Portfolio

Shivani Nitin Golatkar
GSAPP AAD 2024

"If you give people nothingness, they can ponder what can be achieved from that nothingness."

- TADAO ANDO

C O N T E N T S

01

ARCHITECTONICS OF MUSIC

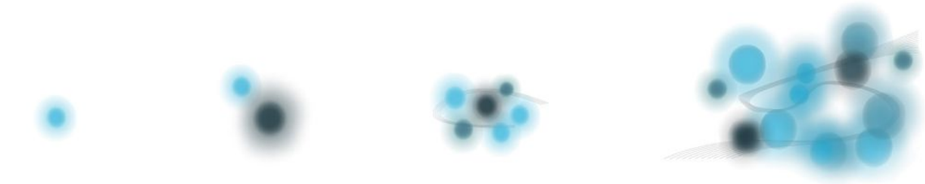
ADVANCED STUDIO I SPRING 2024
GSAPP AAD

Prof. Steven Holl, Prof. Dimitra Tsachrelia

Group Project : Jin Woo Jung

Known for its immersive and expansive sonic landscape, ‘Become Ocean’ captures the essence of the ocean with a haunting orchestral sound, suggesting relentless tidal movements that allows individuals to immerse themselves in a contemplative and expansive environment, reminiscent of the vastness and beauty of the ocean.

Along with the subtle transition the design seeks to create an immersive environment by showing various overlapped layers of relationships such as flow of water, space, light and acoustics that prompt contemplation and connection to the broader ecological narrative thereby stimulating the spiritual aspects of emotions.



Sound Reverbations Harmony Ecology of Music

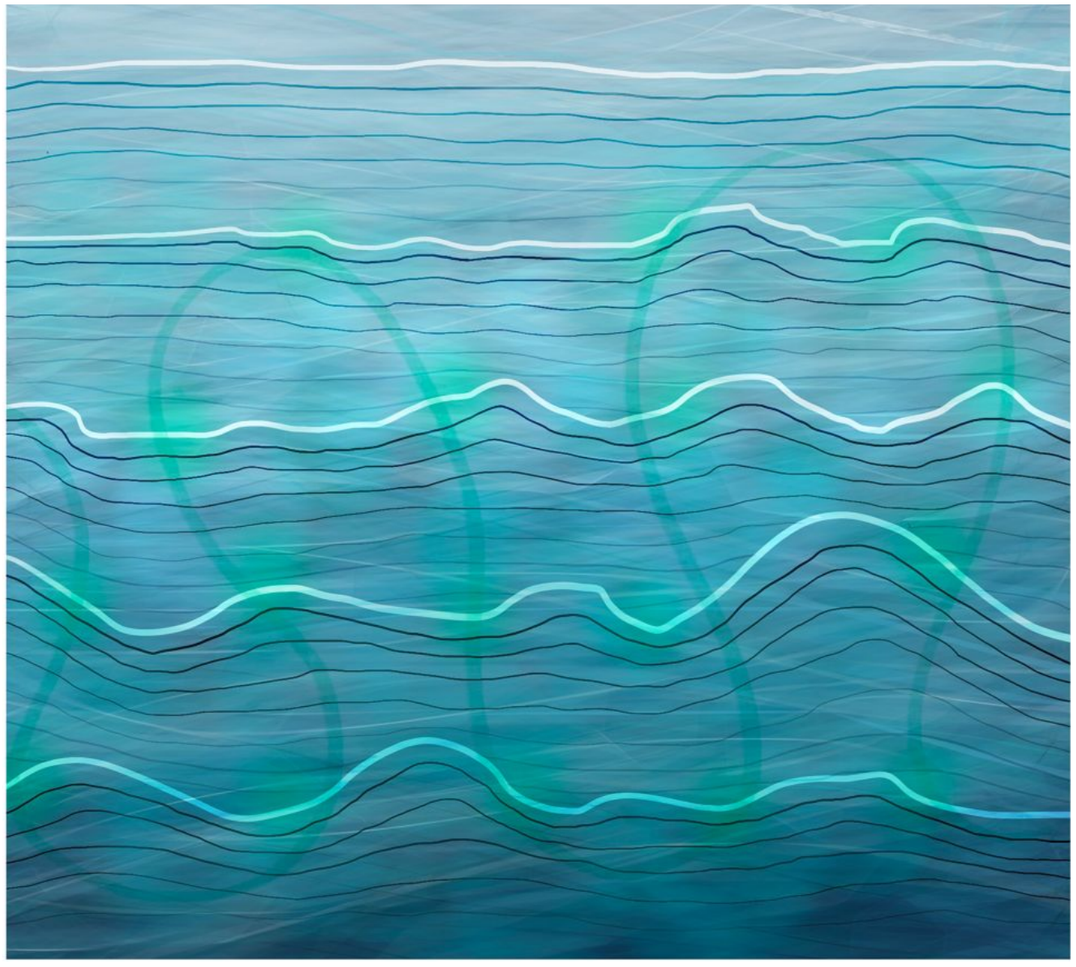
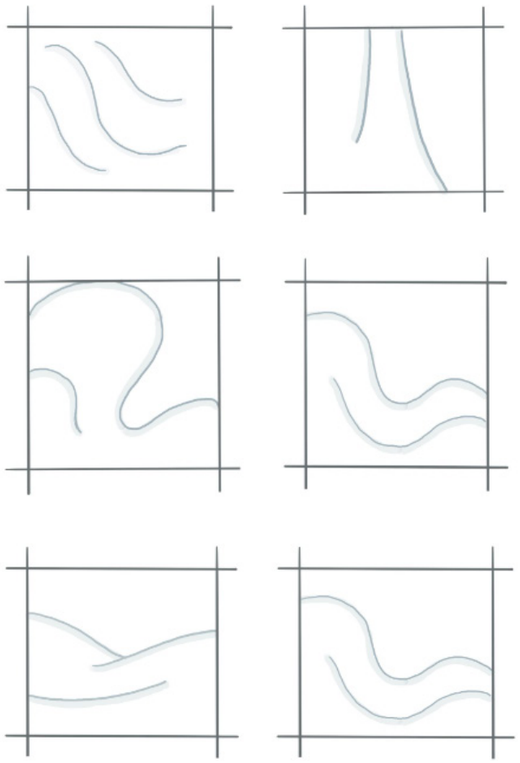
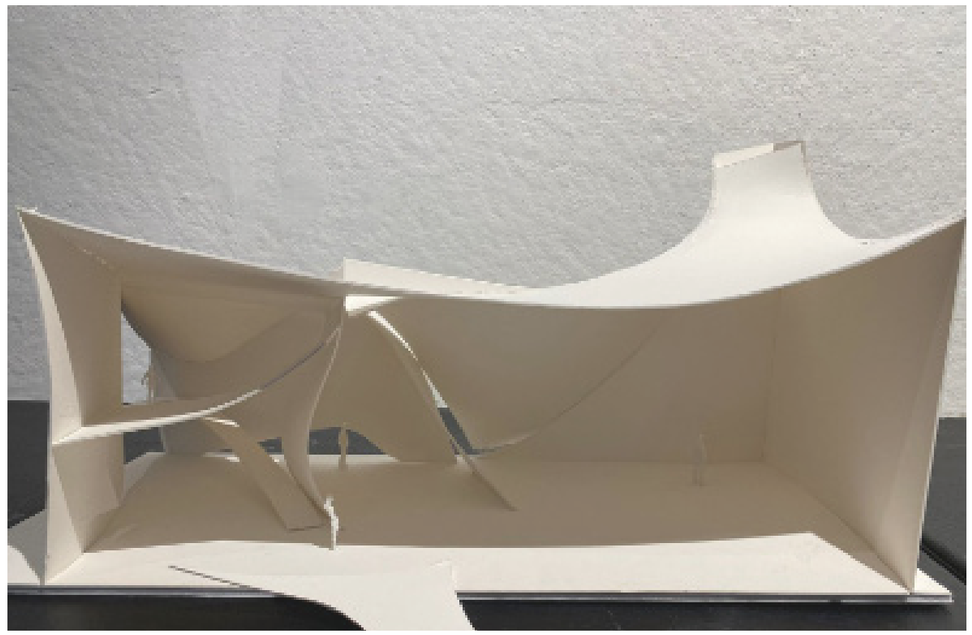


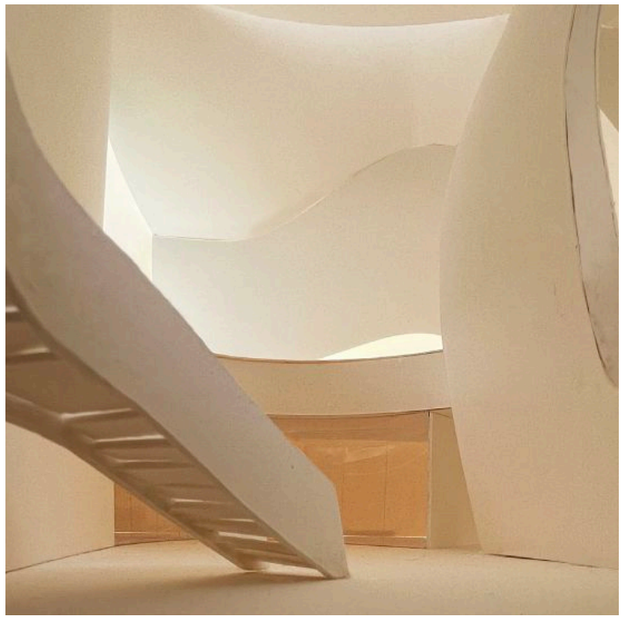
Illustration depicting the ecology of music

