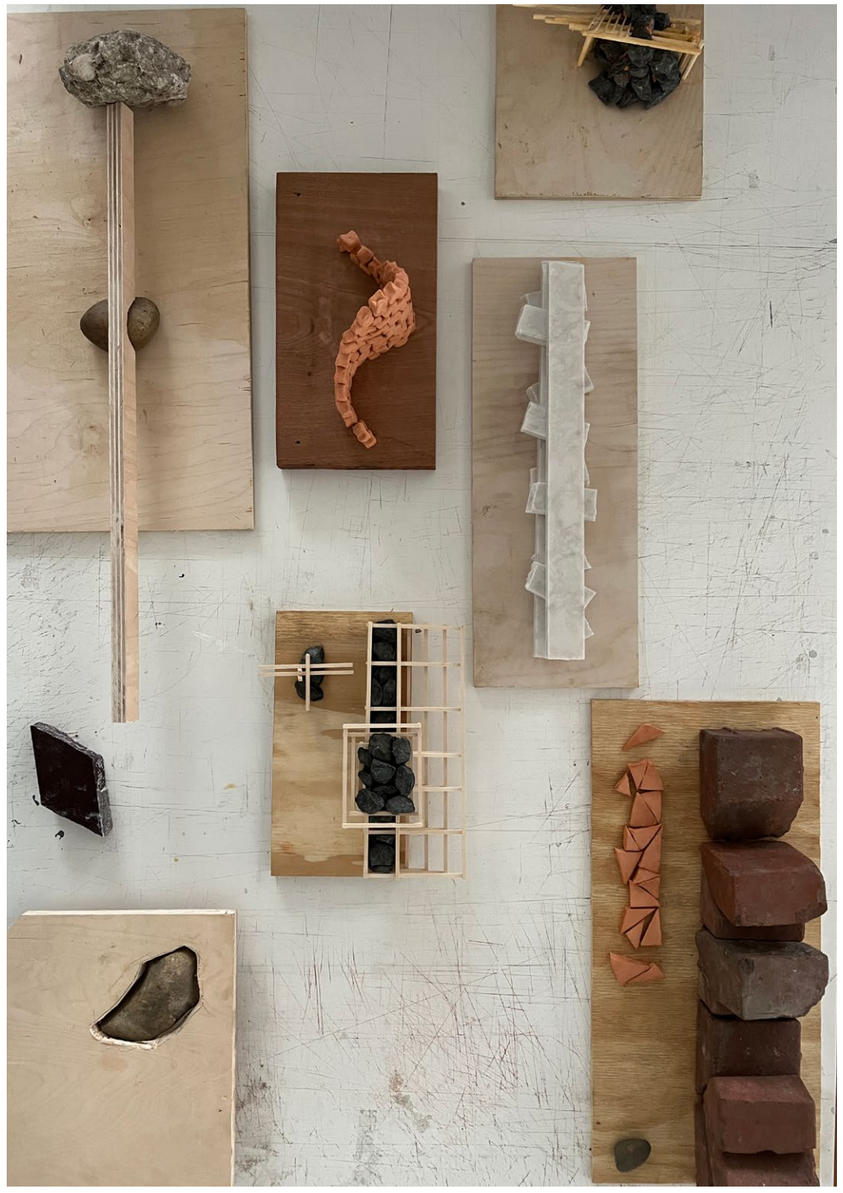
From Stone to Fabric
From Material to Meaning

Portfolio

Foteini Kallikouni



INDEX

From Material to Meaning

Materials bear meanings besides practicality and functionality. I never anticipated this profound shifts in my architectural perspective on materiality on how materials could become the tool for making political, social, cultural and environmental arguments in architecture. This portfolio encapsulates the transformative journey, illustrating my evolving understanding of materiality's role in each project. What I learned through this experience, is that the design process could start from the material and end to the material - a cyclical journey from inception to manifestation.

In this creative journey, my experimentation traversed the spectrum of material possibilities, from the enduring and permanent stone to the soft and ephemeral fabric.

I have experimented with **stone** by creating new construction systems and ways to construct with it, playing with waste marble to understand its properties.

I explored how **fabric** trigger memories, becomes a symbol and creates a community. Fabric becomes the tool that forms new spaces of social meaning.

Moreover, I explored the potential of **waste fabric**, breathing life into new materials.

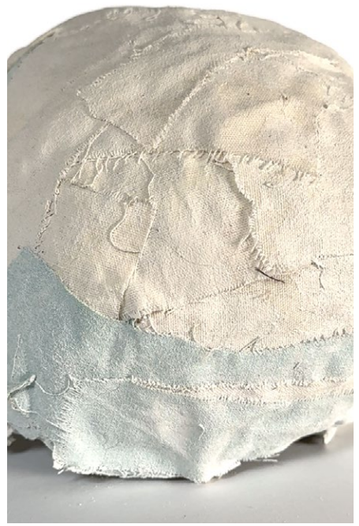
I experimented with **poured earth** and tested the possibility of shaping it on fabric. Now fabric becomes the formwork and defines the form of earth.

Finally, in the context of a travel studio in Thailand, I researched how colour, material and form of **terracota** could bare meanings, signify social status, even gender.

In essence, my portfolio is not just a visual chronicle of creative experimentation but a personal research on how materials become meaningful and therefore shape meaningful spaces.

STONE
Marble

FABRIC
Linen



WASTE FABRIC
Cotton

EARTH
Clay and Soil

TERRA-COTTA
Clay and Mesh

PART 1: Materials as Meaning

Rebirth Brick: Reviving the spirit of a lost place
Transcalarities

The role of Decay and Longevity of material cycle in the projects of Fuminori Nousaku
Arguments

Gendered Materialities: Colours, Ornaments and Plants as signifiers of Femininity
Women, Gender and Modern Architecture

Rebirth Brick: Reviving the spirit of a lost place

Seminar: Transcalarities

Workshop Instructor: Andres, Jaque, Mahdi Sabbagh

The Rebirth Brick project emerged as an innovative construction endeavour showcased at the Venice Biennale of 2011 within the Chinese pavilion, designed by the architect Liu Jiakun. This installation introduced an innovative material composed primarily of aggregated debris. Its inception, however, can be traced back to June 2008, just a month after the devastating earthquake that struck Sichuan, China. In response to the pressing need for cheap construction materials in the aftermath of the disaster, Liu embarked on a journey of experimentation and exploration.

Moved by the tragedy and the call to action, Liu Jiakun visited the affected region to provide support and assistance. Witnessing the immense devastation firsthand, an idea began to form in his mind – the concept of reconstituted bricks made from the rubble of the earthquake. Combining wheat stalks, cement, and debris, these simple, labor-intensive briquettes emerged as a testament to resilience and the power of collective effort. Due to the diverse nature of the debris used, each brick boasts a unique combination of granule size and colour, further enhancing their uniqueness.

While the Rebirth Brick project is undeniably innovative and captivating, this technique isn't truly new. Terrazzo, a similar material, finds its origins in ancient Egyptian mosaics and has been utilised in various forms throughout history. Notably, Italy has been a hub for terrazzo craftsmanship, contributing to its evolution and refinement. However, in the case o Liu Jiakun's technique, these bricks served a dual purpose: rebuilding the damaged areas while redefining the concept of recycled materials. The Rebirth Bricks breathed new life into devastated regions, symbolizing both the physical revival of structures and the emotional reawakening of affected communities.

Beyond its value as a building material, the project embodied a deeper philosophical meaning. The choice of the word "Rebirth" over the more common "Recycled" holds significant weight in Liu's values and beliefs. It encapsulates not only the rebirth of the material itself but also serves as a beacon of hope, encouraging the rebirth of the community and offering a path to spiritual help for those who have endured immense suffering. In order to honour the lost ones he designed and built a memorial hall in the grounds of Jianchuan Museum Cluster using the rebirth brick. After meeting the grieving family of a 15-year-old daughter who was lost under the rubble of Beichuan Middle School, he decided to dedicate this public space in memory of Hu Huishan. According to the architect, the "Hu Huishan Memorial" is the most meaningful project of his career.

In conclusion, the Rebirth Brick project stands as a testament to human ingenuity in difficult times. Through the transformative power of aggregated debris and the vision of Liu Jiakun, these bricks embody the fusion of sustainable construction practices. Their impact transcends physical structures, fostering a sense of hope, unity, and rebirth in communities affected by disaster. As this remarkable project continues to inspire further endeavours, it reminds us of the potential for creativity and resourcefulness to shape a brighter future.

The role of Decay and Longevity of material cycle in the projects of Fuminori Nousaku

Seminar: Arguments

Workshop Instructor: Ranjani Srinivasan

Materiality plays a vital role in the design process of Fuminori Nusaku. He is one of the few architects of his generation that start the design process from the material rather than the form itself. As he mentioned in his book "Edifice of the Wild", "material and form have to collide and intersect, rather than material being subordinate to form" (Nousaku, p.89). The latter position explains how his materials choices usually redirects the design principles and leads him to new design paths. When it comes to sustainable design, Fuminori follows a contradictory approach. He sees the beauty of the decay in the materials and he embeds it in his design narrative. Whereas, on the other hand, he uses traditional techniques to enhance natural material's endurance and longevity. Therefore, decay and longevity are two contradictory design approaches that can be translated as co-sustainable processes in Fuminori's projects.

In his book "Edifice of the Wild," Fuminori invites us to reevaluate the essence of materials, emphasizing their inherent flow and circulation. In a world where consumer culture glorifies the new, Fuminori advocates for a departure from this prevailing mindset. He challenges architects to embrace an ecosystem-oriented approach, where the architectural design process is rooted in the understanding and management of resources. Rather than designing brand-new elements, he encourages the design of structures that derive from discarded remnants, in order to be aligned with the cyclical nature of materials. He believes in architecture that can be harmoniously connected with the environment, allowing materials to return to the earth from which they originated. In this thought-provoking exploration, Nousaku positions the city as a "treasure trove" of potential resources awaiting transformation. "A fast-growing, quickly decaying city can be positively viewed as a treasure trove of recyclable materials" (Nousaku, p. 94). Through these principles, Nousaku presents a compelling design process that honors the rapid growth of the city through organic decay.

These thoughts and concepts that are described in his book are witnessed in many of his projects. More particularly, in the project "Holes in the House", Fuminori embraces the idea that the absence created by dismantling is an opportunity for renewal. The concept of "holes," becomes his design process and instead of designing a space, he points to the materials that will be discarded. This act aligns with his beliefs of decay. Similarly, in the same project, by transforming the conventional parking space in front of the house into a garden, Fouminori reclaims a barren space, inviting a connection between the house and the earth. His act of uncovering the concrete pavement to facilitate the growth of plants exemplifies his aspiration to integrate architecture within the cycle of nature.

In the project "Takaoka guest house" the reuse of old bricks and tiles resonates deeply with his convictions about materiality and resourcefulness. The decayed materials, once discarded, are given new life as integral components of the guest house's structure. Here, Fuminori exemplifies his belief in incorporating discarded elements as a means of embracing the natural cycle of decay and rejuvenation.Through these projects, it becomes obvious his intention to become the "decomposer" demonstrating how architecture can exist between human-made fabric and the organic world.

On the other hand, sustainability also takes the form of material longevity in Fuminori's projects. The project "House with the pointed roof" is an example of how traditional construction methods can prolong the life of materials, especially the natural ones. During his lecture, he mentioned that he is always inspired by traditional Japanese techniques of wood construction and joinery and he decided to follow and showcase them in this housing project. He thoroughly foresaw the construction phase to be sure that everything was implemented according to his design and used very particular methods of wood maintenance. While a typical wood construction would last 30-40 years, he managed to prolong the lifespan of the building to 100 years. As a result, by introducing traditional carpentry to his structure, he guided his design process for longevity.

In addition, similarly to the latter project, prevention of decay was one of the main design decisions in the "akeno raised floor house". In this project, the floor is raised at a height of one meter from the ground surface, a design decision that is also rooted to traditional architectural practices. According to Fuminori, this decision was based on "nunokiso" (Nousaku, p.115-116), the traditional foundation that was constructed of stoned pillars which erect the building from the soil. The reason why this principle is so essential in Japanese architecture is due to the rainy and humid climate of the country. Therefore, Fuminori erects the house from the soil to secure ventilation between the floor and the ground and prevent wood from rotting.

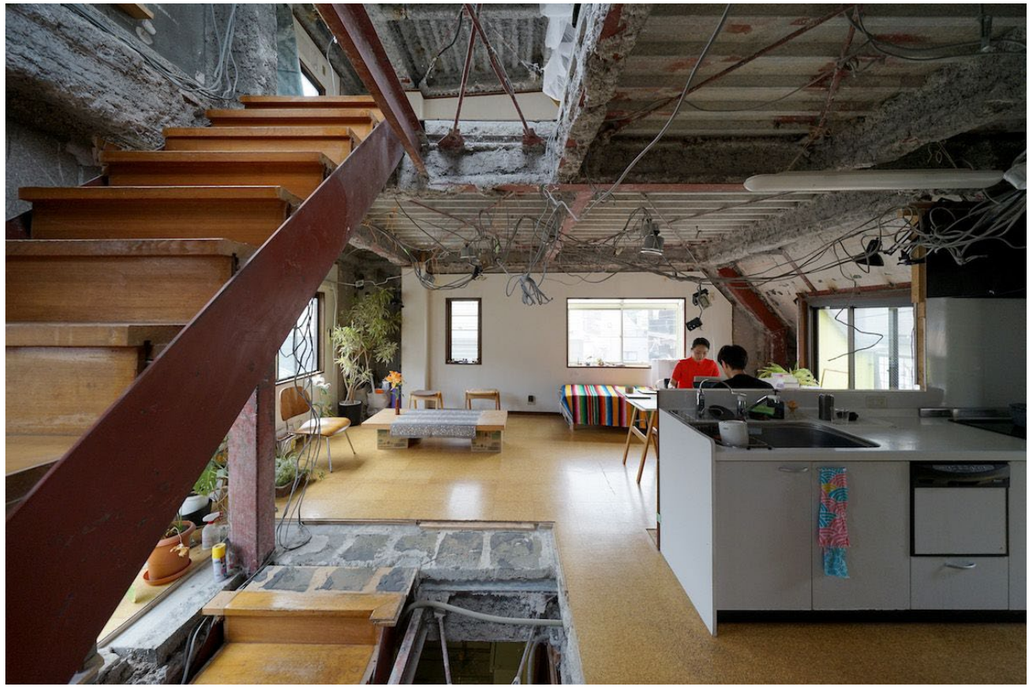
Nevertheless, It is obvious through his writings and his design projects that Fuminori often contradicts himself. In some instances he uses traditional carpentry to make a structure last longer, and in other instances advocates for the decay of material and its replaceability. But these two design approaches may be seen as the two sides of the same coin when it comes to sustainability in his architecture practice. According to Professor Anupama Kundoo an architectural project can operate as an organism, some parts should decay and be replaced and the structural parts must be designed to endure. She recommended not categorizing the entire building into binaries but understanding it on a spectrum. In an analogy, parts of the human body replenish their construct in different timelines: hair, skin and nails which regenerate much faster in comparison to bones. This helps us break the binary where a building or material is either usable or a waste. Often parts of the building can be repurposed or refurbished and brought back into the life of the architecture. Her point of view may help us look beyond the primary use of materials and find a meaning for them in other ways. It is obvious that Fuminori intuitively follows the same thought-process.

