



**HAPPY PROMOTION CENTER  
PROJECT REPORT  
2015 SUMMER**

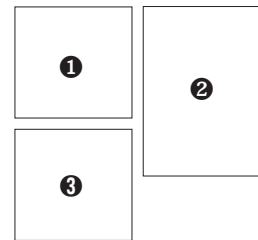
**CONTENTS**

- PART 1: INTRODUCTION ----- 02
  - Current Situation ----- 03
  - Site Location ----- 04
  - Design Proposal ----- 05
- PART 2: COMPLETION DRAWING ----- 08
- PART 3: CONSTRUCTION PROCESS ----- 19
  - PARTICIPANTS LIST ----- 33
- APPENDIX: ORIGINAL DRAWING ----- 36
- BOOKLET IMPLEMENTATERS LIST ----- 48



**PART I: INTRODUCTION**





- ① the classroom located beside the Pipe Line and open space used as playground
- ② pupils inside the classroom
- ③ teacher's house used as a additional classroom somtimes

**Current Situation**

Happy Promotion is a non-formal school started in 2009.

There are about 40 pupils from Baby class to Std.4. Now they are renting a community center in Wesynia in Mukuru Kwa Reuben as a classroom. There is only one room, so all the pupils are learning in one space with 3 teachers. In addition, there is no latrine, playground of their own. In order to upgrade the learning environment, teachers' has been thinking of obtaining their own land and construct new classrooms.

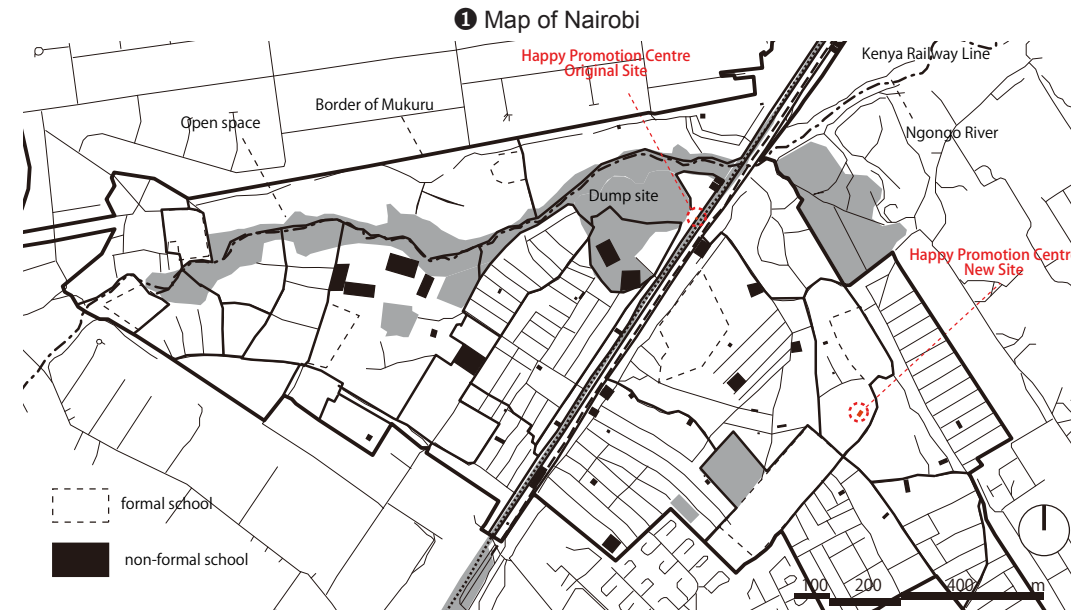
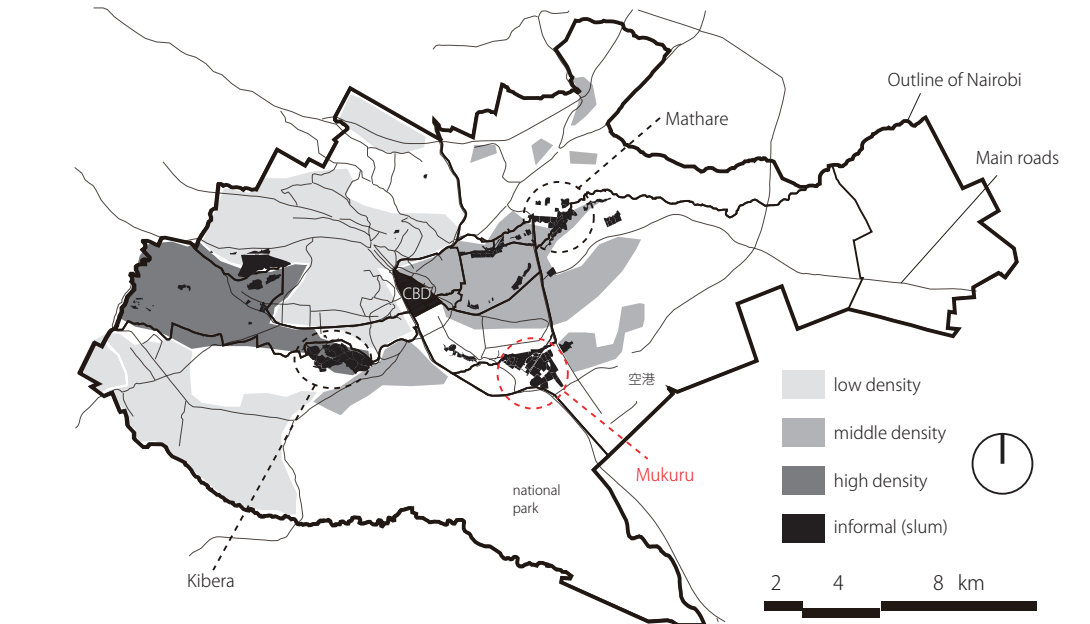
**Site Location**

Since independence from United Kingdom in 1963, rapid modernization and urbanization have proceeded and many slums were formed by a large number of migrant workers from rural areas ①. A land occupied by slums is only five percent of Nairobi, but sixty percent of population resides in these slums as a safety net for low-income population (Mugisha 2006).

Mukuru exists across a border of Makadara Division and Embakasi Division. This slum is the third largest informal settlement, following Kibera (biggest in Africa) and Mathare, and it has a history of expansion by migrant workers working at industrial districts since 1970s.

Mukuru is consisted by three areas; Kwa Reuben, Kwa Njenga and Lunga Lunga. The oldest area is Kwa Reuben and Happy Promotion Centre locates in this area.

Happy Promotion Centre is a school which is not authorised by the Ministry of Education. This kind of school is called 'non-formal school' in Kenya. In Mukuru, there are six formal schools and seventy to eighty non-formal schools ②. It is assumed that about 50% of the children in Mukuru belongs to non-formal schools.



② Location of schools in Mukuru



Design Proposal

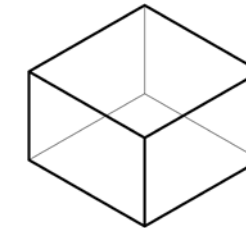


Impression Drawing

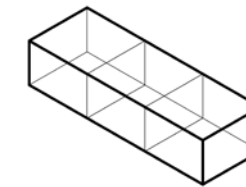
Concept

We want the new school can be used not only for learning, but also as resting, eating and playing place with high flexibility, so we design it as an association consisting of several space units in same or similar size which are rooms or terraces. Some of these rooms and terraces are placed next to each other directly to encourage diversity of pupils' activity and the flexibility is also that the walls deviding these adjacent rooms and terraces are designed movable so that two or more units can be used as one big hall as well if required.

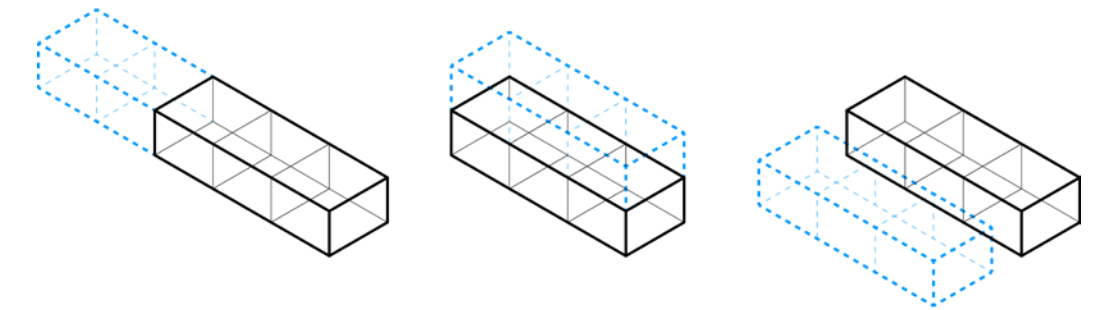
As students increase year by year, the school can be enlarged by adding its units both horizontally and vertically. The structure can extend diversely and flexibly for the future growth.



