

# ARCHITECTURAL DESIGN PORTFOLIO

NIKHITA BHAGWAT

# INDEX

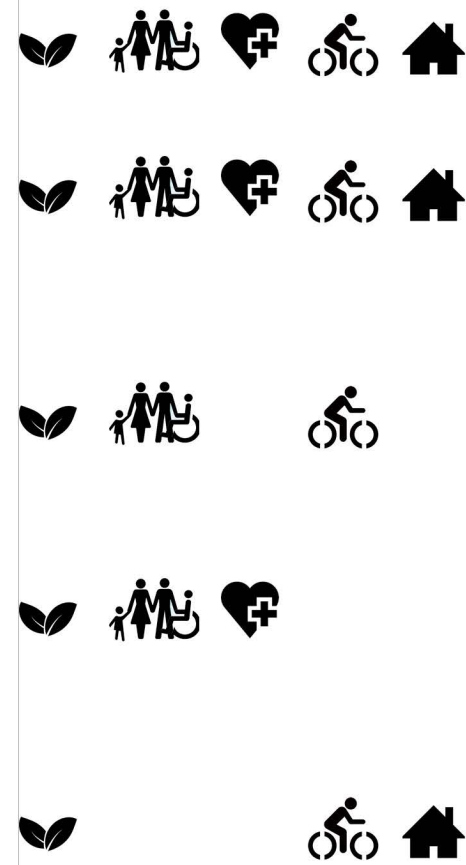
## ACADEMIC WORKS

- 1. ENVIRONMENT FORM AND FEEDBACK  
Year of Completion: 2017  
(M.Arch Semester-I)  
CARNEGIE MELLON UNIVERSITY, USA
- 2. PSYCHOSOCIAL REHABILITATION CENTER  
Year of Completion: 2015  
(B.Arch Semester-8)  
MANIPAL UNIVERSITY, INDIA
- 3. URBANIZATION IN RURAL DEVELOPMENT  
Year of Completion: 2014  
(B.Arch Semester-7)  
MANIPAL UNIVERSITY, INDIA
- 4. MIXED-USE RESIDENCE  
Year of Completion: 2013  
(B.Arch Semester-5)  
MANIPAL UNIVERSITY, INDIA

## COMPETITION ENTRY

- 5. PORTABLE FARM STAND  
Year of Completion: 2018  
(M.Arch Semester-2; 4-day long competition )  
CARNEGIE MELLON UNIVERSITY, USA
- 6. PARAMETRIC SIMULATIONS  
Year of Completion: 2017  
(Summer workshop; 10-days )  
CEPT UNIVERSITY, INDIA
- 7. GENERATIVE MODELLING  
Year of Completion: 2017  
(M.Arch Semester-1)  
CARNEGIE MELLON UNIVERSITY, USA

CURRICULUM WORK



## INTERNSHIPS

- P.R DESIGN GROUP  
Bangalore, India  
December, 2015-May, 2016
- DESIGN FORUM INTERNATIONAL  
New Delhi, India  
May,2015-November, 2015

## WORK EXPERIENCE

- RECREATIONAL CENTER DESIGN  
Year of Completion: 2017  
Volunteer design work  
SAHAJ MARG SPIRITUAL CENTER, India
- HUMAN MILK BANKS  
Year of Completion: 2016  
Design Consultation  
PATH, USA
- LUXURY HOUSING COMPLEX  
Year of completion: 2017  
Junior Architect  
DELHI INFRA TECH, New Delhi, India  
Real Estate and Construction Firm

# 1. ENVIRONMENT FEEDBACK

ACADEMIC WORKS

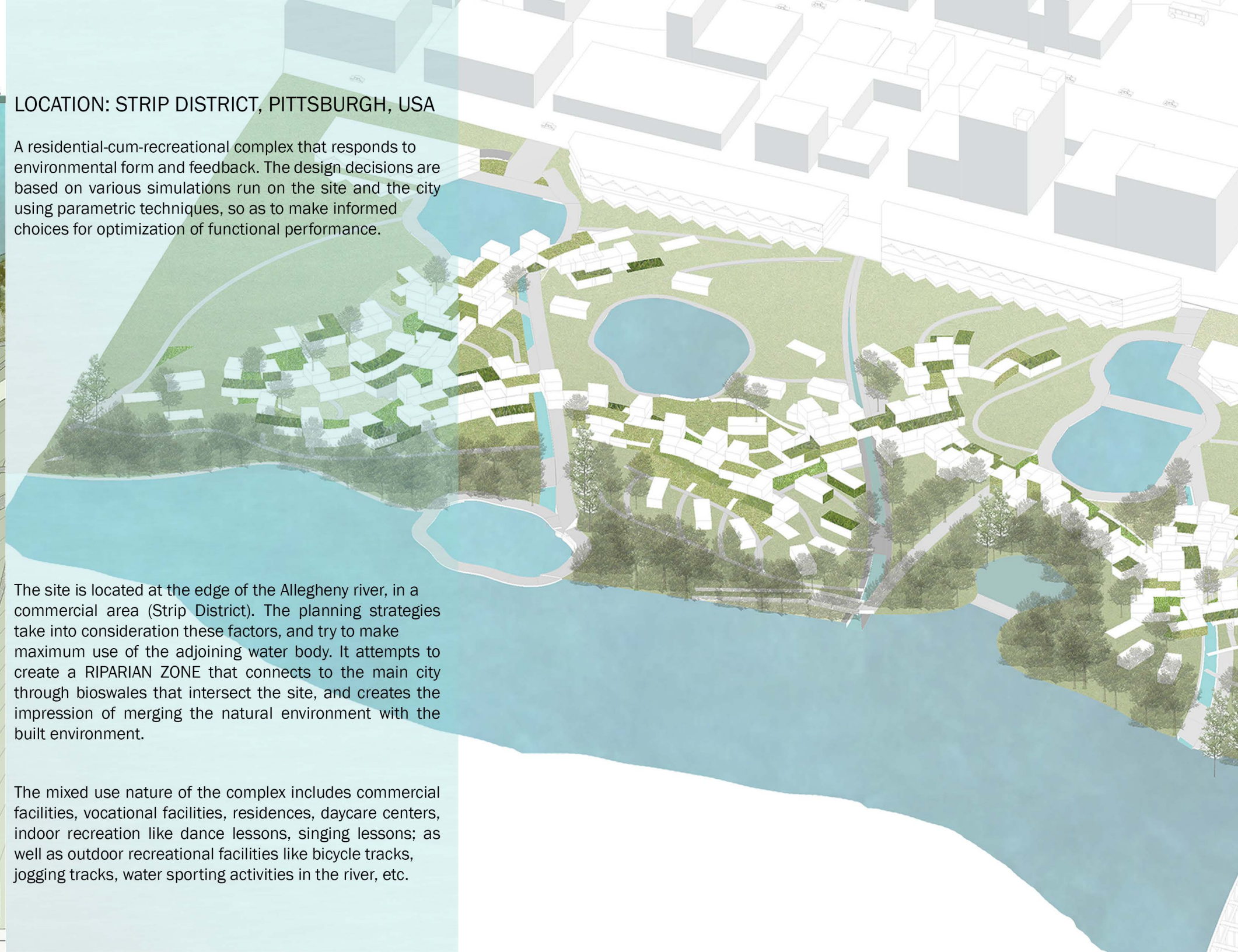


LOCATION: STRIP DISTRICT, PITTSBURGH, USA

A residential-cum-recreational complex that responds to environmental form and feedback. The design decisions are based on various simulations run on the site and the city using parametric techniques, so as to make informed choices for optimization of functional performance.

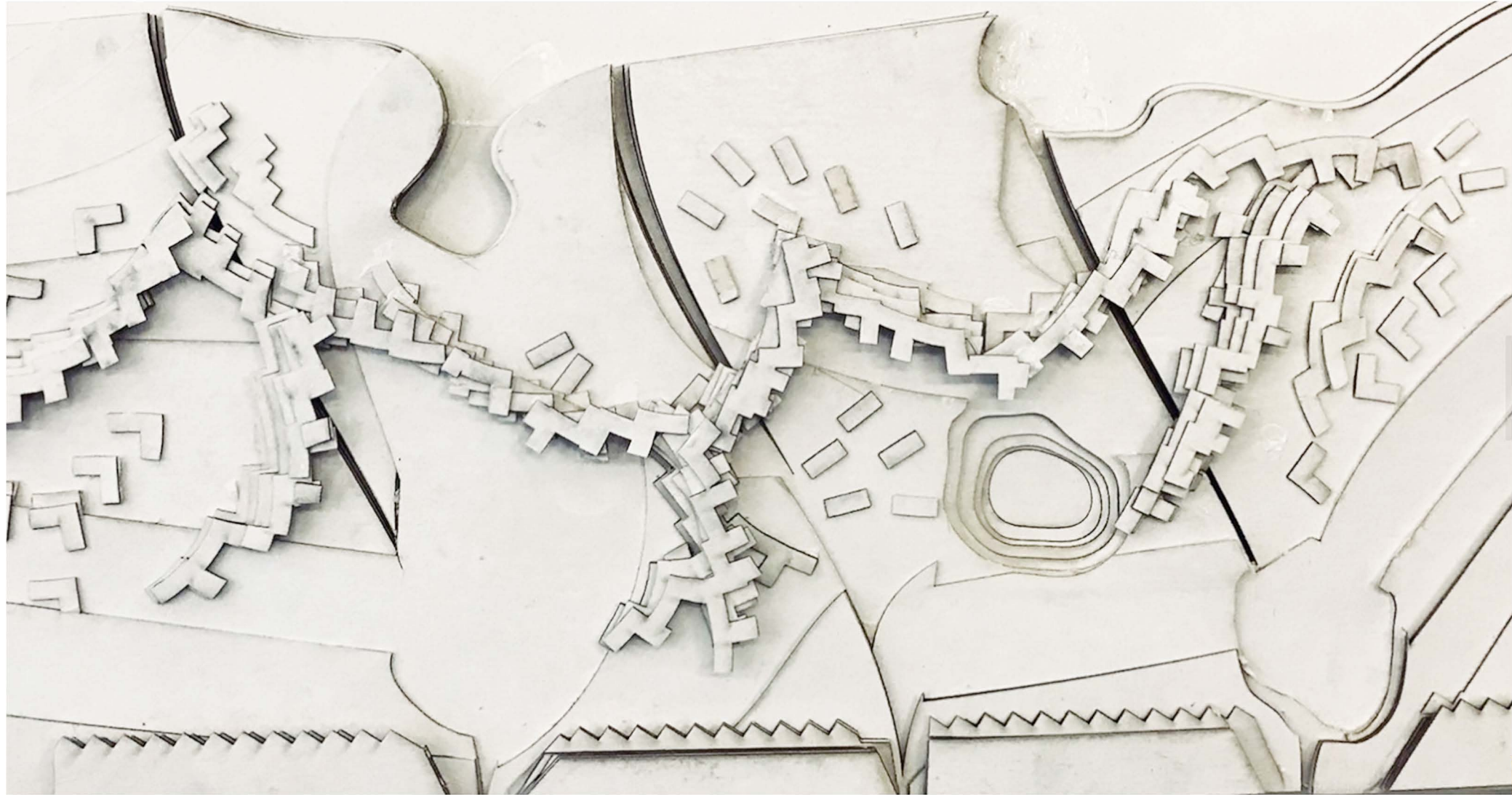
The site is located at the edge of the Allegheny river, in a commercial area (Strip District). The planning strategies take into consideration these factors, and try to make maximum use of the adjoining water body. It attempts to create a RIPARIAN ZONE that connects to the main city through bioswales that intersect the site, and creates the impression of merging the natural environment with the built environment.

The mixed use nature of the complex includes commercial facilities, vocational facilities, residences, daycare centers, indoor recreation like dance lessons, singing lessons; as well as outdoor recreational facilities like bicycle tracks, jogging tracks, water sporting activities in the river, etc.

