet the amount fundraised
  - Total Cost Estimate of 31' x 26' building: **$27,287**
  - Status: DEFICIT of **$4,709**
  - Ambiguity regarding contractor quotes
  - Costs are most likely inflated due to COVID-19
- Scope Plan:
  - Scope of the building will remain the same
    - It is possible that a bathroom will be added for next year

37

Sustainability



38

Fundraising & Transition

Fundraising Overview

- $22,578 raised
  - $20,505 from fall semester HornRaiser
  - $2,073 from spring semester HornRaiser
- Focus on fundraising events as well as our own extended networks
  - Selling Tiff's Treats cookies in PCL and FAC
  - SoulCycle Raffle
  - Selling water bottles in Downtown Austin
  - Profit shares with UTea Pho and Cold Cookie Co.
  - Selling discounted Iron Cactus gift cards
  - Bucketing at basketball games
  - Girl Day
  - 3 Kendra Scott Raffles

40

Possible Fundraising Needs & Uses for 2021 Team India

- Full funding of community center
  - Potential drawbacks:
    - Cost is pushed further away from $15,000 PUC limit
- Bathroom or sanitation station
  - Inside or next to the community center
  - Potential drawbacks:
    - Expensive project
    - Nearby water pump
    - May cause contamination
- Solar panels
  - Potential drawbacks:
    - Expensive project
    - Not an urgent need in the community

41

Transition Plans - Deliverables

Final Report

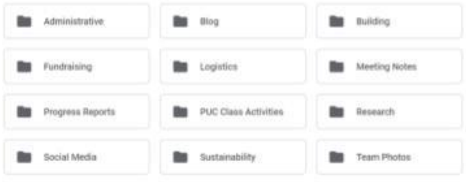
- Communication plan
- Detailed explanation of our designs
- Construction bid
- Project suggestions and add-ons
- Our travel and accommodation planning
- Challenges
- Improvements

42

Transition Plans - Deliverables

Accounts

- Google Drive
  - All of our research, information, designs, assignments, etc.
- Social Media
  - Instagram/Facebook
  - Keep our friends in the loop



43

Transition - 2020/2021 Availability

	Fall 2020	Spring 2021	Implementation	Mentor
Audrey				
Britta				
Colin				
Dain				
Elise				
Jamie				
Ramya				

44

Transition - Communication

Summer

- Continue calls with Poul

Fall

- Audrey will be the transition liaison
- Slack with 2021 team
- Monthly meetings with the 2021 team
- Be on the 2021 team's first call with Poul

Spring

- Planning to be more involved Spring Semester
- Attend Milestone 4
- More frequent meetings

45

Transition - Critical Issues

- **Budget**
  - Negotiations or reduce scope
- **Communication with CASA**
  - Can be infrequent calls
  - Poul may take a while to get back to us with information
- **Add - Ons**
  - Project scope is already large
  - We do not want add-ons to contribute to scope creep
  - Add-on recommendation from Poul
    - Bathroom
      - Expensive and difficult
      - Maybe just a sink

46

Communication & Internal Structure

Client and Partner Engagement

March 9th	Video call with Poul (CASA)
March 22nd	Video call with Poul (CASA)
March 27th	Zoom meeting with Ken Hanks (Technical Advisor)
April 5th	Video call with Poul (CASA)
April 15th	Video call with Poul (CASA)
April 22nd	Video call with Poul (CASA)
April 29th	Video call with Poul (CASA)
May 4th	Zoom meeting with Ken Hanks (Technical Advisor)
May 6th	Video call with Poul (CASA)

CASA
People Helping People

Community Engagement

- Prior to next summer's implementation
  - Continue discussions with CASA to explore ways to support the community, especially during the COVID-19 crisis
  - Virtual engagement throughout the school year
- Possibilities for the summer of 2021
  - Breakfast provided by the team
  - Craft Day
  - Daytime Activities
    - e.g. Carrom Board, Soccer, and Jacks
  - Social distancing activities
    - Sidewalk chalk games
    - Music/dance/talent show

Photos of CASA's COVID-19 response efforts in Siripudi

49

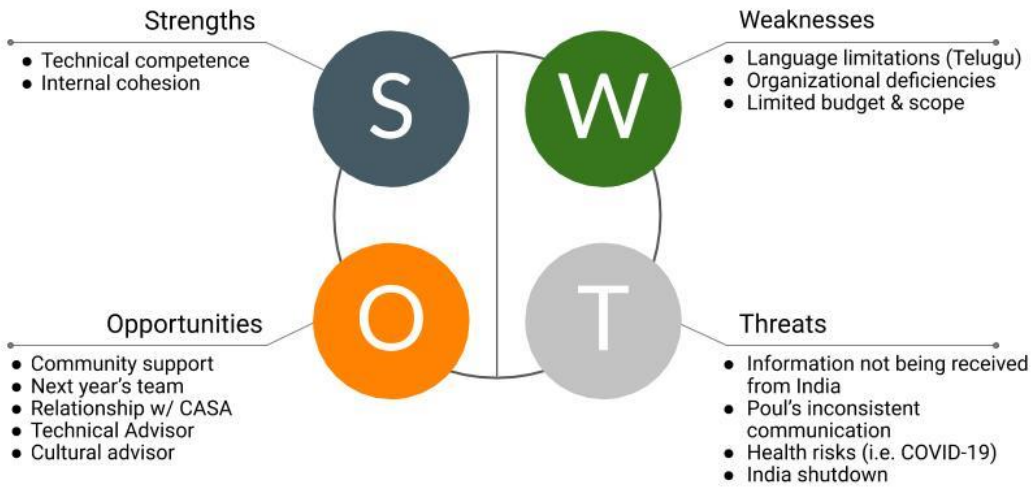
Roles and Contributions

	Team India	CASA	Community
Roles	• **Develop scope** of multipurpose center • **Raise funds** for resources for construction • Utilize customer needs & engineering requirements to **design center**	• Analysis of community **needs** • Establishment of **expectations** • **Obtain resources** for construction (materials, contractors, etc.)	• **Partner** with CASA and Team India to build community center • **Provide** insight to community lifestyle and culture
Services	• Provide CASA with **monetary support** • Deliver **design** of center to 2021 Team India • **Offer guidance** to 2021 Team India regarding design, fundraising, and communications	• **Inform** Team India about surrounding area, materials, and resources • **Provide decisions** regarding scope and purpose	• **Inform** CASA of needs, desires, concerns, and questions • Tear down old community structure

50

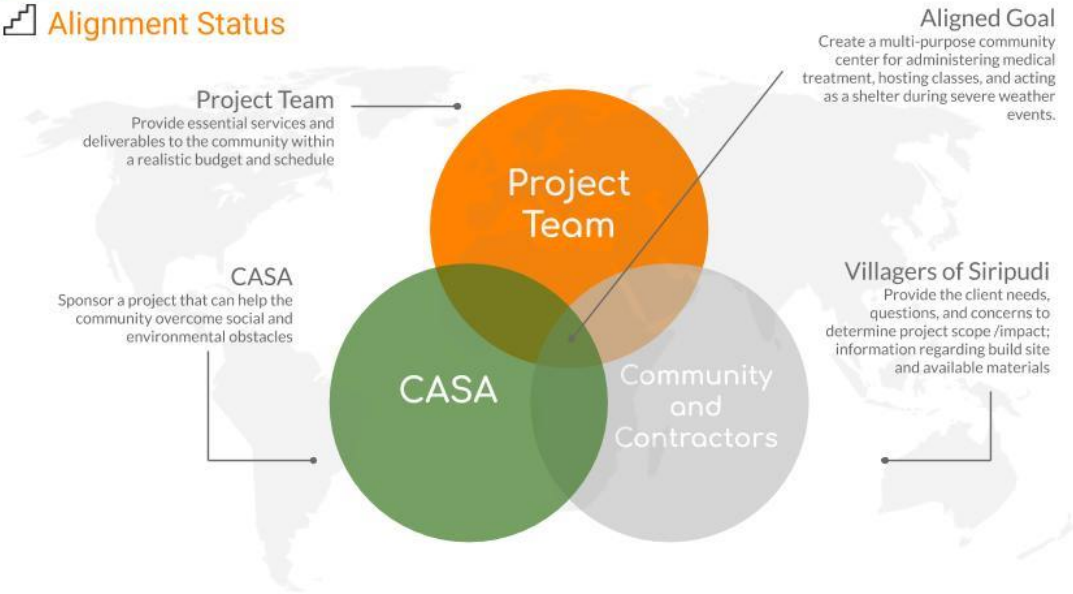
Next Steps

S.W.O.T. Analysis



52

Alignment Status



53

Questions/Barriers Moving Forward

Scope

- Currently insufficient funds
- Waiting on formal bid from contractor to confirm 14 lakh budget limit
- Next year's project
- Fundraising alongside next year's team

Client community

- Specific layout of interior, e.g. rooms and closets
- Feasible additions to benefit the community

CASA

- Inconsistent communication with Poul
- Transitioning to ensure communication continues

54

Questions?

