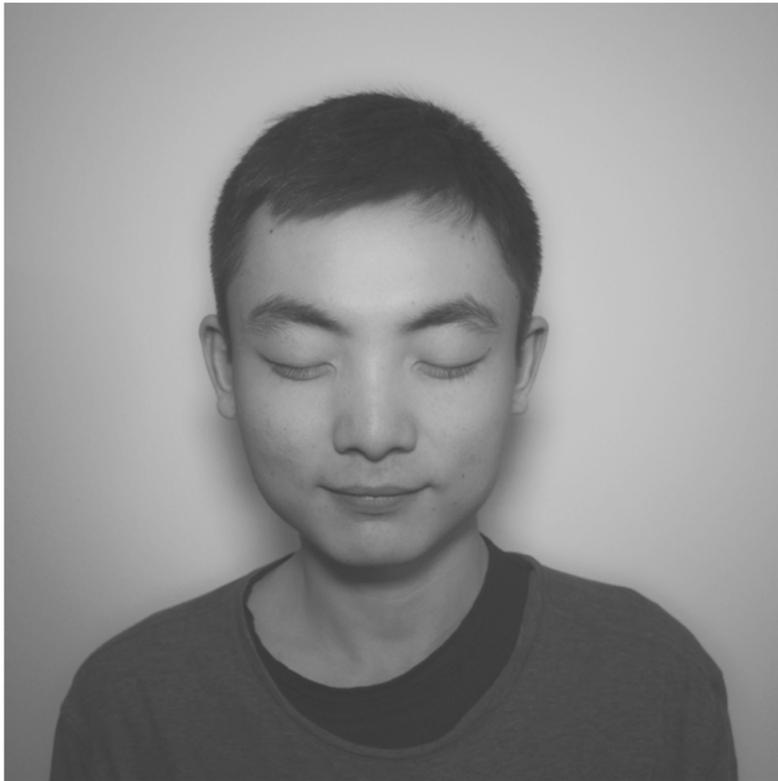


# ANRAN LI

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## *Portfolio 5.1.3*

Anran Li  
100 Memorial Dr. 5-10C  
Cambridge MA 02142  
+1.650.518.6414  
hello@anran.li

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# 01. WINGED

**Taught by**  
Amy Larimer and Ethen Wood  
Graphics Course (Stanford)

**Introduction**  
Winged is the process of asymmetrically turning a block of hardwood. Amy and Ethen taught me how to explore through material and process. I found, unexpectedly, that the resulting piece of wood can balance on the remaining faces of its original geometry as well as on newly created faces.

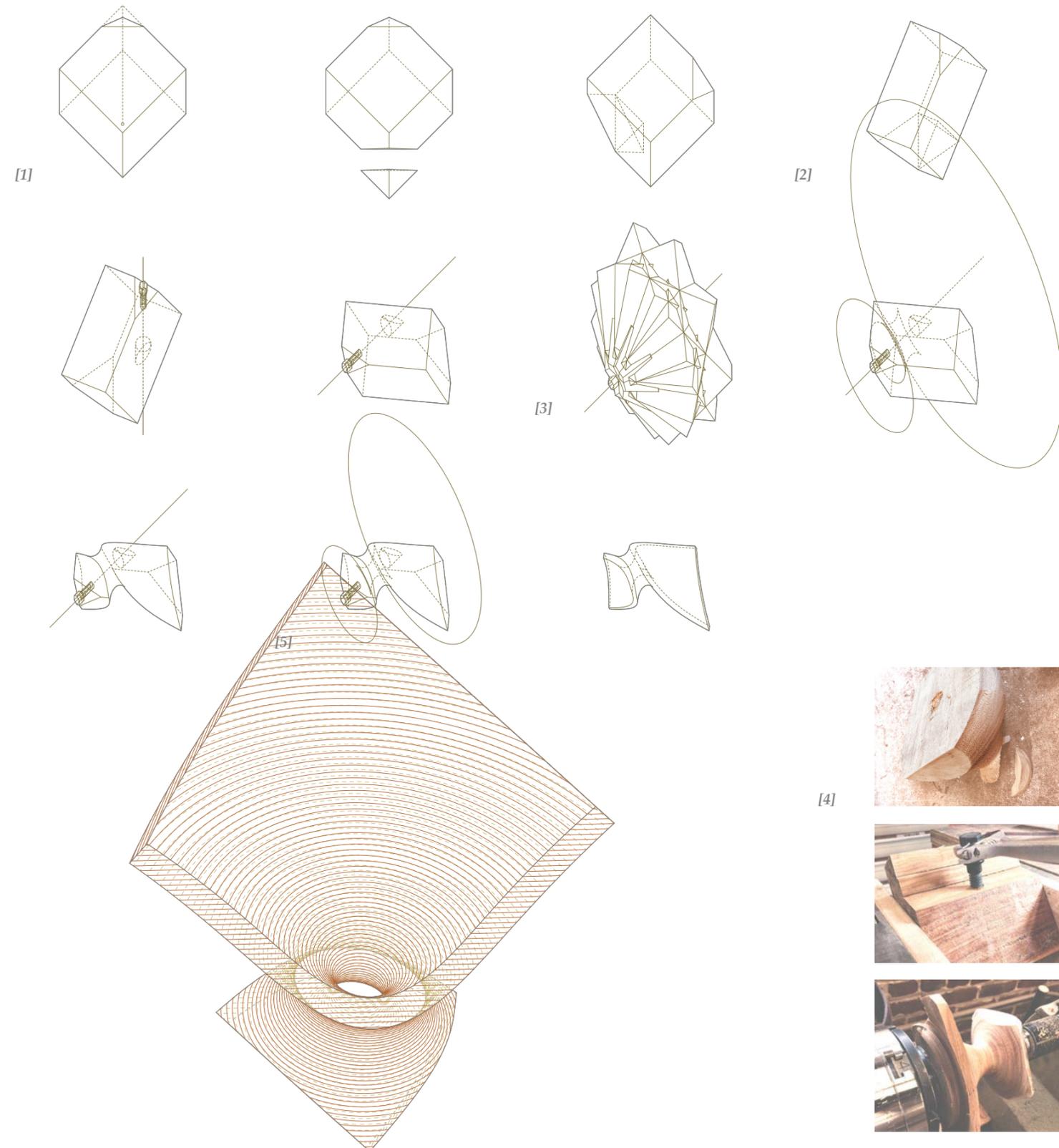


[1] Damaged block of chakte viga and two balsa test pieces

[2] Creation of flat base for the insertion of a chuck

[3] As the wood shifted center of gravity, adjustments to the spindle rate were made to avoid resonant frequencies.

[4] The first unsuccessful balsa test showed that the order of removal needed adjustment.



