portfolio

ANDREW WANG

Andrew Julian **Wang**

architecture undergraduate student

I am Andrew Wang, a fourth-year architecture student in Carnegie Mellon University. As an amicable, hardworking and creative architecture student seeking internship, I believe I am ready to offer all my knowledge and experience gained from the University, extensive skills of multiple design software, and strong teamwork abilities.

EDUCATION

carnegie mellon university
2021.8 - 2026.6
major in architectural and building Sciences / technology
additional major in Human-Computer Interaction
GPA: 3.96

SKILLS

Adobe Photoshop | Illustrator | InDesign | Premiere Pro
Autodesk AutoCAD | Revit | Rhino | Grasshopper | Keyshot
Python | C# | Javascript | CSS | HTML

EXPERIENCE

teaching assistant (generative modeling)
|carnegie mellon univeristy
2023.8 - 2023.12

research assistant (bamboo greenhouse)
|carnegie mellon univeristy
2024.6 - present

LANGUAGE

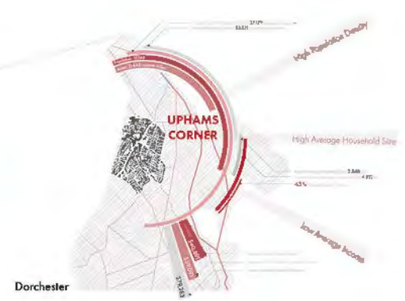
english
mandarin
japanese

CONTENTS

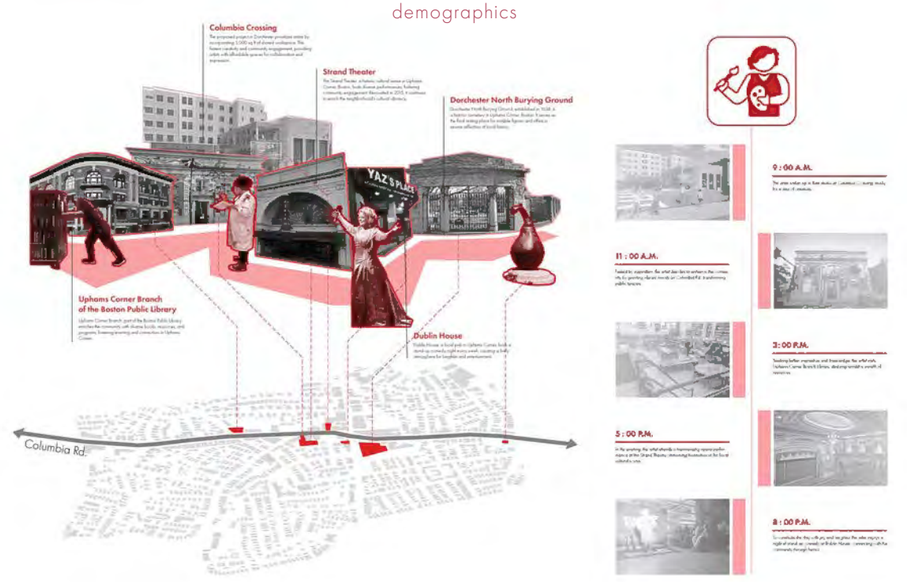
UPHAM'S CORNER LIBRARY

Year: Spring 2024
Team: Indivual
Type: Public Infrastructure
Site: Upham's Corner, Boston, MA

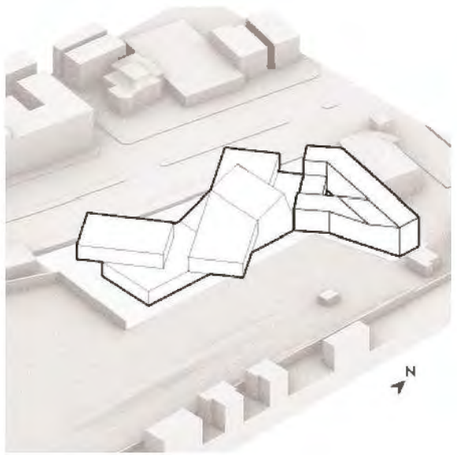
As part of our design project for the Upham's Corner Library, the initial demographic and site research revealed a significant age gap within the community compared to other areas in Boston. This disparity is largely due to the distinct infrastructures and facilities surrounding the site. The northern area of the district is predominantly occupied by office buildings, including a sizable glass manufacturing facility. In contrast, the southern region is home to educational institutions such as middle and elementary schools. This observation played a crucial role in shaping our design approach, ensuring that the library serves as a bridge between these diverse areas and caters to the varied needs of the community.

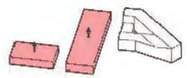


demographics

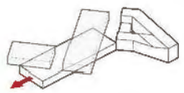


events

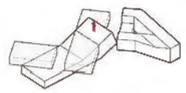




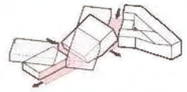
cantilever



extension



escalation



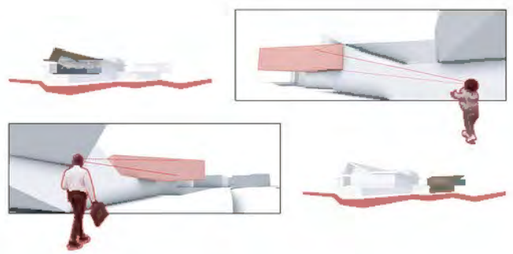
circulation

outdoor space

solar access

FORM FINDING

The form-finding process for Upham's Corner Library balances functional needs and symbolic connections. The design bridges demographic gaps through spatial configurations that optimize interaction, circulation, and access to sunlight. Strategic massing choices create distinct spaces for each age group, fostering community engagement while maintaining harmony with the surrounding environment.

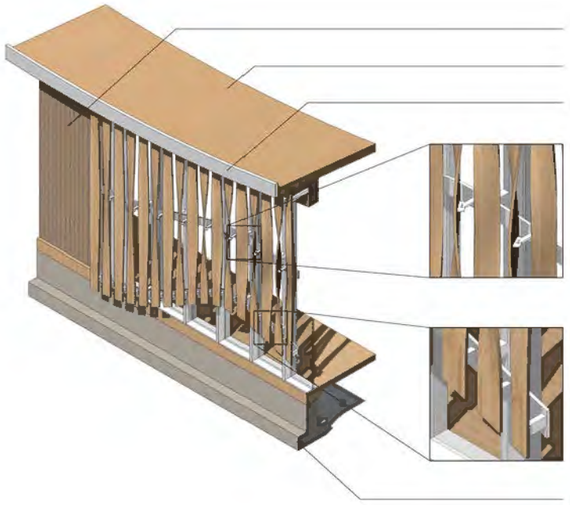


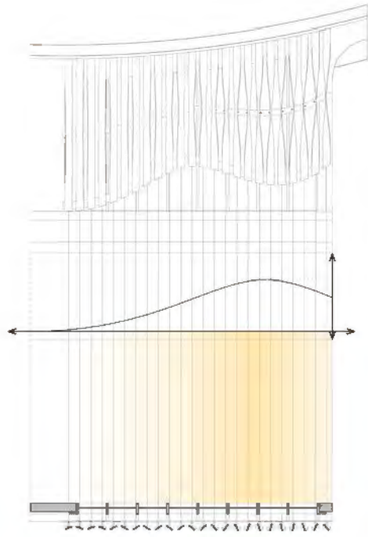
Children's POV v.s. Adults' POV

exterior

interior

experiential collages

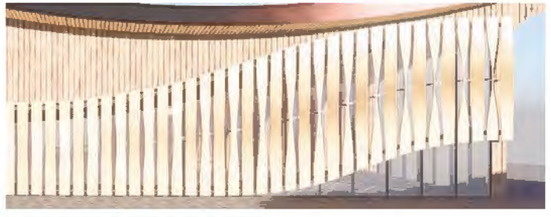




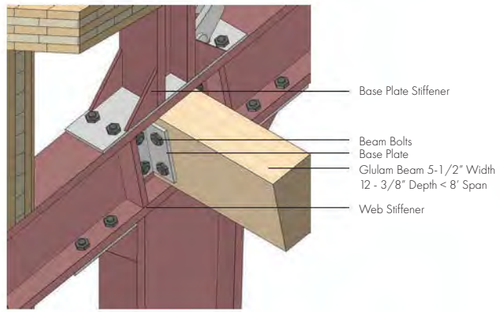
Design indoor population density v.s. Angle twsited

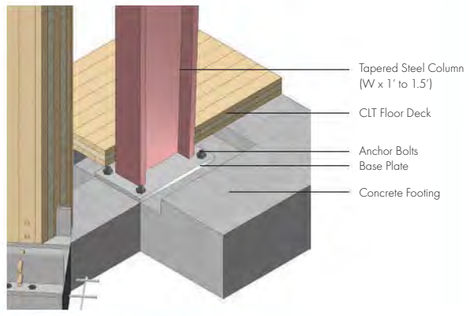
TWISTING FACADE

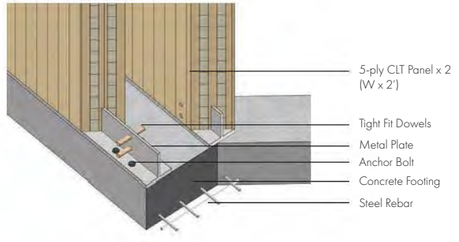
The twisting facade uses braces and supports connected to the mullions to diffuse light. Inspired by various precedents, this design allows for precise control of solar intake. By rotating each panel, it tailors light levels and thermal comfort in the reading spaces, enhancing both aesthetics and environmental performance.