The interplay between decay and longevity within Fuminori's projects underscores a dynamic and adaptable expression of sustainability. By initiating the design process from materials rather than the conventional norm of starting with the form, he takes advantage of the design limitations of natural materials and he uses them accordingly to his sustainable design in practice. He purposely designs by taking into consideration the factor of fast decay while at the same time he designs to extend the longevity of his structures. Therefore, his projects serve as a proof of these coexisting design approaches, exemplifying his commitment to honoring the balance between industrialization and the natural world.

References

Nousaku, F. (2021). Edifice of the Wild (C. Stephens, Trans.). Jin Song Montesano.

Nousaku, F., & Tsuneyama, M. (2023, July 26). Urban Wild Ecology. Arguments Lectures, Columbia GSAPP, New York, USA.



Holes in the house, 2017

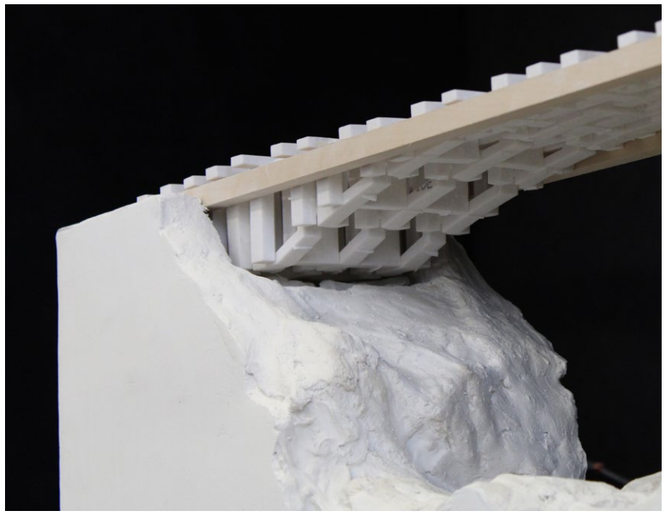
Interior view of the Piles and Pointed Roof, 2021

Takaoka guest house, 2016

Piles and Pointed Roof: The Wooden Structure,

The Model, Piles and Pointed Roof

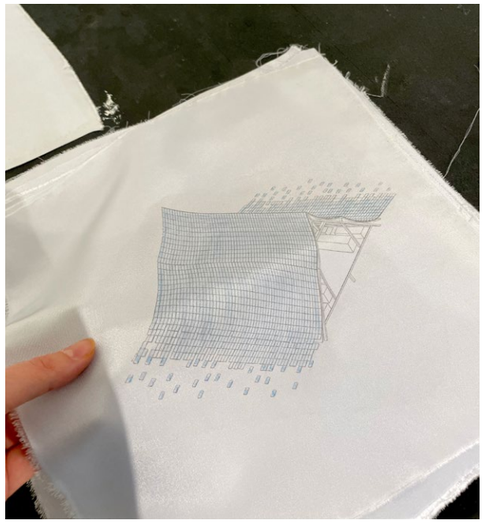
PART 2: Narrating Materials and Meaning



Imperfect Joints
Stone Matters - Summer Studio

Waste - Acoustics - Textures
Home is where the Toxics are - Building Technology Elective

Ropa Blanca
NYCDMX - Advanced Studio V



Soft Tilescapes
Permanently in Progress - Advanced Studio VI

Earth Columns
Material Kitchens - Technology Elective

(Im)perfect Joints

The project began as a sequence of stereotomic experimentations that sparked our interest in the concept of the (im)perfect joint. A research inspired by the artist Isamu Noguchi, attempting to use new structural strategies on the oldest material medium. We started to explore types of stones in their different refinement states: from the natural rocks to the most refined piece of marble. Combining the two helped us device Reciprocating systems that allow us to exploit stone's compressive strength to create tension. The challenge of combining and joining different characteristics of stone in the same structural system reveals an interesting narrative about the contemporary process of refinement and the curving difficulties that are involved on site.

Instead of dismissing the rocky terrain as an obstacle, we can embrace its limitations and make them an integral part of the design process. By preserving the natural roughness, we can take advantage of the terrain's irregularities and stability. As a result, the rock transforms into the very foundation that supports and grounds the construction.

This project recognises the significance of stone not just as a construction material but as an integral part of the natural terrain. Therefore, we envision the construction of easily assembled stoned structures based on the reciprocal system. These systems allow us to exploit stone's compressive strength and its efficiency in assembly. They consist of 2D-cut stone pieces that can be efficiently cut, packed, transported, and assembled on-site.

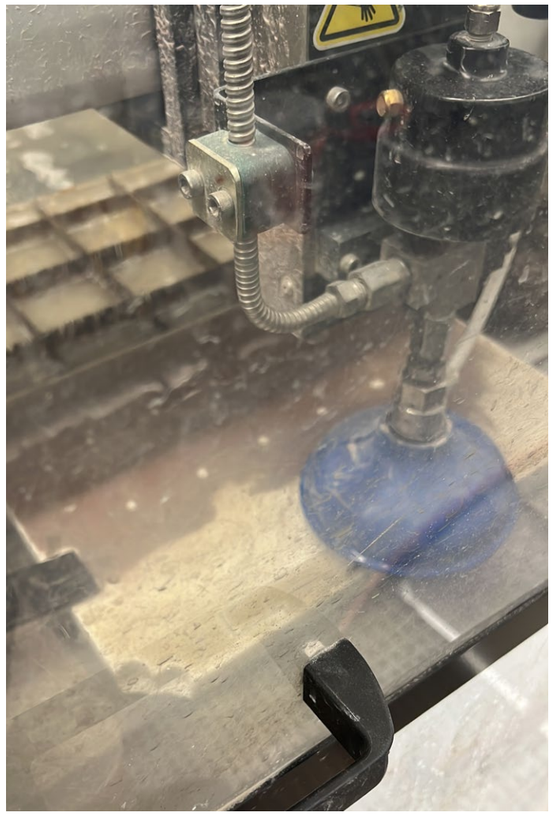
In this vision, a beautiful dialogue emerges between the refined pre-cut stones and the rugged, natural rocky terrain. As a result, the construction becomes a harmonious blend of man-made precision and natural imperfection.

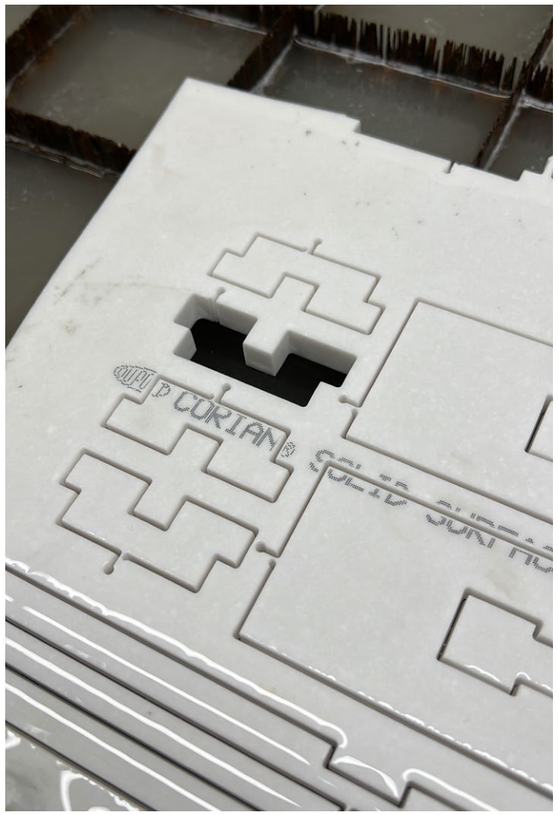
Summer Studio '23: Stone Matters

Studio Instructors: Elias and Yousef Anastas

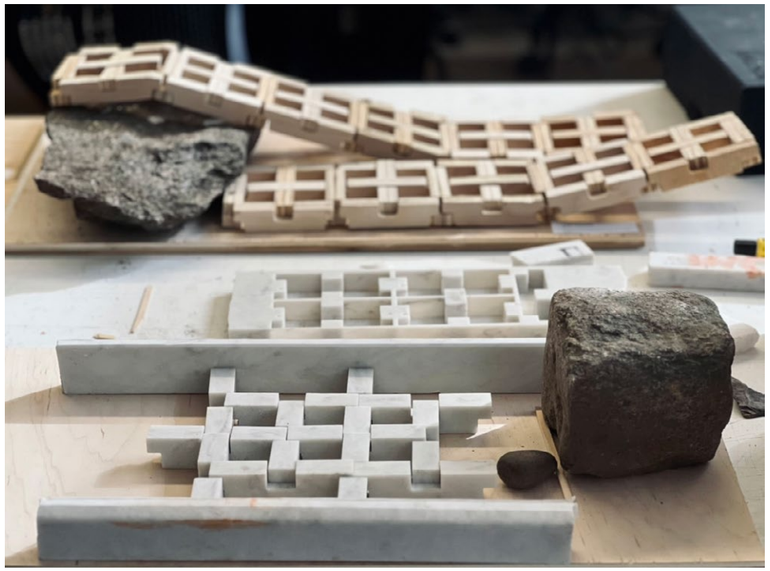
Collaborators: Rachita Viswanath, Abdullah Maddan

Selecting Waste Marble for our experimentations

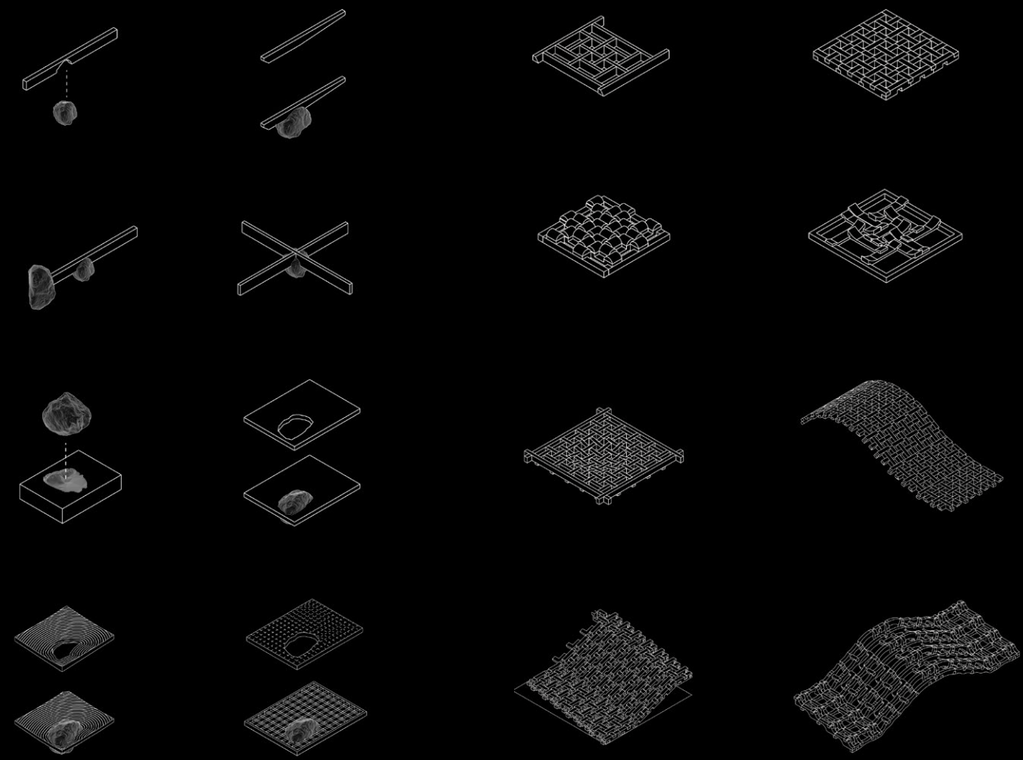




Cutting the Marble pieces on a Water Jet

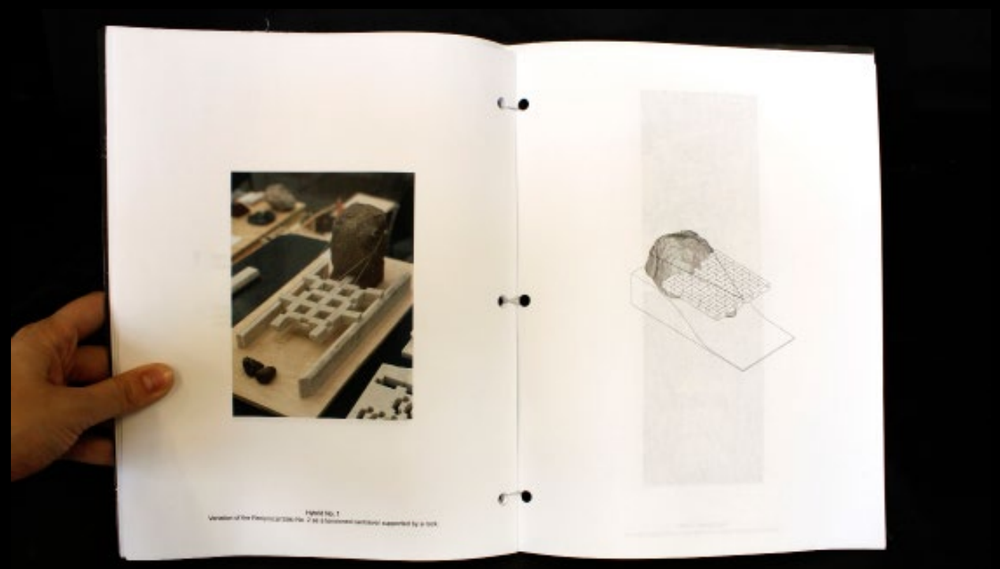


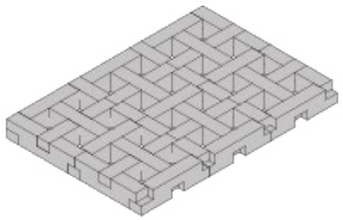
Atlas of “Imperfect Joints”