[4]

# 02. PINNED



**Taught by**  
Brandon Clifford  
Geometric Disciplines II (MIT)

**Introduction**  
Pinned distills the act of dropping a pin. A rotating parachute drastically slows decent while increasing the accuracy of the drop by averaging any directional biases of the parachute.



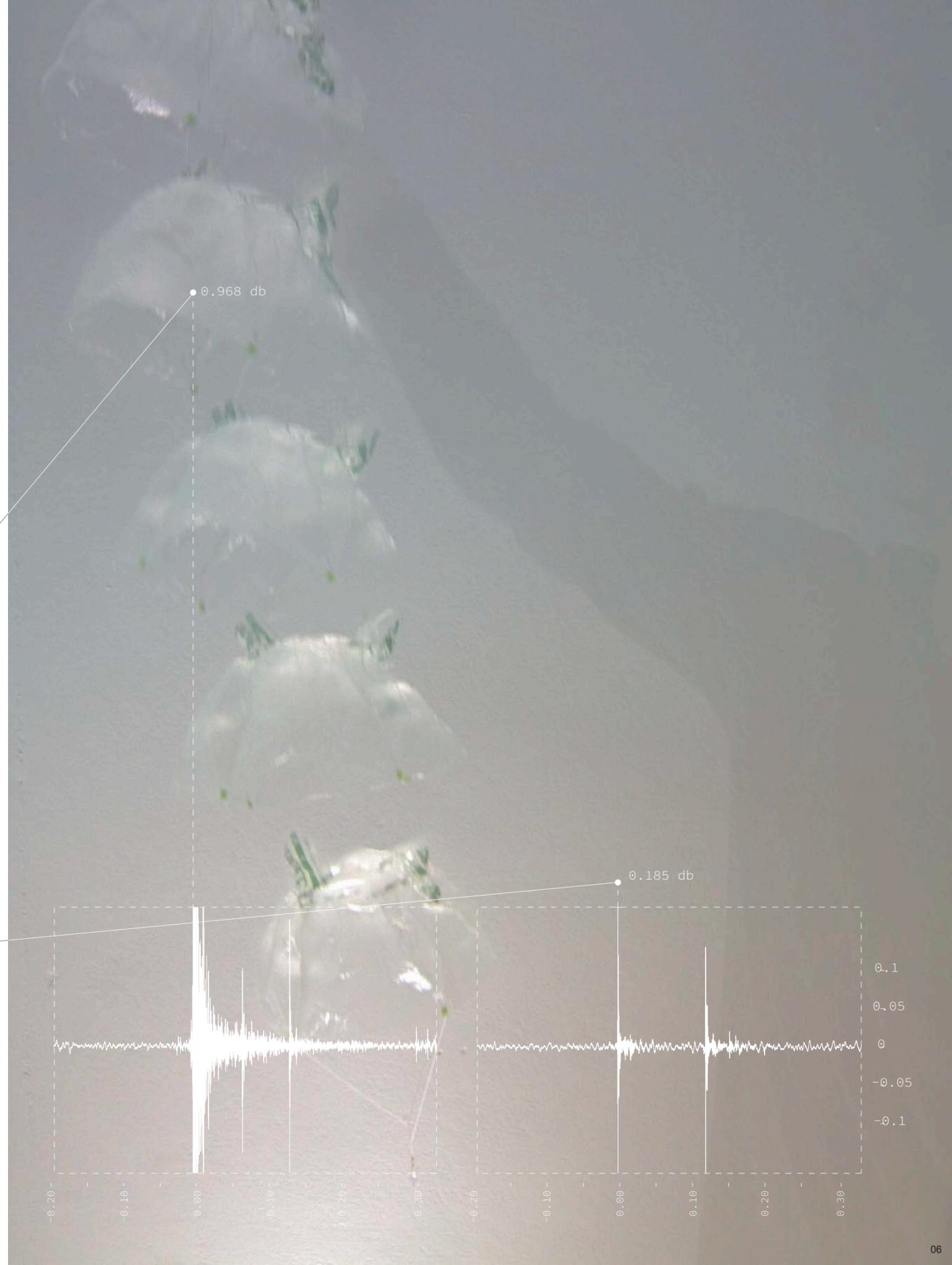
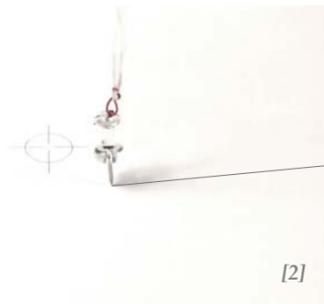
**[Top Array]**  
The process of the parachute unfolding from it's base geometry. An evolutionary solver optimized the parachute for maximum rotational velocity.

**[1]**  
A pin dropped onto the floor, without a parachute. To the right, correlating point in time on the sound plot, with a reading of 0.968 decibels.

**[2]**  
Pin attached to parachute harness, producing 0.185 decibels.

**[3]**  
Parachute and pin assembly fully at rest.

**[Right Image]**  
Multiple exposure shot of parachute falling and spinning



# 03. HOMAGE

to the circle

## Instructor

Beverly Choe  
Light, Color, and Space (Stanford)

## Team

Alex Landeros  
Kelsey Lange  
Hannah Brown

## Introduction

Homage is a series of apertures in which the extension of string into multiple dimensions creates a spatial intervention.

### [Dimension 1: Path]

Movement of viewer from door to window.

### [Dimension 2: Image]

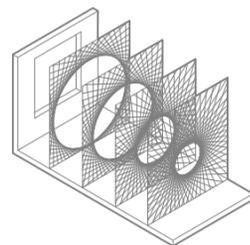
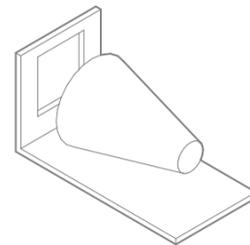
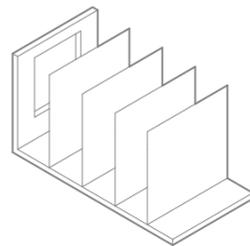
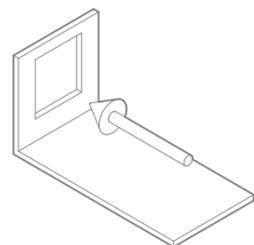
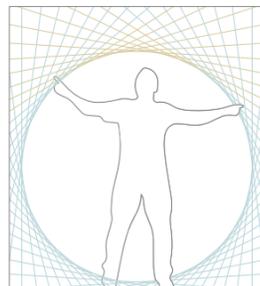
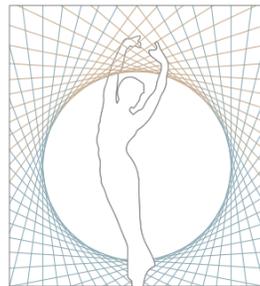
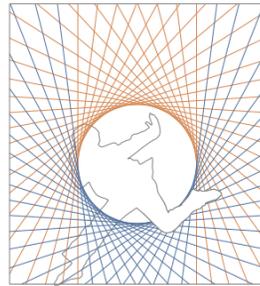
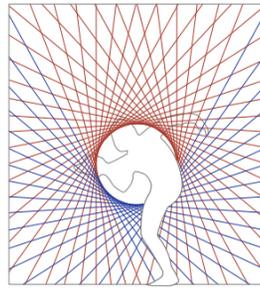
Planes grate with this movement, capturing changes in saturation and luminosity.

