ARCHITECTURE COMES TO LIFE

JIYOON HWANG
COLUMBIA GSAPP

ARCHITECTURE COMES TO LIFE

“Architecture comes to life” embodies an exploration of architecture as a dynamic system that interacts with its surroundings, adapts to changing conditions, and evolves over time. Rather than simply a static object, buildings and spaces are living organisms that respond to the needs and desires of their users, as well as the climate, culture, and context in which they exist.

This exploration is divided into chapters that cover multi-scale design, from landscape to urban environments, buildings, and objects with various material experiment. Through books, physical objects, and digital drawings, the goal is to inspire and stimulate human imagination, emotion, and creativity. Architecture is seen not just as a functional necessity, but as a emotional expression that embodies values, meanings, and aspirations.

When architecture resonates with people’s sensibilities and aspirations, it becomes alive and meaningful, shaping and reflecting the cultural identity of a society. Overall, “architecture comes to life” suggests that architecture is a complex and multifaceted practice that involves social, cultural, aesthetic, and environmental dimensions.

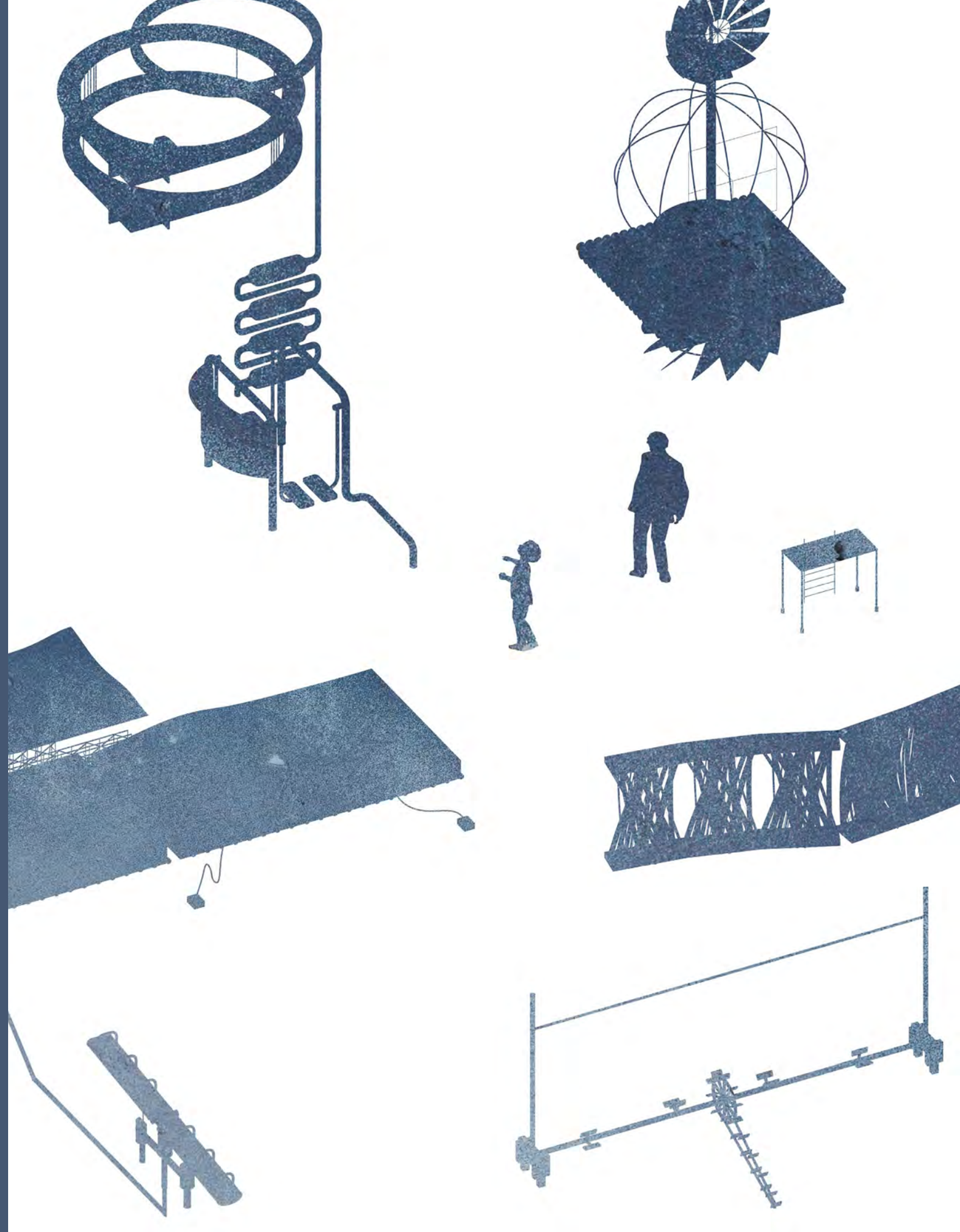
JIYOON HWANG

CONTENTS

01
HYBRID WATERSHED MACHINE FOR JAMAICA BAY

Imaginations for a different kind of labour

GSAPP Adv Studio IV 2022
Professor Marco Ferrari and Elise Hunchuck
Collaboration with Weiyu Xu and Xienyi Deng



QUESTIONS FOR WATER

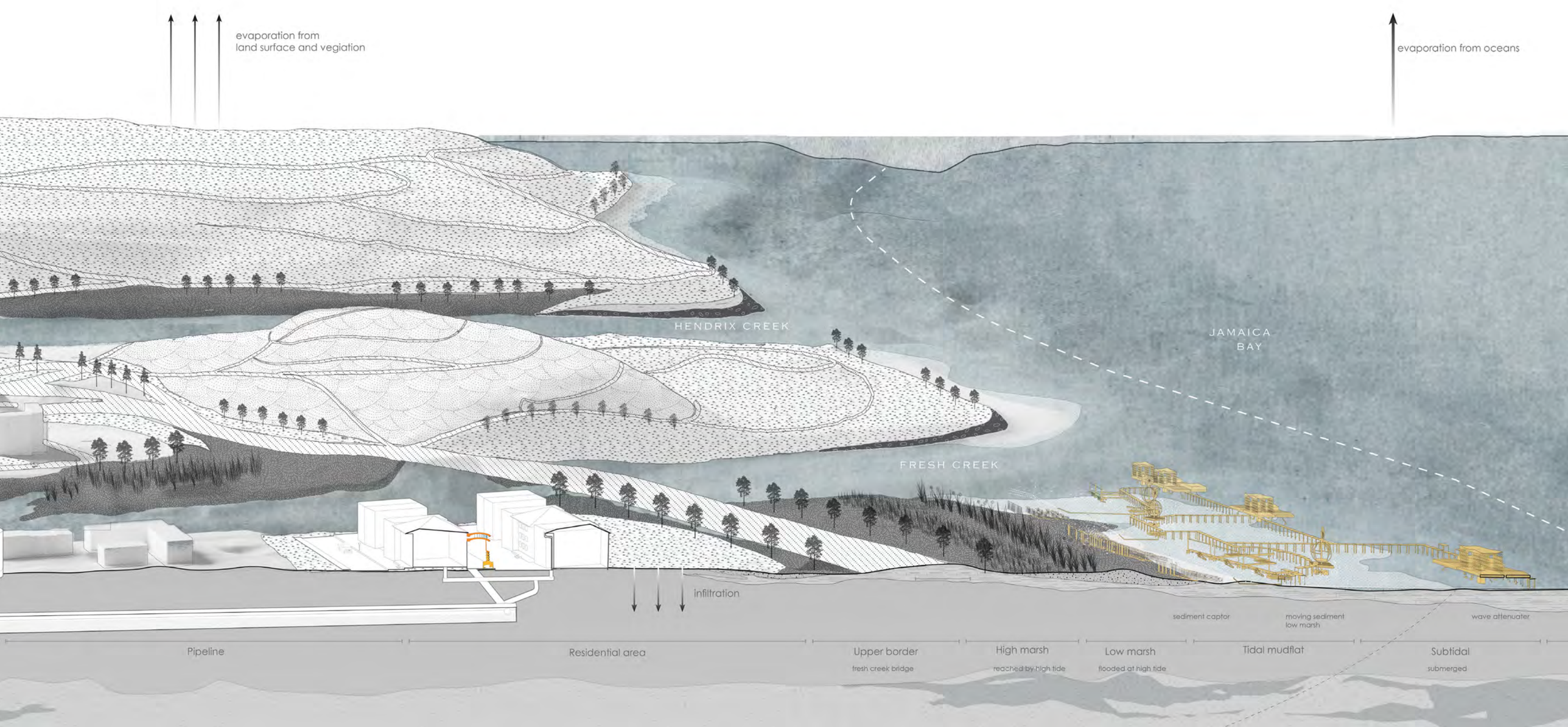
Water is everywhere. It is shapeless, but when it runs through different media, it takes the shape of the media and becomes the proxy for it. Focusing in Jamaica Bay, NYC, our research and design project treated water as a proxy for understanding urban conditions.
It consists of a study upon flow of water, and a series of small low-tech machine intervention for modifying and improving the coastal landscape.

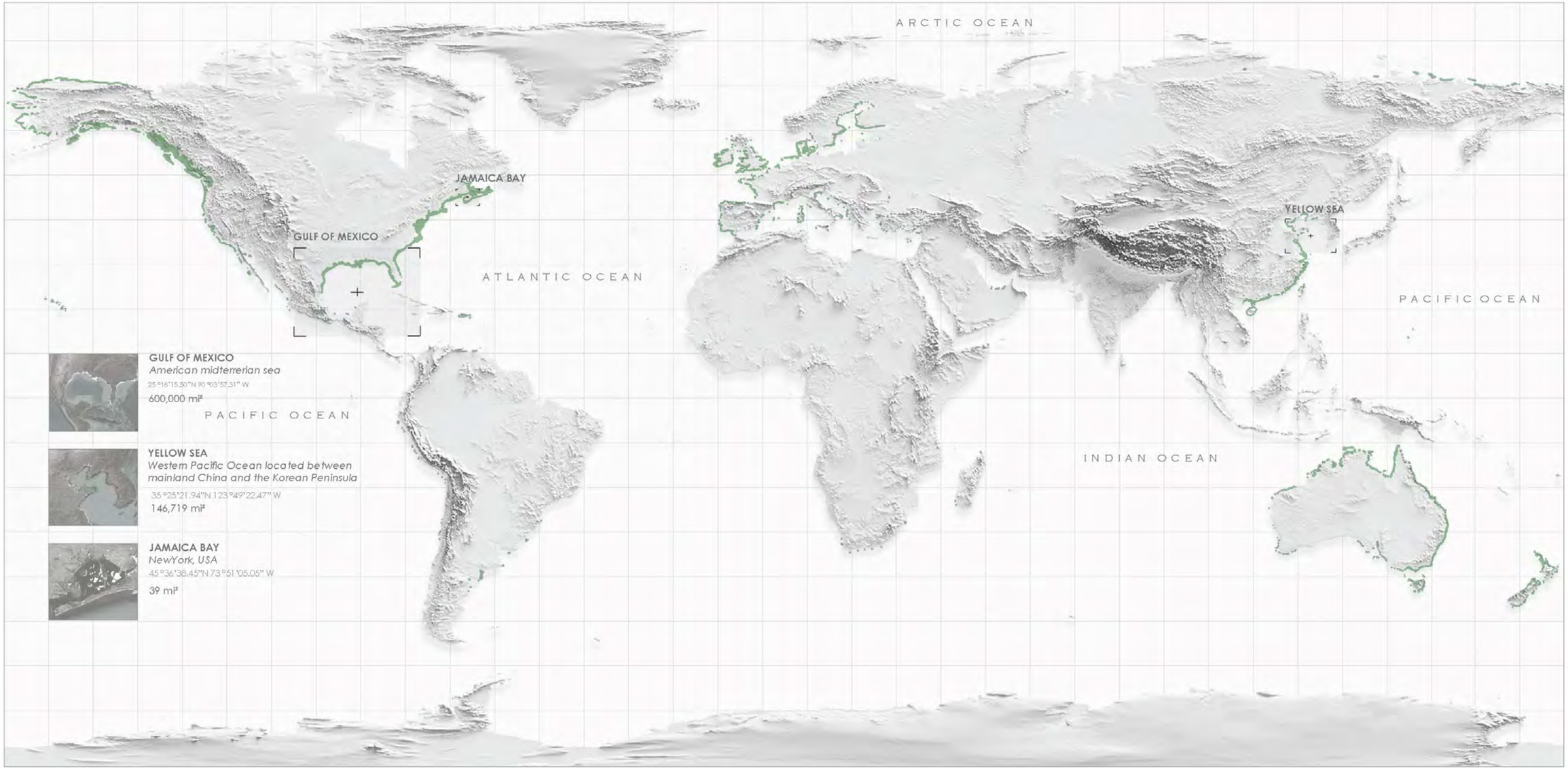
What is the role of water in contemporary coastal urban context?

Can we still call water a natural system if it is highly controlled and manipulated by humans? How does water foster ecological impact on coastal geology?

Machines that collaborates each other on landscape

Hybrid Watershed Machine for Jamaicabay

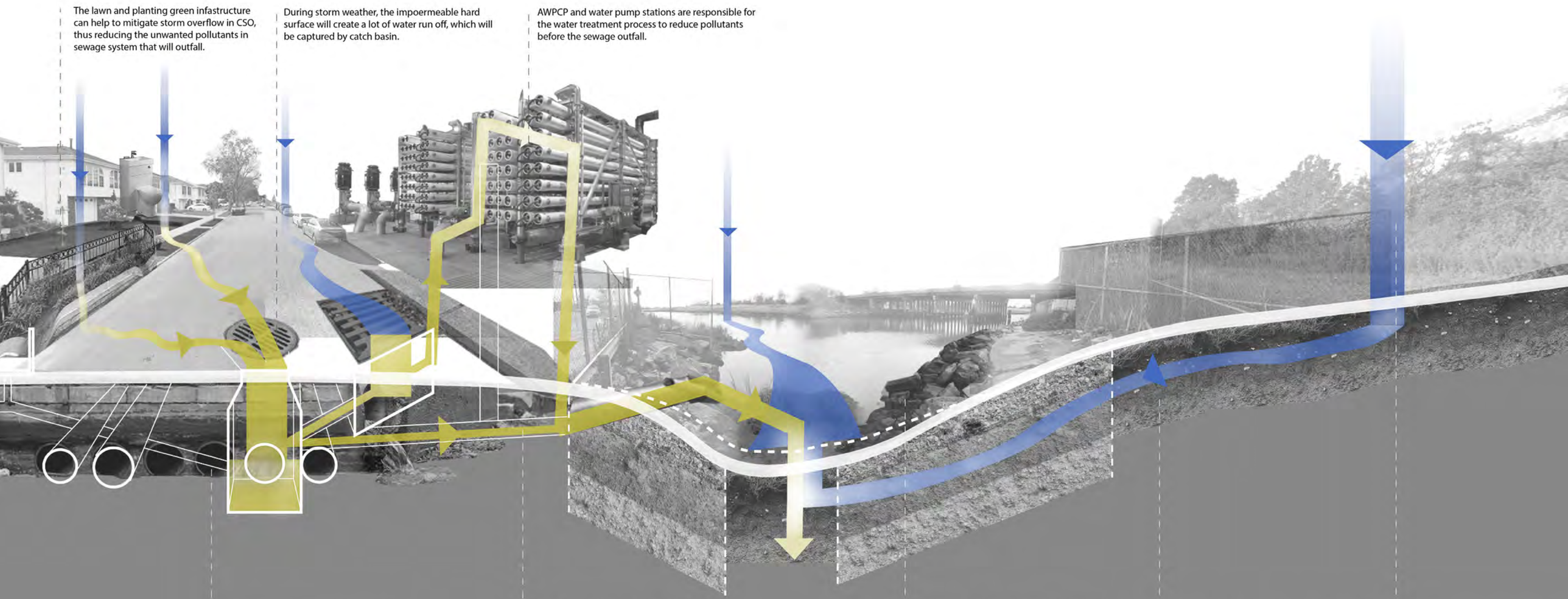


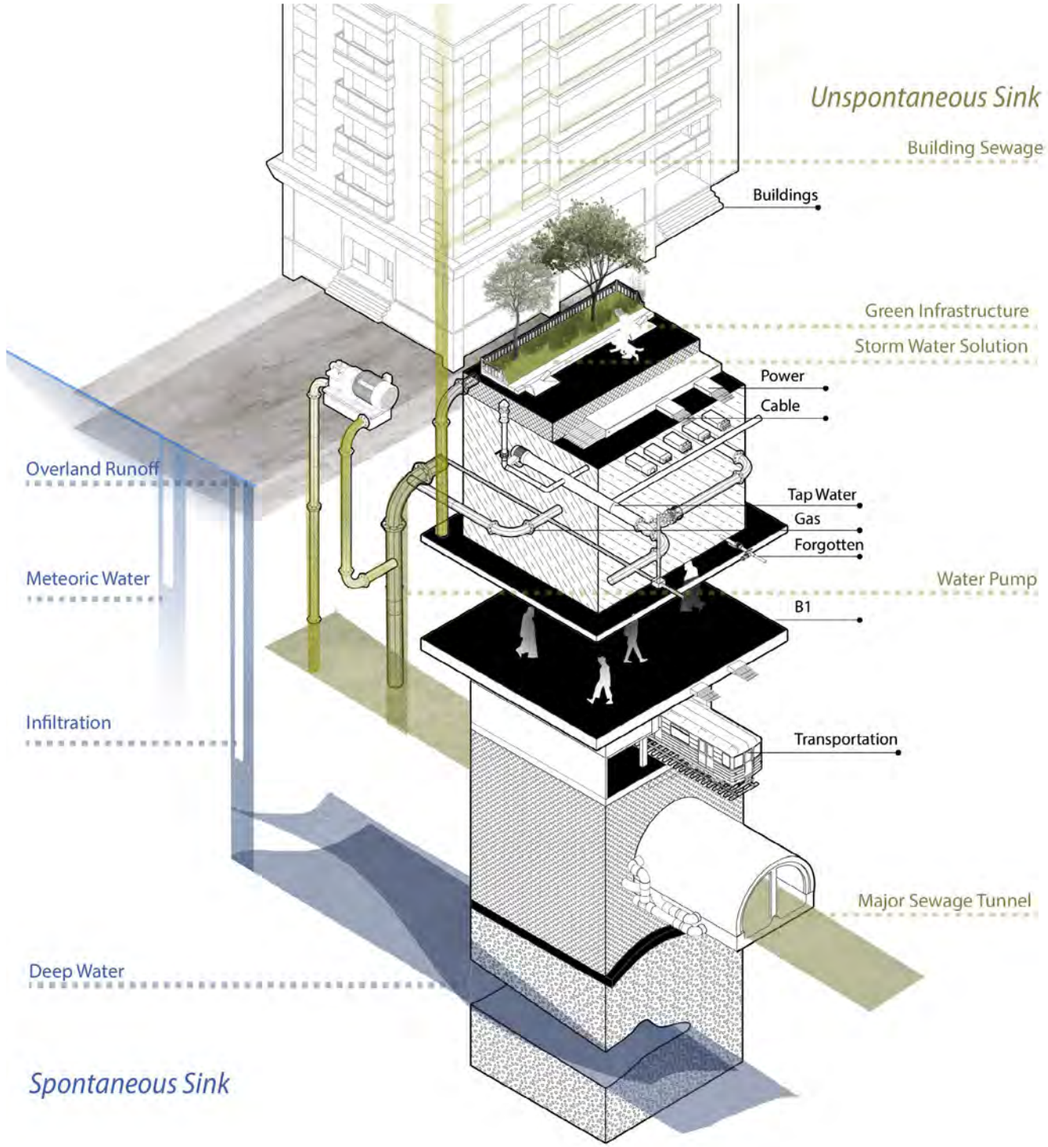


Our project studies a certain geological condition shaped by water - the salt marsh degradation in urban vicinity. As shown on the map, salt marsh is coexisting with a lot of coastal cities.