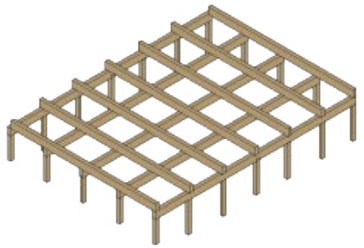


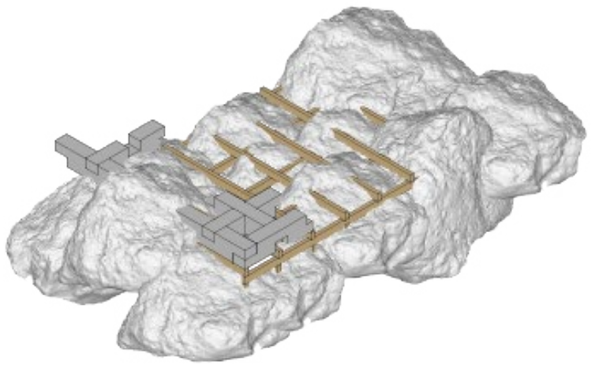
Joineries

Structures



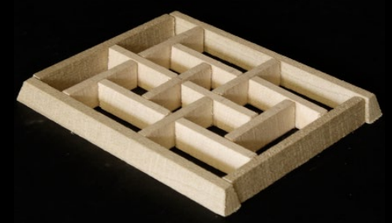


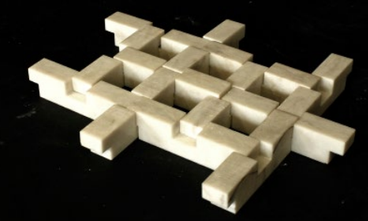




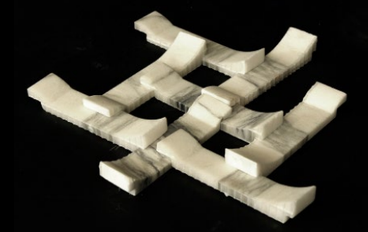
On-site assemply

Variations of 2d-cut modules



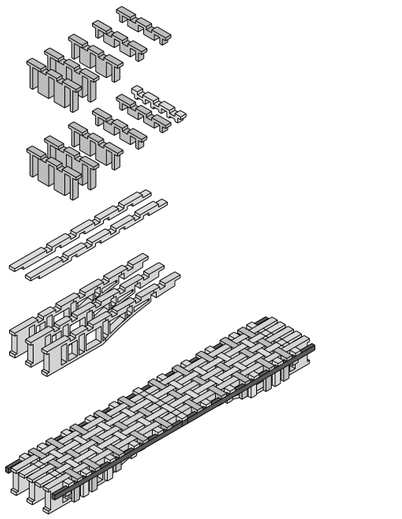


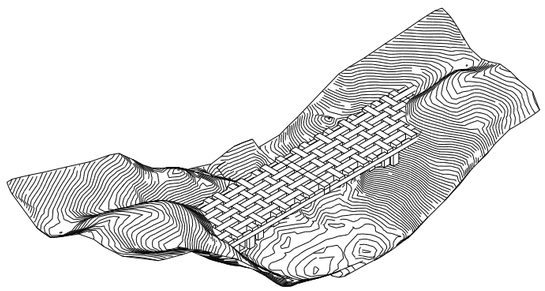
The Stairs



The Melted Slab

Concept models
marble and rocks

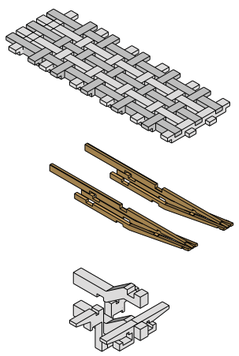


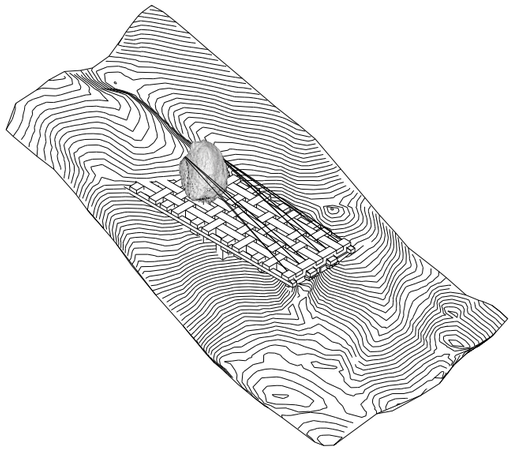


The Bridge

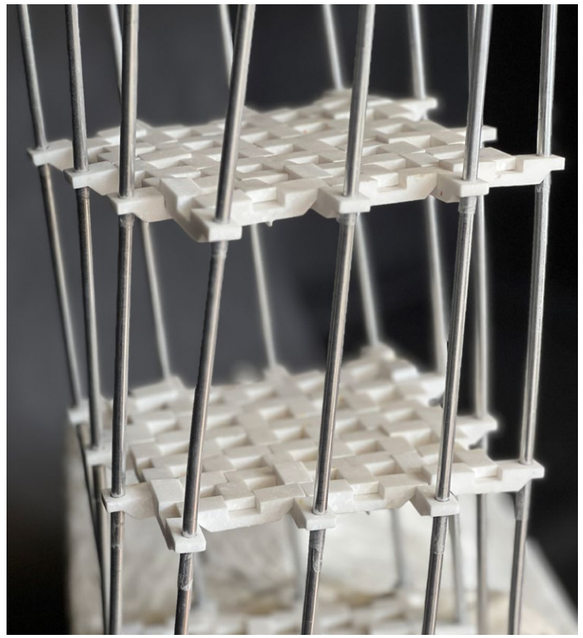
Materials: Marble, Wood, Plaster, Foam

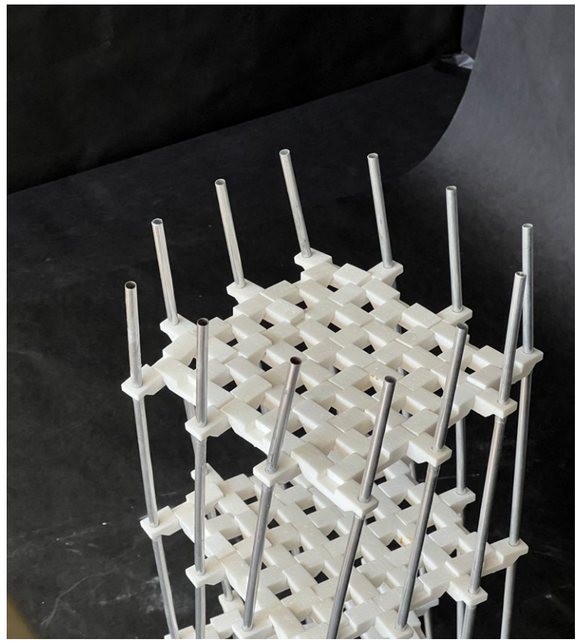
Scale 1: 200 (1.20 m maximum depth of stone)

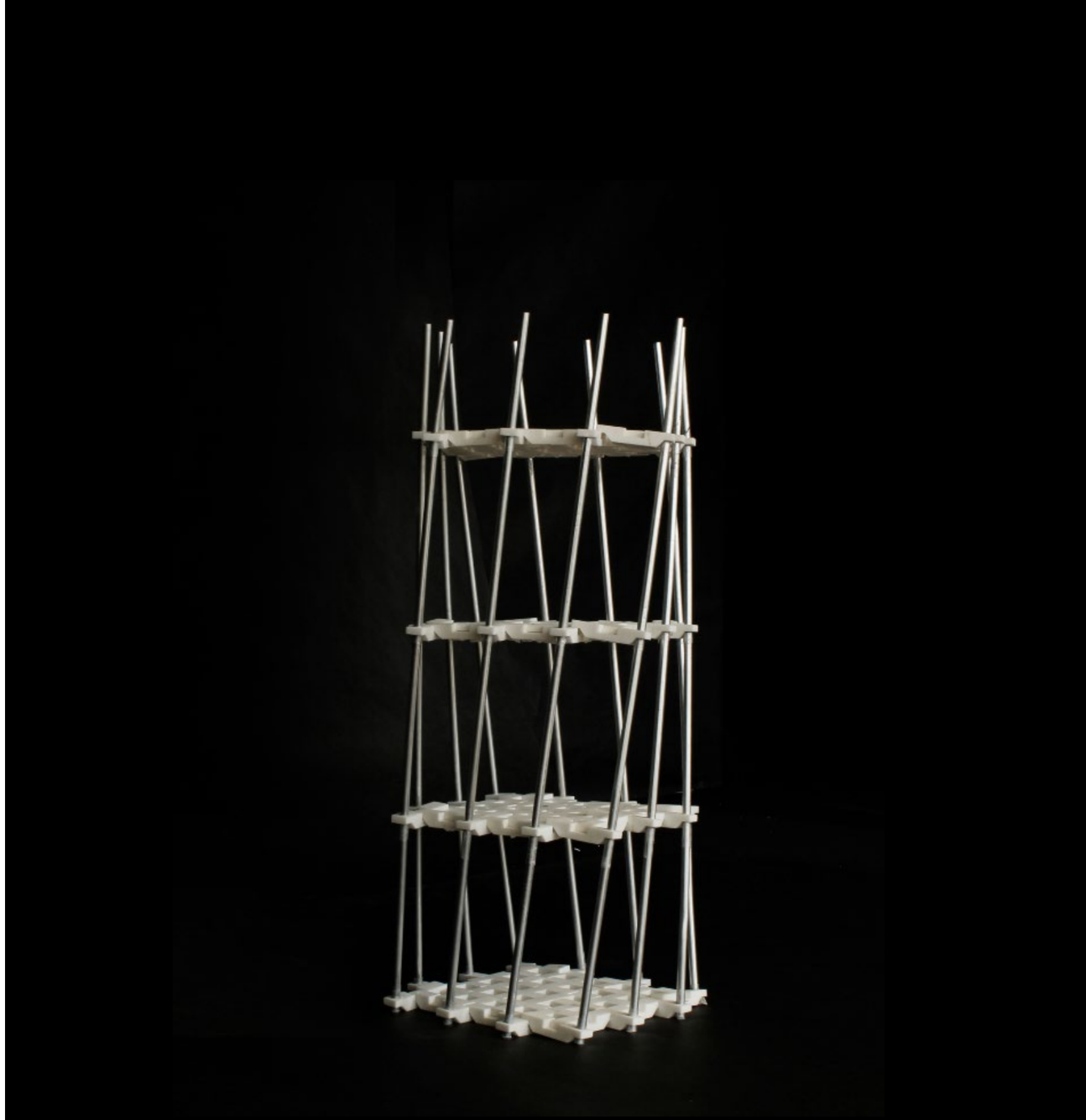




The Cantilever
Materials: Marble, Wood, Plaster, Foam
Scale 1: 250 (0.37 m maximum depth of stone)







The Cantilever

Materials: Marble, Wood, Plaster, Foam

Scale 1: 250 (0.37 m maximum depth of stone)

Ropa Blanca

"Ropa Blanca" is a design research project that explores the contradictory symbolism of white linen and laundry process between the mid 20th century Mexico City and New York City.

The project focuses on the role of patios in the Mexican apartment dwelling, the Vecindad, where used to be a hub for social activities, including communal laundry, shaping the identity of the neighborhood. Laundry, served as a profitable business for Mexican women as well as a vital ritual for socialization. Similarly, in New York City's Tenement Housing, laundry used to take place on terraces and patios, but hanging clothes became a flag of poverty and immigration, facing legal restrictions right after the appearance of laundromats in the late 1940s. While in Mexican patios, clotheslines was part of the strong neighborhood culture, in New York City, they were associated with immigration and was banned in many apartment buildings.