Unit



Present State



Units and Growth

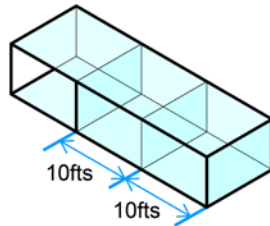
Extension and Reconstruction with Diversity and Flexibility



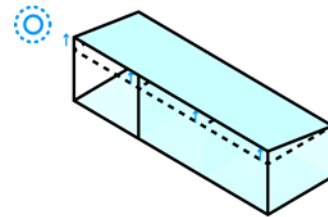
Design Development

Because of the limited site and fund, we could only build 2 or 3 classrooms in the corner of the site at present stage. We then decided to put 2 classrooms which obey the local minimum building unit 10ft×10ft and use the excess land next to them as a terrace for it was too small to make another classroom.

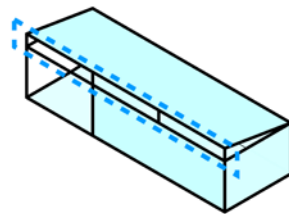
The one side pitched roof corresponds looks of the surrounding houses. And an efficient roof-opening association with this form of roof was adopted to let most light come inside through the open part between wall and roof and the slope of the roof considers draining at well.



2 classrooms obeying to local unit 10 fts × 10 fts  
1 terrace smaller than the room unit added using excess space



one side pitched roof towards the sun



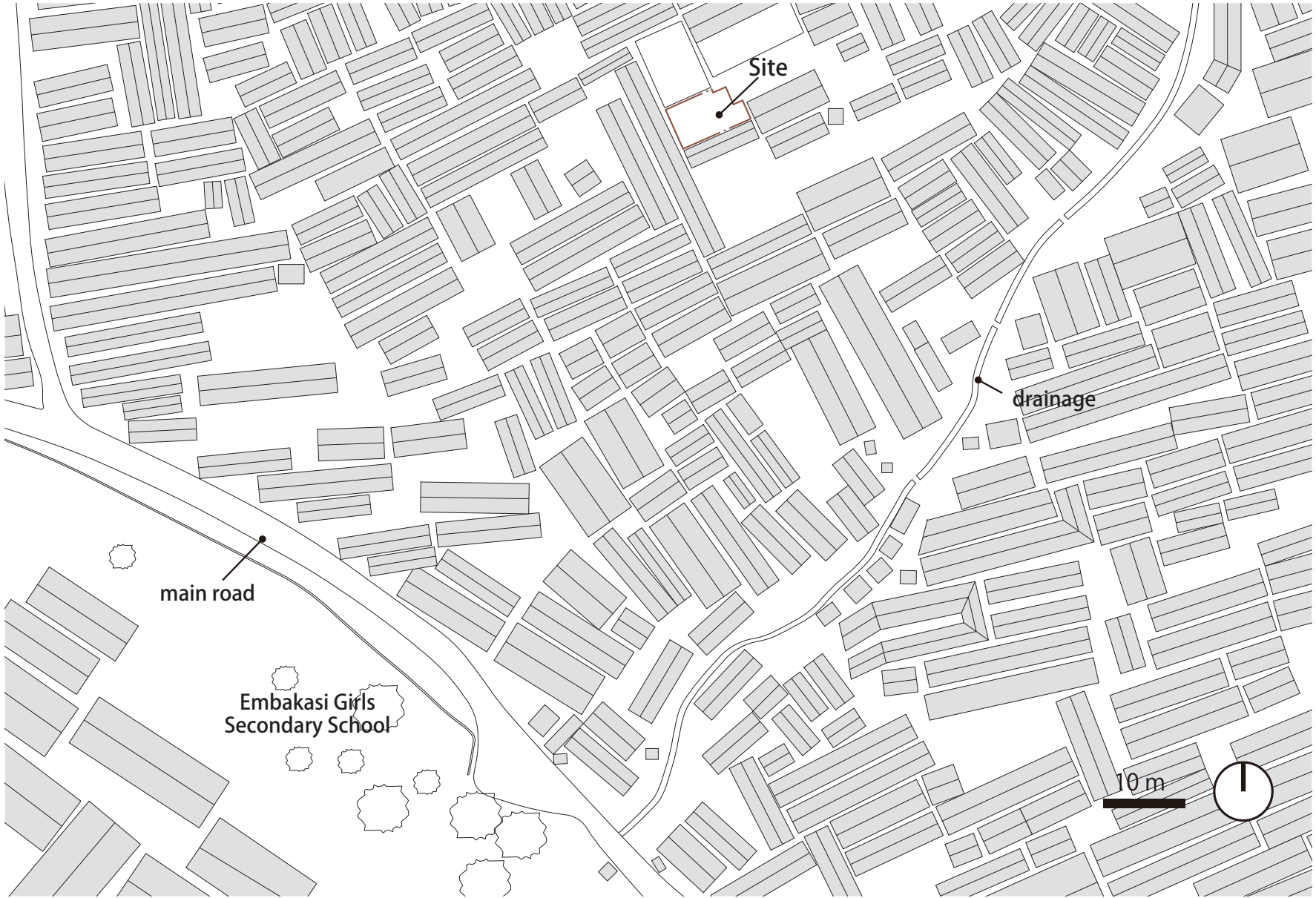
an efficient roof-opening association to let most light come inside

- Roof Plan
- Plan
- Longitudinal Section
- Cross Section
- Elevations
- Isometrics (with dimensions)
- Longitudinal Section Detail
- Isometrics (appearance)

**PART 2: COMPLETION DRAWING**



COMPLETION DRAWING

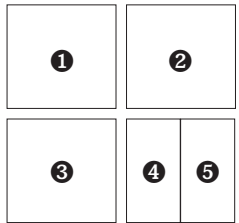


Site Plan

COMPLETION DRAWING

Along the main road of Mukuru Kwa Njenga, there are restaurants and shops run and visited by local residents. The site of new school is located near Embakasi Girls Secondary School which is a formal school on the main road.

A drainage lead a a branch from the main road to the inner part of shacks area. Slum business can also be seen on the two sides of the drainage. Apart from the drainage, after passing through a series of narrow lanes and small open space, the site is just amohng the crowded shacks.



- ❶ restaurants and shops along the main street
- ❷ Embakasi Girls Secondary School
- ❸ the drainage road
- ❹❺ lanes and open space leading to the site