### [Dimension 3: Space]

Spatial qualities are created to augment captured ones.

### [Dimension 4: Experience]

Moving through the frames augments the opening of light and space.





[1]



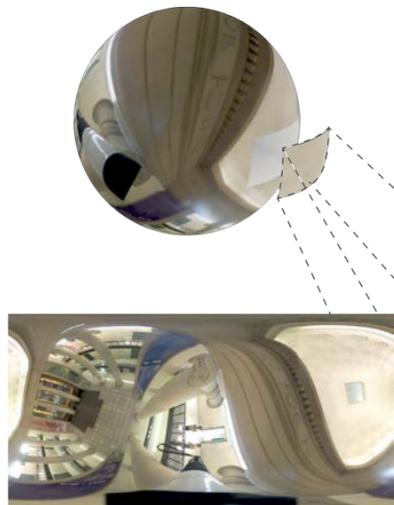
[2]



[3]



[4]



# 04. MIRROR

## Instructor

Takehiko Nagakura  
Special Projects in Advanced  
Visualization (MIT)

## Introduction

Continuing MIT's tradition of pranks, Mirror is the hacking of a kiosk to highlight the absurdity of a hallway space adjacent to the void under a dome.

[1] The MIT SA+P news interface (retrofitted with Rick Astley) [2] turns into a mirror as people walk by. [3] When a pedestrian stops and pays attention, [4] it turns into a window. There are a row of real windows above the display, but the view to the dome is blocked.

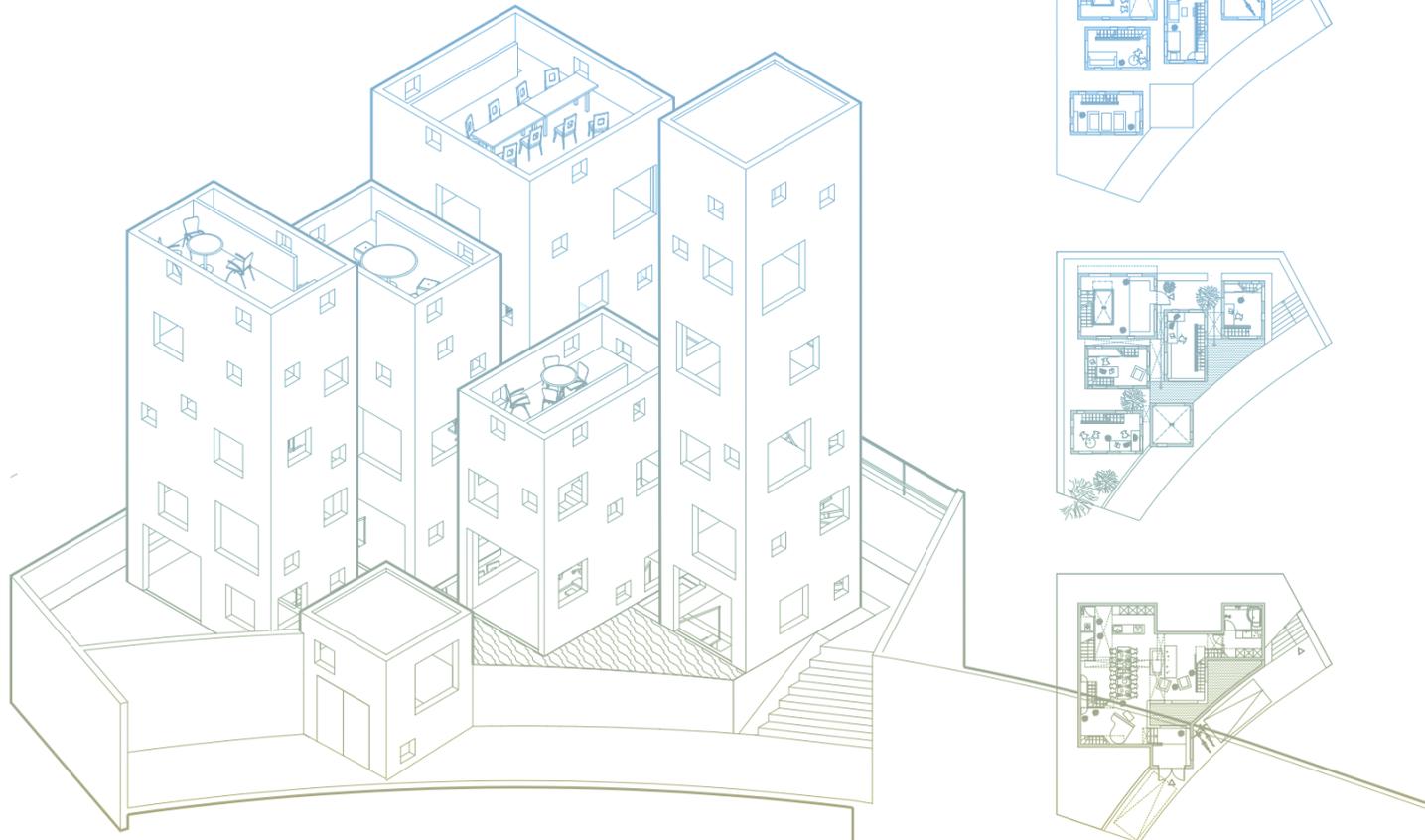
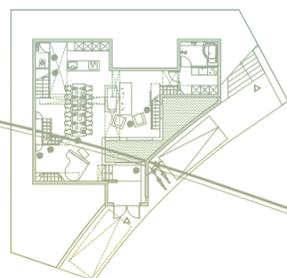
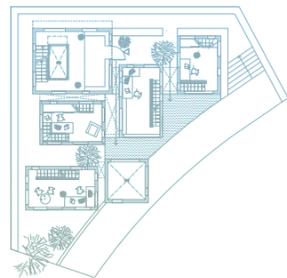
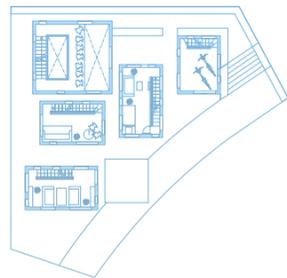
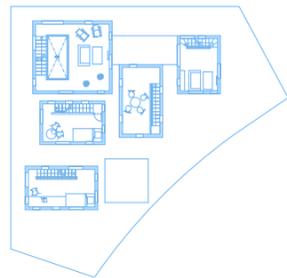
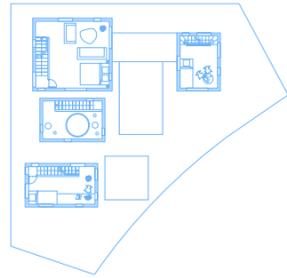
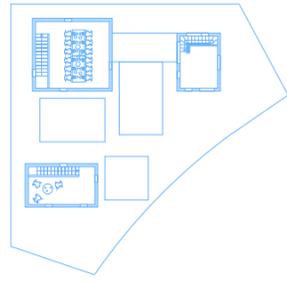


