

IPRO 326: Designs for School Building in Pignon, Haiti



IPRO 326: Designs for School Building in Pignon, Haiti

Team Members: Nick Bailey , Frederico Diaz
De Leon Orraca, Chukwuderaa Dike, Casey
Franklin, Katherine Goldsmith, Brian Hogan,
Chinedu Igbokwe, Sebastian Jaromin, Joseph
Kirsch, Scott Lowe, Janina Samuels, Veselin
Velichkov, Brett Watkins, Allisyn Williams

Haiti Outreach- Background

- What is Haiti Outreach?
- How did IIT become involved with Haiti Outreach?



Problem Addressed

- What problem are we addressing?
- What are our goals for this IPRO?
- What is our strategy to complete these goals?

Minutes for IPRO 326 Week 2 June 15th					
Sub Group	Item No.		Responsibility	Nature of Item	Due Date for Completion
01. Architecture	1.00	Investigate pitched roof system, costs and required labor and technology.	BW, SL, CF		
	1.01	Details of roof connections	SL		
	1.02	Draw collar beam detail as per structural groups specification	SL		
	1.03	Collaborate with G6 cost quantity for the pros and cons of 2 story buildings	BW		
	1.04	Organize working drawing folders	CF		
	1.05	Fix ex -rel dvgs	CF, SL		
02. Structural	2.00	First observations and recommendations are being prepared and will be posted as soon as agreement on its content can be agreed on.			
	2.01	Obtain Copy of ASTM Standard for testing of concrete to determine the compressive strength of concrete mix produced on-site	FD		
	2.02	Investigate options for a suitable mold to be available for ongoing test in Pignon for shipment to Haiti in connection to 2.01			
	2.03	Obtain samples of typical concrete mix from Haiti per ASTM Standard to determine the compressive strength of concrete mix produced on-site	Neal		
	2.04	Investigate means/methods and legal issues of bringing materials into the US to make test mixes in ITT lab to design Standard mix ratios			
	2.05	Design standard mix ratios and test per ASTM Standard			
	2.06	Investigate Primary Load Carrying System from Reinforced Concrete	V.V + SE		
	2.07	Investigate Primary Load Carrying System from Factory Produced Blocks	V.V		
	2.08	Research Haiti Government Issued Codes, Manuals, Guidelines for Construction, Alternatively Dominican Republic, other Caribbean Country	V.V		
	2.09	Research Seismic Risk in Haiti	V.V		
	2.10	Define loading conditions per ASCE 7-05	V.V		
	2.11	Design Primary Load Carrying System for Load condition per 2.09	V.V + SE		
2.12	Write statement on why a pitched tin roof is recommended at this stage	FD			
03. Electrical	3.00	Figure out the number of solar panels needed	CI, DD		
	3.01	e-mail questions to Neal	NB		
04. Mechanical/Plumbing	4.00	Propose three alternative solutions to the issue of sanitation provision at the Pignon school site	BH	Research	
	4.01	Provide preliminary layouts for toilets/urinals/hand basins	SJ	Collaboration	
05. Quantities and Costing	5.00	Request costs and sizes of available materials in Haiti	JK	Request	
06. Fundraising	6.00	Complete the fundraising goals document	KG/NB	Collaboration	
	6.01	Request to the fund raising group to become informed about issues relating to materials so they can contact a professional firm who might be able to offer services to Haiti Outreach at a favorable rate	NB	Collaboration	
	6.02	Due to lack of server space images will be uploaded and taken off iGroups on a 2 week rotation make sure you down load any images you require for your sub group for inclusion in up coming reports	AW		
	6.03	Raw materials bought back from Haiti are in the process of being photographed to help illustrate reasons of concern			
	6.04	Photo of children holding one concrete block is requested for the fundraising letter	Mark		