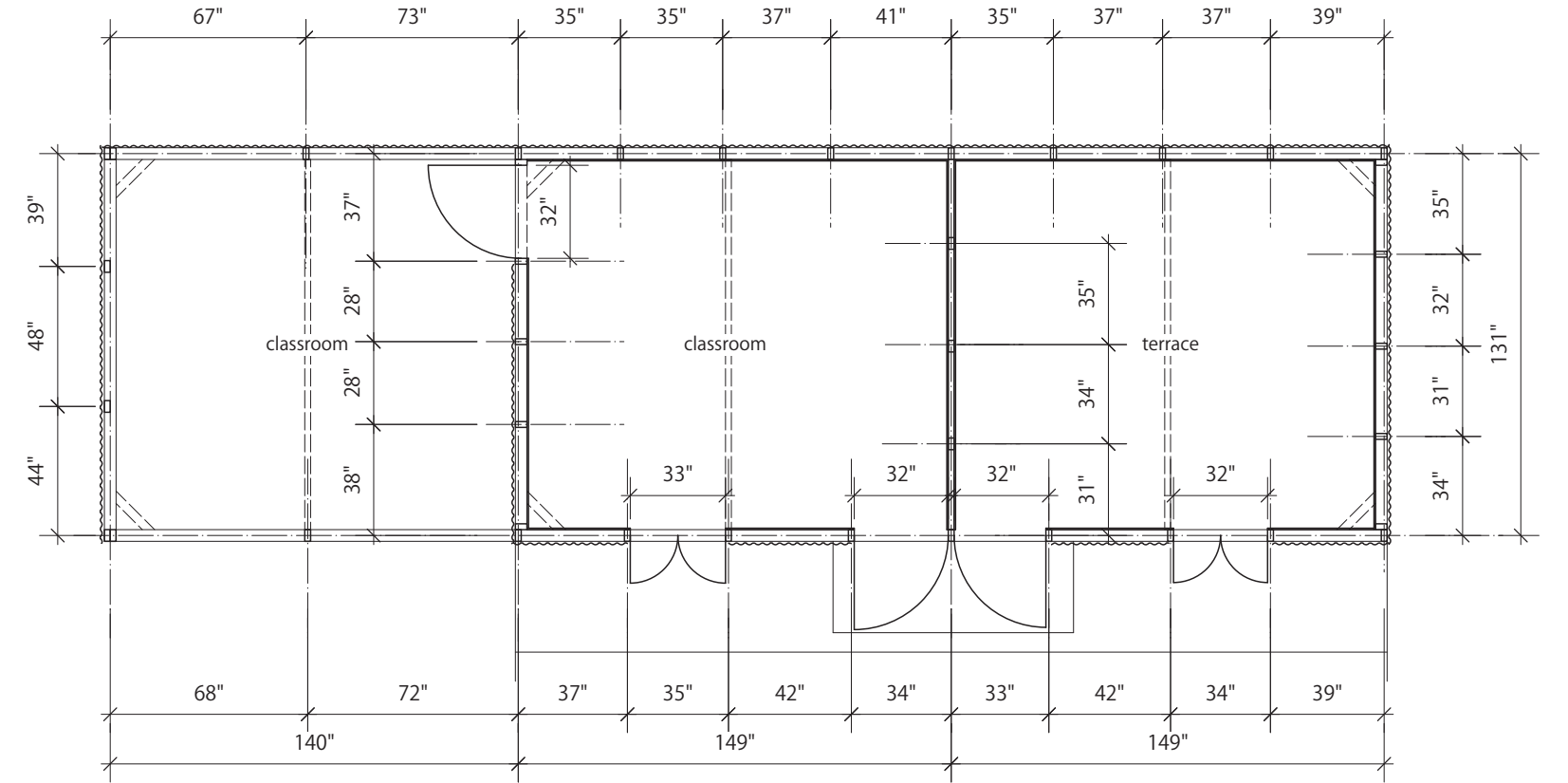


COMPLETION DRAWING



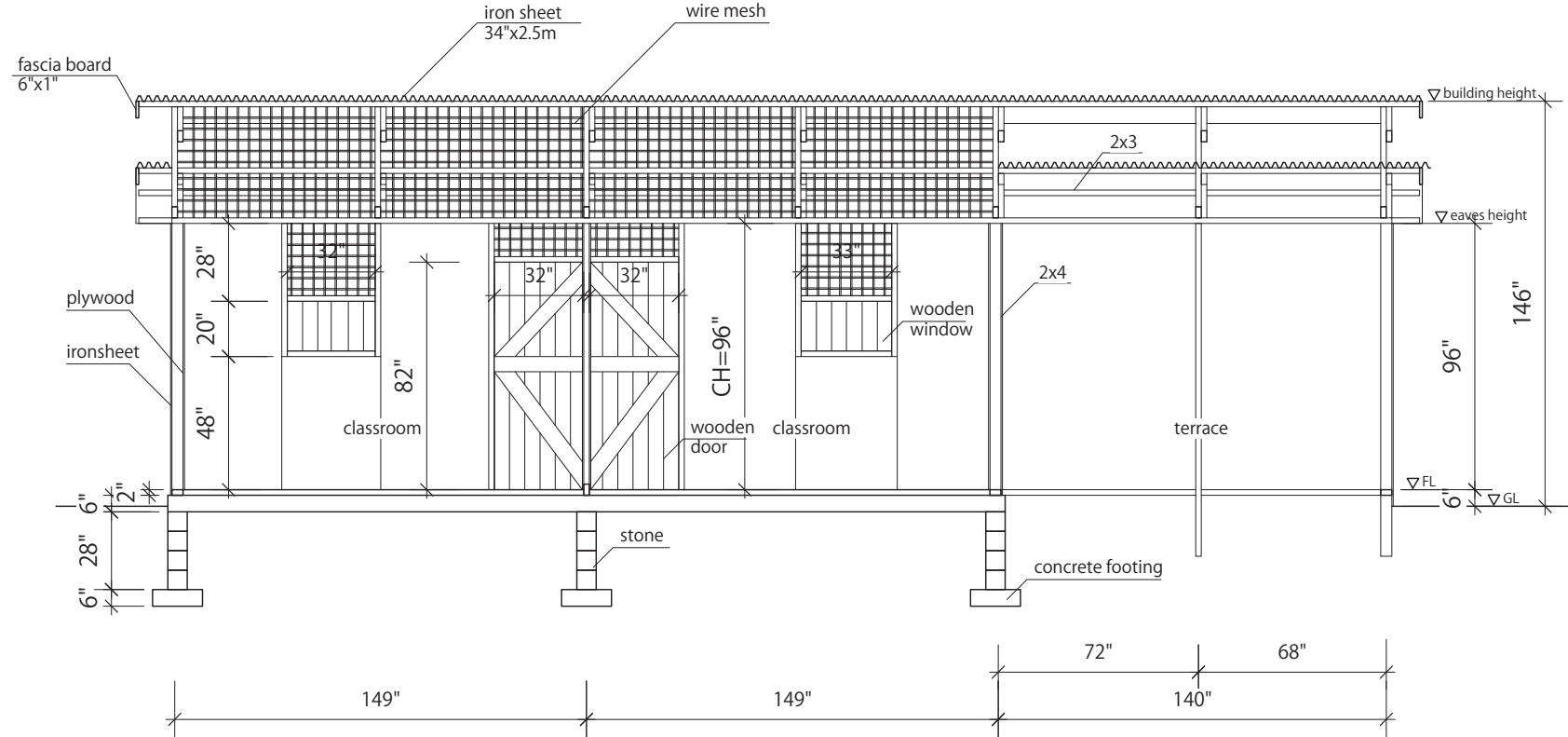
Roof Plan

COMPLETION DRAWING

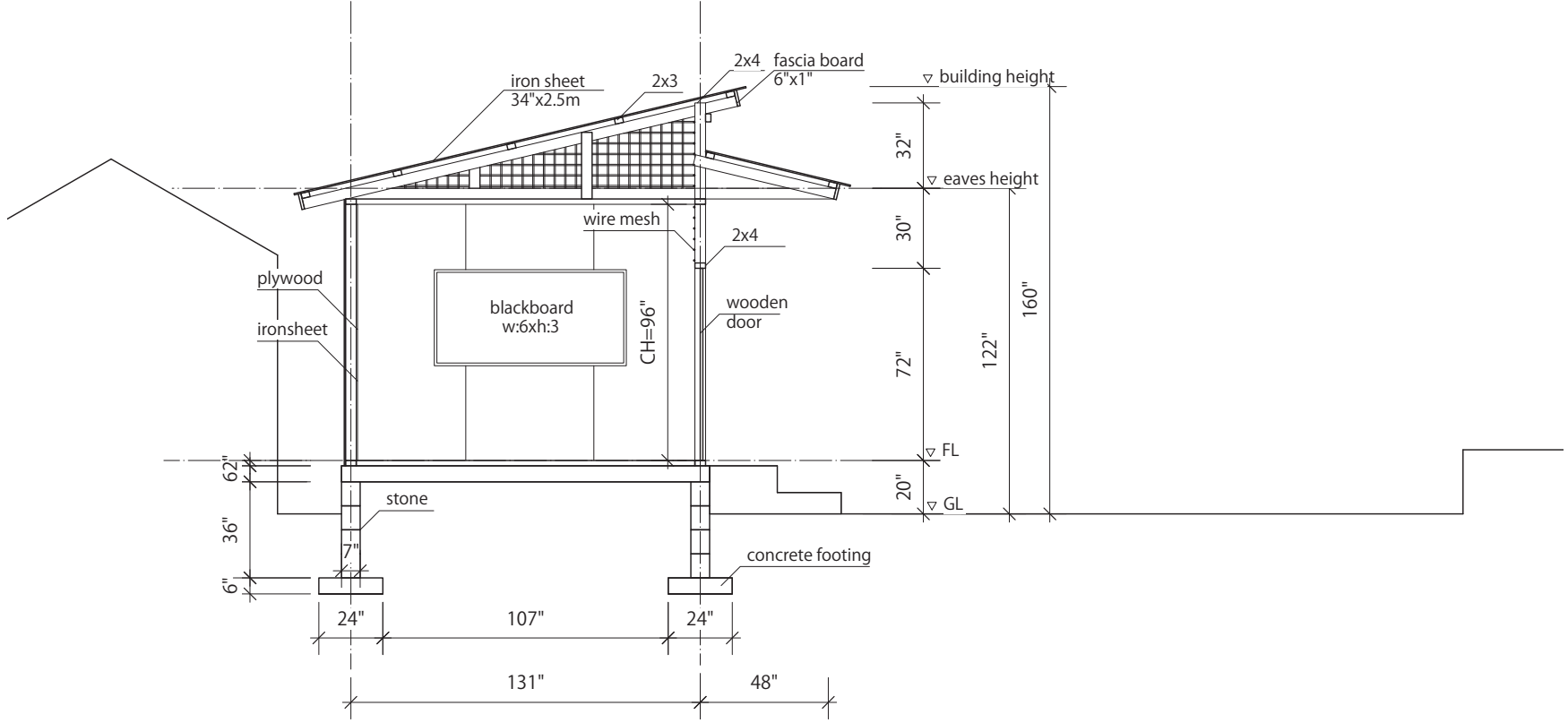


Plan 1:60



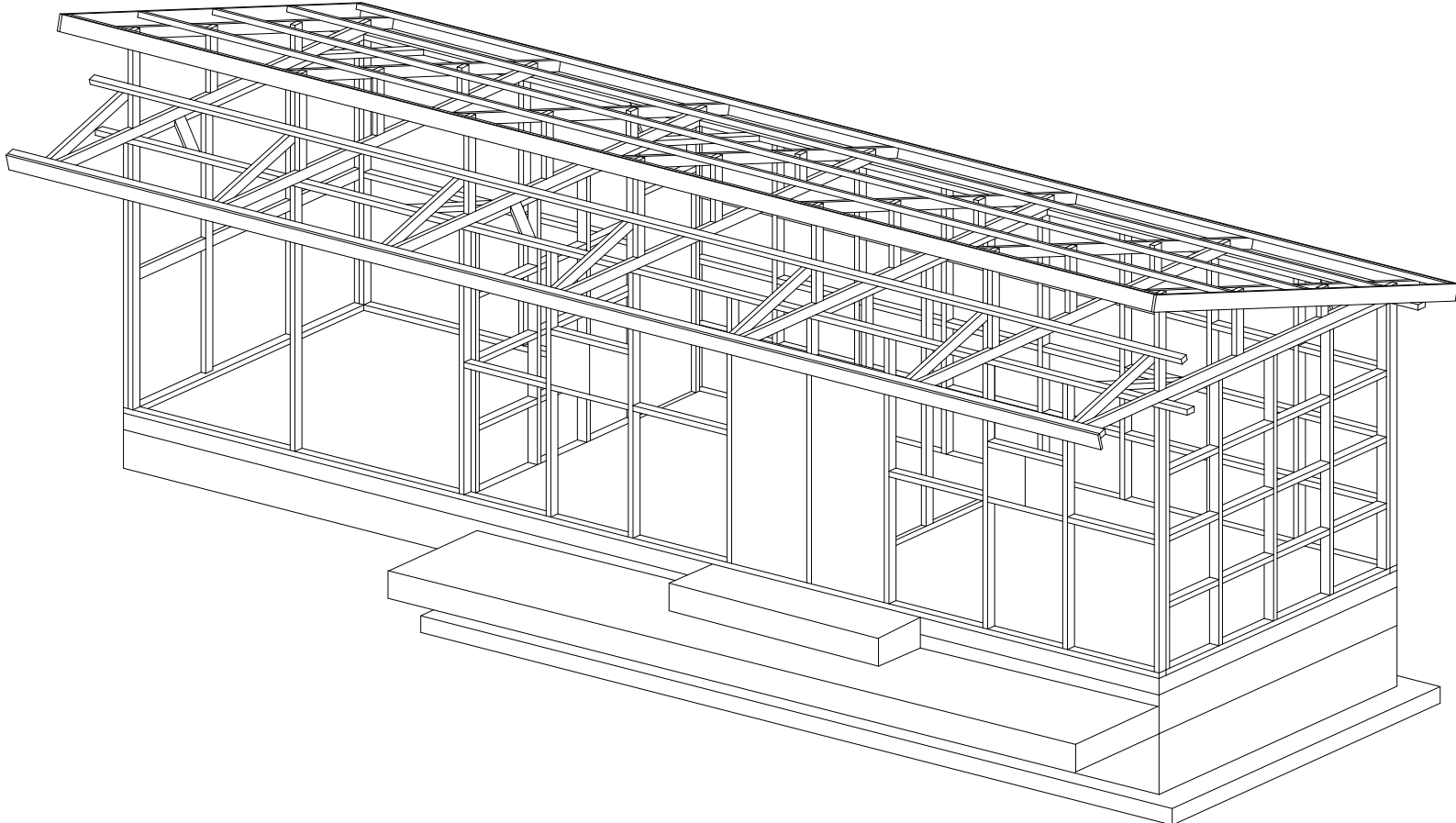


Longitudinal Section 1:60

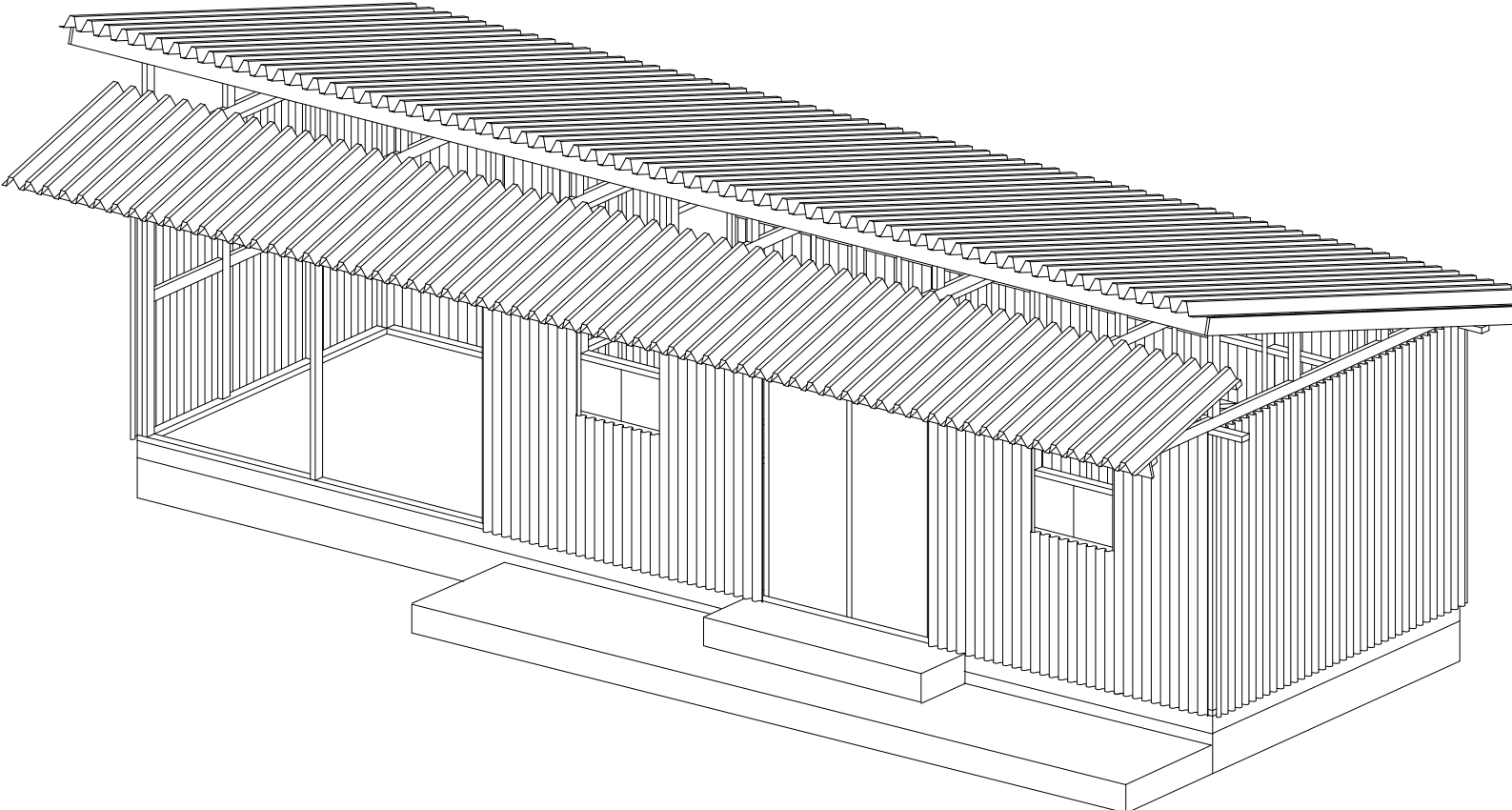


Cross Section 1:60





Structure Isometrics 1:60



Appearance Isometrics 1:60





Longitudinal Section Detail





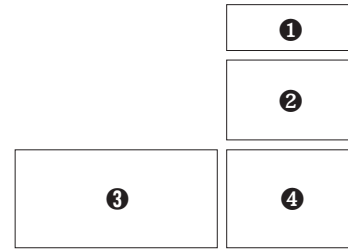
## **PART 3: CONSTRUCTION PROCESS**



# CONSTRUCTION PROCESS

At the first day, we had a visit to the current school-house and checked the new site. Since it was the first time we saw the site and took measurements in person, some adjustment was made after having a meeting with the local members.