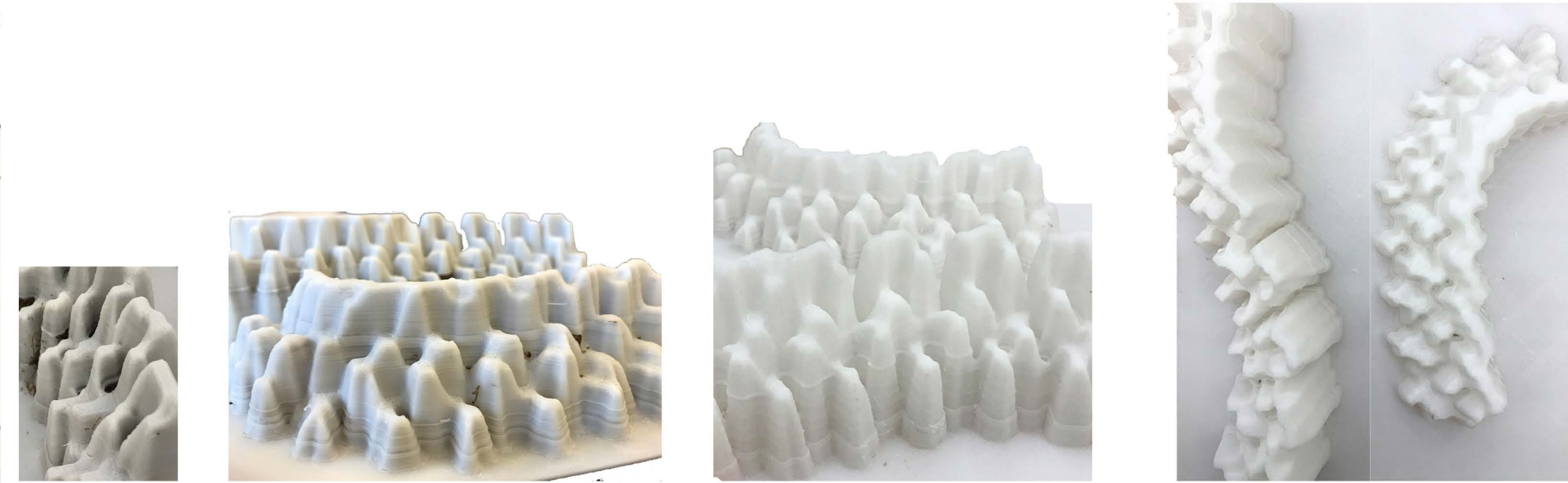


# 1. ENVIRONMENT FORM

ACADEMIC WORKS



SIMULATION-BASED FORM COMPOSITION OF SITE



VOLUMETRIC ANALYSIS FOR FORMAL DECISIONS



# 1. ENVIRONMENTFORM

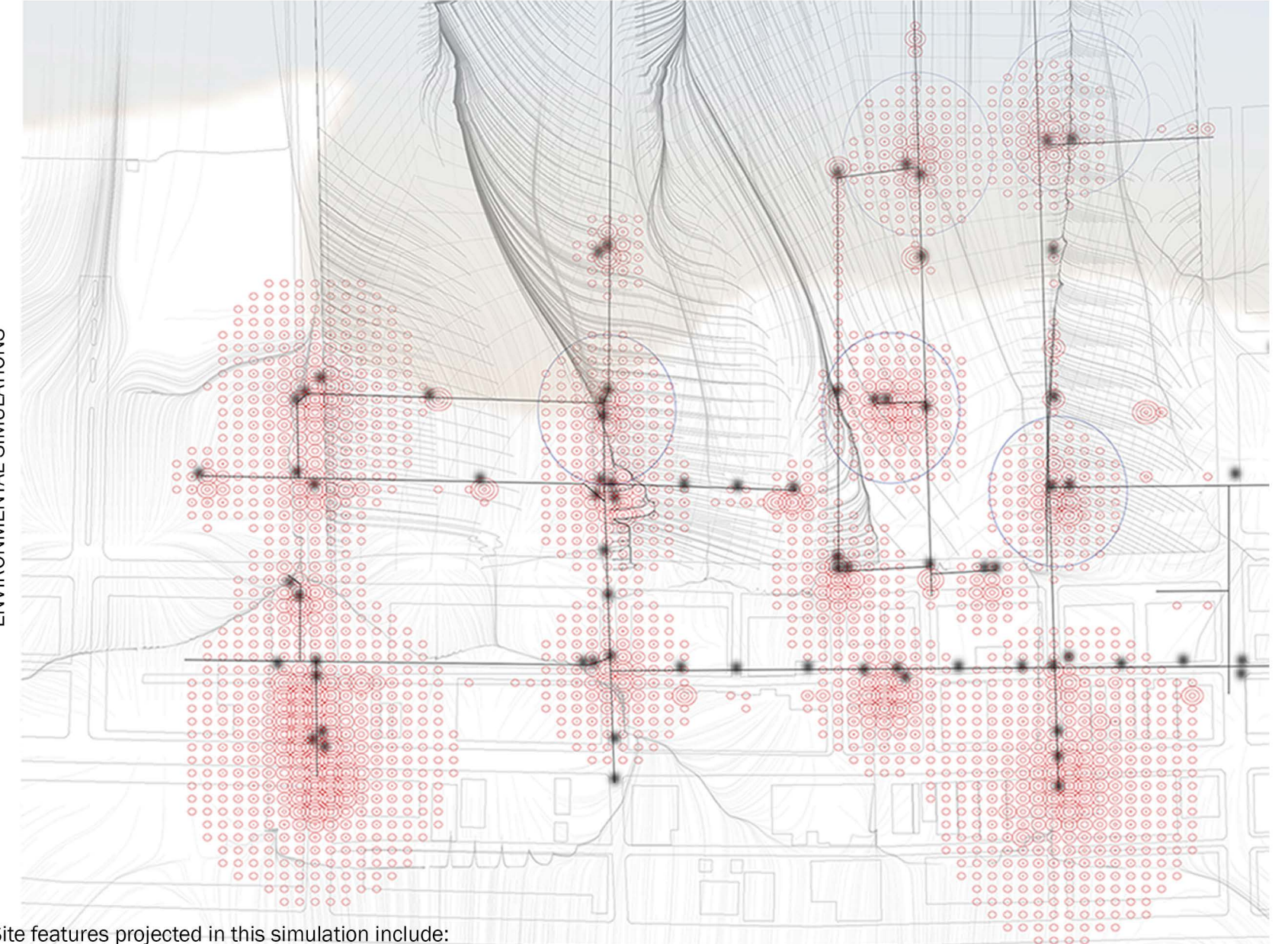
ACADEMIC WORKS

Study models to help determine the best possible positions and orientations for the final product. They play a major part in the design decisions, since each model addresses the different nuances to the process:

- Volumetric analysis
- Site topographical analysis
- Daylighting analysis
- Radiance analysis
- Analysis of adjacent water body



ENVIRONMENTAL SIMULATIONS



Site features projected in this simulation include:  
-SITE TOPOGRAPHY -SEWAGE NETWORK -NATURAL WATER MOVEMENT ON SITE -POINTS OF INTERSECTION OF SEWAGE OUTLETS WITH WATERWAYS

ORIENTATIONAL ANALYSES BASED ON SUMMER SHADOWS, WINTER SHADOWS, DAYLIGHT ANALYSIS

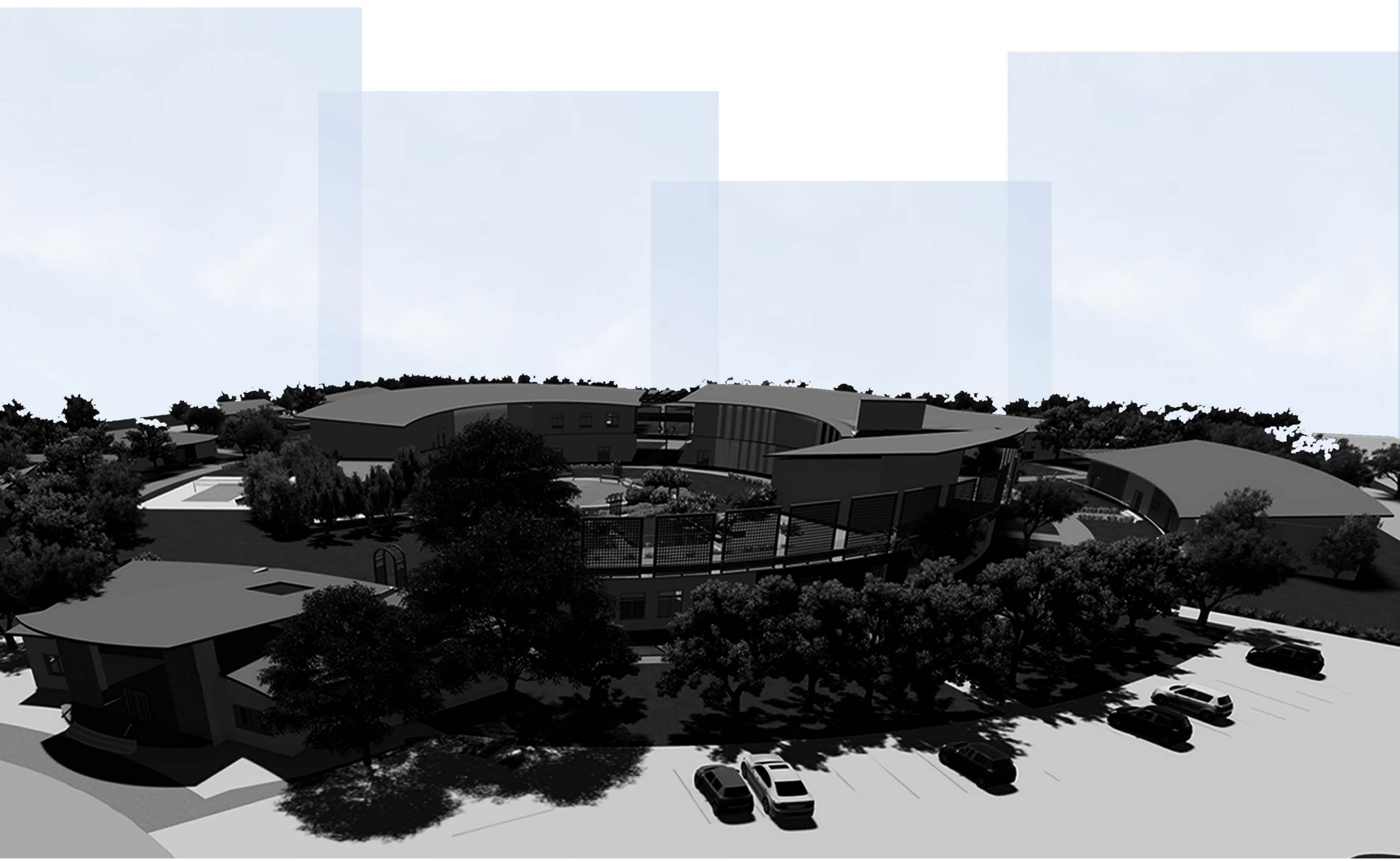
# 1. ENVIRONMENT FEEDBACK

ACADEMIC WORKS



# 2. MINDABODE

ACADEMIC WORKS



LOCATION: NEW DELHI, INDIA

## PSYCHOSOCIAL REHABILITATION CENTER WITH HALFWAY HOMES

A specialty facility for patients of psychotic disorders, halfway homes intend to merge the comfort of homes with the facilities and benefits of a medical institution, thereby eradicating the stringent and sometimes negligent atmosphere of a mental institution.

### WHY HALFWAY HOMES?

Mental health disorders constitute approx. 14% of the global burden of disease. In India, the overall burden is 11.8% .

HALFWAY HOUSES include group homes in the community with scheduled group activities and availability of treatment personnel at all times, to encourage independent living .

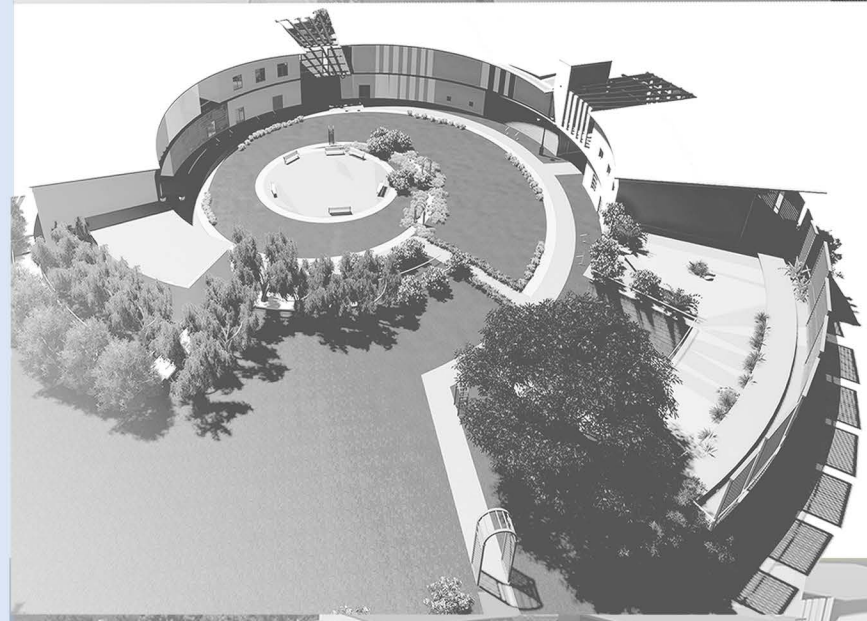
### BIG-PICTURE BENEFITS

- Stigma reduction due to community living
- Enabling of smoother transition into 'normal' life
- Liberty for personalization of spaces
- Limited violation of personal space
- Distant but constant monitoring of patient activity



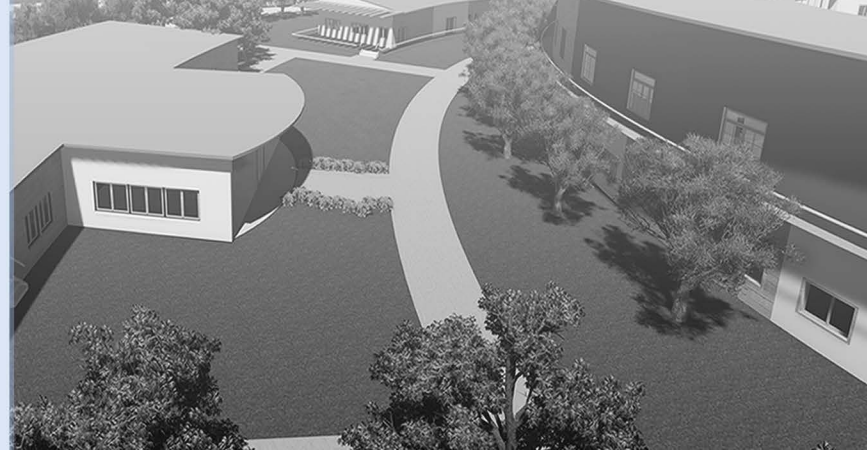
### PATIENTS ACCOMMODATION

Independent houses with all facilities provided to encourage self-sustainability and ability to carry out daily chores by oneself.



### REHABILITATION CENTER

Accommodates spaces for vocational training and recreational activities like art, dance, computer classes to keep patients occupied through the day.  
-Total capacity: 50 patients (25 residents, 25 for daycare)  
-Vocational training center to provide better chances of getting adjusted to the 'normal' world.



### OPERATION THEATRE

Emergency facilities for patients in case of unpredicted psychotic attacks. In close proximity to rehabilitation center, patients' accommodation.

Service road connectivity from rear entrance.

An architectural rendering of a psychiatric facility. The scene is shown from an elevated perspective. In the foreground, there is a parking lot with several cars parked. A paved walkway curves through the site, lined with trees. In the middle ground, there is a large, modern building with a curved facade and a balcony with a decorative metal railing. The building is surrounded by more trees. In the background, there are more buildings and a clear sky. Four callout boxes with lines pointing to specific areas of the rendering contain descriptive text.

Vehicular entrance with parking for doctors and visitors.  
Main entrance from service lane to enhance privacy.

Administrative building to admit and filter patients according to the level of psychotic health . Only patients in the onset stages of psychotic disorders will be admitted into the facility.

Special consideration given to green spaces and landscape features for the benefit of patients, for a soothing effect on their minds.

Patients' accommodation in site corner with residential buildings in the surrounding to enable maximum privacy.



# 3.URBANIZATION IN RURAL DEVELOPMENT

ACADEMIC WORKS



LOCATION: HEBRI TOWN, KARNATAKA, INDIA

Aim: To redevelop the existing town of Hebri, a small town nestled in the plains of Udupi district in Karnataka, India. Population: 6000 people (350 families)

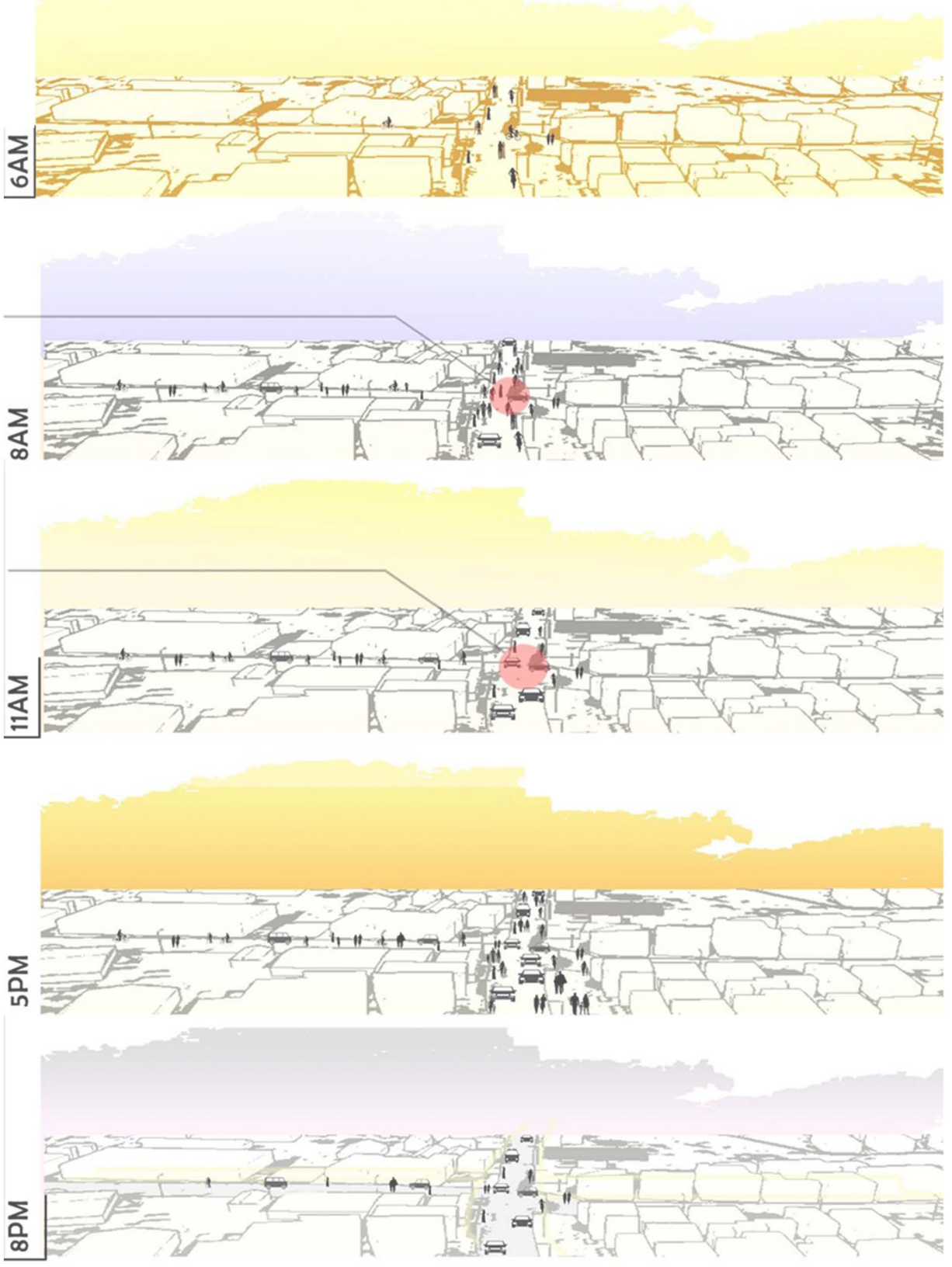
- PRIMARY OBJECTIVES:
- Provision of basic urban amenities
  - Enhance self-sufficiency
  - Women empowerment through vocational training

