

# BLOCK PRESS

JOSH CHARNEY AND KATIE ROSE

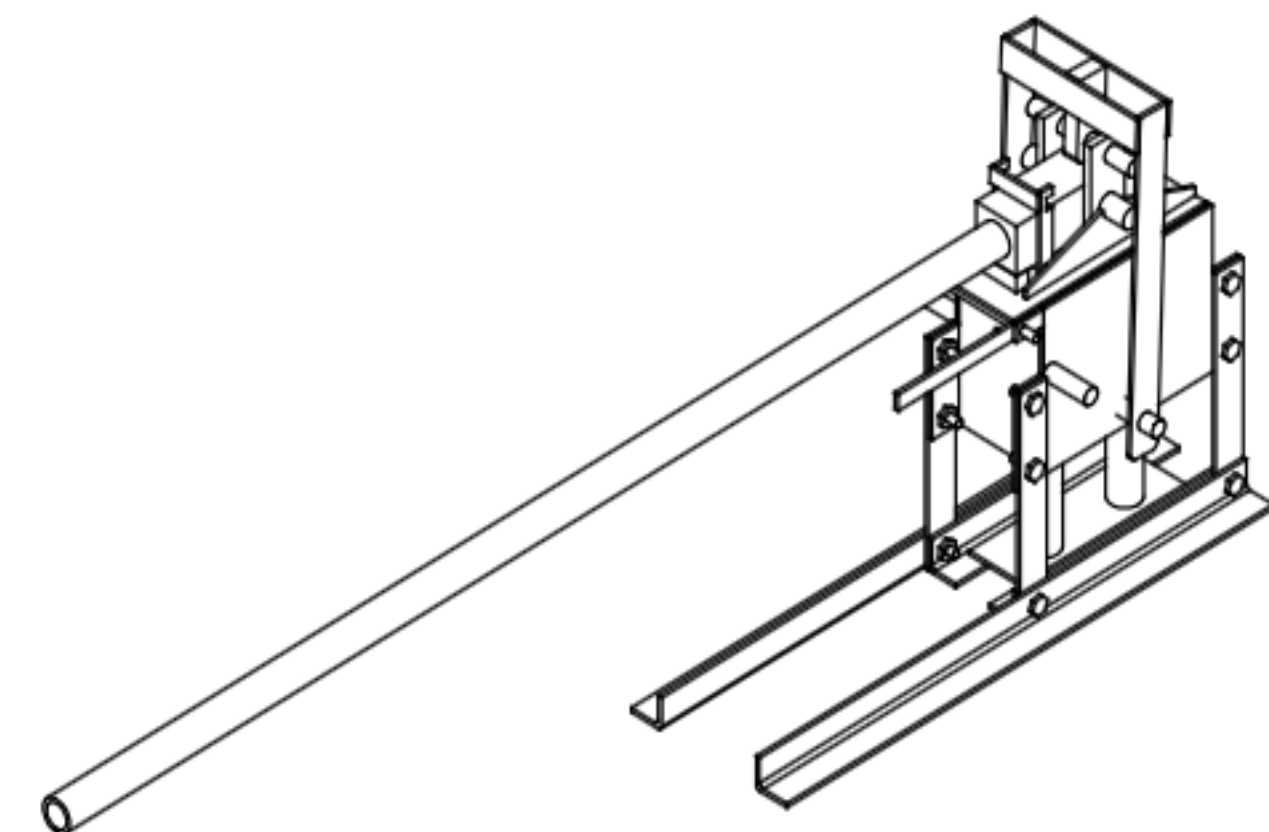
## Problem

Rama Cay, a small island in Nicaragua, is vastly overpopulated with poor living conditions. The people are looking to move inland, which requires the construction of affordable houses. Nicaragua has an abundant resource of clay, which can be used to create compressed earth blocks. The request is for an affordable and simple compressed earth block press that can allow the people of Rama Cay to create their own blocks in order to build houses inland for their families.