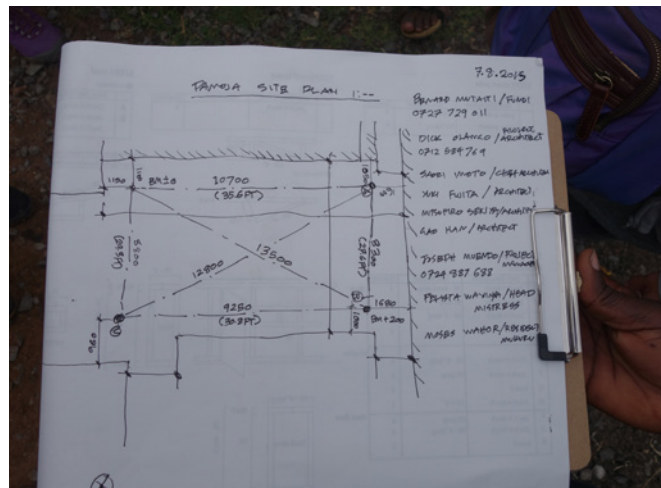
Workers including 3 fundis and 6 helpers were decided to join the construction and tools were orderd within this day.



- 1 a warm welcome given by children from happy promotion center
- 2 a meeting with local members
- 3 measuring the site
- 4 redrawing the site



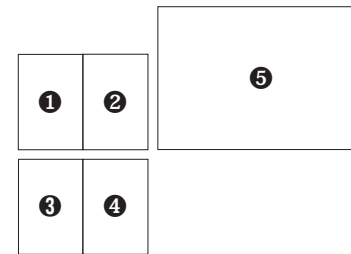
DAY 1 7, August



# CONSTRUCTION PROCESS



All the tools had been ready when we arrived at the site the second day. After putting pegs and setting leveling strings, fundis and helpers started digging foudation at once. Thanks to their skilled work, the digging were almost finished by the end of this day so that we would smoothly advance to the next step the next workday.