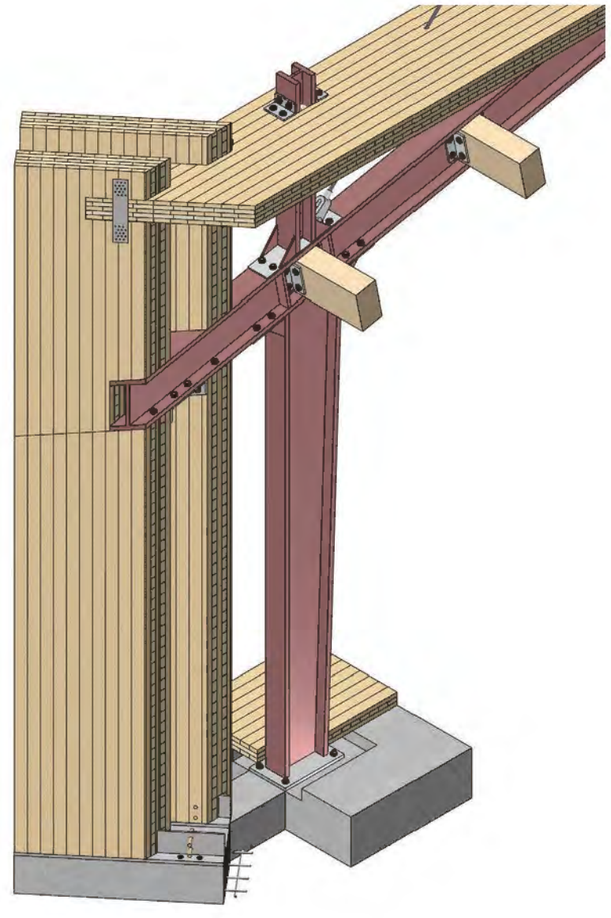


First floor reading space facade

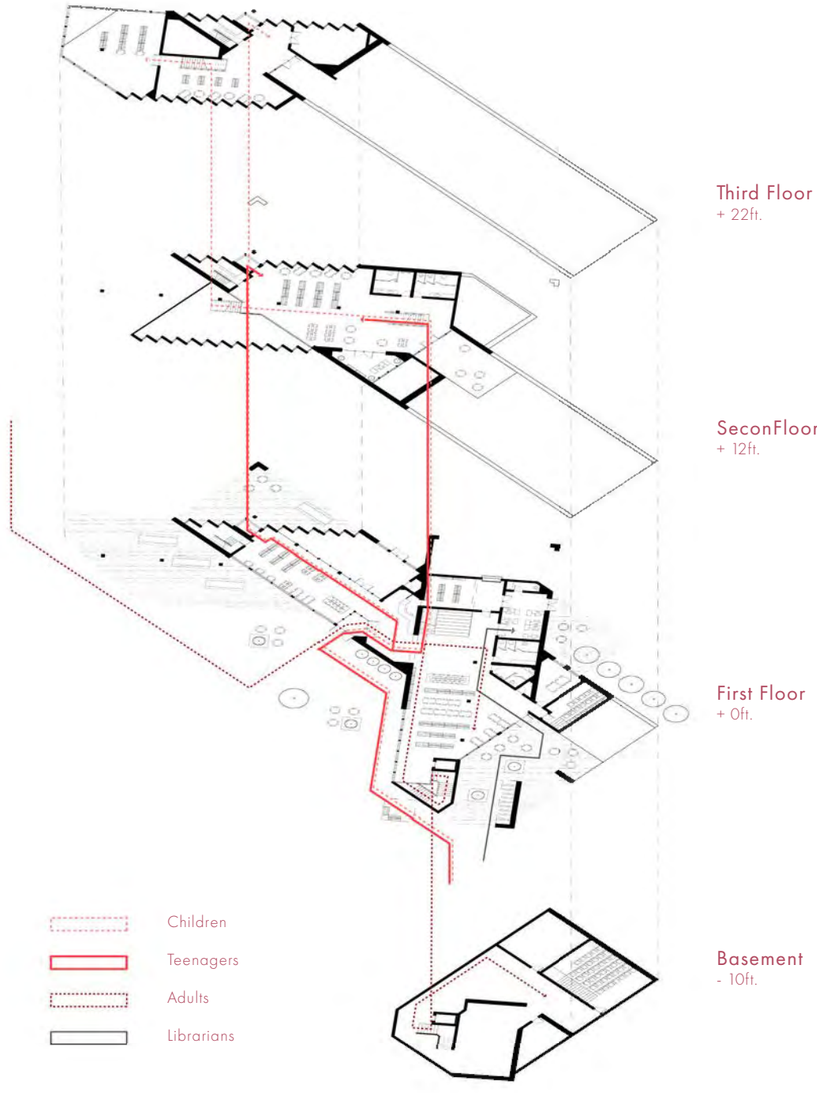




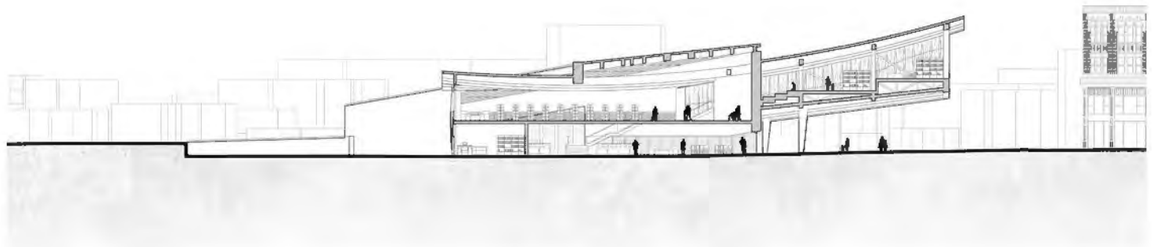




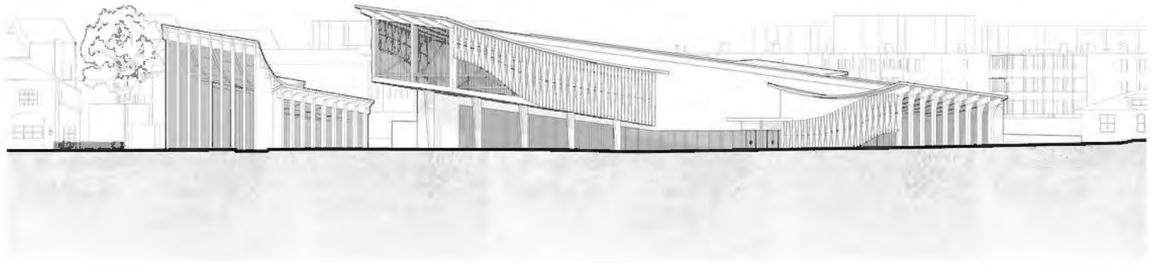
integration of steel and CLT panels



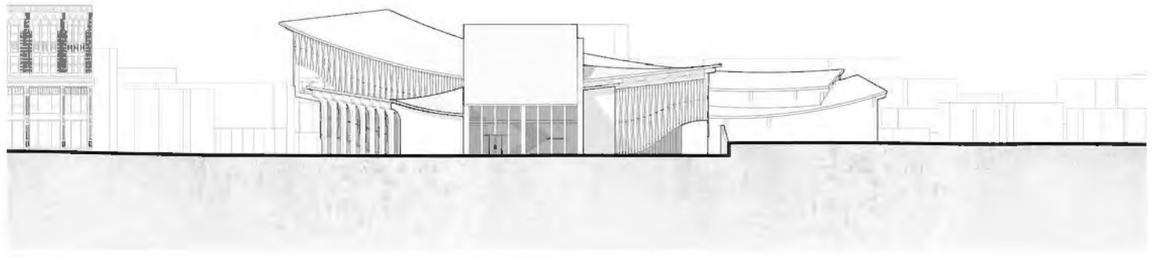
circulation



section

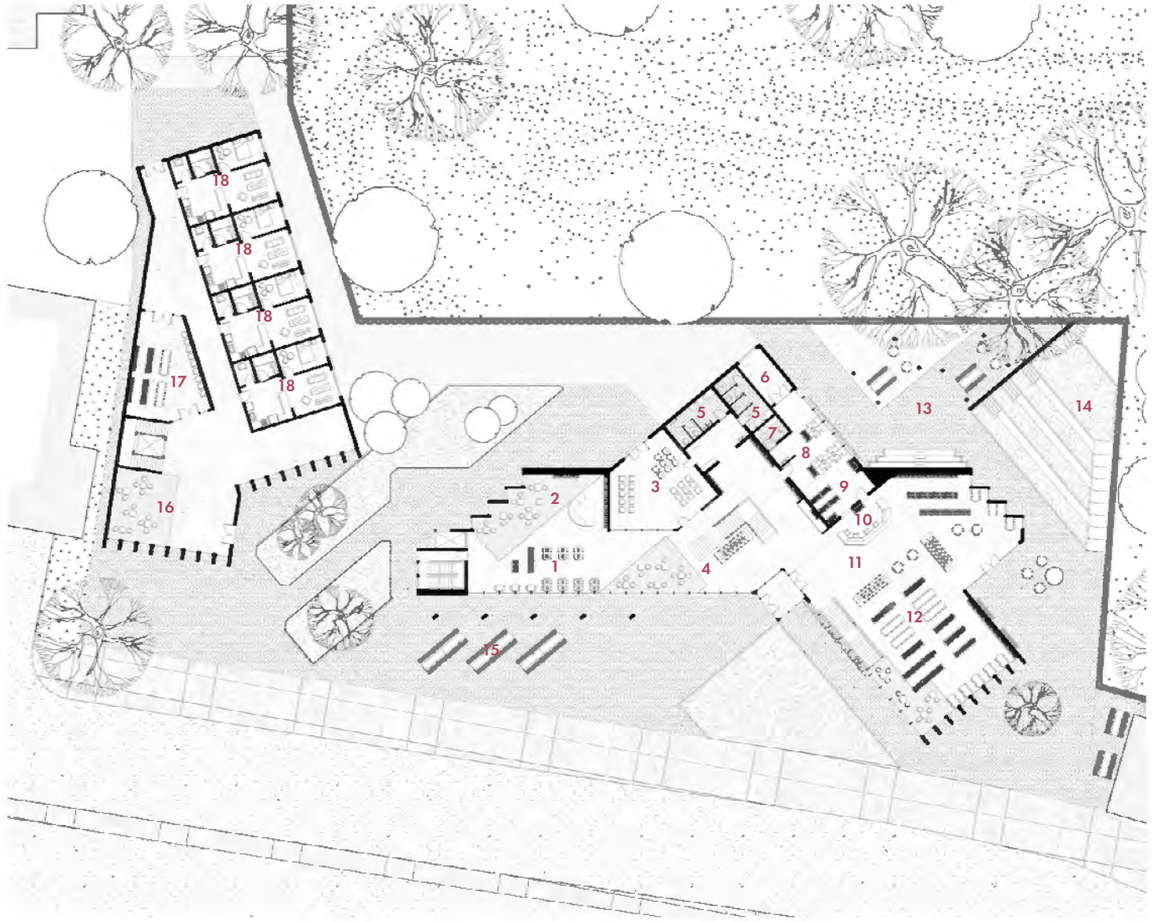


west elevation



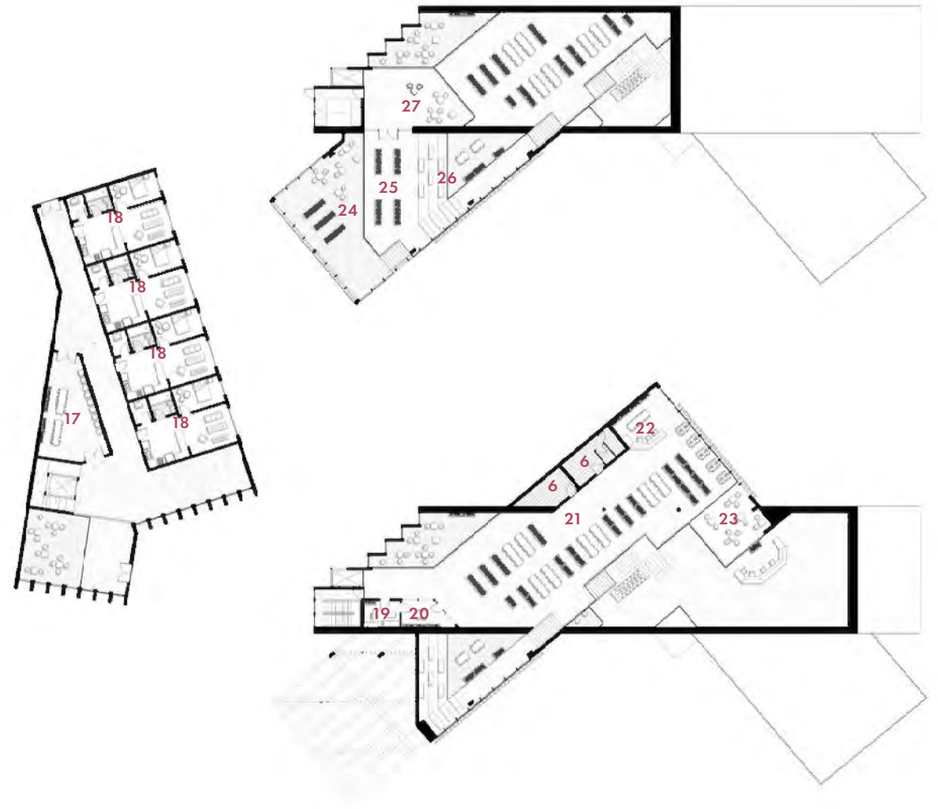
south elevation

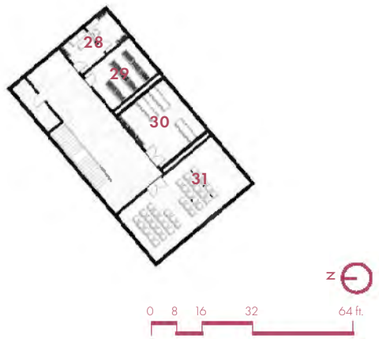
0 8 16 32 64 ft.



site plan & first floor plan

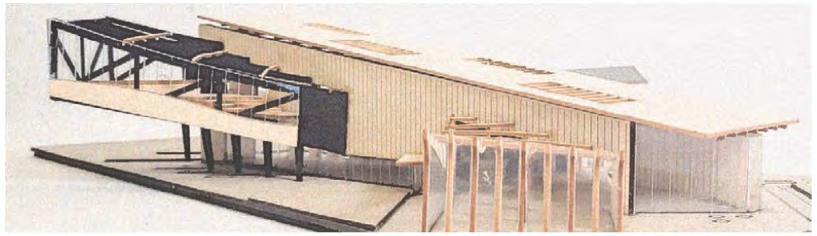
1. audio/video collection
2. adult seating area
3. public conference room
4. new book display
5. restrooms
6. loading dock
7. staff restoom
8. staff workroom
9. staff storage
10. borrower's desk
11. lobby
12. adult collection
13. reading garden
14. auditorium
15. public outdoor seating
16. housing lobby
17. housing activity space
18. housing units





other floor plans

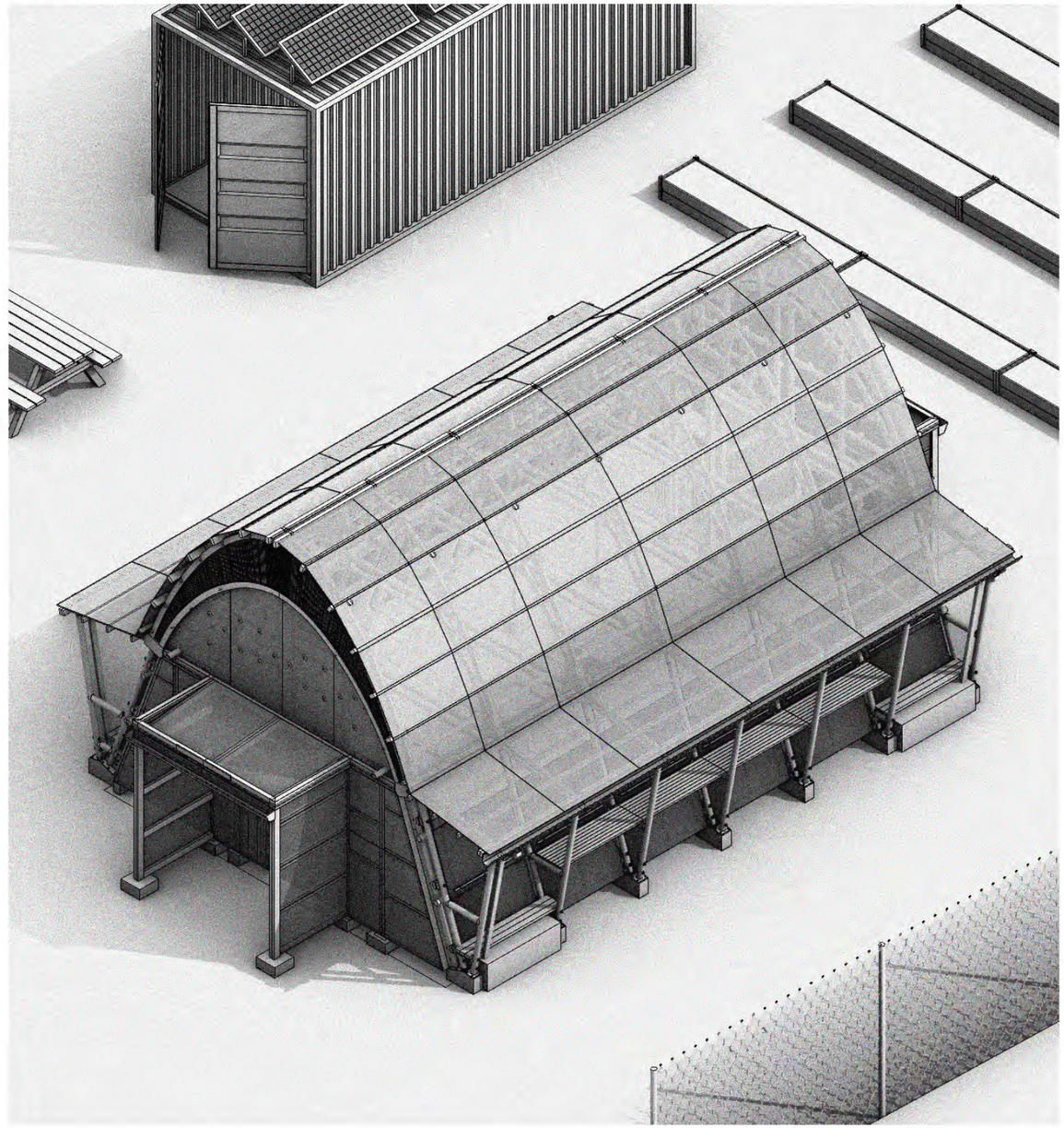
19. branch librarian's office
20. meeting room
21. teen collection
22. teen / children's service desk
23. teen seating area
24. children's seating area
25. children's collection
26. tween's seating area
27. adult waiting area
28. recording studio
29. facilities storage room
30. tool lending
31. lecture room