The redevelopment program takes place in various phases, where the project is resolved as a group but each aspect of it is worked on individually. The various parts of the village that have been worked on are:

1. Expansion of the central main road intersection of the town-Hebri Circle- so as to ease traffic movement, and construction of a bus terminal.
2. Construction of affordable lodging so as to provide travelers with better accommodation, and also create a source of income for the town.
3. Extension of an existing middle school, since most students have to travel to other towns for education due to lack of available seats in the only existing one in Hebri.
4. Construction of a Skill Development Center to enhance women empowerment and also encourage self-sufficiency through vocational training. It also helps create more jobs and increase the income of the town, specifically enable women to work and sustain themselves.

1. BUS TERMINAL                      2. AFFORDABLE LODGING                      3. MIDDLE SCHOOL EXTENSION                      4. SKILL DEVELOPMENT CENTER

TRAFFIC PATTERNS



# 3.URBANIZATION IN RURAL DEVELOPMENT

ACADEMIC WORKS



## PHASE 1

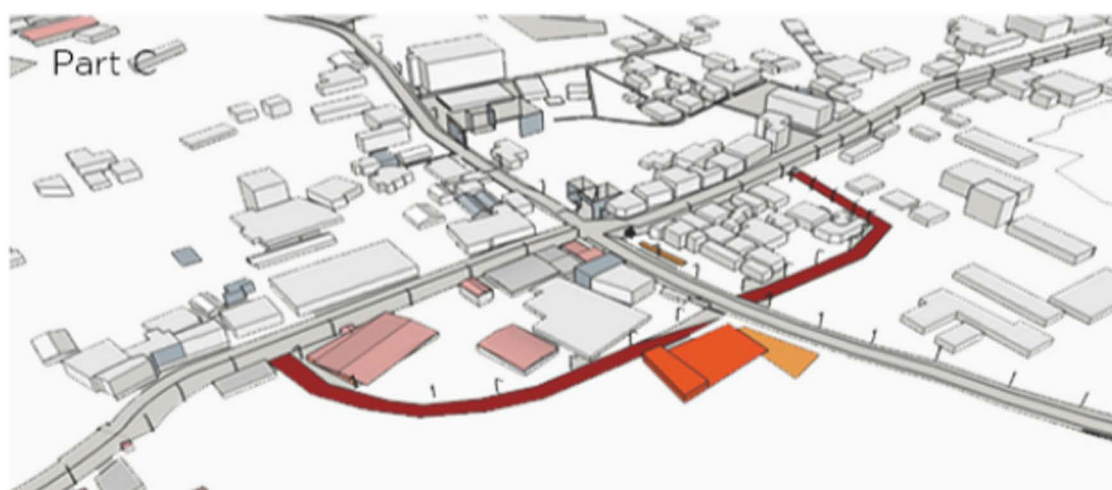
### PART-A

Land acquisition for widening roads to improve traffic movement, as well as enable segregation of traffic based on typology.  
ETP: 3 years



### PART-B

Drainage network + sewage plant construction, since existing networks do not cater to every household/building.  
ETP: 3 years



### PART-C

Road deviation to improve traffic flow, since the existing network is only one-way traffic. Once the roads are widened in Part-A, the deviation can help provide direct access to the bus terminal.  
ETP: 1 year



PHASE-2: Upgradation of existing facilities, improvement of infrastructure  
ETP: 3 years



PHASE-3: Increasing economic independence of the town.  
ETP: 3 years

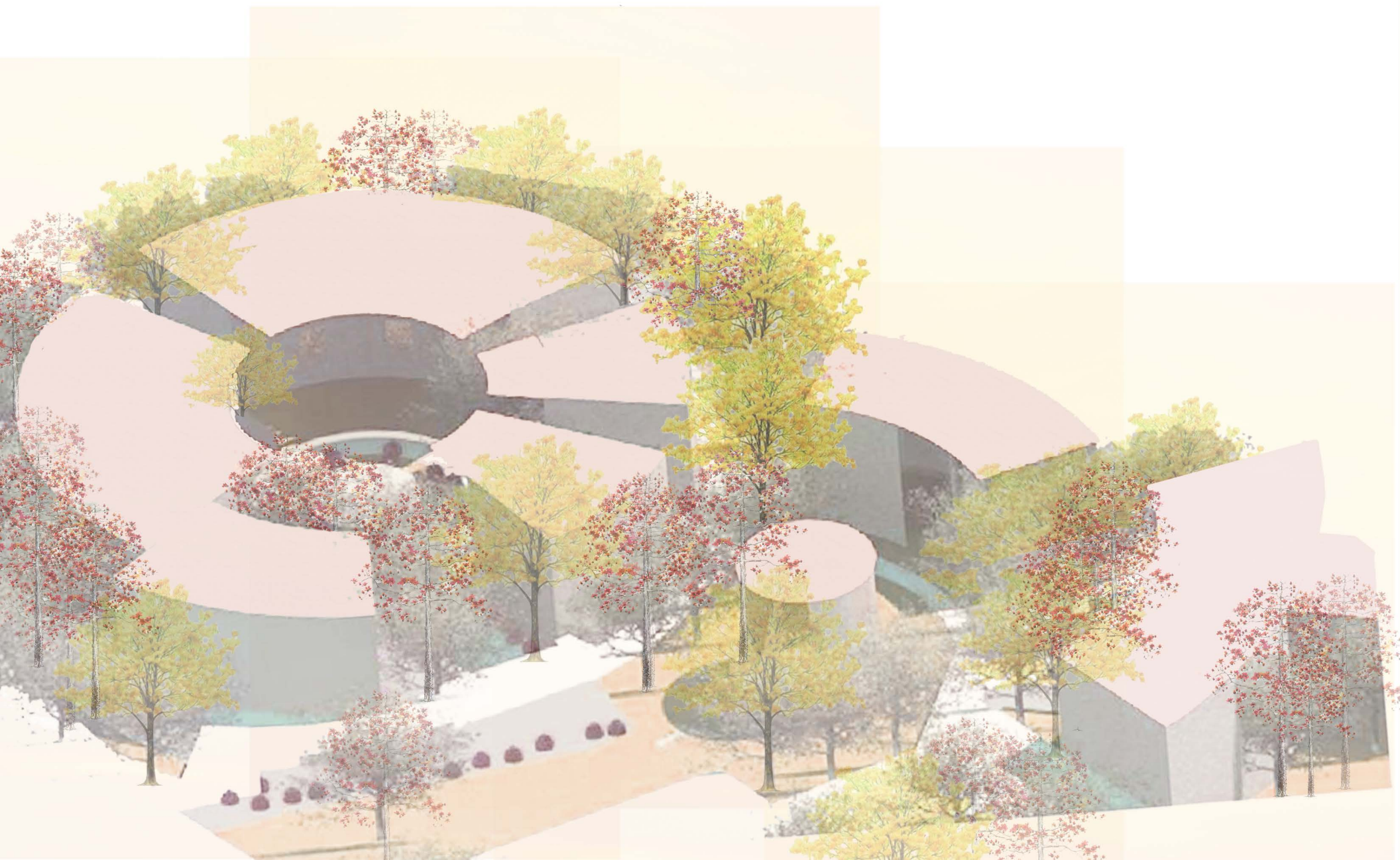


PHASE-4 : Development of streetscapes  
ETP: 2 years



# 3.URBANIZATION IN RURAL DEVELOPMENT

ACADEMIC WORKS



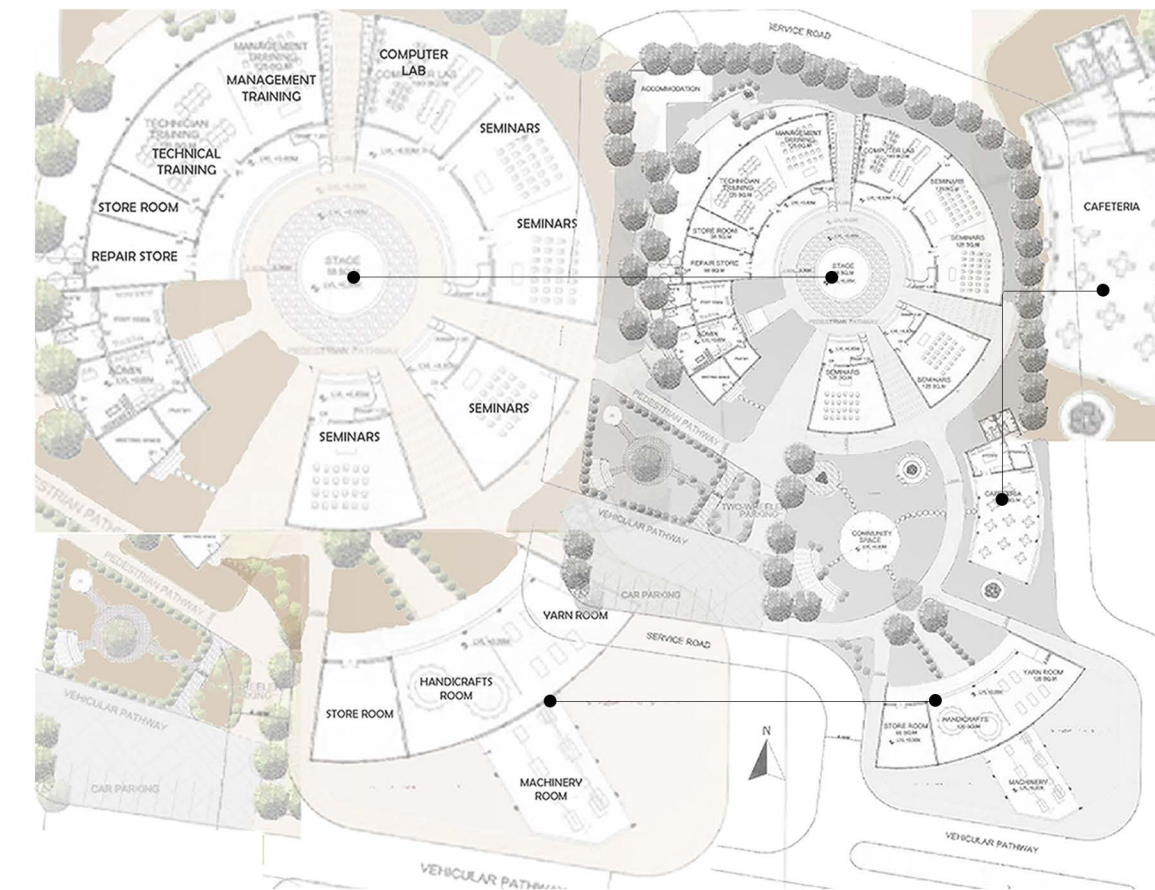
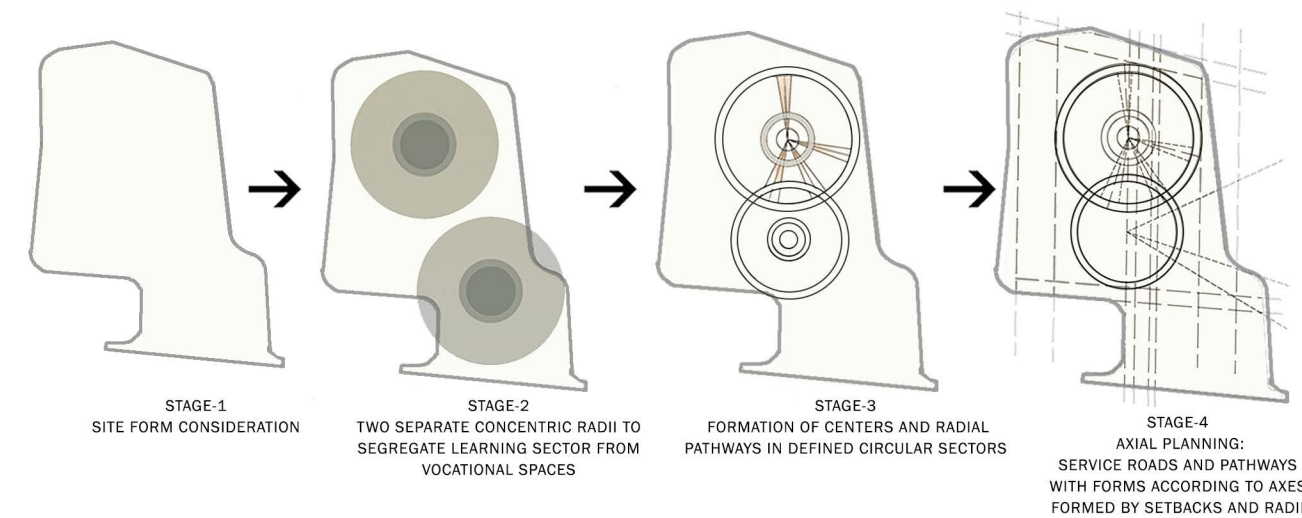
## SKILL DEVELOPMENT CENTER

Individual Project: Skill Development Center that provides vocational training for Hebri natives, to encourage Women Empowerment and also reduce migration to other villages in search of jobs. The center aims to encourage local craftsmanship as well as technical skills so as to build self-sustaining skills in the local population.

The vocational training courses help sell the products in the local sunday market provided in the extended park, and the income goes into the school fees.

