

PROFESSIONAL TRAINING REPORT

Submitted in partial fulfillment of the requirements for the award of
Master of Architecture degree in Sustainable Architecture

by

AKSHAYA.C (39890001)



SCHOOL OF BUILDING AND ENVIRONMENT
DEPARTMENT OF ARCHITECTURE

SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC
JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119

JUNE 2019



SATHYABAMA

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PHONE: 2450 1443/9941912481 INTERNET: www.sathyabama.ac.in

E-mail: archhod@sathyabama.ac.in



**SCHOOL OF BUILDING AND ENVIRONMENT
DEPARTMENT OF ARCHITECTURE
M. Arch (Sustainable Architecture)**

**PROFESSIONAL TRAINING PORTFOLIO S89 INT
DEC 2020**

Name of the Student : AKSHAYA.C

Semester : III

Reg No. : 39890001

Batch : 2019-2021



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SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

M. Arch (Sustainable Architecture)

BONAFIDE CERTIFICATE

This is to certify that the professional training (S89 INT) is the work of AKSHAYA.C (39890001) who had undergone training in SACRED GROOVES, AUROVILLE and has been monitored by the continuous assessment during **Dec 2020 to Jan 2021.**

A handwritten signature in blue ink, appearing to read 'Devyani', is placed over a grey rectangular background.

DR.DEVYANI GANGOPADHYAY

DEAN,

School of Building and

Environment

Department of Architecture

Submitted for Viva voce Examination held on Sheetal.A.

Internal Examiner

External Examiner



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E-mail: archhod@sathyabama.ac.in



DECLARATION

I AKSHAYA.C hereby declare that the Professional Training Report from 11-12-2020 to 22-12-2020 done by me under the guidance of Ar. MANU GOPALAN is submitted in partial fulfillment of the requirements for the completion of practical training session.

DATE : 28-01-2021

PLACE : CHENNAI

A handwritten signature in blue ink, appearing to read 'Akshaya.C', is written over a grey rectangular background.

SIGNATURE OF CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. Devyani Gangopadhyay**, Dean and Head of Department, School of building and Environment, Dept. of architecture for providing me necessary support and details at the right time during the progressive training session.

I would like to express my sincere and deep sense of gratitude to **Ar. Manu Gopalan Chief Architect of Sacred Grooves, Auroville** for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work. My sincere thanks to **Ar. Sheetal Kalamkar**, Professional Training Coordinator for her motivation.

I wish to express my thanks to all Teaching and Non-teaching staff members of the Department of Architecture who were helpful in many ways for the completion of the project.



Date: 11-12-2020
Place: Auroville.

To,
The Head of the Department,
Faculty of Architecture,
Sathyabama Institute of science and Technology,
Chennai, Tamilnadu

CONFIRMATION LETTER

This letter is to certify that Ms. **Akshaya C** of 4th Semester M.Arch -Sustainable Architecture at **Sathyabama Institute of Science and Technology, Chennai** has been confirmed as an **Architectural Intern** in our Organization based on her academic and professional achievements for 1 month practical training starting from **11th December 2020** onwards.

Yours's sincerely,


Amal Ali
Architect


Manu Gopalan
Chief Architect
CA/2000/26025

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Date: 29-01-2021
Place: Auroville.

To,
The Head of the Department,
Faculty of Architecture,
Sathyabama Institute of Science and Technology
Chennai, Tamilnadu

JOINING LETTER

This letter is to certify that Ms. **Akshaya C** of 4th Semester **M.Arch – Sustainable Architecture** at **Sathyabama Institute of Science and Technology, Chennai** has joined our office as a trainee, in the forenoon on **11th December 2020** as a part of internship programme under the university Curriculum.

Yours's sincerely,


Amal Ali
Architect

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WEEKLY REPORT



SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY (DEEMED TO BE UNIVERSITY)

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DEPARTMENT OF ARCHITECTURE M. Arch (Building management)

Continuous Assessment Report for Professional training

(Continuous progress report of the trainee architect/Project Manager for the period of 30 working days in the office to be submitted to HOD by the Trainee attending the training session)

- Name of the office / organization :** SACRED GROVES - Ecological housing project
- Address & Contact Number :** Near center guest house, Auroville - 605101
ph : 04132623696
- Name of the student :** C. AKSHAYA
- Duration :** From 11-12-2020 To 18-12-2020
- Total No. of days :** 6
- Evaluation of Performance criteria shall be on**

* **Note:** Kindly grade the student as per his/her overall performance in the office during the assessment month; which will be converted to the allotted marks by the department.