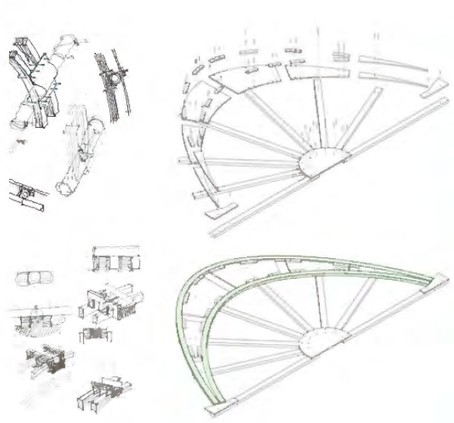


SANKOFA GREENHOUSE

Year: Summer 2024 -
Team: Student team led by Professor Vicky Achnani
Type: Eco-friendly public installation
Site: Homewood, Pittsburgh, PA

The Bamboo Greenhouse Project was conceived as a meaningful gift from Carnegie Mellon University to the local Pittsburgh community, specifically the Sankofa Village Community Garden. Beyond its role as a functional greenhouse, the project embodies a collaborative effort between the university and the neighborhood to promote sustainability and green living. The use of hand-harvested, recycled bamboo reflects a shared commitment to environmental responsibility, while the design process—tailored to the unique properties of the material—demonstrates innovation and craftsmanship. By offering this space, Carnegie Mellon aims to empower the community with a resource that enhances local agriculture, fosters environmental education, and strengthens ties between the university and the residents of Pittsburgh.

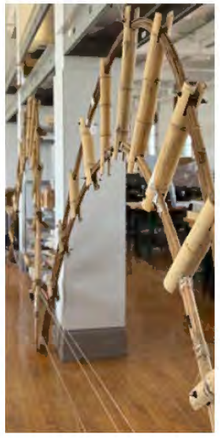




struts & jigs design

processed struts

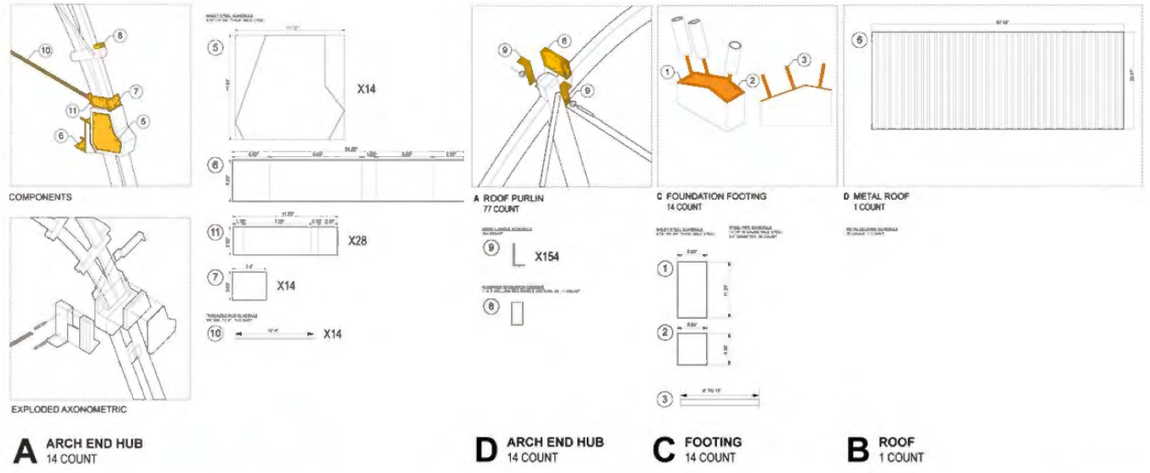
anchoring

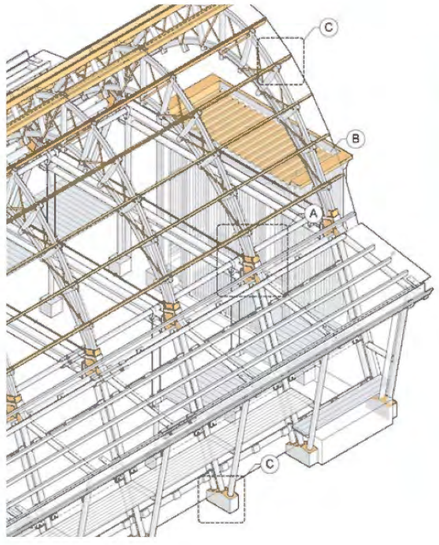


tension reinforcement

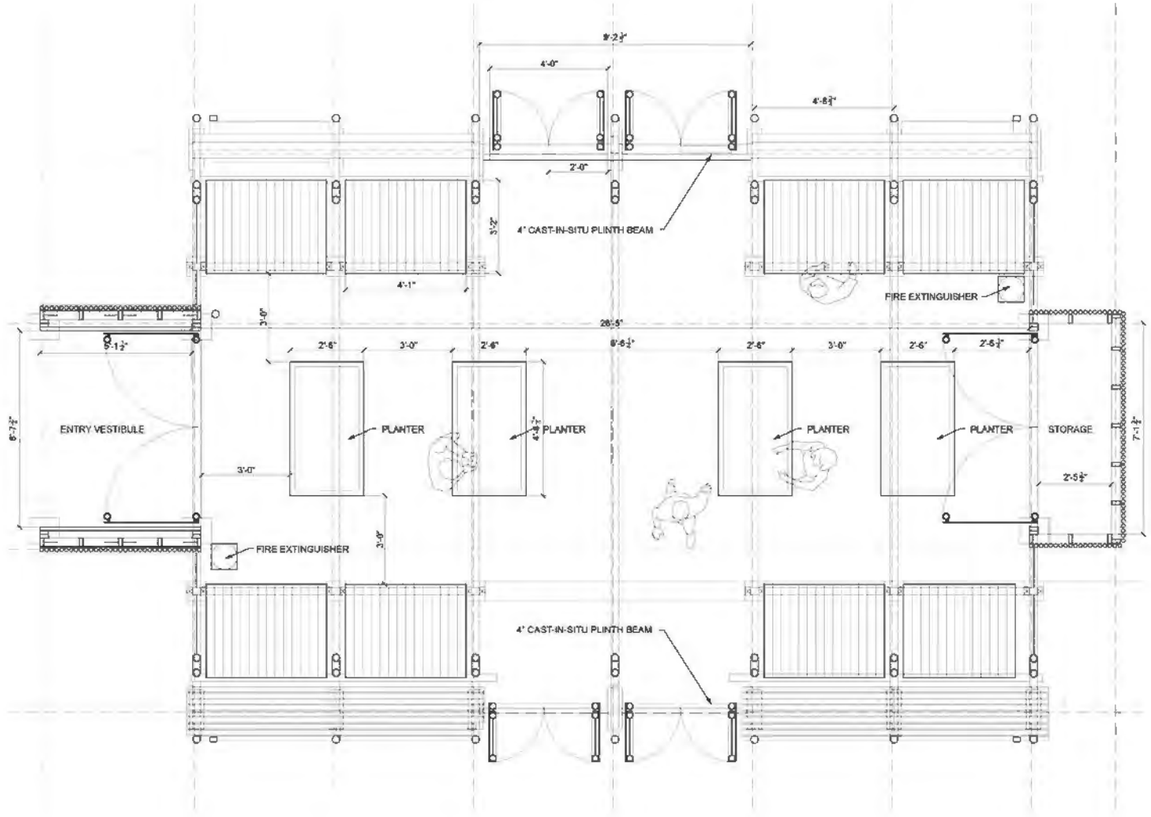
ARCH ASSEMBLY

The arch assembly process starts with designing struts that lock with bamboo strips, secured by bolts to form stable joints. A custom jig is used to ensure all seven arches are constructed with consistent dimensions. Meanwhile, smaller components, such as hubs made from CNC-processed plywood glued together, are fabricated to connect the arches to the columns. These hubs ensure proper alignment and stability throughout the structure, allowing for a smooth assembly process.

