

SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

PROFESSIONAL TRAINING REPORT FORMAT GUIDELINES

Sequence of the **A3 Formats** to be bounded in the Practical Training Report

Title Page –	Refer Annexure - I
Bonafide Certificate –	Refer Annexure - II
Declaration –	Refer Annexure – III
Acknowledgements – Order of names to be acknowledged -	Refer Annexure – IV
Confirmation letter	Annexure – V
Joining Letter	Annexure – VI
Weekly Report (Xerox copy of 2 weeks in oneA3 sheet)	Annexure – VII
Work diary	Refer Annexure – VIII
Consolidated Certificate (Experience)	Annexure – IX
Table of Contents with page numbers	Refer Annexure – X

Note: Bring the original copy of the following

- **Letter of consent to appoint you as a trainee**
- **Confirmation letter, Joining Letter, Monthly Report, Consolidated Certificate**

PROFESSIONAL TRAINING REPORT

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

By

A INDRAVARMAN - 39890008



**SCHOOL OF BUILDING AND ENVIRONMENT
DEPARTMENT OF ARCHITECTURE**

SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC
JEPPIAARNAGAR, RAJIVGANDHI SALAI, CHENNAI-600119

JUNE 2019



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

(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 (S89 INT)
JAN 2021**

Name of the Student :A INDRAVARMAN

Semester :III

Reg No. : 39890008

Batch : 2019-2021



SATHYABAMA

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E-mail: archhod@sathyabama.ac.in



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 **A INDRAVARMAN - 39890008** who had undergone training in **SATHYA CONSULTANT** and has been monitored by the continuous assessment during **Dec 2020 to Jan 2021**.

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



SATHYABAMA

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

E-mail: archhod@sathyabama.ac.in



DECLARATION

I **A INDRAVARMAN - 39890008** hereby declare that the Professional Training Report **DEC 2020 – JAN 2021** done by me under the guidance of **Ar.SATHYA PRAKASH VARANASHI** is submitted in partial fulfillment of the requirements for the completion of practical training session.

DATE :

PLACE :

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. SATHYA PRAKASH VARASHI** 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.

I would also like to thank Ar.d (Also thank Architect of the firm)_____ (**Architect's or PM'S name, Firm Name, Address**)

(Family and Others) _____

CONFIRMATION LETTER

(Annexure –V)

SATHYA CONSULTANTS
ECO FRIENDLY ARCHITECTURE, SUSTAINABLE
URBAN DESIGN AND CONSERVATION



166, KATHRIGUPPE WATER TANK ROAD
4TH CROSS, 4TH BLOCK, 3RD STAGE
BANASHANKARI, BANGALORE - 560085
Ph : 080 - 26794220, 26797854
sathyaconsult@gmail.com (Off.)

Ref No. 109/3771

December 12, 2021

To

The Head of the Department,
Sathyabama Institute of Science & Technology,
Rajiv Gandhi Salai, Jeppiaar Nagar,
Chennai-6000 119
Tamil Nadu.

Dear Sir/Madam,

I am happy to confirm Mr. Indravarman, an M.Arch. student at Sathyabama Institute of Science & Technology to work with us as an intern for a period of 30 working days starting from December 10, 2020. I wish him a happy and learning time.

Yours Sincerely,

Sathya Prakash Varanashi

Principal Architect.

SATHYA CONSULTANTS
Architecture, Interiors, Urban Design
& Conservation
166, Kathriguppe Water Tank Road,
4th Cross, 4th Block, 3rd Stage,
Banashankari 3rd Stage,
BANGALORE-560 085 (C) 6794220

WEEKLY REPORT

(Annexure –VII)



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited with 'A' grade by NAAC
Jeppiyaar Nagar, Rajiv Gandhi Salai, Chennai - 600 119.

Phone: 044 - 2450 3150 / 3151 / 3152 / 3154 / 3155 Fax: 044 - 2450 2344
www.sathyabama.ac.in



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)

- Name of the office / organization: SATHYA CONSULTANTS
- Address & Contact Number: #168, KATHRIGUPPE WATER TANK RD, 4th CROSS, 4th BLK, 3rd Stage, BANASHANKARI, BLR - 560085
- Name of the student: A. INDRAVAR MAN
- Duration: From 10.12.2020 To 17.12.2020
- Total No. of days: 07 days
- 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* B. 70%.

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

7. Any other Remarks: Most "works" not applicable to what he did in office.

8. Signature of the Head of the Office / Organization (With Seal): [Signature] 15/12/20

SATHYA CONSULTANTS
Architecture, Interior, Urban Design & Conservation
168, Kathriguppe Water Tank Road,
4th Cross, 4th Block, 3rd Phase,
Banashankari 3rd Stage,
BANGALORE-560085 C-679472



SATHYABAMA

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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)

- Name of the office / organization: SATHYA CONSULTANTS
- Address & Contact Number: #168, KATHRIGUPPE WATER TANK RD, 4th CROSS, 4th BLK, 3rd Stage BANASHANKARI, BLR - 560085
- Name of the student: A. INDRAVAR MAN
- Duration: From 18.12.2020 To 24.12.2020
- Total No. of days: 06 days
- 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* B. 70%.

(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] 15/12/20

SATHYA CONSULTANTS
Architecture, Interior, Urban Design & Conservation
168, Kathriguppe Water Tank Road,
4th Cross, 4th Block, 3rd Phase,
Banashankari 3rd Stage,
BANGALORE-560085 C-679472

WEEKLY REPORT

(Annexure –VII)



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

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Phone: 044 - 2450 3150 / 3151 / 3152 / 3154 / 3155 Fax: 044 - 2450 2344
www.sathyabama.ac.in



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: SATHYA CONSULTANTS
2. Address & Contact Number: #16B, KATHIRIGUPPE, WATER TANK RD, 4th CROSS, 4th BLK, 3rd Stage BANASHANKARI, BLK - 560085
3. Name of the student: A. INDRA ARMAN
4. Duration: From 28.12.2020 To 03.01.2021
5. Total No. of days: 05 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*

betw. A & B → 75%

(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)

15/1/21
SATHYA CONSULTANTS
Architects & Interiors Urban Design
& Conservation
16B, Kathiriguppe Water Tank Road,
4th Cross, 4th Block, 3rd Phase,
Banashankari 3rd Stage,
BANGALORE-560 085 C: 6794228



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

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Phone: 044 - 2450 3150 / 3151 / 3152 / 3154 / 3155 Fax: 044 - 2450 2344
www.sathyabama.ac.in



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: SATHYA CONSULTANTS
2. Address & Contact Number: #16B, KATHIRIGUPPE, WATER TANK RD, 4th CROSS, 4th BLK, 3rd Stage BANASHANKARI, BLK - 560085
3. Name of the student: A. INDRA ARMAN
4. Duration: From 11.01.2021 To 17.01.2021
5. Total No. of days: 06 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 = 80%

(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)

15/1/21
SATHYA CONSULTANTS
Architects & Interiors Urban Design
& Conservation
16B, Kathiriguppe Water Tank Road,
4th Cross, 4th Block, 3rd Phase,
Banashankari 3rd Stage,
BANGALORE-560 085 C: 6794228

WEEKLY REPORT

(Annexure –VII)



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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: SATHYA CONSULTANTS
2. Address & Contact Number: #168, KATHRIGUPPE, WATER TANK RD, 4th Cross, 4th Block, 3rd Stage BANASHANUR, BLR-560085
3. Name of the student: A. INDRAVARMAN
4. Duration: From 04.01.2021 To 10.01.2021
5. Total No. of days: 06 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*	<u>betn. A & B = 75%</u>
------------------	------------------------------

(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) SATHYA CONSULTANTS
Architects, Interiors, Urban Design
& Conservation
168, Kathriguppe Water Tank Road,
4th Cross, 4th Block, 3rd Stage,
Banashanur 3rd Stage,
BANGALORE-560085 C: 074274

Consolidated Certificate (Experience)

Annexure – IX

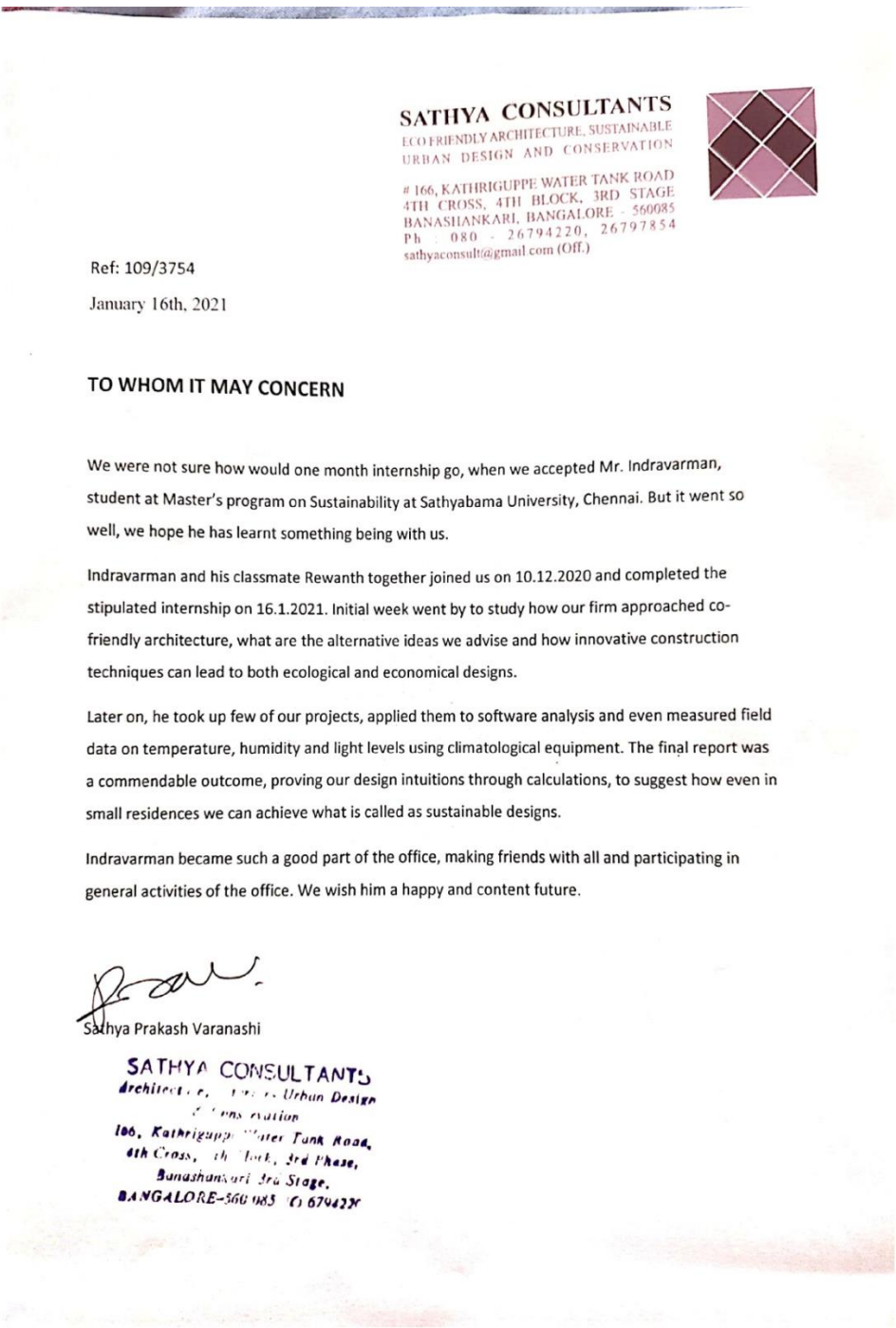
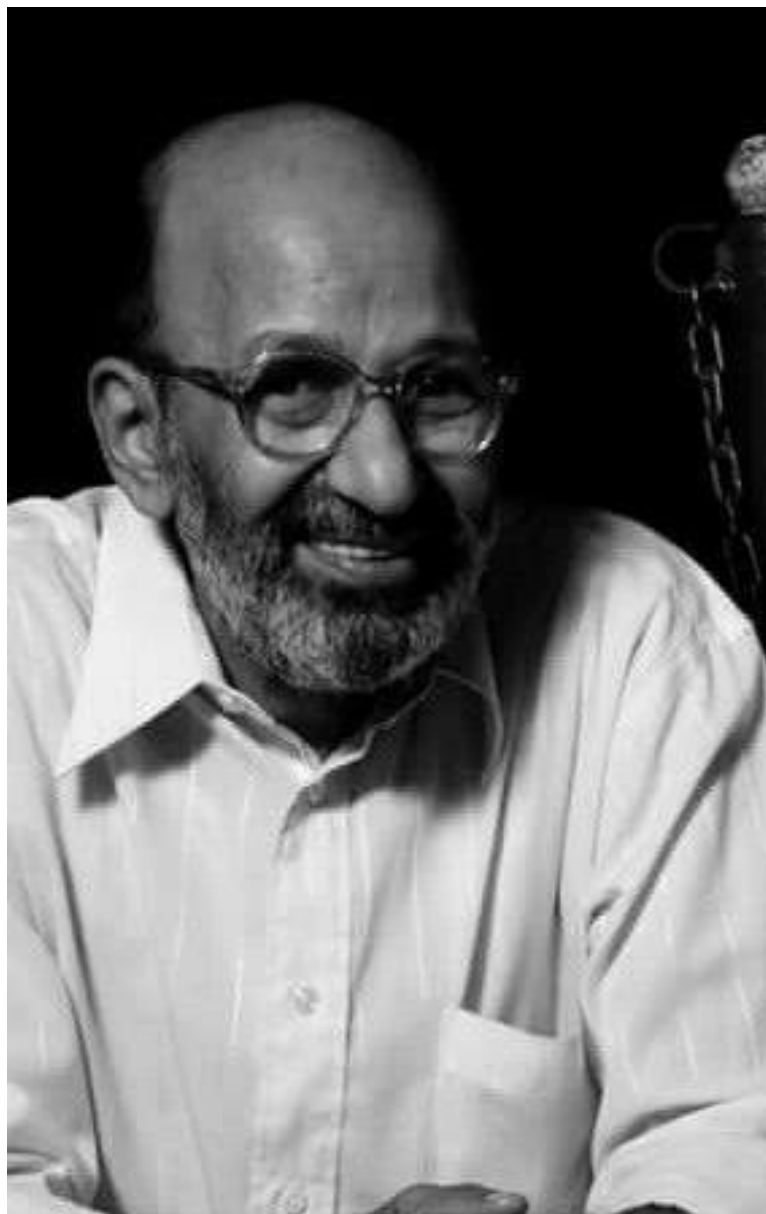


TABLE OF CONTENTS

(Annexure –X)

CHAPTER NO	TITLE	PAGE NO
1.	GENERAL	
2.	HISTORY OF THE FIRM	
3.	MATERIALS & TECHNIQUES	
4.	SHIVASHANKAR & REVATHI RESIDENCE	
5.	SATISH SASTRI RESIDENCE	
6.	SIJI & BINNY RESIDENCE	
7.	VARNASHI HOUSE	
8.	SUNDAR & GIRISH HOUSE	
9.	SIVAGANGA HOSPITAL	
10.	URMILA & KAMALJI RESIDENCE	



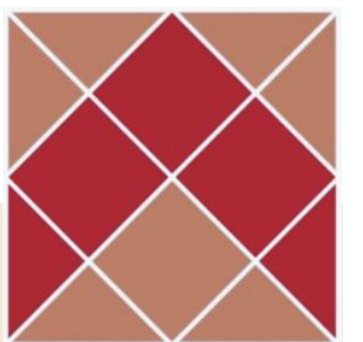
Sathya Prakash Varanashi studied architecture in Bangalore, urban design in Delhi and heritage conservation in England. A former Professor of Architecture, he is involved in academics, outreach activities, freelance writing, professional associations and NGO initiatives.

Right from his early days, he was attracted to designs ideas rooted in cost, culture, climate and creativity, thanks to the influence of architects such as Laurie Baker, Shankar Kanade, K. Jaisim, A.G.K. Menon and K.T. Ravindran. His consultancy firm, Sathya Consultants, in Bengaluru has been professing and practicing eco-friendly cost-effective architecture for the last 28 years.

These articles were authored by Sathya and published in THE HINDU on their Saturday's Column titled Habitat/Property Plus. These are archived and republished here by Rajesh Kav.

SATHYA CONSULTANTS

Ecofriendly Architecture | Sustainable urban design and Art conservation





DESIGN PRINCIPLES

LETTING THE BUILDING BREATHE

___light, air, space

MINIMISING MANUFACTURED MATERIAL

___go local, save resource, least waste

BEAUTY BY MATERIALITY

___aesthetics, aspiration, construction

INSPIRED BY THE VERNACULAR

___culture, climate, familiarity

EFFICIENT IDEAS AT EFFECTIVE COST

___functional plan, long life, easy maintenance

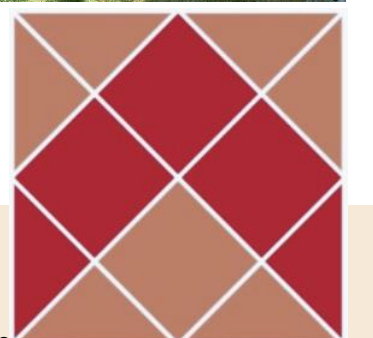


Open planning for ease of circulation and to create a spatial fluidity. Ventilating the interiors for sufficient natural light and air with tall windows and skylights. Entry platform creating a transition between the outdoor and the indoor space.

PLANNING

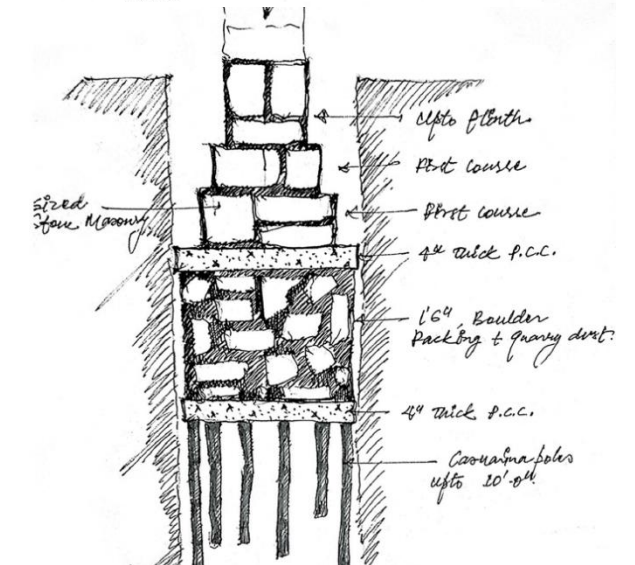
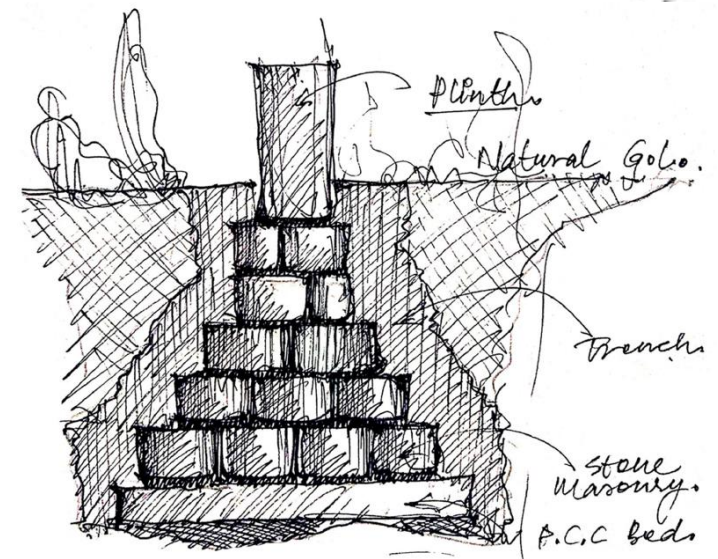
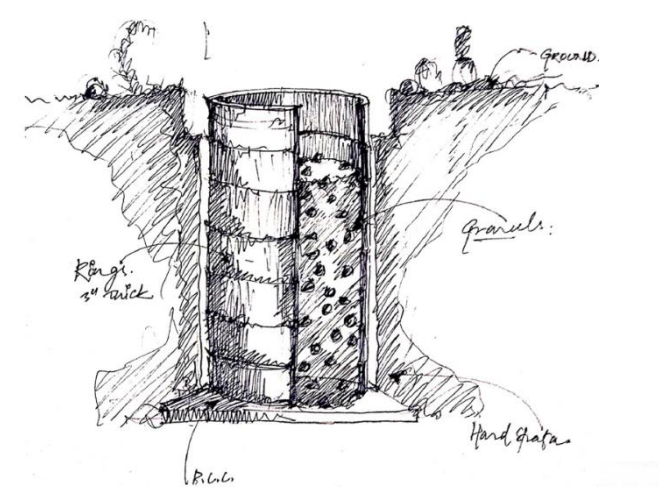
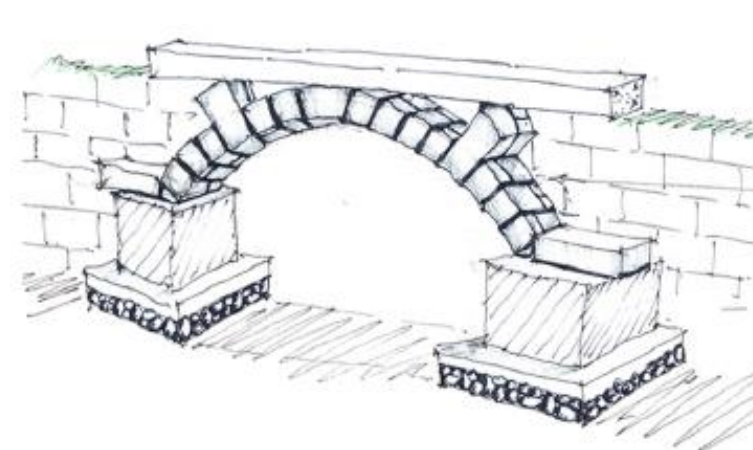
SATHYA CONSULTANTS

Ecofriendly Architecture | Sustainable urban design and Art conservation



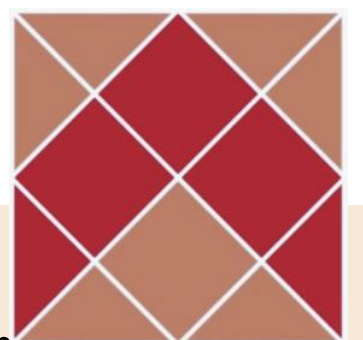


- Arch foundation
- Well ring foundation
- Boulder pack
- Masonry pier



Alternative foundations

The firm strongly believes in using alternate construction technologies which favor the two major concepts which are ecofriendly and sustainable. This has led the practice towards using locally available materials in the construction of foundations which contradict the conventional methods that are loaded with embodied energy.

