HYOSIL YANG

M.S. ADVANCED ARCHITECTURAL DESIGN

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ARCHITECTURE NARRATES A CIRCULATION OF HISTORY, MATERIAL, AND LIFE

1352 BLAST STUDIO

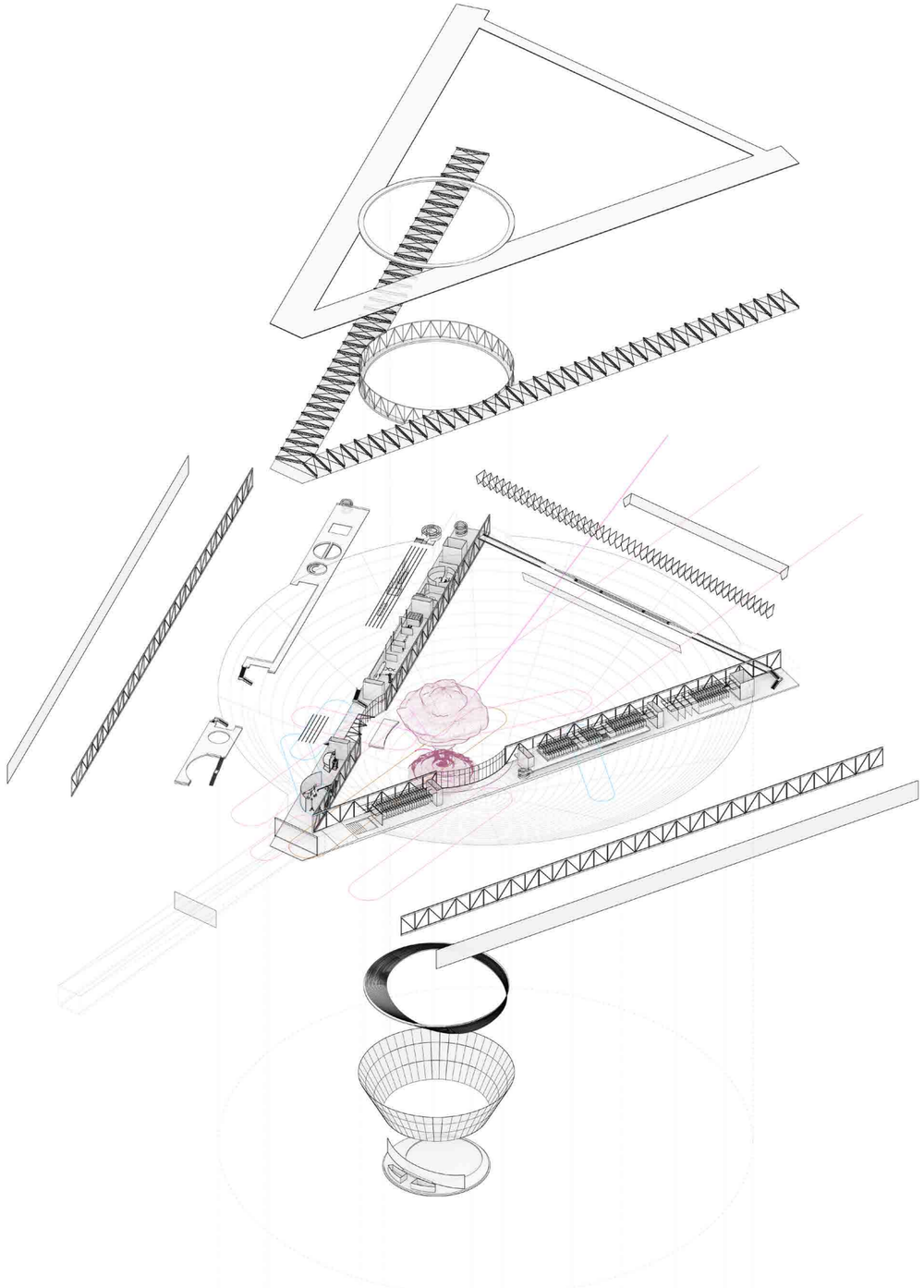
The entanglement of culture and chemicals within Hollywood, Lookout Mountain Laboratory, and Cold War atomic bomb tests.

Hollywood was not only the center of filming entertainment movies, it was also the center of filming and documenting atomic bomb tests. The nuclear bomb test in the US during the cold war are concentrated in the Nevada Desert and the Pacific ocean. In 1947, the US air force established a secret studio known as Lookout Mountain laboratory for atomic Bomb experiments. They hired workers in Hollywood cinema to make this film. The Lookout mountain laboratory had produced more than nine hundred films until it closed in 1969.

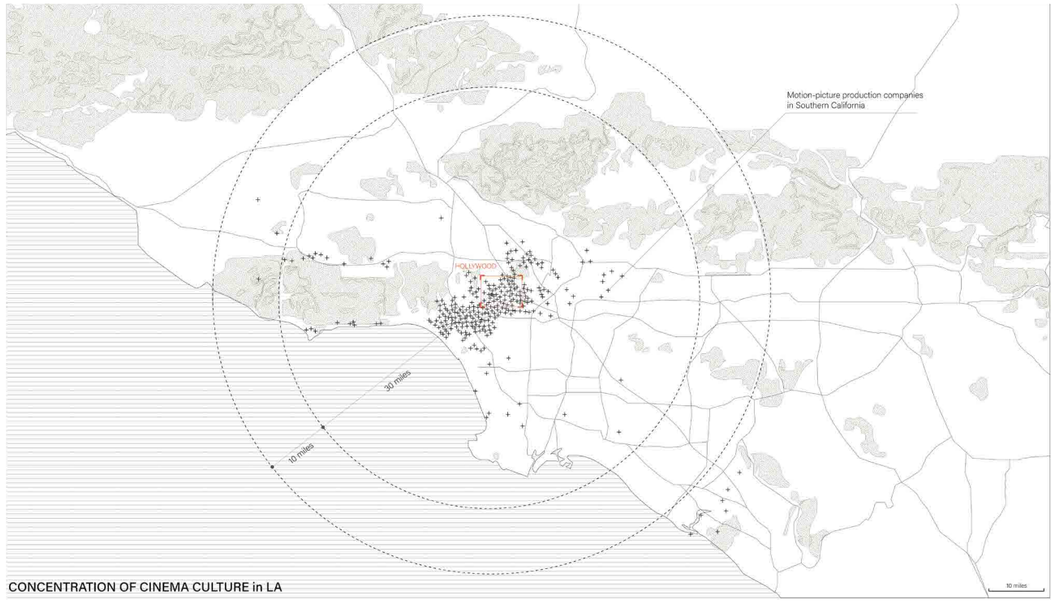
The image of the atomic bomb test, shows a significant moment that marks chemical modernity because it was a major event in the history of nuclear warfare experiments and its alteration of the environment through the proliferation of toxic chemicals in the atmosphere. However, what you don't see in this image are the architectural devices that formed the backstage of US imperialism and its toxic cultural production. This research aims to unveil, interrogate and specify the entanglement of cultural and chemical concentrations within Hollywood and the US military, through its filming of the atomic bomb tests.

Hollywood's secret studio was not a spectator or passive observer of the atomic bomb experiment, but a leading figure in describing the history of atomic bombs and creating images of nuclear bombs. The main concerns of this project are what invisible elements and aspects are associated with these two concentrations, and how architectural design can help present them.

2022 Spring
Instructor | Mark Wasiuta
Individual Work

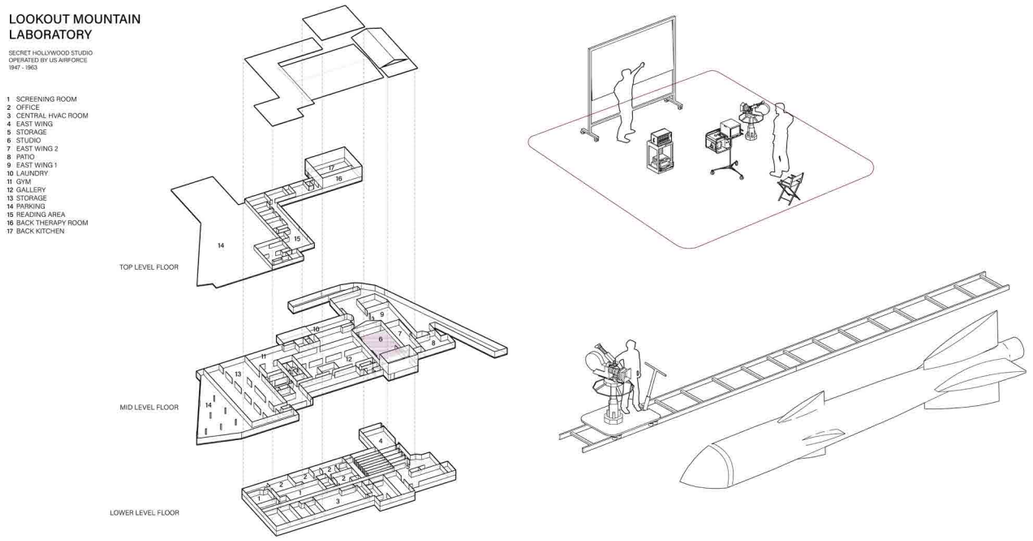


1352 BLAST STUDIO



CONCENTRATION OF CINEMA CULTURE in LA

The geographical aspects of California helped to accelerate this cultural concentration, since it has a great natural environment that can provide multiple different film locations.Map from Paramount studio shows that the beach and shores along the pacific coast were used to film Africa or Spain's environment, and the Nevada desert is used to film the desert scene. However, this geographic condition also contributed to forming another concentration, the Atomic bomb test. Nuclear bomb tests in the US were concentrated in the Nevada desert and the Pacific ocean during the cold war.



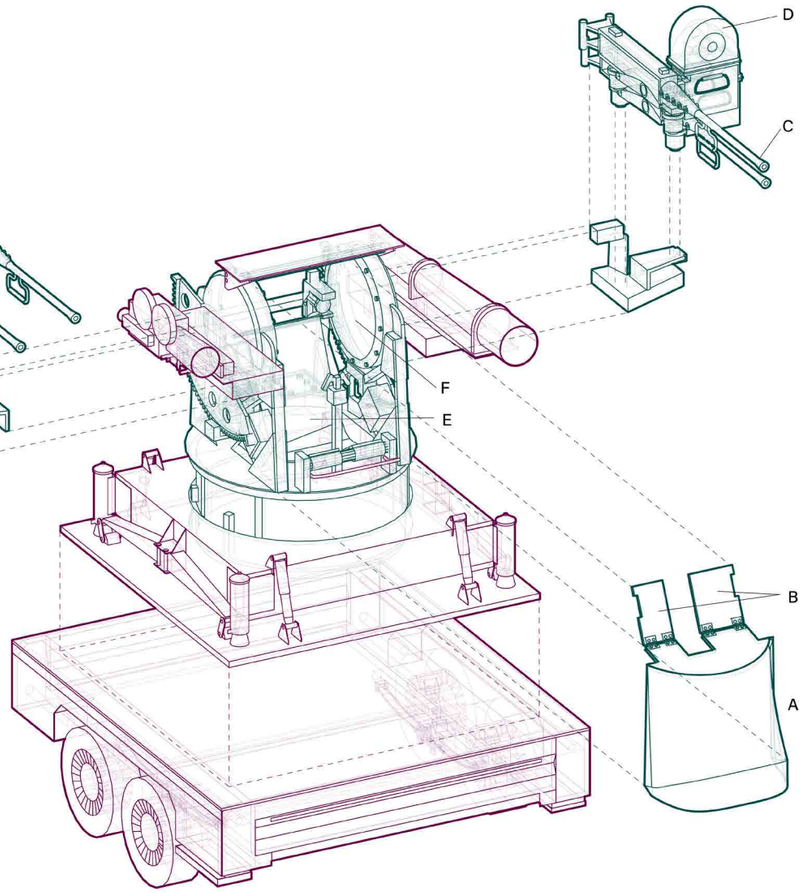
In 1947, the US air force established a secret film studio for producing films for the Atomic Bomb experiment. They hired workers in Hollywood cinema to make this film. These films were imporatant visual data for scientists to analyze in their work calculating the precise effects of a nuclear detonation. For this experiment, US airforce organized the task group with the photography and filming groups. And they specifically coordinate the circulation and function of each task group to film the operation. The Lookout mountain laboratory took in charge of this filiming process .They also filmed the scenes explaining the test process and also used the miniature or actual models of the weapon.

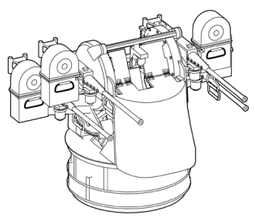
Hollywood Location Map

Pacific Ocean and Nevada Desert as the Major Nuclear Bomb Test Sites

Lookout Mountain Laboratory

To film the explosions, camera devices and technologies were also developed. The interesting aspect was that they developed the devices by using existing military weapons. They modified this m-45 quad mount gun to a giant camera mount. They detached the guns and attached the 48-inch focal length camera. For the aerial shots, lots of different cameras were invented and attached to the planes which were mostly used for carrying missiles. These inventions and modifications helped to film the atomic bomb test, and Hollywood creators and technicians were deeply engaged with this process. The main purpose of all these developments was for developing devices for holding and orienting cameras instead of using a hand to carry them.





MODIFIED M-45 TRACKING MOUNT (BIRD WATCHER)

PRODUCED BY
CAMERA DIVISION & MACHINE SHOP
IN LOOKOUT MOUNTAIN LABORATORY
USED FOR FILMING ATOMIC BOMB EXPERIMENT

ADDITION

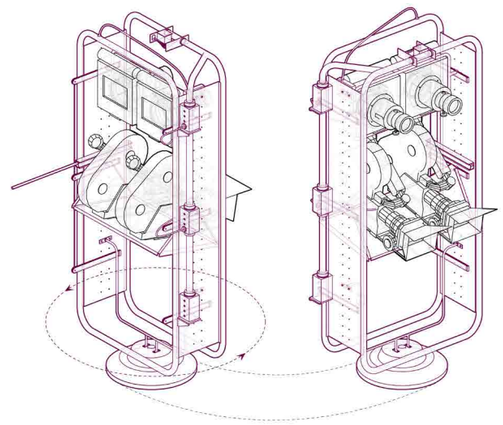
1 48 inch FOCAL LENGTH LENS
2 SILICON TITANIUM BASE PAINT (WHITE)
- increase the reflective power and lower the incidence of contact burns & lower the interior temperature of magazines 12-15

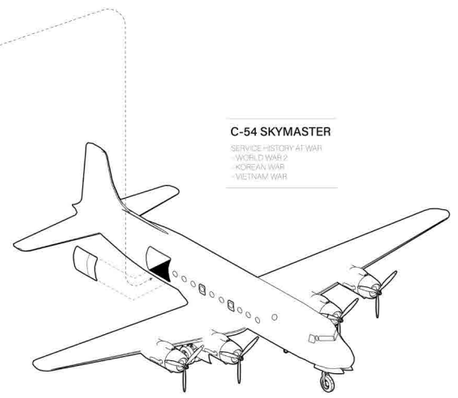
M45 QUADMOUNT

A ARMOR PLATE
B HINGED ARMOR DOORS
C CAL 50 MACHINE GUN
D M2 AMMUNITION CHEST
E TRUNNION ASSEMBLY
F SEAT

M45 QUADMOUNT

SERVICE HISTORY AT WAR
- WORLD WAR 2
- KOREAN WAR
- VIETNAM WAR



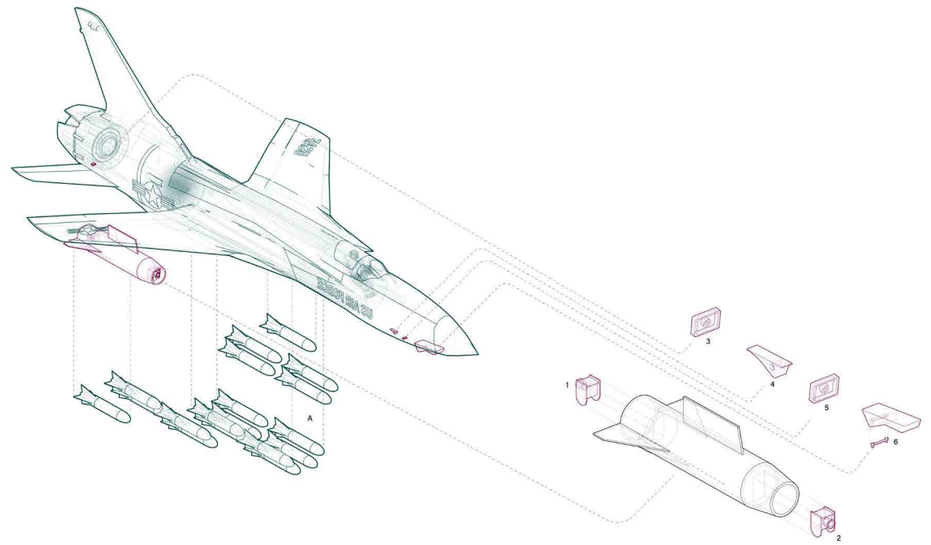


C-54 SKYMASTER

SERVICE HISTORY AT WAR
- WORLD WAR 2
- KOREAN WAR
- VIETNAM WAR

INVENTED CAMERA RAGS FOR C-54 SKYMASTER

PRODUCED BY
CAMERA DIVISION & MACHINE SHOP
IN LOOKOUT MOUNTAIN LABORATORY
USED FOR FILMING ATOMIC BOMB EXPERIMENT



MODIFIED F-105 THUNDERCHIEF

EXPERIMENTS IN AERIAL IMAGING
AT LOOKOUT MOUNTAIN

ADDITION

1 AFT POD CAMERA
2 FORE POD CAMERA
3 AFT BLISTER CAMERA
4 FORE BLISTER CAMERA
5 GUN CAMERA
6 STRIKE CAMERA

F-105 THUNDERCHIEF

AMERICAN SUPERSONIC FIGHTER-BOMBER
USED BY THE UNITED STATES AIR FORCE

A 16 750lb (340kg) BOMBS

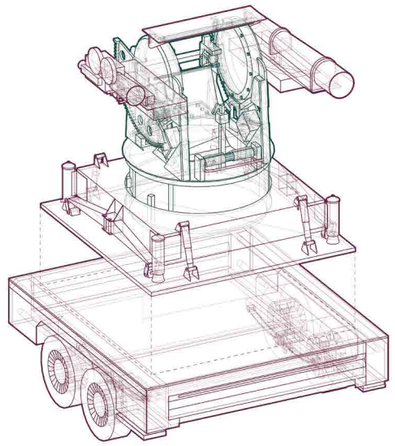
Operation Ivy, King 1952

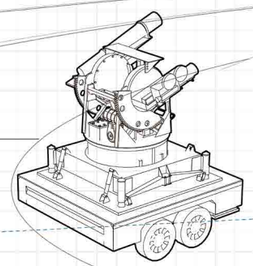
The largest pure fission nuclear bomb ever tested by the US

23:30 15 November 1952 (GMT)
11:30 16 November 1952 (local)
Runit ("Yvonne") Island, Enewetak Atoll
1480 Foot Airburst
500 kt