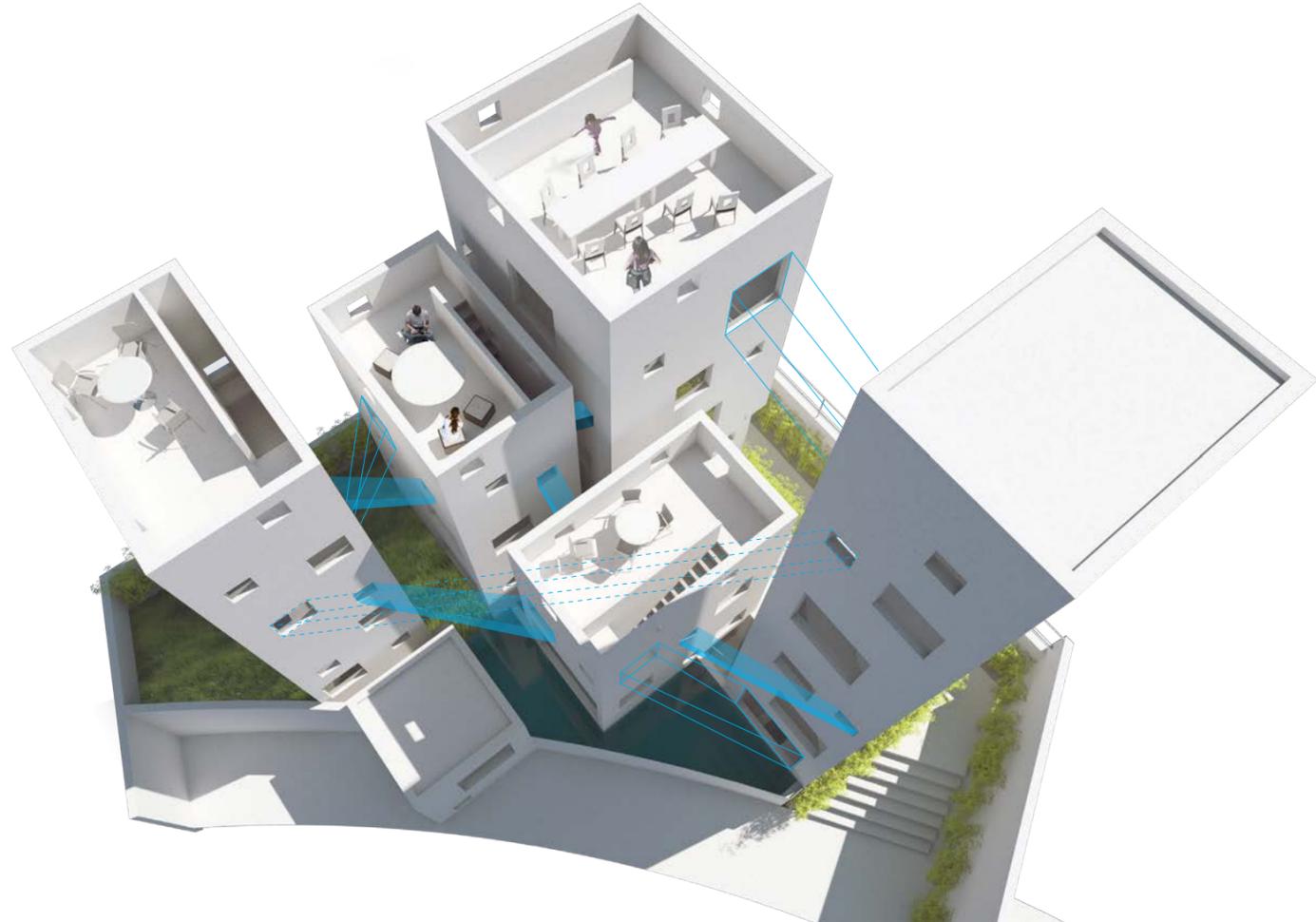
**Principal**  
Kotaro Horiuchi  
Kotaro Horiuchi Architecture

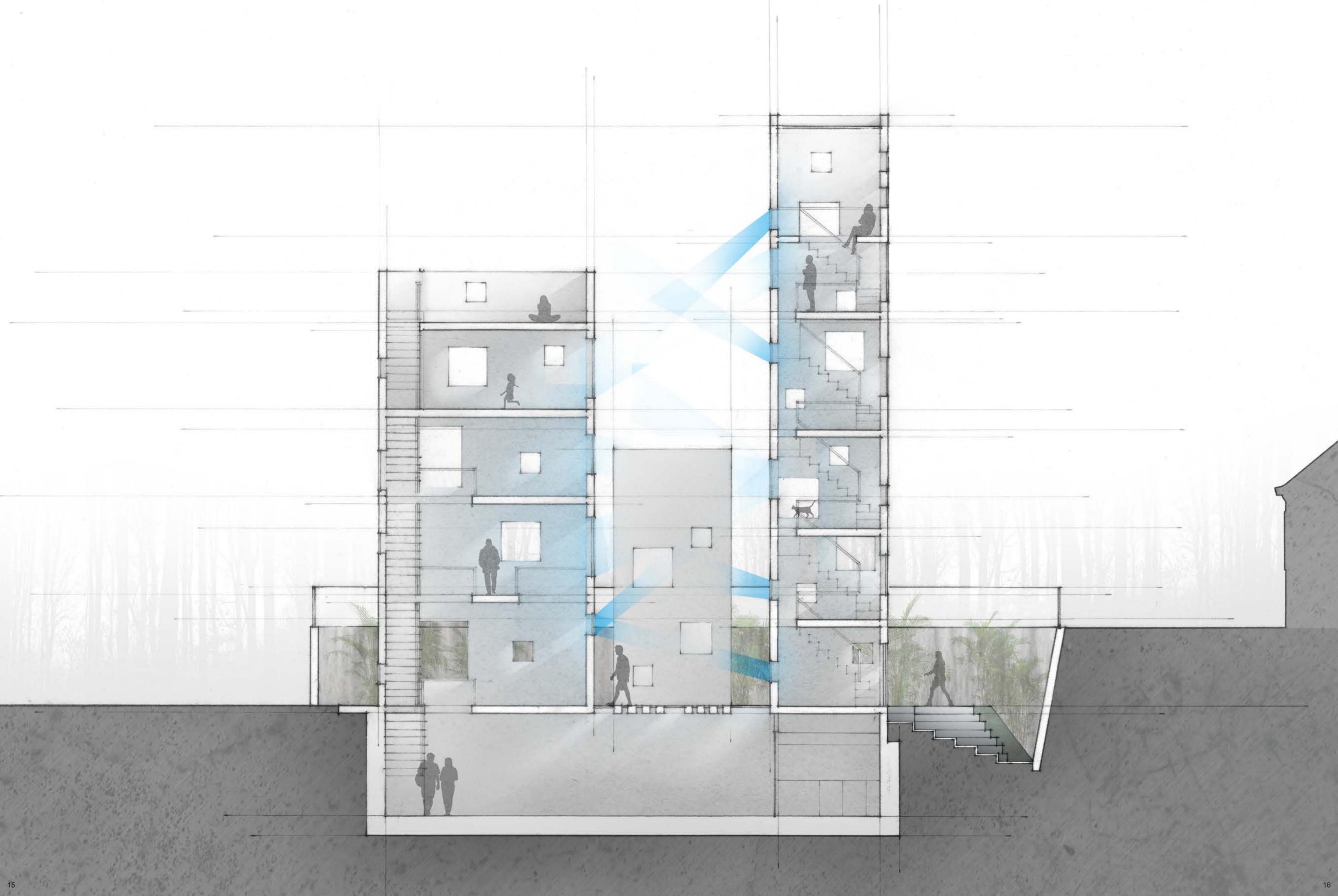
**Project Team**  
Mohamad Alzabadani  
Catherine Tran