Description of works	Excellent	Good	Fair	Poor	NA
Understanding of office culture and methodology	✓				
Active Participation in the Project activities	✓				
Documentation and tracking of project	✓				
Presentation Skills developed	✓				
Understanding of construction details & techniques		✓			
Participation and contribution in project meetings	✓				
Understanding of codes and standards	✓				
Schedule preparation & tracking activities		✓			
Preparation / Management of drawings		✓			
Learning / Application of software in Projects	✓				
Preparation of concept for projects	✓				
Site Management / Discussion with clients	✓				
Overall Grading*	A				

(A - 8.0, B - 7.0, C - 6.0, D - 5.5, E - 5.0, F - <5)

7. Any other Remarks : Good work

8. Signature of the
Head of the Office /
Organization (With Seal)

Amal
SACRED GROVES



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- Name of the office / organization :** SACRED GROVES - Ecological housing project
- Address & Contact Number :** Near center guest house, Auroville - 605101
ph : 04132623696
- Name of the student :** C. AKSHAYA
- Duration :** From 21-12-2020 To 02-01-2021
- Total No. of days :** 10
- Evaluation of Performance criteria shall be on**

* **Note:** Kindly grade the student as per his/her overall performance in the office during the assessment month; which will be converted to the allotted marks by the department.

Description of works	Excellent	Good	Fair	Poor	NA
Understanding of office culture and methodology	✓				
Active Participation in the Project activities	✓				
Documentation and tracking of project	✓				
Presentation Skills developed	✓				
Understanding of construction details & techniques		✓			
Participation and contribution in project meetings	✓				
Understanding of codes and standards	✓				
Schedule preparation & tracking activities		✓			
Preparation / Management of drawings		✓			
Learning / Application of software in Projects	✓				
Preparation of concept for projects	✓				
Site Management / Discussion with clients	✓				
Overall Grading*	A				

(A - 8.0, B - 7.0, C - 6.0, D - 5.5, E - 5.0, F - <5)

7. Any other Remarks : Good work

8. Signature of the
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Continuous Assessment Report for Professional training

(Continuous progress report of the trainee architect/Project Manager for the period of 30 working days in the office to be submitted to HOD by the Trainee attending the training session)

1. Name of the office / organization : SACRED GROVES - Ecological housing project

2. Address & Contact Number : Near center guest house, Auroville - 605101
ph : 04132623696

3. Name of the student : C. AKSHAYA

4. Duration : From 04-01-2021 To 13-01-2021

5. Total No. of days : 9

6. Evaluation of Performance criteria shall be on

* Note: Kindly grade the student as per his/her overall performance in the office during the assessment month; which will be converted to the allotted marks by the department.

Description of works	Excellent	Good	Fair	Poor	NA
Understanding of office culture and methodology	✓				
Active Participation in the Project activities	✓				
Documentation and tracking of project	✓				
Presentation Skills developed	✓				
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Understanding of codes and standards	✓				
Schedule preparation & tracking activities		✓			
Preparation / Management of drawings		✓			
Learning / Application of software in Projects	✓				
Preparation of concept for projects	✓				
Site Management / Discussion with clients	✓				
Overall Grading*	A				

(A - 8.0, B - 7.0, C - 6.0, D - 5.5, E - 5.0, F - <5)

7. Any other Remarks : Good work

8. Signature of the
Head of the Office /
Organization (With Seal)

Amal
SACRED GROVES



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DEPARTMENT OF ARCHITECTURE M. Arch (Building management)

Continuous Assessment Report for Professional training

(Continuous progress report of the trainee architect/Project Manager for the period of 30 working days in the office to be submitted to HOD by the Trainee attending the training session)

1. Name of the office / organization : SACRED GROVES - Ecological housing project

2. Address & Contact Number : Near center guest house, Auroville - 605101
ph : 04132623696

3. Name of the student : C. AKSHAYA

4. Duration : From 18-01-2021 To 22-01-2021

5. Total No. of days : 5

6. Evaluation of Performance criteria shall be on

* Note: Kindly grade the student as per his/her overall performance in the office during the assessment month; which will be converted to the allotted marks by the department.

Description of works	Excellent	Good	Fair	Poor	NA
Understanding of office culture and methodology	✓				
Active Participation in the Project activities	✓				
Documentation and tracking of project	✓				
Presentation Skills developed	✓				
Understanding of construction details & techniques	✓				
Participation and contribution in project meetings	✓				
Understanding of codes and standards	✓				
Schedule preparation & tracking activities		✓			
Preparation / Management of drawings		✓			
Learning / Application of software in Projects	✓				
Preparation of concept for projects	✓				
Site Management / Discussion with clients	✓				
Overall Grading*	A				

(A - 8.0, B - 7.0, C - 6.0, D - 5.5, E - 5.0, F - <5)

