KRISTA WEISS

Architecture Portfolio

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Undergraduate Portfolio

Auburn University

KRISTA WEISS

Auburn University
College of Architecture, Design and Construction
B. Arch. 2021

Email: Krista77w@gmail.com

Phone: 908-399-3732

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BIKE HUB

Blending the Stereotomic and the Tectonic

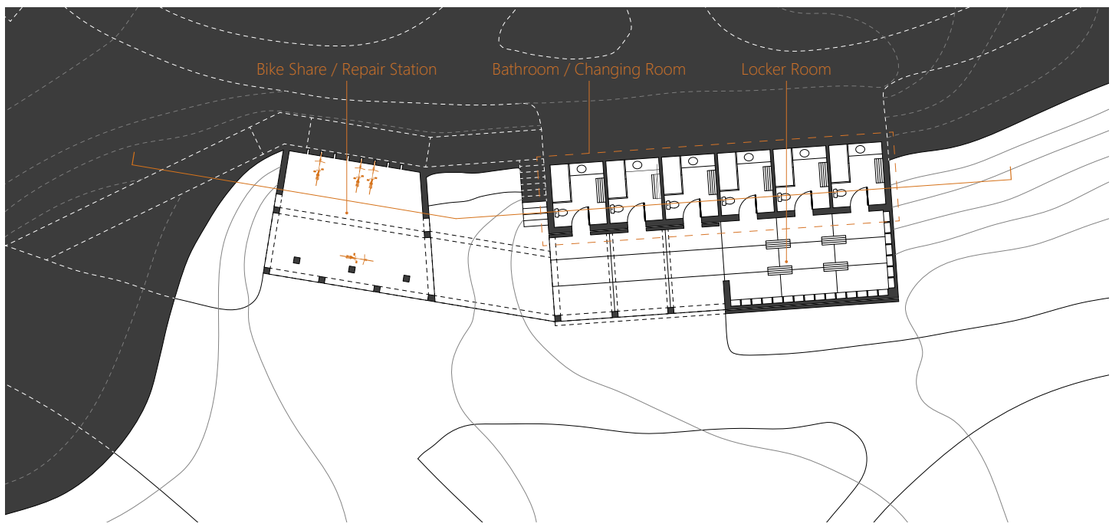
Second Year Studio — 2017-2018
Location: Auburn, AL

The overall design concept for this project was to have two contrasting structures that are mediated by a hybrid structure. A stereotomic structure of stone is partially embedded into the earth, with the ground plane extending over its roof. A light tectonic structure of wood rests upon it, and folds to embody the stereotomic mass. The separate, hybrid, structure is tectonic in its materiality and openness, but its back half of solid walls is enclosed by the ground and ramp.

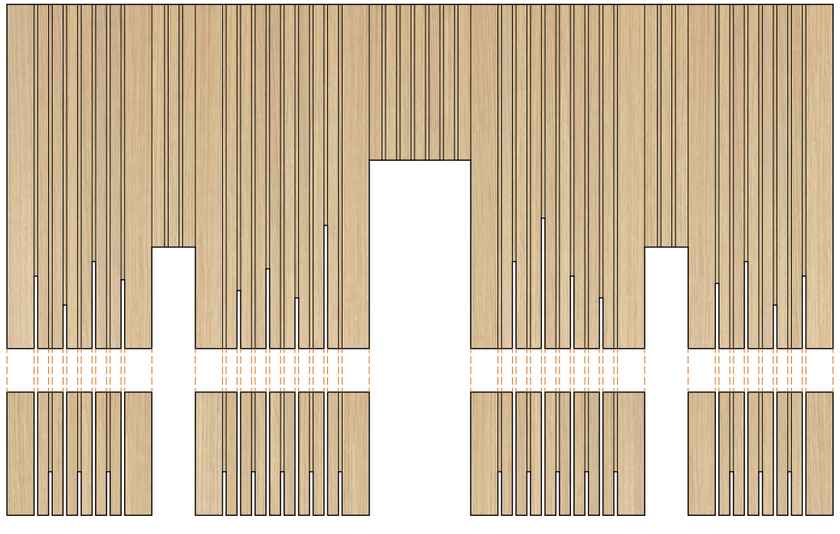
The stereotomic elements of the structure contain the private parts of the program, while the tectonic elements are open for public space. The most frequently occupied spaces exist in the public, tectonic parts of the structure. The purely tectonic structure serves as a space for bike parking. The hybrid structure, which is separated from the stacked structure, is a space in which people may rent a bike through a Bike Share system, or go to repair their bikes. The stereotomic part of the structure consists of six individual bathrooms, and a large locker room.

A major issue with building partially underground is its lack of natural light. Therefore, thin slots were made in the structure to act as bike parking, which then continue into the ground to become skylights. Some of these slots also fold up to create an opening in the roof of the structure.

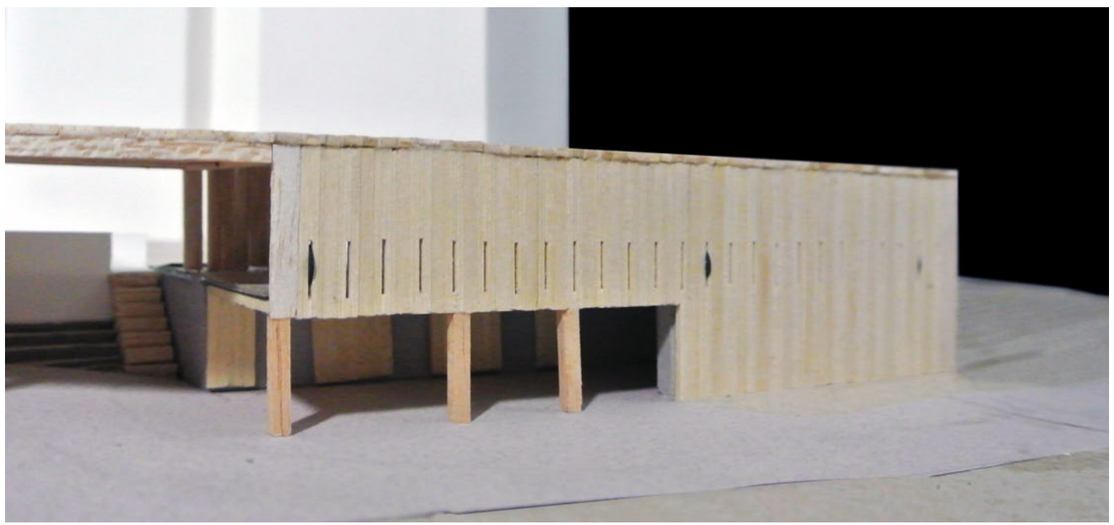
A rendering of the bike hub, showing the materiality of the stereotomic stone structure and the tectonic wood structure.

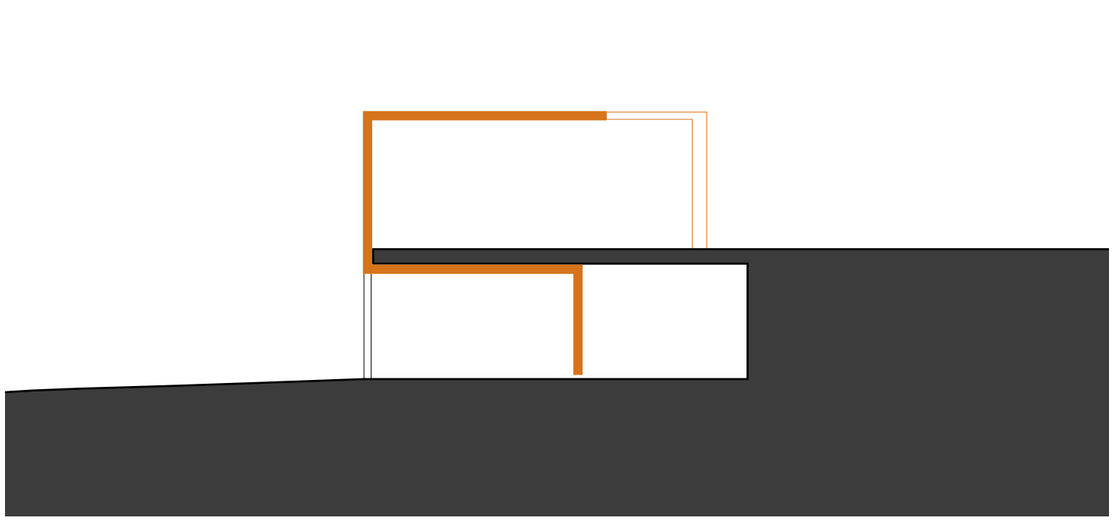


Top: Plan of the hybrid and stereotomic spaces, with labels of programmatic elements.
Bottom: Section that cuts through all three spaces, highlighting how the slots for the bikes extend to context the different parts of the structure.

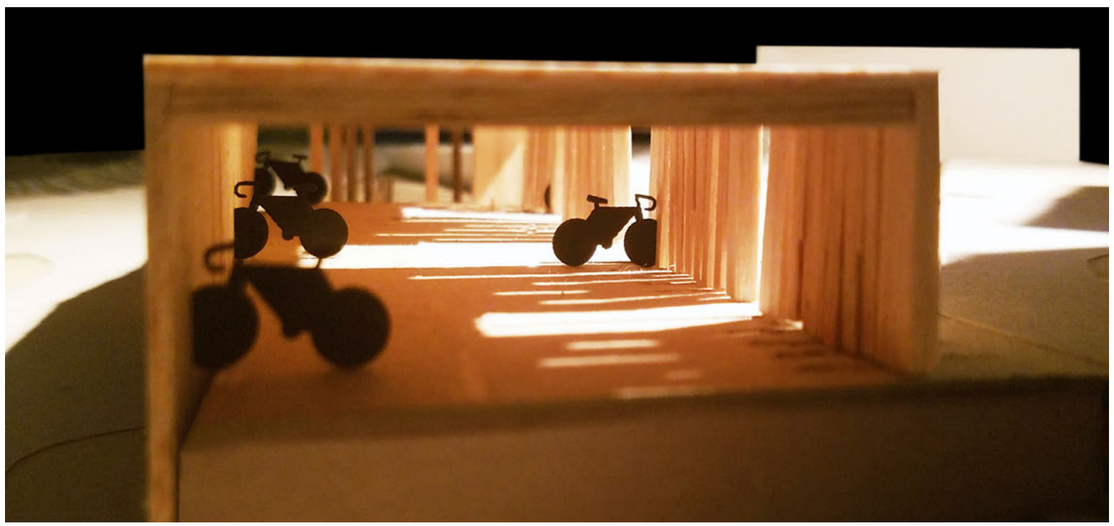


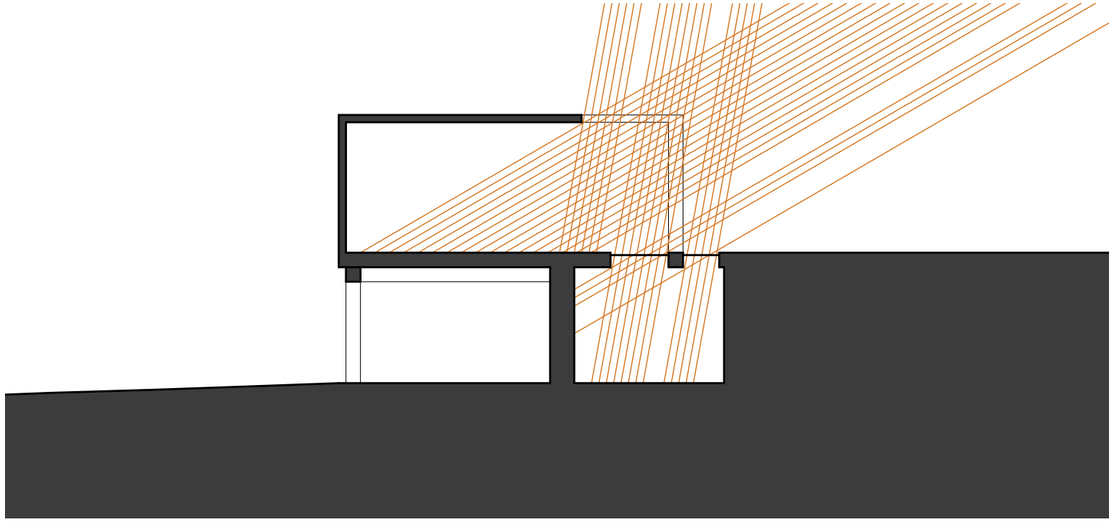
Top: Image of the bike slots, in which all fold down to create skylights in the ground, and some fold up to create light slots in the roof.
Bottom: A diagram showing how the light slots connect, and how the model itself was made by connecting individual pieces of wood.