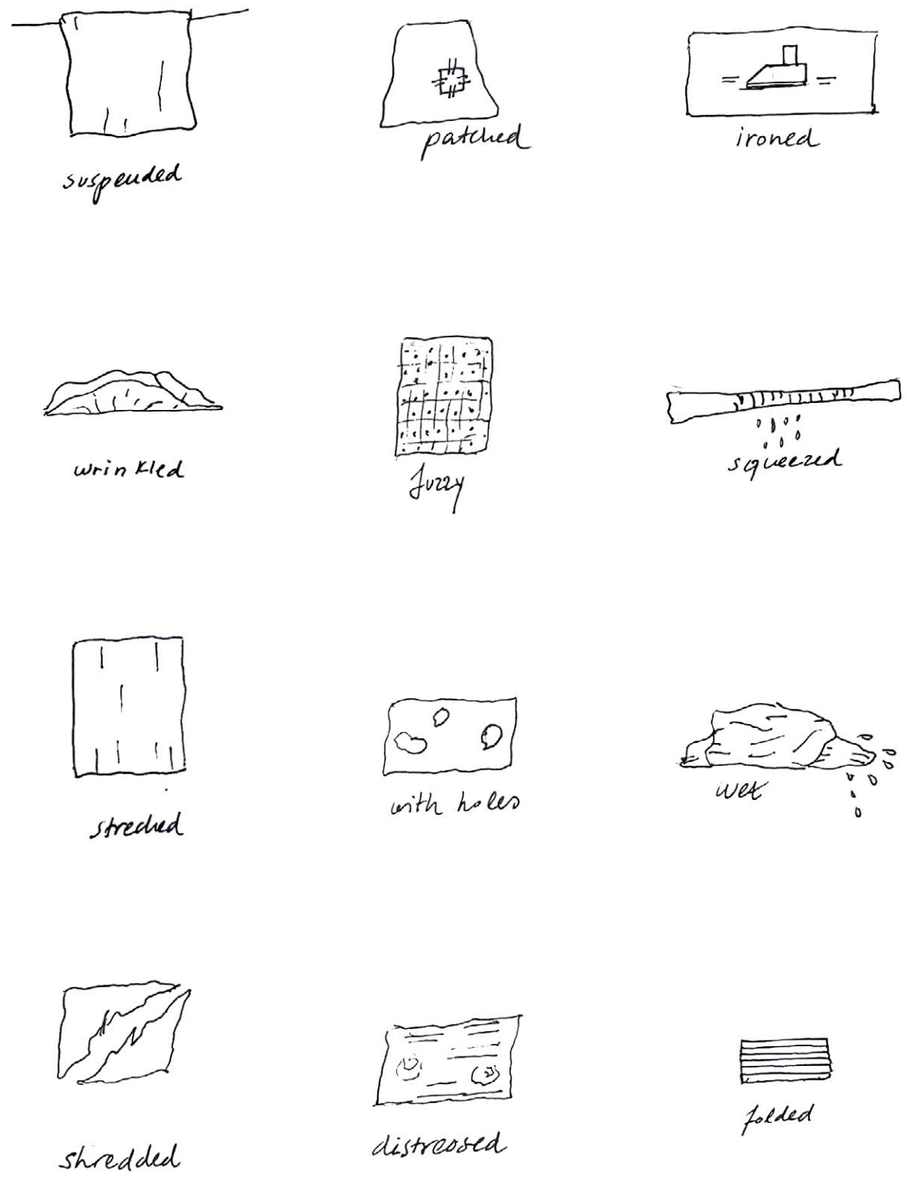
"Ropa Blanca" seeks to reintroduce cloth lines in East Harlem's Little Mexico, and reconnect its symbolism with socialization and strong community culture by proposing a gathering space for children. The project includes a play yard, urban market and day care center, shaped by hanging fabrics. The central "soft" patio encourages interaction with different fabric textures, offering stability and a sense of belonging for displaced children, addressing the challenges faced by immigrant families in the 20th century.