Structural

Start process to determine the strength of concrete used in Haiti



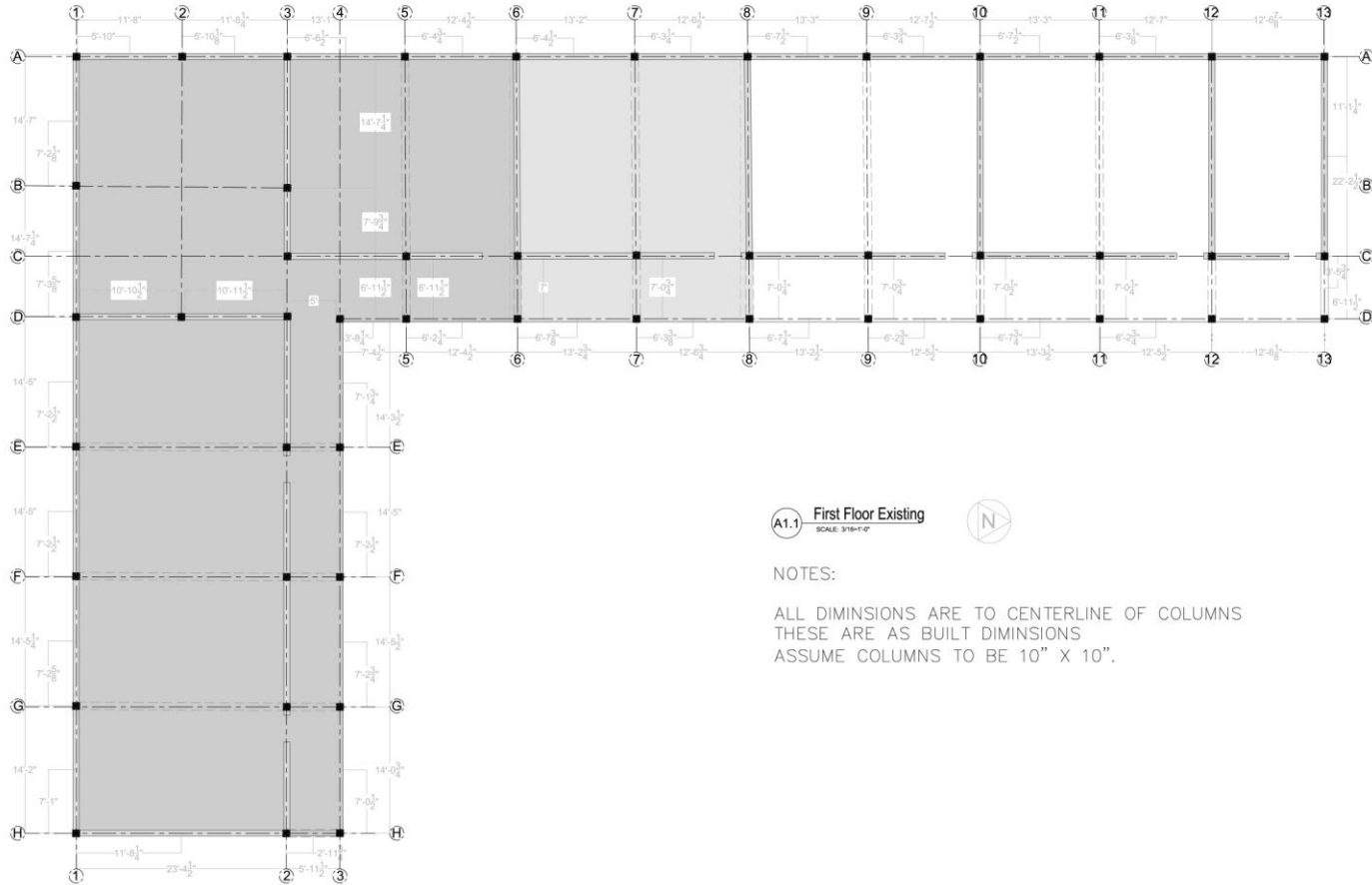
Structural analysis of high school under construction in Pignon.



Architectural

1. Complete drawings for high school under construction.
2. Produce a graphic representation for a prototypical school building

Architectural Plan



(A1.1) First Floor Existing
SCALE: 3/16"=1'-0"



NOTES:

ALL DIMENSIONS ARE TO CENTERLINE OF COLUMNS
THESE ARE AS BUILT DIMENSIONS
ASSUME COLUMNS TO BE 10" X 10".