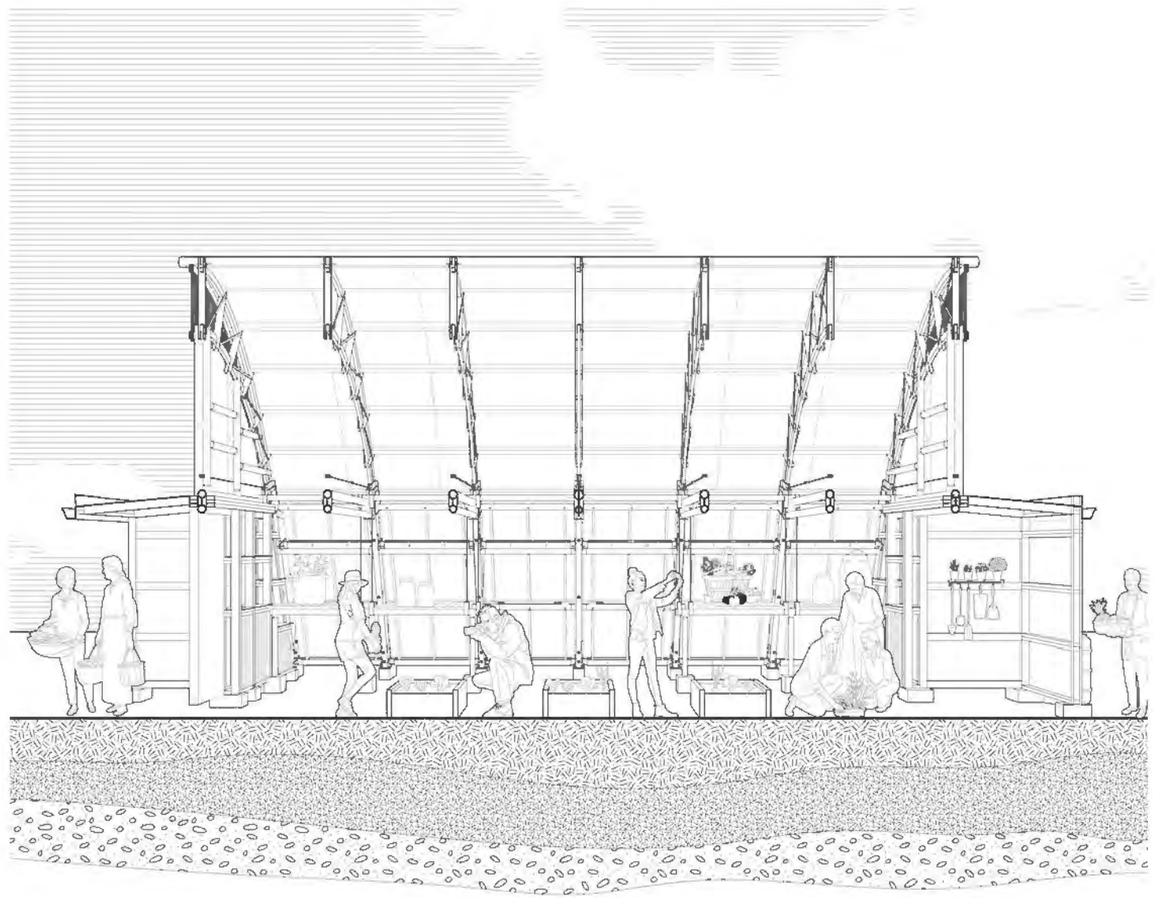




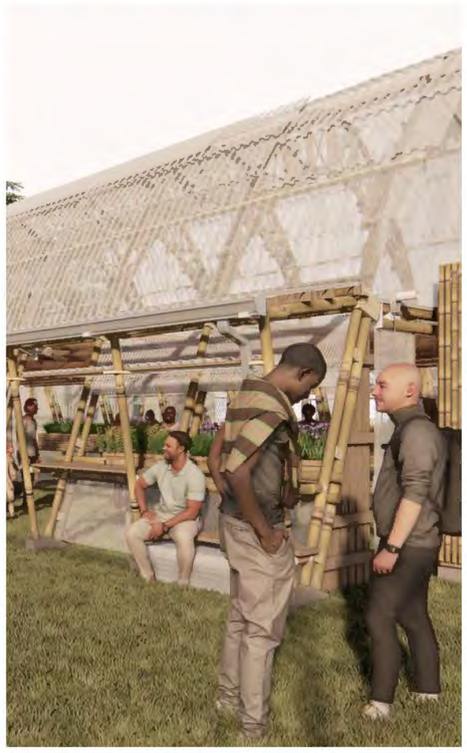
prototype arch components

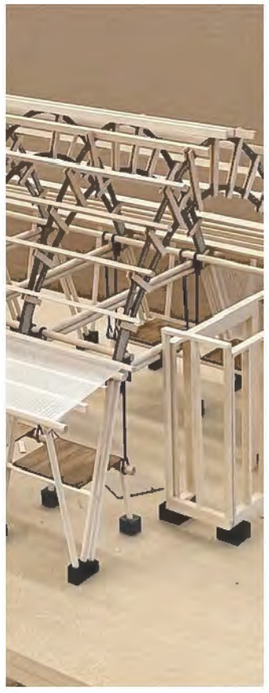


plan



section perspective

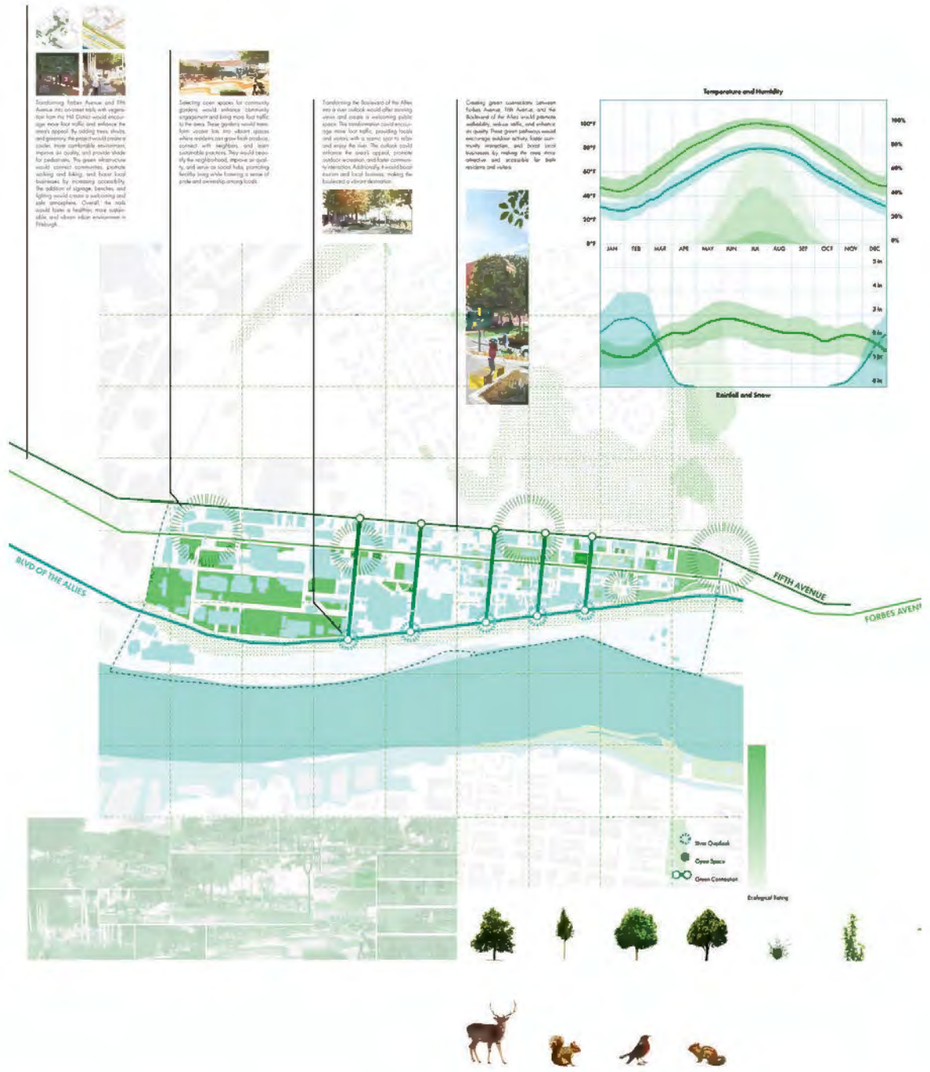




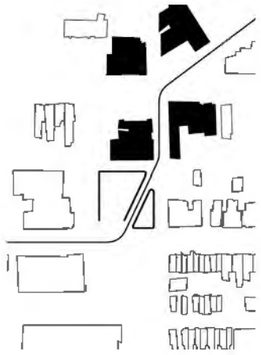
UPTOWN FIRE STATION

Year: Fall 2024
Team: In collaboration with Serena Sun
Type: Public Infrastructure
Site: Uptown, Pittsburgh, PA

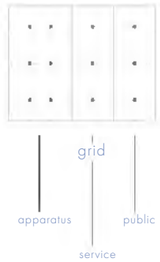
The Uptown Fire Station Project reimagines the traditional purpose of a fire station, expanding its role as a public infrastructure into a civic hub that unites the district's three main streets. By positioning the station as a welcoming nexus, the design connects pedestrians from north to south, fostering interaction and dialogue about work, comfort, and shared experiences. The project addresses the neighborhood's gradual gentrification by creating a space that promotes inclusivity, transparency, and community engagement. By bridging the more public Forbes Avenue with the localized Fifth Avenue, the station strengthens connections within the community. Designed with both public and private zones, the station includes spaces for firefighters to rest, as well as outdoor areas and gathering spots to encourage interaction with residents.

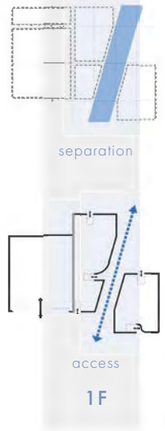


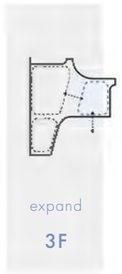
uptown renovation analysis



site path





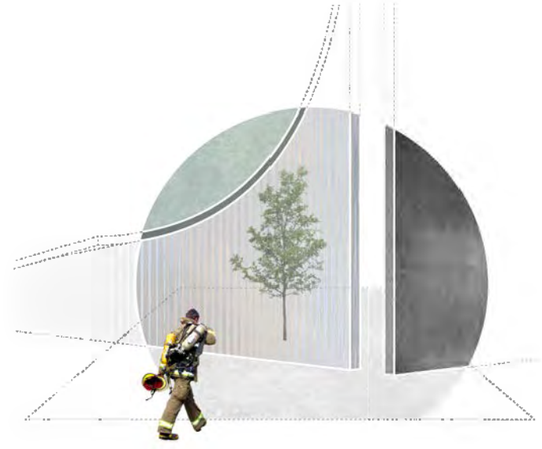


FORM FINDING

The form-finding process of the fire station leverages steel's structural flexibility, enabling the integration of curvature and openness to create a welcoming, connective space. Curved elements and glazed pockets soften the facade, drawing the public inward. Key spatial separation divides work, public, and residential zones for efficiency and privacy, while a diagonal pathway and central atrium link these areas. The grid aligns with the urban context, with the diagonal encouraging movement and public interaction.

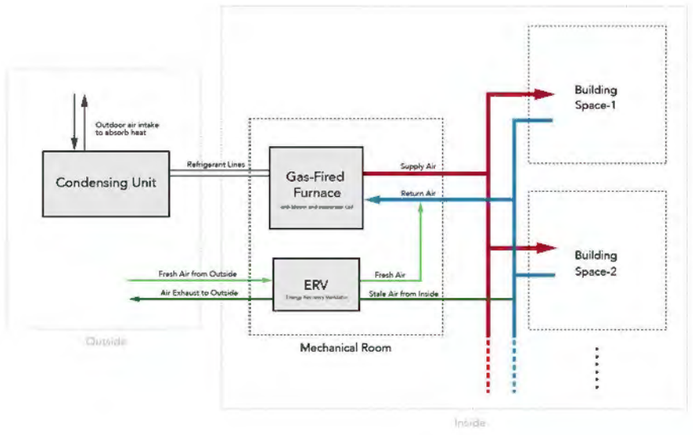
program iteration

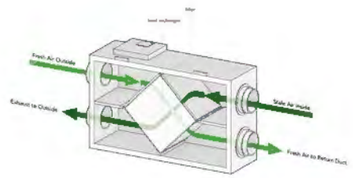
curviture form



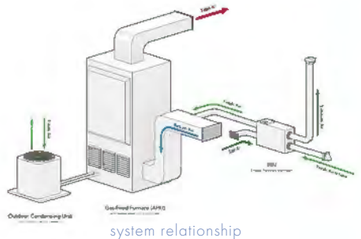
peel materality

experiential collages





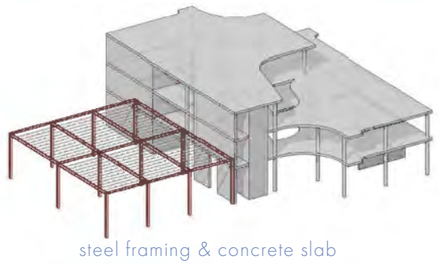
energy recovery ventilation



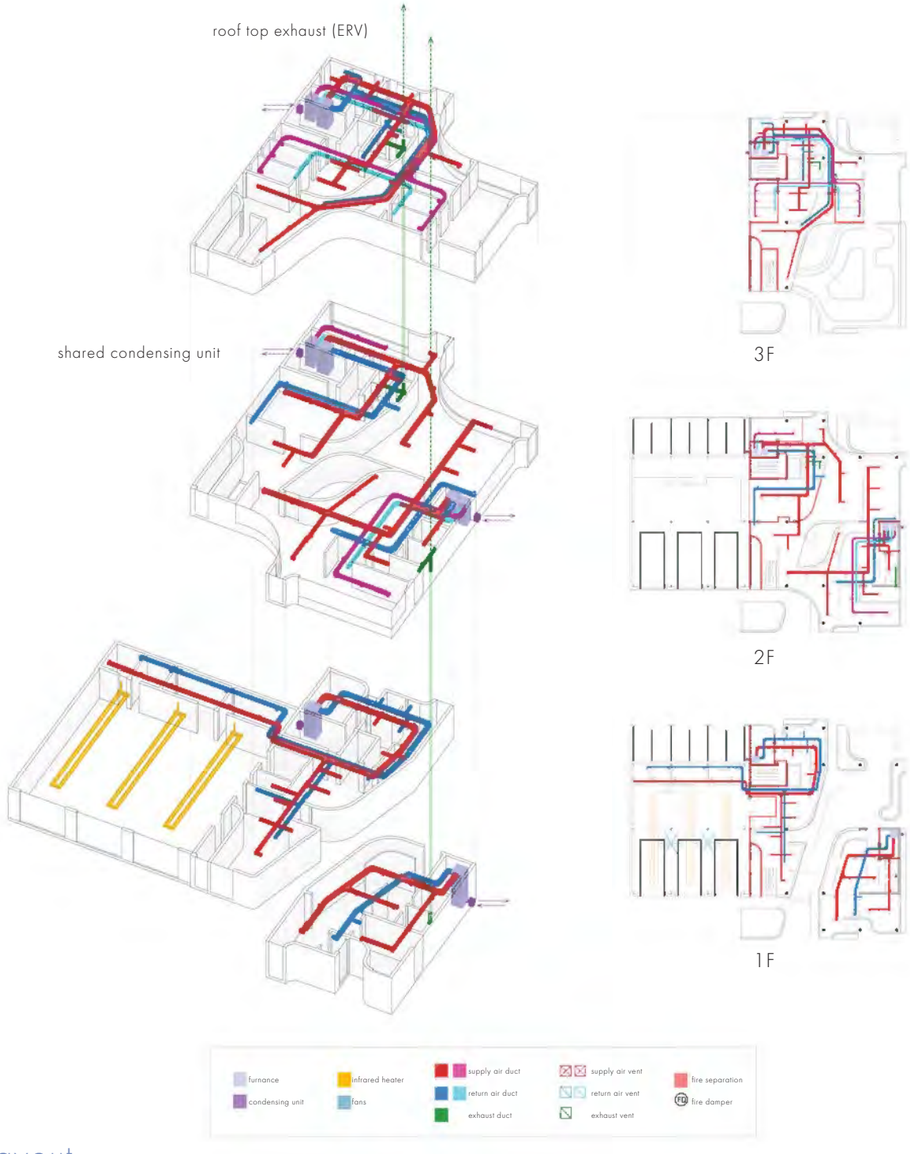
system relationship

MECHANICAL SYSTEM

The mechanical system design features furnace-based HVAC systems tailored to the project's smaller scale, ensuring efficient indoor comfort. A green roof water collection system captures and reuses water, reinforcing the building's sustainability. These strategies enhance both the building's functionality and its environmental responsibility.