## INDUSTRIES ENCOURAGED:

- COMPUTER SCIENCE
- COIR AND ITS PRODUCTS
- HOME SCIENCES
- TEXTILE



# 4. MULTIPURPOSE DWELLINGS

ACADEMIC WORKS

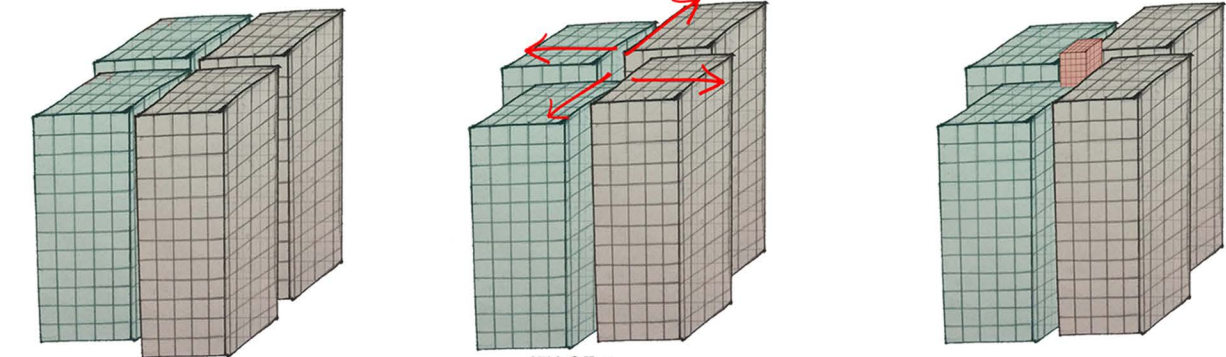
LOCATION: MANIPAL, KARNATAKA, INDIA

A mixed use project in Udupi district, Karnataka, India, that includes a residential building along with a commercial shopping mall.

Commercial building amalgamated with terrace promenade to mix commercial activities with recreational activities like walking, grocery shopping, outdoor exercising and leisure time activities.

Terrace promenade also enables view of the MANIPAL LAKE, a man-made lake built for university students with sporting facilities for town people and university students.

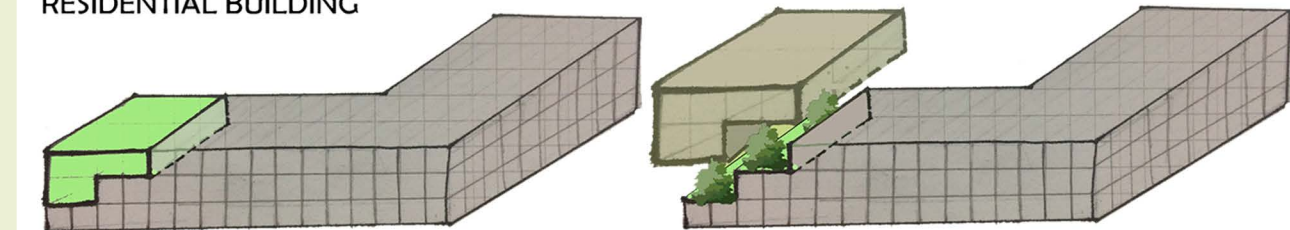
Residential building built to provide ease of access to all provisions and to accomplish availability and affordability of amenities, accommodation and services.



**STAGE-1**  
2 X 3BHK flats  
2 X 2BHK flats  
**RESIDENTIAL BUILDING**

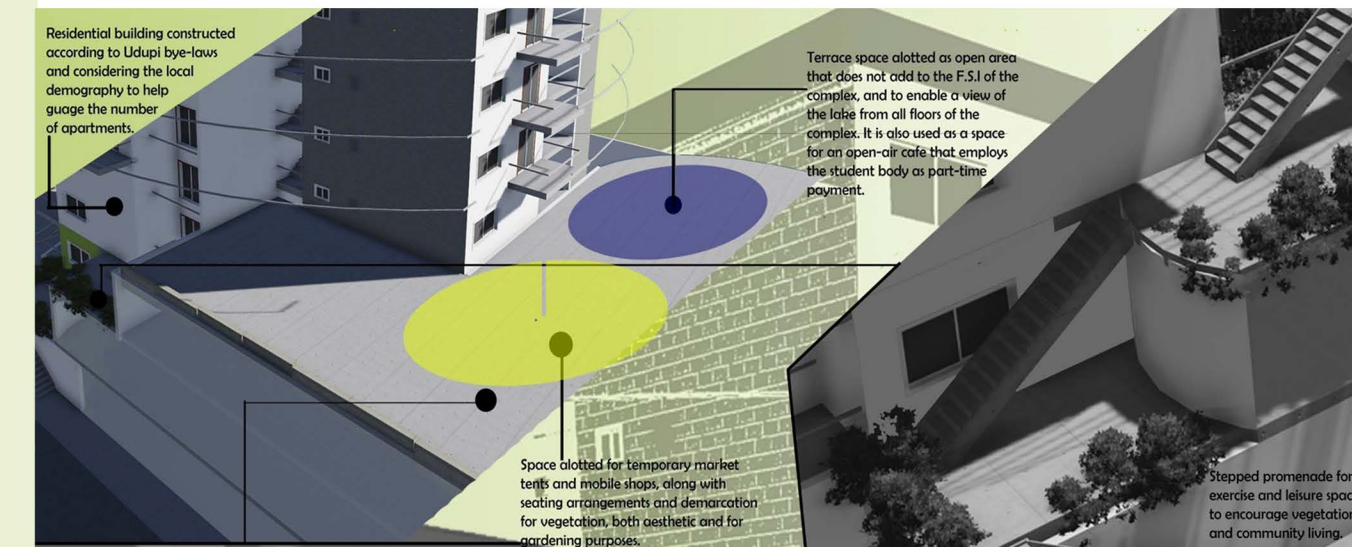
**STAGE-2**  
2 X 3BHK flats  
2 X 2BHK flats

**STAGE-3**  
Moving blocks away to allow service space



**STAGE-1**  
Surface area reduction in increments with rise in floor levels  
**COMMERCIAL BUILDING**

**STAGE-2**  
Use of cut masses for vegetation and landscaping



Residential building constructed according to Udupi bye-laws and considering the local demography to help gauge the number of apartments.

Terrace space allotted as open area that does not add to the F.S.I of the complex, and to enable a view of the lake from all floors of the complex. It is also used as a space for an open-air cafe that employs the student body as part-time payment.

Space allotted for temporary market tents and mobile shops, along with seating arrangements and demarcation for vegetation, both aesthetic and for gardening purposes.

Stepped promenade for exercise and leisure spaces to encourage vegetation and community living.

# 5. COMPETITION ENTRY

ACADEMIC WORKS

## EARLY BIRD MARKET



### EPIC METALS COMPETITION

A portable+foldable stand in conjunction with recreation centers in order to make it a 'learning experience' for visitors. The stand measures perfectly to be transported in standard containers. The main objective of the design is to make the entire structure 'light-weight' so as to encourage even youngsters to work in such settings, thereby providing vocational experience.

The stand sells fresh produce (fruits and vegetables), as well as baked goods. The hydroponics system helps water seedlings so as to encourage more planting of saplings.

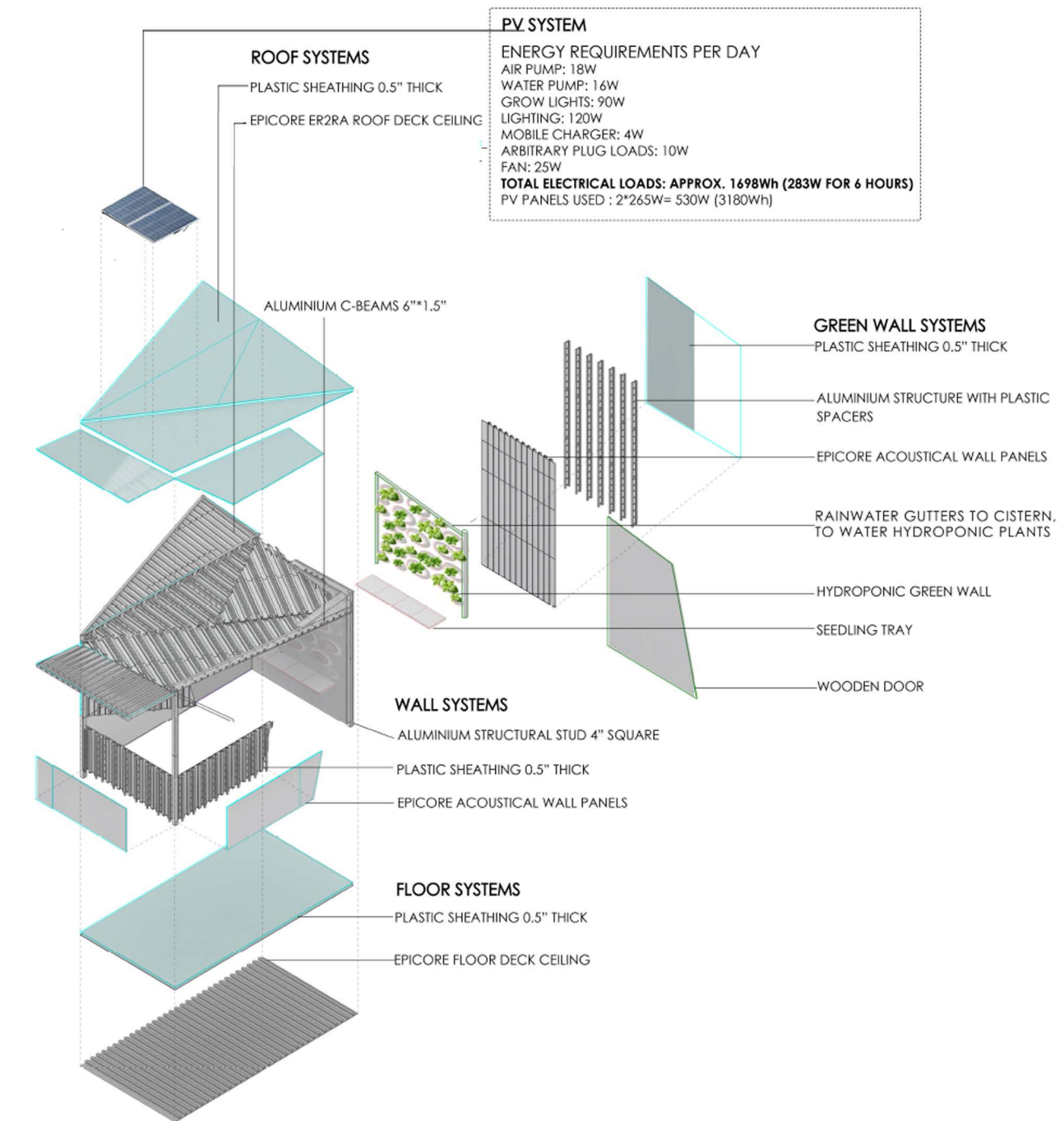
The project was done as part of an intraschool competition sponsored by 'EPIC Metals', hence the kiosk heavily relies on EPIC products for walls, roof and flooring.

The intentions of the stand are three-fold:  
-SELF-SUSTAINING  
-EDUCATIVE  
-EASILY OPERABLE FOR ALL AGE GROUPS

In order to make it self-sustaining, solar panels are installed on the roof, calculated in terms of surface area required to sustain all types of plug loads and electric requirements.

All systems within the kiosk follow the principle of 'transparency', so as to 'EDUCATE' all visitors.

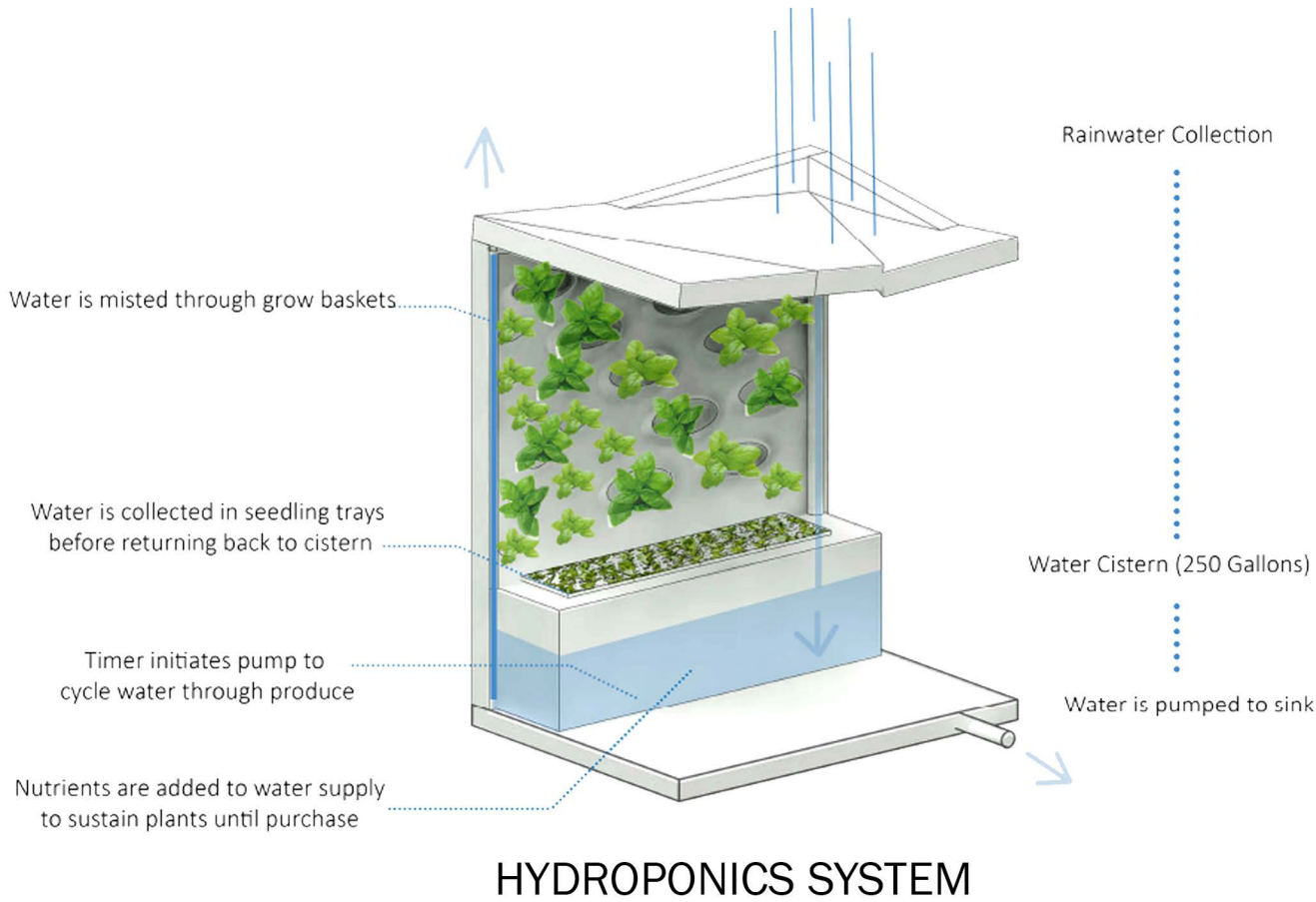
The light weight of materials used in construction and pedantic detail to the foldability of the structure ensures OPERABILITY.