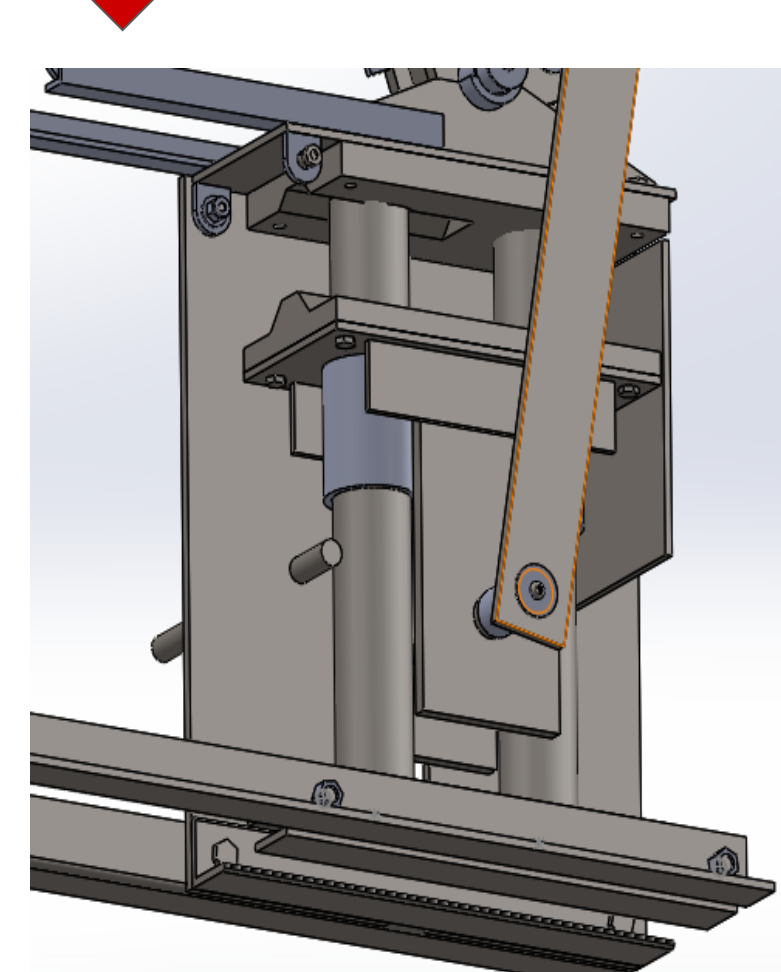


## Solution

Since last year, we have modified our original design from the information gathered during the site team trip to Nicaragua in the summer of 2017. The overall purpose of the press has not changed. The design changes can be seen below.



