portfolio

KRUPA NITESHKUMAR PATEL

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"I am an architect of days that haven't happened yet"
-John Mayer

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M.S. in Sustainable Design Projects

(Carnegie Mellon University)

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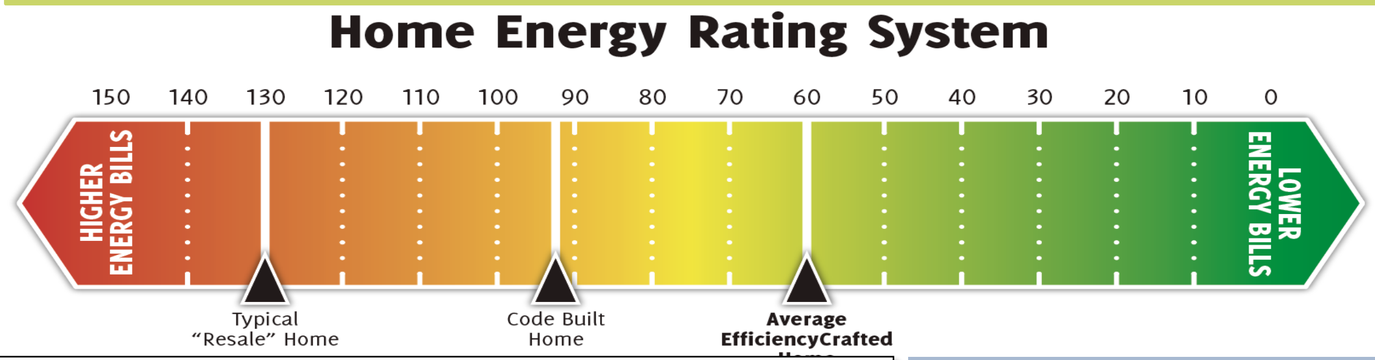
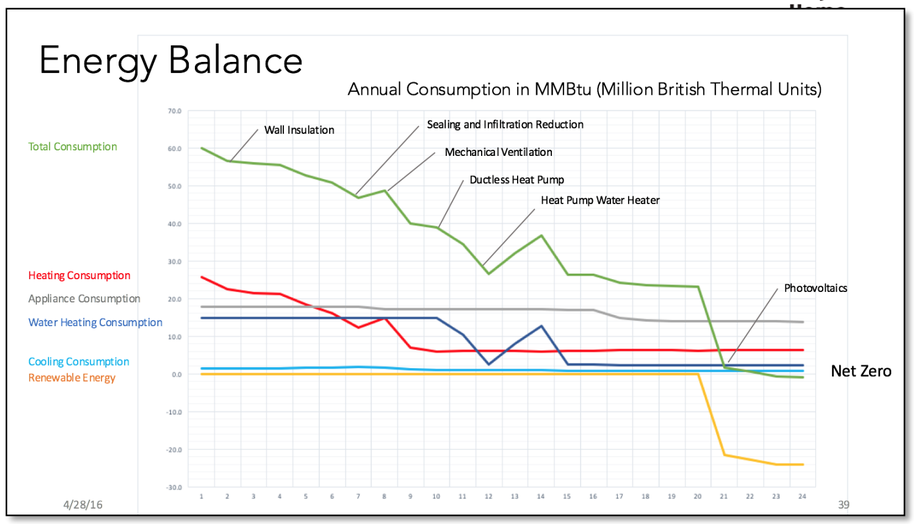
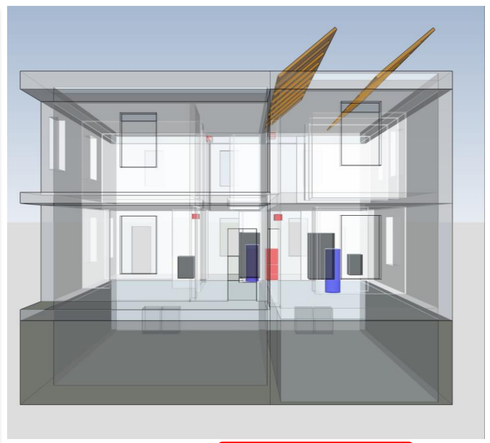
ACADEMIC PROJECT

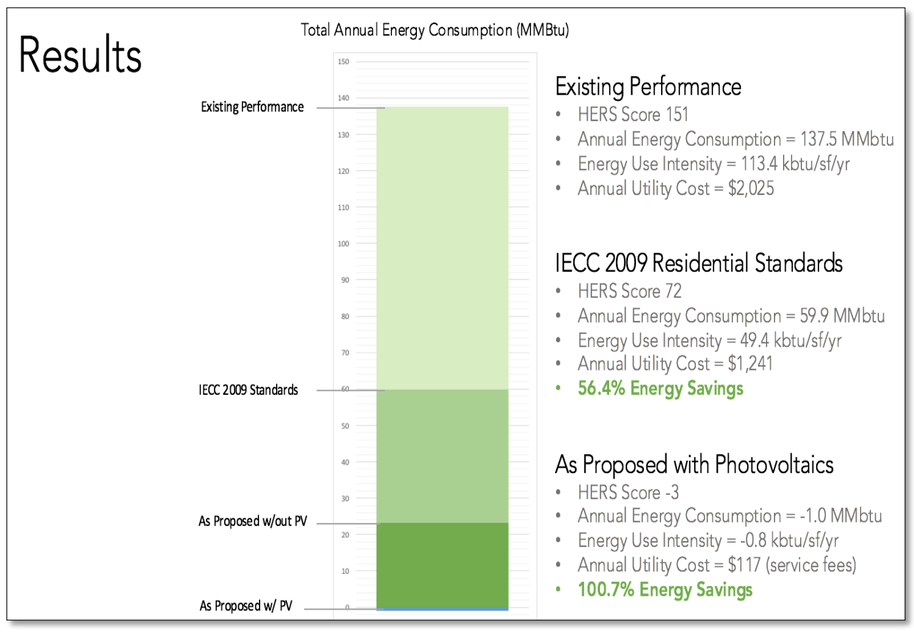
ZERO ENERGY HOUSING

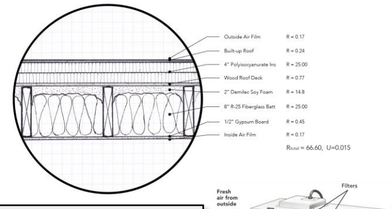
Krupa Patel, Andrew Petralia

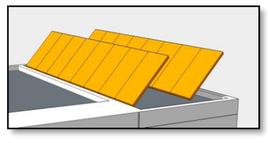


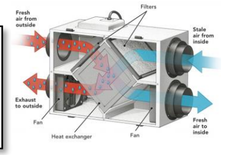












PROJECT:
Low Cost Net Zero Energy Renovation of URA Pittsburgh property
(84-86, Craighead St, Pittsburgh)

The objective of this project was to propose appropriate changes in the existing dilapidated house in order to make it a zero energy home. This gave us exposure to real time situations and handling of actual issues. Various recommendations were tried and tested. The simulation in RemRate software allowed us to decide the most feasible option. After determining various appropriate recommendations, HERS Rating was developed from the software that gave clear report of the feasibility of recommendations. In the process, first of all the house was made code compliant (IECC 2009) and as the next step, it achieved zero energy status.

The factors that were worked upon included,

- Building Envelope: Thermal and moisture boundaries, Infiltration, Openings, Floors, Roof, Above & Below grade walls
- HVAC: Ventilation, Heating & Cooling, Ductless Mini Splits
- Kitchen: Refrigerator, Dishwasher
- Domestic Hot Water
- Laundry: Washer and Dryer
- Renewable Energy: Photovoltaics
- Energy Monitoring System

The final presentation was made to URA officials

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ACADEMIC PROJECT

SYNTHESIS PROJECT

Krupa Patel, Radhna Saxena

An Adaptive and Dynamic Design Approach for Natural Conditioning of Offices in Hot Climates of India (Web based toolkit)

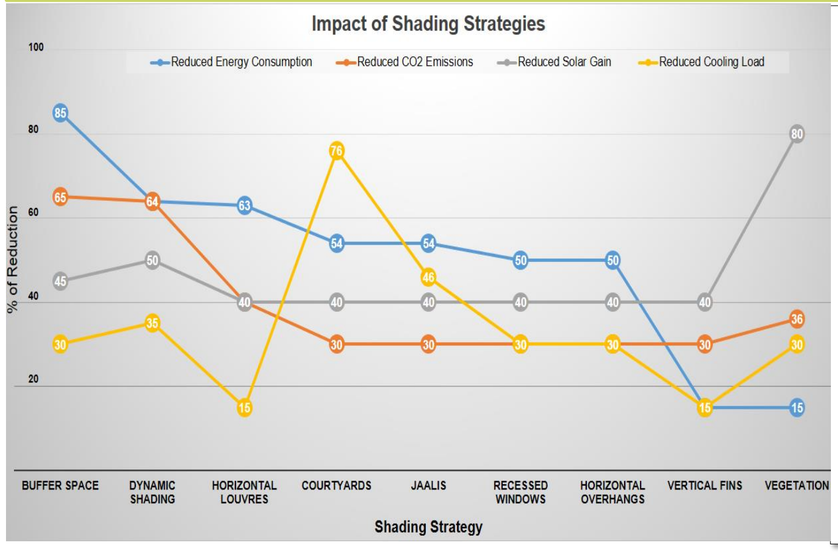
The project aims at providing the building fraternity ways to design offices in hot climates consciously by maximising the use of passive conditioning strategies and suggests not to blindly ape the Glass box architecture.

A three tier approach was taken that included Biomimicry, Vernacular architecture and Modern high performance passive strategies which were studied through case studies.

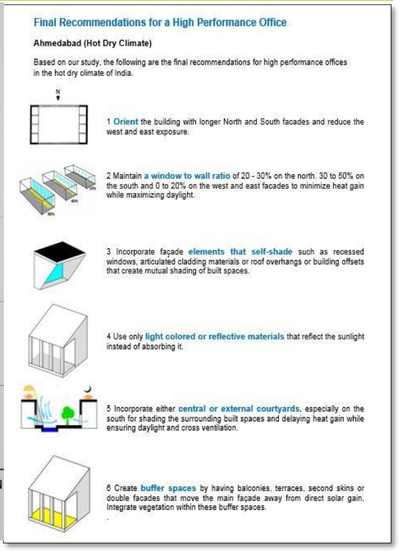
Two sample cities were selected for hot climates: Ahmedabad (Hot Dry Climate) and Mumbai (Hot Humid Climate)
After carefully reviewing the existing trends, studying concepts from sources of inspiration and sorting out the pros and cons of designs, recommendations were made.
It was observed that some modifications are needed on the recommendations page of Climate Consultant for these cities, which were proposed.

A user friendly web based toolkit was created as the end product.

Sample of analysis graph



Sample of recommendations



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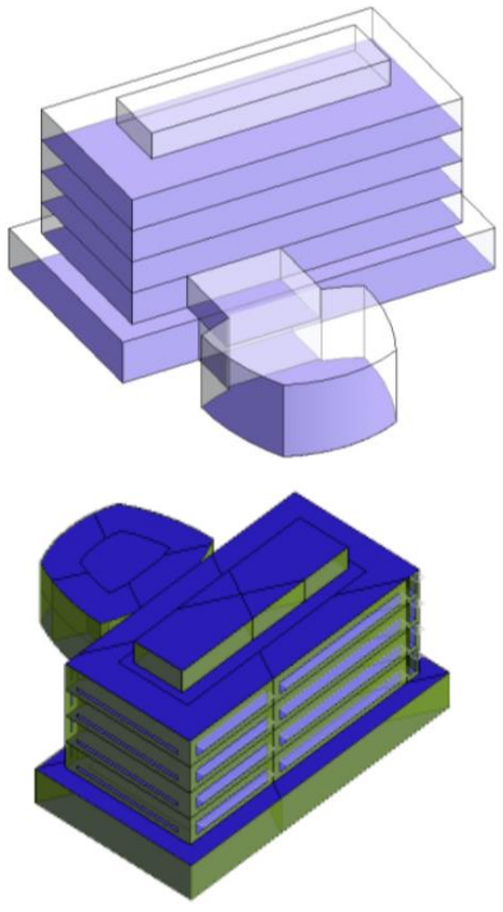
ACADEMIC PROJECT

BUILDING PERFORMANCE MODELING

Krupa Patel, Peter Rothmeier

PROJECT: Simulation of existing building on campus – Scaife Hall as baseline model based on existing conditions, and improvising the results by making appropriate code compliant and effective modifications using three different software consecutively and then comparing the differences and evaluating the most impactful results.

REVIT CEA



EQUEST

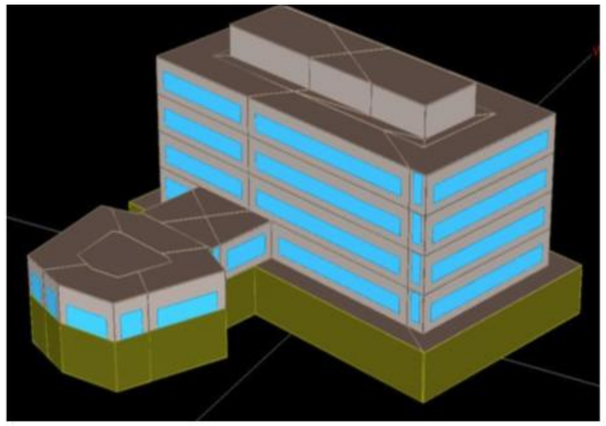


Figure 1 - Scaife Hall 3D model view in eQUEST

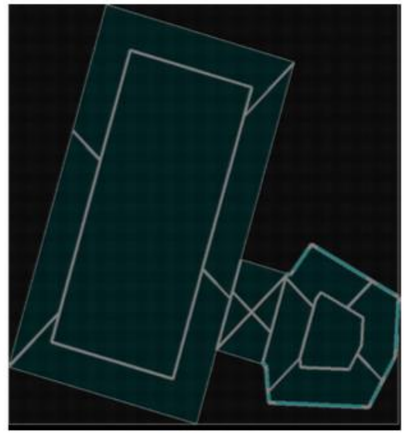
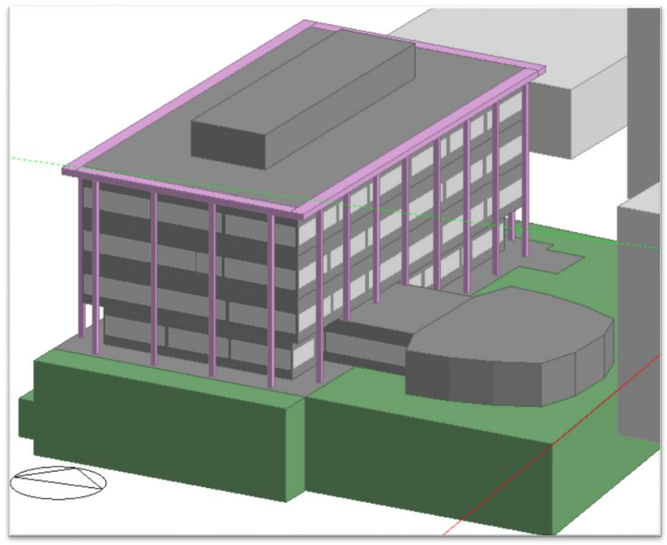
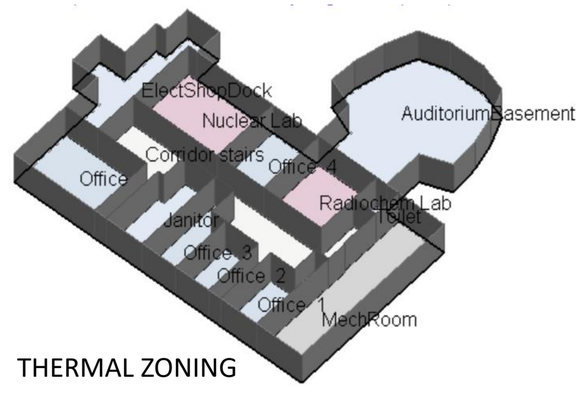


Figure 2 - Scaife Hall 2D plan view with thermal zoning

DESIGNBUILDER-ENERGYPLUS





THERMAL ZONING

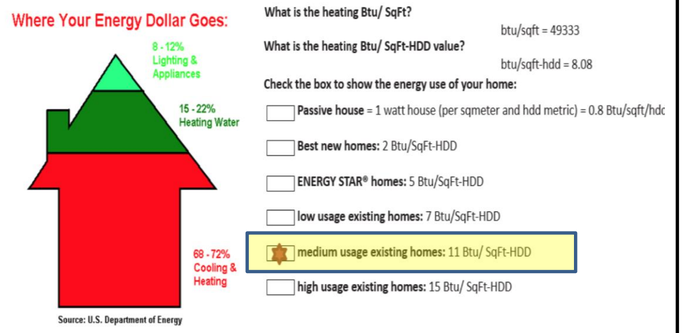
Modifications were made and evaluated in terms of material assemblies of enclosure (walls, roof, openings), glazing, thermal zoning, occupancy variations, electricity consumption, fuel consumption, CO2 Emissions and various other relevant factors that resulted in around 30% decrease in energy use, better Energy Use Intensity and significant cost savings.

ENVIRONMENT: CLIMATE & ENERGY

PROJECT: Energy Audit of a residence

After thorough analysis of existing conditions, strategies had to be devised to improvise the present scenario that would yield energy savings, cost savings and would assure payback by implementation of those.

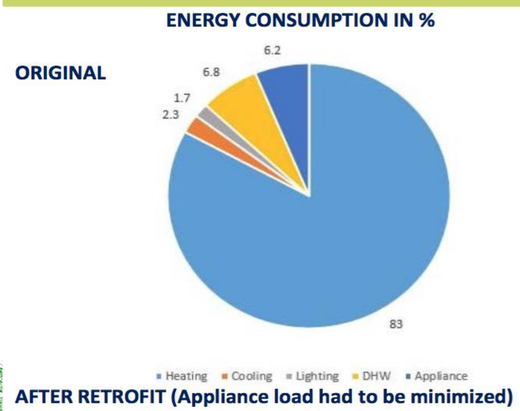
Also, transmission losses, heat losses, water consumption, fuel consumption, electricity consumption were devised in order to get an overall consumption data which was worked upon.