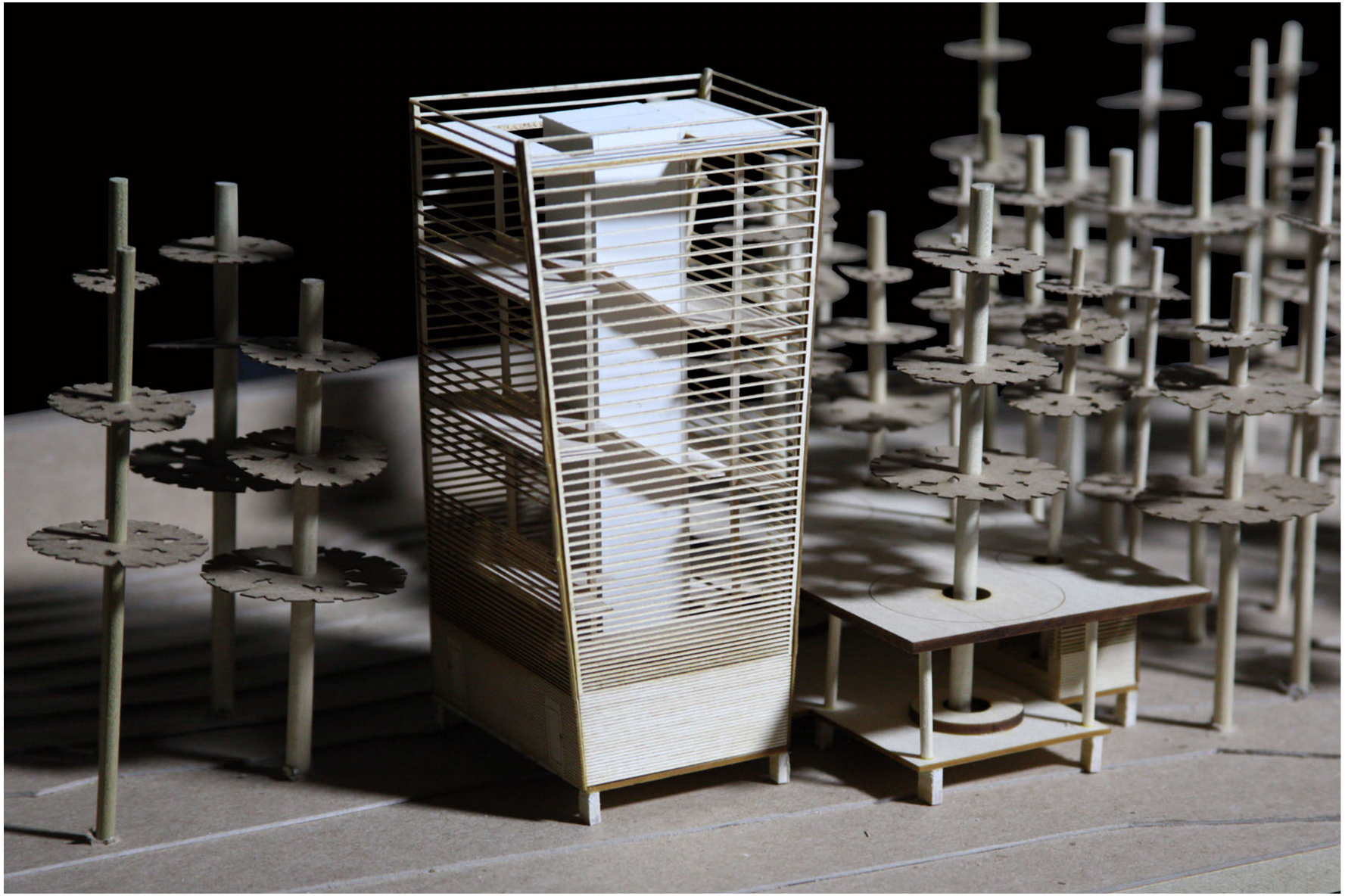


Top: Image of the connection between tectonic and stereotomic, in which the tectonic framework folds over and covers portions of the stereotomic mass to create a facade.
Bottom: A parti diagram, which depicts the folding of tectonic elements and the carving out of earth to create a stereotomic element.





Top: An image demonstrating the strong light effects that are created by the light slots in the roof.
Bottom: A diagram showing how light can enter the outdoor space through the roof's light slots, and the underground space through the skylights. Rays of light are shown for winter and summer sun angles at noon.



WOOD COMPETITION

Accommodating Multi-level Interaction

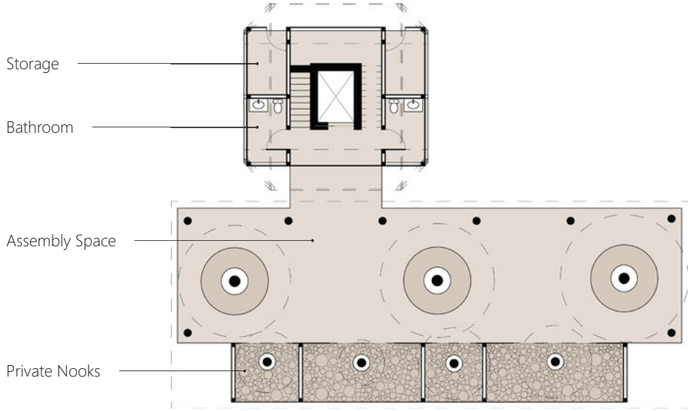
Second Year Studio — 2017-2018
Location: Auburn, AL

This project focused on designing a pavilion that naturally integrates into its surroundings and fosters human interaction with nature. The pavilion was designed to serve Auburn's School of Forestry, providing a space for students to interact and study the longleaf pines on the site. The pavilion provides multiple experience levels, where students can observe and conduct studies on the seven pine trees that shoot up through the structure. The main assembly space forms around the three largest trees, where students can study their trunks. Four private seating nooks forms around the smaller trees, serving as individual spaces for study. The pavilion's CLT roof is occupiable, allowing students to study the trees' transition from trunk to branches.

With the desire to study all parts of the tree came the inspiration for a tower with multiple tree-viewing levels. A hydraulic elevator within the tower enables visitors to reach both the roof level and the top of the tower. The staircase that encircles the elevator has a lookout point at each landing, allowing visitors to stop, rest, and view the trees from different levels as they ascend. As the height of the tower increases, the wood slat facade begins to dissolve, and light fills the interior. At the top of the tower, the elevator opening and railings have been designed to provide 360° views above chest level, providing a clear view to the canopy of trees and the city of Auburn.

The student took interest in learning how to design within a natural context. Special consideration was made to ensure that the structure would not cause harm to the root system, and that the trees received sufficient rainfall. Overall, this pavilion fosters an intimate connection to the trees, where students may observe from afar or learn by touch and interaction.

A model of the pavilion, created with balsa to reflect the design's use of CLT and standardized lumber.

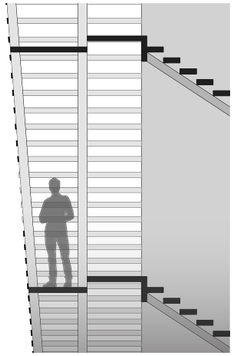


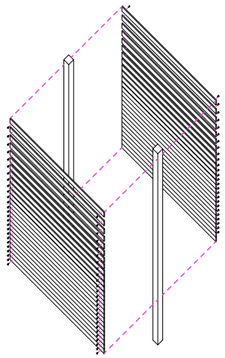
Top (Left): View of the overlook spaces at each landing, which allow for different levels of view.
Top (Right): View of the occupiable roof, where students may study the trees' transition from trunk to branches.
Bottom: Section showing the connection between the nooks, assembly space, occupiable roof, and tower.

Top: A rendered plan of the pavilion's ground floor, labeling programmatic elements within the main pavilion and the tower.
Bottom: Section cutting through only the tower portion of the pavilion. The change in wall angle from this direction highlights the complexity of the tower's form.

Dissolving Wood Slats

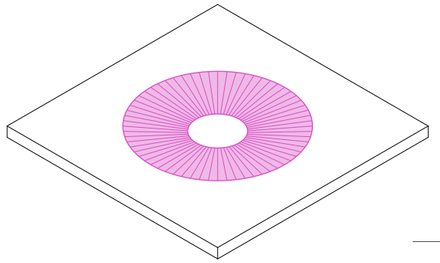
While the pavilion's structure is made with manufactured lumber, the wood "skin" is simply composed of 1x4 lumber. The gaps between these strips of wood get larger as the height of the pavilion increases, causing the tower to appear that it is dissolving into the sky. The openings between these slats allow light to enter the structure and provide visibility outside. Slight variations to this include these wood slats attached to one side of the structure, as in the tower, while the walls between the nooks have the slats on both faces to create stronger walls to lean on.





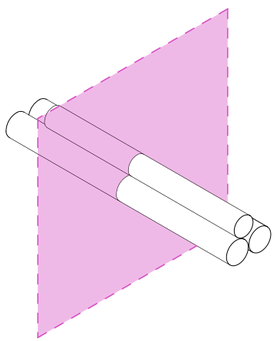
Water Collection Roof Funnels

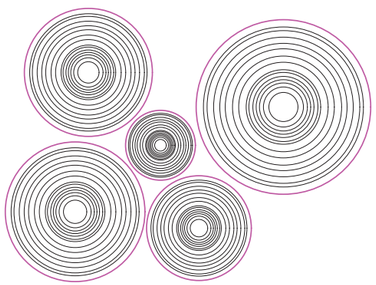
To ensure the protection of the trees that are contained within the pavilion, shallow funnels are carved out of the roof structure to collect and direct water through the pavilion and down to the roots. The roots of trees span the same radius as its branches, and trees require that same circular area to be open for rain flow. Therefore, the carved funnels match the size of each tree's branch and root span to ensure that it captures the right amount of water for the trees' survival.

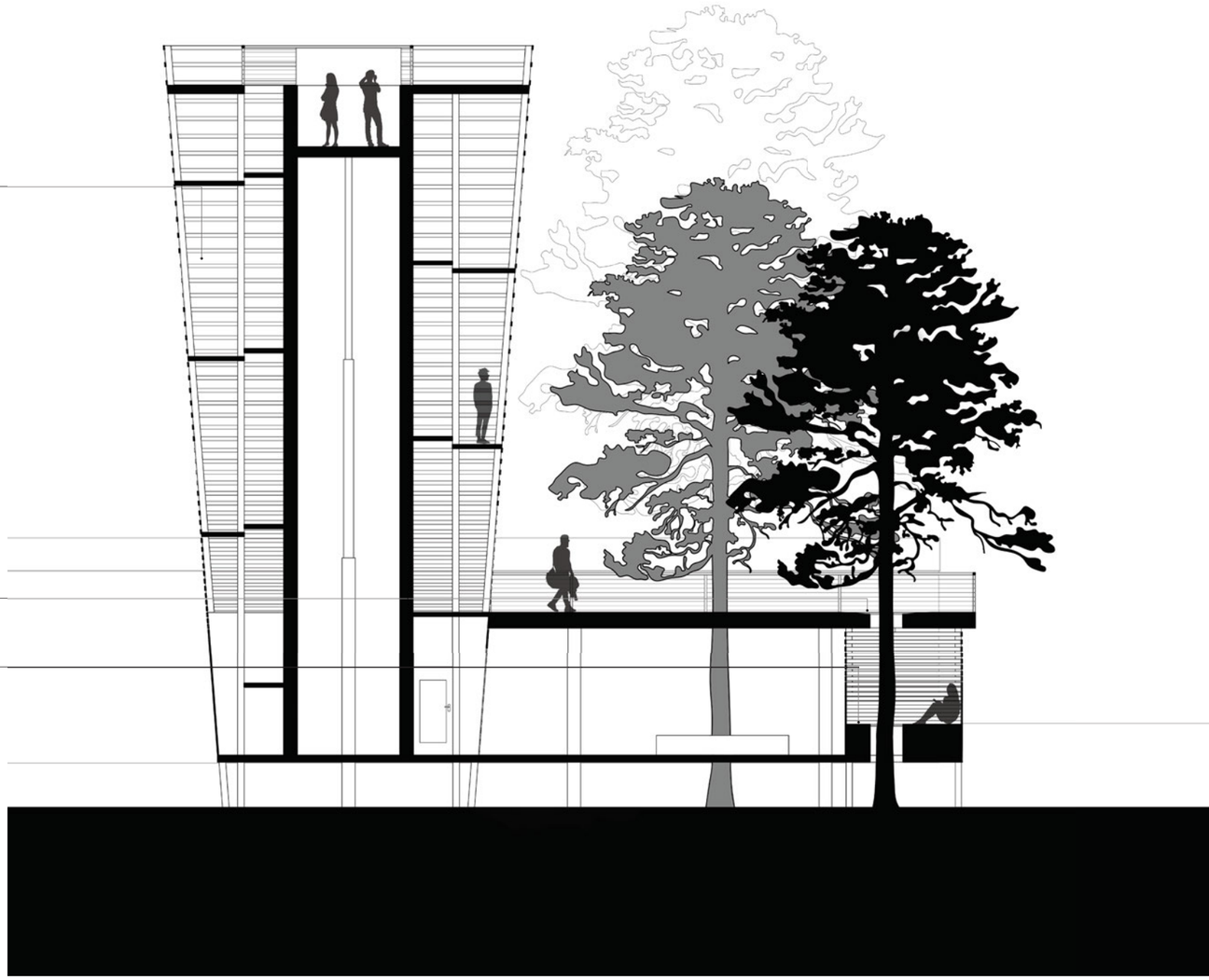


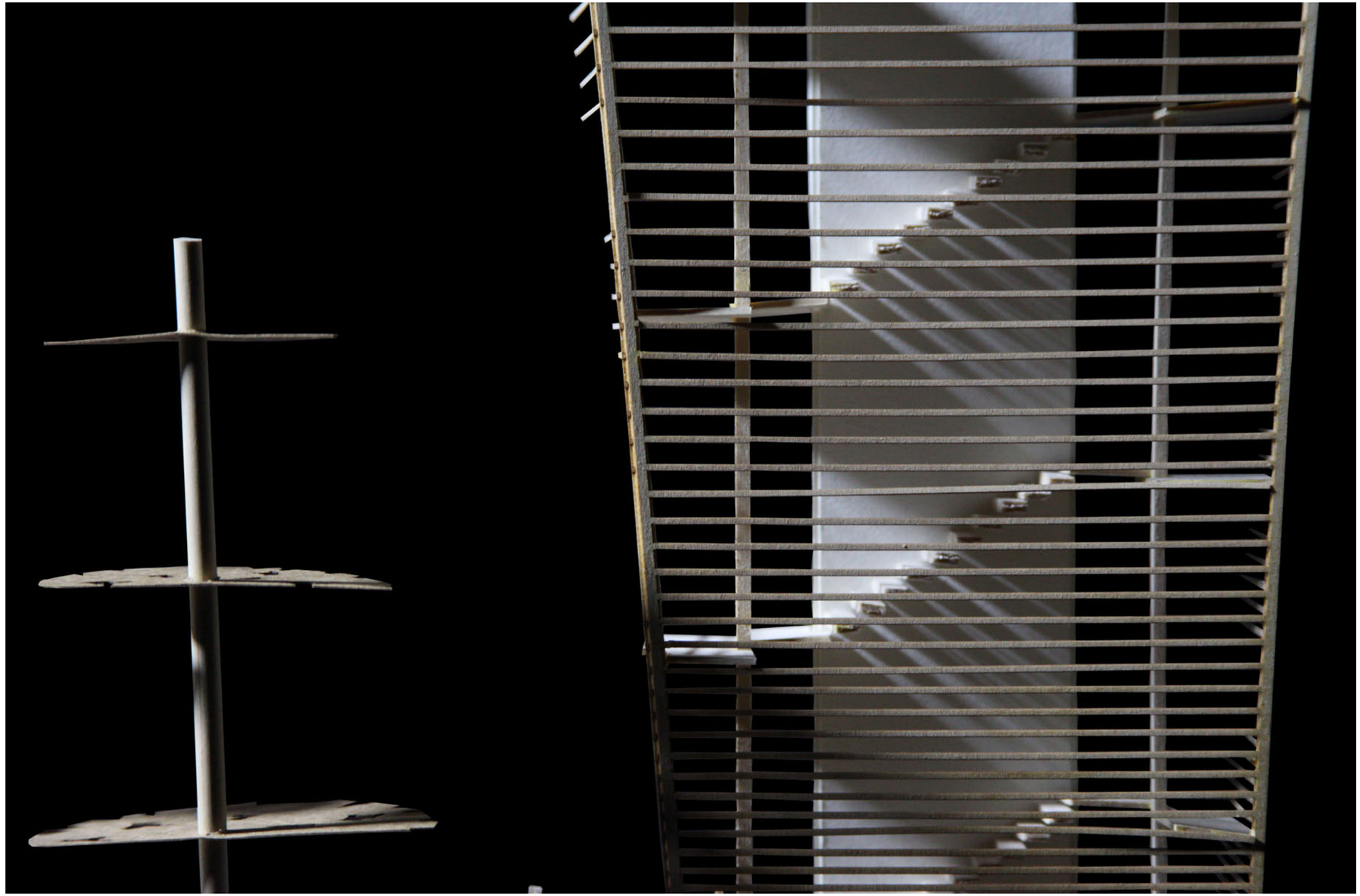
Tree Ring Nook Seating

At an even deeper level of study, tree rings were incorporated into the seating of the nook spaces so that students may begin to study and understand these rings while they are within this space. The top layer of the benches that make up the nook seating is composed of small pieces of tree ring sections pushed beside each other and filled in with a poured resin.