7. Any other Remarks : Good work

8. Signature of the
Head of the Office /
Organization (With Seal)

Amal
SACRED GROVES



WORK DIARY

DATE	PROJECT NAME	WORK DONE	DATE	PROJECT NAME	WORK DONE
11-12-2020		Sacred Grooves Site Tour and Orientation	04-01-2021	Prototype House	Flooring Design
14-12-2020		Earth Crete Column Casting Workshop	05-01-2021	Bubble Area Renovation	Bamboo roof design execution.
15-12-2020		Earth Crete Column Casting Workshop	06-01-2021		Oxide Flooring, Wax Flooring Workshop
16-12-2020	Bubble Area Renovation	Beam Casting and Framework	07-01-2021		Sacred Grooves Site Tour to Tahir House
17-12-2020	Bubble Area Renovation	Beam Casting and Framework	08-01-2021		Introduction to Araish Plaster a Workshop
18-12-2020	Bubble Area Renovation	Beam Casting and Framework	09-01-2021		Introduction to Araish Plaster a Workshop
21-12-2020	Bubble Area Renovation	Existing Structure Dismantle	11-01-2021		Introduction to Araish Plaster a Workshop, Case Study on PTDC
22-12-2020	Bubble Area Renovation	Site Measurements and Design Execution	12-01-2021	Bubble Area Renovation	Tile Cleaning, Roofing Structural Details
23-12-2020	Bubble Area Renovation	Site Measurements and Design Execution	13-01-2021	Bubble Area Renovation	Tile Cleaning, Roofing Purlins and Rafters
24-12-2020		Adobe Bricks and Foundation Digging	16-01-2021	Bubble Area Renovation	Tile Cleaning, Roofing Weathering Treatment
26-12-2020		Column Foundation, Adobe Bricks, Case Study of Town hall	17-01-2021	Bubble Area Renovation	Tile Placement
28-12-2020	Bubble Area Renovation	Roofing Design, Existing Structure Dismantle	18-01-2021	Bubble Area Renovation	Tile Placement
29-12-2020	Bubble Area Renovation	Bamboo Harvesting	19-01-2021	Prototype House	Flooring Design Execution
30-12-2020	Bubble Area Renovation	Bamboo Harvesting	20-01-2021	Prototype House	Flooring Design Execution
31-12-2020	Bubble Area Renovation	Bamboo roof design execution, Case Study Joseba House site visit	21-01-2021		Lime Chakki Workskop
02-01-2021	Prototype House	Flooring Design	22-01-2021		Lime Chakki Workskop

Chief Architect Signature:

Office seal:



Date: 29-01-2021
Place: Auroville.

To,
The Head of the Department,
Faculty of Architecture,
Sathyabama Institute of Science and Technology
Chennai, Tamilnadu

TRAINING CERTIFICATE

This letter is to certify that Ms. **Akshaya C** of 4th Semester **M.Arch – Sustainable Architecture** at **Sathyabama Institute of Science and Technology, Chennai** has been working in our organization as an **Architectural Intern** for a period of **30 days** from **11-12-2020** to **23-01-2021**.

During her Internship tenure, she has worked on the Sacred Groves Ecological housing project and have been exposed to various earth building techniques.

Her contribution to the project has been good!

We wish her all the best for her future endeavors.

Yours's sincerely,


Amal Ali
Architect




Manu Gopalan
Chief Architect
CA/2000/26025

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A photograph of a dense forest with sunlight filtering through the trees, creating a warm, golden glow. The text is overlaid on the left side of the image.

ARCHITECTURAL PORTFOLIO
INTERNSHIP : DEC 2020 TO JAN 2021
SACRED GROOVED-HANDS ON INTERNSHIP

AKSHAYA.C
39890001

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HISTORY:

sacred Groves:

There is an acute shortage of affordable housing in Auroville which deters many good people from joining the community. The SacredGroves project was conceived to alleviate this

problem with the construction of 108 new homes; for newcomers, Aurovillians and long-term volunteers, in a manner consistent with The Mother's vision for Auroville.

SacredGroves is basically concerned about the innovative usage of ecological materials in construction. The project is designed to be a model of ecological community living using ecologically sensitive construction methods.