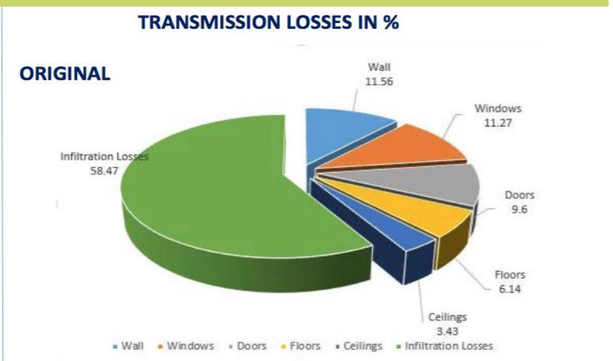


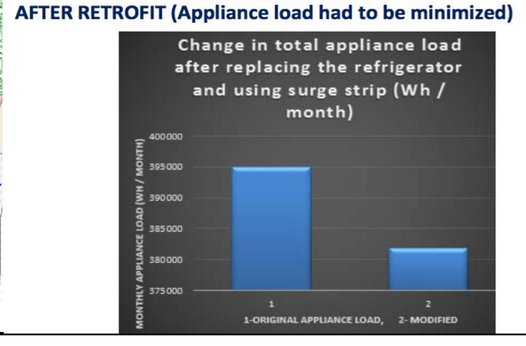
- Site Analysis
- Climate Analysis
- Heat Loss Calculations
- Energy Consumption
- Light & Appliances usage
- Retrofit Recommendations

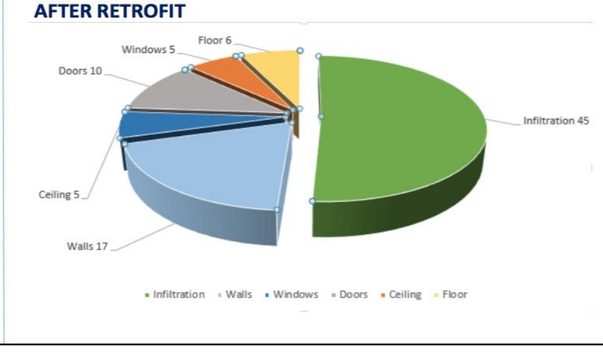
Sample of Retrofit Strategies

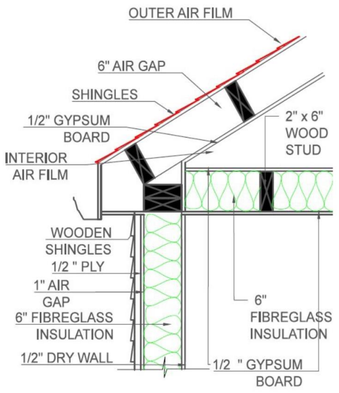
Comparison of Energy Savings

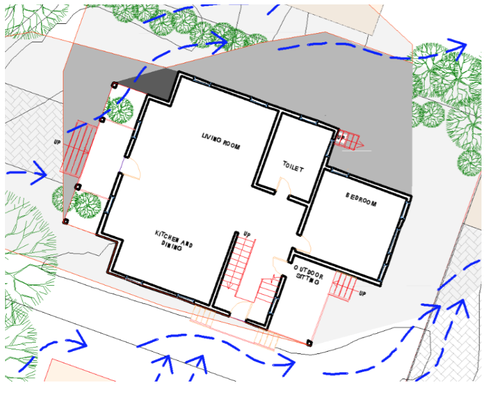












ACADEMIC PROJECT

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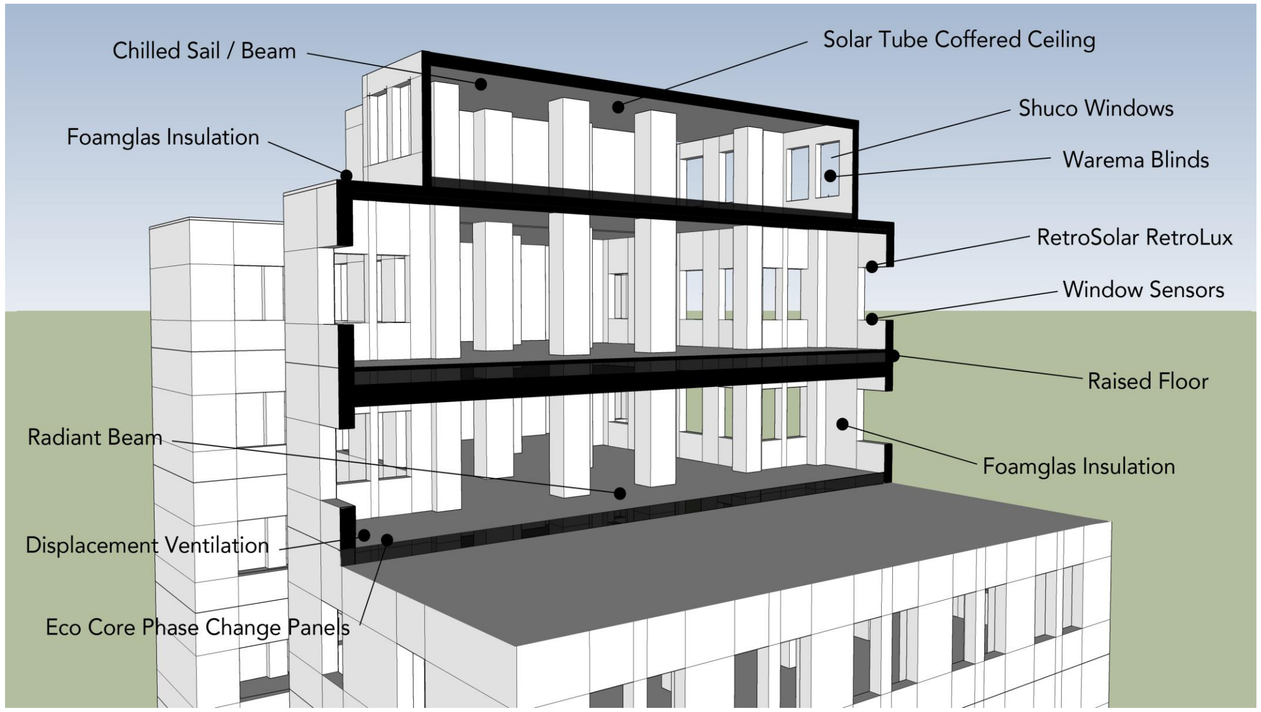
ACADEMIC PROJECT

PERFORMANCE OF ADVANCED BUILDING SYSTEMS

Krupa Patel, Andrew Petralia, Radhna Saxena

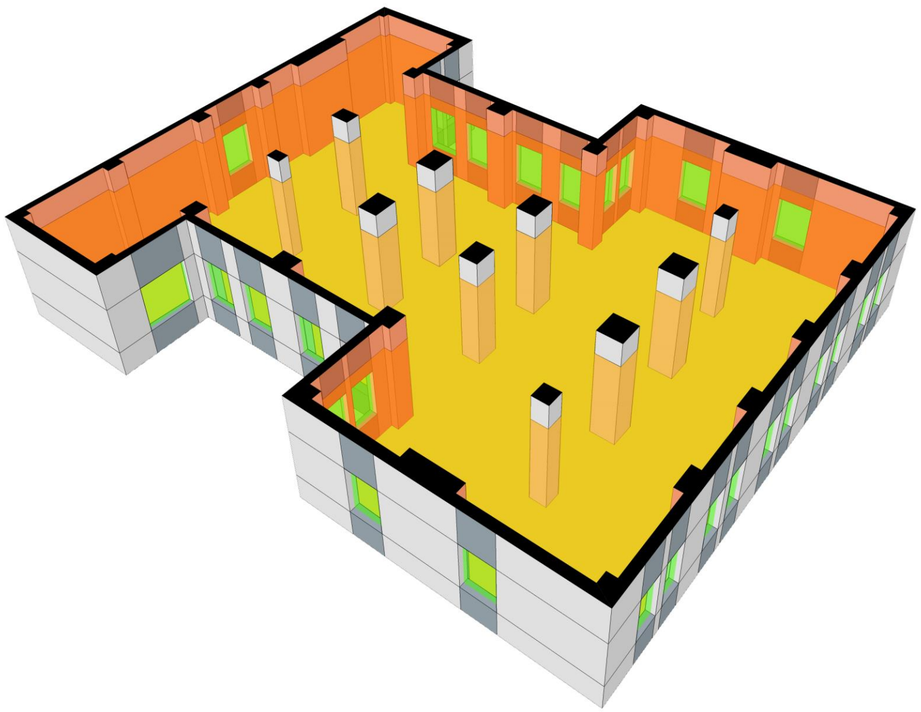


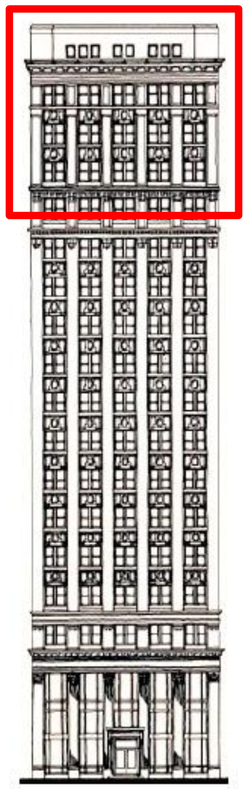
PROJECT:
Optimizing Pittsburgh's Historic Benedum Trees Building Through Systems Integration

The objective of this project was,

- To Owner: Optimize performance and occupant comfort of the Benedum Trees Building while preserving historic character
- To Academia: Establish Benedum Trees as a "flagship" case for future historic building renovations
- To Community: Assist Benedum Trees in achieving 2030 Challenge, reduce energy and carbon footprint, "Go Fourth"

Retrofit recommendations for the uppermost 3 floors as shown in figure, and a performance matrix was also developed to evaluate the systems' effect on the performance mandates.

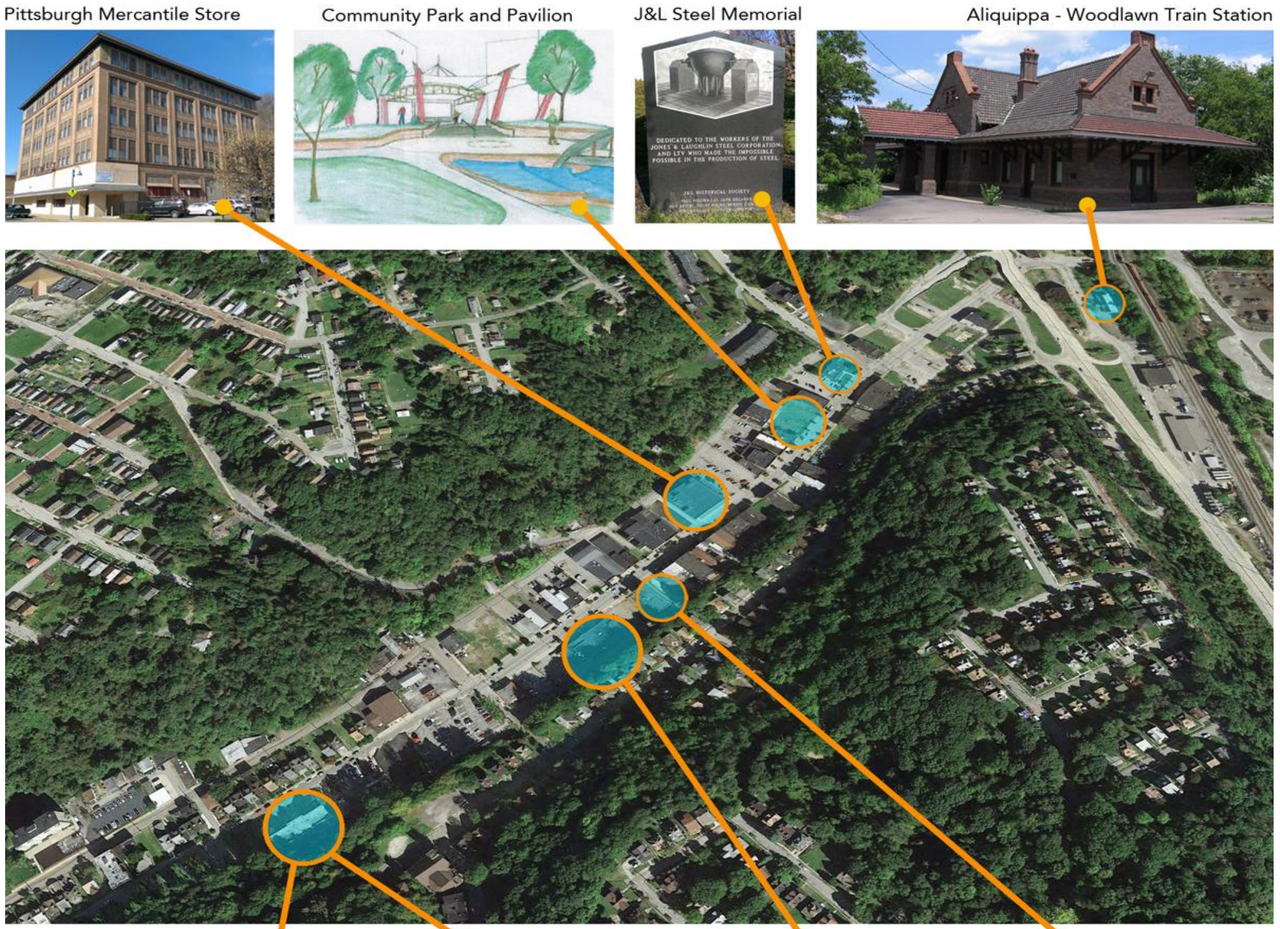




Performance Matrix		Spatial Performance	Visual Performance	Acoustic Performance	Thermal Comfort	Air Quality	Building Integrity
Floor	Raised Floor System	■					■
	In-Floor Radiant Beam	■		■	■	■	
	EcoCore Phase Change Panels				■		
	Displacement Ventilation	■		■	■	■	
Enclosure	Schuco Parallel Windows		■			■	■
	Warema External Shades		■		■		■
	RetroSolar Internal Blinds		■		■		■
	Window Sensors				■		
	Foamglass Interior Insulation			■	■	■	■
Ceiling	Chilled Sail Radiant Cooling	■		■	■		
	Solar Tube Coffered Ceiling		■				
	Foamglass Roof Insulation			■	■	■	■

SUSTAINABLE COMMUNITIES

Krupa Patel, Andrew Petralia, Parul, Radhna



PROJECT:
Franklin Avenue Corridor- A Streetscape Identity Package For Historic Aliquippa

The objective of this project was to propose revival strategies for the once vibrant downtown of the city of Aliquippa that presently suffers from sheer abandonment. The city has a rich history and the project demanded to propose recommendations that were practical, economic and assured preservation of historic features along with necessary additions to the streetscape.

Some of the necessary recommendations were,

- Enhancing outdoor social gathering spaces
- Introducing Activity Pockets
- Integration of Bio swale system
- Addition of planters to beautify the street
- Curbs extension to delineate parking lane from travel lane and buffer sidewalks
- Illuminated crosswalks
- Rental Biking racks
- Introducing clear and concise Signage

Integrating these, we proposed an overall revival proposal that was accepted and appreciated by the local representatives of Aliquippa who are now looking forward to implement it.

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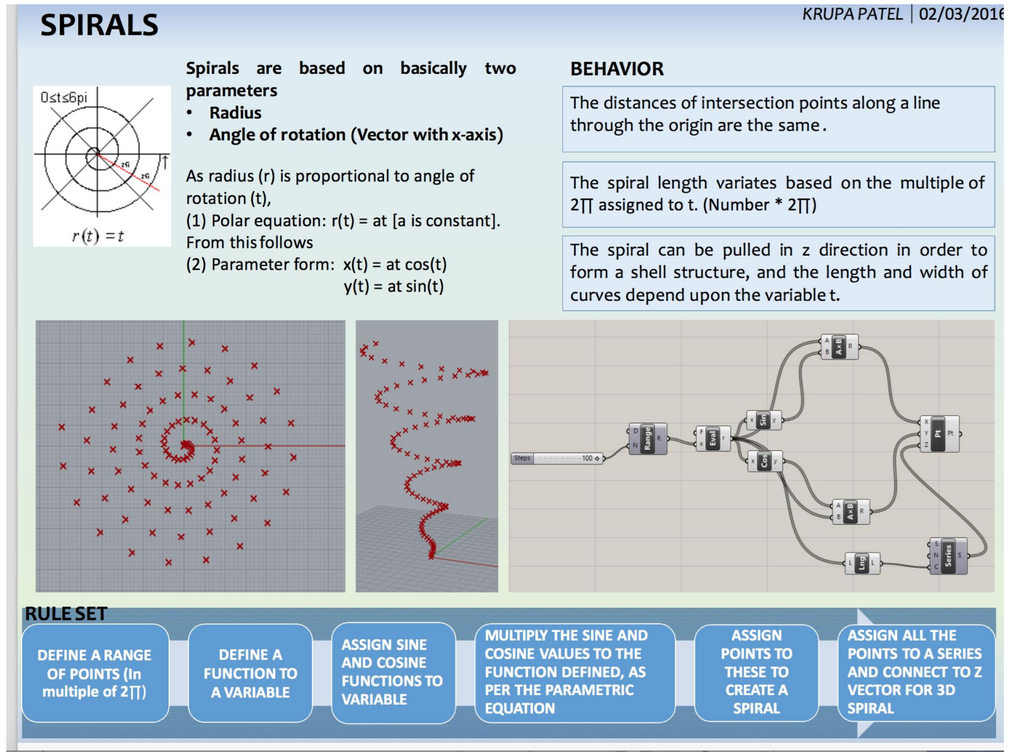
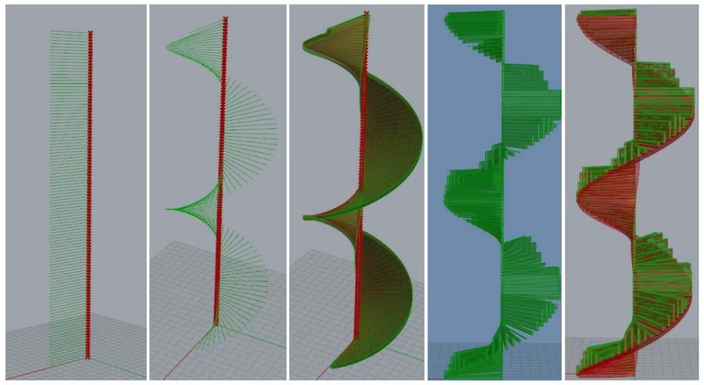
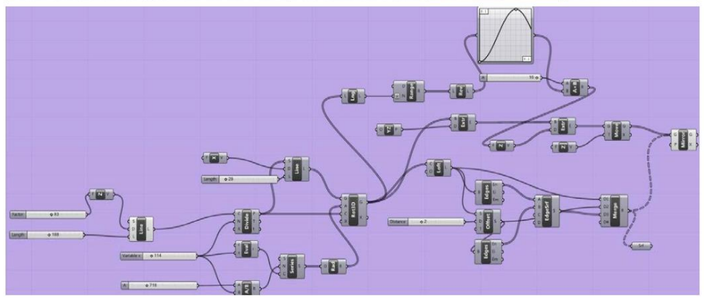
ACADEMIC PROJECT

ECOLOGICS: Computational Techniques for shaping the Built Environment





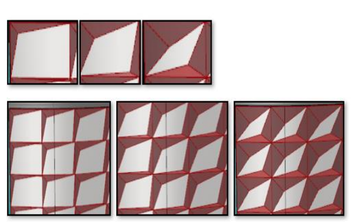


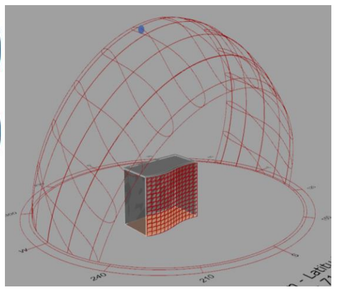
PROJECT 1:
The behavior and function of a spiral shell had to be understood by developing a rule set in Grasshopper and make necessary alterations to see relevant changes. Further, a 3D print was also taken for the same.

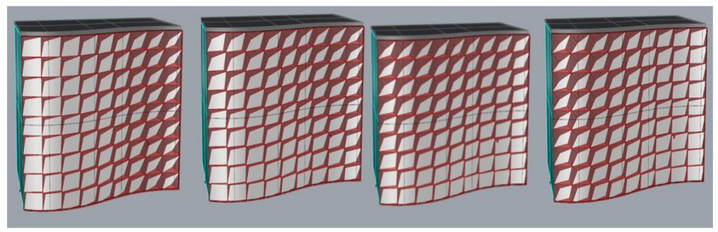
This model was intended to understand the uniform yet illusive progressive nature of spiral. The projections on it are a smaller version of the same principle that is applied throughout the planar surface.

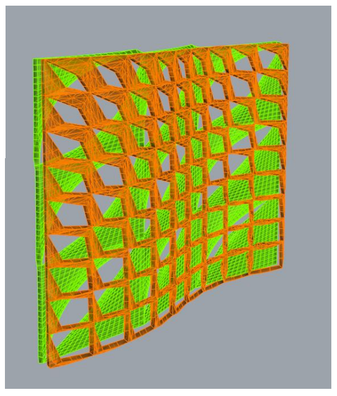
PROJECT 2:
This dynamic façade was developed from a series of modules, using Rhino and Grasshopper that was intended to open and close according to the sun's position. Climate analysis was done for a typical city and then the behavior was linked to the solar movement.

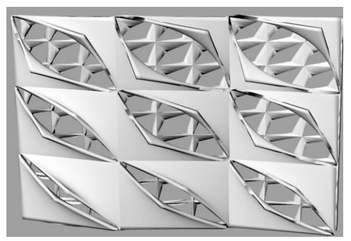
Thermal simulation was also done to see the cooling effect in the interiors. Further, a 3D print was taken as a prototype of idea.