ILLINOIS INSTITUTE OF TECHNOLOGY

DATE: PROJ 1226

PROJECT NO. 1226

DATE: 12/26/12

PROJECT: PROJECTIONS

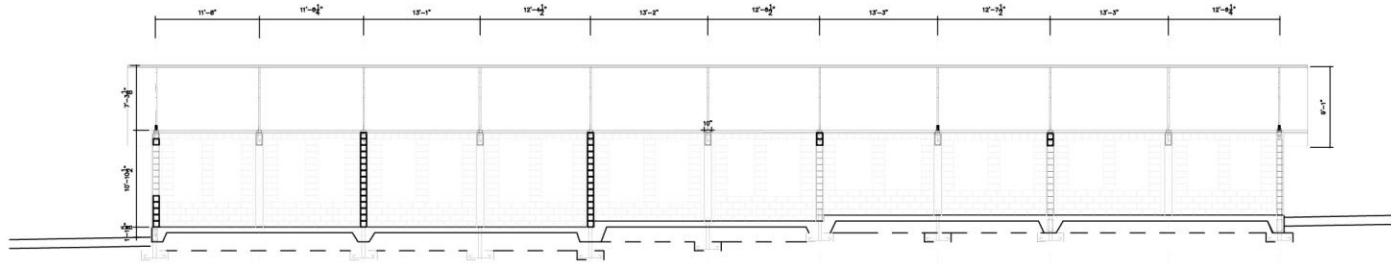
DATE: 12/26/12

PROJECT: PROJECTIONS

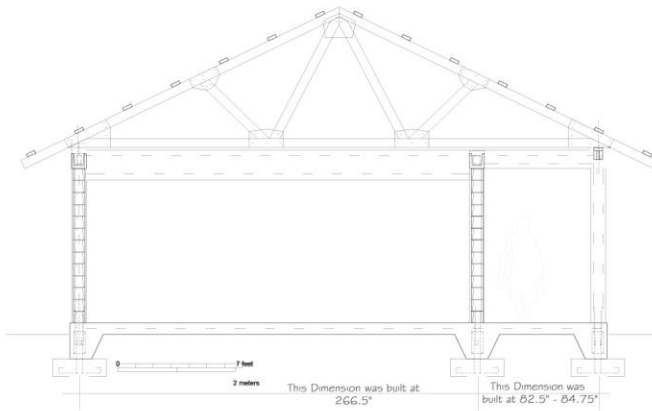
DATE: 12/26/12

PROJECT: PROJECTIONS

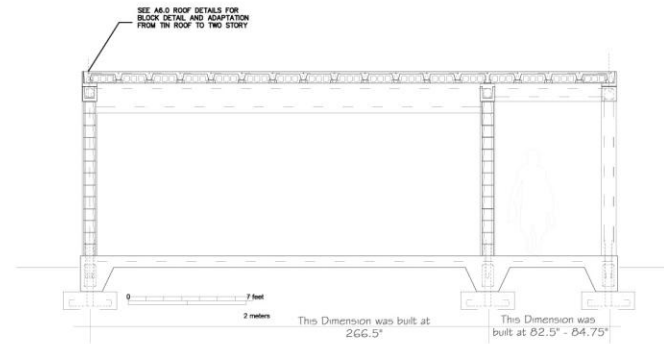
Architectural Sections



A4.0 SECTION & BLOCK COURSE IN EXISTING COLUMN LAYOUT
SCALE: 3/8" = 1'-0"