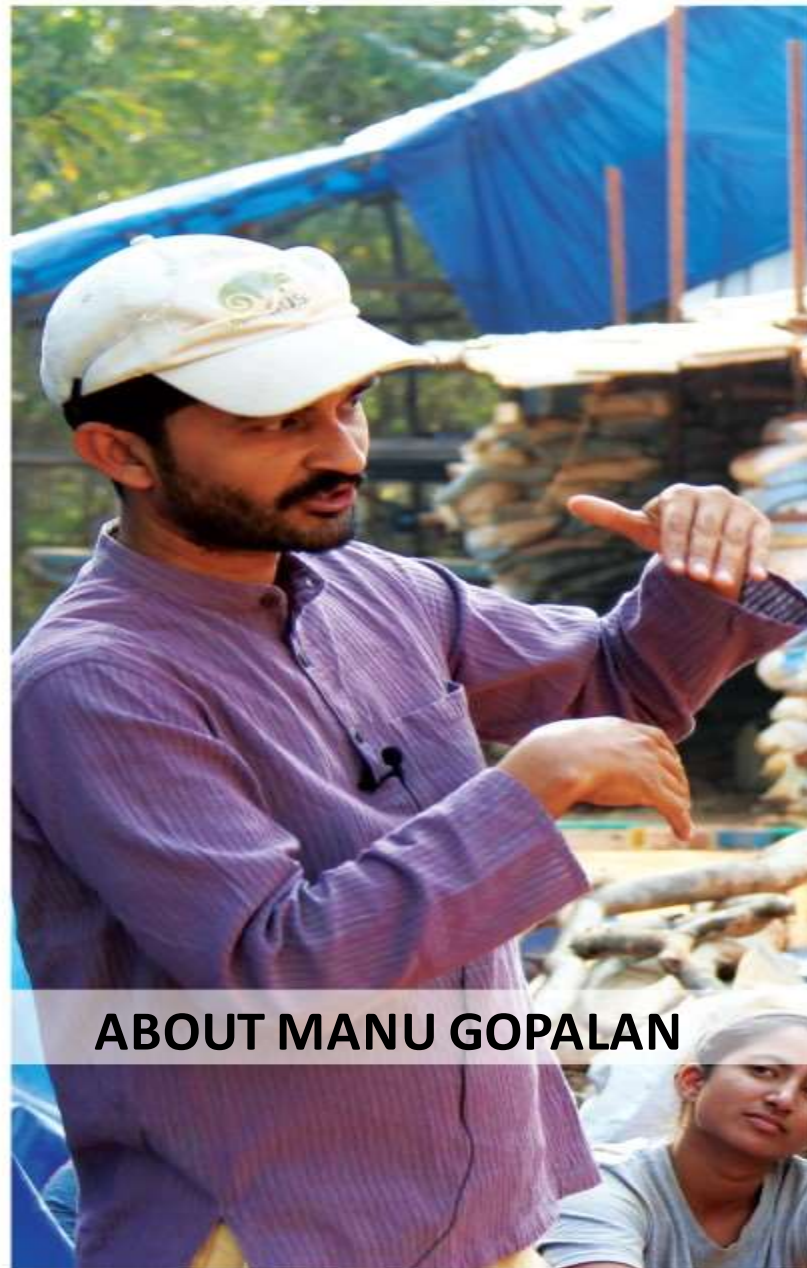
WHY THIS PROJECT?

- A PRACTICAL KNOWLEDGE ON SUSTAINABILITY IN EVERY ASPECT AND NOT JUST IN DESIGN.
- AS THIS PROJECT PROVIDES HANDS ON EXPERIENCE, IT PROVIDES MORE ROOM FOR DOUBTS AND IDEAS.
- A CHANCE TO EXPLORE DIFFERENT METHODS OF CONSTRUCTION AND EXPERIMENTATION.
- LEARN ABOUT DIFFERENT MATERIALS AND TECHNIQUES.

ECOLOGICAL CONSTRUCTION:

The sacred grooves offers various other elements in construction:

1. Reusing waste building rubble to construct house made of earth concrete- an intensive much less cement insentive
2. Recycling wood from packing crates.
3. Reusing discarded petrol pipes from shuttering.
4. Being mindful of our own sacred groves resources like enery and water.



ABOUT MANU GOPALAN

ABOUT HIM:

A Professional Architect, Director of Programs and Photographer.
Over 15 years experience in the management of international organizations such as Greenpeace, Amnesty International. Architecture & Development and Auroville International Township. Worked in multi-country contexts in India, Nepal, Sri Lanka, Pakistan, Burma, Thailand, Philippines, Malaysia, Turkey, The Netherlands and the United Kingdom. Widespread rural development work exposure in south and south-east Asia especially 'developing Ecological Micro-projects in the areas of water, sanitation and housing.

EDUCATION:

School of Planning and Architecture New Delhi
Nomi Bose Award for the Best Thesis
Golden Medal Professional Degree in Architecture
License to Practice, Membership of Council of Architecture 1999
Membership in Amnesty International and Greenpeace International
Professional Training and Certification in Non-Profit Administration, Strategic Planning Campaigns, Communications Strategy Development, Media Management Web Development, Non-Violent Direct Action (NVDA), Epidemiological Research, Zero Waste Technology Systems.

SUSTAINABLE MATERIALS (ADVANTAGES AND DISADVANTAGES):

1.Egg / sand/mud:



2.Kadukkai seed:



Mixture of ratios:

18 kg kadukkai seed: ratio with 750 litres of water

STEPS:

- 1.Kadukkai should be broken and made to set for 2-3 days.
 - 2.To mix lime in machine along with kadukkai water.
 3. 3:5 lime chaki mortar(small scale)
 - 4.9:5 (lime and sand) for larger scale and keep mixture for (5 to 10 days)
- Kadukkai and jaggery water, jaggery at a mixture of 20kg.