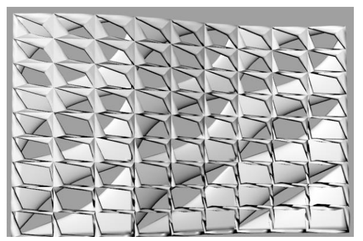












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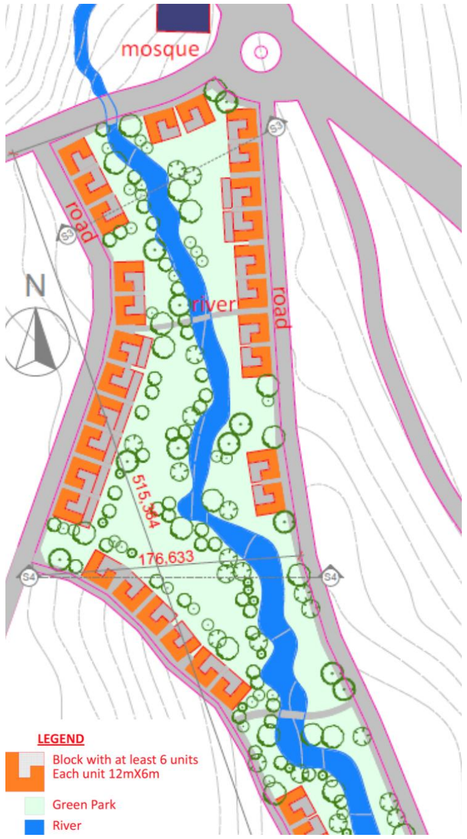
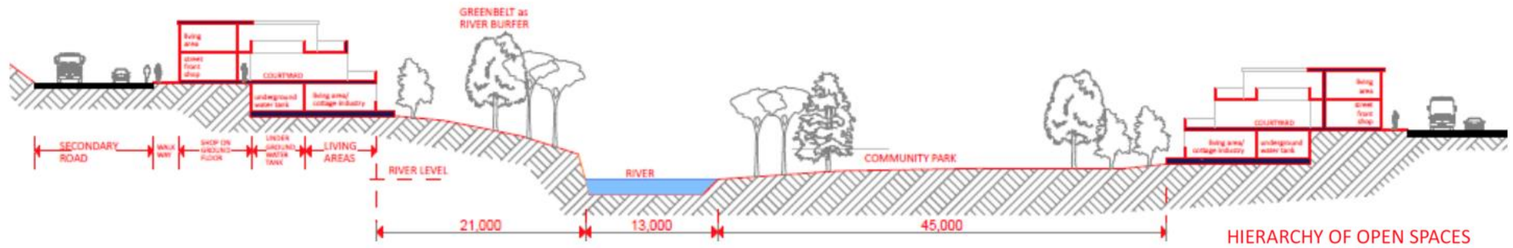
ACADEMIC PROJECT

ECOLOGICAL FOOTPRINTS

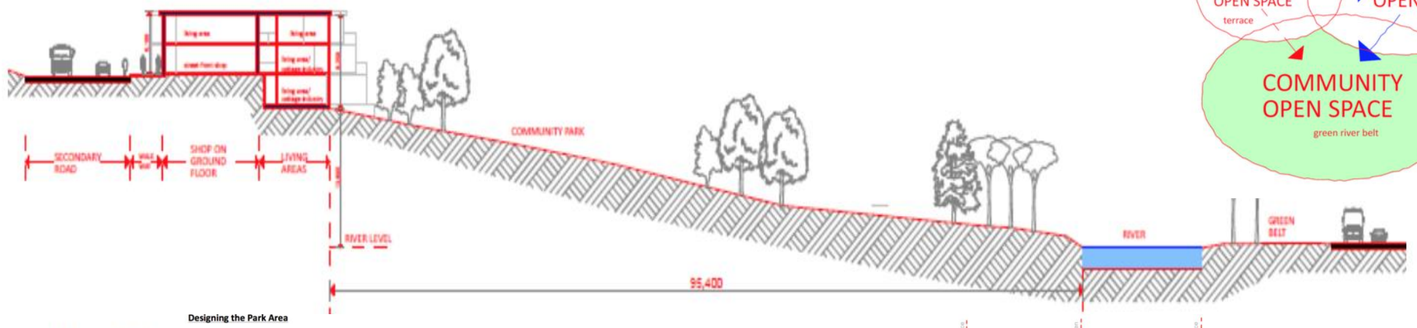
Krupa Patel, James Katungyi & team



PROJECT: Sustainable Development Plan for a stretch along river in Addis Ababa in Ethiopia
The proposal for development included Housing, Parking , Land reuse, Cattle shelters, Parks and recreational facilities, Community gathering spaces, Local shops and taking advantage of the existing river as well as introducing the practice of wastewater recycling.



section S3



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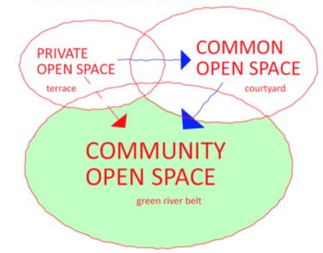
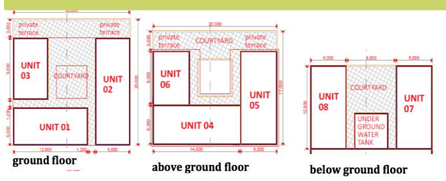
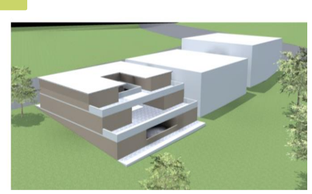
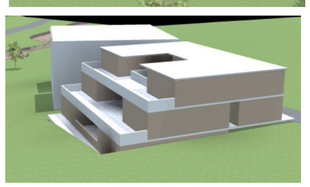
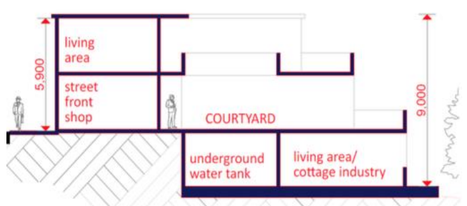


The housing units were designed to accommodate 8 units in one module and each of them got the river view and access to courtyard









section

Designing the Park Area

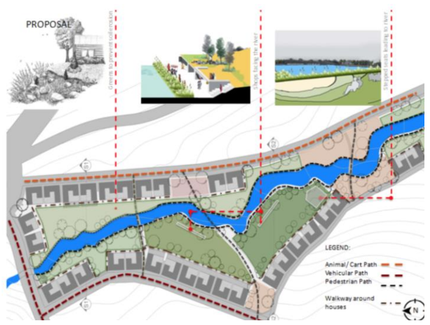


Figure shows:
- Green spaces to prevent soil erosion
- Shops
- Stepped seating near river
- Classified pathways

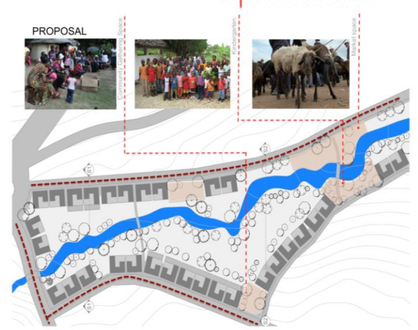


Figure shows:
- Community Gathering space
- Kindergatren
- Market space
- Classified pathways

Pathways and Bridges

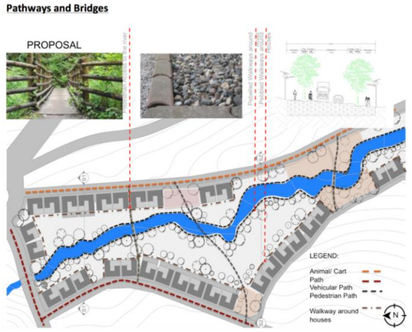


Figure shows:
- Pedestrian access to river
- Pebbled walkways
- Classifies pathways
- Bridges

Community Development

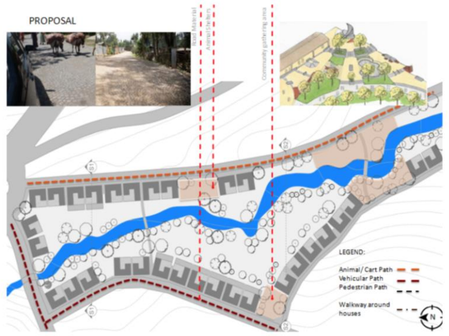


Figure shows:
- Animal Shelters
- Community gathering spaces
- Classified pathways

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ACADEMIC PROJECT

GREEN BUILDING RATING SYSTEMS

PROJECT:
Developing a Green Building Code for home city based on local conditions and requirements

Detailed study of the LEED standards was done

Other rating systems from all over the world such as LOTUS, BREEAM, GRIHA, CASBEE, PEARL were also referred

Based on all the data collected, appropriate recommendations based on local necessities were sorted and modified giving justifiable reasons

As a part of academic exercise, code was developed with credits, prerequisites and scores.

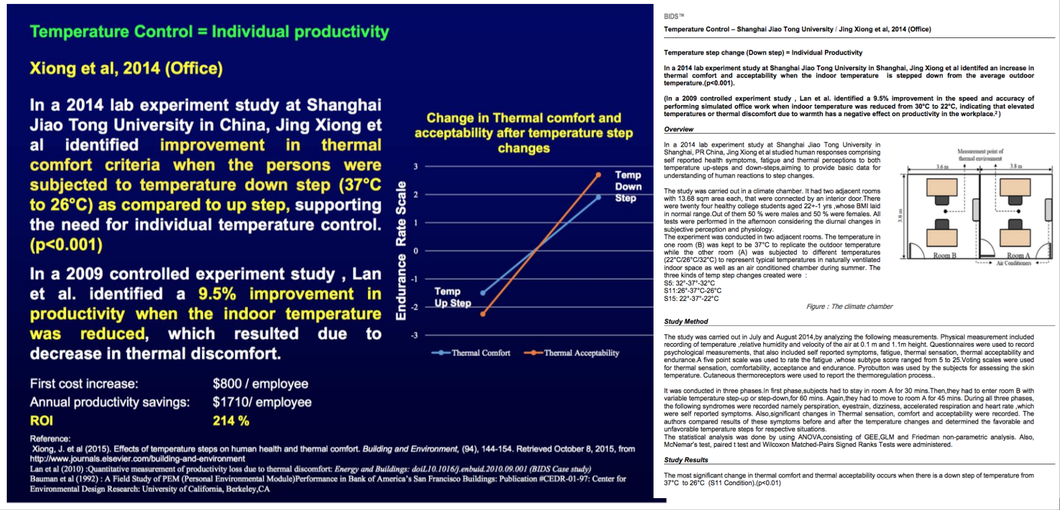
This exercise helped us develop awareness regarding code compliance and thus designing consciously keeping in mind the rating system recommendations.

ENERGY, PRODUCTIVITY, HEALTH AND THE QUALITY OF THE BUILT ENVIRONMENT

PROJECT:
Summarizing research papers, calculating return on investment, life cycle savings and adding the results to the Building Investment Decision Support Tool (BIDS) developed by CBPD at Carnegie Mellon University

The BIDS Tool assumes 1,00,000 sf of office space consisting of 500 employees with a salary of $45,000.
It aims to create a database of case studies with proven results based on different strategies used for improved task performance, occupant health and comfort and various other factors.

These studies played an important role in shaping our thought process in terms of research development and helped in understanding the methodology of study.



Temperature Control = Individual productivity

Xiong et al, 2014 (Office)

In a 2014 lab experiment study at Shanghai Jiao Tong University in China, Jing Xiong et al identified improvement in thermal comfort criteria when the persons were subjected to temperature down step (37°C to 26°C) as compared to up step, supporting the need for individual temperature control. (p<0.001)

In a 2009 controlled experiment study , Lan et al. identified a 9.5% improvement in productivity when the indoor temperature was reduced, which resulted due to decrease in thermal discomfort.

First cost increase:	$800 / employee
Annual productivity savings:	$1710/ employee
ROI	214 %

Change in Thermal comfort and acceptability after temperature step changes

BIDS™

Temperature Control – Shanghai Jiao Tong University / Jing Xiong et al, 2014 (Office)

Temperature step change (Down step) = Individual Productivity

In a 2014 lab experiment study at Shanghai Jiao Tong University in Shanghai, Jing Xiong et al identified an increase in thermal comfort and acceptability when the indoor temperature is stepped down from the average outdoor temperature.(p<0.001).

(In a 2009 controlled experiment study , Lan et al. identified a 9.5% improvement in the speed and accuracy of performing simulated office work when indoor temperature was reduced from 30°C to 22°C, indicating that elevated temperatures or thermal discomfort due to warmth has a negative effect on productivity in the workplace.)

Overview

In a 2014 lab experiment study at Shanghai Jiao Tong University in Shanghai, PR China, Jing Xiong et al studied human responses comprising self reported health symptoms, fatigue and thermal perceptions to both temperature up-steps and down-steps,aiming to provide basic data for understanding of human reactions to step changes.

The study was carried out in a climate chamber. It had two adjacent rooms with 13.68 sqm area each, that were connected by an interior door.There were twenty four healthy college students aged 22~1 yrs ,whose BMI laid in normal range.Out of them 50 % were males and 50 % were females. All tests were performed in the afternoon considering the diurnal changes in subjective perception and physiology.
The experiment was conducted in two adjacent rooms. The temperature in one room (B) was kept to be 37°C to replicate the outdoor temperature while the other room (A) was subjected to different temperatures (22°C/26°C/32°C) to represent typical temperatures in naturally ventilated indoor space as well as an air conditioned chamber during summer. The three kinds of temp step changes created were :
S5: 32°-37°-32°C
S11:26°-37°C-26°C
S15: 22°-37°-22°C

Figure : The climate chamber

Study Method

The study was carried out in July and August 2014,by analyzing the following measurements. Physical measurement included recording of temperature ,relative humidity and velocity of the air at 0.1 m and 1.1m height. Questionnaires were used to record psychological measurements, that also included self reported symptoms, fatigue, thermal sensation, thermal acceptability and endurance.A five point scale was used to rate the fatigue ,whose subtype score ranged from 5 to 25.Voting scales were used for thermal sensation, comfortability, acceptance and endurance. Pyrobutton was used by the subjects for assessing the skin temperature. Cutaneous thermoreceptors were used to report the thermoregulation process..

It was conducted in three phases.In first phase,subjects had to stay in room A for 30 mins.Then,they had to enter room B with variable temperature step-up or step-down,for 60 mins. Again,they had to move to room A for 45 mins. During all three phases, the following syndromes were recorded namely perspiration, eyestrain, dizziness, accelerated respiration and heart rate ,which were self reported symptoms. Also,significant changes in Thermal sensation, comfort and acceptability were recorded. The authors compared results of these symptoms before and after the temperature changes and determined the favorable and unfavorable temperature steps for respective situations.
The statistical analysis was done by using ANOVA,consisting of GEE,GLM and Friedman non-parametric analysis. Also, McNemar's test, paired t test and Wilcoxon Matched-Pairs Signed Ranks Tests were administered.

Study Results

The most significant change in thermal comfort and thermal acceptability occurs when there is a down step of temperature from 37°C to 26°C. (S11 Condition).(p<0.01)

Reference:
Xiong, J. et al (2015). Effects of temperature steps on human health and thermal comfort. *Building and Environment*, (94), 144-154. Retrieved October 8, 2015, from http://www.journals.elsevier.com/building-and-environment
Lan et al (2010) :Quantitative measurement of productivity loss due to thermal discomfort: *Energy and Buildings: doiL10.1016/j.enbuid.2010.09.001 (BIDS Case study)*
Bauman et al (1992) : A Field Study of PEM (Personal Environmental Module)Performance in Bank of America's San Francisco Buildings: Publication #CEDR-01-97: Center for Environmental Design Research: University of California, Berkeley,CA

KRUPA NITESHKUMAR PATEL

portfolio

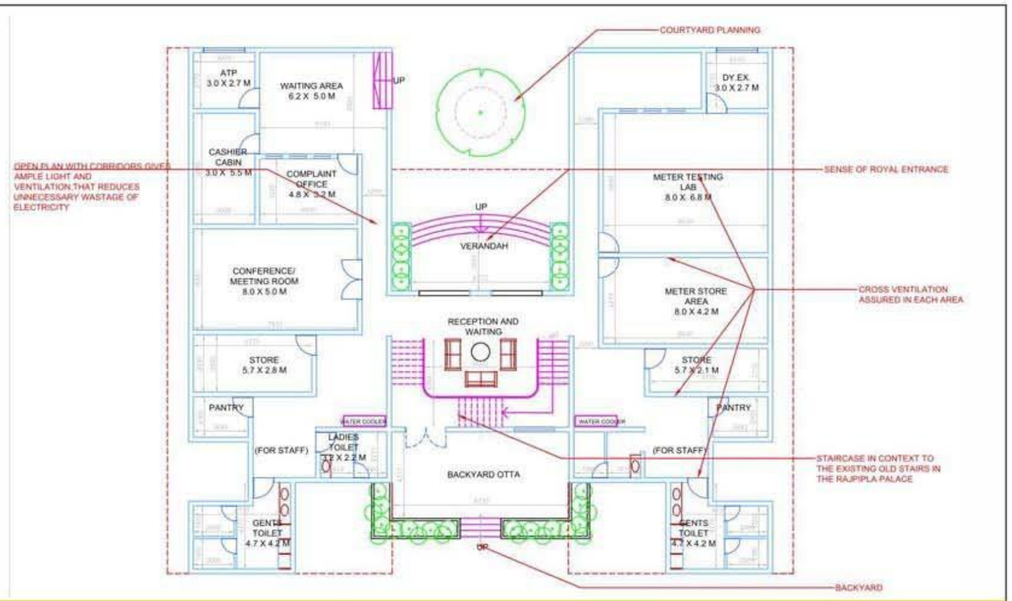
Professional Office Projects

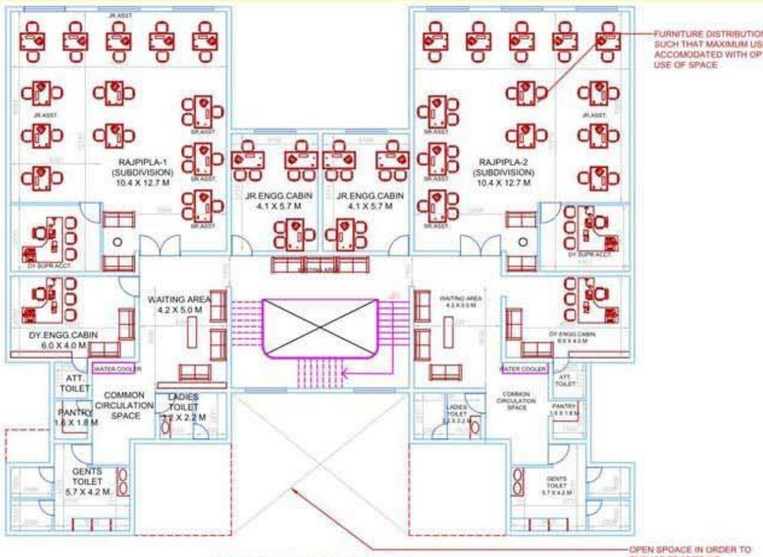
(Project Management Consultants, Matai Associates)

portfolio

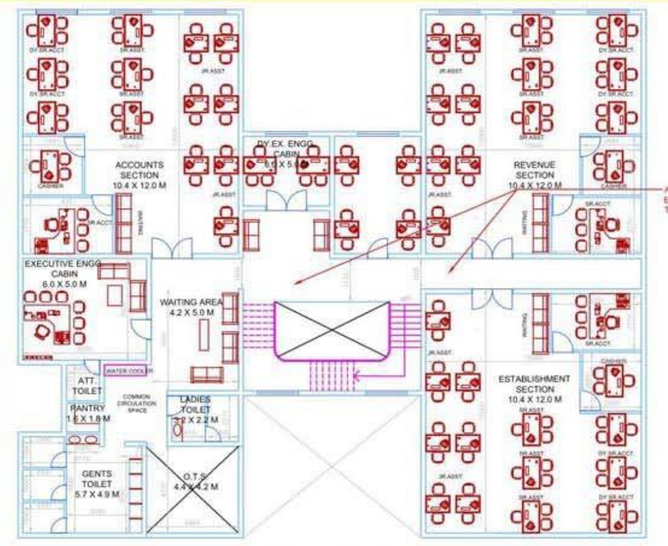
KRUPA NITESHKUMAR PATEL

PROFESSIONAL PROJECT





FIRST FLOOR PLAN



SECOND FLOOR PLAN

PROPOSAL FOR GOVERNMENT ELECTRICITY BOARD OFFICE

Firm : Project Management Consultants

Designation : Architect

Site : Rajpipla, India (November 2014)

Significance : This project presented the challenge of designing with respect to the context of the town.The town boasts of rich historical royal structures,hence,the designed building had to imbibe the historical character.

ABOUT THE PROJECT : The project was supposed to bear the local cultural character,which gives unique identification to the town. In addition, the spaces had to be designed to accomodate at least 80 people per floor,at a time. The design principles used are - typical courtyard planning due to hot climate, use of locally available materials, Large number of louvered windows in order to maintain light and ventilation, Open plan concept followed by wide corridors.

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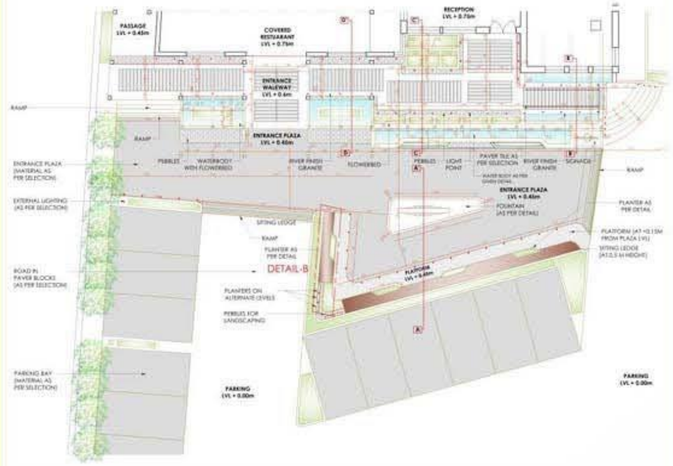
KRUPA NITESHKUMAR PATEL

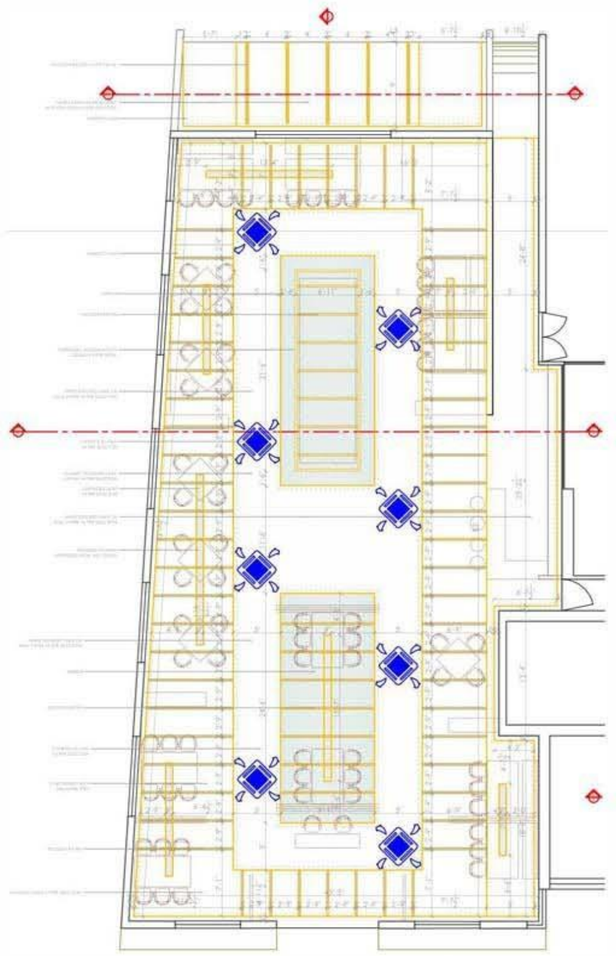
PROFESSIONAL PROJECT

Site Layout



Entrance detail and Parking layout

Backyard Garden Café detail



Restaurant Layout

Restaurant was introduced as an adjoining entity to the existing structure,designing it in such a way that its character dissolved with the existing charater of the place.