MODIFIED M-45 TRACKING MOUNT

PRODUCED BY
CAMERA DIVISION & MACHINE SHOP
IN LOOKOUT MOUNTAIN LABORATORY
USED FOR FILMING ATOMIC BOMB EXPERIMENT





74,000 feet / 23km
The top of the King cloud

40,000 feet / 12km
Mushroom base

1,480 feet / 450m
Detonation Height

DROP B-36

INSTRUMENTATION B-50

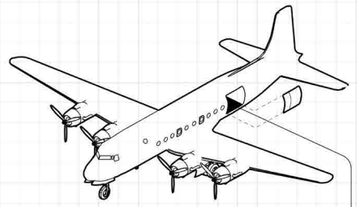
BOMB DROP
11:30am

EFFECT B-36

CARNISTER DROP B-29

Photo C-54

PHOTO C-54



C-54 SKYMASTER

SERVICE HISTORY AT WAR:
- WORLD WAR 2
- KOREAN WAR
- VIETNAM WAR

INVENTED CAMERA RAGS FOR C-54 SKYMASTER

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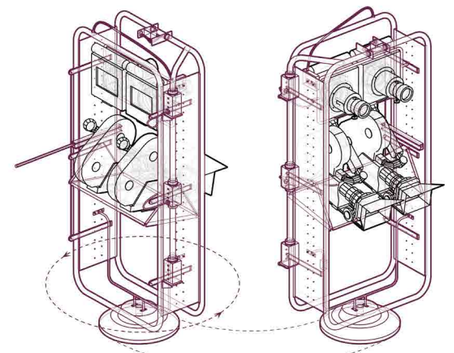
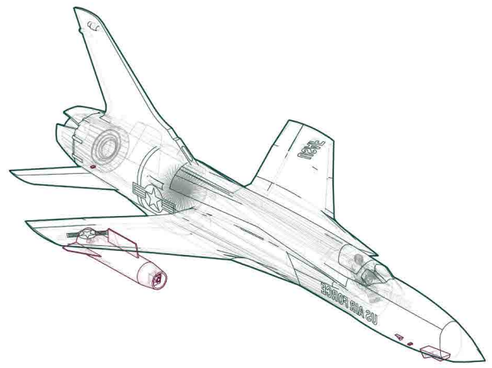


MODIFIED F-105 THUNDERCHIEF

EXPERIMENTS IN AERIAL IMAGING
AT LOOKOUT MOUNTAIN

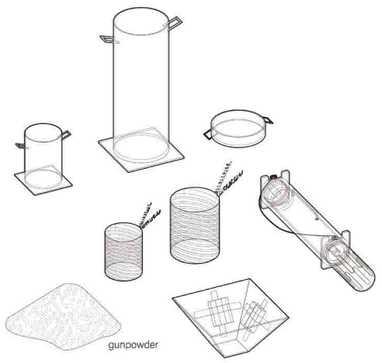


1352 BLAST STUDIO

Operatino IVY Orchestrated with Lookout Mountain Laboratory Photographic Team

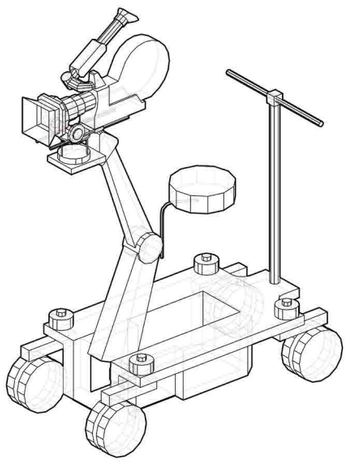
PYROTECHNIC

PYROTECHNICS HAVE BEEN A HOT AND TRENDING SPECIAL EFFECTS TOOL IN THE FILM INDUSTRY SINCE THE 1900s.
IT INCLUDING FIREWORKS, COMBUSTING, MATERIALS, FIRE EXPLOSIONS, FLASHES, AND BOMB EXPLOSIONS.



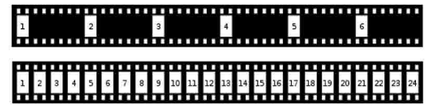
CAMERA CARRIAGE DEVELOPMENT

FIRST CAMERA DOLLY (CAMERA CARRIAGE) WAS DESIGNED IN 1936, BY VICTOR RABY AND MADE BY STUDIO EQUIPMENT COMPANY



SLOW MOTION PICTURE

THE SLOW MOTION TECHNIQUE IS ESPECIALLY ASSOCIATED WITH EXPLOSION EFFECT SHOTS AND UNDERWATER FOOTAGE.



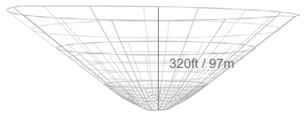
The traditional method for achieving super-slow motion is through high-speed photography, a more sophisticated technique that uses **specialized equipment to record fast phenomena, usually for scientific applications.**

Pyro-button
classic, clear polycarbonate “pickle” with the snap action switch, visible contacts, and 6 ft of cable

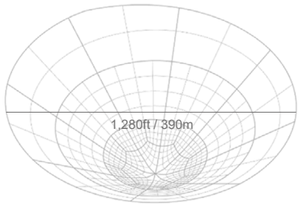
Mad Max : Fury Road

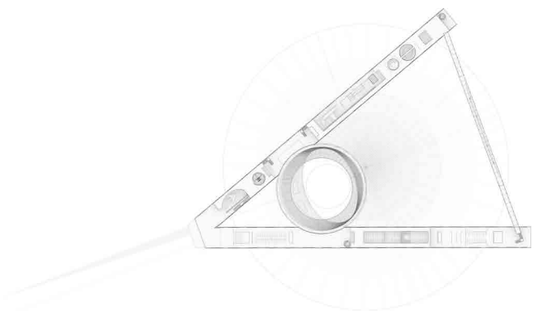
Hollywood Special Effects for Explosion Scenes

1352 BLAST STUDIO



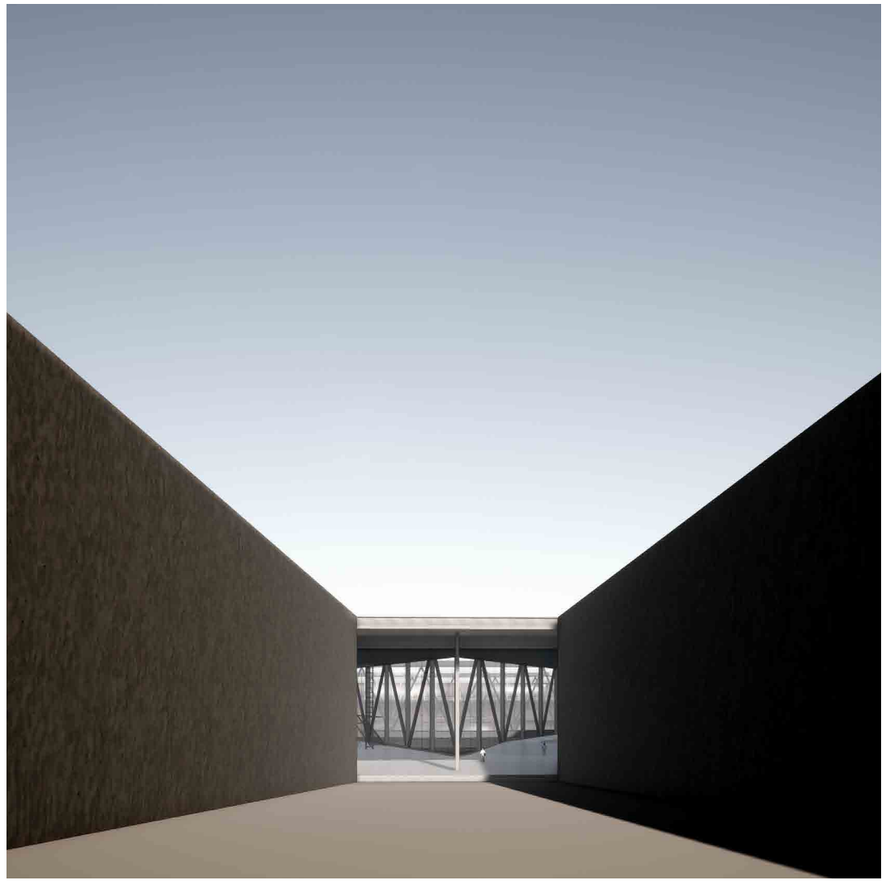
Sedan Crater





At Nevada National Security Site, which was before the Nevada Test Site, the craters created by atomic bomb tests still exist. Between 1951 and 1992, a total of 1,021 nuclear tests were conducted here by the government. In addition, they designed the survival town and constructed it to test the power of the detonation of a nuclear bomb. The entire town and its architecture were fake like a movie set. Sedan crater is the biggest crater in the Nevada desert and now more than 10,000 tourists are visiting every year.

By using the sources from Lookout mountain laboratory and the military test site, this project proposes a film production studio for reproducing the scenes of the operations that shows the active contribution of Hollywood technics to Atomic bomb tests.



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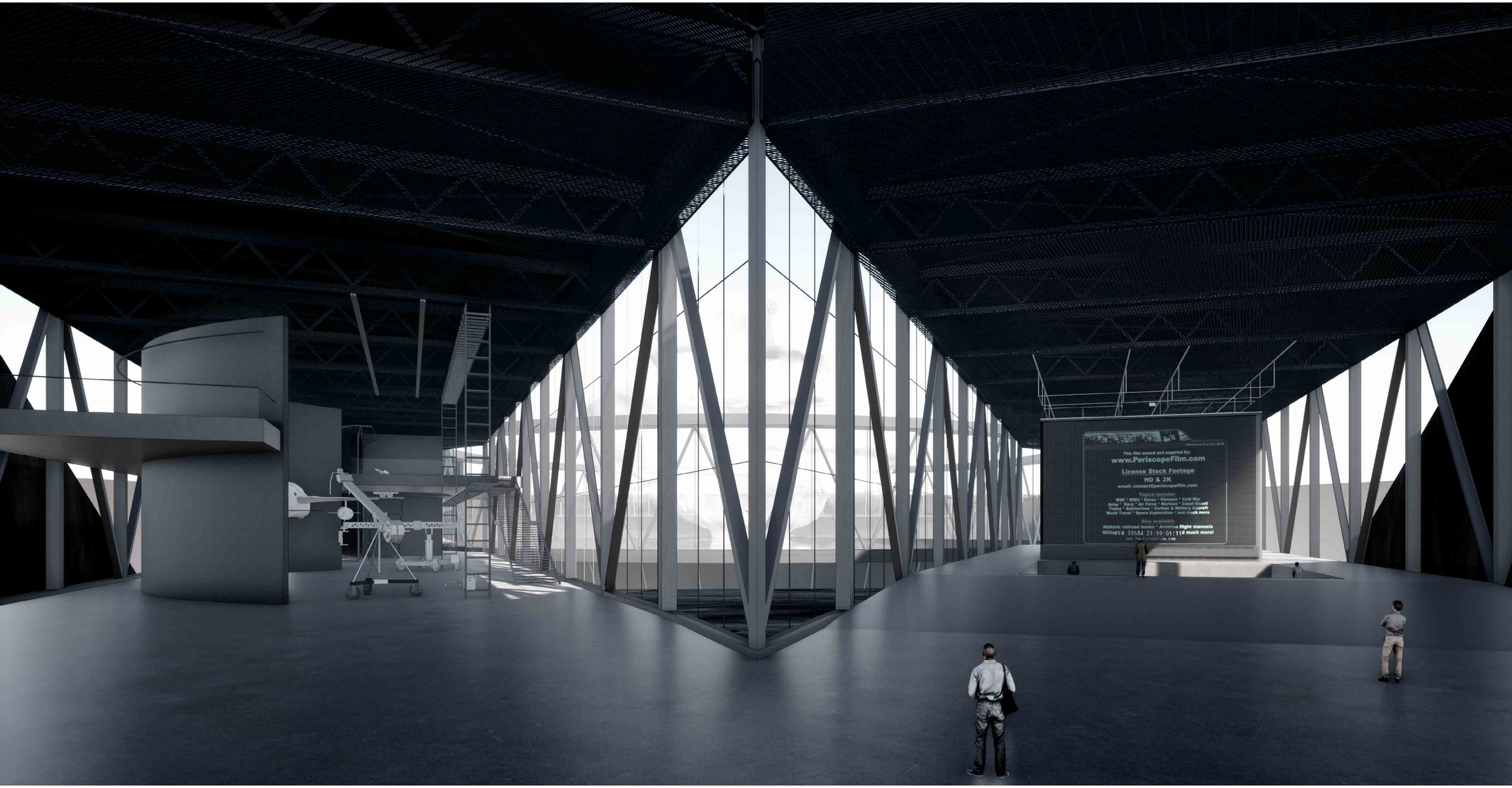
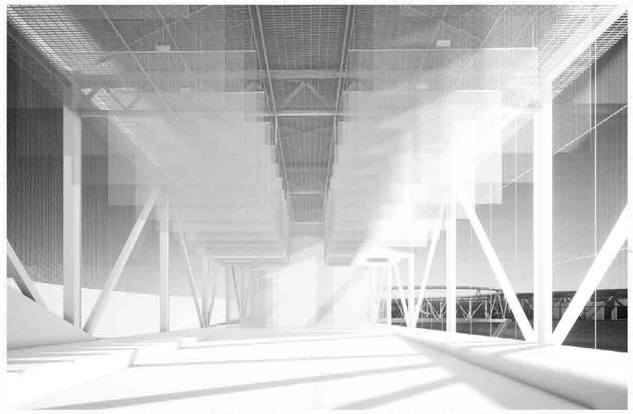
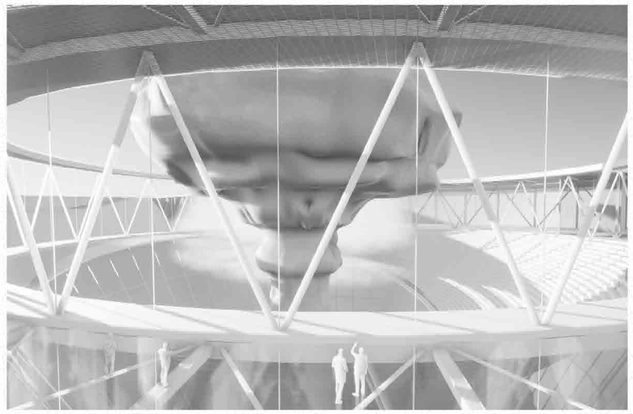


View of the Archinve Wing and the Stage Wing at the Lobby

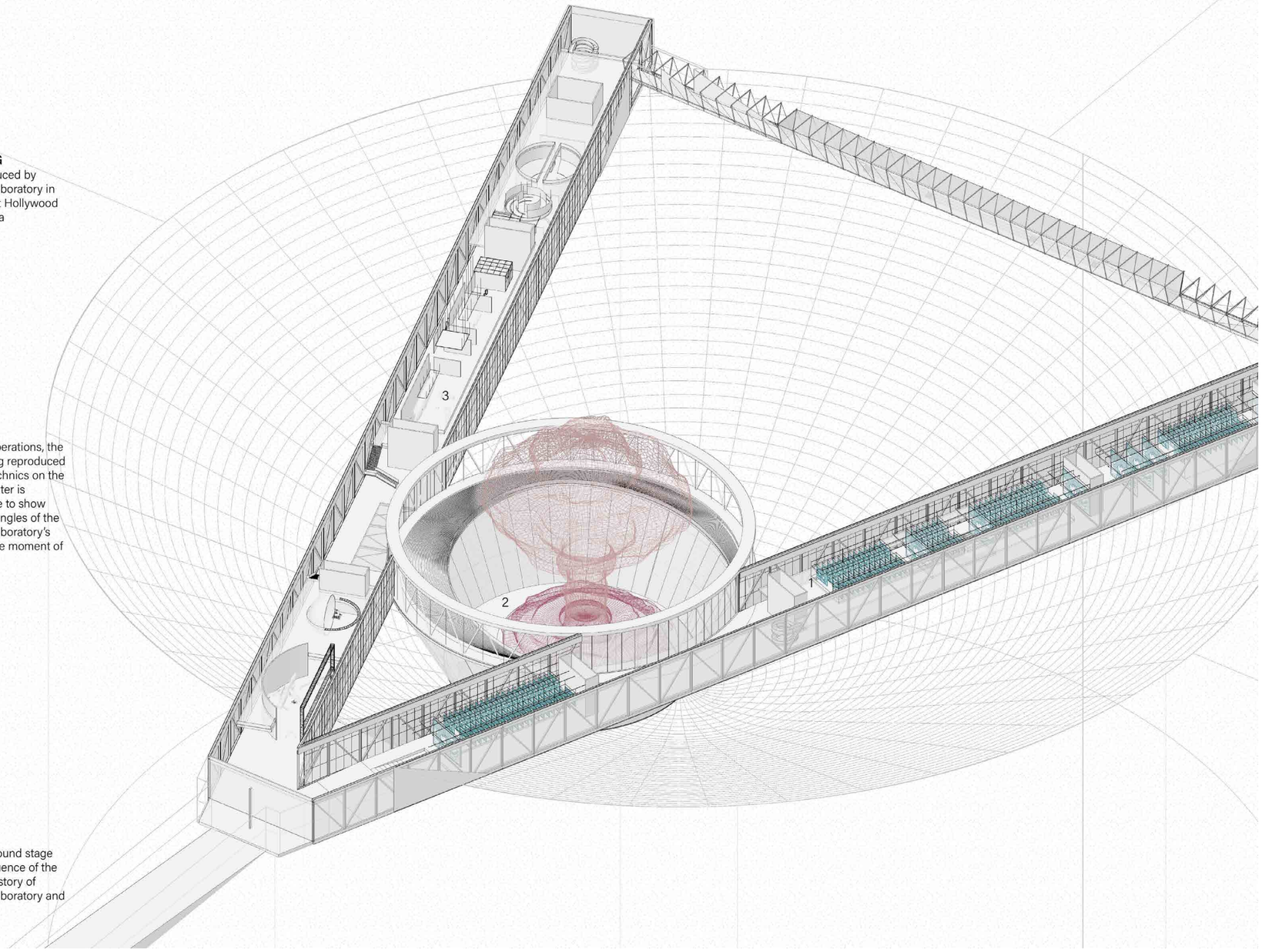


1. ARCHIVE WING
Archive of films produced by Lookout Mountain Laboratory in Hollywood, the secret Hollywood studio in Cold War Era



2. PYRO-STAGE
One of the biggest operations, the operation IVY, is being reproduced by Hollywood pyrotechnics on the stage. The amphitheater is surrounding the stage to show visitors the different angles of the Lookout Mountain Laboratory's cameras capturing the moment of the blast.

3. STAGE WING
Different types of a sound stage are arrayed with sequence of the scenes narrating the story of Lookout Mountain Laboratory and Atomic bomb tests.