3.Lime and shell lime:



Cost: Rs: 30 to 35

Kiln process(burning of lime)
Stack process(3 min)
Add little amount of water



4.Surki Plaster:



Mainly consists of brick powder, in the ratio 1:1, can be used in for brown texture, used as a brick powder. In palingu plaster can be used instead of marble powder and can also be made as matte finish.



cactus

Cow urine:

mainly used as a good binder for lime, it acts as a good binding material. (half white coloured is mostly taken.

cow



LIME:

WHAT IS LIME:

Lime is obtained from limestone, a naturally occurring material which consists of calcium carbonate, the lime can be hydraulic and non-hydraulic lime. Both are used in construction industry in which hydraulic lime is more expensive and pure lime.

HYDRAULIC LIME:

This is used for lime mortar, as it has more impurities it's more cheaper and used for exterior lime plastering, its cost is about Rs. 0.3/kg.

NON-HYDRAULIC LIME:

It's used for making motifs and interior plastering and this lime is obtained from seashells and it gives a very smooth finish.



Why lime:

Lime has been used for thousands of years as a fabulous binder and mortar, plasters and paints. Lime is a breathable material as it allows airborne moisture that it allows to travel freely it does not allow moisture to trap inside.



LIME CYLCE:

1. If limestone is heated it breaks to form calcium oxide and carbon dioxide.
2. Calcium oxide reacts with water to form calcium hydroxide, it is also called as slaked lime.
3. Powdered lime then absorbs CO_2 from atmosphere and convert back to limestone or calcium carbonate.
4. Thus lime stone absorbs above the CO_2 is released during production.

LIME AND LIME CHAKKI:

HANDS ON FIELD WORK: (ON SITE)



Lime is used for the external plaster to protect the walls from the heavy rains. Lime is the major component of the plaster.

LIME AND LIME CHAKKI

-Two mixtures are prepared. First, mix of lime and quarry dust at the ratio of 9 : 15. second, a fermentation of kadakai and jaggery at the ratio of 18 : 20, which is kept for fermentation for 4 weeks.

-3-4 batches of the lime and quarry dust mix is poured in the circular pit of lime chakki.

-Then the fermentation of kadakai and jaggery is poured over it with little water for a perfect grind.

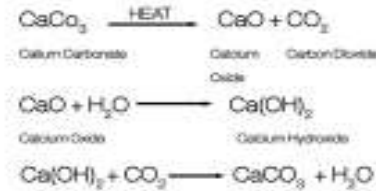
-Then the circular stone which is attached to a rod at the centre of the circular pit is driven by bullocks.

-The bullocks have to drive the chakki along the pit for at least 200 rounds.

-The mix should be fine and perfectly grinded, so the mix has to be stirred with the long trowel.

-Once the mix is ready, it cannot be used immediately. It has to be stored in fermentation for 2 weeks.

-After 2 weeks it can be used for plastering.



We get powdered lime i.e. calcium hydroxide (Slaked lime) on site which is used in construction activity.

This lime then absorbs CO_2 from atmosphere and again converts back to limestone or calcium carbonate.

Constituents:

Lime + Quarry dust + (Kadakai+ Jaggery)

Binding agent : Lime

Structural component (giving it structure) : sand

Fibre (increases strength in reinforcement) :hemp hair, animal hair, straw, cattails, wool, sisal, wood fibre ,horse manure, coconut etc.

Natural stabilizers or additives (gives unique quality to the plaster like water and fire resistance, flexibility, durability etc.) : linseed oil, cooked flour paste, cactus juice(prickly pear), lime

Application of Plaster:

First Coat- First coat is the scratch coat which is spread on the wall from top to bottom just like painting on the wall.

Second coat- This is the levelling coat to maintain the uniform thickness of the plaster.

Finishing coat- This is the last coat generally applied to get the desired finish for the wall.

LIME WASH:

From olden times the lime which is used for lime plaster is the non-Hydraulic lime.

This lime has to be pounded with sand particles together. This is because the sand particles gives strength to the lime.

In this case, the lime is pounded with quarry dust. The fermented solution of kadakai and jaggery helps in decreasing the setting time of lime and also binds the lime and quarry dust very well.



WHAT IS SOIL TEST?

Soil test is the way to examine the composition of our local earth by using the technique of shake test.

Every time the soil that is dug out is tested before starting the premix by using shake test. This is done to evaluate the percentage of clay, silt and sand in it, which gives us a rough idea whether the soil is suitable for making cob or not.

HOW IS IT DONE?