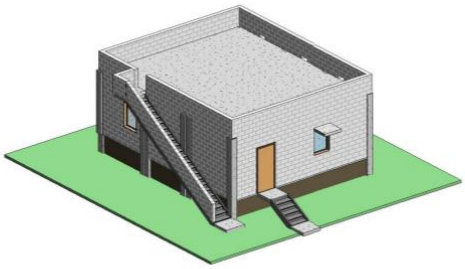
Appendix E. Current Drawings, Design Calculations, and Specifications

MILESTONE 4
PUC TEAM INDIA 2020

PUC '20 INDIA

VIEW LIST

Sheet Number	View Name
A-1	Cover Sheet
A-2	Site Plan
A-3	North Elevation
A-4	East Elevation
S-1	Below Grade Foundation
S-2	Floor Plan
S-3	Roof Plan
S-4	South Section - Cut A
S-5	West Section - Cut B
S-6	Stairs Section - Cut C
S-7	Rebar Details



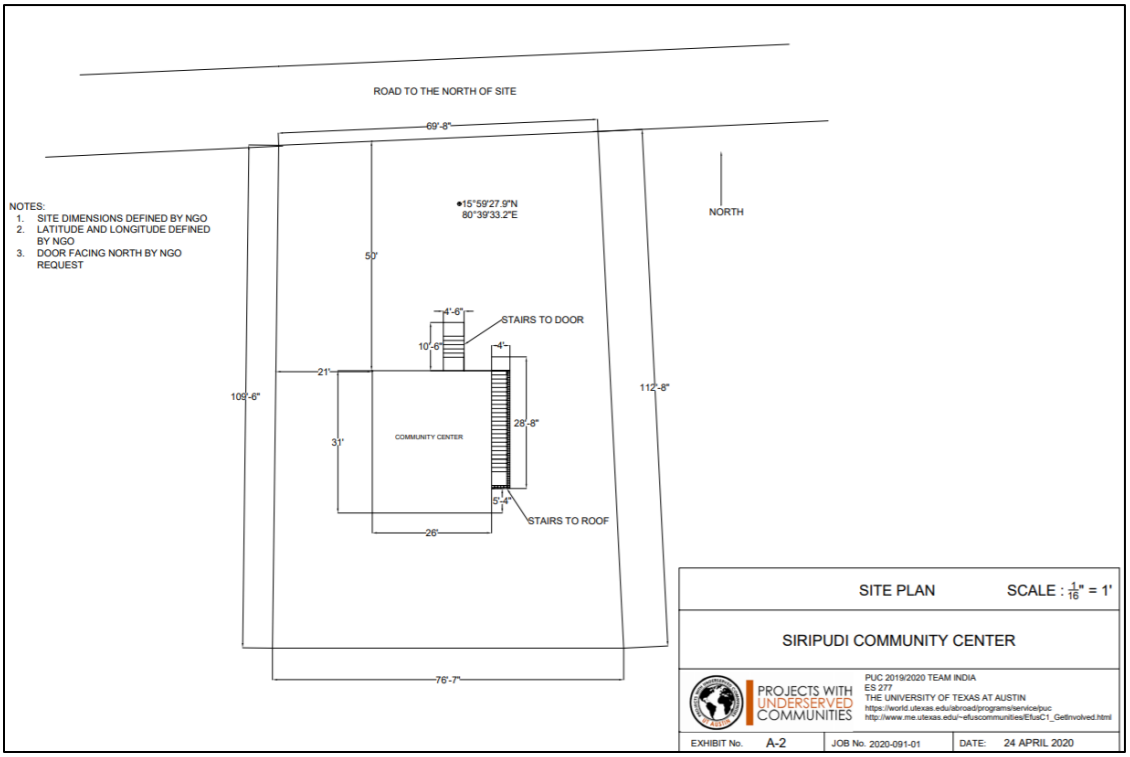
COVER SHEET

SIRIPUDI COMMUNITY CENTER

PROJECTS WITH UNDERSERVED COMMUNITIES

PUC 2019/2020 TEAM INDIA
ES 277
THE UNIVERSITY OF TEXAS AT AUSTIN
https://global.utexas.edu/abroad/programs/service/puc
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html

EXHIBIT No. G-1	JOB No. 2020-091-01	24 APRIL 2020



SITE PLAN SCALE : $\frac{1}{16}$" = 1'

SIRIPUDI COMMUNITY CENTER

PROJECTS WITH UNDERSERVED COMMUNITIES

PUC 2019/2020 TEAM INDIA
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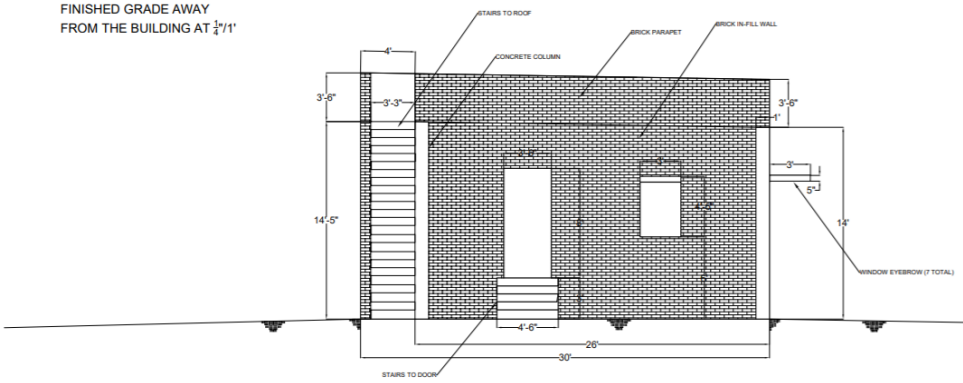
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html

EXHIBIT No. A-2	JOB No. 2020-091-01	DATE: 24 APRIL 2020

NOTES:
1. CONTRACTOR SLOPE FINISHED GRADE AWAY FROM THE BUILDING AT $\frac{1}{4}$"/1'



NORTH ELEVATION SCALE : $\frac{3}{16}$" = 1'

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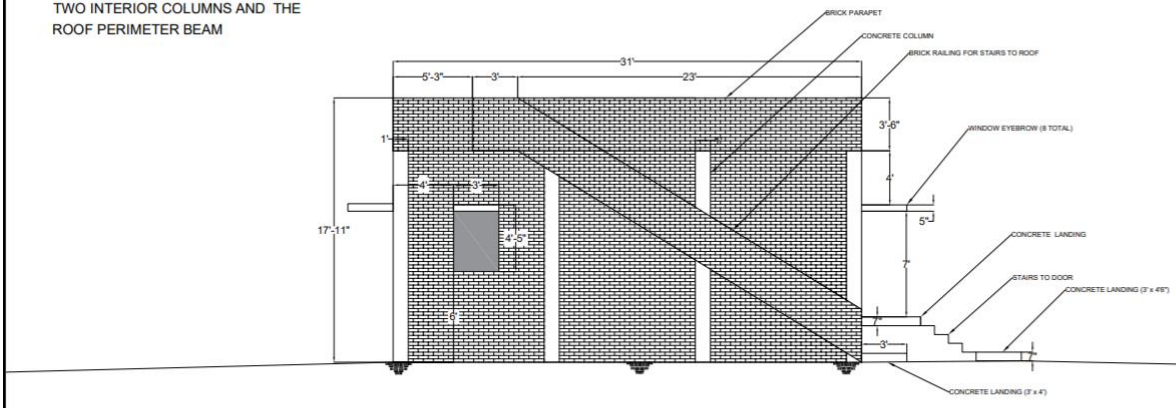
EXHIBIT No. A-3	JOB No. 2020-091-01	DATE: 11 MARCH 2020

NOTES:
1. STAIRS WILL BE CANTILEVERED BY TWO INTERIOR COLUMNS AND THE ROOF PERIMETER BEAM



EAST ELEVATION SCALE : $\frac{3}{16}$"= 1'