# 5. COMPETITION ENTRY

ACADEMIC WORKS

## EARLY BIRD MARKET

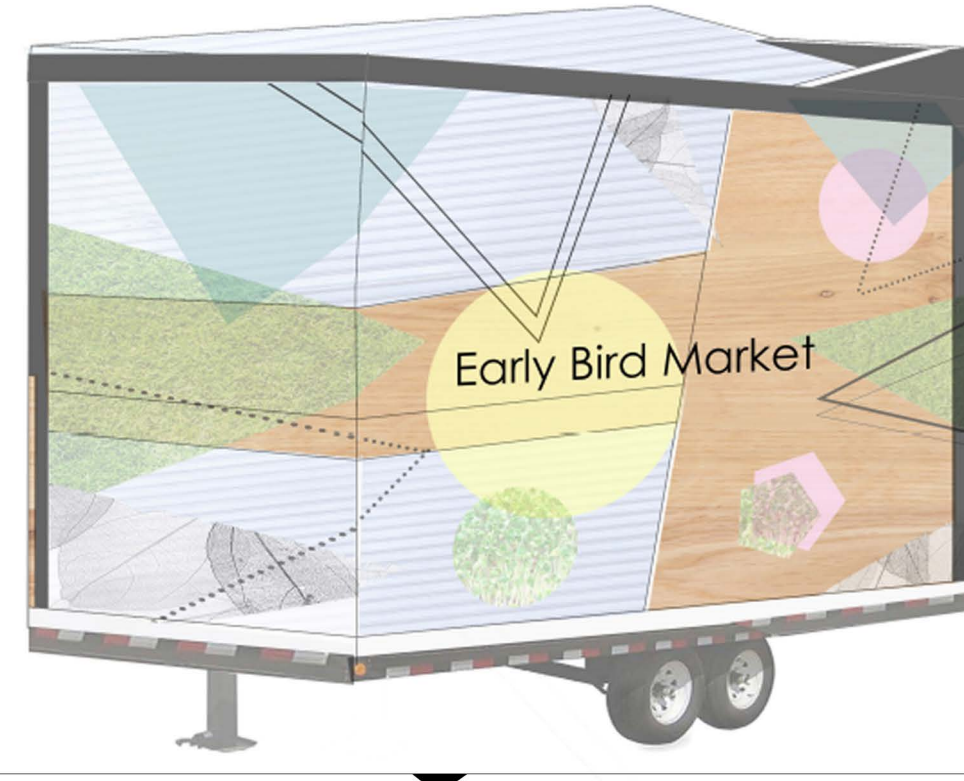


The form-based concept of the farm stand is based on ORIGAMI and DECONSTRUCTION.

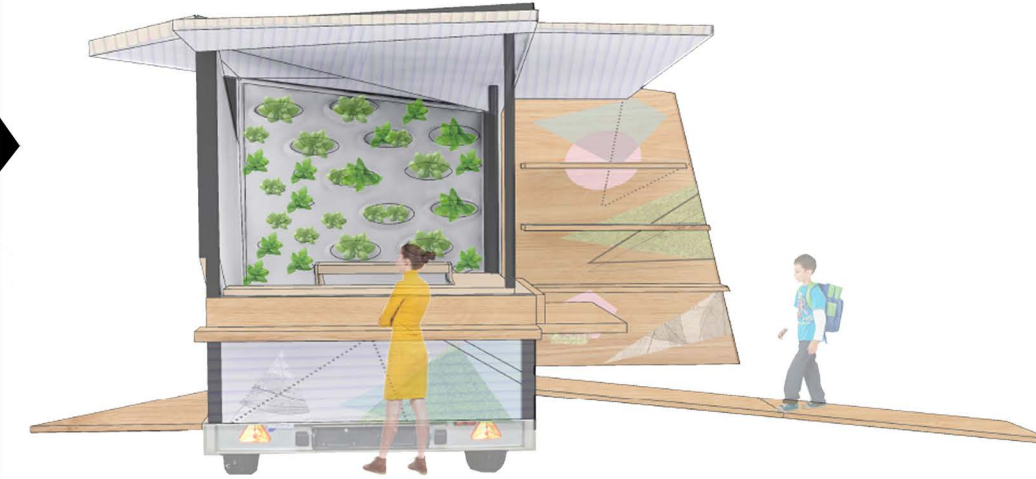
'TRANSPARENCY' is the main goal of the farm stand in terms of materiality and function. The idea is to 'fold' and 'unfold' within the 16'0" \* 8'6" \* 11'6" bounding box so as to increase interaction and circulation within the stand.

Hydroponics systems are low maintenance walls that use water as a delivery system for nutrients in place of soil. The wall serves as a common learning tool for both students and farm stand visitors. It is an innovative system that takes up 85% less water than traditional planted systems.

The exterior of the farm stand is a flush surface, consistent throughout with plastic sheathing. This makes the surface water-tight. It opens up to the visitors everyday, each opened piece serving a different purpose.



## UNFOLDING OF THE 'BOX'



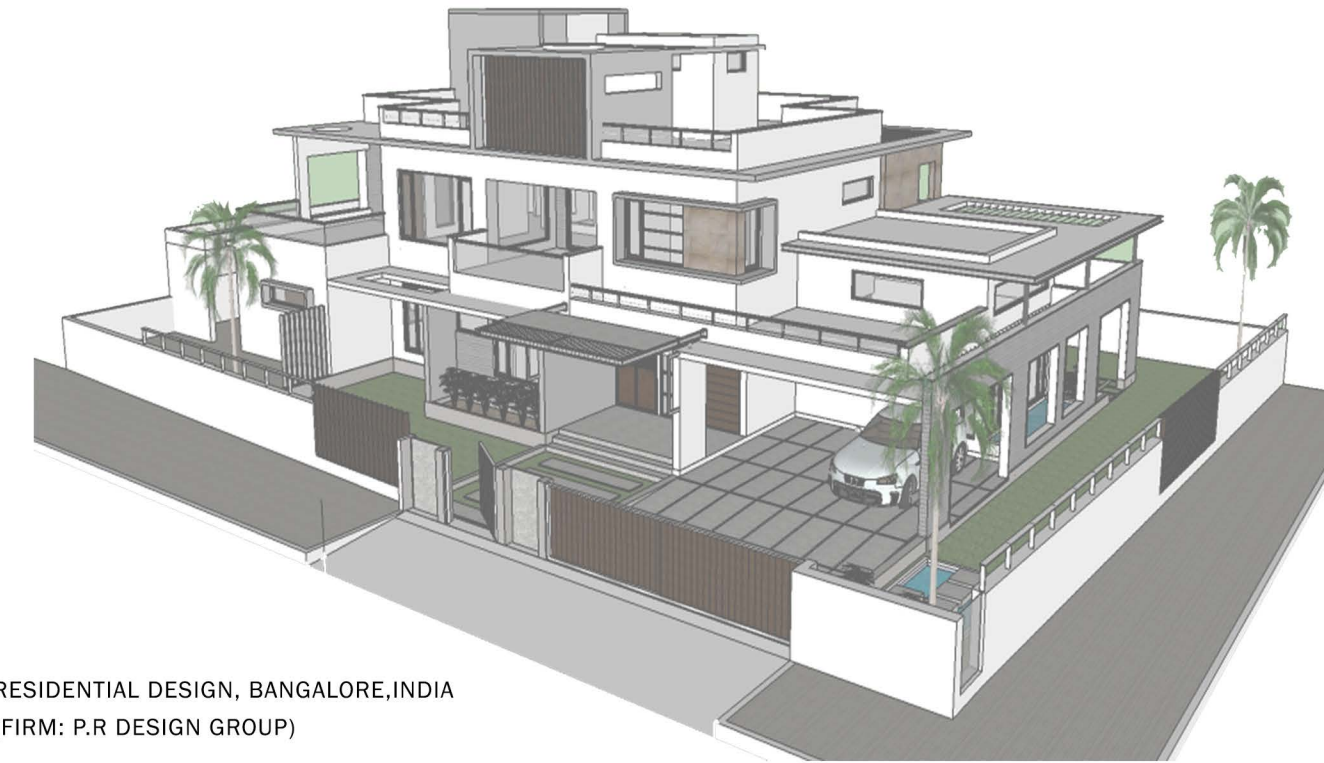
# INTERNSHIPS

FIRM: P.R DESIGN GROUP,  
BANGALORE, INDIA (2016)

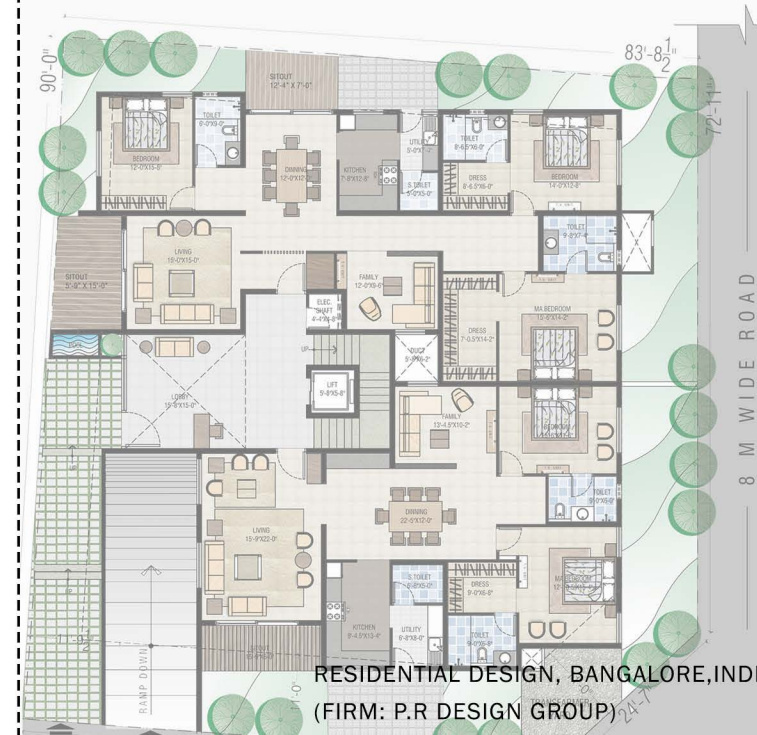
INTERNSHIP AS PART OF CURRICULUM  
(SEMESTER-10, B.ARCH): DECEMBER, 2015-MAY, 2016

Miscellaneous works done as part of curriculum:  
-1 year of internship to complete the B.Arch degree.  
The curriculum requires one to work on all aspects  
of design and construction:

- Conceptualizing
- Drafting skills
- Building services
- Model-making skills
- Construction drawings
- Communication/collaboration skills
- Working drawings
- Presentation skills



RESIDENTIAL DESIGN, BANGALORE,INDIA  
(FIRM: P.R DESIGN GROUP)



RESIDENTIAL DESIGN, BANGALORE,INDIA  
(FIRM: P.R DESIGN GROUP)



GUWAHATI MALL, GUWAHATI,INDIA  
(FIRM: DESIGN FORUM INTERNATIONAL)

# INTERNSTORY

PROFESSIONAL WORKS



## OLD AGE HOME, ERODE, INDIA

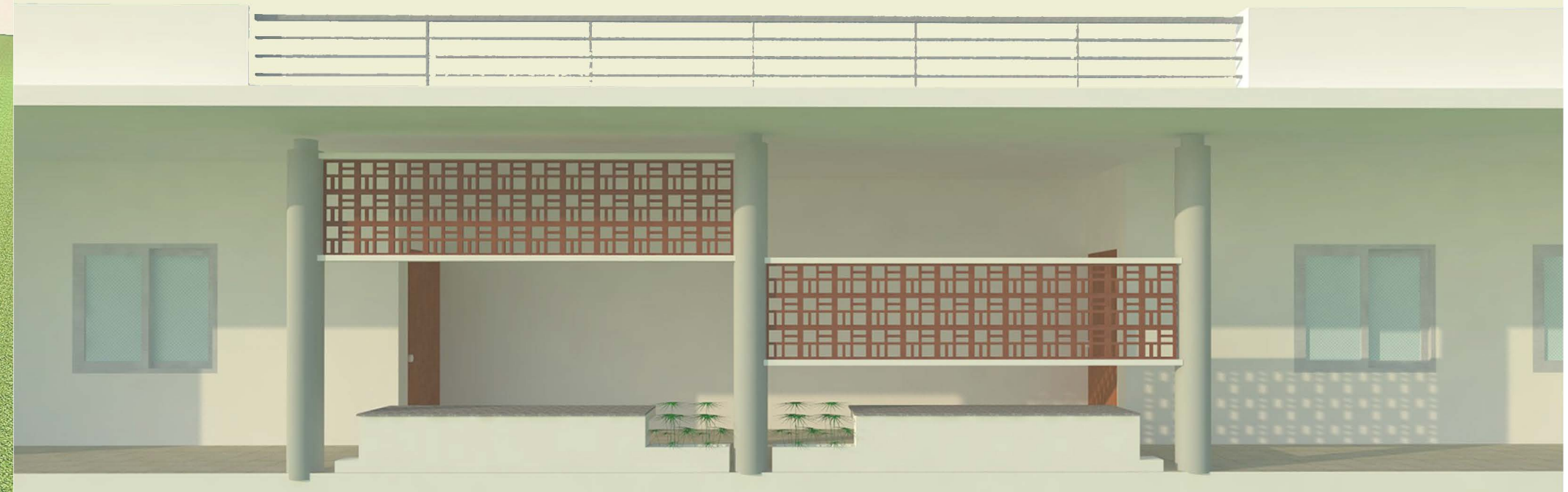
An old age home for terminally ill patients to be admitted . Interior rooms highly enclosed and sanitized in order to keep the patients away from dust or dirt.

Individual project worked on as intern at P.R Design Group, Bangalore.

Aspects worked on:

- Design of plans
- Photoshop rendering
- Working drawings
- Aesthetic exterior aspects
- 3D model
- Rendered images

Use of barrier-free systems in interior and exterior parts of the building in order to enable easy circulation and accessibility.