Advanced Studio V: NYCDMX

Studio Instructors: Rozana Montiel, Thomas De Monchaux

Vecindad patio, Tenochtitlan, Mexico City, 1952

Concept Model



FABRIC STATES

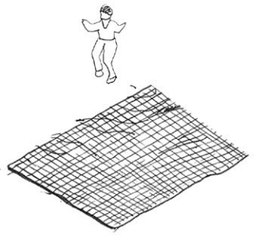
exchange cups of sugar

exchange food

send notes

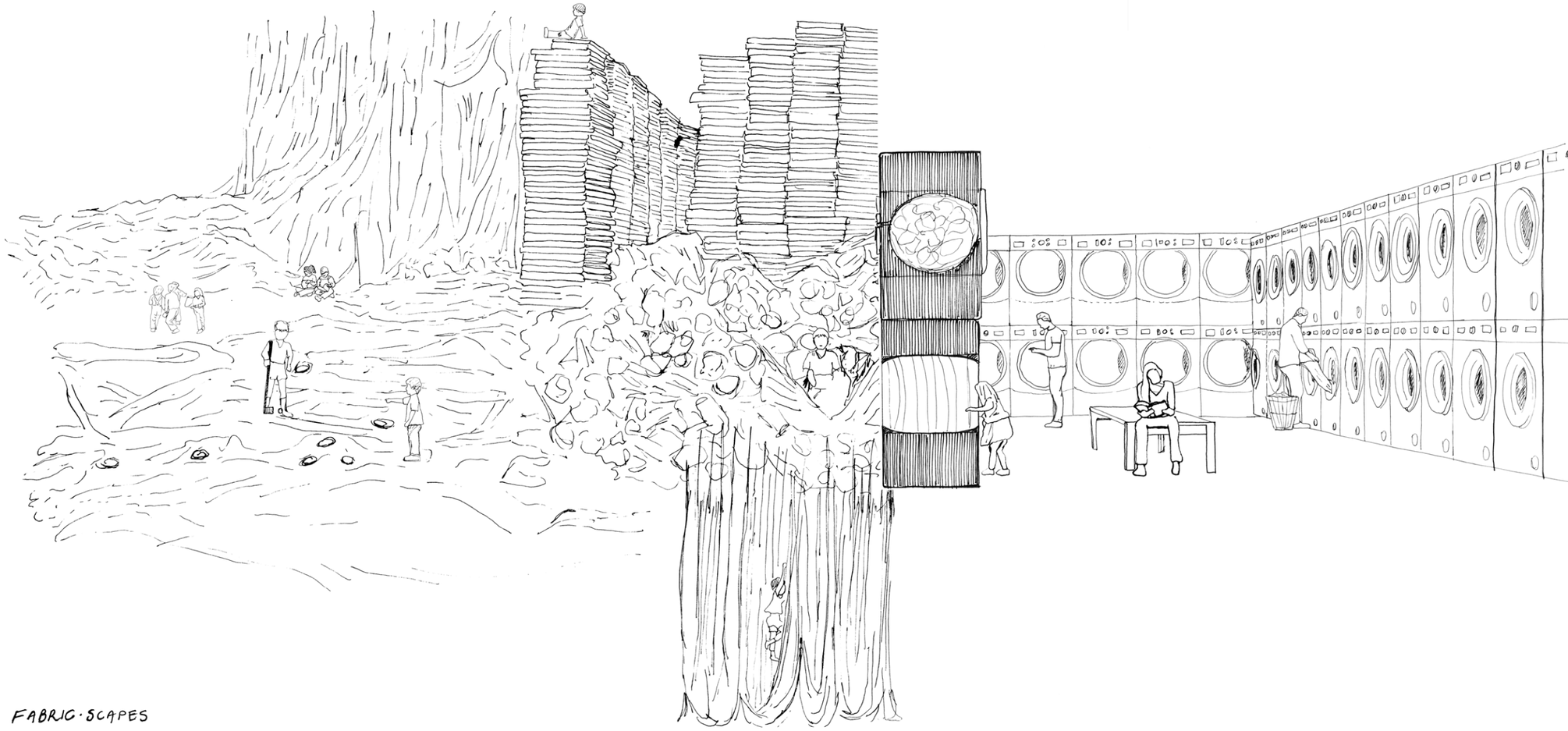
save peoples lives

bring food to elderly



traupolin

fields climbing



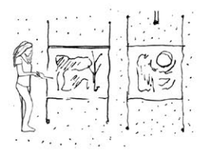
FABRIC·SCAPES

library

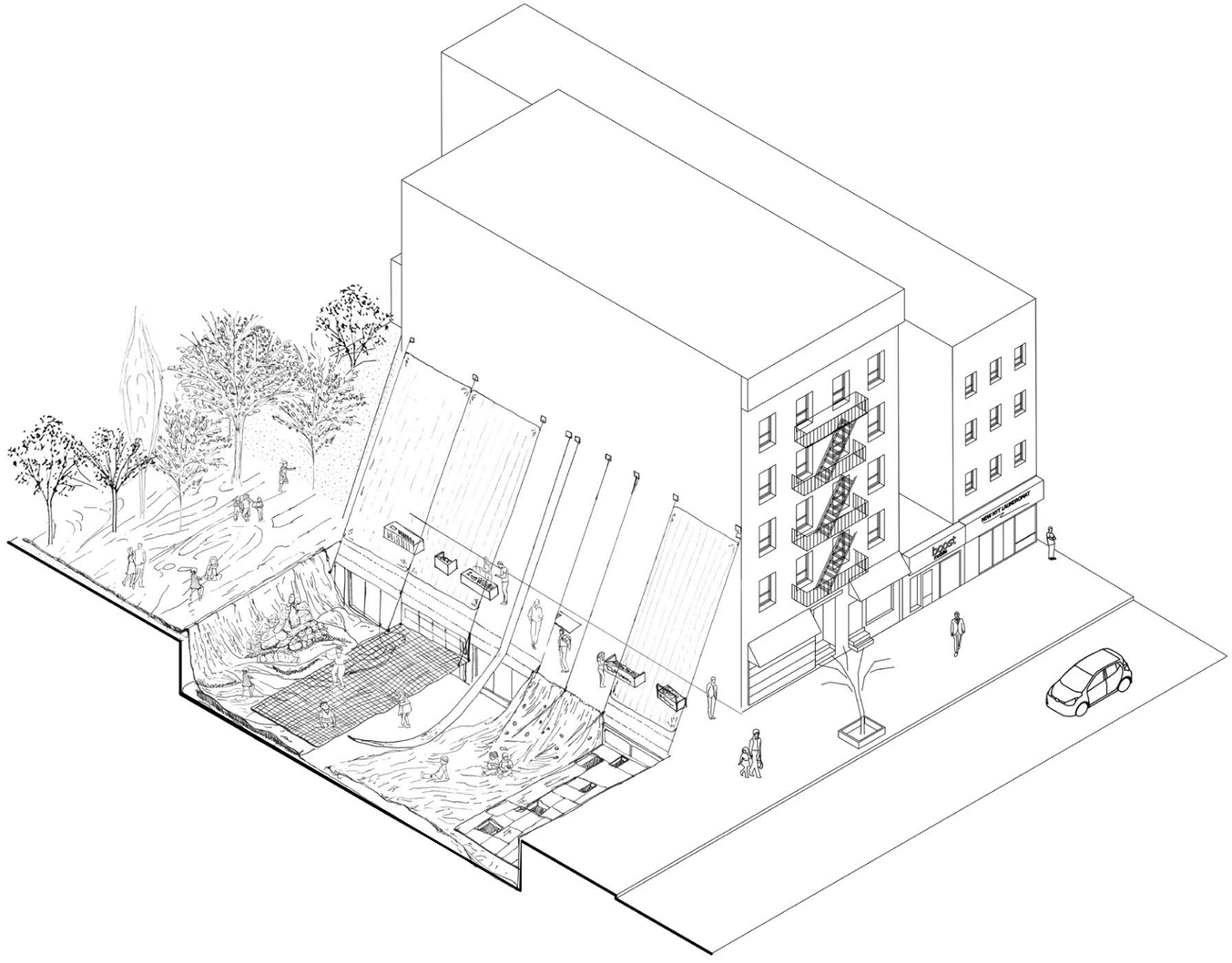
golf

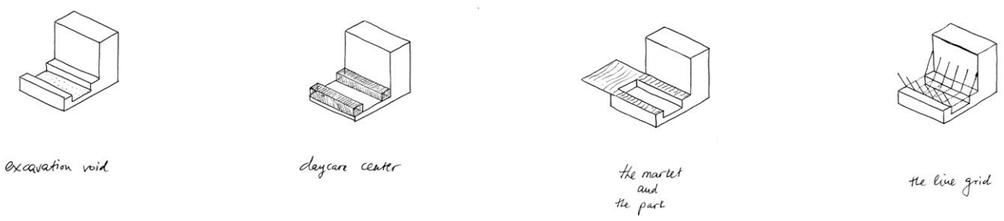
folded room

swing

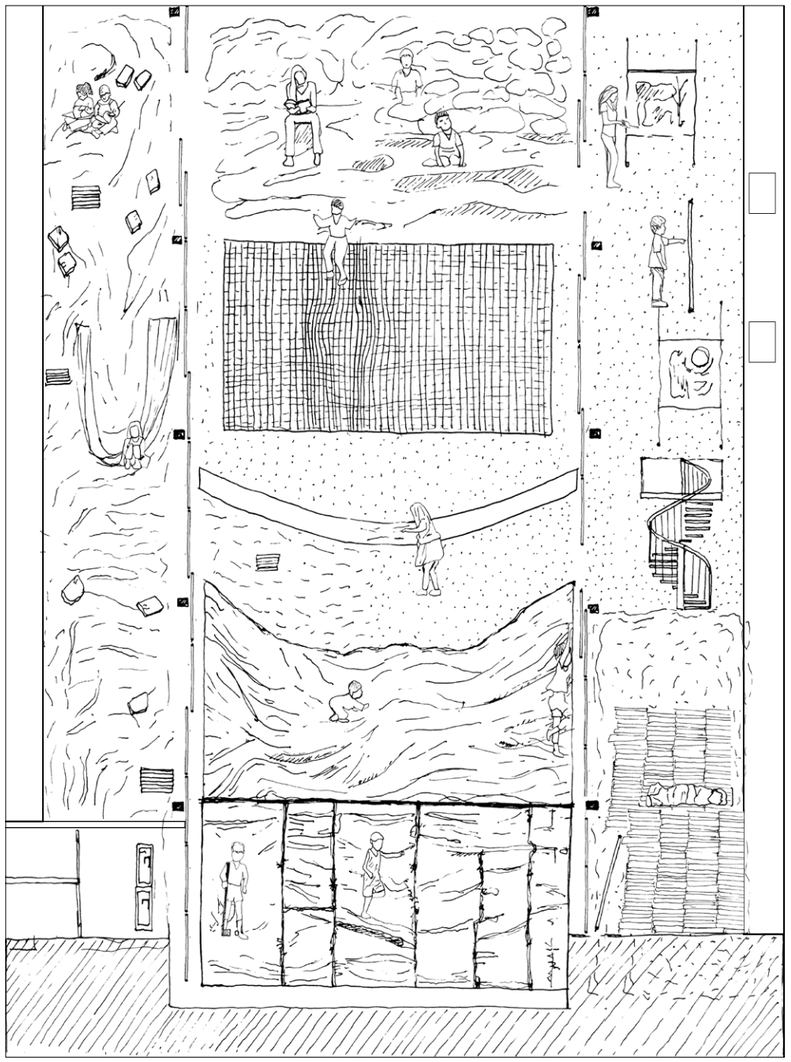


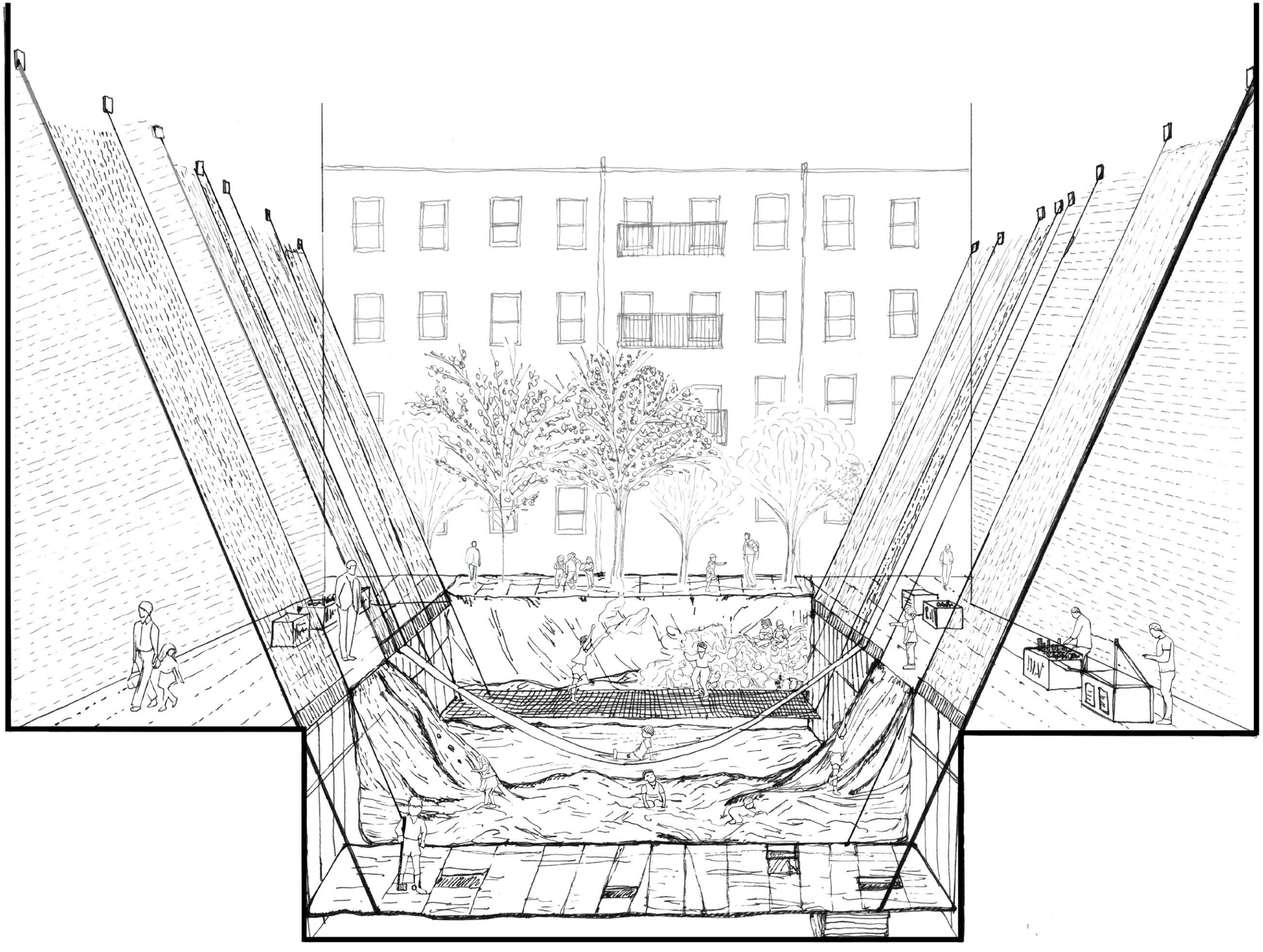
art studio

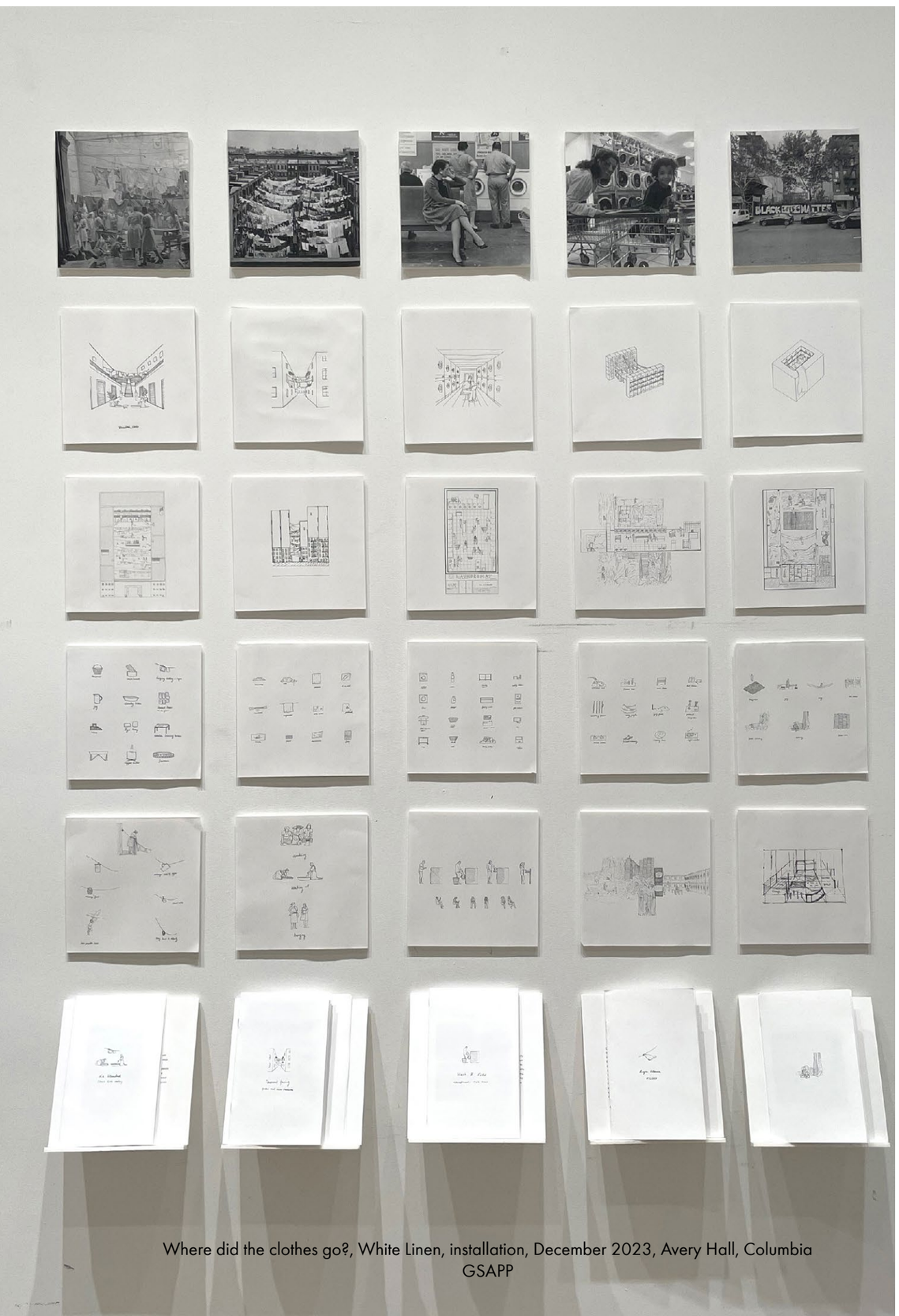




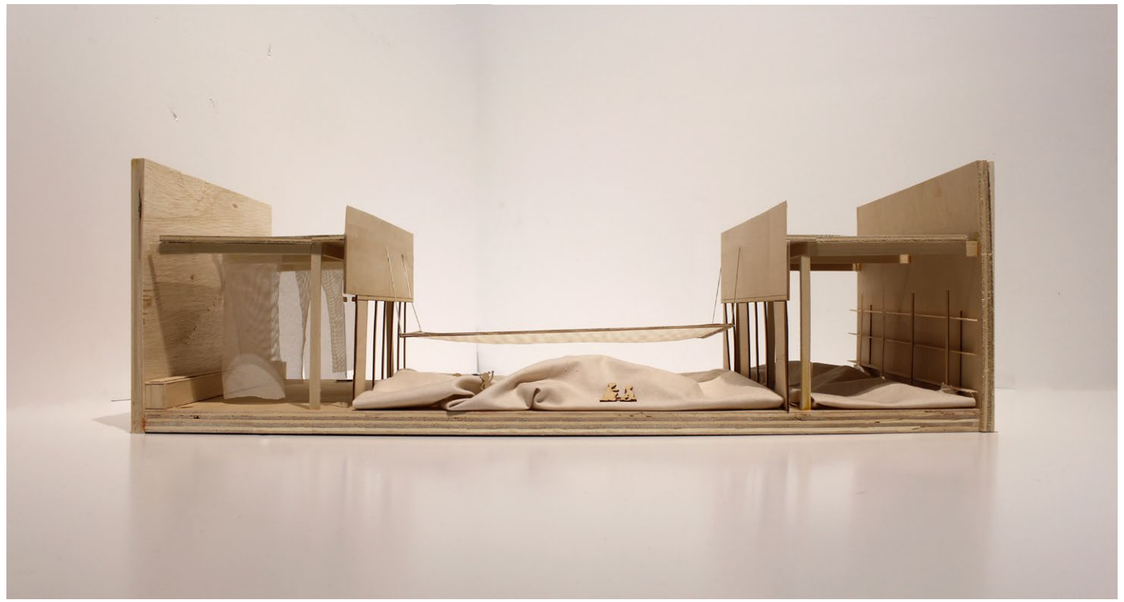
Little Mexico, East Harlem, NY







Where did the clothes go?, White Linen, installation, December 2023, Avery Hall, Columbia GSAPP



Waste - Acoustics - Textures (W.A.T)

By repurposing waste fabric sourced from the fashion industry, the project not only mitigates environmental impact but also addresses the pressing need for sound management in interior spaces. Through a unique blend of waste fabric, clay water, or cornstarch, acoustic panels are ingeniously crafted, offering a harmonious marriage of eco-consciousness and aesthetic appeal.

These acoustic panels not only serve a pragmatic purpose but also boast a diverse range of textures, adding depth and character to interior environments. From sleek and modern to rustic and organic, each panel tells a story of transformation, turning discarded materials into functional works of art. “Waste - Acoustics - Textures” epitomizes the ethos of sustainable design, where waste is not merely discarded but rather repurposed, transforming the way we perceive both waste and the spaces we inhabit.

Building Techology elective: Home Is Where The Toxics Are

Studio Instructors: Marta Heisel - Wisniewska

Collaborators: Aashka Ajmera, Aishwaria Garg

The U.S. generates an average of

25 BILLION POUNDS

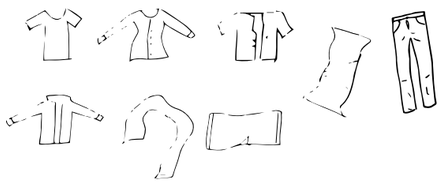
of textiles per year

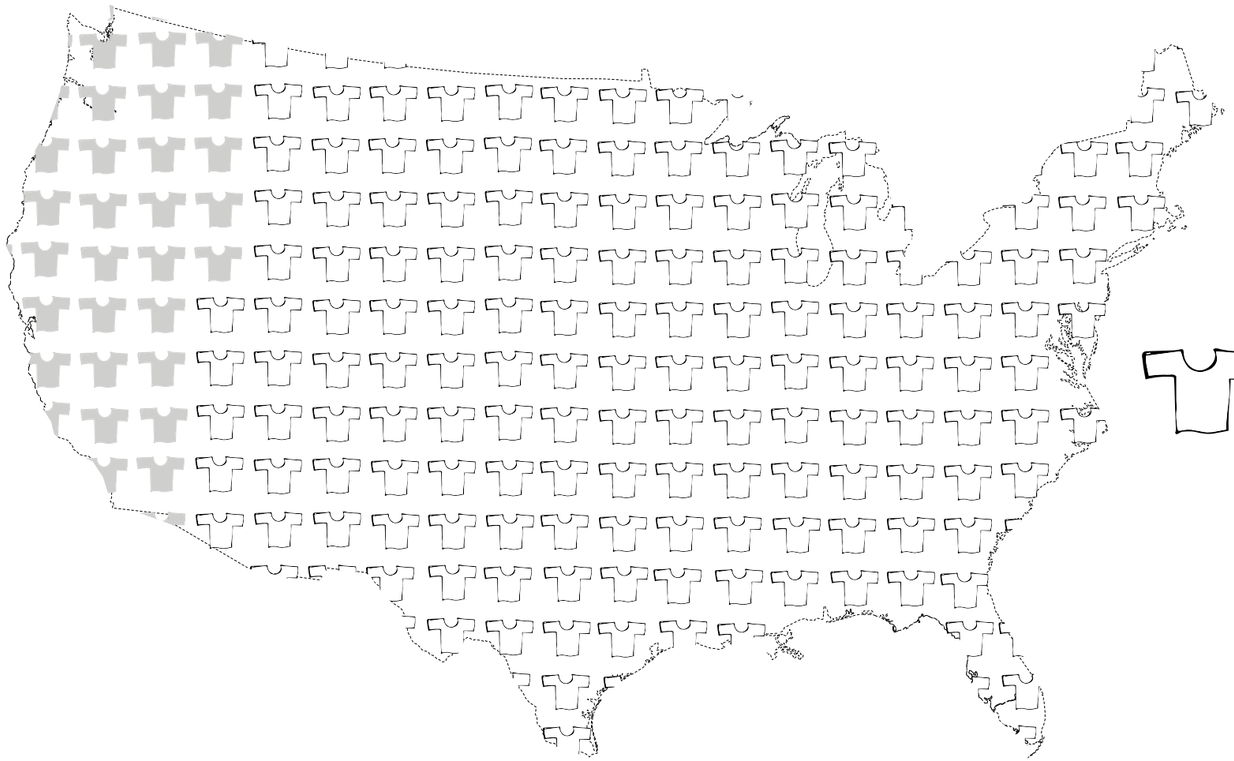
Americans spend

$282 billion

on new clothes each year

They keep only **21%** of these.
The majority includes T-shirts, jackets, trousers, scarfs, towels and bed sheets