1. RESTAURANT CUM ART GALLERY (RENOVATION PROJECT)

Firm	:	Matai Associates
Designation	:	Assistant Architect
Site	:	Vadodara , India
Execution period	:	August 2014 to October 2014

Significance : It proved to be a major learning experience, as practical implementation of the design on site ,was keenly observed and learned by me.

ABOUT THE PROJECT : The project presented the challenge of converting a 25 year old residence into an exclusive restaurant cum art gallery. The project team included three members including me. My role was to conceptualize the design preliminarily, get it approved by the owner and the principal architect and issue the working drawings according to the revisions suggested.

The execution process had to be such that it enhanced the maximum utility of resources already available on site . (Above given drawings are prepared by me,as a part of this project)

portfolio

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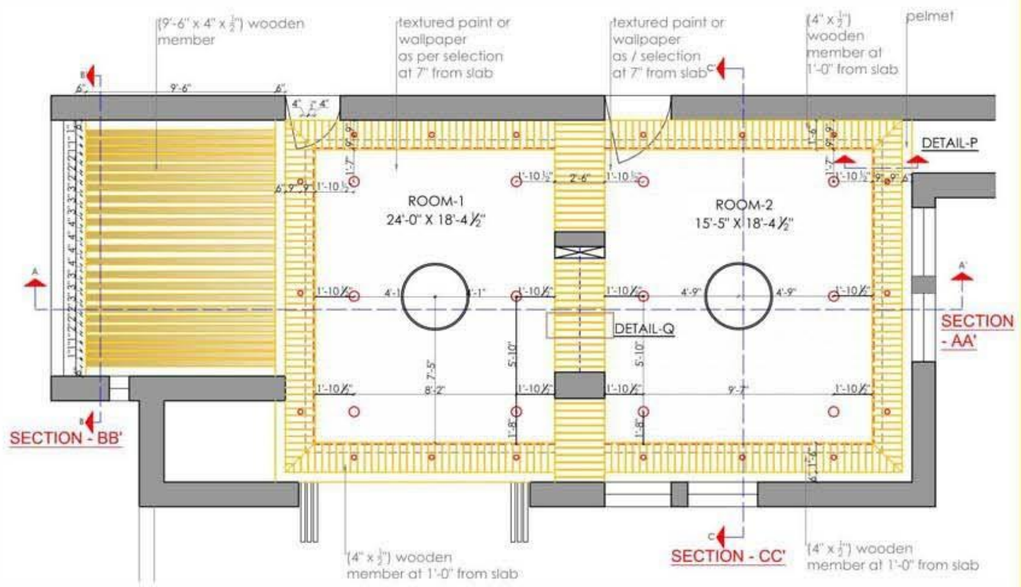
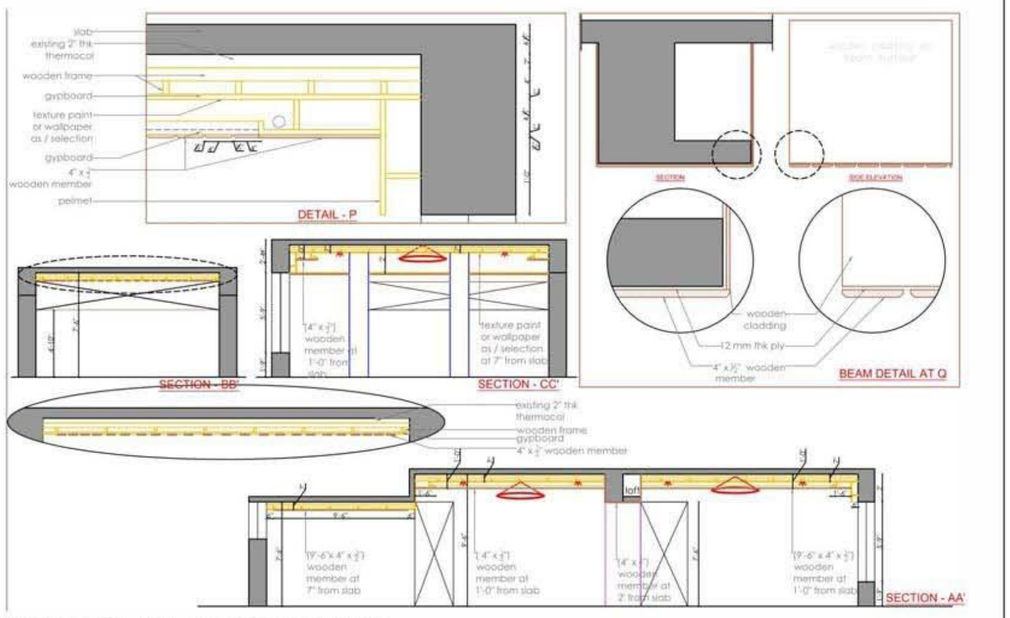
PROFESSIONAL PROJECT



Banquet's false ceiling plan

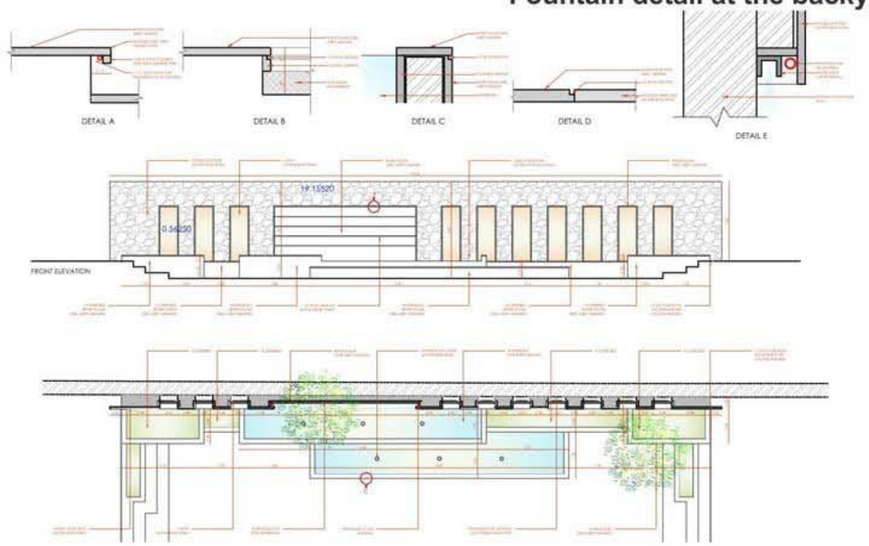
The old master bedroom was large enough to be converted into a banquet. Hence, an existing space was reused just by undergoing some interior transformation.



Banquet's false ceiling details

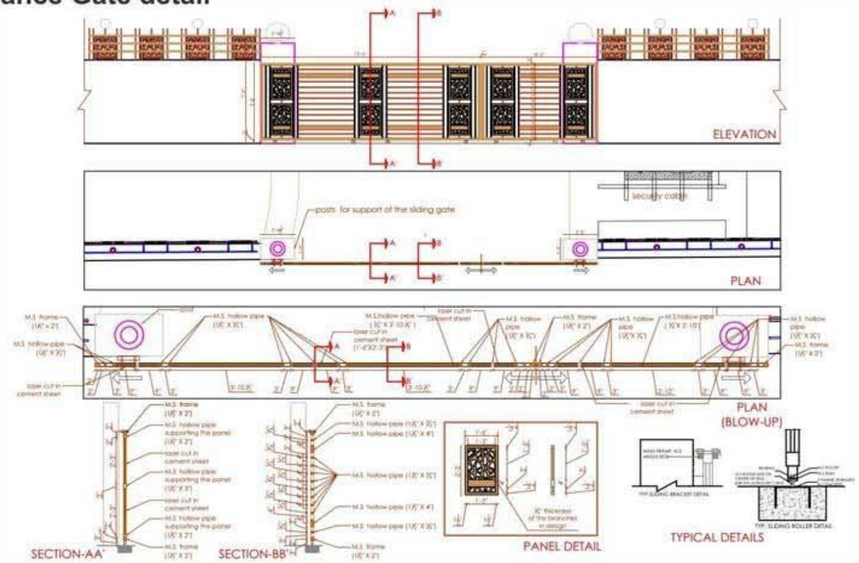
The wood obtained by dissection of the old yet strong teakwood furniture was reused for the false ceiling of the banquet, thus, giving it a rustic and a splendid look sans high cost.

Fountain detail at the backyard



The project focuses on the basic concepts of renovating a structure, without disturbing its original significance. The site lies in one of the most thriving commercial areas of the city.The structure had been an unused residence adjoining the main road. The potential benefits due to its location propelled the owner to renovate it.

Entrance Gate detail



The Restaurant and Art gallery had to be conceptualized according to the modern design principles and exotic interiors. The client expected to see some monotonous yet impressive and appealing concept. As a result, an open plan concept was finalized that also included a Garden café and a semi-open exhibition area.

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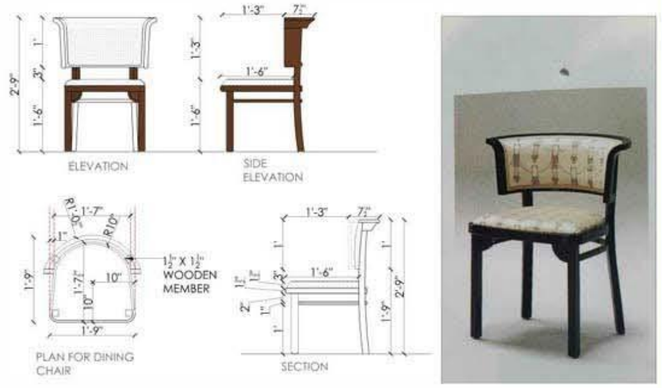
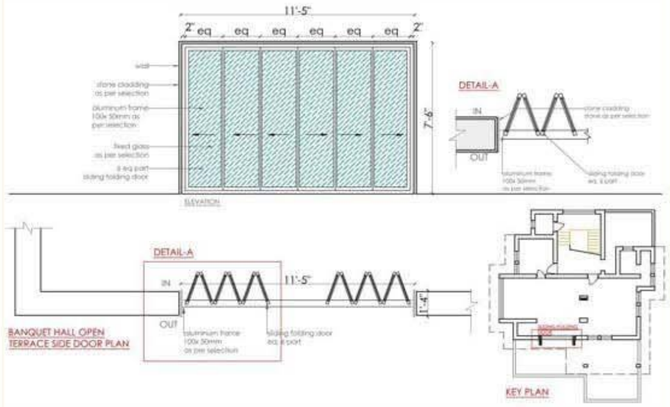
portfolio

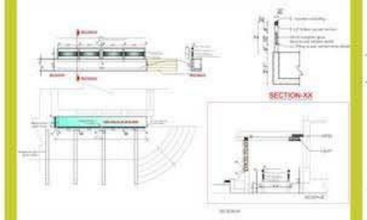
PROFESSIONAL PROJECT



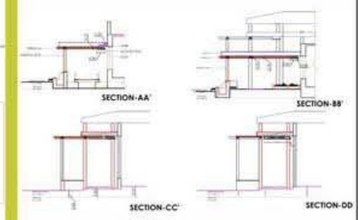
Chair design detail for restaurant



Sliding door detail for Art Gallery



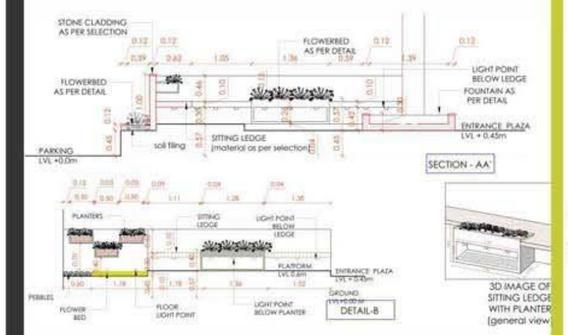
Entrance railing detail



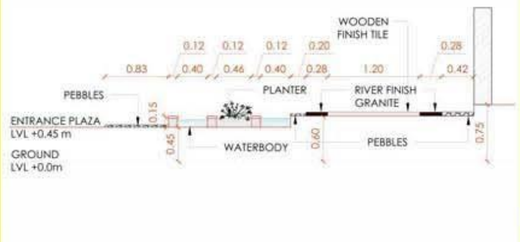
Basic sections at entrance pathway

In this project, even the most meticulous details have been worked out like the chair design, door details as well as facade treatment in order to revive the rustic ambience along with modernity.

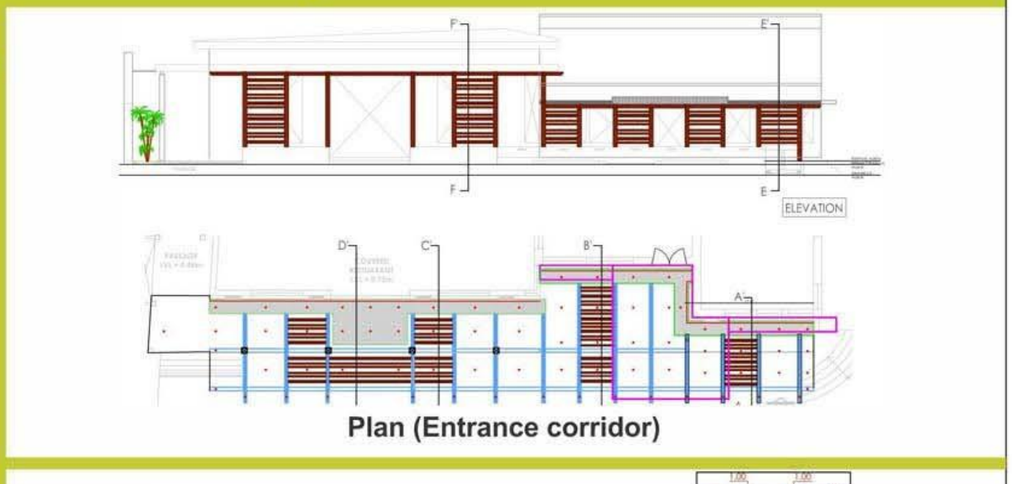
SOME SECTIONS...

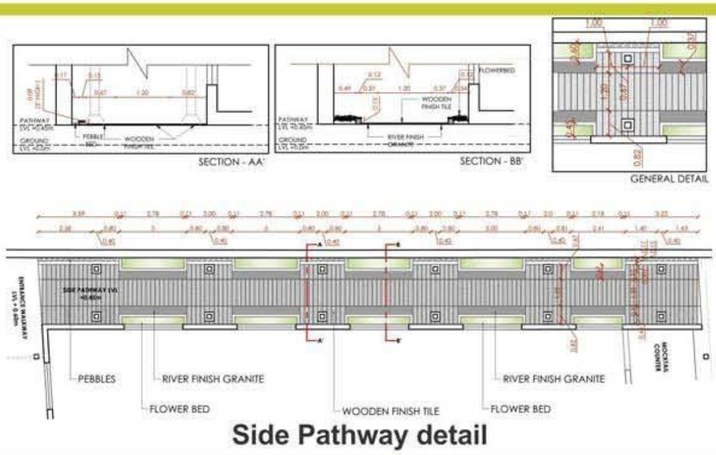


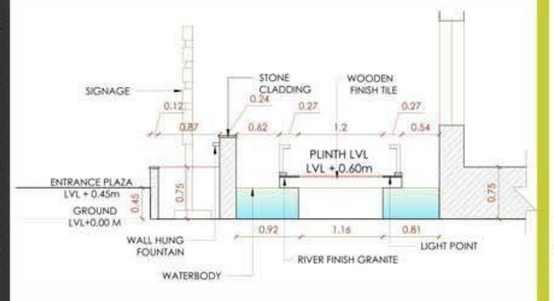
Entrance plaza sectional detail-I



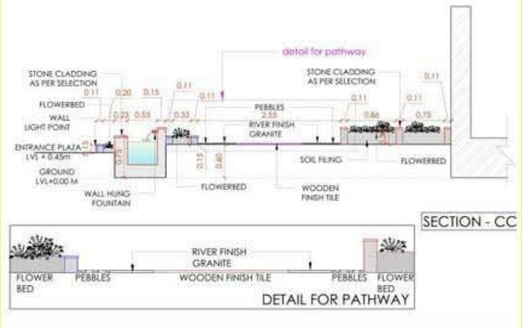
Entrance plaza sectional detail-II







Entrance plaza sectional detail-III



Entrance plaza sectional detail-IV

This project has followed the historical environmental tradition of reuse and recycle,thus minimizing client's cost. Also, the interior concepts of the restaurant and art gallery are notable due to their decency,simplicity and elegance .The ambience of this old place has now become ethereal.

KRUPA NITESHKUMAR PATEL

portfolio

PROFESSIONAL PROJECT

The actual site picture depicts it as an unused residence. A rigorous planning session took place so as to maintain and reuse much of the available material and built-up structure, instead of demolishing it. Also, the existing vegetation was not removed. Reuse and recycling did cut the cost by 25 %.

ACTUAL ON-SITE PHOTOGRAPHS...

portfolio

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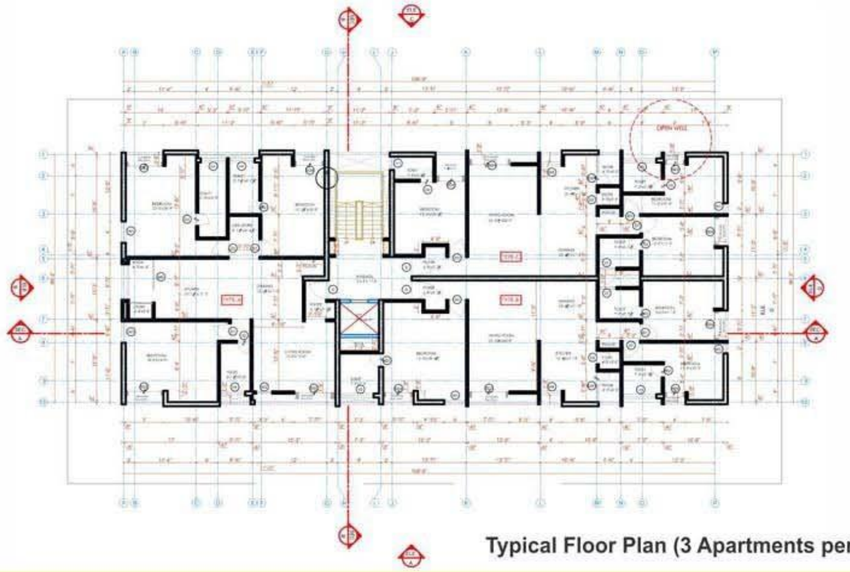
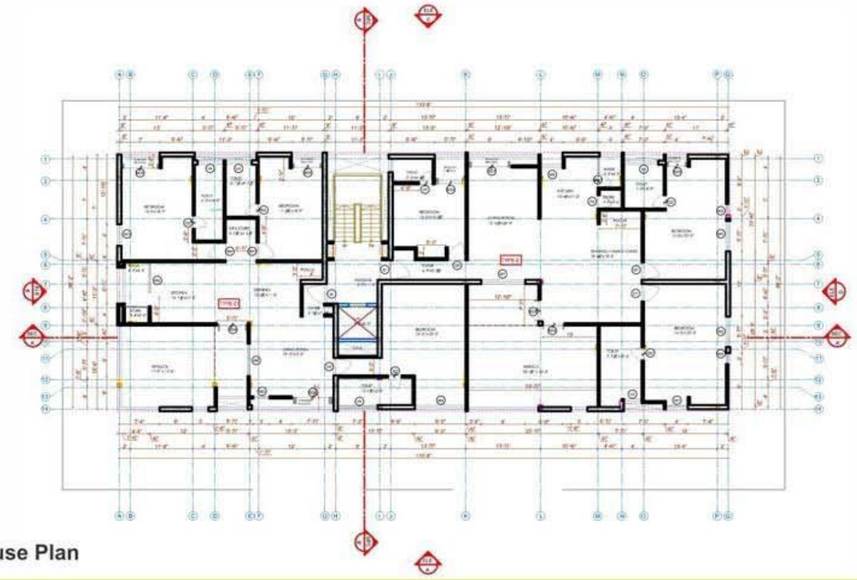
PROFESSIONAL PROJECT

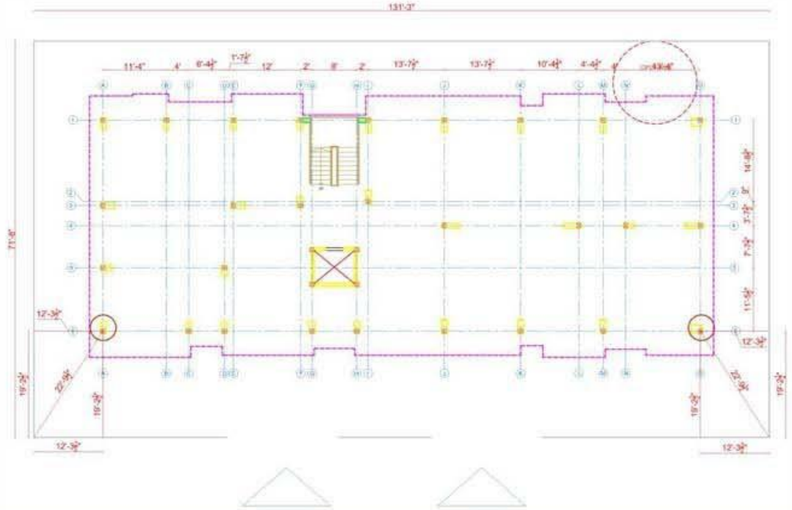


Typical Floor Plan (3 Apartments per floor)

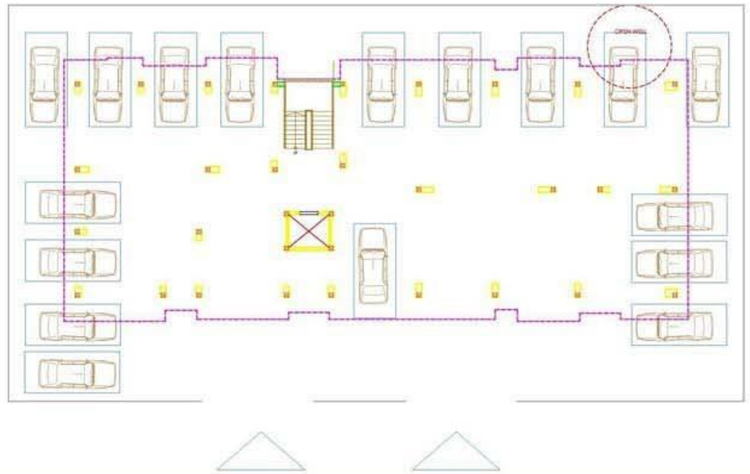


Penthouse Plan

Centreline Plan



Parking Plan



APARTMENT DESIGN AT ABU ROAD

Firm	:	Matai Associates
Designation	:	Intern architect
Site	:	Abu Road, India
Execution period	:	Jan 2014 to May 2014

Significance : This project offered the opportunity to apply my skills for residential architecture-Apartment design. My first practical experience with ground reality in the field of architecture, begun with this project.