- 1 2 tools purchased in the local: shovels, pegs, pangas and mattocks
- 3 4 preparation for foudation work: putting pegs and setting leveling strings
- 5 digging foudation

DAY 2 8, August



# CONSTRUCTION PROCESS

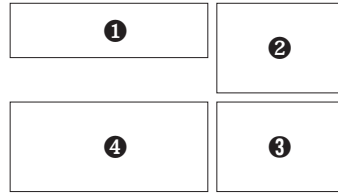


The foudation work was continuing. Stone blocks were laid and then caked by mortar so that the foudation were fixed.

The preparation of materials used for construction work above the foudation got started and we transacted our timber order with a timber factory inside Mukuru Slum.



**DAY3-4** 10-11, August



- ① laying stone blocks and caking by mortar
- ②③ the site before and after work of this day
- ④ Todai team members doing construction work

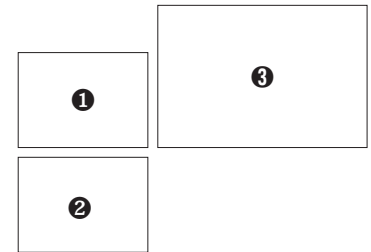


# CONSTRUCTION PROCESS



We finally completed the foudation at the fifth working day. Next, workers filled soil above foundation and leveled it.

As for the preparation of materials above the foudation, several pieces of timber were reordered because of some mistake made by the factory. We also visit a iron sheet factory to select material for wall and roof.



- ① timber cutting in the factory
- ② selecting iron sheet for wall and roof
- ③ a fundi leveling the soil above the foundation



**DAY 5** 12, August

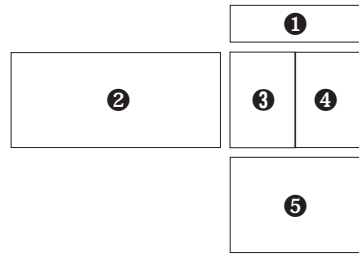


# CONSTRUCTION PROCESS



We mixed aggregate, sand and cement to produce concrete which is used for the floor. A timber fence was made to shape the floor part and then plastic sheet, wire mesh and concrete was filled in to complete the floor.

An eave was decided to be added after a discussion among us, considering the strong sunlight.



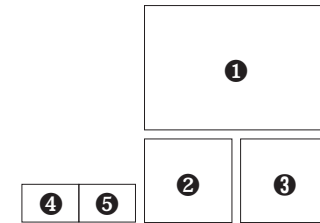
- ① using model for discussion
- ② making concrete
- ③④ doing floor work
- ⑤ completion of floor

DAY 6 13, August



Timber works were begun. We cut timbers for roof structures, and assembled them all. Also, pillars were set up on the foundation.

Order of timbers for structure were added because of the modification of design. Doors and windows were also ordered in another factory this day.



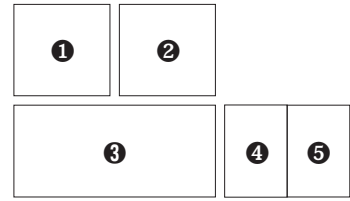
- ① lifting pillars up
- ② cutting timber
- ③ assembling roof frame
- ④⑤ negotiation with timber factories



DAY 7 14, August



# CONSTRUCTION PROCESS

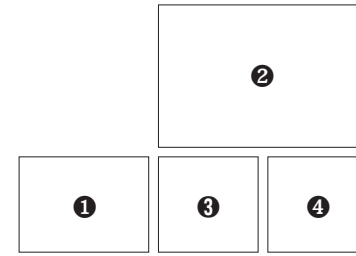


- 1 founding horizontal timber structures
- 2 founding roof structures
- 3 the new school taking its shape
- 4 5 putting iron sheet as wall

Beams, windows and doors frames were founded, and some horizontal timber structures were set up for reinforcement. We climbed up there to place and fix all roof structures on beams. Iron sheets were put around the pillars. Holes for doors and windows were cut out.



DAY 8 15, August



- 1 working till noon
- 2 a great many attendants at the ceremony
- 3 cutting the ribbon
- 4 Felista, the head teacher of the school giving a speech

We kept continuing the working on roof and wall. In the afternoon, an opening ceremony was held involving all the members related to the project and Mwendo's students. All of the members gave speeches and enjoyed performance by children.

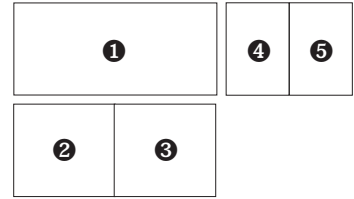
# CONSTRUCTION PROCESS



DAY 9 17, August--Ceremony Day



# CONSTRUCTION PROCESS



- 1 facade of the new school
- 2 3 helpers finishing the floor work
- 4 5 final adjustment



DAY 10-11 18-19, August

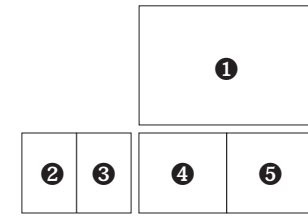
All the roof were fixed. Fascia boards were also put. It was strongly recommended by members from the community to put fascia board to make the structure more formal and smart.

Floor was also finished with mortar and colered powder. Young helpers tried very hard to smooth the floor.

At the same time, the land issue occured that the owner of the neighbor land has told that the classrooms are 5 feet beyond the border.

# CONSTRUCTION PROCESS

After the negotiation with the owner of the neighbor land, we decided to cut the part of the terrace.  
 Plywoods were set inside the wall of classrooms to make the insulation performance better.  
 Veranda was also set with two steps.



- 1 fundi cutting roof to shorten the structure
- 2 3 children observing the construction work
- 4 5 fundi putting plywoods



DAY 12-13 20-21, August



CONSTRUCTION PROCESS



After putting windows and doors, the construction of the new school finished and it finally opened on 1st September.

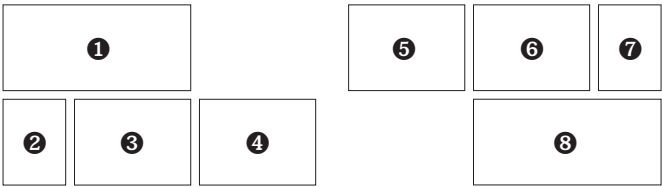
New desks and chairs were donated by Lotary Club, Kenya after they learning about the new school. Pit latrine donated by them was also built.

Because of the conflict with the neighbors, school decided to put fence for security.



Afterwards

CONSTRUCTION PROCESS



- 1 facade after the doors and windows were put
- 2 black boards
- 3 4 during the class
- 5 6 new desks and chairs donated by Lotary Club, Kenya
- 7 pit latrine
- 8 fence for security



Afterwards



## PARTICIPANTS LIST



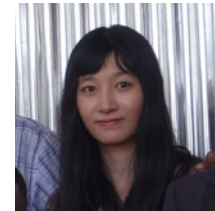
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Graduate School of Engineering,  
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Urban Redesign Studies Unit



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Mitsuhiro Sekiya  
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John Mbatia Waweru

Fundi Leader



Benard Mytaiti

Fundi



Thomas Kaviti Mvia

Fundi



Dickson Muwaviswa

Helper Leader



Jack Mania

Helper



Nicodemus Kimue

Helper



John Mutku

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Helper



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Dick Olango  
Architect & Designer

AOAD  
(ATELIERS OLANGO  
ARCHITECTURE & DESIGN)