A close-up view of the detailed section model. Special consideration was placed on lighting for this design: the design of the staircase, creating streaks of light across the elevator shaft, as well as the wood slats that allow sufficient light to enter the space, dissolving to allow more light in as one ascends.

ACSA HOUSING COMPETITION

Developing New Ideas on Row Housing

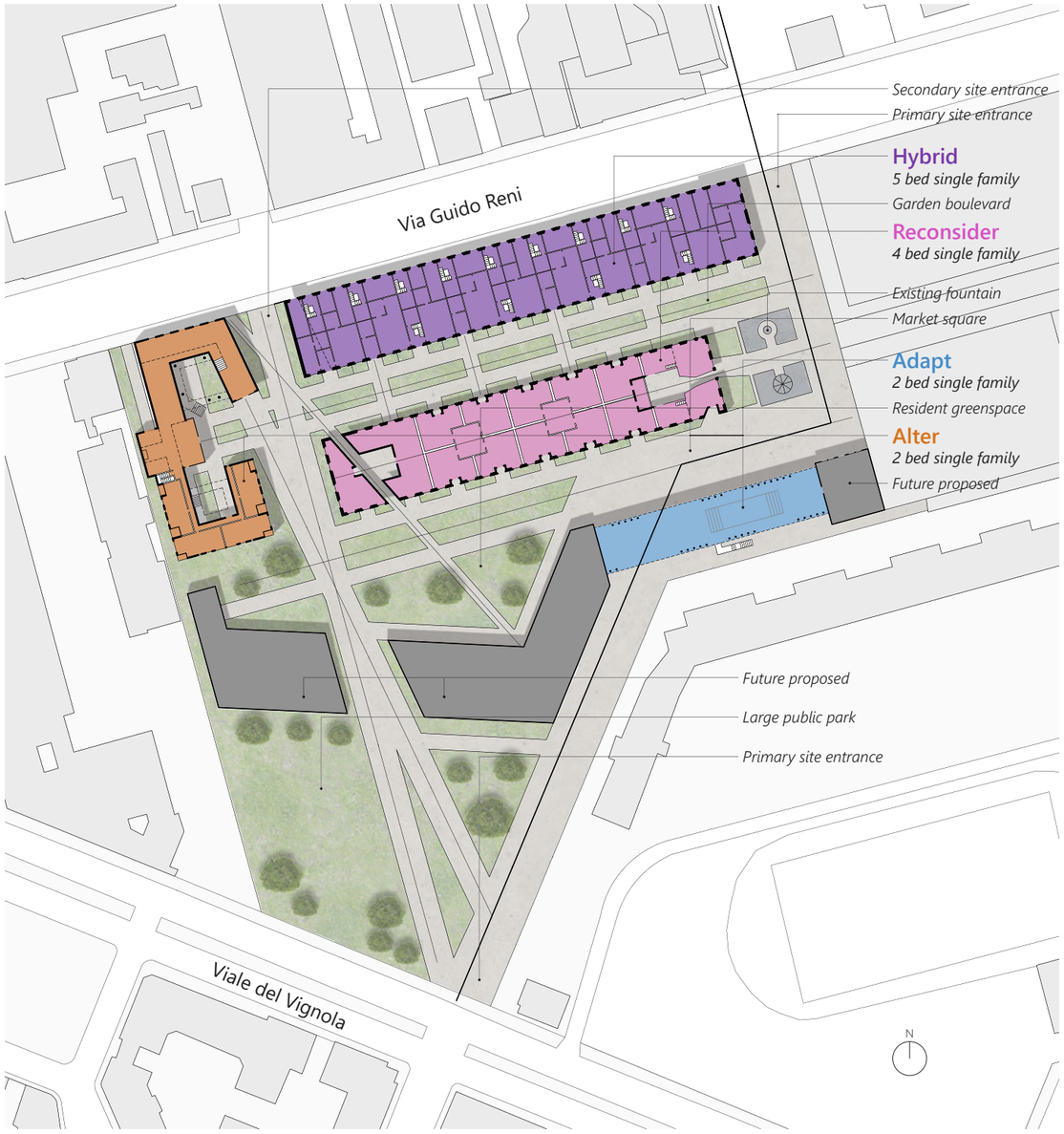
Third Year Studio — 2018-2019
Location: Rome, Italy

While studying abroad in Rome, the studio competed in the 2019 ACSA Housing Competition: HERE+NOW. Tasked with designing a new form of housing for the 21st century, this group recognized the importance of studying old housing typologies to adapt them to our modern needs. Through this process, the group of four focused on two major housing typologies: the typical row house, and the standard Roman apartment block.

The design process began with urban analysis of the site's Flaminio District. By understanding the axes, landmarks, transportation, programs, and historical development of the neighborhood, the group could develop the site to interact with its surrounding context. Adaptive reuse was a major factor in determining the site plan, as the group decided to keep the only two salvageable structures on the site. The group organized new buildings to incorporate sufficient outdoor space for residents, in the form of parks, green spaces and boulevards with community gardens.

The group then split to focus on the individual building designs, later entitled: Reconsider, Hybrid, Adapt and Alter. Hybrid, as its name suggests, acts as a hybrid between a row house and a Roman apartment block. While the exterior form and arrangement of units resemble a Roman apartment, the units themselves are double-level and stacked side-by-side to resemble row houses. Existing in one of the site's salvageable buildings, Hybrid explores stacking an addition level of units on the existing structure, thereby creating a stacked row house. To provide residents with both public and private outdoor spaces, courtyards are carved out of the structure, providing a private "backyard" space for each ground unit. Overall, Hybrid's design focuses on adaptive reuse, the evolution of the row house, and the arrangement of public and private space.

A rendered view of Hybrid, which shows the separation between the salvaged structure and the modern addition.



Reconsider

A restructured row house layout
4 bedroom, 4 bath

This typology closely resembles typical row housing layouts. From the existing structure, various spaces were carved out for private courtyards, entrances, and pathways. The layout of the floor plan is similar to a loft with double height space.

- Public
- Semi-Public
- Private

Hybrid

A stacked row house prototype
5 bedroom, 2 bath

This new interpretation acts as a hybrid between a row house and a typical Roman apartment. However, an additional unit is stacked on the preserved structure. The lower units feature double height living spaces and private courtyards.

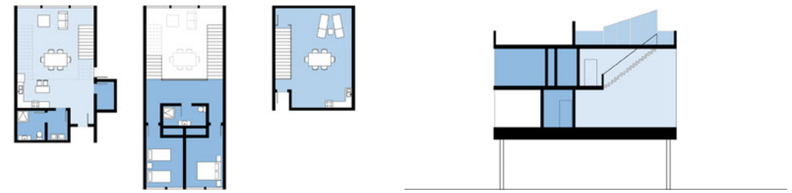
- Public
- Semi-Public
- Private

Adapt

A vertical interpretation of row housing
2 bedroom, 2 bath

This vertical extrusion layers public and private space. The double height first floor of the unit is purely for social interaction, while private sleeping spaces are on the second floor. A roof terrace atop of the block rethinks the common balcony.

- Public
- Semi-Public
- Private

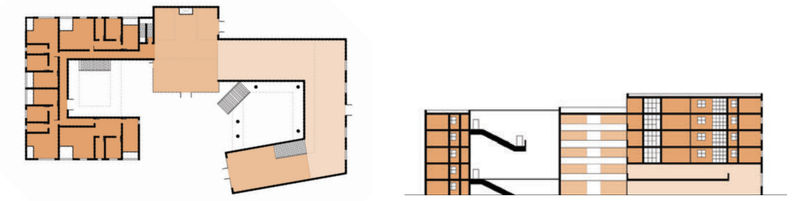


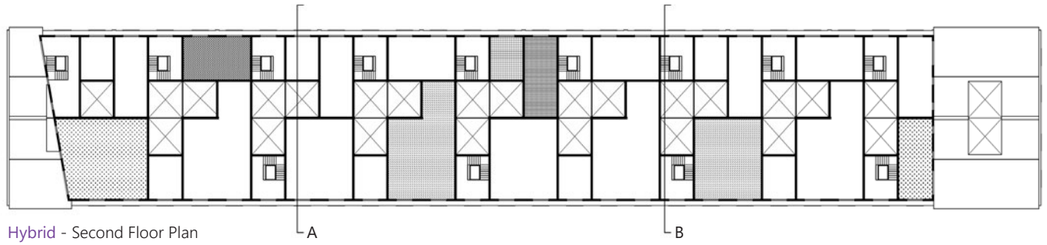
Alter

A new approach to apartment blocks
2 bedroom, 1 bath

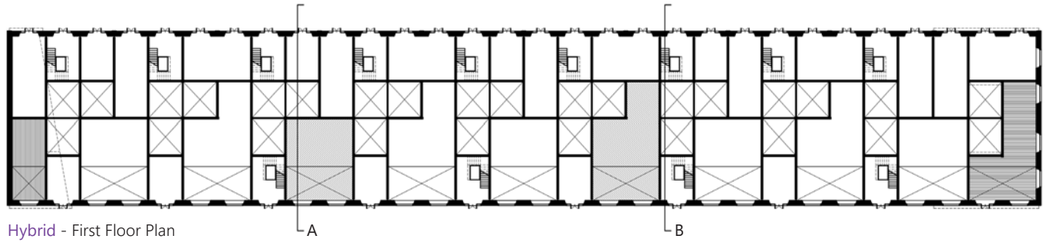
This altered apartment block mimics the double height commercial space present in most Roman apartment blocks. It includes two semi-public lobbies for visitors. The private residences are located on the upper levels of the block.

- Public
- Semi-Public
- Private

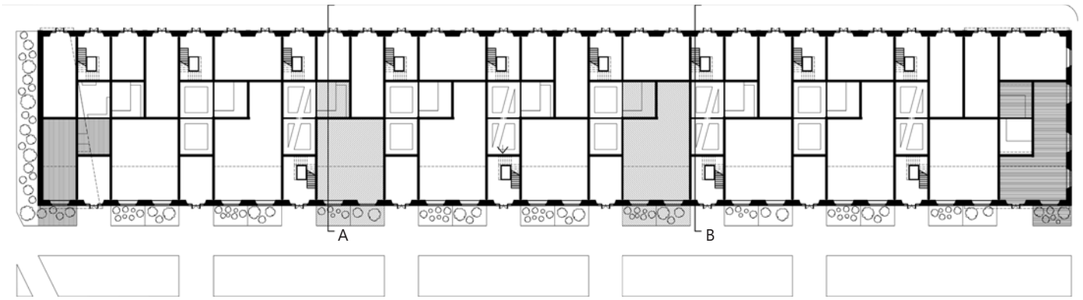




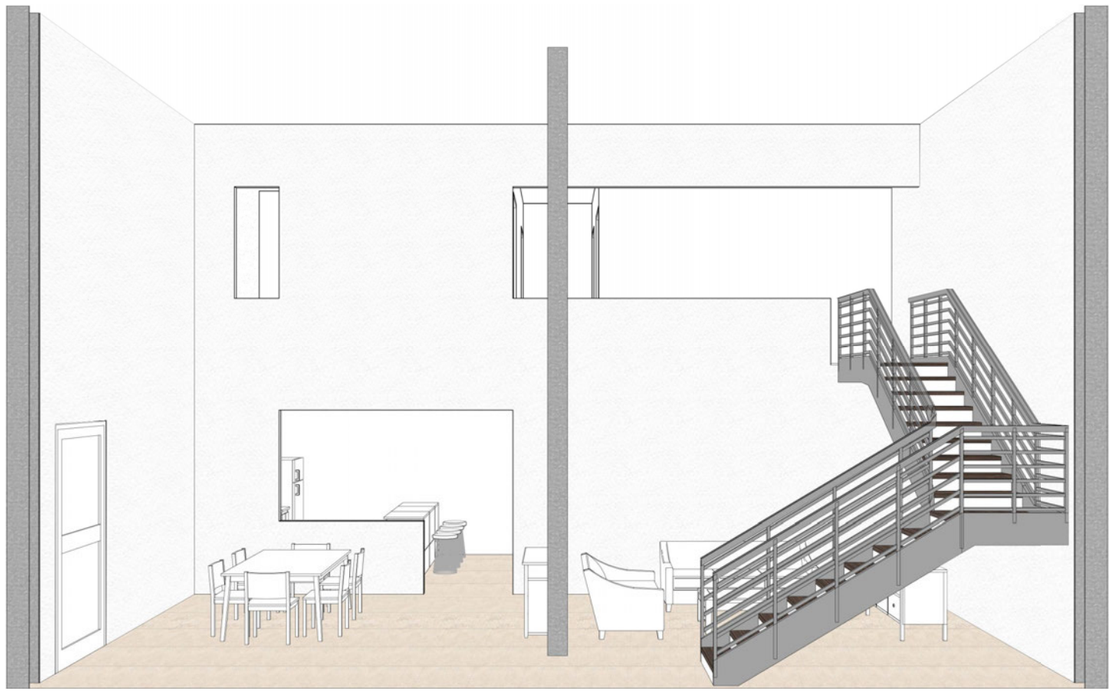
Hybrid - Second Floor Plan



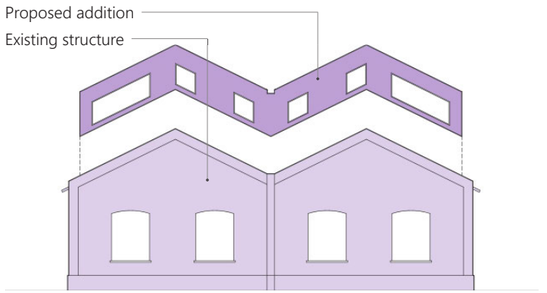
Hybrid - First Floor Plan



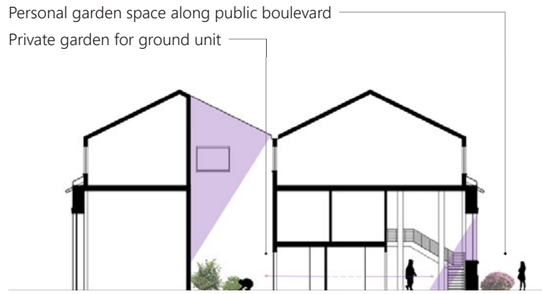
Hybrid - Ground Floor Plan



An interior perspective of Hybrid. Taking inspiration from Richard Meier's *Douglas House*, the units have a double-height living space, which divides the public living space, the semi-public ground floor toward the back and private first floor.