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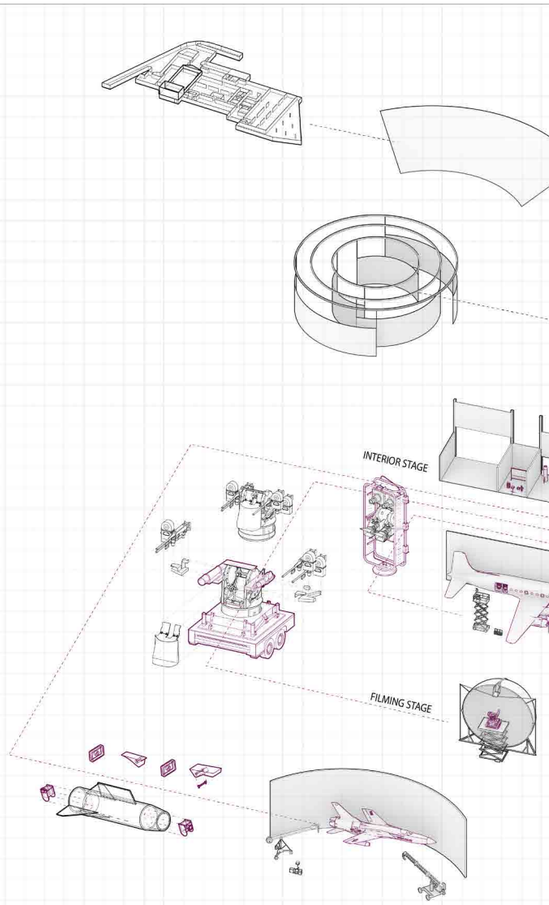
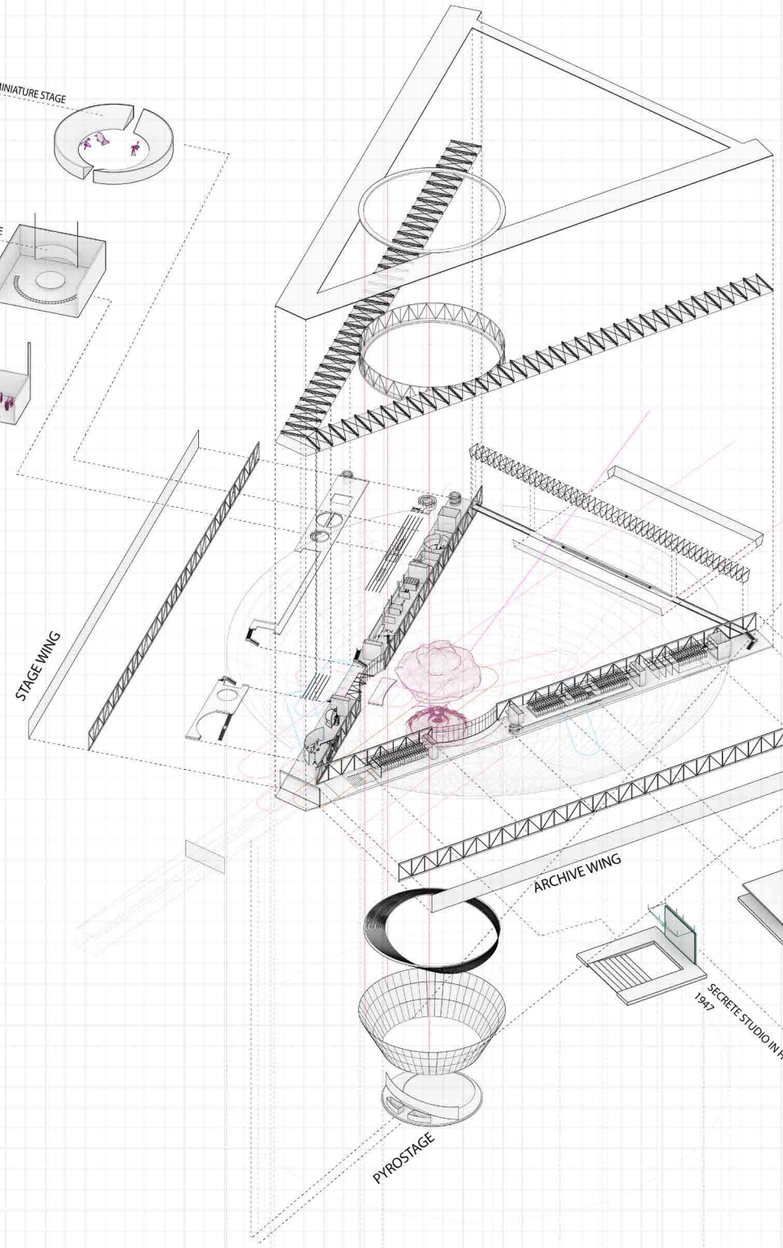
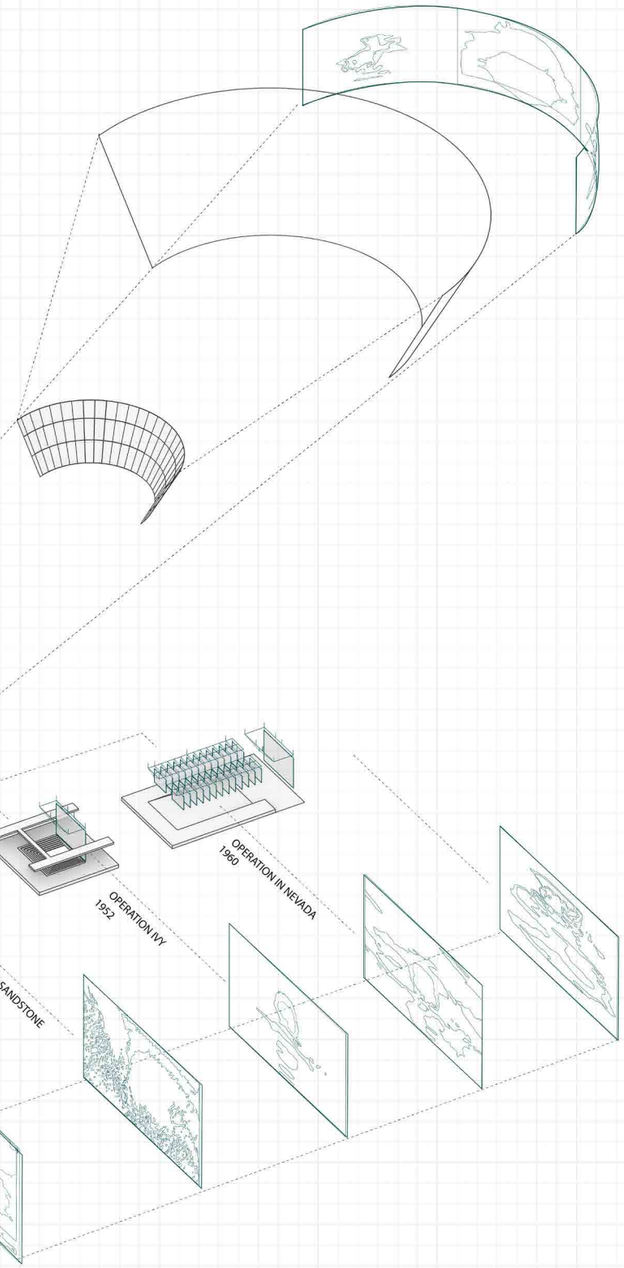
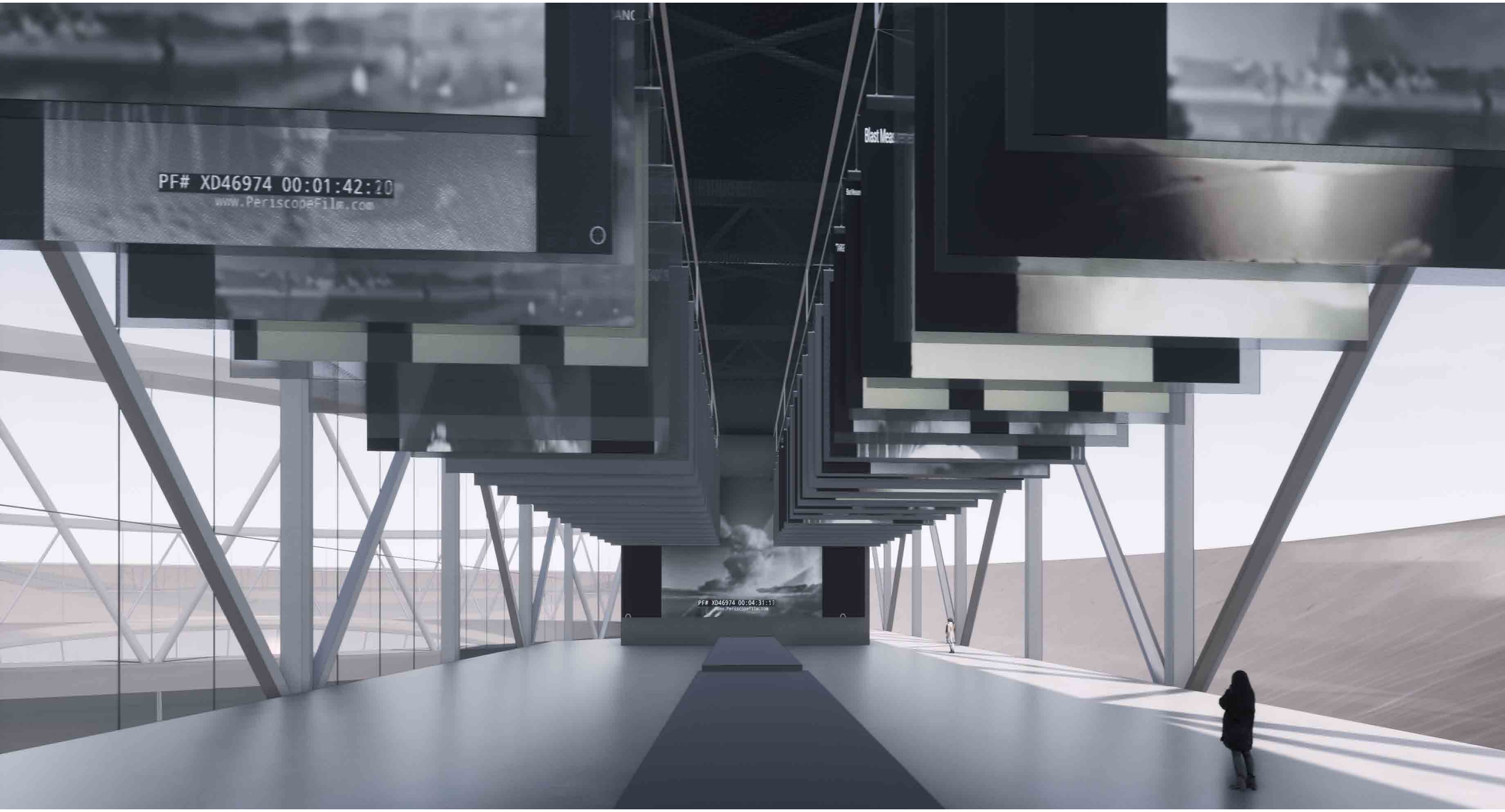




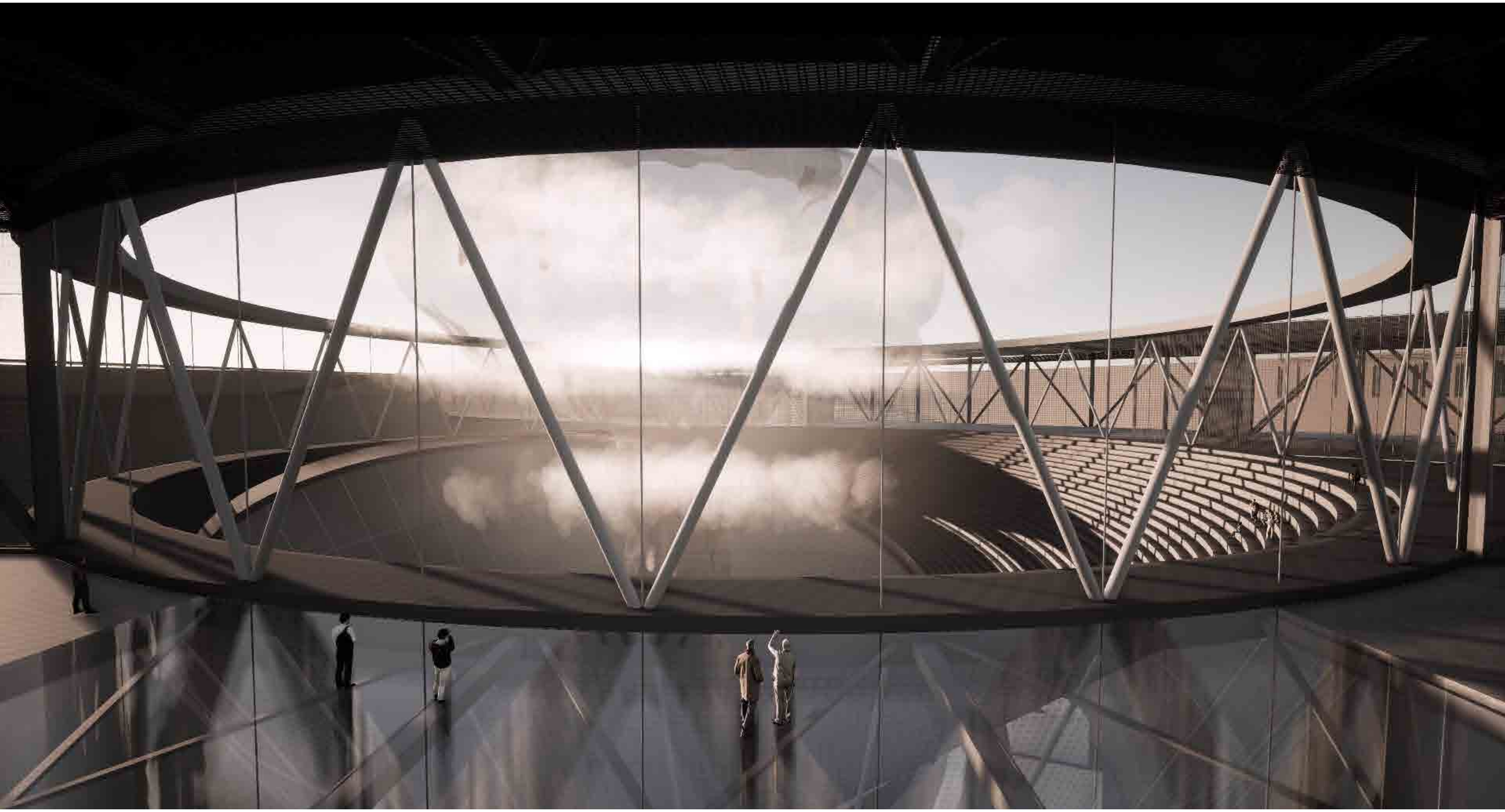


The studio diverged into two main linear wings, one for archiving the history of the Atomic Bomb Test filmed by Lookout Mountain Laboratory and the other one sound stages that keep reproducing the story of Lookout Mountain Laboratory's work. The amphitheater is surrounding the Blast stage to show visitors the different angles of the LML camera capturing the moment of the Blast.

The studio wing has different filming stages to narrate the story of the Lookout Mountain Laboratory. Each stage is designed for filming the specific scenes according to the sequence of the scenario to tell the story of the Lookout Mountain Laboratory. The stage sets are engaged with the different technics developed in Hollywood from the miniature models to the oval-shaped screen of the universal studio rides.

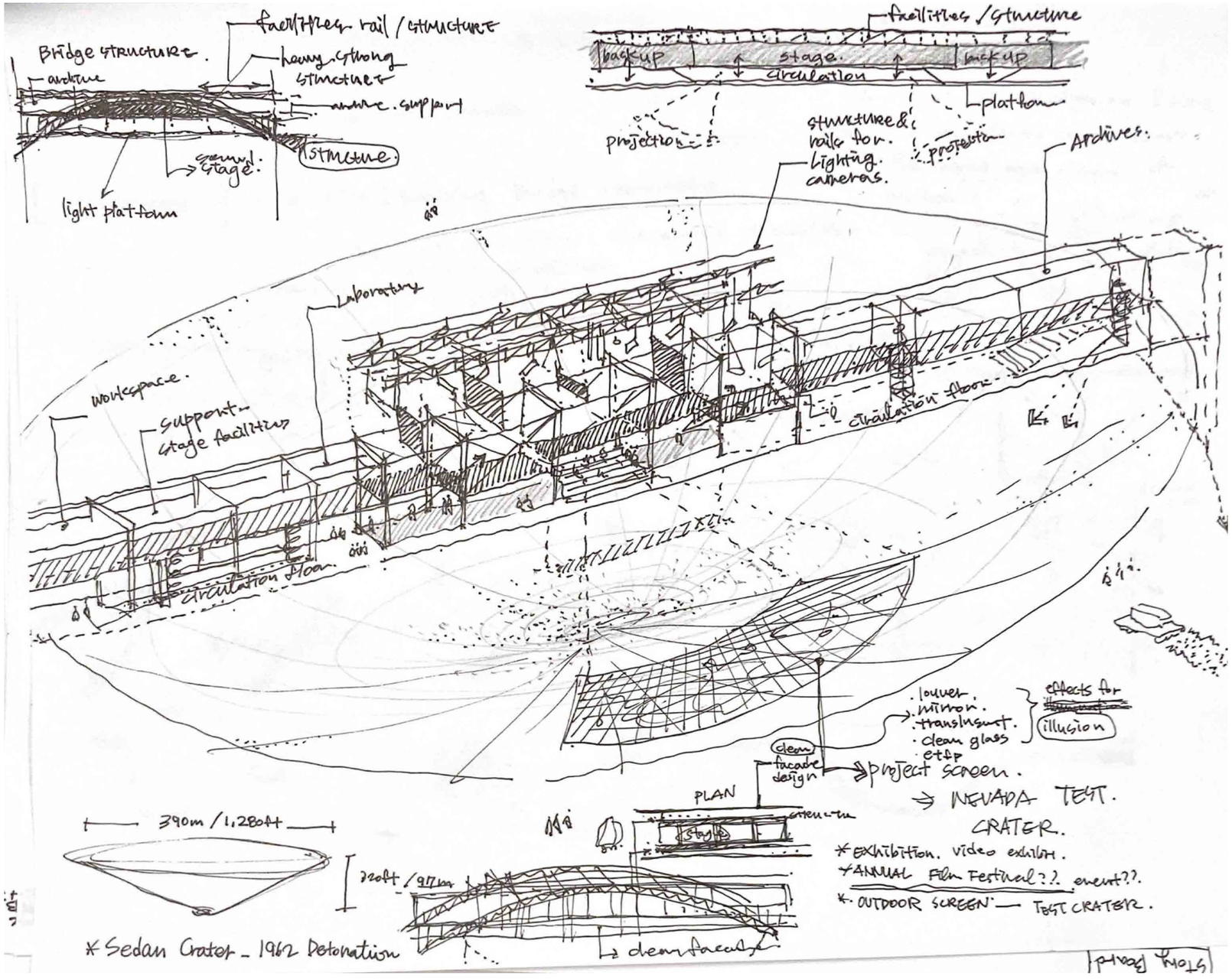


Archive for Films produced by Lookout Mountain Laboratory during the Cold War Era



Reproduction of Operation Ivy at the Pyro-Stage

In this project, the architecture act as a link between the two different concentrations of military testing and Hollywood filmmaking, which are deeply and secretly interlocked from the historical moment of the Lookout Mountain Laboratory.