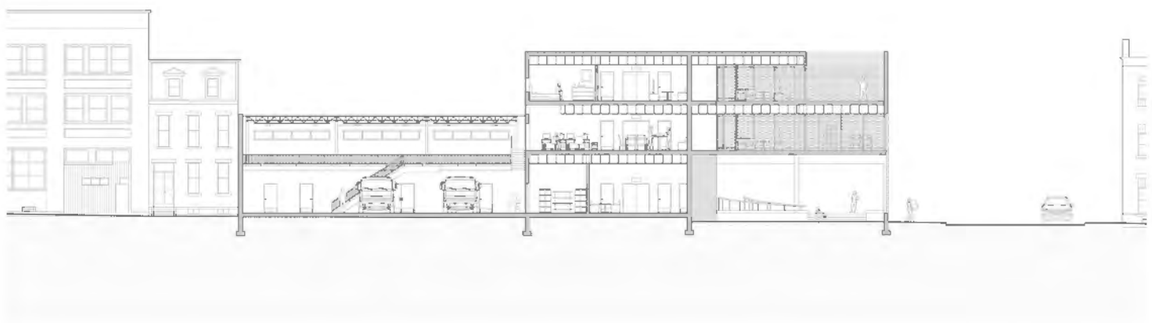
steel framing & concrete slab



MEP layout

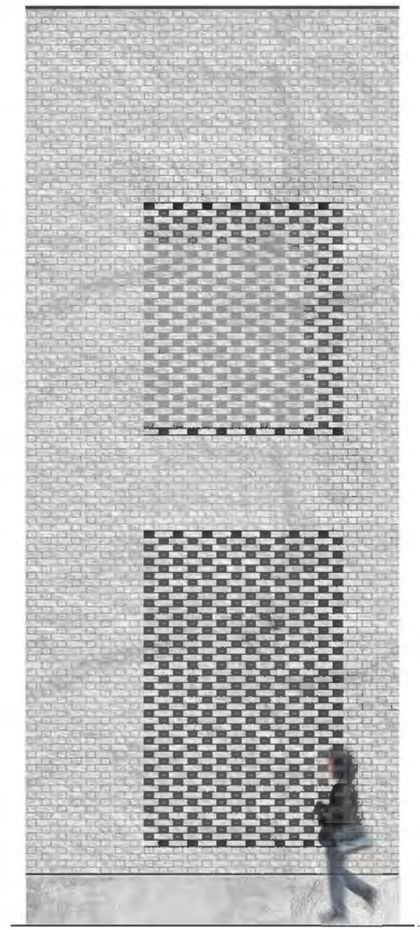
south elevation

east elevation



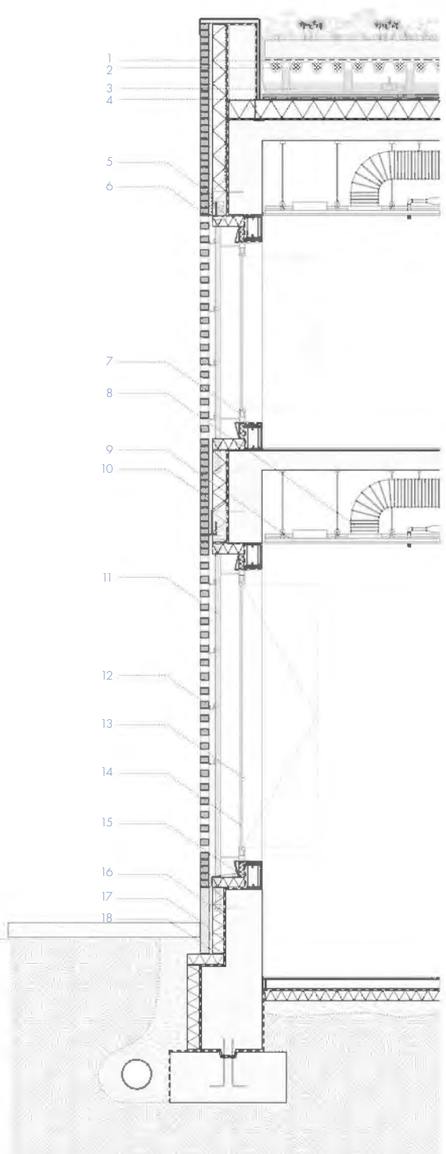
section

0 8 16 32 64 ft.

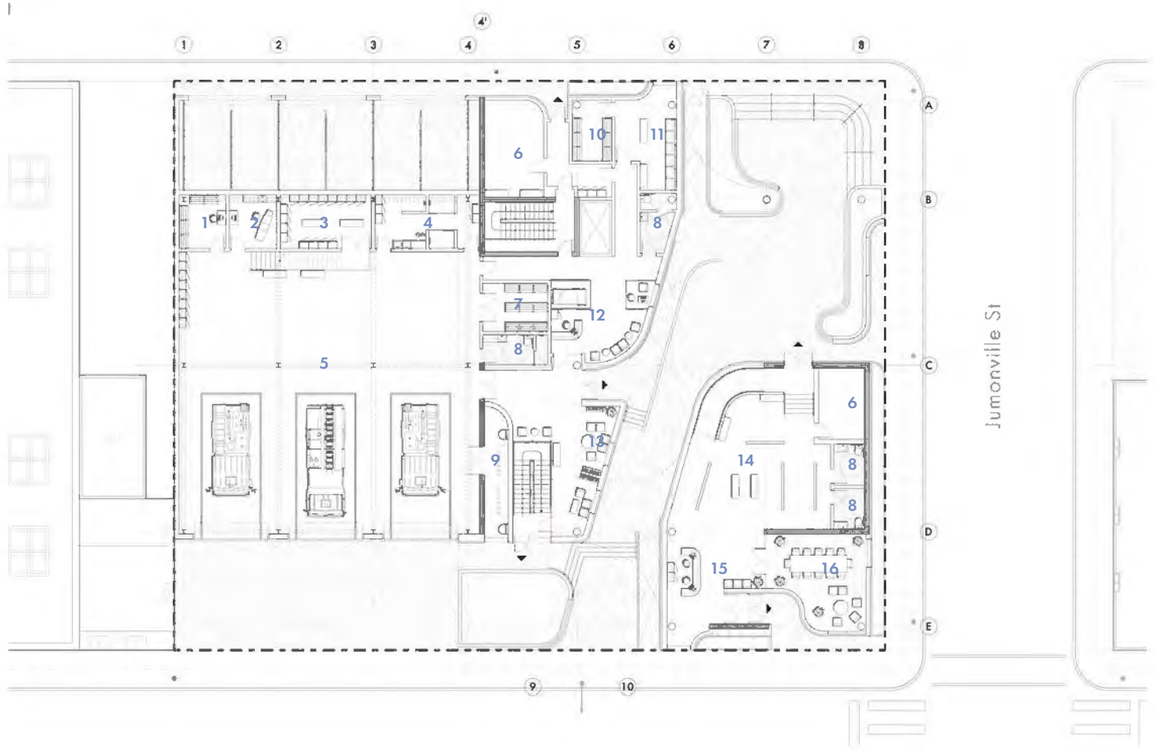


envolope assembly

1. rain system filter
2. garden GR30 cup
3. water reservior
4. hydroflex 30
5. fero C-shape backet
6. fero lintel
7. window moulin
8. HVAC ductwork
9. lighting fixture
10. exterior facade brick
11. angled steel frame
12. HB213 brick anchor
13. concrete column
14. triple glazed window
15. metal sheet finish
16. AWRB resistance layer
17. granite
18. insulation



0 1 2 4 8 ft.



2F

3F

site plan & first floor plan

1. E.M.S. storage
2. M.D.
3. bunker gear storage
4. decon room
5. appratus bay
6. mechanical room
7. apparatus storage
8. W.C.
9. hose tower
10. janitor room
11. gear laundry room
12. triage
13. apparatus lobby
14. gallery
15. public lobby
16. conference room

N

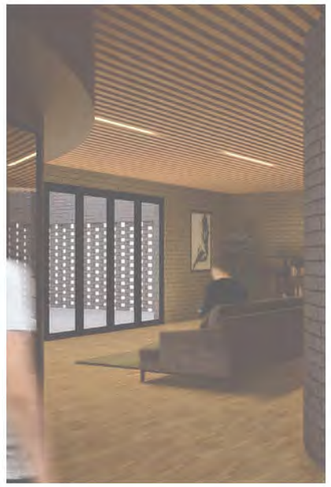
0 8 16 32 64 ft.

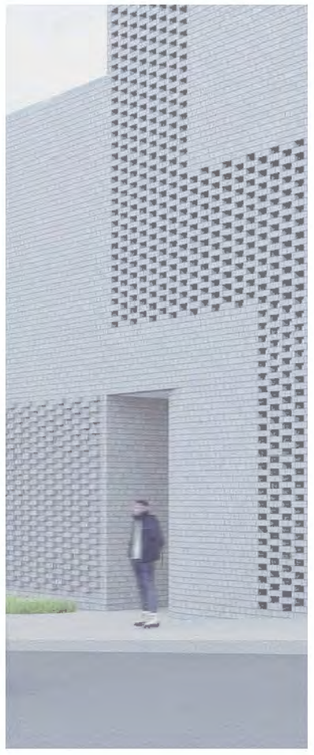
second floor & third floor plan

17. cardio room
18. station office
19. shower room
20. office quarter
21. beanary
22. weight room
23. library / archive
24. kitchen
25. dorm room
26. laundry room
27. lounge
28. day room

N

0 8 16 32 64 ft.



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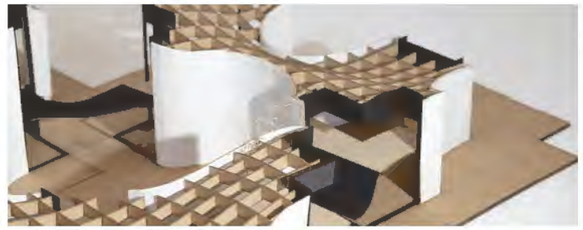
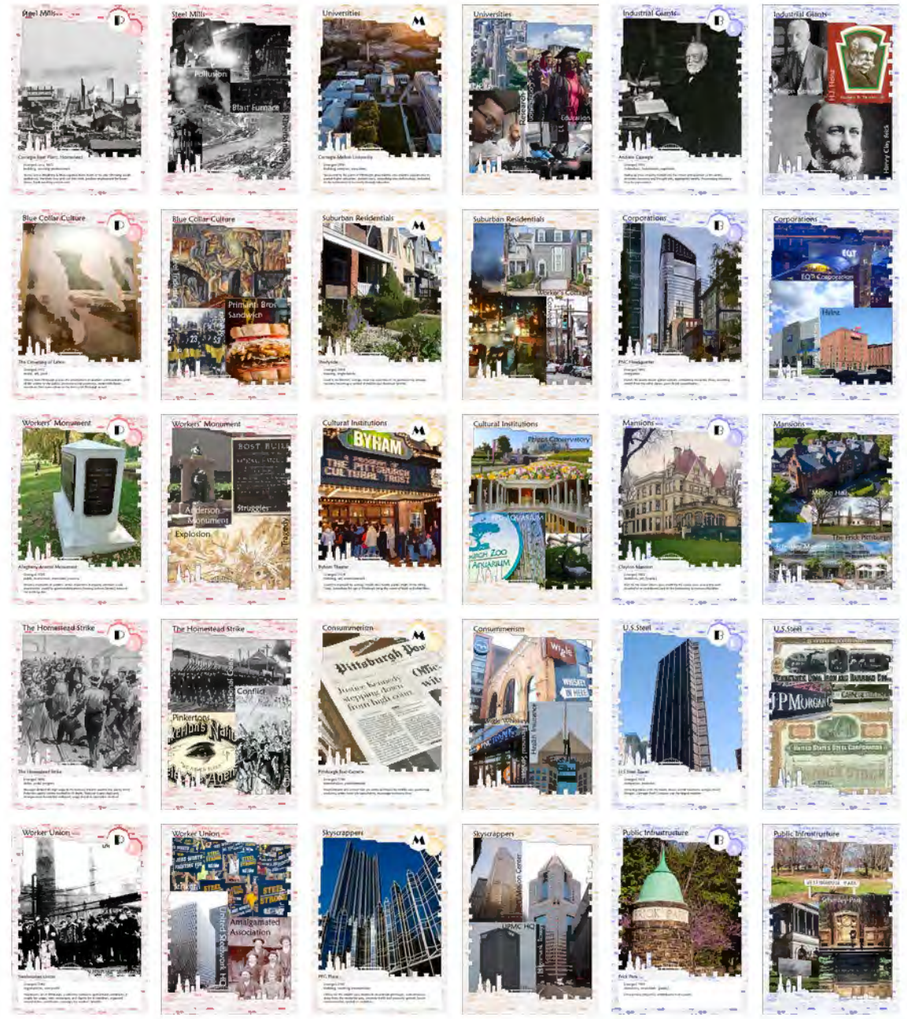


URBAN NECKLACE

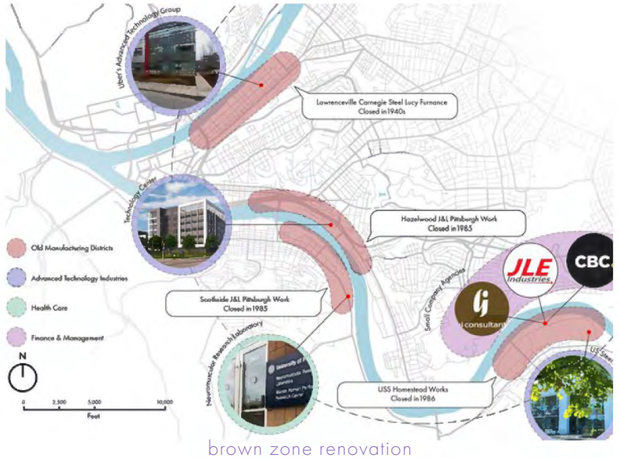
Year: Fall 2023
Team: In collaboration with Serena Sun
Type: Conceptual desgin
Site: Herrs Island, Pittsburgh, PA

Our floating housing project reimagines a former industrial island to tackle housing shortages, blending the island's historic essence with innovative, affordable design. Refurbished materials from the original site are paired with advanced, buoyant construction technologies to create sustainable, floating residential complexes. These materials and methods ensure affordability while adapting to environmental challenges like rising water levels.

Infrastructure improvements include updated utilities and transportation systems tailored to the island's new role. Recreational spaces incorporate the island's natural water features, offering a balance between community engagement and sustainable living within this revitalized industrial landscape.