ABOUT THE PROJECT : The apartment at Abu Road was to be designed in a very stringent time constraint.Also,the site lied in the region where the cold and hot temperatures went to extreme.

Hence, a design that balanced the microclimate had to be implemented. Also,the client required two penthouses for his own use, which had to be spacious as well as impressive. My role was to design according to the requirements and provide the set of working drawings in the given time schedule.

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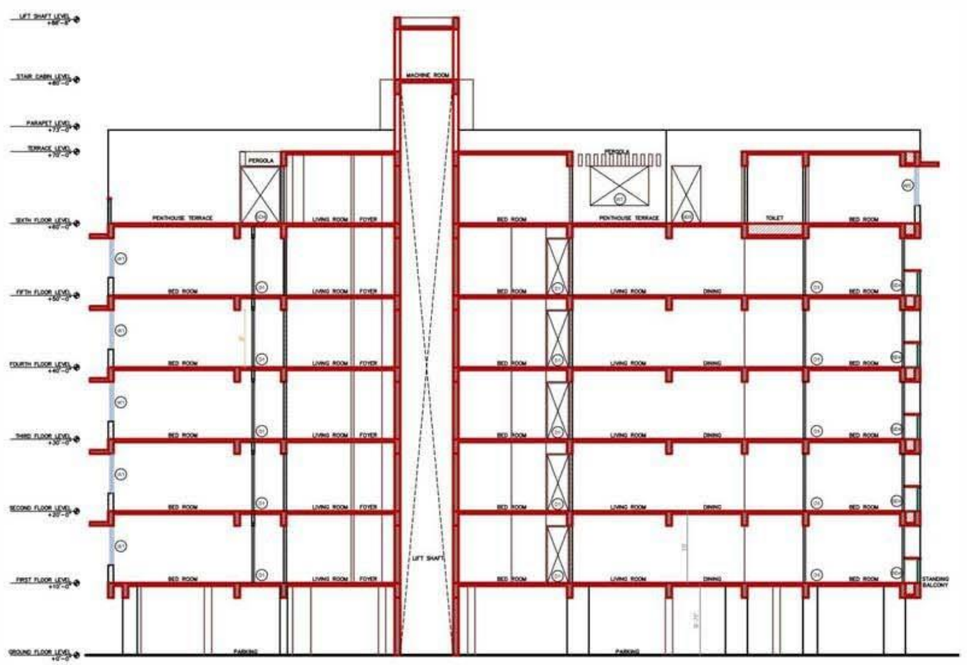
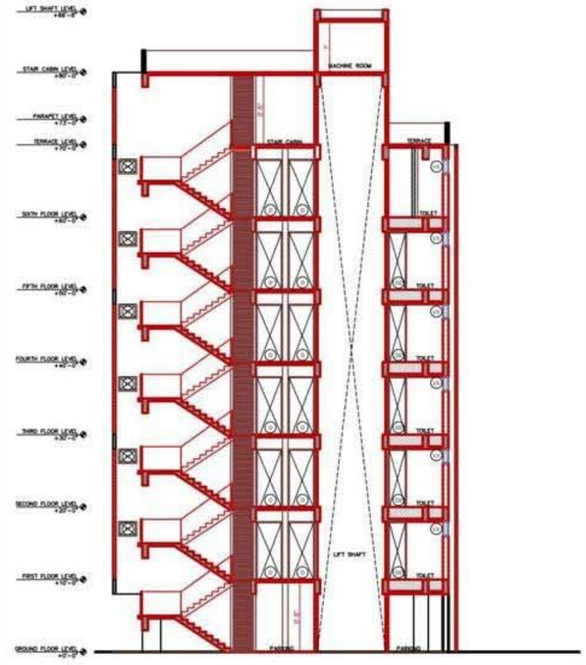
PROFESSIONAL PROJECT



SECTION-AA'

LATERAL SECTION



SECTION-BB'

VERTICAL SECTION

ELEVATION - A

FRONT ELEVATION

ELEVATION - C

REAR ELEVATION

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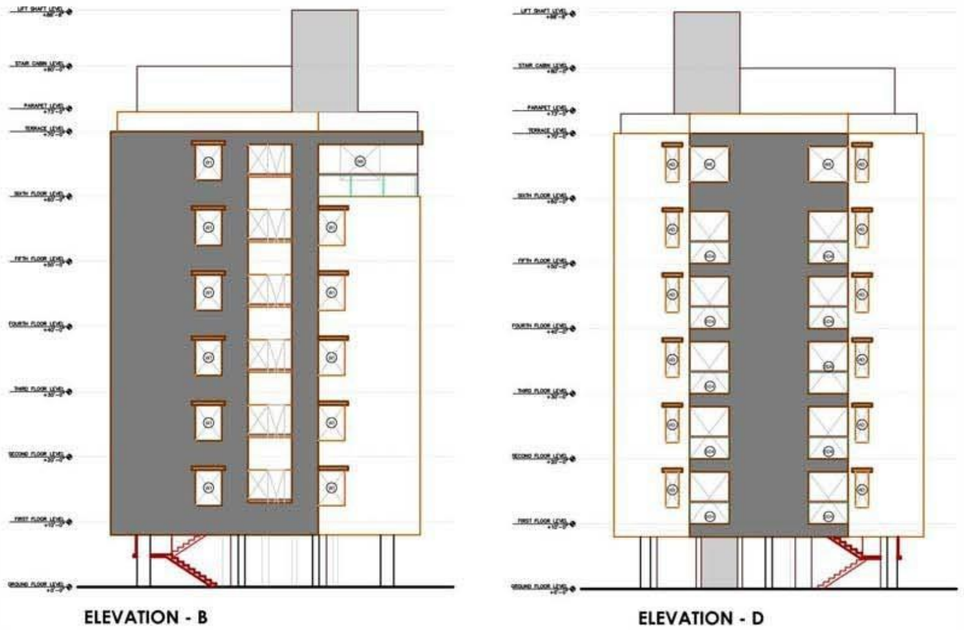
KRUPA NITESHKUMAR PATEL

PROFESSIONAL PROJECT



Side Elevations

The side elevation needed to be decent as well as concealing the services.

Toilet detail

Proper ventilation and the toilet layout had to be ensured in each type of toilet.

Kitchen detail

The kitchen detail had to ensure optimum usage of space available.

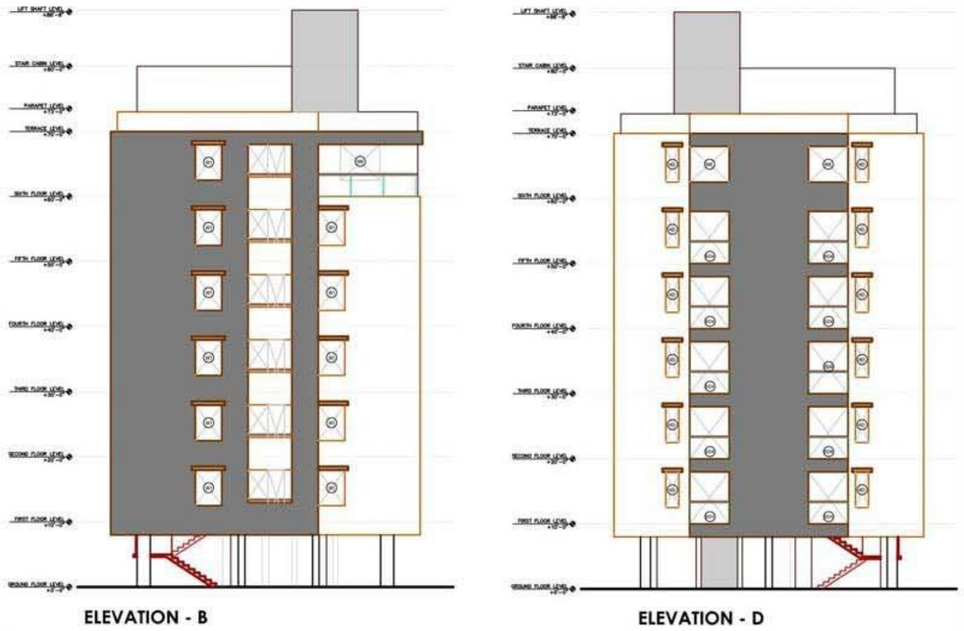
Working on this project improvised my working drawing skills and it helped to get accustomed to reality on site rather than just gaining knowledge from books.

The complications during implementation of drawings on site ,due to certain site conditions and technical problems were encountered. This was a thorough learning experience at grassroot level.

portfolio

KRUPA NITESHKUMAR PATEL

PROFESSIONAL PROJECT



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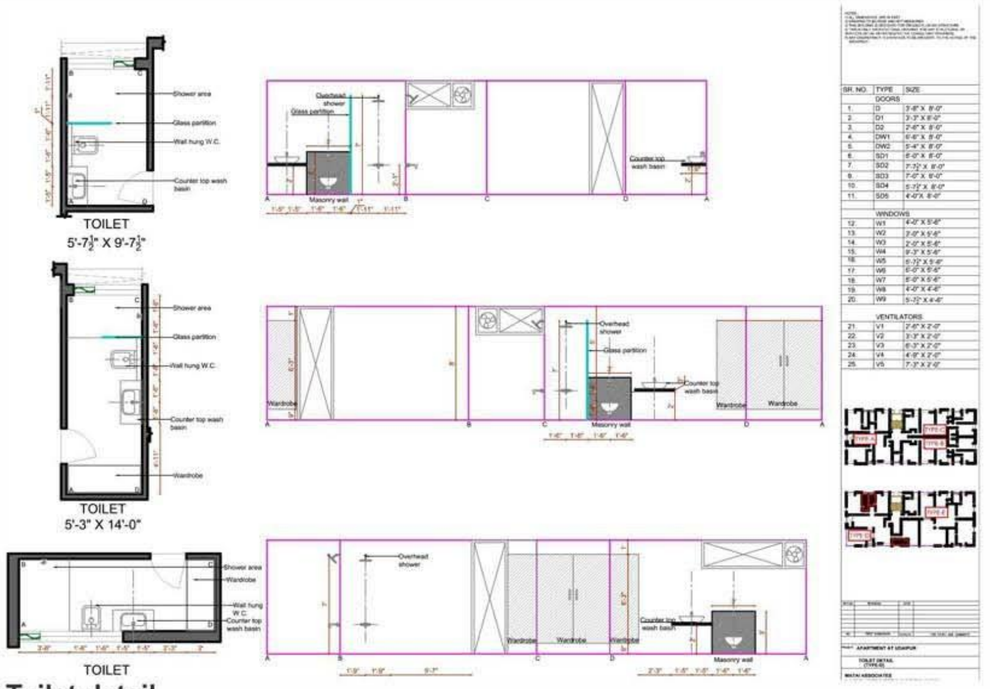

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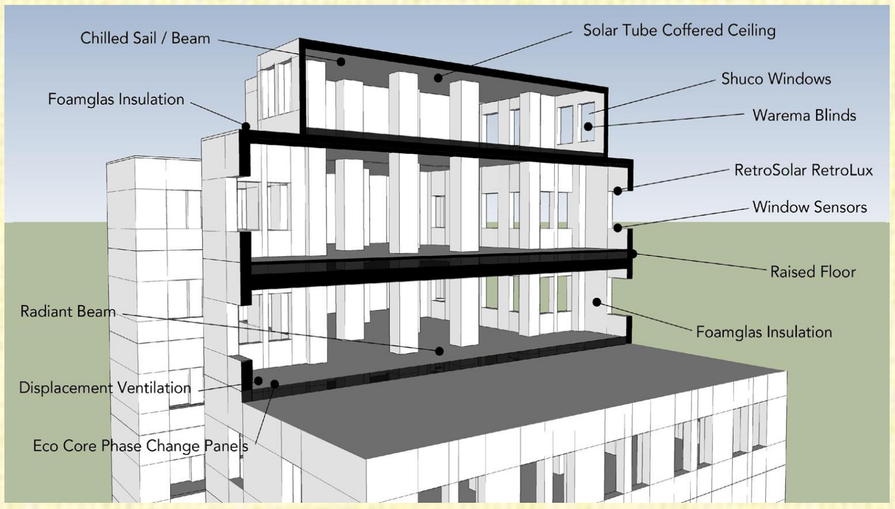
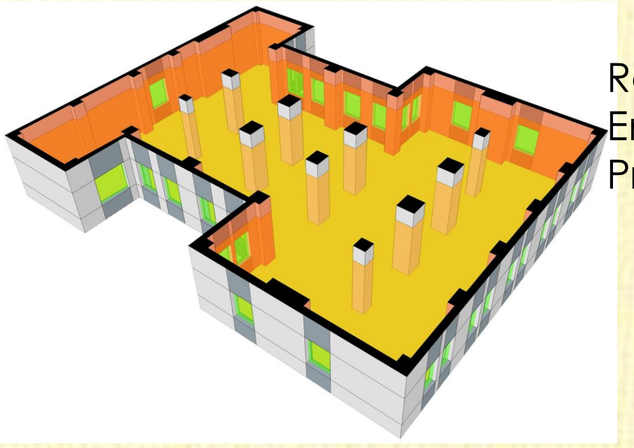
PROFESSIONAL PROJECT

3D RENDERINGS

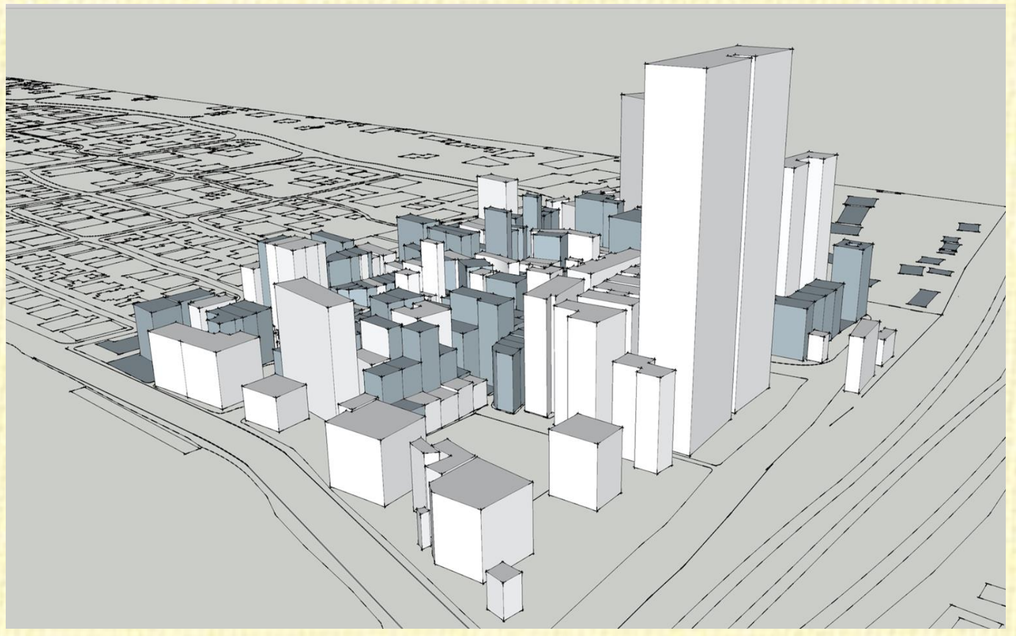
Multifamily Housing

Industrial Park Rendering





Rendering for an Energy Auditing Project



Urban Setting

portfolio

KRUPA NITESHKUMAR PATEL

Bachelor of Architecture: Academic Projects

(Gujarat University)

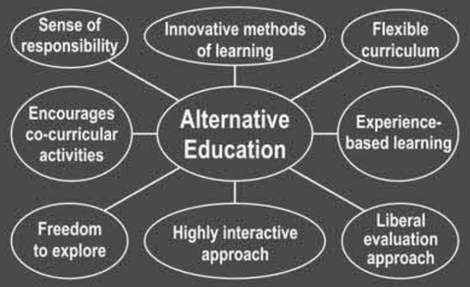
portfolio

KRUPA NITESHKUMAR PATEL

ACADEMIC PROJECT

"To love one's children is to see that they have the right kind of education that will help them to be sensitive,intelligent and integrated." - *J. Krishnamurti*

- The activities designed would not only effect the intellectual formation of the student but also influence the student physically, spiritually and psychologically. This will help the student develop into a balanced personality capable of becoming a productive, effective and sensitive member of the community.



- **AREA OF CONCERN**

  Lack of outer settings for learning practically along with enclosed spaces.

  Need for encouraging the learning that is more experience-based and interest-based rather than mere bookish knowledge.

  Lack of social interactive spaces for children of different age groups to mingle and exchange views.

  Conventional education practices are hindering students' natural creativity and overall development.

  Students experience boredom due to monotonous routine of the classroom culture and need to explore new methods of learning.

  The activities designed would not only effect the intellectual formation of the student but also influence the student physically, spiritually and psychologically.

SCHOOL WITH ALTERNATIVE EDUCATION

Academic project as a part of Design Studio

Site : Vemar village (Dist.Vadodara), India

Significance : This school with alternative education believes in teaching with a difference, laying emphasis on sports, fine arts, mathematics and communication through interactive curriculum designed to make learning enjoyable.This project helped in understanding the mindsets of people of all age groups and to design accordingly.

ABOUT THE PROJECT : The aim of this project is to fulfil the necessity of creating ambient interactive spaces. The open-close relationship of the spaces affects a child's mind very quickly.So, design is conceptualized over play of spaces that can lead the child to be free.

Children from rural areas tend to get lower standard of education.Hence, this school will be one of its kind in the village and vicinity. Alternative education concept had to be imbibed in design also.

portfolio

KRUPA NITESHKUMAR PATEL

ACADEMIC PROJECT

SITE ANALYSIS

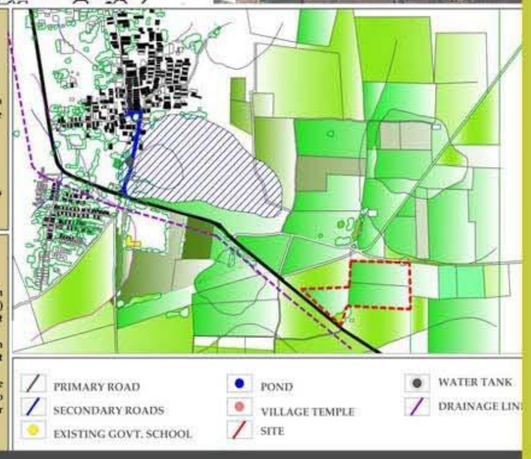
- Site : Vemar (Ta.Karjan,Dist.Vadodara,Gujarat)
- Site Area : 35,500 SQ M (8 acres)
- Official village code number : 01476700
- Vemar village given the status of "Nirmal Gaam"by Govt. of Gujarat.