SIRIPUDI COMMUNITY CENTER

PROJECTS WITH UNDERSERVED COMMUNITIES

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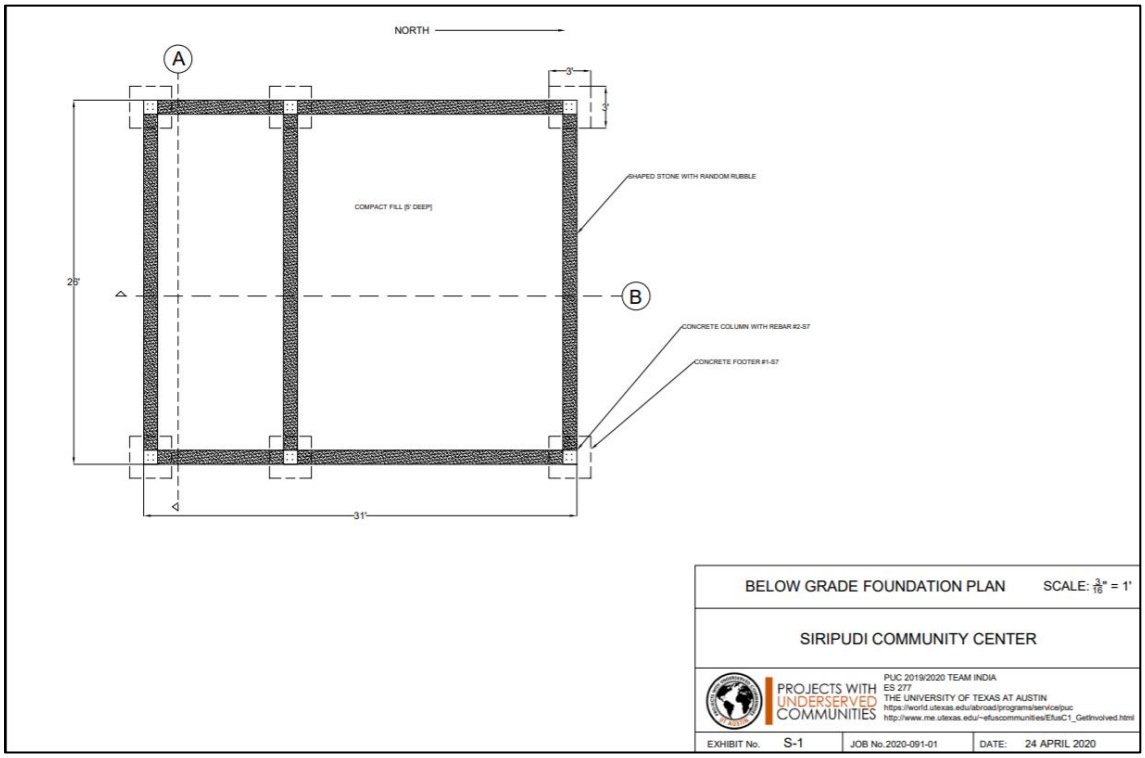
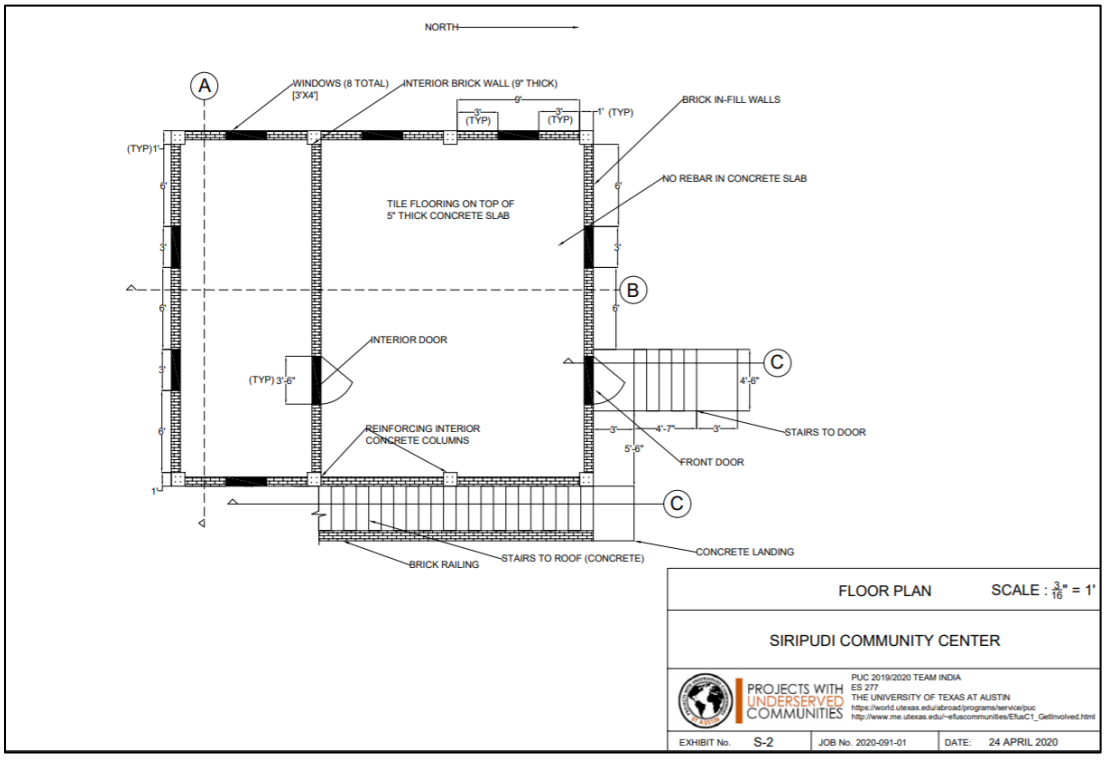
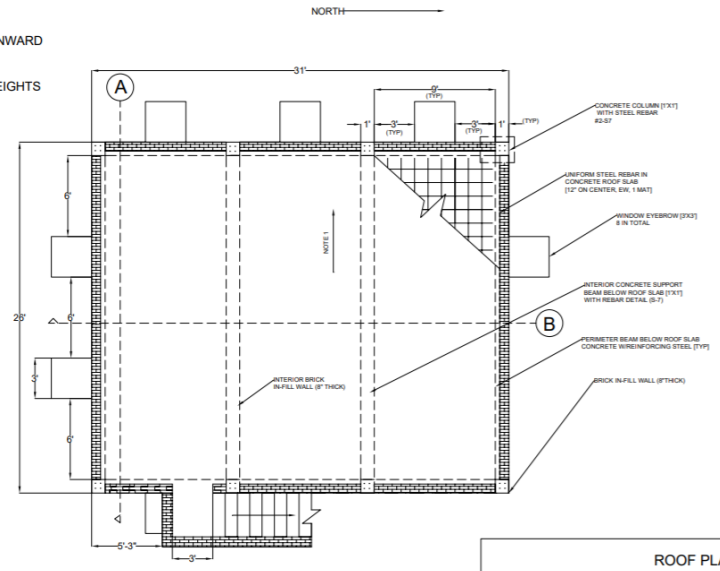
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html

EXHIBIT No. A-4	JOB No. 2020-091-01	DATE: 24 APRIL 2020


NORTH
A
B
3'
5'
SHAPED STONE WITH RANDOM RUBBLE
COMPACT FILL [5' DEEP]
CONCRETE COLUMN WITH REBAR #2-S7
CONCRETE FOOTER #1-S7
26'
31'
BELOW GRADE FOUNDATION PLAN
SCALE: 3/16" = 1'
SIRIPUDI COMMUNITY CENTER
PROJECTS WITH UNDERSERVED COMMUNITIES
PUC 2019/2020 TEAM INDIA
ES 277
THE UNIVERSITY OF TEXAS AT AUSTIN
https://world.utexas.edu/abroad/programs/service/puc
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html
EXHIBIT No. S-1
JOB No.2020-091-01
DATE: 24 APRIL 2020


NORTH
A
B
C
WINDOWS (8 TOTAL) [3'X4']
INTERIOR BRICK WALL (9" THICK)
BRICK IN-FILL WALLS
NO REBAR IN CONCRETE SLAB
TILE FLOORING ON TOP OF 5" THICK CONCRETE SLAB
INTERIOR DOOR
(TYP) 3'-6"
REINFORCING INTERIOR CONCRETE COLUMNS
STAIRS TO DOOR
FRONT DOOR
4'-6"
5'-6"
4'-7"
CONCRETE LANDING
STAIRS TO ROOF (CONCRETE)
BRICK RAILING
FLOOR PLAN
SCALE : 3/16" = 1'
SIRIPUDI COMMUNITY CENTER
PROJECTS WITH UNDERSERVED COMMUNITIES
PUC 2019/2020 TEAM INDIA
ES 277
THE UNIVERSITY OF TEXAS AT AUSTIN
https://world.utexas.edu/abroad/programs/service/puc
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html
EXHIBIT No. S-2
JOB No. 2020-091-01
DATE: 24 APRIL 2020

NOTES:
1. ROOF SLOPE DOWNWARD 6" ACROSS E-W DIMENSION, SEE EXTERIOR WALL HEIGHTS SHEET A-3



ROOF PLAN SCALE : $\frac{3}{16}$" = 1'

SIRIPUDI COMMUNITY CENTER

PROJECTS WITH UNDERSERVED COMMUNITIES

PUC 2019/2020 TEAM INDIA
ES 277
THE UNIVERSITY OF TEXAS AT AUSTIN
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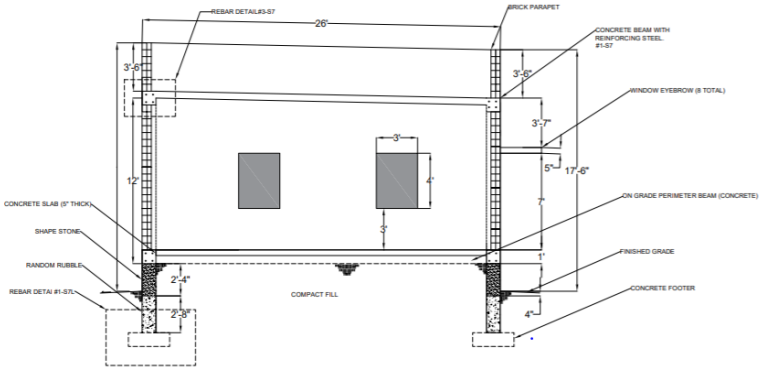
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html

