

PROFESSIONAL TRAINING REPORT

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

By

Harrine. R / 40890005



**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

(Annexure- I)



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
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(Est U/s(3) of UGC Act, 1956) Accredited with Grade "A" by NAAC (A Christian Minority Institution)

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHEMMENCHERY, CHENNAI – 600119. TAMILNADU.

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
Dec 2021- Jan 2022

Name of the Student : Harrine. R

REG NO : 40890005

Semester : III

Batch : 2020-2022

(Annexure- II)



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SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

M. Arch (Sustainable Architecture)

Bonafide Certificate

This is to certify that Harrine. R (40890005) had undergone professional training at Nanda Green Associates and had been monitored by continuous assessment during her internship (Dec 2021 to Jan 2022).

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

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

Submitted for Viva voce Examination held on 5/2/2022

Internal Examiner

External Examiner (Annexure- III)



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E-mail: archhod@sathyabama.ac.in



Declaration

I **Harrine. R** hereby declare that the professional training report **1st Dec 2021 - 11th Jan 2022** done by me under the guidance of **Ar. S. Nanda Gopal** is submitted in partial fulfillment for the requirement for the completion of Practical Training session.

Date : 24th January 2022

Place : Chennai

A handwritten signature in black ink, appearing to read 'D. Harrine'.

Signature of the Candidate

(Annexure- IV)

ACKNOWLEDGEMENT

My sincere thanks to **Board of Management of Sathyabama** for their encouragement and support in doing my Professional Training.

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 Professional Training period.

I would like to express my sincere and deep sense of gratitude to **Ar. Nanda Gopal, Architect, Nanda Green Associates** for his valuable guidance, suggestions and constant encouragement that paved way for the successful completion of my Professional Training.

My sincere thanks to **Ar. Sheetal Kalamkar**, Professional Training Coordinator for her motivation during the Internship.

Lastly, my thanks to my **family** for their constant mental support through the Internship period during these uncertain times.



NANDA GREEN ASSOCIATES

Architects | Interior Designers | Planners
Sustainable Building Design Consultants
Engineers & Contractors

23/11/2021

To,

Head of Department

Sathyabama Institute Of Science & Technology,

Chennai, Tamil Nadu - 600097

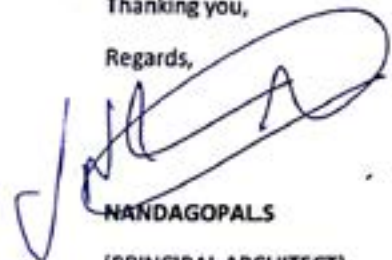
Respected Sir/Madam

Sub: Practical training/ Master of Architecture Internship Program - confirmation.

We hereby accept, Miss Harrine Ravikanth, 2nd year, M.Arch student of your institution to undergo her practical training in our office as trainee architect from December 2021 to January 2022.

Thanking you,

Regards,



NANDAGOPALS

(PRINCIPAL ARCHITECT)

S.NANDA GOPAL

B.Arch. M.Sc, Sustainable Building (UK), AIA

LICENCED SURVEYOR No : RA 591

Class I, Corporation of Madras

CA / 2008 / 42643

IIA No : 16792

No.980,TNHB Colony Main Road,

Erikarai,Velachery, Chennai - 600 042.

Phone : 044 - 42716159

M.I.G. 980, T.N.H.B Colony Main Road, Erikarai, Velachery, Chennai - 600 042. Tamilnadu, India
+91 98401 45917 | nanda_architect@yahoo.co.in | www.ngreenarchitects.com

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Architects | Interior Designers | Planners
Sustainable Building Design Consultants
Engineers & Contractors

To

The Head of the Department,

Sathyabama Institute of Science and Technology,

Chennai - 600119

Respected Sir/Madam,

Subject: Completion letter

This is to inform that Ms. Harrine R (Reg No. 40890005), pursuing M. Arch - Sustainable Architecture in Sathyabama Institute of Science and Technology, has completed her internship successfully at our firm from 01-12-2021 to 11-01-2022.

Thanking You,

Regards,

S.NANDA GOPAL

B.Arch. M.Sc, Sustainable Building (UK), AIA

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DEPARTMENT OF ARCHITECTURE

M. Arch (Sustainable Architecture)

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 : Nanda Green Associates

2. Address & Contact Number : M.I.G. 980, T.N.H.B Colony main road, Erikarai,
Velachery, Chennai - 600042 Tamilnadu,

3. Name of the student : Harrine R

4. Duration : From 11/12/21 To 4/2/21

5. Total No. of days : 4

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 200 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*	B S.NANDA GOPAL				

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

7. Any other Remarks :

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

[Signature]

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Velachery, Chennai - 600042 Tamilnadu,

3. Name of the student : Harrine R

4. Duration : From 6/12/21 To 11/12/21

5. Total No. of days : 6

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 200 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*	B S.NANDA GOPAL				

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

7. Any other Remarks :

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Organization (With Seal)

[Signature]

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Velachery, Chennai - 600042 Tamilnadu,

3. Name of the student : Harrine R

4. Duration : From 13/12/21 To 18/12/21

5. Total No. of days : 6

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 200 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 - 80, B - 70, C - 60, D - 55, E - 50, F - <5)

7. Any other Remarks :

8. Signature of the
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3. Name of the student : Harrine R

4. Duration : From 20/12/21 To 25/12/21

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 200 marks by the department.

Description of works	Excellent	Good	Fair	Poor NA
Understanding of office culture and methodology	/			
Active Participation in the Project activities	/			
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Preparation of concept for projects		/		
Site Management / Discussion with clients		/		

Overall Grading*

(A - 80, B - 70, C - 60, D - 55, E - 50, F - <5)

7. Any other Remarks :

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3. Name of the student : Harrine R

4. Duration : From 27/12/21 To 11/1/22

5. Total No. of days : 4

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 200 marks by the department.

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Preparation of concept for projects	/			
Site Management / Discussion with clients		/		

Overall Grading*

B

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3. Name of the student : Harrine R

4. Duration : From 03/01/2022 To 11/01/2022

5. Total No. of days : 6

6. Evaluation of Performance criteria shall be on

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Overall Grading*

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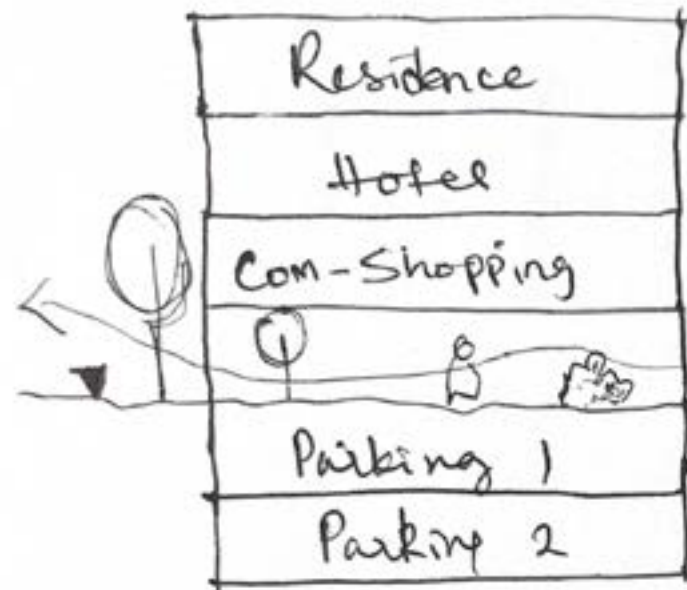
[Signature]

Date	Project name	Work Done
01/12/2021 - 04/12/2021	Pallikaranai Site	Pallikaranai Site Concept Evolution
06/12/2021 - 11/12/2021	Pallikaranai Site	Pallikaranai Site Concept Evolution Area Calculation
13/12/2021 - 18/12/2021	1 Pallikaranai Site 2 Club House	1 Parking layout for Hotel building 2 Site plan
20/12/2021 - 25/12/2021	1 Tiny House 2 Venkatraman house	1 Material Study- Alternate flooring and wall finishes 2 Venkatraman house view
27/12/21 - 01/01/2022	Tiny House	Material Study- Treated Bamboo, Bamboo boards and Treated Wood 3D Model
03/01/2022 - 08/01/2022	1 Tiny House 2 Pallikaranai Site	1 Mud House- Plan and 3D Model 2 3D Model