- Take the sample of the soil that you may want to use.
- Crush these sample and place them in the jar, between one third of the jar itself.
- Fill the jars nearly to the top with water and about a full teaspoon of salt or two drops of non-foaming liquid soap.

Things Required To Perform Soil Test



MATERIALS REQUIRED:

To perform the soil test or shake test, we need a clear glass jar with tight lids and straight sides, subsoil that we will use to make cob, a gallon of clear water and a couple of ounces of salt or non-foaming liquid soap.

TIME TAKEN:

- Useful sand will fall in 3-5 seconds.
- Fine sand and silt will fall next, for up to 10-20 minutes.
- If the jar is left undisturbed, the clay will gradually settle down, leaving the clear water above it.
- It might take hours, days or even weeks, depending upon the type of clay.

CALCULATION OF PERCENTAGE!

$$\begin{aligned} \text{Total height of } a &= a \\ \text{Clay \%} &= \frac{X}{a} \times 100 \\ \text{Silt \%} &= \frac{Y}{a} \times 100 \\ \text{Sand \%} &= \frac{Z}{a} \times 100 \\ \text{Clay \% should} &= 14\% - 20\% \\ &\text{be b/w} \end{aligned}$$

- Fill the jars nearly to the top with water and about a full teaspoon of salt or two drops of non-foaming liquid soap.
- The salt or soap will accelerate the clay settling out.
- Shake long and hard.
- At the end of shaking, suddenly stop moving the jar and leave it undisturbed





WHAT IS WATTLE AND DAUB

Wattle and daub is a simple and very effective wall construction technique. It was often used in medieval Europe.

A wattle is a woven wooden skeleton and daub is a sticky mixture of sub soil (the layer of earth beneath the top soil) and fibers like rice straw and rice husk that is applied on the wattle. It is a very effective earthquake resistant structure.

In our site, wattle is made of bamboo, palm reeds and reapers.

Daub is made of a mixture of mud and straw.

HOW DID WE CONSTRUCT WATTLE AND DAUB?

We constructed wattle and daub as an exterior walls in the dorm.

Bamboo vertical supports were laid at 2ft interval dividing the span of 12ft into 6 divisions.

In the 2ft gaps palm reed were laid in a diagonal fashion with the help of reapers. The wet mix was then laid on the wattle from both the sides in such a manner that there were no air gaps left. It was left to dry until it lost moisture completely. Since it is a simple interior partition wall and did not require any water proofing we applied a simple wet mix of sub soil as plaster.



WATTLE & DAUB CONSTRUCTION ON SITE:

- Prototype Interior Walls
- Dry Compost Toilet
- Dormitory Ground Floor



ADOBE CONSTRUCTION: PROCEDURE AND MIXING CONTENT:

SOIL + WATER + RICE HUSK



Stamping the whole mix with feet



The mix of earth, rice husk & water well stamped and kneaded



Adding the mix into wooden form work



Ingredients	Tensile strength(in Kgs)				
	earth & long straw	earth & chopped straw	earth:rice husk=6:1	earth:rice husk: straw =6:1:0.5	earth:rice husk: straw =6:0.5:1
brick dimensions(cm)					
45X30X7	32.5	52	62	74	76.5
45X30X6	20	48	48	58	39
45X30X5	27	20	44	28	26



PROTOTYPE HOUSING:

Cob Plastering



Wet the wall area to be plastered such that the water can loose the top layer of the mud wall

The mix shall be made consistent depending on the ease of application.



Fill the depression and cracks with the mix once the filling is done, remove the extra mud from the wall with the trowel.

After cleaning apply water with brush for fine finish.

Water shall be applied continuously as cracks develop on the process of drying water gives strength to the plaster to resist cracking.



Cob Leveling



The wall to be cobbled should be cleaned with the broom.

Wet the wall and allow it to dry for 2-5 minutes

Cobbing should be done by layers such that there is a time gap of minimum half an hour between each layer

Cobbing is done by throwing small chunks of cob to the wall and spreading with palms in upward direction

The surfaces made rough in order to prevent cracking and also for the proper breathing of the wall.

Once the spreading is done, we have to scratch off the wall with our finger.

Benefits of Cob

Cob is known to be therapeutic and curative.

It absorbs toxins and reduces humidity within the house.

Insulation from Sound and Temperature change

cob is a poor transmitter of sound. It is helpful in keeping the sound in and also prevents noise from outside.

The thumb rule is that the heat transfer through cob at the rate of an inch per hour. So a 2 feet thick wall takes 24 hours to transport the effects of heat or cold all the way through. The great thermal mass of the cob walls soak up and store the sun's energy, then release it over the hours of the day..



PALINGU PLASTER ALSO KNOWN AS ARISH PLASTER:

INTRODUCTION:

Pallingu plasters are waterproof plasters mainly used on the walls of toilets, kitchens and many areas. It is a traditional rajastani plaster, it is quite expensive and requires a lot of man power.