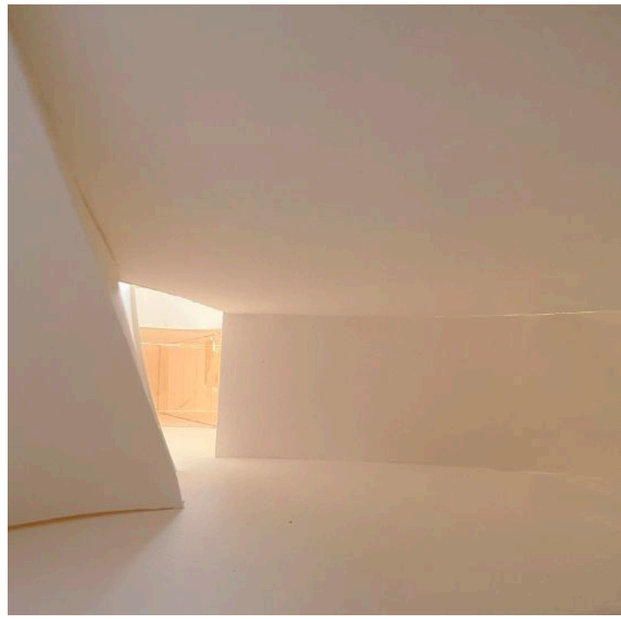




Typology of waves portraying ecology of music

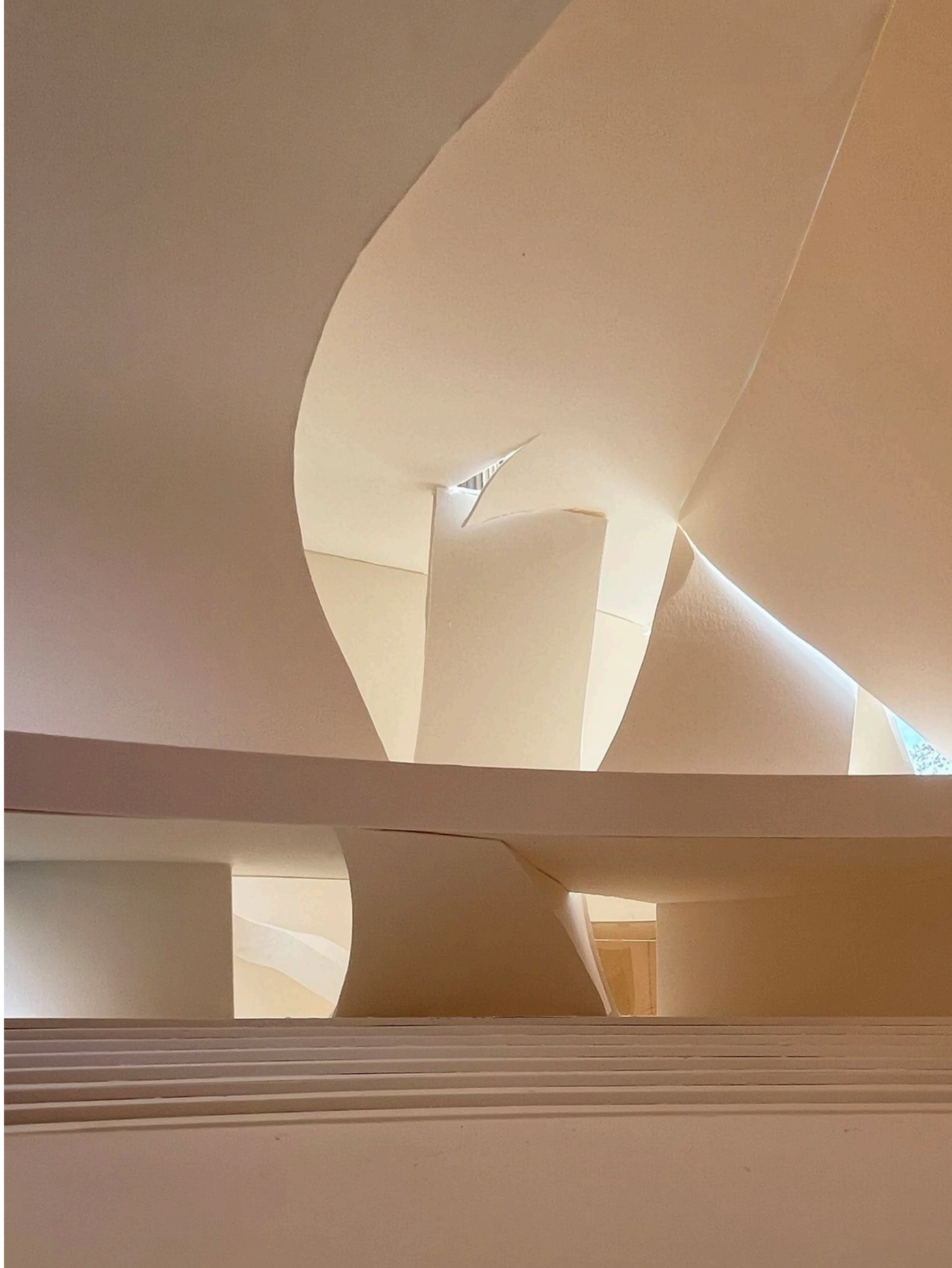
View of the entrance lobby





Lounge area

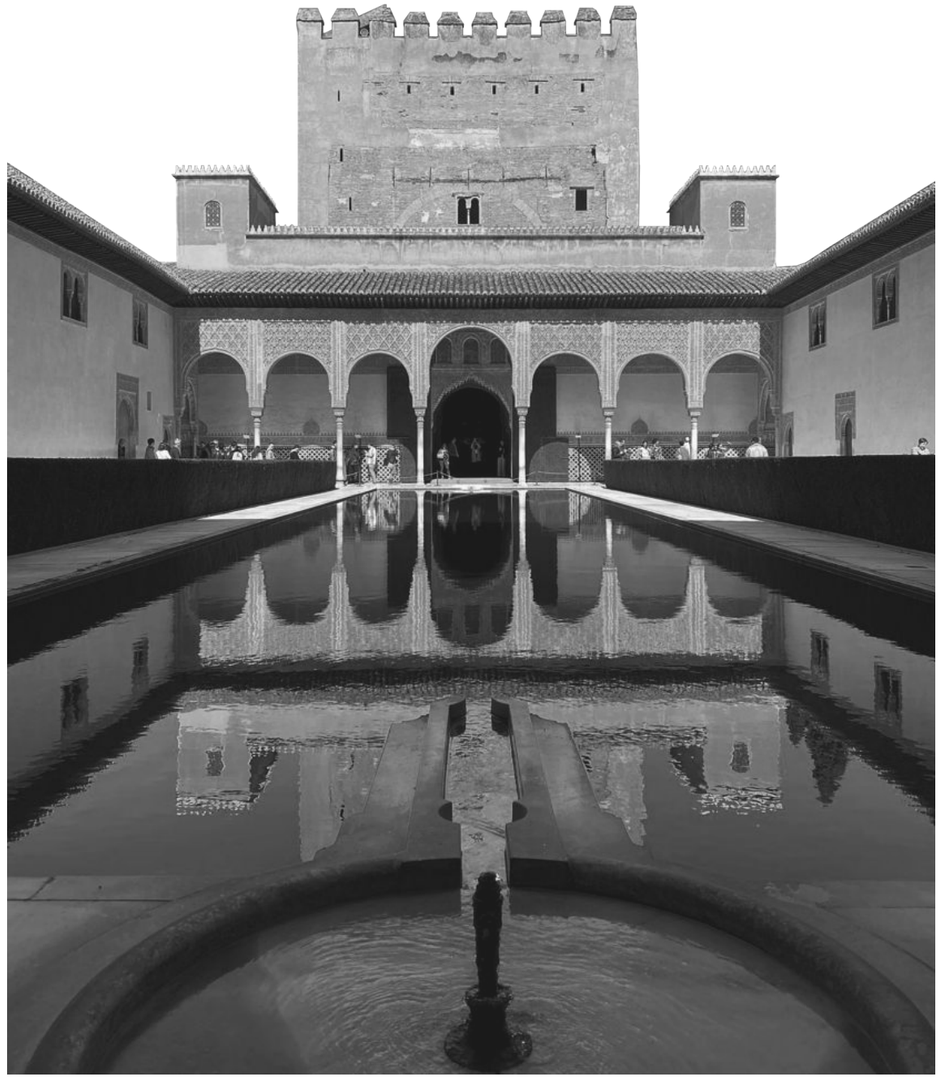
View of the concert hall



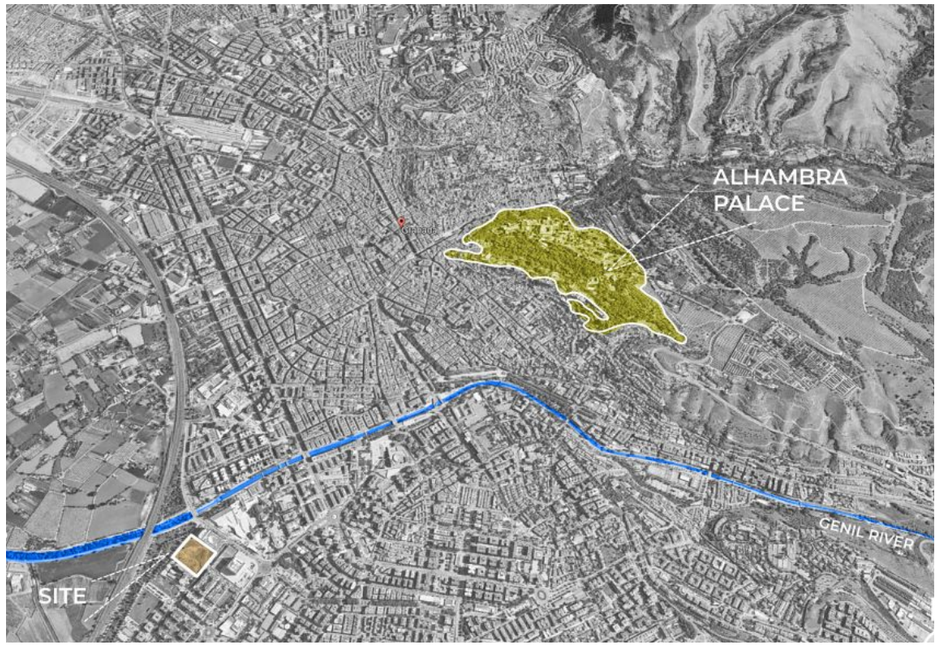
View of the concert hall

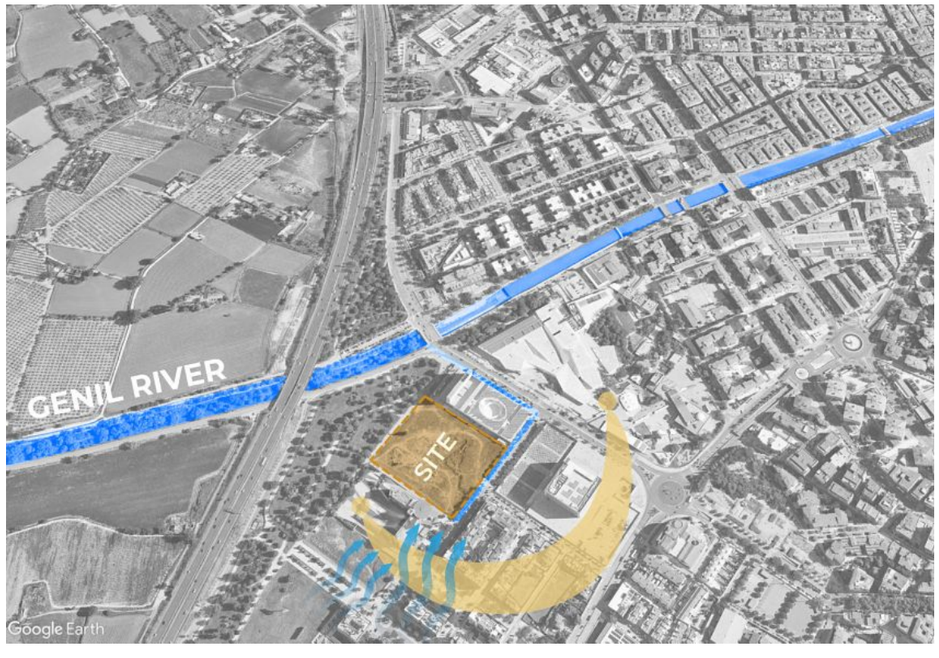
Chamber of Music, interplay of light

Reflections, Interplay of light, Flow of water

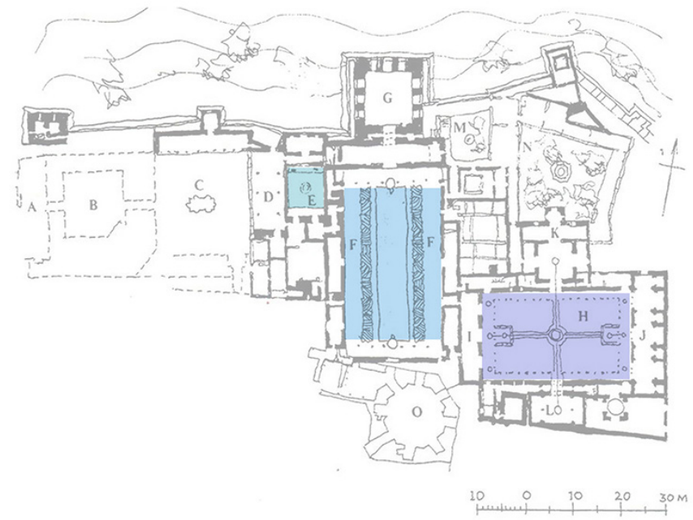


Alhambra Palace





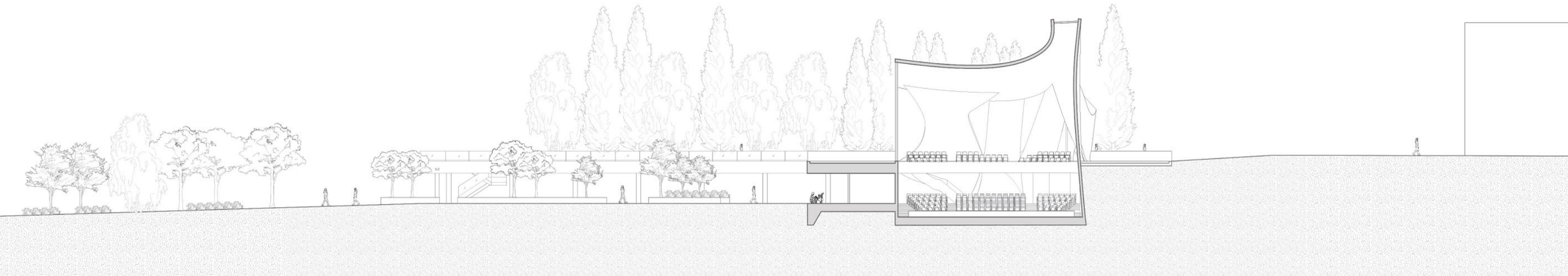
T- Location of Alhambra Palace
B - Site analysis

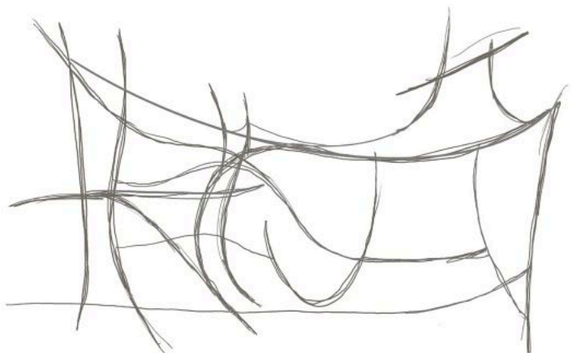


T - Scale and proportion of inside and outside spaces of Alhambra Palace, B - Site Plan comparison

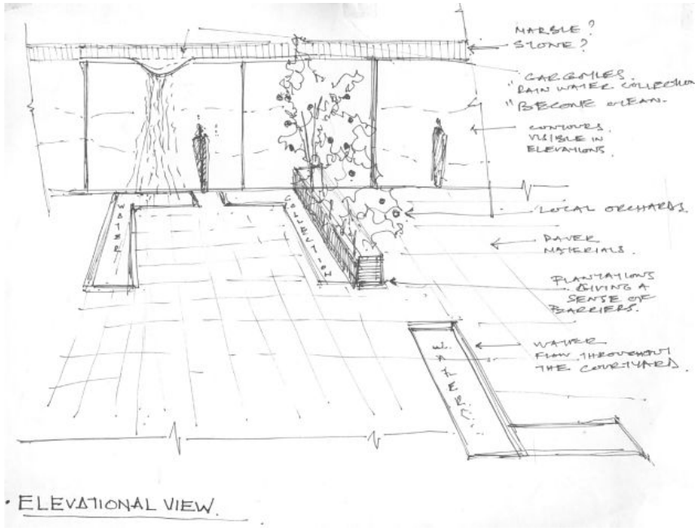

1 Entrance
2 Cafeteria
3 Lobby
4 Technical room
5 Mens washroom
6 Women washroom
7 Office
8 Auditorium
9 Mens washroom
10 Women washroom
11 Store room
12 Green room
13 Green room
14 Machine room
15 Rainwater harvesting room
16 Office
17 Men washroom
18 Women washroom
19 Conference room
20 Music library
0
10
20
50


1 South entrance
2 North entrance
3 Entrance to the auditorium
4 Waterbody
5 Connecting bridge
6 Main courtyard
7 Small seating nook
8 Exhibition area
0
10
20
50





Conceptual sketch of the building



Conceptual sketch of the graden

02

THE MAISON STUDIO

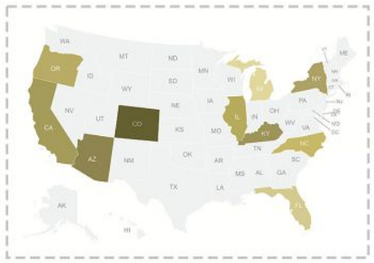
ADVANCED STUDIO I FALL 2023
GSAPP AAD

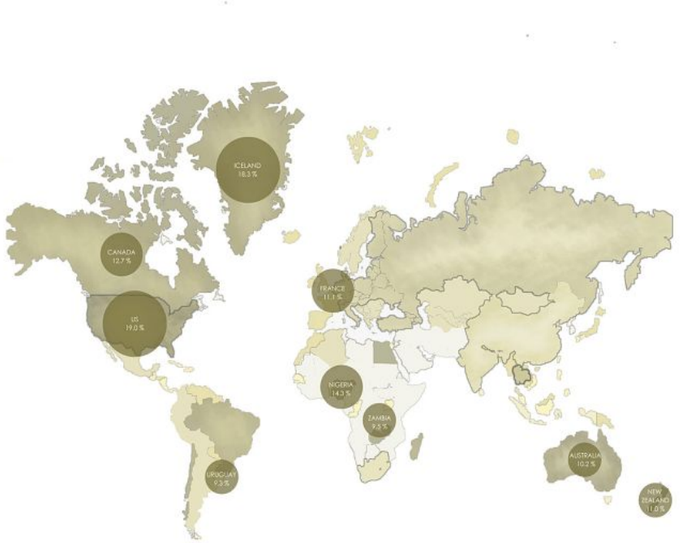
Prof. Gordon Kipping

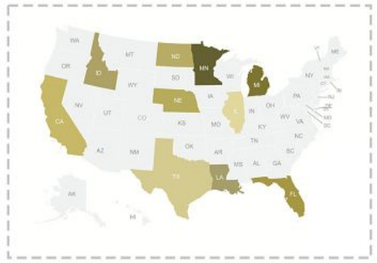
Group Project : Simar

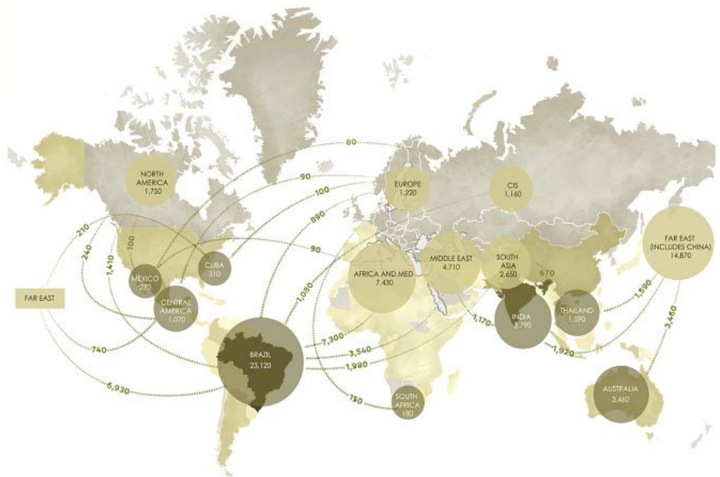
The Maison Studio addresses the climate crisis by exploiting emerging building technologies to propose solutions for building more sustainably. The climate crisis has challenged us to change how we build and what we build in an effort to reverse the climate disaster we are facing.

The Maison Studio exploits emerging building technologies to propose solutions for building more sustainably to address this crisis.