**Introduction**  
Forest proposes a vertical living scheme for a family. Each tower is tailored to the needs of its inhabitant while the basement provides shared spaces and utilities. A field of small windows creates conditions of porosity and privacy.

# 05. FOREST







*Instructor*  
Bryan Shiles  
Intermediate Studio (Stanford)

*Team*  
Julia Schubach

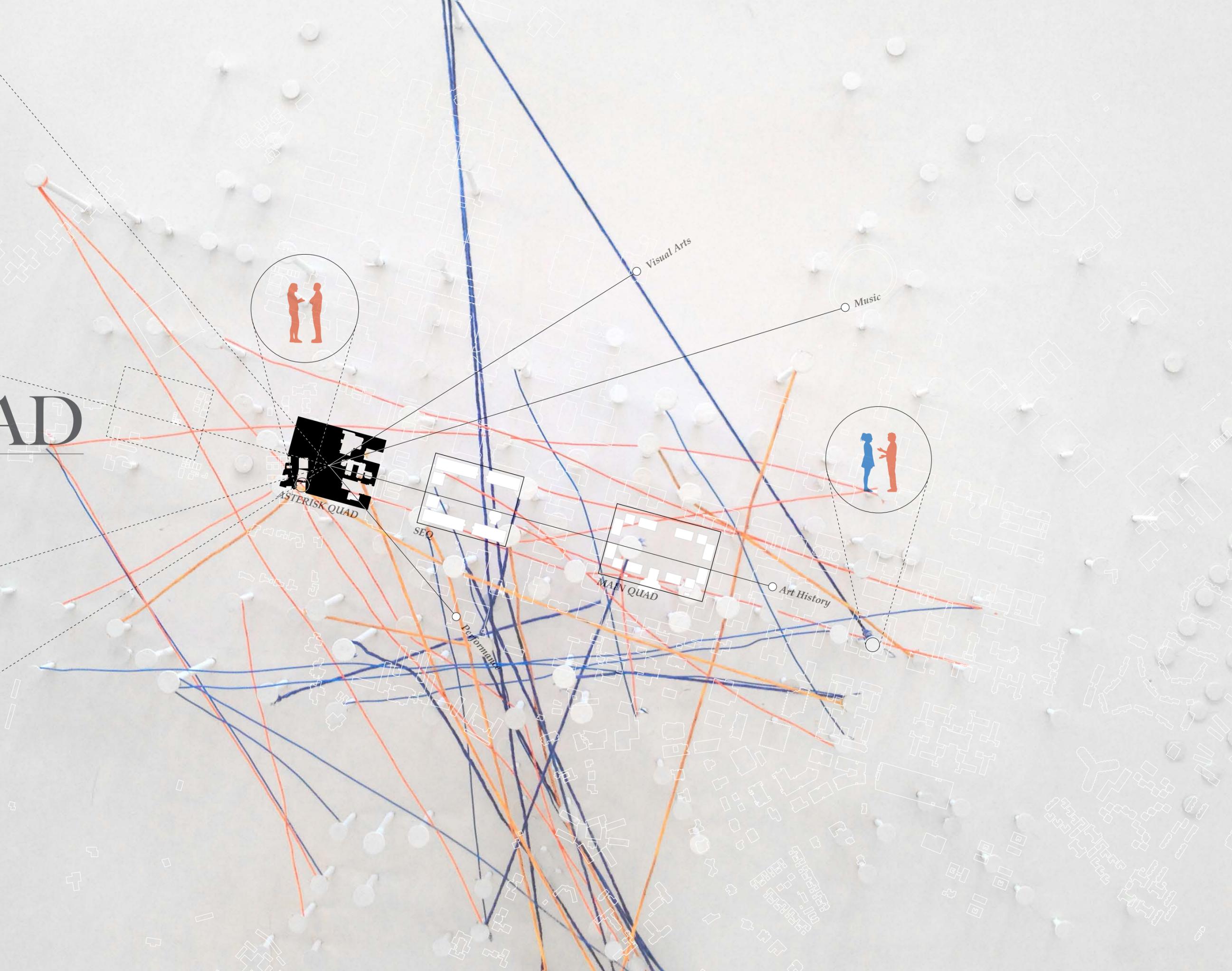
*Introduction*  
(Asterisk) \*Quad is designed to be used by students rather than tourists and event organizers. It fixes the typo(logy) of Stanford's quadrangles by mingling students from outside disciplines and creating intimate spaces rather than heroic ones.