Preservation and adaptive reuse are major considerations of the design. Focusing on how to build on top of an existing structure, this proposed addition steps back from the existing walls to sit on new structural columns. Parts of the existing roof are preserved so that the addition appears to fold and sit on top of the original building.



The idea that housing in an urban environment should have a direct connection to nature became an important design ideal for this project. Therefore, this design provides two types of garden spaces for each unit: private gardens for individual use, and public gardens that encourage inhabitants to interact with their neighbors.

K-5 STEAM SCHOOL

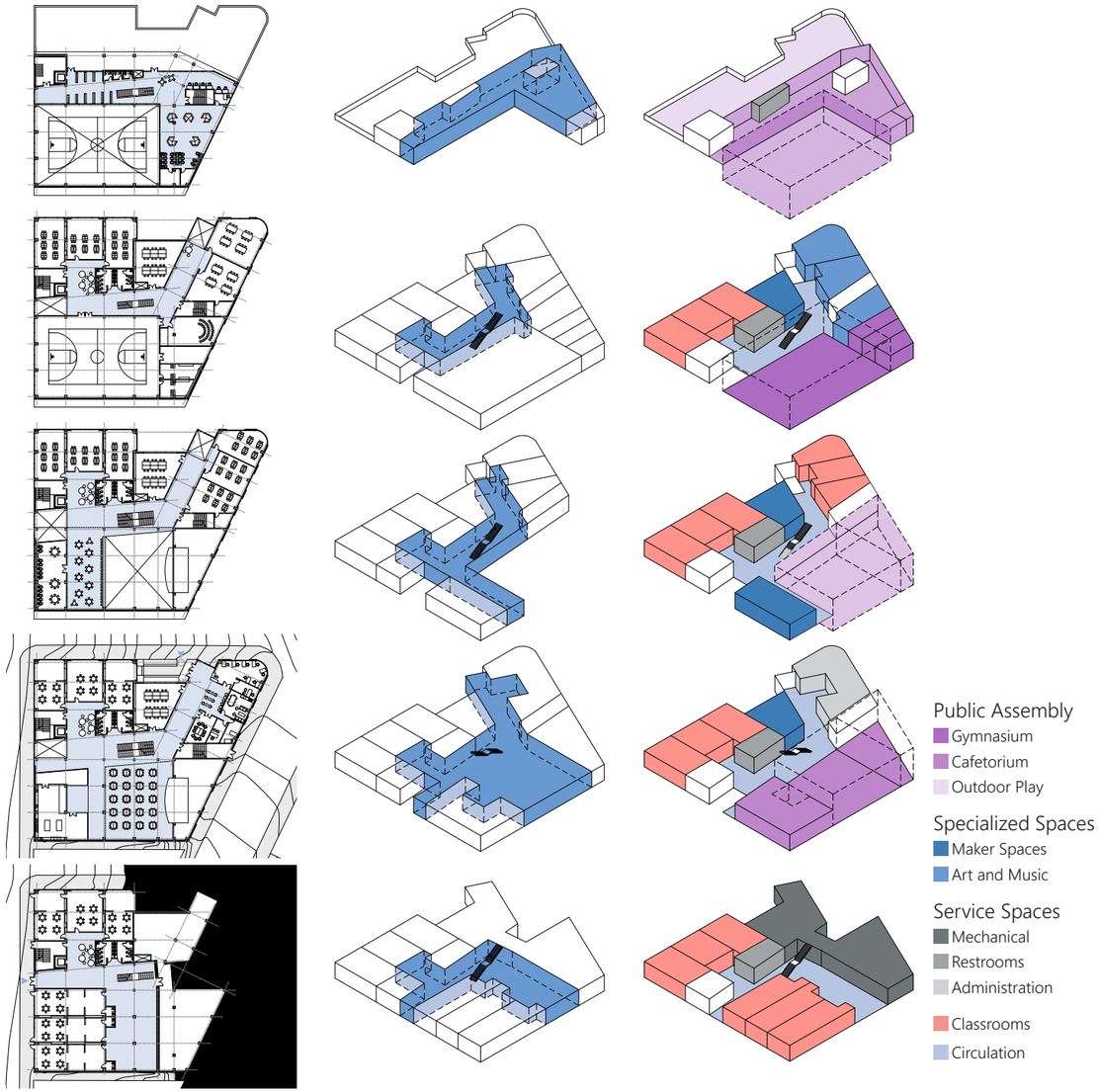
Connecting Views and Learning Experiences

Fourth Year Studio — 2019-2020
Location: Chattanooga, TN

This project focuses on creating a K-5 STEAM School in downtown Chattanooga, Tennessee. As these types of schools focus heavily on student interaction and learning-by-doing, the design puts the student maker spaces at the heart of the scheme. Through the connection of different types of learning spaces, this school creates interactive spaces for student engagement. Assembly spaces are separated from classrooms to provide a clear threshold between learning environments. However, visual connections are created between these spaces so that students may learn through observing different activities.

The design centers on an angular circulation zone that hinges around a central maker space, helping connect views and unite assembly spaces, classrooms, and labs. Visual connections between different programs are established through the use of atria, mezzanines, and glass walls to remove solid visual boundaries between rooms. The central circulation space serves as the main means of visual connection, as it physically separates the classrooms and maker spaces from the assembly spaces, but exposes these programs to each other at key moments. The maker space acts as the design's node, exposed to the interior and exterior to allow for the students' work to be on display to the city and their classmates. Similarly, classrooms are open to each other through occupiable window seats between classrooms, which allow students to observe the learning of their classmates. These window units lead to a view of the maker spaces, creating a connection between typical classroom education and hands-on education. In general, the end goal was to create a school that highlights the importance of interactive learning environments and visual connections between different educational activities.

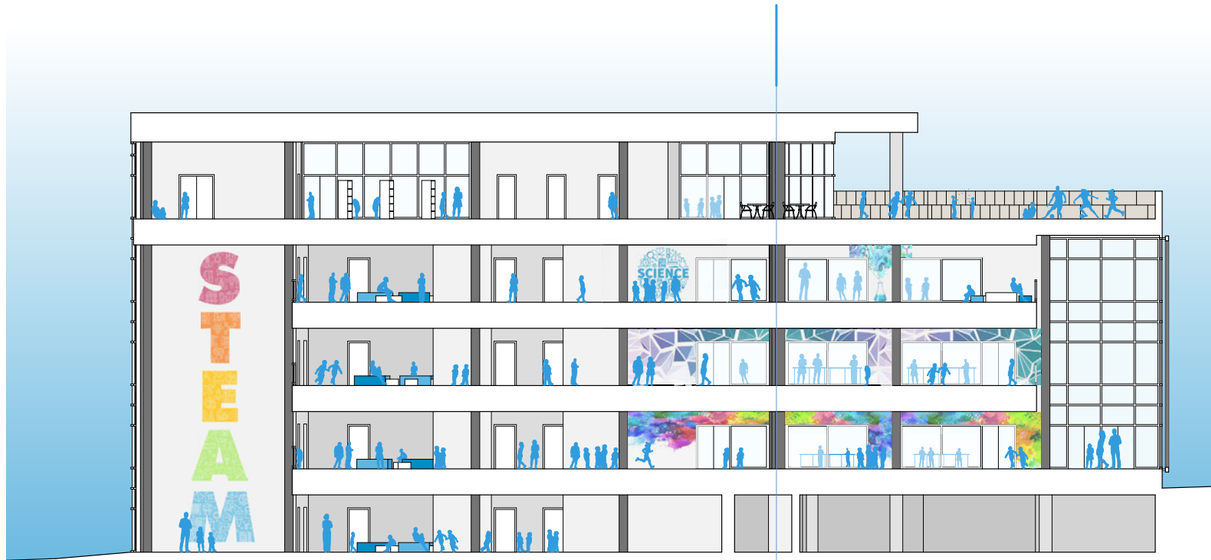
An exterior rendering at the corner of E 8th St. and Cherry St., showing the sense of verticality created by the apertures and atria.



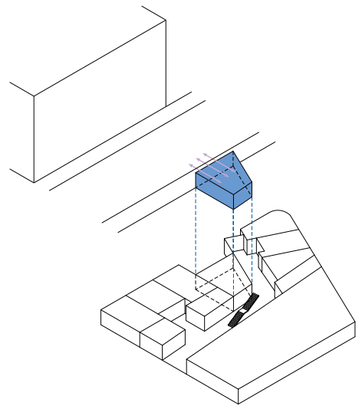
Floor Plans
Stacked plans descending from the fifth floor to the ground floor.

Extending Circulation
Gathering spaces form through the extension of circulation space.

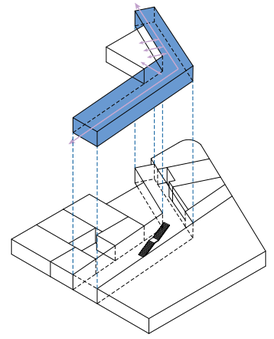
Program Diagram
The program is arranged to have north-facing classrooms, public assembly spaces to the south, and centralized maker spaces.



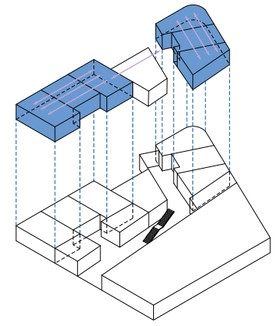
A folded section through the angular circulation space, highlighting the celebrated maker spaces at the center of the fold, and the gathering spaces created around the atria.



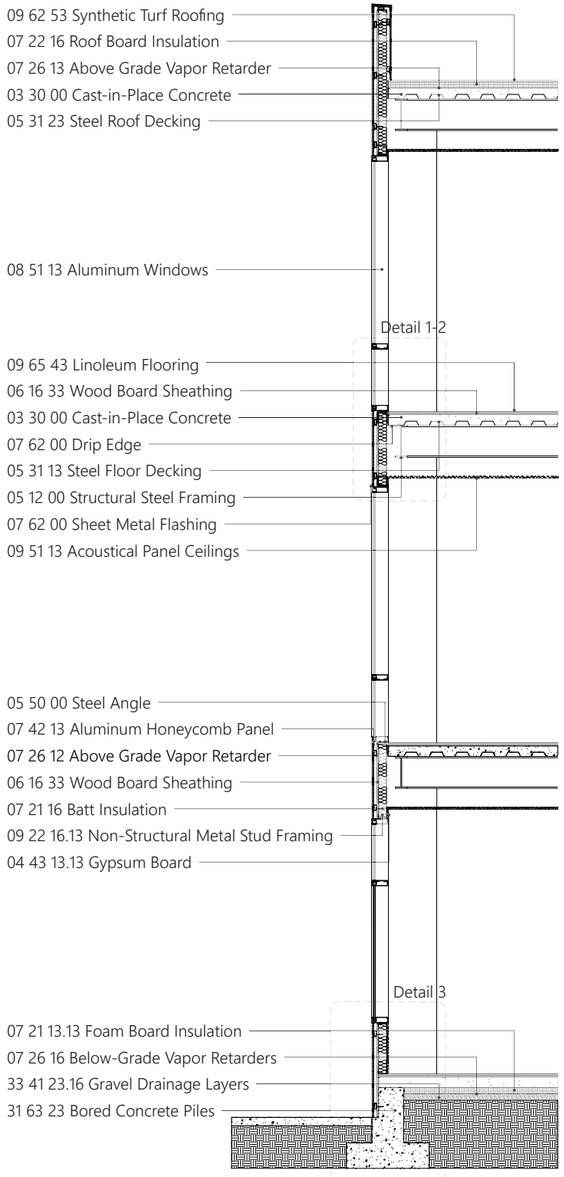
Maker Space Connection
The maker spaces on each floor are centrally located and exposed for views out to the city.

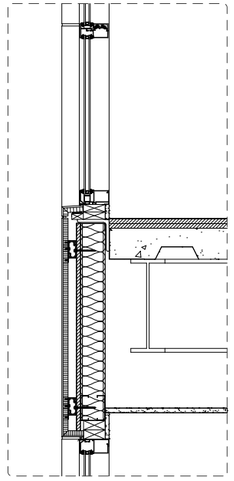


Hallway Connection
Circulation space hinges around the maker space, allowing students to view the learning process.

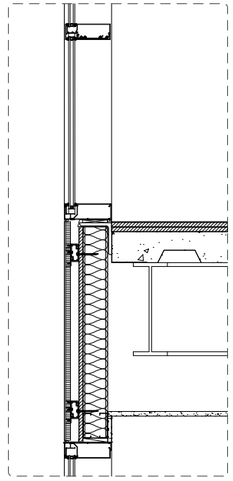


Classroom Connection
Classrooms are situated around the maker space, allowing for views between learning spaces.