HEMPCRETE

HEMP PRODUCTION MAP

USE BY % OF POPULATION - 2016

COUNTRIES THAT ALLOW GROWTH OF HEMP - 2019

SUGARCRETE

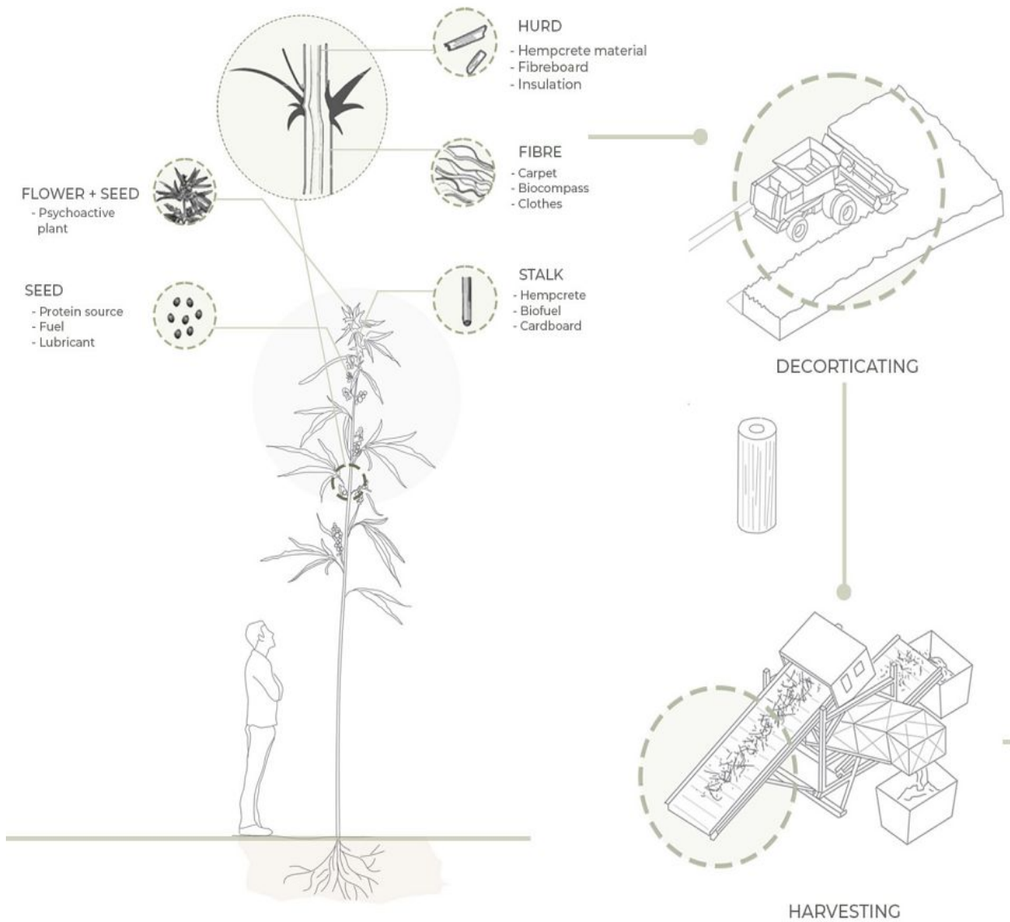
SUGARCANE PRODUCTION MAP

ALL FIGURES IN KILO METRIC TONNES - 2021

ORIGINATING TOTAL EXPORTS

DESTINATION TOTAL IMPORTS

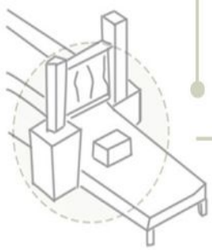
HEMPCRETE PRODUCTION



DECORTICATING

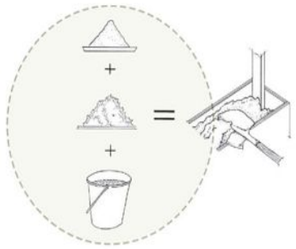
HARVESTING

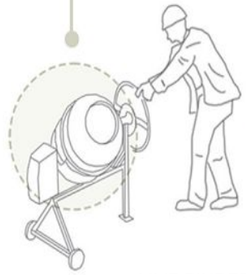
HEMP SHIV



MACHINE COMPRESSED

INSULATION

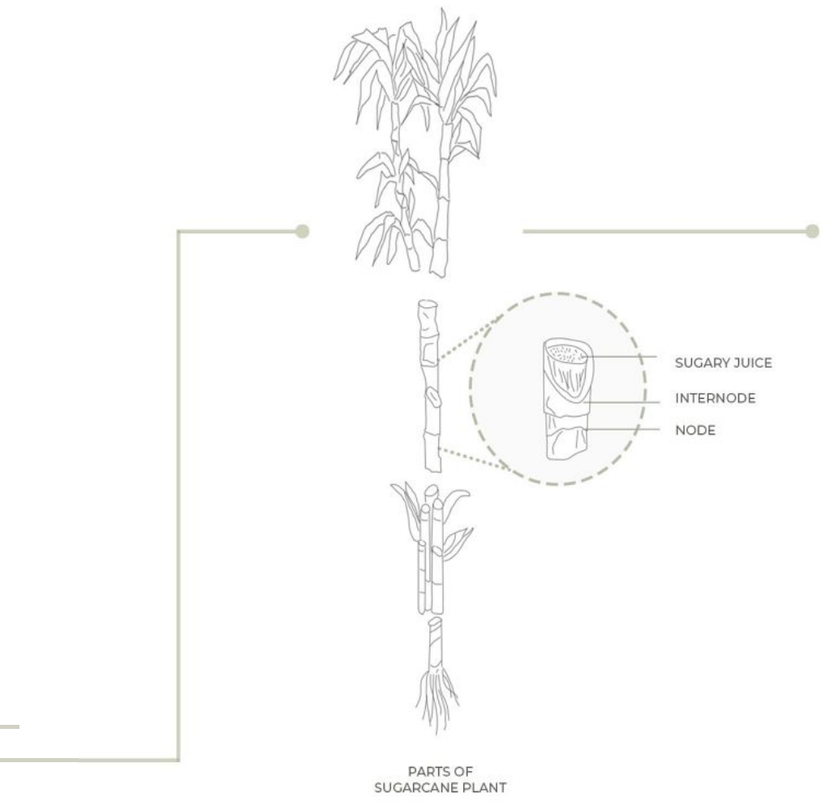


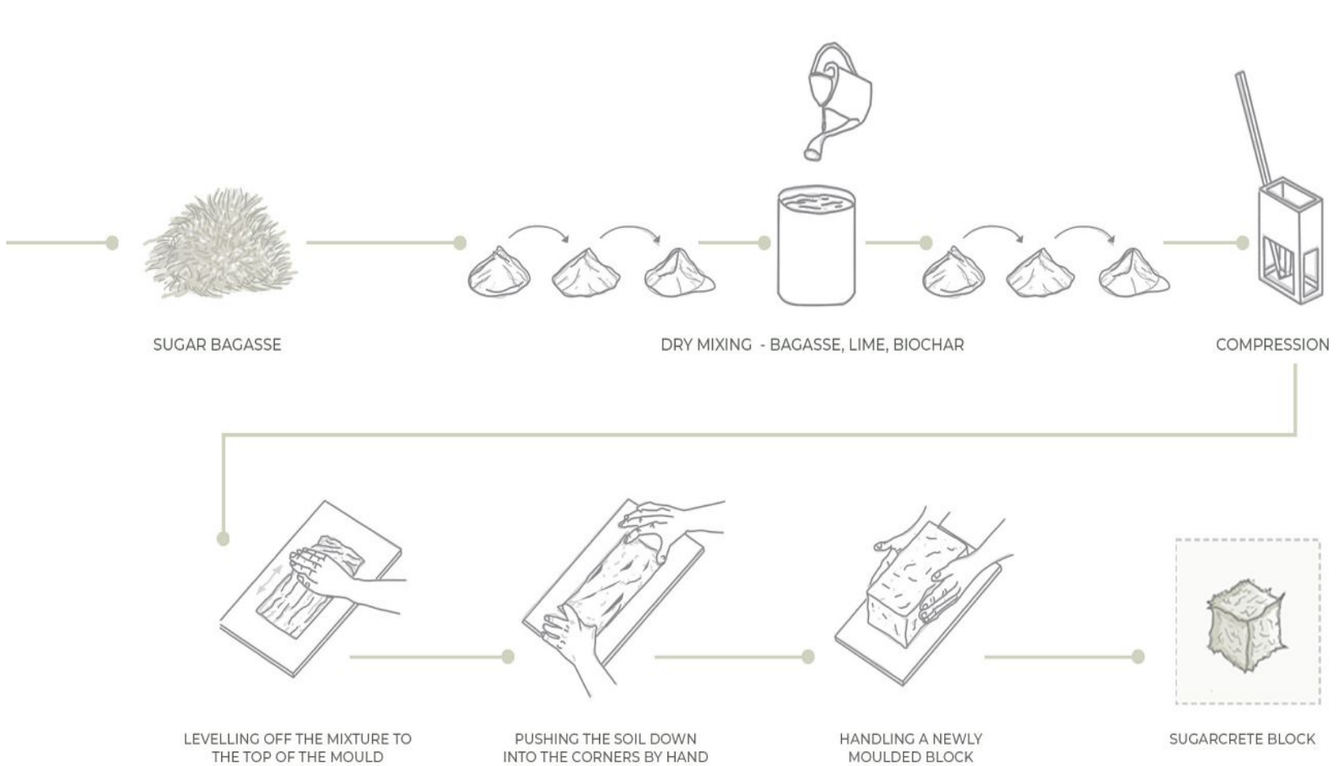


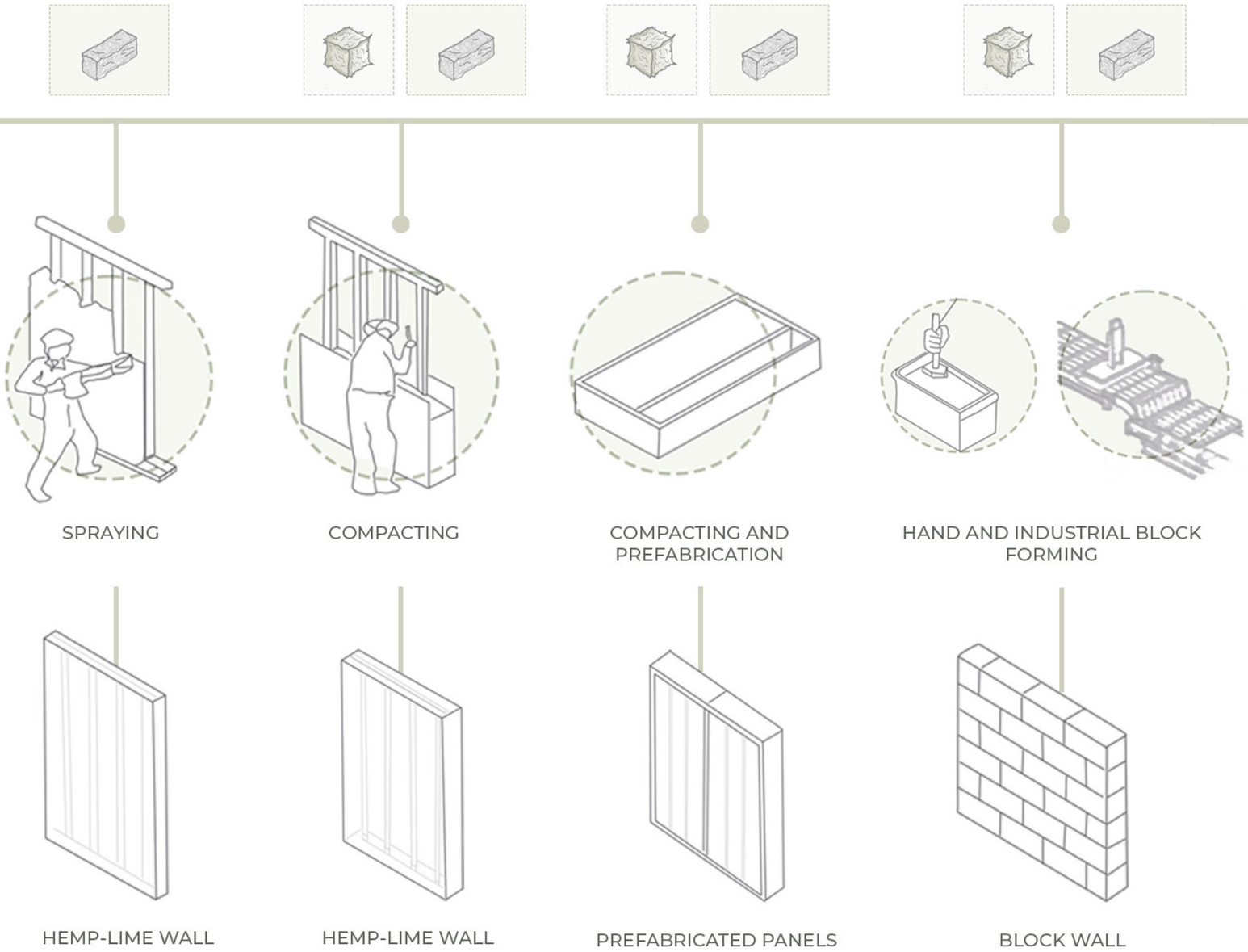
LIME BINDER + HEMP(HURD + SHIVES) + WATER

HEMPCRETE

SUGARCRETE PRODUCTION

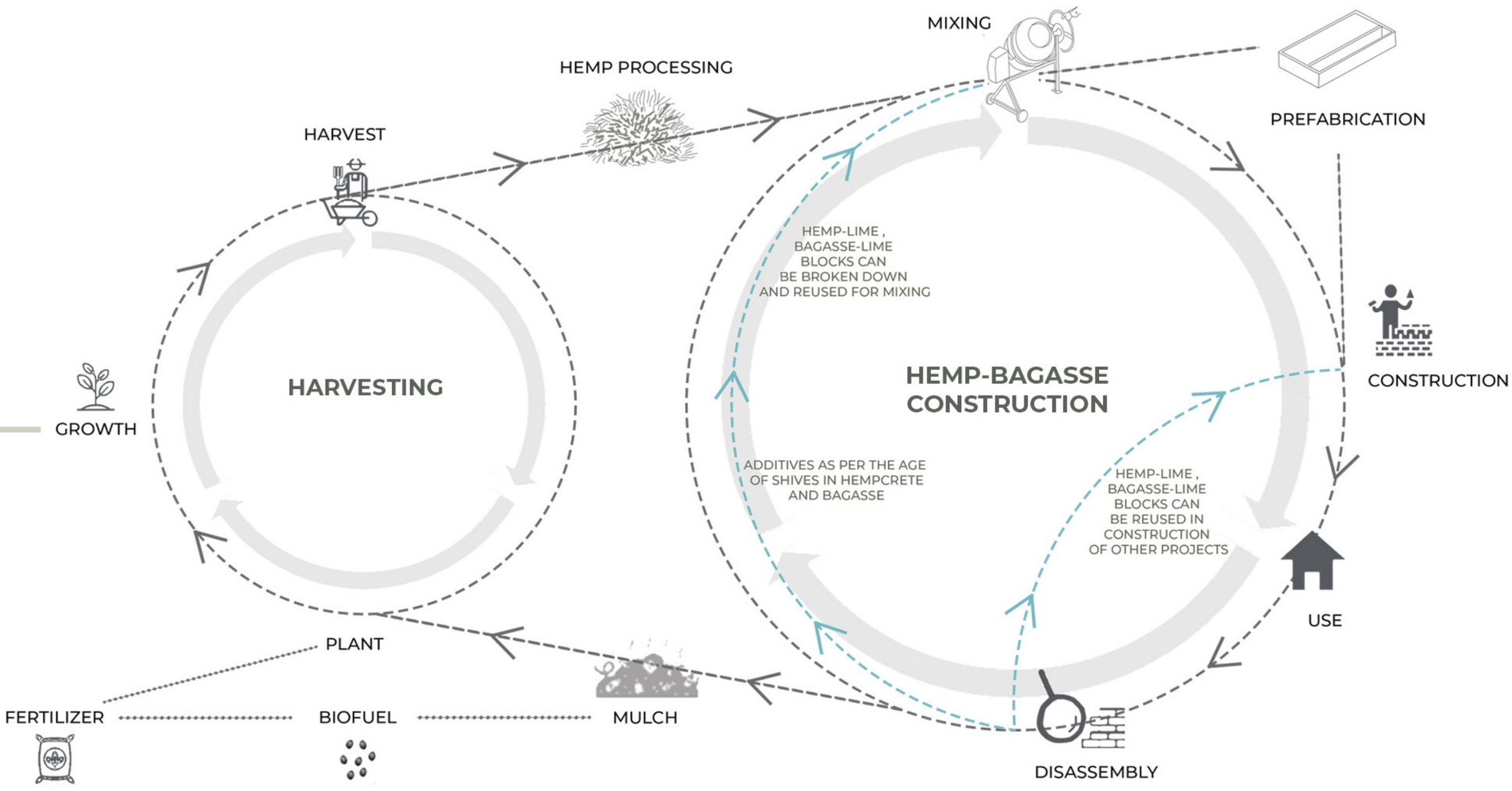


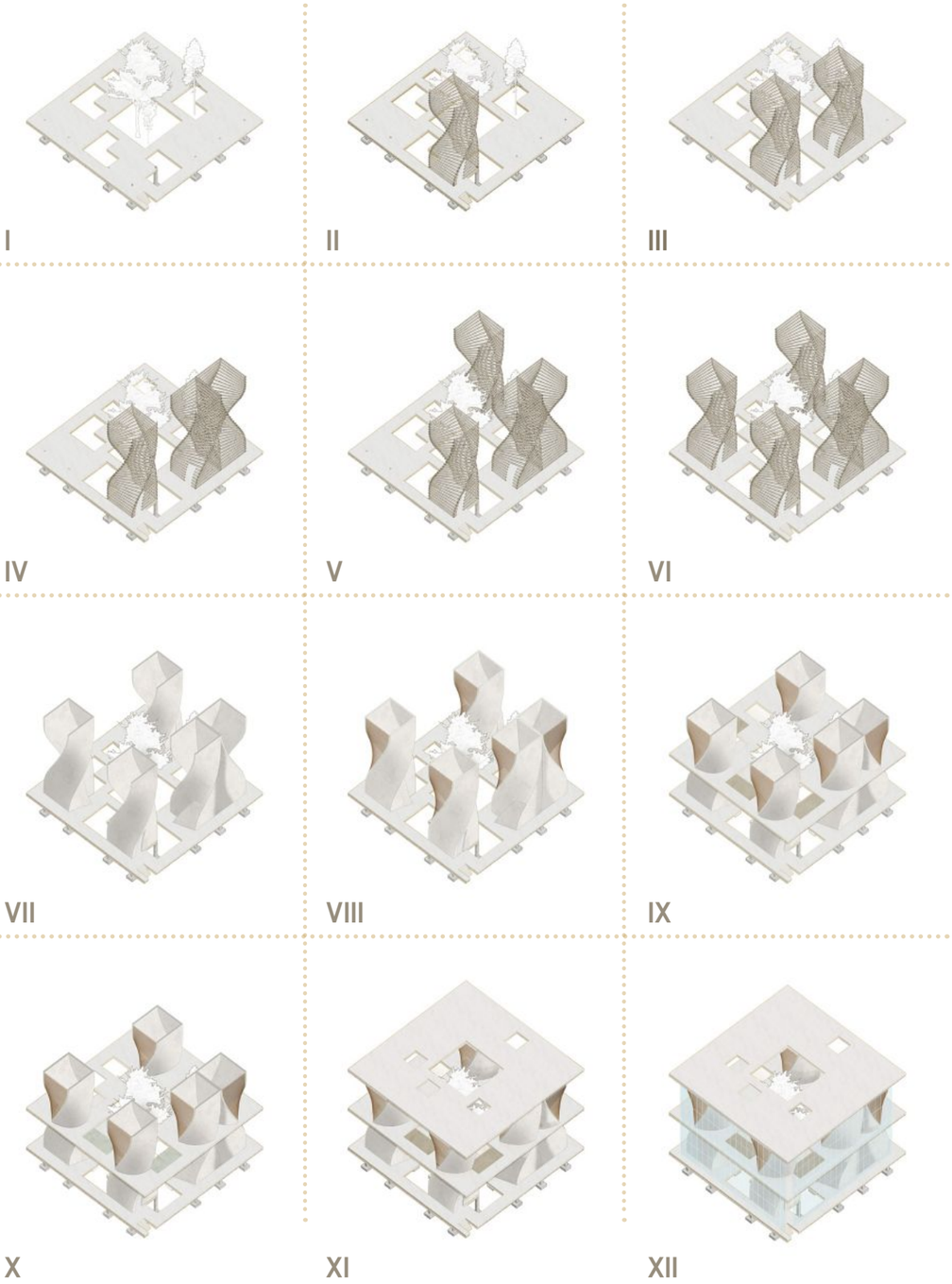




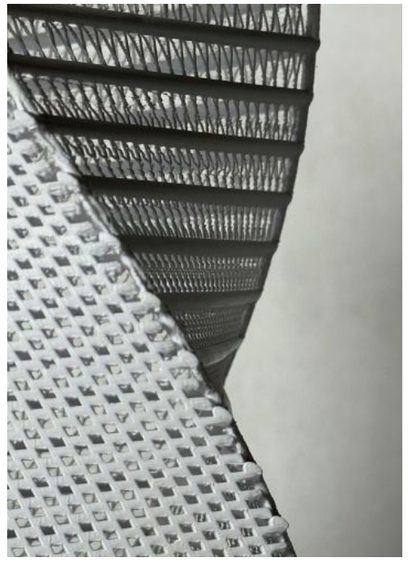
APPLICATIONS

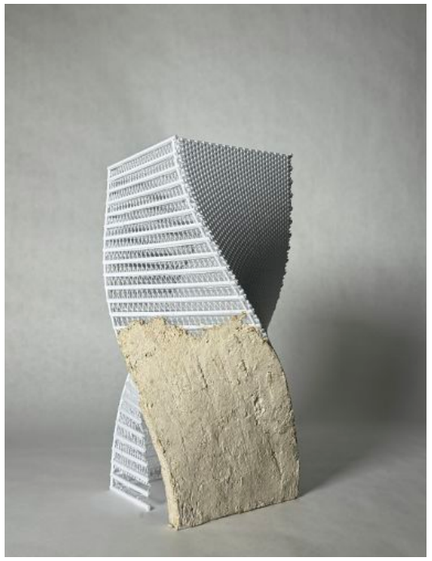
LIFE CYCLE


MIXING
HEMP PROCESSING
HARVEST
PREFABRICATION
HEMP-LIME , BAGASSE-LIME BLOCKS CAN BE BROKEN DOWN AND REUSED FOR MIXING
HARVESTING
HEMP-BAGASSE CONSTRUCTION
CONSTRUCTION
GROWTH
ADDITIVES AS PER THE AGE OF SHIVES IN HEMPCRETE AND BAGASSE
HEMP-LIME , BAGASSE-LIME BLOCKS CAN BE REUSED IN CONSTRUCTION OF OTHER PROJECTS
USE
PLANT
FERTILIZER
BIOFUEL
MULCH
DISASSEMBLY