Conceptual Idea Sketch for Design Intervention

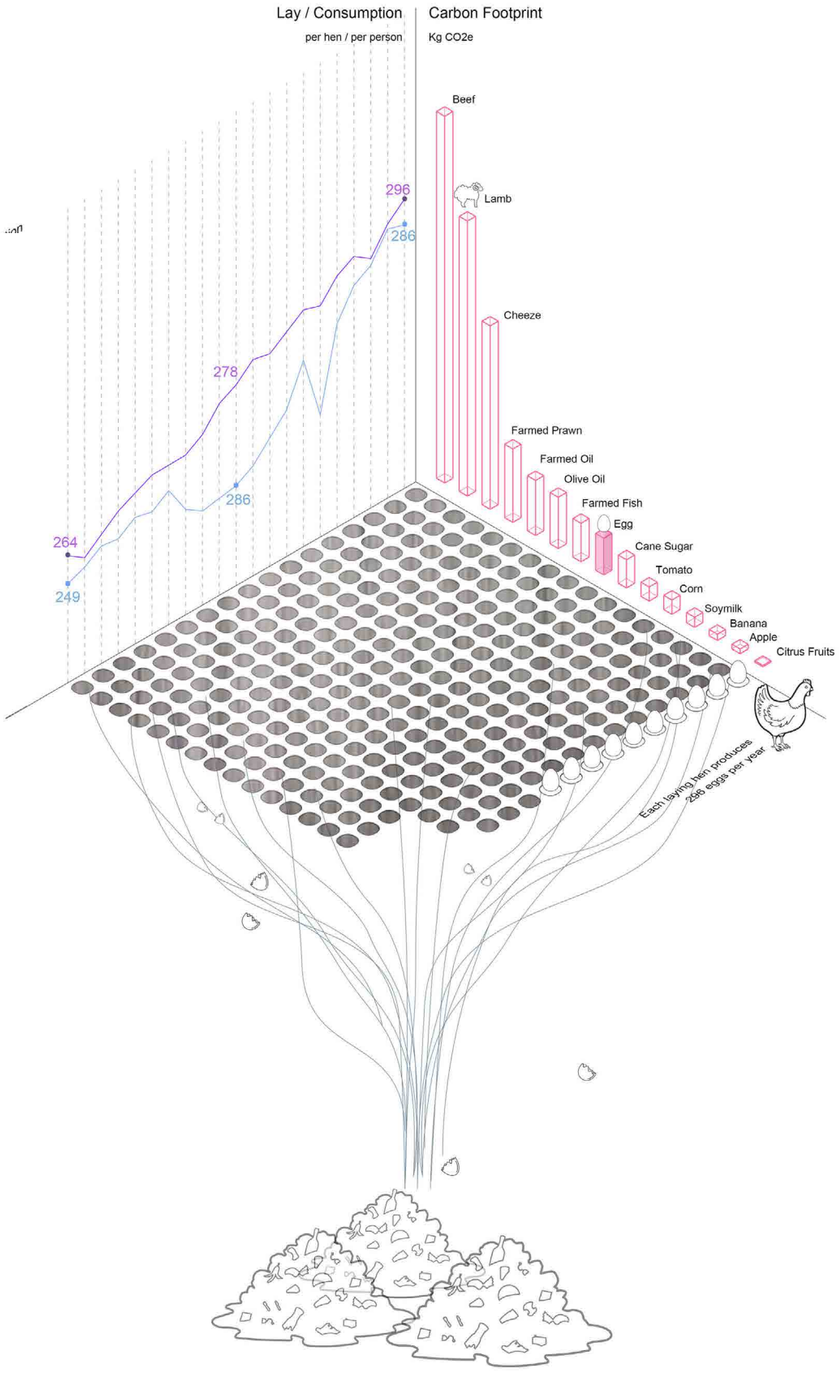
EGG ASSEMBLE

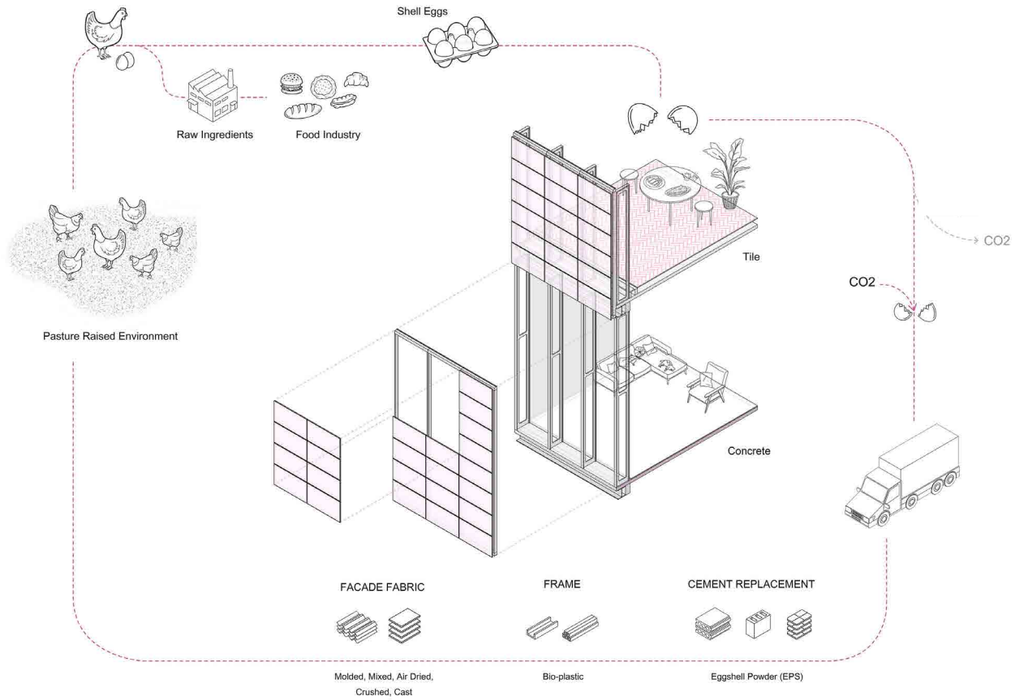
Reset the Climate Change with Carbon Sink Material

We need a radical change throughout all living activities to address the climate emergency, and architecture could become a mediator to create a sustainable connection among those living activities. By recycling eggshells, one of the most common food waste in our daily life, we can reset the relationship between food consumption, waste, and the building environment. Schools with a proposed green education system will lead this change with the young generation by collecting and utilizing eggshells from the community.

By designing the eggshell recycling system, this project proposes a start point to reset the relationship between food consumption and building construction. Also, green education and community collaboration are the essential factors for amplifying this sustainable movement. When all these human activities are connected to make a synergy, the impact would be powerful, and also a sustainable lifestyle will be created.

2021 Fall | GSAPP
Instructor | David Benjamin
Individual Work

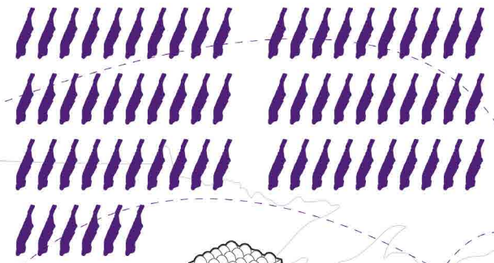




Eggs are a sustainable protein source with the lowest carbon footprint among food sources from animals, and egg consumption is increasing worldwide. Most of the eggshell waste is going to the landfill. These eggshells release methane as they break down. Using eggshells as a building material can reduce carbon emissions in food waste and the construction process. Eggshells can absorb carbon dioxide seven times its weight, and 150 thousand tons of annual eggshell waste can replace 10% of cement.

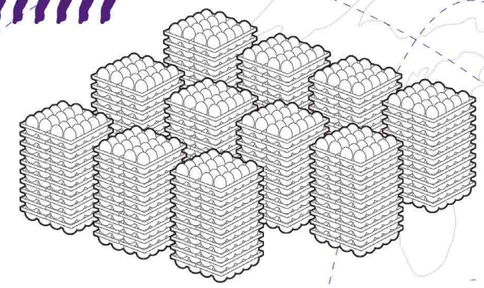
39,000km²

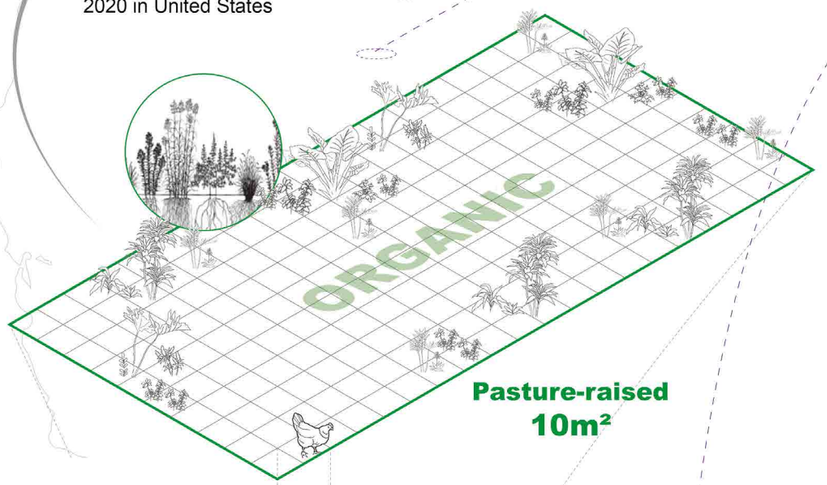
66.1 x MANHATTAN
0.039% of US Land Area



390,000,000 hens

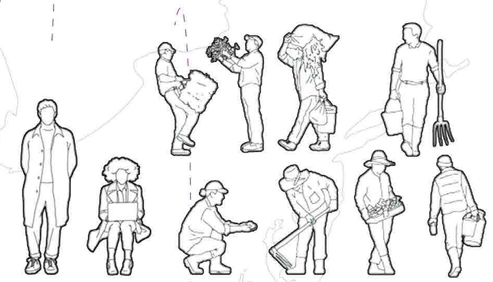
2020 in United States





Pasture-raised
10m²

105,000,000,000 Eggs



urban — **suburban**

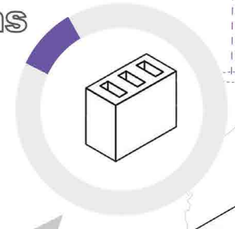
skilled — **unskilled**

$100,000

Eggshell waste has been ranked as the **15th major food industry pollution** problem.

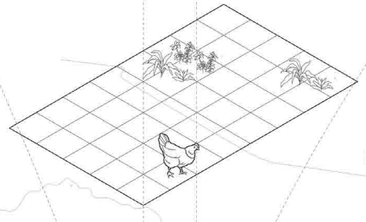
135,000 tons CO2

10%
cement Replacement



CO2

can absorb CO2 as 7 times of its weight = **1,050,000 tons**

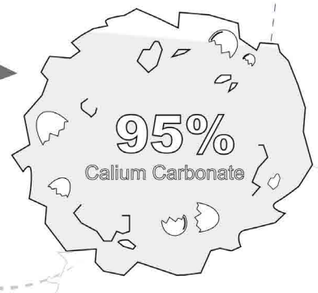


Free-range
0.18m² - 2m²

Cage-free
0.09m² - 0.14m²

Eggs
0.043m²

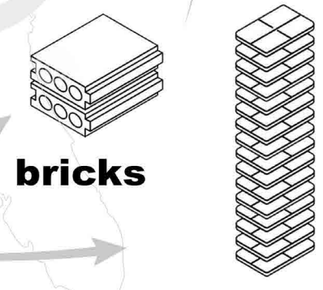
Conventional eggs are laid by birds that are typically in battery cages. The cages are usually shared by multiple hens which have little room to turn and no space their wings or engage in natural behaviors such as dust bathing and perching.



CO2
Methane

150,000 tons

7.4 million tonnes of CaCO3 / Year



bricks

3,500,000m² tiles

TOWARD SUSTAINABLE LIFE

CHECK NEW POLICIES FOR SUSTAINABLE CONSTRUCTION 2022

ESP BIOMATERIALS LEED CERTIFIED BUILDING MATERIAL

New biomaterial made with Eggshell Powder was approved as a sustainable green material for construction.

RECYCLABLE EGGSHELL WASTE BAN

All recyclable eggshells from the food industry should be collected and conveyed to the ESP manufacture factory. Dumping eggshell waste to landfills is prohibited.

bring the eggshells to the near grocery and get points!

happy pasture - raised farm

buy organic eggs

Civilian Climate Corps

We are looking for new workers work with Civil Climate Corps. No skills were needed. We ering different working conditions from suburban farm to th onstruction site.

"START FROM YOUR KITCHEN"

1. eat healthy
2. collect eggshells
3. boil the eggshells (15min)
4. dry them in the sunlight or using oven (100°C / 10min)
5. grind the eggshells
6. put it in DIY block mold

play block with your child

make your own ceramic products

make your own tiles

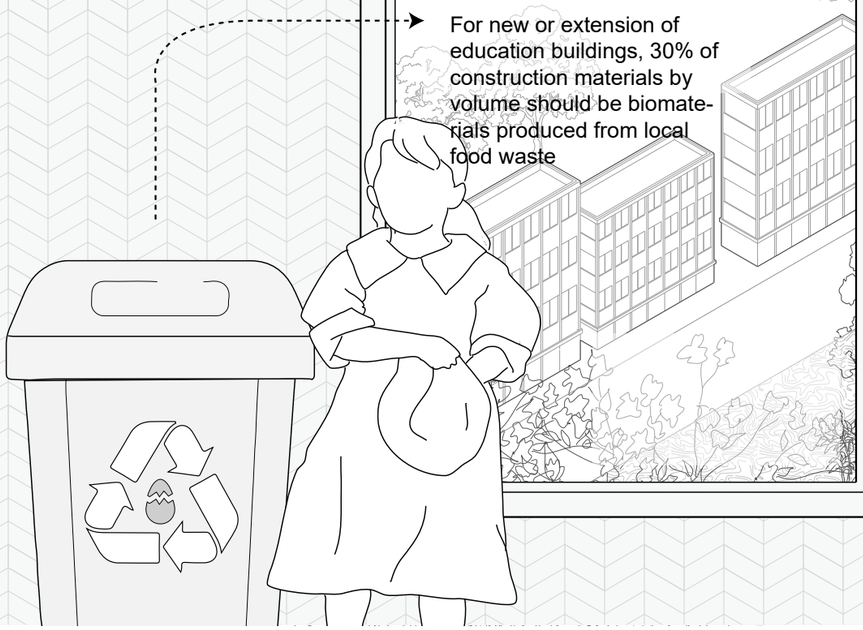
EGG ASSEMBLE

GREEN EDUCATION

NYC SCHOOL CONSTRUCTION AUTHORITY

CARBON REDUCTION IN EDUCATION BUILDING CONSTRUCTION

For new or extension of education buildings, 30% of construction materials by volume should be biomaterials produced from local food waste



GREEN EDUCATION GOAL 2030

Starting from 2022, all schools in the US must be aligned with green education programs either edible schoolyard or local farms for farming workshops.

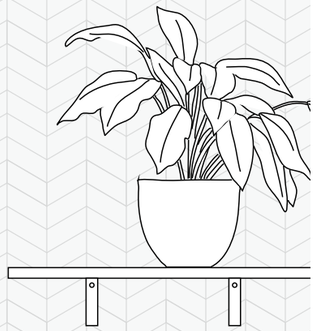
Green material classes are mandatory for all public schools in 4th-8th grade.

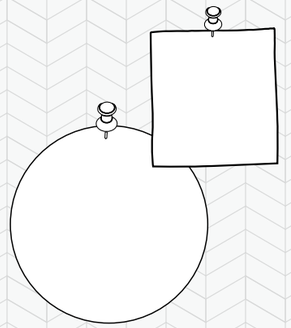
EDIBLE SCHOOLYARD NYC

EDIBLE EDUCATION FOR ALL CHILD IN NEW YORK

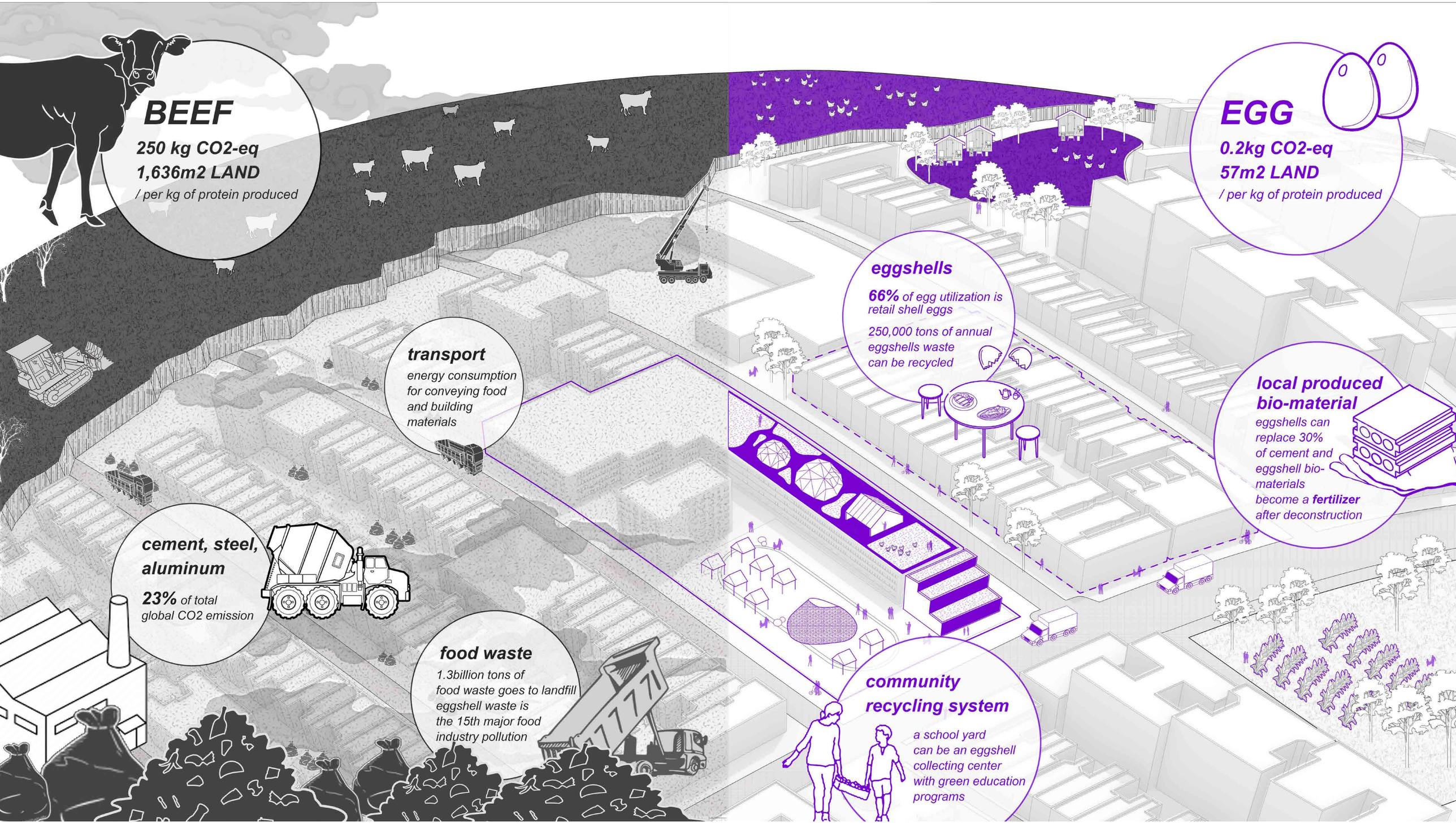
cultivate healthy students and communities, transforming children's relationship with food.