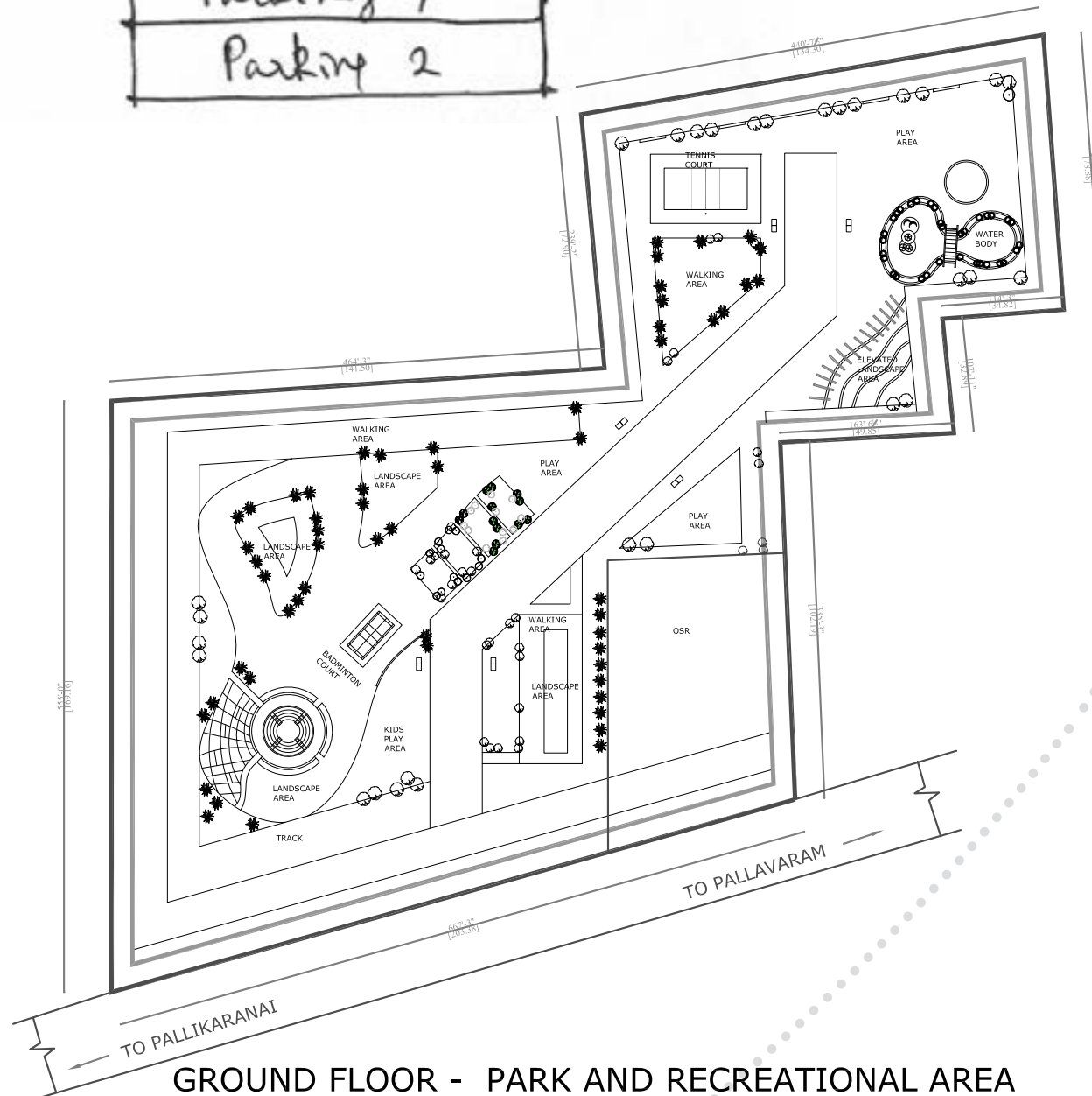


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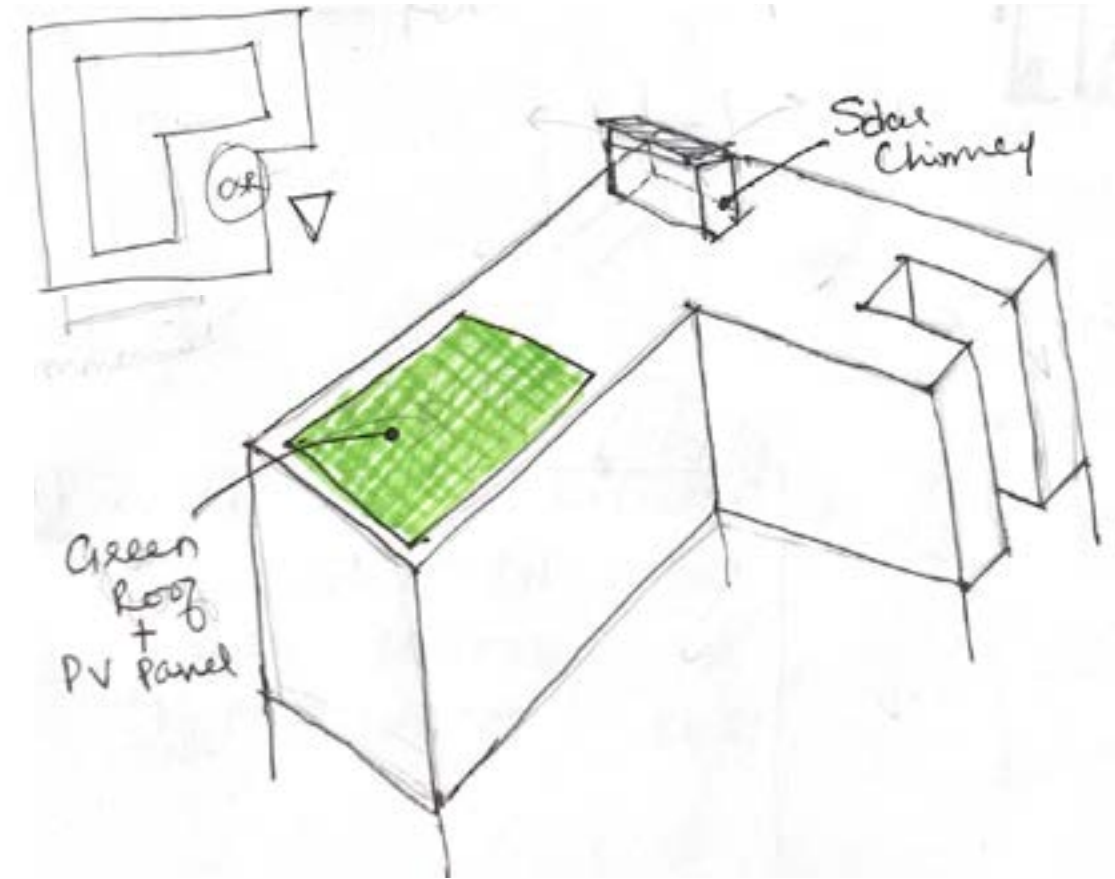
Pallikaranai Conceptual- Iteration 1



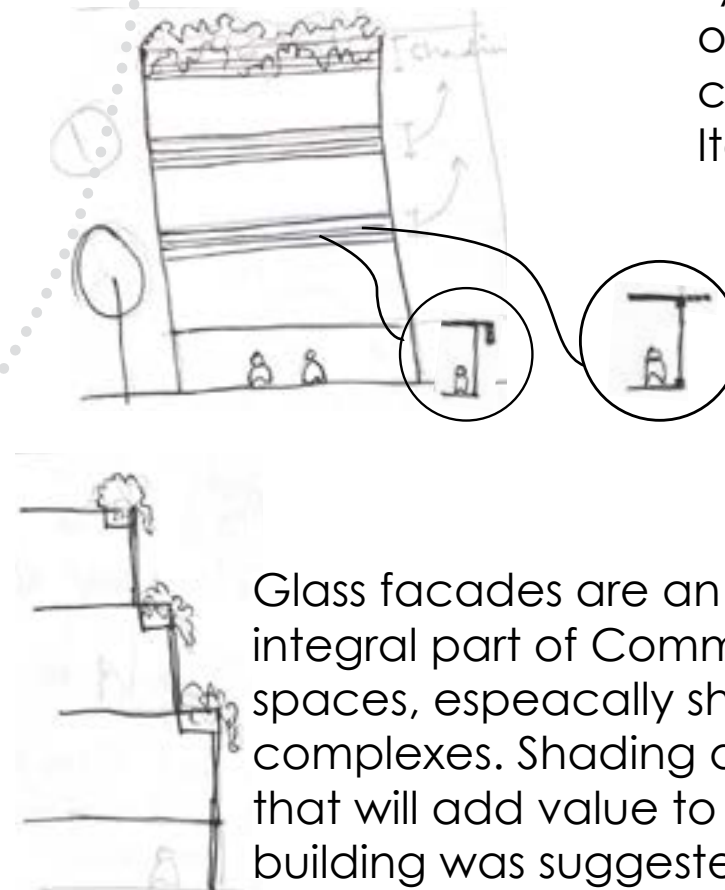
The idea was to raise the whole building on stilt and retain the ground cover as park and recreation space for visitors. The parking to be pushed to the basement level so as to make the ground level pedestrian friendly.



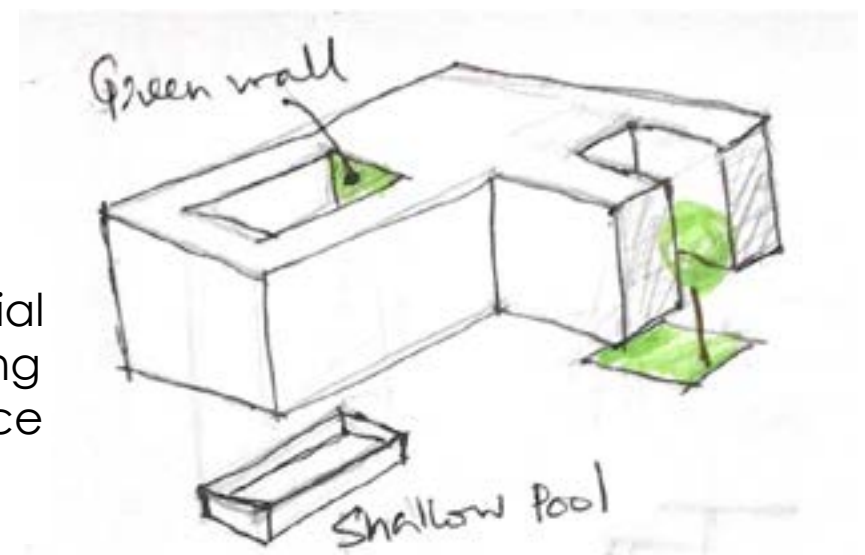
GROUND FLOOR - PARK AND RECREATIONAL AREA