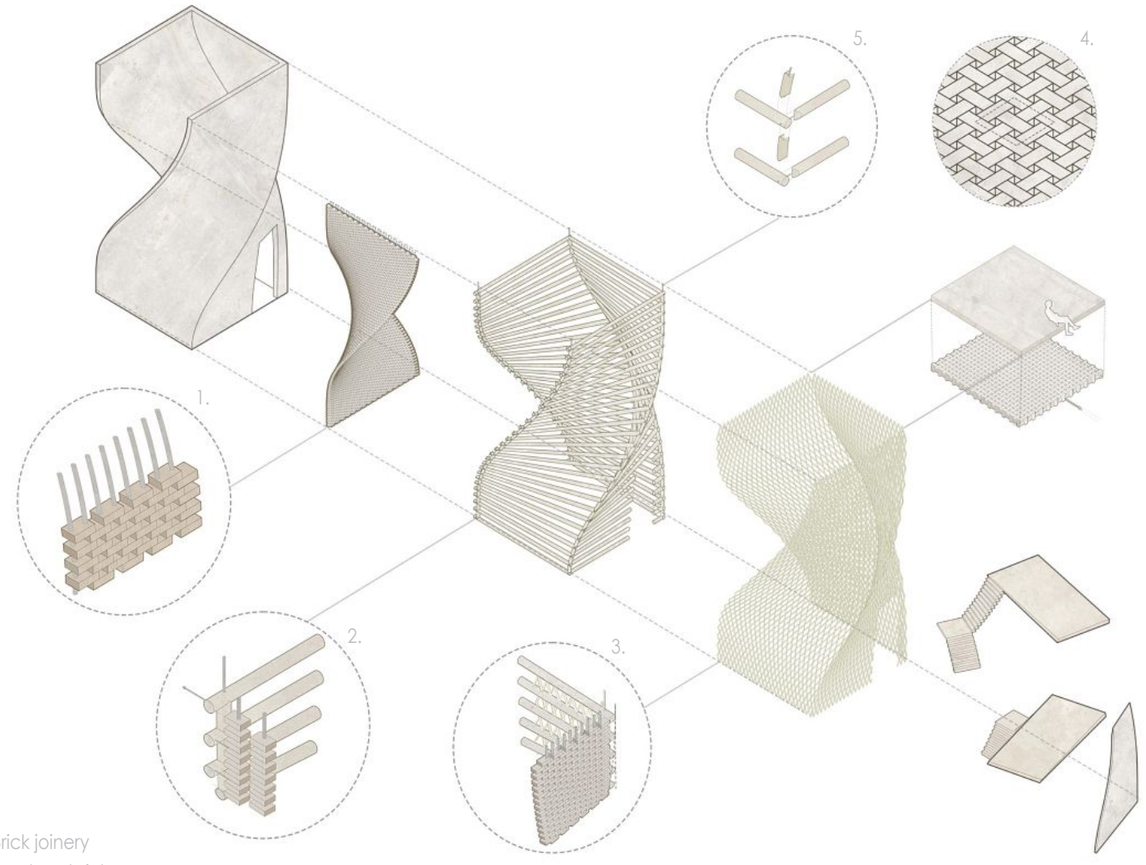


Conceptual study and construction of Maison Dom-Ino





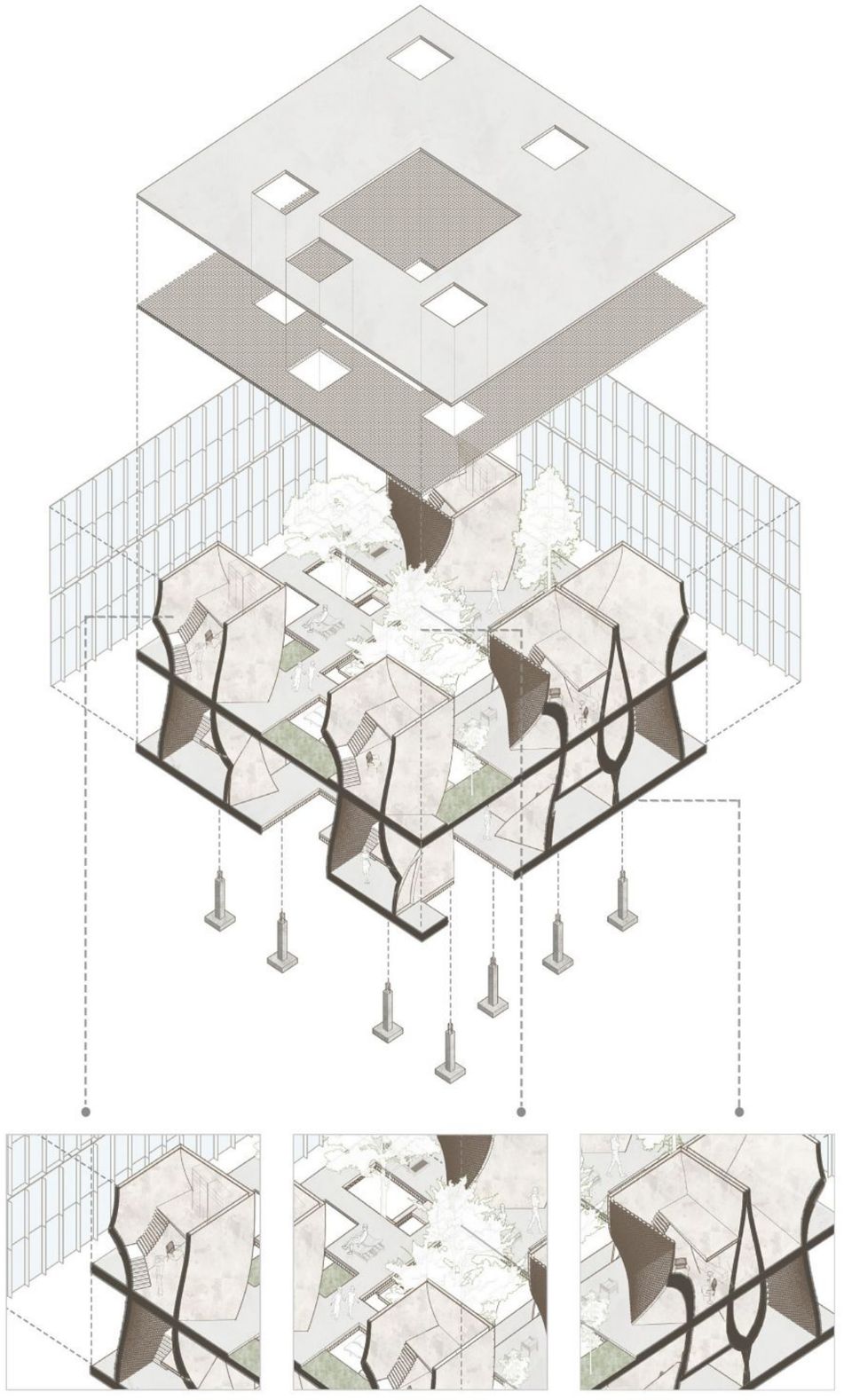
Physical Model - Facade study and exterior views



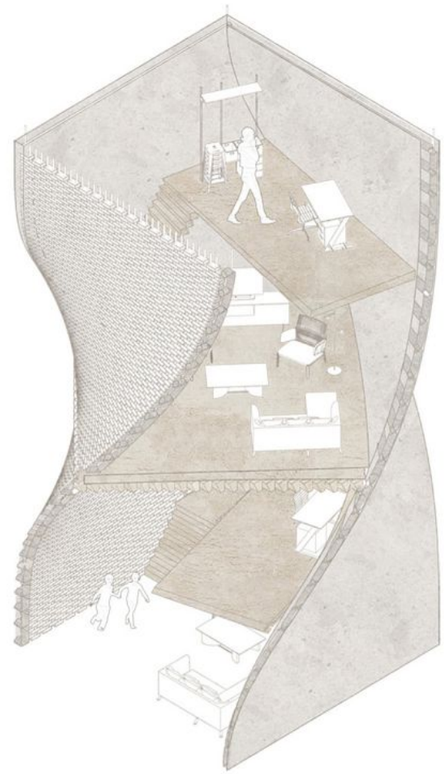
1. Brick joinery
2. Bamboo brick joinery
3. Bamboo brick webbing joinery
4. Sugarcrete slab
   Bamboo joinery

Exploded view of the structural components - Hempcrete and Sugarcrete

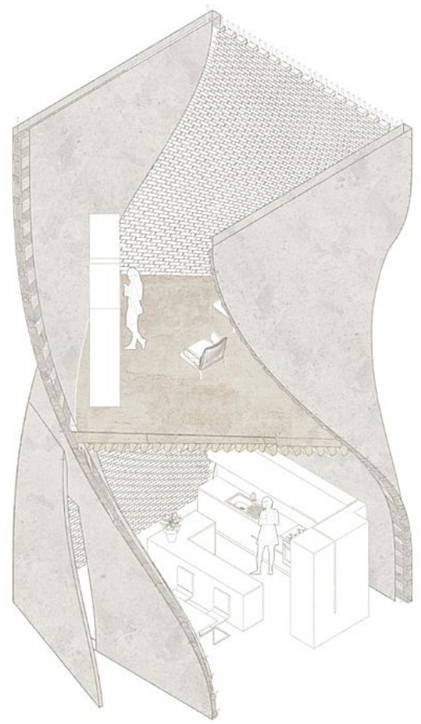
Interior views of the module



Exploded axonometric view with interiors of Maison Dom-Ino

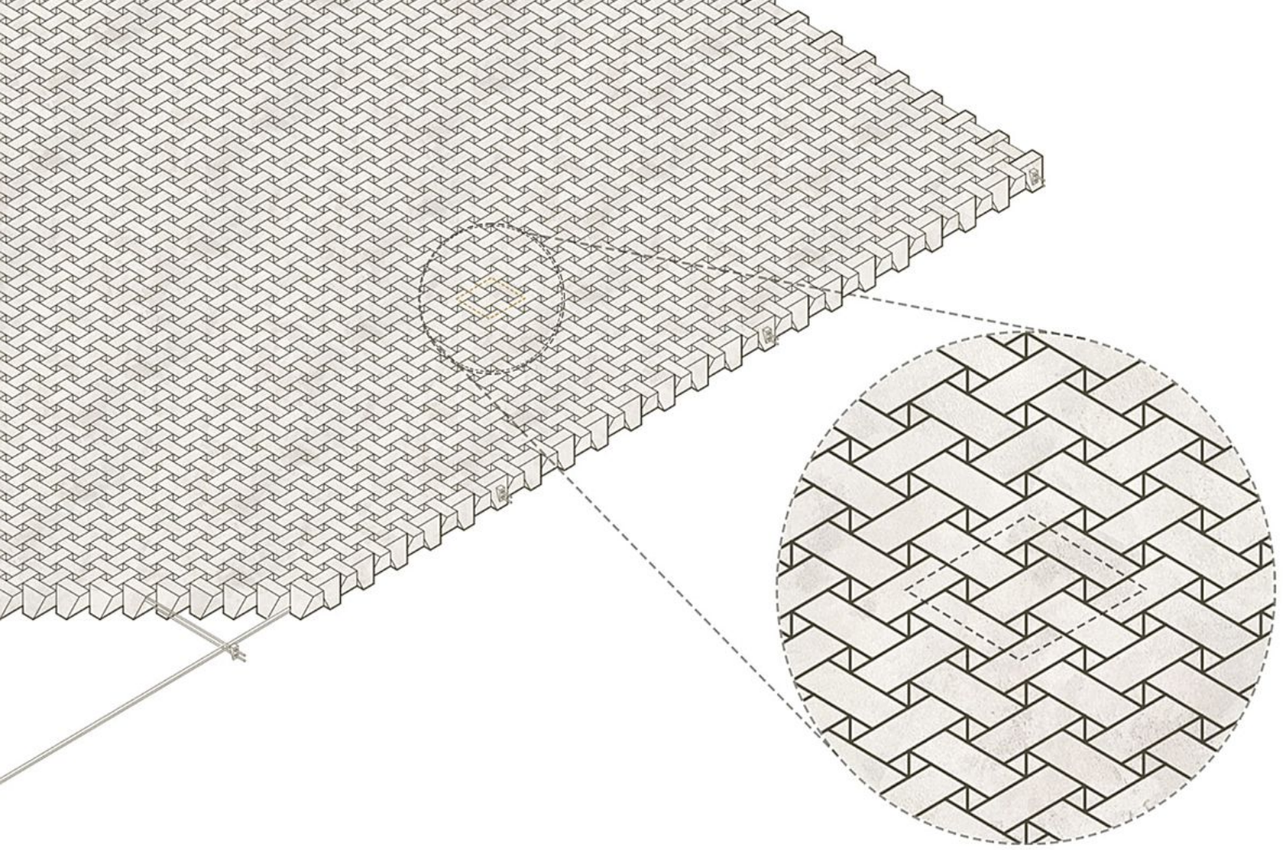


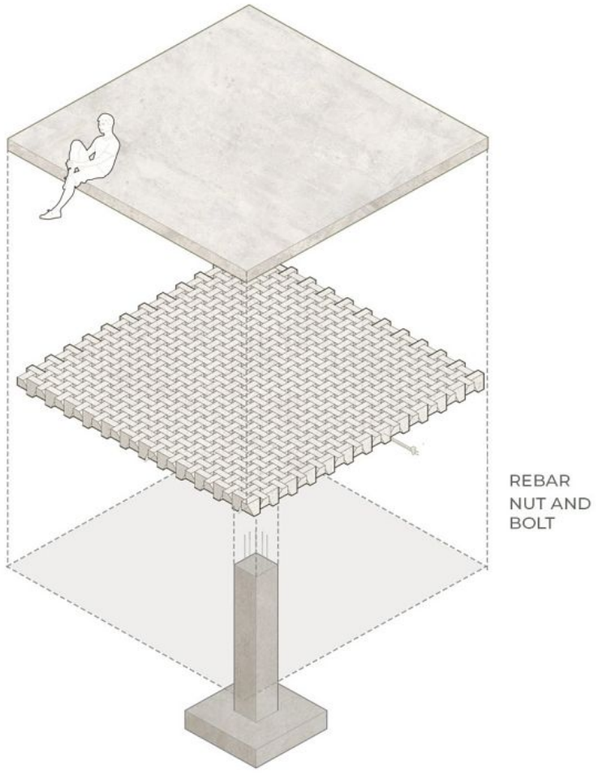
LIVING ROOM

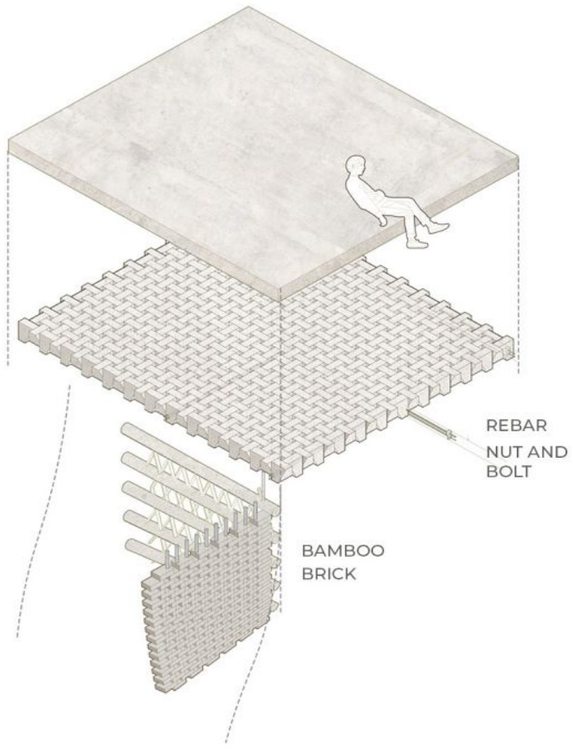


KITCHEN

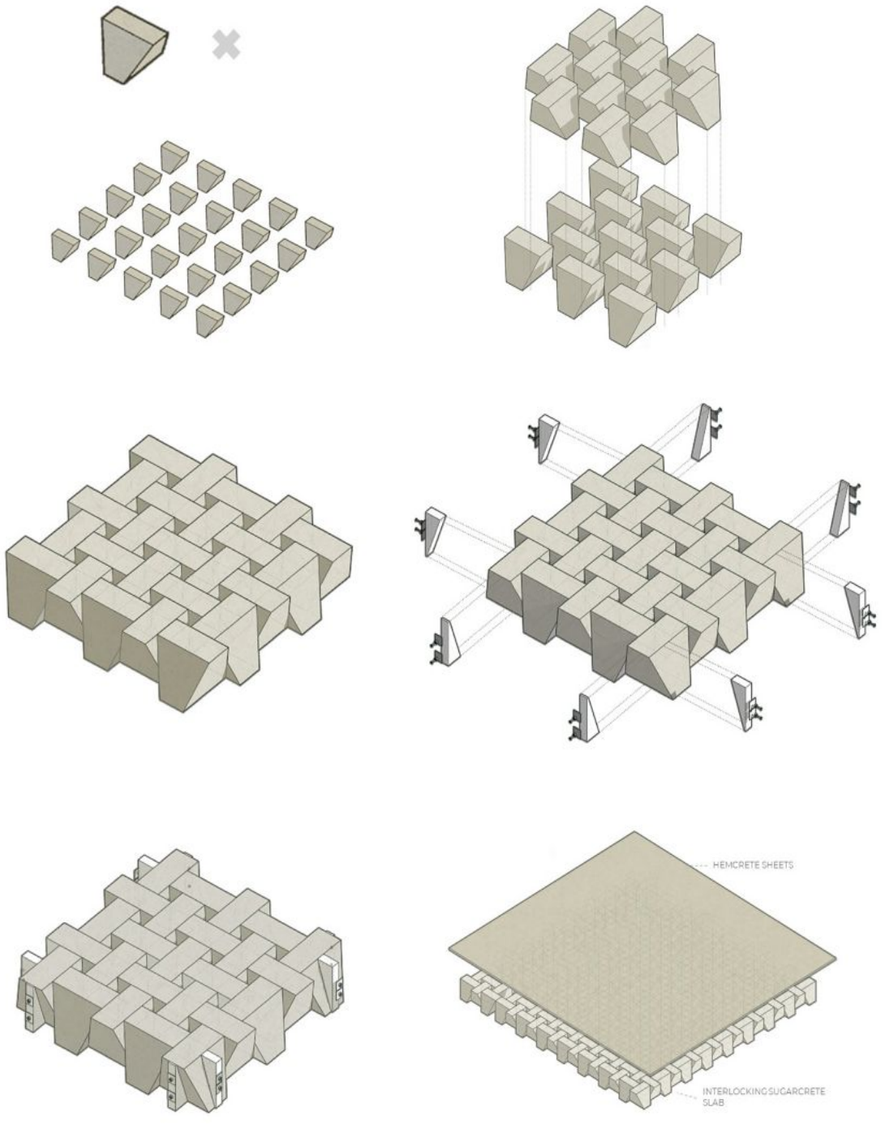
T - Section AA
B - Interior view of the twisted module



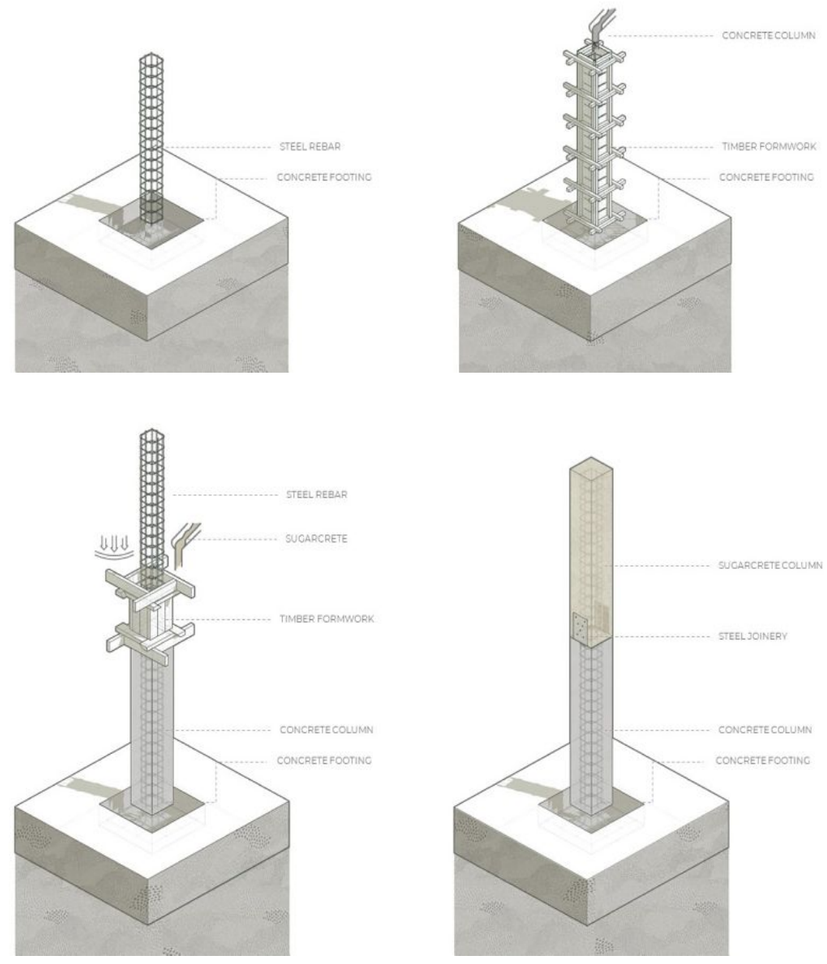




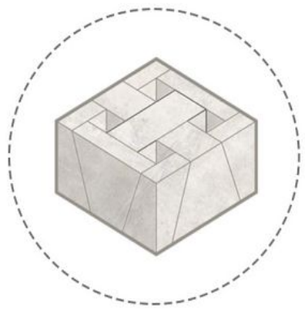
T- Sugarcrete slab detail, fragment
R- Hempcrete and Sugarcrete construction detail

