

HAO CAO
Iowa State University **BA | 2021-2025**

HAO CAO

5th Year - Architecture Student



INFO

April 26, 2000
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I am delighted to submit my portfolio for your review. Enclosed are several selected projects that offer insight into my experiences and achievements during my tenure at architecture school from 2021 to 2024. I hope you find them to be a valuable representation of my skills and dedication.

REFERENCE

Bosuk Hur Associate Porfessor of Practice Design Principal, FOLIO +1 (857) 756-4345 bhur@istate.edu	Rod Kruse FAIA LEED AP Principal, BNIM +1 (515) 559-0435 rkruse@bnim.com
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SKILLS

Design	Rhino AutoCAD Climate Consultant Climate Studio Revit	Additional Skills Hand-drawn 3D Printing Model Making Casting Concrete Pottery / Clay Sculpting
Editing	Photoshop Illustrator InDesign Lightroom Microsoft Office Procreate	Language English Vietnamese
Render	V-Ray Enscape 3DS Max Twin Motion	

PERSONAL STATEMENT

My passion for architecture ignited during high school when I dreamed of designing a home for my parents. Since then, my aspirations have evolved towards using architecture as a catalyst for positive change on a global scale. Confident in my abilities and eager to learn, I am committed to excelling in this field and seizing every opportunity for growth. This upcoming opportunity represents a crucial step towards achieving my professional goals and opening doors in architecture and related fields. Additionally, my fluency in English and Vietnamese equips me to collaborate effectively with diverse teams and engage with a wide range of individuals, enriching the architectural process with varied perspectives and cultural insights. With a multicultural background as my foundation, I am ready to embark on a fulfilling journey in architecture, driven by a desire to make a meaningful impact on the world.

ABOUT ME

EDUCATION

Iowa State University, BA | January 2021 - May 2025
Substance Design Forum Finalists | 2024
DLR Prized Finalists | 2023
Richard F. Hansen Finalists | 2022
Iowa Masonry Institute's Construction Project (Brick Contest) Winners | 2022

WORK EXPERIENCE

Undergraduate Teaching Assistant August 2024 - December 2024 Evaluated and graded assignments to provide timely feedback. Monitored class attendance to maintain accurate records. Supported students by addressing questions and clarifying assignments.	BNIM Architectural Summer Intern May 2024 - August 2024 Assisted in the creation and refinement of architectural drawings for award submissions, ensuring high-quality presentation and accuracy. Conducted site visits to gain hands-on experience with building design and construction processes, enhancing understanding of real-world applications. Collaborated with seasoned professionals, gaining insights into industry standards, workflows, and innovative architectural practices. Strengthened communication and teamwork skills through active participation in project discussions and interdisciplinary collaboration.
Undergraduate Research Assistant November 2024 - February 2025 Proficient in 3D modeling and visualization Skilled in creating detailed plans, sections, and axonometric drawings Experienced in documenting workflows, processes, and results effectively	

ACHIEVEMENTS

Substance Design Forum Finalists Fall 2024 Two Stage Competition (Final round is expecting in April 2025): A team of 3 students worked on a conceptual project to achieve meaningful design for Agent Orange victims in Vietnam	Studio Finalists
Spectacular Studio Awards January 2024 & June 2024 Studio project "DEW" from 4th year in Fall 2023 Studio project "Vacant to Vibrant" from 4th year in Spring 2024 Studio project "Forgotten History" from 5th year in Fall 2024 Featured on Spectacular Design	National Winner
DLR Prized Finalists - DEW Fall 2023 Two Stage Competition: Team of 2 students through the process to achieve iconic and feasible design solution for a near brown-state site in Ames, near Iowa State University campus	Studio Finalists
Richard F. Hansen Finalists- Resurgence Fall 2022 Two Stage Competition: Structural and conceptual design in a team of 2 students to achieve unique design solution to chosen site at Ledges State Park	Studio Finalists
Architectural Visualization Award, Edition #2 Summer 2023 Silent drawing competition: Produced one sufficient architectural visualization without use of any descriptive text through proficient application of Rhinocerus 7.0, Photoshop, and Midjourney to produce in a timely manner.	Shortlisted Top 40 Internationally

Forgotten History

Beyond the White Cube
Fall 2024
(6-17)



Vacant to Vibrant

Parasitic Architecture
Spring 2024
(18-27)



DEW

Ames Energy Conservatory
Fall 2023
(28-43)



Resurgence

Neo-Nomadisms—Unfrozen Architectures
Fall 2022
(44-59)



Other Projects

(62-65)

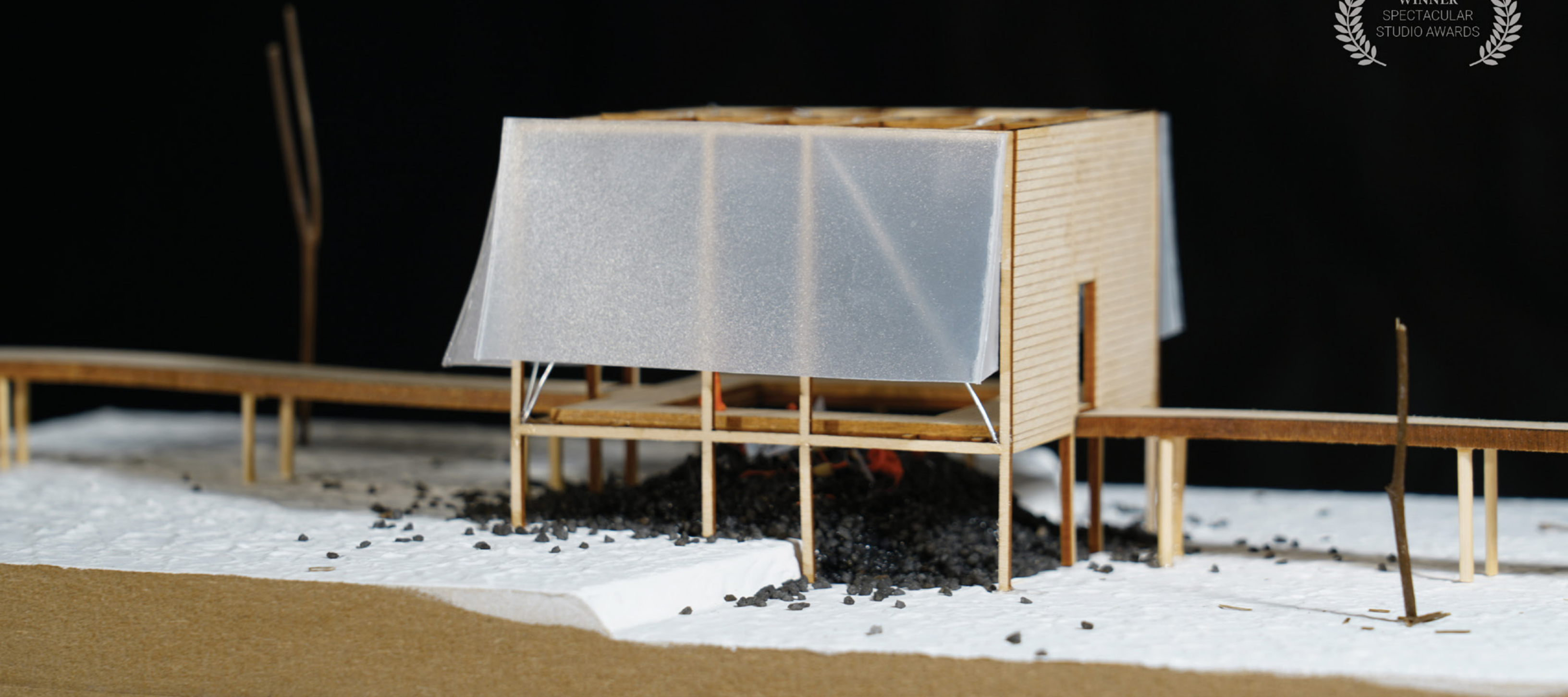
Forgotten History

HAO CAO, TRUC NGUYEN, AARON DANIEL

ACADEMIC TERM: ARCH 403 - FALL 2024

PROFESSOR: BOSUK HUR

TYPE: MUSEUM / PUBLIC SPACE



Forgotten History aims to shed light on the harrowing devastation wrought by Operation Ranch Hand during the Vietnam War—a tragedy too often overlooked. The scars it left on the land and its people demand recognition, yet they remain shrouded in silence. Through our architectural vision, we seek to reignite public awareness, ensuring these events are neither ignored nor forgotten. This space will stand as a poignant reminder, inviting visitors to reflect, learn, and connect with the weight of this history.

01. WHAT IS A WHITE CUBE?

1. Memorial is the Main Character:

- Stand's as one
- Sole user of the space

2. No Sense of Place:

- Lacking interaction
- Underutilize's preexisting space

3. Cold:

- Distance themselves too far from the human experience
- Difficult to feel all emotions



Tuyen Quang Memorial



Monument to Heroes and Martyrs of Lao Cai Province



Truong Son Martyrs Cemetery Memorial

02. WHAT IS BEYOND THE WHITE CUBE?

1. Taking a Step Back:

- Work hand in hand with the history
- Should NOT be a dominating figure

2. Engage Place:

- Allow the place to speak
- Connect people with place

3. Create Emotion:

- Emotion driven architectural spaces
- Visitors should feel the history



"All wars are fought twice, the first time on the battlefield, the second time in memory Memory is haunted, not just by ghostly others but by the horrors we have done, seen, and condoned, or by the unspeakable things from which we have profited."

- Viet Thanh Nguyen

03. HISTORY BACKGROUND



Operation

Ranch

Hand

1961
-
1971

19 million
gallons of
defoliants

5 million
acres of
forest

500,000
acres of
crops

400,000
deaths

4.8
million
Agent
Orange
Victims

Out of all the 'defoliants' and 'herbicides' used, Agent Orange was the most notable used during this operation as it was contaminated with Dioxin. A highly toxic chemical that leads to cancer, reproductive development problems, compromised immune systems, and disturbed hormone systems, and is carried through generations. After the war ended, the problems caused by Operation Ranch Hand continued as the Vietnamese government estimated around 4.8 million people had been affected due to the Dioxin-contaminated Agent Orange.

Y
↑
nature vs.
architecture



X
→
destroyed
to whole

04. AI MATRIX

The bottom left depicts the beginning of Operation Ranch Hand, where chaos has poisoned the land and destroyed the lives of many.

The top right depicts a tranquil and serene forest that has recovered from the devastation caused by Operation Ranch Hand.

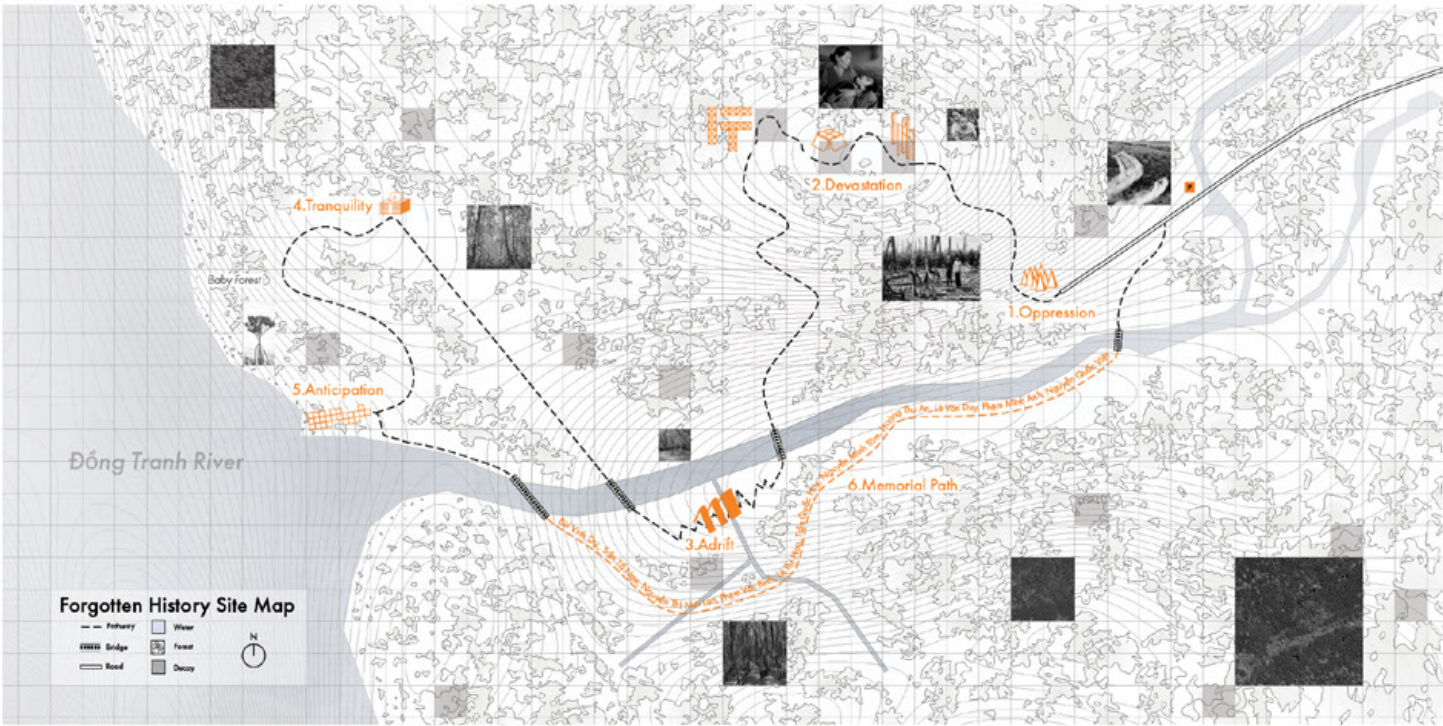
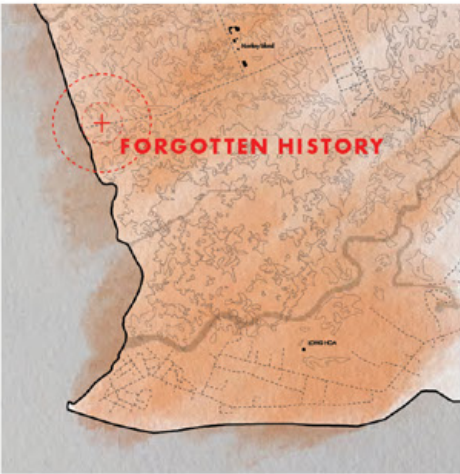
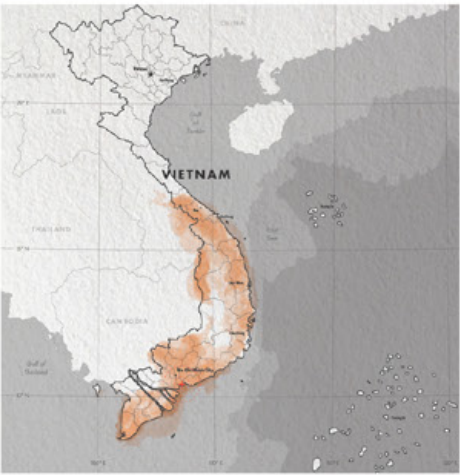
The area between the two end conditions is the struggle and fight to push forward and the continuous battle Agent Orange has caused on the innocent.