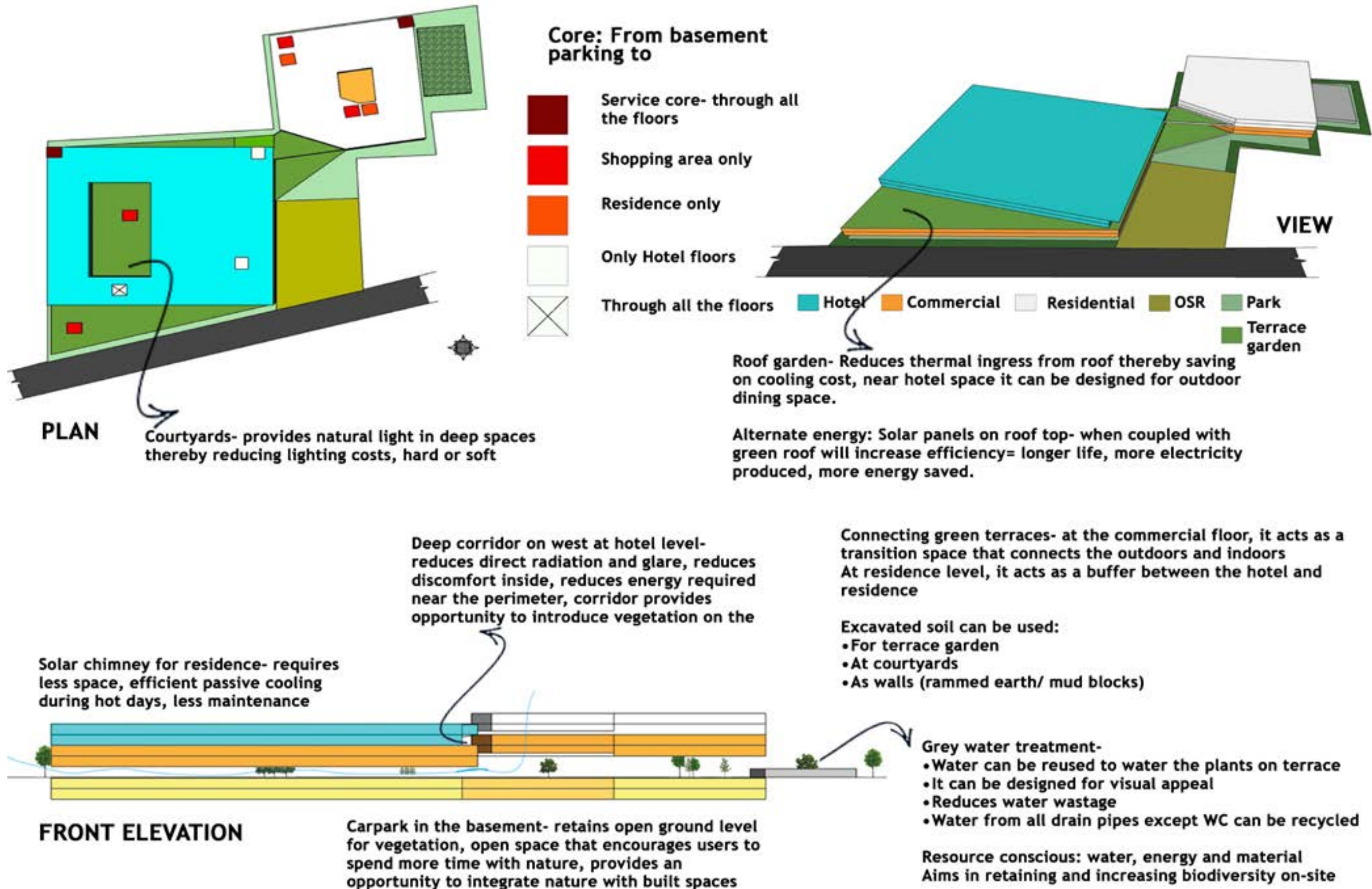
Passive strategies such as Solar chimney on the South, Green roof coupled with PV system, green wall, shallow pool and cut out for vegetation was suggested to the client, which was further modified in Iteration 2.



Glass facades are an integral part of Commercial spaces, especially shopping complexes. Shading device that will add value to the building was suggested.



Pallikaranai Conceptual- Iteration 2



Clubhouse Site Plan

Concept:

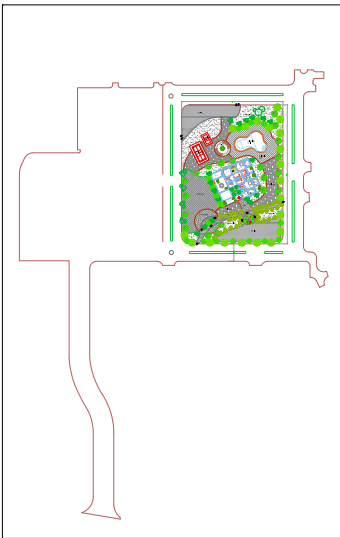
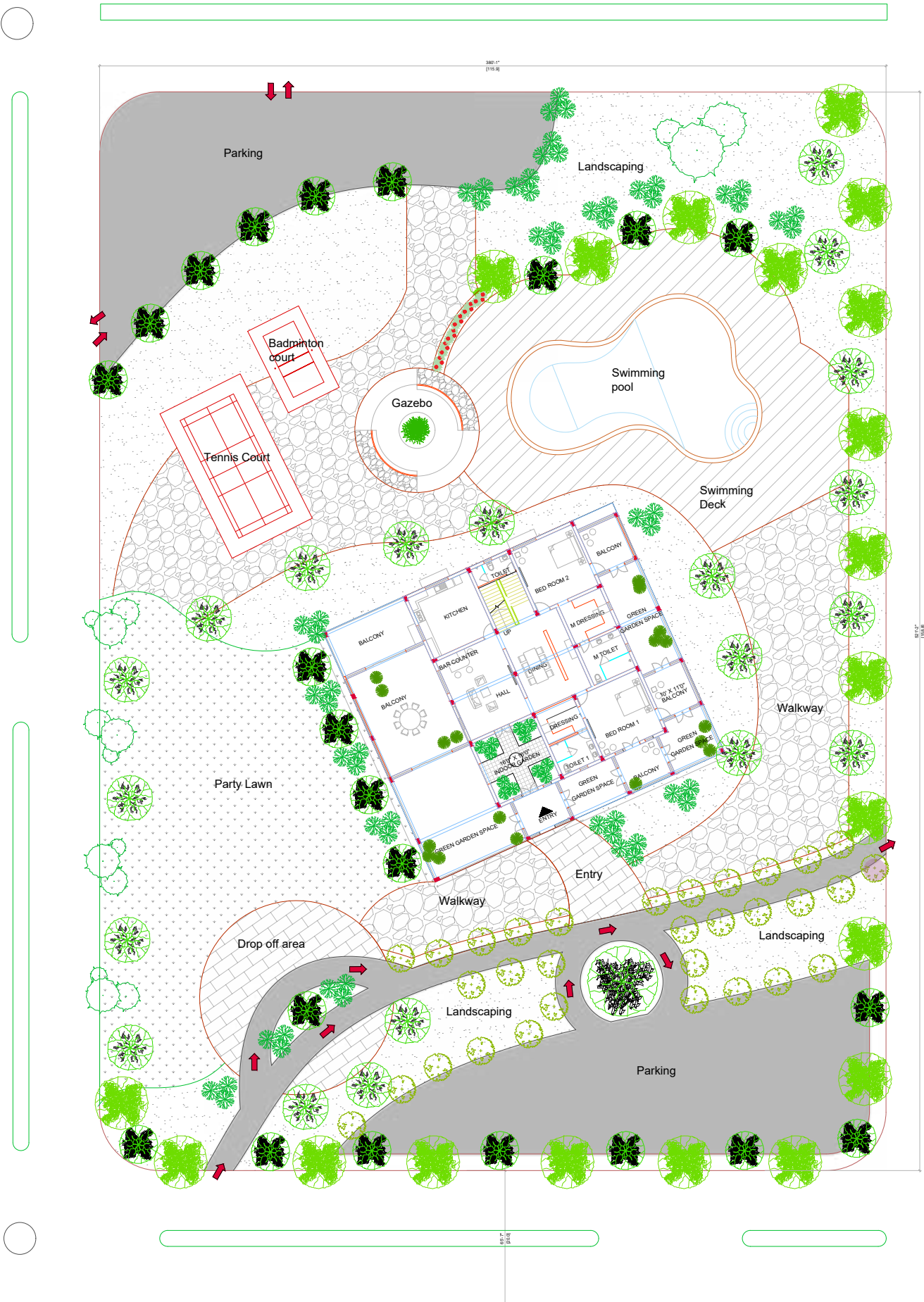
The 4.5 acre site is situated in a residential area, surrounded by apartments. Thus, the challenge was to design the clubhouse and its surrounding area to provide privacy to the clubhouse users, planning spaces to reduce / avoid disturbance to the residence caused by activities in the clubhouse, ease the non-residential space in a residential area by making it context specific and, as per client's need, make it rooted to their culture and heritage.

This was achieved by adopting the Chettinadu style of architecture for the clubhouse. Chettinadu architecture represents luxury and comfort while living in harmony with nature.

The large courtyards keep the interiors cool and well lit all through the year. Decor handcrafted by the local artisans reflect the culture and heritage of Chettinadu. Carefully designed gardens provide an escape from the monotony of the concrete jungle outside. Chettinad houses and palaces are designed for a lavish lifestyle, and so is the clubhouse, with its spacious rooms and amenities.

Work Done:

Site Planning
Landscape Planning and design



Key Plan

Legend:

- Permeable paving
- Decking
- Stone paver
- Ground
- Lawn
- Road
- Vehicular Movement



Site Plan and Ground Floor

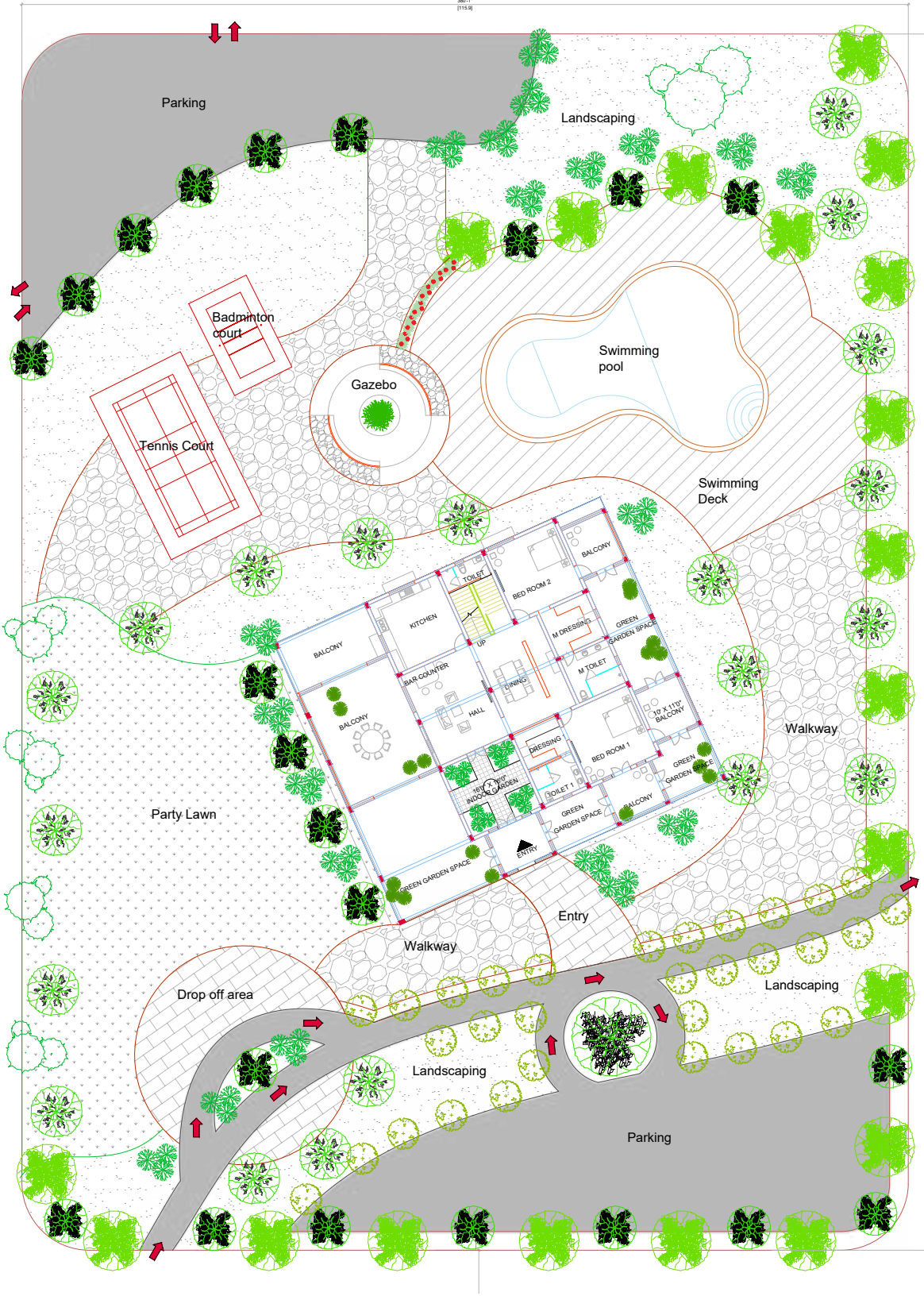
Clubhouse Site Plan

Hardscape planning Concept:

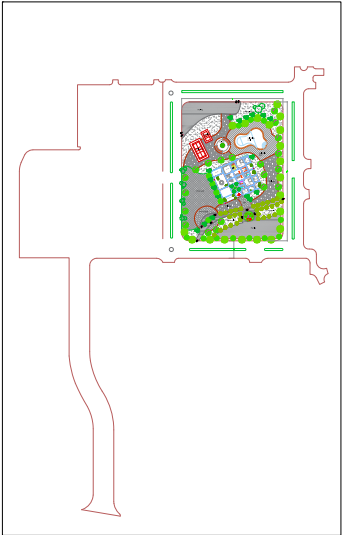
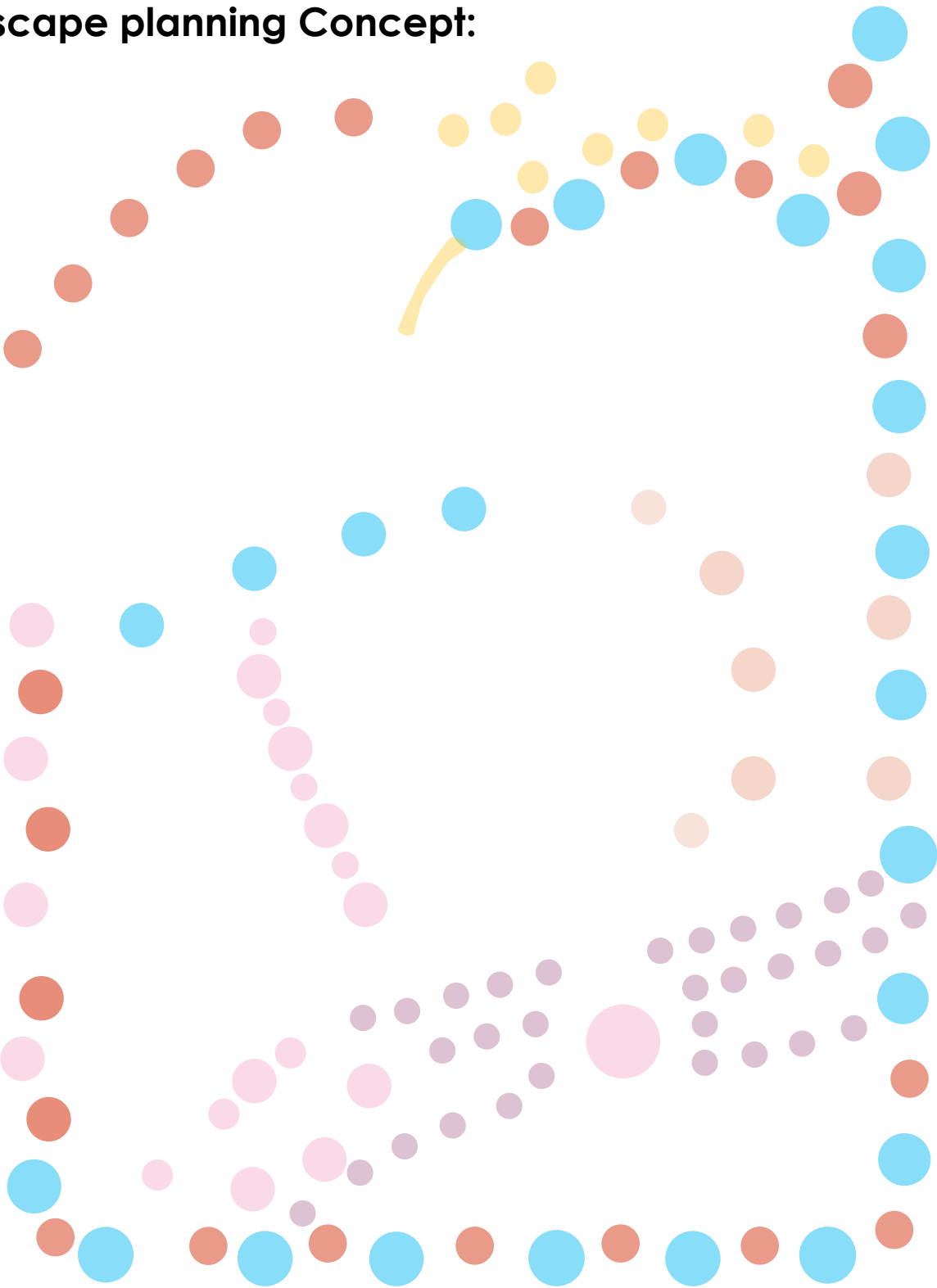
- 1) The drop off point and Entry pathways are the first place the Clubhouse member steps foot on. It should be hard and safe to step on.
- 2) Compact gravel groundcover to entertain a leisurely pace of walking.
- 3) Loose soil covered with mulch around the building for passive cooling.
- 4) Stone or Wooden deck around swimming pool, a contrast to the gravel footpaths surrounding it.
- 5) Lawn for party area: The space can be a lawn area completely, or stone tiles can be designed to coordinate with the lawn layout to reduce maintainance on the lawn.
- 6) Asphalt road (with plastic) in areas of vehicular movement. Recycling plastics reduce construction costs, produce better quality roads, and removes plastic from landfills.



Clubhouse Site Plan



Landscape planning Concept:



Key Plan

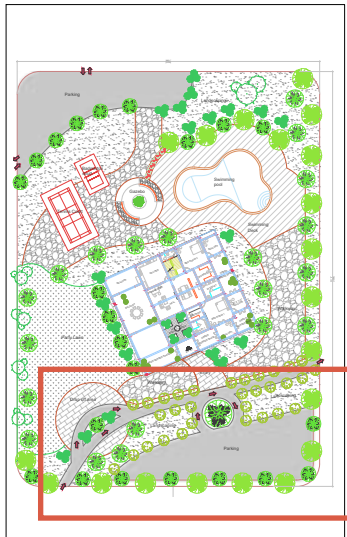
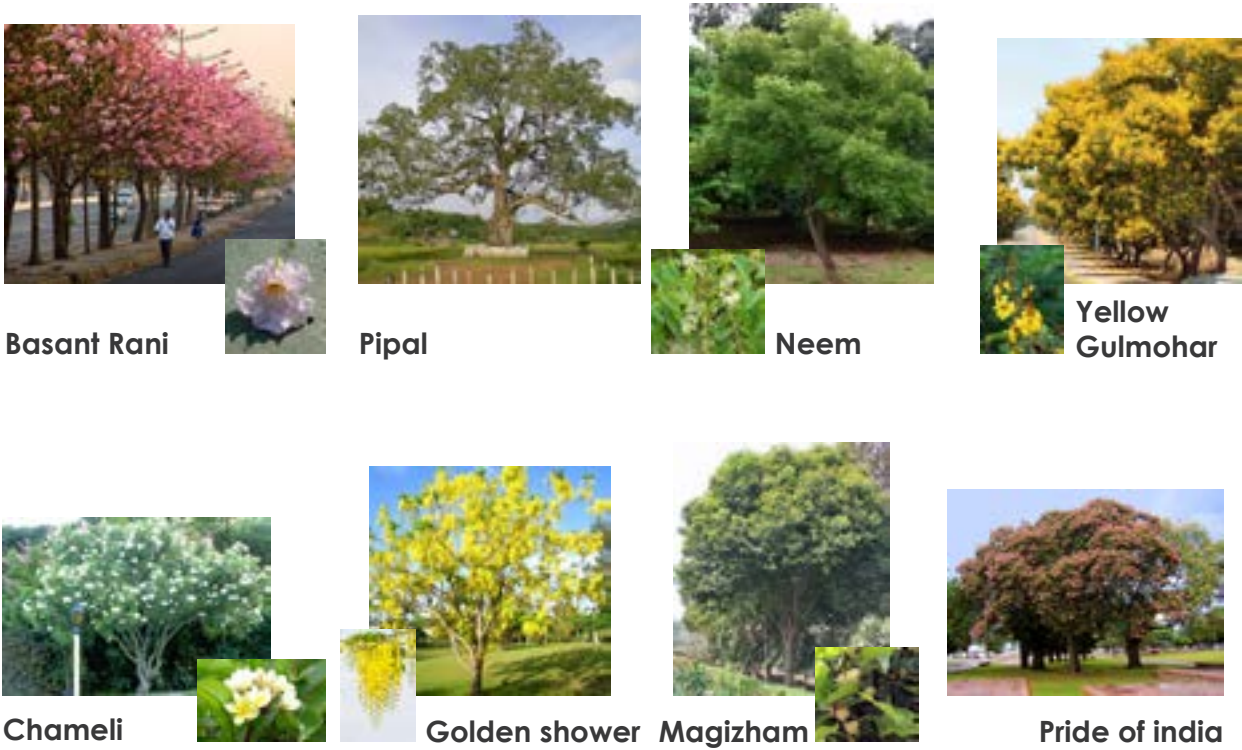
Legend:

Screen
Shade
Ornamentation
Orchard
Visual Barrier
Shade + Ornamentation

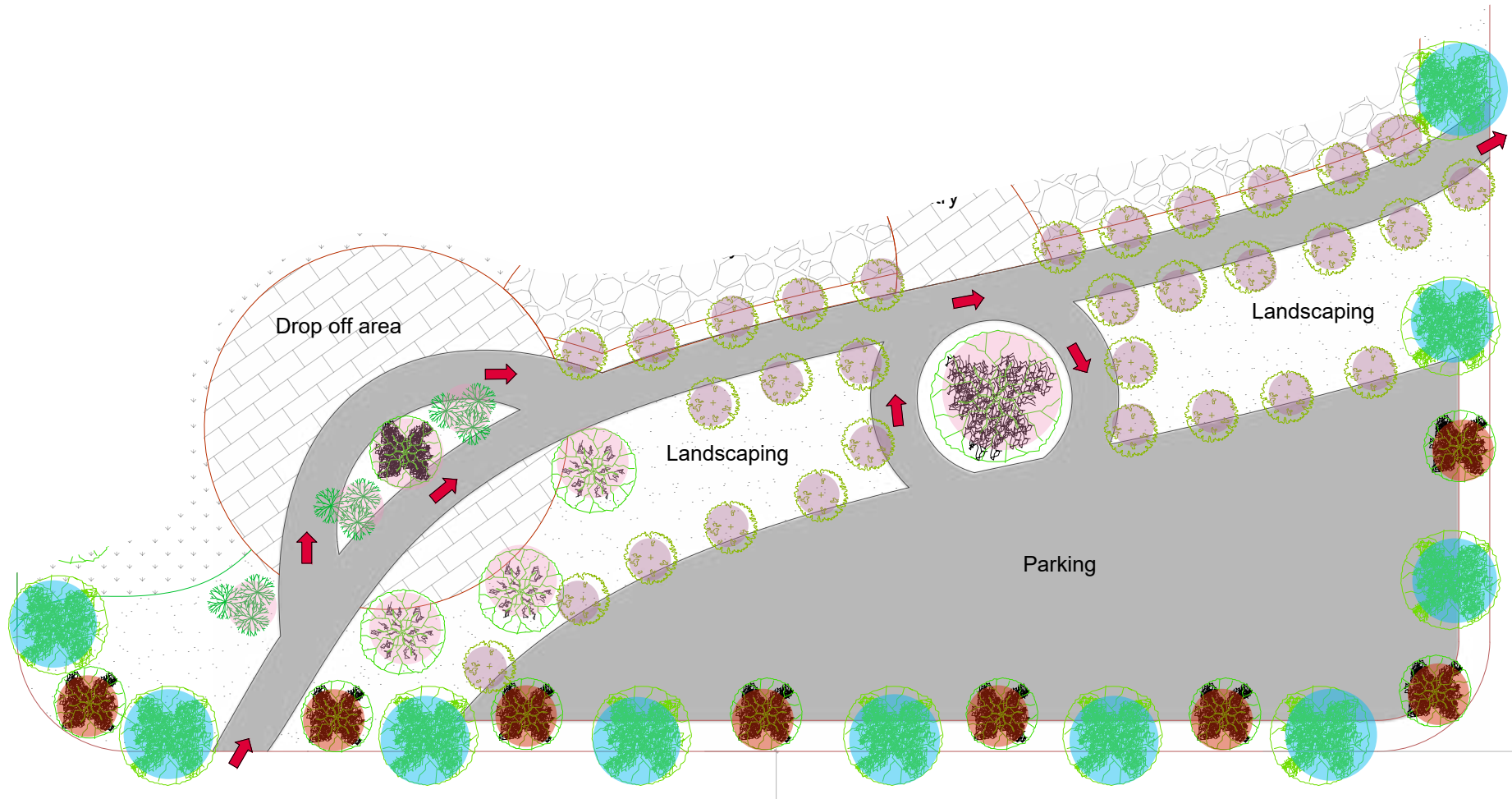


Clubhouse Site Plan

S. No	Location	Intent	Plant Name		Height	Spread	Evergreen / Deciduous
			Botanical name	Common Name			
1	Along Site Boundary	●	tabebania spectabalis	Besant Rani	5-9	4-7	D
		●	ficus religiosa	Pipal sacred fig	12-19	15-25	D
2	Along Parking and Driveway	●	azadirachta indica	Neem	12-20	15-22	D
		●	cassia fistula	Golden shower	10-14	9-14	D
		●	mimusops elengi	Spanish cherry, Magizham	12-15	12-19	E
3	Near Drop off Point	●	lagerstoreima speciosa	Arjuna, Pride of India	6-11	5-9	D
		●	plumeri alba	Chameli	4-6	6-8	D
4	Roundabout	●	peltophorum ferruginoim	Yellow Gulmohar	18-24	15-19	D



Key Plan



Legend:

Screen
Shade
Ornamentation
Orchard
Visual Barrier
Shade + Ornamentation



Clubhouse Site Plan

S. No	Location	Intent	Plant Name		Height	Spread	Evergreen / Deciduous
			Botanical name	Common Name			
1	Along Driveway	●	azadirachta indica	Neem	12-20	15-22	D
		●	cassia fistula	Golden shower	10-14	9-14	D
		●	mimusops elengi	Spanish cherry, Magizham	12-15	12-19	E
2	Along Walkway near building	●	manilkara zapota	Sapodilla, Sapota, Chikoo	12-18	10-13	E
		●	punica granatum	Pomegranate	1.8 - 6	1.2 - 4.5	D
3	Along Site Boundary	●	magnifera indica	Mango	15-22	12-19	E
		●	azadirachta indica	Neem	12-20	15-22	D



Sapota



Mango



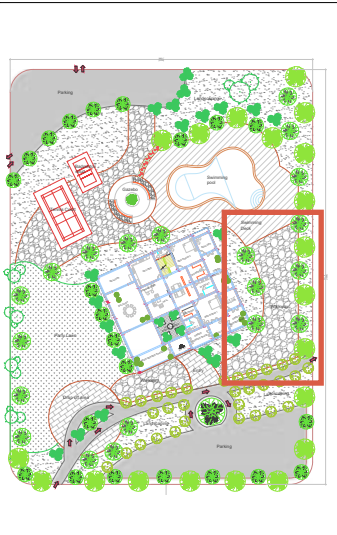
Neem



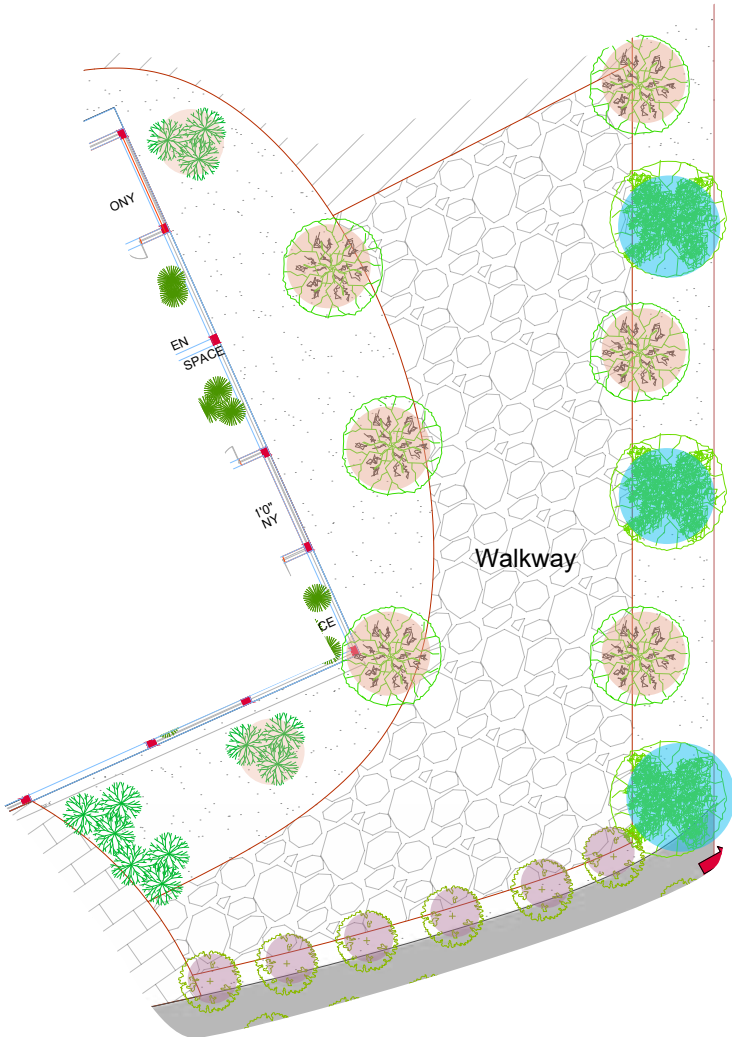
Golden shower



Magizham



Key Plan



Legend:

- Screen
- Shade
- Ornamentation
- Orchard
- Visual Barrier
- Shade + Ornamentation



Clubhouse Site Plan

S. No	Location	Intent	Plant Name		Height	Spread	Evergreen / Deciduous
			Botanical name	Common Name			
1	Along Site Boundary	●	azadirachta indica	Neem	12-20	15-22	D
		●	lagerstoreima speciosa	Arjuna, Pride of India	6-11	5-9	D
2	Along Swimming Pool	●					
	Layer 1- Tall Shrub	●	tecoma stans	Trumpet flower	1.5 - 5	0.6 - 1.2	E
	Layer 2- Short Tree	●	plumeri alba	Chameli	4-6	6-8	D
	Layer 3- Tall Tree	●	peltophorum ferruginoim	Yellow Gulmohar	18-24	15-19	D
3	Near Gazebo	●	ixora coccinea	Flame of the woods, Vrikshi	1.8 - 2.5	0.9-1.5	E