LOHI PLASTER:

To get lohi plaster same as pallingu mix required as binding agent. For the aggregates and mixture surki plaster is obtained in it for additional texture and colour.

NATURAL PIGMENTS:

Natural pigments and synthetic colours can be used for additional textures, both work well as colouring pigments, it can fade if exposed to sun.

PREPARING THE MIXTURE:

STEP 1:

- To prepare the pallingu mix, we require a binding agent, fine aggregates and pigments.
- Here we use slaked lime as basic binding material, finely sieved marble powder and quarry dust are used.
- A few drops of coconut oil and egg whites are added for smooth finish.

STEP-2:

- Wet the wall with kadukkai jaggery water or plain water an hour before starting the plaster.
- Now apply the mixture into wall in to layers.
- First layer is thin, second layer in 2mm-3mm layer
- Can be finished using a floater



PALINGU PLASTER ALSO KNOWN AS ARISH PLASTER:

BURNISHING THE PLASTER:

- When the surface is semi wet it can be polished by using a pebble.
- The pebble is rubbed in a circular motion making sure the whole surface is burnished upto the same level.
- This procedure can be followed if we are using a monochromatic plater.
- If you want to customize a wall then we have to add the colour to the mix and apply them next to each other and then continue the same production.
- The finishes of the palingu plaster is upto the satisfaction of the client.
- It can be smoothened till you get a matte finish or a glossy finish.

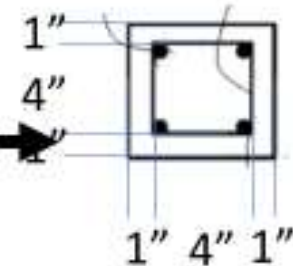


DESIGN – ROOF DETAILS:

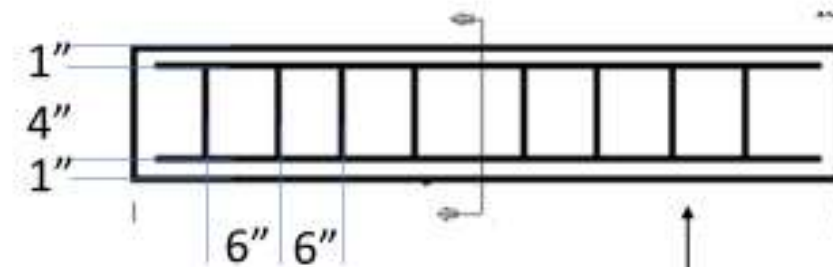
COLUMN DETAILS:



Form Work with Double legged Stirrup paced at 6" C/C



Placing columns



Mixing Ratio

4



Stone

2



M Sand

2



Locally available Sand

1



Cement

Earth Crete as its name suggests is concrete but made with its main component as earth and not cement. It is a wet mixture of earth, broken debris and cement is used for the sole purpose of binding all of these materials.



The usage of bottles also involved in the treatment of breaking of glass bottles

Bottles used in between the space to reduce the usage of materials and also to improve aesthetically.

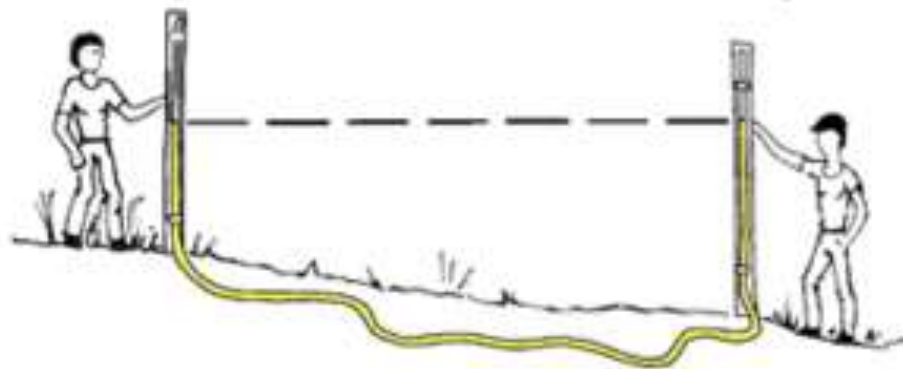


These columns were made in four numbers on all the four corners

DISMANTLING THE EXISTING STRUCTURE AND PLACEMENT OF EARTH CRETE COLUMNS



Dismantling of the structure and creating pits to at proper levels and measuring it with tubular level.



Tubular Level for Checking the levels of all the 4 columns without any height difference.

Tube leveler is a technique used to determine the apparent inclination of an object or surface and for matching elevations of locations that are too far apart for a spirit level to span. The simplest water level is a section of clear tubing, partially filled with water. The ends are held vertical, and the rest of the tubing lies on the ground or floor. The water level at each end of the tube will be at the same elevation, whether the two ends are adjacent or far apart.