EXHIRIT No.	S-3	JOB No. 2020-091-01	DATE: 24 APRIL 2020

NOTES:
1. SLOPE GRADE AWAY FROM BUILDING $\frac{1}{4}$"/1'
2. FINISHED GRADE TO BE MINIMUM 4" ABOVE TOP OF RANDOM RUBBLE



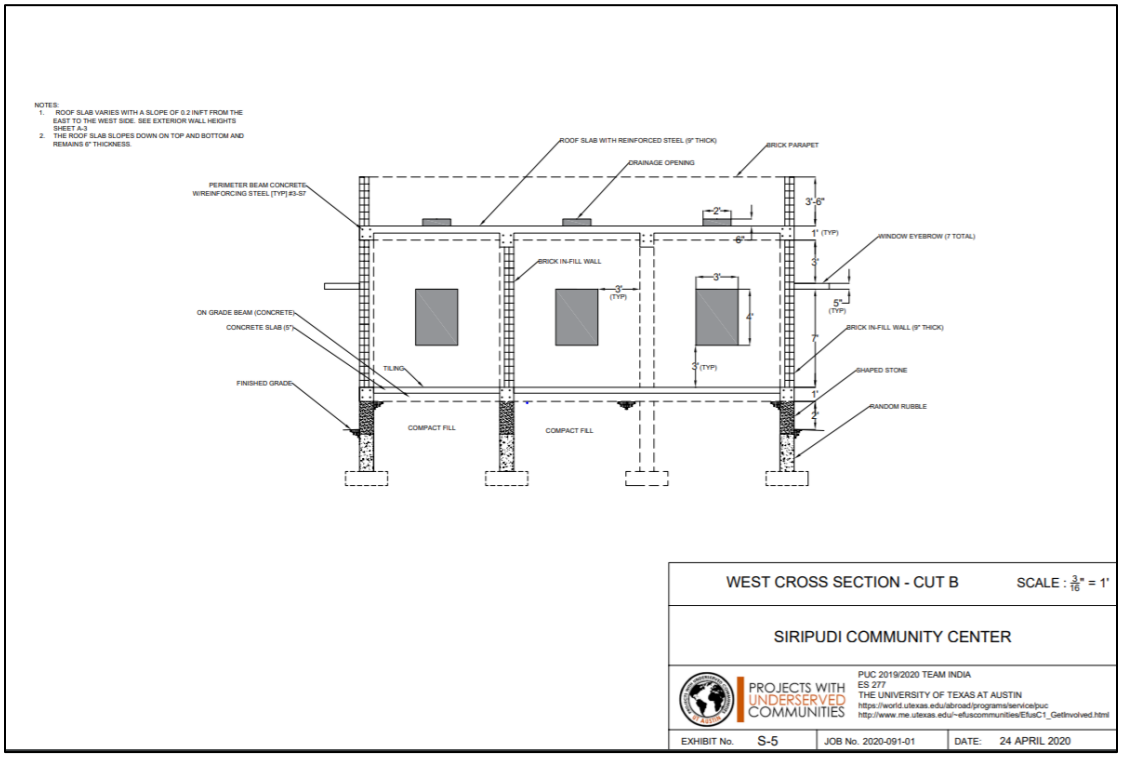
SOUTH BUILDING SECTION - CUT A SCALE : $\frac{3}{16}$"= 1'

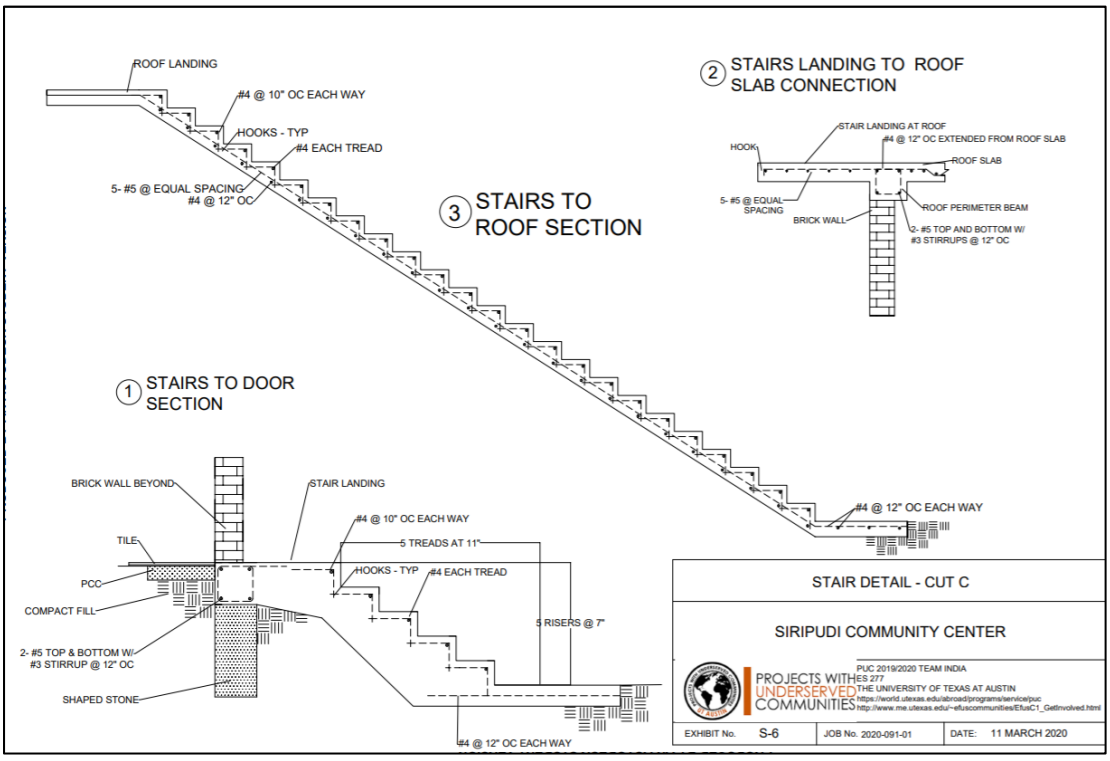
SIRIPUDI COMMUNITY CENTER

PROJECTS WITH UNDERSERVED COMMUNITIES

PUC 2019/2020 TEAM INDIA
ES 277
THE UNIVERSITY OF TEXAS AT AUSTIN
https://world.utexas.edu/abroad/programs/service/puc
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html

EXHIBIT No.	S-4	JOB No. 2020-091-01	DATE: 24 APRIL 2020


NOTES:
1. ROOF SLAB VARIES WITH A SLOPE OF 0.2 INFT FROM THE EAST TO THE WEST SIDE. SEE EXTERIOR WALL HEIGHTS SHEET A-3
2. THE ROOF SLAB SLOPES DOWN ON TOP AND BOTTOM AND REMAINS 6" THICKNESS.
ROOF SLAB WITH REINFORCED STEEL (6" THICK)
BRICK PARAPET
DRAINAGE OPENING
PERIMETER BEAM CONCRETE W/REINFORCING STEEL [TYP] #3-S7
WINDOW EYEBROW (7 TOTAL)
BRICK IN-FILL WALL
ON GRADE BEAM (CONCRETE)
CONCRETE SLAB (5")
BRICK IN-FILL WALL (9" THICK)
TILING
SHAPED STONE
FINISHED GRADE
RANDOM RUBBLE
COMPACT FILL
COMPACT FILL
3'-6"
1' (TYP)
3'
5" (TYP)
7'
1'
2'
3' (TYP)
4'
WEST CROSS SECTION - CUT B
SCALE : 3/16" = 1'
SIRIPUDI COMMUNITY CENTER
PROJECTS WITH UNDERSERVED COMMUNITIES
PUC 2019/2020 TEAM INDIA
ES 277
THE UNIVERSITY OF TEXAS AT AUSTIN
https://world.utexas.edu/abroad/programs/service/puc
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html
EXHIBIT No. S-5
JOB No. 2020-091-01
DATE: 24 APRIL 2020