Yellow Gulmohar



Vrikshi



Pride of india



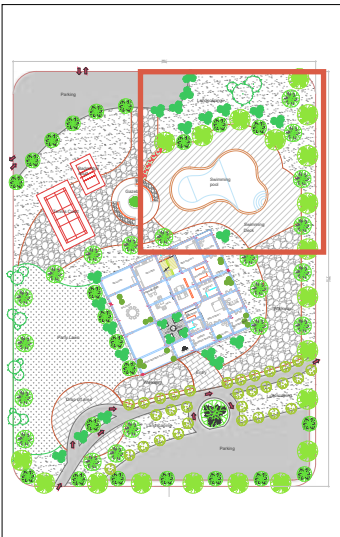
Tumpet Flower



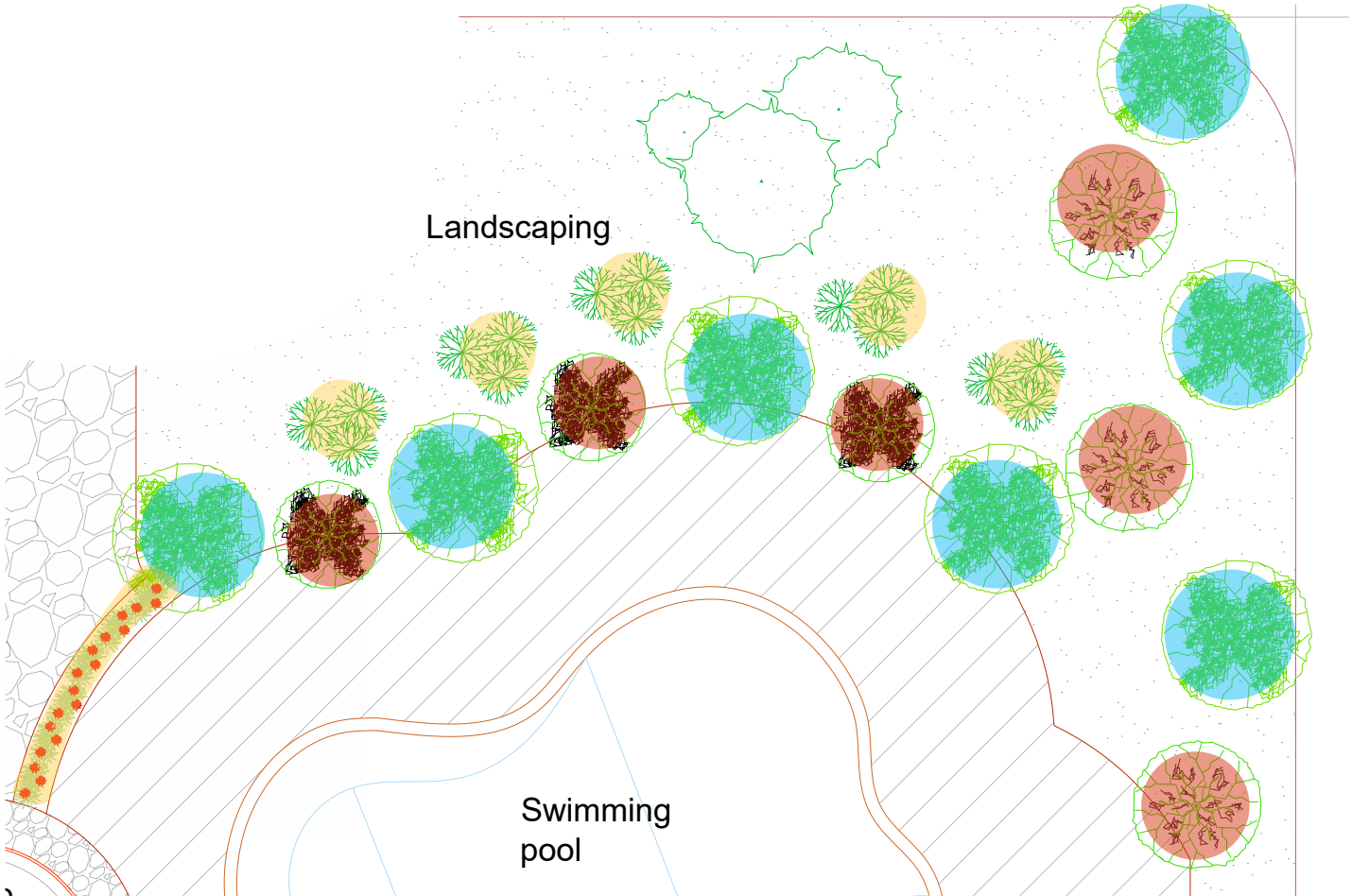
Chameli



Neem



Key Plan



Legend:

- Screen
- Shade
- Ornamentation
- Orchard
- Visual Barrier
- Shade + Ornamentation



Clubhouse Site Plan

S. No	Location	Intent	Plant Name		Height	Spread	Evergreen / Deciduous
			Botanical name	Common Name			
1	Along Parking	●	ixora coccinea	Flame of the woods, Vrikshi	1.8 - 2.5	0.9-1.5	E
2	Gazebo	●	bambusa multiplex	Dwarf bamboo	5-9	-	E
3	Along Walkway	●	plumeri alba	Chameli	4-6	6-8	D



Vrikshi



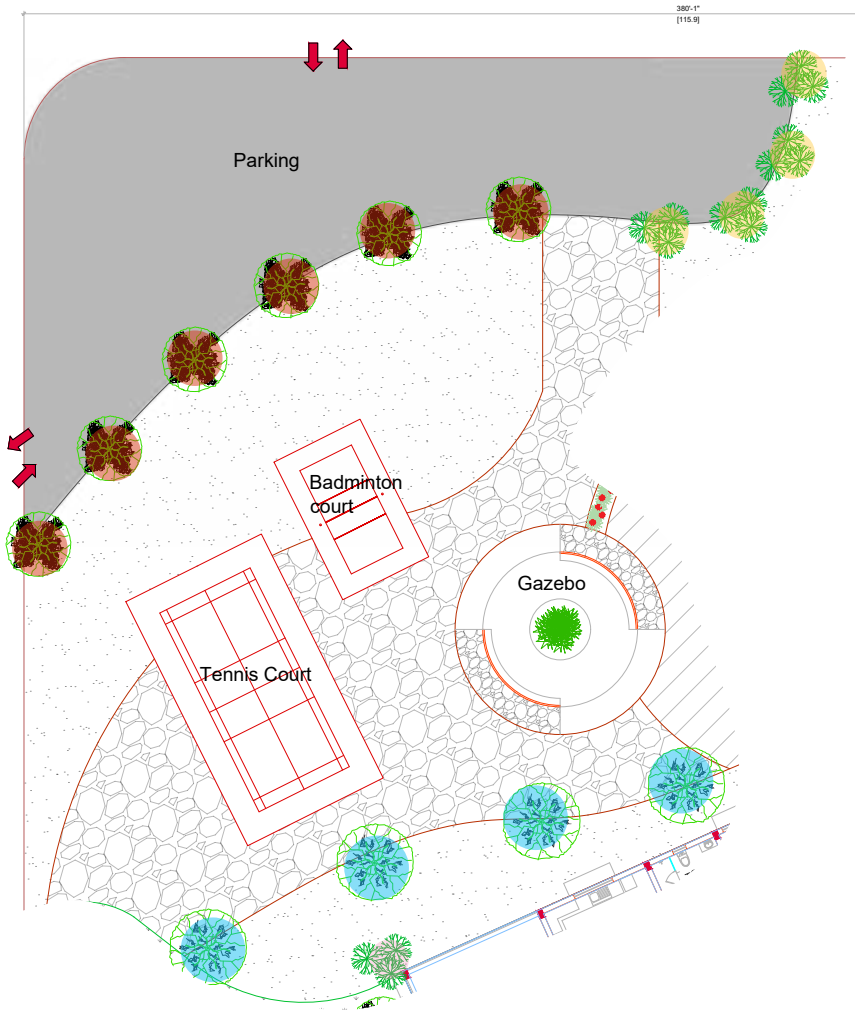
Chameli



Dwarf Bamboo



Key Plan



Legend:

- Screen
- Shade
- Ornamentation
- Orchard
- Visual Barrier
- Shade + Ornamentation



Clubhouse Site Plan

S. No	Location	Intent	Plant Name		Height	Spread	Evergreen / Deciduous
			Botanical name	Common Name			
1	Along site boundary	●	spathodea campanulata	Fountain tree	9-13	6-9	E
		●	plumeri alba	Chameli	4-6	6-8	D
2	Along the building	●	plumeri alba	Chameli	4-6	6-8	D
		●	ixora coccinea	Flame of the woods, Vrikshi	1.8 - 2.5	0.9-1.5	E



Vrikshi



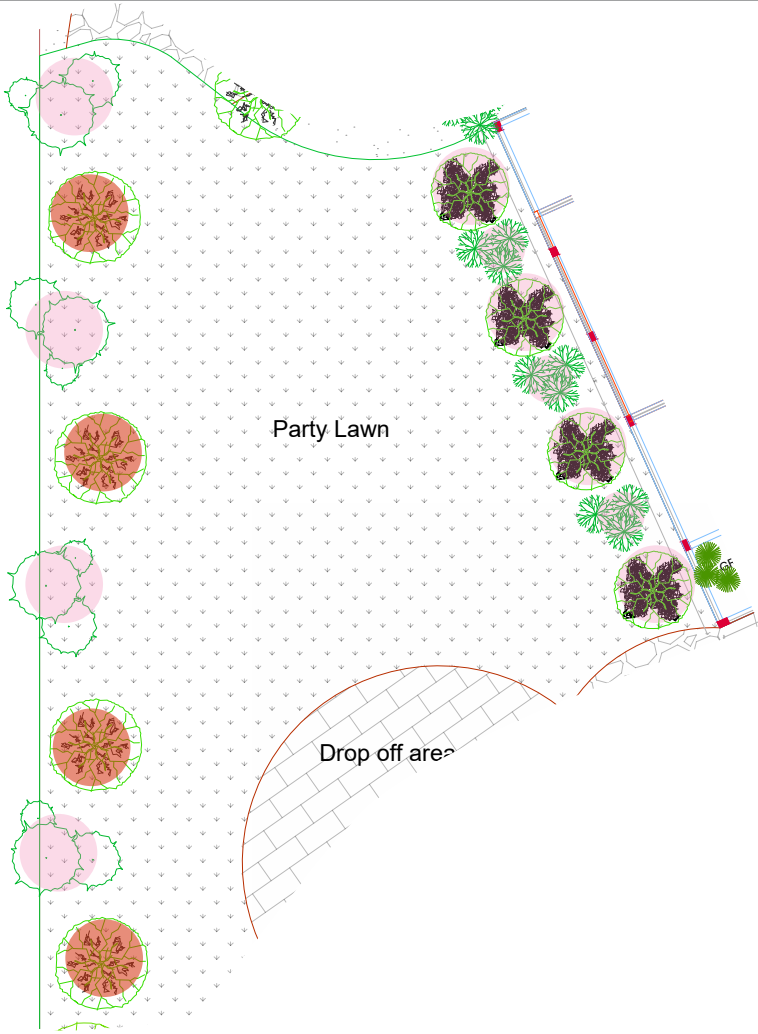
Chameli



Fountain tree



Key Plan



Legend:

- Screen
- Shade
- Ornamentation
- Orchard
- Visual Barrier
- Shade + Ornamentation



Material Study- Alternate wall and floor finishes



Alternative and sustainable floor & wall finishes

Mud Plaster for floor and wall



Materials required for mud flooring:

- sifted sand
- clay
- cow manure
- chopped and sifted straw



CONSTRUCTION

- Wet the base floor with water
- Spread out the mix
- Ram well so as to get consolidated thickness of 150mm
- Water is not added during the process of ramming
- Flatten the floor surface with trowel
- To maintain the mud floor in good condition, a thin coat of cement-cow dung is added once or twice a week in proportion of 1:2 ratio



Mud flooring is commonly constructed in villages.