Original SolidWorks Model



## Specifications

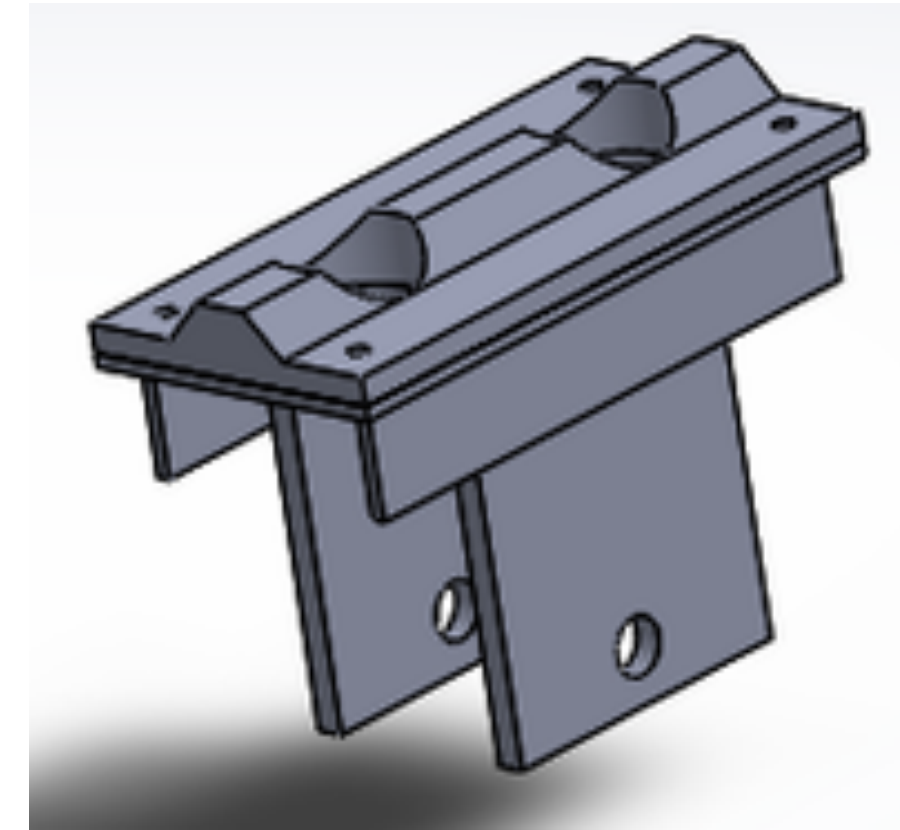
- An optimal mixture of clay, sand and cement with mixing procedure
- SolidWorks design of newest iteration
- Fabricated fully-functional design for shipment trip in April-May 2018 for site team trip in June
- Design must be light enough for two/three people to move and operate
- Must have consistent pressured and sized blocks for successful house building
- New iteration must last up to one year in country being used constantly

## Fabrication

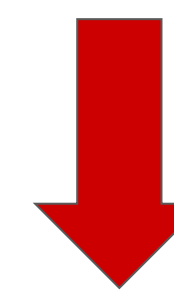
- The design for this block press was developed by modifying the Cinva Ram Block Press in order to meet our criteria.
- Model for our block press was created on SolidWorks.
- The drawings were then sent to a E&E Metal Fab., Inc., who began the fabrication process.
- Fabrication has been completed and brought to shop for modifications.

## E&E Metal Fab., Inc

The new press was made locally in Lebanon, PA. The team made many trips to help consult and help put the press together. Here is one of the finished subassemblies with the bottom form for pressing.



Bottom Form for Inner Chamber



Block pressed and cured

## Upcoming Site Team Trip

Our team will be headed to Rama Cay, Nicaragua, the first week of June through AROMA Missions in order to introduce our newest design. We will be testing the new material used as well as the modifications made from the prototype. Demonstrations will continue to be held in order to teach the people how to operate the press. Friends in Action will be partnering with The Collaboratory in this trip. Tim Johnston has well established relationships with the Rama people and will be leading our group throughout the week. We are extremely excited about the trip and would appreciate your prayers!