15%

gets donated or recycled

85%

goes to landfills and incineration*

*According to the Environmental Agency's Office of Waste

2,700 litres

of water for just one T-shirt

a truck

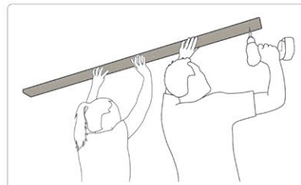
full of clothes sent to the landfill every second

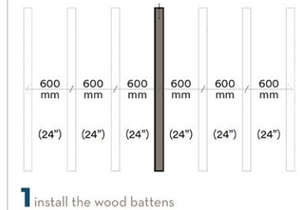
=

one and a half

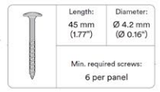
of Empire State Buildings every day

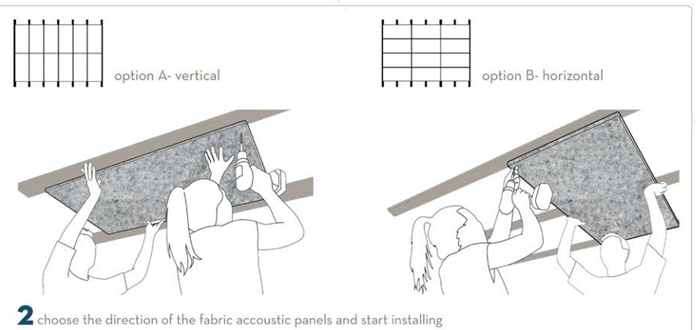
550% increase of carbon emissions per item by reducing the longevity of a shirt from 1 year to 1 month



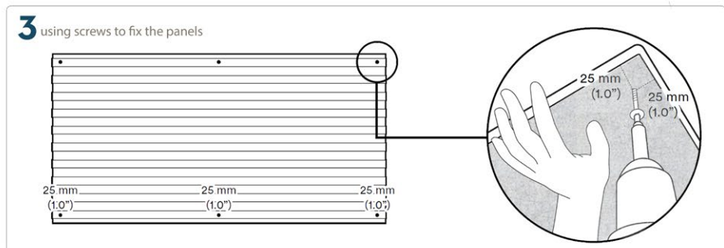


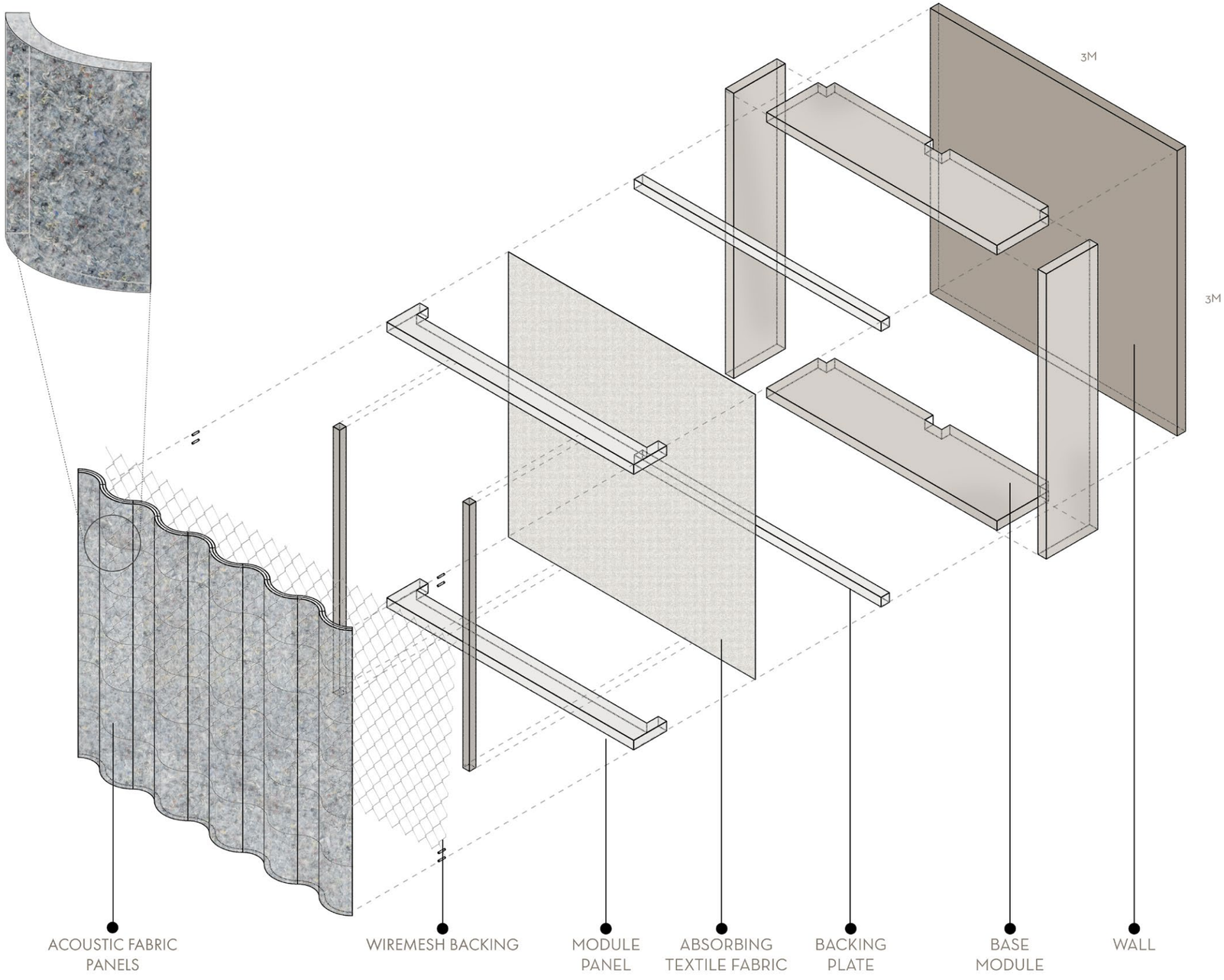
1 install the wood battens

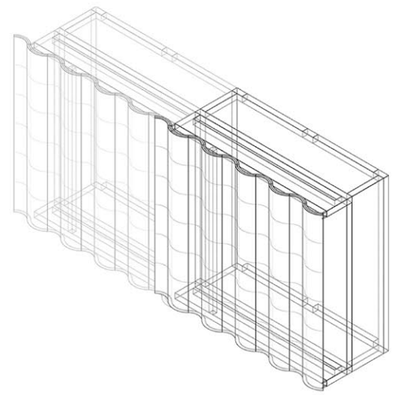


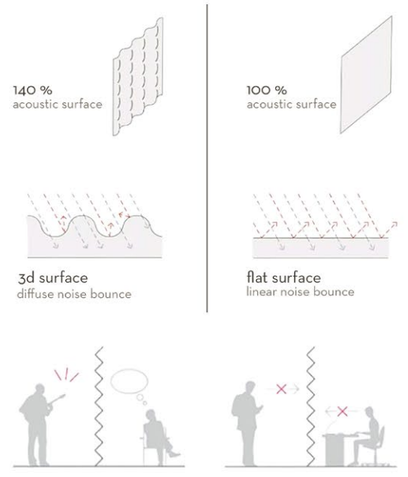


2 choose the direction of the fabric accoustic panels and start installing

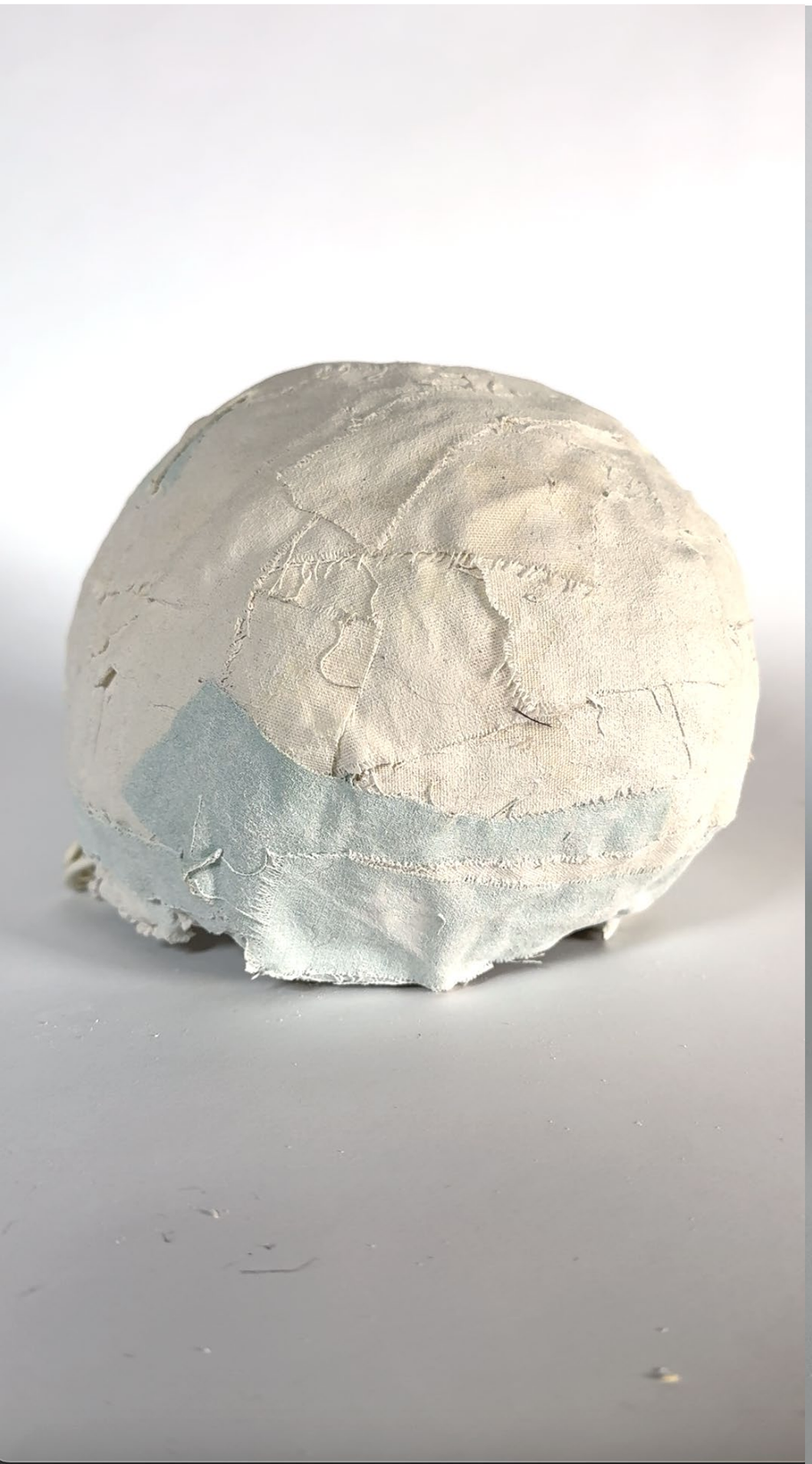








CURVED FABRIC PANEL
ACOUSTIC PROPERTIES



Earth Columns

My experimentation is focusing on finding a methodology to cast “earth columns” using only sand and clay for the mixture and fabric as a formwork. A scaffolding structure was developed using cylindrical-shaped fabric formwork supported by wooden rings.

From the research that was conducted and especially from the academic paper of Catherine Page Harris and Charlie O’Geen , it became obvious that using fabric as framework helps the unstabilized earth mixture to dry quicker limiting the possibility of cracking after uncasting the unstabilized earth. Therefore, for the following experimentation, fabric is used as framework to cast earth columns.

For the first phase of experimentation with poured earth, three different mixtures are tested according to the mixtures of Catherine Page Harris and Charlie O’Geen: a mixture of gypsum stabilized earth (70% sand, 26% clay, 4% gypsum), a mixture of lime stabilized earth (70% sand, 26% clay, 4% lime) and a mixture of unstabilized earth (70% sand, 30% The amount of water was estimated in such a way that the mixture would be fluid enough to move but stable enough to not leak from the framework. clay).

For casting the mixtures, a fabric formwork in a cylindrical shape has been developed, supported by wooden rings and vertical wooden supports. Therefore, the framework resembles a scaffolding structure. After pouring the 3 different mixtures into the scaffolded fabric framework, the samples were shacked slightly so that the mixture could evenly flow. The gypsum stabilized sample solidified approximately after half an hour and the lime stabilized sample, after one and a half day, The unstabilized sample took its solid form after 2 days and from the first day it became obvious that it shrunk unlike the two other sample. The texture of the fabric has been imprinted on all of the samples.

After establishing from the first phase that the unstabilized sample solidified successfully, for the second phase, the experiment is focusing only on the unstabilized version. We are building a longer formwork using the same materials in order to cast a column. After this step, the same procedure is followed for mixing and pouring the earth. The three columns that are constructed, can easily support a fabric in order to form a small installation or a canopy system.