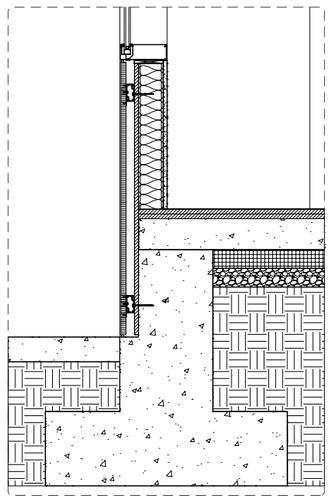


Detail 1 - Recessed Window

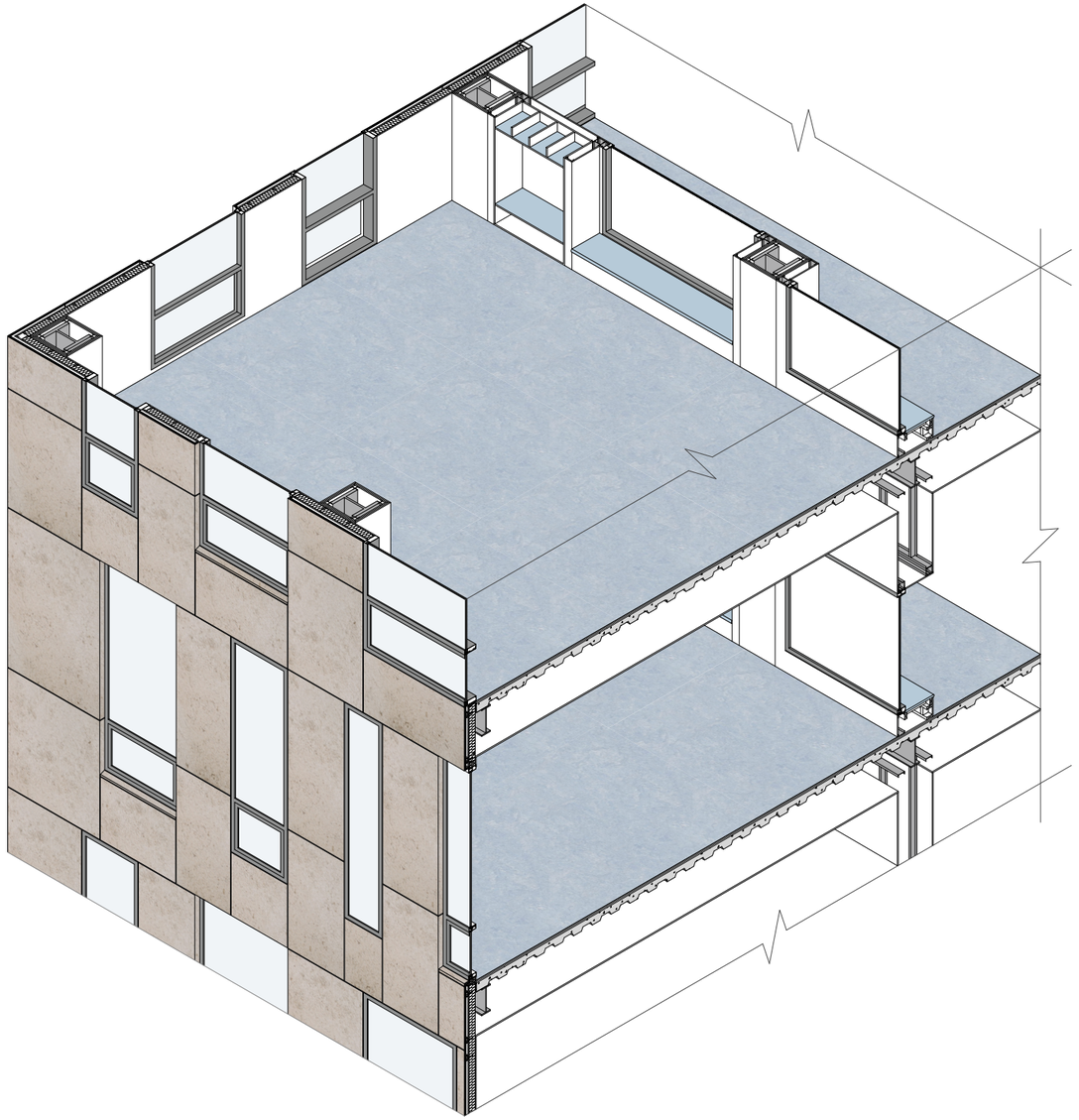


Detail 2 - Flush Window

Details are designed for the aluminum honeycomb panel system to accommodate both recessed and flush windows. The panels either align flush with the face of a window or turn to meet a recessed window. By accommodating both recessed and flush windows, a pattern of shadows adds a layer of depth to the elevation.

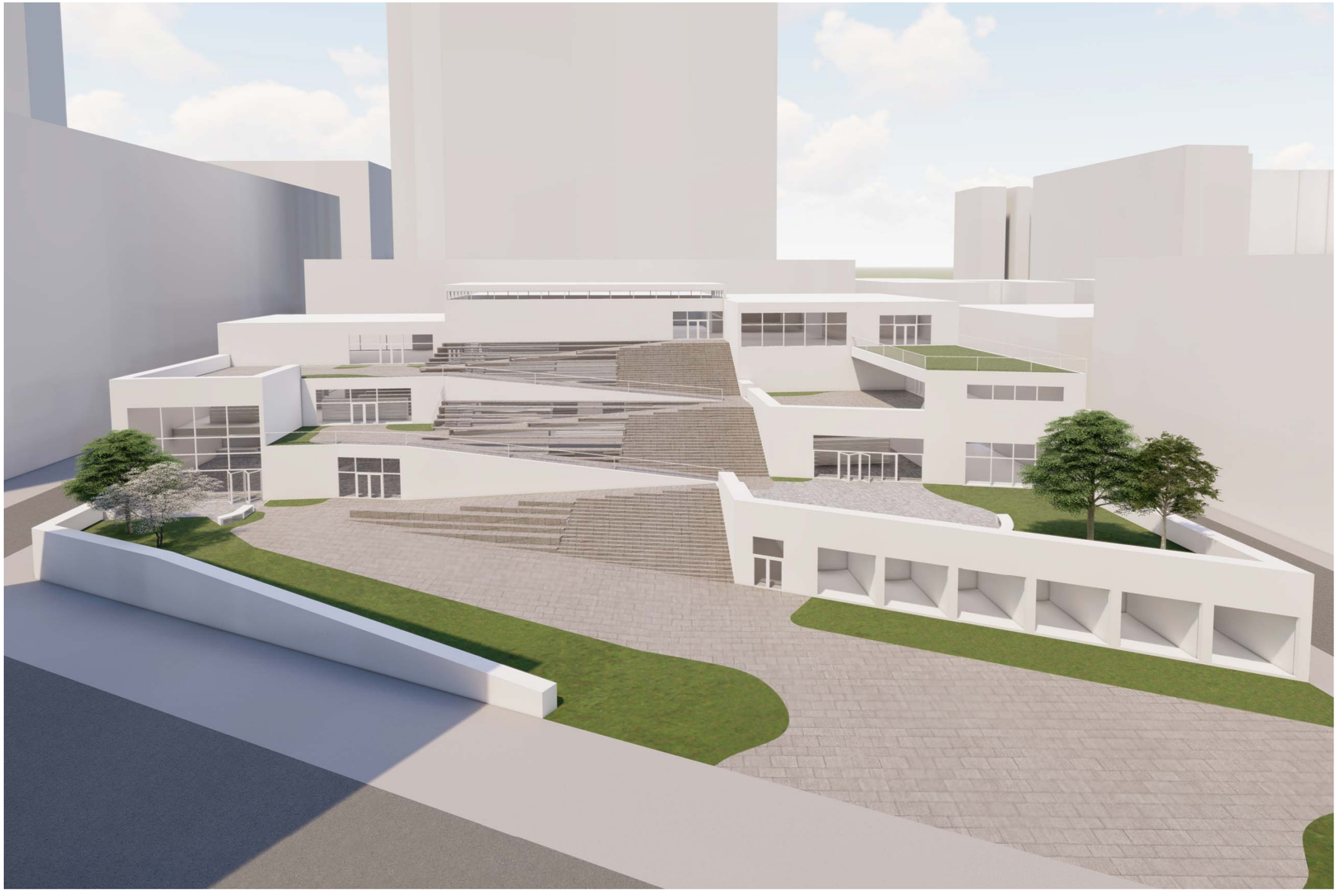


Detail 3 - Foundation



An isometric wall section detailing the exterior wall, composed of a limestone aluminum honeycomb panel facade, as well as the thickened interior walls of the classrooms, which have built-in shelving and occupiable window seats.

An interior rendering of the entry level maker space. As this main hallway hinges around the maker space, it connects the main entrance to the staircases and cafetorium. Therefore, large window walls put the maker space on display for this area of heavy circulation.



BROOKLYN LIBRARY

Folding the Landscape for an Exterior Library

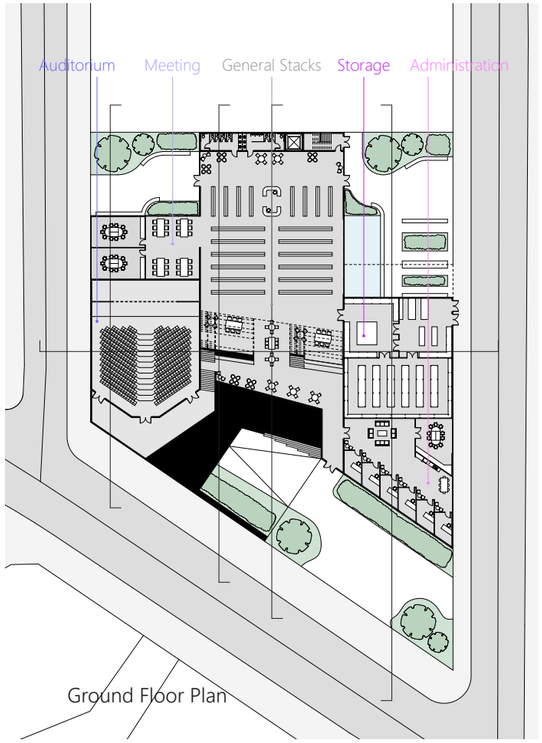
Fourth Year Studio — 2019-2020
Location: Brooklyn, NY

Tasked with designing a library in Downtown Brooklyn, this landform building expands the role of the traditional library. As the contemporary library evolves to incorporate new forms of technology and use, this library also attempts to broaden its range of use for the community. With an artificial landscape ascending the building, this landscape may serve as a specialized community park space, where people may gather without ever entering the library.

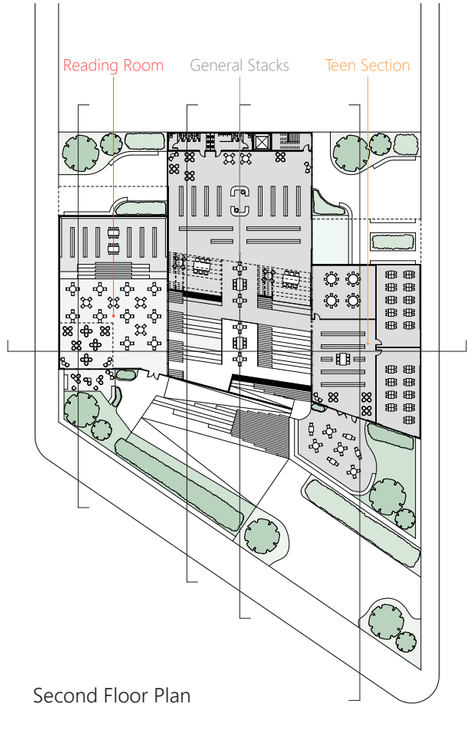
As the form of this landscape folds up the building, a series of stairs and ramps connects exterior patios. Each patio provides direct access to the library's specialized programs. With these programmed patios, every program has the opportunity to extend out to the exterior, with large doors and windows dissolving the barrier between inside and outside. Futhermore, this exterior landscape provides the opportunity for visitors to traverse this exterior landform for direct access to their desired destination.

To accomplish this exterior patio sequence, the building is arranged with two side wings of specialized programs, while the circulatory central space serves the library's general functions. This central zone of interior circulation mirrors the exterior landscape, with a series of staircases climbing up the building. Housing the library's reading spaces and book stacks, this central circulation zone connects the library's general functions to its specialized spaces. On both the interior and exterior, staircase seating with glass risers allow light to penetrate the otherwise buried central zone. Through the creation of an artificial landscape, this library aims to emphasize the threshold between the interior and exterior environment, while physically and visually connecting its visitors to their exterior surroundings.

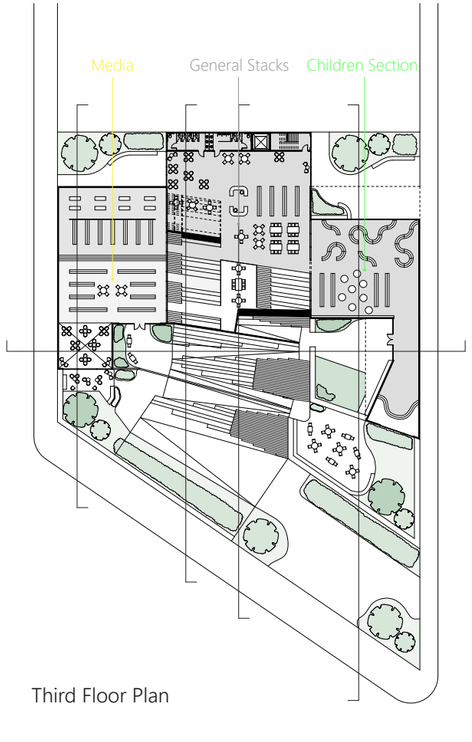
An exterior rendering showing the library's general form and the changing textures of landscape that fold up the building.