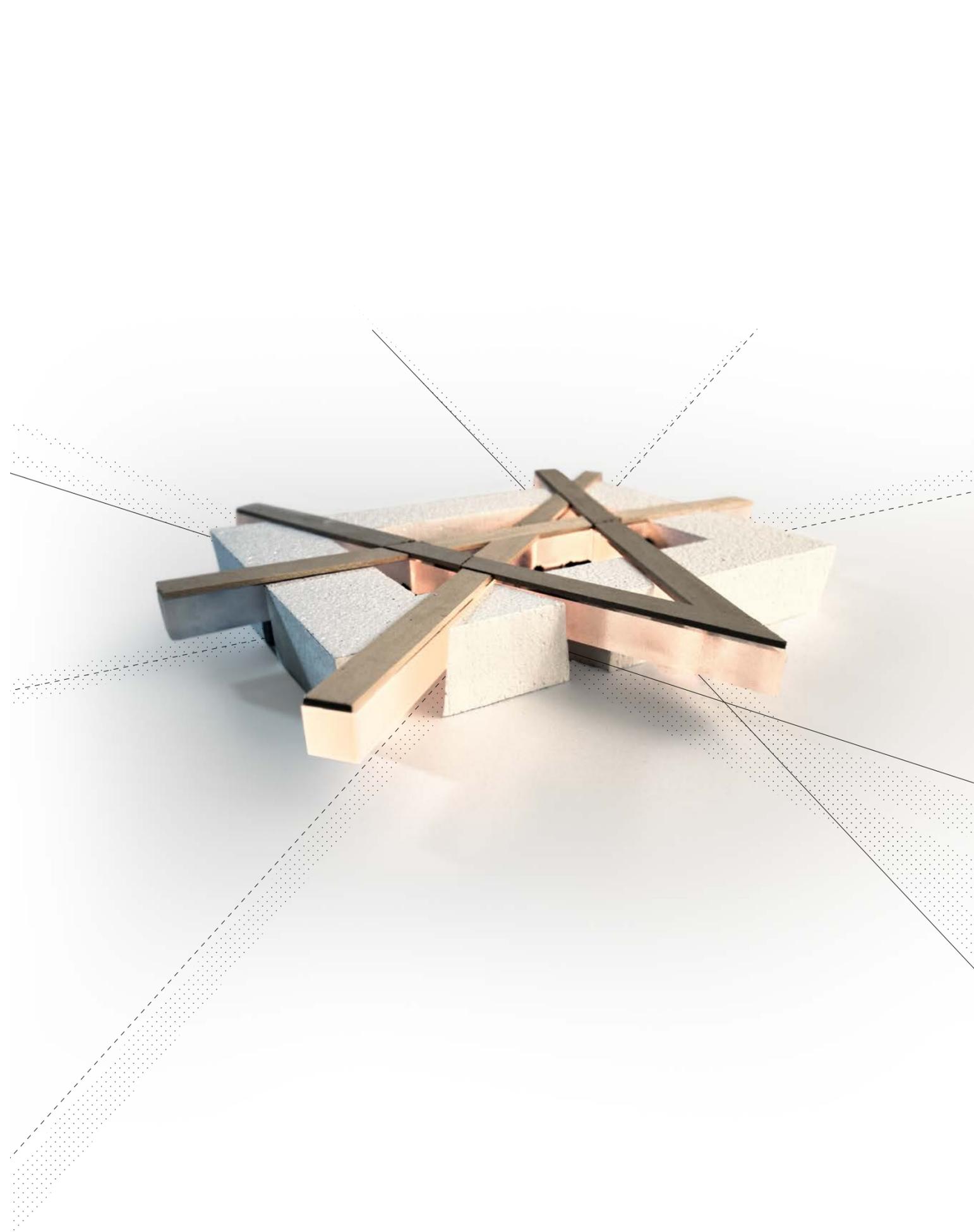
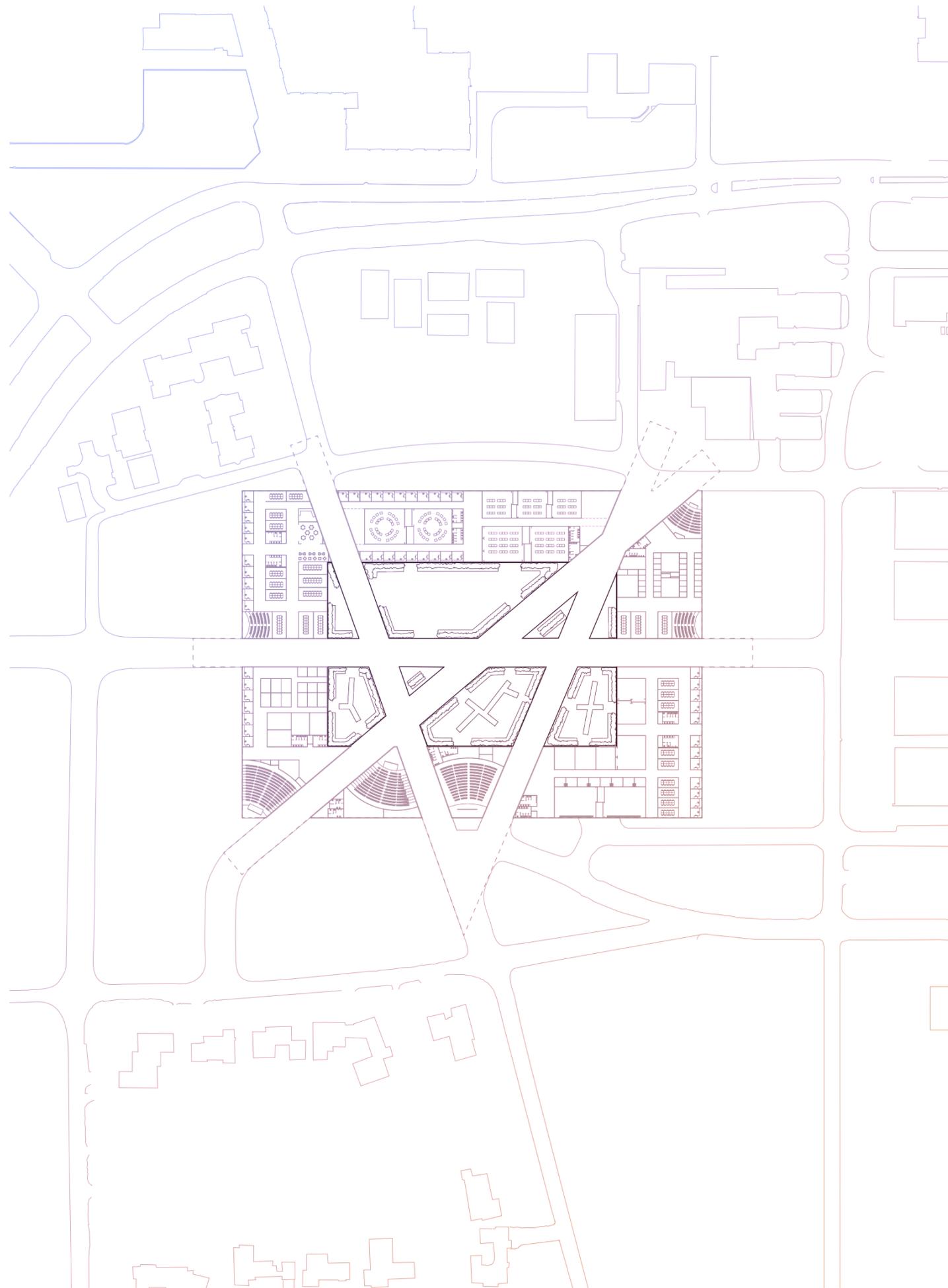
# \*QUAD