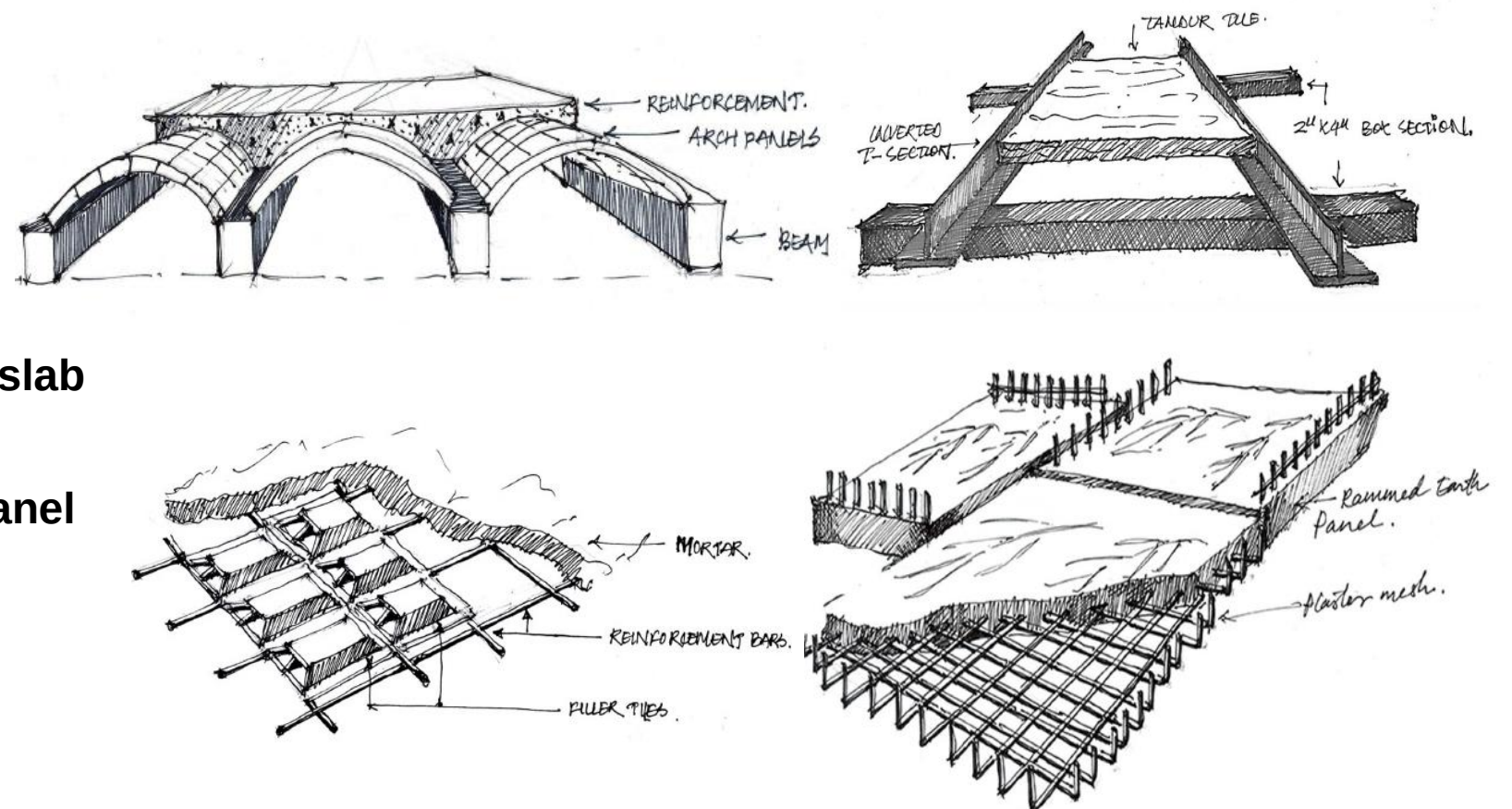


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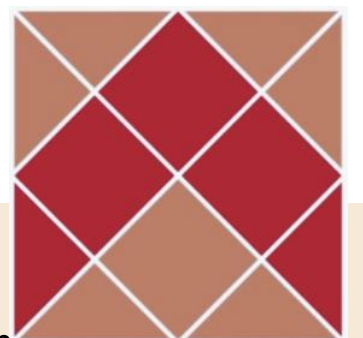


- Filler slab
- Fabricated stone slab
- Jack arch slab
- Rammed earth panel



Alternative slabs

The wide use of different roofing techniques allows the spaces to be aesthetically Appreciated and follows sustainable principles which reduces the use of embodied energy and also increases the thermal lag allowing the SHG factor to Reduce drastically.



SATHYA CONSULTANTS

Ecofriendly Architecture | Sustainable urban design and Art conservation

BANGALORE CLIMATE DATA:



The climate typology of the Bangalore comes under the moderate climate. The moderate climate has to mild to warm summers and cool winters. In the mountains of the great dividing range, winters are cold and summers are pleasantly mild.

BANGALORE:

Latitude : 12° 58' N

Longitude: 77° 35' E

Altitude: 921m above mean sea level

Temperature Range: 65.2%

Temperature Range:

April is the warmest month of the year. The temperature In April averages up to 27.1 deg.celcius. The lowest average temperature in the year occur in December, when it is around 20.7 deg.celcius. The maximum variation in temperatures throughout the year is 6.4 deg.celcius.

BANGALORE												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TEMPERATURE (MAX)	27	30	33	34	33	29	28	28	28	28	27	26
(AVG)	21	23	26	27	26	23	23	22	23	22	21	20
(MIN)	15	17	19	21	21	20	19	19	19	19	17	15
HUMIDITY	65	45	51	49	67	77	74	85	77	79	71	71
PRECIPITATION	5	8	10	44	112	80	110	139	186	162	59	17
RADIATION	424	520	514	519	472	425	430	374	413	376	391	374
WIND DIRECTION	90	90	90	90	270	270	270	270	270	90	90	90
	E, NE	E	E	E, SE	W, NW	W, SW	W, NW	W, NW	W	E	E, NE	E, NE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TOO HOT	2%	24%	26%	32%	26%	8%	5%	1%	4%	2%	1%	1%
WARM	3%	6%	6%	6%	8%	5%	4%	3%	5%	5%	6%	3%
COMFORTABLE	35%	21%	37%	39%	41%	41%	43%	39%	42%	38%	35%	31%
COLD	7%	7%	9%	11%	10%	12%	14%	15%	12%	16%	10%	6%
TOO COOL	54%	42%	22%	11%	15%	34%	34%	41%	38%	39%	48%	59%

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
COMFORT HOURS	330	228	383	406	436	421	456	430	424	436	370	299
%	44	34	51	56	59	58	61	58	59	59	51	40
DISCOMFORT HOURS	414	444	361	314	308	299	288	314	296	308	350	445
%	56	66	49	44	41	42	39	42	41	41	49	60

Critical months – Jan,Feb and Dec.

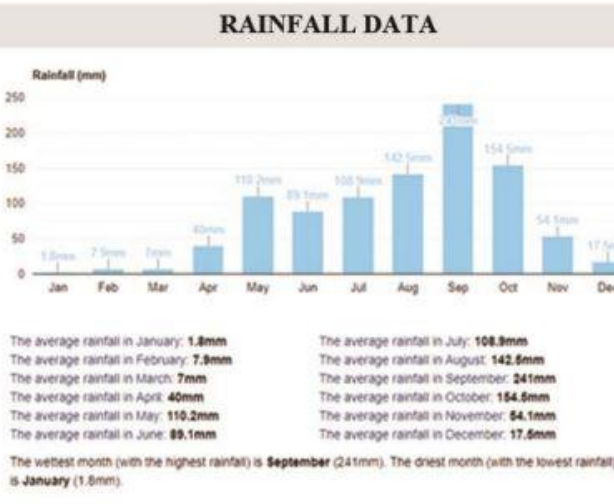
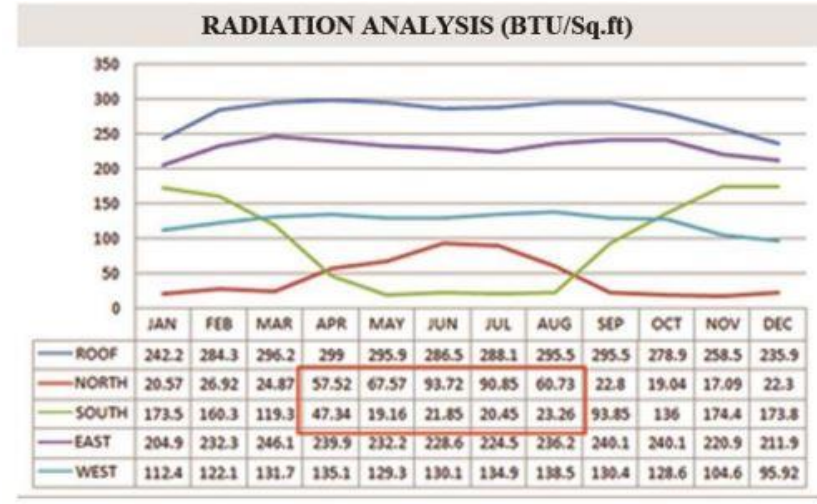
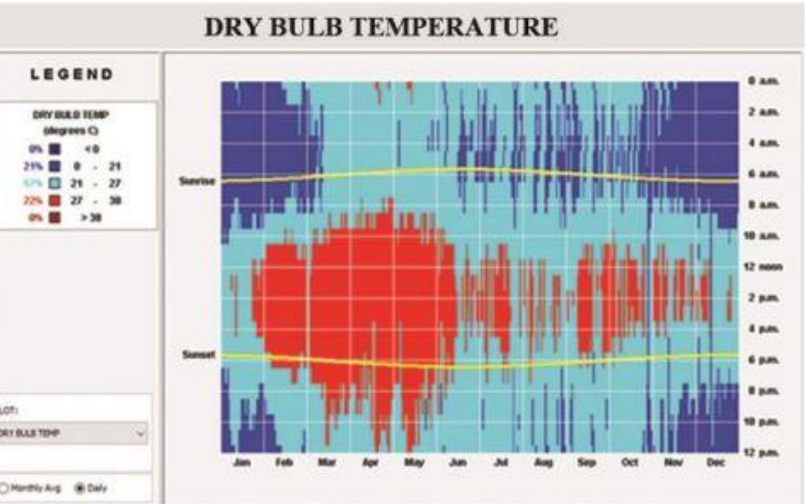
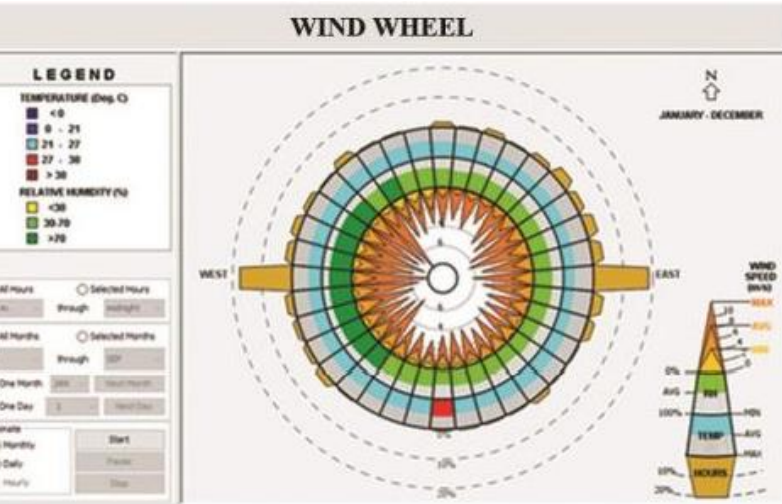
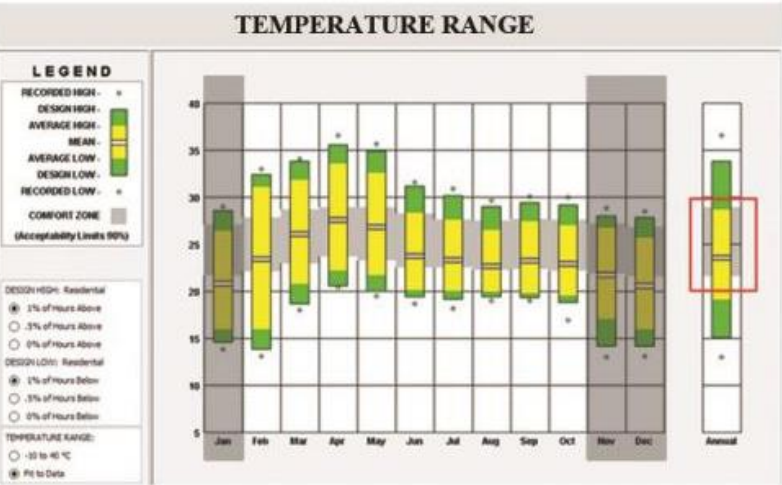
PREDOMINANT WIND DIRECTION: East and West direction

East – 7 months (jan to apr & oct to dec)

West – 5 months (May to Sep)

Increase thermal resistance – roof insulation, east and west wall insulation.

- Increase air ventilation like courtyards and arrangement of openings.



SHIVASHANKAR & REVATHI RESIDENCE:

PROJECT DETAILS

LOCATION : Horamav , Bengaluru
Built up area : GF – 1750 sqft FF – 884 sqft
Site area : 2820 sqft

The extensive use of eco-friendly materials such as stabilized mud block, rammed earth wall and stone wall has contributed to the aesthetic & sustainable use of locally available materials.

The roofing technique used In the project is filler slab with clay tile which increases the thermal lag by providing a air buffer between the interior and the exterior finally contributing to the reduction of solar heat gain.

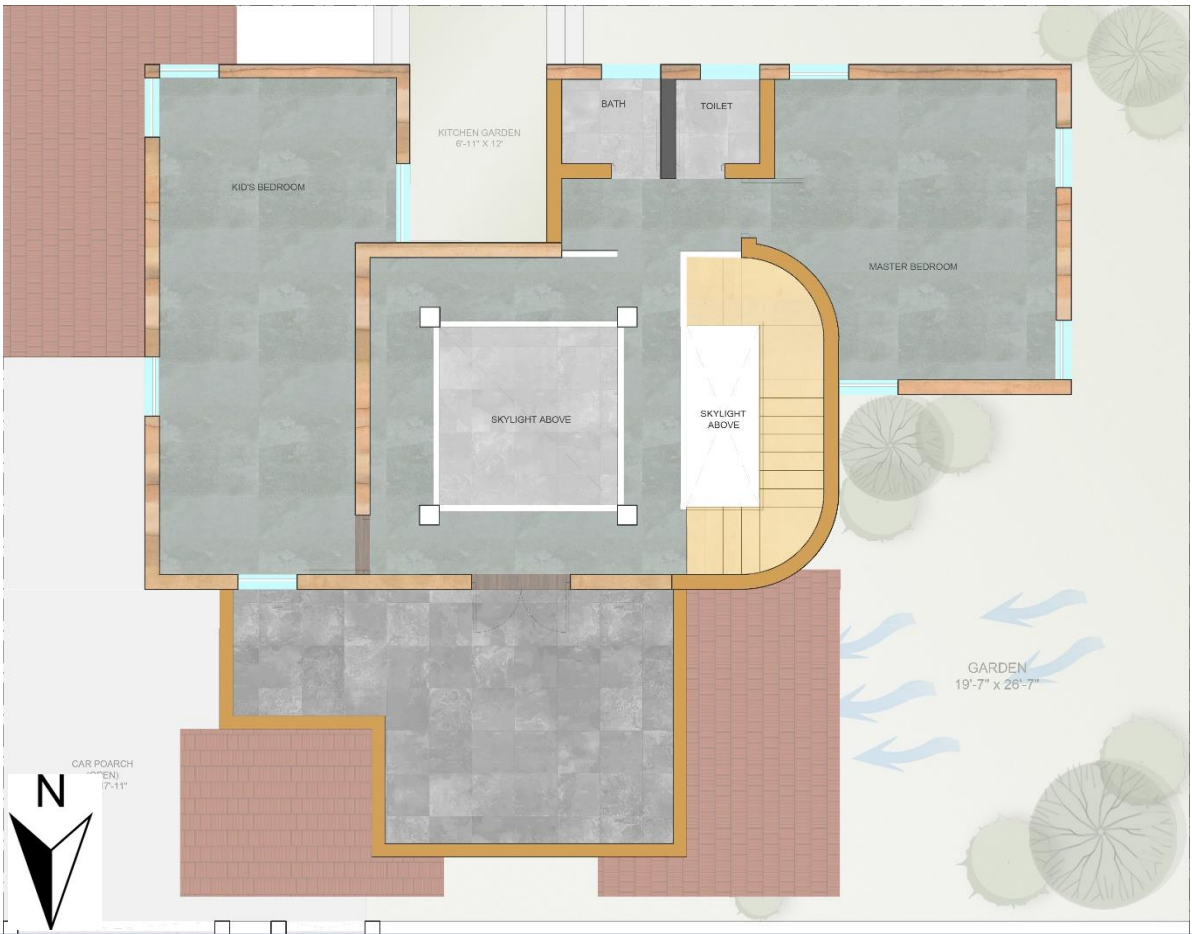
The internal planning has a MUTRAM which is a vernacular element used in houses to increase the stack effect and also to bring the daylight inside the house.

The conscious use of roof openings has increased the lux levels in major usage areas and has avoided unwanted wall openings.

GROUND FLOOR PLAN



FIRST FLOOR PLAN



SHIVASHANKAR & REVATHI RESIDENCE:

Material used in the project:

- The use of clay tile roof ,stabilized mud block ,rammed earth and stone walls proved to be having very less embodied energy keeping in mind the nature of local availability.
- These material also have very less u value proving the material has high thermal lag so the thermal comfort inside the house is maintained

U- VALUE (W/m2.K)		
Wall	Rammed earth blocks	0.326
	Stone wall	1.6
	Stabilised Mud block	1.2
Roof	Mangalore tile	0.42
	Hourdi roof	1.37
	Concrete- 5"	2.07
Floor	Jaisalmar marble	2.07
	Kota	3

Rammed earth blocks



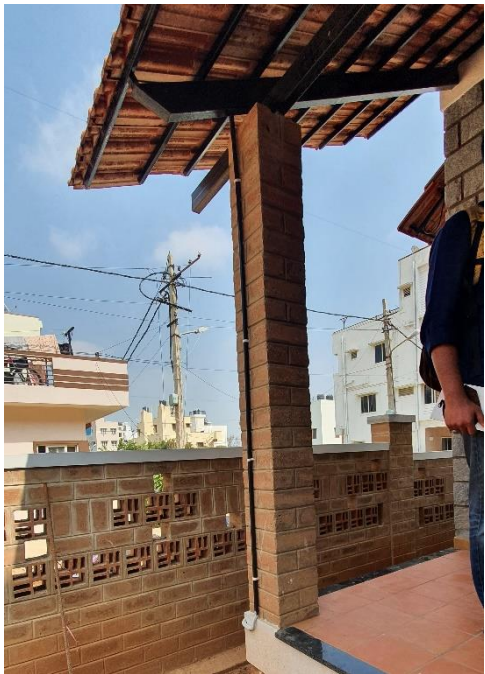
Rammed earth roof



Mud block arch



SMB wall:

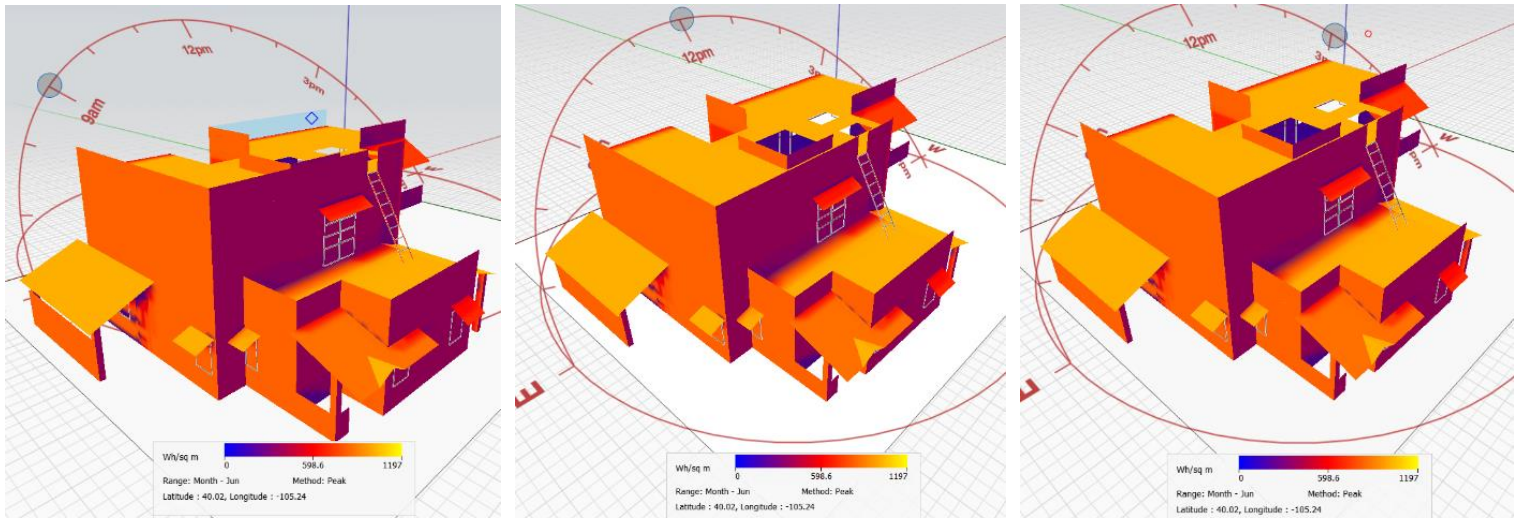


Hourdi roof:

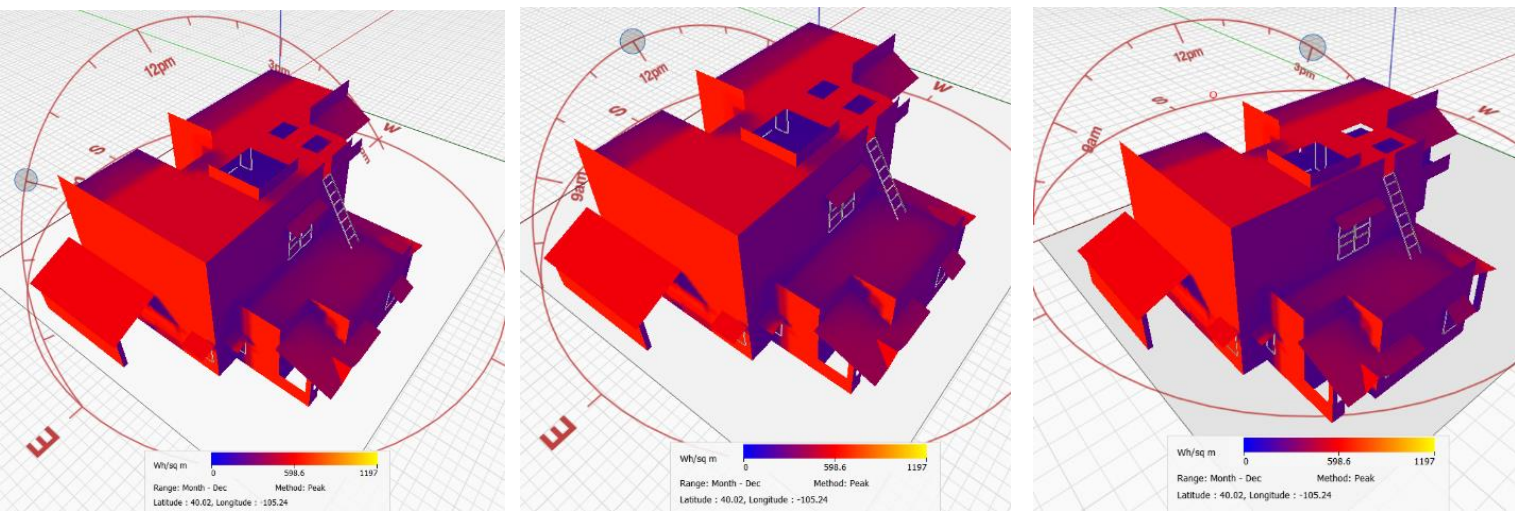


SHIVASHANKAR & REVATHI RESIDENCE:

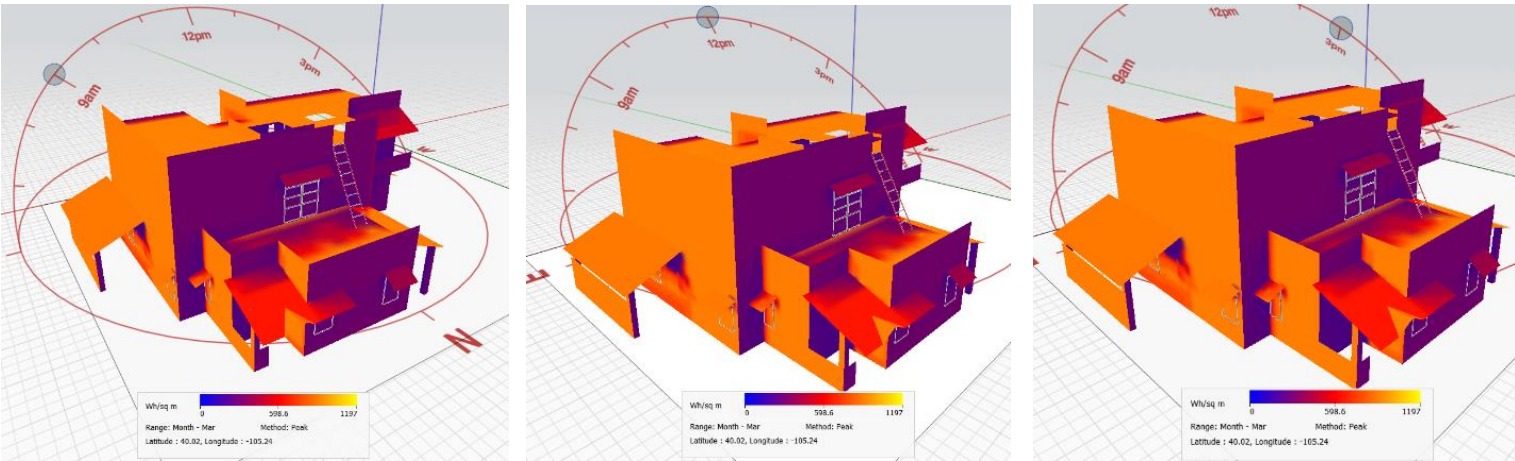
Summer solstice:



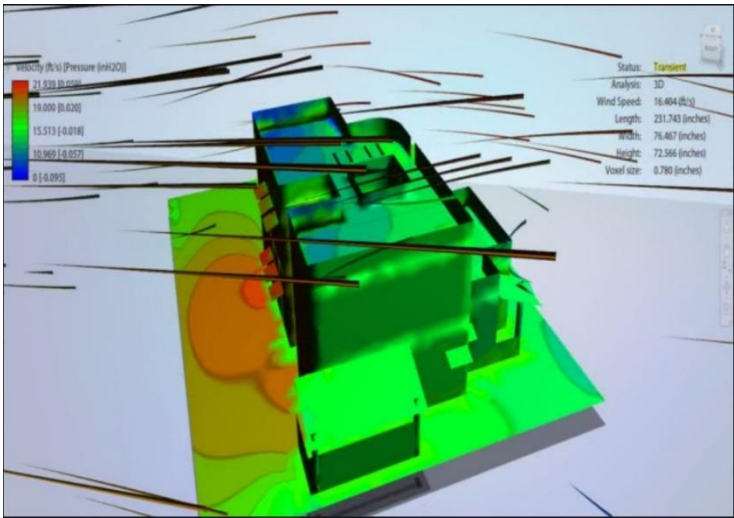
Winter solstice:



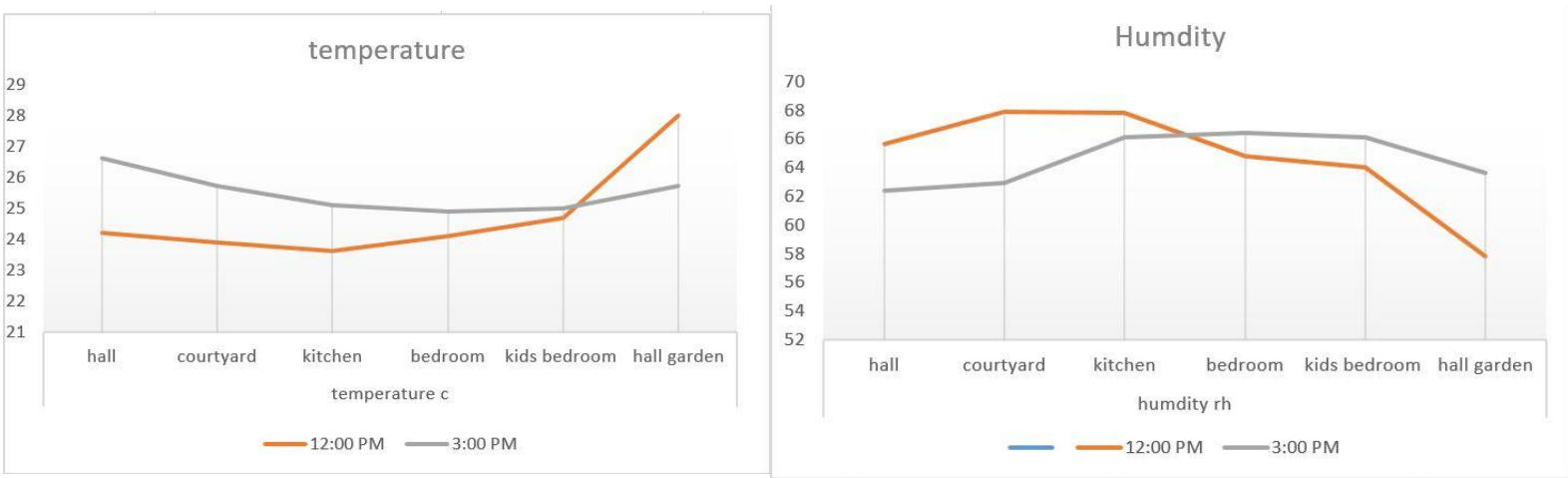
Equinox:



Wind flow:



Thermal Analysis:



INFERENCE

On site measurements were taken and the simulations were compared. The house reflected a temperature variation of 6 deg cel. which proved that the materials used has got a major thermal lag properties. The wind flow was considered and the prevailing wind direction was from E-W. which maintained the flow since a open garden area is situated in the western side providing a diffused radiation and daylight.

SATHISH SASTRI & DHARITRI RESIDENCE:

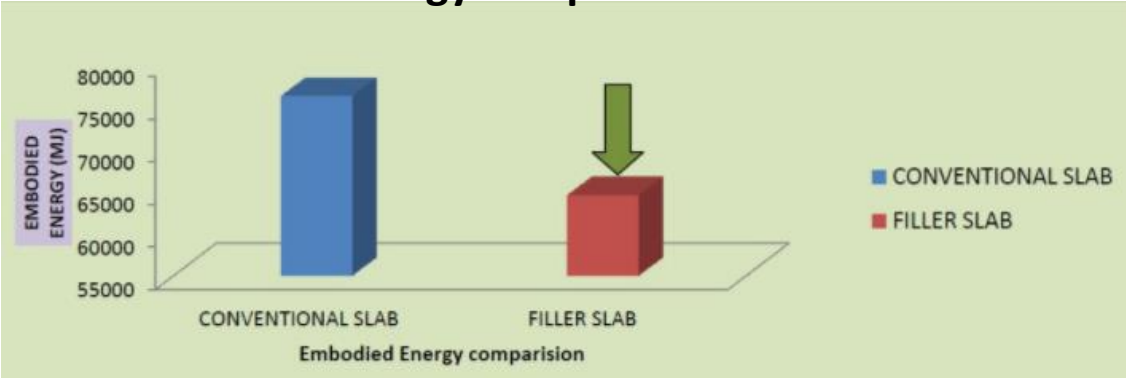
PROJECT DETAILS

LOCATION : vajarahalli,bengaluru
Built up area : GF – 1071 sqft FF – 832 sqft
Site area : 1200 sqft

The residence was proposed in a site of 40ft by 30ft which could accommodate 3 bedroom spaces. The roofing and the wall have hollow clay blocks which helped the site to achieve the preferred thermal lag to the interior thermal comfort.

The site had arched foundation to bear the load which has a much less embodied energy compared to a conventional framed structure.

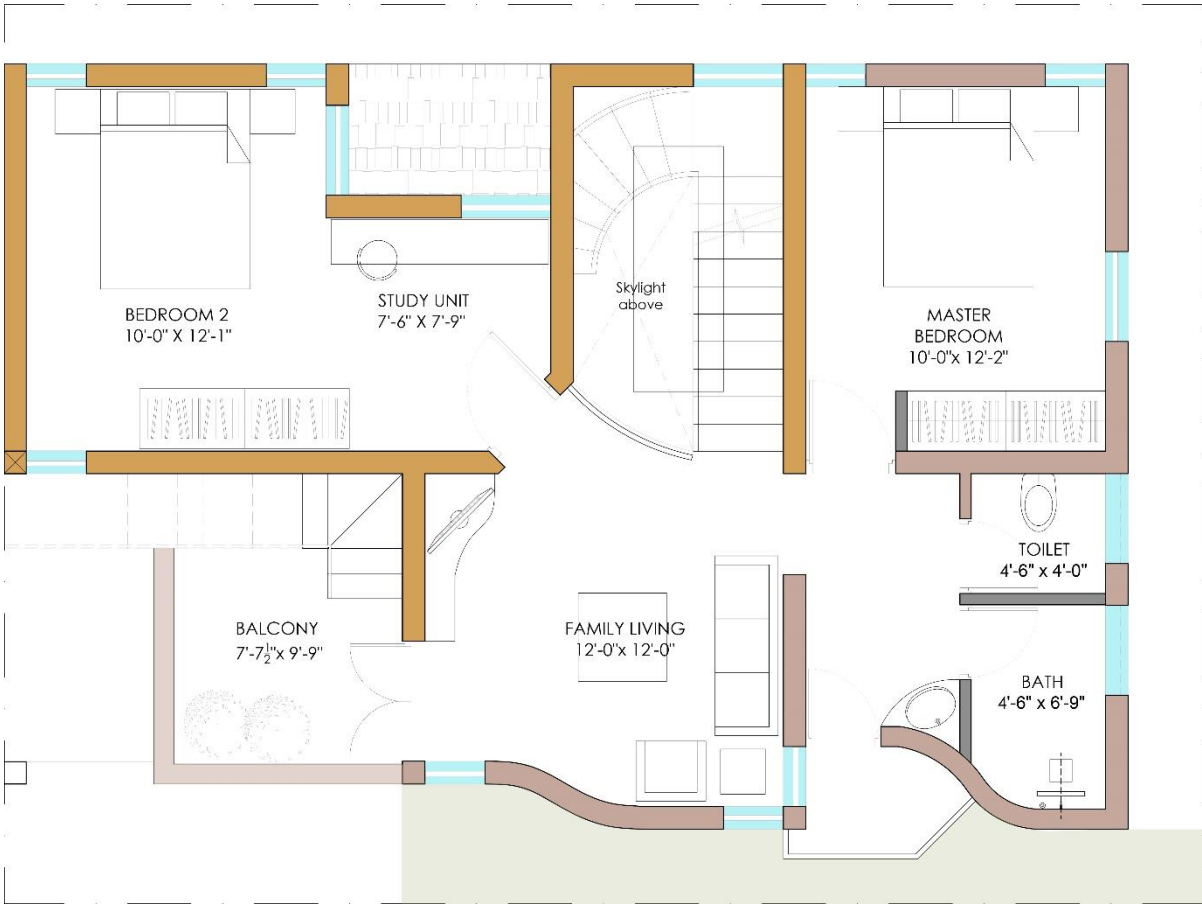
The roofing was of hollow clay filler slab which involved less Amount of solar heat gain from the roof which reduced the Temperature of the indoor .



GROUND FLOOR PLAN



FIRST FLOOR PLAN



SATHISH SASTRI & DHARITRI RESIDENCE:

Material used in the project:

The walls were made of hollow clay block and stabilized mud block which had 'u' factor not above 1.2 .since the mud blocks could be procured locally the embodied energy was Also less.

The flooring was made of athangudi tiles which are mostly handmade and not mass produced. The tiles also were made of locally available clay so the embodied energy in them also were very less.

The provision of tall windows were helping with the displacement ventilation which would expel the hot air .

U- VALUE (W/m2.K)		
Wall	Hollow clay block	0.92
	Stabilised Mud block	1.2
Roof	clay tile	0.42
	Hourdi tile	1.37
	Concrete- 5"	2.07
Floor	Athangudi tile	
	Kota	3



Athangudi tile:

Hourdi tile:



SMB wall:



Hollow clay blocks



Jack arch roof

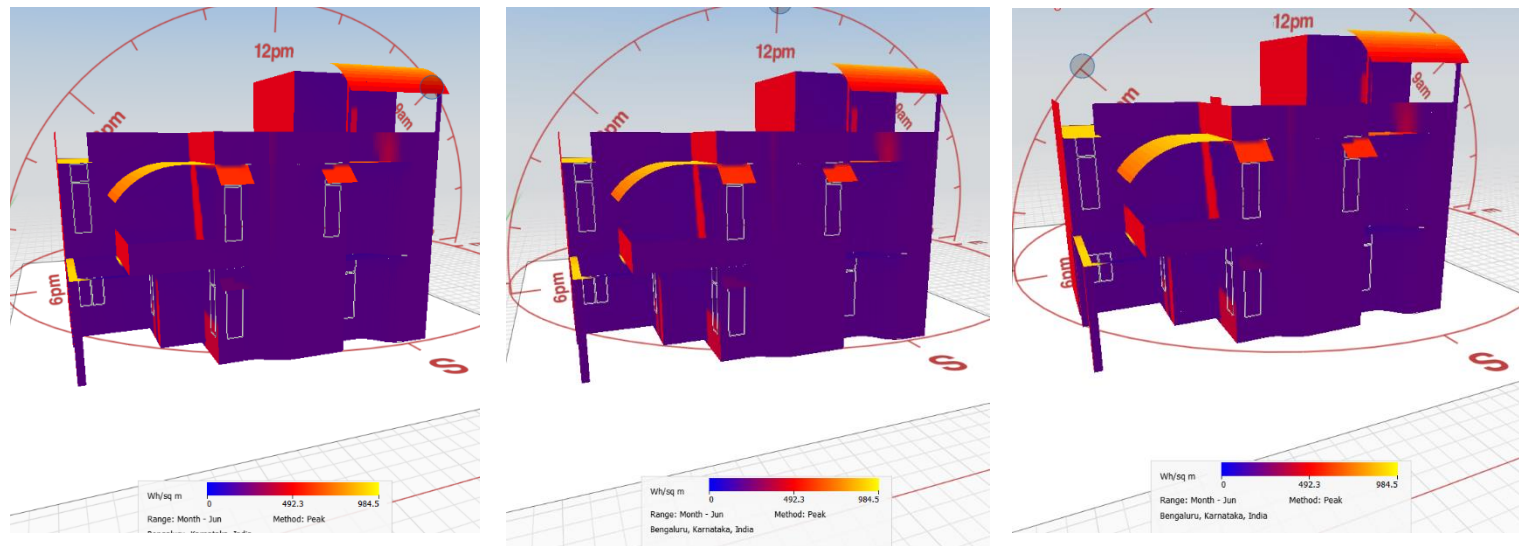


Mud block arch



SATHISH SASTRI & DHARITRI RESIDENCE:

Summer solstice:

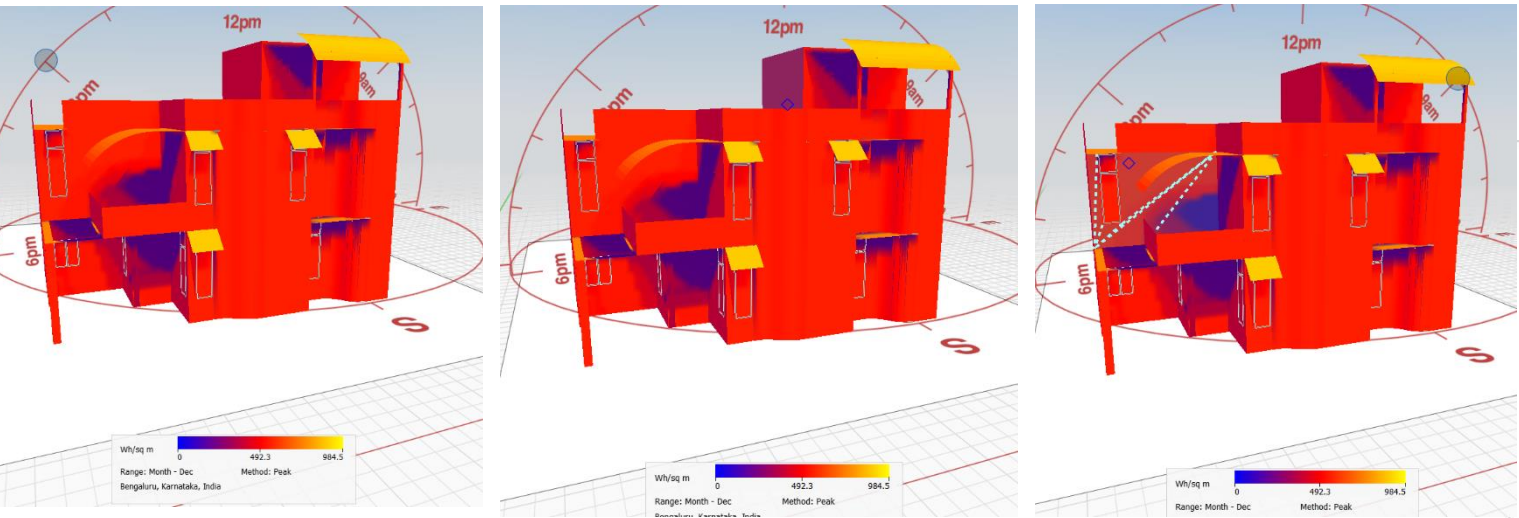


The radiation analysis proved that the house received very less amount of heat in the summer solstice thus reducing the heat gain . But it received large amount of radiation in December thus heating the cold months .

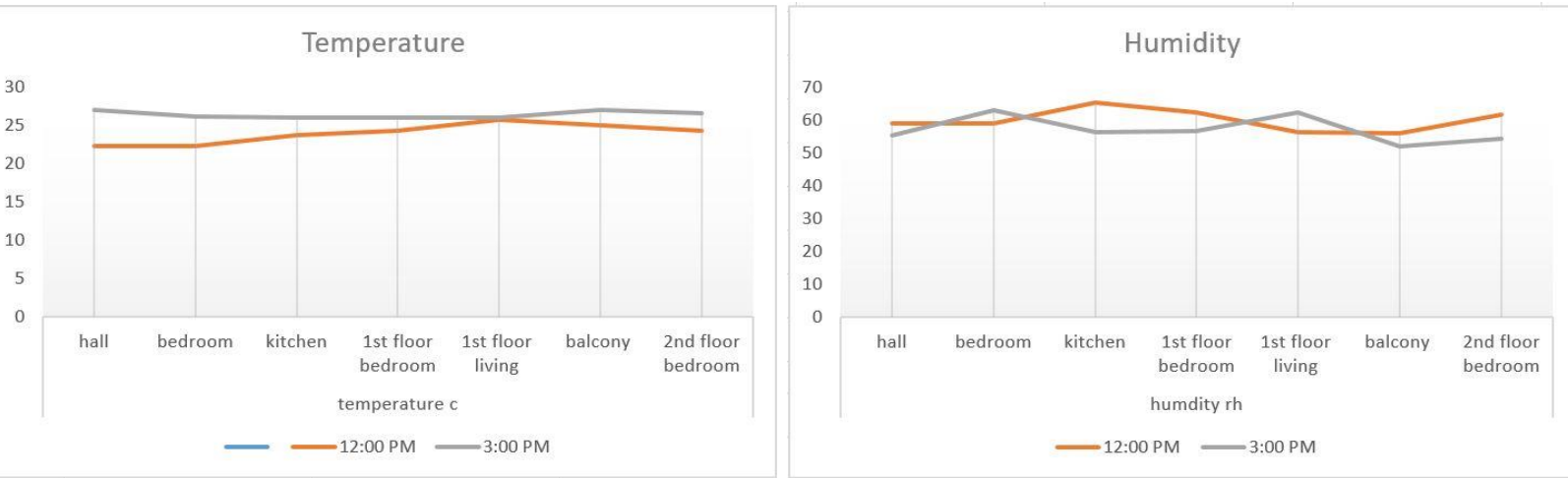
Due curved profile which facilitated the mutual shading of the building it received very less amount of direct sun light.

The curved profile of the Hourdi roof also enhanced the shading of the building and deflected the direct solar radiation falling on the building.