05. SITE CONTEXT

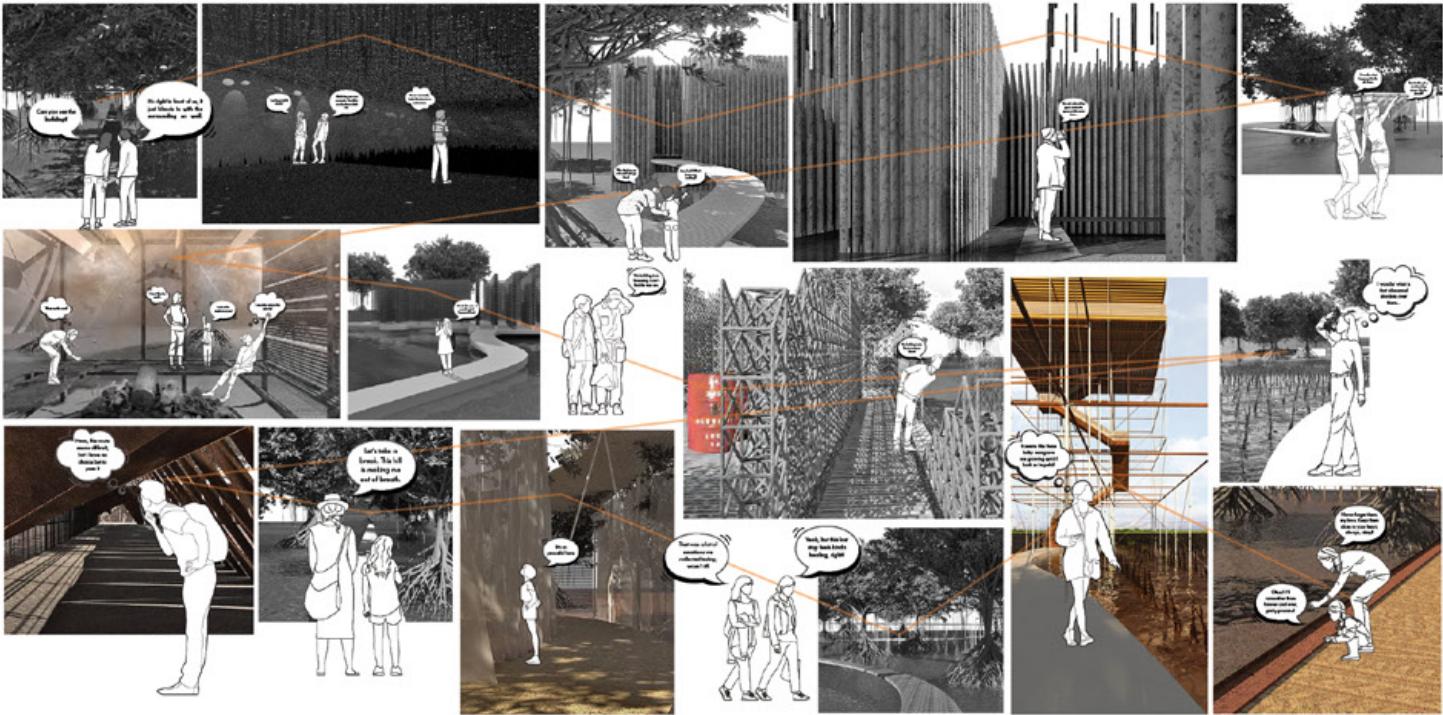
Our Site is located in southern Vietnam, where the operation occurred, and south of Ho Chi Minh City in the Sac Forest. The orange on the map represents the area of effect during Operation Ranch Hand, and the deeper orange represents higher-hit areas.

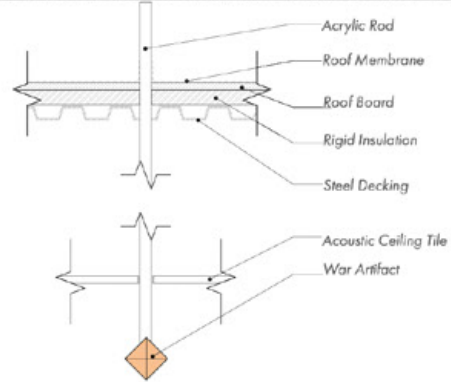
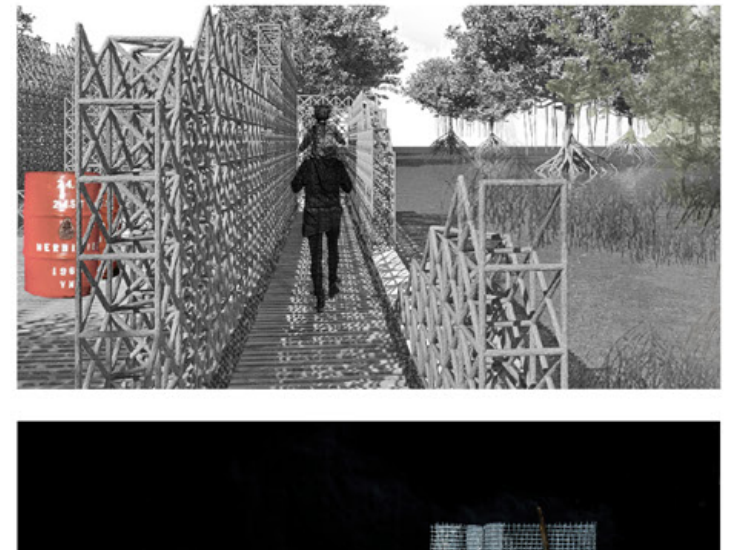
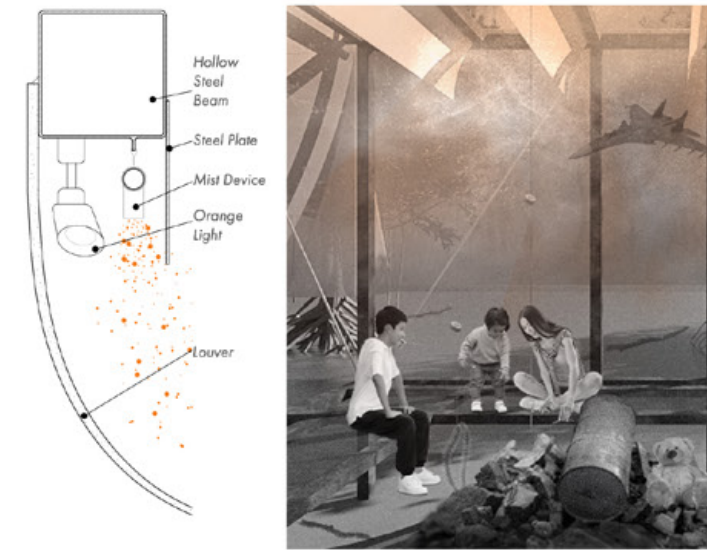
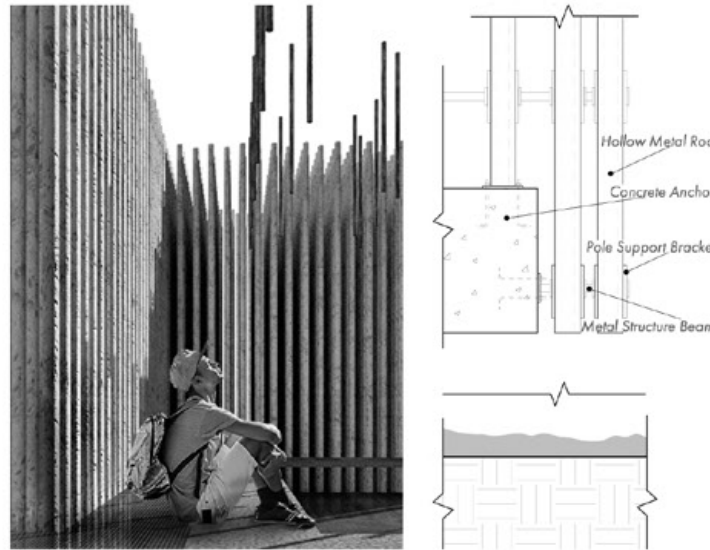
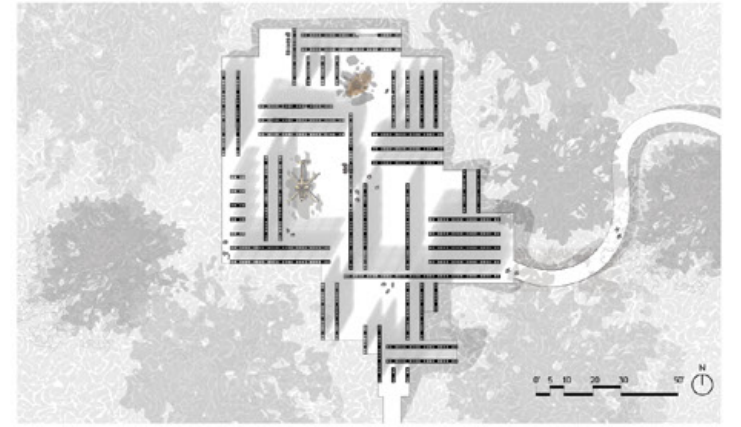
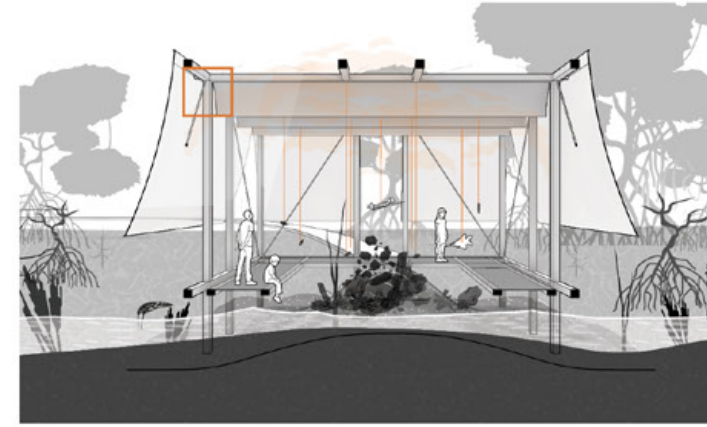
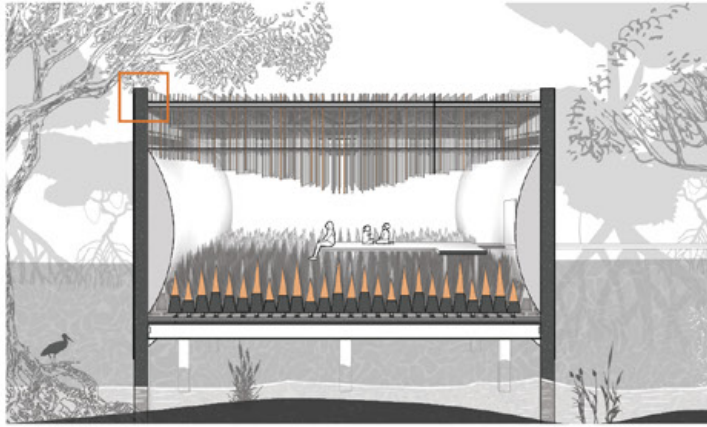
Zooming into the Ho Chi Minh region, Operation Ranch Hand's main target was devastating the Sac Forest. This forest was bombed 300 times with 'defoliants' and 'herbicides,' adding up to 930,000 gallons. The Sac Forest was also the location of the government's first cleanup efforts in the country, which started in 1979 with the help of local volunteers.

Finally, after almost 60 years and totaling an area of more than 30 acres, the forest that used to be called "Death Land" is now 75% recovered from the native mangrove forest. It houses many endangered plants and animals and is now regarded as the "green lungs" of Ho Chi Minh's population. The local community cares for the forest, aiming to restore it to its original state before Operation Ranch Hand.



Forgotten History begins along a gravel drive winding through the dense mangroves. The forest is alive with noises of monkeys and birds calling to one another and the dense foliage almost covers the sight of a large building. The mirrored facade blends the building into the surroundings and a single pathway leads to its entrance.





OPPRESSION

Stepping inside, the outside world vanishes. Silence replaces nature's sounds, amplifying even your heartbeat. Jagged foam muffles every noise, while dim lighting makes the room feel endless. Above, acrylic rods hold war remnants—bullet shells, bomb shards, charred fabric—looming overhead. The space evokes the disorientation and numbness soldiers faced, trapped in the chaos of war.

Stepping outside, clarity replaces the weight left behind. Distant echoes of air raids and bombs pierce the stillness. Scorched trees stand as silent witnesses to the devastation, while the path inclines, revealing the forest's hidden scars.

DEVASTATION

Atop the hill, a poisoned forest bears the scars of Agent Orange, overlooking a rusted structure hovering over the water. The barren landscape amplifies the destruction. At the entrance, metal rods hum eerily in the wind, mimicking air raids, while a faint metallic scent evokes blood and pain. Suspended 25 feet high, delicate rods hang, careful not to disturb history. The building splits into two spaces: a tight, oppressive corridor echoing with fear and a mother's silent anguish, and an open-air space where pipes blend with nature, symbolizing her resilience. Together, they embody the coexistence of chaos and strength during war.

Exiting the building, the path winds through a lifeless, contaminated forest, still unrecovered after half a century. Silence replaces wildlife, and the air carries an industrial scent. In the distance, a fragile structure emerges amid the devastation.

DEVASTATION

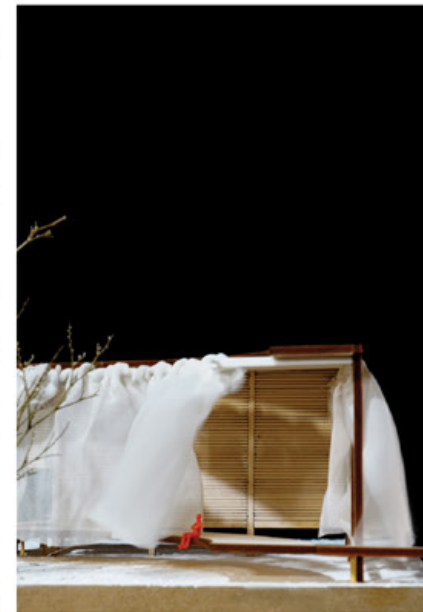
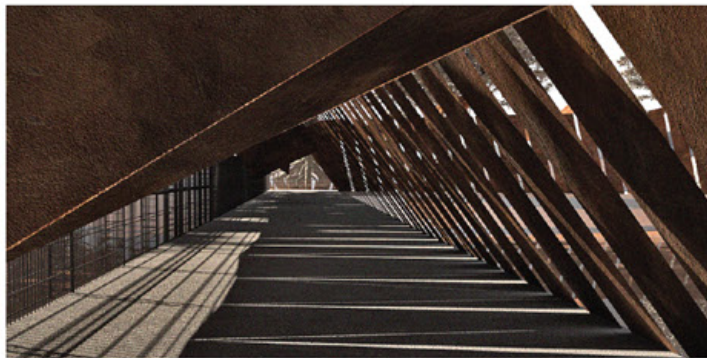
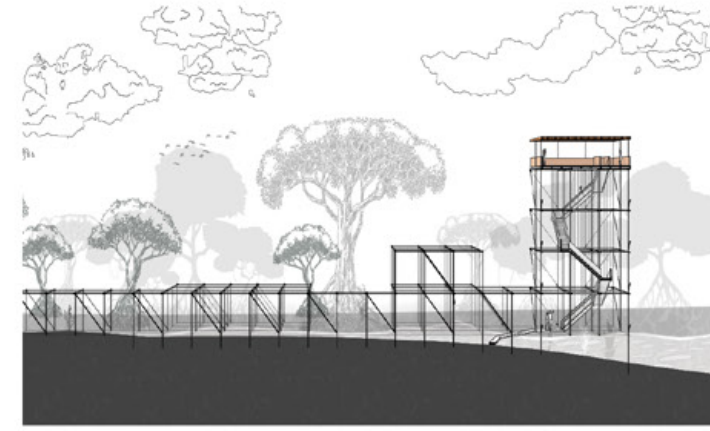
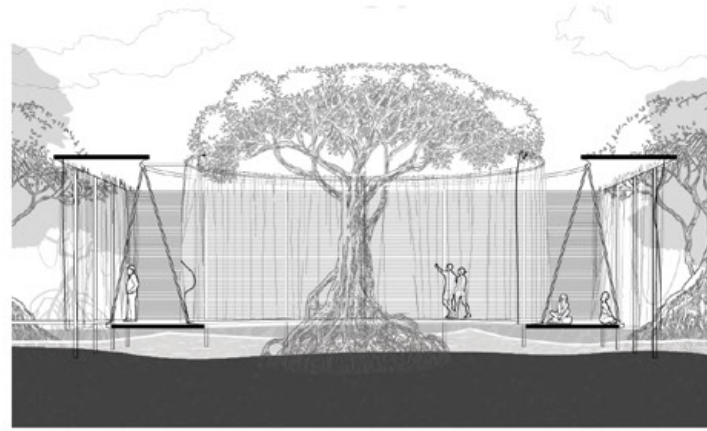
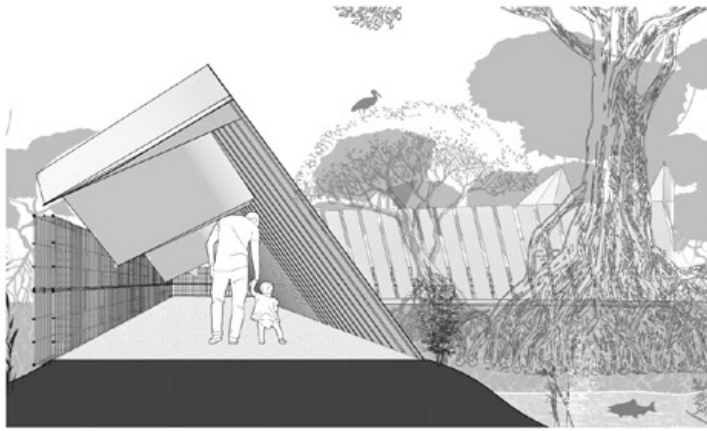
Approaching the building, its fragile structure contrasts with the devastated landscape. Rusted columns barely lift it above ground, shrouded in a thin polycarbonate shell like a child's coat. Inside, narrow walkways encircle a void filled with war debris—twisted metal, toys, and chemical drums. From the ceiling, strings suspend rusted toy planes, depleted ammo belts, and disarmed mines, reflecting how children unknowingly played with these dangers. Suddenly, an orange mist descends, its chemical scent a stark reminder of Agent Orange's lasting impact on generations, especially children.