community farms in school district have a eggshell collecting center





EGG ASSEMBLE

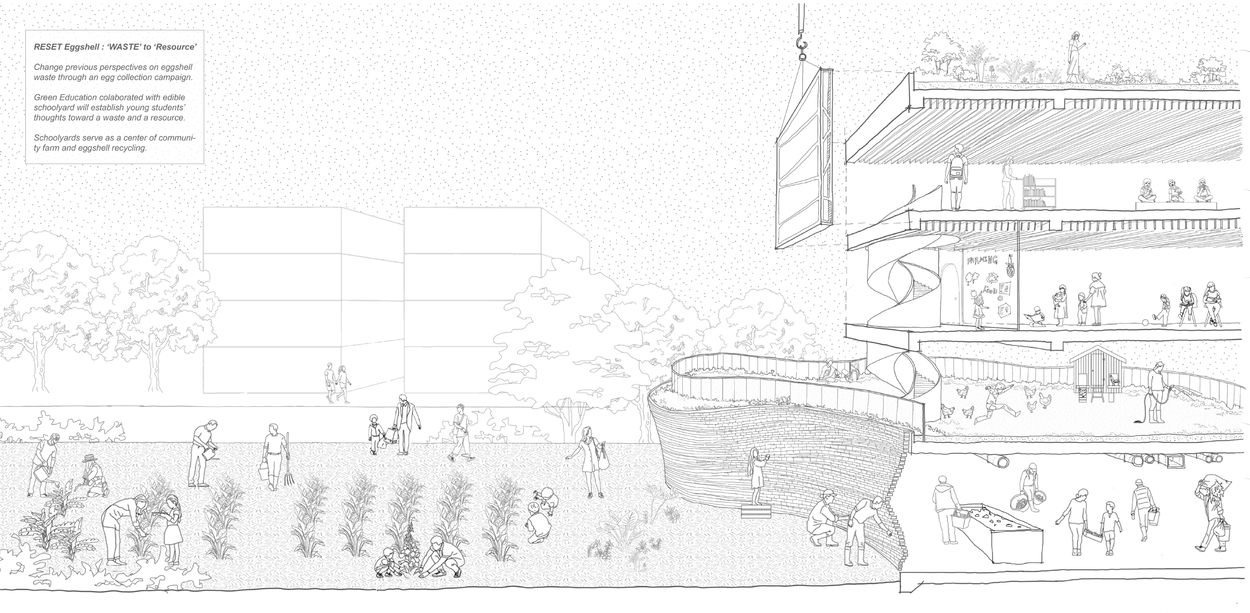

BEEF
250 kg CO2-eq
1,636m2 LAND
/ per kg of protein produced
transport
energy consumption for conveying food and building materials
cement, steel, aluminum
23% of total global CO2 emission
food waste
1.3billion tons of food waste goes to landfill
eggshell waste is the 15th major food industry pollution
EGG
0.2kg CO2-eq
57m2 LAND
/ per kg of protein produced
eggshells
66% of egg utilization is retail shell eggs
250,000 tons of annual eggshells waste can be recycled
local produced bio-material
eggshells can replace 30% of cement and eggshell bio-materials become a fertilizer after deconstruction
community recycling system
a school yard can be an eggshell collecting center with green education programs

RESET Eggshell : 'WASTE' to 'Resource'

Change previous perspectives on eggshell waste through an egg collection campaign.

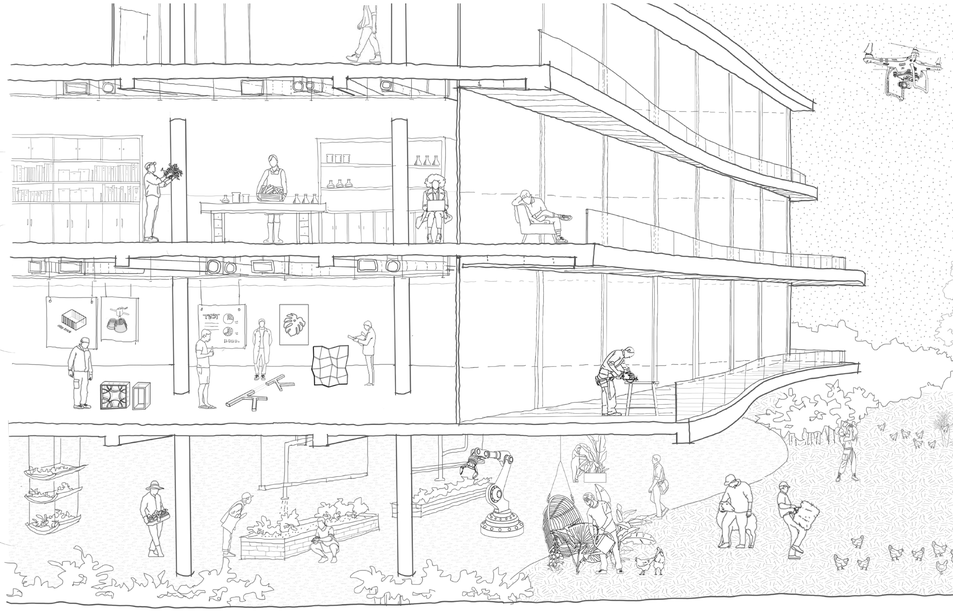
Green Education colaborated with edible schoolyard will establish young students' thoughts toward a waste and a resource.

Schoolyards serve as a center of community farm and eggshell recycling.



Start From Community

Green Education



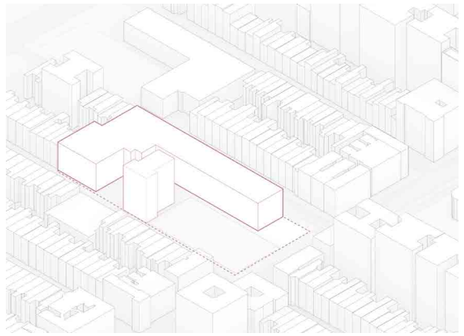
Bio-material Laboratory

RESTART to build the CITY

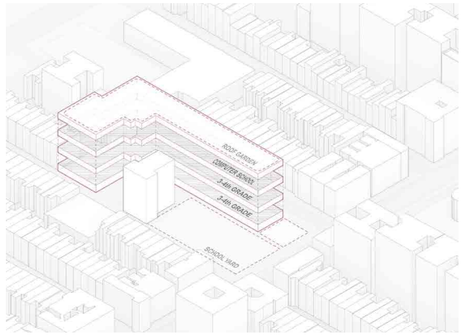
Future generation who exprienced green education such as a food waste recycling will continue to developе the biomaterial study.

New technology will contribute to developе the biomaterial experiement and constructions.

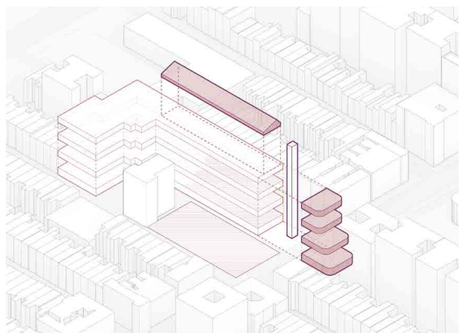
Future Constructuion



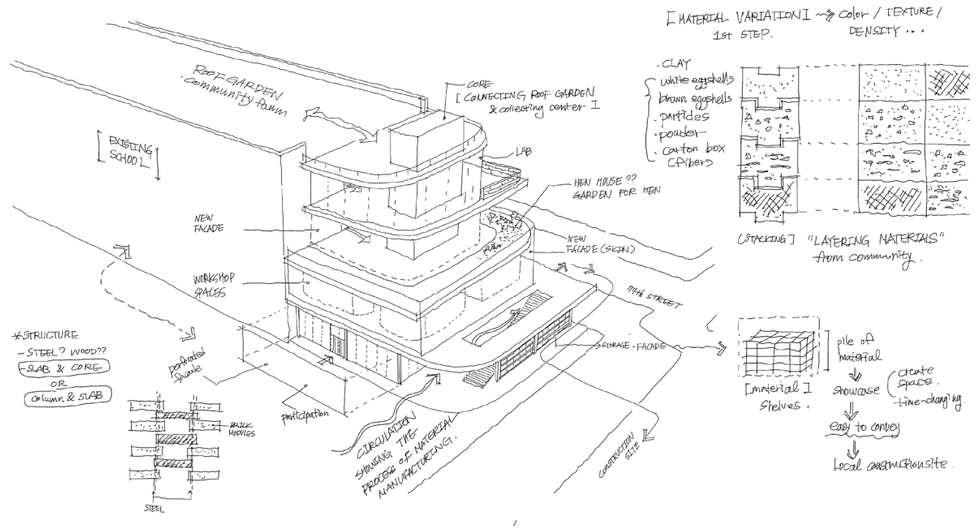
Existing School



Potential Space for the Eggshell Center



Plug-in Eggshell Center for School



School has the potential to lead this change since it can be a center for collecting eggshells from the community, and make young people rethink food waste as a resource. The next generation who grew up in this educational environment could think of food waste as a resource and develop biomaterials. Government policies throughout building material and food waste would be needed to promote practical change. By 2022, for new or extension of education buildings, 30% of construction materials by volume should be biomaterials produced from local food waste.

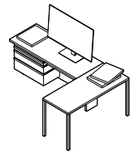
All schools in the US must have Green education programs. As well as participating in collecting eggshells from home, students will get a green education with the materials. Every school with Green education system will lead this change with young generations and communities. 270 thousand tons or more of carbon dioxide can be reduced if all the eggshell wastes are recycled in the future.

EGG ASSEMBLE

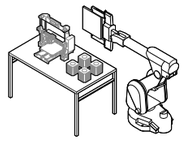
DAY | Material Education Program for Students

GREEN EDUCATION CURRICULUM

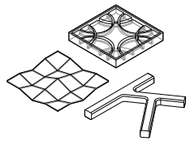
3F | COMPUTER BIO-LAB _ 9th to 12th grade



INFORMATION RESEARCH

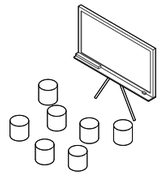


TECHNOLOGY

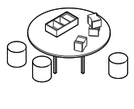


EXPERIMENT

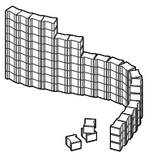
2F | MAKER SPACE _ 4th to 8th grade



LEARNING BIOMATERIAL

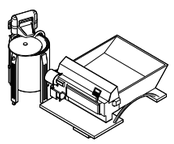


MAKING YOUR BLOCKS

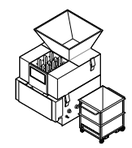


CREATING SPACE

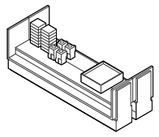
1F | MATERIAL LIBRARY _ all students participation



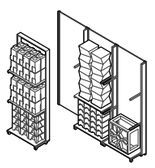
COLLECTING & CLEANING



BLENDING EGGSHELLS



MANUFACTURING



MATERIAL ARCHIVE

COMMUNITY

COMMUNITY

NIGHT & WEEKENDS | Community Engagement for Labor and Research

COMMUNITY COLLABORATION

Besides the school curriculum itself, several organizations exist for climate change in the city. The eggshell center will connect these organizations with the community.

Rooftop | COMMUNITY BIO LAB

Genspace is the world's first community biology lab — a place where people of all backgrounds can learn, create, and grow with the life sciences. At Genspace, anyone can work in our biolab on their own project. Receive 24/7 access to our facility, equipment, and basic lab training from our staff.

Genspace

4F & Roof Garden | EDIBLE SCHOO YARD

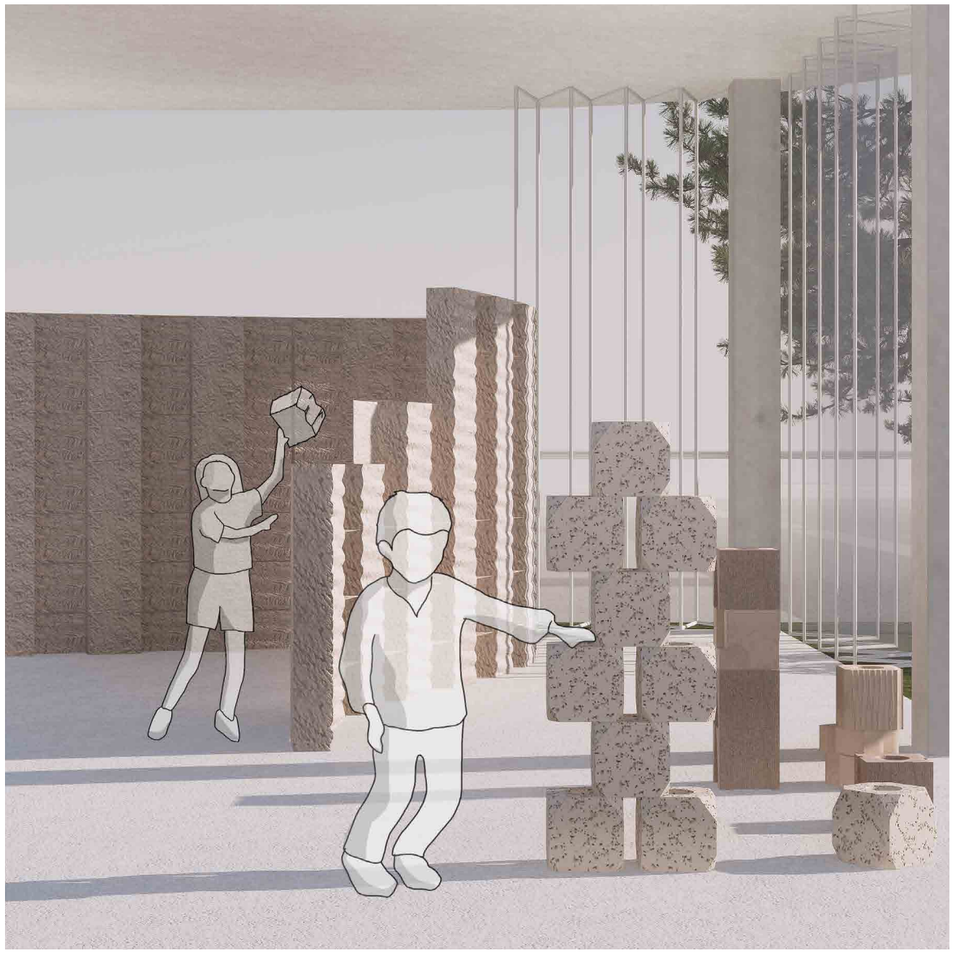
Edible education provides hands-on experiences that connect students to food, nature, and each other; and it systematically addresses the crises of climate change, public health, and social inequality. At its heart is a dynamic and joyful learning experience for every child.

THE EDIBLE SCHOOLYARD PROJECT

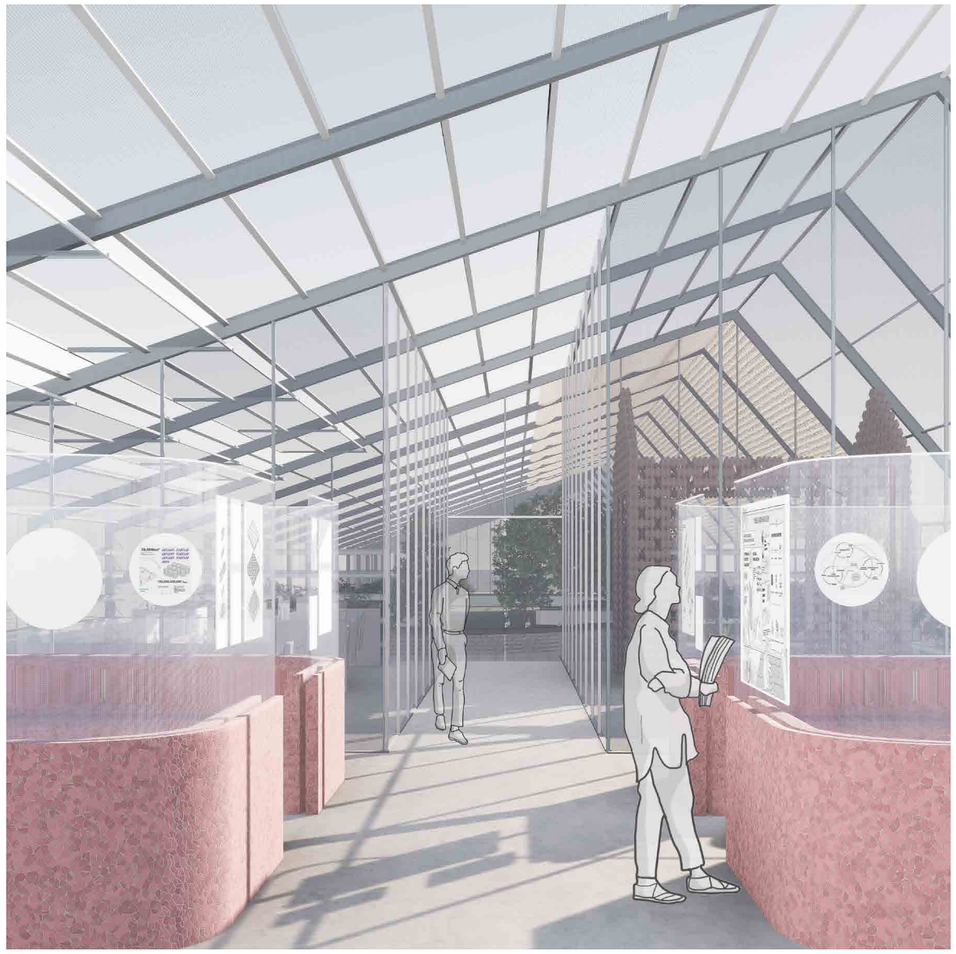
Classrooms | CIVILIAN CLIMATE CORPS

Work with communities and organizations to develop and implement sustainability projects, while receiving training and financial support. Climate Corps simultaneously addresses climate and sustainability projects and cultivates the next generation of environmental leaders.