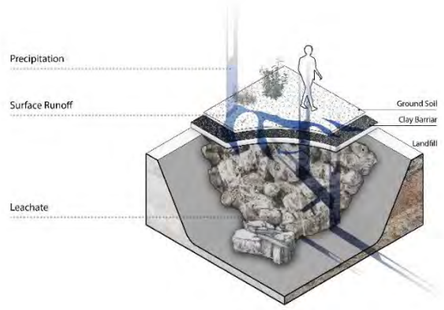
NYC CSO sewage system that flows to the creek near Jamaica bay

View from Spring Creek





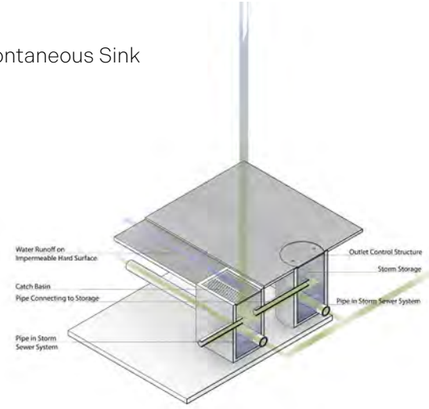
Spontaneous Sink



Landfill sink

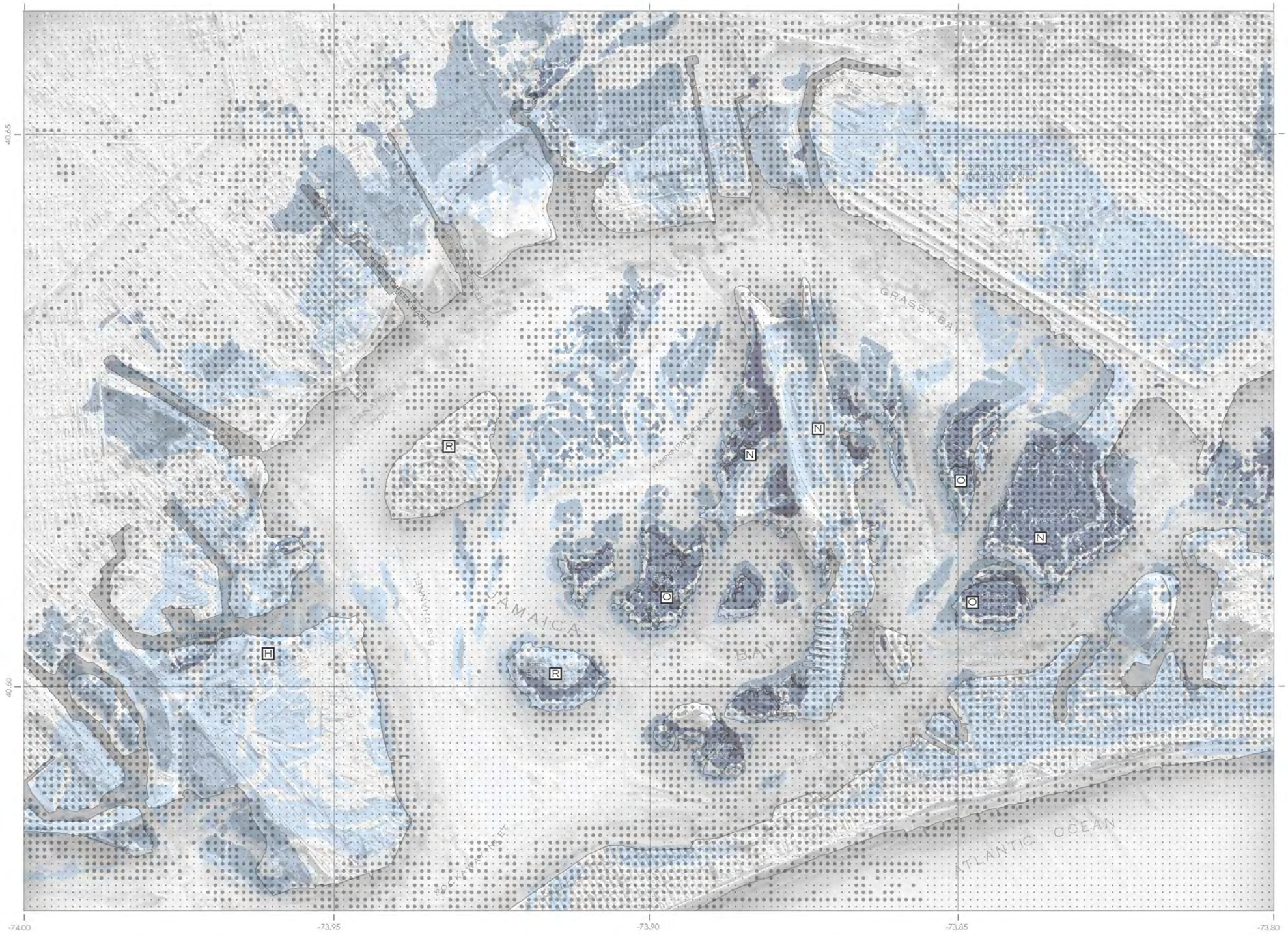
Wetland sink

Unspontaneous Sink



Catch basin

Green infrastructure



Soil Depth

Salt Marsh

1879 1948 2011

Watershed boundaries

Herp reintroduction area

Rookery

Bird nesting / Migration site

0 mi 0.5mi 1 mi

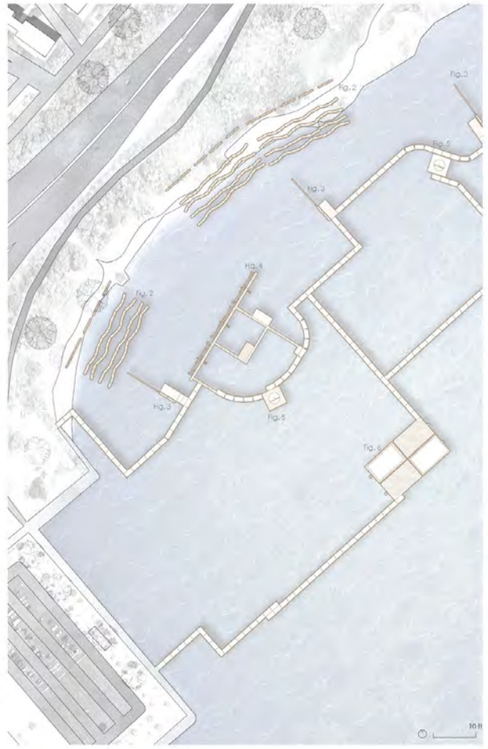
Jamaica bay's spontaneous watershed shows the flow of water through different media of surfaces under the influence of gravity, wind and etc. Water flows freely without human directed direction.

Jamaica bay's un spontaneous watershed contains external forces, such as capturing,pumping up, and dumping out water, which move water from urban environments to coastal areas.

Humans have been inventing machines to produce labour, profits, and values.
However, machines in out project are invented as imaginations for a different kind of labour on landscapes. Instead of exploiting the landscape, the 'labour' is a actually **playful way** for human and all apecies to experiment, **interact with landscape**. Hybrid machines on Jamaica bay act as a way of emerge hybrid water action, dealing with differnet problems in salt marsh degradation-pollution, sea level rise and erosion.

Zoom-in Map

Site Plan - Location A

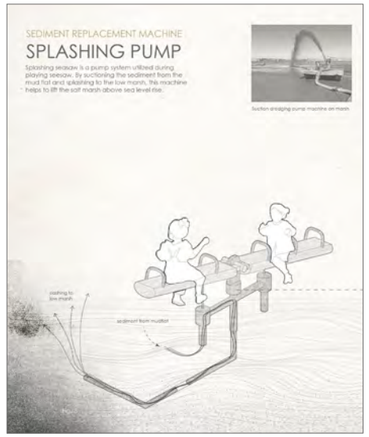


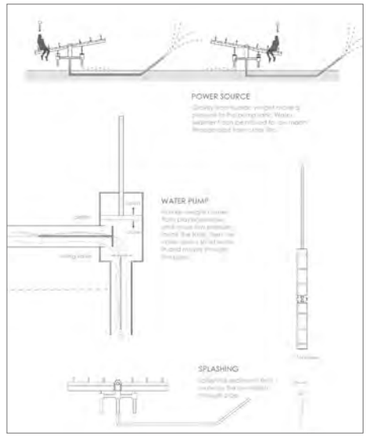
Site Plan - Location B

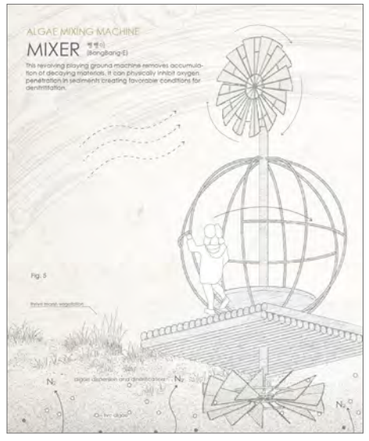
Fig.1 Fig.2 Fig.3 Fig.4 Fig.5 Fig.6

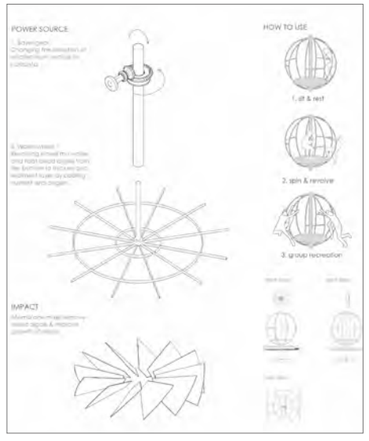
existing boat route
possible boat route in future

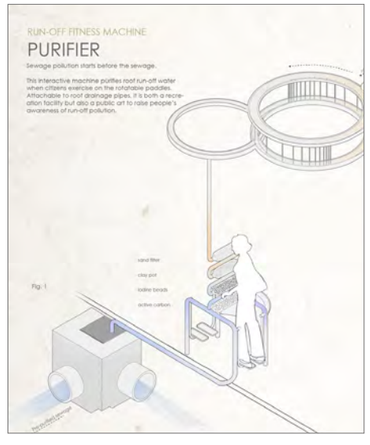
habitat area

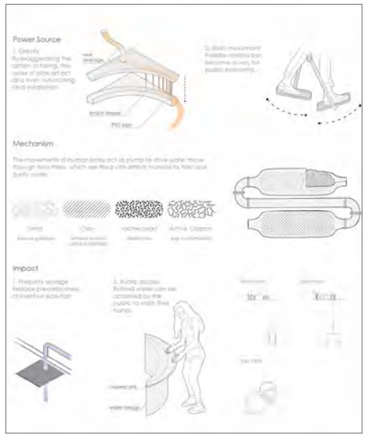


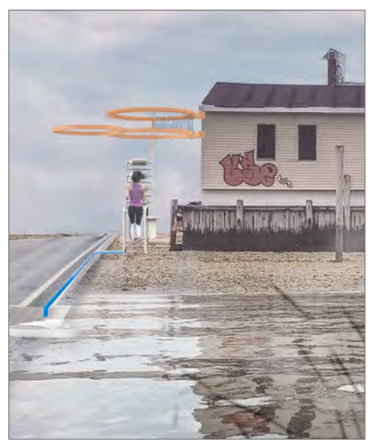












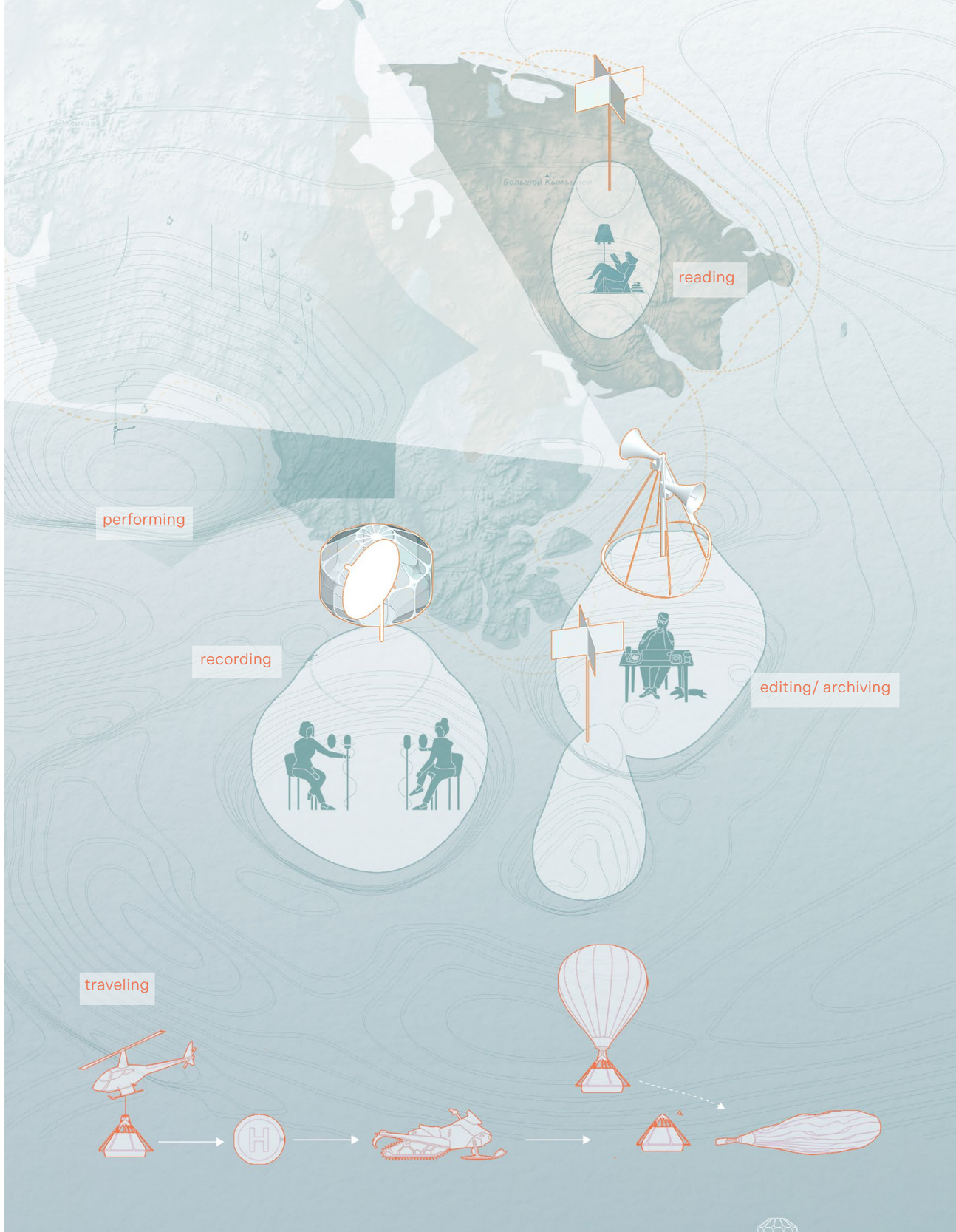
Each machine filterates, replace, mixing, splash, and capture the water in a theatrical and playful wats of interacting water.

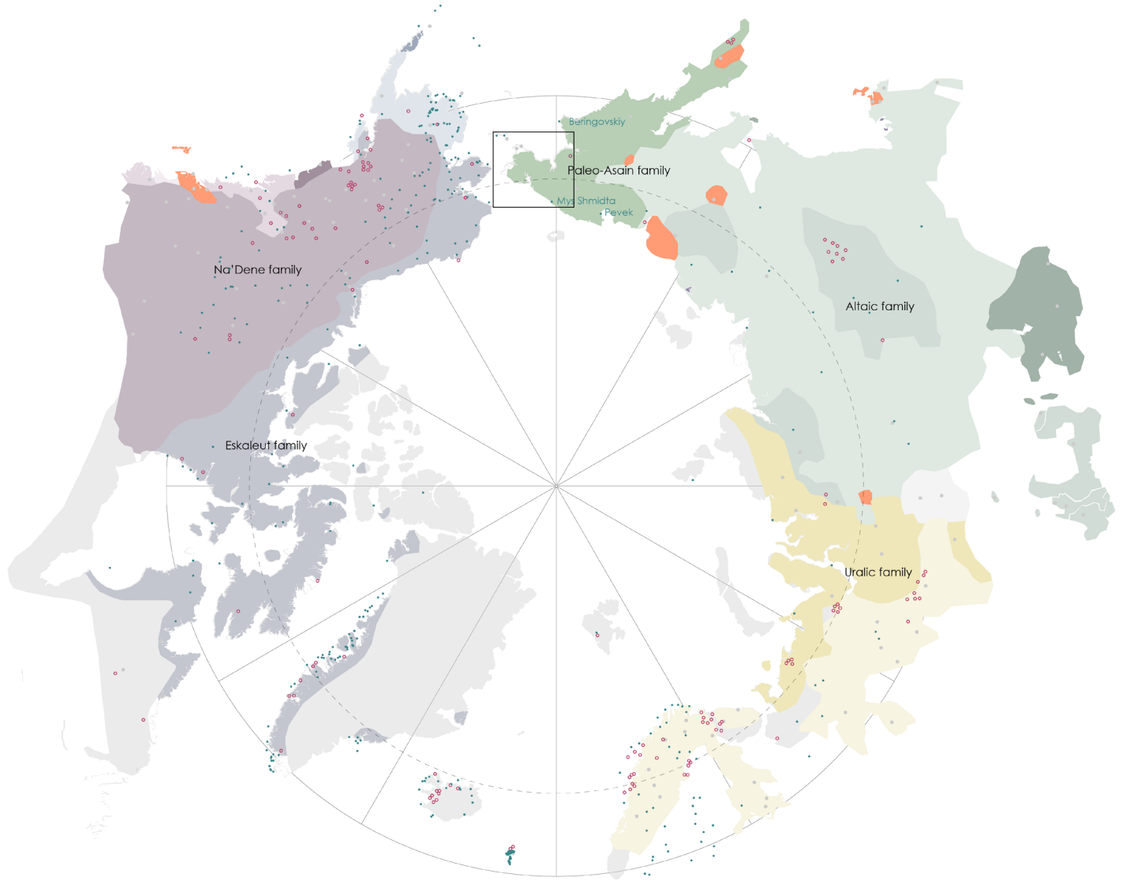

NYC DEP
H.S.V. OSPREY
DEP

02
STORYTELLER CHUKOTSKY

Traveling education center for indigenous people in Russian Arctic area

GSAPP Adv Studio V 2022
Professor Leslie Gill and Khoi A. Nguyen





Language Family

Na'Dene family — Tlingit | Athabaskan | Eyak

Eskaleut family — Yupik group of Inuit Yupic | Inuit group of Inuit-Yupik | Aleut

Altaic family — Tungsuo-Manchurian | Turkic | Mongolic

Paleo-Asain family

Uralic family — Finno-Ugric | Samoyedic

Language Isolates

Ket, Nivkh, Tsimshianic, Haida, Yukagir

- **Indigenous Language Group**
- **Small communities**
- **Higher Educational Institutions**

Universities and other educational institutions on post- secondary and tertiary level

The Storyteller Chukotsky project aims to preserve the endangered Indigenous languages and cultures in Chukotsky, Russia, by providing recording, editing, and archiving studios that will be available for daily use by local people.

The project consists of two parts: a permanent landscape that implies temporary program by design, and a temporary part that changes according to seasonal usage. This temporary part includes a performance hall and a portable unit that can be plugged into the existing landscape for recording, editing, and archiving purposes.

The project is of significant importance because there are over 40 endangered indigenous languages in the Arctic, and the Chukotka area lacks higher education institutions, making it even more crucial to preserve these cultures.