As you move forward, the image of a wartime child lingers. Nature, once vibrant, is now scarred, with a burned metal structure in the distance. War's sounds have faded, but destruction's remnants still overshadow nature's slow recovery.

DEVASTATION

The burned metal structure forms a maze, each path leading to an exhibit within a skeletal ruin of war. Visitors encounter remnants like dioxin containers and airplane fragments, evoking confusion, frustration, and a sense of being lost. This design reflects the experience of fathers during and after the war—unaware they carried Agent Orange, trapped in its cycle, and angered by the lasting suffering of their families, still seeking justice decades later.

Exiting the maze, the path weaves through living and dead mangroves, gradually leaving devastation behind for lush forest. As the trail descends, the sound of water grows louder, leading to a bridge.



ADRIFT

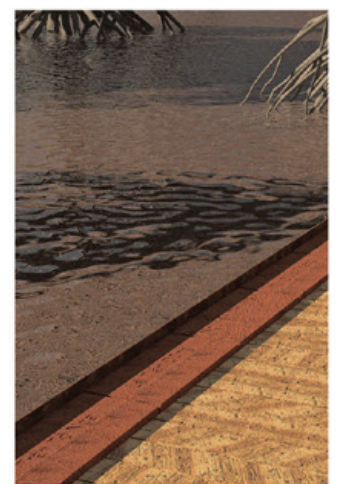
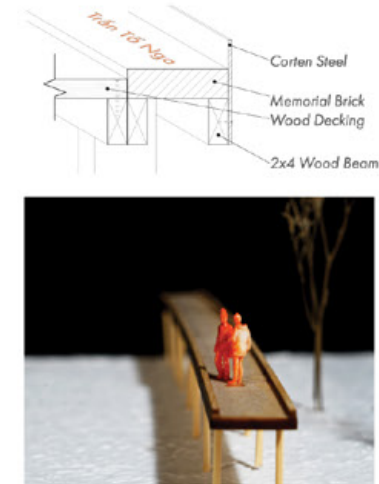
Crossing the bridge, the path descends as walls rise around visitors. A stone wall presses inward while looming steel structures seem ready to collapse. Uneven gravel makes each step unsteady, and the tunnel narrows and widens unpredictably, mirroring the victims' endless struggle. The path eventually inclines, symbolizing their relentless fight. As it emerges from the enclosure, a long uphill climb appears—challenging yet carrying a glimmer of hope on the horizon.

The path continues at a steady incline as it navigates away from the river bed. The forest is again ever present as it envelopes the pathway with the extensive mangroves shading the visitors from the sweltering sun. Approaching the end of the walkway, a large building stands.

TRANQUILITY

Clad in charred wood and flowing curtains, the building merges with nature. A mangrove tree grows at its center, its canopy filtering sunlight. Here, the journey ends in peace. Visitors reflect on their emotions—fear, loss, and struggle—before stepping into a world free of war. The circular space opens to views of the recovered forest, while the resilient mangrove stands tall, symbolizing the enduring strength of Agent Orange victims.

Leaving through the curtains, the path opens to a recovered forest. The trail winds around mangroves, gradually leading to the Dong Tranh bank, where saplings sprout new life. Moving through the young forest offers hope for its future growth. In the distance, a tower rises above the trees.



ANTICIPATION

The path is framed by a thin grid as mangroves intertwine with the structure, which expands outward and upward, blending with nature to offer new perspectives of the forest. The path leads to a tower, where six flights of stairs offer a view through the foliage. At the top, visitors are greeted with an expansive view of the Dong Tranh and the recovering forest, symbolizing hope for the future.

Operation Ranch Hand unleashed a level of devastation that must never be repeated. Forgotten History highlights the struggles of its victims, illuminating the full extent of the destruction and giving a voice to those who have suffered in silence. The impact of Operation Ranch Hand is a tragedy that the world cannot afford to forget, and it is crucial that we acknowledge its history so that the victims are no longer forced to endure their pain in silence.

So please, don't forget them.

MEMORIAL

Leaving the overlook, the path winds through the recovered mangrove forest to a bridge over the river. Steel and name-carved stones line the path, with engraved names of Agent Orange victims. The silent walk through the forest, marked by hundreds of thousands of names, serves as a powerful reminder to remember the history and its victims.

Vacant to Vibrant

HAO CAO, KHUSHI JAIN, TRAVIS NGO

ACADEMIC TERM: ARCH 402- SPRING 2024

PROFESSOR: BOSUK HUR

TYPE: URBAN PLANNING / MASTER PLAN



01. SITE CONTEXT



SITE LOCATION



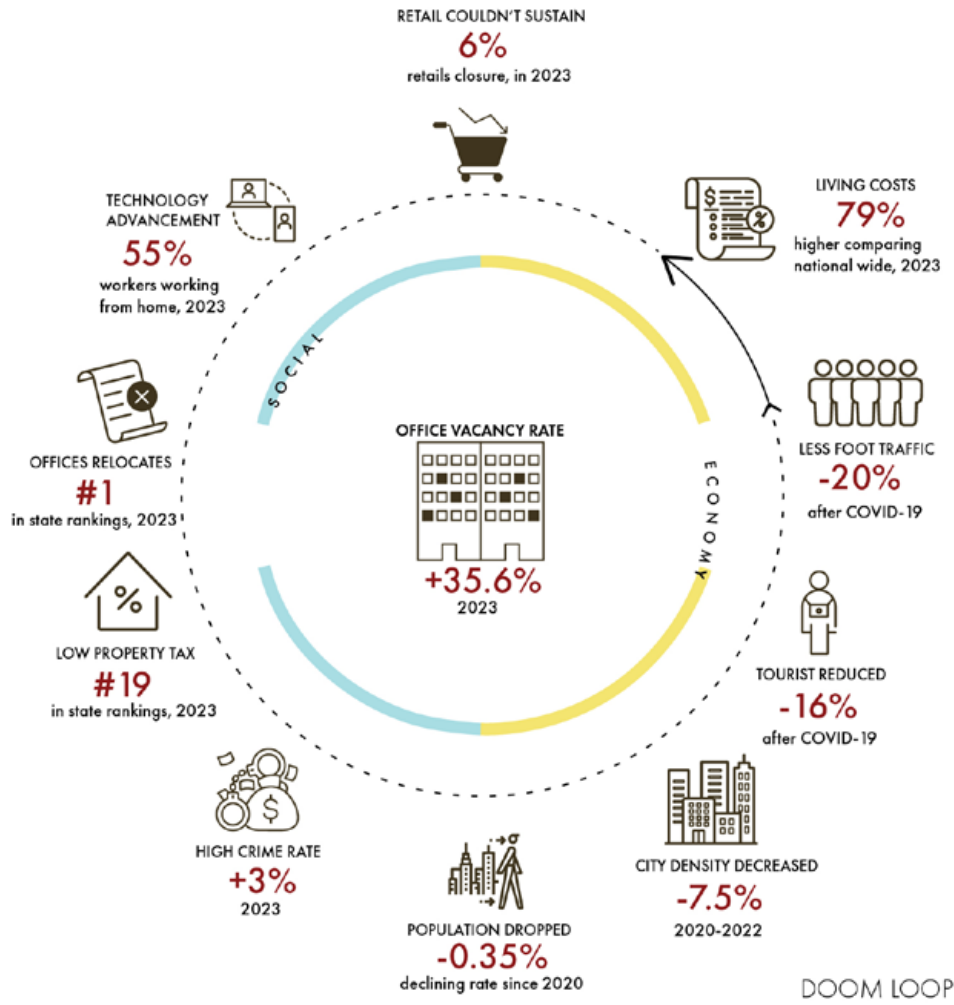
FINANCIAL DISTRICT



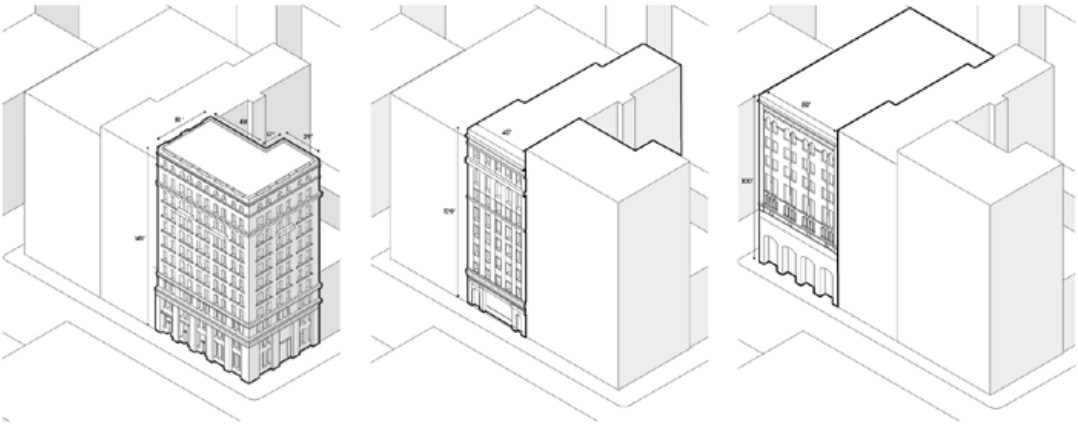
VACANCY RATES

The increasing number of office vacancies in San Francisco has become a massive problem for the downtown and city areas. Technological advancement has changed work patterns, and economy have influenced people to work from home. Therefore, offices had to shut down. The rise in office vacancies is attributed to various factors, including the COVID-19, increasing living costs, changes working models, and long commute time, which have led to a big question of whether there is a need for traditional office spaces anymore.

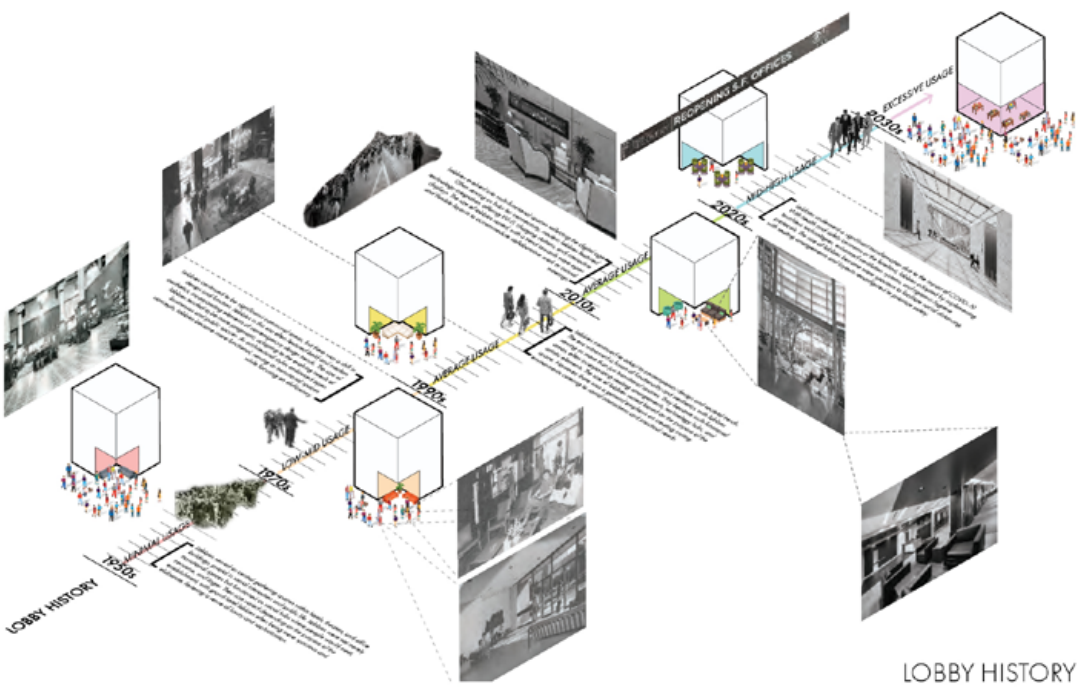
This alarming trend creates a detrimental doom loop, directly impacting the economy, social fabric, and political landscape. San Francisco is at the forefront of this crisis, with a staggering 30% vacancy rate—2 to 3 times higher than densely populated like New York or Houston. Our selected site buildings mirror this trend, with 340 Pine St. facing a substantial 51.8% vacancy and 330-332 Pine St. experiencing a notable 27.1% vacancy rate.



DOOM LOOP



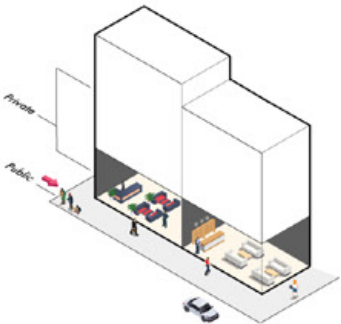
300 PINE ST - WEST FACADE	300 PINE ST + 332 PINE ST - SOUTH FACADES	340 PINE ST - SOUTH FACADES
FLOOR PLATE <ul style="list-style-type: none">Average Floor Depth11 stories	FLOOR PLATE <ul style="list-style-type: none">Average Floor Depth10 stories	FLOOR PLATE <ul style="list-style-type: none">Average Floor Depth7 stories + Penthouse
BUILDING FORM <ul style="list-style-type: none">Rectangular Form, Mid riseSymmetrical	BUILDING FORM <ul style="list-style-type: none">Rectangular Form, Mid riseSymmetrical	BUILDING FORM <ul style="list-style-type: none">Rectangular Form, Mid riseSymmetrical
SERVICING <ul style="list-style-type: none">No Parking/ Loading	SERVICING <ul style="list-style-type: none">No Parking/ Loading	SERVICING <ul style="list-style-type: none">No Parking/ Loading
SITE CONTEXT <ul style="list-style-type: none">Excellent Walkability/ TrafficPrime Corner Location	SITE CONTEXT <ul style="list-style-type: none">Excellent Walkability/ TrafficEpicoenter of financial district	SITE CONTEXT <ul style="list-style-type: none">Excellent Walkability/ TrafficHistoric recognition
VACANCY <ul style="list-style-type: none">20% to 40% Empty	VACANCY <ul style="list-style-type: none">20% to 40% Empty	VACANCY <ul style="list-style-type: none">40% to 60% Empty



LOBBY HISTORY

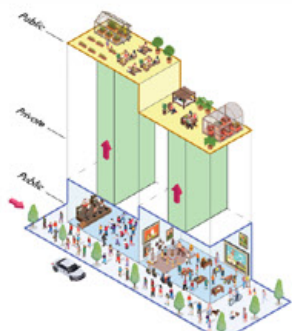
The rise of remote work and the non-renewal of office leases due to high rents have led to a sharp decline in property tax revenue. This financial strain has weakened essential services like law enforcement and firefighting, compromising public safety. As vacant spaces attract homelessness and drug use, the city's challenges intensify, creating a ripple effect of economic and social decline. These intertwined issues are driving residents to leave, as the city struggles to address its growing crises.