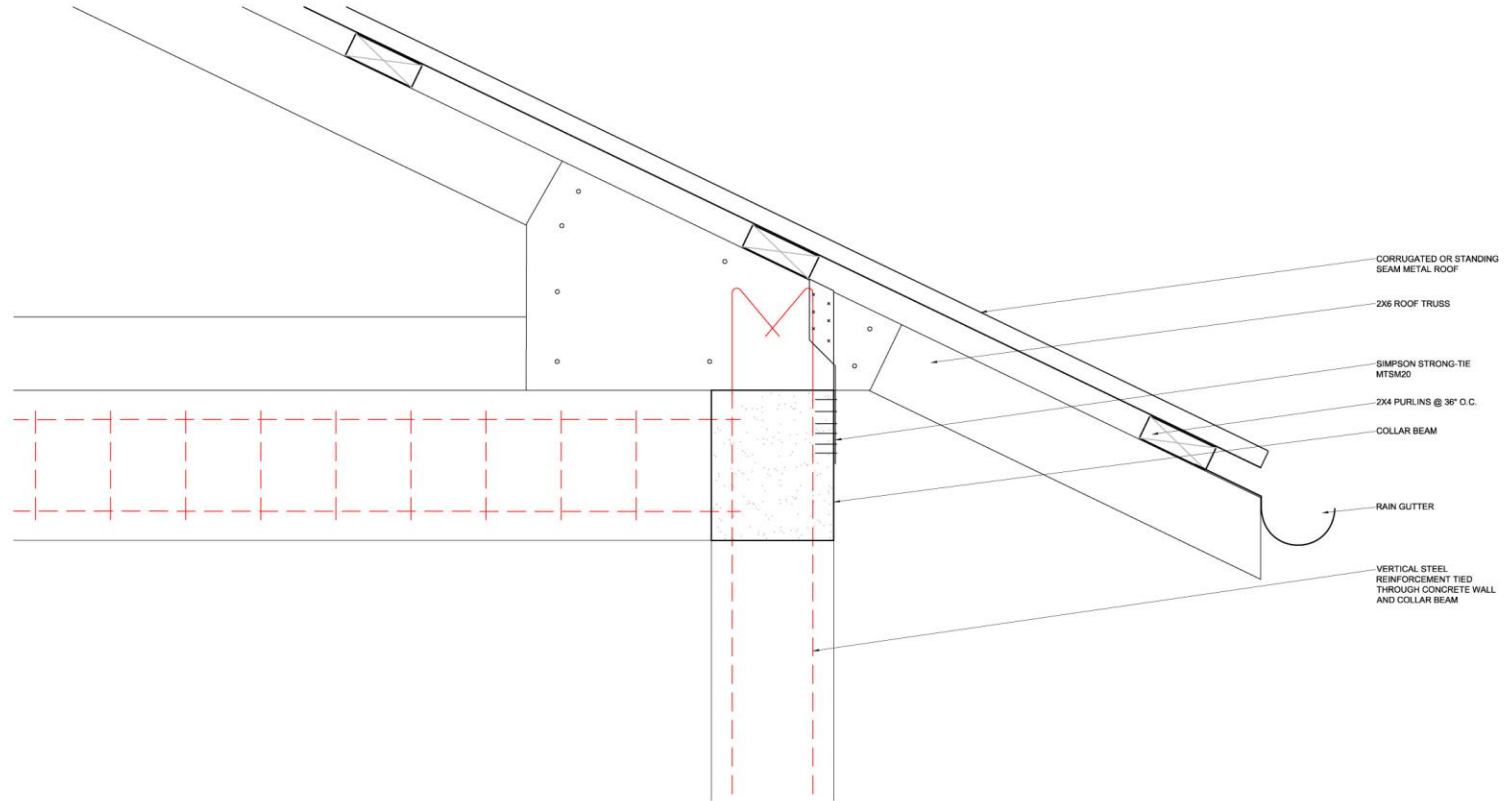
A4.0 PROPOSED SECTION FOR ONE STORY BUILDING
SCALE: 3/8" = 1'-0"



A4.0 PROPOSED SECTION FOR TWO STORY BUILDING
SCALE: 3/8" = 1'-0"