Lorino, in Chukotsky District of Chukotka Autonomous Okrug, Russia

There is only one high school in Lorino and only primary education is available in most of the other villages. The villages are isolated and only towns and adjacent villages have paved roads; there are no railways, but there is a heliport and an airport. Lorino has a rich water source and its landscape is connected to nature through the waterway.

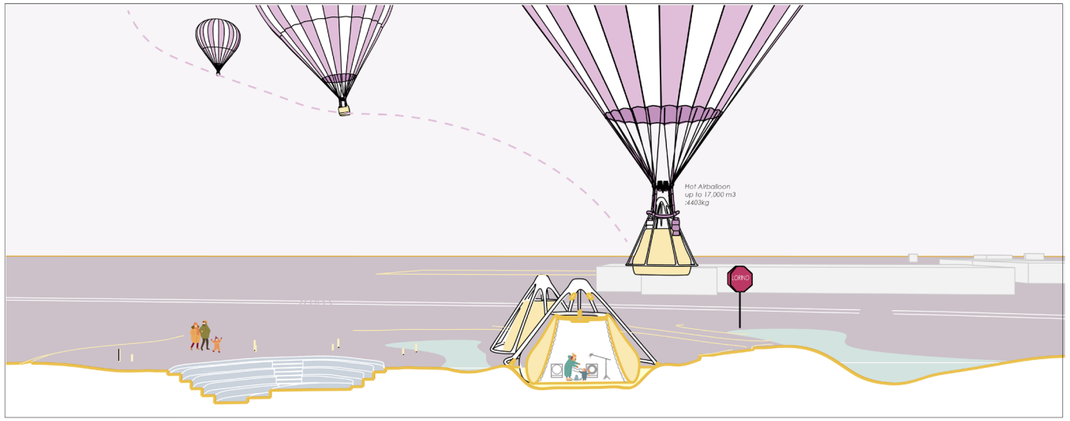
Seasonal changes

Traveling education center

Winter

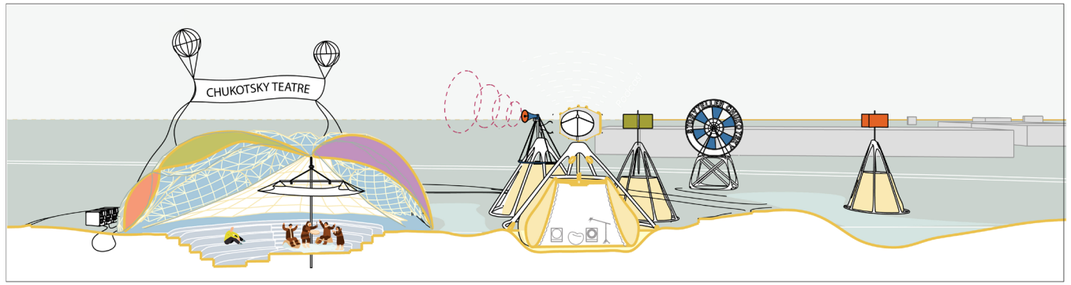
Summer

Fall/ Spring



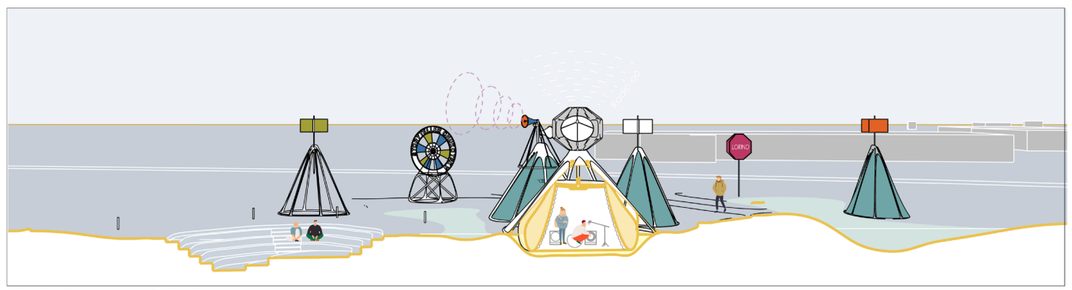
Early Summer *May- June (Avg -0.7~5.6°C)*

untis delivered via airballoon



Summer *Jul- Sep (Avg 5.4~10°C)*

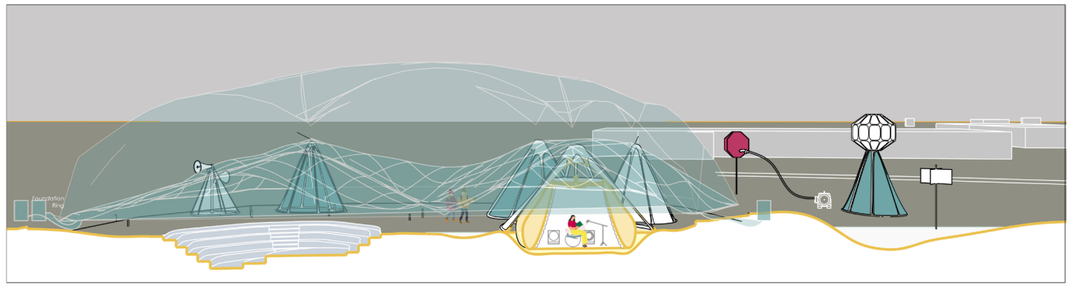
temporal inflatable performance hall



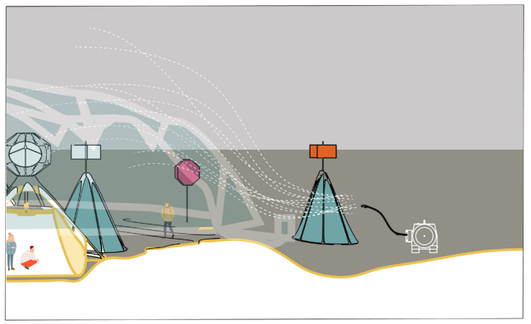
Late Summer & Fall *Oct- Nov (Avg -3.0~-9.8°C)*

open space

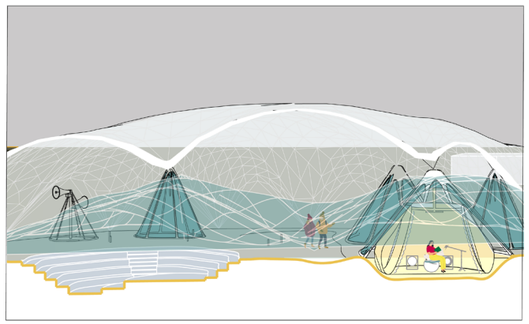
Storyteller Chukotsky have permanace basement landscape with temporary elemenets.
Whole program works as an annual cycle with inflatable performance center, portable unit, snow dom by season.