Lobby spaces of San Francisco find themselves undergoing a subtle transformation, gradually experiencing reduced foot traffic and utilization over time. Once vibrant hubs teeming with activity, these communal areas now often witness a more subdued atmosphere. Factors such as the increasing prevalence of remote work, heightened digital connectivity, and shifting social dynamics contribute to this trend. As professionals opt for flexible work arrangements and virtual meetings become common, the traditional function of lobbies diminishes. Consequently, the iconic lobby spaces of San Francisco's architectural gems, once emblematic of bustling urban life, now reflect a quieter, more introspective aspect of the city's evolving identity.



Existing Program

The pandemic, remote work, and digital communication have reduced lobbies' role as social hubs. Once bustling, many now feel underutilized, reflecting shifting engagement in the 21st century.



Proposed Program

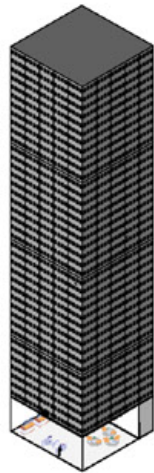
The library will revolutionize San Francisco's Financial District by focusing on art, design, culinary, cocktails, and DIY. It will enrich employees, travelers, and the local economy through resources, workshops, and events, fostering skills, growth, and creative traditions.



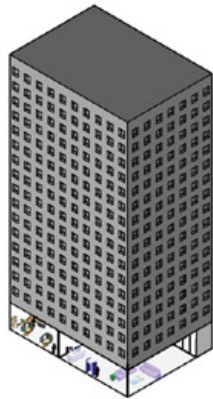
DESIGN LIBRARY

The Design library will curate a diverse and comprehensive collection of design-related books, magazines, workshop and exhibition spaces, and design professionals-led events for skill enhancements. It will act as a space to encourage creativity, collaboration, and hands-on exploration of design concepts.

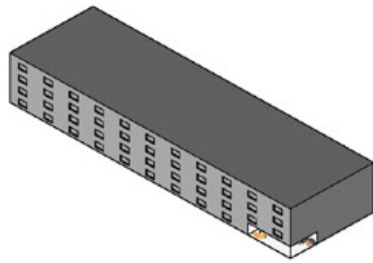
HIGH-RISE/
SKYSCRAPER



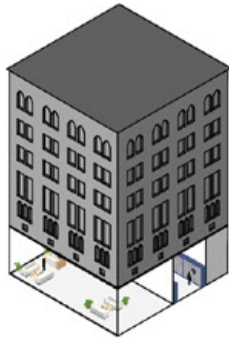
URBAN OFFICE



COMMERCIAL APARTMENT



LOW-RISE



02. MATRIX

The design series categorizes spaces into four typologies: greenery, recreation, sports, and residential. These variations aim to revitalize San Francisco's Financial District by influencing building form, function, and community engagement. Exploring ground and rooftop programs helps identify the best ways to activate public spaces and address vacancy, bringing life back to the city's streets.



- QUALITY OF LIFE
- Healthier City
 - Greener Spaces
 - Biodiversity



- SOCIAL & ACTIVITY
- Community spaces
 - Sports
 - Recreation



- VACANCY RATE
- Ground Level
 - Rooftop Level
 - Office / Lobby



- DENSITY
- Concentration
 - Increased foot traffic

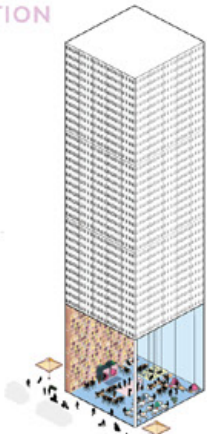


- DIVERSION & INCLUSION
- Multiplicity
 - Integration
 - Participation

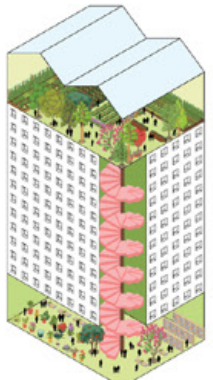


- GROWTH OF THE CITY
- Inflow
 - Revitalization

RECREATION

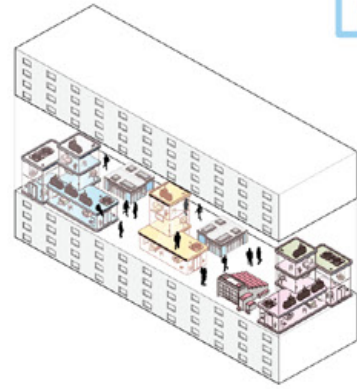


GREENERY & SUSTAINABILITY



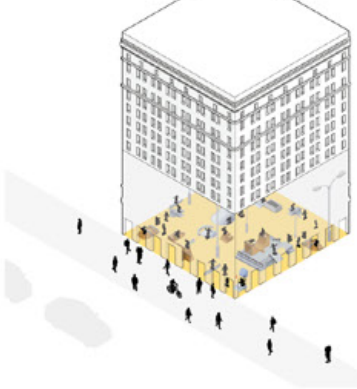
- Urban Challenges
- Greenery
 - Sustainability
- Building Typologies
- Greenery
 - Sustainability
- Types of Ground Level
- Greenery
 - Sustainability
- Types of Rooftop
- Greenery
 - Sustainability

RESIDENTIAL



- Urban Challenges
- Residential
- Building Typologies
- Residential
- Types of Ground Level
- Residential
- Types of Rooftop
- Residential

SPORTS & FITNESS



- Urban Challenges
- Sports
 - Fitness
- Building Typologies
- Sports
 - Fitness
- Types of Ground Level
- Sports
 - Fitness
- Types of Rooftop
- Sports
 - Fitness



COCKTAIL LIBRARY

The cocktail library will curate resources on mixology, cocktails, and beverage culture, including a bar and several seating spaces to create a unique and holistic cocktail experience with workshops, bars, and classes to provide a hands-on experience.



GREENHOUSE GARDEN

The garden provides freshly grown food for culinary and bar libraries to serve quality dishes. It includes outdoor seating to enjoy the views. Greenery in the city breaks the normalities of tall structures and architectural typologies.



MUSIC LIBRARY

The Music library will curate a diverse collection of materials, catering to the needs of musicians, researchers, students, and music enthusiasts. It will consist of recordings, instruments, multimedia, archives, and rare collections.



MUSEUM

The Museum has viewing spaces for sculptures, artworks, and historical monuments of San Francisco, exhibition spaces for items and anything created in other libraries. Artists bring in works from different areas to show off skills and expertise.



CULINARY LIBRARY

The Culinary library will curate an extensive collection of worldwide culinary books and resources, along with cooking stations for culinary classes, chef demonstrations, and tasting events.



MASTER PLAN



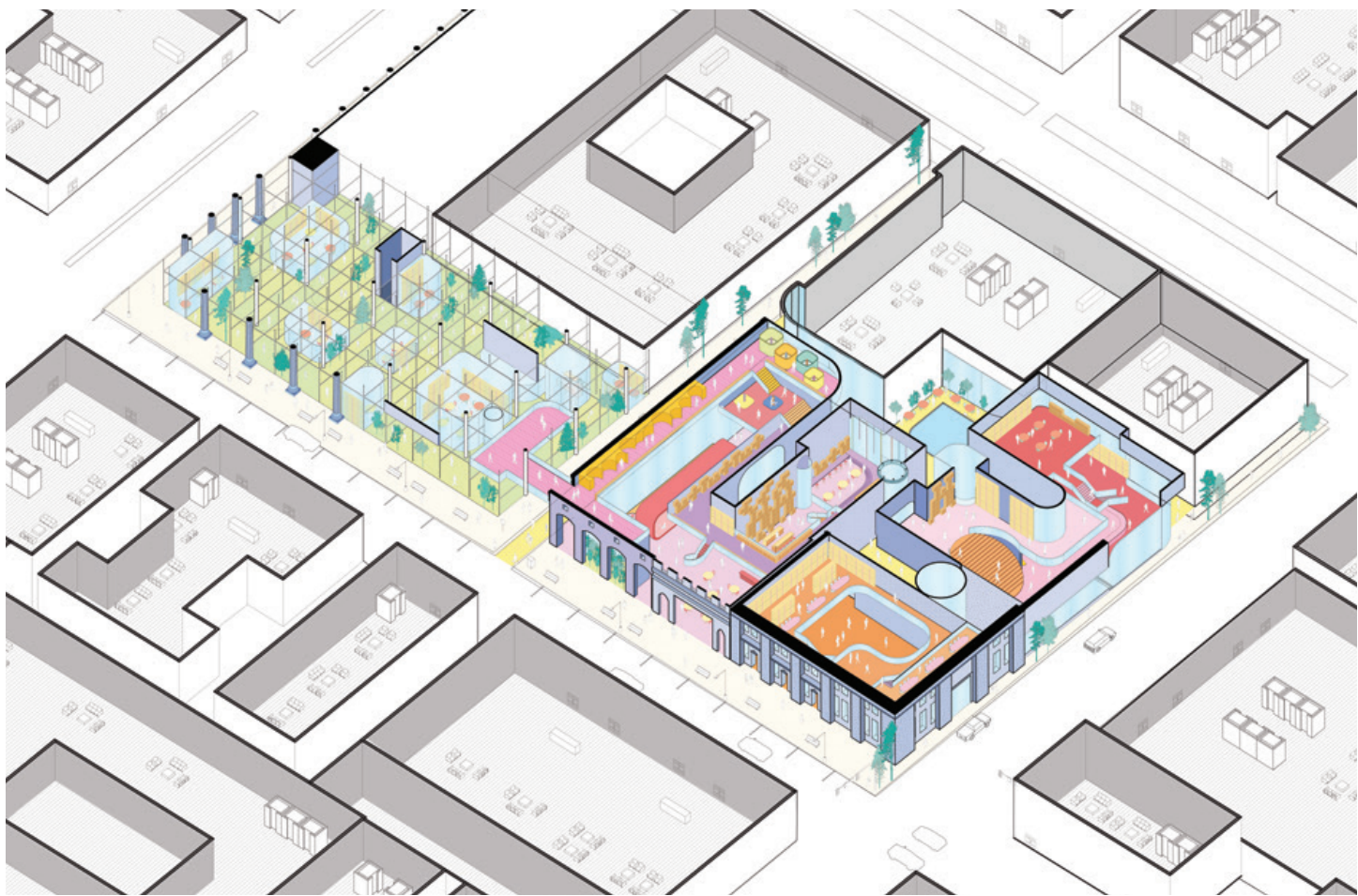
GREENERY LIBRARY



MUSIC LIBRARY



COCKTAIL LIBRARY

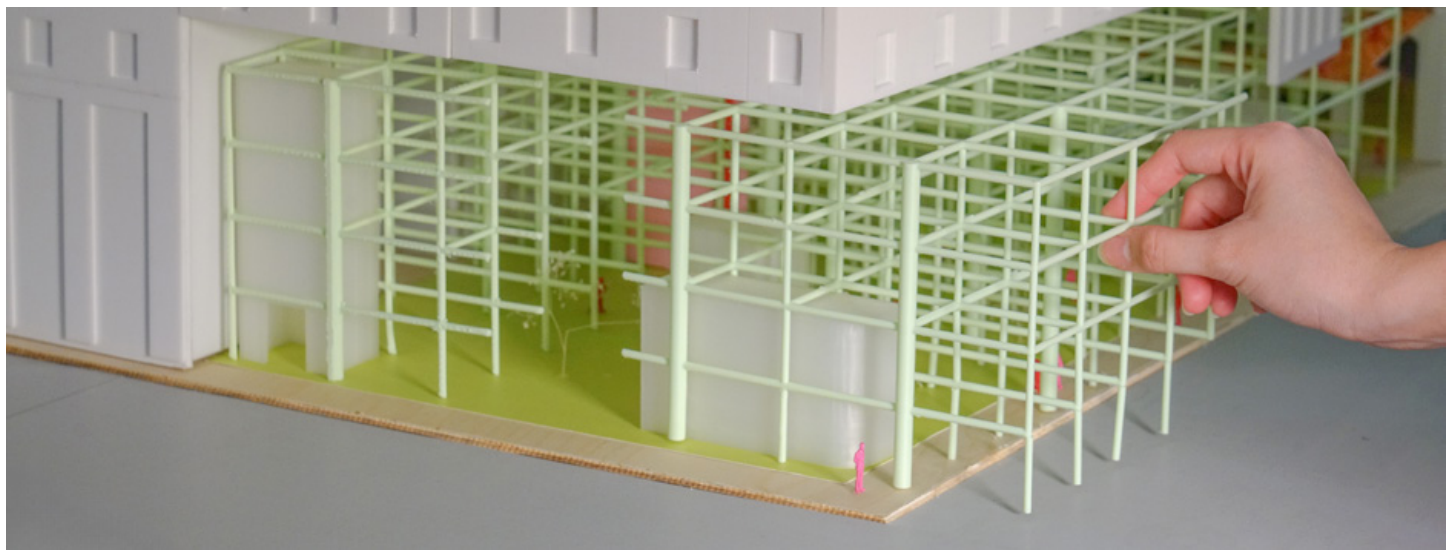


AXON PLAN

View full project at: <https://www.behance.net/gallery/219383509/Vacant-to-Vibrant>



MODEL - FRONT FACADES





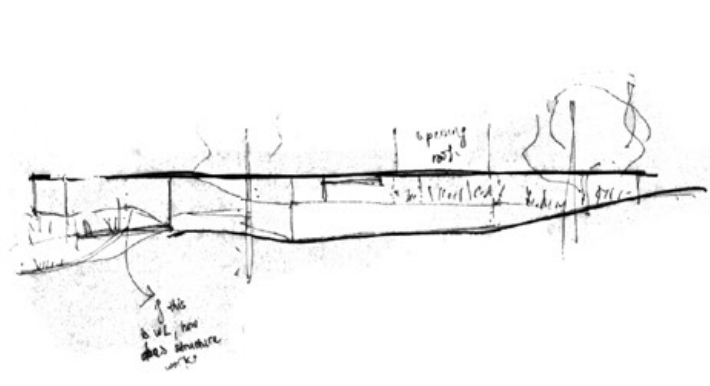


DEW

SIERRA WROOLIE & HAO CAO

ACADEMIC TERM: 401 DESIGN STUDIO | FALL 2023
PROFESSOR: AYODELE IYANALU & ROD KRUSE
TYPE: MIXED USE/COMMERCIAL
SITE: AMES, IA