ROOF LANDING
#4 @ 10" OC EACH WAY
HOOKS - TYP
#4 EACH TREAD
5- #5 @ EQUAL SPACING
#4 @ 12" OC
3 STAIRS TO ROOF SECTION
#4 @ 12" OC EACH WAY
2 STAIRS LANDING TO ROOF SLAB CONNECTION
STAIR LANDING AT ROOF
#4 @ 12" OC EXTENDED FROM ROOF SLAB
HOOK
ROOF SLAB
5- #5 @ EQUAL SPACING
ROOF PERIMETER BEAM
BRICK WALL
2- #5 TOP AND BOTTOM W/ #3 STIRRUPS @ 12" OC
1 STAIRS TO DOOR SECTION
BRICK WALL BEYOND
STAIR LANDING
#4 @ 10" OC EACH WAY
TILE
5 TREADS AT 11"
HOOKS - TYP
#4 EACH TREAD
PCC
COMPACT FILL
5 RISERS @ 7"
2- #5 TOP & BOTTOM W/ #3 STIRRUP @ 12" OC
SHAPED STONE
#4 @ 12" OC EACH WAY
STAIR DETAIL - CUT C
SIRIPUDI COMMUNITY CENTER
PROJECTS WITH UNDERSERVED COMMUNITIES
PUC 2019/2020 TEAM INDIA
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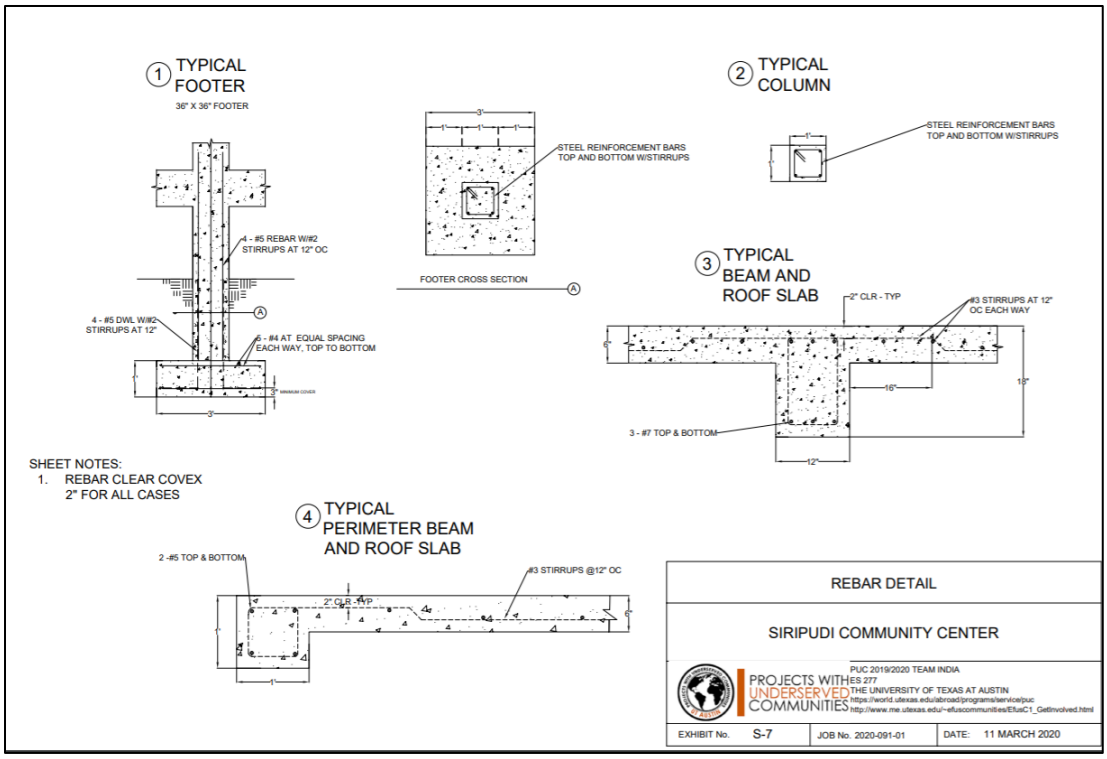
https://world.utexas.edu/abroad/programs/service/puc
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html
EXHIBIT No. S-6
JOB No. 2020-091-01
DATE: 11 MARCH 2020


1 TYPICAL FOOTER
36" X 36" FOOTER
4 - #5 REBAR W/#2 STIRRUPS AT 12" OC
4 - #5 DWL W/#2 STIRRUPS AT 12"
5 - #4 AT EQUAL SPACING EACH WAY, TOP TO BOTTOM
3" MINIMUM COVER
3'
STEEL REINFORCEMENT BARS TOP AND BOTTOM W/STIRRUPS
FOOTER CROSS SECTION
A
2 TYPICAL COLUMN
STEEL REINFORCEMENT BARS TOP AND BOTTOM W/STIRRUPS
3 TYPICAL BEAM AND ROOF SLAB
2" CLR - TYP
#3 STIRRUPS AT 12" OC EACH WAY
6"
16"
18"
3 - #7 TOP & BOTTOM
12"
SHEET NOTES:
1. REBAR CLEAR COVEX 2" FOR ALL CASES
4 TYPICAL PERIMETER BEAM AND ROOF SLAB
2 -#5 TOP & BOTTOM
#3 STIRRUPS @12" OC
2" CLR - TYP
6"
1'
REBAR DETAIL
SIRIPUDI COMMUNITY CENTER
PUC 2019/2020 TEAM INDIA
ES 277
THE UNIVERSITY OF TEXAS AT AUSTIN
https://world.utexas.edu/abroad/programs/service/puc
http://www.me.utexas.edu/~efuscommunities/EfusC1_GetInvolved.html
PROJECTS WITH UNDERSERVED COMMUNITIES
EXHIBIT No. S-7
JOB No. 2020-091-01
DATE: 11 MARCH 2020

Appendix F. Construction Bids & Contracting Updates

The following table contains the received contracting bids for the 31’ x 26’ structure. Miriyala Jyothi of Citadel Technologies Guntur has been selected by CASA to be the contractor and as previously stated, has agreed to construct the building for 14 lakhs. The current bid does not reflect that and the team is waiting on Poul to send the documents; the hope is to receive this as soon as India is re-opened. A thing to keep in mind that costs may be reduced as material prices are currently inflated due to the pandemic and shutdown in India.

Table 8: Contracting Bids

Contractor / Entity	Item Description	Amount (INR)	Amount (USD)
J. Sriramam *Consulting Engineer*	Cost of construction of ground floor RCC roof building	₹1,562,169.02	$20,699.35
	Provision for sanitary arrangements with accessories	₹150,000.00	$1,987.56
	Provision for internal and external electrification	₹85,000.00	$1,126.28
	Provision for elevation work with stainless steel railings, mesh work, etc.	₹120,000.00	$1,590.05
	Provision for bathroom tiles (glazed tiles)	₹75,000.00	$993.78
	Miscellaneous	₹5,125.00	$67.91
	TOTAL	**₹1,997,294.02**	**$26,464.93**
Y. Narayana Reddy *Consulting Engineer & Licensed Surveyor*	Cost of construction of ground floor RCC roof building	₹1,667,331.88	$22,092.80
	Provision for sanitary arrangements with accessories	₹155,000.00	$2,053.81
	Provision for internal and external electrification	₹115,000.00	$1,523.79
	Provision for elevation work with stainless steel railings, mesh work, etc.	₹155,000.00	$2,053.81
	Provision for bathroom tiles (glazed tiles)	₹95,000.00	$1,258.79
	Miscellaneous	₹15,000.00	$198.76
	TOTAL	**₹2,202,331.88**	**$29,181.76**
Miriyala Jyothi *Contractor, Citadel Technologies Guntur*	Cost of construction of ground floor RCC roof building	₹1,314,378.65	$17,416.03
	Provision for sanitary arrangements with accessories	₹90,000.00	$1192.54
	Provision for internal and external electrification	₹70,000.00	$927.53
	Provision for elevation work with stainless steel railings, mesh work, etc.	₹75,000.00	$993.78
	Provision for bathroom tiles (glazed tiles)	₹35,000.00	$463.76
	Miscellaneous	₹4500.54	$59.63
	TOTAL	**₹1,588,879.19**	**$21,053.27**

Note: 1 INR equals 0.013 USD

Appendix G. List of Contacts

PUC Team India 2019-2020

Colin Phillips, *Project Manager*
colinphillips@utexas.edu
(210) 551-5285

Ramya Yedatore, *Fundraising Manager*
ramyayedatore@gmail.com
(512) 736-9640

Britta Dalton, *Logistics Manager/Transition Liaison*
britta.dalton@utexas.edu
(606) 369-3589

Dain Kasprak, *Scope & Deliverables Manager*
dain.kasprak@gmail.com
(512) 810-2309

Elise Higgins, *Cost & Resources Manager/Technical Lead*
elise.higgins98@utexas.edu
(512) 983-2294

Audrey Soltau, *Quality & Safety Manager/Technical Lead*
a.soltau@utexas.edu
(903) 806-2370

Jamie Li, *Communications Manager*
jamieli5900@gmail.com
(832) 719-1608

Technical and Cultural Advisors

Ken Hanks, P.E., *Traveling Technical Adviser*
khanks2000@gmail.com

Martin Rumbaugh, P.E., *Technical Adviser*
martin.rumbaugh@aecom.com

Naman Agrawal, *Technical Adviser/Teaching Assistant*
naman94agrawal@gmail.com

Victor Butcher, *PUC Team India 2018-2019 Technical Adviser*
victorbutcher@utexas.edu

Jane Cloninger, *PUC Team India 2018-2019, Fundraising Manager*
jane.cloninger413@gmail.com

Church's Auxiliary for Social Action (CASA)

Poul Luther, *CASA Project Manager*
poulluther@yahoo.co.in (Preferred)
poul@casa-india.org
+91 98409 36157

Karuna Yesupadam, *CASA Staff Member-Andhra Pradesh*
yesupadam.casabapatla@gmail.com
+91 996315 98697
**Note: Mr. Yesupadam is the point of contact for Siripudi*