inflating pneumatic formwork, by using 2D membrane bag



application of snow and water

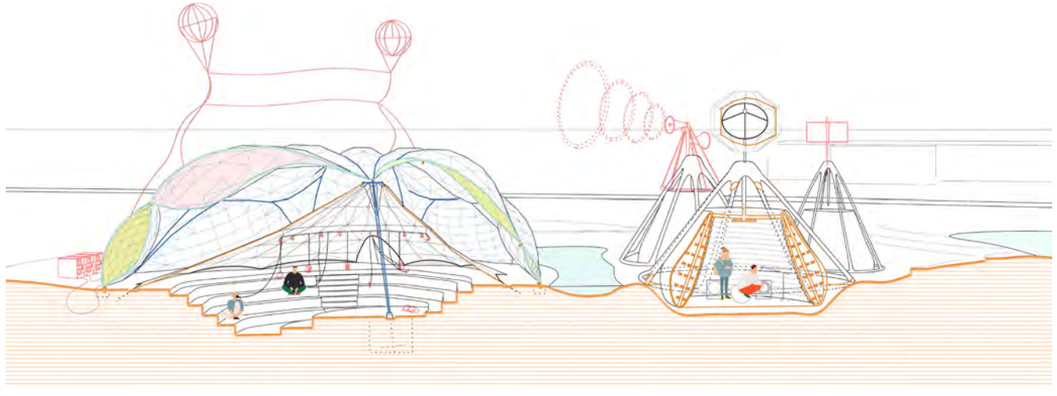


deflating membrane

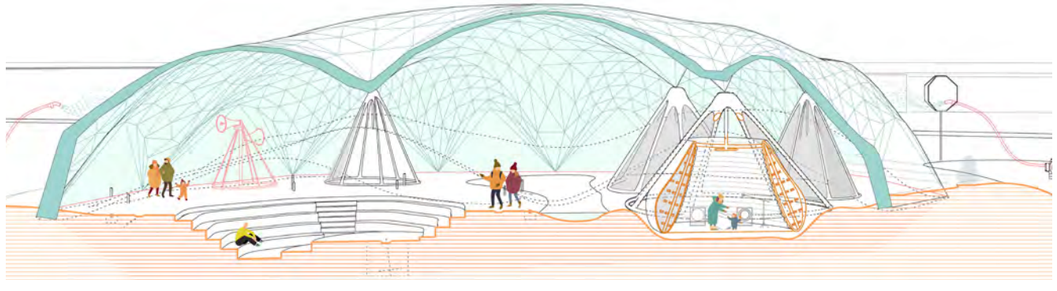
Winter *Dec- Apr (Avg -15.2~ -23.9 °C)*

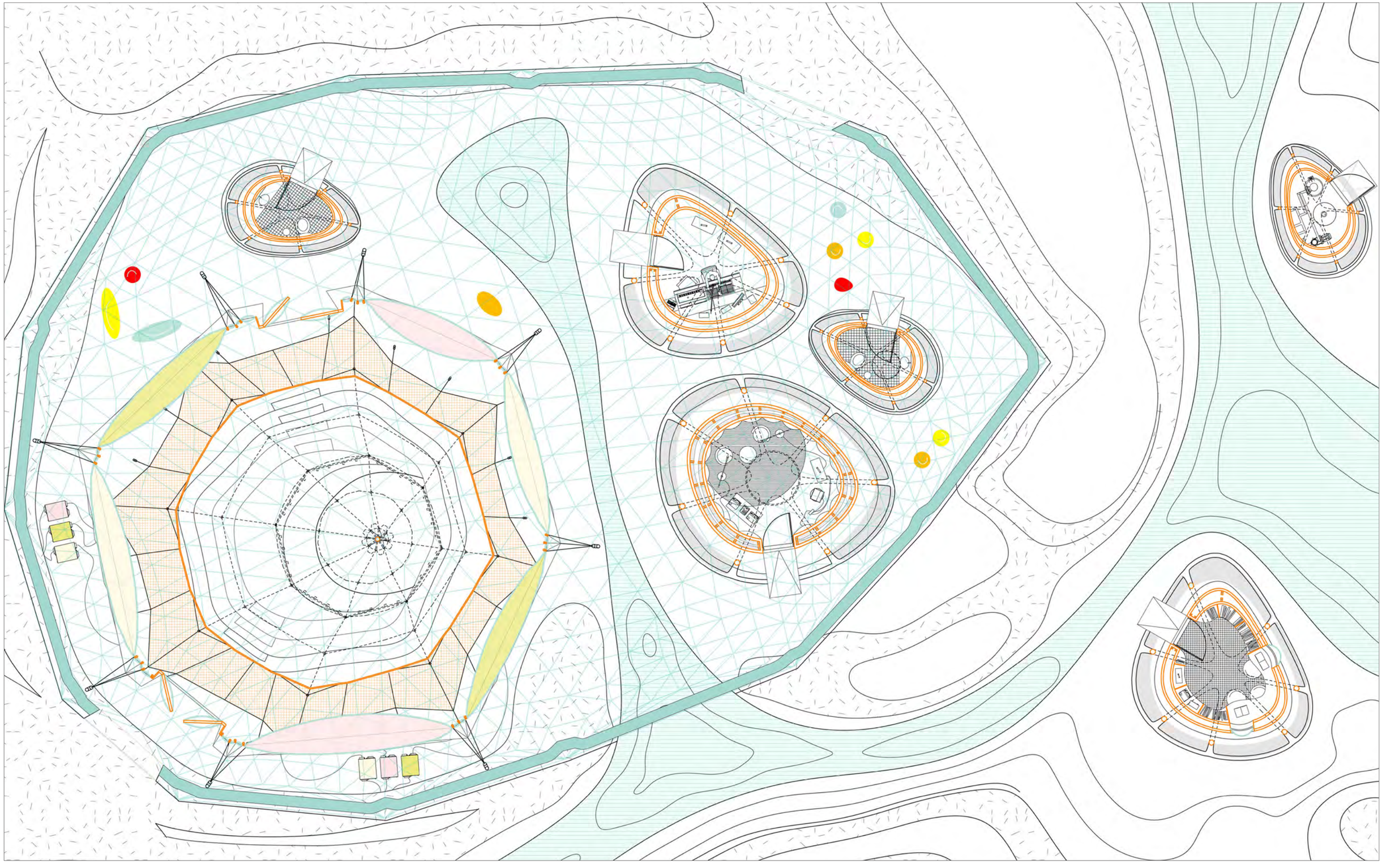
completion of ice shell construction

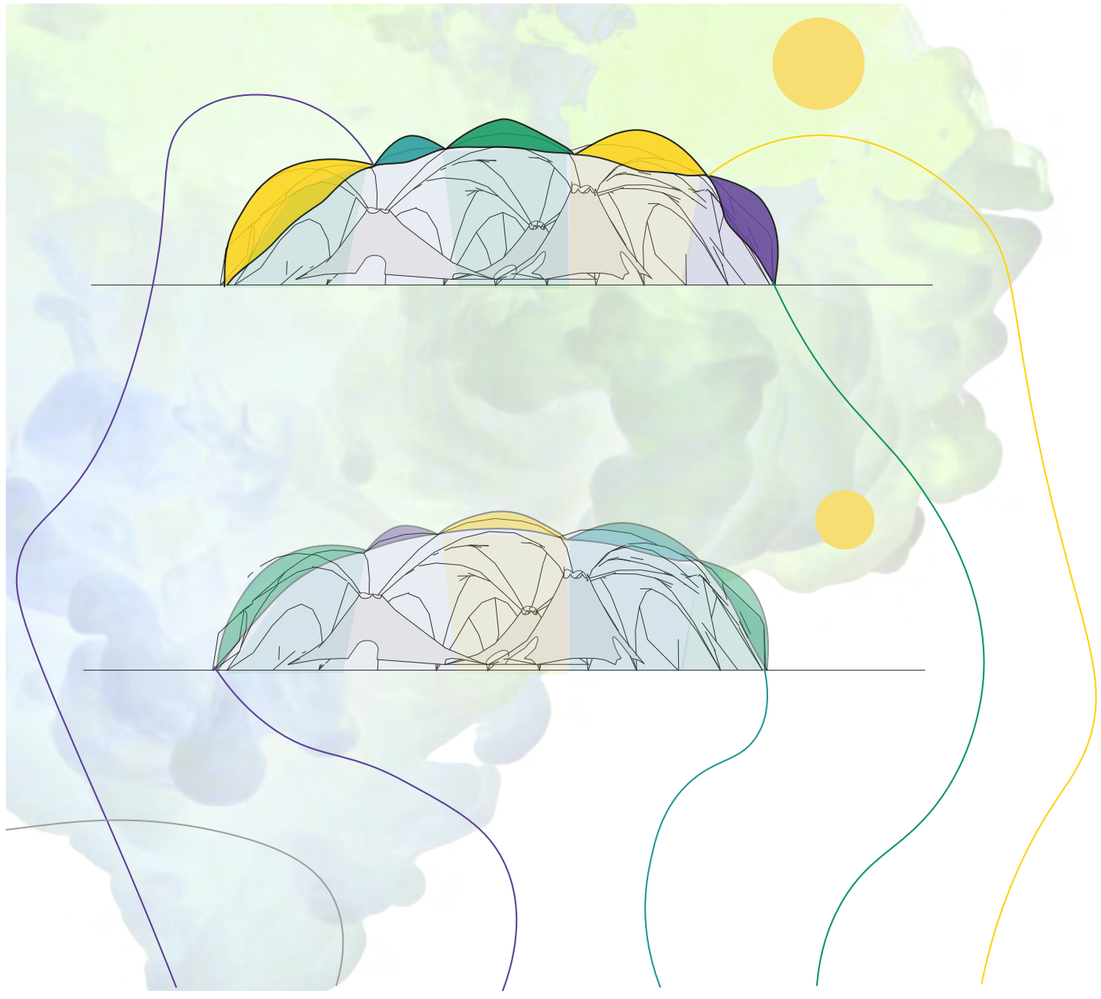
Summer

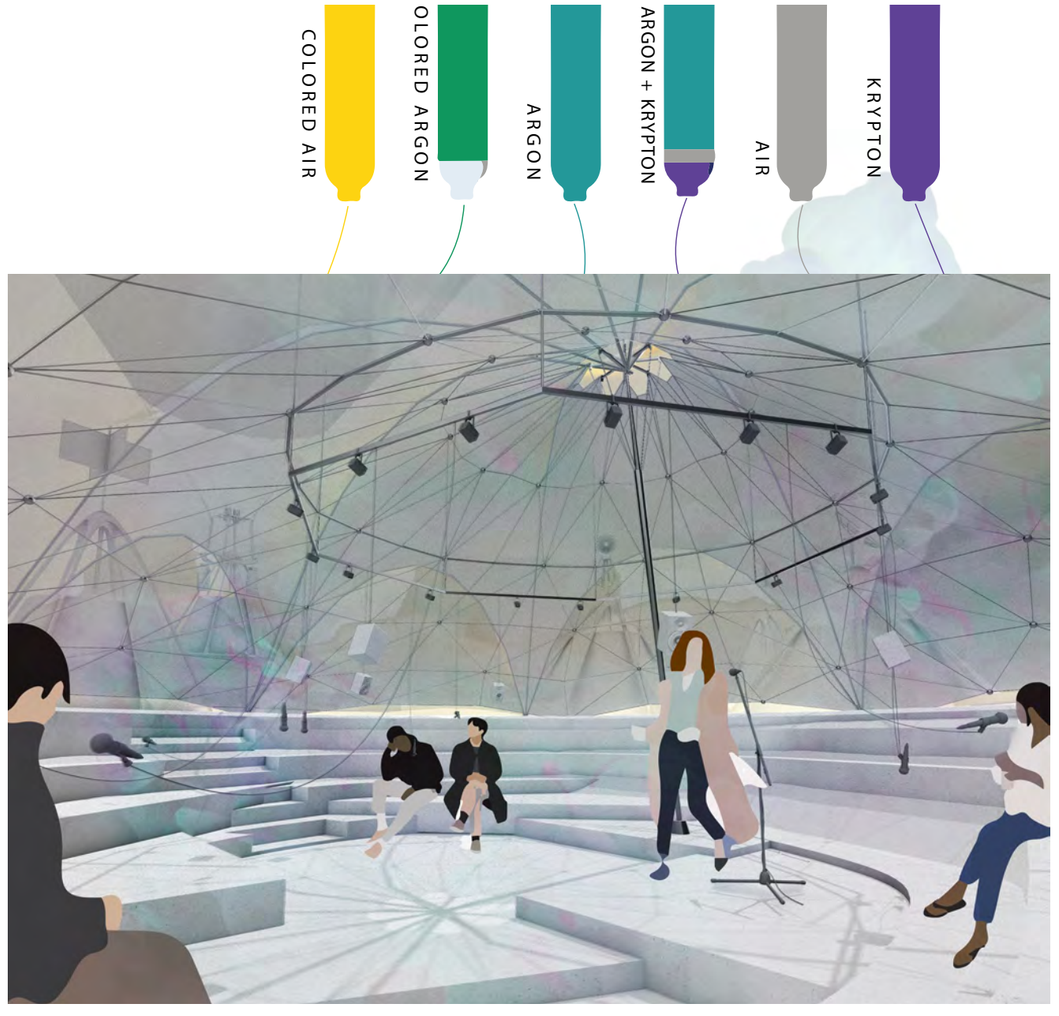


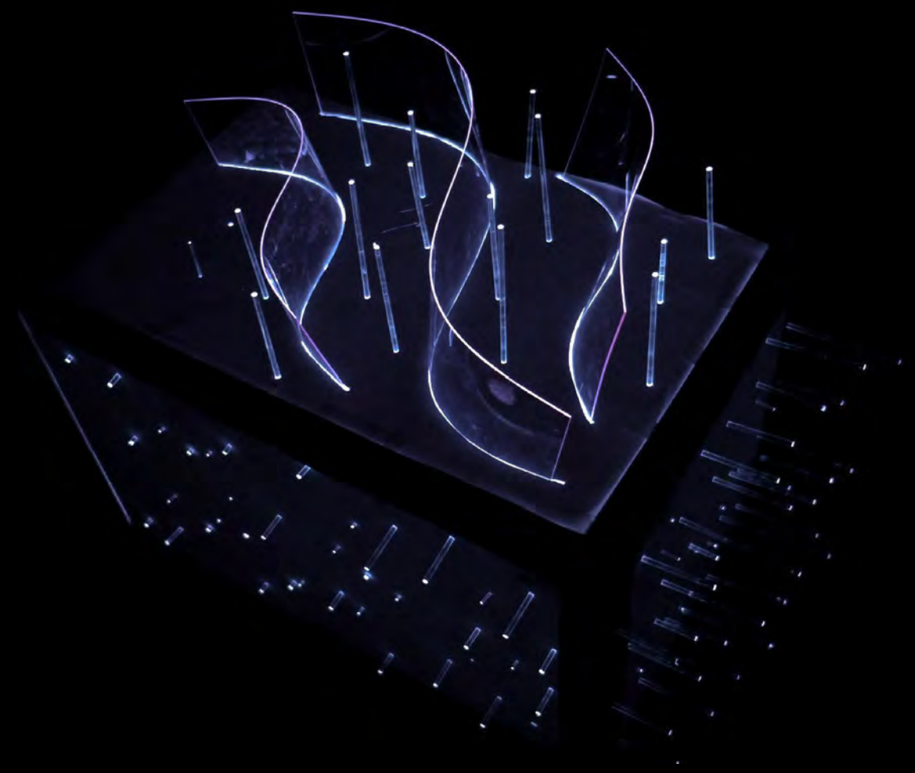
Winter



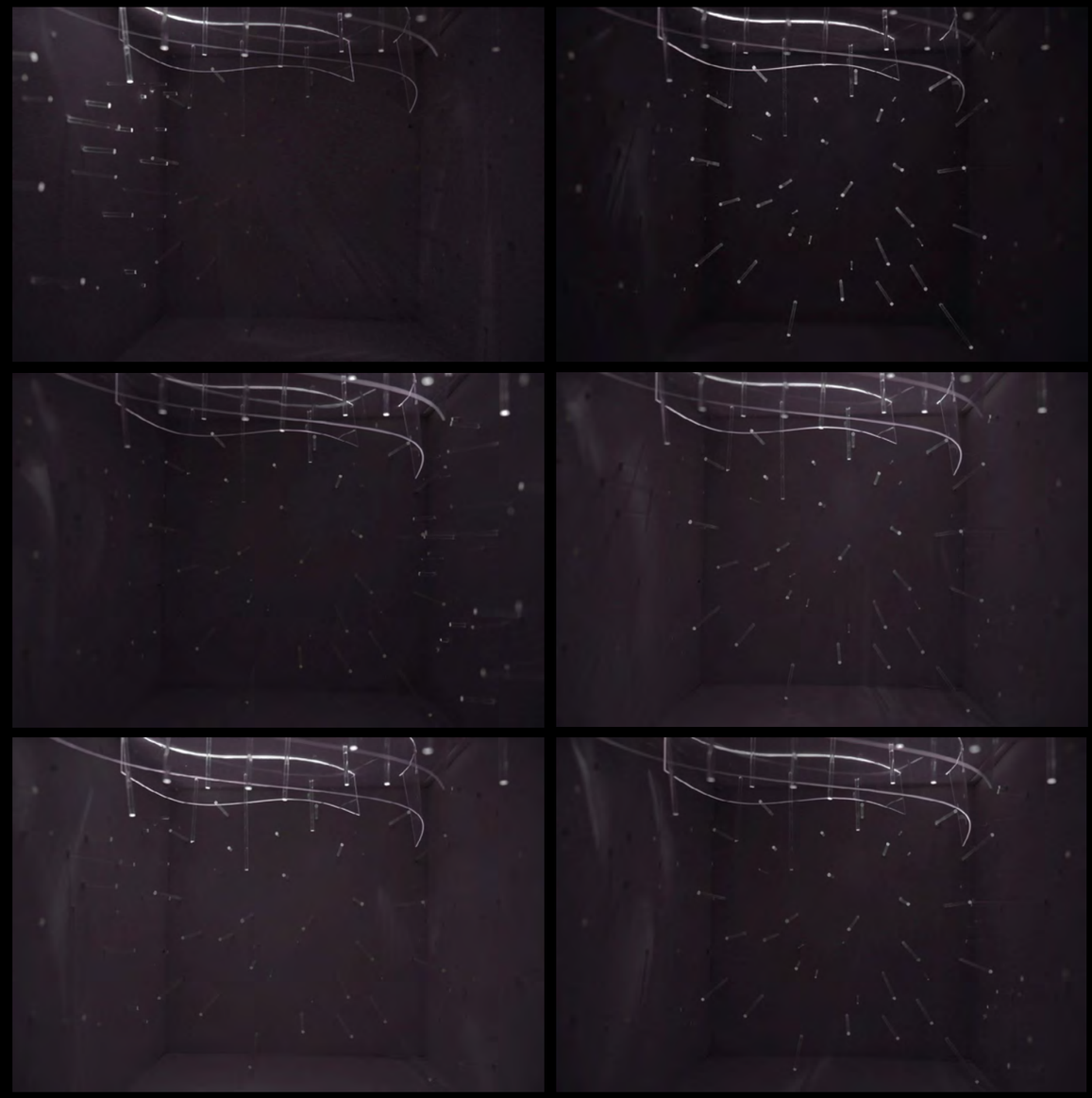





COLORED AIR
OLORED ARGON
ARGON
ARGON + KRYPTON
AIR
KRYPTON



Inside to Outside



Outside to Inside

Landscape Model_ Foam, spackle

Icedome

Inflatable performing center

03
EVERYTHING COMES TO LIFE

Instructions for animating non-living objects by making

GSAPP Adv Studio VI 2023
Professor Ada Tolla, Giussepe Lignano and Thomas De Monchaux

흐르는 돌

보행하는 금속

기지개를 켜는 나무

숨쉬는 플라스틱

EVERYTHING COMES TO LIFE

To me, everything possesses a sense of liveliness, even if it may appear inanimate. Objects respond to external stimuli and undergo gradual changes in different scales of time and space.
For example, the rocks in Joshua Tree desert slowly erode and transform due to external stimuli such as wind, water, and geological movements. These are processes that happen in reaction to the objects' environments rather than independent occurrences, leading me to believe that even seemingly lifeless objects are imbued with vitality.

I utilize discarded, abandoned, or ignored scraps of various materials, and through techniques such as stacking, pouring, cutting, threading, weaving, and inflating, I infuse them with energy with motility, volition, and reproduction. Making is a process of letting a structure act or react by itself. Each material relates to one another, creating a network of energy and emotion. The result is an object that breathes, runs, and even tears, much like us.

흐르는 돌

01. MASONRY THAT FLOWS

I find broken pieces of pavements in the Riverside park and stack them vertically. To connect those pieces together, I insert poured vertical columns made of Rockite naturally flow through gravity.
First, I pour Rockite onto each group of rocks, creating a balcony space that showcases its fluidity as it spread across the ground. Then, I stack these groups again and pour Rockite on top to complete the structure.

While the Rockite appears liquid on the surface of the rocks, it quickly solidifies to form vertical columns that interlocked the entire structure. The stacked Rockite on the suggests height while working as joints to connect the rocks together. The finished structure resembles a cake with flowing cream, resulting in an intriguing surface that captures the essence of its past fluidity.

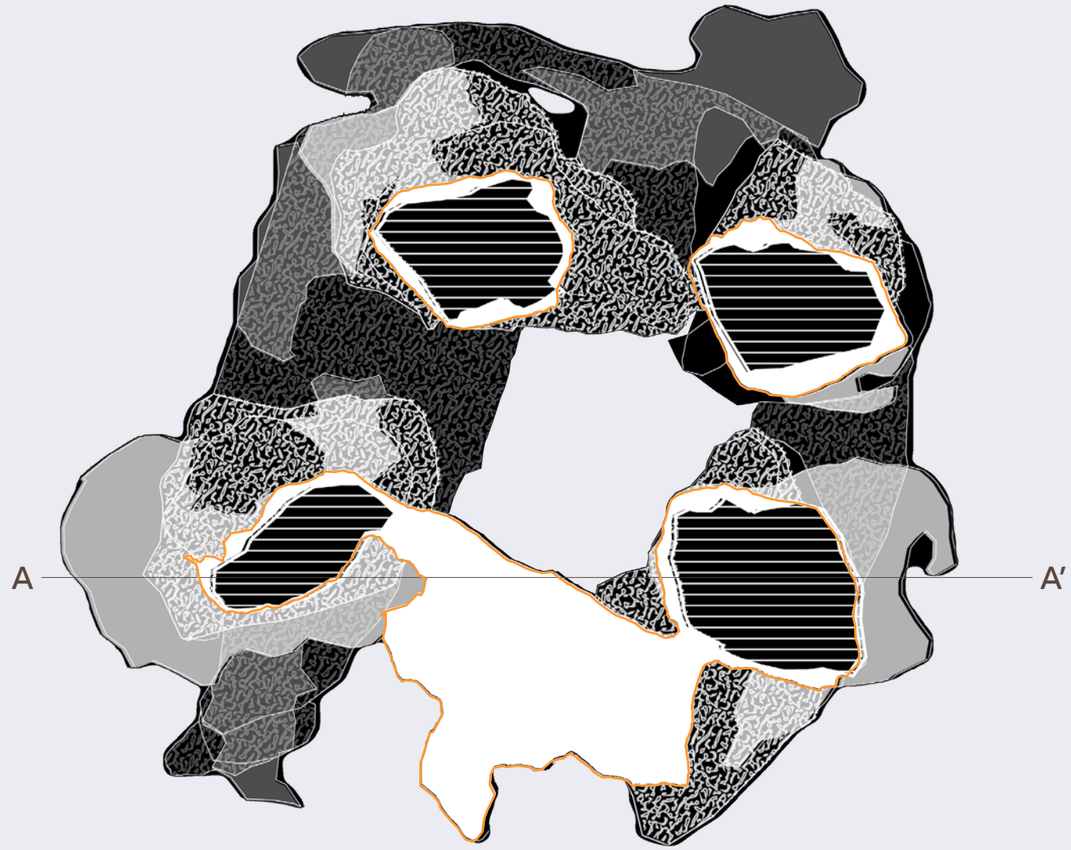
시간을 타고 흐르는 석재

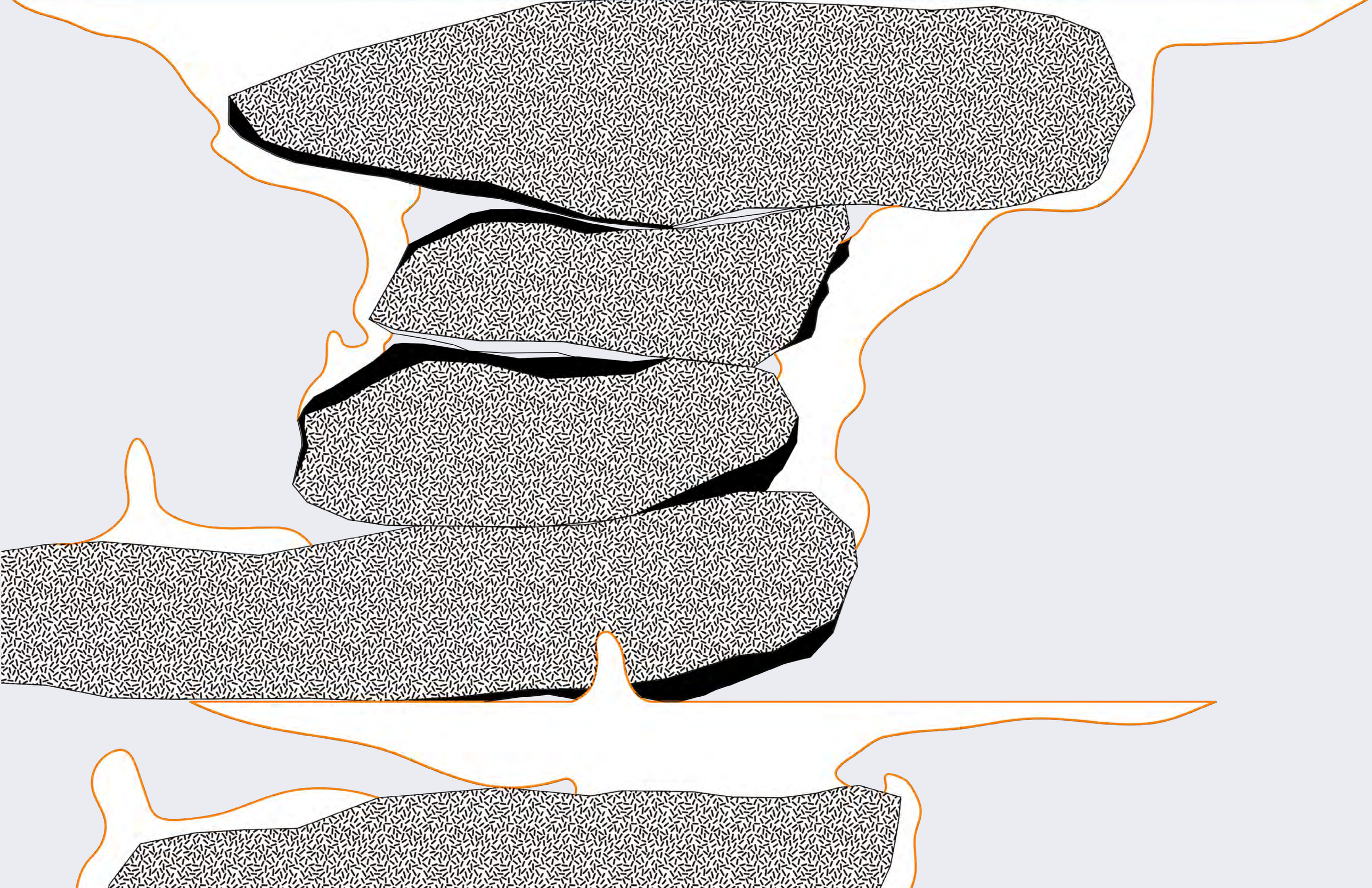
조르르 아스팔트위를 주르륵

떨어진 다 똑똑 뚝 물 방울 부

A-A′ vertical section

B-B′ horizontal section

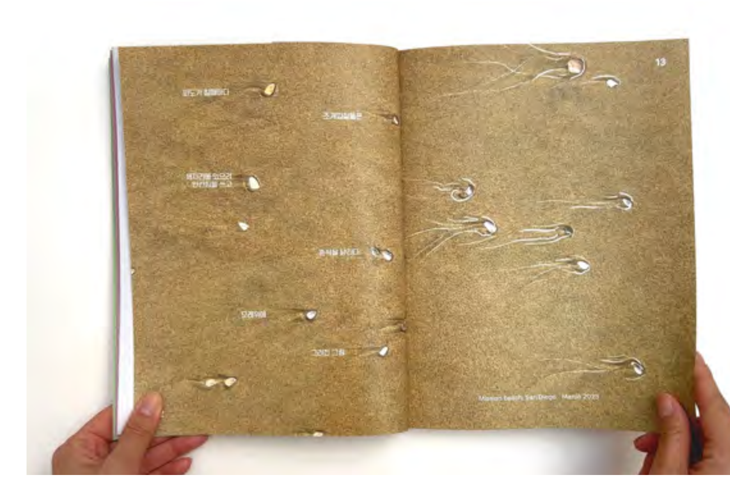


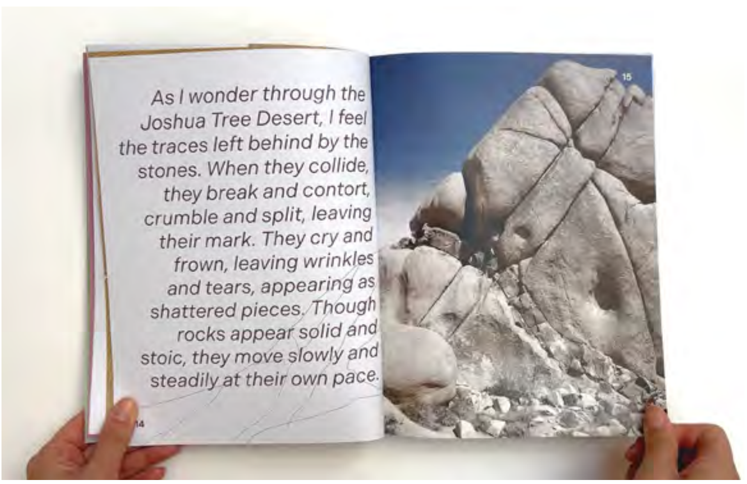



MASONRY THAT FLOWS
07
EVERYTHING COMES TO LIFE
흐르는 돌


09
OBSERVING
MASONRY THAT FLOWS


In the Mojave Desert, I climbed the sand dune, following the footsteps of the person ahead. The sand was flowing like a liquid dance. As we ascended, the slope grew steep. The sand flowed down, in a motion so deep. Like a cascade of water, it tumbled down. With the wind, it vanished. A cycle of life, a pure rhythm.




As I wonder through the Joshua Tree Desert, I feel the traces left behind by the stones. When they collide, they break and contort, crumble and split, leaving their mark. They cry and frown, leaving wrinkles and tears, appearing as shattered pieces. Though rocks appear solid and stoic, they move slowly and steadily at their own pace.


MAKING
MASONRY THAT FLOWS
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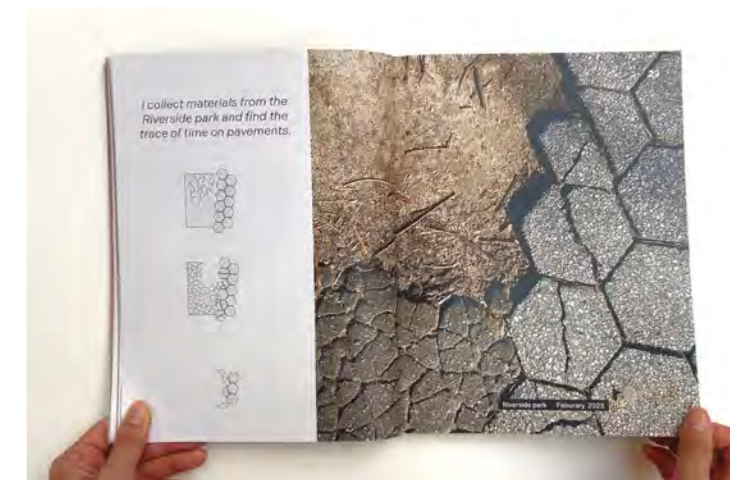

I collect materials from the Riverside park and find the trace of time on pavements.