# INTERNSTORY

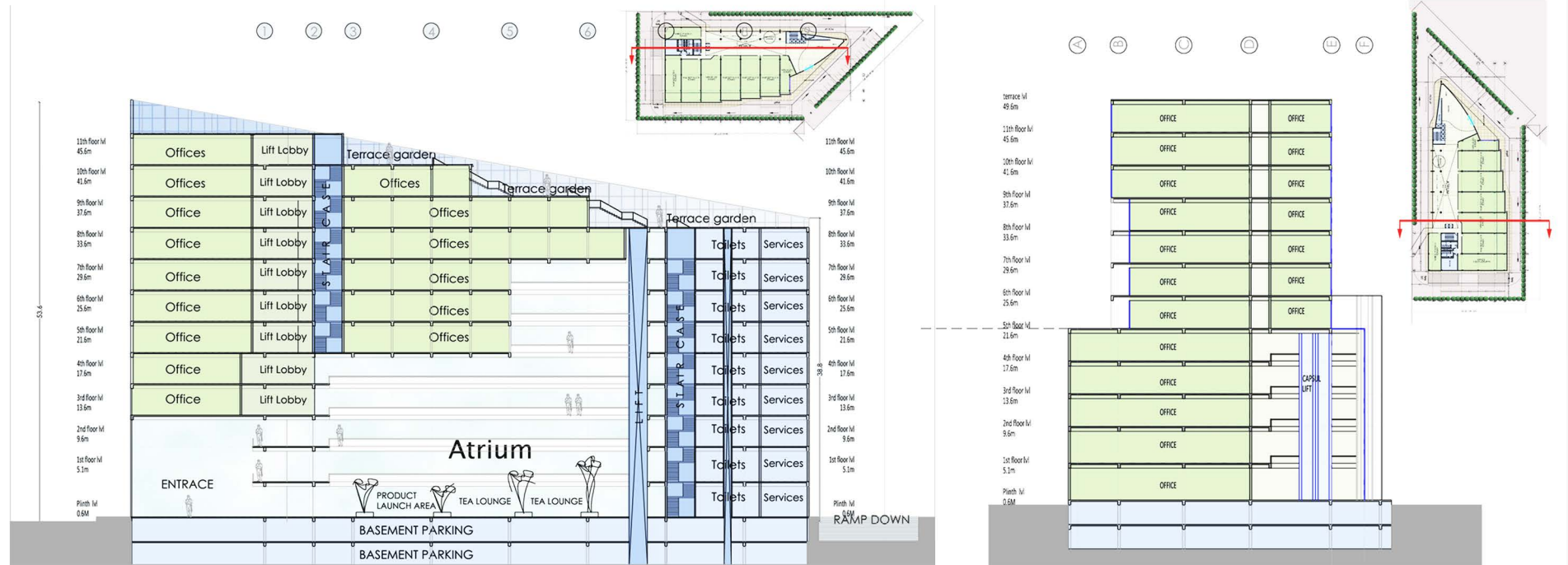
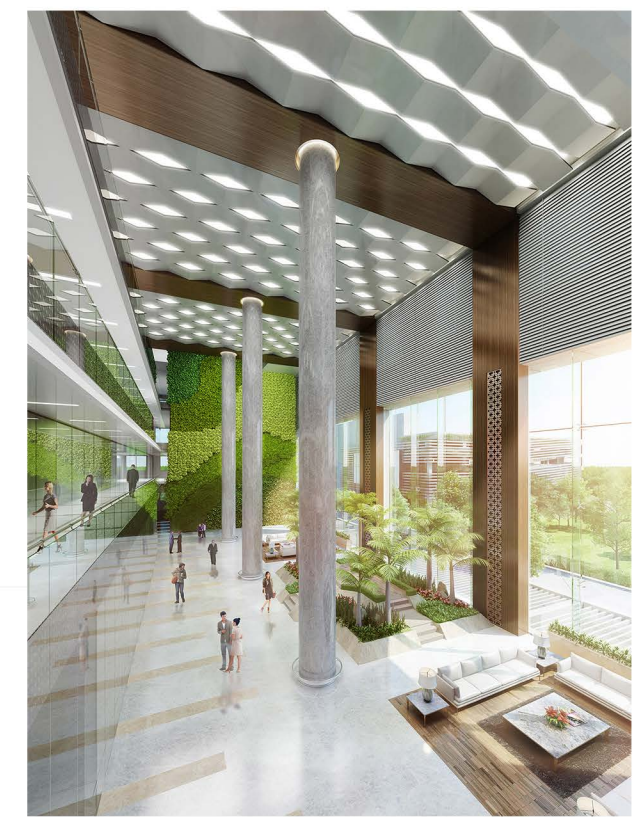
PROFESSIONAL WORKS



FIRM: DESIGN FORUM INTERNATIONAL,  
NEW DELHI, INDIA (2015)  
INTERNSHIP AS PART OF CURRICULUM  
(SEMESTER-9, B.ARCH): MAY, 2015-NOVEMBER, 2015

-1 year of internship to complete the B.Arch degree.  
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- Building services
- Model-making skills
- Construction drawings
- Communication/collaboration skills
- Working drawings
- Presentation skills



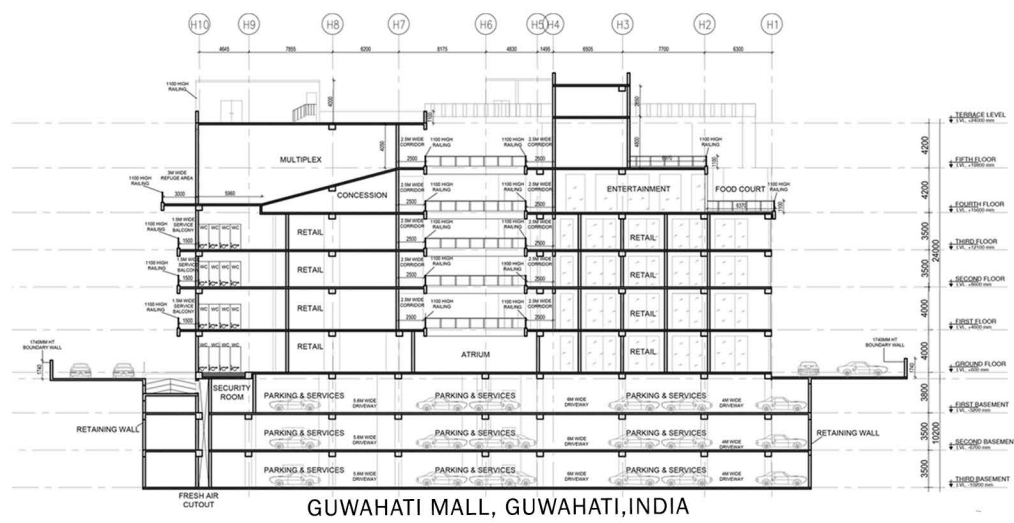
PROJECT:CHINTELS CORPORATE PARK, NEW DELHI, INDIA  
ASPECTS WORKED ON INDIVIDUALLY: BUILDING SECTIONS, ELEVATIONS, PARKING DETAILS, BASIC RENDERS

# INTERNSTORY

PROFESSIONAL WORKS



# WORK EXPERIENCE



# HUMAN MILK BANKS

PROFESSIONAL WORKS

## CONSULTANCY ASSIGNMENT FOR PATH FOUNDATION, USA

Breast milk is best milk as known to everyone. But there are time when a mother's milk may be unavailable or insufficient when she may need to resort to use pasteurized donor human milk. To make available safe milk for such babies, there is a need to establish human milk banks.

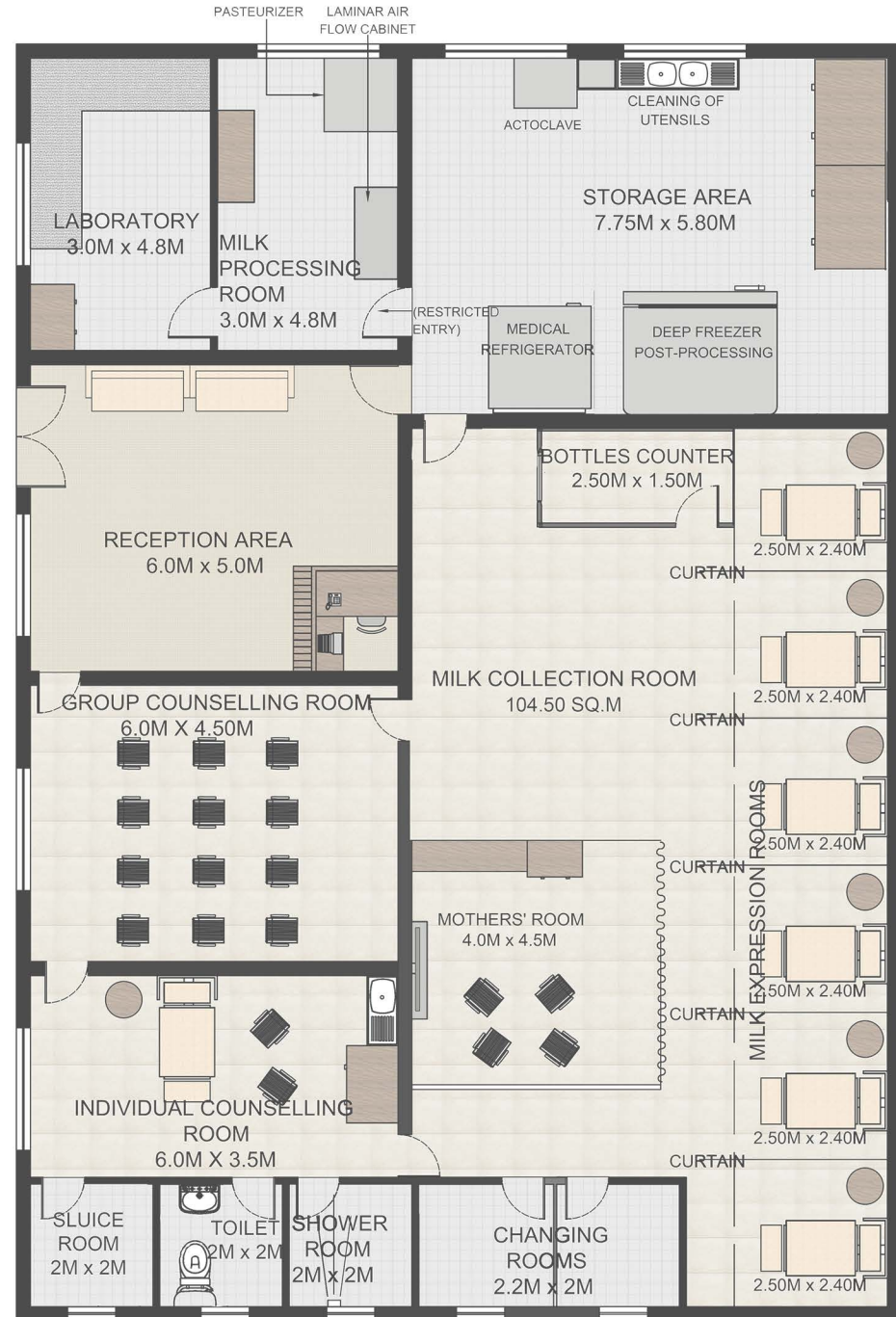
**Objectives:**  
Provide a generic design for construction of human milk bank

The project envisages setting up of HMBs in secondary and tertiary level health care facilities.

Under the PATH initiative, HMB is expected to be part of the Mother-Baby Friendly Initiative Plus (MBFI+) which will include also counseling and support mothers for breastfeeding, encourage skin-to-skin contact and conduct community outreach activities for promoting milk donation and breastfeeding.



Image courtesy of : Cheshire and North Wales Human Milk Bank;  
<http://sites.path.org/vietnam/reproductive-maternal-and-child-health/human-milk-banking/>



SUPER BUILT-UP AREA: 300.5 SQ.M

CARPET AREA: 275 SQ.M

# RECREATION IN SPIRITUALITY

PROFESSIONAL WORKS



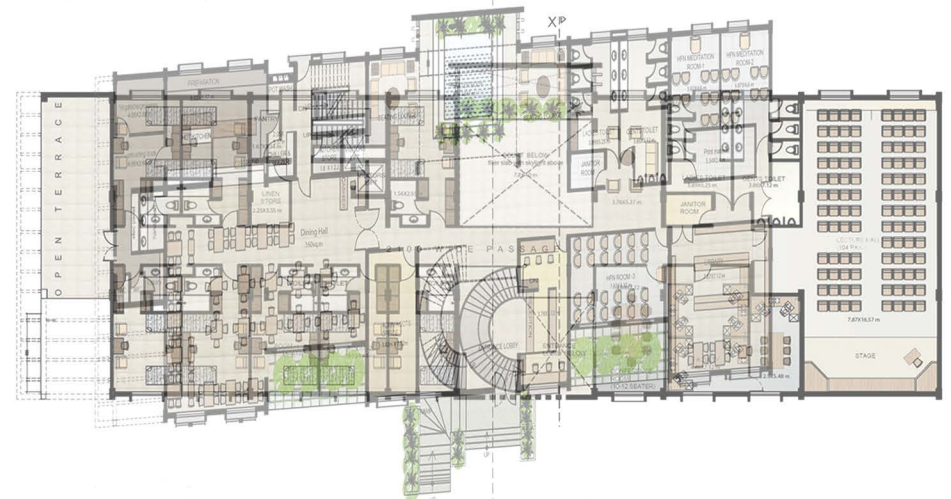
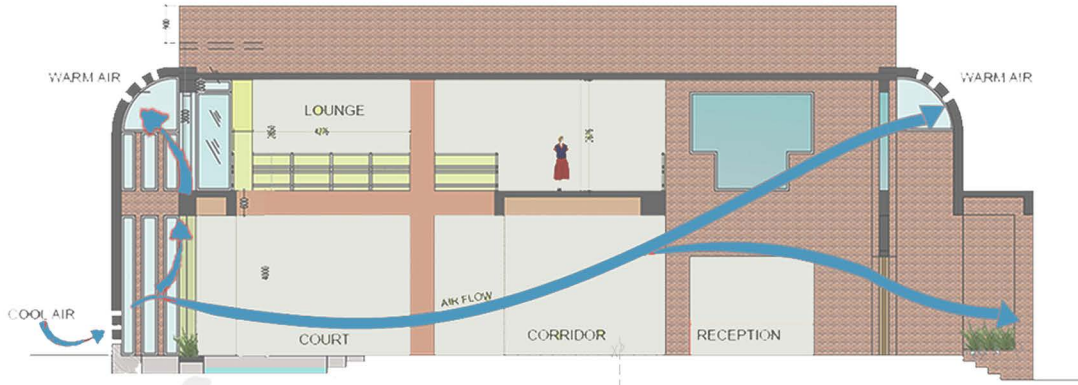
## VOLUNTEER WORK

LOCATION: NEW DELHI, INDIA

Designing of recreational center for Sahaj Marg, a global spiritual community, for its branch in Gurgaon, New Delhi, India. Drawings done as a volunteer for the community, to help build a public facility.

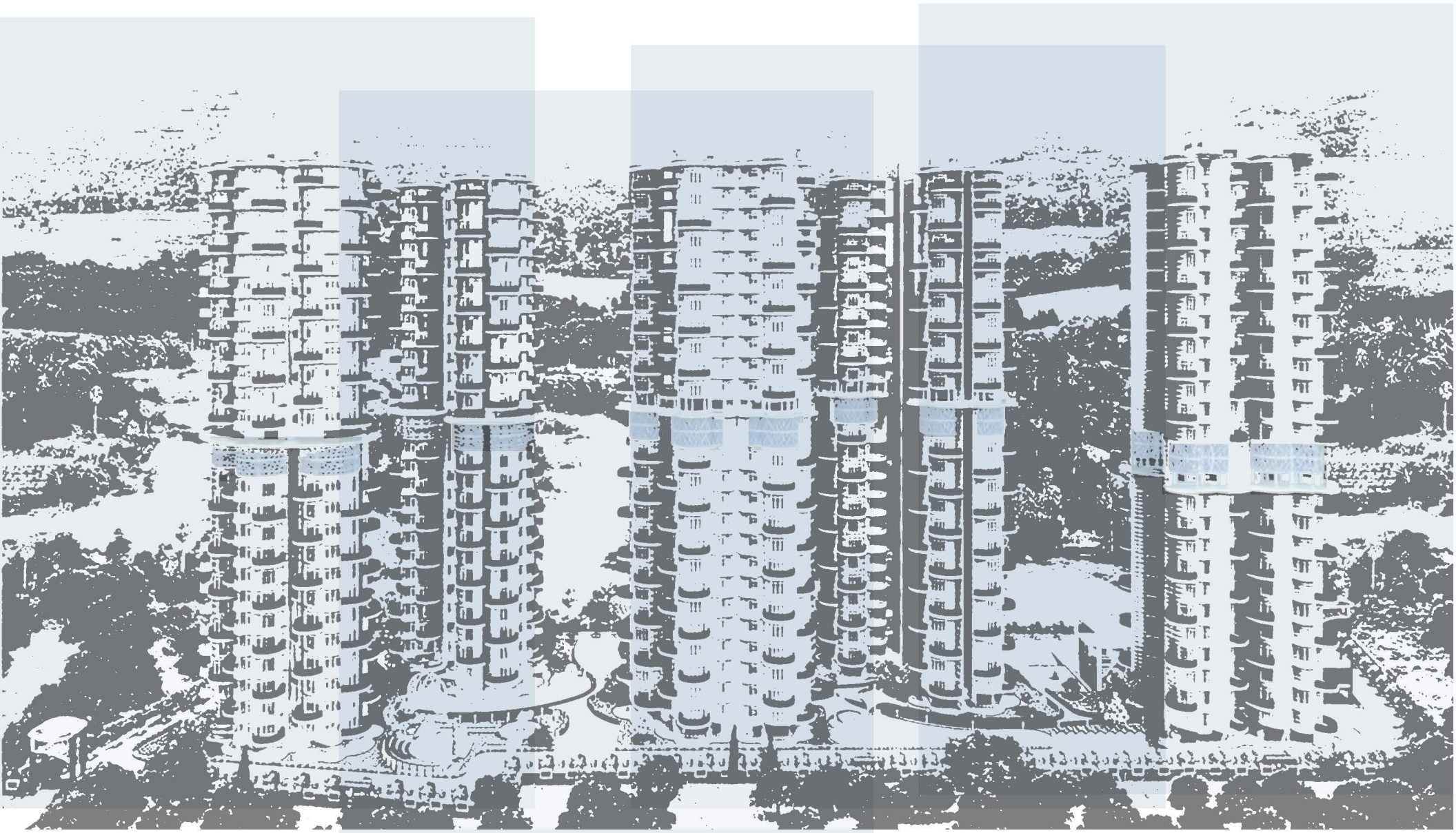
Provided assistance with technical drawings, designing and rendering.