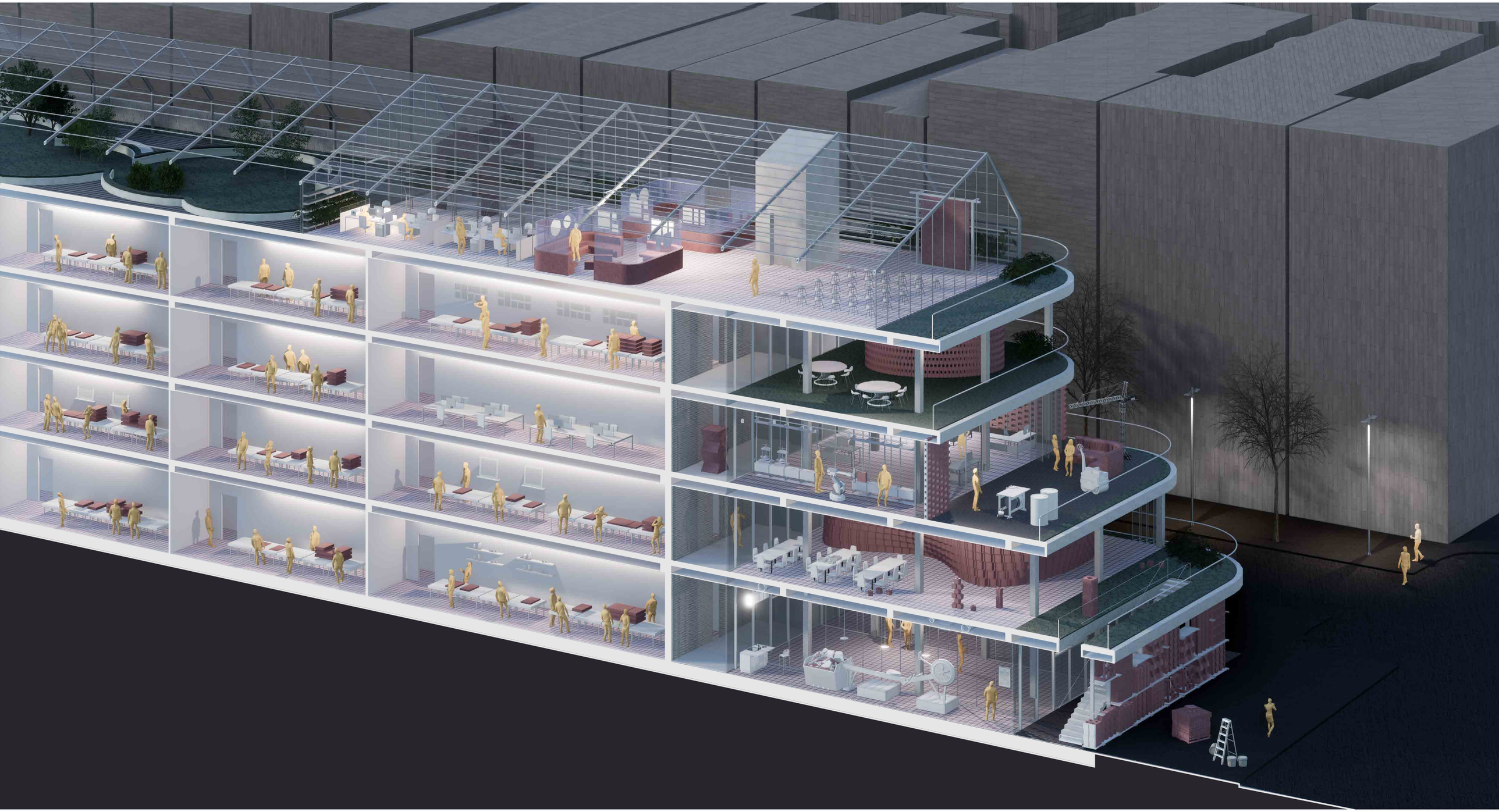
CIVILIAN CLIMATE CORPS



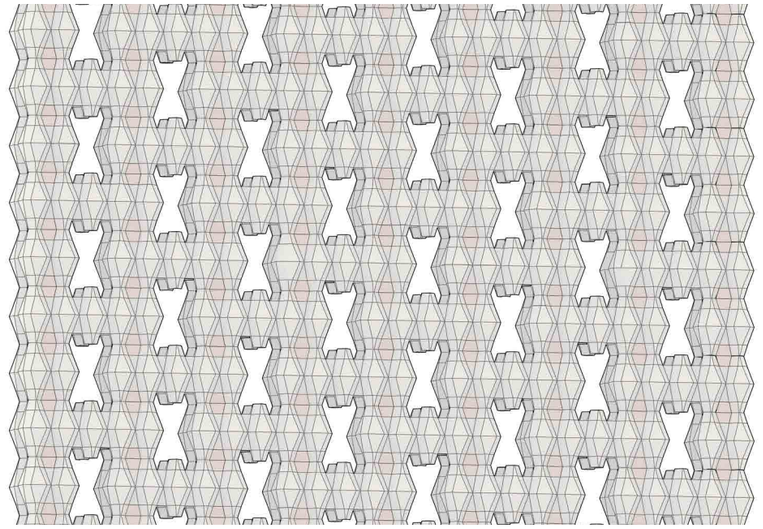
Material Education Program for Students



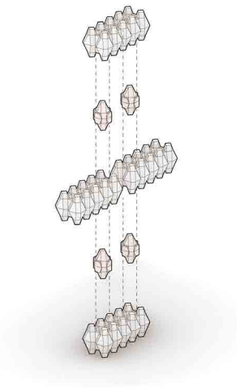
Rooftop Laboratory Space for the Community Program



‘dining shell’ : diy blocks for outdoor seats

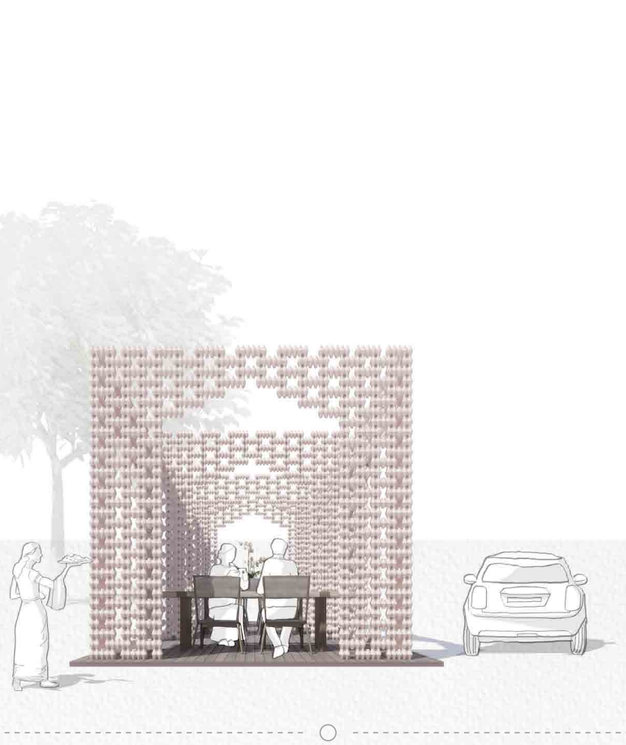


diy blocks made by utilizing egg cartons

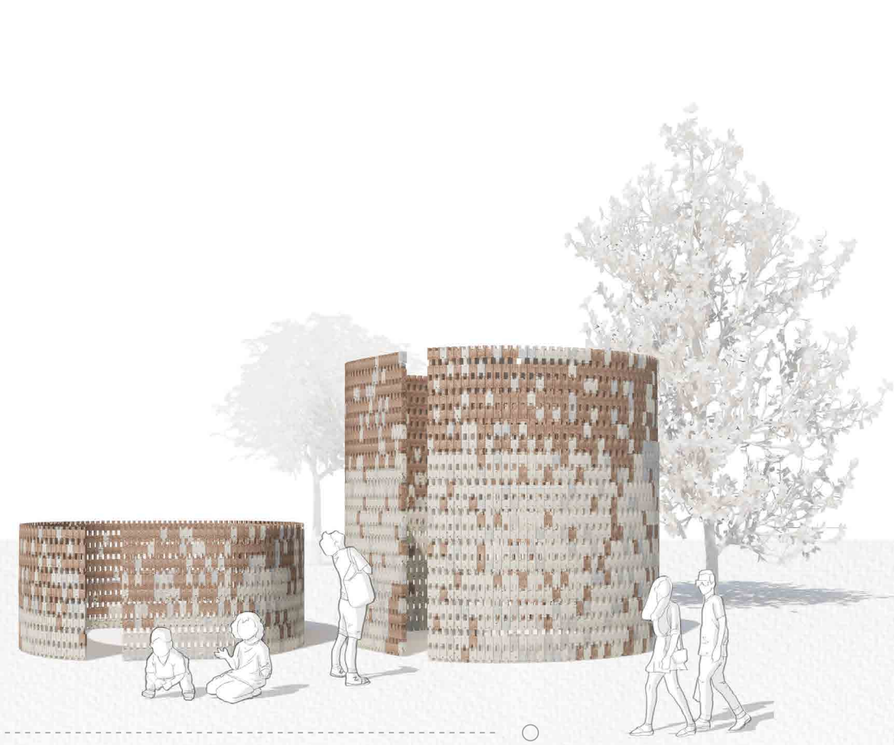


EGG ASSEMBLE

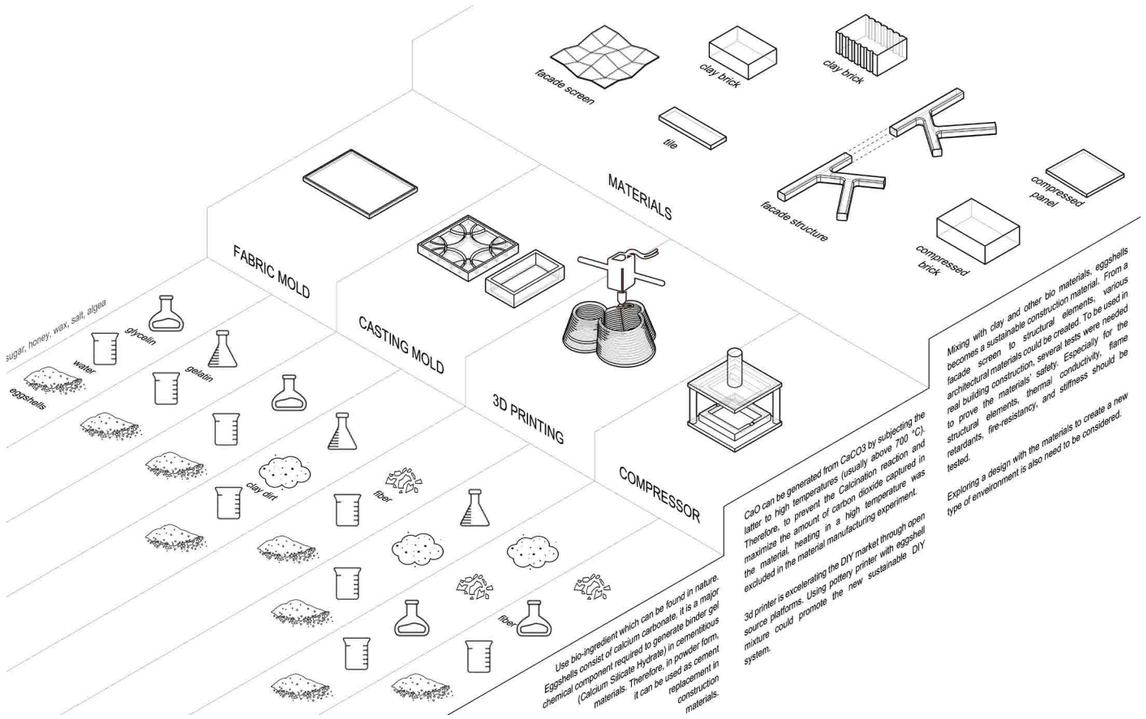
Local Construction



Outdoor Restaurant

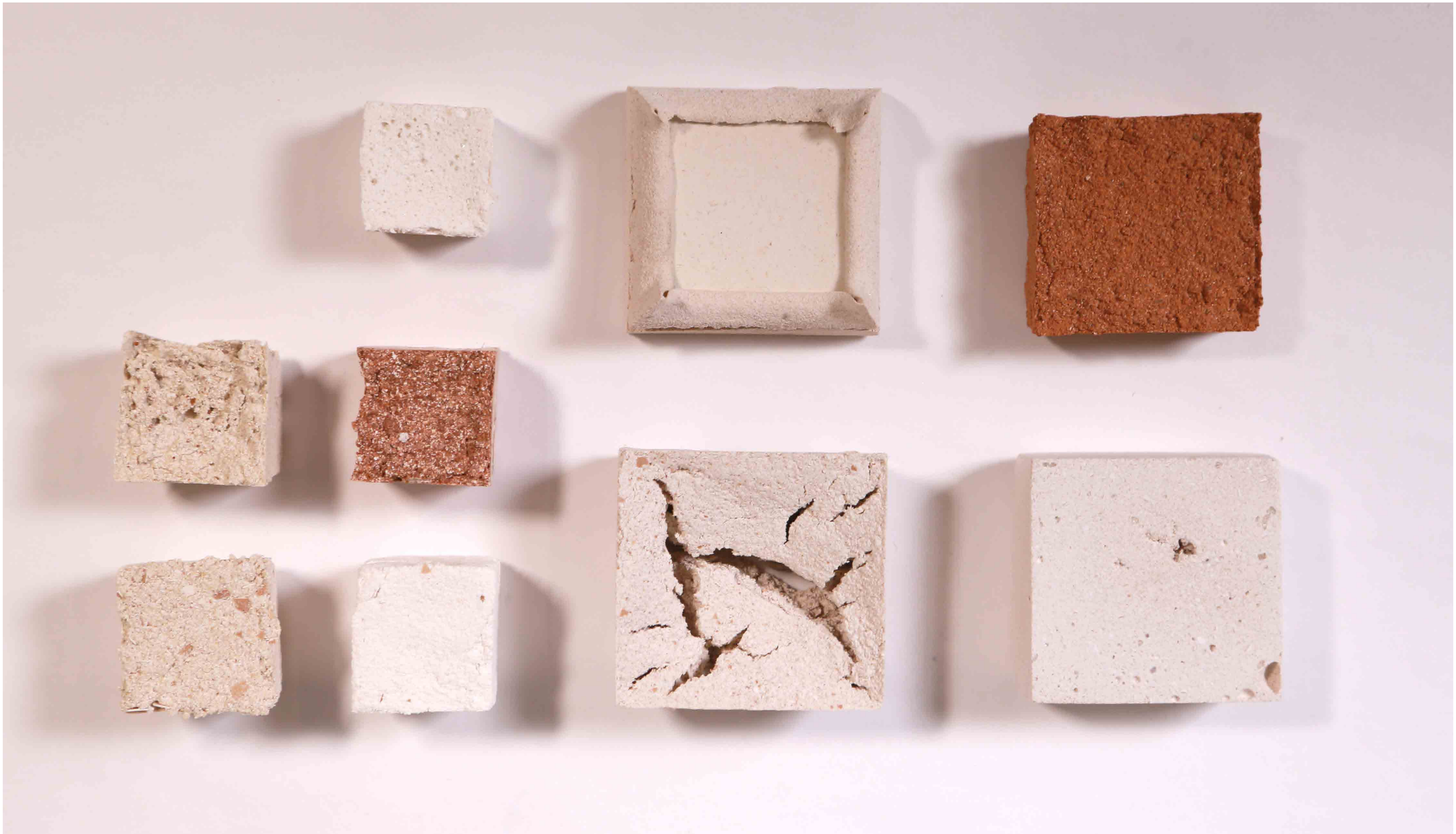


Pavilion | Temporary Architecture



Various Potential of Eggshell Material
with Different Manufacture Process and Materials

Material experiments were conducted with brown and white eggshells collected from neighborhood. Egg cartons, brown and white eggshell powder, eggshell particles, gellatine, and clay were the main ingredients. The different combinations of these materials can make various colors and textures of the facade.