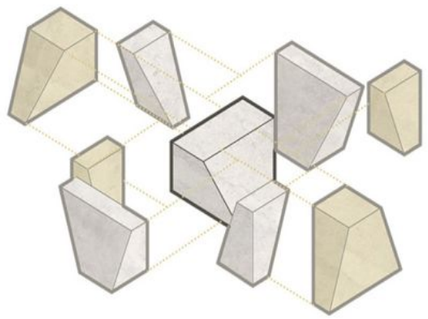


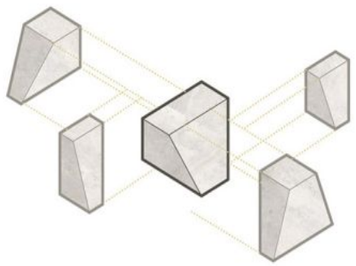
Process of Sugarcrete slab construction

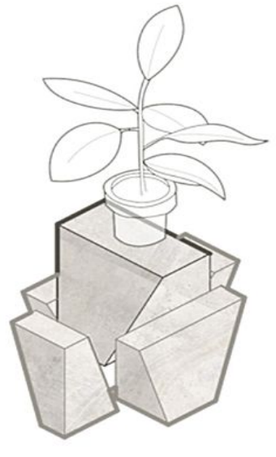


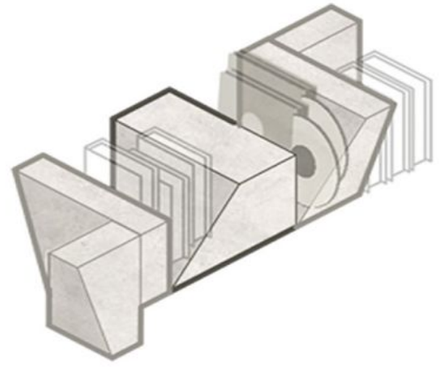
Concrete foundation construction details





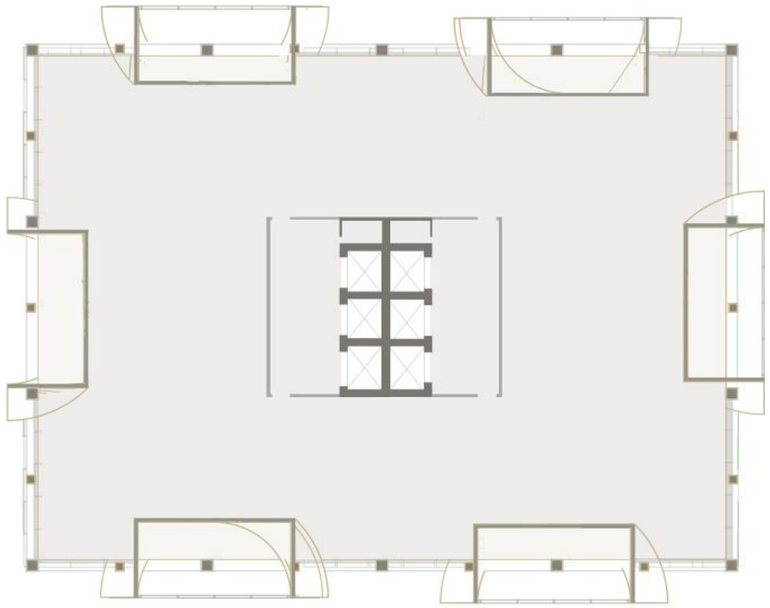






Selection of fragments from sugarcrete slabs
to create furniture products

Sectional perspective of the module tower



Conceptual plan of the module tower

03

SPECULATIVE CITY ISLANDS, CONEY ISLAND

ADVANCED STUDIO I SUMMER 2023
GSAPP AAD

Prof. David Eugin Moon

Group Project : Harshil Shah

Coney Island, a site of speculation and historical significance, sometimes an escape for weary urbanites or the inspiration for imaginative writers, filmmakers, and artists and inspired by an era of great exhibitions and festivals.

The Island has been a site of speculation and in some ways a miniature version of Manhattan itself

1877
Manhattan Hotel, the first luxury hotel, opens at Coney's far eastern end

1880
The New Iron Pier is built to handle arriving steamships from Manhattan

1897
Steeplechase amusement park opens

1903
Luna Park opens and the Bowery burns

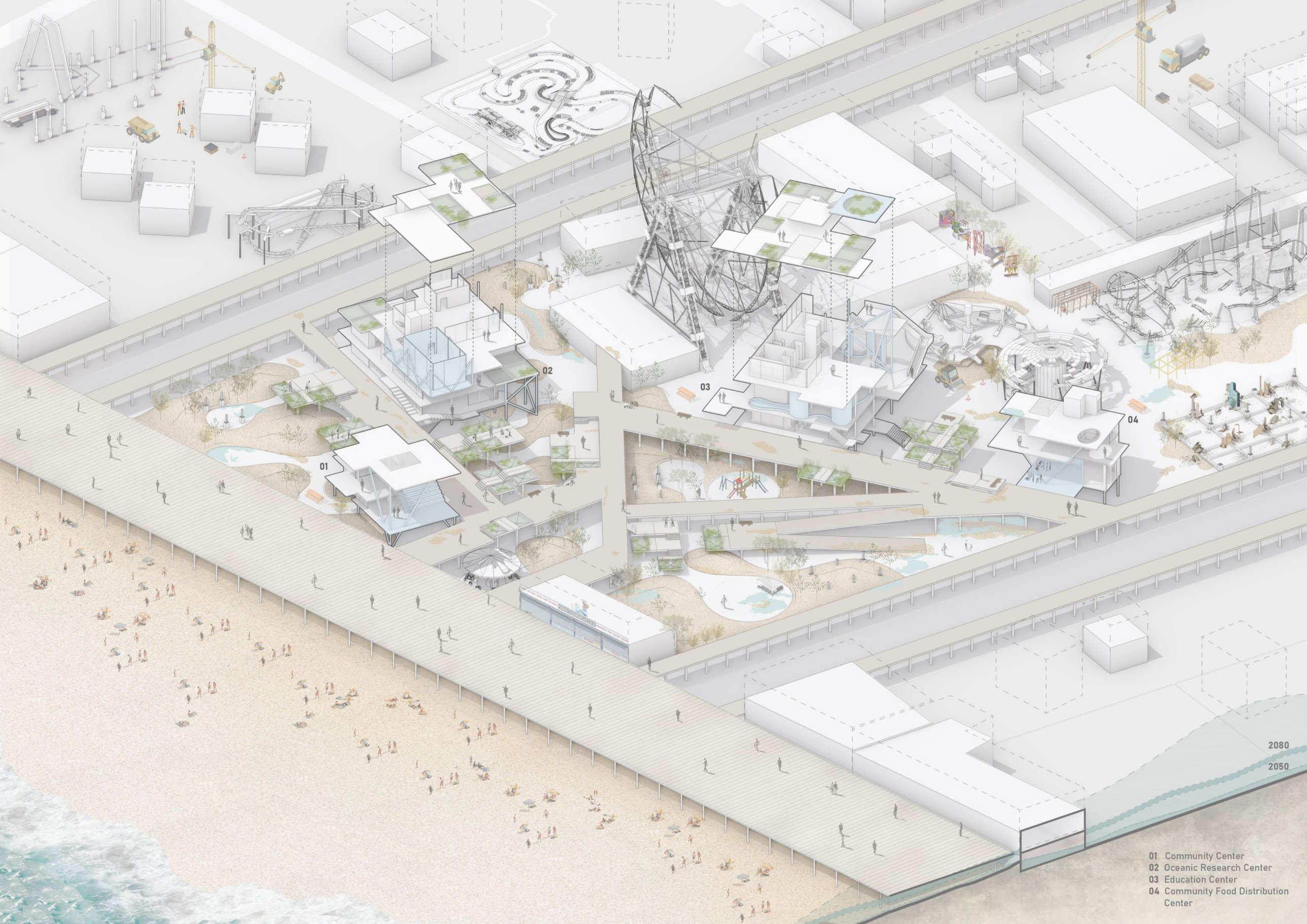
1907
Steeplechase amusement park burns

1911
Dreamland amusement park burns

1923
The Boardwalk opens and 175 businesses razed to widen Coney's streets

1939
The Parachute Jump was originally built for New York World's Fair

Historic timeline of events that occured at Coney Island


01
02
03
04
2080
2050
01 Community Center
02 Oceanic Research Center
03 Education Center
04 Community Food Distribution Center

RISING SEAS

Coney Island's waterfront was divided among private entities in the 19th century. Plans for a boardwalk emerged in the late 1890s to unite the island and revitalize the area. The boardwalk represents tolerance, inclusivity, and equity, attracting people of all ages for leisure activities.However, Coney Island faces the threat of being underwater due to climate change.

Climate scientists predict that the entire island will be underwater in a matter of decades. Urban planners and government officials are working towards a shorter timeline. They think if we protect the island from 2030 to 2050, then that buys us time to think of a strategy for 2060 to 2090. Currently, only 4% of the buildings meet flood-resilience standards. Officials were banking on future technological innovations that could allow people to live in areas dramatically reshaped by climate change.

- High-risk flood zone
- Moderate-risk flood zone
- Low-risk flood zone
- Shoreline during low tide
- Phase 1 Redevelopment
- Phase 2 Redevelopment
- Proposed Site
- Phase 1 Elevated Roads

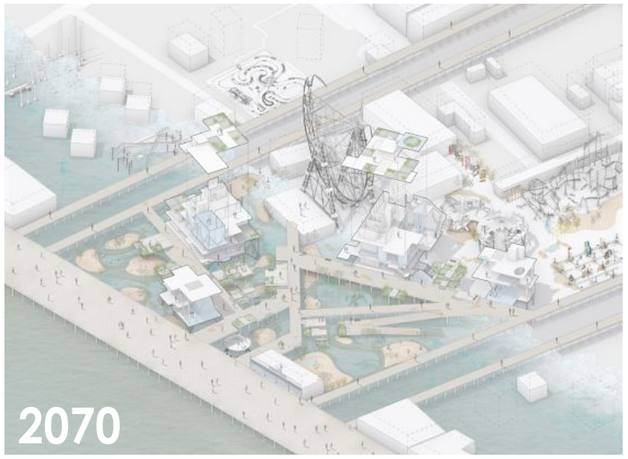
Prediction for 2080
By 2080, less than 60 years, the island will be flooded during high tides and by the end of the century, it will be underwater.

Prediction for 2050
Over the next 15 years, water will rise by 6 inches, and every inch of sea level rise translates to a loss of 100 inches of coastal land. By 2050, the total sea level rise will be around a foot which, when combined, translates to a total loss of 100 feet of shoreline.


Boardwalk


Amusement Park


Food Stalls



Site getting attected by rising sea levels

L : Collages of scene from the post desctruction era - post 2080
R: Interior view of recreational deck area

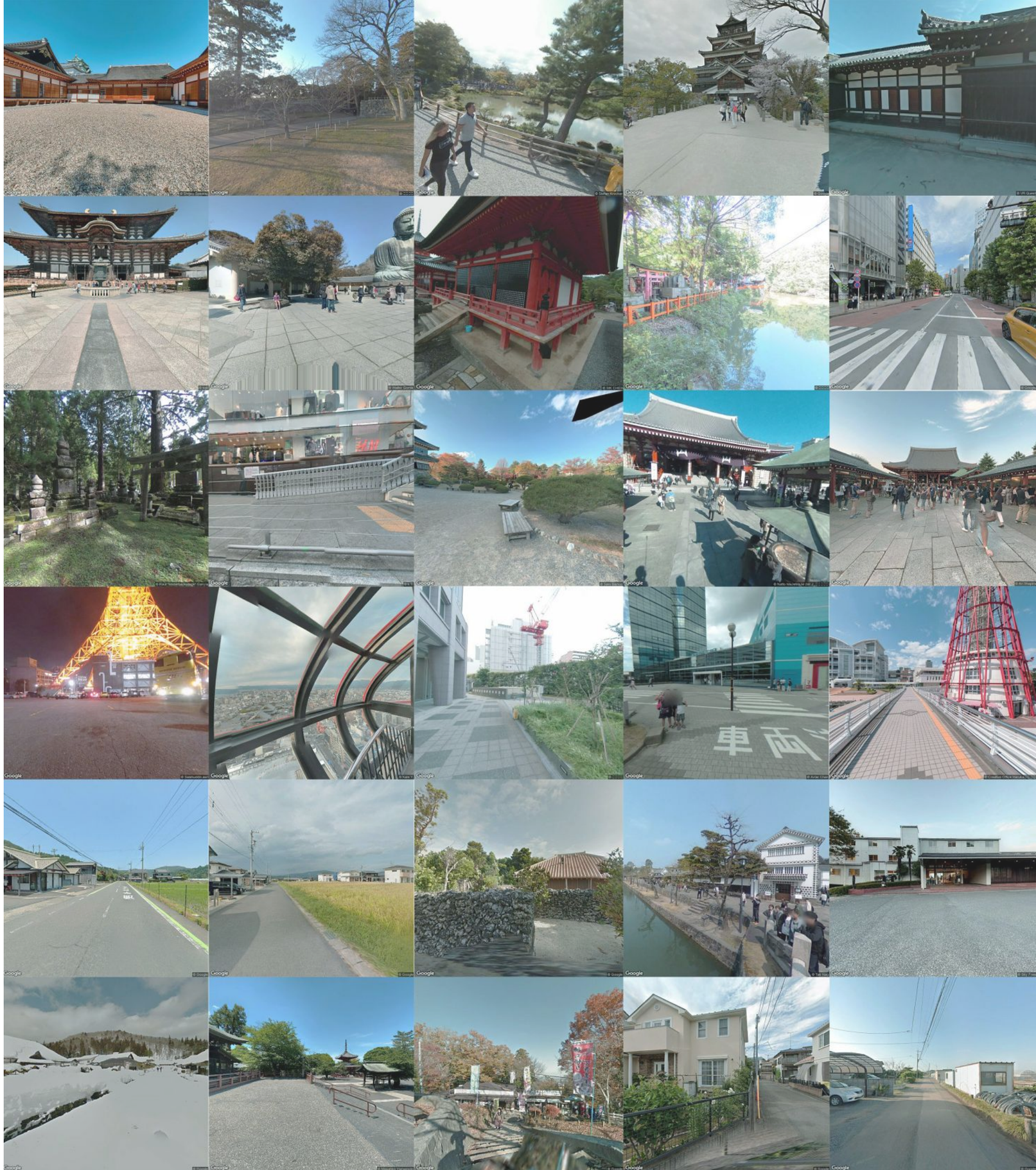
04

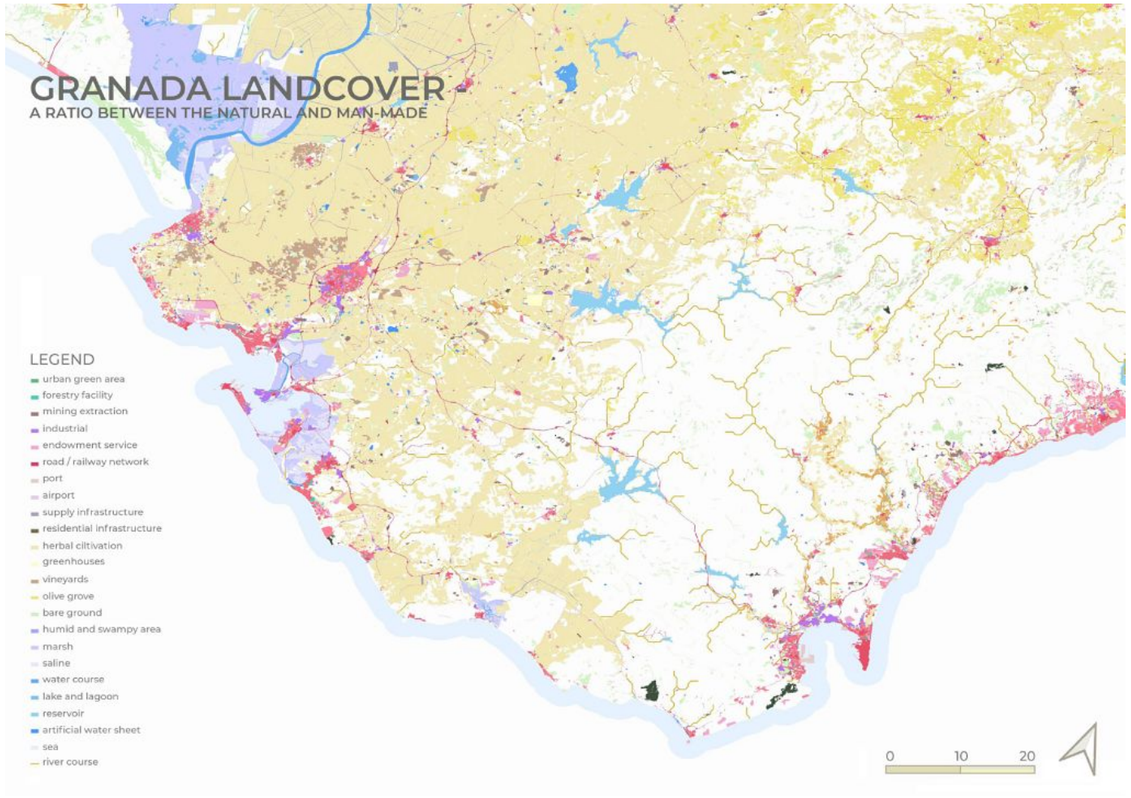
SPATIAL METHODS IN RESEARCH

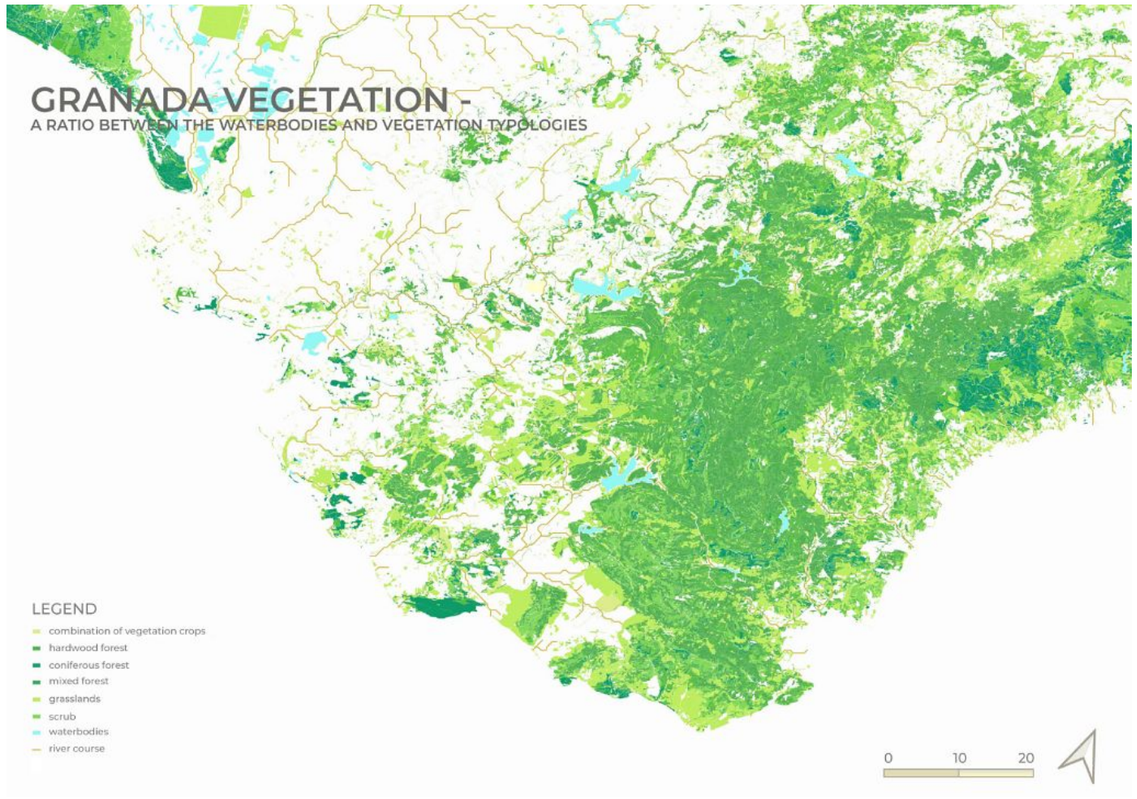
COMPUTATIONAL ELECTIVE I SPRING 2024
GSAPP AAD

