

# IPRO 326

## High School in Pignon, Haiti

### Midterm Report

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**Sponsor:** Haiti Outreach IIT Student Chapter

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The objectives for our team have not changed from what was originally established in the project plan. During the summer semester, the team has set forth the following objectives:

- Develop the architectural plans for the high school in Pignon
- Complete designs for the solar electrical system
- Complete designs for a water distribution and sanitation system
- Create a manual detailing how to complete key details in the construction
- Raise funds or receive donations for key aspects of the investigation or for the supply of crucial components

## **2.0. Results to Date**

Structural team:

1. Problem to be solved: Unknown compressive strength of concrete
  - a. At midterm the sub-group has investigated methods of determining compressive strength of concrete on-site. It has been decided to do a compressive test of concrete cylinders in (reasonable) accordance with ASTM C-192. The test cylinders are to be prepared on-site and delivered to IIT lab for testing. The molds necessary for testing have been received donated by the manufacturer and are on their way to Haiti. Also, adequate methods for testing have been researched and a summarized set of guidelines is being sent to Haiti.
2. Problem to be solved: Verifying Structural Soundness of the Building
  - a. As of midterm the structural team has investigated applicable building codes for Haiti. It has been determined that there are no current pertinent codes and so U.S. codes will be used instead: ASCE7-02 will be used for loads and ACI 318-05 for design of reinforced concrete.
  - b. Based on recommendation, a structural engineer has been involved in the project. Initial meetings and discussions have taken place. Given the amount of uncertainties, lack of required data to conduct substantial structural analysis, and based on recommendations by the structural engineer, we have decided to perform partial, or preliminary structural analysis that would only yield estimates for critical member sizes by working with assumed values.
  - c. Additionally, the structural team is preparing a set of further recommendations regarding design and structural issues that may be useful in the event of the construction of new facilities in Haiti.

Architectural team:

1. Problem to be solved: Create clear and concise guides for detail construction for the school

- a. The architectural group has two main deliverables for the detail construction of the school. The first of these is to create a complete set of architectural drawings which represent the building currently under construction. These drawings will serve as an architectural and structural suggestion of how the building may be constructed; this includes sizing and arrangement of various components and structural details. These drawings will then be given to Haiti Outreach, our partner organization. As of midterm the architectural group is making progress with the drawings, and they will be mostly completed in the next few weeks.
- b. The second deliverable we are focusing on is the creation of a general construction technique and details guide. This will feature details to be used in the building under construction and ways in which they may apply to different buildings. It will also include instructions and tips regarding the process of construction which will hopefully inform builders and help to increase the strength of materials and the safety of construction. We hope to complete this guide by the end of the semester.

Electrical team:

1. Problem to be solved: Determining the power requirements of the school
  - a. As of midterm, the electrical team has done a rough estimate of the power needs of the school and is at the final stage of design for determining the power needs for the school.
2. Problem to be solved: Designing a system to fit the power requirements of the school
  - a. The electrical team still needs to do the cable/wiring diagram in the design of the electrical system for the school. The goal is to finish this diagram by the end of the semester.

Mechanical/Plumbing team:

1. Problem to solve: Design a clean bathroom with an effective septic system and facilities for the students to wash their hands.
  - a. Different options for replacement bathrooms were examined initially. Composting toilet systems were researched along with pit toilets and conventional septic tank methods. Because of cost considerations and the need for a sanitary solution, the septic system was chosen as the replacement. The placement of the bathroom and septic system was the next question to answer. Maps of the school site were examined and an optimal layout was chosen. Currently, designs and drawings are being produced and refined for the conclusion of the project.

Costing team:

1. Problem to solve: Define costs
  - a. The quantities and cost group has currently completed a basic spreadsheet that calculated the building material costs and quantities for the building already in progress in Haiti. This program of spreadsheets can be easily

adapted to another building. However what the group would like to do before the end of the semester is to make it more organized and verify the costs of some of the materials in Haiti. Also a composition of spec sheets for the various materials and products used in the building will be assembled to allow anyone staying with the project some background support of the materials and projects we thought of using. And finally the cost team would like to write an instruction on how to estimate sizes and quantities for another building.

Fundraising team:

1. Problem to solve: Currently the high school project in Pignon is lacking sufficient funds to continue
  - a. As of midterm the fundraising team has completed a fundraising letter template as well as a picture brochure to send out to potential donor companies. The goal for the fundraising team is to send out letters and brochures to 60 companies by the end of the semester.

### **3.0. Revised Task / Event Schedule**

For our midterm report we made a revised task/event schedule which can be viewed on the attached PDF document. We made some changes to the original task/event schedule. We decided not to include the structural analysis in the instructional manual that we are designing, due to the fact that there is not enough time in the semester. Therefore we will only complete the structural analysis for the building that is currently under construction. Also, in order to be more organized we made a list of the remaining deliverables and when we are going to complete them.

### **4.0. Changes in Task Assignments and Designation of Roles and Team Organization**

We decided that in order to facilitate communication between sub-teams, as well as to give a status report on the project, we needed to have a meeting at least once a week with all team members present. It was decided that Casey and Nick would lead the weekly meeting, and they would also keep everyone on track throughout the duration of the meeting. Other than adding the role of “weekly meeting leader” to Casey and Nick, the designation of roles and task assignments have stayed the same. They are as follows:

<b>Group</b>	<b>Name</b>	<b>Role</b>	<b>Major</b>
01 Architectural	Franklin, Casey	Working Drawings, weekly meeting leader	Architecture
	Lowe, Scott	Working Drawings, Liaison between Architectural and Structural Groups	Architecture
	Jaromin, Sebastian	Working Drawings, Plumbing Drawings w/	Architecture

		Mechanical Group	
	Watkins, Brett	Working Drawings	Architecture
02 Structural	Diaz De Leon Orraca, Federico	Material Testing	Architecture
	Velichkov, Veselin	Building Design	Civil Engineering
03 Electrical	Dike, Chukwuderaa	Solar Panel/Electrical System Design	Electrical Engineering
	Igbokwe, Chinedu	Solar Panel/Electrical System Design	Electrical Engineering
04 Mechanical and Plumbing	Hogan, Brian	Water Sanitation, Septic System Design	Chemical Engineering
05 Quantities and Costing	Kirsch, Joseph	Data Organization	Architecture
06 Fundraising	Bailey, Nicholas	Fundraising, Electrical System Design, weekly meeting leader	Mechanical Engineering
	Goldsmith, Katie	Fundraising, Minute Taking, Overseeing Reports and Presentations	Psychology
	Samuels, Janina	Image Preparation	Architecture
	Williams, Allisyn	Image Preparation	Architecture

### **5.0. Barriers and Obstacles**

We have had some communication problems in IPRO. This is due to the fact that the nature of this project required our team to break into many different sub teams in order to accomplish specific tasks for the design of the school. However, communication between sub-teams is essential in this project, as the tasks generally require information and work product from more than one sub-team. In other words, if one sub-team does not have the information they need from another sub-team then they will not be able to progress on their own project. Due to this problem occurring, we decided to hold weekly meetings to facilitate communication.

### **6.0. Code of Ethics**

See attached document.

### **7.0. Midterm Presentation Slides**

See attached document.