Building Techology elective: Material Kitchens

Studio Instructors: Lola Ben Alon

First phase: experimenting with three different recipes and the scaffolded fabric framework

For the first phase of experimentation with poured earth, three different mixtures are tested according to the mixtures of Catherine Page Harris and Charlie O'Geen: a mixture of gypsum stabilized earth (70% sand, 26% clay, 4% gypsum), a mixture of lime stabilized earth (70% sand, 26% clay, 4% lime) and a mixture of unstabilized earth (70% sand, 30% clay). During the first round of experimentation, the water was not been weighted beforehand and it was added after the three ingredients were mixed together. The amount of water was estimated in such a way that the mixture would be fluid enough to move but stable enough to not leak from the framework.

	excavated soil	sand	aggregate	clay	gypsum	lime	water	formwork
Lime Stabilized Earth		52%		25%		4-5%	18%	Scaffolded fabric
Gypsum Stabilized Earth		52%		25%	5%		18%	Scaffolded fabric
Unstabilized Earth (C. Harris – C. O' Geen)		52%		30%			18%	Scaffolded fabric

Recipes Table for the first phase of experiments.

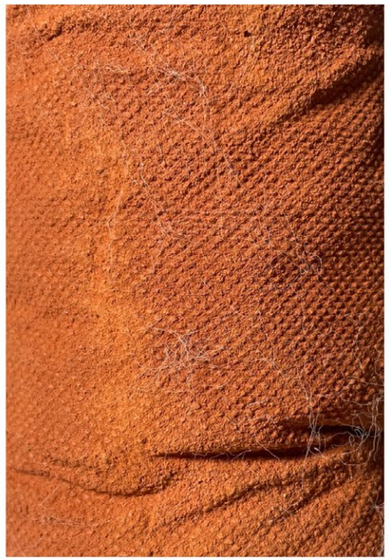
For casting the mixtures, a fabric formwork in a cylindrical shape has been developed, supported by wooden rings and vertical wooden supports. Therefore, the framework resembles a scaffolding structure. After pouring the 3 different mixtures into the scaffolded fabric framework, the samples were shacked slightly so that the mixture could evenly flow. The gypsum stabilized sample solidified approximately after half an hour and the lime stabilized sample, after one and a half day, The unstabilized sample took its solid form after 2 days and from the first day it became obvious that it shrunk unlike the two other sample. The texture of the fabric has been imprinted on all of the sample.

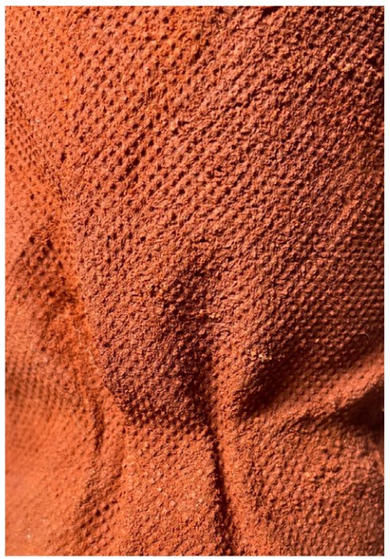
Building the formwork with fabric and a scaffolded structure around it.

Second phase: building an unstabilized earth column

After establishing from the first phase that the unstabilized sample solidified successfully, for the second phase, the experiment is focusing only on the unstabilized version. We are building a longer formwork using the same materials in order to cast a column. After this step, the same procedure is followed for mixing and pouring the earth. The three columns that are constructed, can easily support a fabric in order to form a small installation or a canopy system.

Left: *Building the scaffolded fabric formwork for casting the earth columns.*
Right: *Once the earth is casted in the formwork, the water is liking out from the porous fabric. As a result the mix is drying quicker avoiding the possibility of cracking.*





Soft Tilescapes

Roofs and their tiles are one of the most unique characteristic of Thai architecture from the urban temples, to the more conventional residential typology and rural salas. There structure typically covers more than the 2/3 of the elevation of the building, so obviously it is a very important element of Thai architecture The most fascinating fact for me is that they hide information about the location, the inhabitant and the use of the building. And that's why they are so diverse. We could say that they could form an interesting alphabet.

After coming back from Thailand, what I could say with certainty is that "Roofs and their tiles are not just roofs and their tiles."For example, the color, materiality and shape of the tiles as well as the shape of the roofs used to be a signifier of the social status of the building owner shaping an architectural "hierarchy". Gender as well. An other interesting fact about tiles is that the small pieces of tiles that we see in most of the temples had a past life since they had been recycled from broken ceramic or porcelain objects from locals. Therefore, their donation of their broken ceramics was a signifier of social awareness and an effort to contribute to the architectural scale of the city.

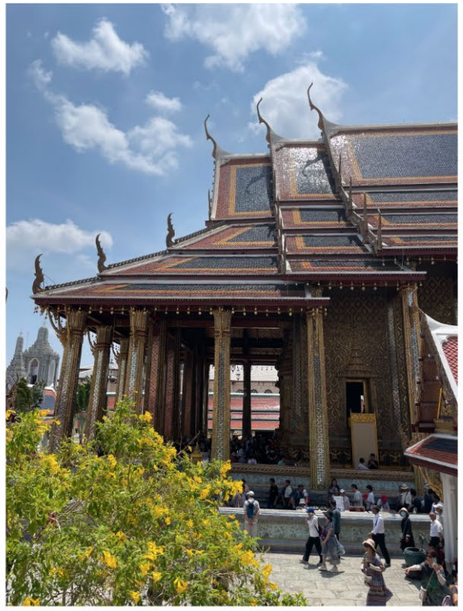
In the context of Thai culture where uses and materials are adjusted to the current need, everyday pottery could also become a structure itself and could create an architectural element. So, to conclude, in Thailand ceramic tiles are not just a decorative material that covers the roofs but apart from their functional use, they bear meanings.

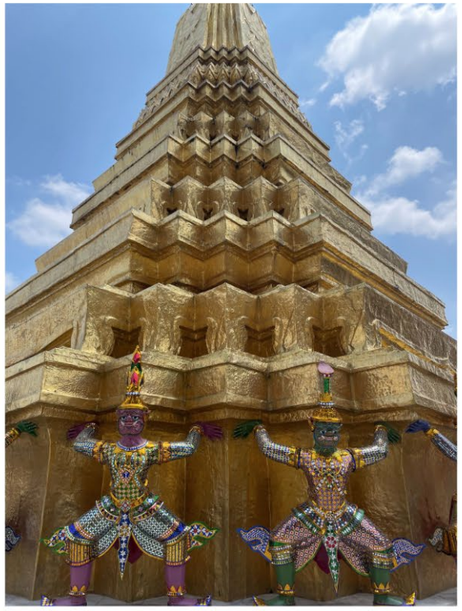
My first inner thought when I saw this was what if we could bring this ceramic tapestries closer to human scale so that they become more tangible and play a role in shaping the space. The area where Jim Thomson farm is located have a long tradition in terracotta pottery. Actually, there is a pottery village very close to our site. So given the proximity of the village to the farm we could use their expertise in terracotta tiles to construct them there. So for the artists residence in Jim Thomson Farm I experimented with a series of livable tilescapes trying to rethink the roof typology and how can be adjusted to host the needs of its residence.

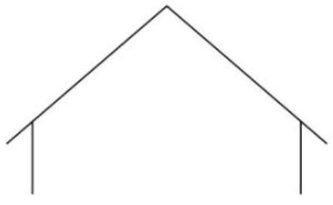
Or how the tiles could be "misused" to reach the ground.

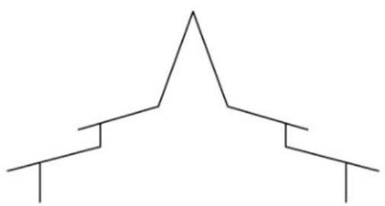
Adanced Studio VI: Permanently in Progress

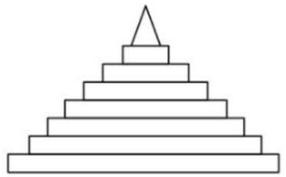
Studio Instructor: Rachaporn Choochuey, Lucy Navarro

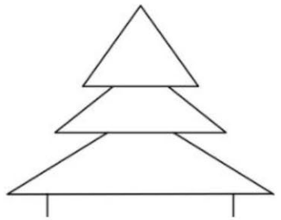




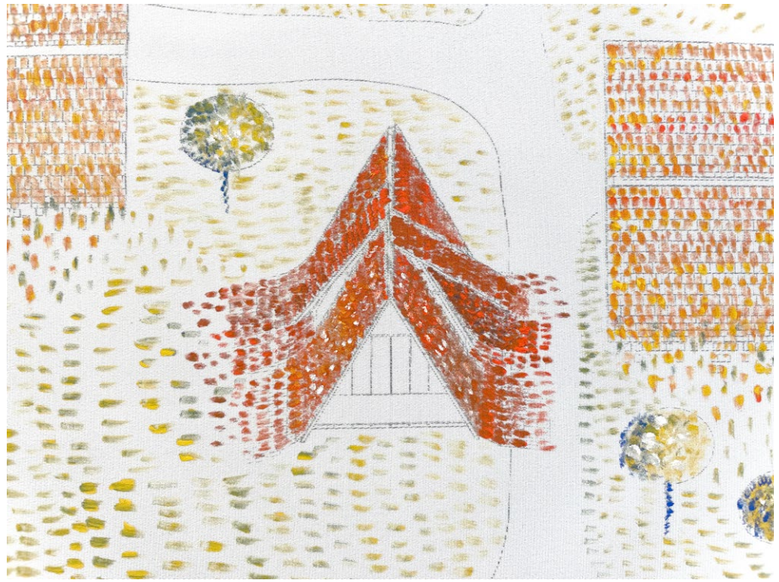




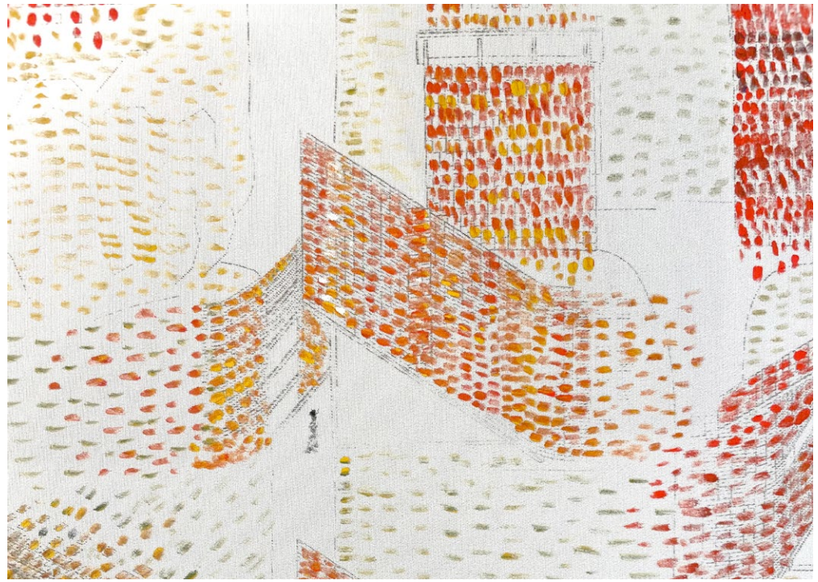




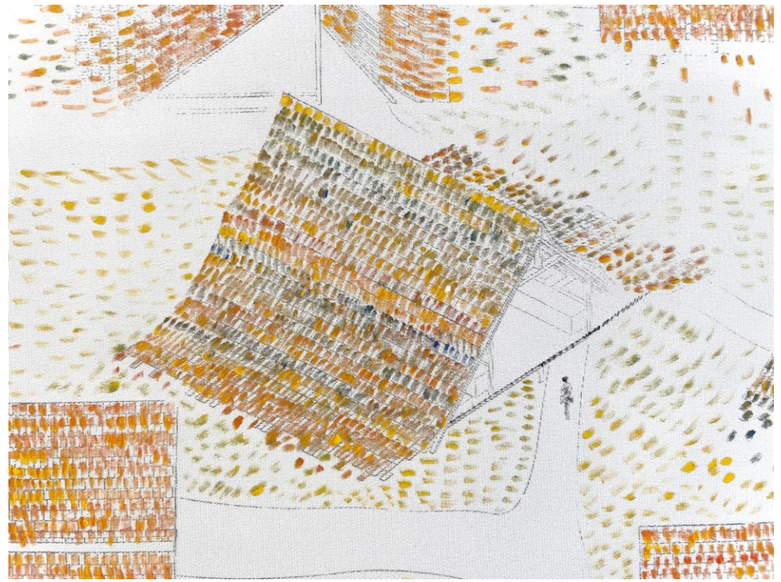
Masterplan, Acrilic paints on Silk fabric