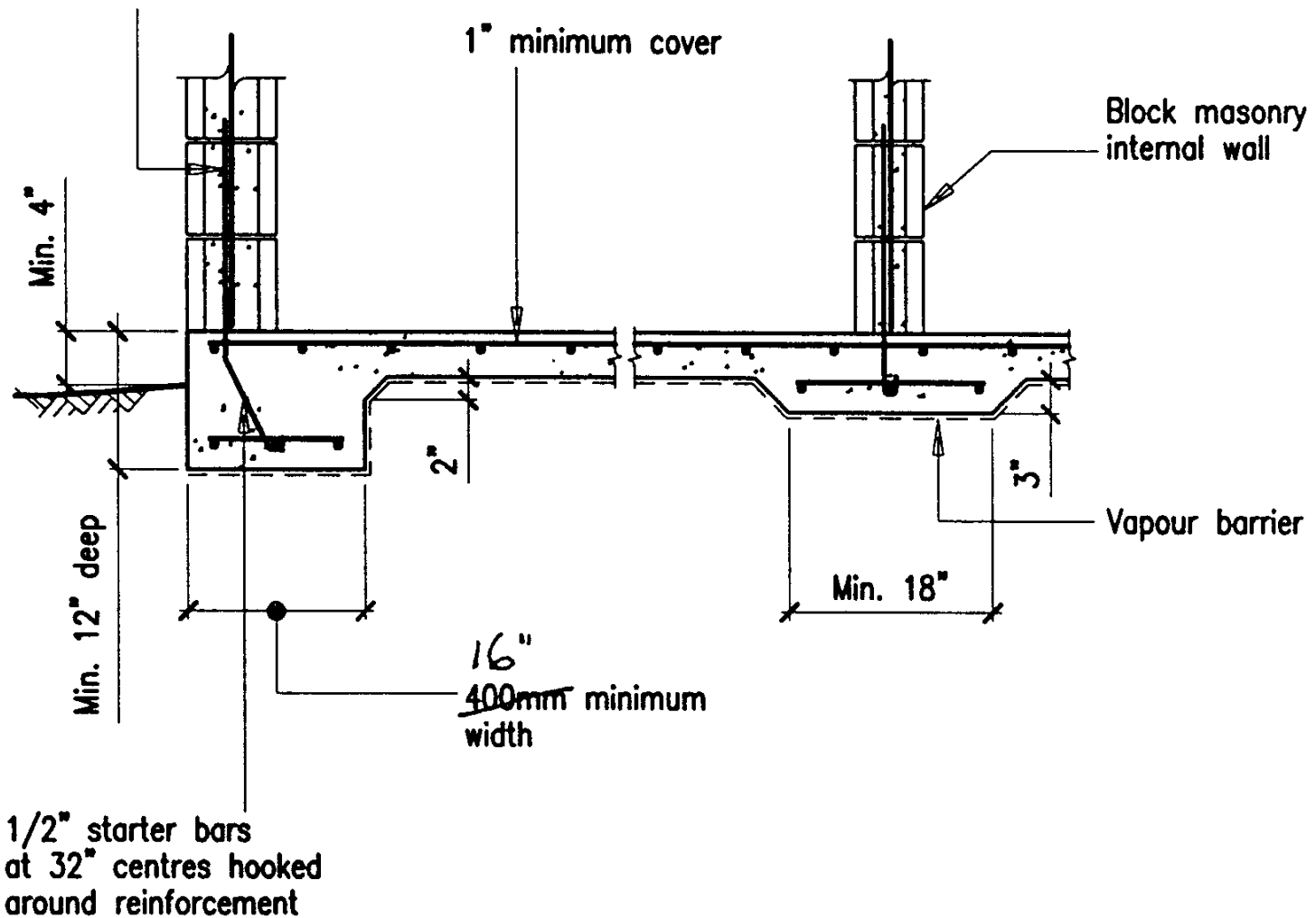
 ILLINOIS INSTITUTE OF TECHNOLOGY	CODE PROJ 526
	REVISIONS NO. DESCRIPTION 1.0
	DATE 12/10/2014
	LOCATION PIONON, ILLINOIS PART PART
PROJECT PIONON SCHOOL BUILDING	SHEET 4.0 SECTIONS

Architectural Details



01a Sheet Metal Roof Option
SCALE: 3" = 1'-0"