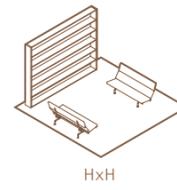
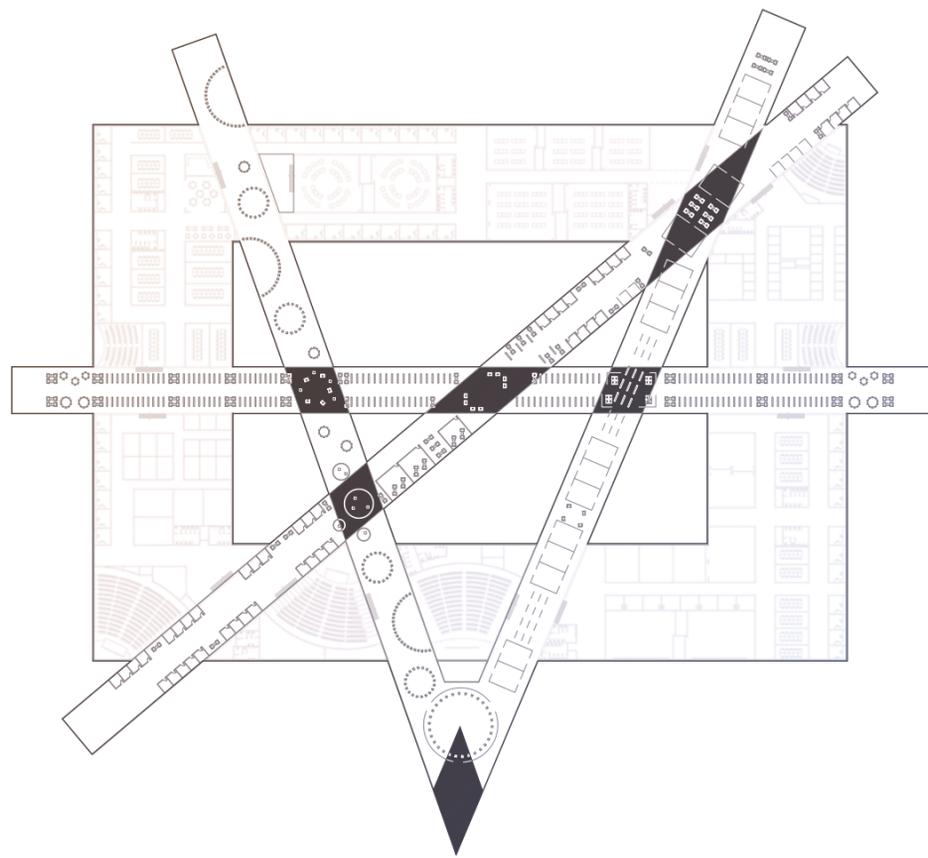
*[Research Model]*  
A figure ground drawing showing the extension of Olmstead's Stanford master plan is overlaid on a study model of surveyed students' travel paths. Unlike dormitories, classrooms do not comprise a mixture of discipline types or, in Stanford lingo, "Fuzzies" and "Techies."

*[Study Model Layer]*  
Each nail represents a building on campus, with height denoting the building's popularity. The material and color of the string reflect different sets of data:  
Wire: Engineering (Techies)  
Yarn: Humanities (Fuzzies)  
Pink: To favorite place  
Blue: To most frequented place

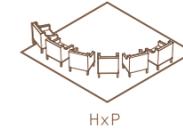
*[Figure Ground Layer]*  
The proposed \*QUAD continues off of the original Olmsted plan. Key arts buildings are brought in as guiding lines.



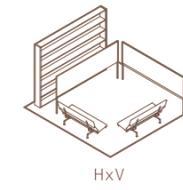




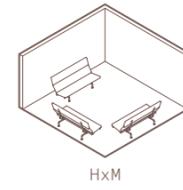
HxH



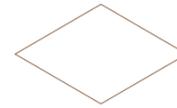
HxP



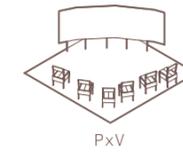
HxV



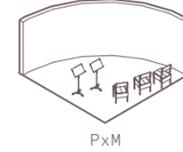
HxM



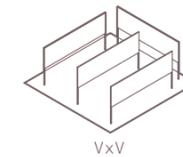
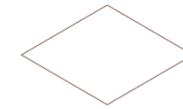
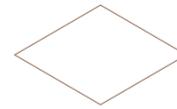
PxP



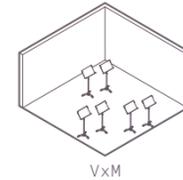
PxV



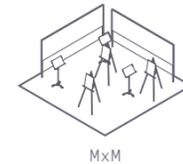
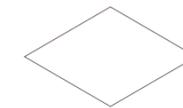
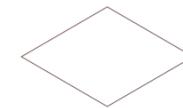
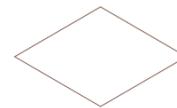
PxM