Prof. Adam Vosburgh

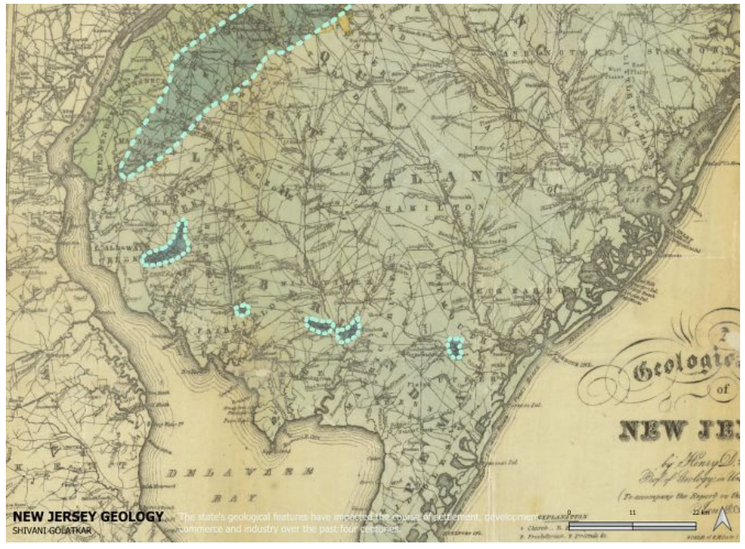
Japan's distinct appeal is derived from a tapestry of palaces, tourist destinations, and scenic landscapes that collectively form the country's identity. In contrast to the sleek modernism of cities like Tokyo and Osaka, the royal palaces, like the Tokyo royal Palace, remain as eternal monuments of Japan's rich history and cultural legacy. However, calm natural settings like Mount Fuji and the Arashiyama Bamboo Forest provide peaceful getaways from the bustle of the city. Japan's character is defined by the seamless fusion of modern and traditional architecture with breathtaking natural beauty, which captivates tourists with its timeless charm and startling contrasts.

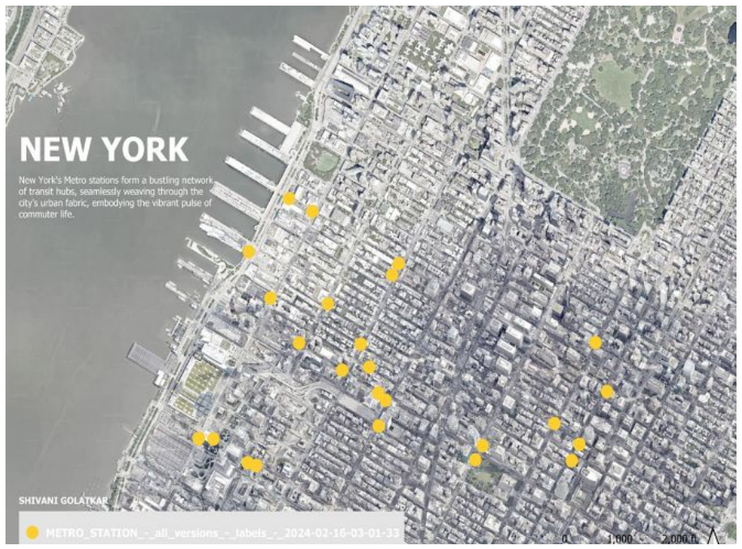






The map functions as a geographical analysis tool and a call to action for balancing urban growth with environmental protection using strategic design components derived from past projects.





1 - This revised map supports disaster management plans, urban planning, and the study of hydrological trends. It offers vital insights for sustainable development and resilience-building initiatives in New Jersey's communities by concentrating on the dynamics of water flow and flood threats.

2 - Considering ecological, historical, artistic, and socioeconomic viewpoints is necessary while examining NYC's tree population. Color-coded overlays, annotations, and different symbol sizes were to be used as a visual aid to convey the advantages and disadvantages of each viewpoint.

3 - A unique interaction between environmental sustainability and urban development can be seen when mapping reclaimed airports in China and Japan.

4 - Subway station mapping could improve knowledge to support accessibility and urban planning activities, promoting equitable transportation and raising local standards of living.

05

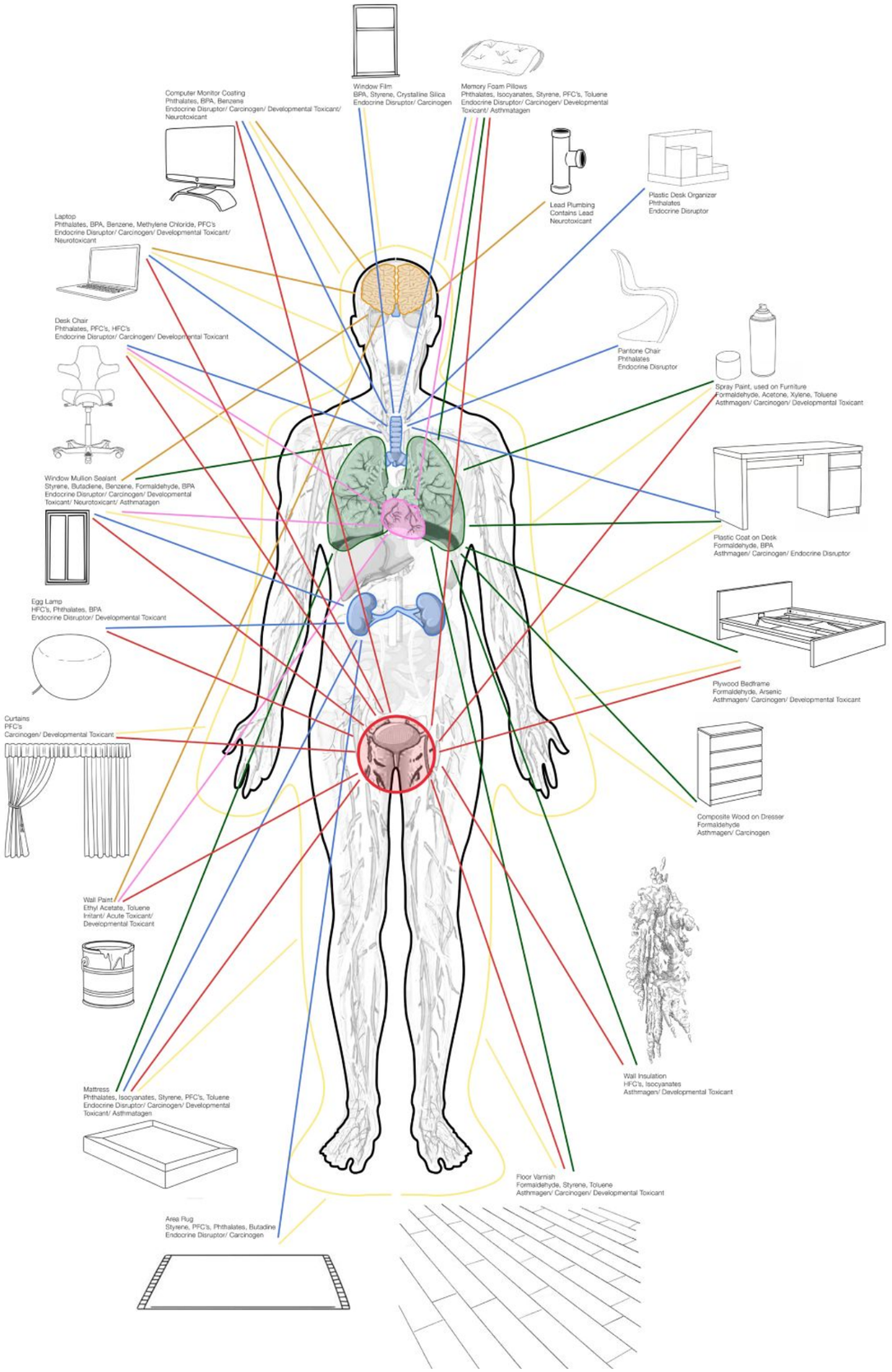
HOME IS WHERE THE TOXICS ARE

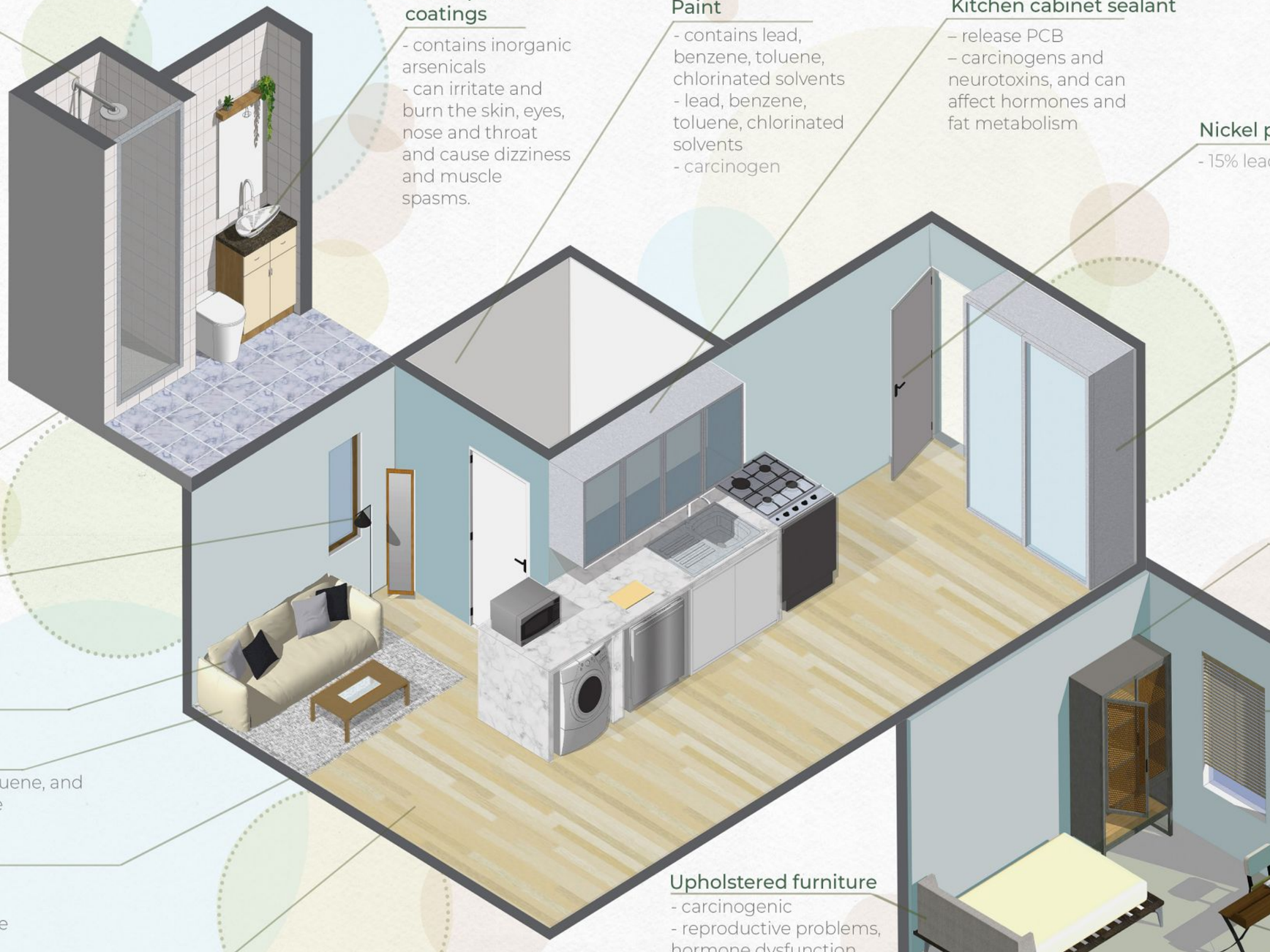
BUILDING TECH I FALL 2023
GSAPP AAD

Prof. Marta Wisniewska

Group Project : Boris

Inspired by the wide range of smart, carbon-free, regenerative, healthy, circular, durable and/or affordable alternatives, the seminar addressed the stated design problem through material research and product design. The majority of the semester was dedicated to hands-on experimentations, connecting to (local) resources and designing a low-tech production processes.





Silicon sealants for bathrooms

- contain isocyanates and phthalates
- cause stomach irritation, nausea, and vomiting if inhaled or swallowed

Toilet paper

– Source of 'Forever chemicals' PFA's
– poly-fluoroalkyl substances

Insulation foam boards

- contain isocyanates and HFRs

Light

Bed cushions

Sofa fabric

- benzene, toluene, and formaldehyde

Carpet

- beyond the off-gassing of VOCs—they are a sink of pollutants that remain in the home

Vinyl floor panels

- contains high VOC levels
- cause headaches, eye, nose and throat irritation, and dizziness in the short-term

Varnish on furniture

Fabric sheets

- contains Azo dyes
- carcinogens

Wood preservative coatings

- contains inorganic arsenicals
- can irritate and burn the skin, eyes, nose and throat and cause dizziness and muscle spasms.

Paint

- contains lead, benzene, toluene, chlorinated solvents
- lead, benzene, toluene, chlorinated solvents
- carcinogen

Kitchen cabinet sealant

– release PCB
– carcinogens and neurotoxins, and can affect hormones and fat metabolism

Nickel painted door knobs

- 15% lead

MDF furniture cabinet

- formaldehyde
- carcinogen
- irritate the skin, eyes, and respiratory systems

Wooden dresser

- adhesives contain formaldehyde

PVC blinder

- (VOCs), Phthalates
- visual disorders, liver, kidney damage

Upholstered furniture

- carcinogenic
- reproductive problems, hormone dysfunction

Electric wires

- contains PBTE flame retardants
- endocrine and thyroid disruption

Mattress adhesive

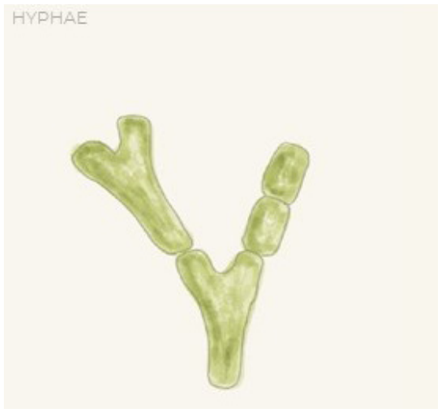
- contains Formaldehyde

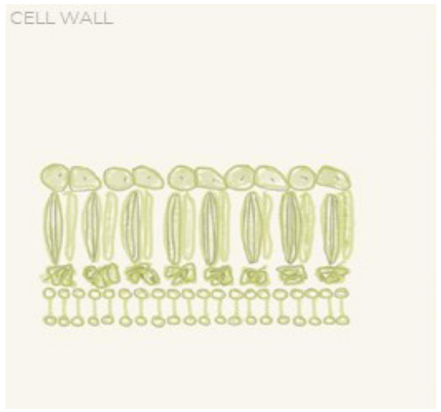
Scented candles

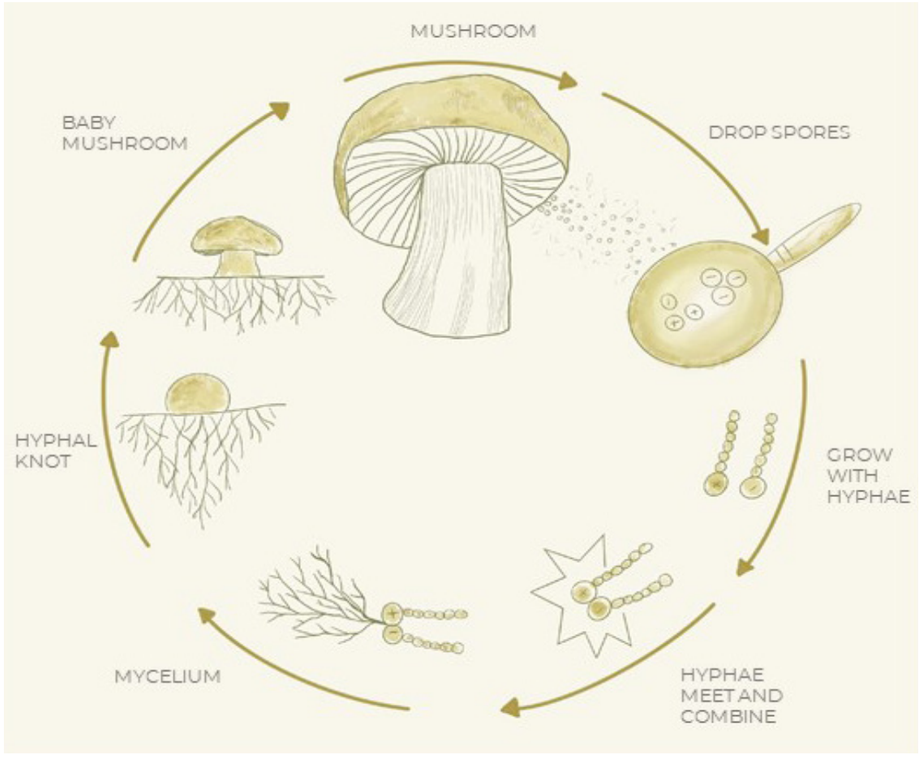
- adding VOCs and other chemicals to the mix