SITE JUSTIFICATION CRITERIA FOR THE SITE

- Vemar lies in the center of the concerned villages, hence children of all villages will have to commute for same time and that too,for lesser time period,compared to present scenario where students going to far places places have to commute for 1-2 hours daily.
- Also, the site lies adjacent to the main road due to which it is easily accessible.
- As the site is in the outskirts of the village, it will serve a conducive environment for learning.
- The site also has natural surroundings and a rural setup.
- It provides ample breathing space.
- As it is adjacent to the main road, it also provides proper infrastructure such as drainage line passes from the edge of the road.
  Also, electricity supply is available in this part of the village.

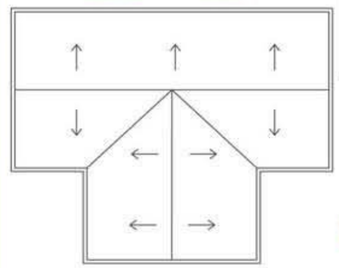
CLIMATE

Vemar lies in the Hot-dry climate zone.
The winters are mild, pleasant, and dry with average daytime temperatures around 29 °C (84 °F) and nights around 12 °C (54 °F) with 100 percent sunny days and clear nights.
The summers are extremely hot and dry with daytime temperatures around 41 °C (106 °F) and at night no lower than 29 °C (84 °F)
In the weeks leading up to the arrival of the monsoon rains the temperatures are similar to above but with high humidity which makes the air feel hotter.



The site lies adjacent to the main road but away from the chaos of the village, surrounded by the serene farms. Also, children from the villages in the vicinity will get the benefit.

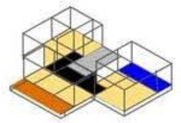
KINDERGARTEN AND ADMINISTRATION OFFICE

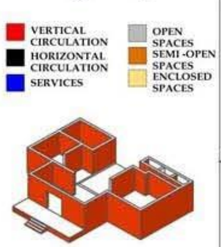


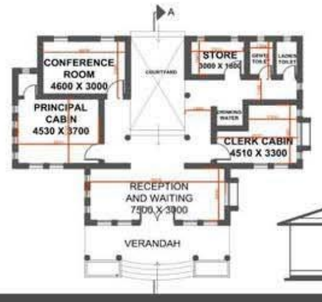
ADMINISTRATION OFFICE :

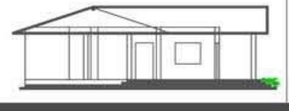
STAFF	TOTAL NO.	TOTAL
PRINCIPAL	1	4
RECEPTIONIST	1	
CLERKS	2	

TOTAL GROUND AREA COVERED : 1405 SQ M.
TOTAL BUILT UP : 2695 SQM.
TOTAL CIRCULATION AREA : 650 SQ M. (CORRIDORS,STAIRS,LOBBY)
TOTAL CARPET AREA : 1100 SQ M.
O.T.S. AND SEMI OPEN SPACES' AREA : 340 SQ M.









KINDERGARTEN:

CLASSES: JR.KG , SR.KG
(AGE GROUP 3 TO 5YRS)

CLASS	SECTIONS	NO. OF STUDENTS	TOTAL STUDENTS
JR.KG.	4	80	160
SR.KG.	4	80	

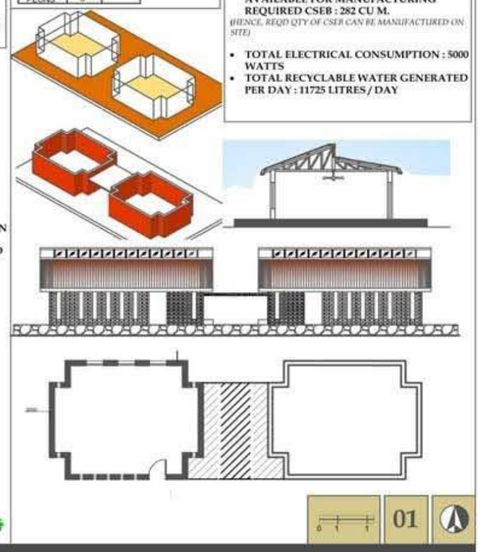
STAFF	TOTAL NO.	TOTAL
HOD	1	15
TEACHERS	8	
PEONS	3	

TOTAL NO. OF USERS : 175

- TOTAL CIRCULATION AREA : 650 SQ M. (CORRIDORS,STAIRS,LOBBY)
- TOTAL CARPET AREA : 1100 SQ M.
- O.T.S. AND SEMI OPEN SPACES' AREA : 340 SQ M.
- INDIVIDUAL REQUIREMENT OF CSEB : 262.4 CU. M.
- SURPLUS EXCAVATED EARTH QTY AVAILABLE FOR MANUFACTURING REQUIRED CSEB : 262 CU M.

(HENCE, REQD QTY OF CSEB CAN BE MANUFACTURED ON SITE)

- TOTAL ELECTRICAL CONSUMPTION : 5000 WATTS
- TOTAL RECYCLABLE WATER GENERATED PER DAY : 11725 LITRES / DAY



01

The kindergarten has a flexible plan allowing children to be free beyond the classroom. Also, the northlight provides diffused light in the study space. Hence a kid is free to do anything of his interest.

MIDDLE SCHOOL

MIDDLE SCHOOL

CLASSES : STD. 9 , 10 , 11 , 12 (SCIENCE , COMMERCE)
(AGE GROUP : 13 TO 17 YRS)

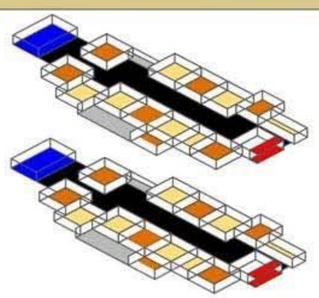
CLASS	SECTIONS	NO. OF STUDENTS	TOTAL STUDENTS
9	2	80	320
10	2	80	
11-SCI.	1	40	
12-SCI.	1	40	
11-COM.	1	40	
12-COM.	1	40	

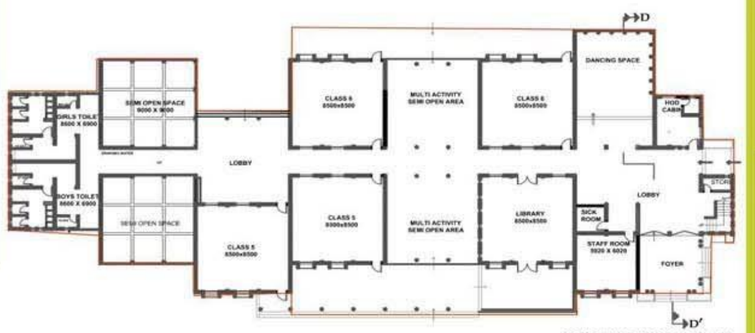
STAFF	TOTAL NO.	TOTAL
HOD	1	15
TEACHERS	9	
LAB ASST.	3	
PEONS	2	

TOTAL NO. OF USERS : 335

TOTAL GROUND AREA COVERED : 1234 SQ M.
TOTAL BUILT UP : 1243 SQM.

TOTAL CIRCULATION AREA : 234 SQ M. (CORRIDORS,STAIRS,LOBBY)
TOTAL CARPET AREA : 1234 SQ M.
O.T.S. AND SEMI OPEN SPACES' AREA : 1243 SQ M.





GROUND FLOOR PLAN

SOUTH ELEVATION

EAST ELEVATION

SECTION AA'

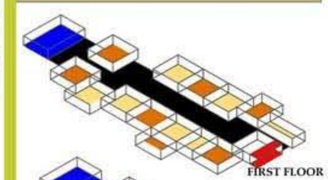
The roof pattern and simple planning are inspired from the context of the village. Ample interactive spaces have been provided between any two classes, which extends itself to become an open classroom on pleasant days.

MIDDLE SCHOOL

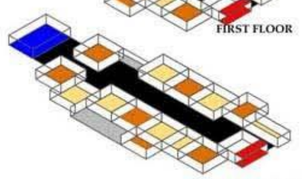
- TOTAL CIRCULATION AREA : 520 SQ M. (CORRIDORS,STAIRS,LOBBY)
- TOTAL CARPET AREA : 690 SQ M.
- O.T.S. AND SEMI OPEN SPACES' AREA : 600 SQ M.
- INDIVIDUAL REQUIREMENT OF CSEB : 346.4 CU. M.
- SURPLUS EXCAVATED EARTH QTY AVAILABLE FOR MANUFACTURING REQUIRED CSEB : 946 CU M.

(HENCE, REQD QTY OF CSEB CAN BE MANUFACTURED ON SITE)

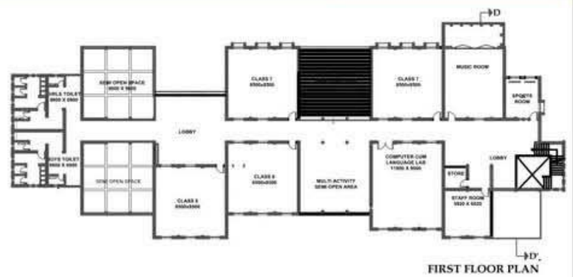
- TOTAL ELECTRICAL CONSUMPTION : 16,451 WATTS
- TOTAL RECYCLABLE WATER GENERATED PER DAY : 11,850 LITRES / DAY



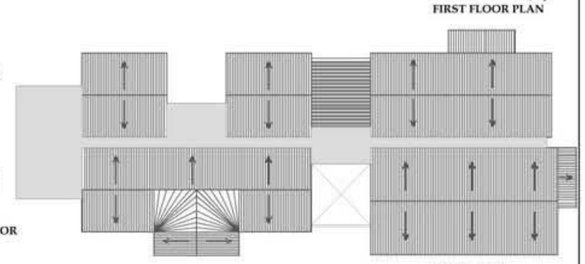
FIRST FLOOR



GROUND FLOOR



FIRST FLOOR PLAN



ROOF PLAN

The school provides an extremely flexible curriculum.So,the design had to be in harmony with the concept. The concept emphasized on freedom of thought and deeds in a positive way.Similarly,the spaces were defined inside and outside in such a way that no enclosed barrier can become an obstacle in child's psychological progress.

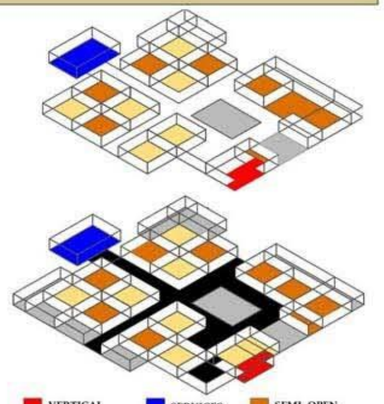
Designing spaces according to the thought processes and ways of perception, of children belonging to different age groups is indeed a challenging task.

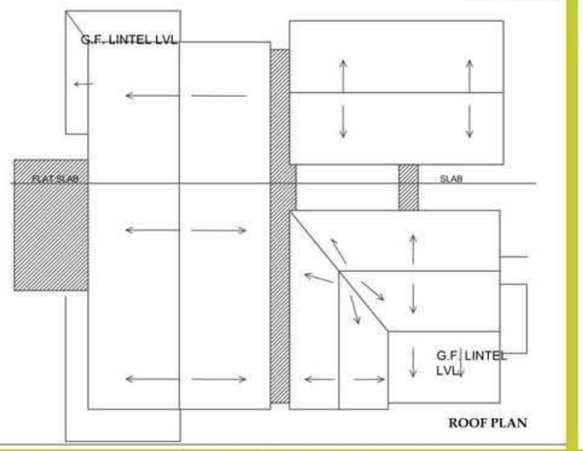
portfolio
KRUPA NITESHKUMAR PATEL

ACADEMIC PROJECT

JUNIOR SCHOOL

- TOTAL CIRCULATION AREA : 650 SQ M. (CORRIDORS,STAIRS,LOBBY)
- TOTAL CARPET AREA : 1100 SQ M.
- O.T.S. AND SEMI OPEN SPACES' AREA : 340 SQ M.
- INDIVIDUAL REQUIREMENT OF CSEB : 262.4 CU. M.
- SURPLUS EXCAVATED EARTH QTY AVAILABLE FOR MANUFACTURING REQUIRED CSEB : 282 CU M. *(HENCE, REQD QTY OF CSEB CAN BE MANUFACTURED ON SITE)*
- TOTAL ELECTRICAL CONSUMPTION : 5000 WATTS
- TOTAL RECYCLABLE WATER GENERATED PER DAY : 11725 LITRES / DAY





SENIOR SCHOOL

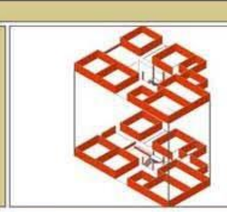
SENIOR SCHOOL :
CLASSES : STD. 9 , 10 , 11 , 12 (SCIENCE , COMMERCE)
(AGE GROUP : 13 TO 17 YRS)

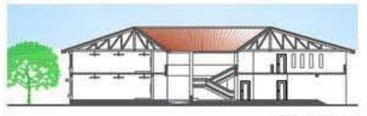
CLASS	SECTIONS	NO. OF STUDENTS	TOTAL STUDENTS
9	2	80	320
10	2	80	
11-SCI	1	40	
11-SCI	1	40	
11-COM	1	40	
12-COM	1	40	

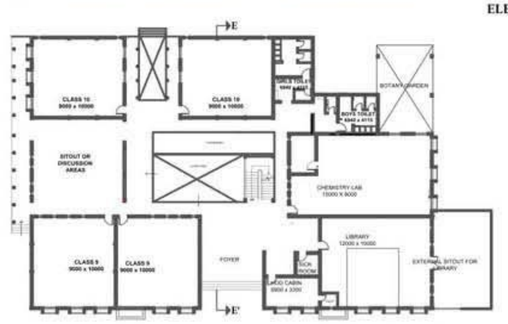
STAFF	TOTAL NO.	TOTAL
PRINCIPAL	1	15
TEACHERS	9	
LAB ASST	3	
PEONS	2	
TOTAL NO. OF USERS : 335		

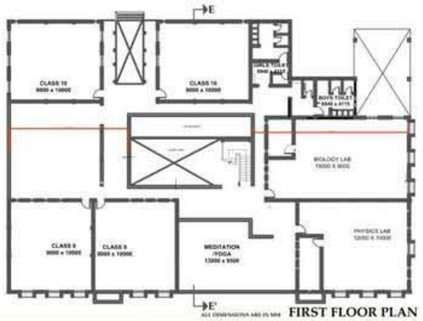
TOTAL GROUND AREA COVERED : 1405 SQ M.
TOTAL BUILT UP : 2695 SQ M.

- TOTAL CIRCULATION AREA : 650 SQ M. (CORRIDORS,STAIRS,LOBBY)
- TOTAL CARPET AREA : 1100 SQ M.
- O.T.S. AND SEMI OPEN SPACES' AREA : 340 SQ M.
- INDIVIDUAL REQUIREMENT OF CSEB : 262.4 CU. M.
- SURPLUS EXCAVATED EARTH QTY AVAILABLE FOR MANUFACTURING REQUIRED CSEB : 282 CU M. *(HENCE, REQD QTY OF CSEB CAN BE MANUFACTURED ON SITE)*
- TOTAL ELECTRICAL CONSUMPTION : 5000 WATTS
- TOTAL WATER REQUIREMENT PER DAY : 11,700 LITRES/DAY









The circulation spaces are well emphasized in the Junior school, as the children of this age group tend to do more activities compared to their seniors .As such they need more open space to play and roam around.

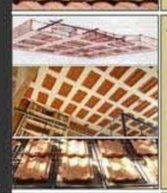
CONSTRUCTION MATERIALS

ROOFING MATERIAL : MANGALORE TILES ON STEEL TRUSS

For the pitched roofing, mangalore tiles have been used, that are laid upon the steel truss. Mangalore tiles offer good insulation, low-cost and ample air movement. It provides excellent air ventilation during summer.These tiles are not only eco-friendly but also cheap, durable and costs only one third that of cement.eillage, v
Also, it reflects the context of thevillage, where the site is situated.

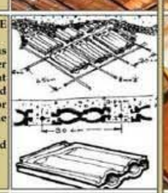
WALLS : COMPRESSED STABILISED EARTH BLOCKS

The soil, raw or stabilized, for a compressed earth block (CEB) is slightly moistened, poured into a steel press (with cement stabiliser) and then compressed either with a manual or motorized press.
CSEB are made on site as the excavated earth (after filling of plinth) is enough for the required quantity of CSEB, in a building.
PLAIN 245 INTERLOCKING BLOCKS by Aurum 3000 press are used in the campus.



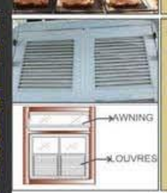
SLABS : FILLER SLABS WITH MANGALORE TILES AS FILLER MATERIAL

Lightweight, inexpensive materials such as lowgrade Mangalore tiles ,is used as filler materials in filler slabs to replace the redundant concrete in tension zones.These materials are laid in the grids of steel reinforcement rods (6mm or 8mm dia.), and concreting is done over them. The concrete mix used is 1:2:4.
For Mangalore tiles (size 23cm by 40cm), the grid size is 33cm by 50cm. The slab thickness is 10 cm
This roofing costs 30-35% less than conventional.



FLOORING : TERRACOTA TILES and COLOR OXIDES,KOTASTONE

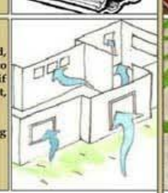
Flooring is of terracotta tiles and colour oxides. The bed is made out of broken brickbats (this saves wastage of brick), over which a 3" mortar layer is laid and tiles are placed over it. Various patterns and designs are worked out, dependent upon shape, size of tiles, span of flooring .
flooring is poured cement with colour oxide finishes, usually in red, black, or ochre, and sometimes with red for most of the floor and black as a border.



DOORS AND WINDOWS :

The doors and the windows are made of wood, with ventilators, as an additional device. Due to these, there is constant air flow in the room, even if it is closed. Also the, glazing invites diffused light, as the chhajjas block the harsh sun from entering.

Ventilators play an important role in maintaining the room temperature in hot-dry climate.



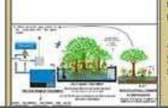
PAVING : PERMEABLE PAVER BLOCKS

These blocks create a series of openings that allow rainwater to drain through the pavement surface and infiltrate into the soil below where contaminents are naturally filtered.

They play an important role in the natural recharging of the existing aquifersThese are also pedestrian friendly. Permeable pavers are cost effective and environment friendly.
Also they are available in different patterns.

FOUNDATION : RCC FOUNDATION AND UNCOURSED RUBBLE MASONRY TILL PLINTH

The stone is a locally available material, which can be obtained from around 100 km radius from the site. Hence, for foundation upto plinth,stone is used as a construction. It offers strong and a firm base as well as gives a strong feeling to the campus, to be one with nature.
Also, it imparts great aesthetic quality to the elevations.

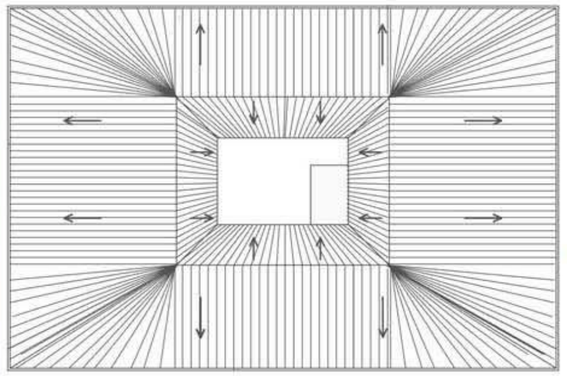


BLACKWATER RECYCLING THROUGH STP :

A sewage treatment plant has been made ,in order to recycle the blackwater generated everyday.
Hence, the blackwater, that is recycles passes through the sewage treatment plant, and it is used to water the landscape area of the whole campus.

Also, the water runoff is absorbed due to green pavers, which helps in the grooud water recharging.

The above mentioned sustainable practices have been incorporated in the design process at all levels, right from the conceptualization to finalization level.



SENIOR SCHOOL ROOF PLAN

0 2 5 7

07

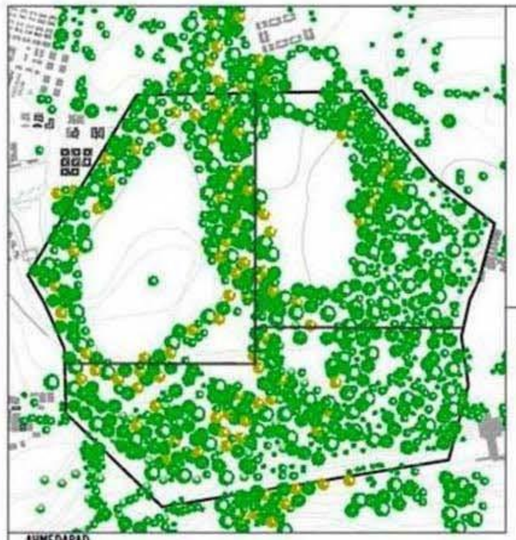
This design project had some constraints like limited availability of resource.es and low budget, but it also presented various advantages like getting advanced education while being attached to the traditional roots of our culture.