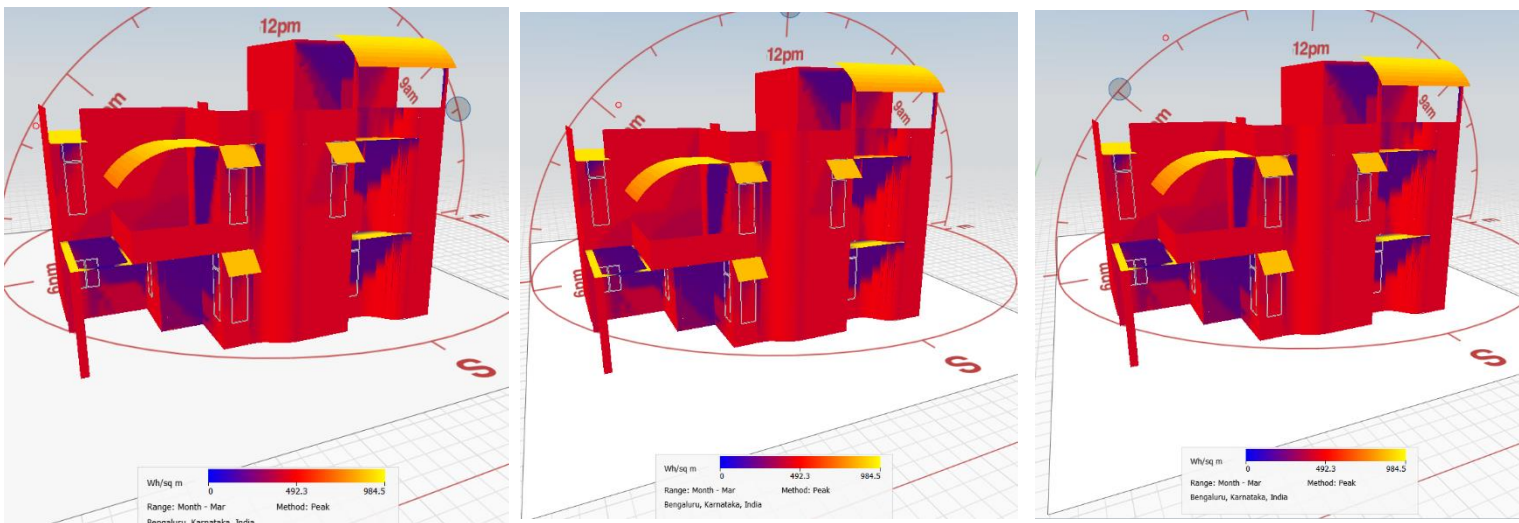
Winter solstice:



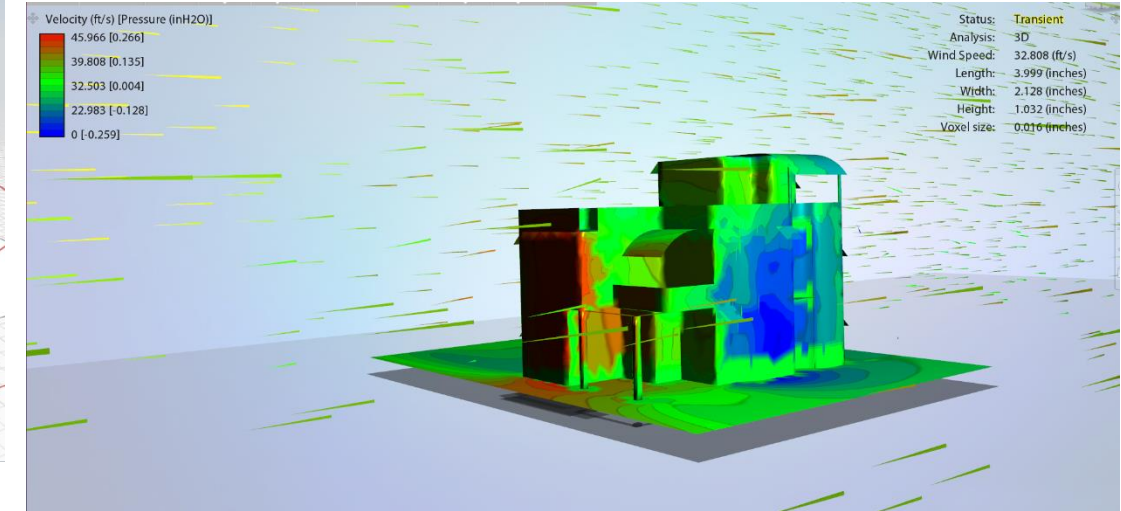
Thermal Analysis:



Equinox:



Wind flow:



VARNASHI HOUSE:

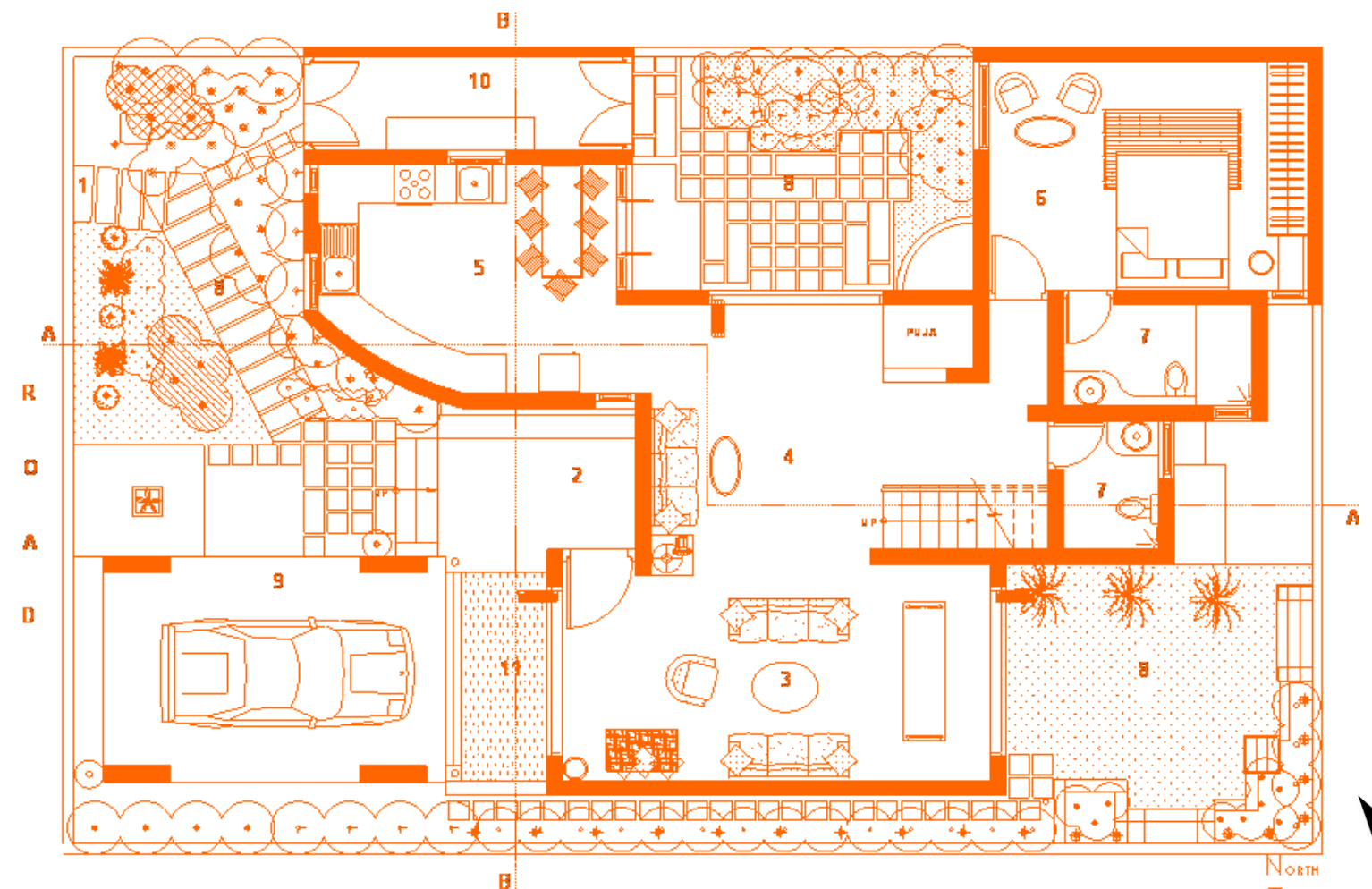
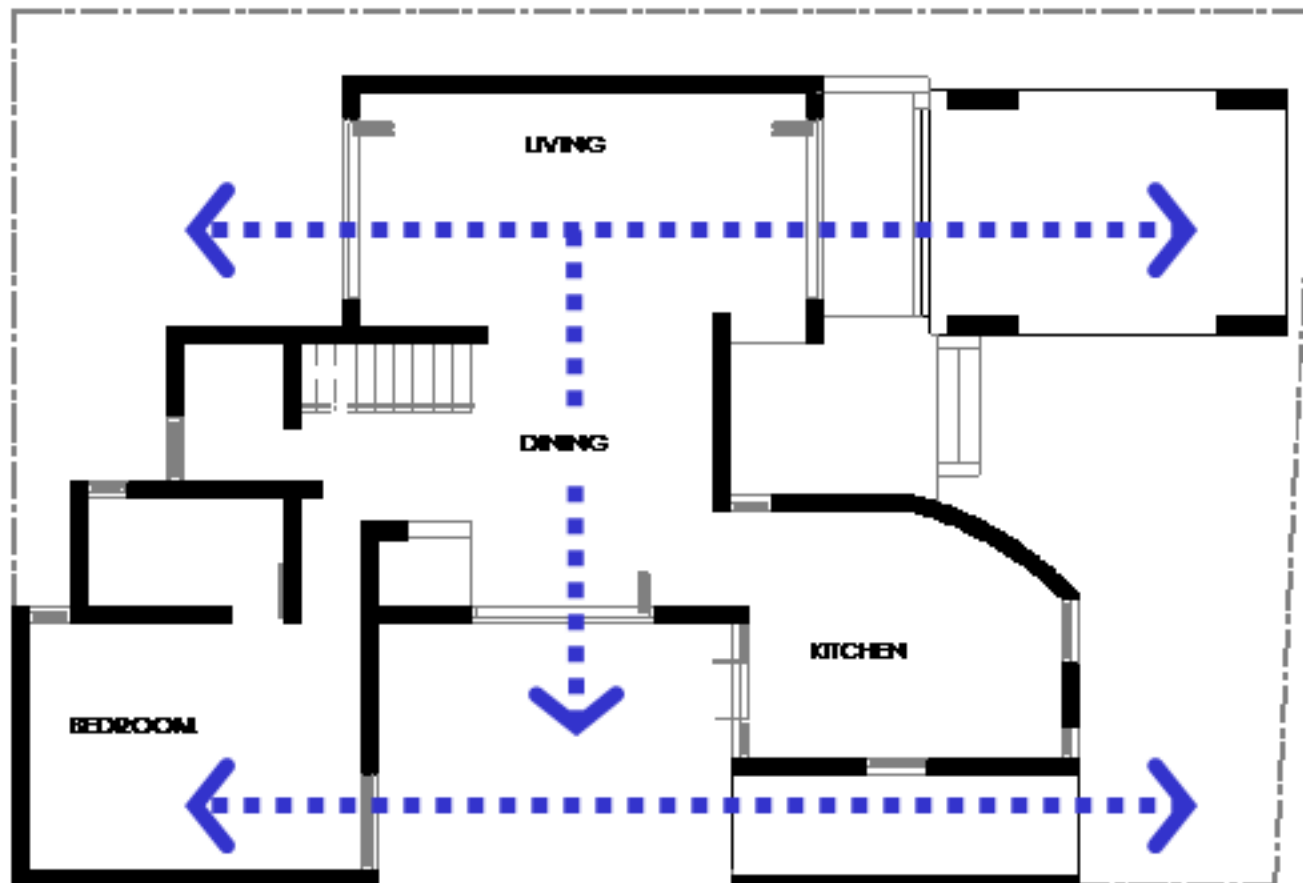
PROJECT DETAILS

LOCATION : kumarasamy layout
Built up area : 2500 sqft (G+2)
Site area : 2400 sqft

The house has a open planning which minimalised the use of internal wall by staggering the spaces. The house also invited the nature inside by providing two major garden spaces which ensured the cross ventilation and a serene ambience to the habitants.

The house had curved roof to avoid the direct solar radiation falling on the roof ,since the roof element is the most exposed surface to direct radiation.

The house also had tall window to facilitate displacement ventilations.The use of roof opening provided ample daylighting and the provision of corner windows has a sense of view and non glaring daylighting .

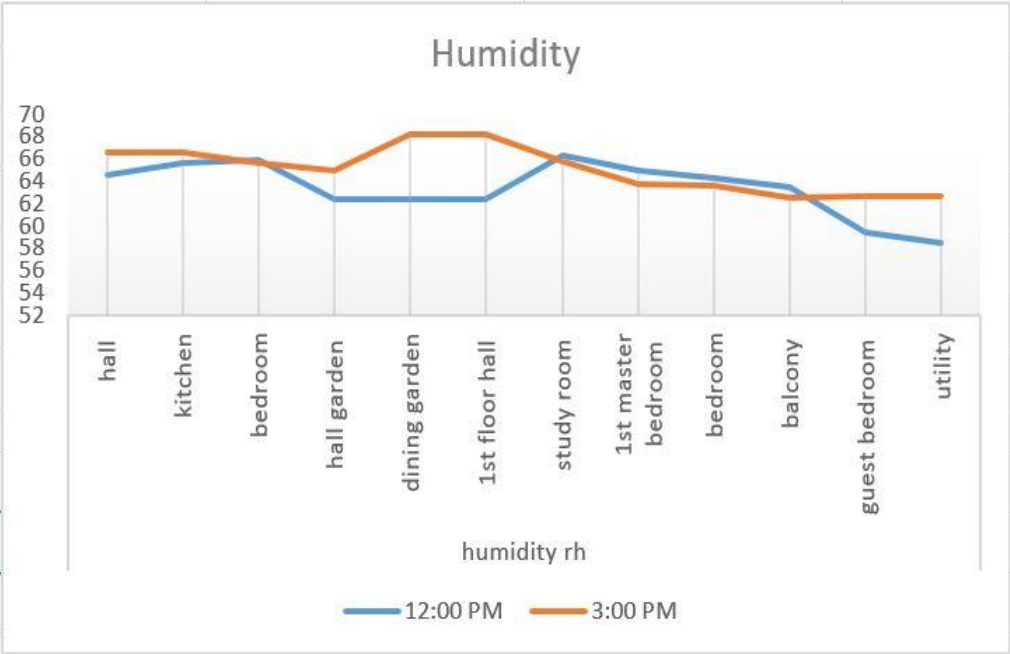


VARNASHI HOUSE:

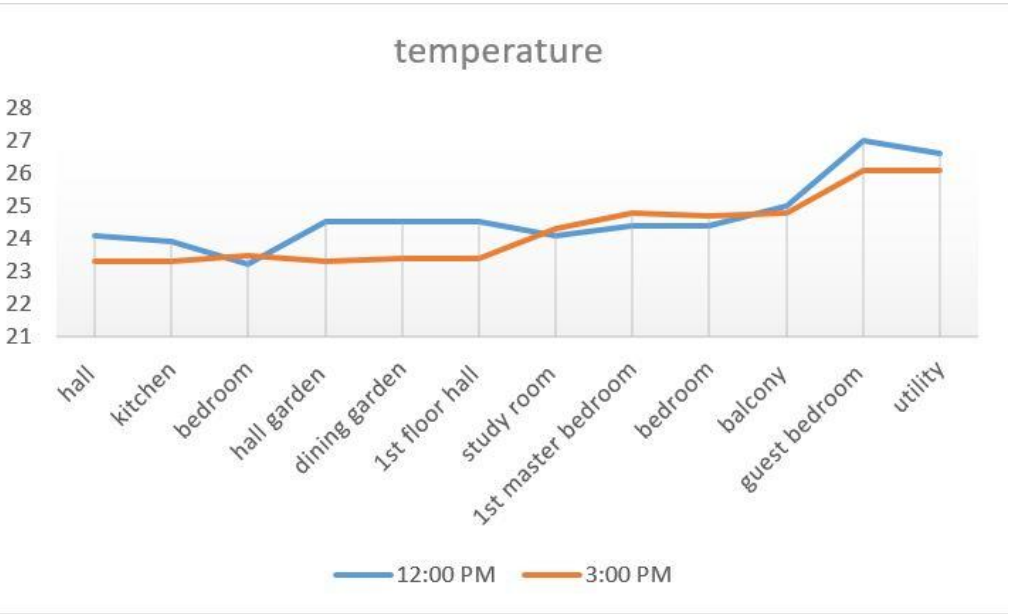
The house has hollow clay block walls and clay tile roofing which decreased the thermal lag and it eventually maintained the indoor thermal comfort of the house.

The use of red oxide flooring throughout the project included authenticity and truth to material.

The measurements from 9am to 3 pm showed a very narrow variation in the temperature and was within the comfort band thus proving the site has a good thermal lag and was responding to the principles.



U- VALUE (W/m2.K)		
Wall	Hollow clay block	0.92
Roof	Clay tile	0.42
	Hourdi roof	1.37
	Concrete- 5"	2.07
Floor	Red oxide flooring	
	Kota	3



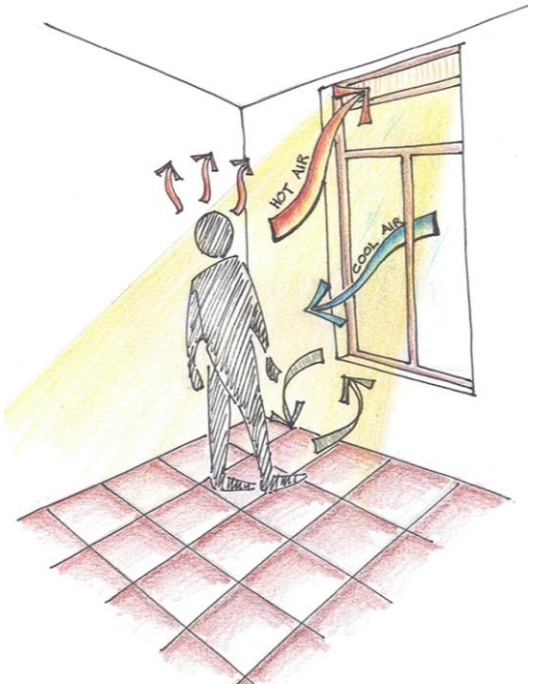
SIJI & BINNY RESIDENCE:

PROJECT DETAILS

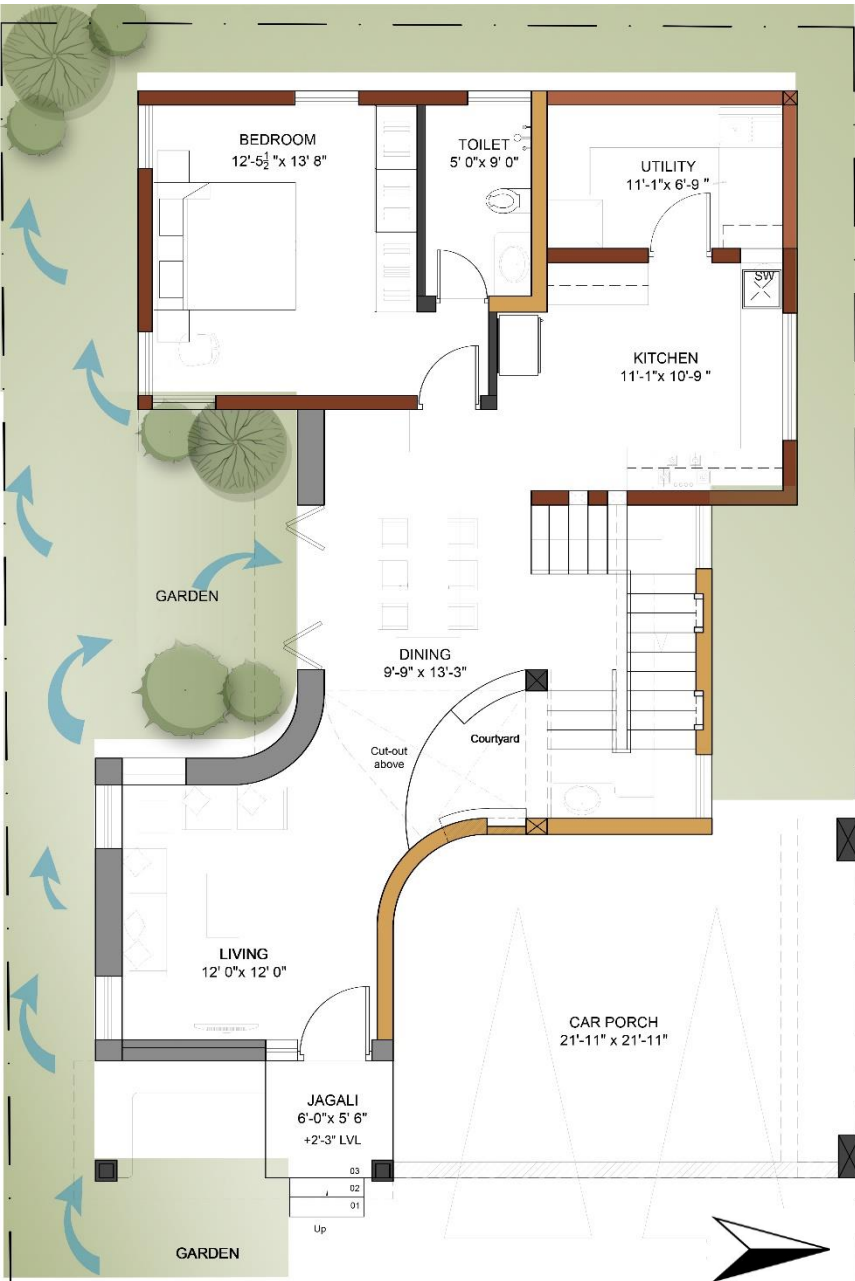
LOCATION : LG lake dew ,Bengaluru
Built up area : GF – 1665 sqft FF – 1157 sqft
Site area : 2400 sqft

There is a combination of stone ,clay and mud blocks being used in the site ,this feature added versatility of material usage and improved the aesthetics of the residence.