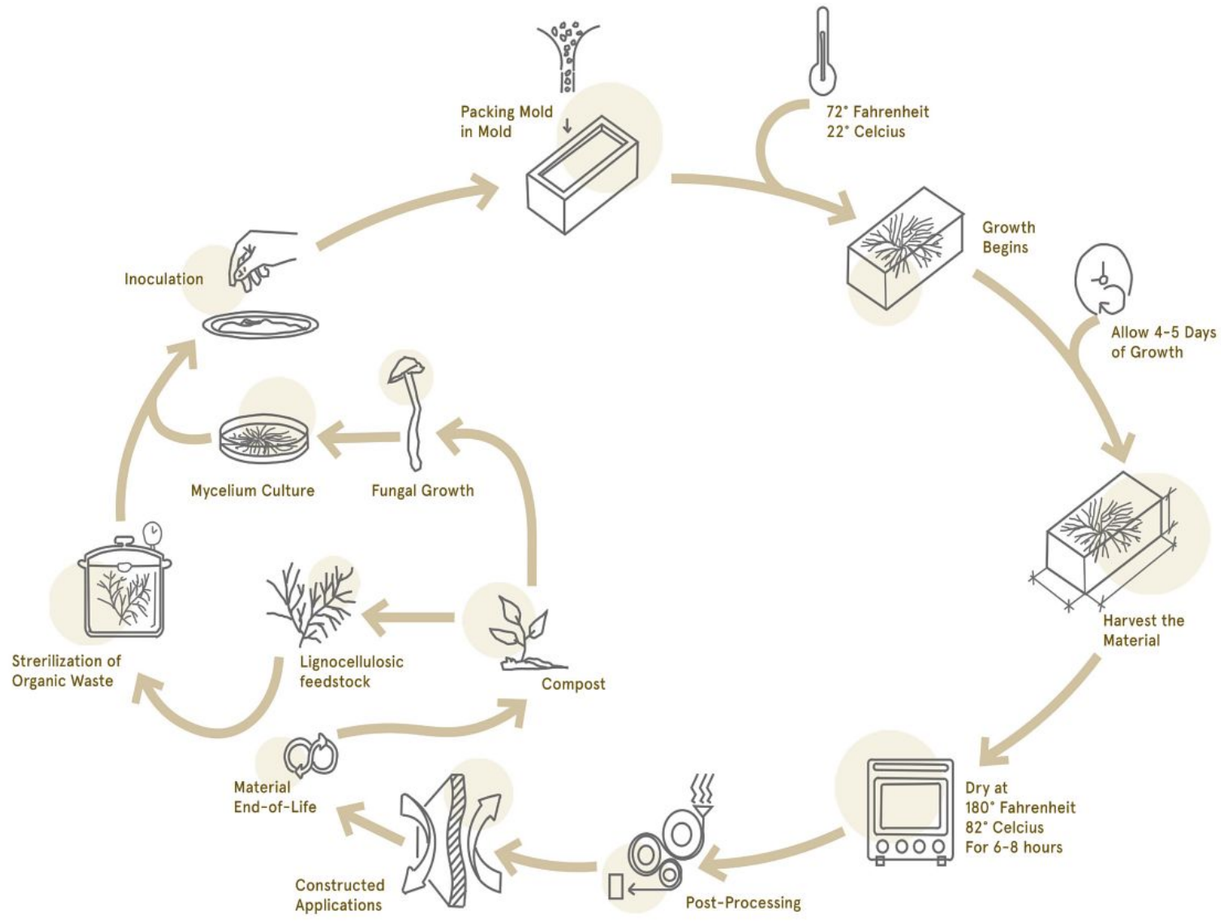
Metal bed frame

- contains Formaldehyde, Methylene Chloride









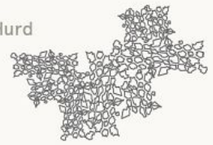
Mushroom growth cycle

MYCELIUM ACOUSTIC INSULATION

Assembly instructions for a mycelium and sheep wool acoustic insulation.

Included Components:

Hemp Hurd



Mycelium

Sheep's Wool

You'll additionally need:

Water

Latex Gloves

Scissors

Mixing Bowl

Zipper Bag

Whisk

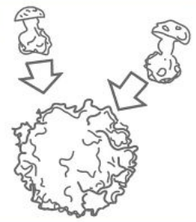
Oven

Scale

Plastic Wrap

Formwork

1



Mix Mycelium and Hemp Hurd at a 10:5 Ratio.

2

Mix in Water and Flour at a 3:1 Ratio, corresponding to the ratio in Step 1.

3

Let inoculate for 3-4 days. Allow for one additional day if growth does not occur.

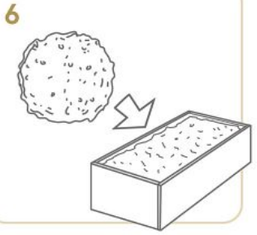
4

Break up the Initial Growth.

5

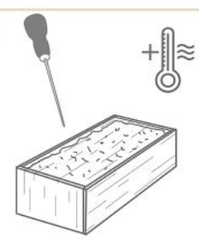
Mix in Flour and Sheep's Wool at a 1:1 ratio corresponding to Steps 1-2.

6



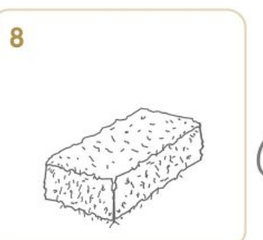
Pack into the Mold. Compress enough to ensure the Substrate enters every Nook.

7



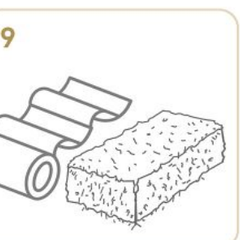
Tightly cover in Plastic Wrap. Poke a few holes. Let grow 5-6 days at 72° Farhenheit- 22° Celcius.

8



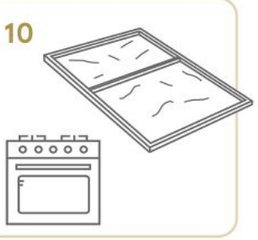
Remove Formwork.

9



Let grow for one day outside of the formwork. Loosely cover with Plastic Wrap.

10



Bake at 180° Fahrenheit- 82°Celcius for 6-8 Hours

11

Post-Produce.

12

Ship Away.

As the mushroom fruit body matures, gills (or pores in some cases) begin to become visible on the underside of the mushroom. Some mushrooms have a 'veil' or a ring around the stem protecting the gills during early growth. But eventually as the cap of the mushroom grows, the gills become exposed and begin to release spores. Sometimes spores can be released in such vast quantities that they appear as wisps of smoke wafting from the mushrooms gills.

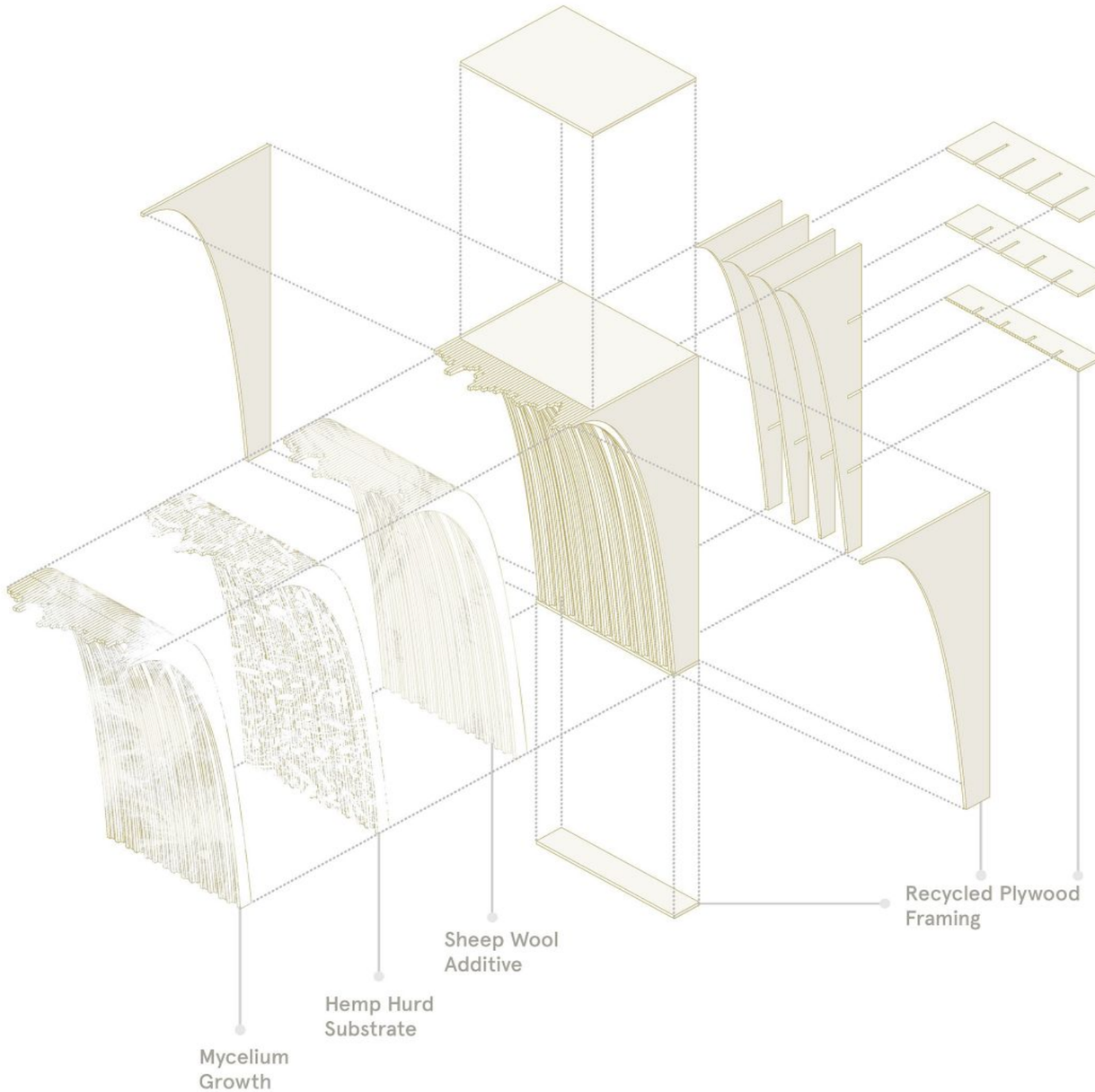


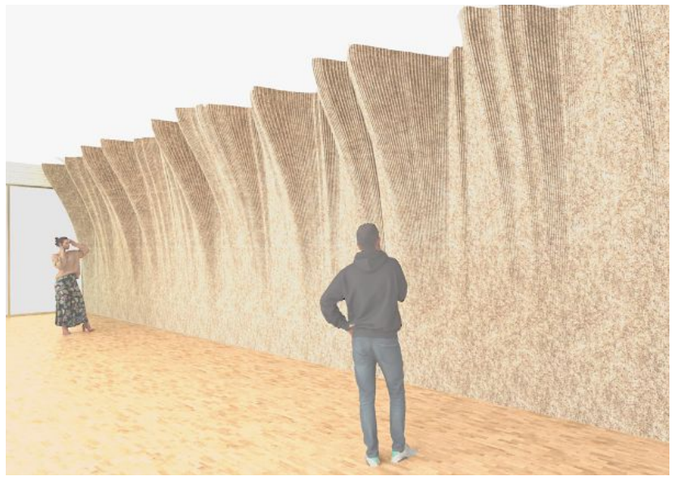






The process of making mycellium-brick





Mycellium acoustic panels design

06

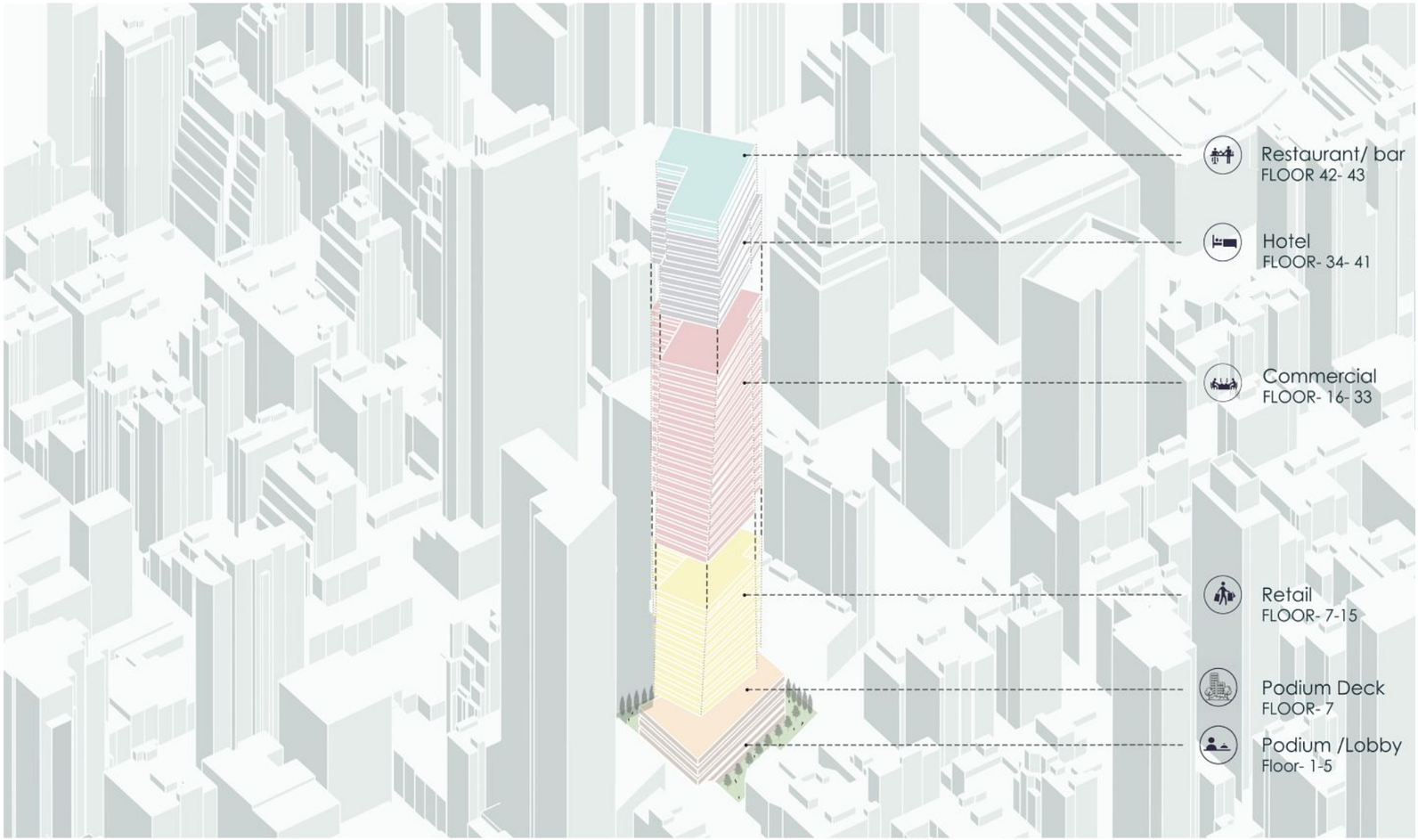
BUILDING TECH ELECTIVE I FALL 2023
GSAPP AAD

Prof. Joseph Brennan

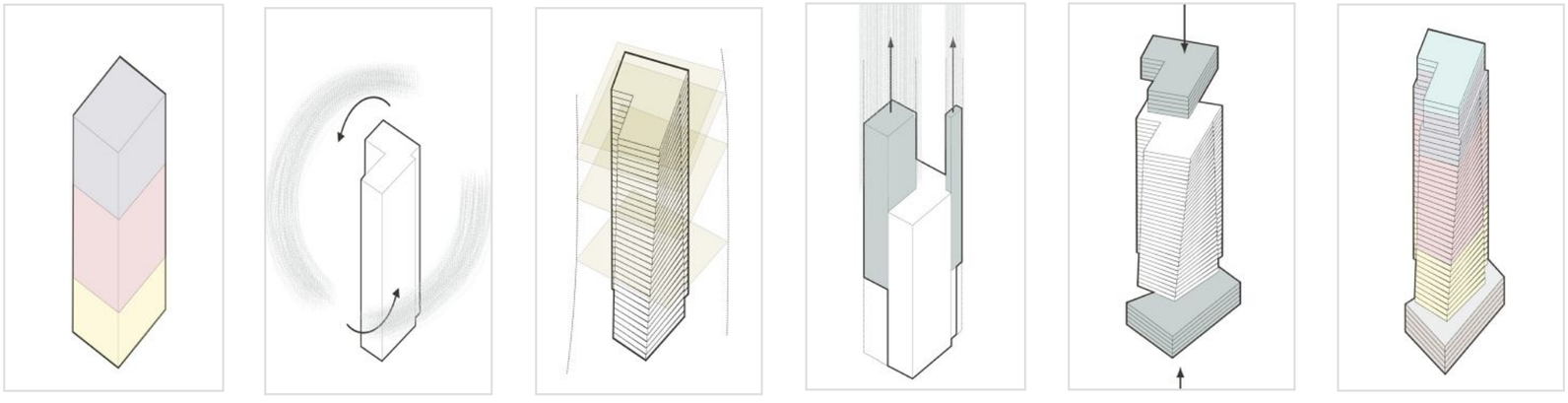
Group Project : Simar, Sudhanshu

The elective focused on BIM's role in project management, from conceptualization to construction. It delved into parametric modeling, scripting, and data-driven design to push the boundaries of what BIM can achieve, elevating design possibilities.