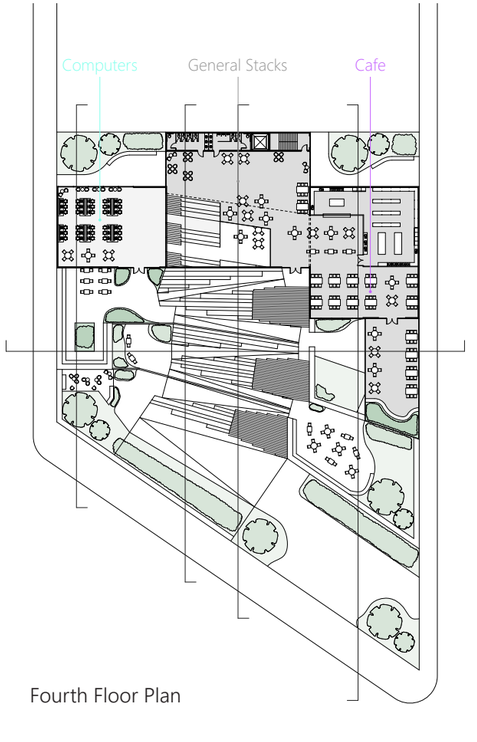
Ground Floor Plan



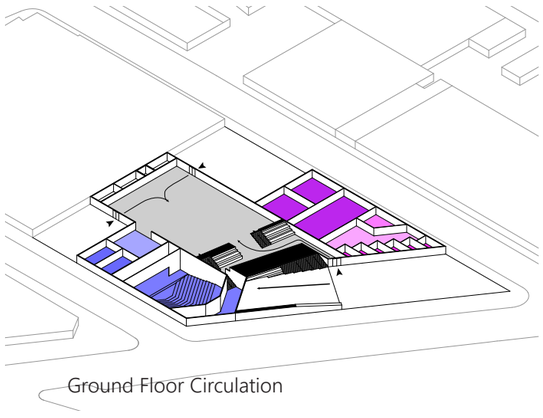
Second Floor Plan



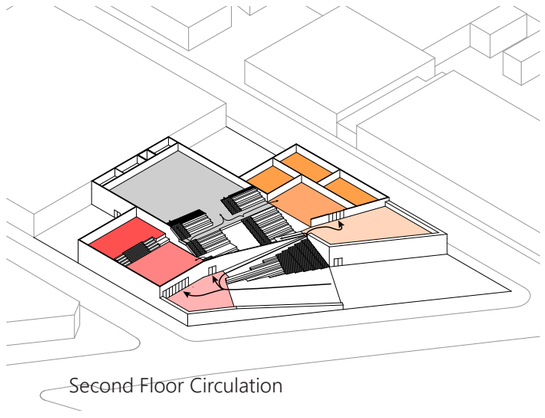
Third Floor Plan



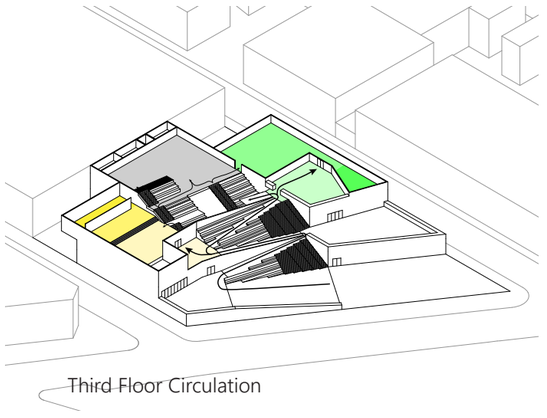
Fourth Floor Plan



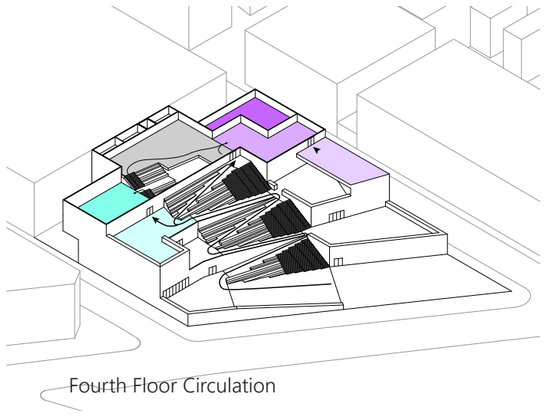
Ground Floor Circulation



Second Floor Circulation

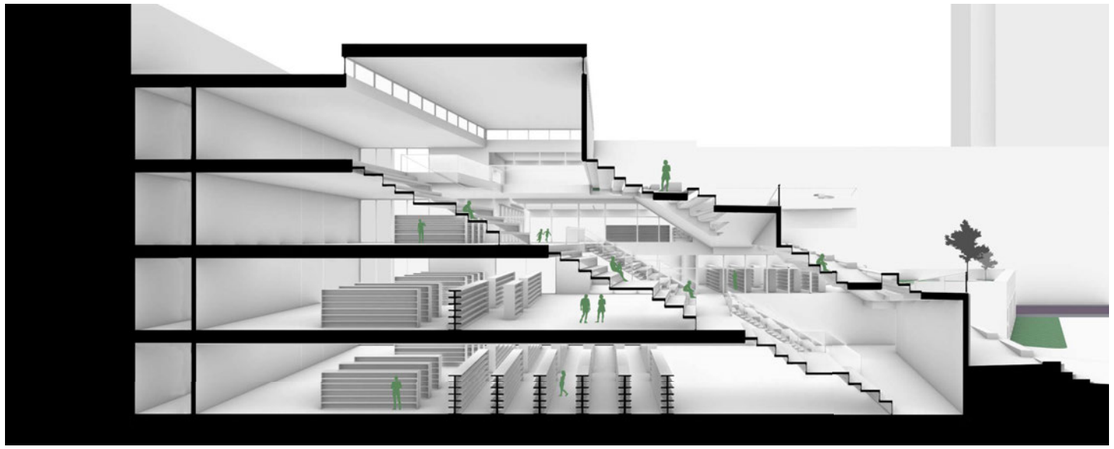


Third Floor Circulation

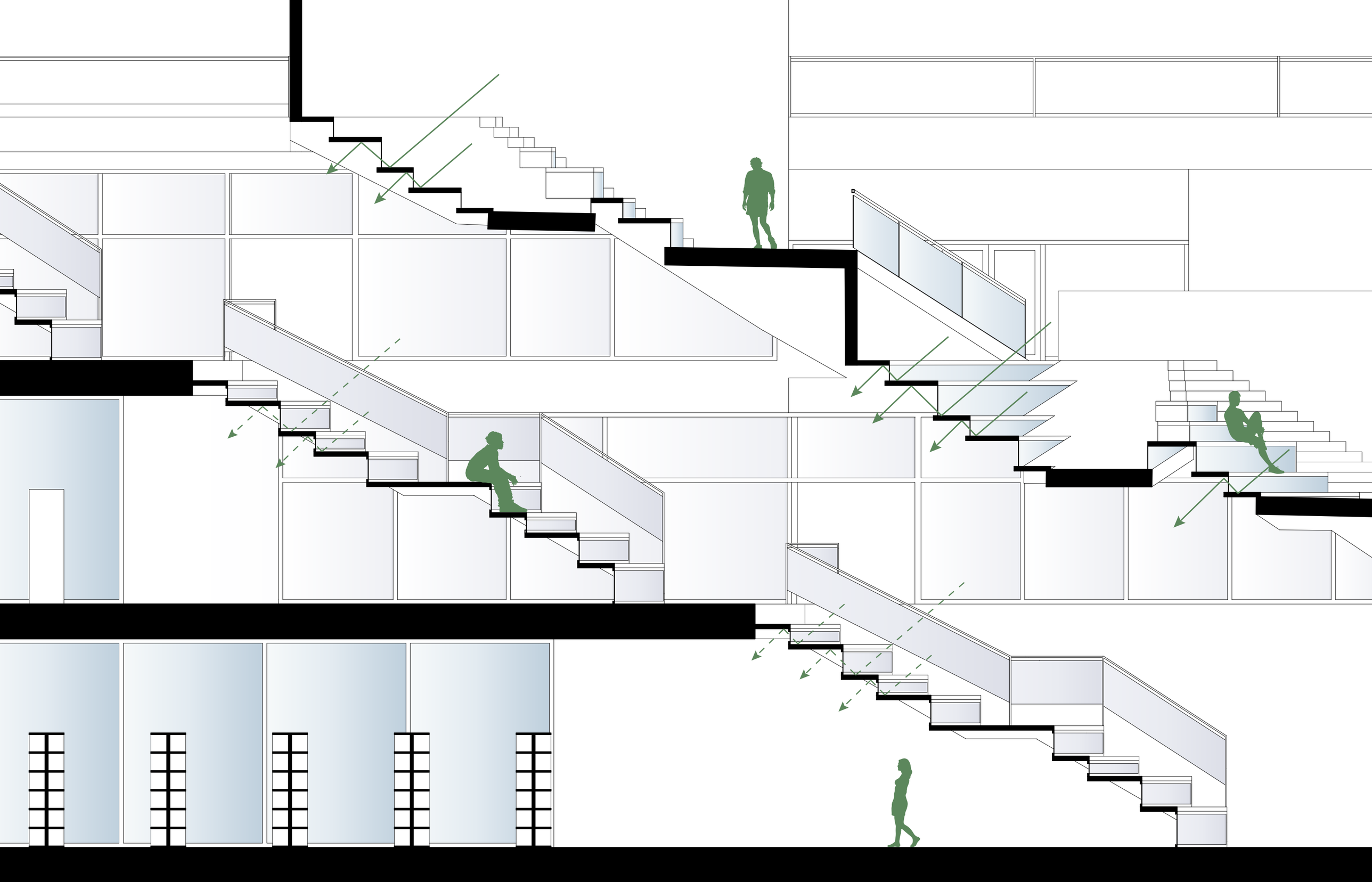


Fourth Floor Circulation

Top: A rendering of the double-height reading room, with its folding glass doors opening to extend the program out into the exterior patio space.
Bottom: A section perspective cutting through the double-height reading room, demonstrating how the different program spaces extend out onto their exterior patios.



Top: A rendering of the library's central circulation space, featuring staircase seating that encourages visitors to sit and read. Light filters down from the landscaped stairs above.
Bottom: A section perspective cutting through the central circulation space, with general stacks toward the back, and staircase seating climbing up both the interior and exterior of the library.



ATLANTA CONTEMPORARY ARTS

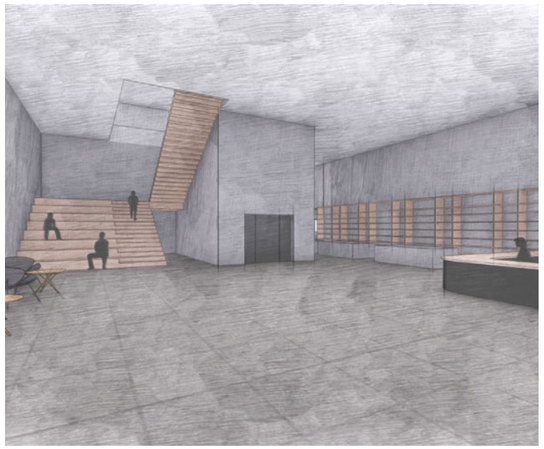
Celebrating the Transition Zone

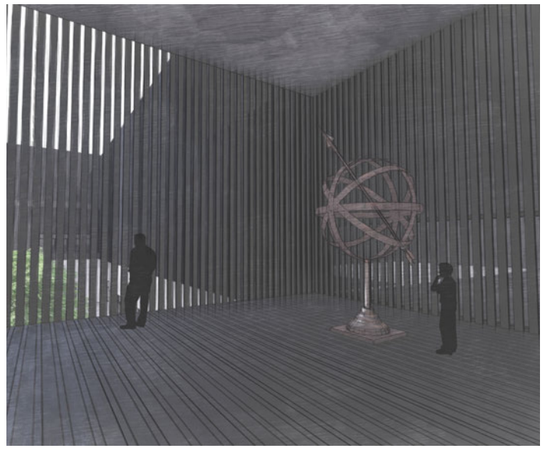
Fifth Year Studio — 2020-2021
Location: Atlanta, GA

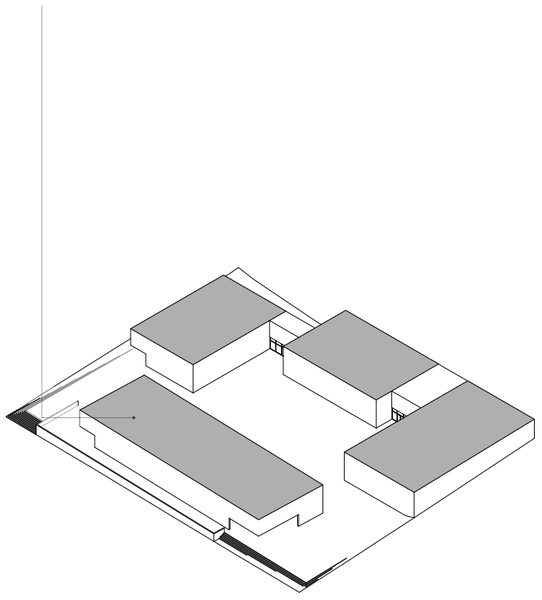
This new extension to the Atlanta Contemporary Art Center seeks to enhance the viewer experience by fostering a connection between the interior and exterior. The museum is arranged as a series of stacked, overlapping masses, which are separated to provide semi-exterior transition spaces between galleries. The masses stack and shift to pull visitors in at the most prominent street corners, leading them into an intimate courtyard space. The most public program spaces are arranged on the ground floor, which may open up into this courtyard space to extend the program outwards. All of the gallery spaces float above this public base, with opportunities to overlook the activity in the courtyard from the gallery's transition zones. Arranged in a "circular" form around the courtyard, the gallery masses require visitors to pass through these transition zones as they circulate between galleries. Upon entering the transition zone, visitors are presented with the option to break out onto an exterior terrace before continuing the gallery sequence.