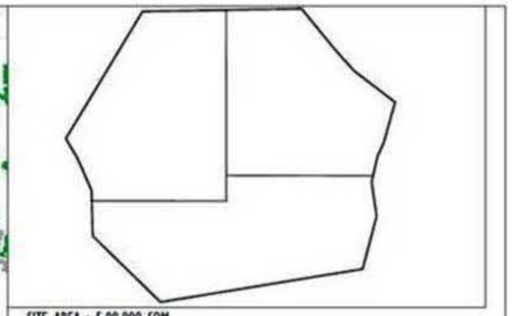
Hence,this educational project, with its unique concept and curriculum offered a wide range of possibilities to explore ways to use spaces in different ways rather than using it in old conventional ways as well as to study the young minds.

KRUPA NITESHKUMAR PATEL

portfolio

ACADEMIC PROJECT





SITE AREA : 5,00,000 SQM
PHASE AREA : 1,60,000 SQM
PERMISSIBLE F.S.I. : 1.2
PERMISSIBLE FOOTPRINT : 64,000 SQM (40% OF PLOT AREA)
FOOTPRINT ON SITE : 57,394 SQM
PERMISSIBLE AREA FOR ROADS : 27,200 SQM (17% OF PLOT AREA)
AREA OF ROADS ON SITE :

AHMEDABAD
LAT./LONG : 23.03°N , 72.58° E
AVG ANNUAL RAINFALL : 800 mm
AVG ANNUAL WIND SPEED : 4.5 kts

RESIDENTIAL TYPOLOGIES IN THE TOWNSHIP :

HIGHRISE APARTMENTS	(G+12)	(3BHK & 2BHK)
LOWRISE APARTMENTS	(G+7)	(3BHK & 2BHK)
TENAMENTS	(G+1)	(2BHK)
ROW HOUSES	(G+1)	(3BHK & 2BHK)
WALKUP APARTMENTS	(G+3)	(1BHK)

Any one phase of the site had to be selected. My choice was the western phase because it was a wasteland that could be successfully revived, and hence, no extant vegetation would be harmed.

RESIDENTIAL TOWNSHIP (ON GREEN DESIGN PRINCIPLES)

Academic project as a part of Green Design Studio

Site : Motera (Ahmedabad), India

Significance : This project was beneficial in satiating the curiosity regarding the sustainable architecture,that id highly prevalent globally.Also,many facets of residential architecture were encountered.

ABOUT THE PROJECT : The green design studio project consisted of designing a township based on sustainable principles. This included the study and implementation of residential architecture as well as climatology and sustainable concepts.

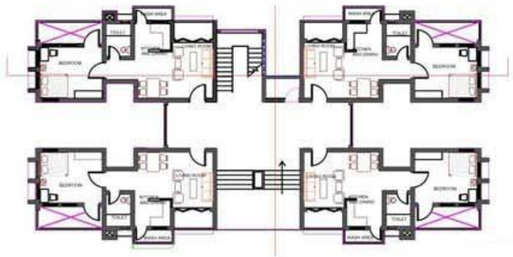
The typology that had to be incorporated in the township was:

Highrise apartments, Lowrise apartments, Walkup apartments, Tenaments and Row houses. Alongwith this,the prevailing by-laws had to be taken care of, while designing each typology. (Individual project)

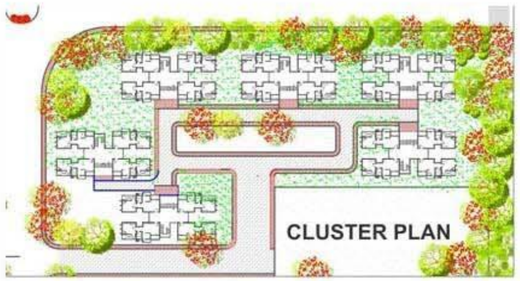
KRUPA NITESHKUMAR PATEL

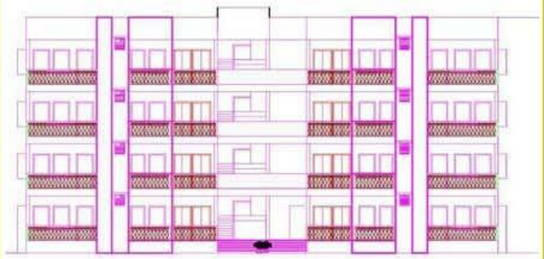
portfolio

ACADEMIC PROJECT

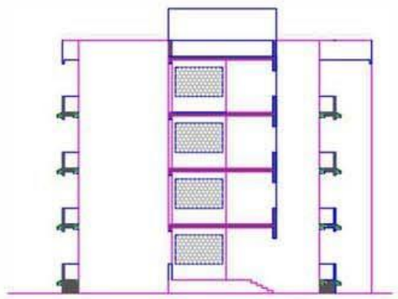


GROUND FLOOR PLAN



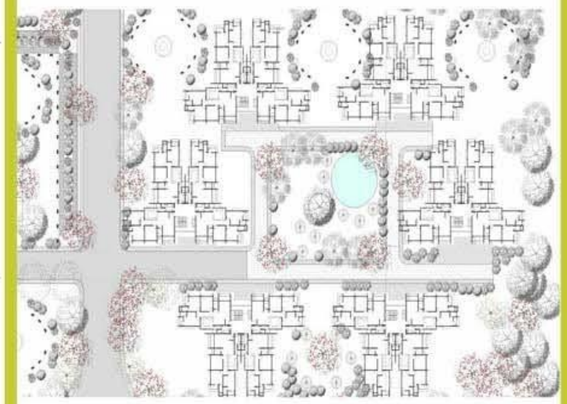


ELEVATION

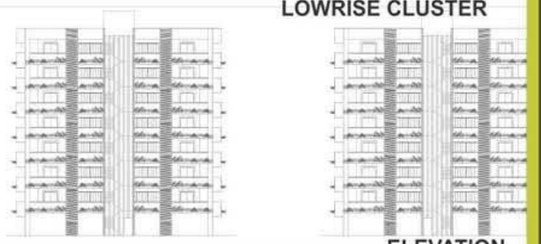


SIDE ELEVATION

Walkup apartments are residences with minimum rooms and more open spaces.



LOWRISE CLUSTER



ELEVATION

Lowrise apartments had the best cluster design.

Different typologies demanded different design strategies. For instance,while designing a row house, maximum possible circulation area had to be incorporated in minimum possible space, while designing a tenament,luxurious spaces had to be taken care of.

Similarly, while designing lowrise and highrise apartments,their by-laws had to be considered.

Clustering of habitats and creating community spaces was a stategy to promote social and cultural bonding among residents.

While designing, following sustainable practices were incorporated :

- Optimum use of spaces
- Rain water harvesting
- Solar street lights
- Eco friendly paver blocks
- Aerated concrete clocks for walls
- Maximum possible natural lighting
- Proper air ventilation
- Grey water recycling
- Use of passive devices according to hot climate
- Community spaces
- Roof gardens
- Vertical green walls with ivy plants
- High SRI paints
- Low-flow plumbing fixtures
- Bicycle pathway to reduce pollution
- Solar water heaters
- Storm water drainage system
- Protecting the existing vegetation on site

Lowrise apartments had the best cluster design.

Lowrise apartments had the best cluster design.

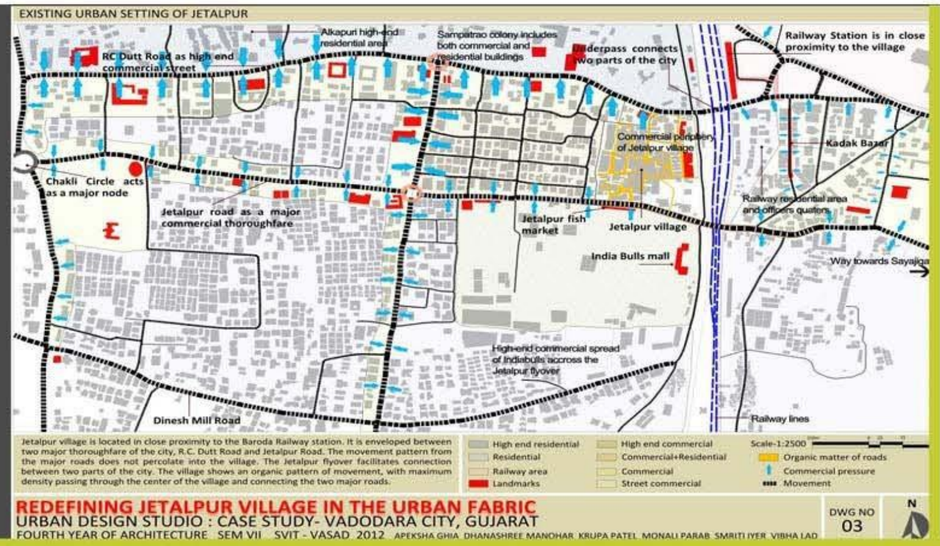
Lowrise apartments had the best cluster design.

KRUPA NITESHKUMAR PATEL

portfolio

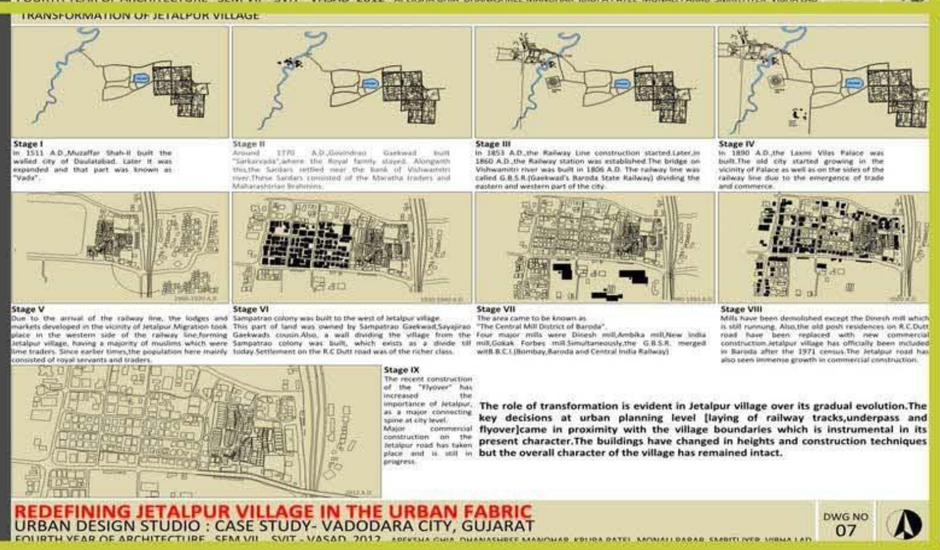
ACADEMIC PROJECT

EXISTING URBAN SETTING OF JETALPUR



On site sketches were made in order to personify the situation and to get acquainted with the lifestyle of the residents.

TRANSFORMATION OVER THE YEARS...



The whole village and urban structures enclosing it,were drafted in 3D in order to get proper understanding of the existing scenario.

REDEFINING JETALPUR VILLAGE IN THE URBAN FABRIC

Academic project as a part of Urban Design Studio

Site : Jetalpur (Vadodara), India

Significance : This project helped me a lot to imbibe urban awareness with respect to importance of small entities that unite to form a thriving city. Identification of issues and thorough site visits proved to be rigorous yet exciting experience. It was an intellectual experience, being the team leader.

ABOUT THE PROJECT : The urban design studio consisted of detailed analysis of the urban conditions of Jetalpur. The prevailing issues were identified and documented in context to the development of Vadodara. Some projects were then listed out as part of the proposals for the betterment of the existing conditions. After doing case-study in group,each member was assigned individual project. (The above displayed work has been done by me,as a part of group

work)

KRUPA NITESHKUMAR PATEL

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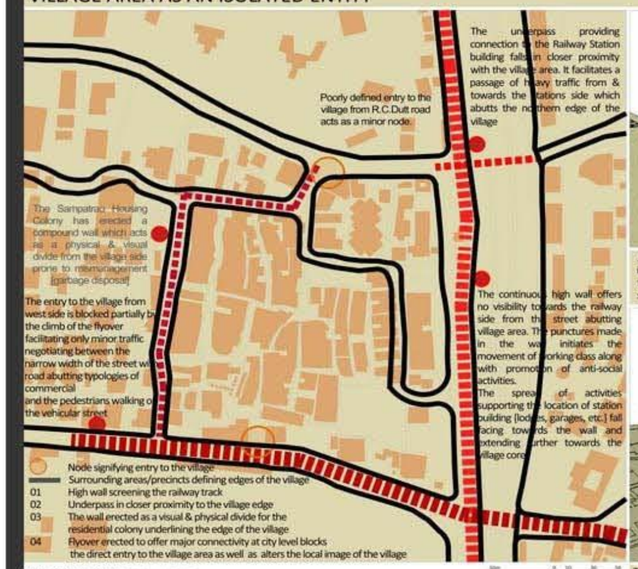
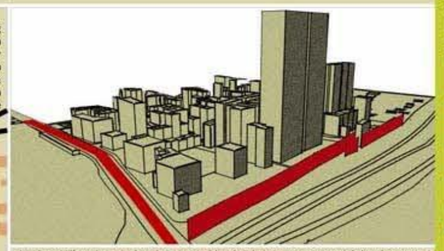
ACADEMIC PROJECT

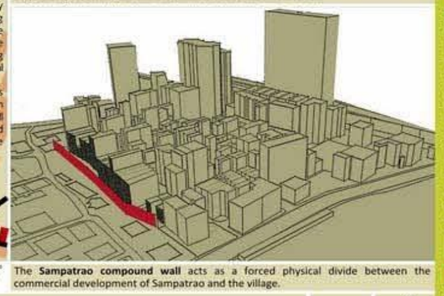
VILLAGE AREA AS AN ISOLATED ENTITY



EXISTING LAYOUT Scale 1:1000



Jetalpur Village is an isolated entity amidst the thrives or commercial development. It is enclosed between the **railway compound wall** which acts as a major edge deviding the railway area and the village. The **Jetalpur flyover** acts as a physical divide seperating the village from the commercial boom of Indiabulls.



The **Sampatrao compound wall** acts as a forced physical divide between the commercial development of Sampatrao and the village.

REDEFINING JETALPUR VILLAGE IN THE URBAN FABRIC
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DWG NO 05

As result of rigorous site study,we concluded that Jetalpur was an isolated identity and mapped the reasons for that conclusion. (As shown above)

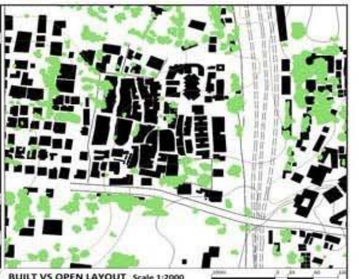
URBAN FABRIC & ITS SPECIALNESS - 01. PHYSICAL SETTING

The Jetalpur village in today's context indicates character which is peculiar because of its location, economical activities & its inter relations, transformations it has undergone, changing typologies with time and the contrast in the 'changing surroundings' where it situates strategically.

STREET NETWORK Scale 1:2000

Jetalpur Village area is located on gradual contours sloping towards south -east side. The village is surrounded by commercial streets on all three sides. The area is divided into narrow streets organically formed intersecting at various nodes. The peripheries around offers the sense of an area compounded from all the sides where streets run mostly north south direction. The internal clusters formed by the roads vary in sizes, predominantly larger ones located towards south east side [due to market pressure] and the village core comprises of smaller clusters depending on its community structure and location of institutions.
The flyover constructed on southern side offers sense of enclosure to the village and the coinciding edges [western edge of the bridge and village] blocks the vision of the village edge as well as possibility of any further thoroughfares between north and south side which is otherwise observed elsewhere.
The narrow, winding streets going towards the core from the outer periphery indicates sense of entering into a village area/domain which is also a private public place for the users of Jetalpur.

CLUSTERING NETWORK Scale 1:2000



BUILT VS OPEN LAYOUT Scale 1:2000

BUILDING LINE PLAN Scale 1:2000

FIGURE GROUND MAP Scale 1:2000

REDEFINING JETALPUR VILLAGE IN THE URBAN FABRIC
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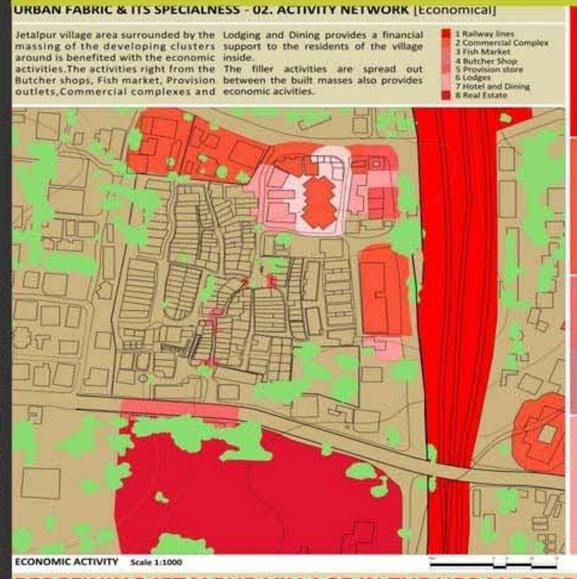
DWG NO 06

Due to its strategic location, enclosed by various factors,Jetalpur has lost its true essence.In order to study the existing landscape,the street patterns,natural contours affecting the clustering of habitats and various such factors, the above shown mapping was done.This helped a lot in deciding the needed urban insertions,in the area, which were eventually going to be our individual projects.

URBAN FABRIC & ITS SPECIALNESS - 02. ACTIVITY NETWORK [Economical]

Jetalpur village area surrounded by the massing of the developing clusters around is benefited with the economic activities.The activities right from the Butcher shops, Fish market, Provision outlets,Commercial complexes and Lodging and Dining provides a financial support to the residents of the village inside. The filler activities are spread out between the built masses also provides economic acivities.

1 Railway lines
2 Commercial Complex
3 Fish Market
4 Butcher Shop
5 Provision store
6 Lodges
7 Hotel and Dining
8 Real Estate



ECONOMIC ACTIVITY Scale 1:1000

RAILWAYS LINES

The distribution of parking space around the railway lines

Temporary activities adjoining the railway wall

The space between the railway wall and the Lalita tower overlooking the Flyover

COMMERCIAL COMPLEX

Lalita tower and its spillover activities

White house, right next to Lalita tower, which is an old heritage building

Activities taking place near Lalita tower in the evening time

FISH MARKET

BUTCHER SHOP

Butcher shops, holding one of the prime occupation of the residents of Jetalpur

Atmosphere around the Butcher /meat shops

The main provision store for the Jetalpur village people at the southern side of village entrance

LODGES AND HOTELS

The Lodges located on the north side gaining its importance because of the railway proximity

Eating joints outside Raajpath hotel on the east side, next to the underpass

Entry to Raajpath hotel

REDEFINING JETALPUR VILLAGE IN THE URBAN FABRIC
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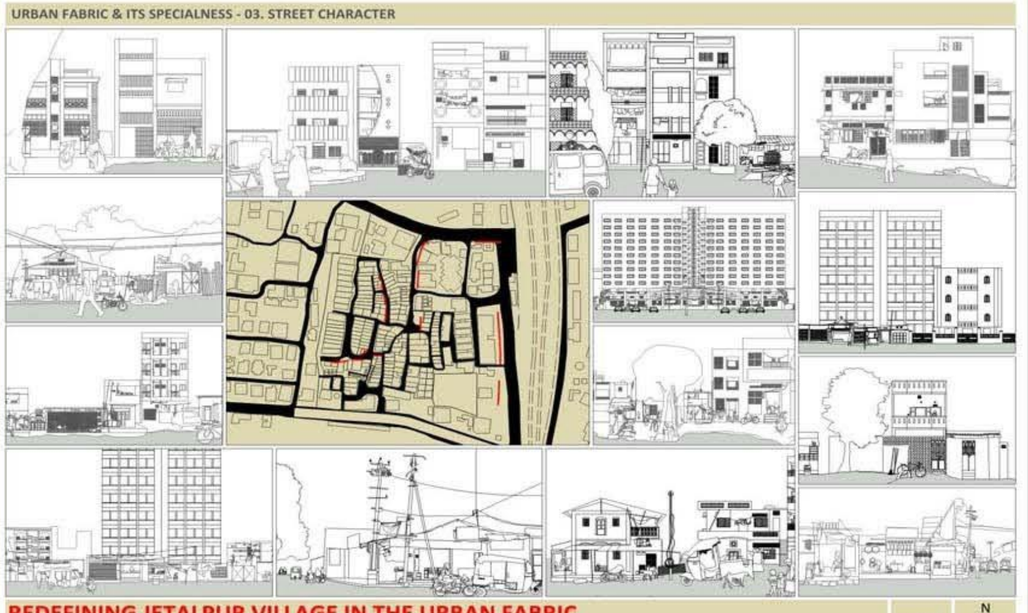
DWG NO 08

To get acquainted with the lifestyle of residents of Jetalpur, the economic activity mapping was done.This gave us the tentative idea of their sources of livelihood as well as their standard of living. This had to be studied because social factors matter the most while attempting to propose urban insertions.