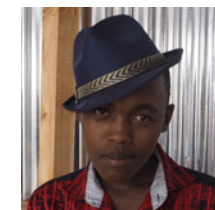
Joseph Muendo Musyoka

Owner  
Project Manager



Felista Wavinya Mutangili

Owner  
Head Teacher



Vincent Muriithi

Helper



Moses Wahor

Material Supplier



Peter Ngoenjiri

Material Supplier



Caroline Ndanu

Safety Supervisor





Group Photograph after the Ceremony

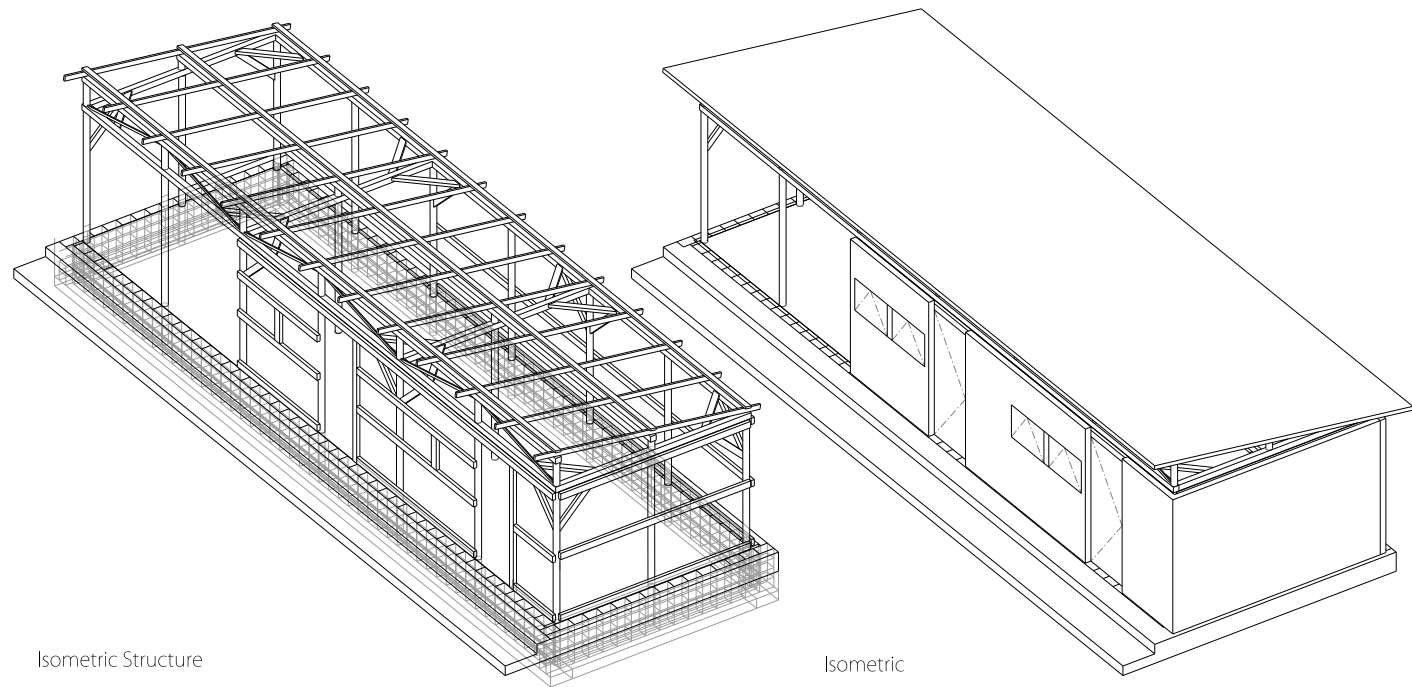
## **APPENDIX: ORIGINAL DRAWING**

Foundation  
Plan/ Section  
Elevations  
Isometrics  
Cross Section Detail  
Longitudinal Section Detail  
Construction Process  
Construction Process - Foundation  
Construction Process - Above Foundation