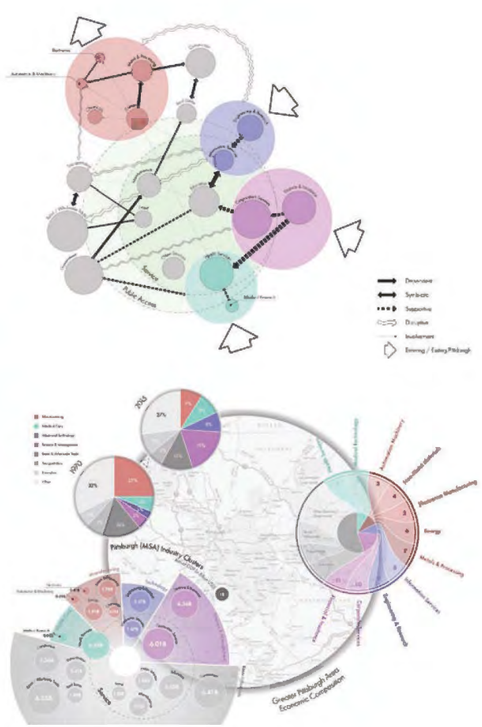
Pittsburgh "trading card" collage



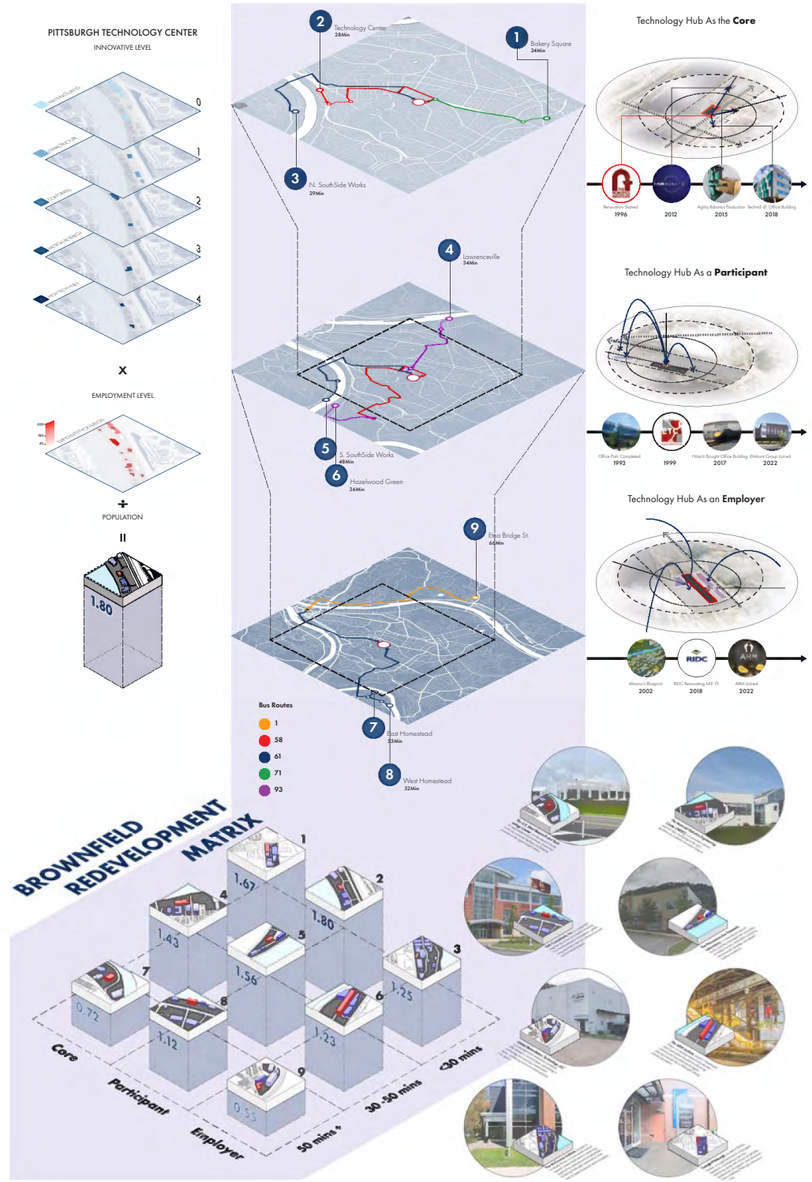
brown zone renovation

INDUSTRY RESEARCH

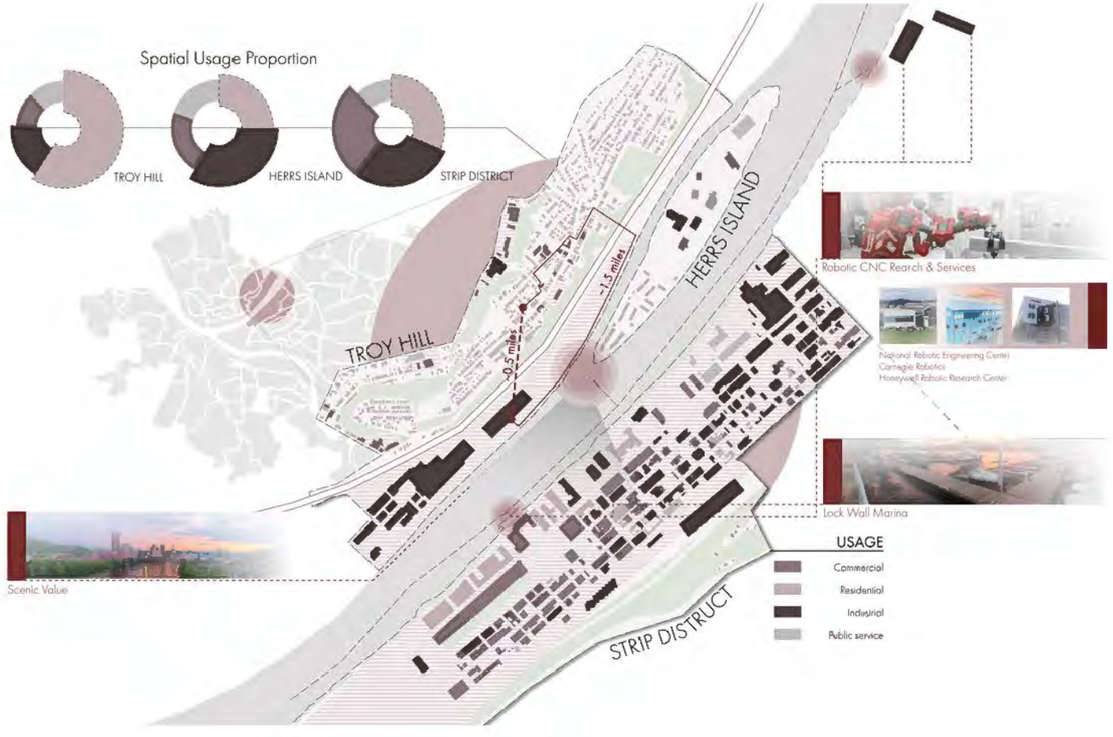
In this academic project, our objective was to craft a series of intricate diagrams that not only showcased our prowess in visual design but also underscored our adeptness in comprehending and analyzing the intricate fabric of the site's constituents. To achieve this, we embarked on an exploration of Pittsburgh's industrial legacy, using it as the cornerstone of our design narrative.



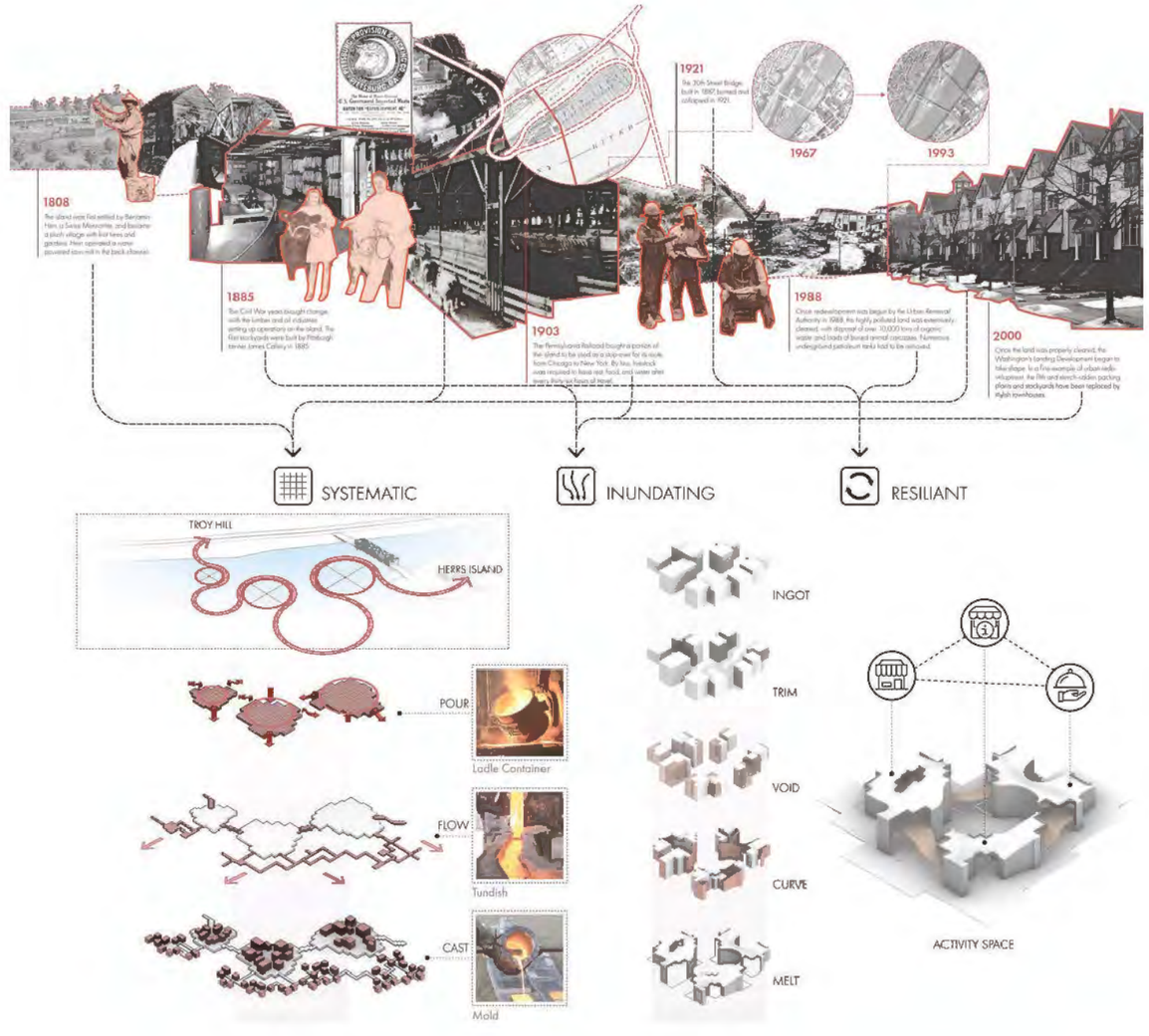
Pittsburgh industry relationship & percentage