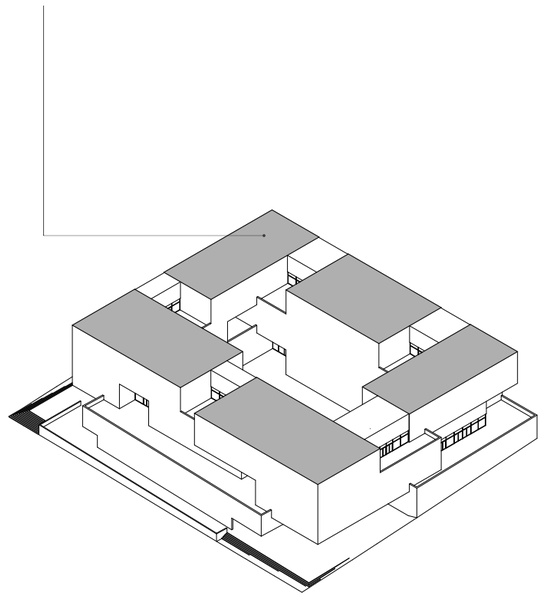
Through the separation of galleries and the implementation of transition zones, the museum's form acts to combat museum fatigue. The transition zones give visitors the opportunity to reflect on the artwork they have just viewed, take a moment to go outside and catch a glimpse of the city, and prepare themselves for the next set of galleries. The separation of galleries also allows each space to assume its own identity, displaying different types of artwork in each gallery, further helping to prevent a sense of museum fatigue. Therefore, while the form of the building encourages visitors to follow a long, linear sequence through the galleries, these moments of pause and visual transition may provide moments of relief that enhance the viewing experience.

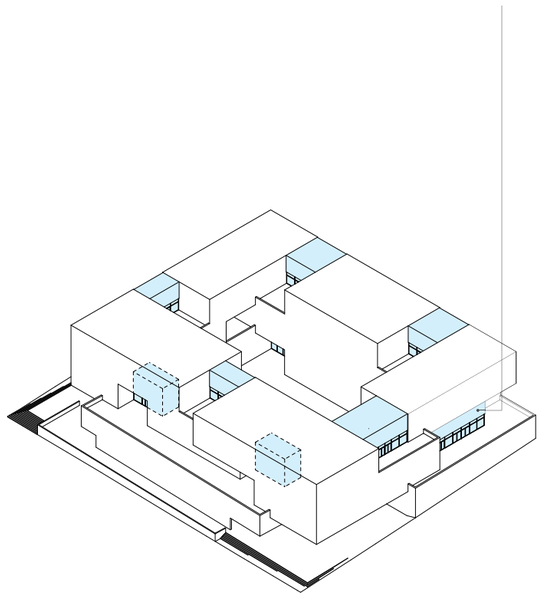
An exterior rendering at the main entry, with a glimpse of the courtyard beneath the floating gallery space.

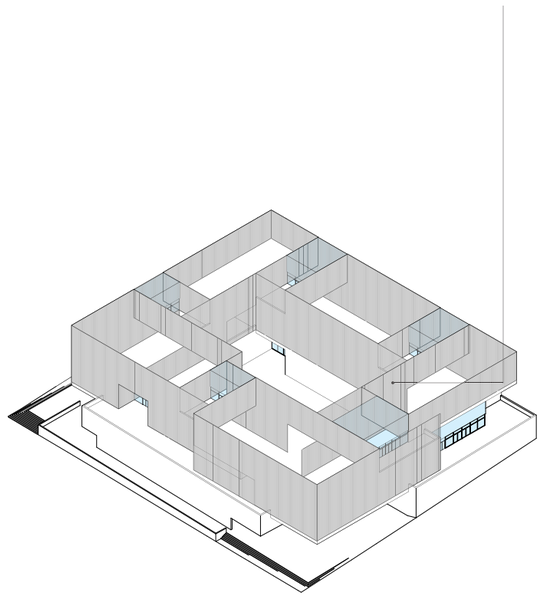










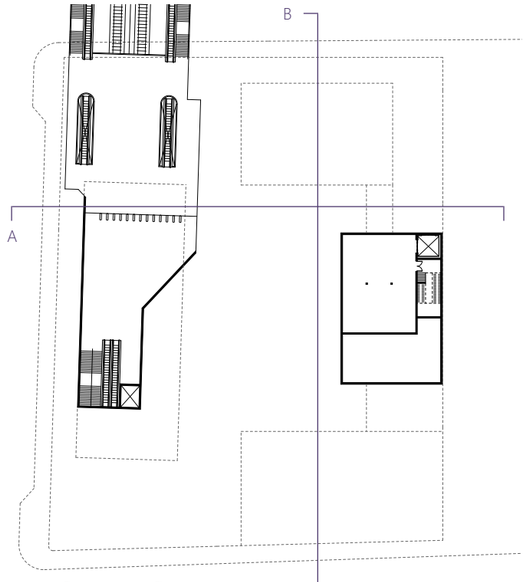


Public Base
The heavy, concrete base houses all public-facing program, which opens up and extends into the exterior courtyard.

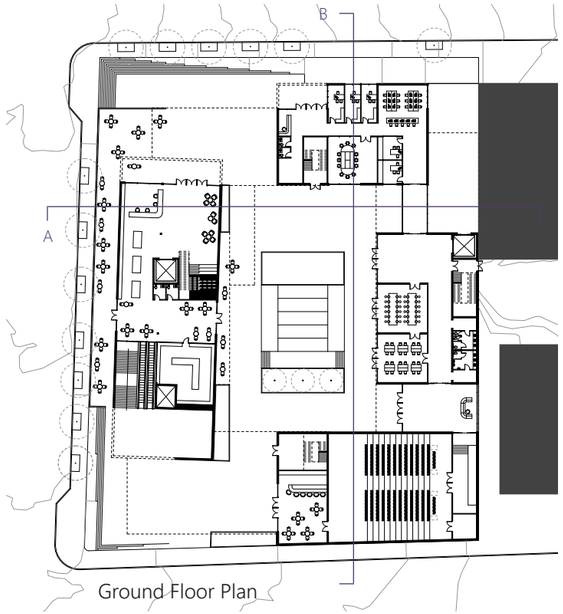
Stacked Galleries
Two floors of galleries stack upon the heavy base, shifting to cantilever and bridge between the separated masses.

Glass Transitions
Glass boxes infill the transition space between gallery masses, providing an opportunity to connect with the exterior.

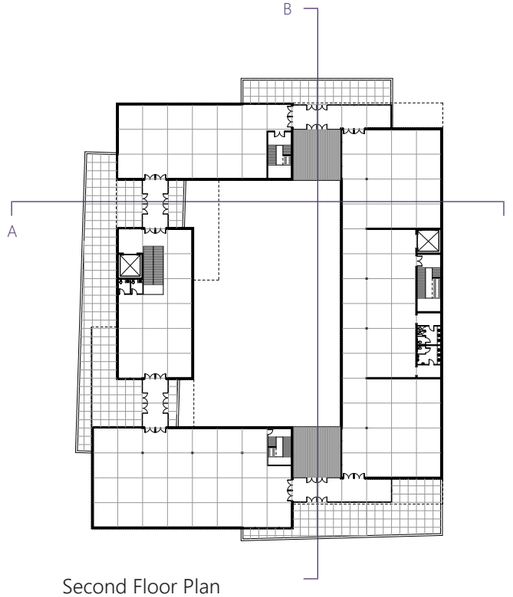
Vertical Screen
A vertical screen facade slips down over the upper galleries, creating screened-in exterior patios off of the transition zones.



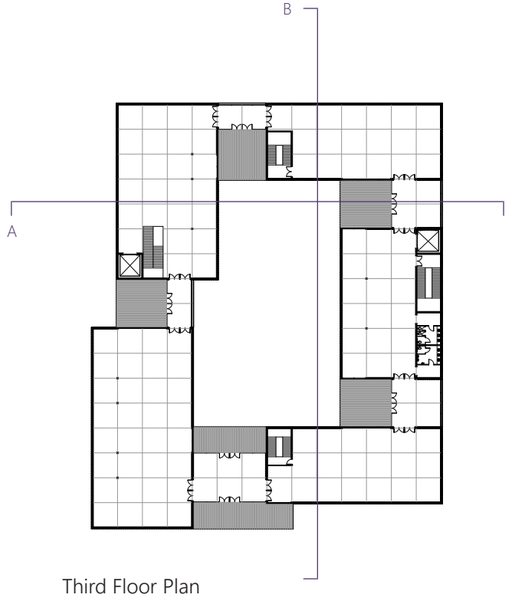
Basement Plan



Ground Floor Plan



Second Floor Plan

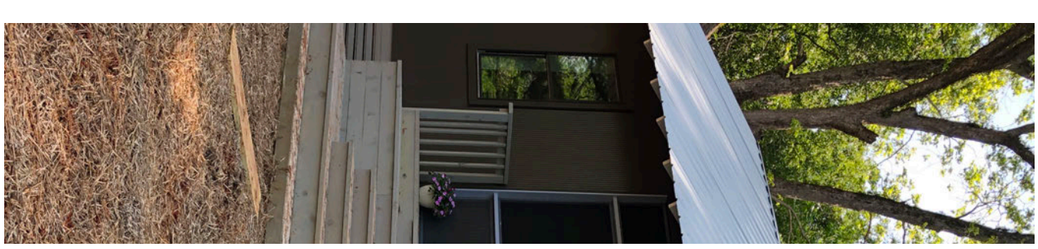


Third Floor Plan

Section Perspective A

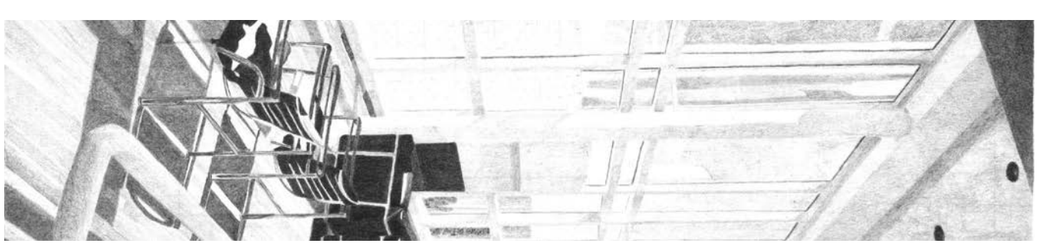
Section Perspective B

An exterior rendering of the museum's courtyard space. Open at the two prominent street corners, visitors are pulled into this semi-public courtyard space. The courtyard allows classroom activities and cafe seating to extend to the exterior, as well as provide areas for exterior art displays, exhibitions, and events.



RURAL STUDIO PROJECTS

Mrs. Patrick's Home — Folding Chair — Watercolor Analytique



FIRST YEAR PROJECTS

Contrast Rendering — Faceted Wall

MRS. PATRICK'S HOUSE

Rural Studio's 20K Homes

Third Year Studio — 2018-2019
Location: Newbern, AL

At Rural Studio, this student team was tasked with expanding a 20K baseline model, Mac's Home, to accommodate FHA requirements. The students increased the width of the home by 2' in order to enlarge the bedroom and bathroom for wheelchair accessibility. In increasing the width of the home from 16' to 18', standard lumber could no longer be utilized for the platform. Rather, the platform framing was constructed with engineered lumber, donated to Rural Studio by Boise Cascade.

The Rural Studio program is broken up between the Fall and Spring Semester. As part of the Fall Semester, this group of 15 students focused primarily on redesigning and readapting the 20K baseline model to accommodate the needs of their client, Mrs. Patrick. After making design changes and determining the home's orientation on the site, the students collaborated on the construction of the house's foundation, platform, and wall framing. The remainder of the house was constructed by a new group of students in the Spring Semester.

An exterior sketch perspective of Mrs. Patrick's Home. The sketch was originally completed to study the orientation of the house on its site, in relation to Mrs. Patrick's original home (right).

At the end of the Fall Semester, the student team completed construction on the house's footings, floor platform, and exterior walls. (Photo Credit: Yoon Dong Kyu)

Fall Semester design and construction completed in collaboration with:
Addie Harchelroad, Alex Hamady, Ashley Dehne, Becca Wiggs, Jonathan Grace, Judith Seaman, Lorenzo Herrera, Nessi Ozako, Reed Klimoski, Tanner Harden, Tom Reutlinger, Victor Bufano, Xiao Boyu, and Yoon Dong Kyu.

An image of Mrs. Patrick's House at its completion. (Photo Credit: Rebecca Kravec)

Spring Semester construction completed by: Dylan Braziel, George Slaughter, Elsa Leonard, Hilary Bird, Madeline Ray, Noah Jones, Paul Fallin, Riley Boles, Rebecca Kravec, Zach Barber, and Zach Coffey.

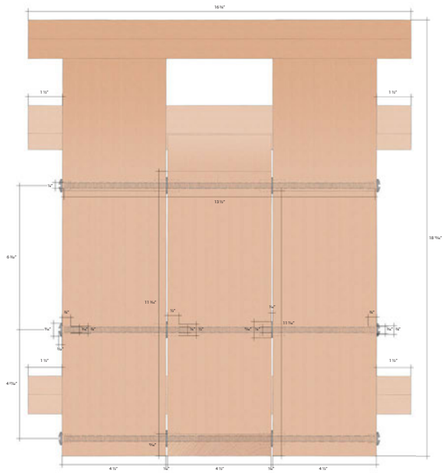
FOLDING CHAIR

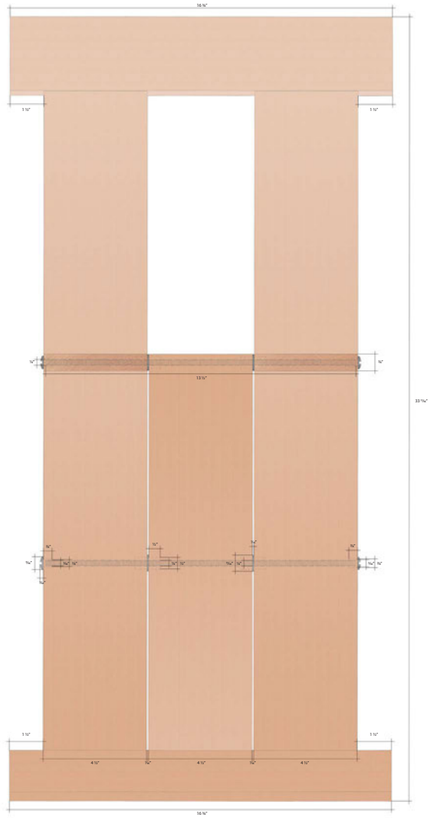
Lina Bo Bardi's *Frei Egídio* Chair

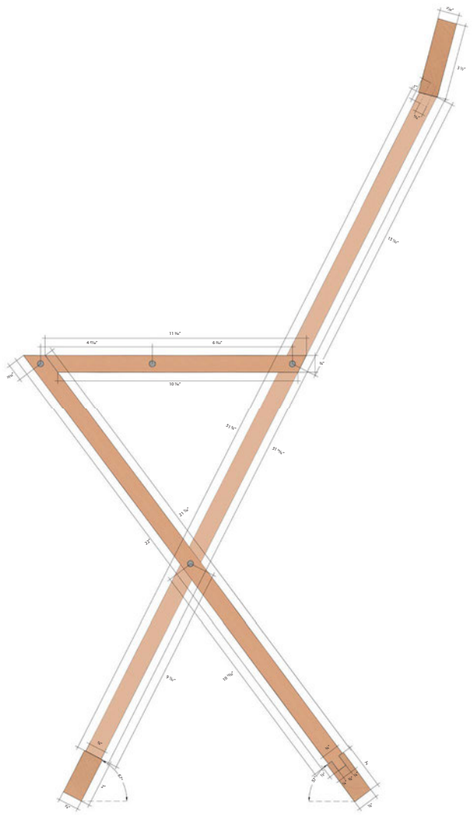
Third Year Studio — 2018-2019
Location: Newbern, AL

At Rural Studio, students are given the opportunity to develop woodworking skills. This woodshop class focuses on the construction of a chair as a way for students to learn the machinery and joinery involved in woodworking. In groups of three, students select a famous wooden chair to build. This team chose Lina Bo Bardi's *Frei Egídio* folding chair, which was designed in 1986.