Vertical reinforcement
wired to starter bars



Electrical and Plumbing

1. Determine the electrical and plumbing needs of the school
2. Design a system to fit these needs

Quantities/Costing

1. Define costs for the project

LEVEL 1 MAJOR GROUP ELEMENTS A SUBSTRUCTURE	LEVEL 2 GROUP ELEMENTS A10 Foundation	LEVEL 3 INDIVIDUAL ELEMENTS A1010 Standard Foundation/Footing A1011 Open In-ground A1012 Retain	LEVEL 4 Subcategories
			1/4" 3/8" 1/2" 1"
		A1013 Drags/ Pilecap Laying A1014 Aggregate and Concrete Mix	Gravel Sand Cement
		A1015 Drags/ Pilecap Laying Concrete A1016 Special Foundations A1017 Sub in Grade A1018 Retain	1/4" 3/8" 1/2" 1"
		A1019 Drags/ Pilecap Laying A1020 Aggregate and Concrete Mix	Gravel Sand Cement
	A20 Basement Construction	A1035 Drags/ Pilecap Laying Concrete A2010 Basement Evaluation A2009 Basement Walls B1010 2nd Floor Construction B1011 Poured	
A-SHELL	B10 Superstructure	B1012 Rebar Blocks B1013 Expansion Joints B1020 Rebar Construction B1021 T-Junction Ties B1022 Wallties B1023 Anchors B1024 Pilecaps B2010 Exterior Walls	rebar for top and bottom strings near columns strings aggregate sand cement Tying people Concrete Columns Block walls
	B30 Roofing	B0200 Exterior Windows B0310 Exterior Doors B0310 Roof Coverings B0320 Roof Openings C1020 Interior Doors C1010 Partitions C1015 Partings C0110 Base Construction C0210 Chair Frames C0210 Wall Frames C0200 Floor Frames C0200 Ceiling Frames D0020 Escalators & Moving Walks D0110 Staircases & L.R. D0400 Other covering Systems D0210 Plumbing Fixtures D0210 Domestic Water Distribution D0210 Sanitary Waste D0240 Rain Water Drainage D0200 Other Plumbing Systems D0010 HVAC D0220 Heat Exchanging Systems D0410 Cooling/Generating Systems D0410 Distribution Systems D0410 Terminal & Package Units D0410 Control and Instrumentation D0410 Other H.V.C. Systems & Electrical Systems D0210 System Testing & Release D0410 Sprinklers D0220 Standpipes D0410 Fire Protection Specialties D0210 Other Fire Protection Systems D0410 Electric Service & Distribution D0210 Lighting and Branch Wiring D0410 Communications & Safety D0210 Other Electrical Systems E1010 Commercial Equipment E1020 Mill/Stone E1030 Vehicle Equipment E1090 Other Equipment E2010 Power Fundings E2020 Material Fundings E1010 Special Materials F1020 Integrated Construction F1010 Selective Building Construction/POV-Inspection/Structural Observation	
C-INTERIORS	C10 Interior Construction		
D-ELECTRICAL	D10 Wiring		
E-EQUIPMENT & FURNISHINGS	E10 Equipment		Computer servers
F-SPECIAL CONSTRUCTION & DEMOLITION	F10 Special Construction		Block/brick shelling Cement/Chalk/Blockers

RE-BAR				
	Length when Purchased	Cost In Pignon in Haitian Goudes	Cheaper Cost from other Town in Haitian Goudes	Delivery Costs in Haitian Goudes
Local 1"				
Local 1/2"	30'	275-300	275-300	80 gds per mile
Local 3/8"	30'	135-150	135-150	
Local 1/4"	20'	50	50	
Local 1/8"				

CEMENT & AGGREGATE				
	Price per load - local measure	Approx No. of 5 gallon buckets per local measure	Approx cost in Goudes per 5 gallon buckets	
P Gravel from near Hinch	100 (1 barrick)	25-30	~4	2240
Pignon Sand	2000-2500 (1 Berganabe)	30		160 gds per mile
Large Pignon hand broken white rock	100	5	20	80 gds per mile