## Conclusion

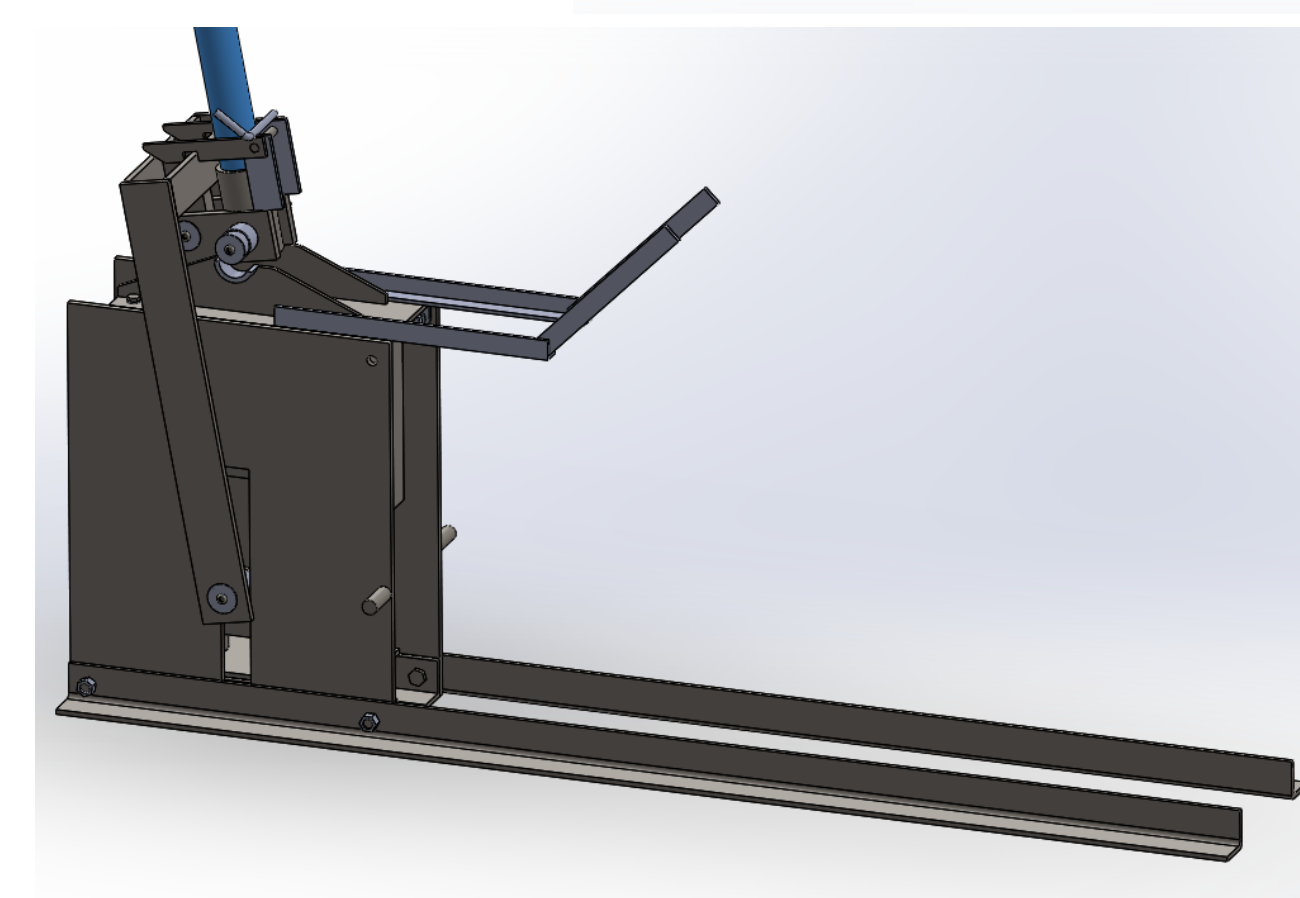
This project started two and a half years ago with the aspirations of delivering a practical manual press that can be used to build homes for the Rama people. Our second iteration is built and in the final stages of modifications and testing before being sent down to Nicaragua. This design meets our client's needs and will hopefully be a viable asset to home building for the whole community. This second iteration will stay in Nicaragua for the foreseeable future.

## Moving Forward

The second iteration will be tested in the Rama Cay community during the site team trip. We will contact more fabricators for making another second iteration press for testing and modifications in the 2018-2019 academic year. We hope to design a hopper to be fabricated along with a press. The team also plans on creating a manual to reproduce the press in Nicaragua and in other countries that Friends In Action are tied to.

## Partners and Acknowledgements

Tim Johnston: Friends in Action  
Willie Erb: CEO of E&E Metal Fab., Inc.  
Thomas Soerens: Project Manager  
Adam Janney: Student Project Manager  
Brandon Skirk and Addison Morrone: IPC team members  
John Meyer: Shop Manager  
Jonathan Schlabach: Engineering consultant  
Jake Hitz: Machinist for first prototype



Newest Model