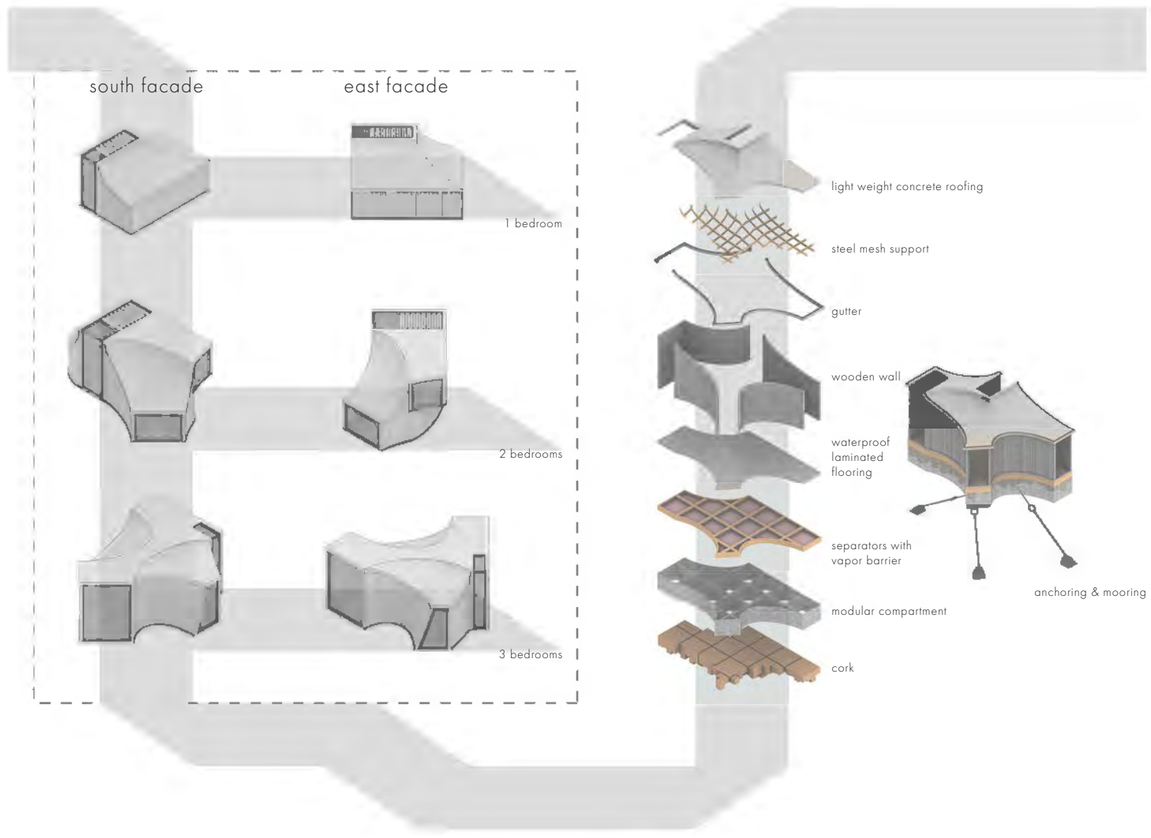
industry matrix



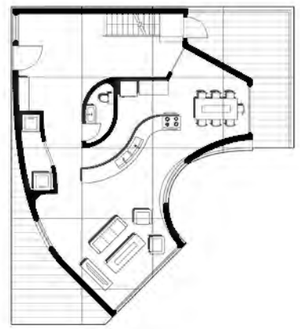
tri district industry analysis

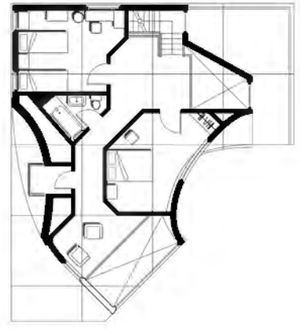


histrory inspired form development

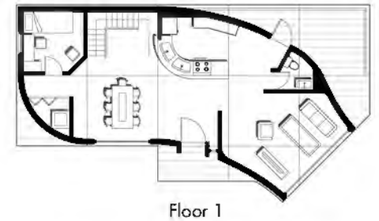


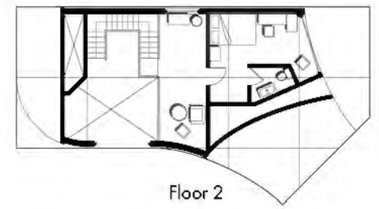
housing unit structure axon





3 BED ROOM

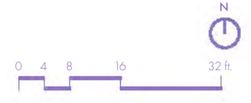


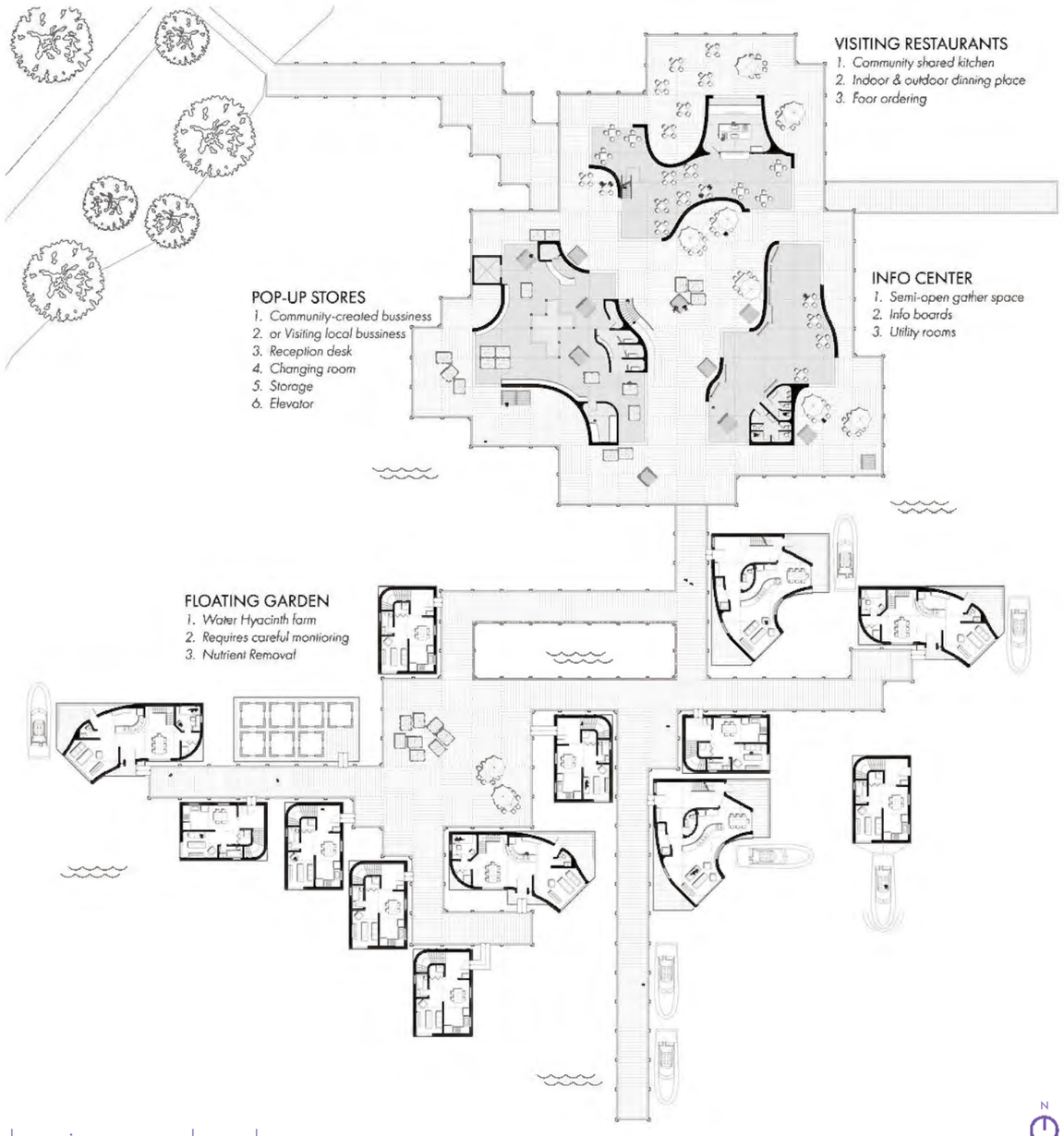


2 BED ROOM

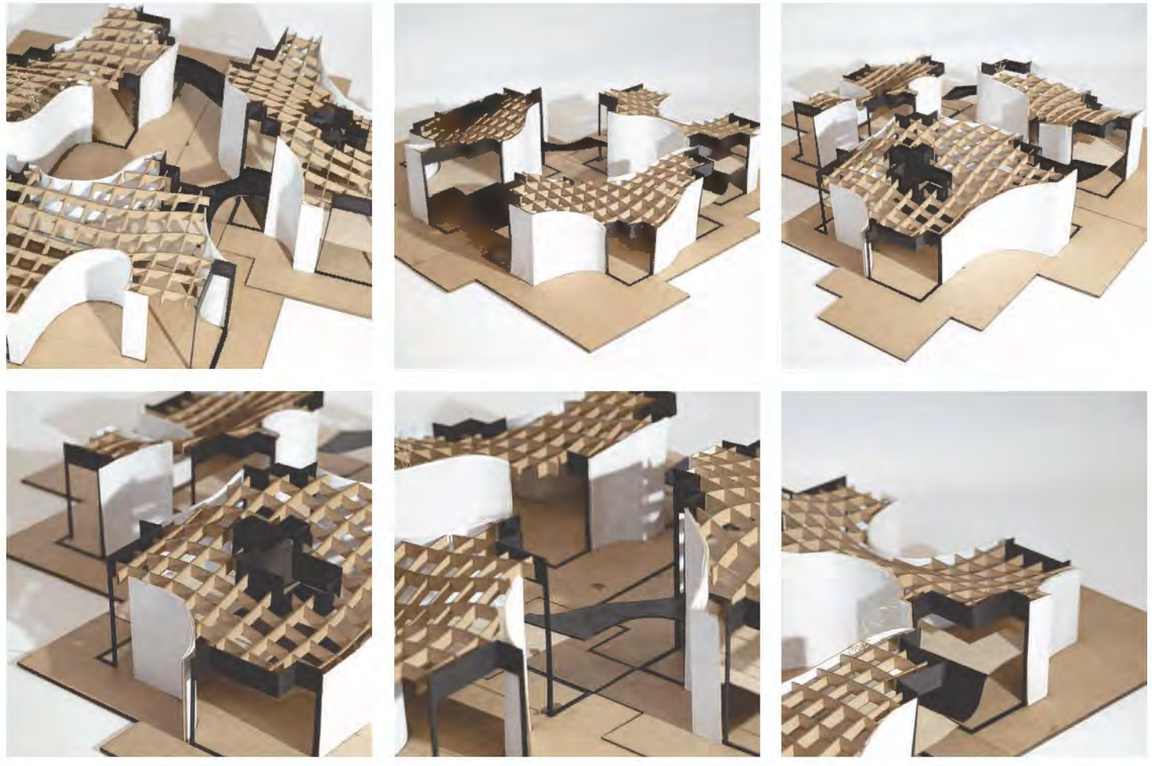
1 BED ROOM

housing unit floor plans





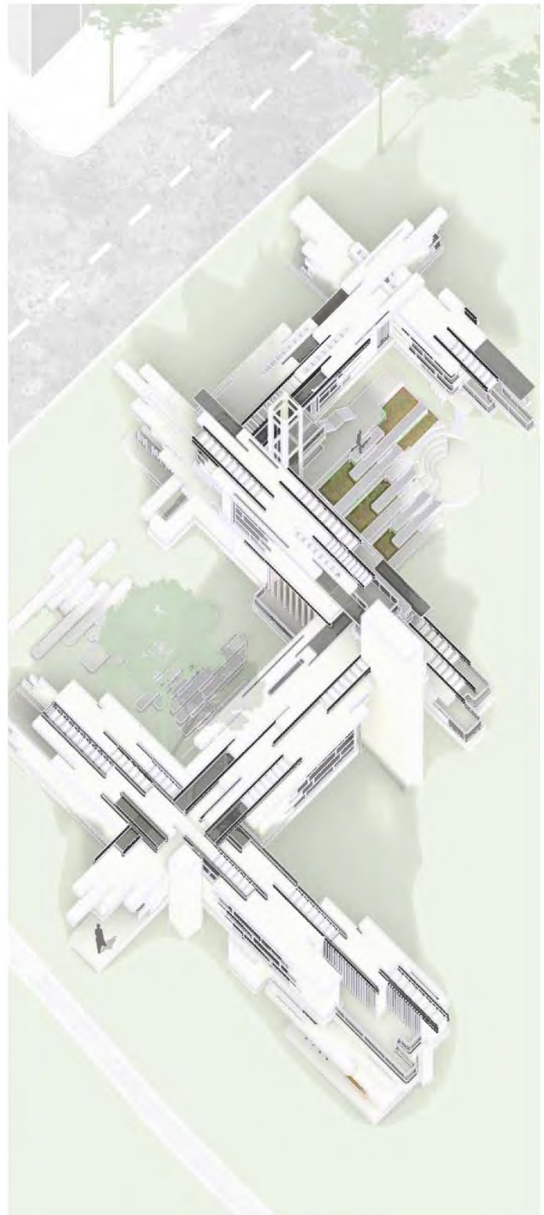
housing complex plan

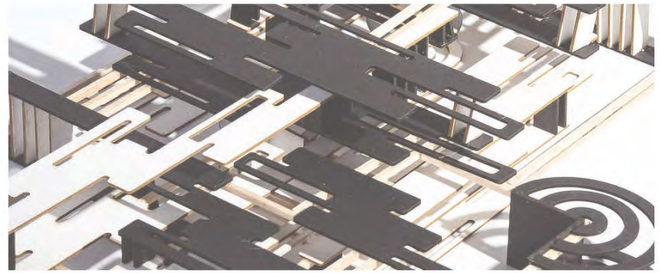


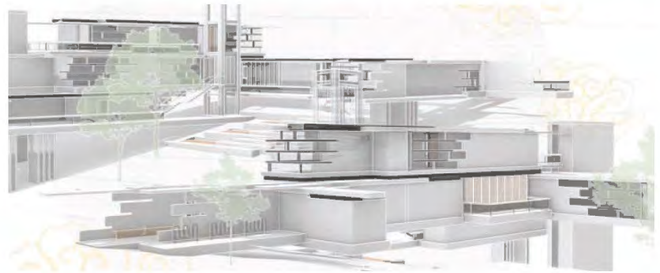
SLIPPAGE

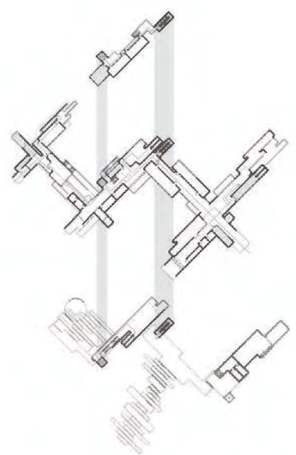
Year: Summer 2024 -
Team: In collaberation with Serena Sun
Type: Institution Building
Site: Frick Park, Pittsburgh, PA

Our project draws inspiration from Buddhist monk chefs, who embrace the use of imperfect produce and practice "fenceless" farming in harmony with nature. We developed an experiential model that integrates these principles with Frick Park's sledding hill, creating a foundation for a culinary institute tailored to their lifestyle. The design merges the monks' teachings with the landscape, reflecting their commitment to simplicity and sustainability. Through the blend of geometry and form, the institute fosters an environment for exploration and learning, connecting the monks' philosophy to the surrounding community and nature.