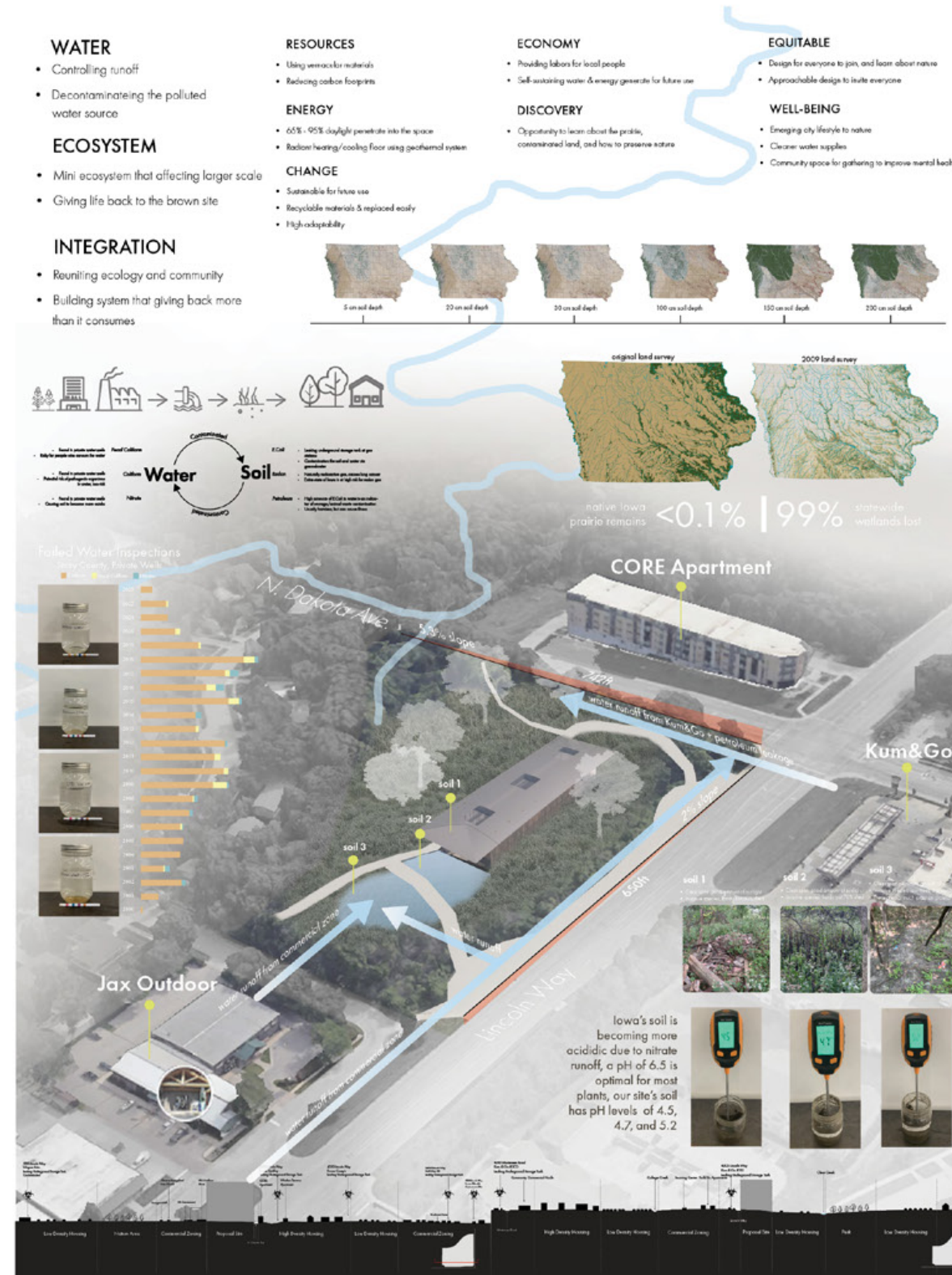


[illegible]

Hand-drawn site plan of a building complex. The plan shows a central building with a blue-shaded rectangular section and a yellow-shaded rectangular section. An arrow points from the yellow section to a separate sketch of a building with the text "see exposition - palette". To the left, a line points to the building with the text "building surrounded - study revealing". At the bottom, a sketch of a building is labeled "willard".

01. SITE CONTEXT

The site is located on the west end of Ames Iowa just north of Lincoln Way. The site is 9.34 acres large which includes the houses on the property. The Southwest corner of the site is the highest point, and the elevation down to the lowest corner (Northeast) is approximately 74 feet. This site is also just west of the Munn Woods, which the Munn Family gifted to the Iowa Natural Heritage Foundation (INHF) to protect it from any residential development. This forest stretches roughly to the west end of university campus.



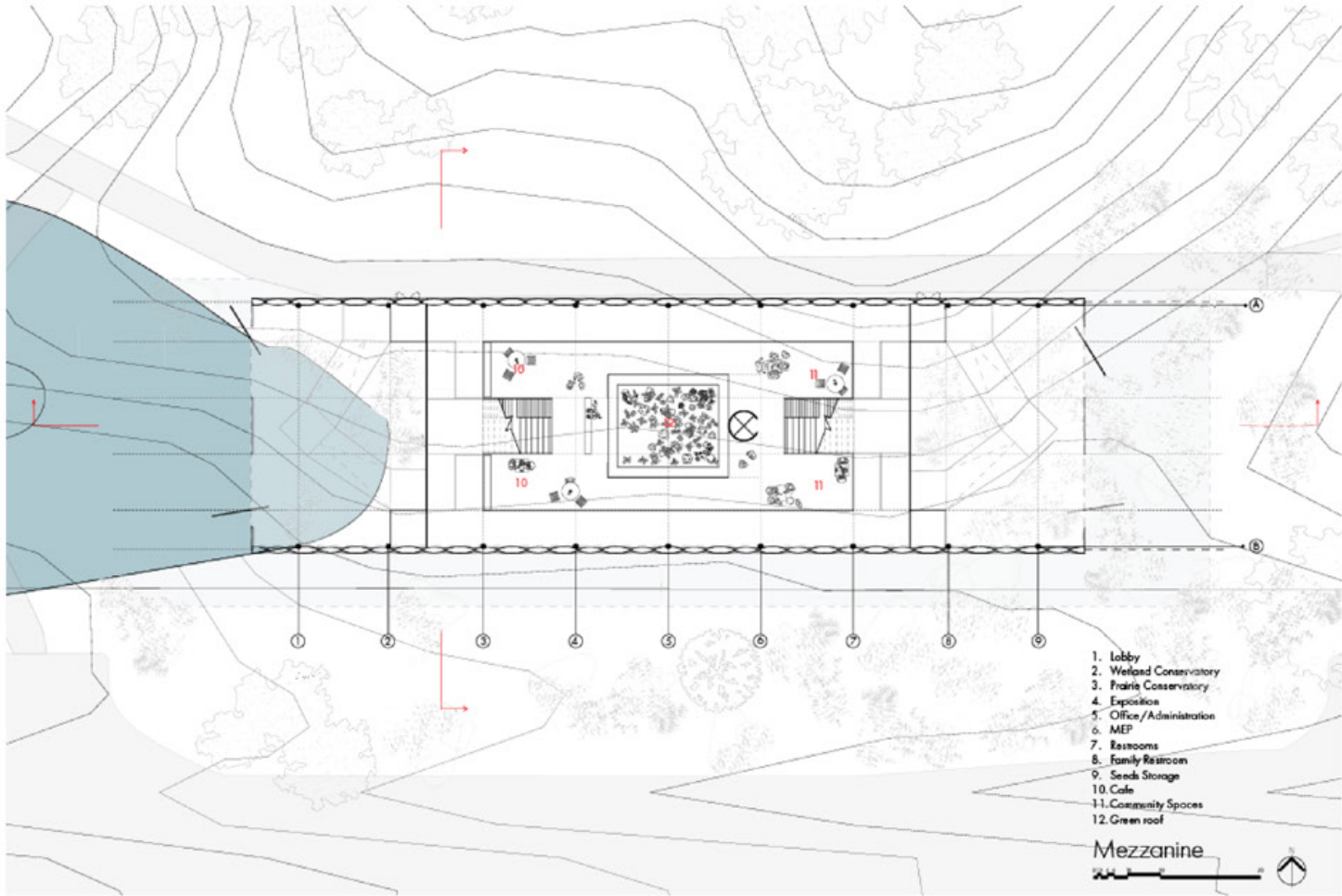
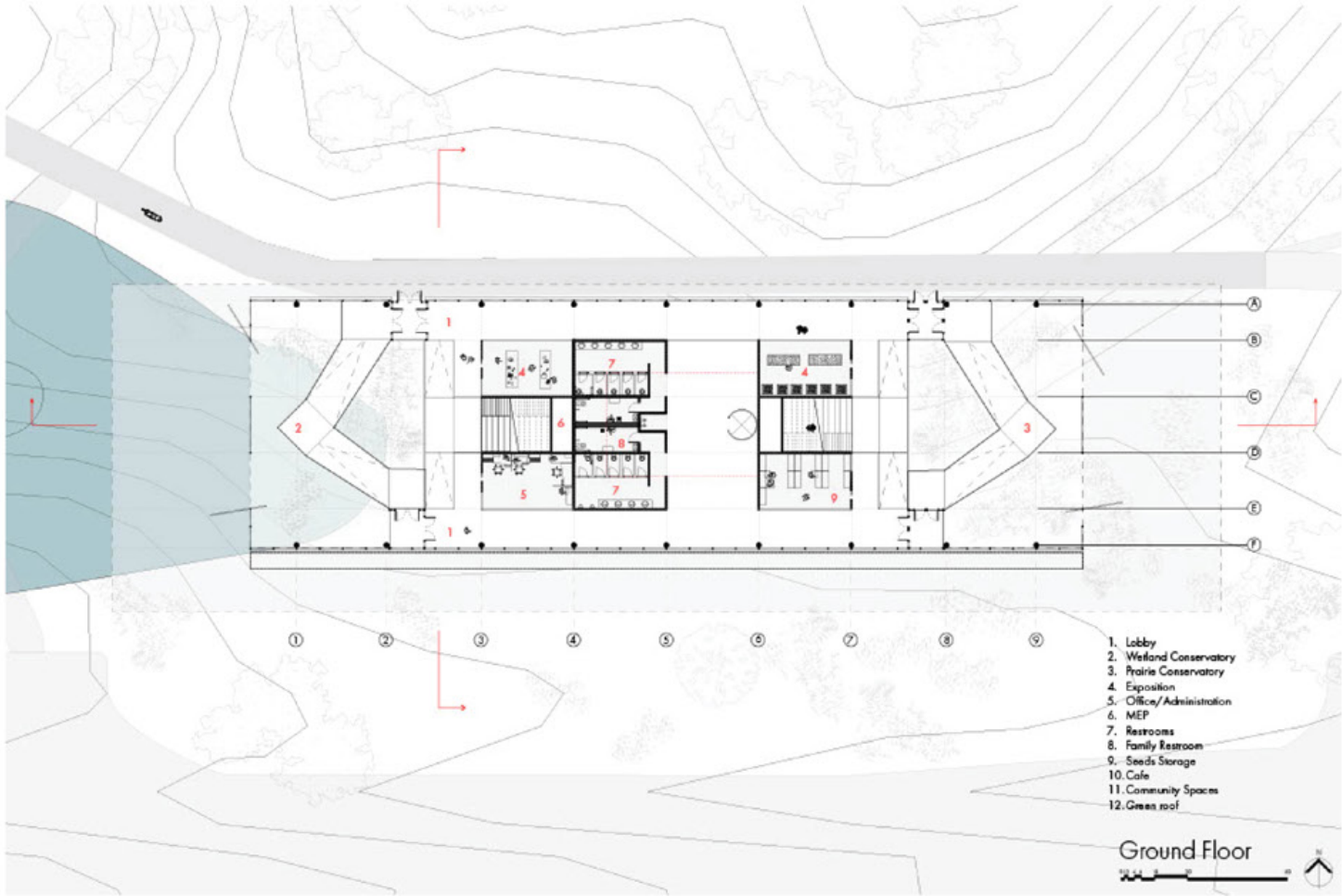


STEPATHORIUM RENDER

CONCEPT DIAGRAM
DIVIDED PROGRAMS
INTO 3 PARTS:
PUBLIC
PRIVATE
CONSERVATORIES
(WETLAND AND PRAIRIE)



HALLWAY RENDER



02. CONCEPT

Building's proposal is to put the program at the heart of the contamination. The building bridges the two ecologies of wetlands and prairie. The base was 23,000 sqft near the most contamination and where water runoff enters on site. The mass is divided based on landscape shifts with wetlands on the West, and prairie on the East with mainly 3 programs: public, private, and conservatories. The conservatories move to the ends, integrating the landscape while compressing the core to create circulation. A mezzanine with cafeteria and community spaces is placed on top the core with an indoor rain garden space. A lightweight timber truss and column structures and a light envelope encloses the building year-round programmatic use. An extended top plane mediates the threshold between interior and exterior. Thresholds placed on each end of the building further strengthen the connection between architecture and land.



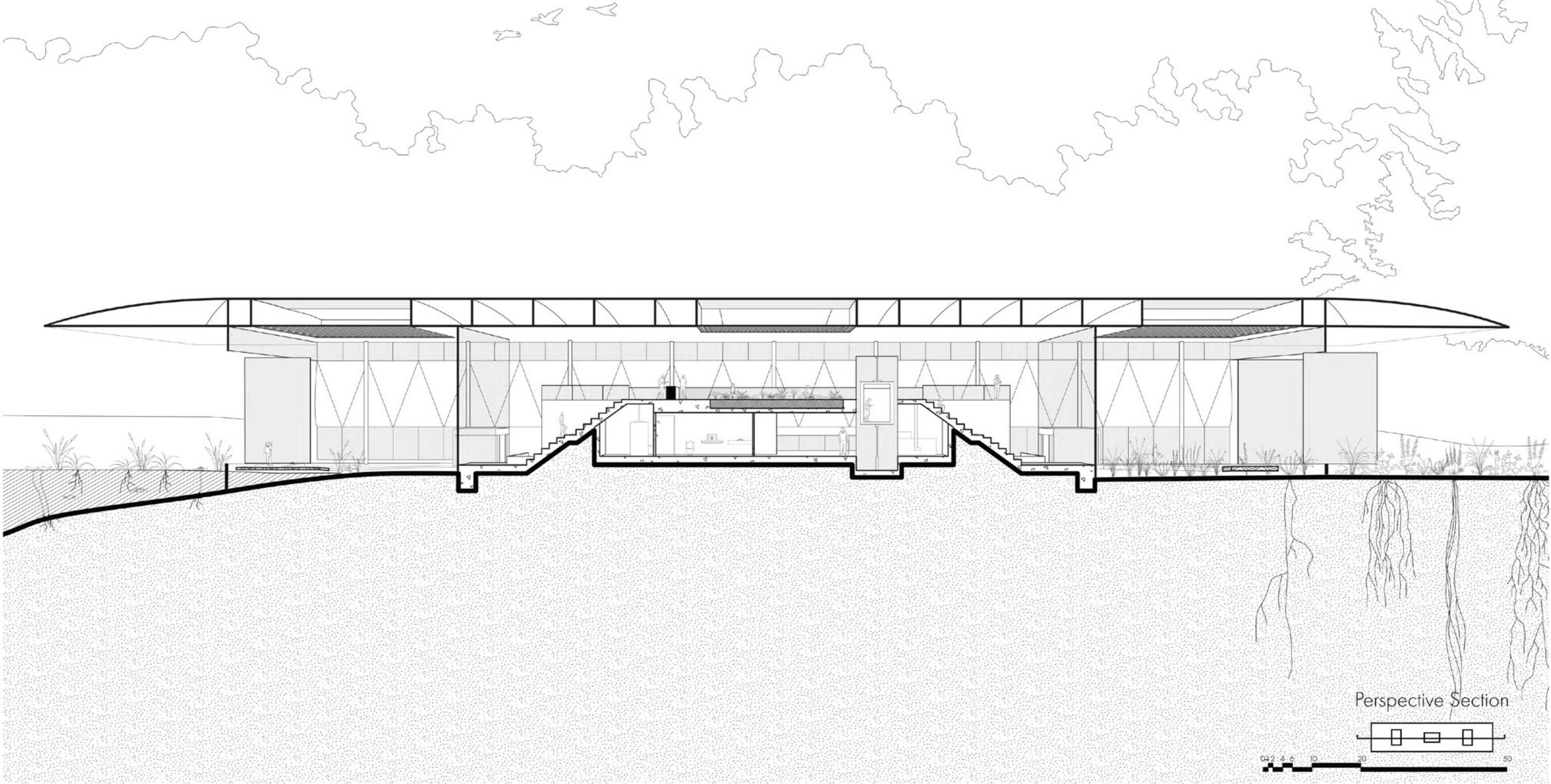
PRAIRIE CONSERVATORY | GROUND FLOOR

CONNECTING NATURE & HUMAN

The constructed wetlands act as natural filters, purifying the contaminated water and preventing further pollution downstream. Simultaneously, native prairie plants naturally clean the soil. Engaging the community in this restoration process is key—educating them about the contaminated site and the native ecology within the building, and involving them in the revitalization efforts in the conservatories will strengthen the bonds between human and nature.