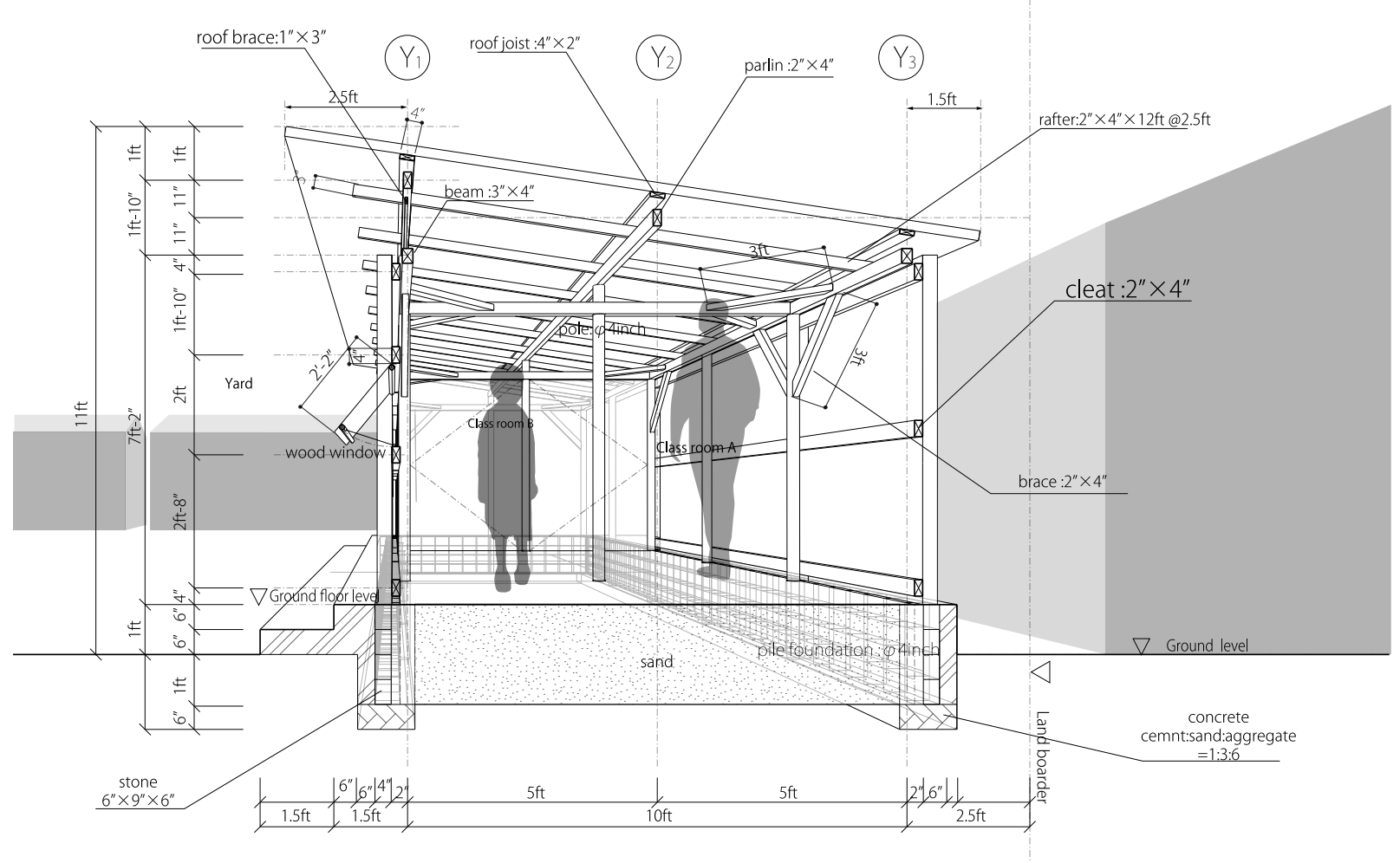




Isometric Structure

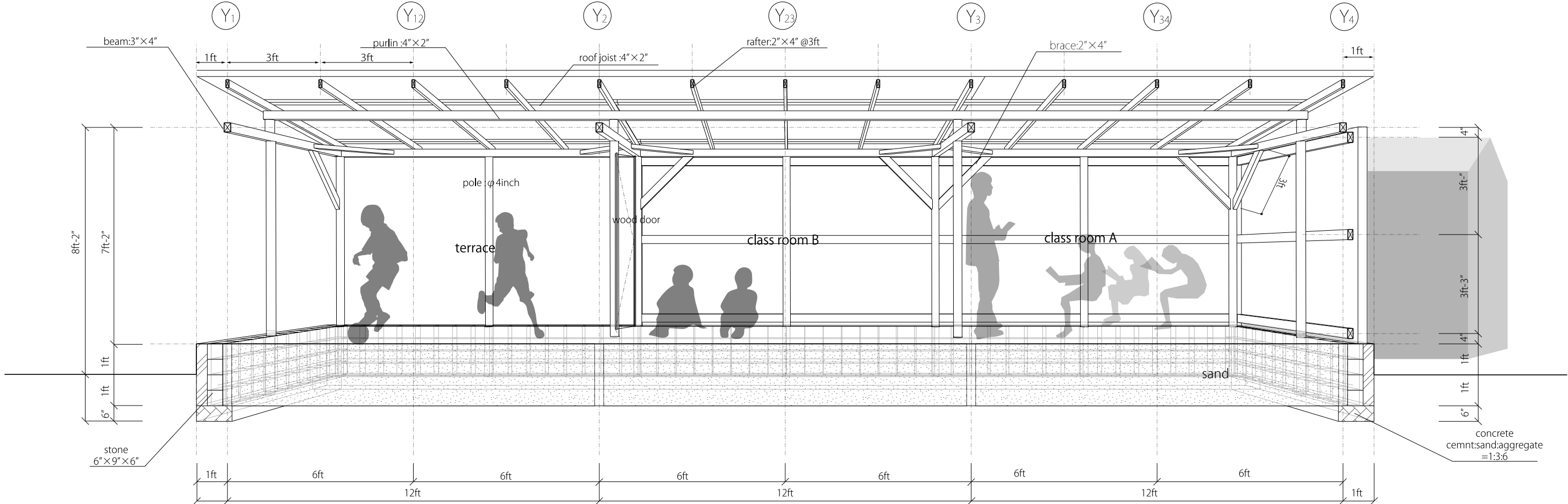
Isometric

Isometrics 1:100



Cross Section Detail 1:40



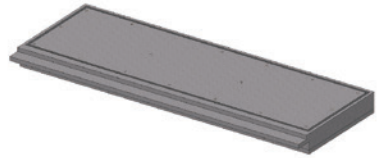


Longitudinal Section Detai 1:40



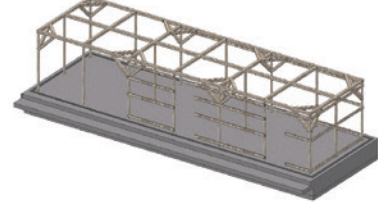
# ORIGINAL DRAWING

STEP 1



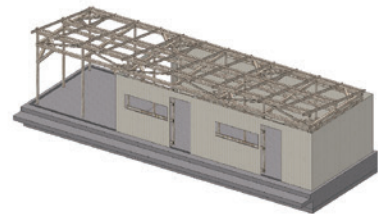
● lay foundation

STEP 4



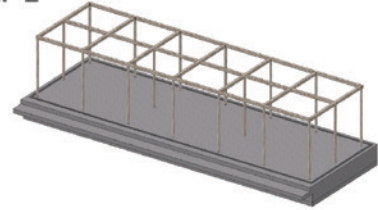
● atrengthen with braces

STEP 7



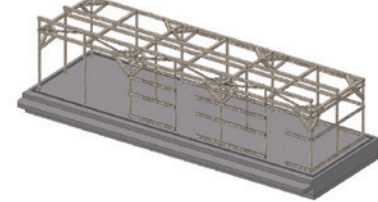
● build walls

STEP 2



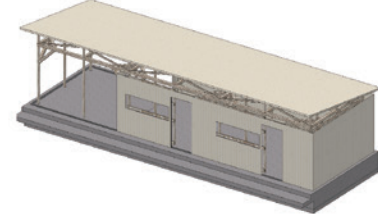
● construct poles and beams

STEP 5



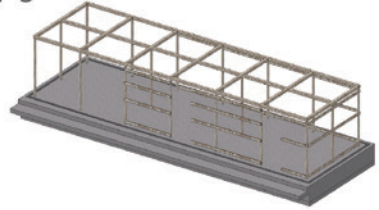
● construct roof braces and beams

STEP 8



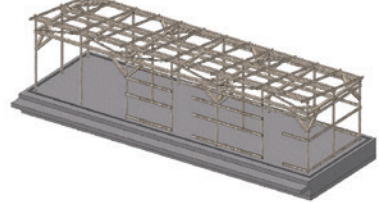
● build roof

STEP 3



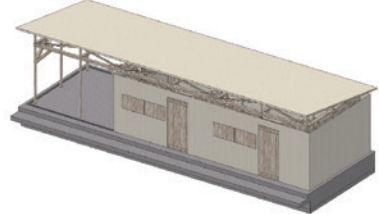
● strengthen with cleats

STEP 6



● construct rafters, parlins and roof joists

STEP 9



● install doors and windows

Construction Process

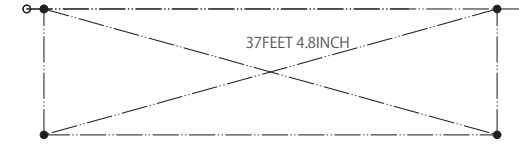
# ORIGINAL DRAWING

STEP1



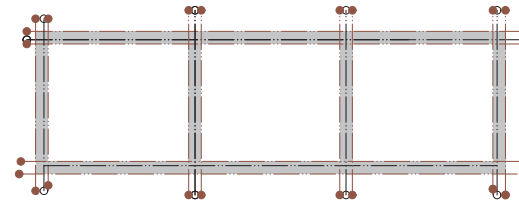
● set leveling string by pegs

STEP4



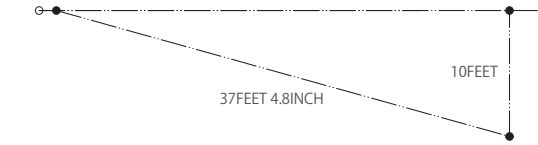
● confirm that diagonal line is 37'4.85" long

STEP7



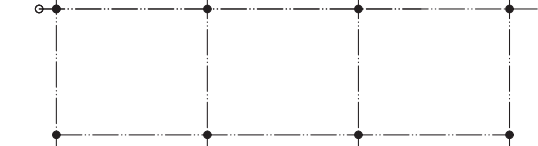
● dig the ground painted grey and put concrete 6" depth  
● dry concrete for a few days

STEP2



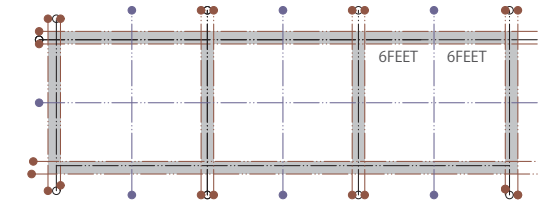
● measure 36 feet and put pegs  
● measure 10 feet and 37'4.8" and put pegs

STEP5



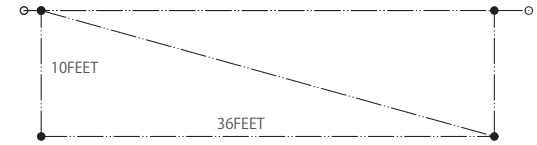
● measure 12 feet and set leveling string by pegs

STEP8



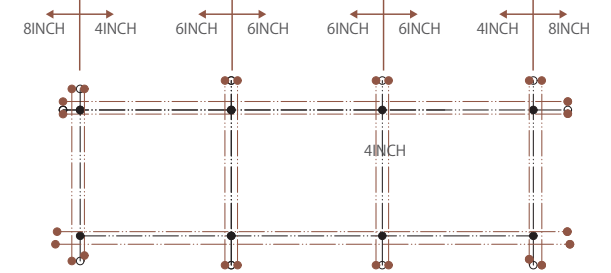
● set leveling strings 6 feet or 5 feet from the original line

STEP3



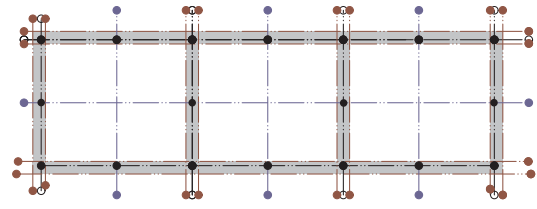
● measure 36 feet and 10 feet and put pegs

STEP6



● set leveling string 4" inside and 8" outside from the original line  
● set leveling string 6" for both side from the original line

STEP9



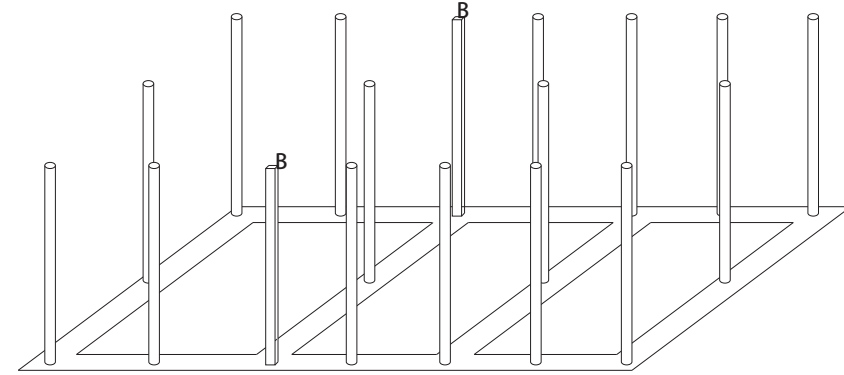
● put poles at the corners

Construction Process - Foundation



# ORIGINAL DRAWING

## STEP1 Pole

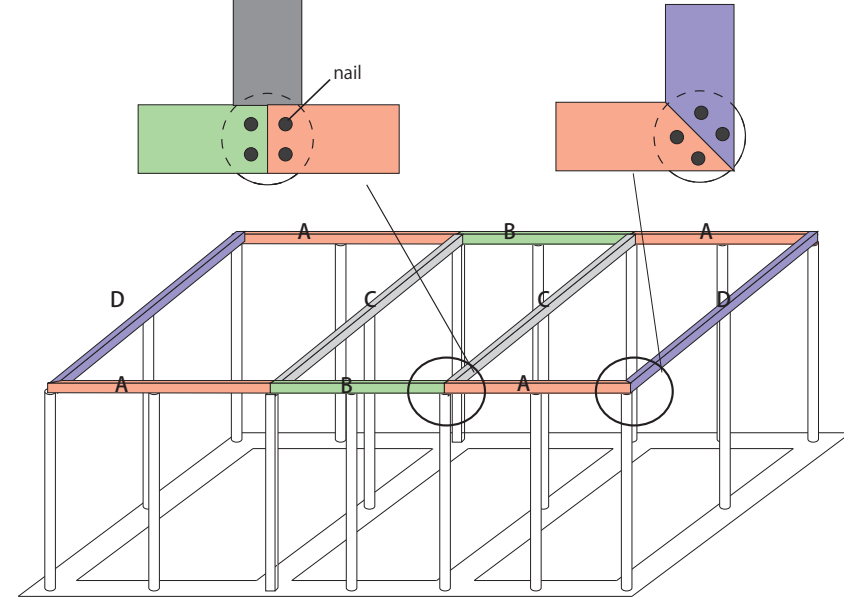


● put the poles at the corners

● materials

	Item Description	Specification	Quantity
A	poles $\varnothing$ 4inch	9ft long	16
B	poles 4inch $\times$ 4inch	9ft long	2