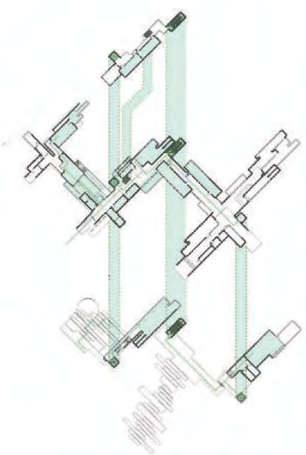




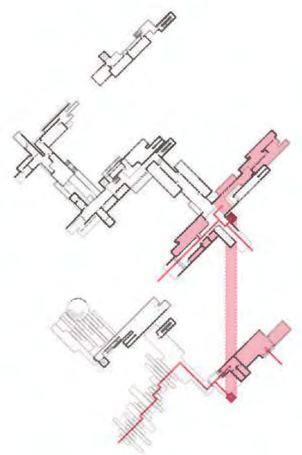




circulation_service



circulation_student



circulation_public

MIURA FOLD

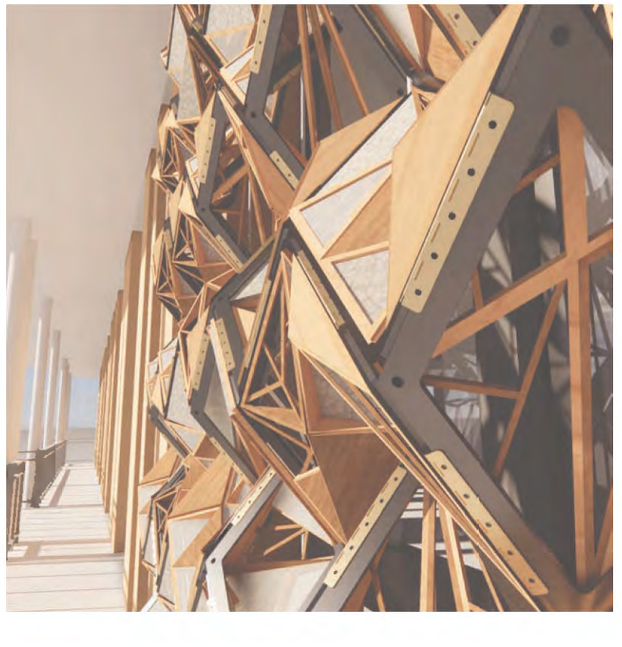
Year: Spring 2023
Team: In collaberation with Aayush Saxena
Type: Bird safe facade proposal
Site: Frick environmental center, Pittsburgh, PA

In our effort to design a bird-safe façade for the Frick Environmental Center, we focused on developing an innovative tectonic solution that balances functionality with aesthetic appeal. Our goal was to create a system that not only prevents bird collisions but is also lightweight, durable, and flexible enough to allow for easy removal, retraction, and replacement. We were concerned with ensuring that the design could be easily transported, facilitating maintenance and long-term sustainability. Drawing inspiration from the delicate art of origami, we meticulously studied various folding techniques, experimenting with patterns and materials that would enhance the design's structural efficiency while maintaining visual harmony with the natural surroundings. This approach allowed us to create a façade that is both practical and elegant, blending seamlessly into the environment while promoting bird safety.

foldable module

hinges & frame

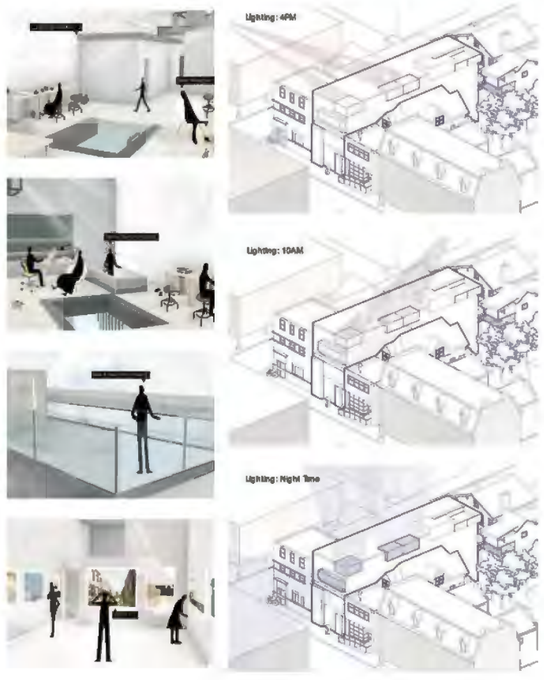
individual panels

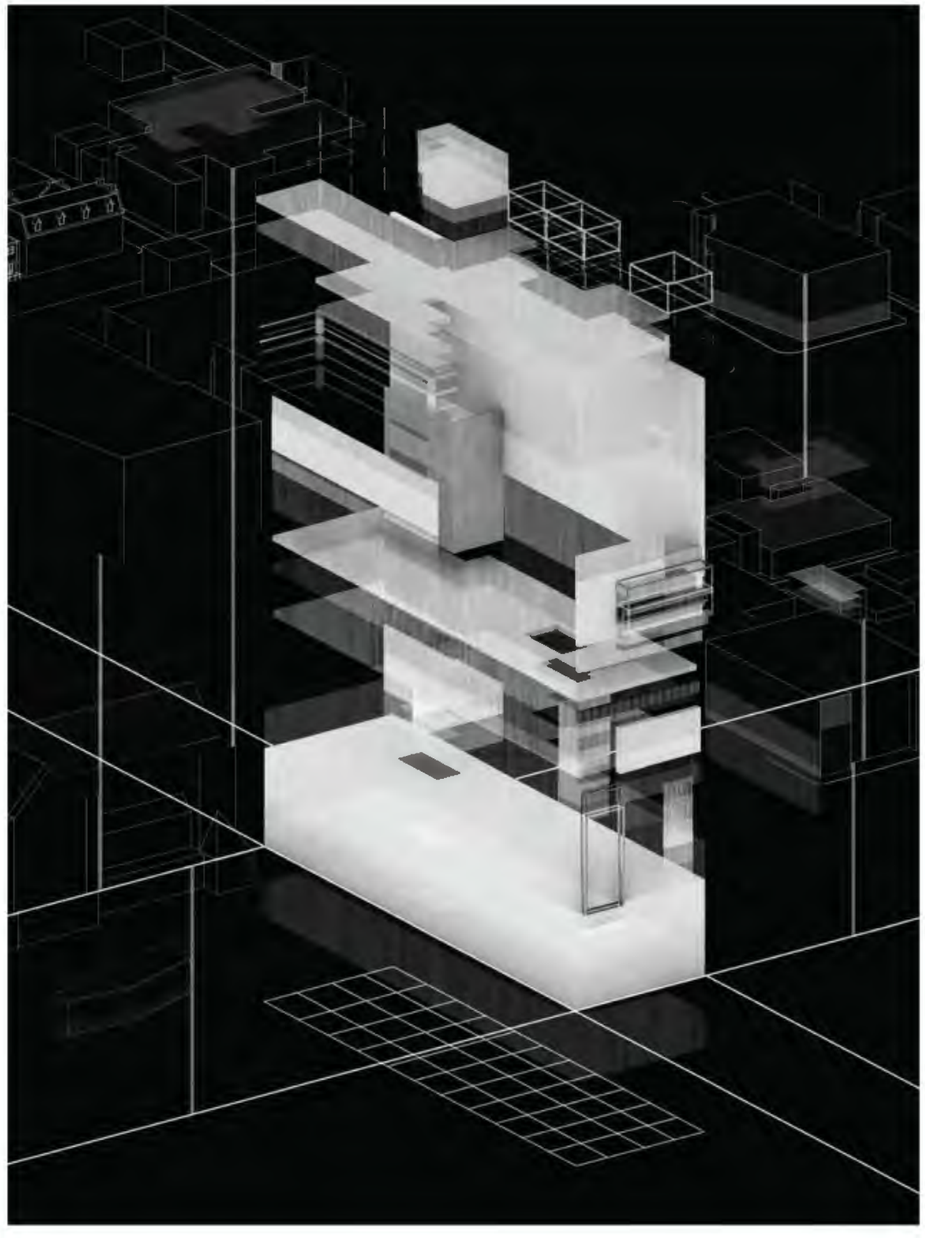


LIGHT BOX

Year: Spring 2022
Team: In collaberation with Pauline Zheng & Paul Lee
Type: Art Gallery & Studio
Site: S. Craig Street, Pittsburgh, PA

"LIGHTBOX," our design, intricately weaves together proportion, light, and the seamless flow between interior and exterior spaces. Initially considering rotating mechanical "strips" to manipulate sunlight, we opted for a more practical and intentional approach. By strategically placing impactful openings, we've achieved a delicate balance between functioning as an art gallery and an architecture studio, crafting a space that is both welcoming and focused. Drawing inspiration from architectural precedent, we meticulously organized critical openings and opaque surfaces using ratios and proportions, resulting in a harmonious arrangement that optimally balances natural light and spatial connections.

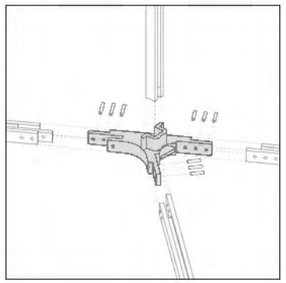


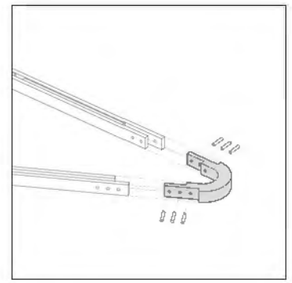


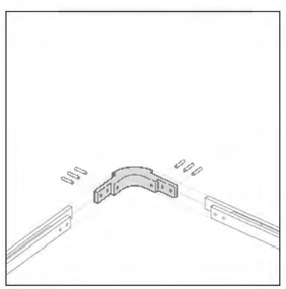
JOINST CHAIR

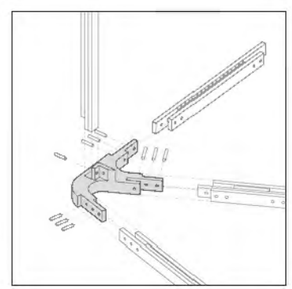
Year: Summer 2024 -
Team: In collaberation with Vicky Achnani
Type: Furniture design

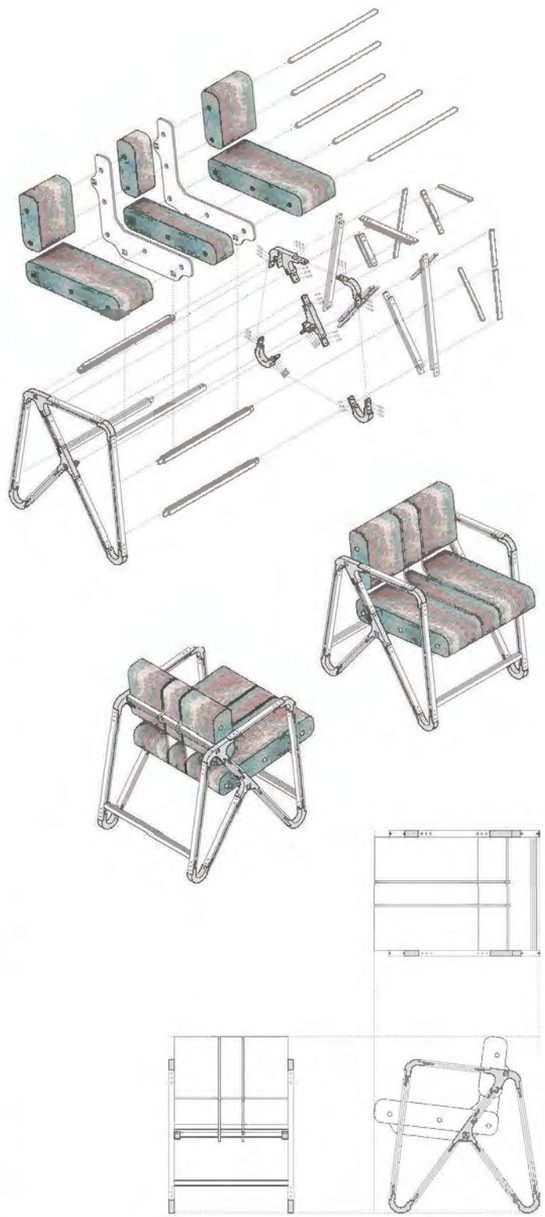
The Joint Chair integrates sustainable materials like recycled paper blocks, split bamboo, PLA + CF 3D-printed joints, and wooden dowels. Each component is carefully crafted to prioritize material efficiency, durability, and environmental responsibility. The design emphasizes rapid assembly, low-carbon processes, and a structured aesthetic achieved through the principle of parallel planes. Split bamboo sets the dimensions of the frame, while 3D-printed joints ensure stability and load transmission at critical points. This prototype highlights the potential of combining unconventional materials and advanced fabrication techniques, resulting in a sustainable, functional, and refined piece of furniture.

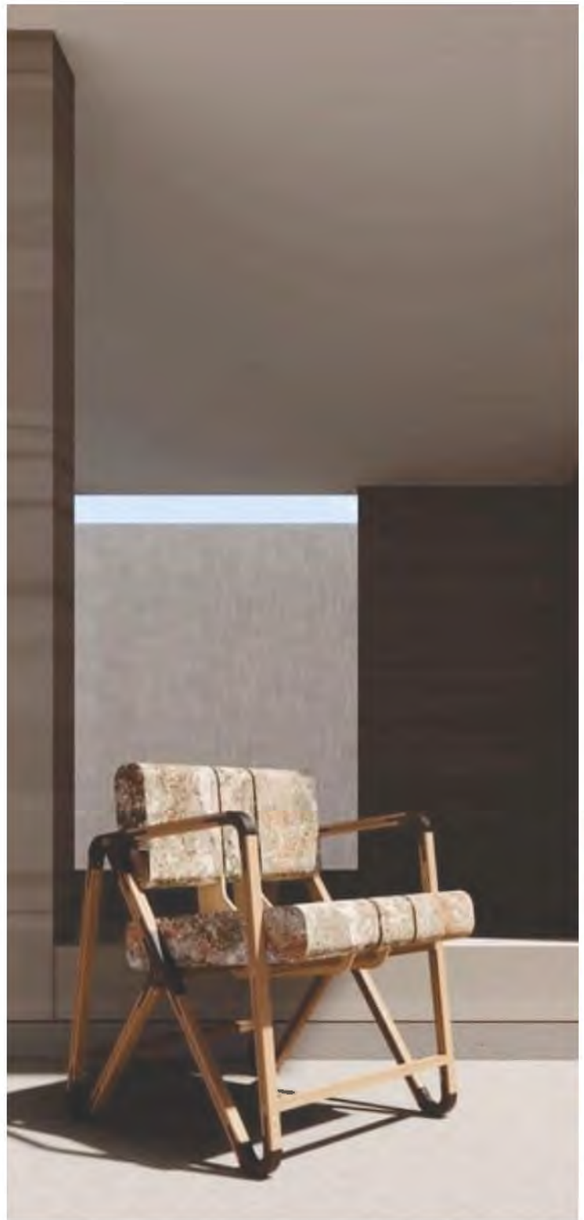












MISCELLENEOUS WORK

Year: 2021 -
Team: Individual
Type: Sketches, drawings & models

This section highlights my miscellaneous work, including model-making drawings created using charcoal pencils or pastels. These pieces reflect my hands-on approach to design, showcasing the exploration of form, texture, and detail through traditional drawing techniques. Each piece embodies a balance of precision and creativity, demonstrating my passion for experimenting with different mediums to express complex ideas.

THANK YOU.

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Phone: 301-332-7852

ANDREW WANG'S PORTFOLIO

2021 - 2025