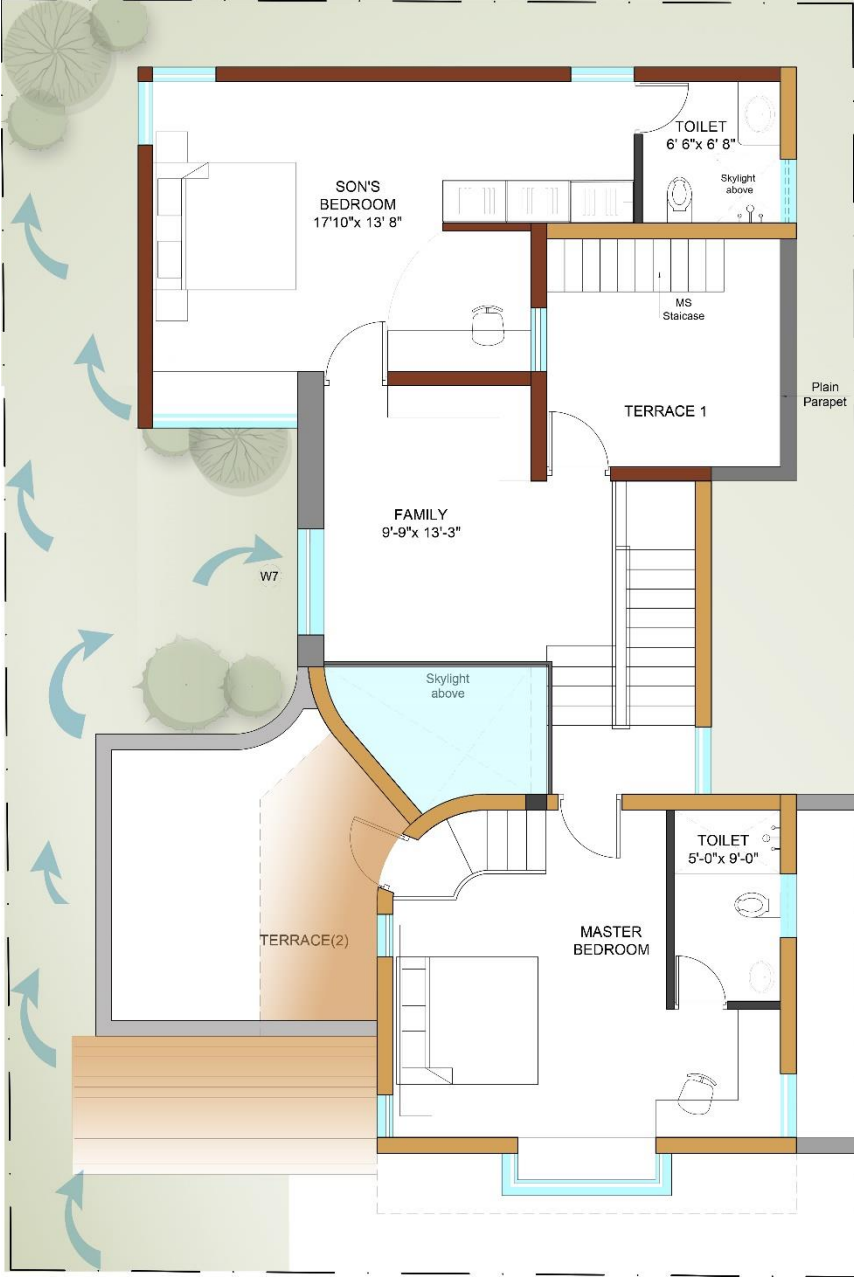
The curved profiles probably received very less amount of direct solar radiation to the residence.



GROUND FLOOR PLAN



FIRST FLOOR PLAN



SIJI & BINNY RESIDENCE:

Material used in the project:

There were applications of jack arches which were aesthetically appealing and also traps and expels hot air.

The proper use of terracotta jallis improved the façade aesthetics and also cooled the air entering the interior.

The materials were locally available and stabilized mud blocks were cast in site to avoid transportation and mass produce.

U- VALUE (W/m2.K)		
Wall	Hollow clay block	0.92
	Stone wall	1.6
	Stabilised Mud block	1.2
Roof	Mangalore tile	0.42
	Hourdi roof	1.37
	Concrete- 5"	2.07
Floor	Red oxide flooring	
	Kota	3

Hourdi tile:



Filler slab roof

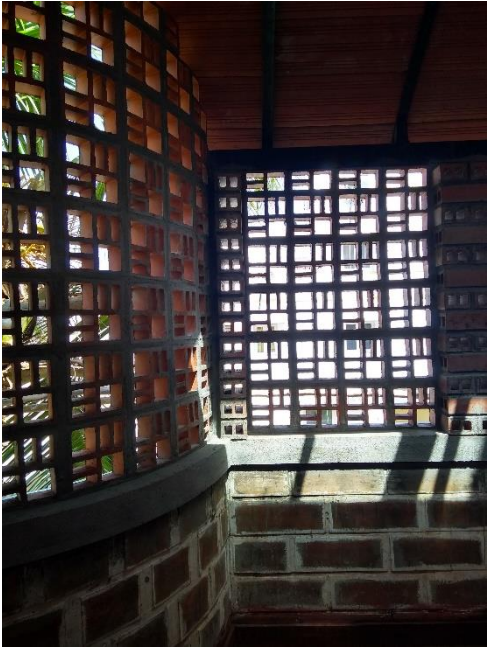


Hollow clay blocks



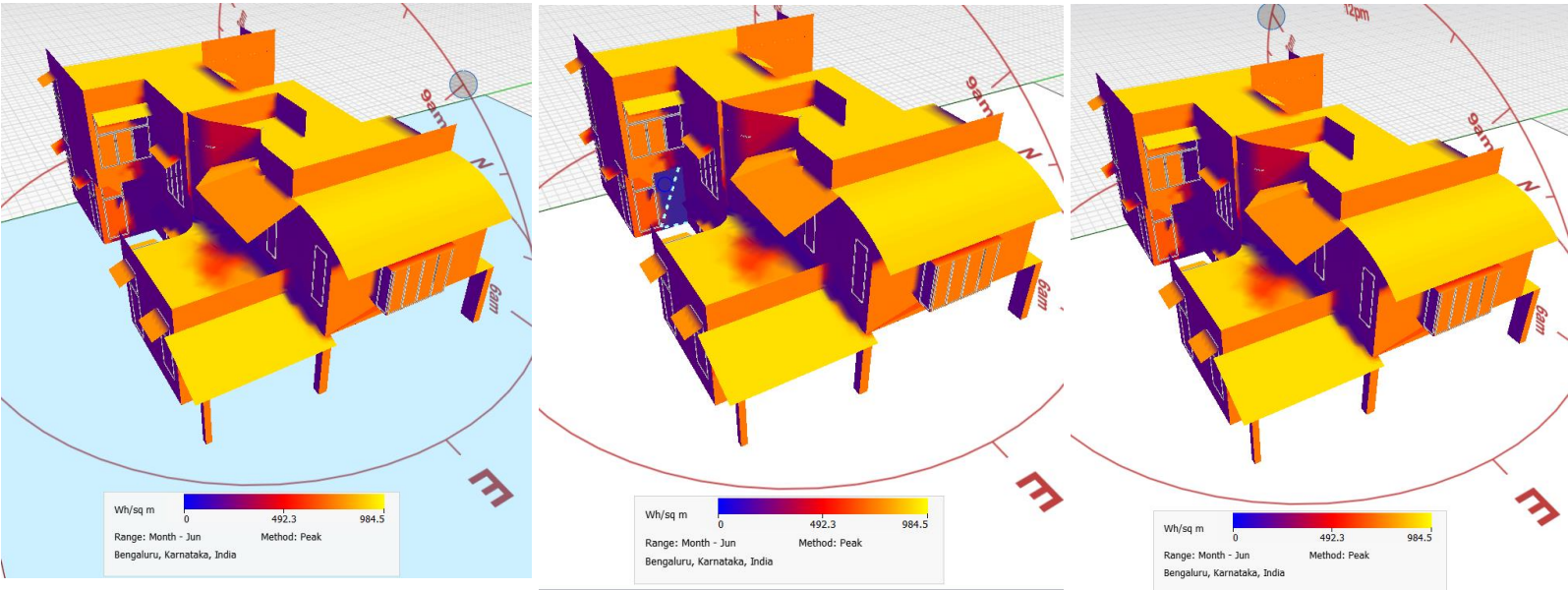
Jack arch roof

Jalli wall

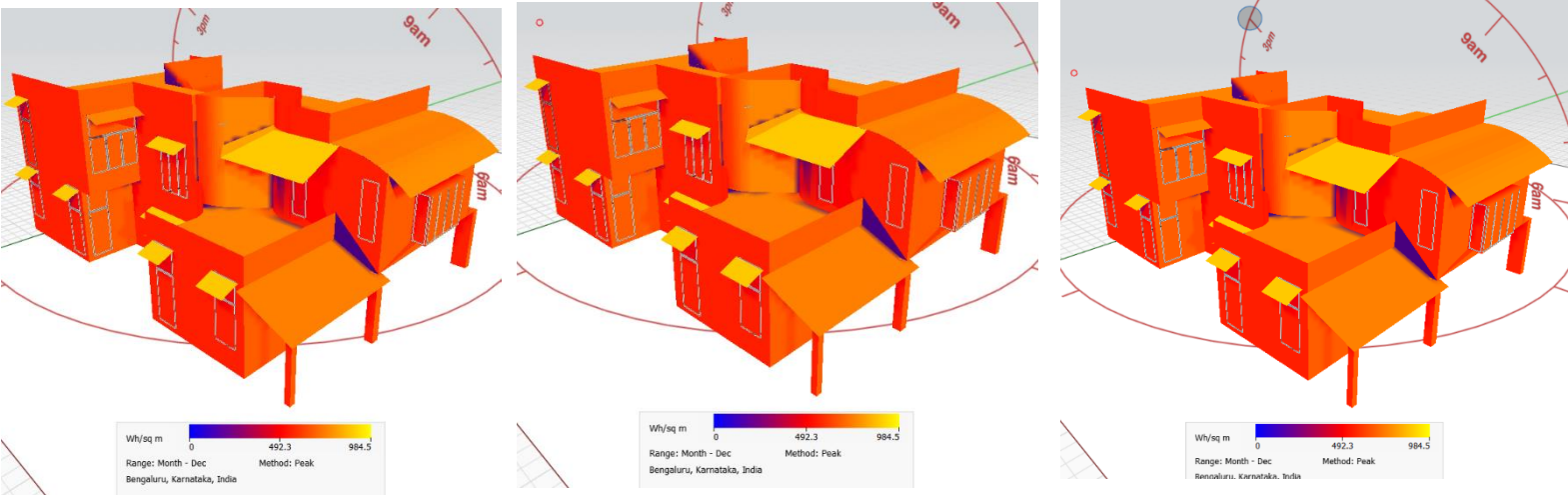


SIJI & BINNY RESIDENCE:

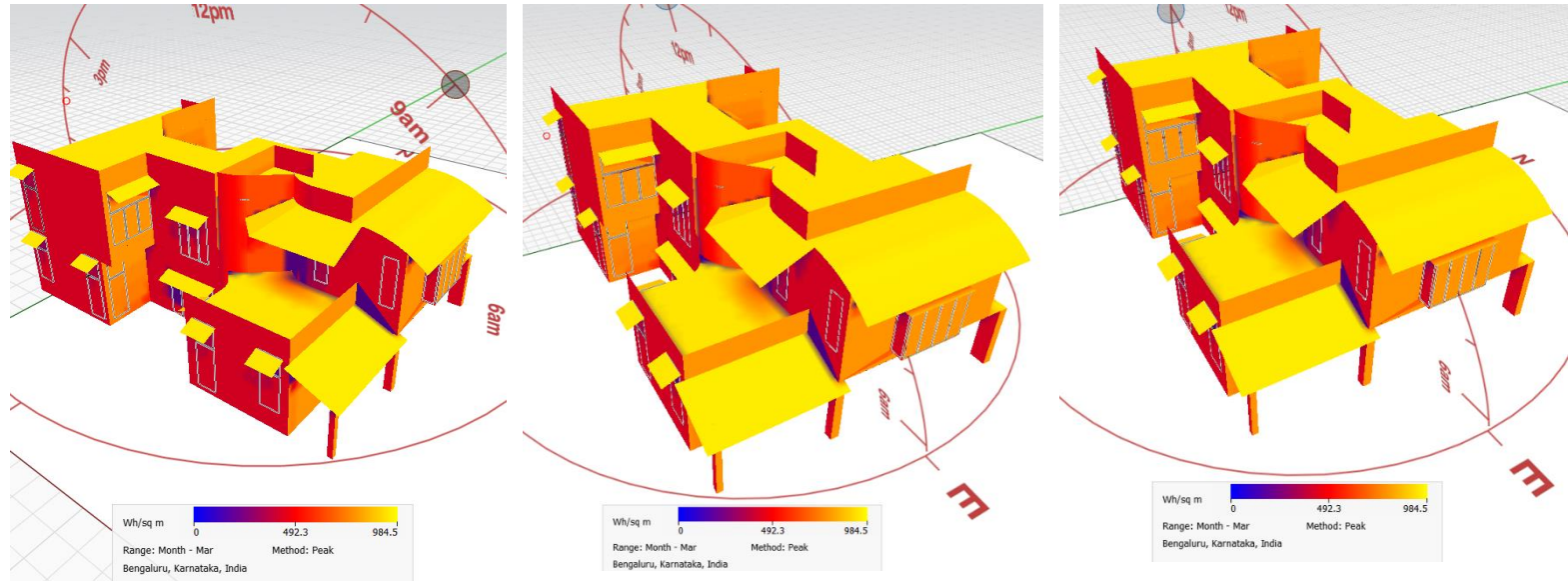
Summer solstice:



Winter solstice:



Equinox:



There were applications of jack arches which were aesthetically appealing and also traps and expels hot air.

The proper use of terracotta jallis improved the façade aesthetics and also cooled the air entering the interior.

The materials were locally available and stabilized mud blocks were cast in site to avoid transportation and mass produce.

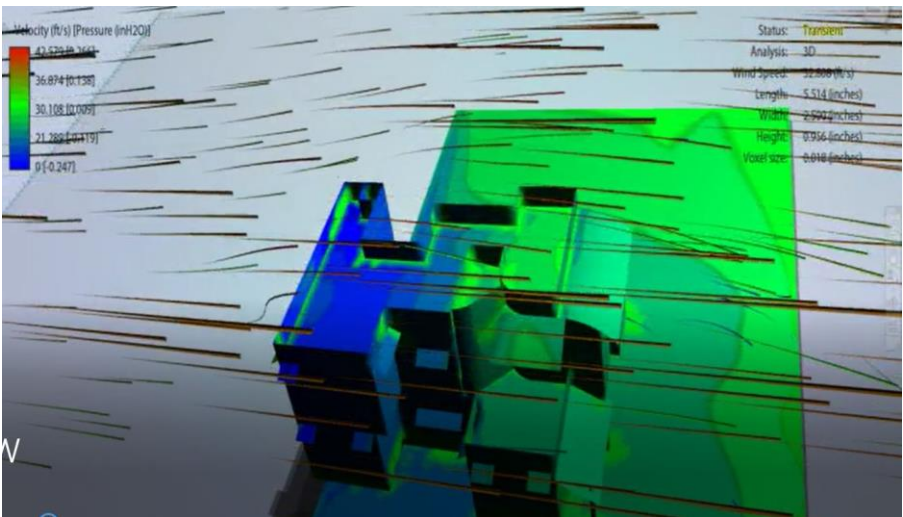
In summer solstice, it experiences the maximum heat and in the north part of the house experience less amount of heat.

The east facing heat get reduced with the curved roof to get enter into the house.

The wind flow directly hit front portion of the house and then get deviated to the central garden of the house. The central court at the house will experience more skylight.

The chajjas are placed in the angled position so the direct sunlight can gets cuts out and the diffused light gets into the house.

Wind flow:



CHENNAI CLIMATE DATA:



Chennai experiences hot and dry humid climate due to the costal area. It does not experiences extreme variation in seasonal temperature. This can increase discomfort considerably.

Comfort band for Chennai- 20 deg.celcius to 24 deg.celcius

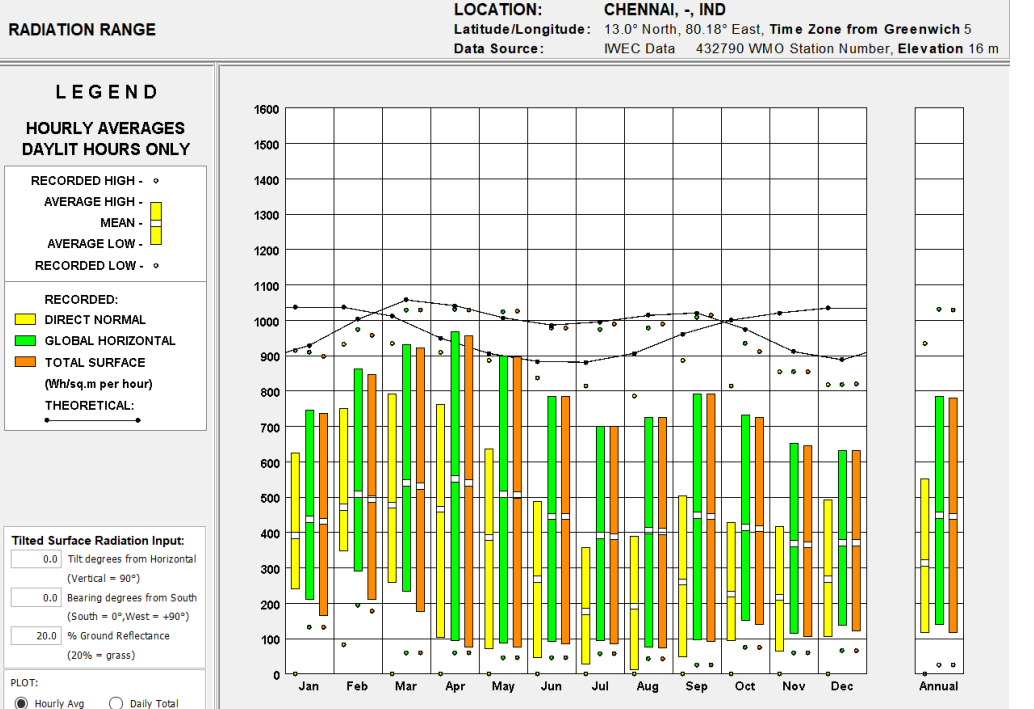
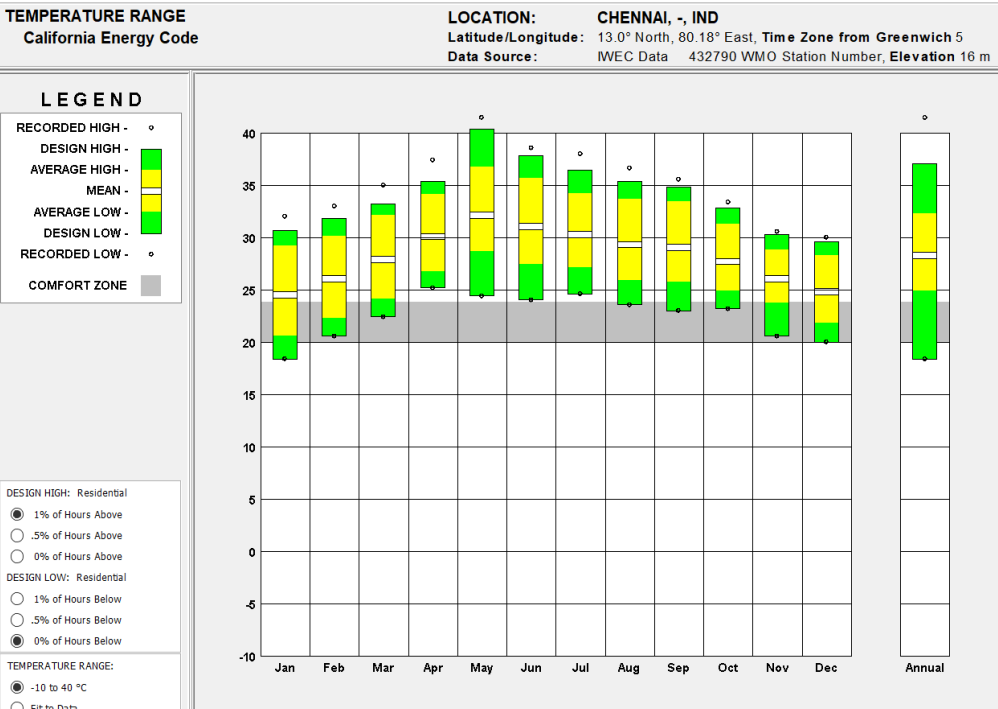
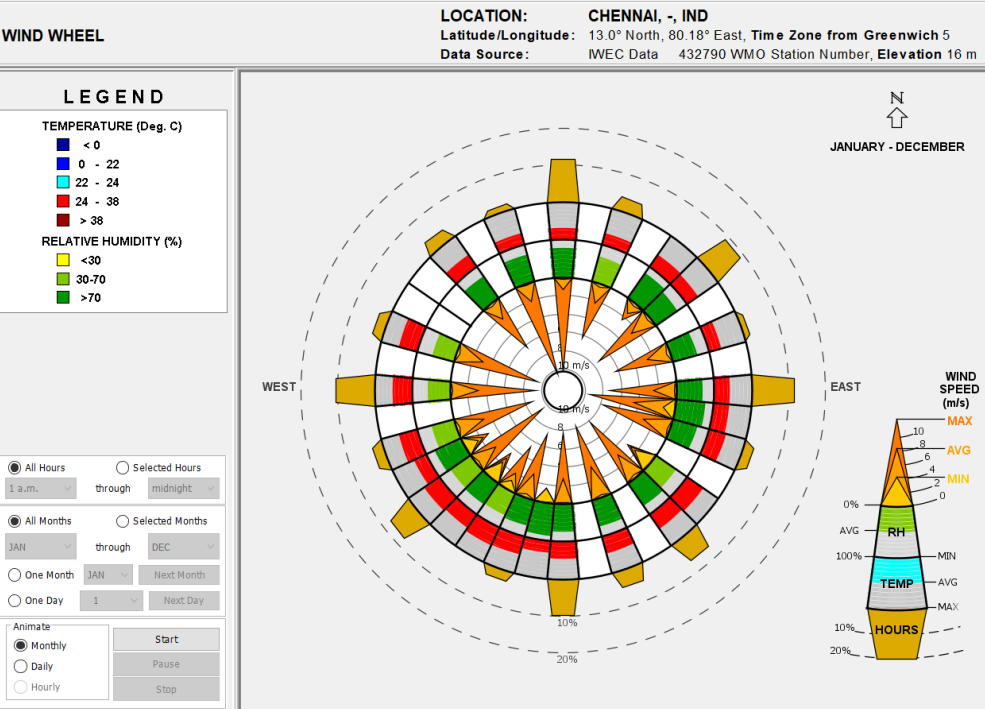
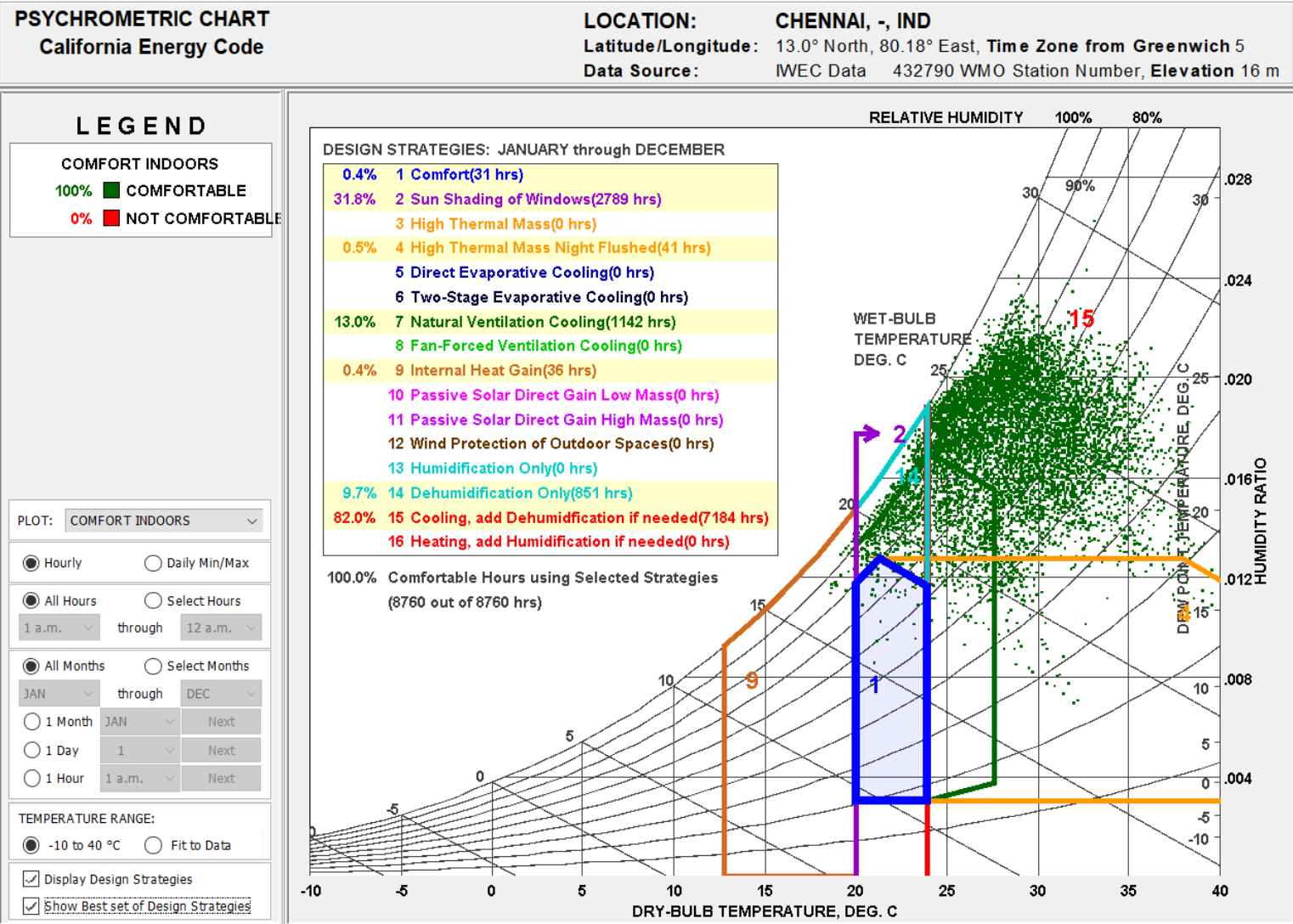
Temperature range:
In summer it experiences 30-35 deg.celcius during daytime and in night 25-30 deg.celcius
In winter 25-30 deg.celcius during day and 20-25 deg.celcius at night.