- Use of passive environmental architecture to enhance interior cooling during harsh Delhi summers
- Use of vernacular cost-effective materials local to the region



# LUXURY HOUSING

PROFESSIONAL WORKS

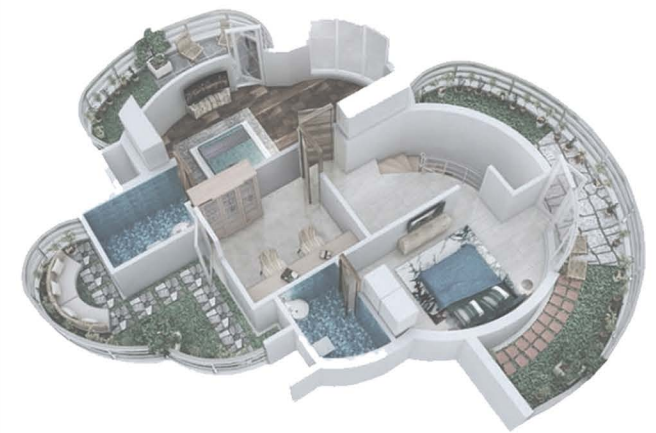


FIRM: DELHI INFRATECH LTD.,  
NEW DELHI, INDIA

Sole architect at Delhi Infratech Ltd., a real estate and construction firm in New Delhi, India: Construction of DeNest, a luxury service apartment complex to be located in Mandi Hills, Gurgaon, India. The apartments' target demography includes families, young renters, and couples, depending upon the number of bedrooms in each apartment.

The apartment complex consists of 5 blocks of varying heights and a recreational complex around these residential blocks in order to encourage exercise and maximum utilization of fresh air.

The FORM of the buildings and individual apartments was proposed by the client, who was interested in making the complex a UNIQUE metaphor for a 'nest', and hence the name. It caters to the demography of the upper middle classes of the North Capital Region of India.



2 BHK

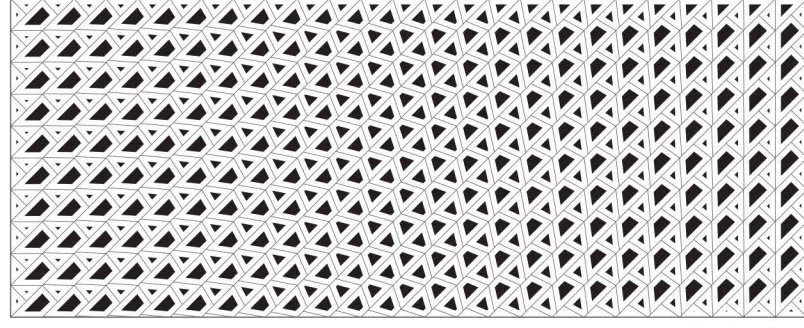


DUPLEX

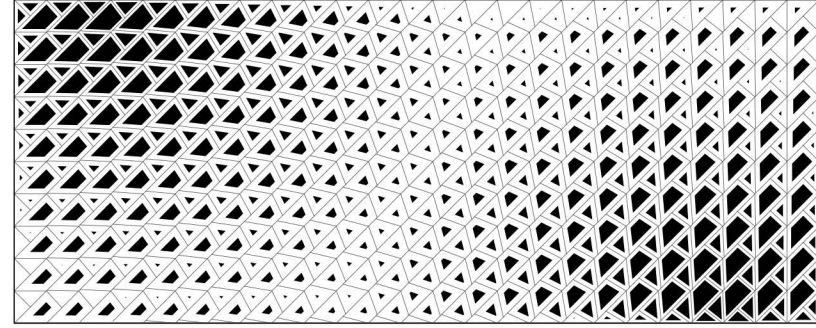
APARTMENT MODULES



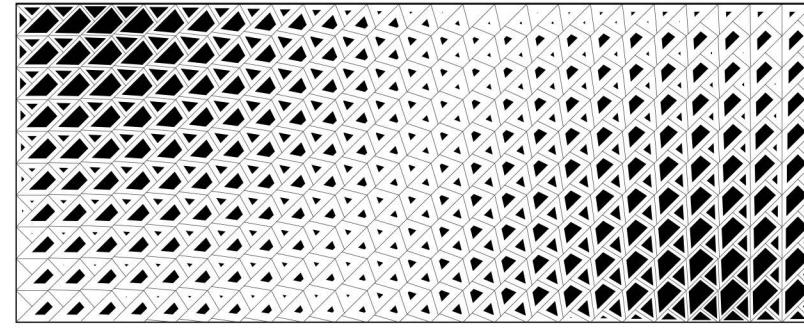
# 5. PARAMETRIC SIMULATIONS



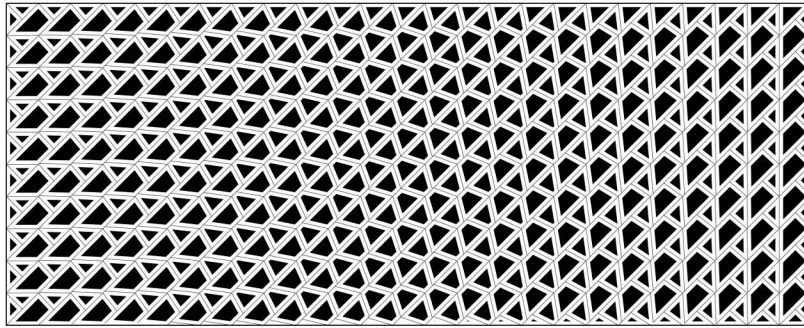
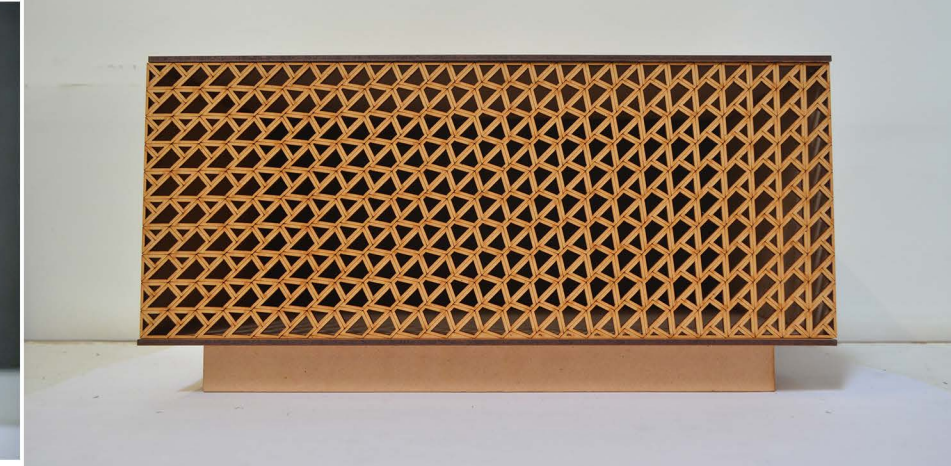
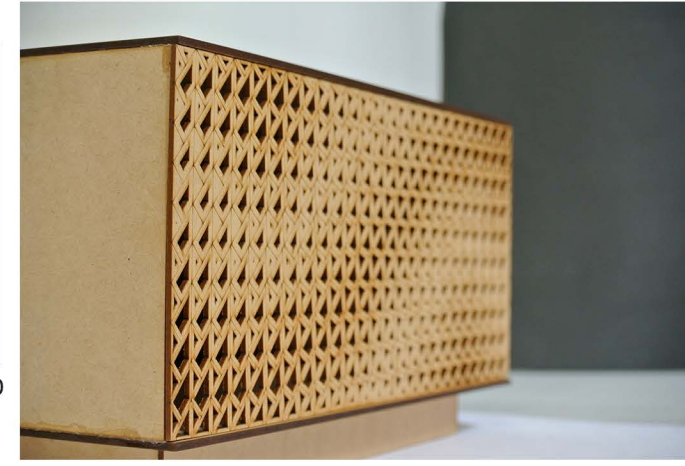
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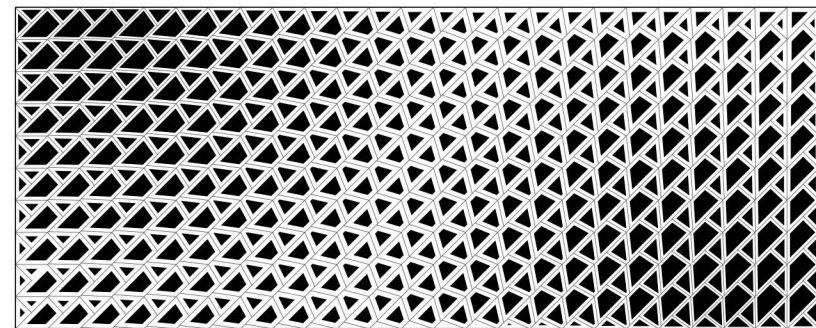
WWR | 0.20



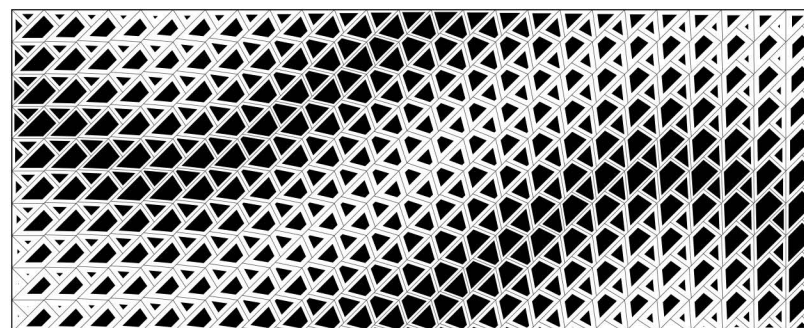
WWR | 0.20



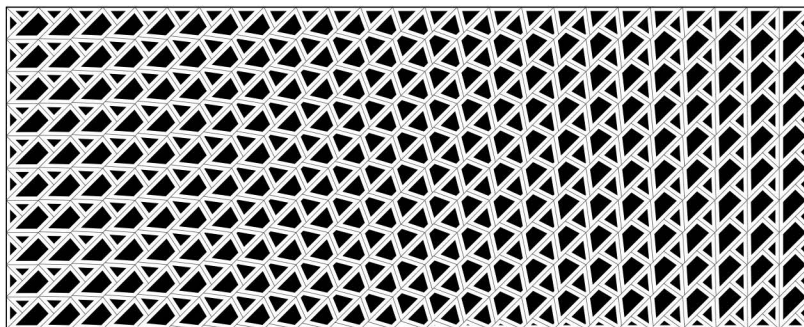
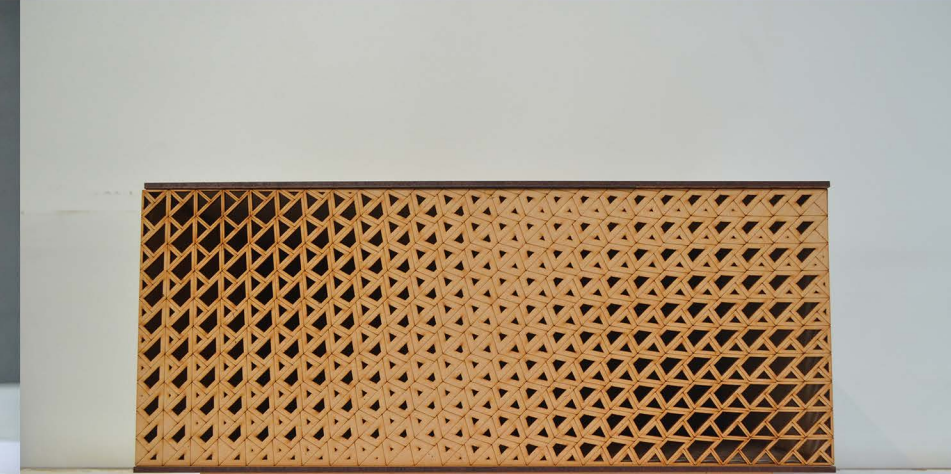
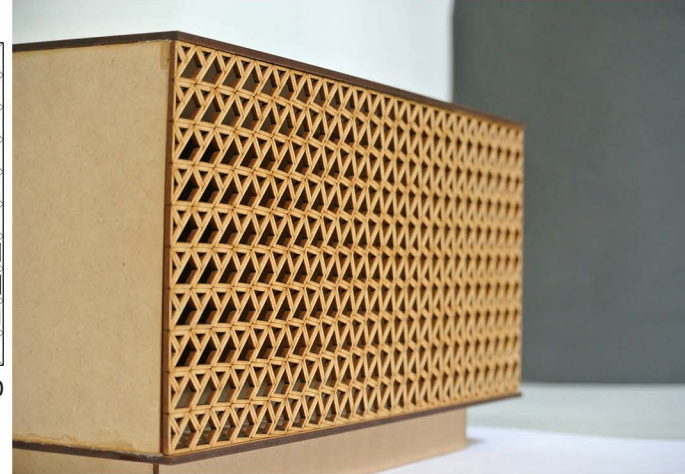
WWR | 0.40