27
ROCKITE


Pouring
MIXING

보행하는 금속

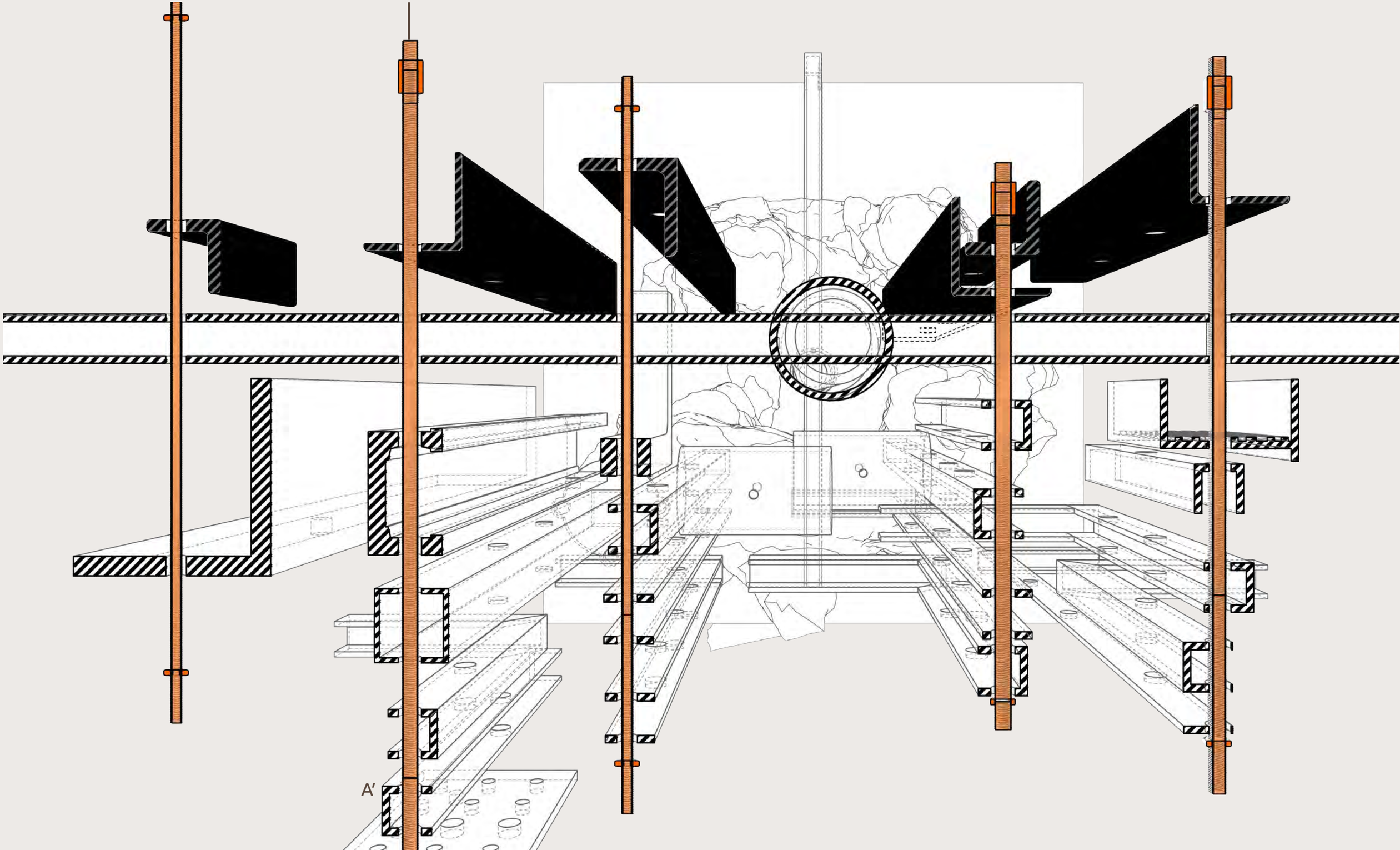
02 METAL THAT WALKS

As an IT student worker at Columbia, I often visit the hidden dumpsters on campus to dispose of used ink cartridges. On one such visit, I stumble upon a storage area filled with various signs, stools, and temporary construction materials. I end up borrowing four shiny light aluminum sign frames used to guide people during events on campus. I also pick up some dark heavy metal scraps from the metal shop.

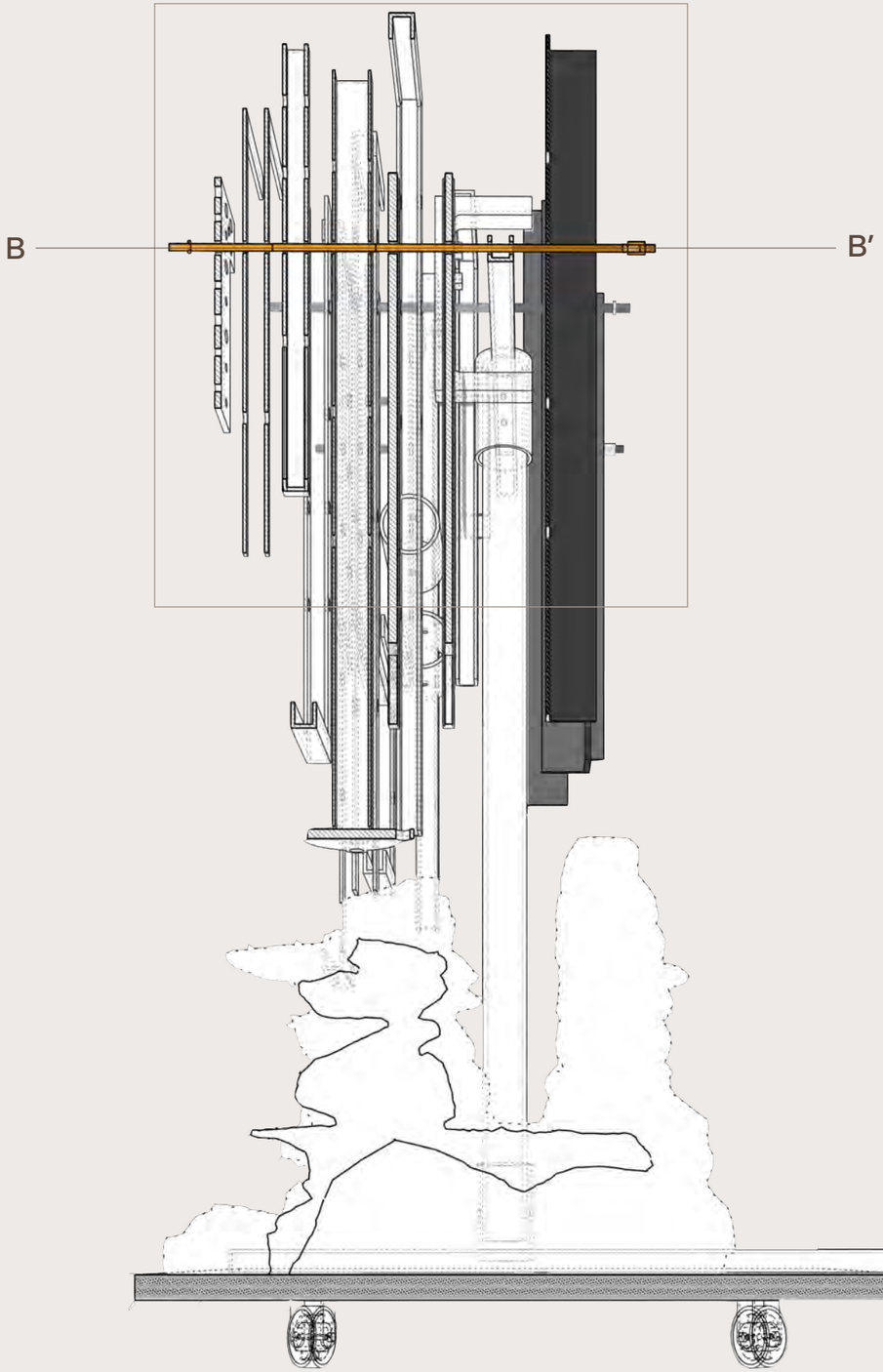
Next, I cut the aluminum signs in four pieces and drill three to four 10mm holes into all the metal scraps. I then thread the aluminum and black metal pieces onto a rod and secure each end using coupling nuts. The metal scraps swing freely resembling small limbs about to take off running.

This is a process of stimulating metal to make it capable of walking.

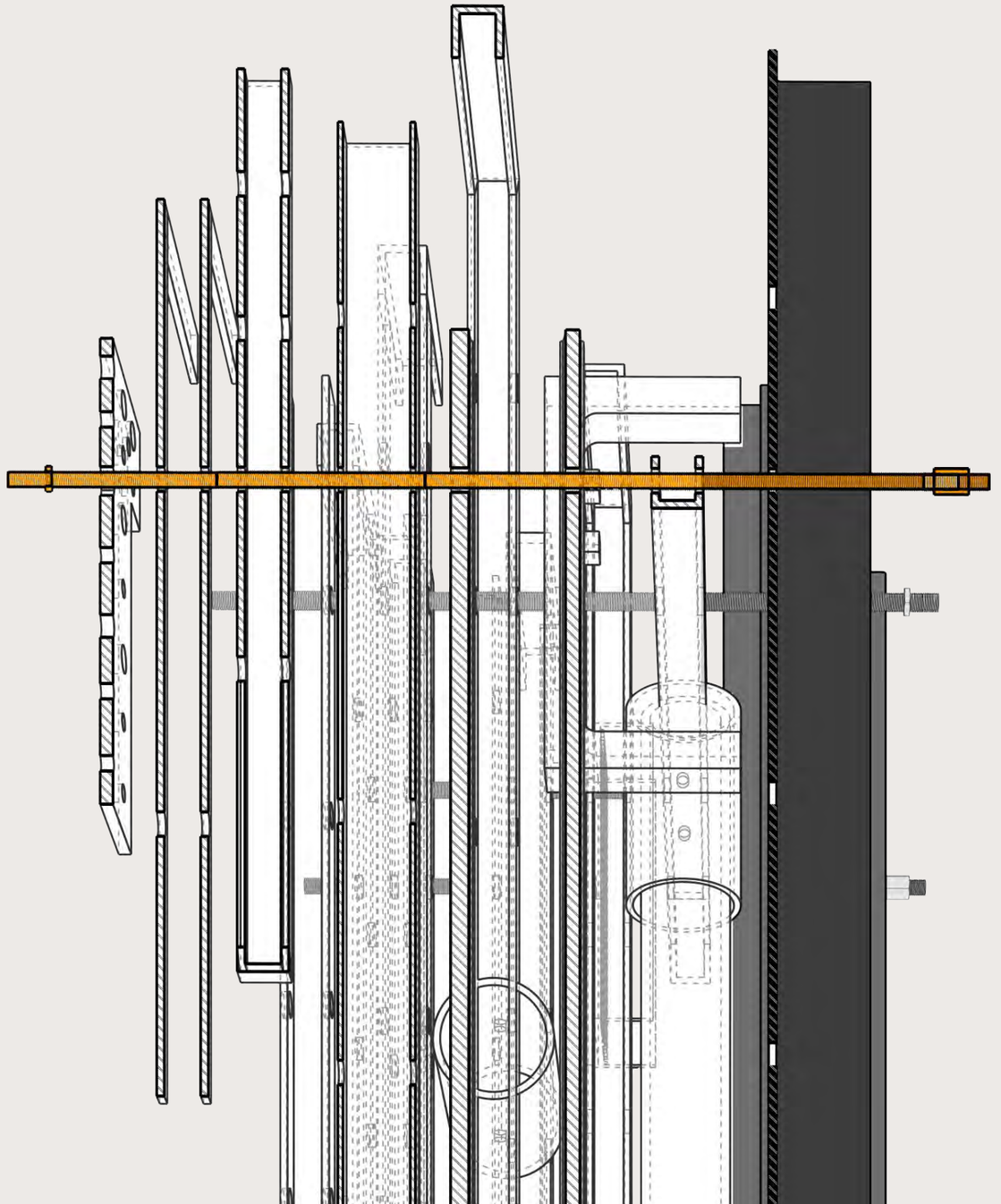
이것을 금속이 보행할 수 있도록 자극하는 과정입니다.


A′

A-A′ Vertical section



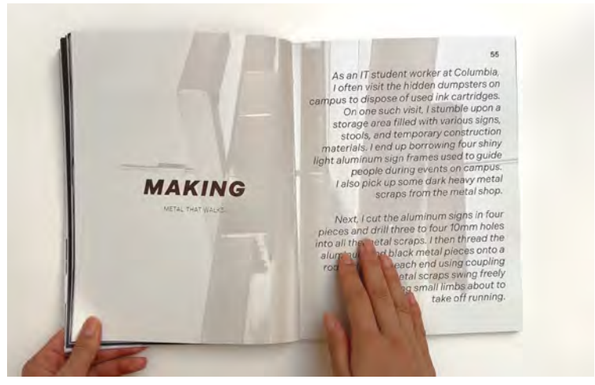
Metal that walks

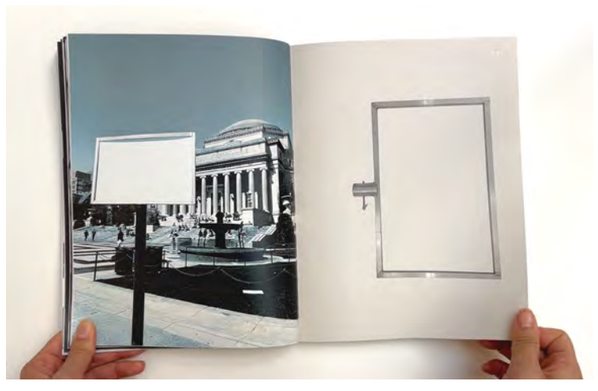


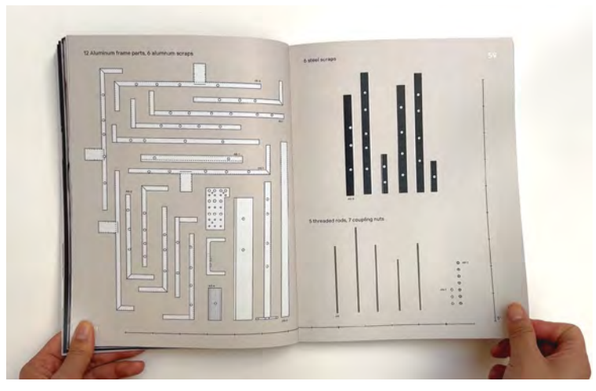

METAL
THAT
WALKS
EVERYTHING COMES TO LIFE
보행하는 금속


OBSERVING
METAL THAT WALKS
Metal fences encircle tightly, protecting trees from the street's harshness. But metal fences slowly bend low and lean towards the tree gently like friends huddling in the night. They shield the tree from the wind using their strength to support the tree.


In the construction site, there is a pile of metal scraps, the sound of their cutting echoes harshly. Every morning I wake to their piercing scream like a metallic symphony.
But once the cutting comes to an end, the scraps lay still, peaceful, and yet ready to ascend. They appear almost free, alive, and alert, as though they're waiting for something to exert. The scraps seem ready to move and take flight. Their potential to escape from the chaos is evident in every curve and twist.

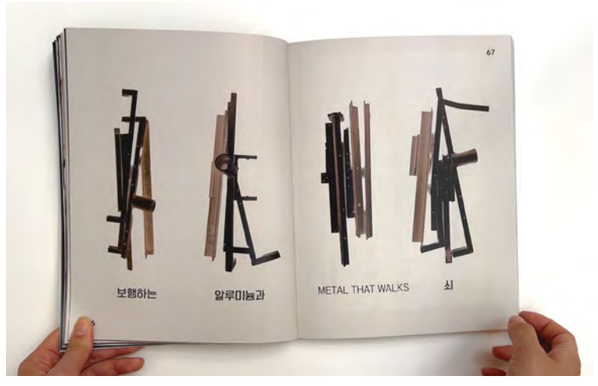

MAKING
METAL THAT WALKS
As an IT student worker at Columbia, I often visit the hidden dumpsters on campus to dispose of used ink cartridges. On one such visit, I stumble upon a storage area filled with various signs, stools, and temporary construction materials. I end up borrowing four shiny light aluminum sign frames used to guide people during events on campus. I also pick up some dark heavy metal scraps from the metal shop.
Next, I cut the aluminum signs in four pieces and drill three to four 10mm holes into all the metal scraps. I then thread the aluminum and black metal pieces onto a rod with each end using coupling nuts. The metal scraps swing freely like small limbs about to take off running.

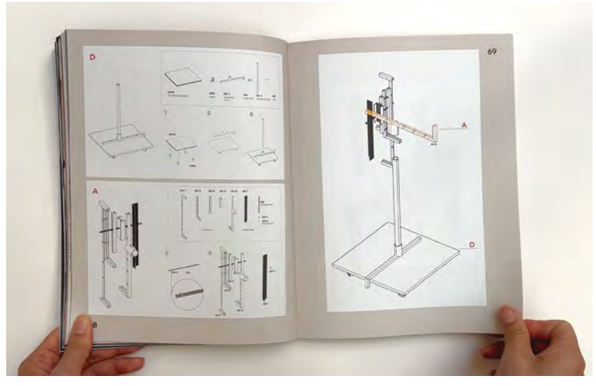


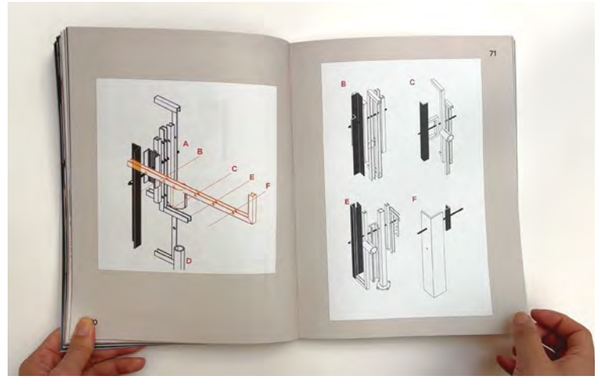

12 Aluminum frame parts, 6 aluminum scraps
6 steel scraps
5 threaded rods, 7 coupling nuts

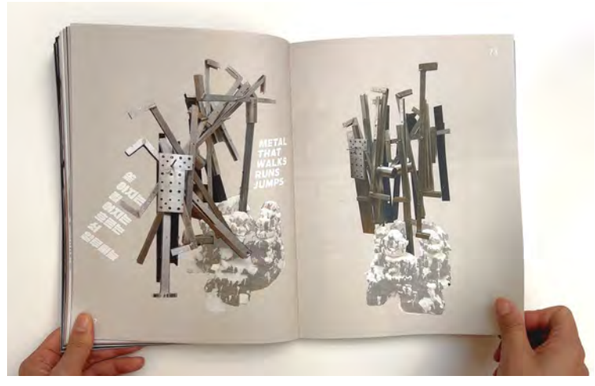

Cutting

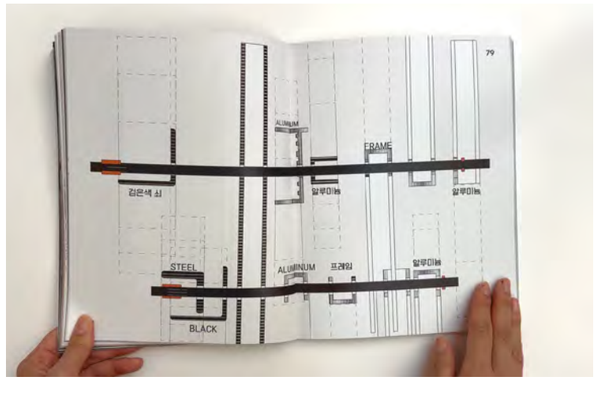

Tips.