EGG ASSEMBLE

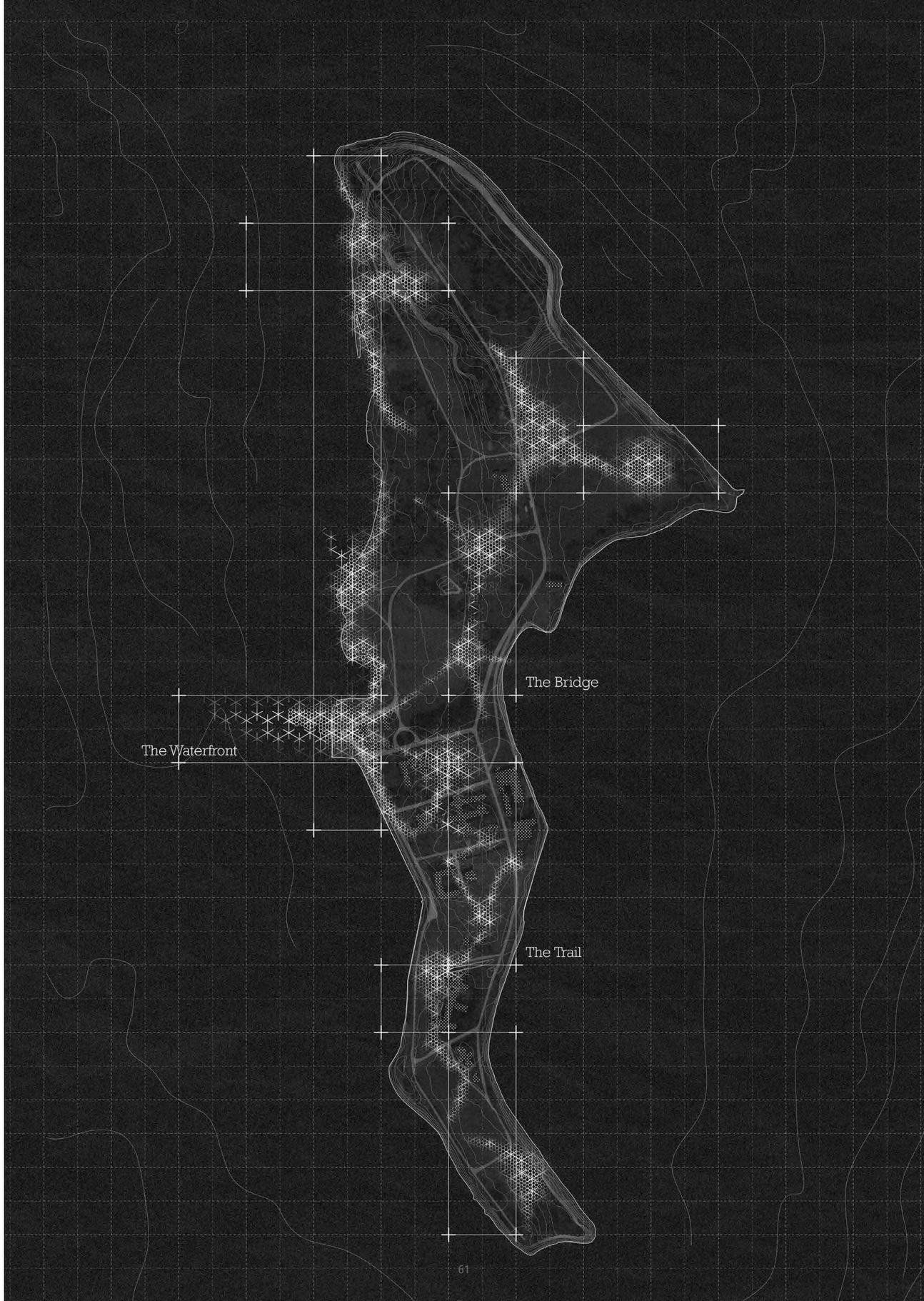
HARMONY GROUND

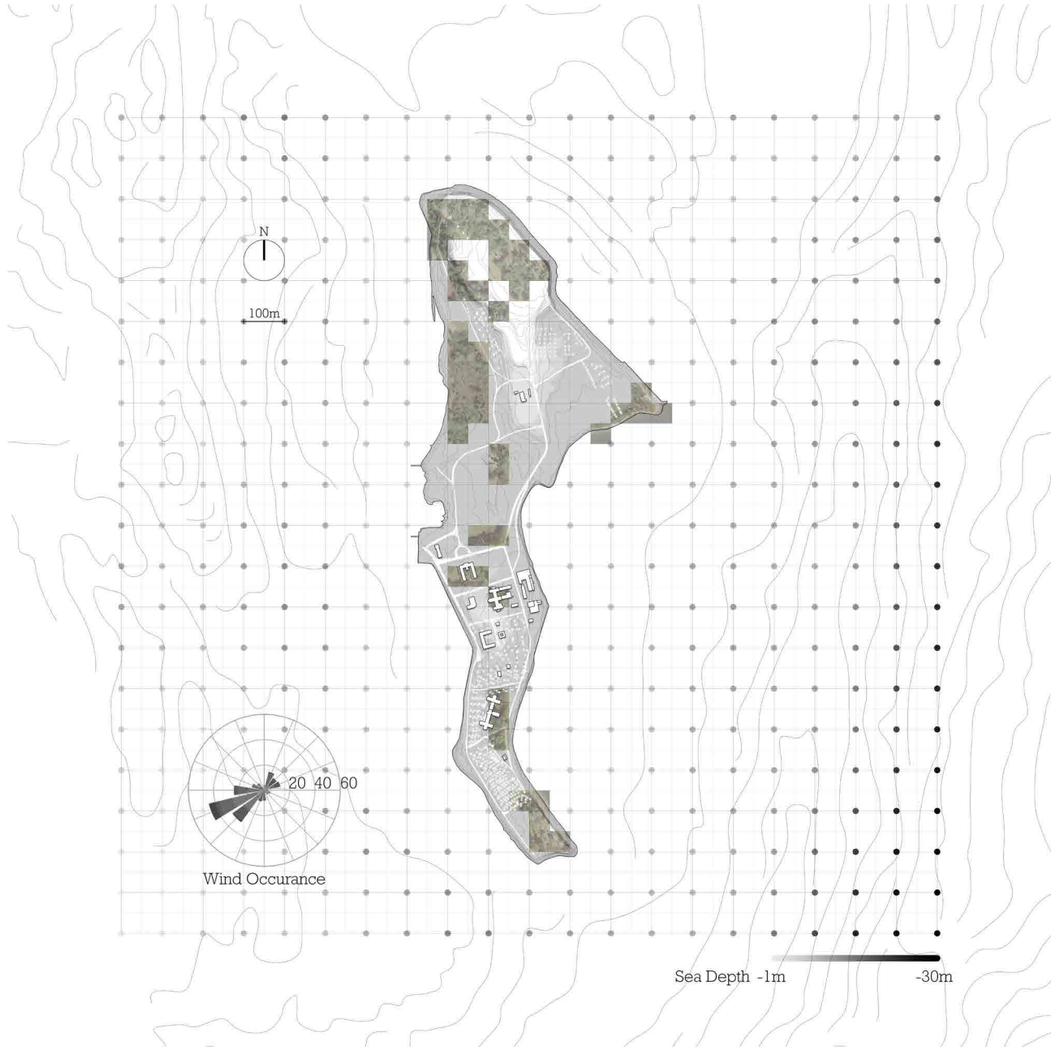
Among the Living and the Dead

Harmony Grounds is a commemorative communal space that seeks to transform Hart Island from a dark and foreboding area to an ever-growing vivacious natural commemorative environment. Enhancing the urban connectivity of the historical burial site, this project celebrates continuities in life and death. Harmony Grounds seeks to transform traditional spaces of death and grieving into spaces of life and reflection by integrating remains into a soft modular infrastructure system to generate a revitalized landscape.

This new terrain provokes intimate interactions among family, friends, strangers and their loved ones. The soft infrastructure is integrated with sustainable mechanisms that aid in the mitigation of flood damage, and has the potential to develop additional programs and spaces through a variation of modules and scenarios; solving the issue of a lack of burial space for New York City residents.

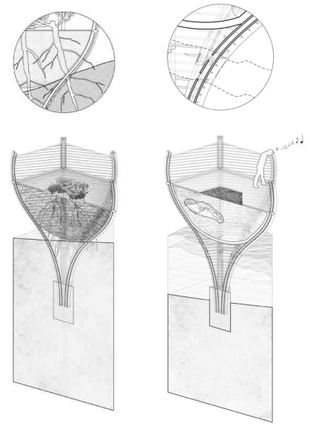
2021 Summer | GSAPP
Instructor | Karla Rothstein
Group Project | Hyosil Yang, Frank Wang, Yuedong Lin

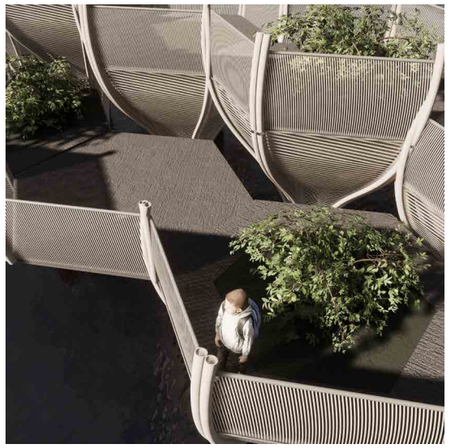




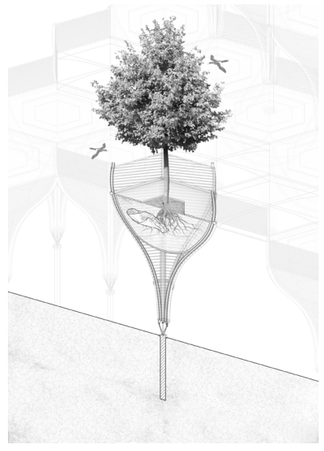
Hart Island is already the eternal home of over 1 million individuals. With this in mind, the grounds will initially be able to facilitate the burial sites for 5,000 deaths per year. Over time, as the project grows it is projected to accommodate 20% of the over 50 thousands annual deaths in NYC; relieving the City's dire need for burial space. Harmony Grounds hopes to annually welcome over 1 million visitors to this commemorative island oasis.

The project addresses three critical issues in the island's development. First, waterfront scenarios allow for increased accessibility for the general public; expanding the land mass of Hart Island. Second, bridge scenarios provide natural habitats for the flourishment of wildlife; aid in future flood management, and provide indoor space for intimate and collective gathering. Third, commemorative pathway scenarios seamlessly coalesce old and new burial sites in order to ensure that all deceased are engaged and honored.

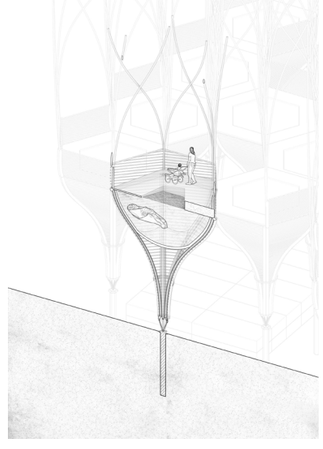




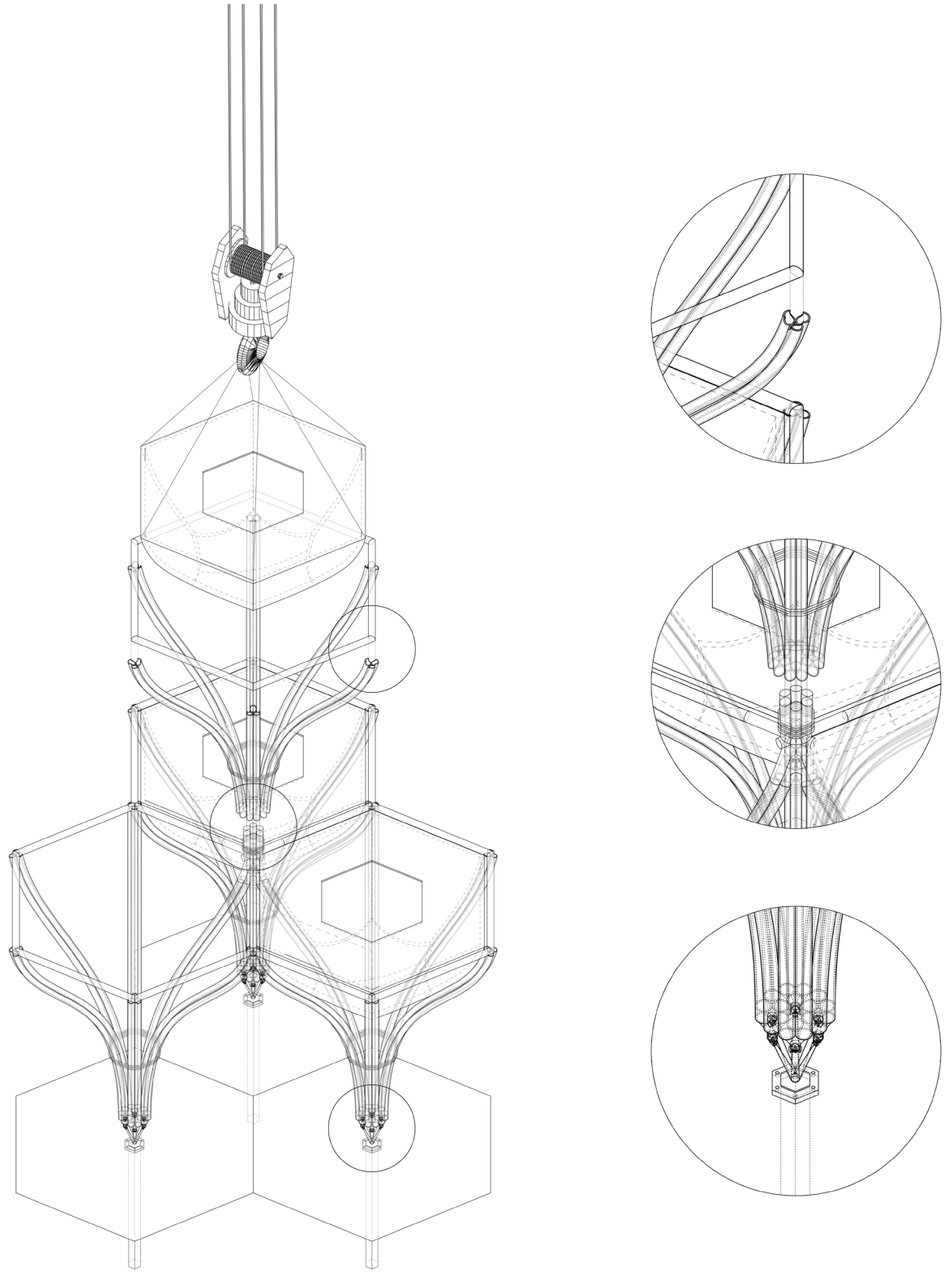
The Waterfront



The Bridge



The Trail



Module Assembly

Each burial component has the ability to be customized with vegetation, sound, or light, to bring greater respect for the individuality of the deceased within the communal burial ground. For the structural material, bamboo was chosen because of its fast-growth, resilience, sustainability, as well as plasticity before air-drying. Modules are interlocked through joints and can be assembled to create various sizes of spaces.

A burial pot can be fitted into each of the tulip-shaped bamboo modules. One, three or six different burial solutions are provided per the pot. Within the burial pots, a tree will be planted for each buried body. The nutrition from the decomposition of the corpse will help this tiny ecosystem to grow. And once the body is completely decomposed, the trees can be moved to another location in New York for urban planting over two years.

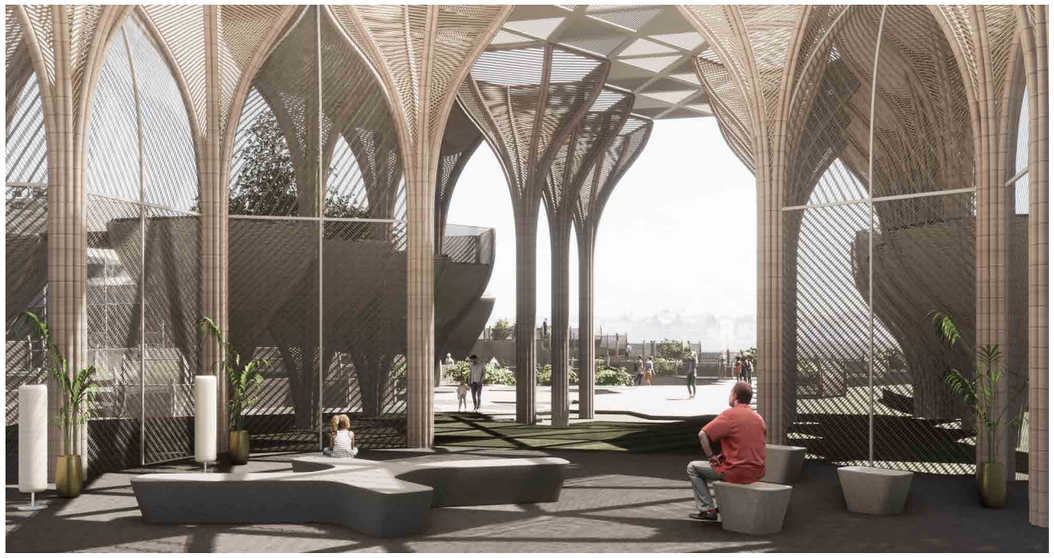
Burial Component

HARMONY GROUND

Section Pesrpective | The Bridge

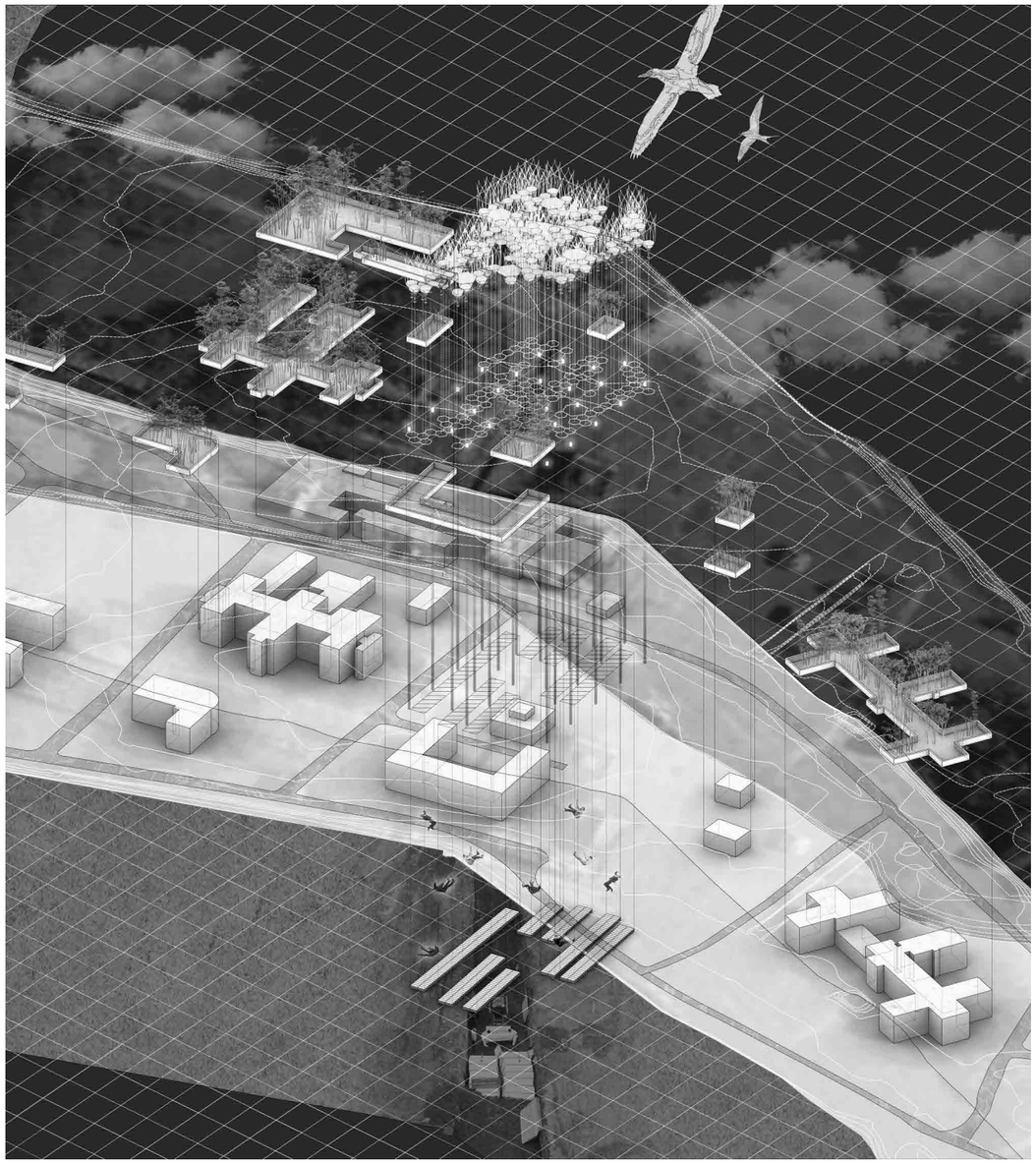
Harmony Ground in Different Environmental Conditions