CAFE STATION | MEZZANNINE FLOOR





ETFE Panel

Warm air pumping into the inner layer turns ETFE into insulation facade. This process will still induce condensation to collect water during winter.



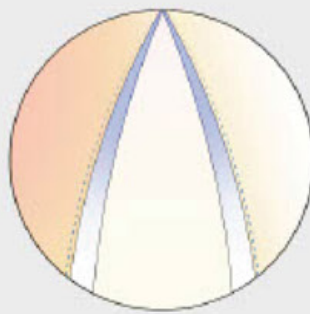
Wetland

The wetland conservatory still operates with vegetations being preserved inside. The outdoor might be harsh during winter in Iowa, but the conservatories will be less harsh, which is suitable for vulnerable pieces.



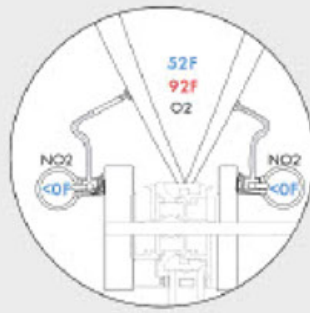
Prairie

The prairie conservatory still operates with vegetations being preserved inside. The outdoor might be harsh during winter in Iowa, but the conservatories will be less harsh, which is suitable for vulnerable pieces.



Humidity/Moisture Collection

8,000 gallons water collects per day



Liquid Nitrogen

Summer

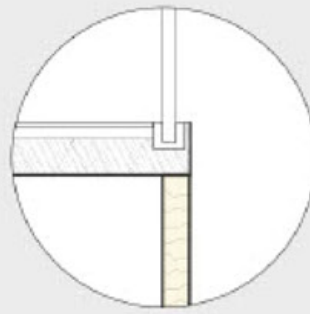
Pumping liquid nitrogen
Cooling facade
Induce moisture/condensation

Outer Layer <0F
Inner Layer 52F

Winter

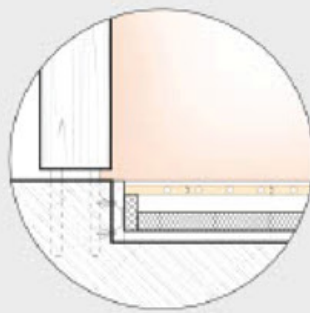
Pumping warm oxygen
Insulation Facade
Induce moisture/condensation

Outer Layer <0F
Inner Layer 92F



Rammed Earth

85% Reduction in Concrete Use
Reduce carbon during construction
Easily recyclable
Use for interior walls



Radiant Heating/Cooling

Using geothermal system
Reduce EUI by 30%
Thermal mass concrete floor

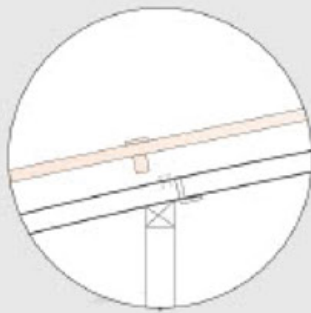
90% Radiation penetrate into the space during Summer

65% Radiation penetrate into the space during Winter

Rainwater Collection

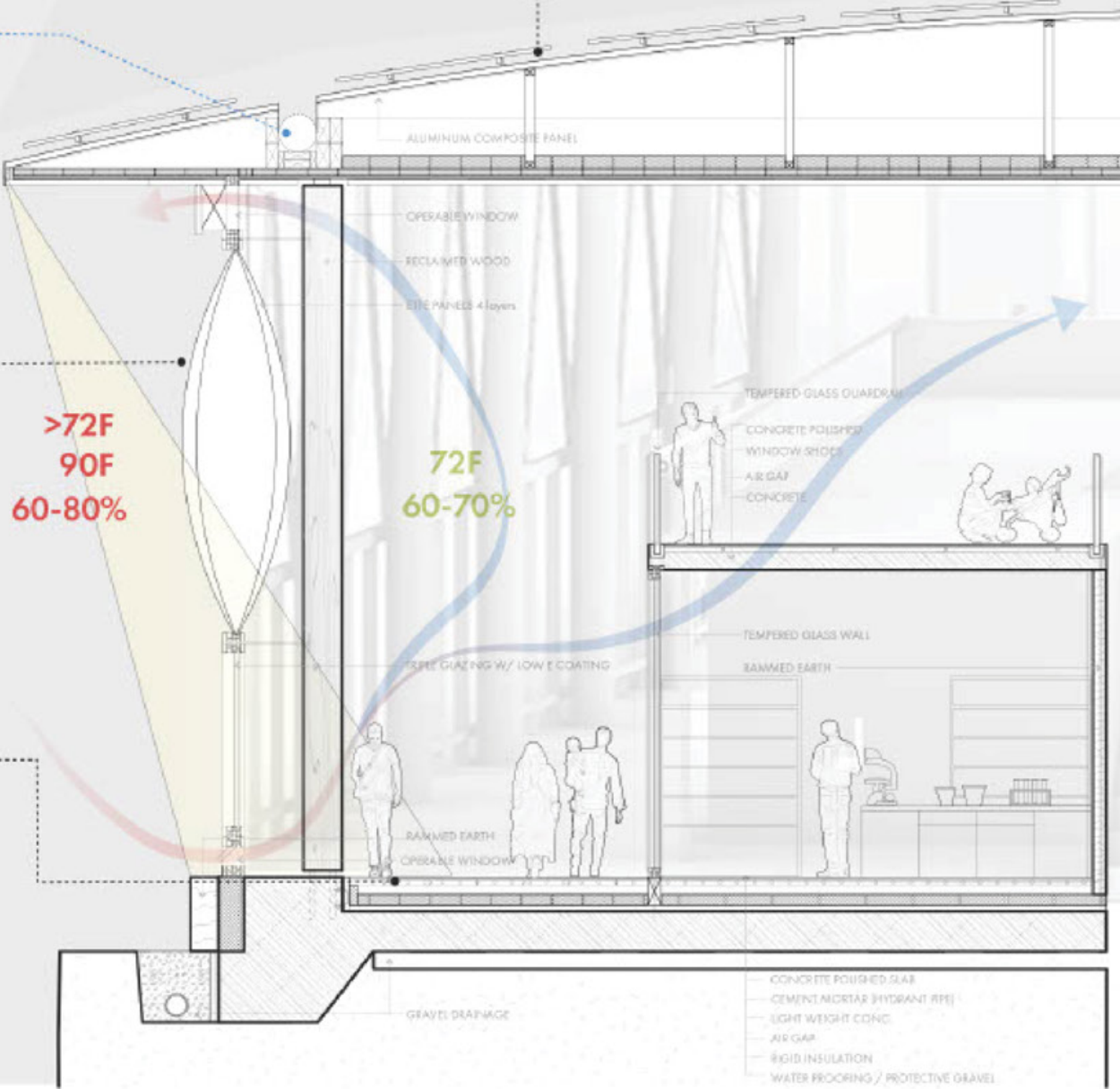
2,000 water collects per day at peak time

3,460 gallons water usage
3,460 water collects per day at peak time
= 10,000
3,800 gallons water stores on-site cistern
2,740 gallons gives back to community



Solar Power Collection

5 to 9 hours of solar gain
301,253 kWh annually building energy usage
1,095,000 kWh annually energy produce
2/3 energy giving back to community



Roof Structure

The roof is a curved roof with sharp, thin edges, creating the illusion of a razor-thin roofline.



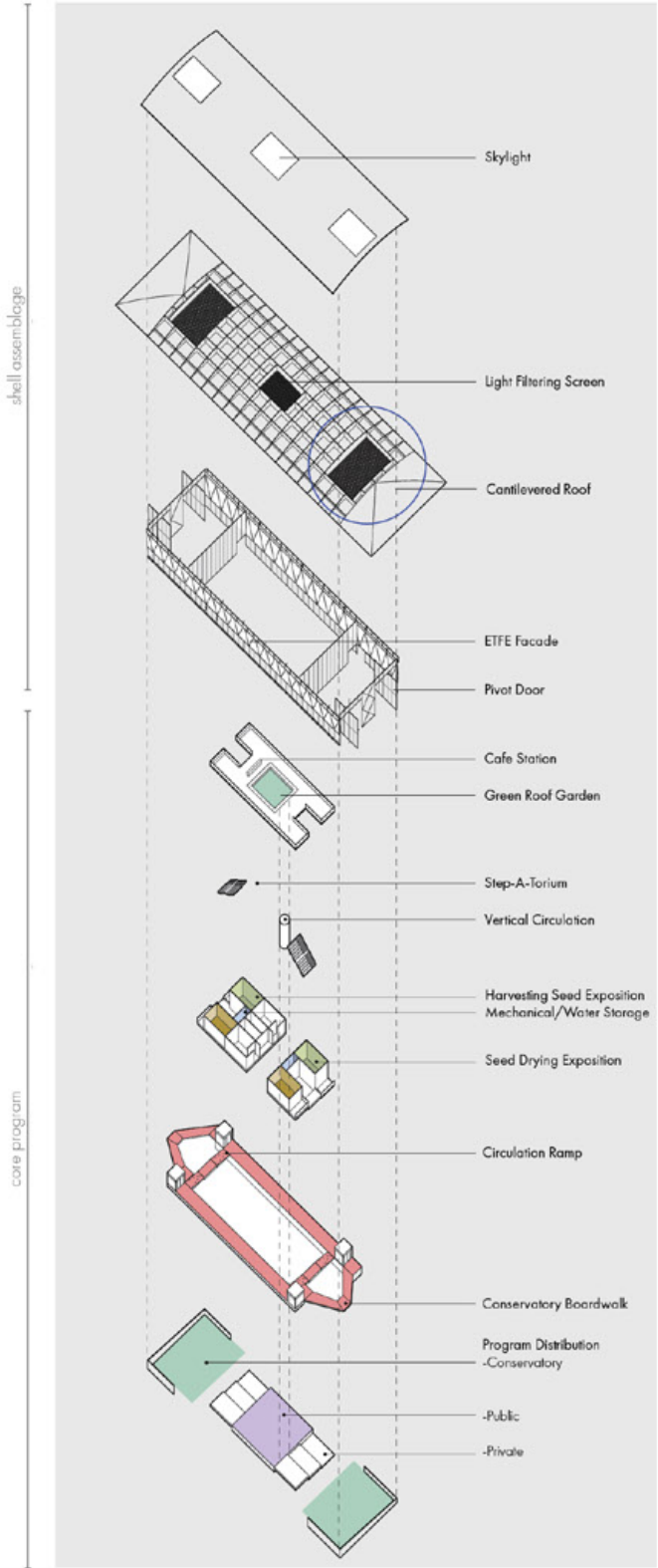
Cafeteria

Cafeteria is done in a kitchen well connected to the main lodge, which can be either staffed, or stashed with supplies for occupants to collect vegetables in the greenery area.

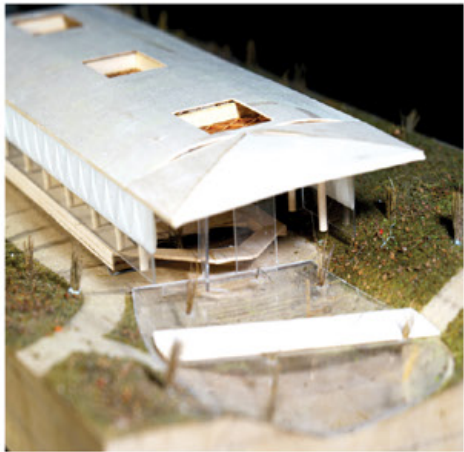


Exhibit Room

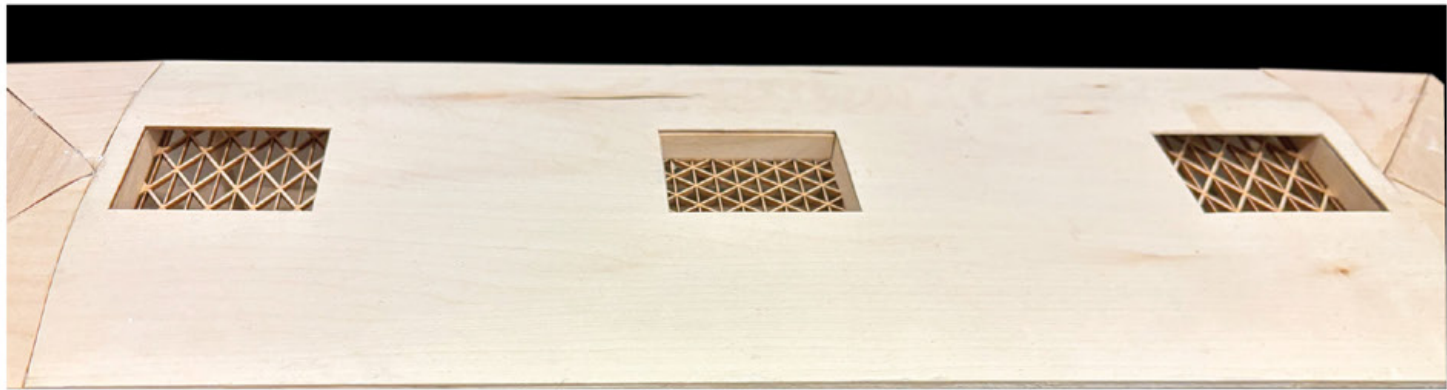
Exhibition area of storing seeds will be more active during winter. This area is public to have the community coming in and learn about the process of storing/preserving seeds.