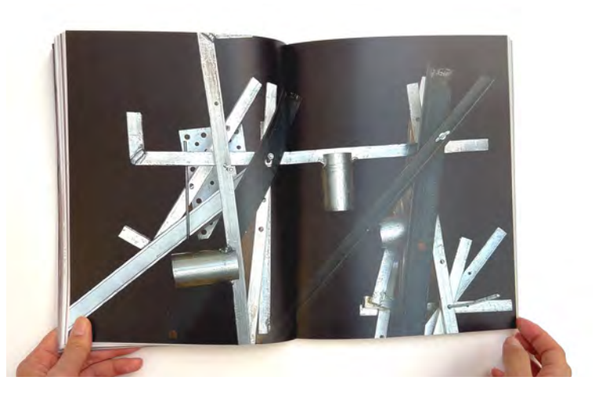

보행하는
알루미늄과
METAL THAT WALKS
쇠



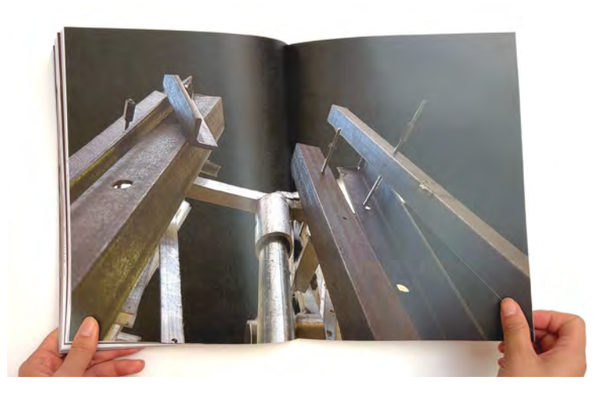



METAL
THAT
WALKS
RUNS
JUMPS


ALUMINUM
FRAME
검은색 쇠
알루미늄
알루미늄
STEEL
ALUMINUM
프레임
알루미늄
BLACK




I remember my mother's voice waking me up every morning during my school days



기지개를 켜는 나무

03 WOOD THAT STRETCHES

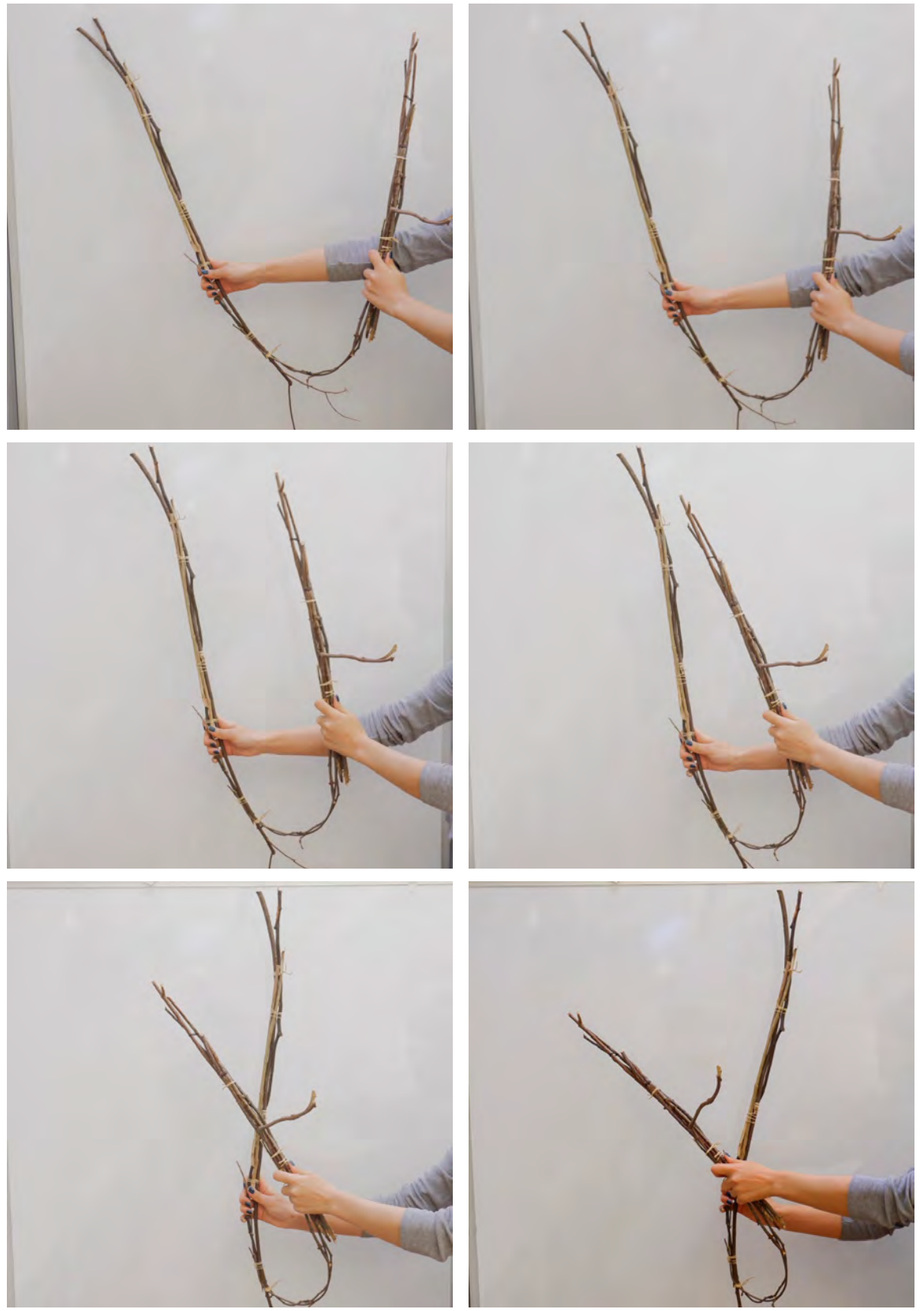
While wandering through Central Park, I collect a bunch of branches - some robust and rigid, while others more flexible and pliable. Seeing these differences reminds me of the human body, with its hard and flexible parts working together in harmony to facilitate movement.

To create something unique, I group the branches together into three distinct sets - one made of long, stiff branches, another of flexible ones, and a final group composed of shorter, rigid pieces. I then fasten them to a metal frame using elastic bands, allowing movement to transmit from the metal to the wood. To bring everything together, I utilize the flexible branches to connect the limbs, folding them in eight different places to achieve a bouncy movement. This assembly connects with the metal frame, and its distinct shape embraces and interacts with the other materials used. Overall, the result is a beautiful and dynamic object that demonstrates importance of balance and cooperation between hard and flexible elements.

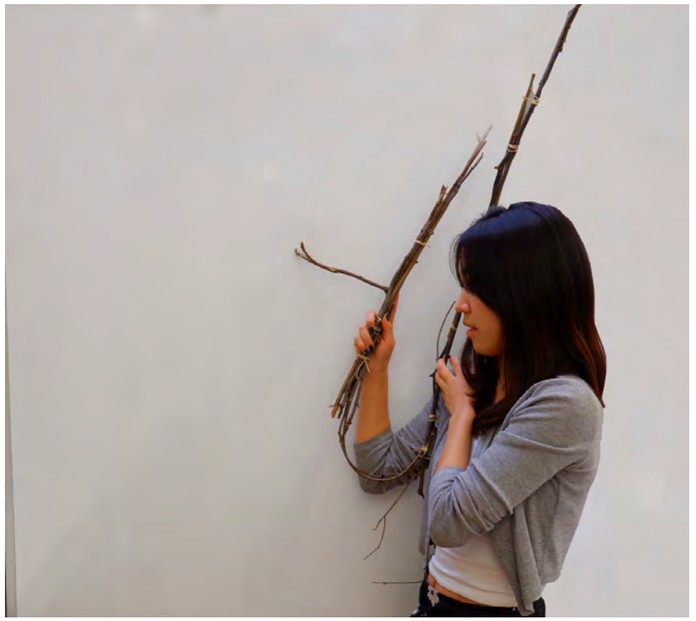
A-A' Vertical section

Connect two robusts and one flexible.

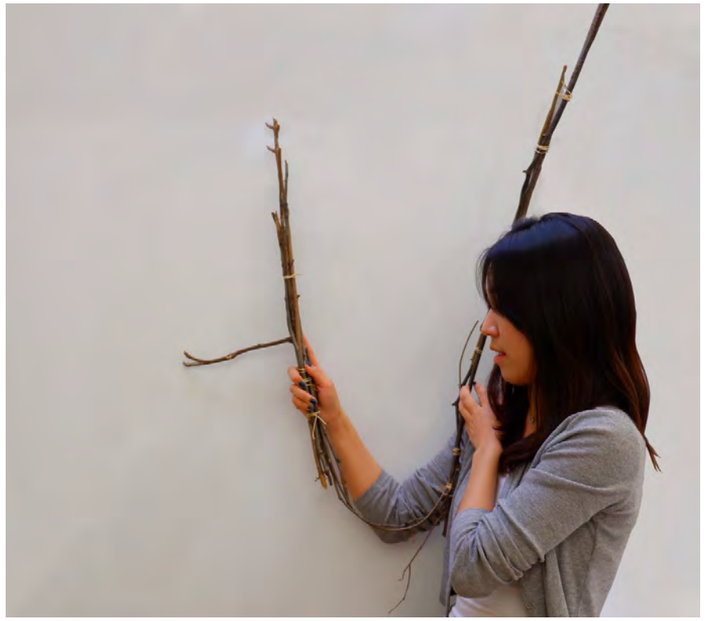
Wood that stretches



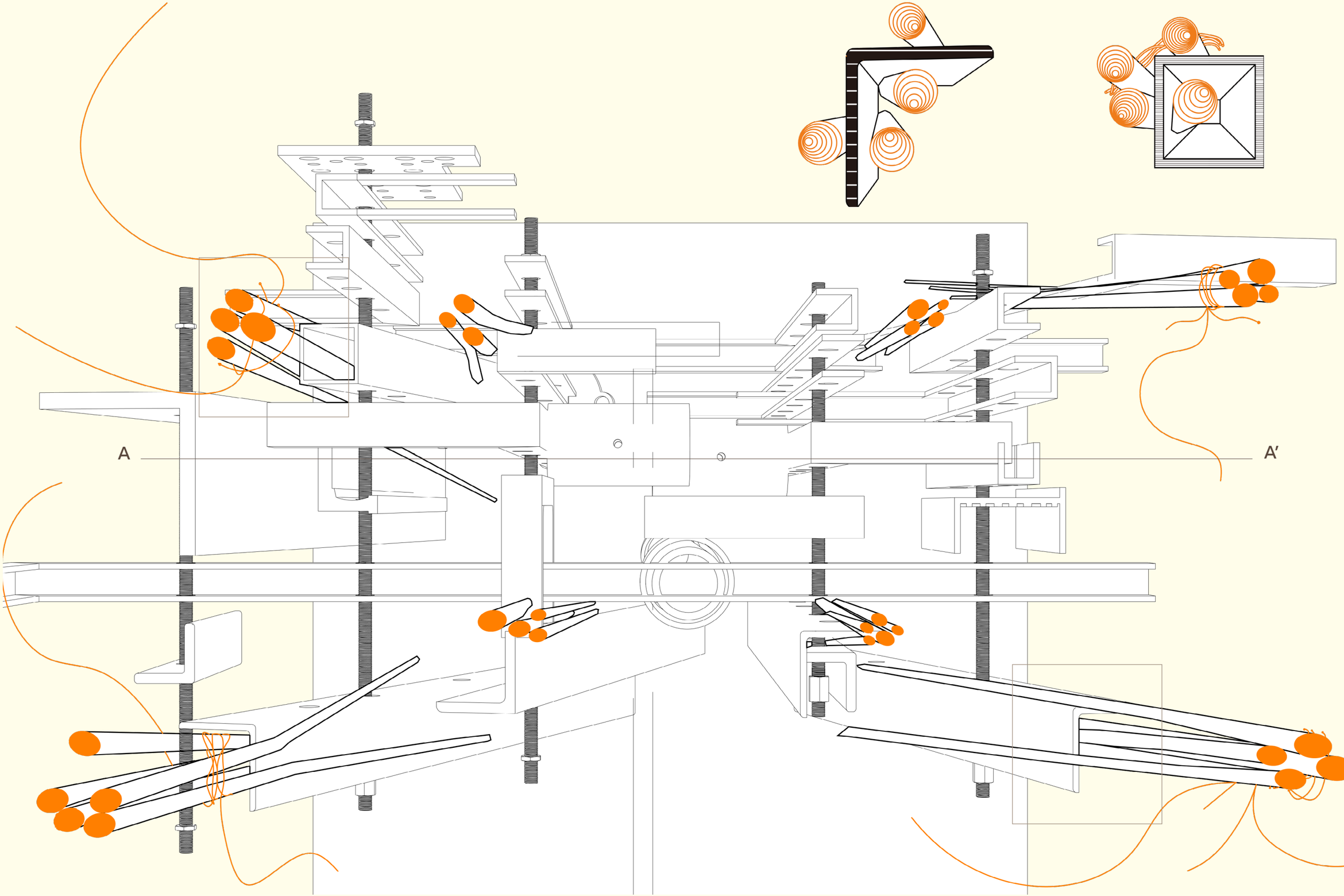
Limbs



Wood that stretches



B-B′ horizontal section detail



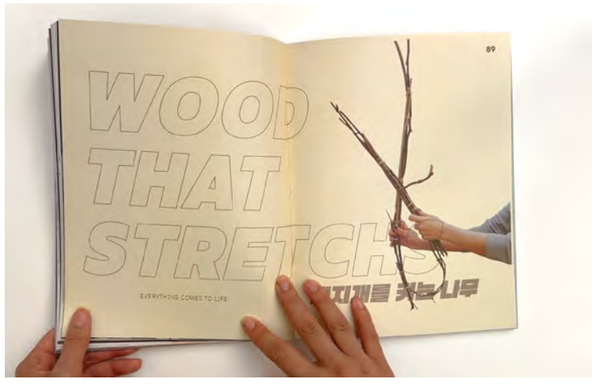
Wood that stretches

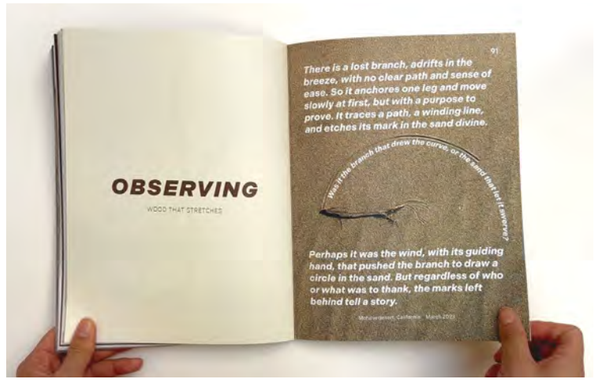
A-A′ horizontal section detail

Wood that stretches

B

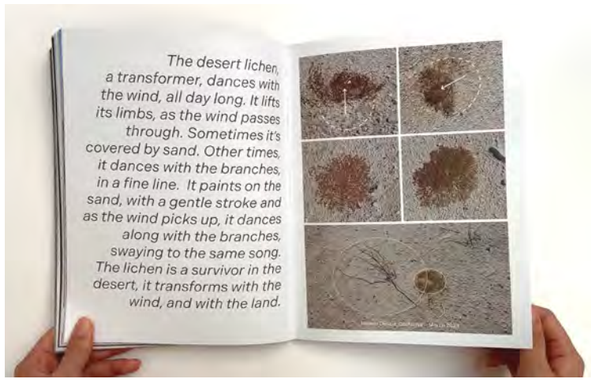
B′


89
WOOD
THAT
STRETCHS
EVERYTHING COMES TO LIFE


91
OBSERVING
WOOD THAT STRETCHES
There is a lost branch, adrifts in the breeze, with no clear path and sense of ease. So it anchores one leg and move slowly at first, but with a purpose to prove. It traces a path, a winding line, and etches its mark in the sand divine.
Was it the branch that drew the curve, or the sand that left it unnerve?
Perhaps it was the wind, with its guiding hand, that pushed the branch to draw a circle in the sand. But regardless of who or what was to thank, the marks left behind tell a story.


93


95
Amidst the scorching desert sand, where life seems too harsh to stand, the bushes grow, with tenacity, stretching towards the wind's ferocity. They don't resist, they don't fight, but they bend and sway, For they know that to survive, they must be flexible and thrive.
The wind, it whispers, a guiding force, directing the bushes on their course. They follow, willingly, without protest, trusting the wind to lead them to their best. And as they bend and stretch and strain, they feel that their bodies grow more supple, less plain.


The desert lichen, a transformer, dances with the wind, all day long. It lifts its limbs, as the wind passes through. Sometimes it's covered by sand. Other times, it dances with the branches, in a fine line. It paints on the sand, with a gentle stroke and as the wind picks up, it dances along with the branches, swaying to the same song. The lichen is a survivor in the desert, it transforms with the wind, and with the land.


99
MAKING
WOOD THAT STRETCHES
While wandering through Central Park, I collect a bunch of branches - some robust and rigid, while others more flexible and pliable. Seeing these differences reminds me of the human body, with its hard and flexible parts working together in harmony to facilitate movement.
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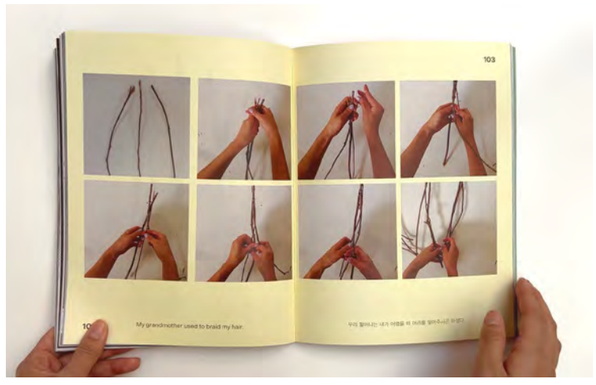
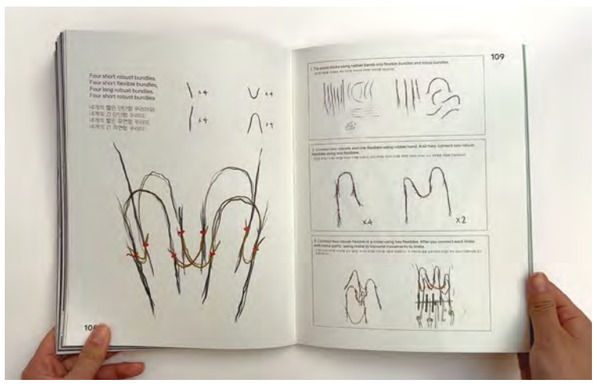
101


103
My grandmother used to braid my hair.


109
Four short robust bundles,
Two short flexible bundles,
Four long robust bundles,
Four short robust bundles
x4
x2


111


오즈의 마법사
Wizard of Oz
117


119


121


123


127

숨쉬는 플라스틱

04 PLASTIC THAT BREATHES

When I moved from Seoul to New York last year, packing was one of the biggest challenges I faced. I was unsure how to fit all my clothes into my luggage without taking up too much space. I decided to use vacuum plastic bags to create more room. I remember that my father even helped by using his body to compress them further.

When I arrived in New York and opened my luggage, they burst out. As I felt freedom when they burst out, I decided to use the same plastic bags in a different way. Instead of compressing them, I inflate them with air and put my clothes inside. Each piece of clothing holds its own story, memories, and emotions attached to it. As I fill the bags, I watch as they bloom like flowers, expanding with air.