URBAN FABRIC & ITS SPECIALNESS - 03. STREET CHARACTER



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DWG NO 10

The existing character of the village was depicted by various digital and handmade sketches.

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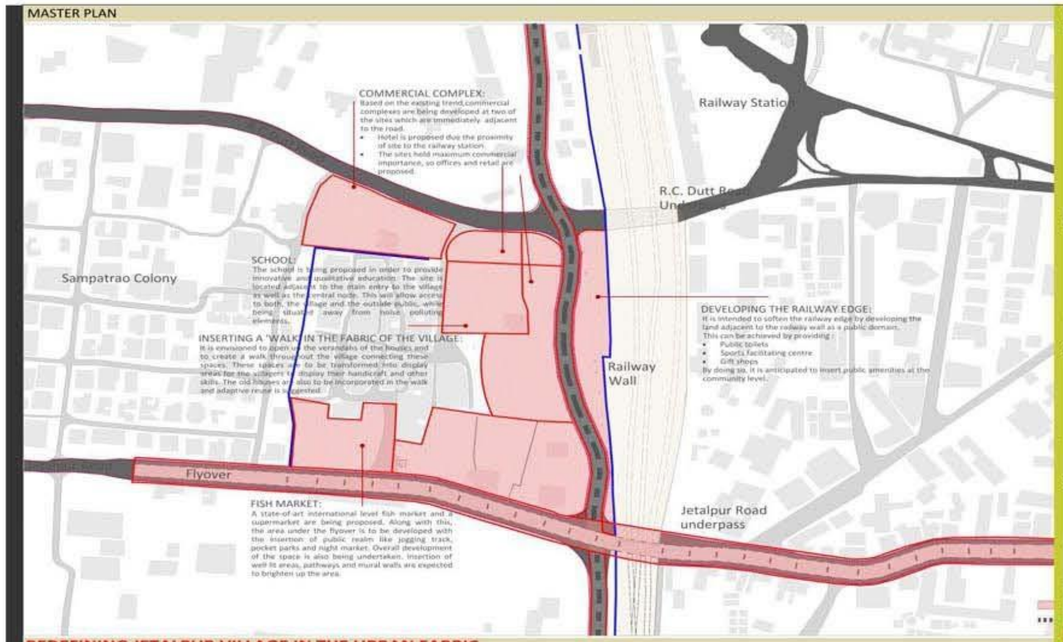
ACADEMIC PROJECT

MASTER PLAN



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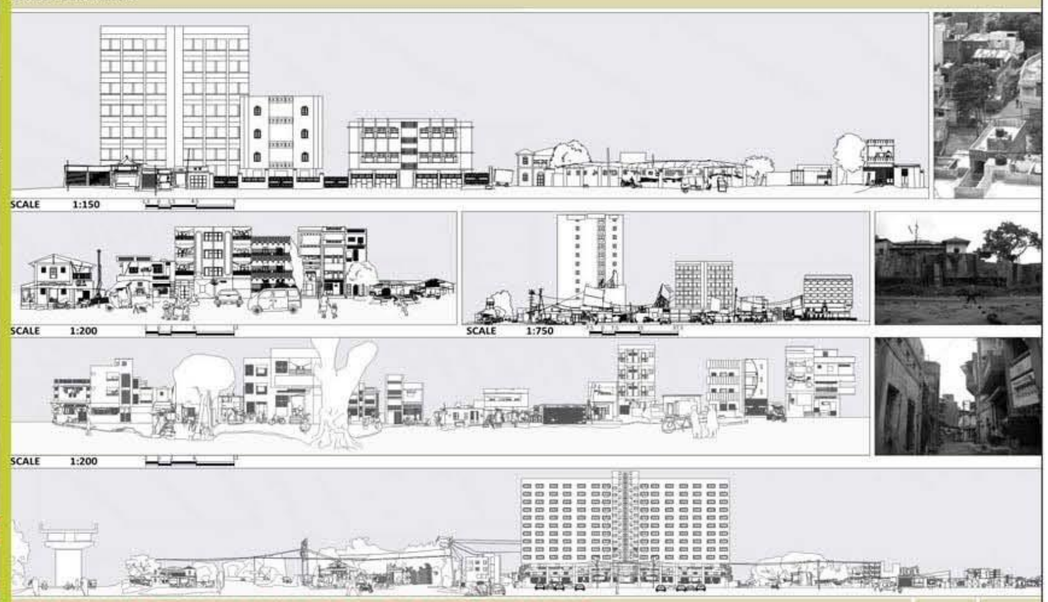
Finally,catering to the needs of Jetalpur, six proposals were drawn along with valid justification, so as to raise the standard of living as well as to promote Jetalpur as an independent entity rather than being an enclosed one

STREET ELEVATION



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DWG NO 18

Through sections were made for presentation of the exact scenario of Jetalpur. In these sections,we tried to imbibe the cultural and physical character of the place.

URBAN FABRIC & ITS SPECIALNESS - 02. ACTIVITY NETWORK [Socio-Cultural]

COMMUNITY MAPPING Scale 1:1000

Jetalpur village indicates an example of mixed residential population [Hindus, Muslims as well as specific communities belonging to schedule cast]. The narrow streets punctuated with nodes and open spaces facilitate social interaction among communities irrespective of class, creed and religion.Pattern of movement inside the village is organic and undefined. The activities on the periphery overspill on all the edges with its impact filtering inside the core

ACTIVITY MAPPING Scale 1:1000

REDEFINING JETALPUR VILLAGE IN THE URBAN FABRIC
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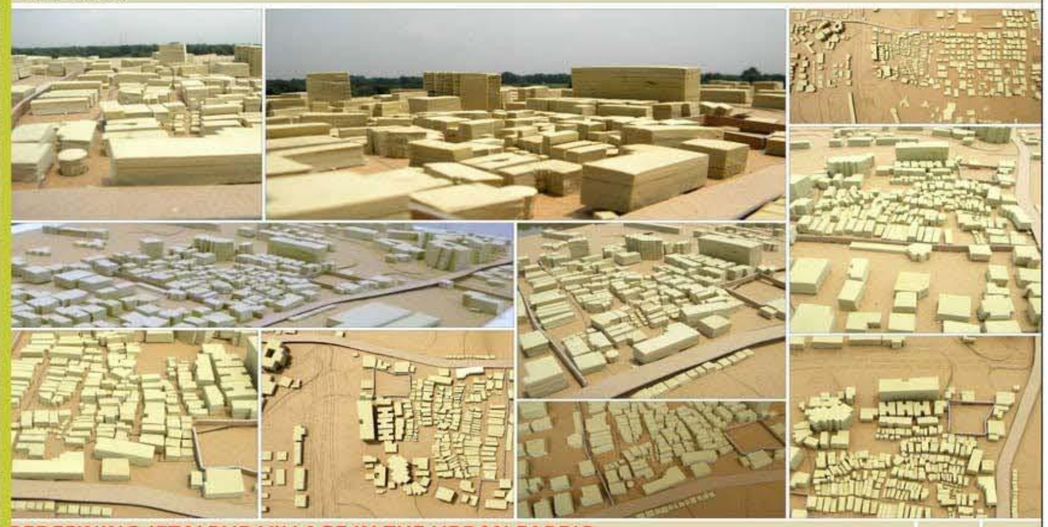
DWG NO 09

Community mapping was done so as to study the harmonious relationship between the differnt communities staying there,together as well as to identify the social issues bothering them.

MODEL IMAGES



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DWG NO 01

As a result of this spectacular studio, I became familiar with the Urban terminology. Also,the interactive study approach provided beneficial while studying the routine and lifestyle of the habitants. This project was beneficial in such a way the case study, that it changed my perception towards the classroom study methods. It was realized that site study and documentation remains etched in memory forever. Thus, after the case study, six proposals were drawn in to address the identified issues of the region and were pursued by individual members of the group.

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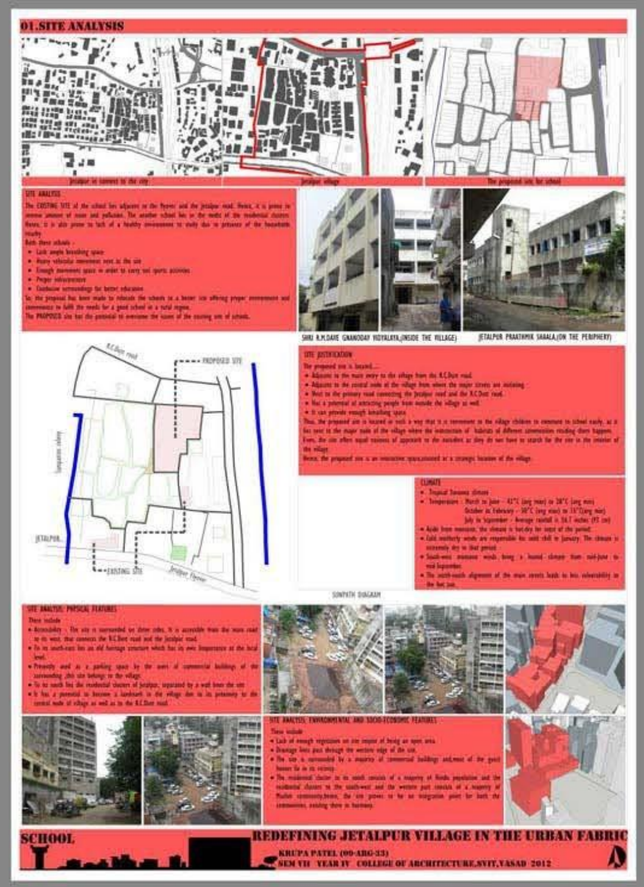
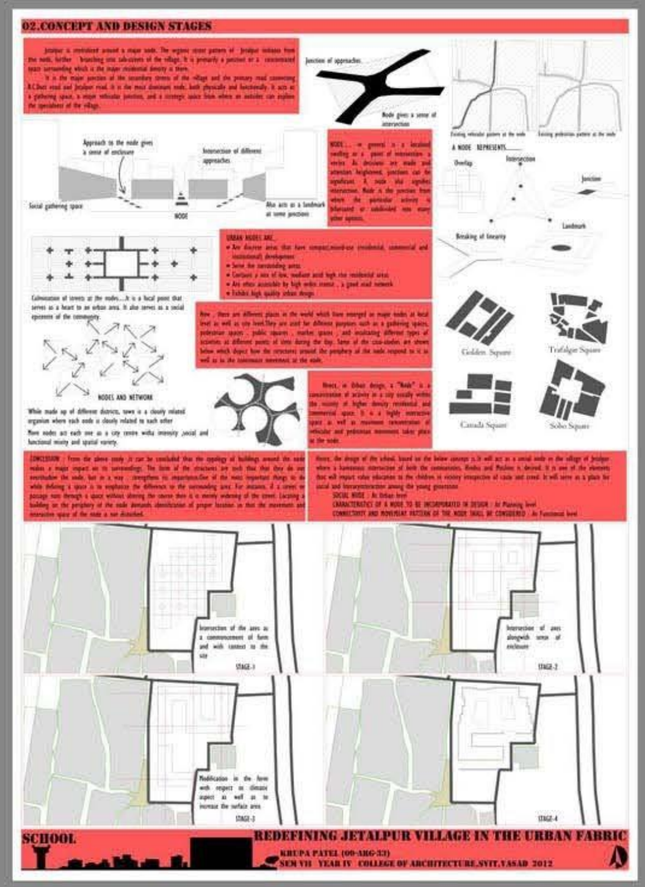
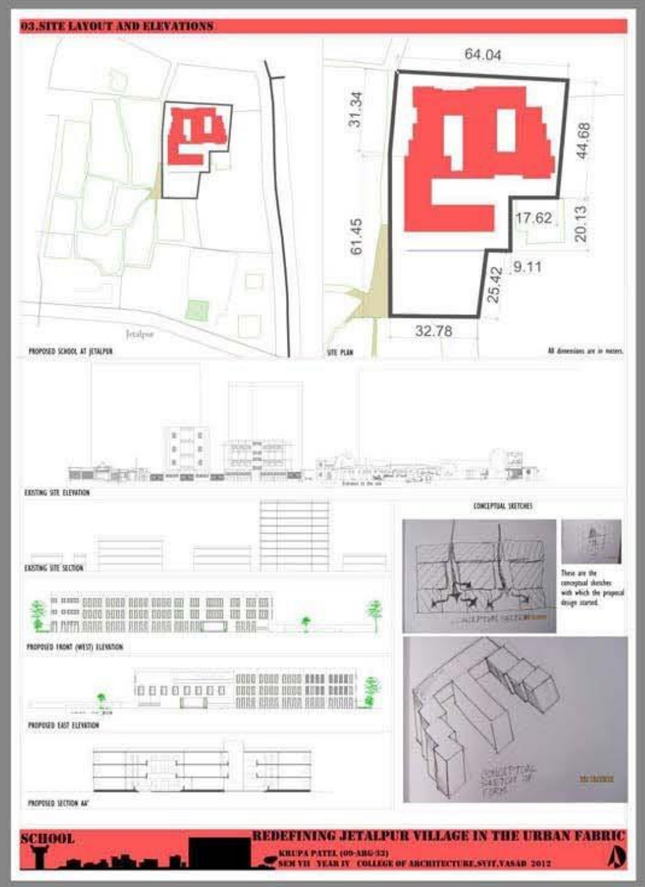
ACADEMIC PROJECT

INDIVIDUAL PROJECT : Insertion of school in the region





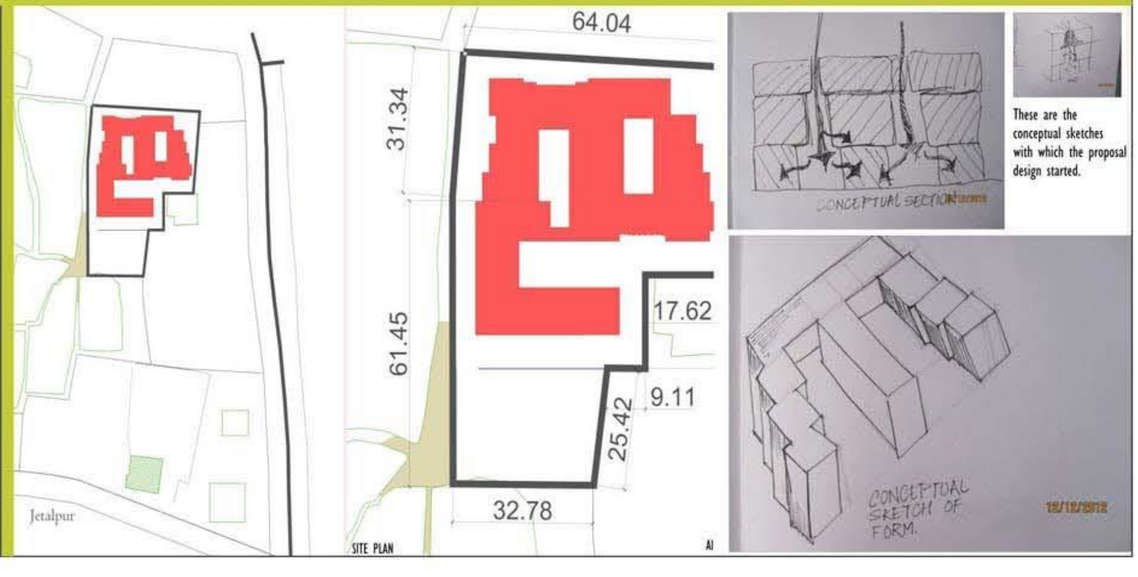


Finally, the proposed project pursued by me was of designing a school in the locality.

As the population consisted of various castes this school was supposed to be a social node of interaction of the cultures coexisting there.

Hence,taking the concept of the SOCIAL NODE, the school was further designed in context to the location of the site as well as climatic considerations.

In the above sheets,site justification and consequently site analysis is depicted. Also the design of the school was based on the concept of node such that the junctions and the corridors where the students can casually meet,played an important factor in designing.



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KRUPA NITESHKUMAR PATEL

portfolio

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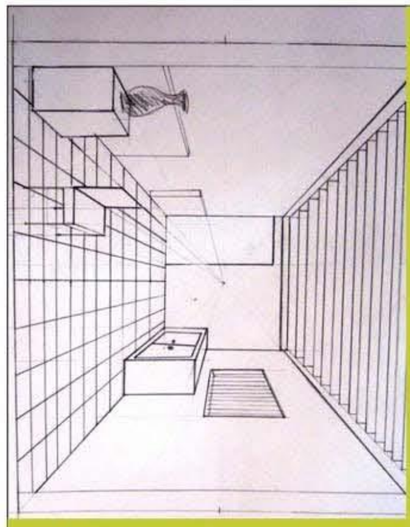



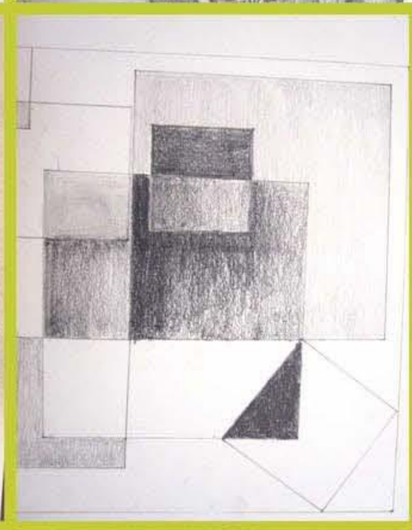



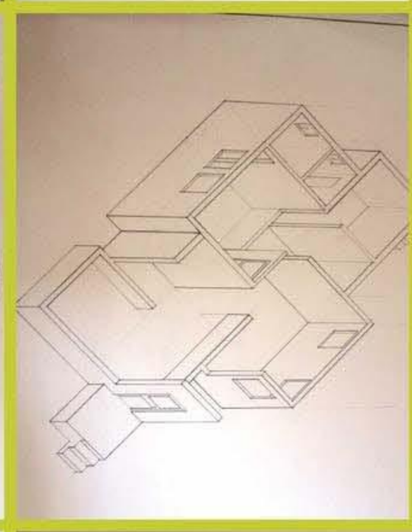
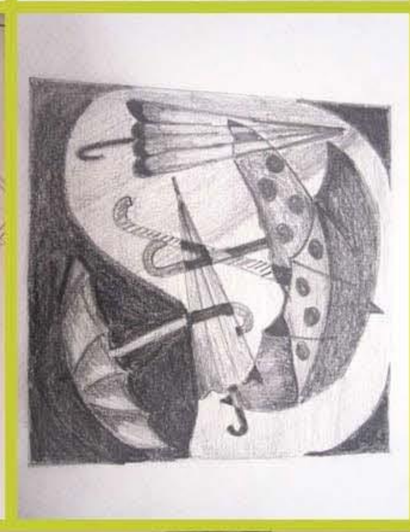
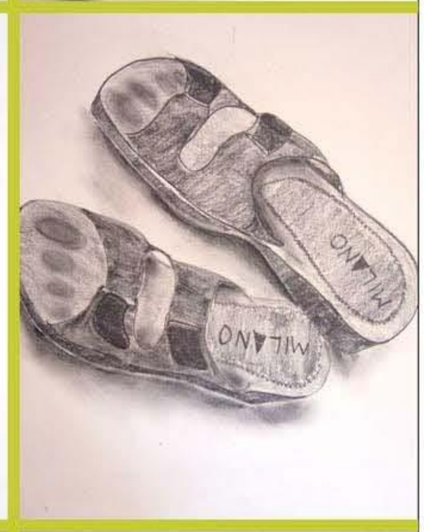

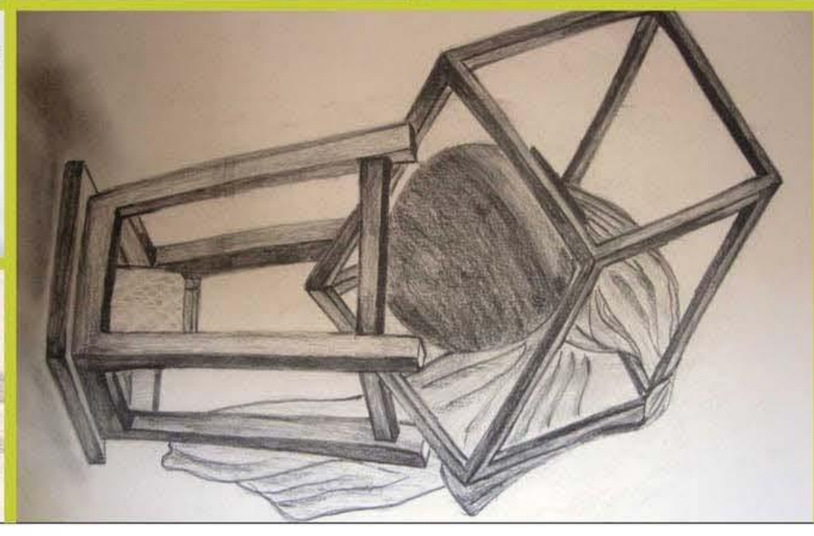


SKETCHES...