Humidity:
It experiences very high ranging from 70-90%

Passive strategies:
To reduce heat gain by providing shading, and to promote heat loss by ventilation.
Thick walls should be provided with high ceiling rooms.

PREVAILING WIND DIRECTION:
South east to north west

Radiation range:
The radiation range of Chennai recorded as high in the months of march and recorded low in the month of October.



SUNDAR & GIRISH RESIDENCE:

PROJECT DETAILS

LOCATION : Chennai , Tamil nadu.

Built up area : GF – 1361 sqft FF – 1129 sqft SF – 532 sq.ft

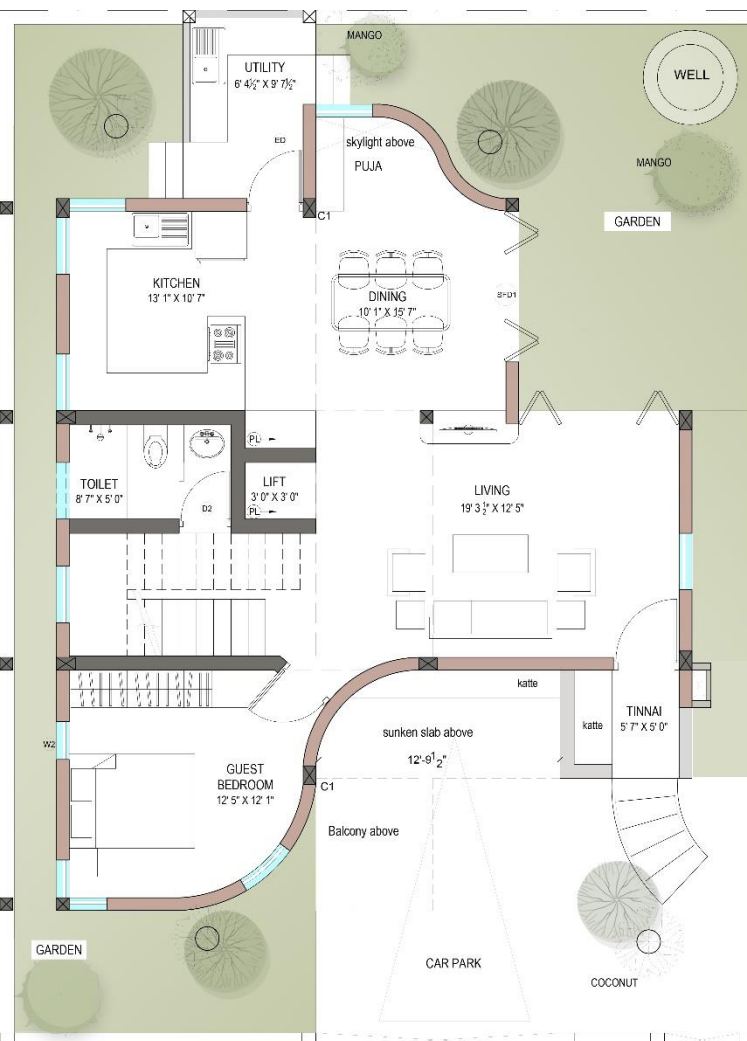
Site area : 2200 sqft

The site is located in the Chennai, tamilnadu . The planning strategies in the site was to plan accordingly since the site has the existing trees , The extensive use of eco-friendly materials such as hollow clay blocks and stone wall has contributed to the aesthetic & sustainable use of locally available materials.

The roofing technique used in the project is filler slab with clay tile which increases the thermal lag by providing a air buffer between the interior and the exterior finally contributing to the reduction of solar heat gain.

The large garden in the north east direction will receive the good wind flow and the sunlight into the building. The conscious use of roof openings has increased the lux levels in major usage areas and has avoided unwanted wall openings.

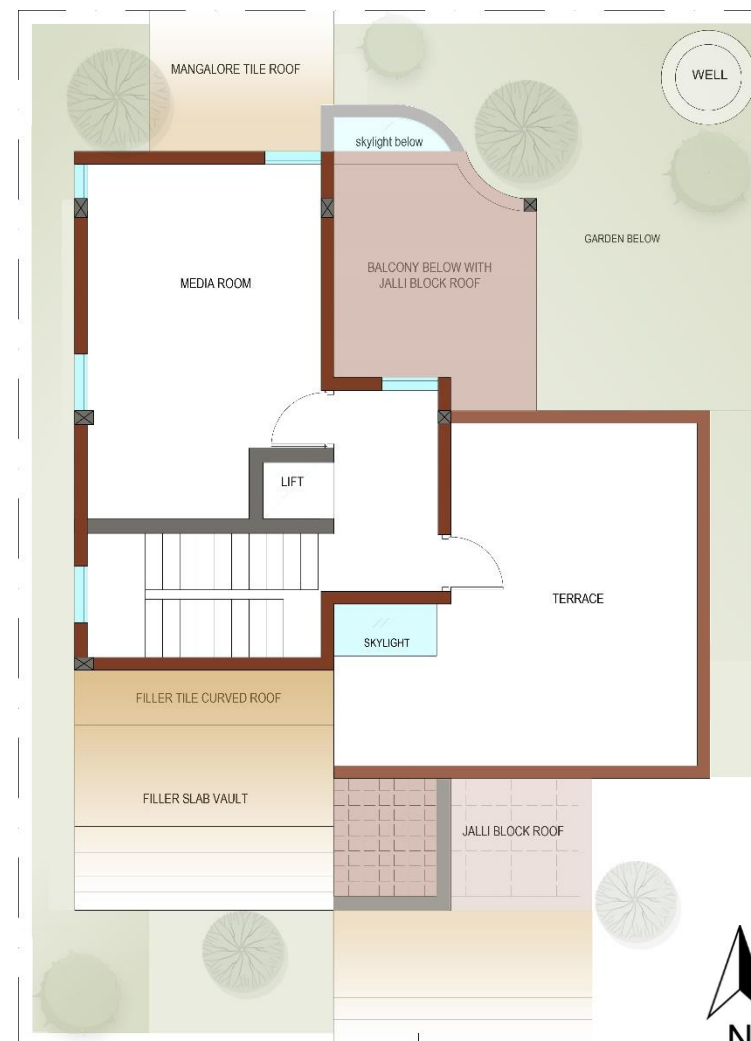
GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



SUNDAR & GIRISH RESIDENCE:

Material used in the project:

The walls were made of hollow clay block and stone wall which had ‘u’ factor not above 1.2 .since the mud blocks could be procured locally the embodied energy was Also less.

The flooring was made of athangudi tiles which are mostly handmade and not mass produced. The tiles also were made of locally available clay so the embodied energy in them also were very less. The jalli roof techniques which has the more skylight and aesthetically pleasing to the building.

The provision of tall windows were helping with the displacement ventilation which would expel the hot air .

	U- VALUE (W/m2.K)	
Wall		
	Hollow clay block	0.92
Roof		
	clay tile	0.42
	Hourdi tile	1.37
	Concrete- 5"	2.07
Floor		
	Athangudi tile	
	Kota	3

Hourdi tile:



Filler slab roof

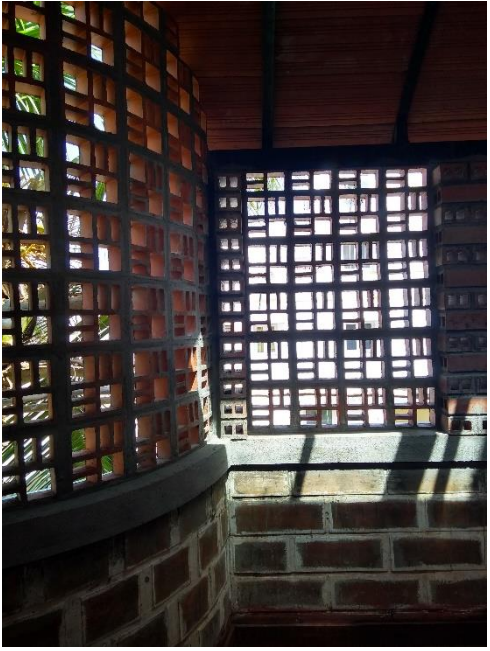


Hollow clay blocks



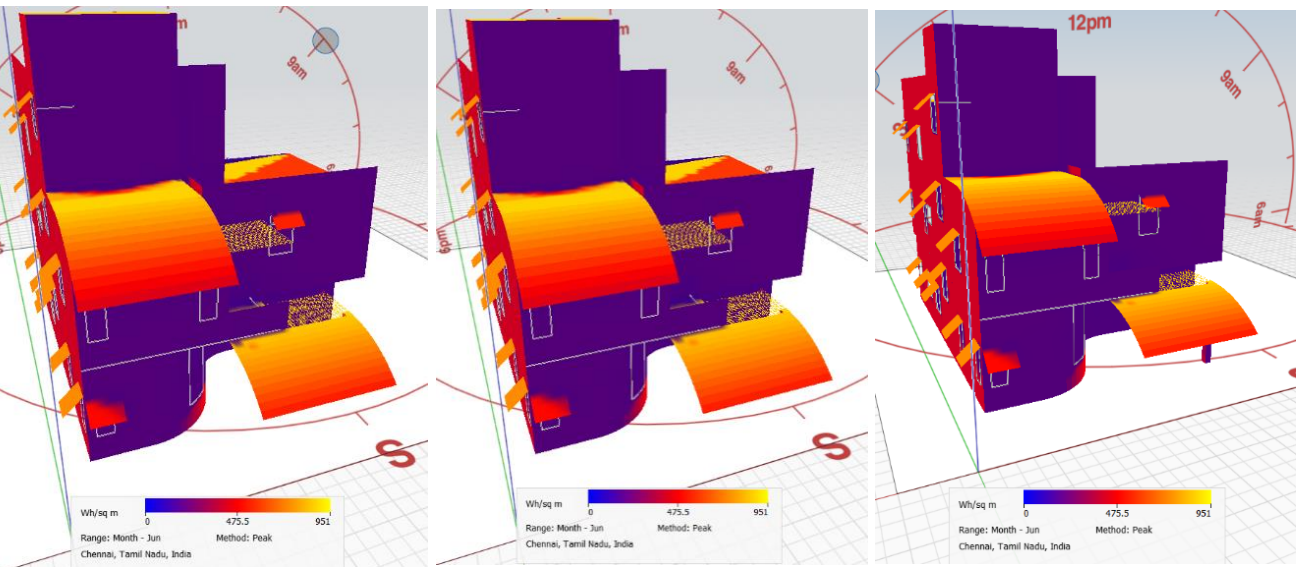
Jack arch roof

Mud block arch

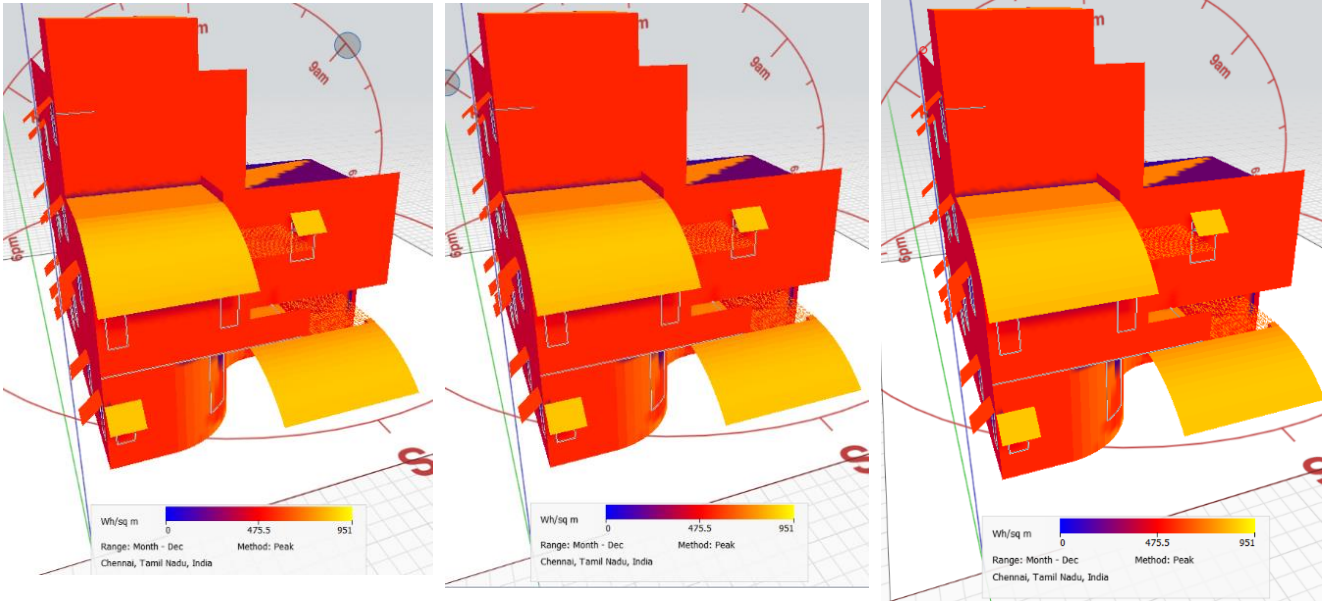


SUNDAR & GIRISH RESIDENCE:

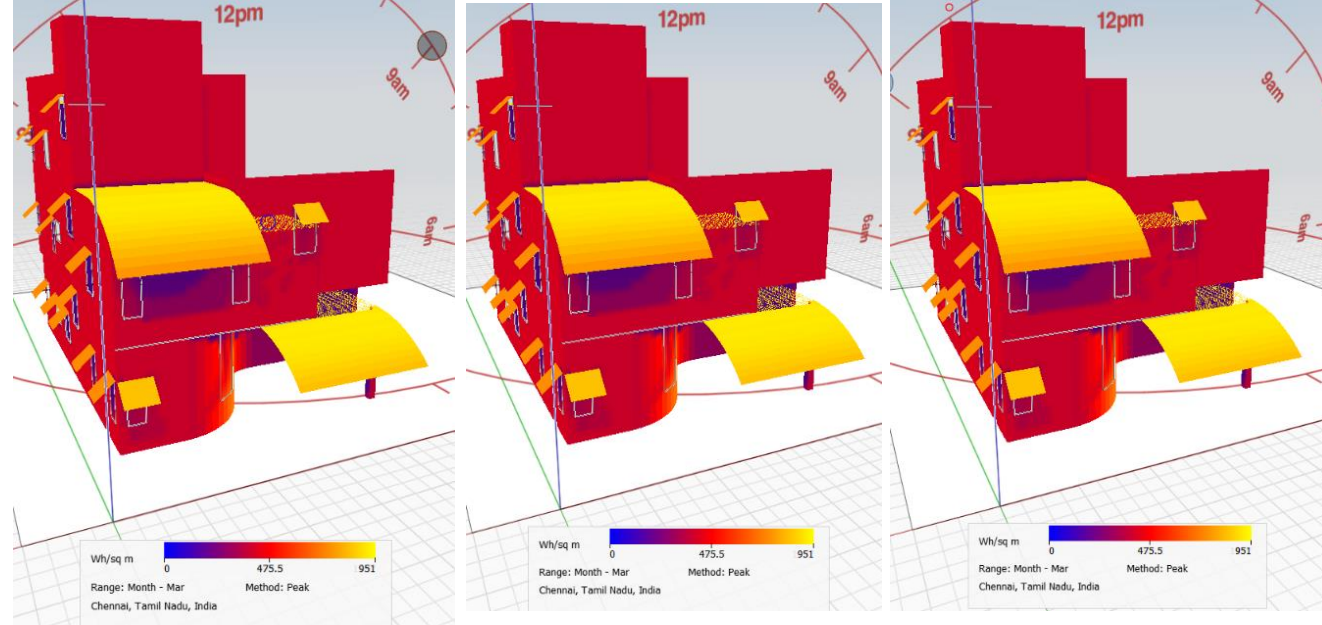
Winter solstice:



Summer solstice:



Equinox:



INFERENCE:

The thermal analysis of the residence has been done in the software. The radiation energy has been analysed in the form it. In the orientation of the site is east facing direction, where the direct heat gets enter into the building.

To cut down the direct heat into the building , the south facing wall has been constructed with hollow clay block and the roof are done with the curved filler slab roof, so the heat will get reduced inside the building.

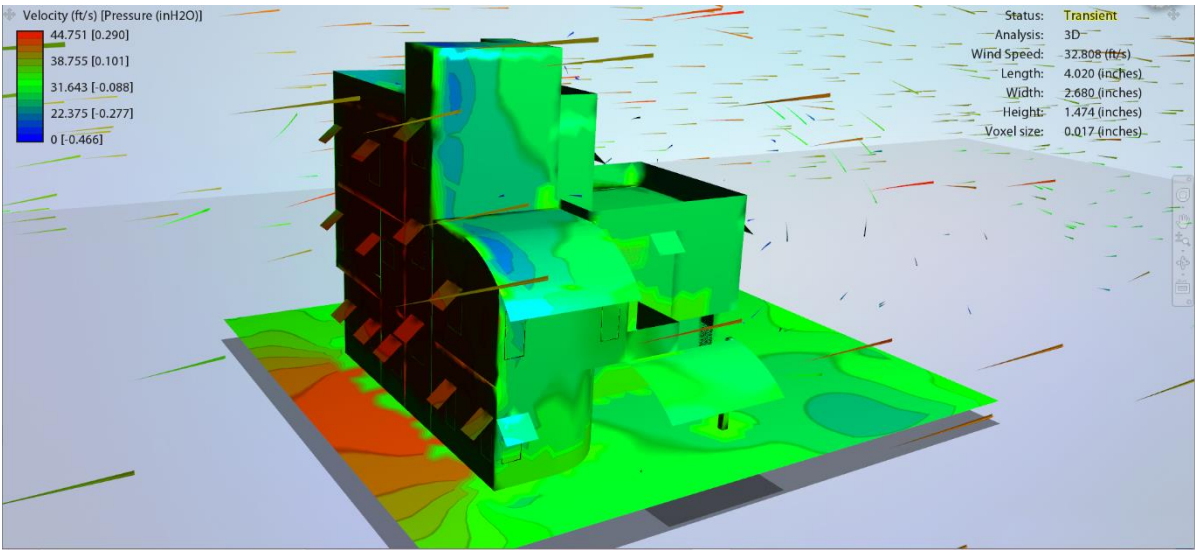
Since the large garden in the north east region of the residence the light will passes throughout the building.

In summer solstice, the building experiences high amount of heat while comparing to the other climatic region. The major amount of heat gets fall on the roof.

The roof of the building is done with filler slab. In which the cavity will cut the heat into building, and the balconies are covered with the hourdi tile roofing.

To satisfy the lux level the buildings have the clerestory window, so the building experiences the maximum amount of daylight gets into the building.

Wind flow:



The predominant wind flow for the site is west direction.

The garden are placed in the for the residence and opening in the north east direction will helps the cool breeze to enter into the building.

HYDERABAD CLIMATE DATA:



Temperature Range:

During the summer months, the temperature goes as high as 42 deg. Celsius and in winter as the minimum temperature may come down to as low as 12 deg.celcius. Hyderabad has hottest part in the summer and coldest part in the winter.

Hyderabad has a unique combination of a tropical wet and dry climate that borders on a hot semi- arid climate. The climate of Hyderabad remains fairly warm through most parts of the year and does not receive much rainfall in the monsoon.

Winters in north and central part of India, temperature marginally come down in the months of December and January and the nights become quite cool in and around Hyderabad city.

PREVAILING WIND DIRECTION

west is the prevailing wind direction in the month of may to September.

Radiation range:

The radiation range for Hyderabad recorded high in the month of February and recorded low in the month of September.