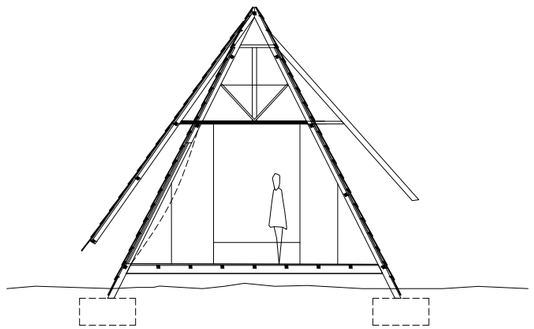
Artist's unit

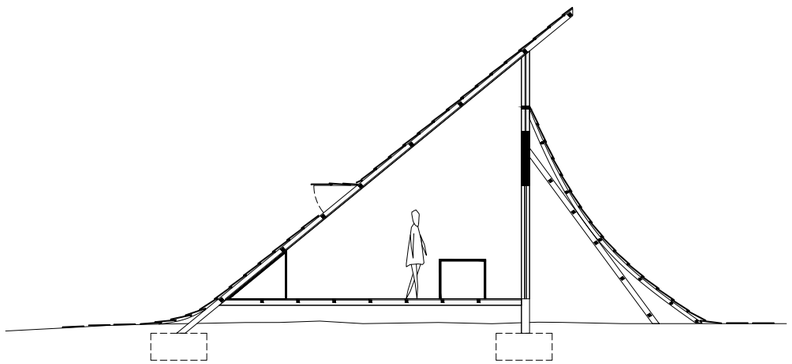


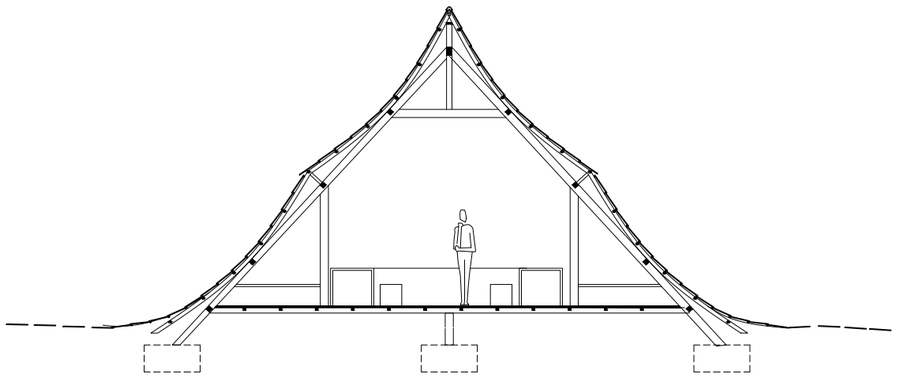
The Artist's Studio

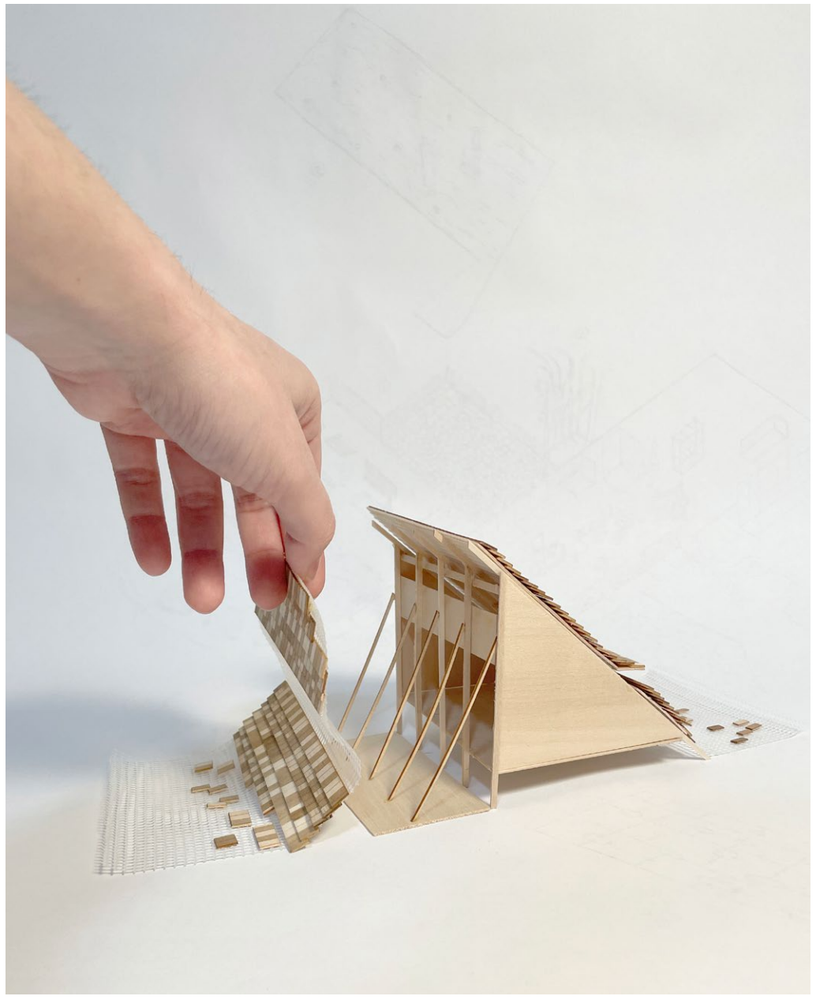


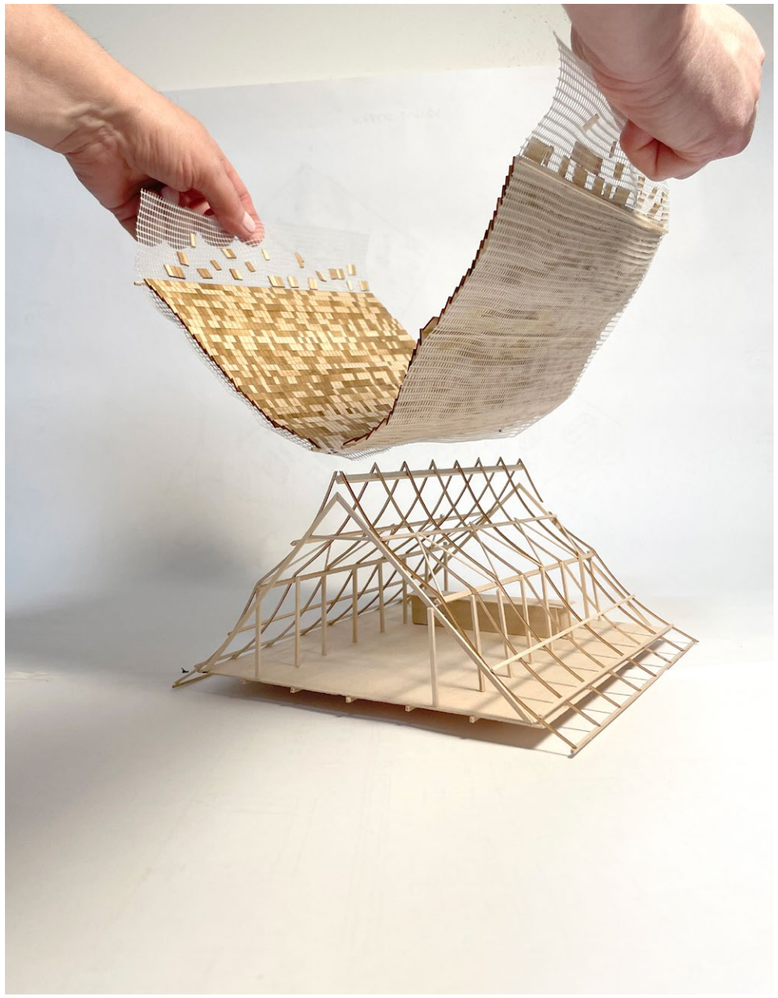
The Dining space

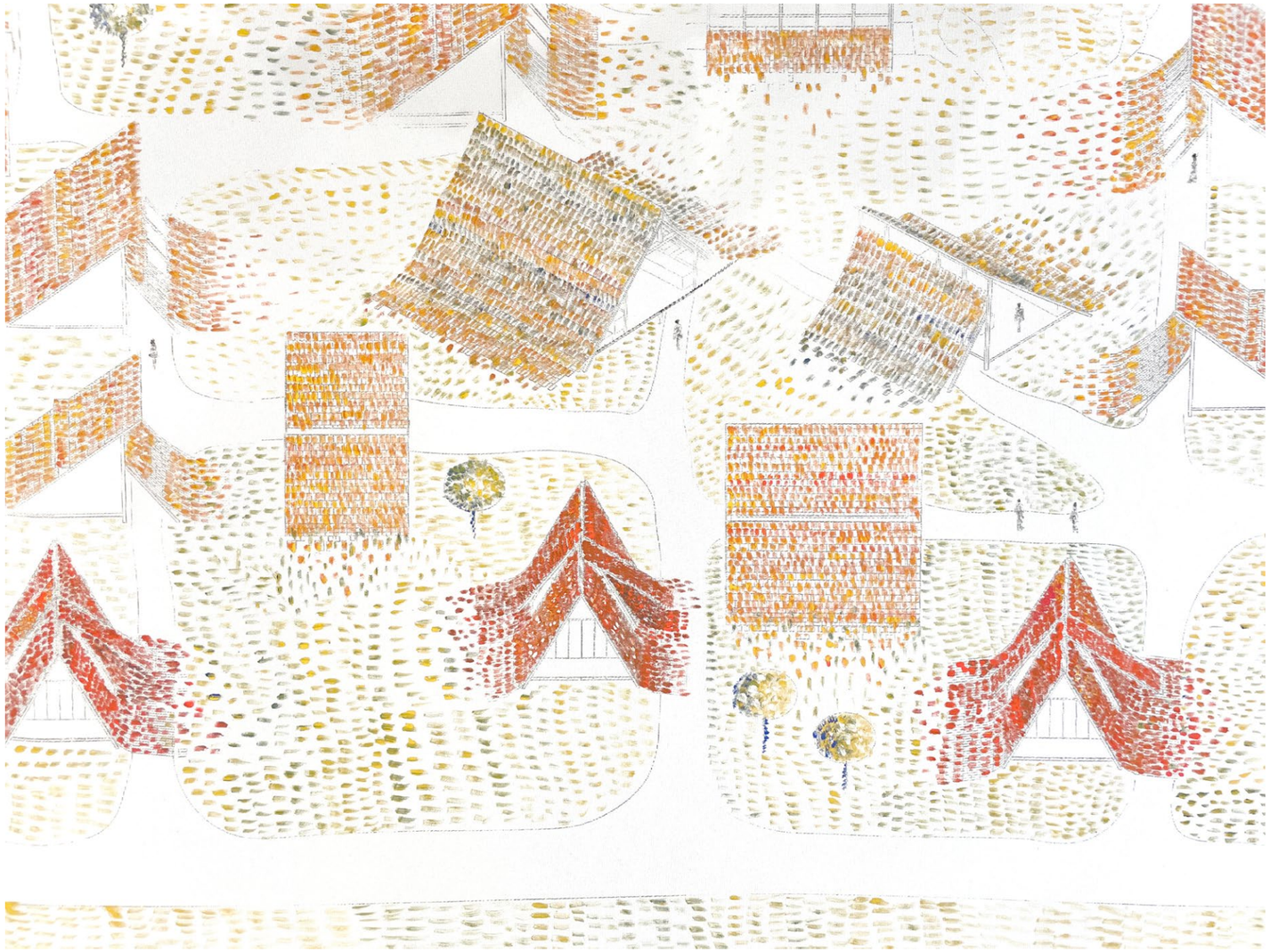


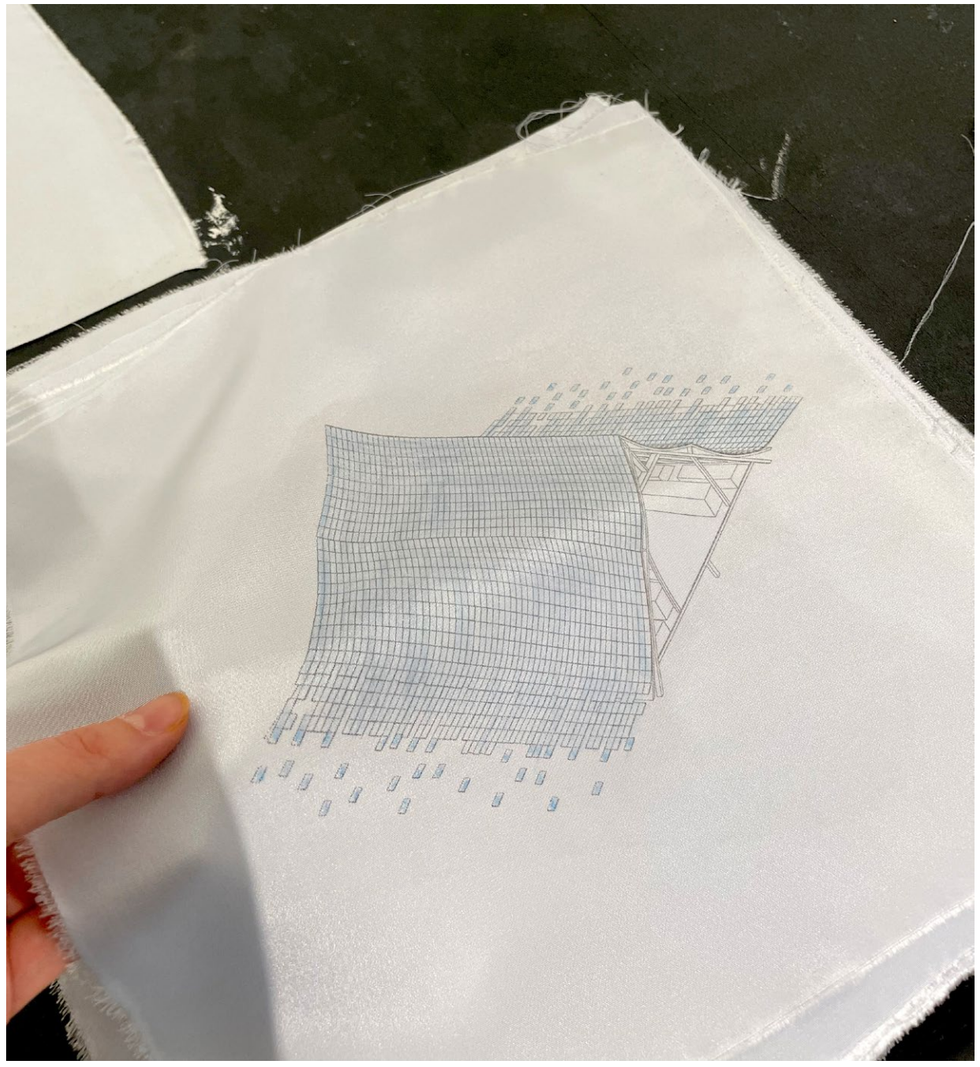












Tiles experimentation - Casting on fabric