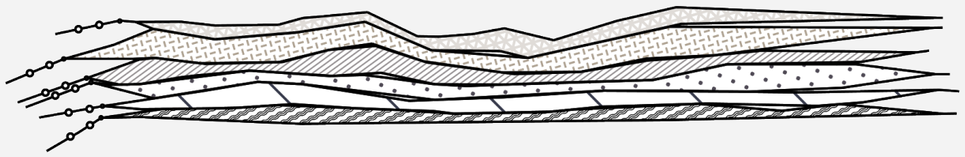
들숨 Inhale

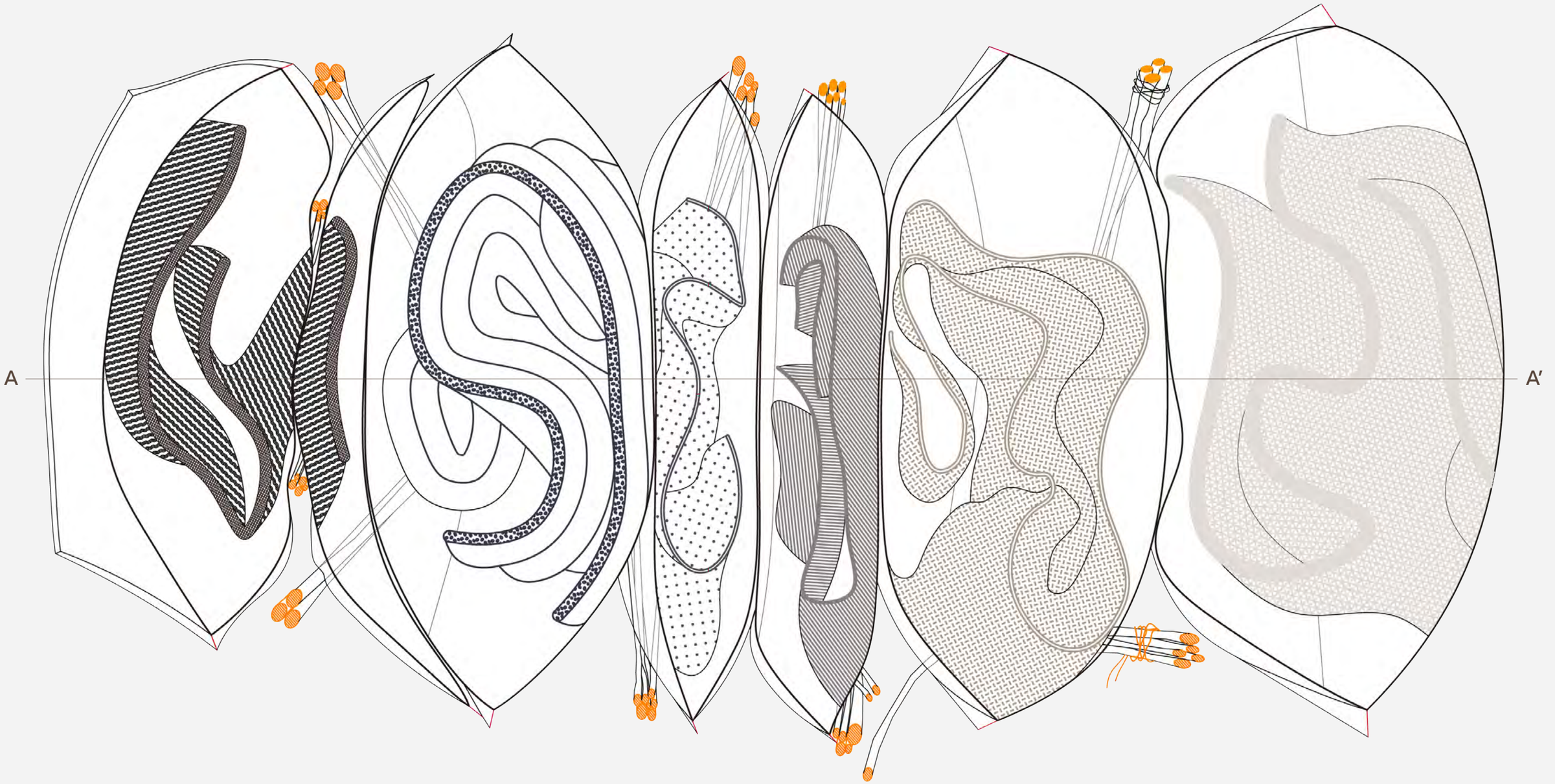
호흡하는

EXhale 날숨,

B

B′




A
A′


PLASTIC
THAT
BREATHES
EVERYTHING COMES TO LIFE
숨쉬는 플라스틱


131
OBSERVING
PLASTIC THAT BREATHES
One plastic bag, caught in a fence,
entangles in its barbed defense, but
the wind come to intervene, and set the
bag to stream. With every gust,
the bag sway and dance along in its own
way. The plastic bag filled with air and
floats high. It looks just like a flying
insect and the flapping of a bird's wings.


A plastic bag, with open arms, embraces trash.
It gathers the garbage all close and tight and holds
them dear throughout the night. The used objects, now
a family in plastic wrap and in the bag, talk and share
their stories. They laugh and cry in this plastic bag.


137
MAKING
PLASTIC THAT BREATHES
When I moved from Seoul to New York
last year, packing was one of the biggest
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my clothes into my luggage without taking
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clothing holds its own story, memories, and
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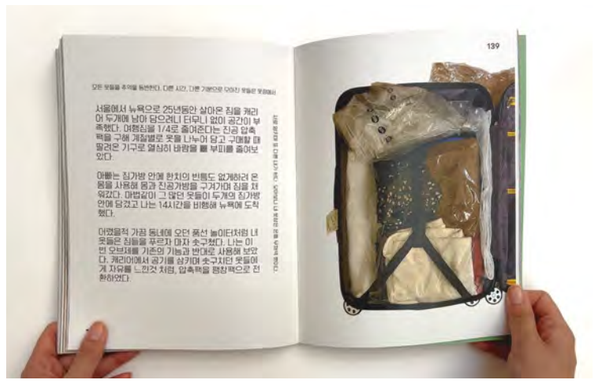
with air.


139


SPACE MAKER
Vacuum bag, traveling from Seoul to New York 2022


SPACE SAVER
SPACE MAKER, SPACE SAVER

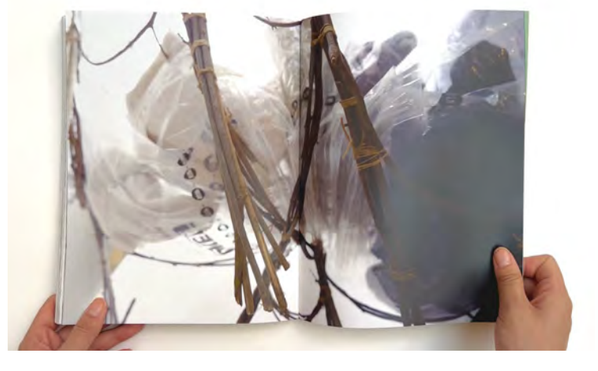

141


Inhale


149

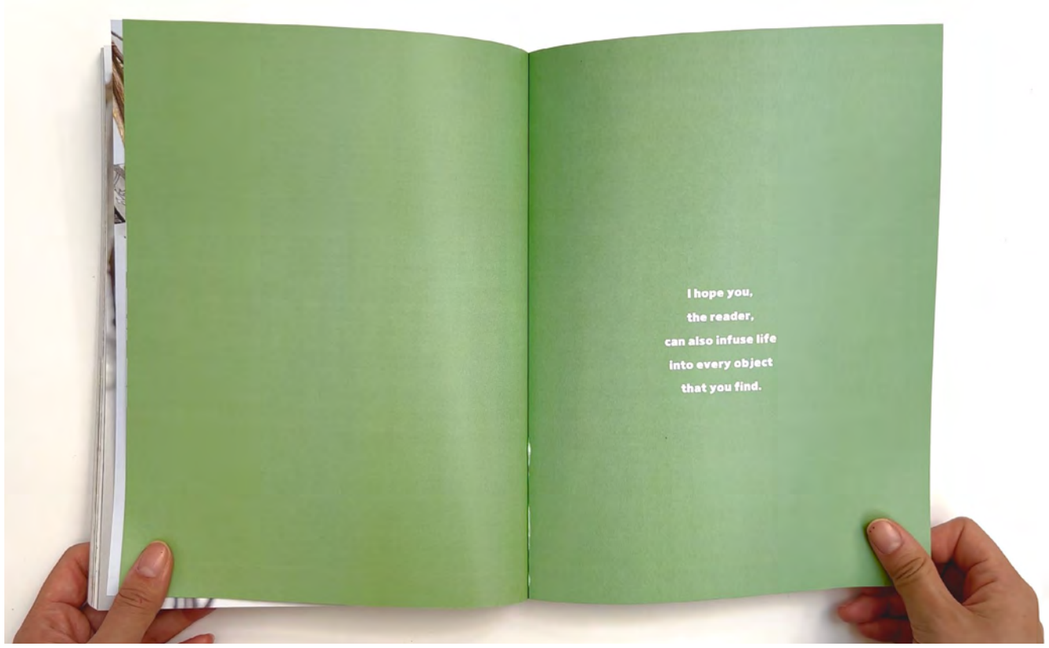

151


163




167


169
이 책을 읽는 모든분들이 일상에서
찾아낸 물체에 생명을 불어넣을 수
있기를 바랍니다.
168


I hope you,
the reader,
can also infuse life
into every object
that you find.


재활용
불어넣는
방법
황지윤

ARCHITECTURE COMES TO LIFE

Visual / Building Tech/ Material studies

04

Section of Bioclimatic Prototype

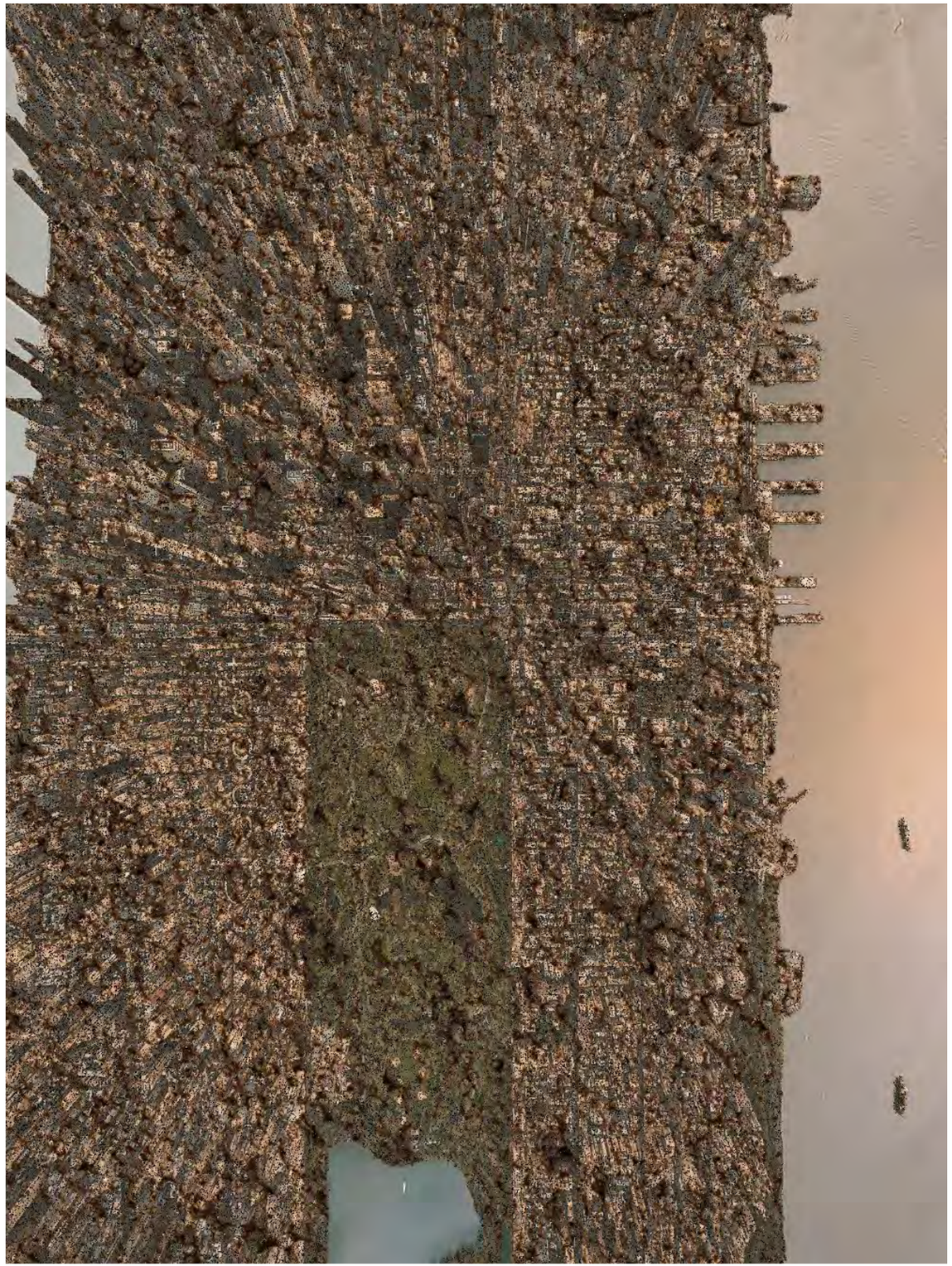
Bioclimatic Prototype of a Host and Nectar Garden Building / Husos Architects

GSAPP Visual studies
Seminar of section, Spring 2023
Professor Marc Tsurumaki

05
FIRST AID KIT-OSAN

First Aid Kit for buildings by using chitosan as an self-healing materials

GSAPP Building Tech/ Visual studies
Making kin with bio materials , Fall 2022
Professor Christopher Woebken



“What if, in 400 years from now, all the buildings in NYC were made with bio-materials and we could fix our own apartments using a first aid kit for buildings?

Imagine using simple materials found in the kitchen, such as potato starch, eggshells, and shrimp shells. No dangerous tools required. And the best part? All the materials would be **biodegradable, non-toxic, edible, and sustainable**.”


FIRST AID KIT-OSAN GUIDE
CHITOSAN POWDER
1% ACETIC ACID
CHITOSAN SOLUTION
EGGSHELLS/ PRAWNSHELLS
BIOLITH
MOLDING/ CASTING
INSTANT CHITO PATCH
WOUND PATCH
PAIN RELIEF CREAM

MEDICAL APPLICATION OF CHITOSAN

WOUND HEALING

BONE REPAIR

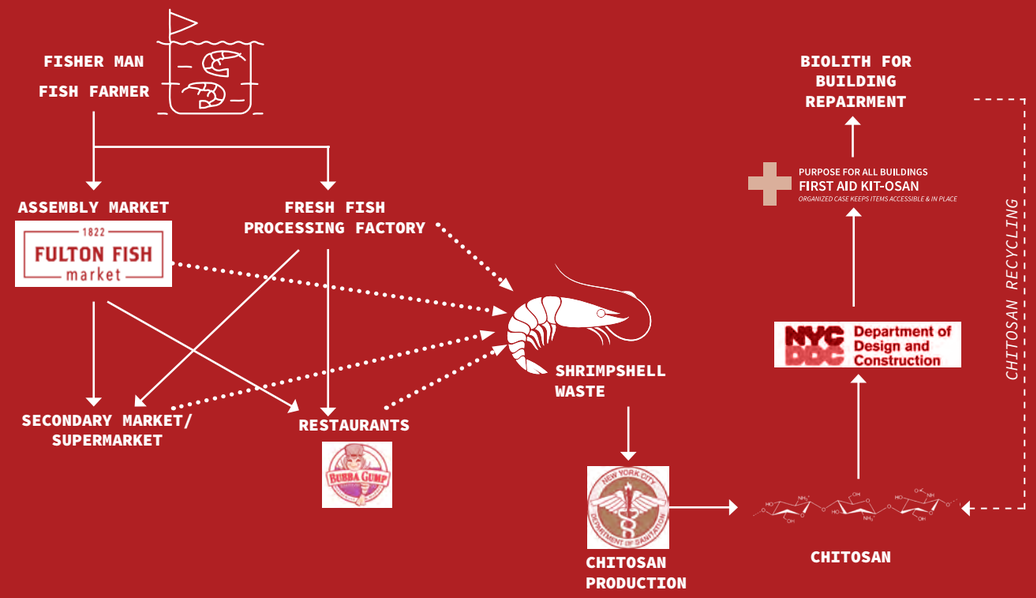
BIO SENSING

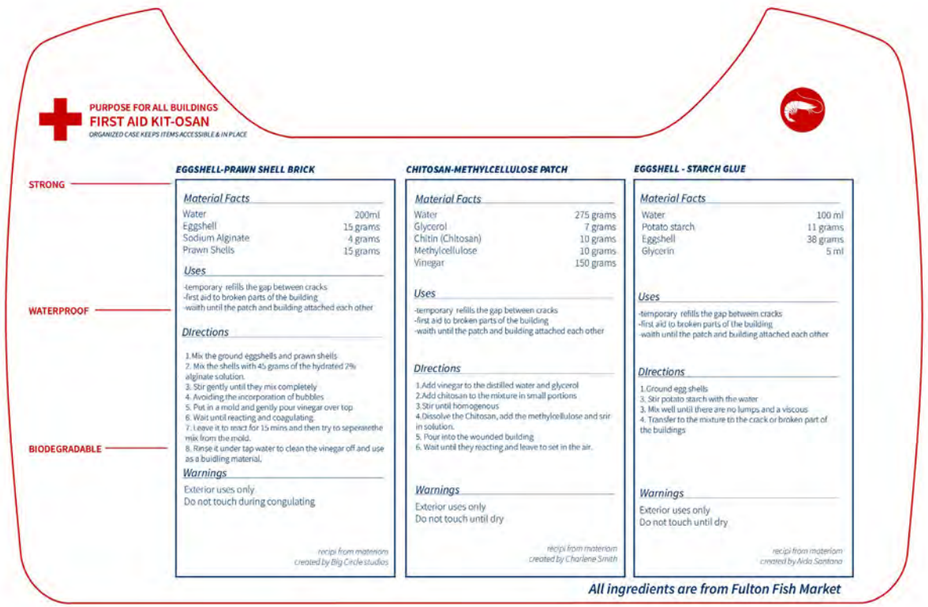
MEMBRANES

GENE THERAPY

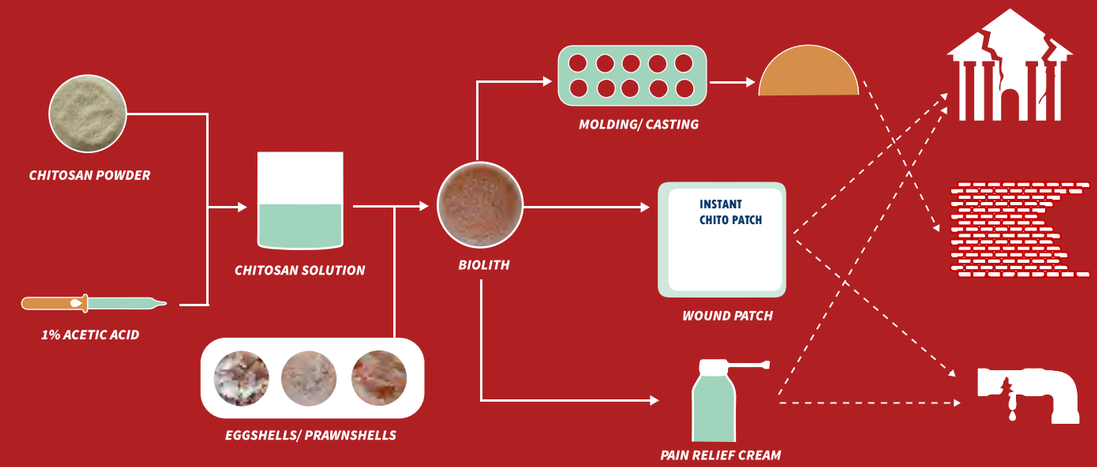
DRUG DELIVERY

First aid Kit-Osan is a biomaterial experiment that utilizes the self-healing peoperties of chitosan. The project showcases vision for sustainable and innovative future of architecture, where buildings are constructed with the second most abundant material in the earth, Chitosan.