The University of Texas at Austin

Kirsten Hagen, *PUC Program Coordinator*
kirsten.hagen@austin.utexas.edu

Josh Klein, *Interim PUC Coordinator*
internships_GA@austin.utexas.edu

Dr. James O'Connor, *Project Management Lecturer*
jtoconnor@mail.utexas.edu

Cameron Oden, *Teaching Assistant*
cam.oden@gmail.com

Appendix H. Project Assessment

PUC: Project Selection Criteria & Knowledge Assessment

		Project Analyzed Here:	Multipurpose Community Center 26' x 31'	Date & Iter'n #: Milestone 4

Weighting	#	Criteria	Sub-Criteria	Info. Availability or Reliability		
50 Pts	**1.0**	**Feasibility of Project**				
45%	**1.1**		**Technical complexity of project / Ability of team to accomplish technical objectives**	**L**	**M**	**H**
		0 %	Student team WILL BE CHALLENGED in accomplishing MOST technical objectives			
		25 %	Student team WILL BE CHALLENGED in accomplishing MANY technical objectives			
		50 %	Student team WILL BE CHALLENGED in accomplishing SEVERAL technical objectives			
		75 %	Student team should be able to accomplish MOST technical objectives WITH EASE			1
		100 %	Student team should be able to accomplish ALL technical objectives WITH EASE			
40%	**1.2**		**Portion of approximate total project cost & student travel cost requiring fundraising**	**L**	**M**	**H**
		0 %	> $40K			
		25 %	$20K - $40K			1
		50 %	$10K - $20K			
		75 %	$5K - $10K			
		100 %	< $5 K			
15%	**1.3**		**Ability of the local community to effectively contribute labor to the site construction effort**	**L**	**M**	**H**
		0 %	The local community is not able to contribute any portion of the total construction effort			
		25 %	The local community is only able to contribute a small portion of the total construction effort			
		50 %	The local community is able to contribute between a small and moderate portion of the total construction effort			
		75 %	The local community is able to contribute a moderate portion of the total construction effort			1
		100 %	The local community is able to contribute a significant portion of the total construction effort			
50 Pts.	**2.0**	**Impact on Community from Project**				
50%	**2.1**		**Number of community members impacted by project**	**L**	**M**	**H**
		0 %	< 20			
		25 %	20 - 50			
		50 %	50 - 100			
		75 %	100 - 250			
		100 %	> 250		1	
50%	**2.2**		**Depth or degree of impact per community member**	**L**	**M**	**H**
		0 %	Project does not provide for an important need			
		25 %	Project provides for an important weekly need			
		50 %	Project provides for an important daily need			
		75 %	Project provides for a VERY important daily need			
		100 %	Project provides a FUNDAMENTAL daily need: i.e., food, water, and/or shelter		1	

100 Pts.	3.0	Project Risks (DEDUCTIONS!!!)				
6%	3.1		Access to/familiarity with client, work scope, and site characteristics	L	M	H
		0 %	High		1	
		25 %	Moderate-to-High			
		50 %	Low-to-Moderate			
		75 %	Low			
		100 %	None			
10%	3.2		Reliability of local partner/facilitator	L	M	H
		0 %	High			1
		25 %	Moderate-to-High			
		50 %	Low-to-Moderate			
		75 %	Low			
		100 %	None			
6%	3.3		Availability/reliability of local communication and transportation infrastructure	L	M	H
		0 %	High			
		25 %	Moderate-to-High	1		
		50 %	Low-to-Moderate			
		75 %	Low			
		100 %	None			
12%	3.4		Availability of local health facilities and services	L	M	H
		0 %	High			1
		25 %	Moderate-to-High			
		50 %	Low-to-Moderate			
		75 %	Low			
		100 %	None			
10%	3.5		Availability of adequate and safe local housing for students	L	M	H
		0 %	High		1	
		25 %	Moderate-to-High			
		50 %	Low-to-Moderate			
		75 %	Low			
		100 %	None			
2%	3.6		Quality of local food & water for student consumption	L	M	H
		0 %	High			
		25 %	Moderate-to-High			
		50 %	Low-to-Moderate	1		
		75 %	Low			
		100 %	None			

				L	M	H
16%	3.7		**Local/regional political instability or violence**			
		0 %	None			1
		25 %	Low			
		50 %	Low-to-Moderate			
		75 %	Moderate-to-High			
		100 %	High			
4%	3.8		**Likelihood of force majeur events in area: hurricane, earthquake, monsoon, etc.**	L	M	H
		0 %	None			
		25 %	Low			
		50 %	Low-to-Moderate			
		75 %	Moderate-to-High			
		100 %	High			1
6%	3.9		**Likelihood of student challenges with local vernacular language**	L	M	H
		0 %	None			
		25 %	Low			
		50 %	Low-to-Moderate			
		75 %	Moderate-to-High			
		100 %	High			1

				L	M	H
10%	3.10		**Likelihood of challenges with accessibility to sites by students**	L	M	H
		0 %	None			
		25 %	Low	1		
		50 %	Low-to-Moderate			
		75 %	Moderate-to-High			
		100 %	High			
4%	3.11		**Likelihood of challenges with accessibility to local sites for materials and equipment**	L	M	H
		0 %	None			
		25 %	Low			
		50 %	Low-to-Moderate			
		75 %	Moderate-to-High			1
		100 %	High			
2%	3.12		**Reliabillity of needed local/regional material supply chain**	L	M	H
		0 %	High			
		25 %	Moderate-to-High	1		
		50 %	Low-to-Moderate			
		75 %	Low			
		100 %	None			

				L	M	H
2%	3.13		**Reliability of needed local/regional technical expertise**			
		0 %	High			
		25 %	Moderate-to-High	1		
		50 %	Low-to-Moderate			
		75 %	Low			
		100 %	None			
4%	3.14		**Likelihood of site construction safety hazards**	L	M	H
		0 %	None			
		25 %	Low			
		50 %	Low-to-Moderate		1	
		75 %	Moderate-to-High			
		100 %	High			
2%	3.15		**Likelihood of other safety hazards to students, such as local predatory or life-threatening wildlife, viral contagions, etc. (define):**	L	M	H
		0 %	None			
		25 %	Low			
		50 %	Low-to-Moderate			
		75 %	Moderate-to-High			1
		100 %	High			

				L	M	H
4%	3.16		**Likelihood of team challenges with one or more unproven technologies**			
		0 %	None			1
		25 %	Low			
		50 %	Low-to-Moderate			
		75 %	Moderate-to-High			
		100 %	High			

Summary of Assessment:

	27.5	**Feasibility of Project** (Point range: 0 - 50)
+	50	**Impact on Community from Project** (Point range: 0 - 50)
-	22.5	**Project Risks** (Point range: 0 - 100)
	55	**NET SCORE** (Best: + 100 pts Worst: - 100 pts)

Appendix I. Pre-Trip Risk Assessment

Table 9: Pre-trip Risk Assessment

Category	Likelihood of Occurrence					Relative Impact					Baseline	Coordinate
	1	2	3	4	5	A	B	C	D	E		
I. Finance / Funding	X									X	E	E1
II. Cultural				X			X				B	B4
III. Political		X				X					A	A2
IV. Legal		X							X		D	D2
V. Project Scope			X					X			C	C3
VI. Sourcing and Supply		X						X			C	C2
VII. Design / Engineering	X									X	E	E1
VIII. Construction		X						X			C	C2
IX. Sustainability / Maintenance		X							X		D	D2