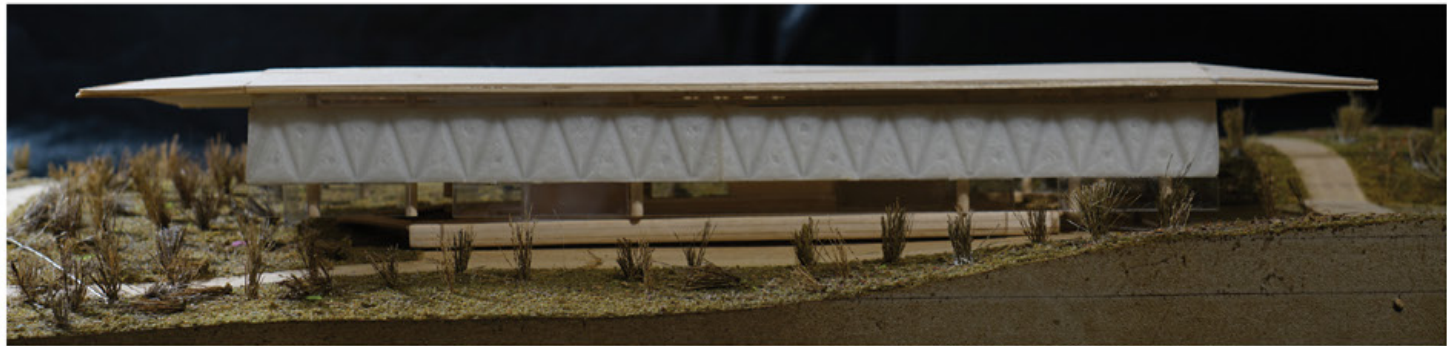
EXTERNAL WALKWAY FROM PRAIRIE



EXTERNAL WALKWAY FROM WETLAND



ROOF



NORTH ELEVATION



ENTRANCE / APPROACH FROM SOUTH (LINCOLN WAY)



RESURGENCE

BRETT CHERRY & HAO CAO

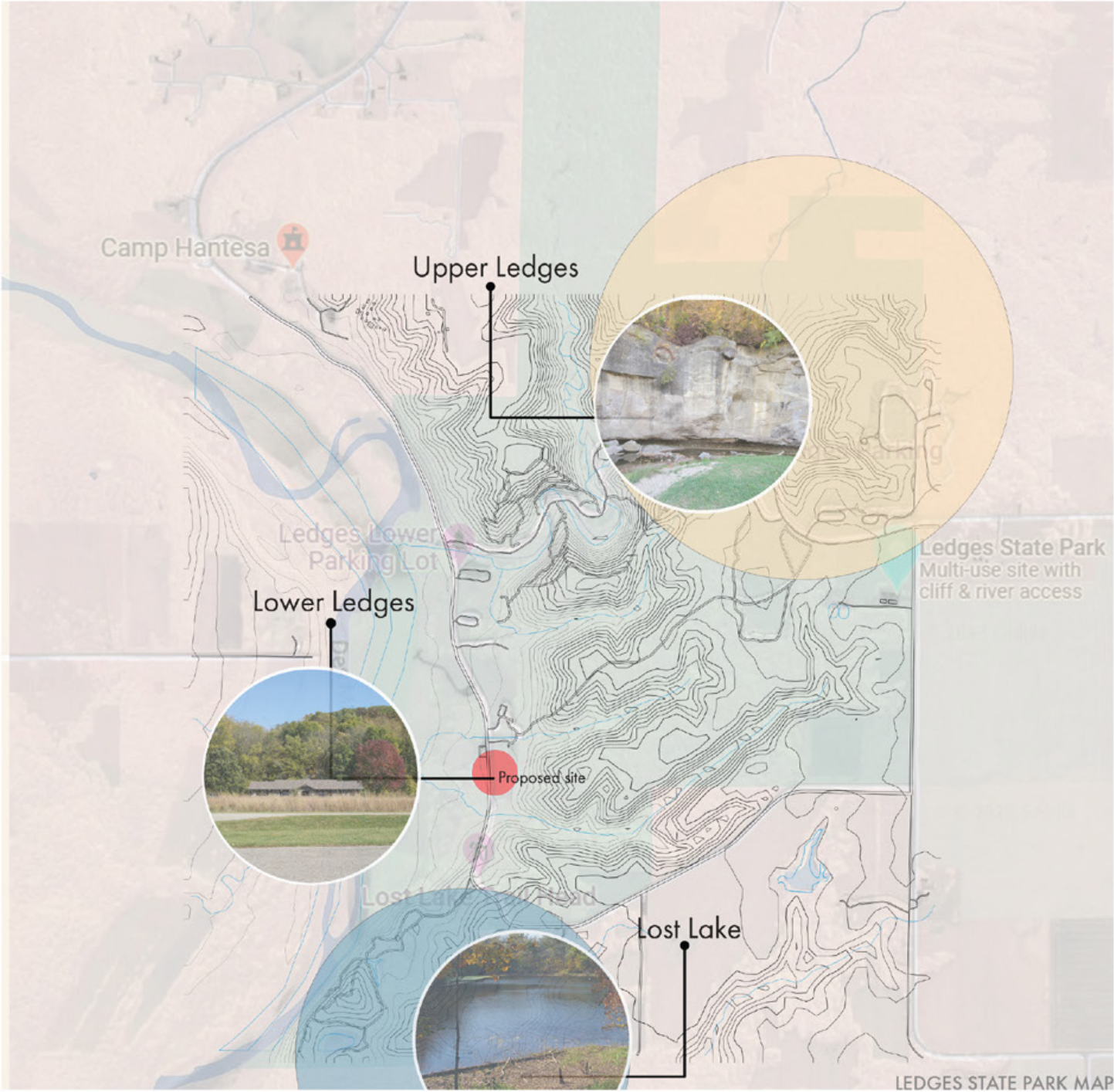
ACADEMIC TERM: ARCH 302 - FALL 2022

PROFESSOR: ANDREW GLEESON

TYPE: COMMERCIAL

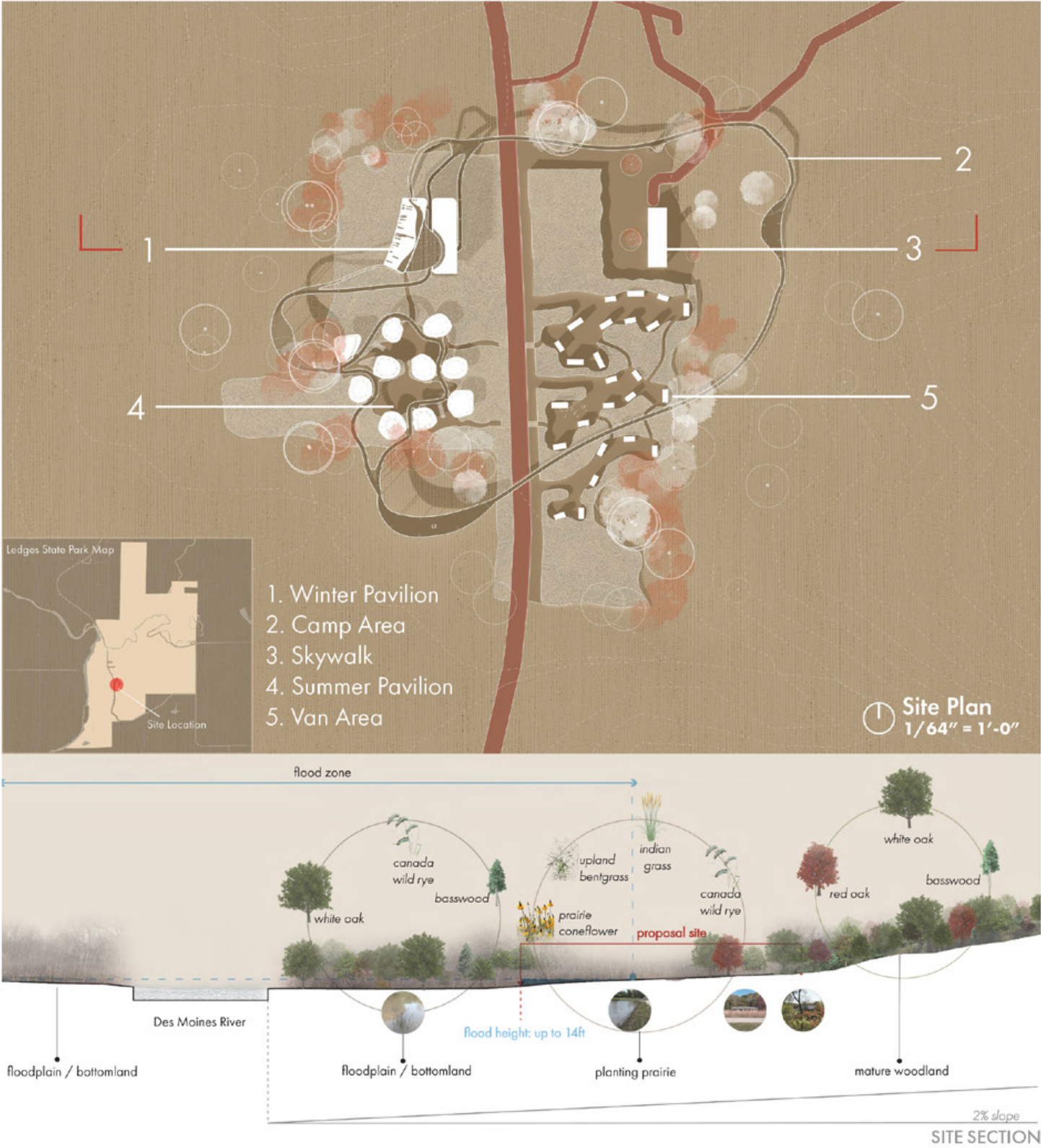
SITE: LEDGES STATE PARK - IOWA

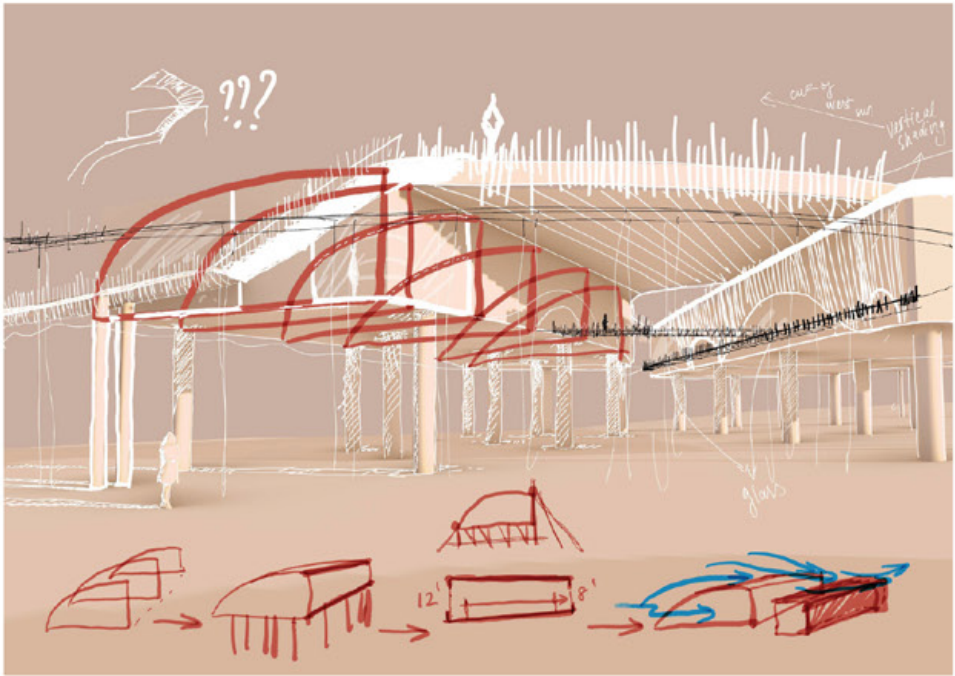




01. SITE CONTEXT

Our site at Ledges State Park, Iowa, is a meeting point for neo-nomadic people all over the continent. We used our research about Ledges State Park, its geography, and its flora to shape the site and how it's used.

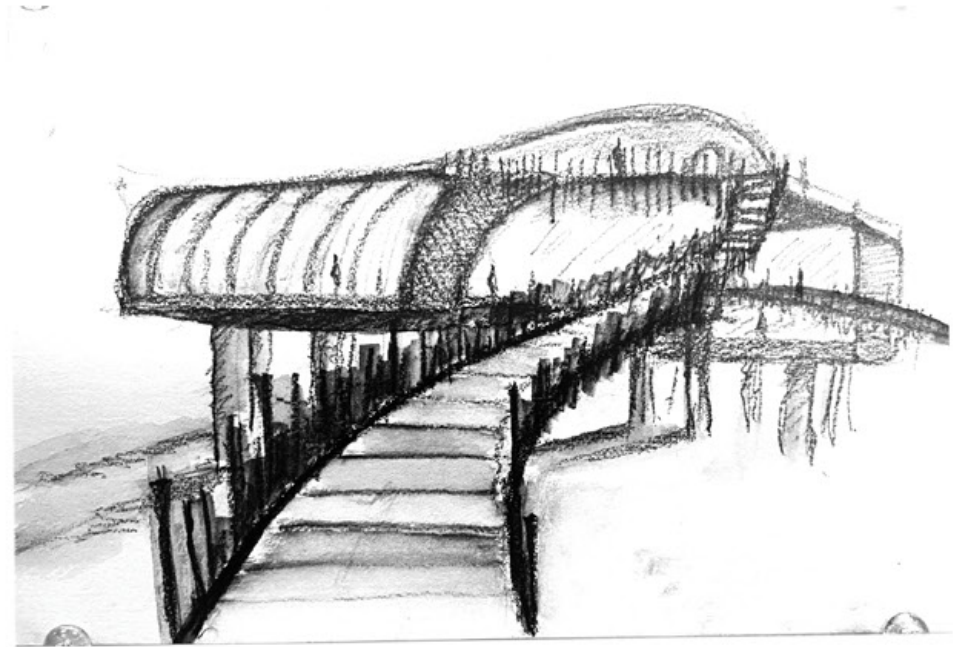


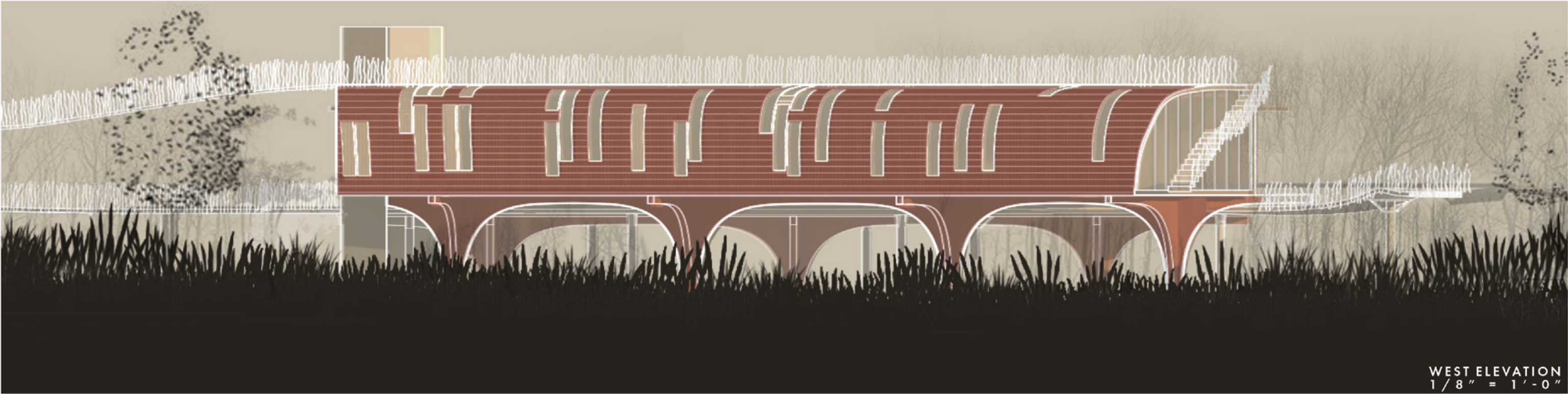


02. CONCEPT

With the narrative of flooding adaptability and natural preservation, we developed a site that is adaptable to the weather and seasons, while also touching the historical site as little as possible. Our narrative elevates some of

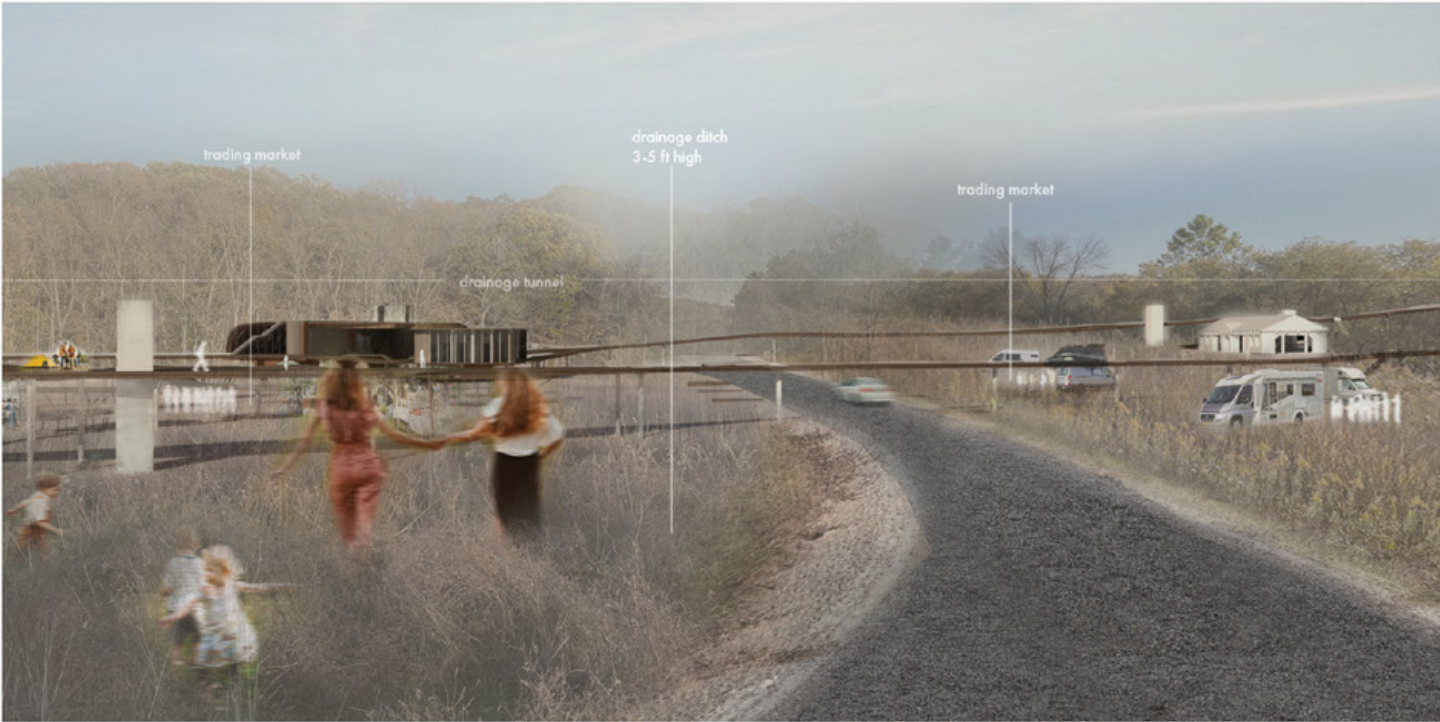
the programs above the flat landscape, and allows the site to change, grow, and adapt throughout the year, creating a site that's both adaptable and resilient, much like the neo-nomadic van dwellers of today.