FIRST AID KIT-OSAN GUIDE



First Aid Kit-Osan

Process of self healing

Shrimp shell

Calcium carbonate

Egg shell

Soduim Alginate

Methylcellulose

4% Acetic Acid

Ingredients:

Potato starch
Eggshells
Water
Glyserin

STEP1:

Wash them in water and boil them for about 15 minutes to kill all the bacterias. Strain the water and put the eggshells in a tray

STEP2:

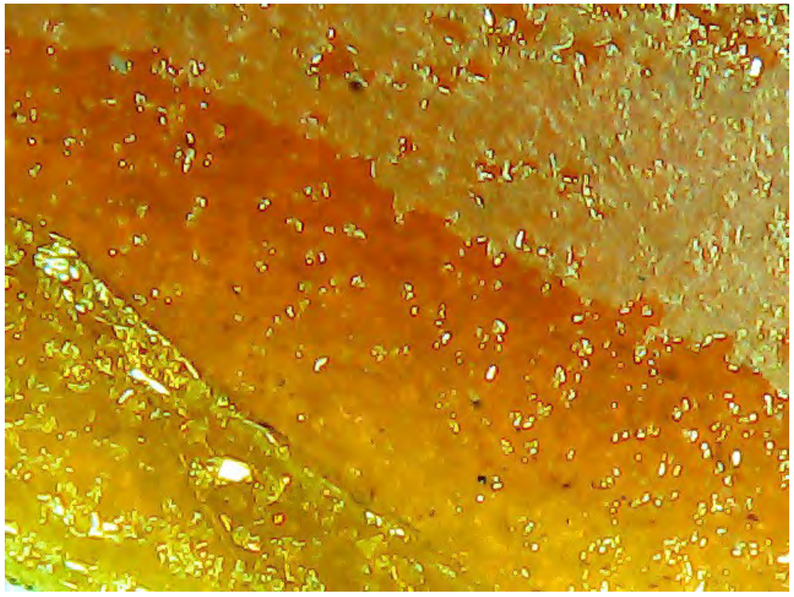
When they are completely dry, grind them to a fine powder in a grinder.

STEP3: In a pan add the potato starch and the water and stir well until there are no lumps and the starch is completely dissolved./ Heat the solution over low heat and stir constantly until it becomes a thick, translucent paste.

STEP4. Remove from heat and add the eggshell and glycerin. Mix well until there are no lumps and a viscous, sandy paste is reached.

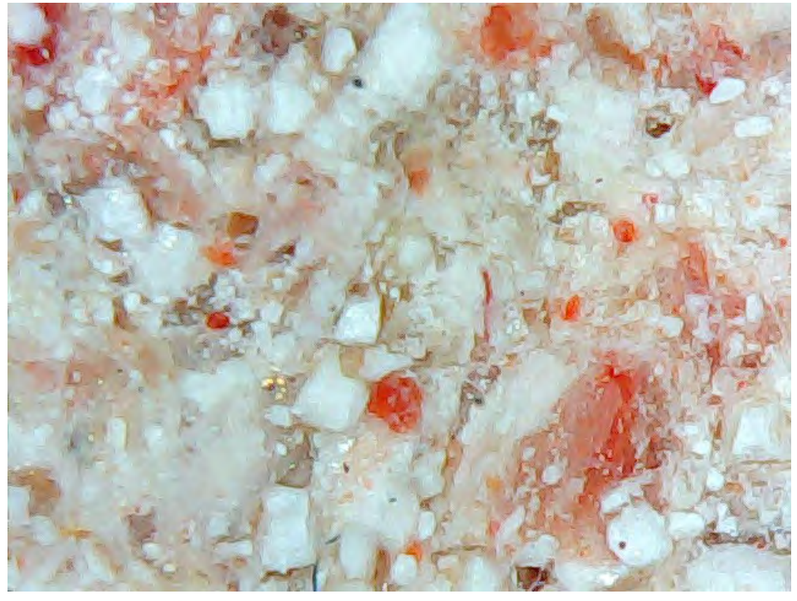
STEP5: Transfer the mixture onto a flat surface or mold. Let it air dry

First Aid Kit-Osan



Soduim Alginate, Methylcellulose, 4% Acetic Acid

Zoomed in texture



Eggshell- potato starch-shrimp based biomaterial

Exhibition in Brooklyn, New Lab

First Aid Kit-Osan

06
JAZZ BALLS

Interactive art/ sound installation that playfully depicts Harlem Jazz history for children

GSAPP Building Tech
If buildings could talk, Spring 2023
Professor Sharon Ayalon
Collaboration with Claire Koh, Yilin Zhang, and Renwen Yu

Riverside Dr/W 112 St Playground in Riverside Park

The artwork is installed at a playground in Riverside Park in Morningside Heights. It aims to introduce the children and visitors of Morningside Heights to the jazz history of neighboring Harlem in a playful manner. It will evoke interest in one of the most significant roots of Harlem that have been overshadowed by the other mainstream reputation of the neighborhood.

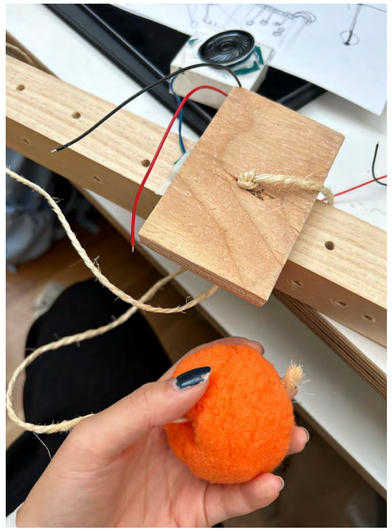
The installation is made of ten sound modules that are installed along a railing of an appropriate height for children to interact. Each module will be made of a plushie ball and a rope, with electronic parts secured along the top of the speaker and along the rope. The visual side of the installation is inspired by musical notes - the foam balls on a cord. They are arranged in a way that hints at the tempo and the pitch of the sound module.

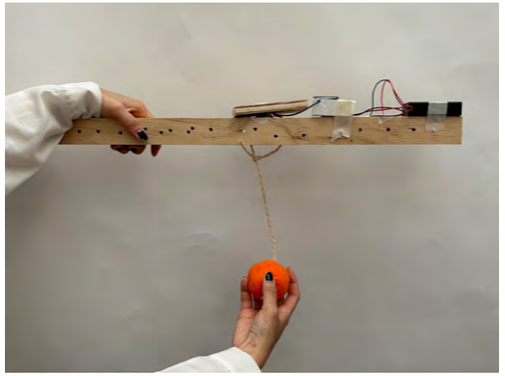
The Jazz Balls interactive art/sound installation playfully depicts Harlem Jazz history. It will introduce future generations to Harlem's glorified tradition in a fun and educational way.

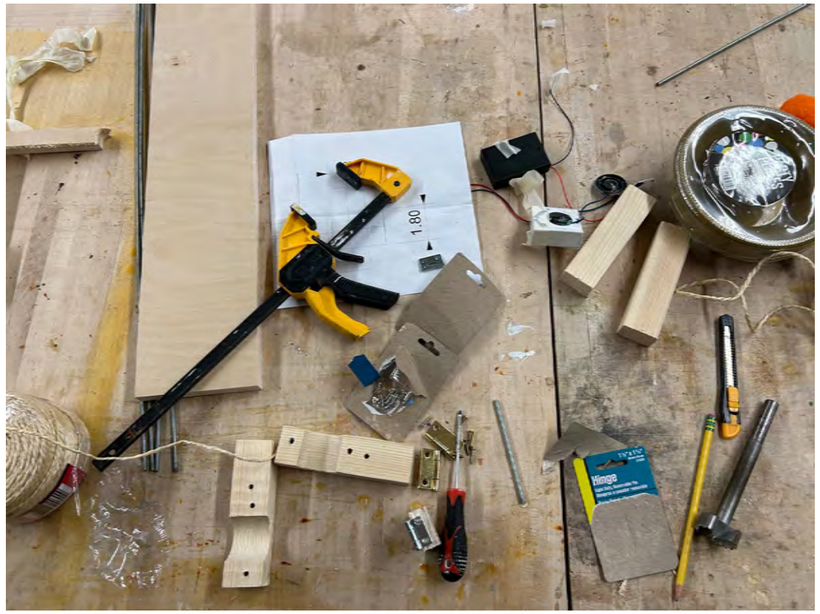
Each ball contains a unique sound of different chords, tempos and instruments used in a common jazz progression. Children can activate the installation by pulling the plushie ball at the end of the rope, which will play the individual sounds from the speaker. The accumulation of children playing could create the sound of an improvised jazz session.

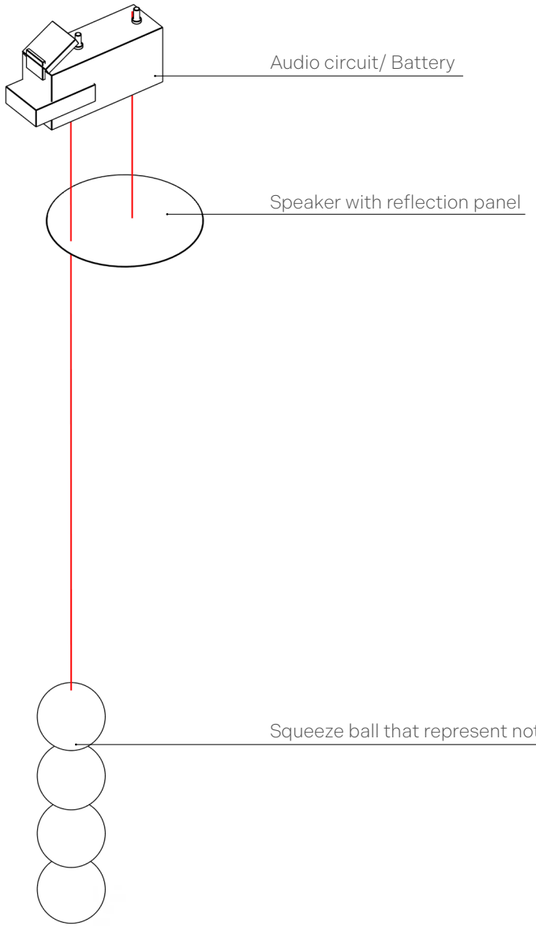
Children could play these modules individually to familiarize themselves with the musical progression, or basic drum beats, or history of jazz. They could also stack them together to create their own unique piece of jazz.

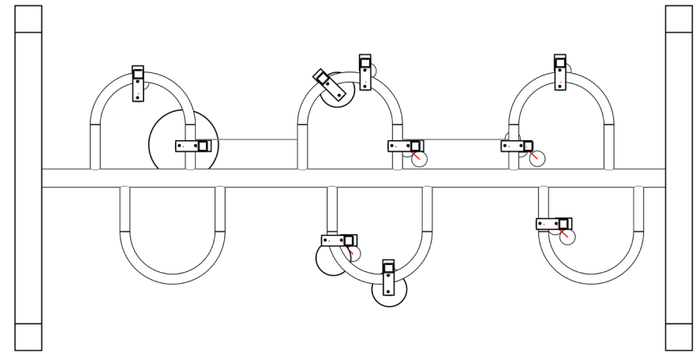
The electronic parts are made of a circuit board wires, push button and a piezo speaker. Since the piezo speaker may not be loud enough to adequately deliver the sound to the visitors, we made special speakers out of paper plate and cups that face down towards the users (children). The installation is accompanied by a brochure that describes the installation, a brief jazz history of Harlem and several notable figures.

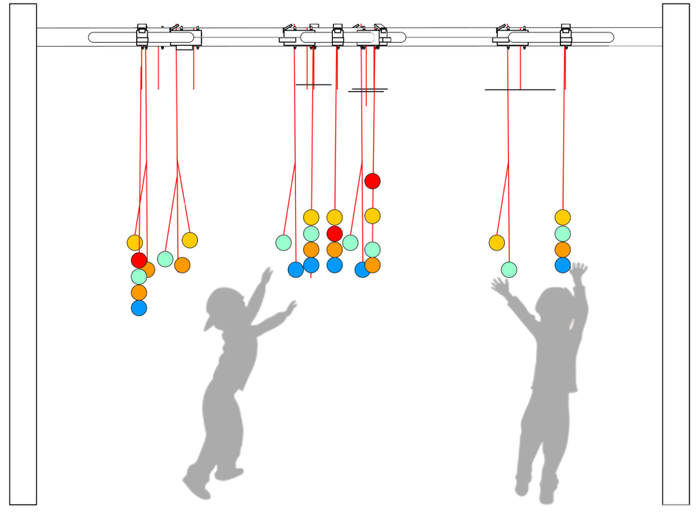







Audio circuit/ Battery
Speaker with reflection panel
Squeeze ball that represent notes





JAZZ BALLS

BACKGROUND AND BEAT ..... JAZZ OF HARLEM ..... SOUND EFFECT

Background Beat 1:
Excerpt from : Lick No. 1 – Left Hand Variations | Blues Piano Lesson #11

Title: Walking Bass (I - VI - ii - V) - Two Chord/Bar
Artist: David Magyel

Background Beat 2:
Excerpt from : Dynamic Jazz Beat / Backing Track 120 BPM (royalty free)

Artist: Jim Dooley

Background Beat 3:
Excerpt from : Lick No. 1 – Left Hand Variations | Blues Piano Lesson #11

Title: Walking Bass (I - VI - ii - V) - Two Chord/Bar
Artist: David Magyel

Background Beat 4:
Excerpt from : John Goldsby - Solo Double Bass Performance of “Sweet and Lovely”

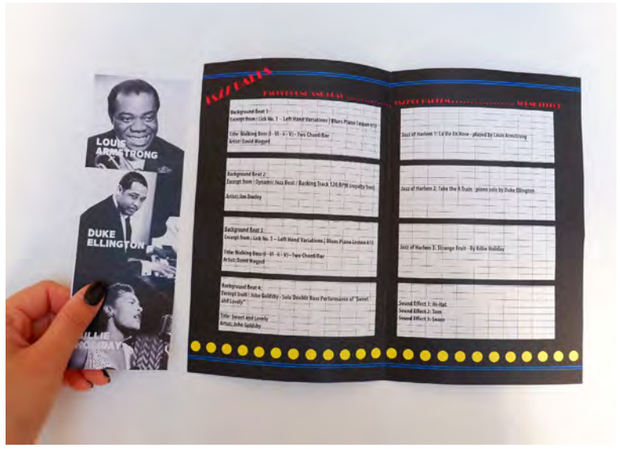
Title: Sweet and Lovely
Artist: John Goldsby

Jazz of Harlem 1: La Vie En Rose - played by Louis Armstrong

Jazz of Harlem 2: Take the A Train - piano solo by Duke Ellington

Jazz of Harlem 3: Strange Fruit - By Billie Holiday

Sound Effect 1: Hi-Hat
Sound Effect 2: Tom
Sound Effect 3: Snare



There will be four modules containing general beats made of piano, drums(x2), and double bass, three modules containing pieces performed by the famous musicians of Harlem (La Vie En Rose by Louis Armstrong, Strange Fruit by Billie Holiday and Take the A Train by Duke Ellington) and three modules containing sounds of a specific drum (hi-hat, tom, snare) for interactive purpose.


THE FRESH MARKETPLACE
REUSABLE

07
LAST MAN ON EARTH

Storytelling with 3d modeling and rendeing

GSAPP Visual studies
Techniques of Ultrareal, Fall 2022
Professor Phillip Crupi
Collaboration with Andy El Set, Deniz Mahir, and Karolina Dohnalkova

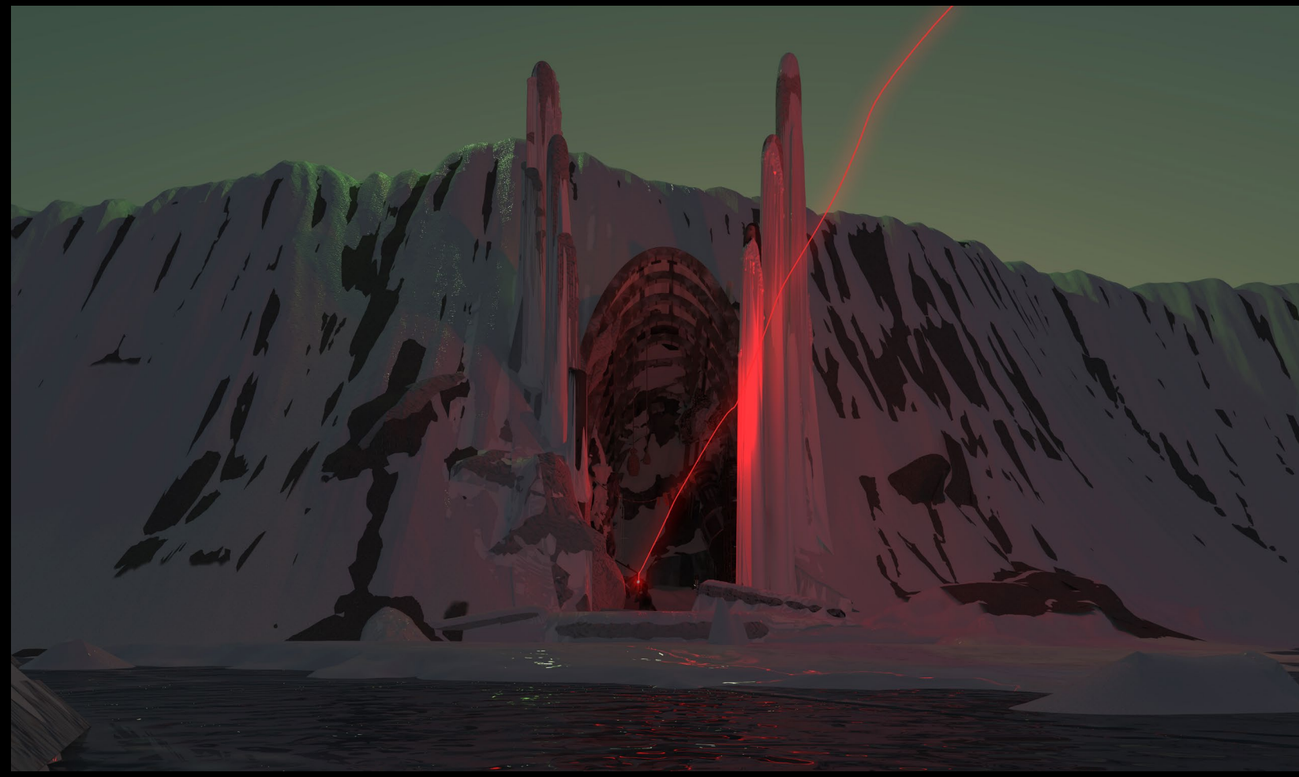
In the year 2430, the world had changed beyond recognition. The Earth had become a desolate wasteland, and humanity was all but extinct. The only known human left alive was a man, stranded in the middle of the arctic region in Svalbard.

At first, the man was surviving in a cave, living off whatever he could find or hunt. But as time passed, he started to scavenge for scraps of ruined trains, satellites, and machines. Using his survival skills, he gradually built his own shelter, turning it into a work of art.

Despite his impressive construction, the man's life was a lonely one. He had no one to talk to, no one to share his experiences with, and no one to care for. His only companions were his memories of a world that had been long gone.

As time passed, he grew more and more desperate for companionship. One day, he saw a faint light in the distance. It was a glimmer of hope in his otherwise desolate world. He knew that the light represented the possibility of other survivors.

Without hesitation, he lit his last red flare and sent it shooting up into the sky. It was a desperate plea for help, a beacon of hope that would hopefully bring other survivors to him. He waited anxiously, unsure if anyone would see his signal.



Special thanks to

Marco Ferrari
Elise Hunchuck
Leslie Gill
Khoi A. Nguyen
Ada Tolla
Giussepe Lignano
Thomas De Monchaux
Sanober Khan
Andres Jaque
Mark Wigley
Bart-Jan Polman
Samuel Streward-Halevy
Sharon Ayalon
Phillip Crupi
Christopher Woebken

JIYOON HWANG/ 황지윤
COLUMBIA GSAPP 2023