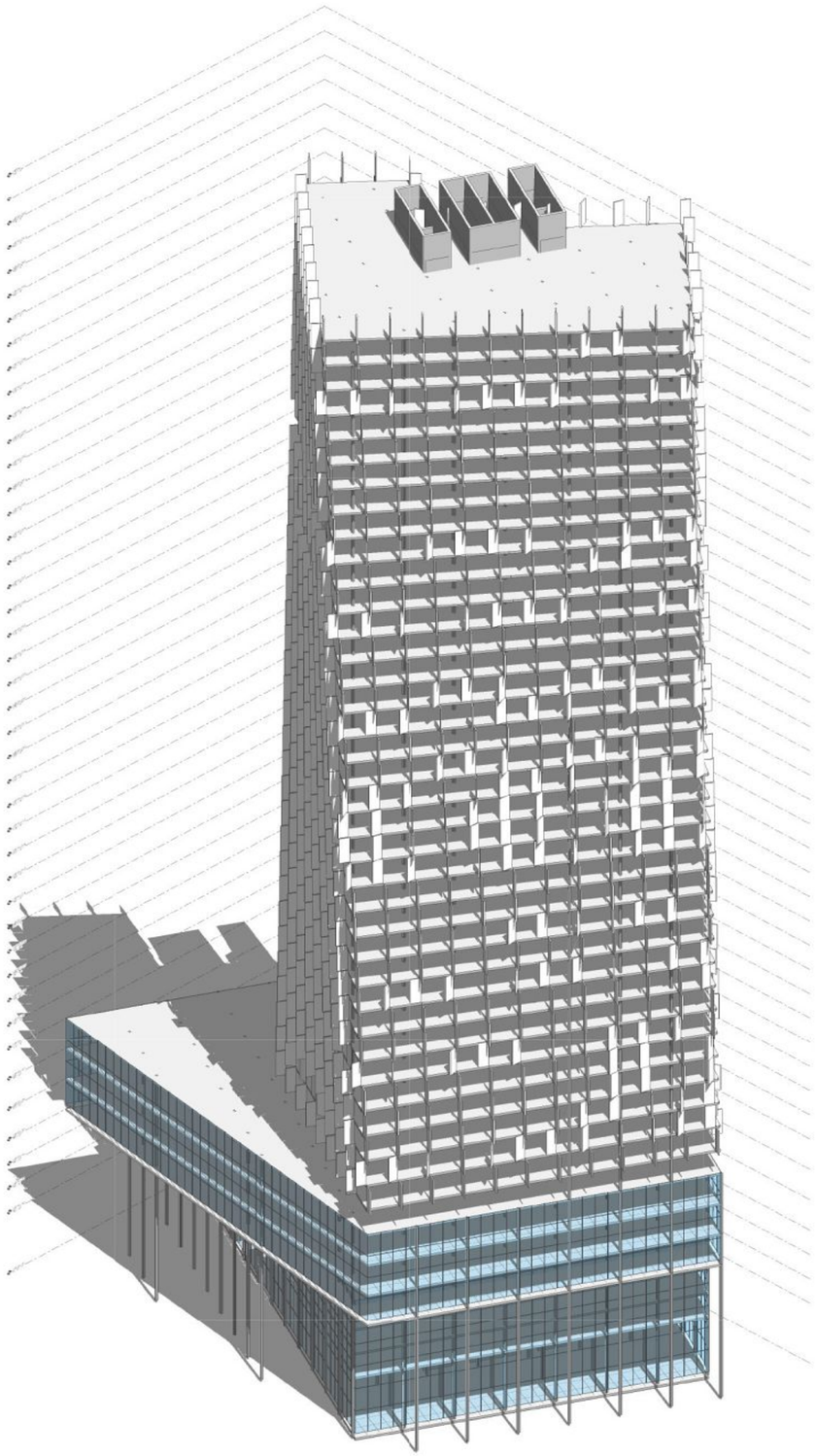
The elective further focused on using BIM tools for energy analysis, life cycle assessment, and environmentally responsive design, aligning architecture with contemporary ecological imperatives.



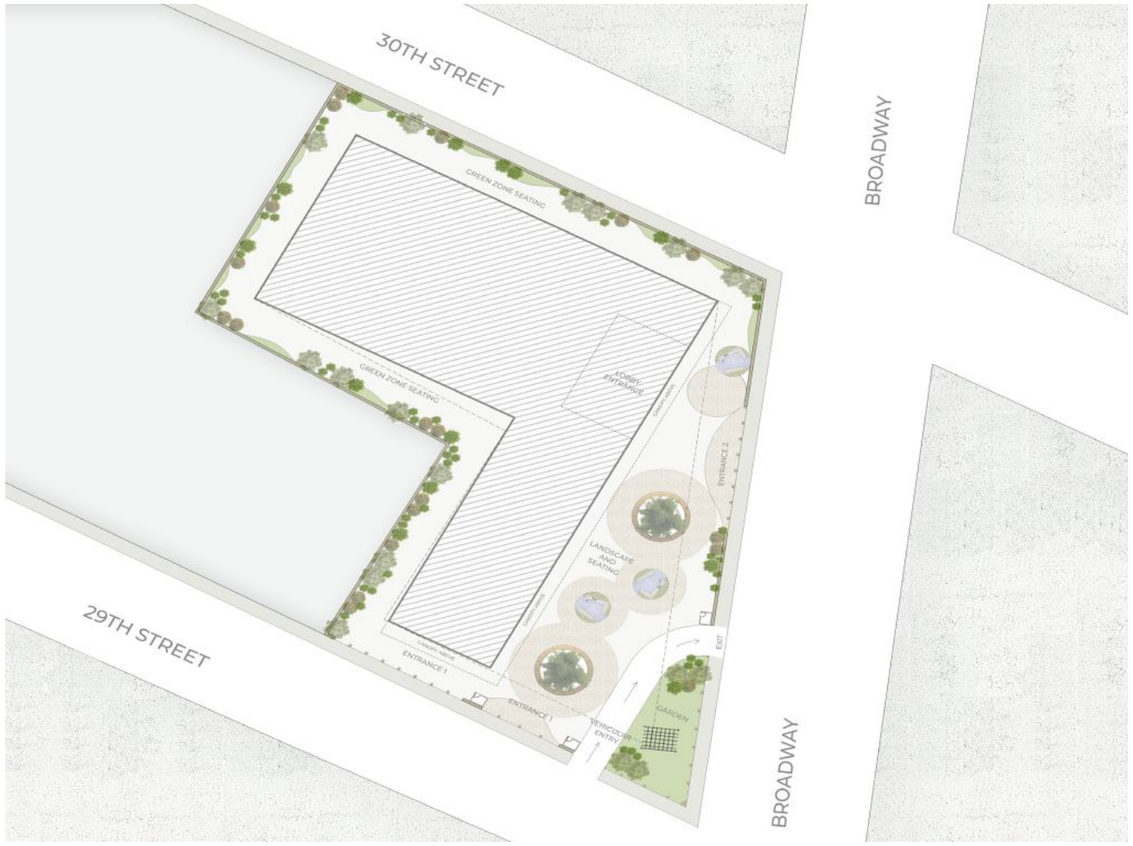
Building program



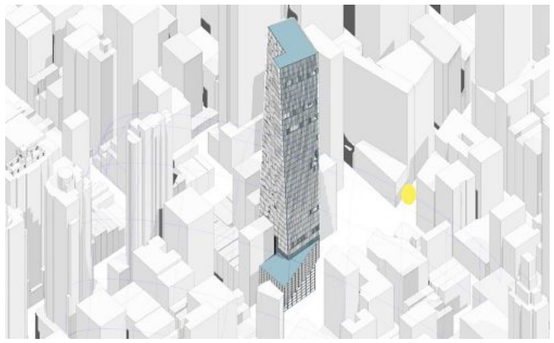
Building form development



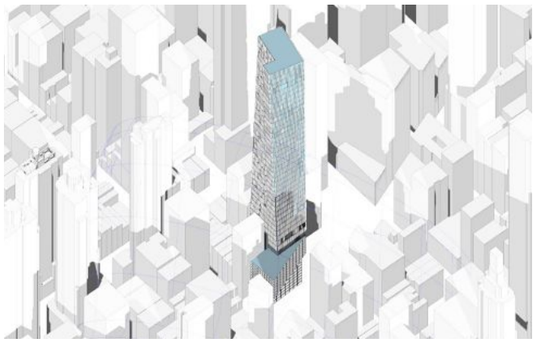
Facade design - Sun shading device study



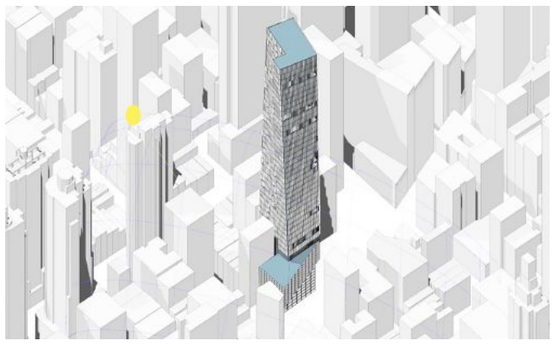
Site Plan



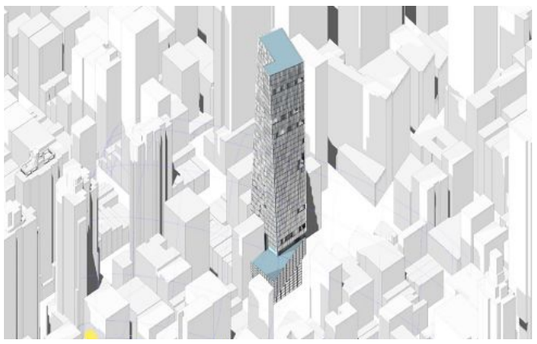
9 AM Summer Sun



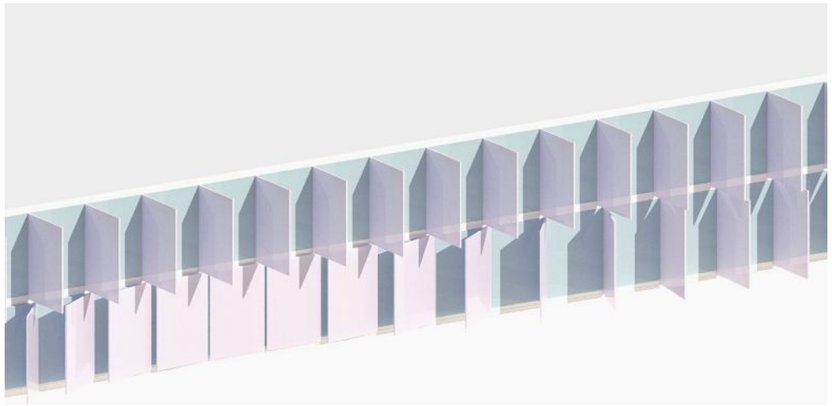
9 AM Winter Sun

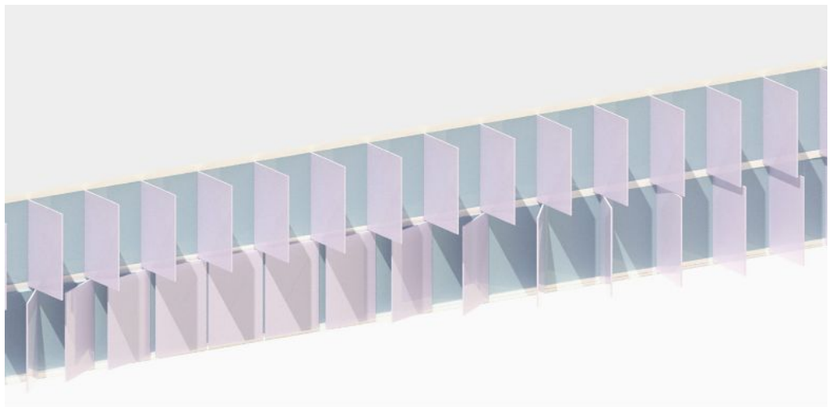


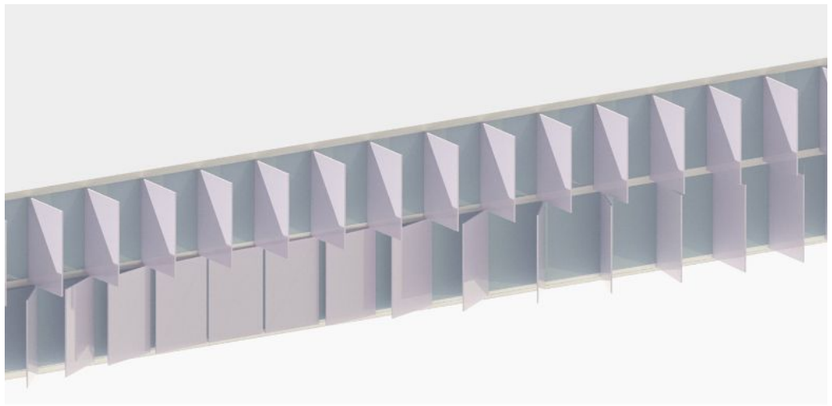
3 PM Summer Sun



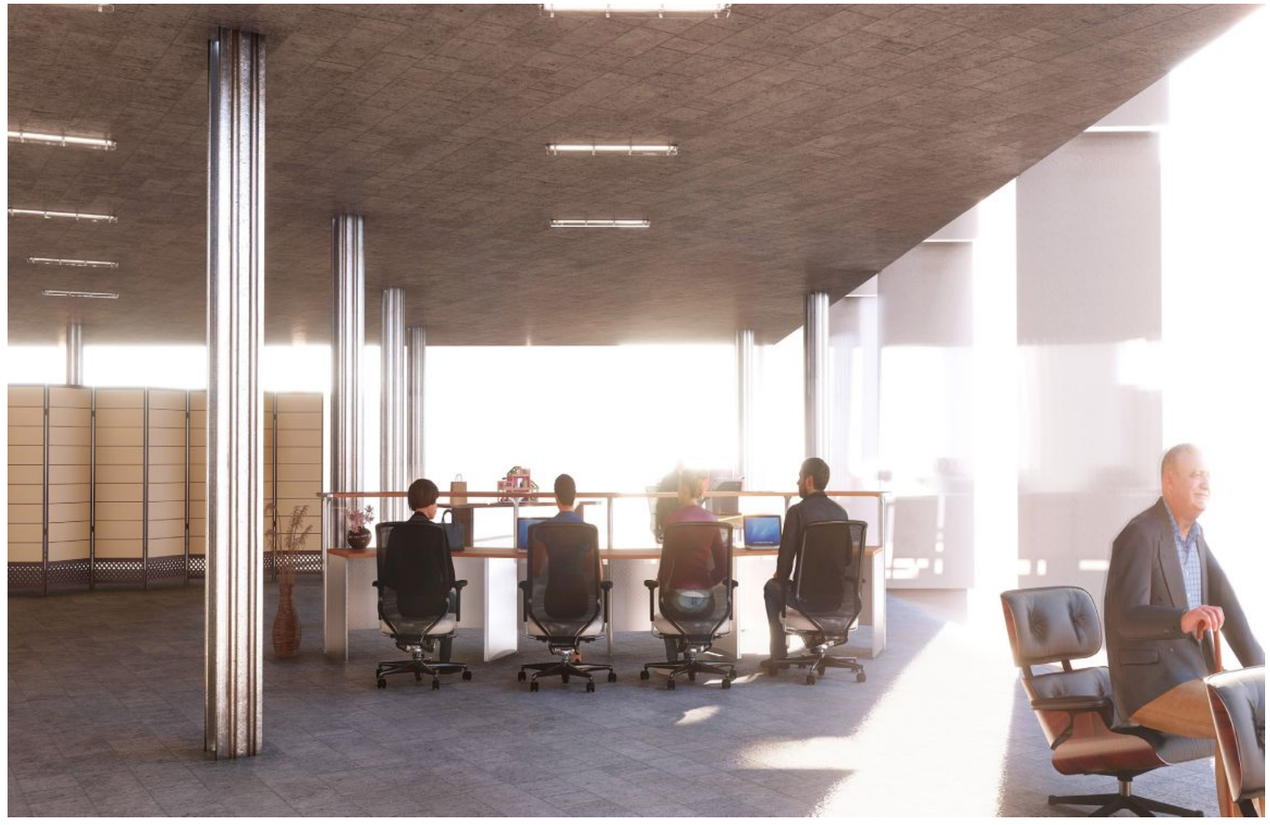
3 PM Winter Sun

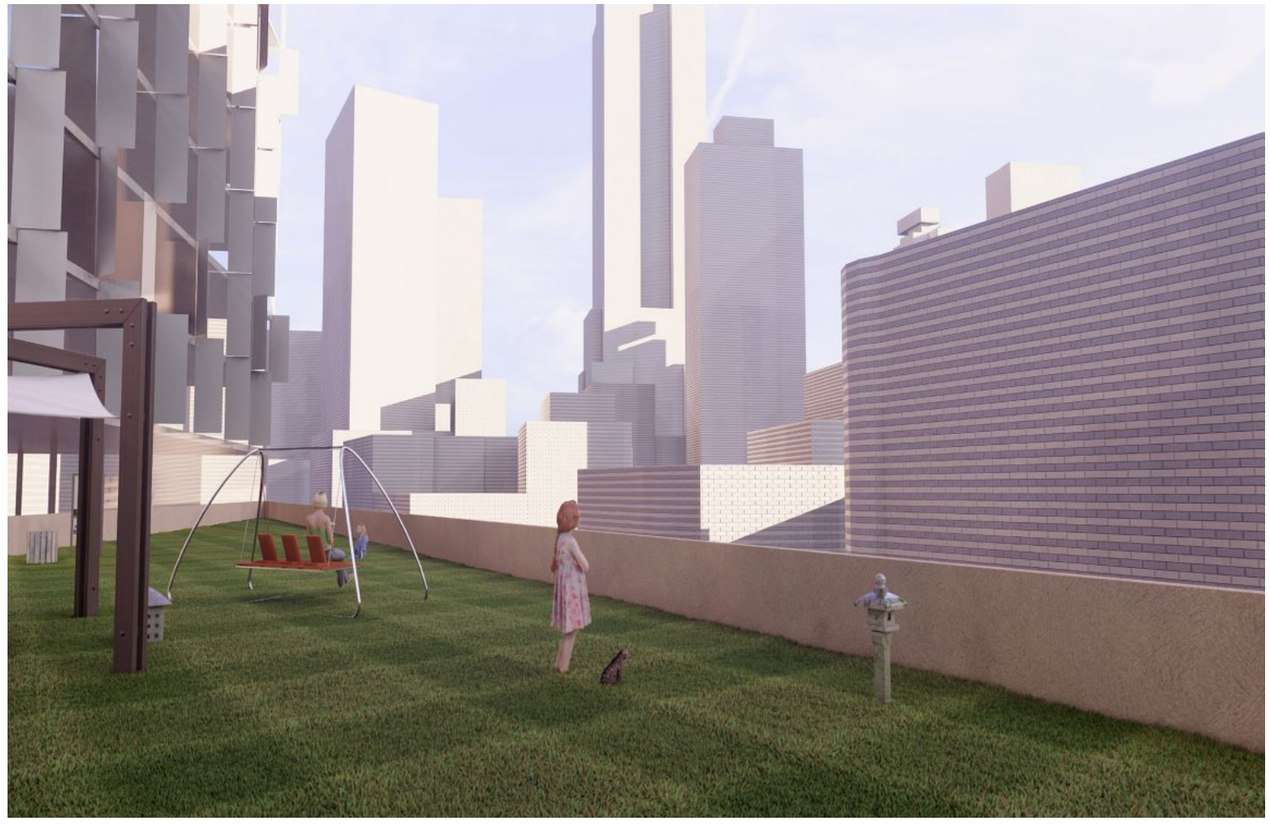






Facade design - Sun shading device study





Interior views of the building

THANK YOU

To be continued .....