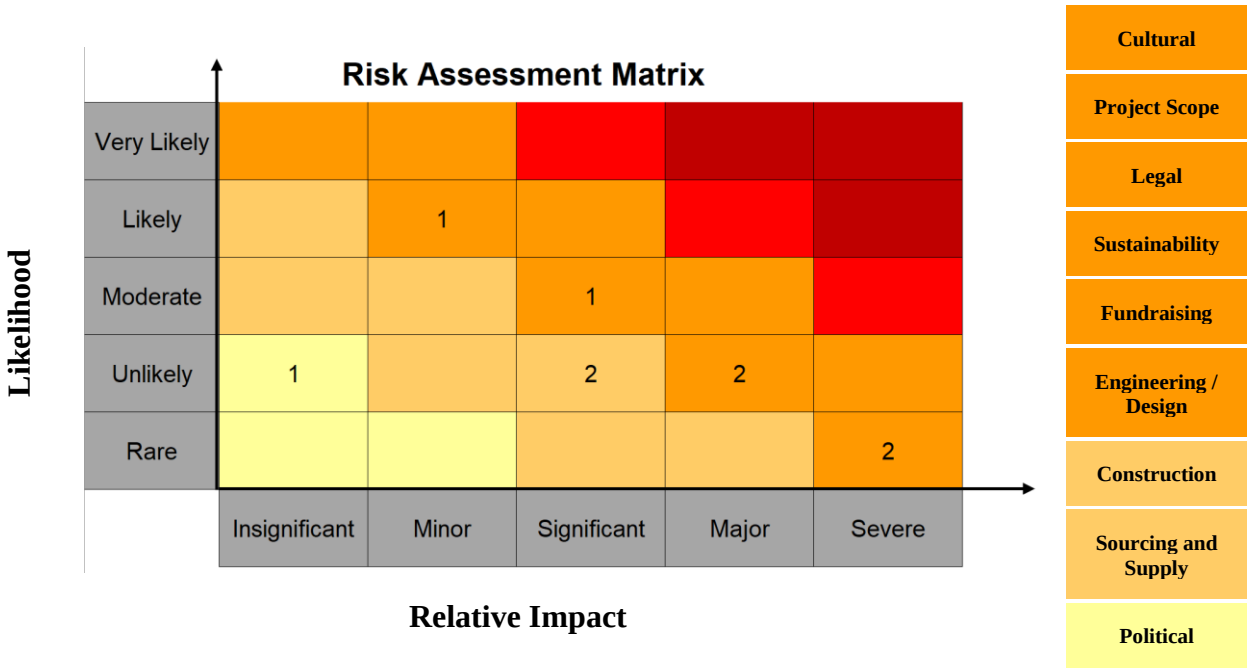


Figure 2: Risk Assessment Matrix

Appendix J. Pre-Trip Project Final Budget & Materials List

Table 10: Materials List

Materials List	
RCC Specifications: All RCC works are 1:2:4 mix with 20 mm chips using cement mortar	**Total Volume (ft^3)**
Grade Beams (short side)	78
Roof Beams (short side)	104
Grade Beams (long side)	62
Roof Beams (long side)	62
Columns (west side)	68
Columns (east side)	70
Footers	24
Roof Slab	339
Concrete	**Total Volume (ft^3)**
Floor Slab	292
Window Covers	26
Stairs to Roof	42
Stairs to Door	9
Door Steps Landing	16
Roof Stairs Bottom Landing	7
Roof Stairs Top Landing	5
Brick Specifications with 1:6 mix using cement mortar	**Total Volume (ft^3)**
Interior Wall	153
In-Fill Outside Walls (short side)	209
In-Fill Outside Wall (west side)	324
In-Fill Outside Wall (east side)	170
Stair Railing (longways)	75
Stair Railing (sideways)	9
Parapet (short side)	96
Parapet (long side)	117

Table 11: Additional Specifications & Quantities

Additional Specifications & Quantities		
Foundation	**Quantity**	**Unit Type**
Earth Work Excavation	2418.00	ft^3
Compact Fill (sand & gravel)	2465.68	ft^3
TOTAL	**4883.68**	**ft^3**
Finishings	**Quantity**	**Unit Type**
Flooring (tiles)	696.00	ft^2
Wall plaster (interior + exterior)	3850.04	ft^2
Painting (interior + exterior)	3850.04	ft^2
Ceiling plaster	696.00	ft^2
TOTAL	**9092.08**	**ft^2**
Other	**Quantity**	**Unit Type**
Steel reinforcement	7,365	Kgs
Doors	2	
Windows	7	
Electrical	1	

Table 12: Estimated Construction Budget

Construction Phase	Total Cost
Foundation (random rubble, shape stone, & compact fill)	$1,403
Ground Floor	$4,189
Reinforcing Steel	$6,223
Finishings (flooring, plaster, & paint)	$5,271
Elevation Work and Railings	$975
Tiling and Miscellaneous	$514
Electrical	$910
Sanitary Arrangements	$1,170
TOTAL	**$20,655**

Table 13: Detailed Construction Budget

Foundation	Description	Cost (INR)	Cost (USD)	Comments
	Earthwork Excavation	₹9,457	$123	In foundation trenches
	Gravel Filling	₹44,616	$580	(Qty = Plinth area x 0.75)
	Footers	₹39,171	$509	RCC, Trapezoidal and Square footings. For Trapezoidal footings (Qty = 45% of Square footings Qty)
	Mass Concrete Bed	₹14,735	$192	1:4:8 mix with 40mm HBG metal stones
	TOTAL	**₹107,979**	**$1,404**	
Ground Floor	**Description**	**Cost (INR)**	**Cost (USD)**	**Comments**
	Plinth Beams, RCC	₹22,770	$296	(Total length is taken)
	Slab Beams, RCC	₹37,260	$484	(Total length is taken)
	Lintel Beams, RCC	₹12,406	$161	(Total length is taken)
	Columns, RCC	₹36,221	$471	
	Slab with Extensions, RCC	₹97,347	$1,266	
	Brick Masonry Walls	₹116,204	$1,511	1:6 mix using cement mortar
	Reinforcing Steel	₹478,696	$6,223	including fabrication charges
	TOTAL	**₹800,904**	**$10,412**	
Finishings	**Description**	**Cost (INR)**	**Cost (USD)**	**Comments**
	Plaster	₹72,512	$943	1:5 mix using cement mortar with 0.012m thickness
	Flooring	₹119,624	$1,555	(Plinth area is taken)
	Windows	₹101,621	$1,321	with carving & polishing work
	Doors	₹63,406	$824	Using Teakwood with carving & polishing work
	Ventilators	₹13,176	$171	
	Paint	₹35,157	$457	Altech paints. (Qty = Total plastering area)
	TOTAL	**₹405,496**	**$5,271**	
General Cost Breakdown	**Description**	**Cost (INR)**	**Cost (USD)**	**Comments**
Cost for foundation, ground floor, and finishings		₹513,475	$17,087	
Provision for Sanitary Arrangements		₹90,000	$1,170	
Provision for Electrical Work		₹70,000	$910	
Provision for Elevation Work & Railings		₹75,000	$975	
Provision for Tiling		₹35,000	$455	
Miscellaneous		₹4,501	$59	
	TOTAL	**₹787,975**	**$20,655**	
	Contingency (20%)	**₹157,595.016**	**$4,131.09**	
	TOTAL COST	**₹945,570.096**	**$24,786.52**	

Table 13: Total Cost Estimate

Project Components	Cost (USD)
Construction Costs	$20,655
Contingency (20%)	$4,131
Technical Adviser	$2,500
TOTAL COST	**$27,287**

Appendix K. Sustainability Plan

In order to flesh out the sustainability plan, more conversations need to occur between PUC Team India and CASA. However, there are currently more action items that are of much higher priority (including finding a contractor and working around COVID-19). This preliminary plan is subject to change and will be refined alongside next year's team:

1. **Inclement Weather Resistance:** Building provides structural support and resistance to degradation during monsoon season, hurricanes, and other forms of inclement weather
    a. Community center is constructed on a reinforced mound raised 2 ft. 7 in. above the ground to account for the highest levels of floodwater experienced by the Siripudi community
        i. Compact fill is surrounded by concrete perimeter beam
    b. Roof parapet and slab designed to allow dozens of people to stay on the roof in case their homes are inaccessible/flooded
        . Access to rooftop is from the interior of the building, which doesn't descend to levels of potentially high levels of floodwater
    c. Plaster coating on the walls and roof to prevent water from infiltrating potential crevices

2. **Implementing Multiple Functionalities:** Allow community center to be utilized for various purposes
    a. Storage area for ceremonial, educational, and medical tools/items
        i. This will allow the main area of the community center to constantly be open instead of cluttered by items for its different uses
    b. Large room for functionalities of community center
        . Community leaders will manage scheduling of events

3. **Maintenance and Upkeep:** Sustain integrity and functionality of building
    a. Contract formulated between CASA and community
        i. CASA will set aside 5% of budget for six months to help with any issues with the building and ensure its upkeep
        ii. After six months, Village Sangam will oversee upkeep of building
            1. Includes payments of electric bills, cleaning, general maintenance
    b. PUC India will prepare an instruction manual for maintenance including details about the design of the building
    c. NGO audit details (e.g. CASA visits every few months to check on building)

4. **Preserving Design Elements:** Parts of building to improve safety and livability
    a. Sloped roof for water runoff; reduces drainage problems and increases lifespan of building
    b. Natural sunlight through windows, electrical lighting, and ventilation through ceiling fans to provide comfort for occupants
    c. Necessary fire relief and medical equipment will be stored and replenished as needed

5. **Future Adjustments**
    a. Requirements from community to improve plan and potential adjustments to be made by community
        i. If any change in community governing structure, the new entity must agree to this Sustainability Plan through the Sustainability Agreement between CASA and the village of Siripudi

ii. If any social issues - CASA notified and works to ensure Sustainability Agreement is upheld by signees

b. Potential projects for future PUC teams
   . Exploiting further usage of electrical power (adding computer or other devices)
   i. Attaching water source to building and constructing sink

c. If community has an issue with building structure, what steps they should take

Appendix L. Fundraising & Proposed Community Outreach

The following table is a broad overview of major fundraising events held throughout the fall and spring semesters. The focus in the fall was on the HornRaiser while smaller events were the priority in the spring. The team's networks were essentially exhausted by the fall HornRaiser and a sharp decrease in regular donations to crowdsourcing campaigns was observed in the spring. It is also highly recommended to participate in Girl Day in the spring and other events thrown by Cockrell.