BAMBOO HARVESTING

Bamboo Harvesting and Treating

Bamboo should be harvested when the wood is at its maximum strength, usually between 3 to 5 years old. It is best to harvest bamboo with the least amount of sap in it to minimize the sugars and starches that attract pests and fungal growth.

The best time is in the dry season, during the period of the new moon and in the early morning or evening.

Treating:

After the bamboo is cut as much of its sap is removed as possible. A traditional method is to lie the freshly cut bamboo in a flowing stream for several weeks to leach out the sap replacing it with water.

Another method is to stand the bamboo upright in drums of water for several days. The bamboo draws in the water and exudes the sap.

Yet another method is to inject water under pressure into the end of the culms to force the sap out.

Untreated bamboo will, like any grass, not last long. For short term purposes such as scaffolding or buildings for temple ceremonies the bamboo is not treated and may only last 2 or 3 years. Good harvesting and treatment can extend the life up to as much as 20 or 30 years.

Treatment provides protection against the natural enemies of bamboo, termites, powder borer, fungus and wet rot.



Bamboo water treatment



Bamboo after treatment



ROOFING DESIGN – Structural Details



Roofing
structural
details:

King Post
rafters

Tile Beam

Earth Crete
Column

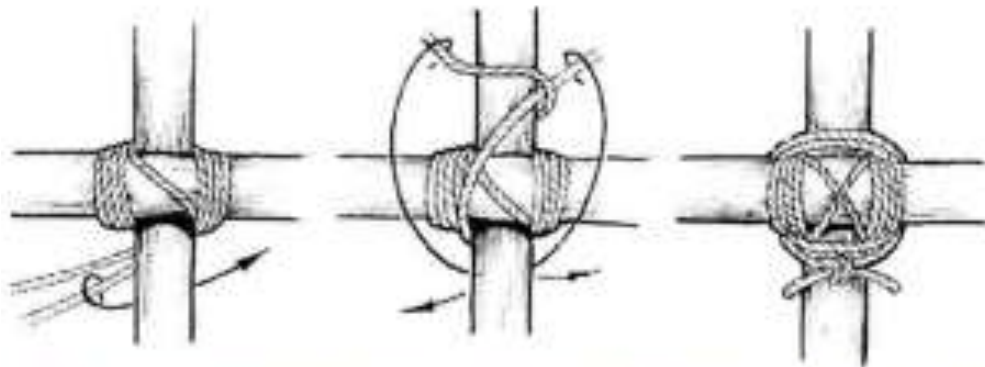


Use of Bamboo Nails for structural stability



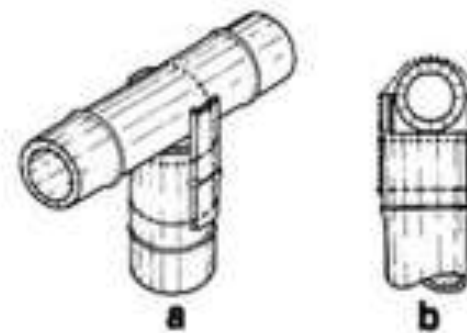
ROOFING DESIGN – Knotting and placing of tiles

Bamboo Lashing with coir rope
Japanese Square Lashing technique

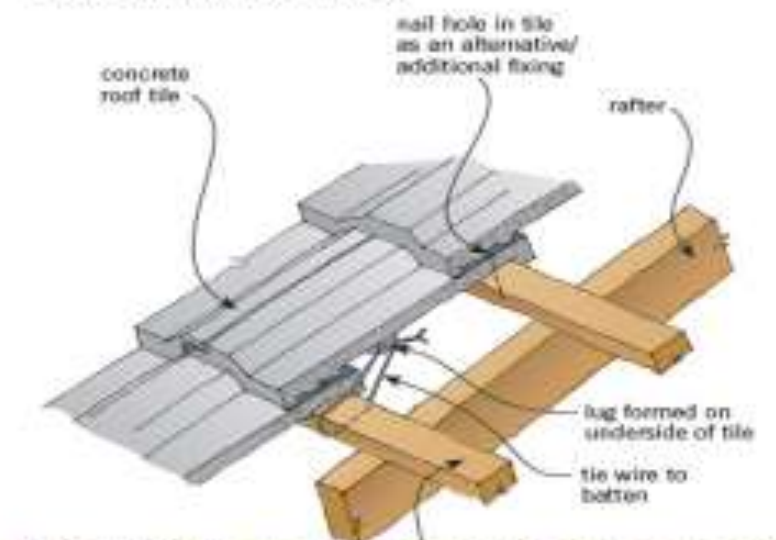


After placing mangalore tiles

Joinery details of King Post and Ridge
Beam – Double ear Flap Joint



PLACEMENT OF TILES:



THANK YOU