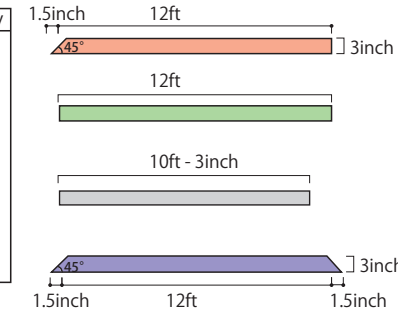
## STEP2 Beam



● put the beams on the poles

● materials

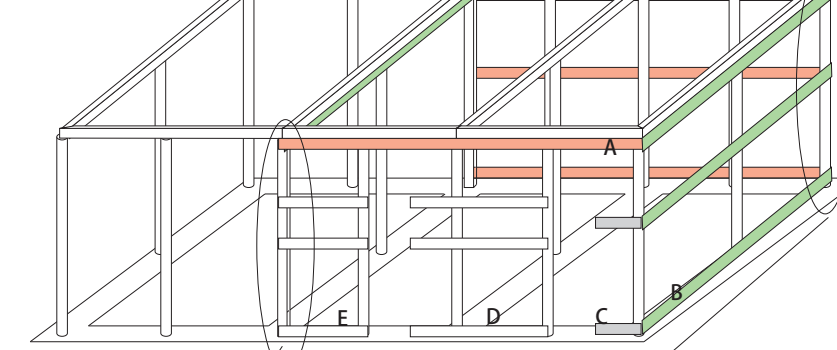
	Item Description	Specification	Quantity
A	beams 3inch $\times$ 4inch	12ft + 1.5inch long	4
B	beams 3inch $\times$ 4inch	12ft long	2
C	beams 3inch $\times$ 4inch	10ft - 3inch long	2
D	beams 3inch $\times$ 4inch	10ft + 3inch long	2



Construction Process - Above Foundation

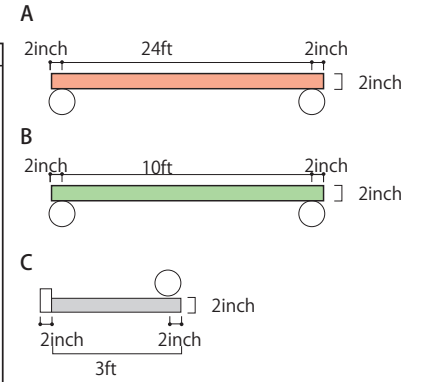
# ORIGINAL DRAWING

## STEP3 Cleat



● materials

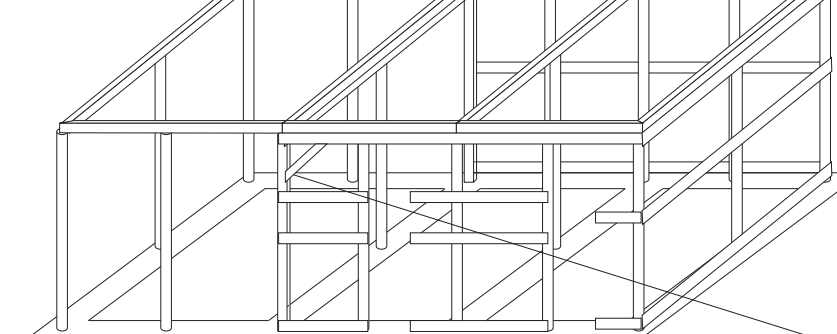
	Item Description	Specification	Quantity
A	2inch $\times$ 4inch	24ft + 4inch long	4
B	2inch $\times$ 4inch	10ft + 4inch long	4
C	2inch $\times$ 4inch	3ft long	2
D	2inch $\times$ 4inch	9ft long	3
E	2inch $\times$ 4inch	6ft + 4inch long	3



● put the cleats on the poles



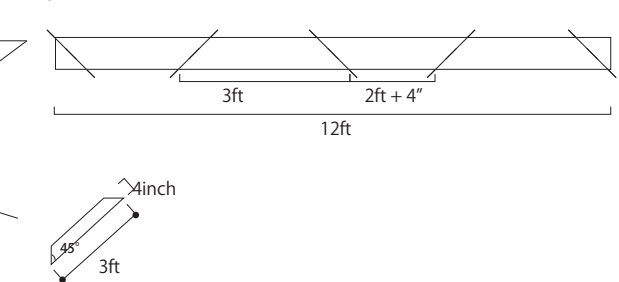
## STEP4 brace



● materials

	Item Description	Specification	Quantity
	2inch $\times$ 4inch	3ft long	26

● How to cut



Construction Process - Above Foundation



# ORIGINAL DRAWING

## STEP5 short pole

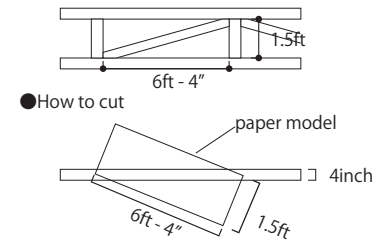
### ●materials

Item Description	Specification	Quantity
poles φ4inch	1.5ft long	7
poles φ4inch	7inch long	4

## STEP6 roof brace

### ●materials

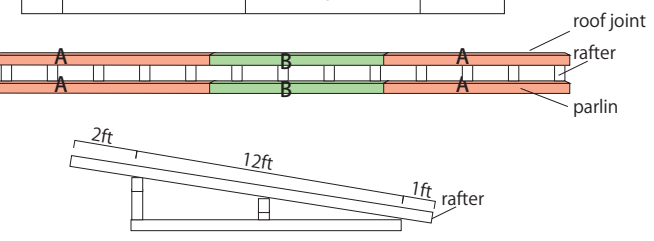
Item Description	Specification	Quantity
2inch×4inch		6



## STEP7 roof

### ●materials

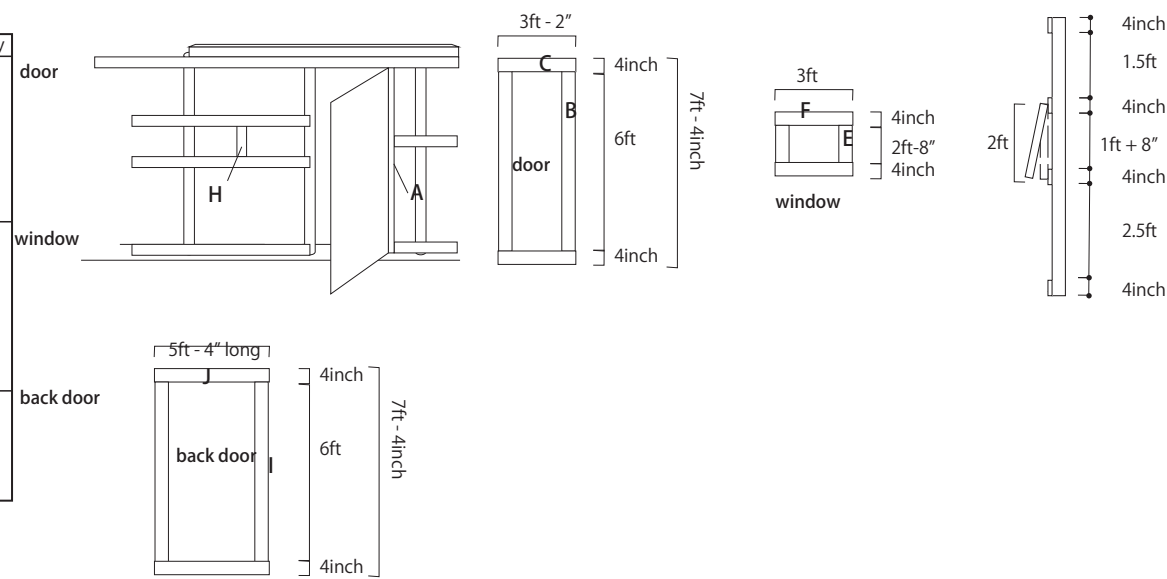
Item Description	Specification	Quantity	
A	2inch×4inch	12ft + 2inch long	10
B	2inch×4inch	12ft long	5
	2inch×4inch	15ft long	13



## STEP8 door • window

### ●materials

Item Description	Specification	Quantity	
A	2inch×4inch	7ft - 4inch long	2
B	2inch×4inch	6ft long	4
C	2inch×4inch	3ft - 2" long	4
D	board		2
E	2inch×4inch	2ft - 8" long	8
F	2inch×4inch	3ft long	8
G	board		4
H	2inch×4inch	1ft + 8"	2
I	2inch×4inch	6ft long	4
J	2inch×4inch	5ft - 4" long	4
K	board		2



# BOOKLET IMPLEMENTATORS LIST

Planning: Saori Imoto

Typesetting: Han Gao

Drawing: Yuki Fujita (working drawing, completion drawing, impressive drawing), Saori Imoto (working drawing, completion drawing, map), Han Gao (impression drawing, diagram), Mari Tanehashi (working drawing)

Word: Saori Imoto, Han Gao, Mitsuhiro Sekiya

Photo: Mitsuhiro Sekiya, Han Gao, Saori Imoto

Model: Mari Tanehashi, Mitsuhiro Sekiya

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Construction Process - Above Foundation



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