HARMONY GROUND

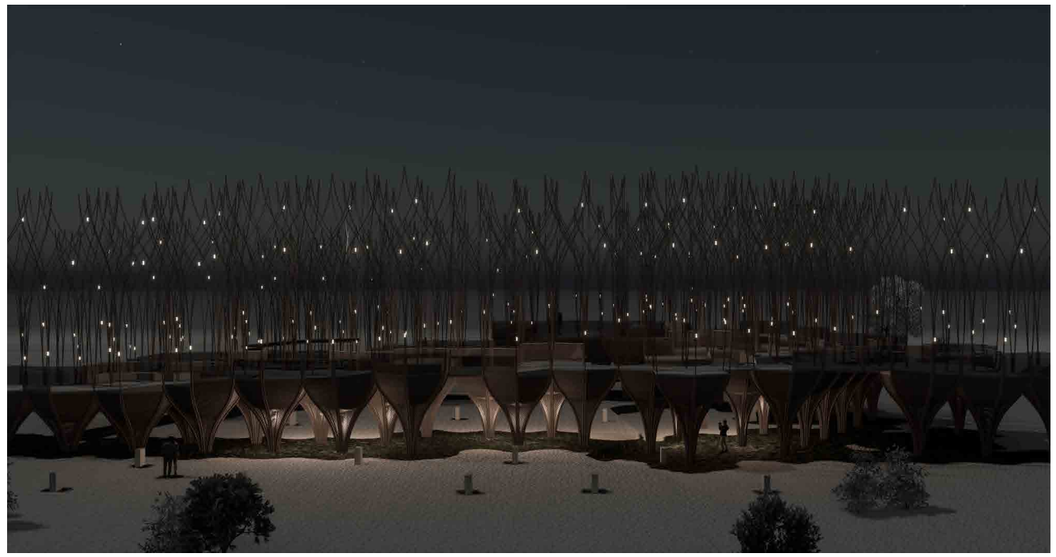


The Waterfront

The Bridge



Exploded concept diagram for the trail



The Trail

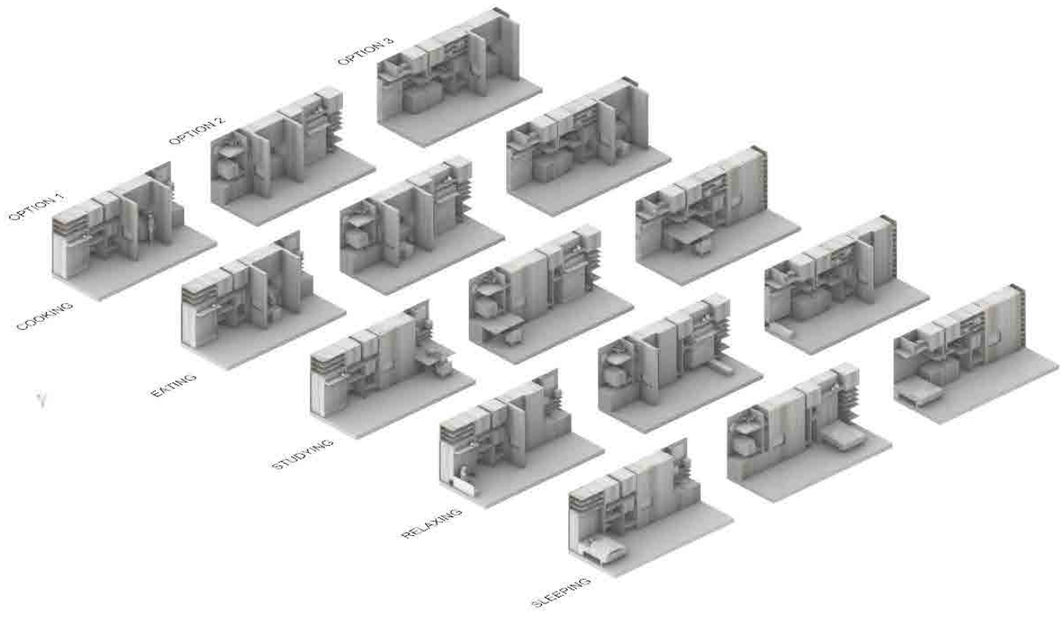
HARMONY GROUND

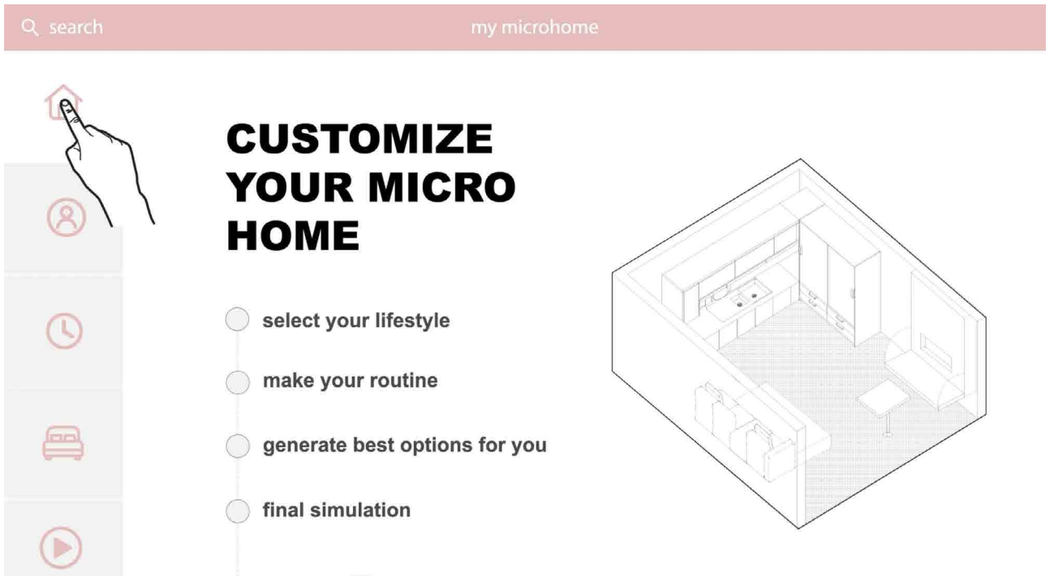
RETHINK ARCHITECTURE TO RE -

OPTIMIZE SPACE
SHAPE CULTURAL IDENTITY
BUILD COMMUNITY

MY MICRO-HOME
Customize your Micro Home

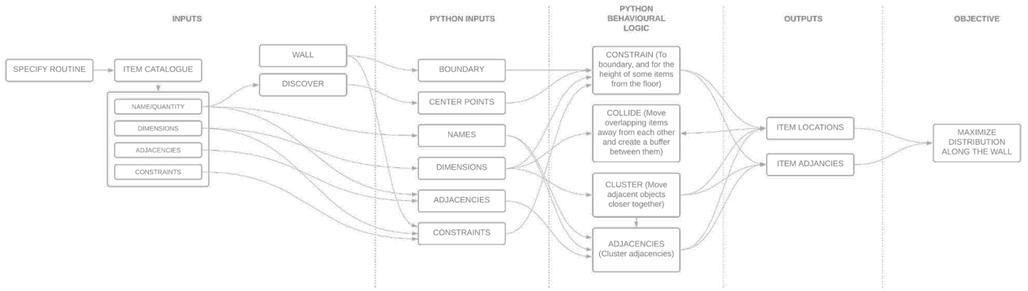
Adrianna Fransz, Anoushaé Eirabie,
Francesca Doumet, Hyosil Yang, Leo Di Wan



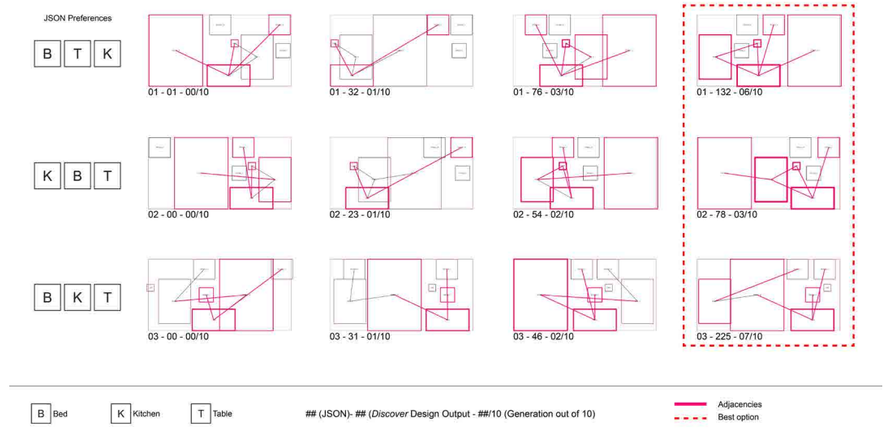


The topic of living and working space has enjoyed a spotlight in recent years as the value of space in major cities increases, and as the global community searches for ways to redefine productive, healthy environments that promote holistic lifestyles. Just over the last year and half as COVID-19 took over our typical lives, quarantines and large periods of ‘work from home’ forever altered the ways in which we use our personal spaces. Never before have our living rooms and kitchens enjoyed such critical analysis than during the pandemic. How a home, office or other living space is arranged to facilitate a routine can have a subconscious or conscious long-term impact on productivity and even overall comfort. As a response to these issues this investigation proposes a solution that relies on user preferences to generate designs tied to lifestyle choices.

My Microhome optimizes the use of a wall in a typical micro-home by maximizing the distribution of activities across it. We chose specifically to use a micro home as a precedent for the design space because compared to typical apartments which are usually designed for efficiency in plan, a micro home forces our attention on any available space in the unit, including walls, ceilings and floors. For the purpose of this optimization we isolate a wall in a micro home and designate certain furniture that can fold out and into the wall to allow for the best use of space elsewhere in the apartment. To generate a Microhome wall, the user inputs their lifestyle, sets a routine for the wall to follow, and then selects a single design option that best suits their needs.



The computational design process



Optimal outputs generated through Discover

The process of accomplishing this design task without optimization while not impossible would be tedious and difficult to maintain consistently. By deploying design through generation, multiple solutions can be created quickly allowing designers to focus on finishes without worrying about placements. Additionally the average designer could miss opportunities just based on the sheer number of options developed through the ‘Discover’ process.

The project begins by allowing a user to define a specific routine. In doing so, a series of suggested items/furniture populate a catalogue. We used to a JSON text file to define each item’s name; dimensions, in this case width and height (all typical furniture sizes); constraints on location, some items when placed on a wall have to be a certain distance from the ground in order to remain functional (i.e. the surface of a table should be no higher than 2.5 feet); and adjacency, meaning other items that would sit in proximity to said item in order to establish a pattern of use.

This data list was then converted into point locations randomly generated using the Discover: Continuous input parameter that were constrained in range only by a specified “wall” boundary. These point locations were then passed through another python script to receive a series of behavioural treatments in order to decide their final locations for evaluation. The python behaviours are defined as follows:

a) Constrain: Keeping the newly generated locations within the same bounding box they were generated in. Also implementing the ‘height constraint’ input specified in their JSON profile by raising the center points to a specific ‘y’ value.

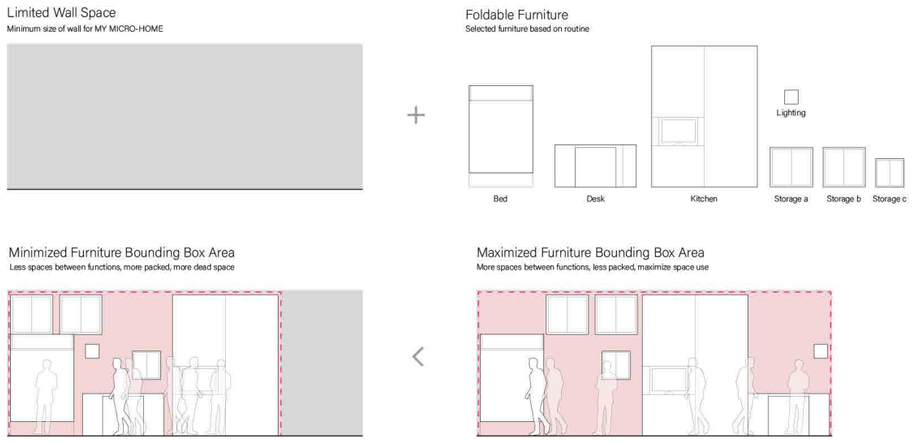
b) Collide: Evaluating whether or not the ‘widths’ and ‘heights’ of the rectangles surrounding the center points overlap, and if so, moving them in the ‘x’ and ‘y’ directions so that their collective dimensions are no longer overlapping.

c) Cluster Adjacencies: Pulling items designated ‘adjacent’ in their JSON profiles closer together by applying a clustering logic: if the distance between ‘adjacent’ objects is greater than their combined widths and heights, move them closer together.

Generated outputs include new item locations (based on a new center point) and number of adjacencies established. We associate the original dimensions of the items to the newly generated center points and produce a bounding area. We multiply this new bounding area by the established quantity of adjacencies and in doing so create an objective to maximize the potential area these items can occupy inside the wall boundary while increasing their adjacency.

The model was able to generate ideal options based on JSON preferences. The image above demonstrates that it did take a certain number of generations for the model to recognize and eliminate overlap, and move the items in their optimal positions based on adjacency. The Discover plot was set up to output 20 designs per generation over 10 generations at a mutation rate of 0.05.

Optimal outputs generated through Discover



Optimization logic comparing minimizing area to maximizing area.

Result from Optimization with Discover

Having Discover do the work of finding an optimal location for key items in a wall allows designers to focus on how to infill the space between these items, and create actual “homes” out of generated spaces.

More can always be done, the model developed here is simple and at times predictable. There is room to introduce a wider variety of items and integrate a broader hierarchy for implementation in order to provoke objectives that generate a more searchable model. There are also opportunities to introduce different types of the same functions generating ever more possibilities for the user.

There is, however, an excitement surrounding the possibility of extending the hand of the designer to the user directly through the kind of methodology My Microhome attempts to define. The notion that a user can design a space based on parameters that they are most familiar with, like their own routines, is a novel approach to architectural and interior design, both of which are professional careers and usually involve years of drafting experience and education. My Microhome expands the role of an architect/designer in the sense that it removes the routine and predictable work that takes so much time away creating a space. Direct user and designer exchanges see the generative model become a catalyst for collaborative and participatory design.

Re-shaping Identity : Ornaments in The National Museum of African American History and Culture

"The narrative of slavery is a real reminder to America of how much enslaved labor is woven into the fabric of the nation. The mission of the museum is to make African American history understood as American history."

Mabel O.Wilson, author of <Begin with the Past>

More than simply seeing African American history as an exploited and oppressed past, the design of the National Museum of African American History and Culture was intended to praise achievements earned by their struggles and highlight the richness and diversity of the African American culture as a part of American history. To fulfill this purpose, David Adjaye, the architect of the museum, put efforts into instilling a sense of cultural identity through design. He mainly focused on the history of human activities. The form of the building suggests the joyful gesture of arms raised for celebration in "ring shout" which was African American's spiritual dance. In particular, the elaborate pattern design that forms the facade of the building attracts attention. This pattern design has cultural and historical meanings related to African American craftsmanship.

Reinvent African American craftmanship in American History

Figure 1. Historic Precedents : New Orleans Balconies,Granger-historical picture archive

Adjaye was inspired by the elegant design of cast-iron screens of the architecture of New Orleans and Charleston by slave and freed African American blacksmiths. [fig.1] Metalworking was a prized skill that had its roots in ancient Africa and spread throughout West Africa. Enslaved African Americans from West Africa who have talented skills in iron crafts made artefacts for porches, screens, rails, and gates in Charleson, but this fact was not well documented in history. Some slaveholders even allowed them to earn money from iron crafts in order to buy freedom for their families. [1] The freed African American blacksmiths made workshops and developed their forms with aspects of African cultures. In these respects, ironwork goes beyond simple slave labor in African American history, and shows that it was a means of economic independence and liberation through their traditional talents.

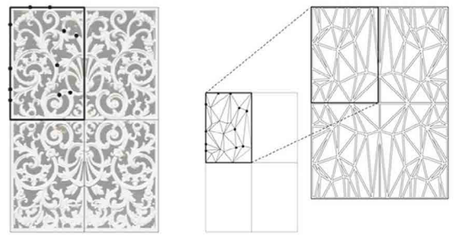


Figure 2. Digital Process to modernize the pattern of Charleston Gates and opacity variations, by Freelon Adiaye Bond, SmithGroup

Through the research of iron railings and facade ornaments from South Carolina to New Orleans, David Adjaye selected the historic grille as the reference of the facade design.

During the research, the design team studied not only the shape but also the way the pattern was made. They discovered that African American ironworkers constructed grilles by casting hot iron in sand molds and welded the pieces together line by line. They analyzed how its geometry was organized and how its cast-iron leaves welded together to create the structure that held all the pieces together. Based on this observation, the architect drew an abstract pattern diagram by taking weld points as nodes.[2] [fig.2] Through this process, the historic pattern was recreated in a modern shape, but still retains traces of the iron casting method.

When labor becomes craftsmanship, it becomes identity

Given that this museum is the Smithsonian's 16th museum, the museum's construction history itself is a journey that reveals African American efforts to build American culture. Enslaved workers were mobilized to build the Smithsonian castle, the first building of the Smithsonian Institution, completed in 1855.[3] At that time, the toil and sweat of countless enslaved workers to construct the building for American culture were nothing more than simple labor without fair compensation. After numerous historical efforts to build a museum of African American history, Adjaye's project was finally constructed at the site of Washington, D.C, showing off the shimmering facade among the monotonous, heavy marble museums on the street of the National Mall. Now, the design of the museum shed light on the forgotten efforts and talents of enslaved works and made their work a symbol of American history and culture.

The National Museum of African American Culture and History demonstrates that architectural design can reflect historical and cultural contexts and can be a way of communicating in search of identity. The architecture of museums as cultural institutions cannot change the history of the past, but it has the power to reshape the historical perceptions through its design. Patterns in modern architecture are normally considered as decorations and treated as additional features rather than have meanings by themselves. Moreover, with the advent of the age of mechanization, the value of craftsmanship and labor in architectural design has become somewhat lighter than before. Nevertheless, what makes ancient architecture astonishing is the great craftsmanship and labor of the people of that era. Adjaye's design of the African American Museum shows that patterns can still have many meanings, from symbols to human activities associated with cultural identity.

1. Wilson, Mabel O. Begin with The Past. Washington, DC: Smithsonian Institute, 2016.
2. Ibid.
3. Mark Auslander, "Enslaved Labor and Building the Smithsonian : Reading the Stones.", Southern Spaces, 2012

Re-building Community through Design : Rockaway Boardwalk

Figure 1. Rockaway Boardwalk

Figure 2. Rockaway Boardwalk with a sand dune

How can we build society through design? Architects always have imagined the social effects of the space they designed. Most of the time, architects design first, and want to see their initial concept and expectation about the social impact actually happen. On the contrary to this approach, the Rockaway boardwalk reconstruction project proves a design process itself could be a process of forming a community.

Boardwalks, made up of wood, began appearing on the peninsula in the 1890s and had been used as a place to connect the locals. However, in 2012, Hurricane Sandy destroyed the boardwalks. When the city began to plan the reconstruction, residents raised their voices and emphasized how important the boardwalk was to them. Throughout the design and construction process, NYCEDC and NYC Department of Parks & Recreation held dozens of meetings with local communities. As the result, the design that spelling out “ROCKAWAY” in a different color of the concrete panel became the final decision. After the reconstruction ended in 2017, the local community had revived with millions of visitors.

This project may appear to be rebuilding the Rockaway residents community through design. However, to borrow Bruno Latour’s ANT theory, society is not made by humans alone, but by non-humans and human elements together. According to the concept of society, this project can be viewed from two different scales in terms of the restoration of society.

First, from the scale of human society, the design process made residents choose the community’s new design identity. This participation not only gave pride to the local community members but also created cooperative relationships between each government group and the local community. It shows that society among human actors had already started to form before the realization of the design.

Another point of view is to look at the actors of society from a larger scale. Reconstruction of the Rockaway boardwalk which had been destroyed by the natural digester implies that the project also rebuilt the relationship between the environment and humans. Even before the digester, environmental factors such as air, sand, and waters also played the role of the main actors of the Rockaway society. The new design of the boardwalk includes the enhancement of the sand dune and creating a sand fence with plants to defense against storms.

Moreover, the sand dune provides habitats for the ecological species of the peninsula. Therefore, the design of the Rockaway boardwalk created a new sustainable society between non-human actors and human actors by exploring ways to adapting each other and mediating their impacts.

To conclude, designing itself can be used as a tool to create a society. Rather than provide refined design to the site to invite society, by inviting the various actors of the community into the design process, the reconstruction of the Rockaway boardwalk brought more meaningful social results than just constructing the infrastructure. Furthermore, the ‘social’ not only indicates the human society but also a wide range of actors including non-human actors. Before questioning “How can we build society through design?”, the question “What actors of the society that the design can affect?” should come first.

OUTSIDE IN | PAVILION DESIGN PROPOSAL : SPECTRA

OUTSIDE IN | FURNITURE DESIGN

HYOSIL YANG

M.S. ADVANCED ARCHITECTURAL DESIGN

2021 SUMMER - 2022 SPRING