PSYCHROMETRIC CHART California Energy Code

LOCATION: Hyderabad, Andhra Pradesh, IND
Latitude/Longitude: 17.45° North, 78.47° East, Time Zone from Greenwich 5
Data Source: ISHRAE 431280 WMO Station Number, Elevation 545 m

LEGEND

COMFORT INDOORS
100% COMFORTABLE
0% NOT COMFORTABLE

PLOT: COMFORT INDOORS

Hourly Daily Min/Max

All Hours Select Hours

1 a.m. through 12 a.m.

All Months Select Months

JAN through DEC

1 Month 1 Day 1 Hour

1 a.m. Next

TEMPERATURE RANGE:

-10 to 40 °C Fit to Data

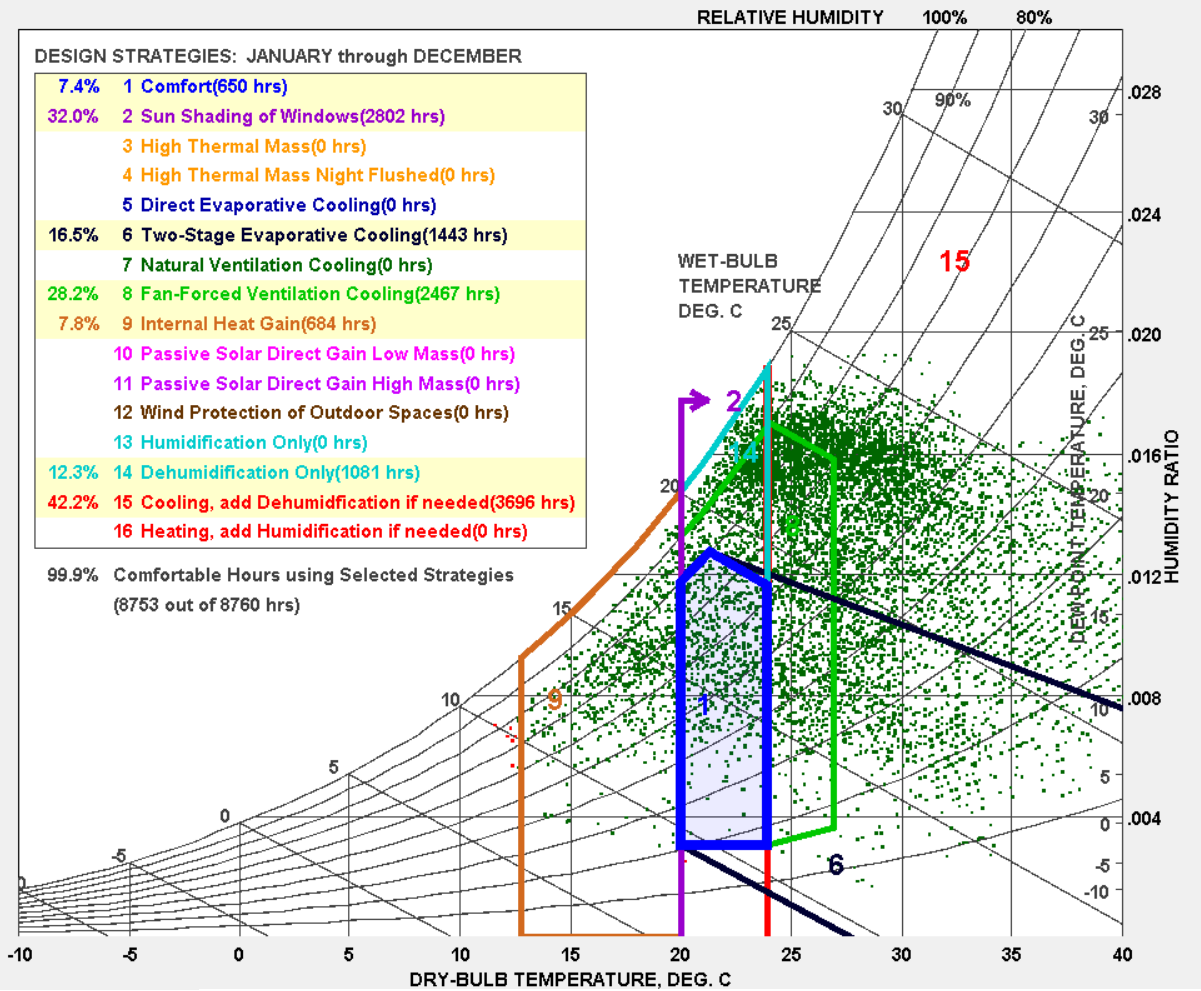
Display Design Strategies

Show Best set of Design Strategies

DESIGN STRATEGIES: JANUARY through DECEMBER

- 7.4% 1 Comfort(650 hrs)
- 32.0% 2 Sun Shading of Windows(2802 hrs)
- 3 High Thermal Mass(0 hrs)
- 4 High Thermal Mass Night Flushed(0 hrs)
- 5 Direct Evaporative Cooling(0 hrs)
- 16.5% 6 Two-Stage Evaporative Cooling(1443 hrs)
- 7 Natural Ventilation Cooling(0 hrs)
- 28.2% 8 Fan-Forced Ventilation Cooling(2467 hrs)
- 7.8% 9 Internal Heat Gain(684 hrs)
- 10 Passive Solar Direct Gain Low Mass(0 hrs)
- 11 Passive Solar Direct Gain High Mass(0 hrs)
- 12 Wind Protection of Outdoor Spaces(0 hrs)
- 13 Humidification Only(0 hrs)
- 12.3% 14 Dehumidification Only(1081 hrs)
- 42.2% 15 Cooling, add Dehumidification if needed(3696 hrs)
- 16 Heating, add Humidification if needed(0 hrs)

99.9% Comfortable Hours using Selected Strategies
(8753 out of 8760 hrs)



WIND WHEEL LOCATION: Hyderabad, Andhra Pradesh, IND
Latitude/Longitude: 17.45° North, 78.47° East, Time Zone from Greenwich 5
Data Source: ISHRAE 431280 WMO Station Number, Elevation 545 m

LEGEND

TEMPERATURE (Deg. C)

< 0

0 - 22

22 - 24

24 - 38

> 38

RELATIVE HUMIDITY (%)

< 30

30-70

> 70

All Hours Selected Hours

1 a.m. through midnight

All Months Selected Months

JAN through DEC

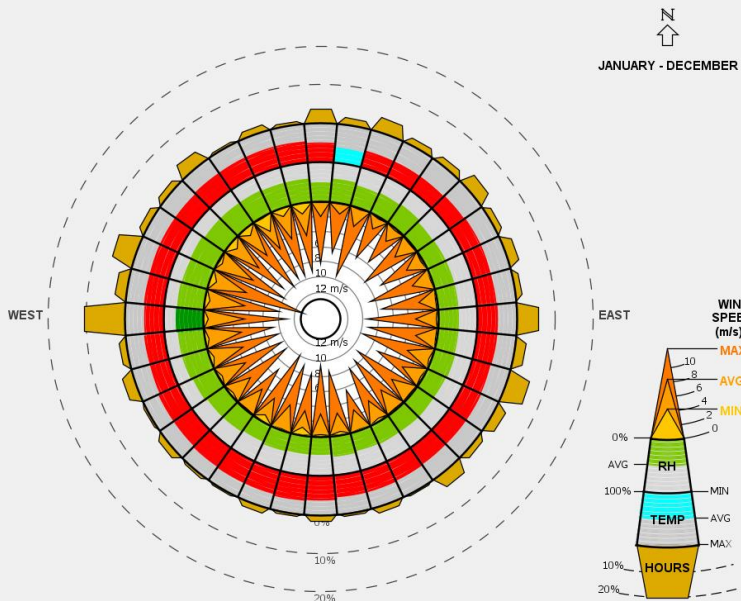
One Month 1 Day 1 Hour

1 a.m. Next

Animate

Monthly Daily Hourly

Start Pause Stop



TEMPERATURE RANGE
California Energy Code

LOCATION: Hyderabad, Andhra Pradesh, IND
Latitude/Longitude: 17.45° North, 78.47° East, Time Zone from Greenwich 5
Data Source: ISHRAE 431280 WMO Station Number, Elevation 545 m

LEGEND

RECORDED HIGH -

DESIGN HIGH -

AVERAGE HIGH -

MEAN -

AVERAGE LOW -

DESIGN LOW -

RECORDED LOW -

COMFORT ZONE

DESIGN HIGH: Residential

1% of Hours Above

.5% of Hours Above

0% of Hours Above

DESIGN LOW: Residential

1% of Hours Below

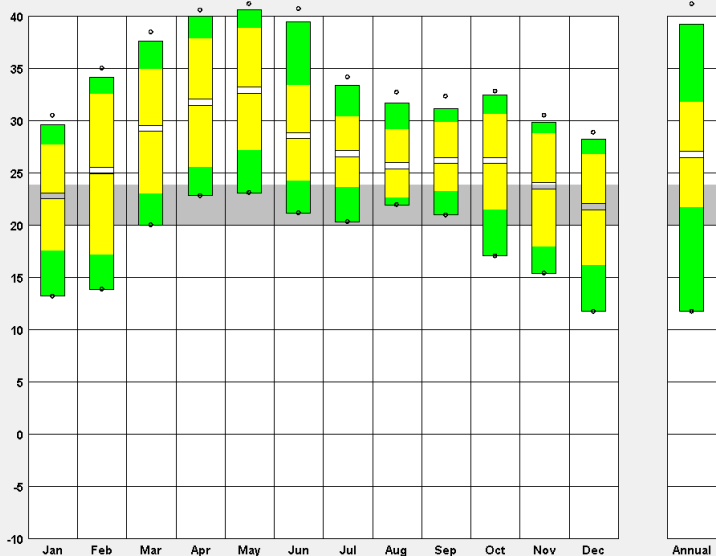
.5% of Hours Below

0% of Hours Below

TEMPERATURE RANGE:

-10 to 40 °C

Fit to Data



RADIATION RANGE

LOCATION: Hyderabad, Andhra Pradesh, IND
Latitude/Longitude: 17.45° North, 78.47° East, Time Zone from Greenwich 5
Data Source: ISHRAE 431280 WMO Station Number, Elevation 545 m

LEGEND

HOURLY AVERAGES

DAYLIT HOURS ONLY

RECORDED HIGH -

AVERAGE HIGH -

MEAN -

AVERAGE LOW -

RECORDED LOW -

RECORDED:

DIRECT NORMAL

GLOBAL HORIZONTAL

TOTAL SURFACE

(Wh/sq.m per hour)

THEORETICAL:

Tilted Surface Radiation Input:

0.0 Tilt degrees from Horizontal

(Vertical = 90°)

0.0 Bearing degrees from South

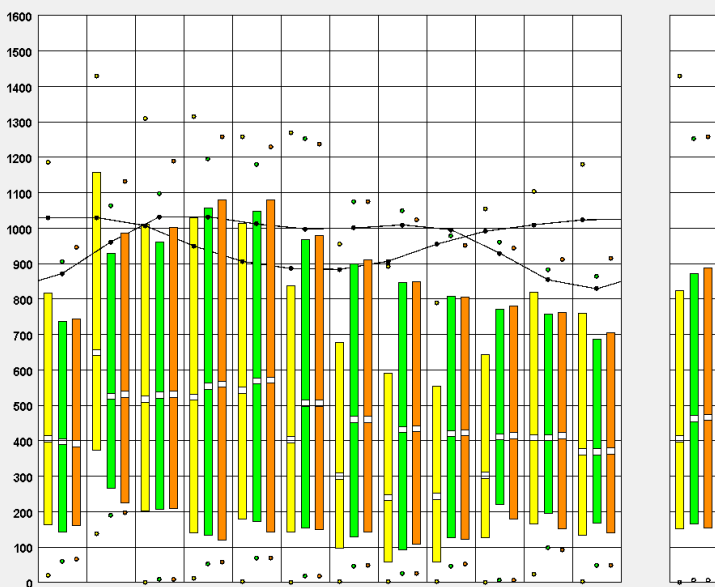
(South = 0°, West = +90°)

20.0 % Ground Reflectance

(20% = grass)

PLOT:

Hourly Avg Daily Total



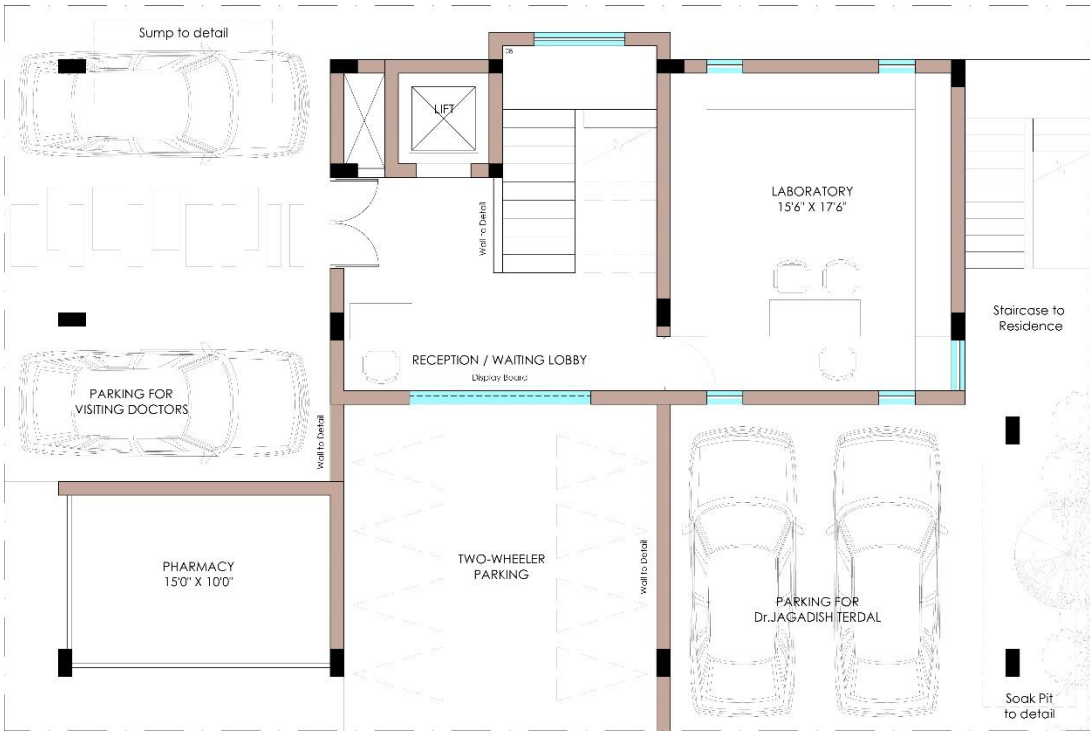
SHIVAGANGA HOSPITAL – ATHANI :

PROJECT DETAILS

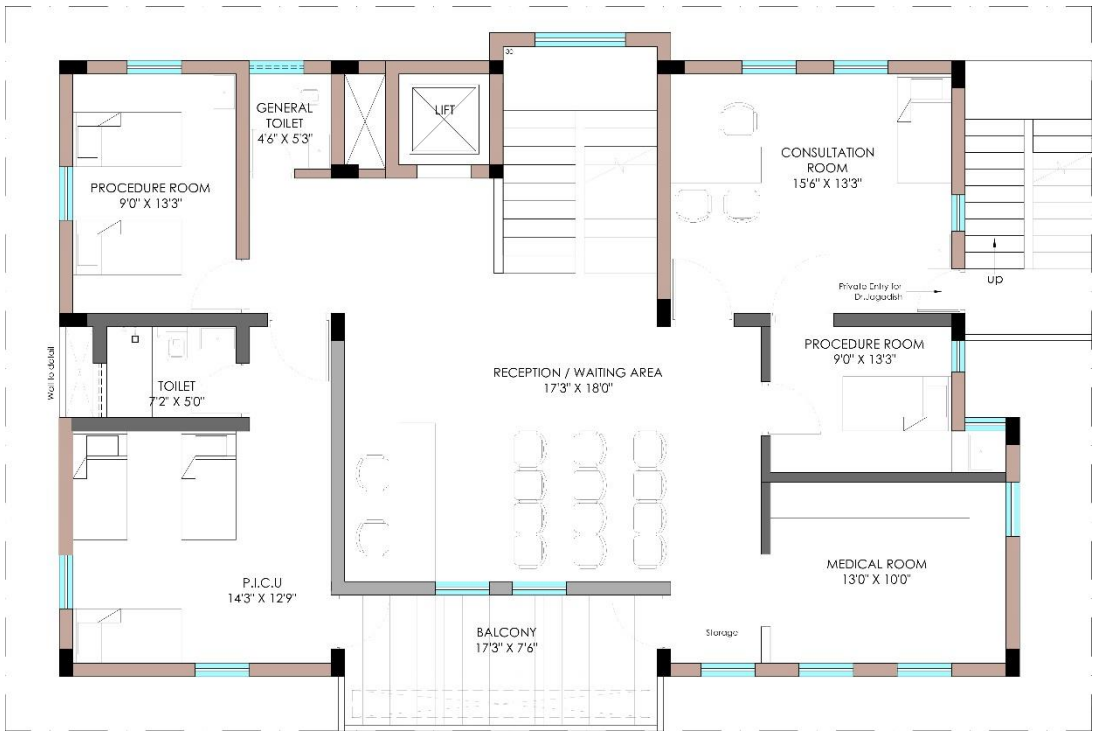
LOCATION : Athani , Karnataka
Built up area : SF – 2148 sqft ; GF – 1927 sq.ft; FF – 1798 sqft ; SF- 1700 sq.ft; TF – 1636 sq.ft
Site area : 2400 sqft

This project is a mixed use building. The client’s hospital at the first 2 storeys and next 2 storeys with their residence.

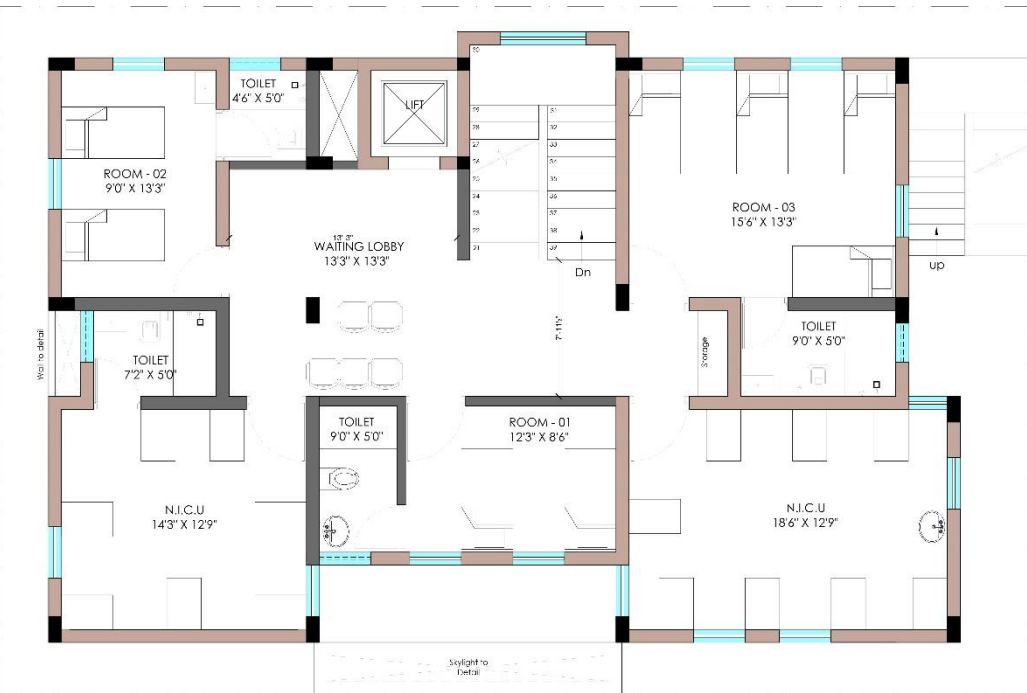
GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN



FOURTH FLOOR PLAN



SHIVAGANGA HOSPITAL – ATHANI :

Hourdi tile:

Material used in the project:

This walls were made of hollow clay block and stone wall which had ‘u’ factor not above 1.2 .since the stone wall was used in the east direction of the residence to cut down the direct heat radiation to get enter into the building could be procured locally the embodied energy was Also less.

The provision of tall windows were helping with the displacement ventilation which would expel the hot air .

Jalli walls are placed, so the hot air can convert into the cool breeze while entering into the building.

Red oxide flooring will reduce the embodied energy of the building and also has very less heat producing factor.