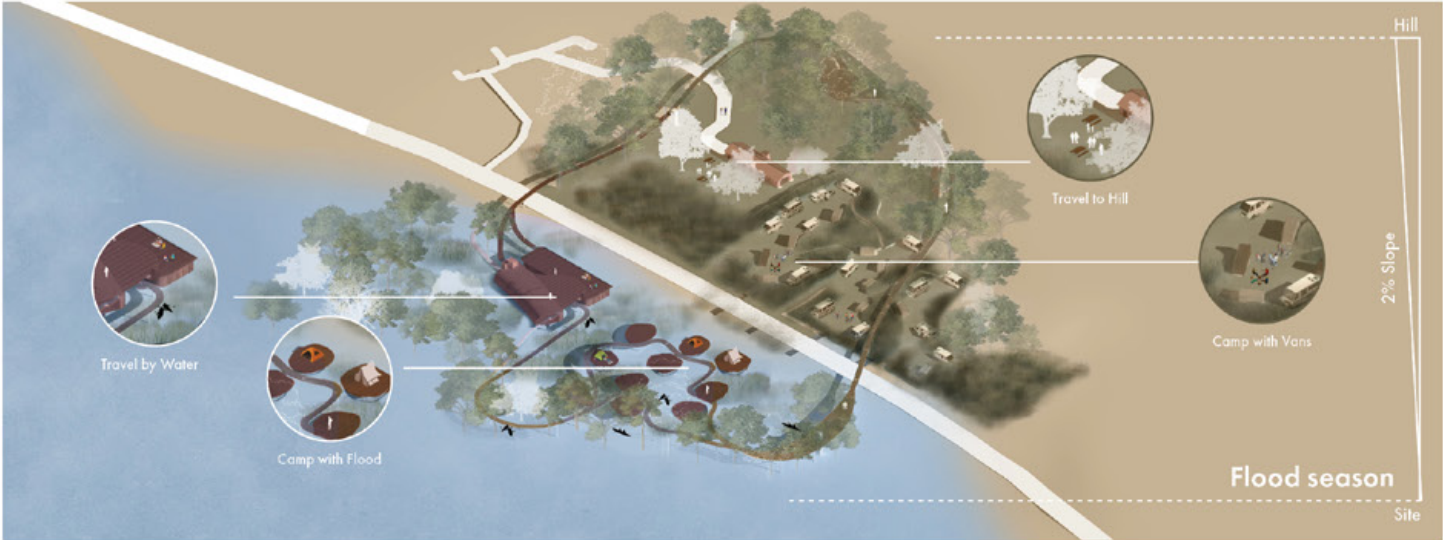




FLOOD SEASON RENDER

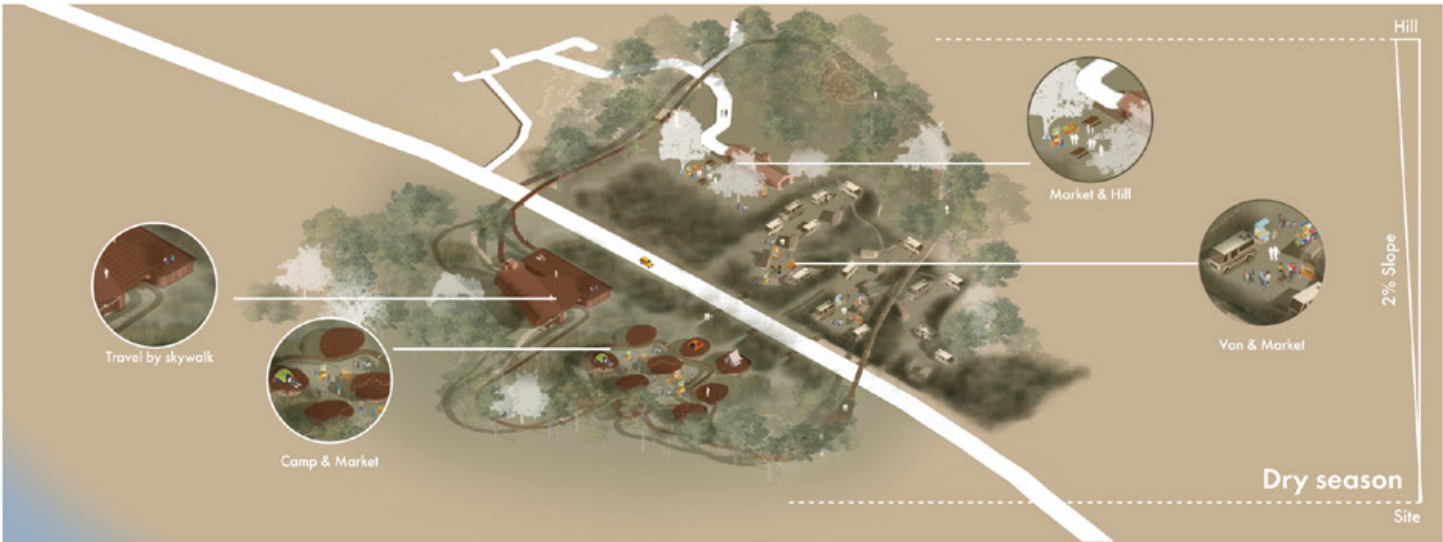


DRY SEASON RENDER



We realized how flooding issues have damaged the park throughout the years, leading to a decline in annual visitation during heavy flooding seasons. Our site also contains many

historical elements that we wanted to preserve, from the prairie and other vegetation such as trees and vines, to the Carl Fritz Henning shelter that is already on the site.





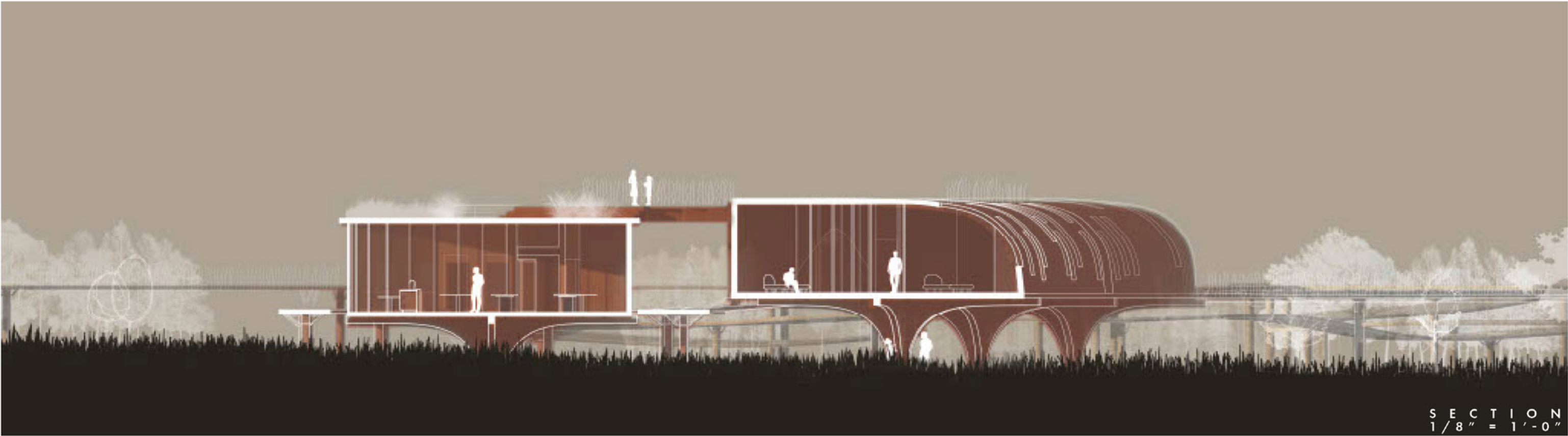
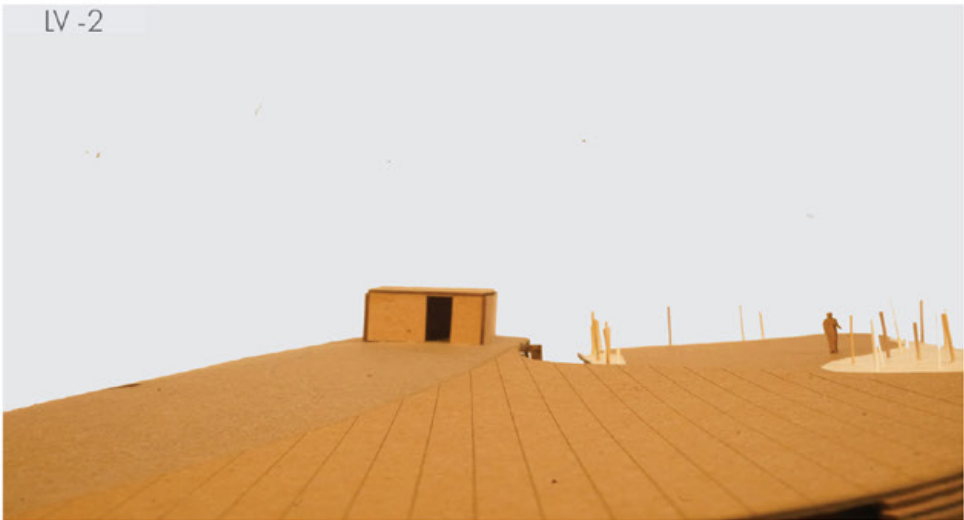
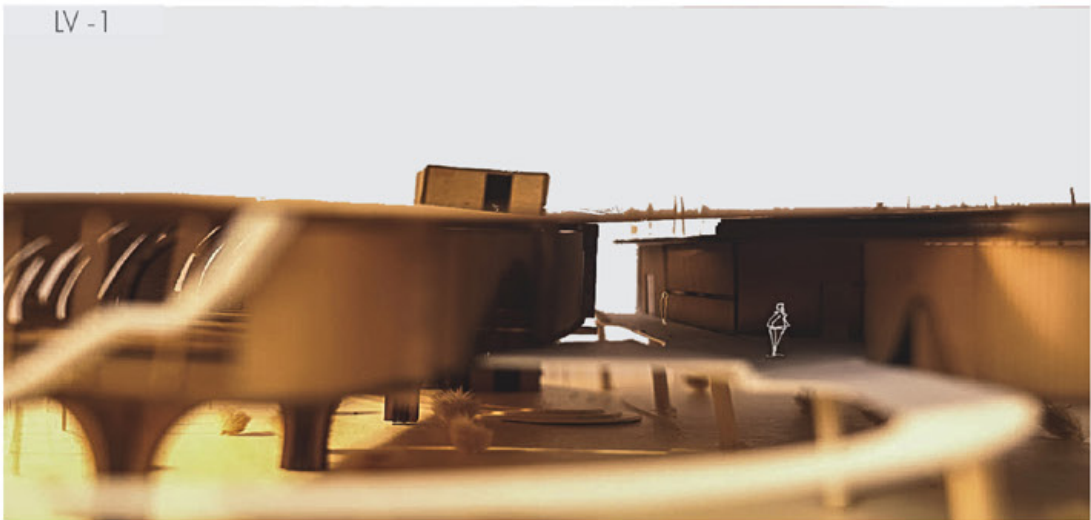
03. PROGRAM

The programs are meant to accommodate the neo-nomadic lifestyle that many people embrace today, while also being respectful and sensitive to the existing site, be it existing buildings, vegetation, or soil.



We learned that nomadic people are resilient to all weather, and easily adapt to many different living conditions, so why not make the

site have the same level of resilience and adaptability for different weather conditions as well?





VAN PARKING AREA



MARKET AREA IN DRY SEASON

Internship Works

BNIM, HAO CAO

PROJECT: LIFESERVE BLOOD CENTER
SUMMER 2024
TYPE: PUBLIC SPACE / COMMERCIAL



Long Section



Short Section



OTHER PROJECTS

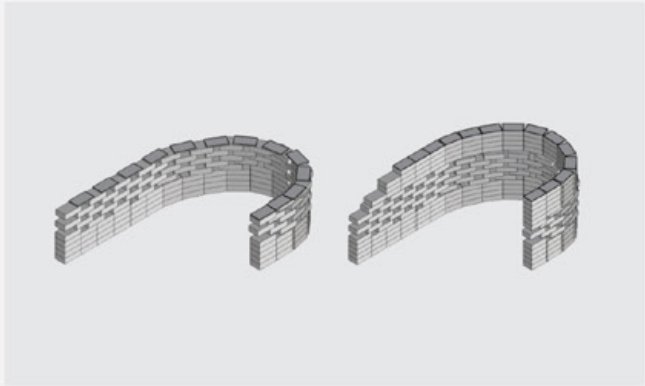


HEREAFTER **SHORTLISTED**

Type: Render
Organizer: Buildner Architecture Competitions - ARCHITECTURAL VISUALIZATION EDITION #2
Collaborators: Truc Nguyen, Isabel Witten
Software: Midjourney, Photoshop, Lightroom

<https://architecturecompetitions.com/architecturalvisualizationaward2/>

+ A silent contest using architectural visualization to convey the idea



IOWA WELLS INSTITUTE - **WINNER**
BRICK CONTEST

Type: Hands-on experience
Collaborators: Cheyenne Oberlechner, Jenea Jones, Kimberly Greiner, Makenna McManemy, Madalyn Niemeier
Professor: Eric Badding, Bosuk Hur

+ The key ideas in our design were stability, perforation, aesthetic, repose, and efficiency. We wanted a design that had a high amount of stability, even though we need to construct it in a short amount of time. We all collaborated excellently in discussing the final design and building this project on site.



MOI POTTERY // **CLOSED**
PERSONAL

Type: Throwing pottery as hobby
Collaborator: Truc Nguyen

+ Practicing throwing pottery after school
+ Joined Art Mart Fall 2023
+ Planning to turn this hobby to side hustle in future



2DOTS1LINE CLAY // **ONGOING**
PERSONAL

Type: Handmade air-dry clay creations
Solo Project

+ Another hobby besides pottery
+ Joined Art Mart Fall 2023
+ Planning to launch online shop this March



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JESSICHAO2607@GMAIL.COM