Table 14: Fundraising Outcomes and Plan

PUC India 2020 Fundraising Outcomes and Plan			
Completed Fundraising Activities	**Date**	**Activity Description**	**Donations**
	November 5 - December 6, 2019	Fall Semester HornRaiser	$20,505.00
	February 1, 2020	Men's Basketball Game Bucketing	$72.00
	February 5, 2020	Spring Semester HornRaiser beings	$1,275.00
	February 8, 2020	Men's Basketball Game Bucketing	$118.00
	February 10, 2020	Selling samosas	$124.00
	February 8-14, 2020	Kendra Scott Raffle	$96.00
	February 22, 2020	Girl Day + selling samosas	$388.00
		TOTAL	**$22,578.00**

In regards to community outreach, a formal plan was not created as the team was never able to talk with the cultural adviser, Lavanya. She was selected as the in-person cultural adviser right before the lockdown began in India and so the team never spoke with her. It's highly encouraged to have calls with the community as fast as possible to talk more with them to determine what activities to hold. An idea is to bring carrom boards and host a day of games for the children in the village. Another possibility are socially distant games to both engage children and reinforce practical health strategies.

Appendix M. Example Solicitation Letters

Friends and Family

October 12, 2019

Dear Family and Friends,

For those of you I haven't seen in a while, I am currently in my ____ year at the University of Texas at Austin, studying _____. This year, I was chosen for a program called Projects with Underserved Communities, or PUC. PUC provides opportunities for engineering and social work students to work together in teams to design solutions to tackle real-world problems in underserved/developing areas around the world.

I'm now serving as the _____ for PUC Team India! Our team consists of seven students from a variety of studies: architectural engineering, biomedical engineering, mechanical engineering, civil engineering, electrical engineering, and social work. This is my team:

In the summer of 2020, my team will be traveling to Andhra Pradesh to a village called Siripudi. To be exact, we will be visiting a site that is about 3 kilometers outside of the main village, where 44 Schedule Tribe families and 15 Schedule Caste families currently live and are extremely ostracized from mainstream society. These families live in thatched huts without basic amenities, and almost everyone is illiterate, with the exception of some school children. The men hunt and catch fish, rodents, and snails, and only a small portion of their findings is able to sell. Some get the opportunity to work as day laborers in nearby villages to clean, dig, or remove garbage. Some women from the area get hired to clean the farmers' homes in exchange for used clothes, food, or little money. Below are some photos of the area:

The tribal population living near the main village also have very limited access to health facilities; they must travel around 40 kilometers to receive medical treatment at a facility. The government has attempted to send mobile medical teams to Siripudi to conduct check-ups and and provide treatments, but there is no sanitary space for the nurses and doctors to see patients, especially where the tribal and Schedule Caste families live. The most viable option is to see patients in their homes, but their homes are not sanitary and the floors aren't suitable to set up any medical equipment.

In addition, as a coastal village, Siripudi is heavily affected by cyclones. Villagers have no place to keep themselves safe during the storms, so they are forced to travel to nearby towns to seek shelter in their school buildings.

Next summer, my team will be working to build a Multipurpose Community Center for the tribal populations in Siripudi. This community center will provide a safe shelter for people during cyclones, a classroom for school children in the evenings, an area for medical treatments when mobile medical teams visit the village, and a common space for community gatherings and ceremonies/weddings. As of now, we are planning to have three areas in the community center: a large room, a small room, and a storage

closet. We will be designing this center all year long, and I'll be sure to keep you updated if these plans change. Our hope is that this center will provide more opportunities for these historically disadvantaged peoples, and that this will increase their quality of life.

We have partnered with a non-profit organization in India called CASA (Church's Auxiliary for Social Action). CASA works in over 10,500 villages across India and aims to combat deep-rooted issues such as food insecurity, resource-based conflict, limited educational opportunities, and gender inequality. With this project, CASA will help us by providing contractors at the site and organizing most of our communication with the people of Siripudi.

To fund this project, we need to raise at least $17,000. This goal was determined based on past years' PUC projects that were similar to this one (a community building or structure) along with the time constraint of having less than a year to fundraise, coordinate, and design the project. UT Austin has an official fundraising system called HornRaiser (because our mascot is a Longhorn!), around which our fundraising campaign will be centered. The only downside to HornRaiser is that we only have one month to reach our goal of $17,000.

Our project's fundraising campaign begins on November 6th and ends on December 6th, and I would be so, so grateful if you would consider donating. I realize this is a lot to ask, and I completely understand if you are unable to. I appreciate you reading my letter and I would love any advice you have for me regarding this project! I will send out more letters like these to keep you all updated on the project and I'll be sure to include the link to our fundraising campaign when it opens on November 6th.

My phone number is _____ and my email is _____, if you would like to get in touch with me or have any questions/advice for me. I also have WhatsApp if that is easier for you! Thank you so much for reading this and for all of your support. It means the world to me. These kinds of projects are the reason I chose to study engineering and I am so excited to have the opportunity to do this!

With all my love,

_____

Appendix N. Travel Preparation & Logistics

Getting Travel Approved

We did not find out the necessary process to get travel approved until mid-February. Texas Global gave a presentation in class going over all the necessary forms and procedures that needed to be completed. It is important to note that you CAN NOT book your travel until Texas Global has approved your plans. Your plans will likely not be approved till late February or early March. Below, a brief overview is provided of all the steps necessary to get travel approved. This is just to give a heads up on the information you will need from Poul. Please do not fill out these forms until after you have seen the Texas Global presentation.

You will need to complete the SAPPSA (Study Abroad Program Safety & Security Assessment). This form includes maps, proposed program itinerary, and risk management procedures. Our SAPSSA can be found in the Google Drive → Logistics → Texas Global. However, our SAPSSA was never approved due to COVID, so only use it for guidance and do not rely heavily on it. Try to find out the on-site contact information, housing details, and emergency procedures from Poul. It took us a while to receive that information from Poul; Karuna will be a good resource to obtain this information.

You will also need to fill out the ERP (Emergency Response Plan). This is an excel sheet where you will need to provide everyone's contact and emergency contact information, transportation plans, emergency meet-up locations, housing address, and on-site contacts. Poul should not be put for the first on-site contact, because he will not be with us during the entire implementation. This can also be found in Google Drive → Logistics → Texas Global.

Additionally, the Travel Application will need to be completed. This form requires more detaila on our technical advisor, cultural advisor, potable water access, internet access, safety precautions, and cultural awareness. This can also be found in Google Drive → Logistics → Texas Global.

These three forms cover the group procedures. There are several things that will have to be completed on an individual level to travel. Everyone must have a valid passport that is valid at least 6 months upon return to the US. Apply for one immediately if you do not have one. You do not need to apply for a visa until the spring semester. Do not get a tourist visa! This is what had been done in previous years, but part of the 2019 Team was taken behind closed doors to be investigated. Dr. Ellzey made it very clear to us that this would no longer be allowed. You will have to work with CASA to get a volunteer or business visa. You will also have to get a health clearance form approved and the proper vaccines. What vaccines you want to get is ultimately up to you and your doctor. However, it is important to note the necessary timelines for different vaccines. We have provided some information on certain recommended vaccines in the Logistics Folder of the Drive. Some require multiple doses over many months. There are more steps that need to be completed on an individual level, but these are the most pressing issues we saw.

Travel Plans

The closest big city to Siripudi is Vijayawada. We could have flown directly into Vijayawada, but we thought it would be better to fly into Hyderabad or Chennai, stay there a couple days, and then fly to Vijayawada. We wanted to see one of the big cities in India, and it would have provided a good buffer time in case of any flight delays or cancelations.

We were not going to be housed in Siripudi. We were supposed to stay in Nagaram, which is about a 15-minute drive away from Siripudi. We never found out the exact location we would be staying, because Poul did not want to start renting the place until late May. In previous years, PUC India Teams

did not have air conditioning. We were told the house in Nagaram would have had air conditioning, but Ken informed us that Poul most likely meant swamp coolers. Team 2019 had thought they would be in a house to themselves, but when they arrived, they found out they were sharing the house with a city leader's family. When we asked about this, Poul told us we would have a house to ourselves, but we would have a cook and a CASA staff member with us 24/7. Below is our general travel and work itinerary.

1. May 26th - Fly to Chennai
2. Stay in Chennai a couple days
3. May 29th - Fly together to Vijayawada
4. CASA driver picks us up
5. Drive to Nagaram (2 hour drive)
6. Stay in Nagaram
7. Commute to Siripudi (15 minute drive)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		5/26 Depart	**5/27**	**5/28** Arrive	**5/29** Relax	**5/30** Fly to Vijayawada
5/31 Community day	**6/1** Work Day	**6/2** Work Day	**6/3** Work Day	**6/4** Work Day	**6/5** Relax/ Excursion	**6/6** Relax/ Excursion
6/7 Relax/ Excursion	**6/8** Work Day	**6/9** Work Day	**6/10** Work Day	**6/11** Work Day	**6/12** Work Day	**6/13** Relax/ Excursion
6/14 Relax/ Excursion	**6/15** Work Day	**6/16** Work Day	**6/17** Work Day	**6/18** Workday/ Celebration	**6/19** Depart	

Figure 3: Original Implementation Schedule

The above calendar is color coded. Yellow represents travel days, blue represents excursion days, and green represents work days. After talking to the 2019 team and Ken, we decided it would be best to have our first work week only be 3-4 days. They told us the heat takes a toll, and it is best to spend a long weekend at an air-conditioned hotel to recoup. We only have 13 work days in the above calendar, which is less than the recommended 3 weeks. Our team wanted to get back to the US in time for summer classes and internships, so we cut the work days a bit short.