		Cost In Pignon in Haitian Goudes	Cheaper Cost from other Town in Haitian Goudes	Delivery Costs in Haitian Goudes
Portland Cement 1bag		265	250-Cap Haitien	7200 (from Cap)
Cement dust 1 bucket (or how many bags do you need to fill a one 5 gal. Bucket)	1			

Conversion \$1 US = 40 Haitian Goudes

Bay Sizing/Block wall calculator**Wall Number 1**

Bay Length (ft)	12.5
Bay Depth (ft)	23
Bay Height (ft)	9
Gross Block number	255.6

Subtraction for windows/ doors

Height (ft)	10
Width (ft)	10
Number of Blocks to Subtract	80

Approximate Number of Blocks for the wall 175.6

Wall Number 2

Bay Length (ft)	12.5
Bay Depth (ft)	23
Bay Height (ft)	9
Gross Block number	255.6

Subtraction for windows/ doors

Height (ft)	10
Width (ft)	10
Number of Blocks to Subtract	80

Approximate Number of Blocks for the wall 175.6

Bay Block Calculator**Bay number 1**

How many of Wall #1?	1
How many of Wall #2?	2
How many of Wall #3?	1
How many of Wall #4?	0

Total Blocks for Bay number 1 702.4

Bay number 2

How many of Wall #1?	1
How many of Wall #2?	2
How many of Wall #3?	1
How many of Wall #4?	0

Total Blocks for Bay number 1 702.4

Fundraising

- Contact the companies to try and establish connections with potential benefactors.

To whom it may concern:

I am writing on behalf of the Haiti Outreach Student Chapter at Illinois Institute of Technology. We are in the midst of a project that will impact the lives of children in Haiti, designing an environmentally friendly sustainable High School to educate 400 children per year. There is currently only one other school in the region so it is imperative that this project be successful. The design includes seven classrooms and is being design in such a way that it can be maintained with little outside support.

The town of Pignon has little resources in terms of electricity and modern technology. A large generator on the outskirts of town supplies electricity for only 4 hours a day, in the evening. Our design includes a solar panel electrical system that will work in conjunction with the generator to charge a battery array to power the school. This system will serve to power a water distribution system to supply water to the students, fans to ventilate the classrooms, the first computer lab in the region, and lighting during night classes.

Our end goal, beyond this specific school, is to design a pamphlet that gives detailed instructions to complete one classroom module, so that other schools may easily be built in the future by connecting several classroom modules together depending on the size needed. As the economy grows the educational needs of the community will grow as we feel that our research and design will have long-term benefits as well.

Our hope is to send a group of 4 to 6 students to Haiti upon completion of design to assist in the building and to bring the funds and supplies needed to complete construction. While it is helpful to bring a sustainable school plan to Haiti, it is useless if never implemented, and we require you help to make that happen.

We are asking your help in achieving our fundraising goal of \$150,000 which will cover the cost of sending a team of IIT students to Haiti, construction supplies, plumbing and sanitation equipment, and the components of a solar electrical supply system. All donations are tax-deductible and will be received with deep gratitude from the students at IIT and, more importantly, at the school in Pignon, Haiti.

Haiti Outreach at IIT will send out periodic updates about the progress of this project and pictures of the school to those that are invested in the future of these children. We look forward to hearing from and working with you in the near future. If you would like more information about our project, please visit our website at <http://www.iit.edu/~haiti> or send us an email, haitioutreach@iit.edu.

Sincerely,

Nick Bailey
Haiti Outreach @ Illinois Institute of Technology
"Learn and Make a Difference."

EMPOWERING YOUNG MINDS

Haiti, only 600 miles SE from the coast of Miami, is the poorest country in the Western Hemisphere. Over 80% of the population lives in abject poverty with little resources. There is currently only one school in the area of Pignon. Students at Illinois Institute of Technology are working to develop and design an environmental friendly and sustainable High School to educate 400 children per year. With your help, Illinois Institute of Technology and Haiti Outreach will successfully complete this project and create many children's lives.

ILLINOIS INSTITUTE OF TECHNOLOGY

IIT team members from the January Trip.

Contact: haitioutreach@iit.edu www.iit.edu/~haiti