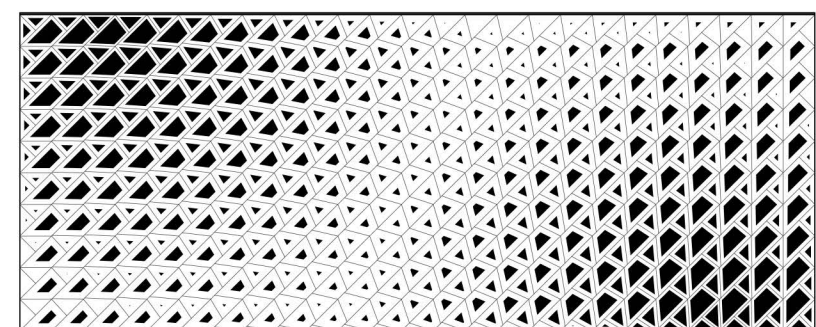
WWR | 0.40



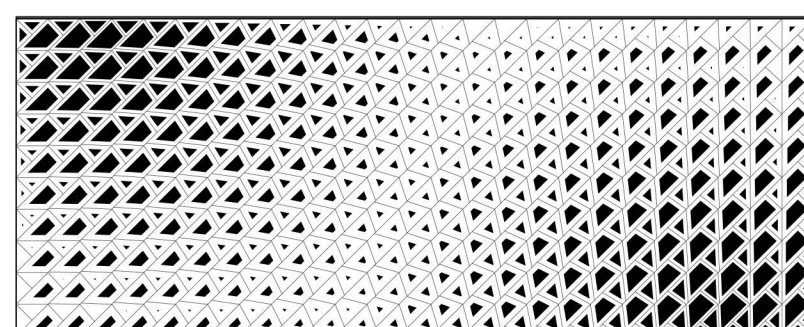
WWR | 0.40



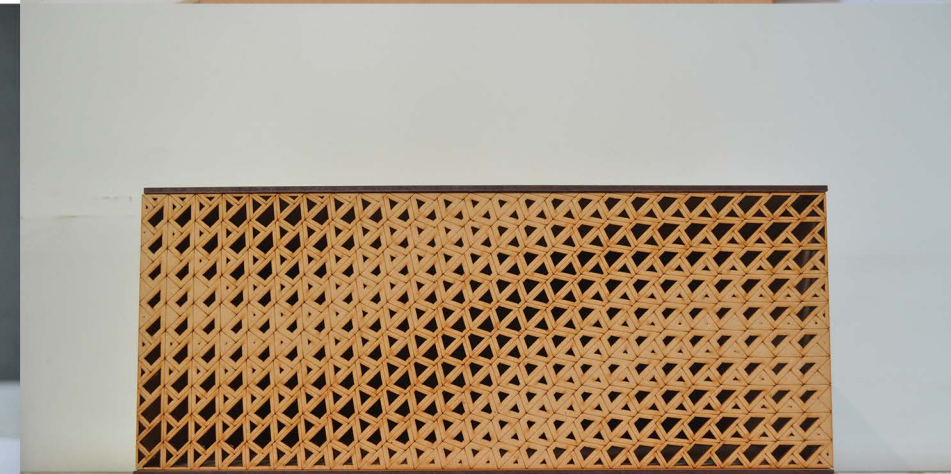
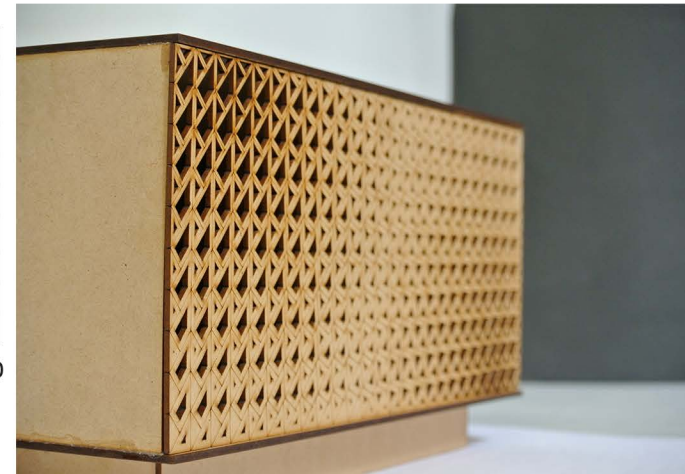
WWR | 0.60



WWR | 0.60



WWR | 0.60



**SIMPLE OFFSET**

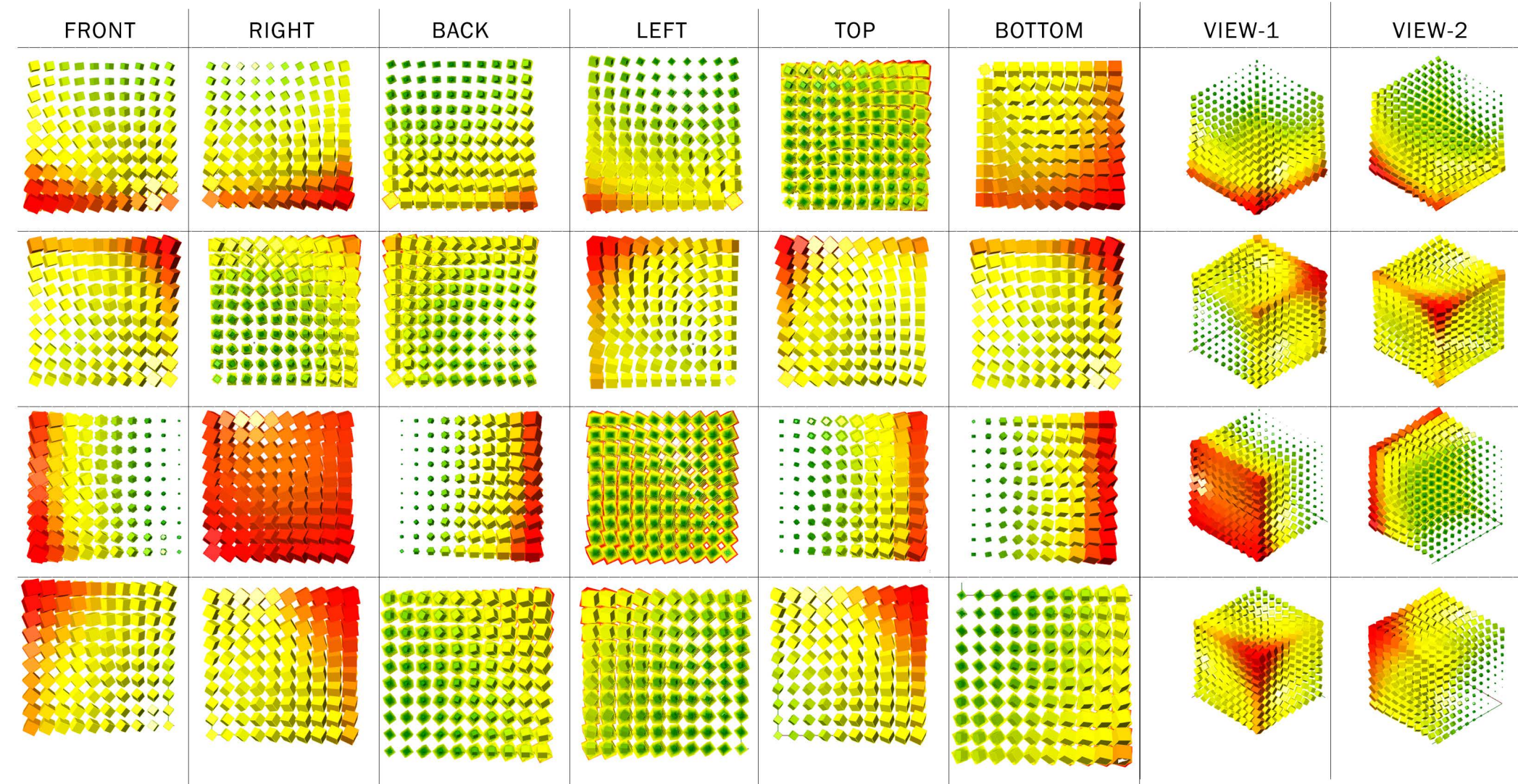
**2-POINT ATTRACTOR**

**2 -CURVE ATTRACTOR**

Parametric permutations with building facades to determine the number of outputs for given WWR. (Part of summer workshop conducted by CEPT University, India; 2017).

# GENERATIVE MODELLING

ACADEMIC WORKS

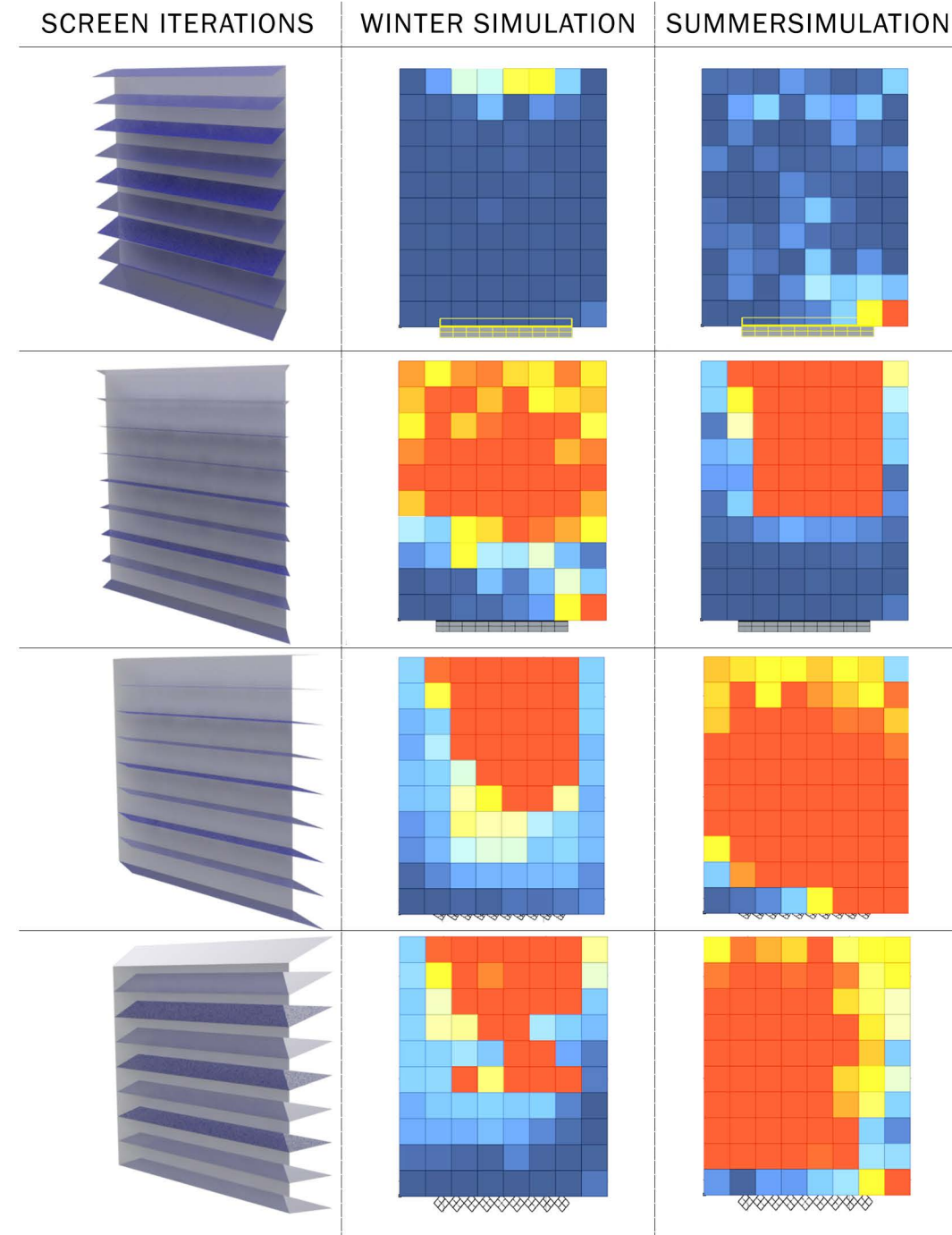


1. ATTRACTOR POINT DEPENDENCY THROUGH VARIATIONS

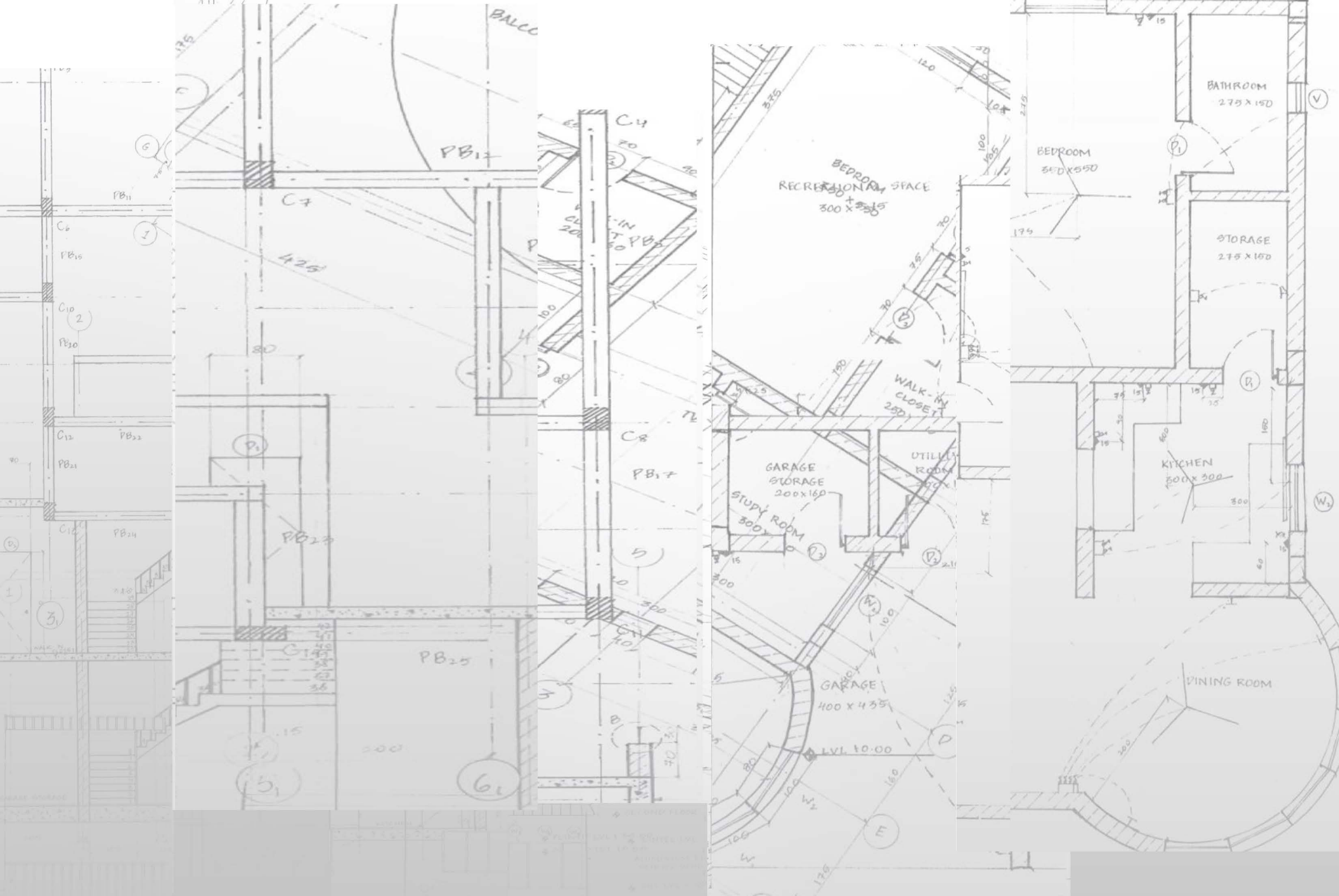
Academic experiments conducted to explore the usage of parametricism in different aspects of our lives. Simple geometric shapes can be analogous with various objects to understand the fundamentals.

1. ATTRACTOR POINT DEPENDENCY  
Attractor point definition that enables one to explore the variations that could occur in form/aesthetic/structure/lighting by mere manipulations with distance and center of gravity.

2. DAYLIGHTING  
Use of parametric techniques for checking the effectiveness of screen walls and openings, using color coding based on the intensity of sunlight penetrating through the openings. The attractor points used are the winter and summer suns respectively, hence the screens tend to increase shading from the summer sun and reduce it during winter.



2. SUNLIGHT PATTERNS THROUGH DAYLIGHT ANALYSIS



CULMINATE.