This wooden chair is one of the most complex options, as much precision is required to ensure that the chair folds properly. Each piece of the chair's seat and legs are intersected by connecting rods, which allow the wood pieces to pivot and fold. The construction process was thoroughly explored prior to development and several mock-ups were constructed to test the joinery. The final chair, made with red oak wood, was completed in collaboration with Alex Hamady and Jonathan Grace.





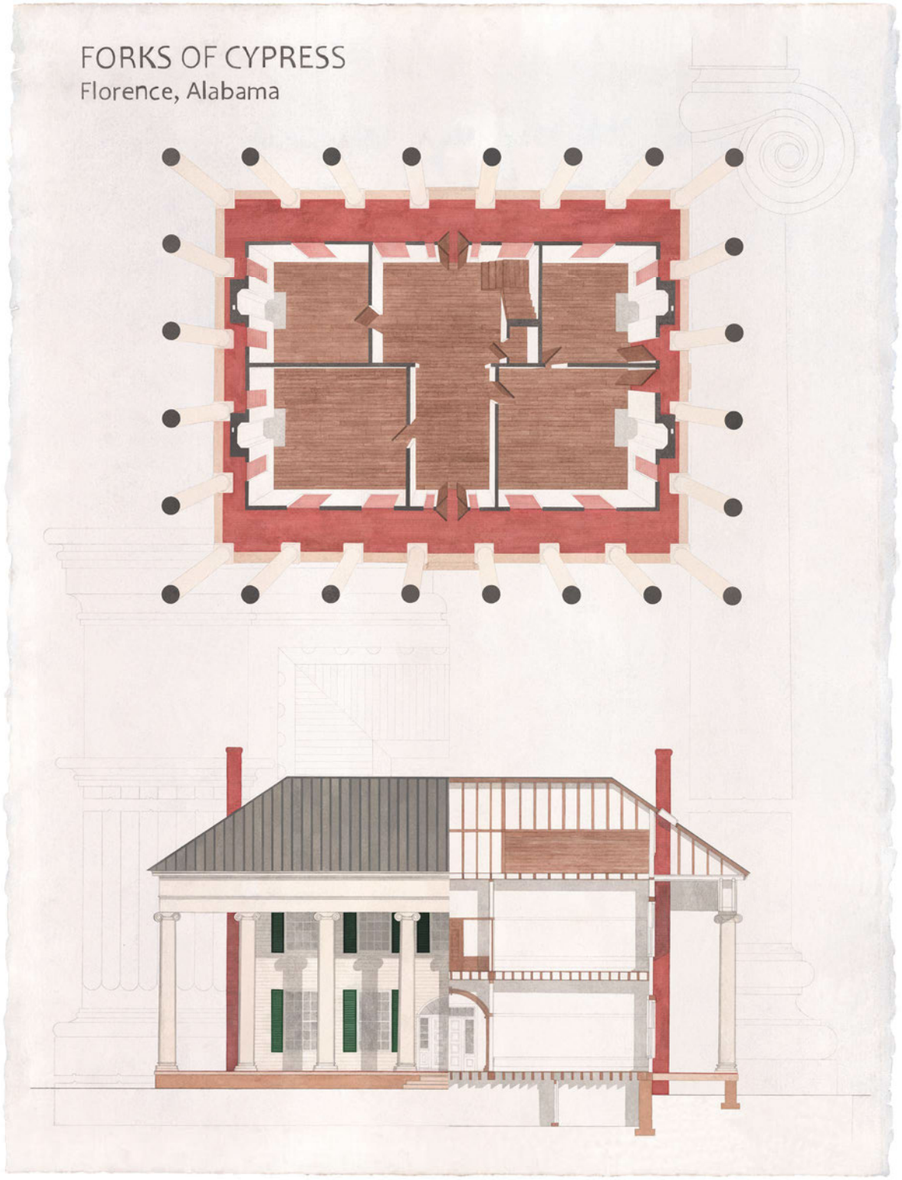


Plan
Detailed construction drawing of the chair's plan, rendered and dimensioned.

Elevation
Detailed construction drawing of the chair's front elevation, rendered and dimensioned.

Section
Detailed drawing of a section cut through the chair, rendered and dimensioned.

Axonometric
Detailed axonometric drawing of the chair, rendered to provide a view of the chair's final form.

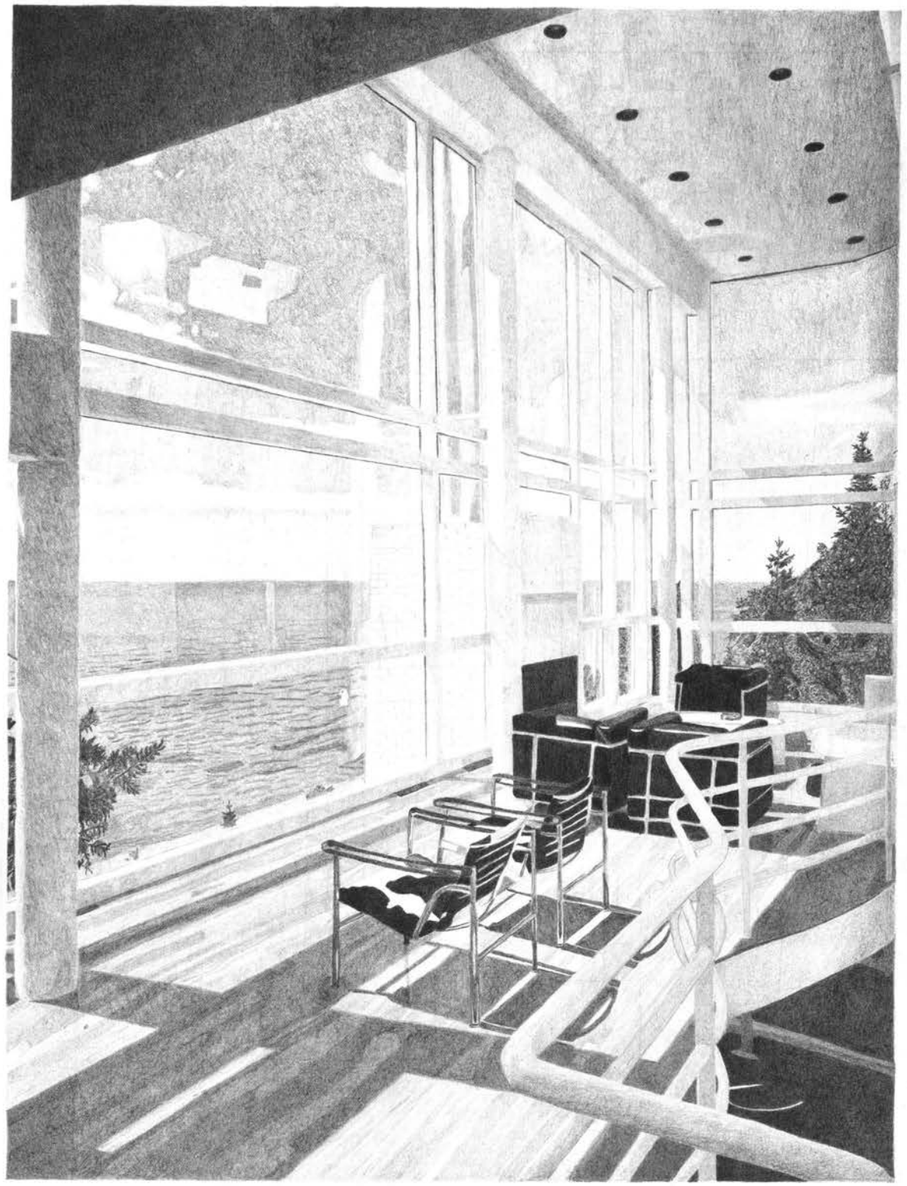


WATERCOLOR ANALYTIQUE

Historic *Forks of Cypress* Plantation House

Third Year Studio — 2018-2019
Location: Newbern, AL

At Rural Studio, this Watercolor Seminar teaches students hand-drafting and watercolor skills through the lens of historic houses. The first half of the semester involves a series of visits to the many historic plantation houses in rural West Alabama. Students explore the details of these homes through weekly sketches and watercolors. The second half of the semester focuses on the development of a watercolor analytique. This drawing layers a perspective plan, elevation, section, and multiple details, which were subsequently watercolored for material accuracy.

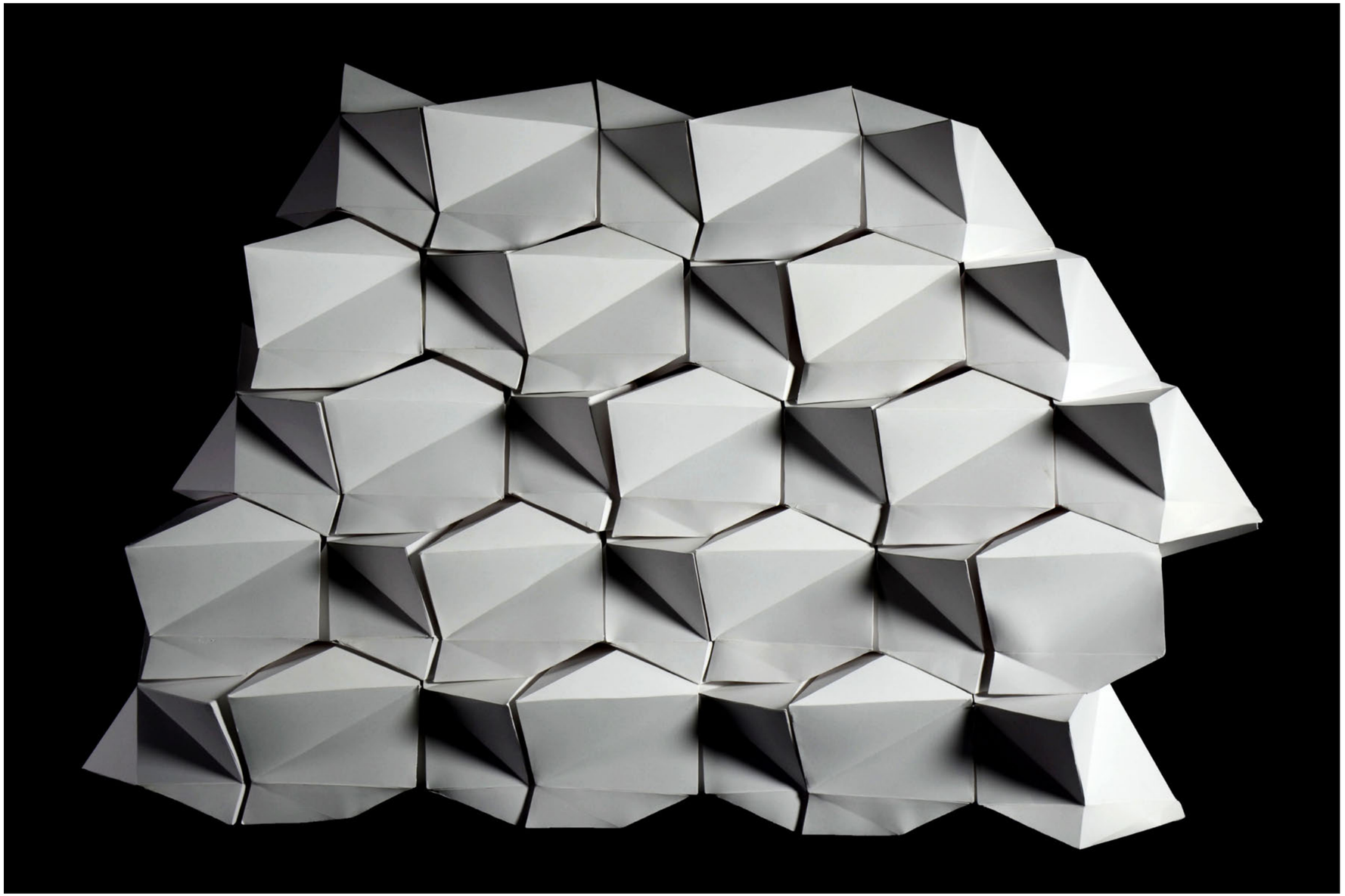


CONTRAST RENDERING

Richard Meier's *Douglas House*

First Year Studio — 2016-2017

This first year project focuses on developing a graphite rendering as a way to learn hand-drafting and rendering skills. A photograph of Richard Meier's *Douglas House* was selected for this exploration due to its incredible contrast between dark and light. This week-long project involved learning how to hand-draft through plotting various points along lines, and how to hand-render through various methods to ensure smooth, blended layers of graphite.



FACETED WALL

Interlocking Module Design

First Year Studio — 2016-2017

This project focuses on how the folding of paper in various manners can be used to create patterns and three-dimensional objects. While the design process began with the learning of simple folding patterns, the complexity of the project heightened with the task of creating interlocking modules. After the development of the “primary” module, an second module was constructed as an “interstitial” form of the first. Both modules were then redeveloped in accordance with one another so that not only could they connect side-by-side, but also stack upon each other. The “primary” and “interstitial” modules were then created in bulk to build a wall of modules. The resulting wall, with its many geometric facets, became an interesting study in light and shadow.