- When the available soil is not suitable enough for construction then soil can be used by manipulating its composition by adding suitable stabilizers.
- Stabilizers enhances the property of the soil by -
 - increasing the tensile and shear strength
 - reducing shrinkage.
 - Cement — modern contemporary stabilizer.
 - Indigenous stabilizer— straw, plant juices, molasses , cow dung , animal urine , oil , tannic acid

Advantages:

1. It is cheap
2. It is hard
3. It is fairly impervious
4. It is easy in construction
5. It is easy to maintain
6. It remains warm in winter and cold in summer and hence it is most suitable for places where the temperature is extreme during these seasons.

Disadvantages:

It is only well suited for small towns and villages as the wear and tear when compared to an urban lifestyle is lesser.



Alternative wall finishes



Lime Plaster

Lime plaster and exposed brick walls are alternate wall finishes that are low (or zero) on harmful chemicals that are hazardous to health. Lime plaster enhances breathability of walls and gives an earthy feel to the space. Mud plaster can also be applied on the walls just as with the floor.



Lime Plaster



Exposed Brick Wall

Material Study- Wood as building material- Feasability Study

Generally:

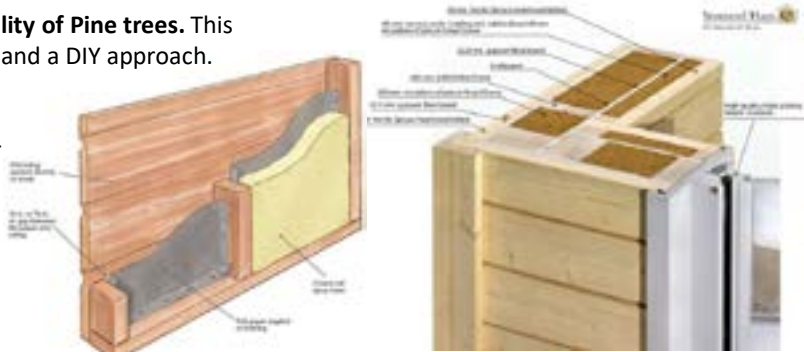
Non-load bearing wall- Mostly hollow, made of wooden frame and Gypsum board.
Load Bearing/ Exterior walls- Concrete wall

In the US:

Wood is cheaper due to the abundant availability of Pine trees. This lead to a more simpler construction technique and a DIY approach.

1. Foundation- Masonry or Poured Concrete
2. Frame- Wooden frame with framing timber
3. Exterior wall-
 - A layer of Ply wood
 - A layer of Water proofing
 - Breathable fibrous insulation
4. Exterior wall finish- Stone, Brick, etc
5. Interior wall finish-
 - Gypsum based "Sheetrock", Dry wall/ Plaster board (Plaster in-between 2 layers of heavy cardboard.)
 - Surface is smoothened and painted.

Note: Plasterboards may require replacement occasionally.



In UK:

The same process for interior wall is followed, but for exterior walls, **Wood is not used due to Britain's cold and wet climate.**

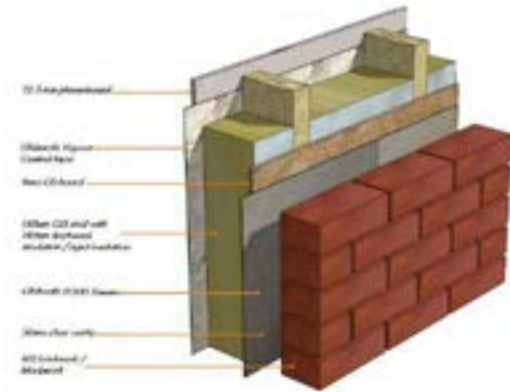
Instead, Exterior walls are **double layered cavity wall** with the outer layer built with high quality material like attractive brick finish and the interior leaf made of cheap concrete blocks also called "breeze blocks".

Why is wood a favored material? In the US, it is very cheap due to the abundance of material availability. It is lighter than masonry and hns, speedy construction.

Cons:

1. Fire hazard
2. Not good for wet and humid areas
3. Low wind resistance

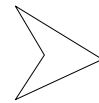
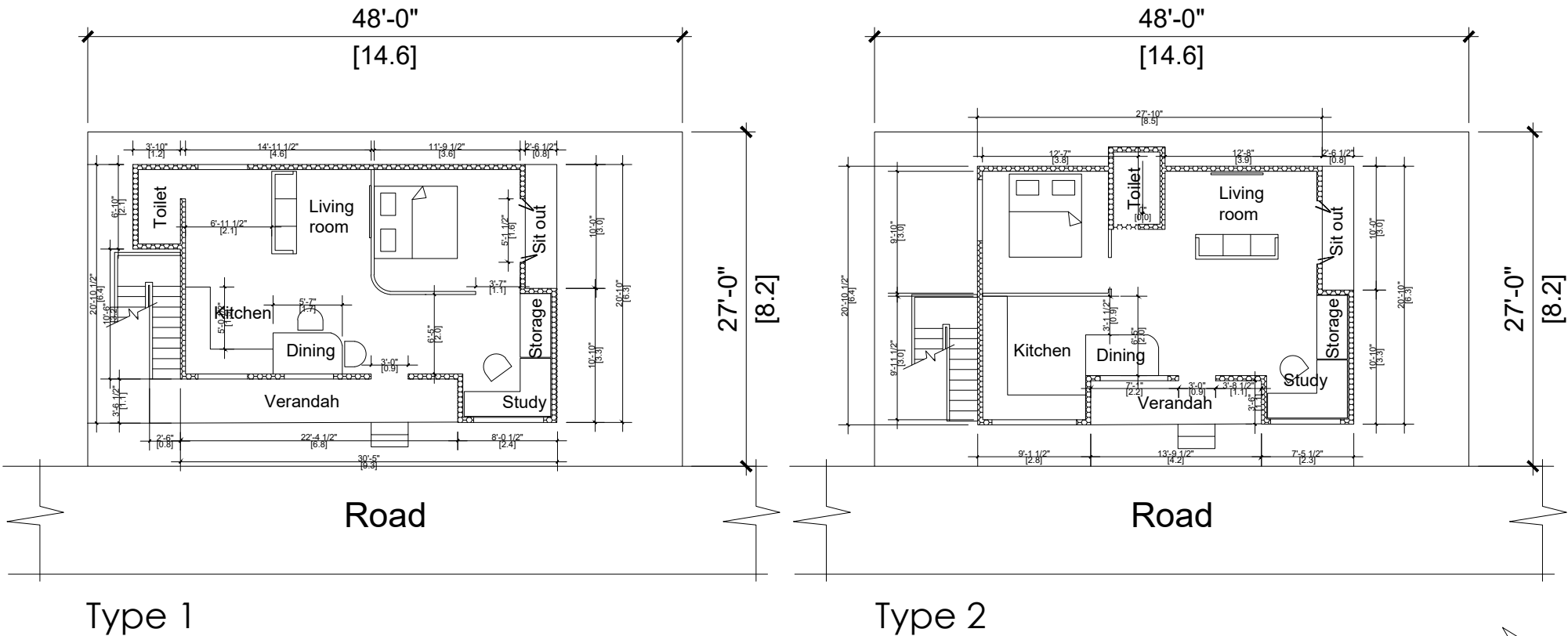
Hence, to deal with this, external concrete/ brick wall is added.



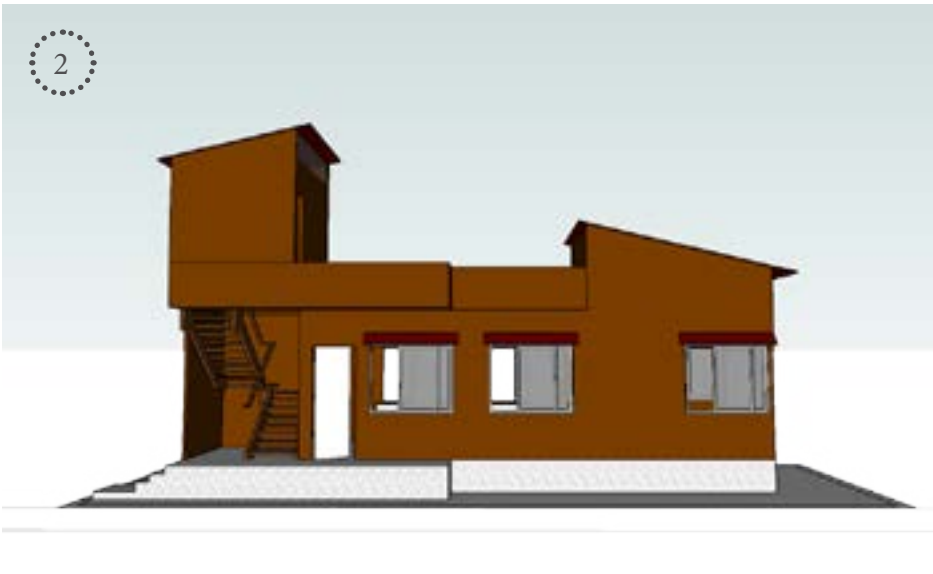
Tiny House Iteration 1- Bamboo House

This tiny house is a residence for one in Coimbatore. The client wanted a concrete free house built entirely of bamboo. This was further modified and other natural materials and their feasibility were explored.