U- VALUE (W/m2.K)		
Wall	Hollow clay block	0.92
	Stone wall	1.6
Roof	Clay tile	0.42
	Hourdi roof	1.37
	Concrete- 5"	2.07
Floor	Red oxide flooring	
	Kota	3



Hollow clay block arch



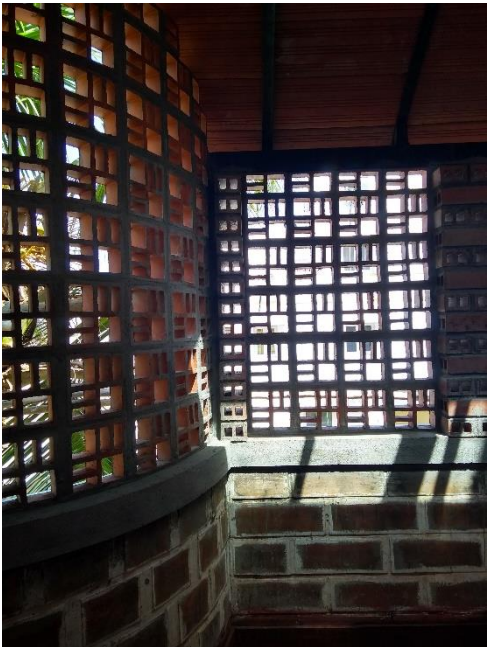
Hollow clay blocks



Jack arch roof

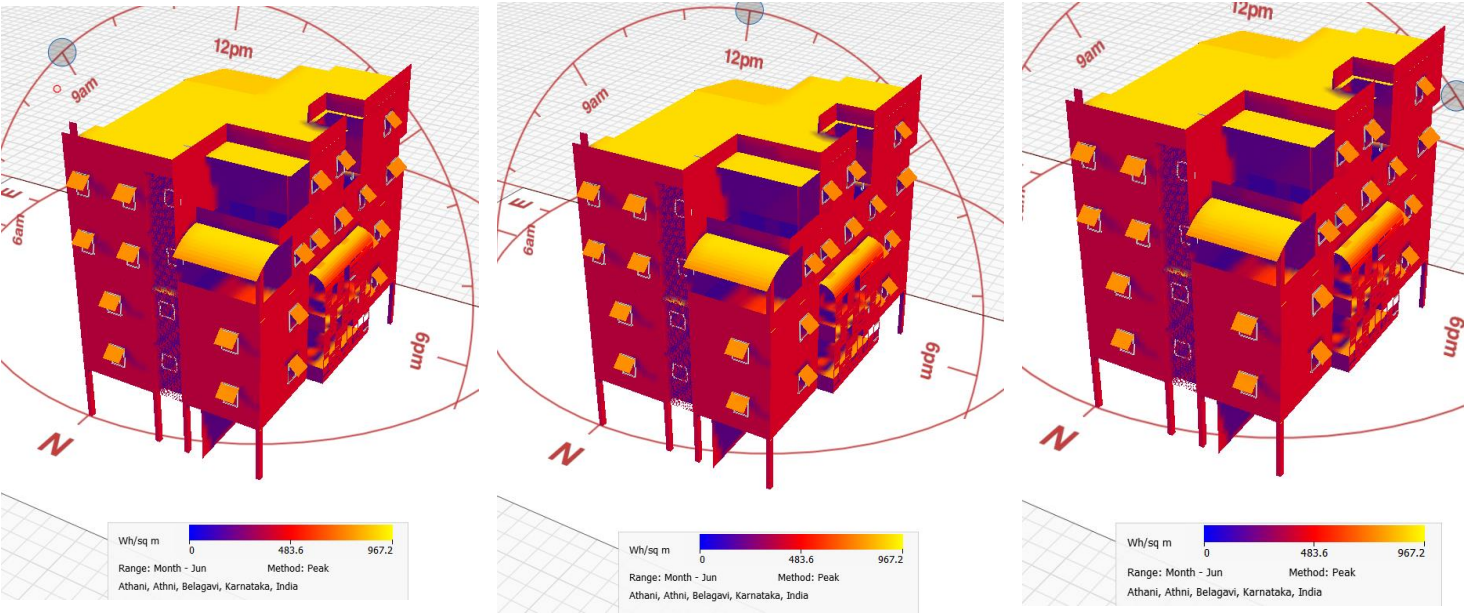


Jalli wall

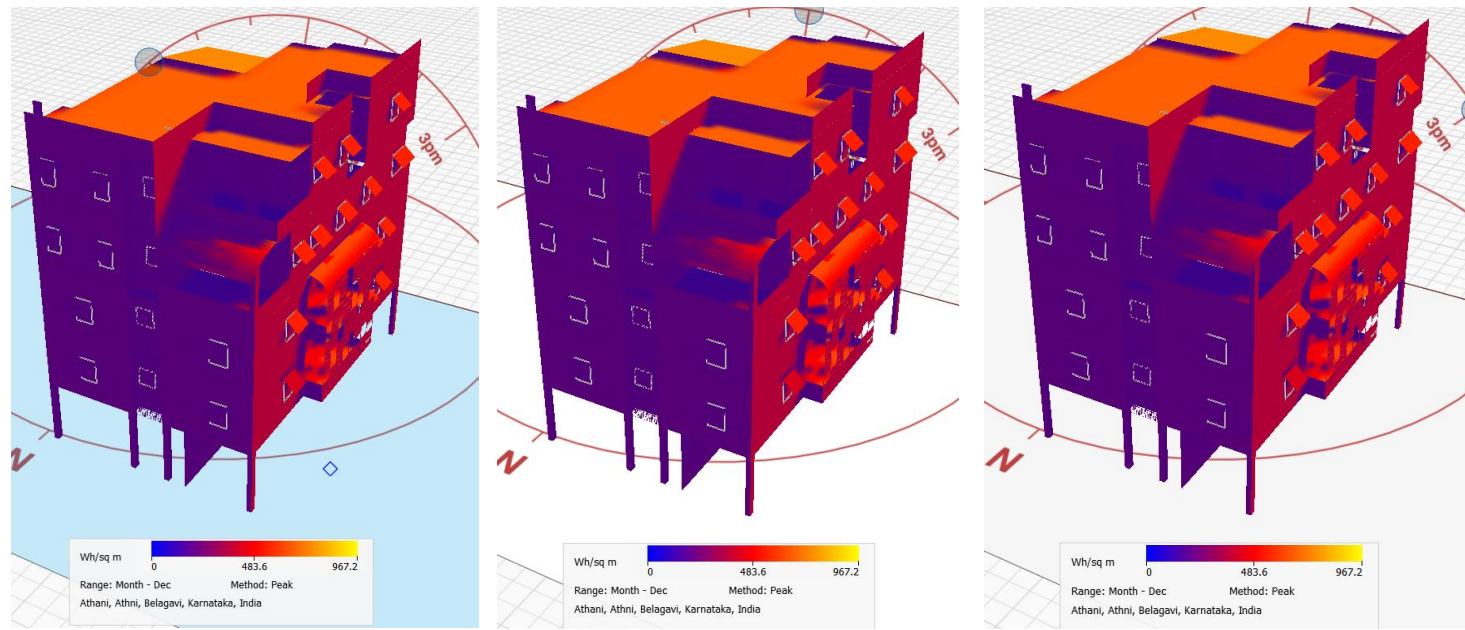


SHIVAGANGA HOSPITAL – ATHANI :

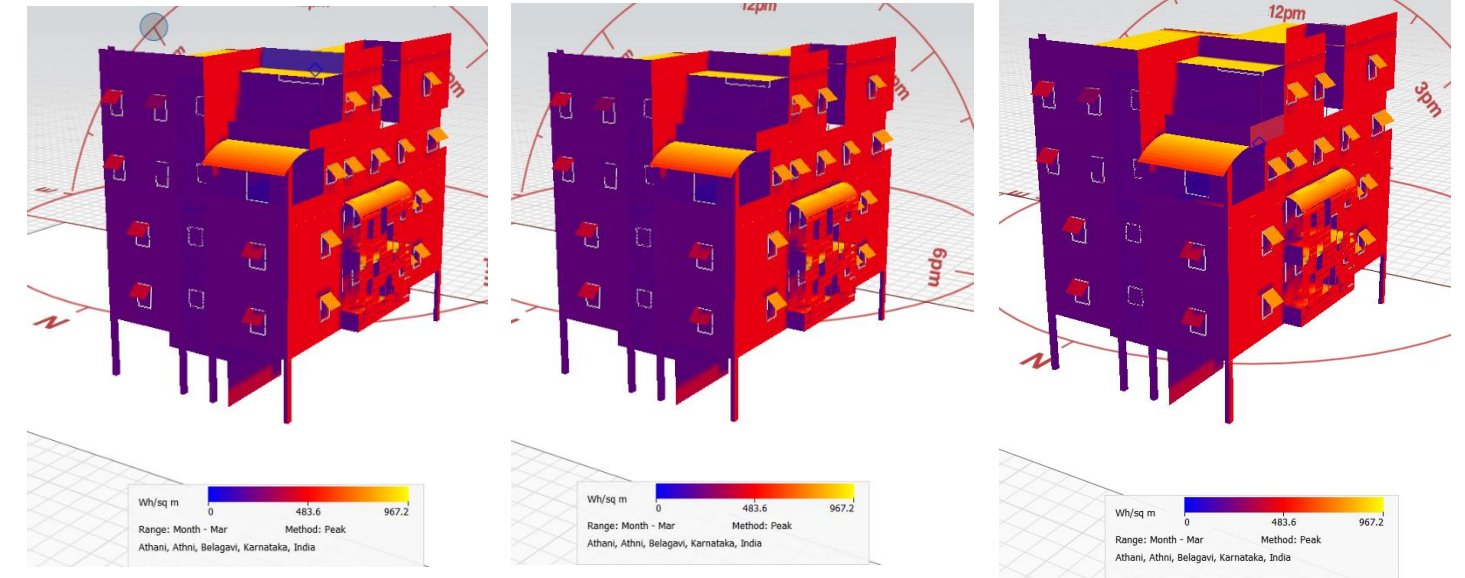
Summer solstice:



Winter solstice:



Equinox:



INFERENCE:

The thermal analysis of the residence has been done in the software. The radiation energy has been analysed in the form it. In the orientation of the site is east facing direction.

To cut down the direct heat into the building , the east facing wall has been constructed with stone wall.

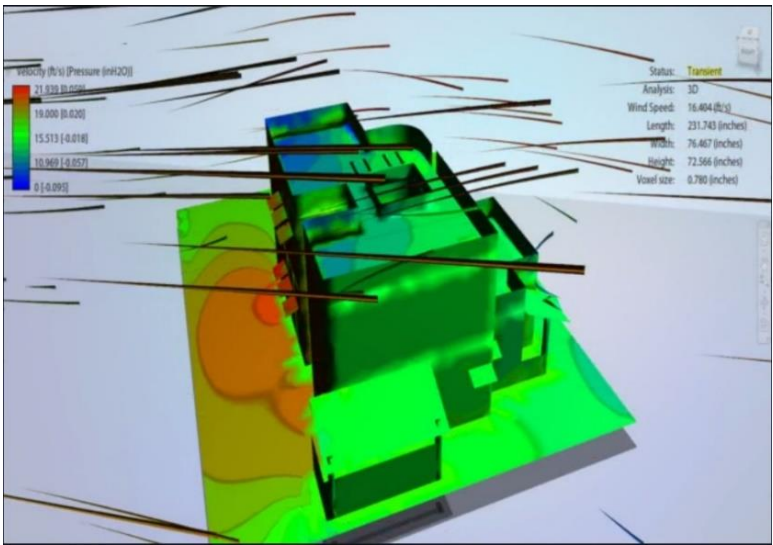
Stone wall will produce less amount of heat inside the building.

In summer solstice, the building experiences high amount of heat while comparing to the other climatic region. The major amount of heat gets fall on the roof.

The roof of the building is done with filler slab. In which the cavity will cut the heat into building, and the balconies are covered with the hourdi tile roofing.

To satisfy the lux level the buildings have the clerestory window, so the building experiences the maximum amount of daylight gets into the building.

Wind flow:



The predominant wind flow for the site is west direction.

The garden are placed in the second floor for the residence and opening in the west direction will helps the wind to enter into the building.

URMILA & KAMALJI RESIDENCE– KARIMNAGAR :

PROJECT DETAILS

LOCATION : karimnagar , Andhra pradesh
Built up area : GF – 2533 sqft FF – 2033 sqft
Site area : 3498 sqft

The extensive use of eco-friendly materials such as hollow clay blocks and stone wall has contributed to the aesthetic & sustainable use of locally available materials.

The roofing technique used In the project is filler slab with clay tile which increases the thermal lag by providing a air buffer between the interior and the exterior finally contributing to the reduction of solar heat gain.

The internal planning has a MUTRAM which is a vernacular element used in houses to increase the stack effect and also to bring the daylight inside the house. The west facing garden will keep the bedroom cooler even in the evening time.

The conscious use of roof openings has increased the lux levels in major usage areas and has avoided unwanted wall openings.

GROUND FLOOR PLAN



FIRST FLOOR PLAN



URMILA & KAMALJI RESIDENCE– KARIMNAGAR :

Hourdi tile:

Material used in the project:

The walls were made of hollow clay block and stabilized mud block which had ‘u’ factor not above 1.2 .since the mud blocks could be procured locally the embodied energy was Also less.

The provision of tall windows were helping with the displacement ventilation which would expel the hot air .

Jalli walls are placed, so the hot air can convert into the cool breeze while entering into the building.

Red oxide flooring will reduce the embodied energy of the building and also has very less heat producing fator.

U- VALUE (W/m2.K)		
Wall	Hollow clay block	0.92
	Stone wall	1.6
Roof	Clay tile	0.42
	Hourdi roof	1.37
	Concrete- 5"	2.07
Floor	Red oxide flooring	
	Kota	3



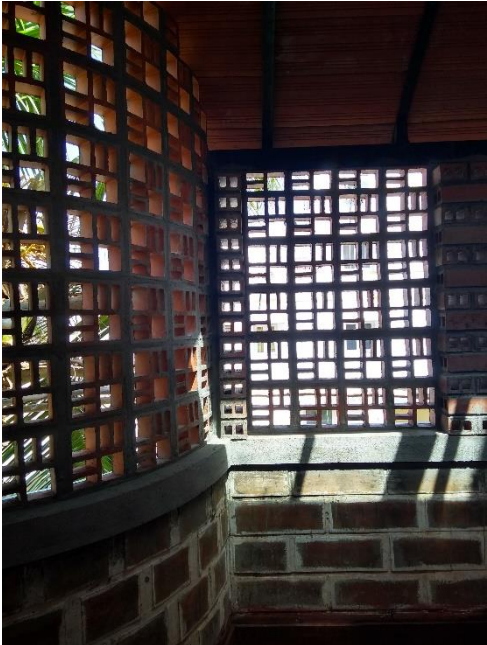
Hollow clay block arch



Hollow clay blocks

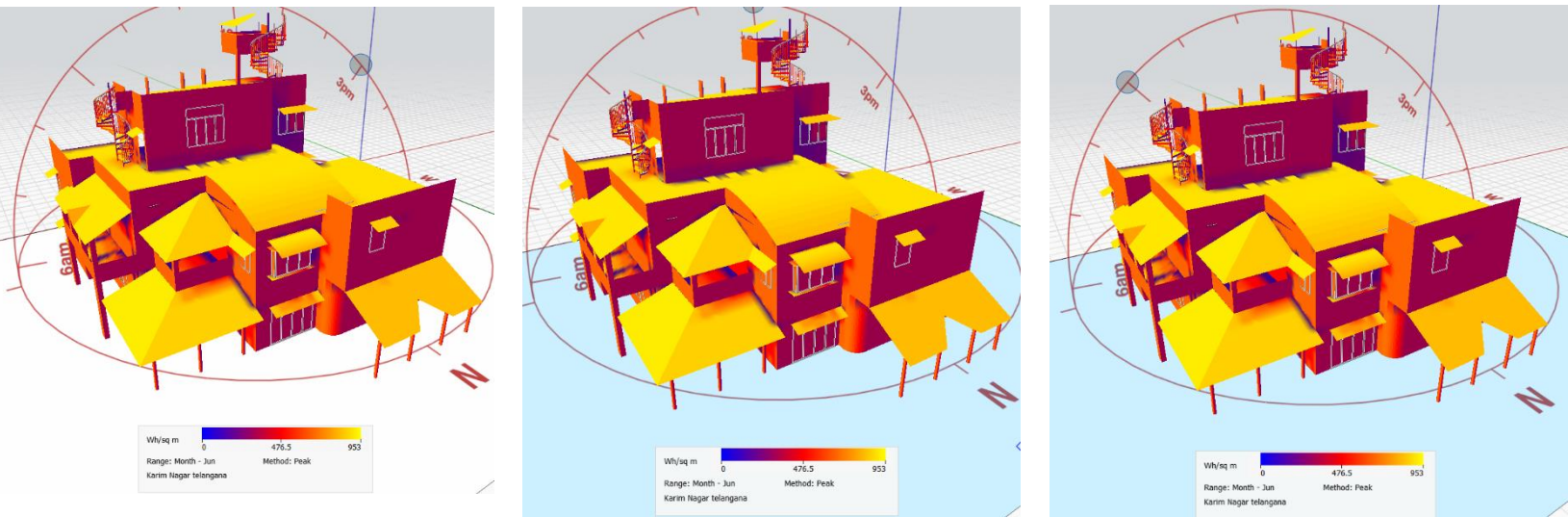


Jalli wall

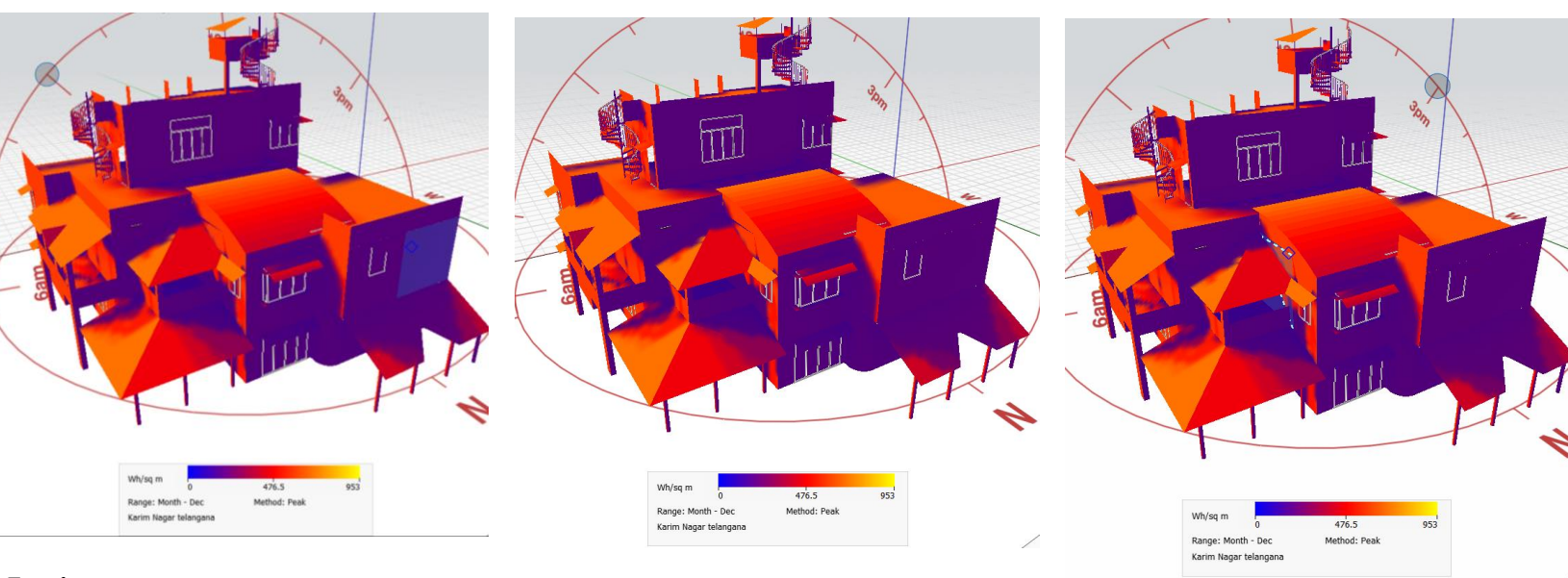


URMILA & KAMALJI RESIDENCE– KARIMNAGAR :

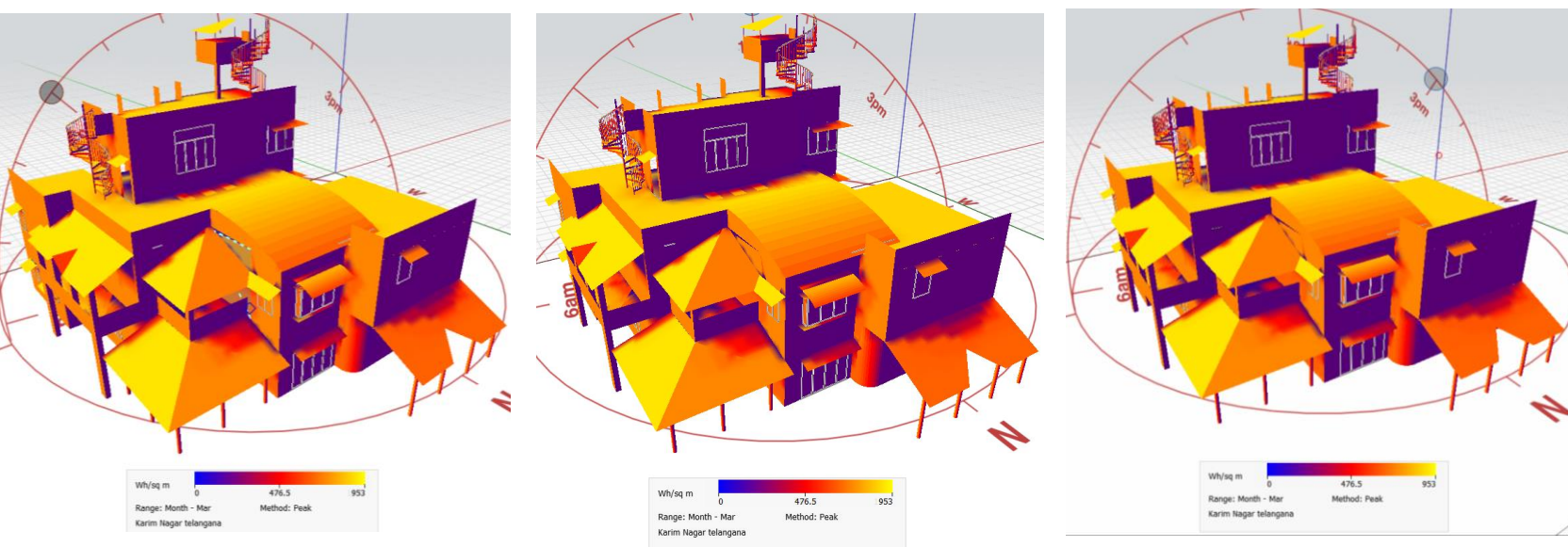
Summer solstice:



Winter solstice:



Equinox:



INFERENCE:

The thermal analysis of the residence has been done in the software. The radiation energy has been analysed in the form it. In the orientation of the site is east facing direction, where the direct heat gets enter into the building.

To cut down the direct heat into the building , the east facing wall has been constructed with stone wall.

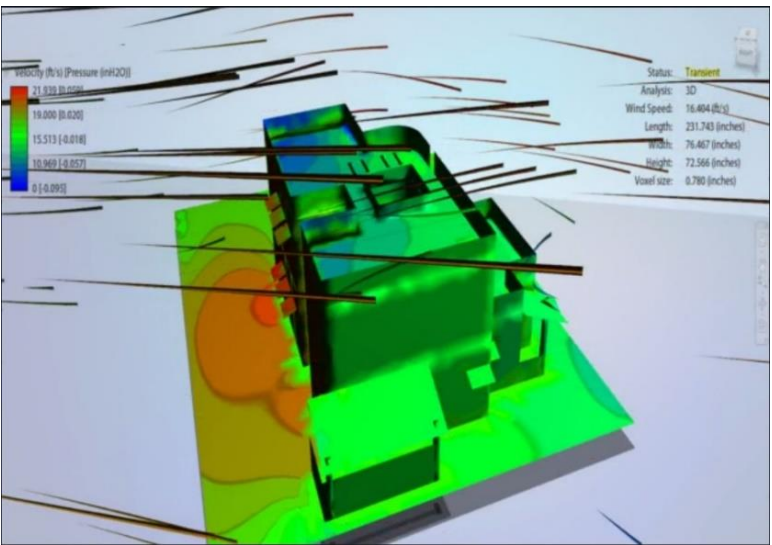
Stone wall will produce less amount of heat inside the building.

In summer solstice, the building experiences high amount of heat while comparing to the other climatic region. The major amount of heat gets fall on the roof.

The roof of the building is done with filler slab. In which the cavity will cut the heat into building.

To satisfy the lux level the buildings have the clerestory window, so the building experiences the maximum amount of daylight gets into the building.

Wind flow:



The predominant wind flow for the site is west direction. The garden and opening in the west direction will helps the wind to enter into the building. The first floor wall is done with the jalli wall, so the hot air becomes cool breeze while entering into the building.