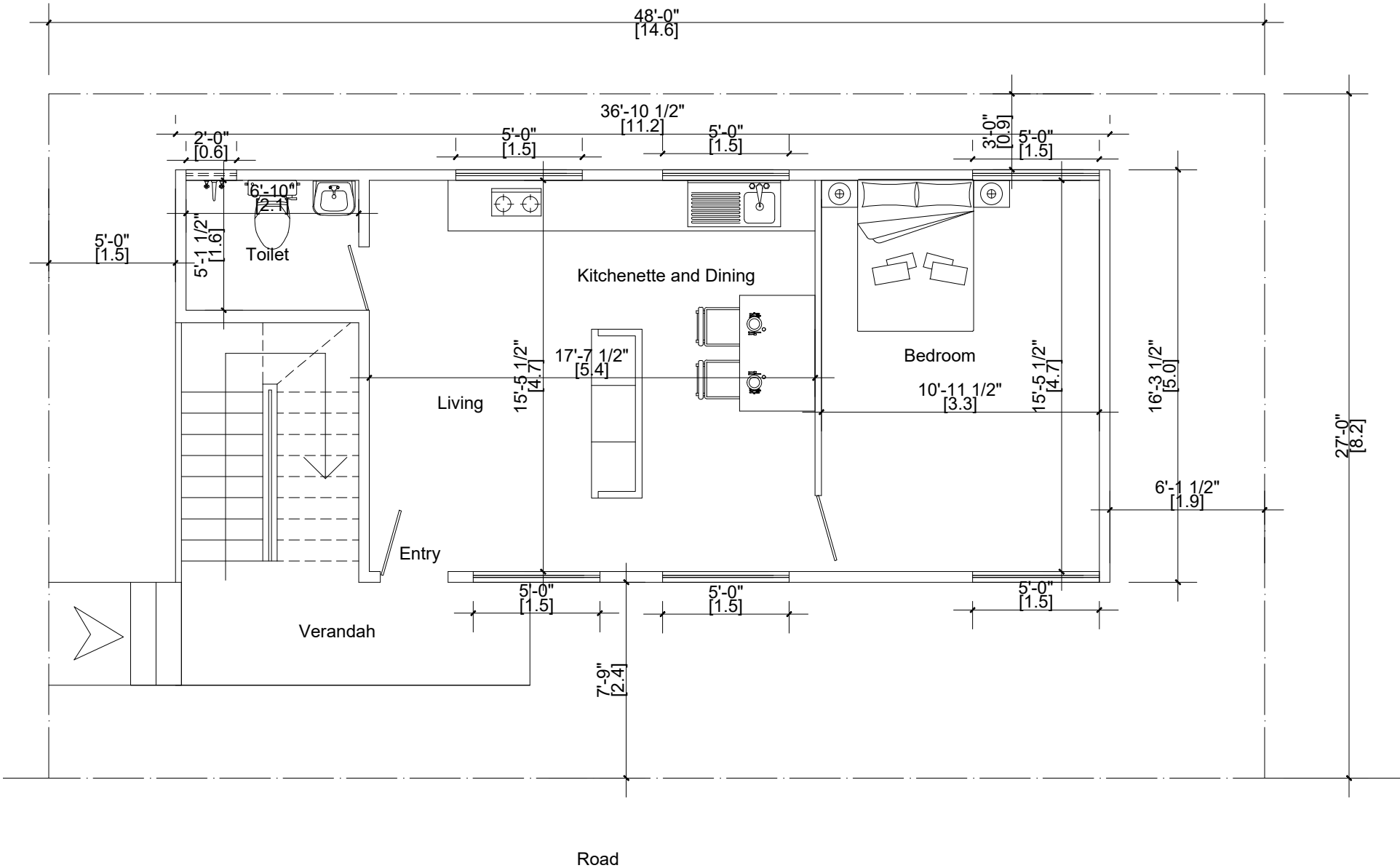
The client wanted usable terrace space. Various combinations altering the roof area were tried out.



Tiny House Iteration 2- Wooden House

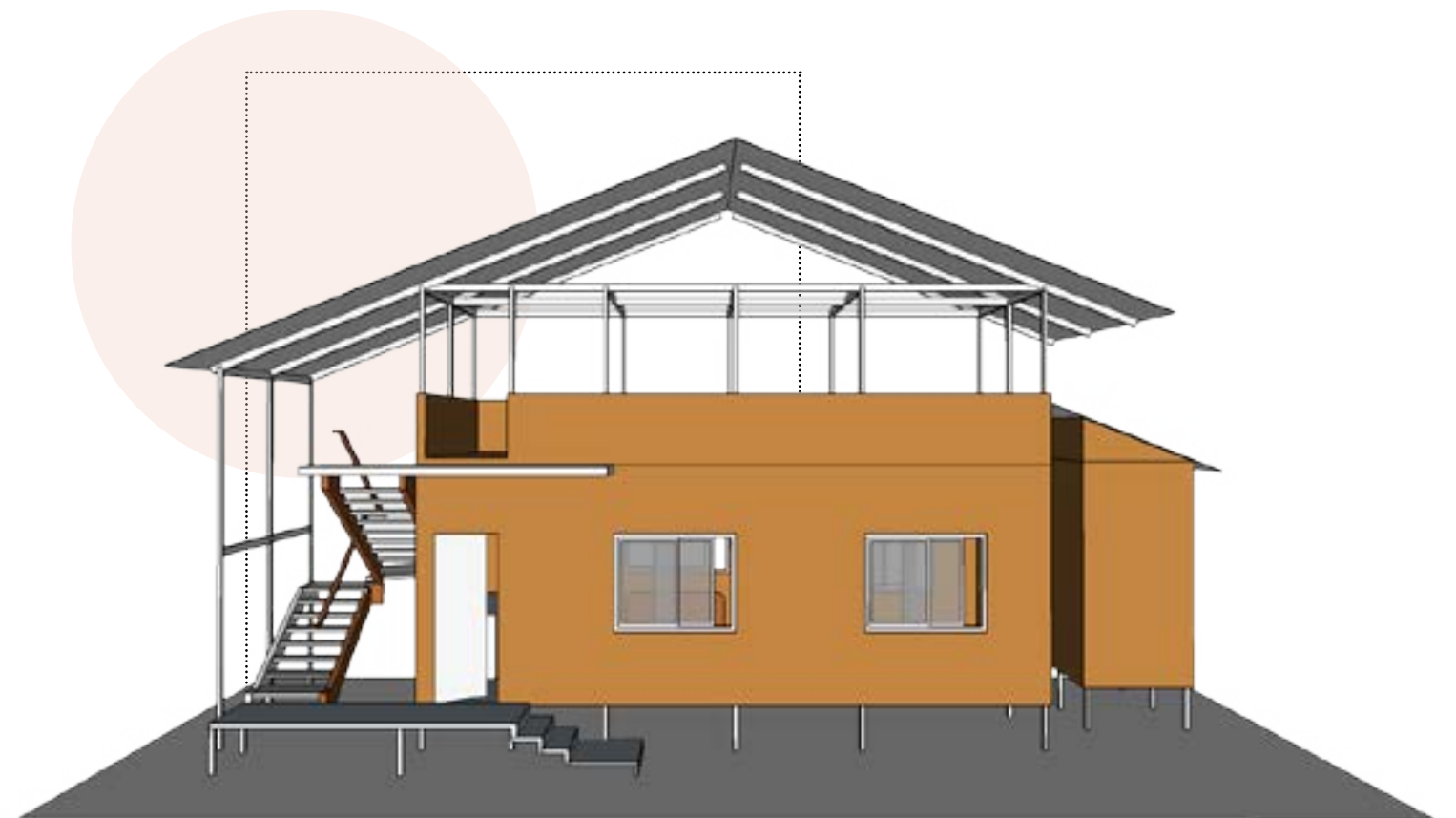
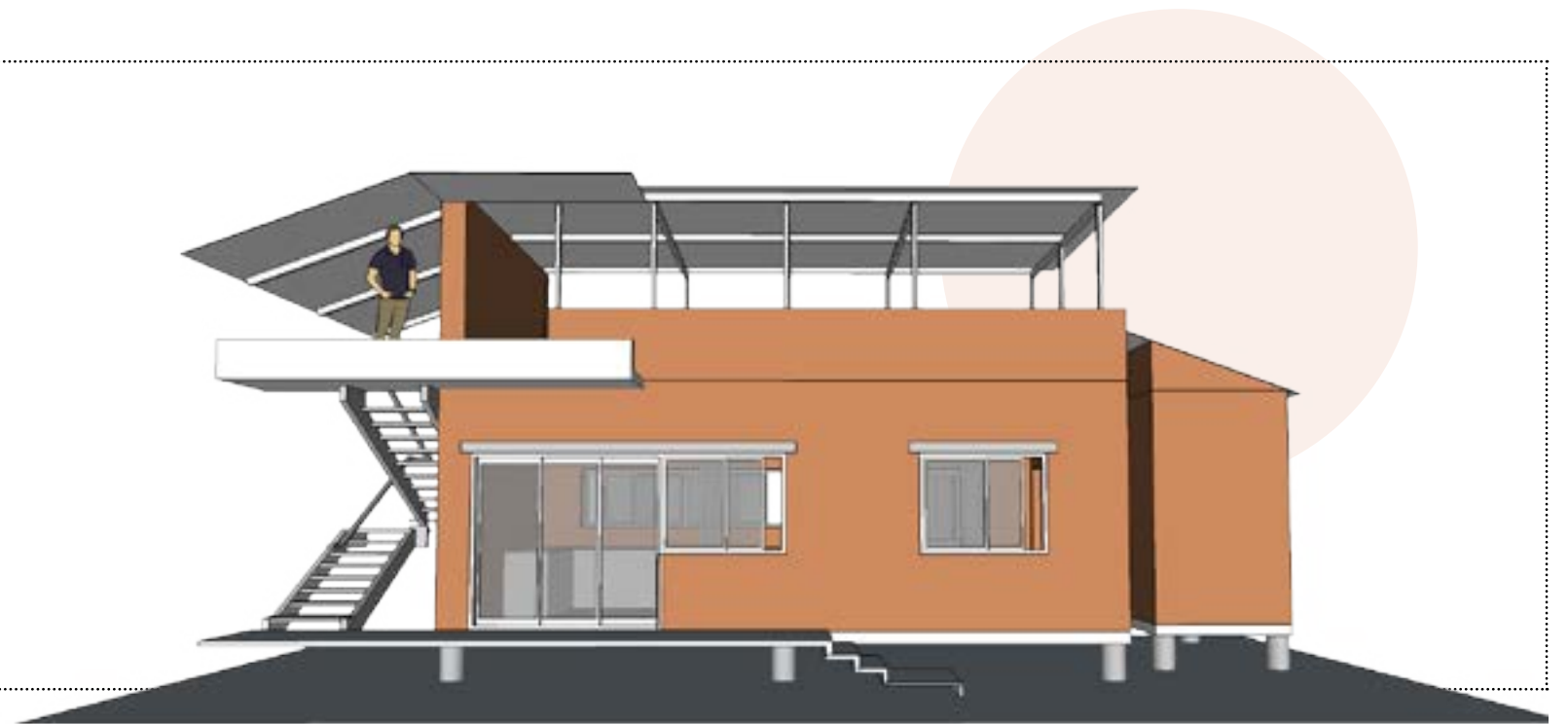


It was later decided to be built with wood- Teak or Bamboo planks, as per the availability. Container house was also an option. Cost of procurement and transporation to site discouraged its implementation.



(1) Bamboo Plank house (2) Wood plank House with raised bedroom ceiling (3) Wood plank House with terrace altered.

Tiny House Iteration 3- Mud House



Architectural works- Mr. Venkatraman Residence- 3D View