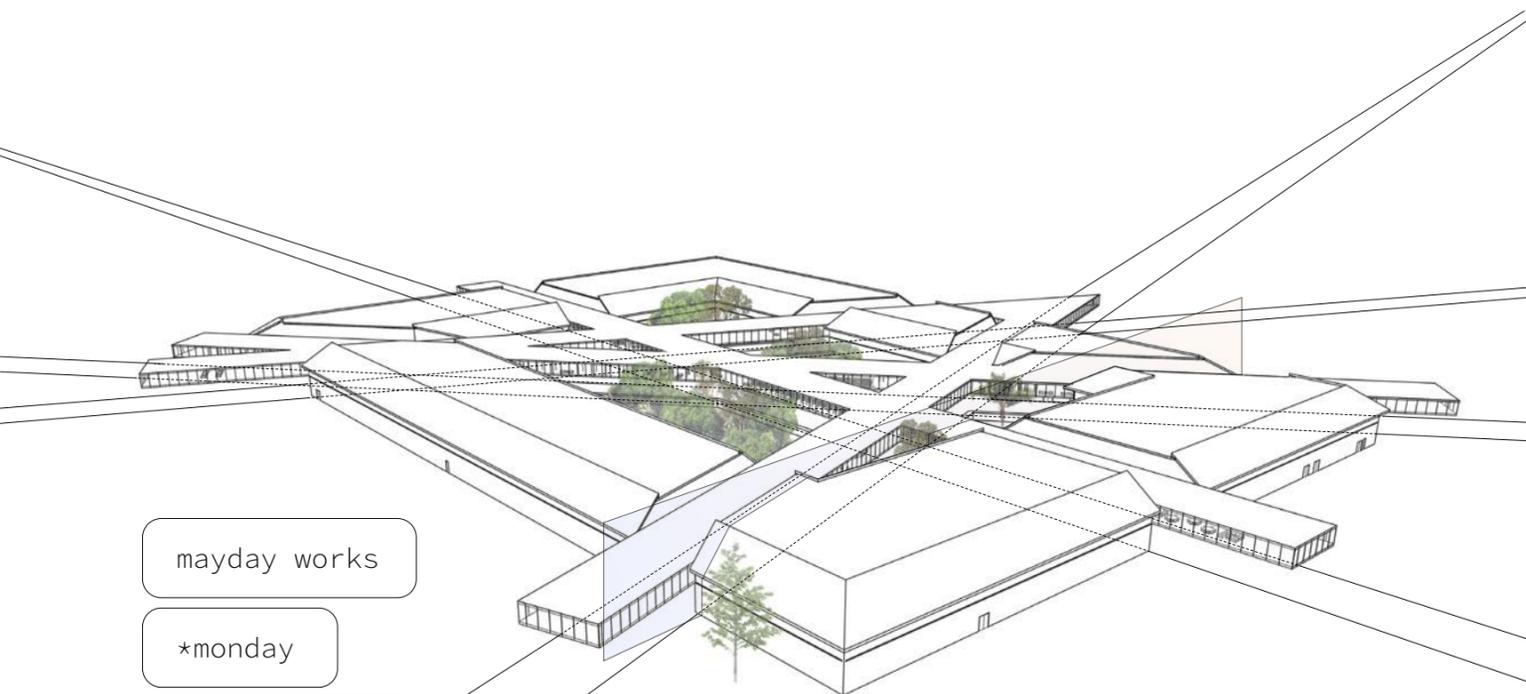
VxV



VxM



MxM



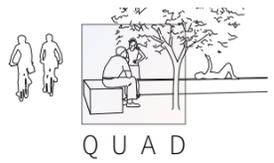
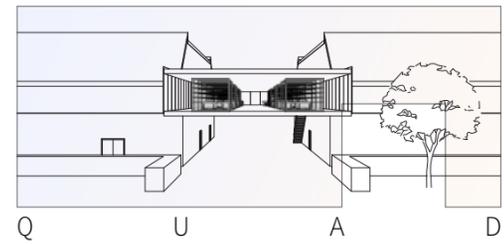
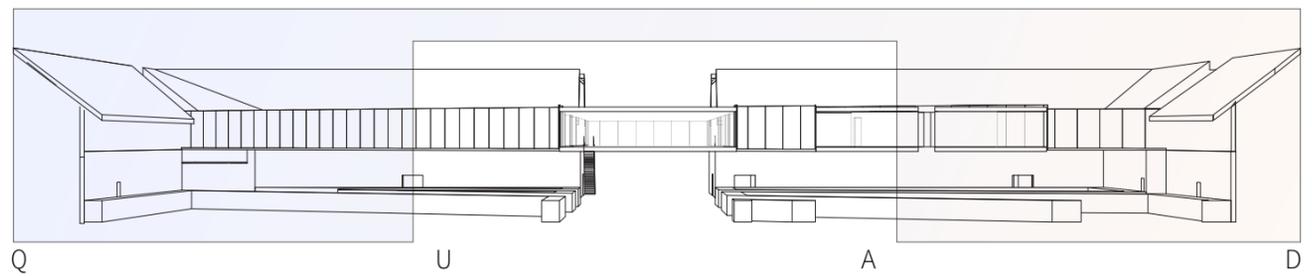
mayday works

\*monday

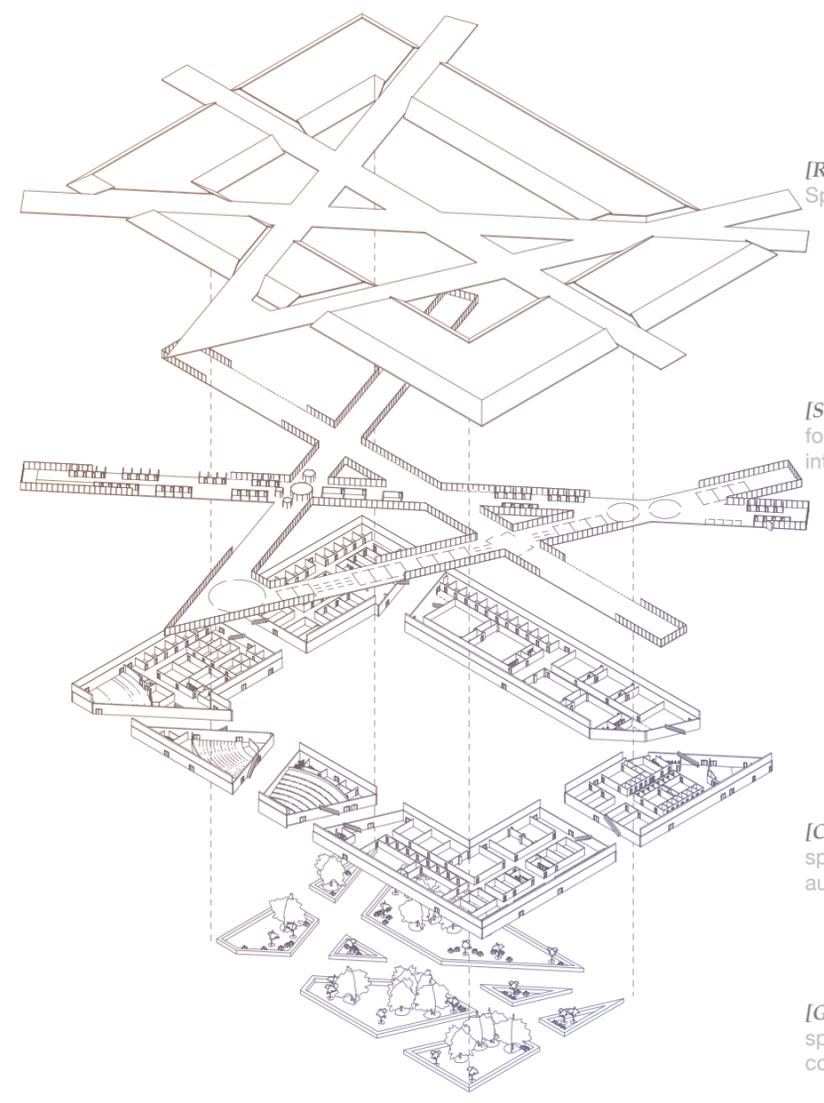
where should we meet up?

the quad?

\*said no student ever



the \*quad



[Roofs] Stanford's iconic Spanish tiles.

[Studios] Practice spaces for students as "ribbons" of intersecting program.

[Classrooms] Discipline-specific classes and auditoriums for instruction.

[Gardens] Intimate quadrangle spaces create nodes of collaboration.

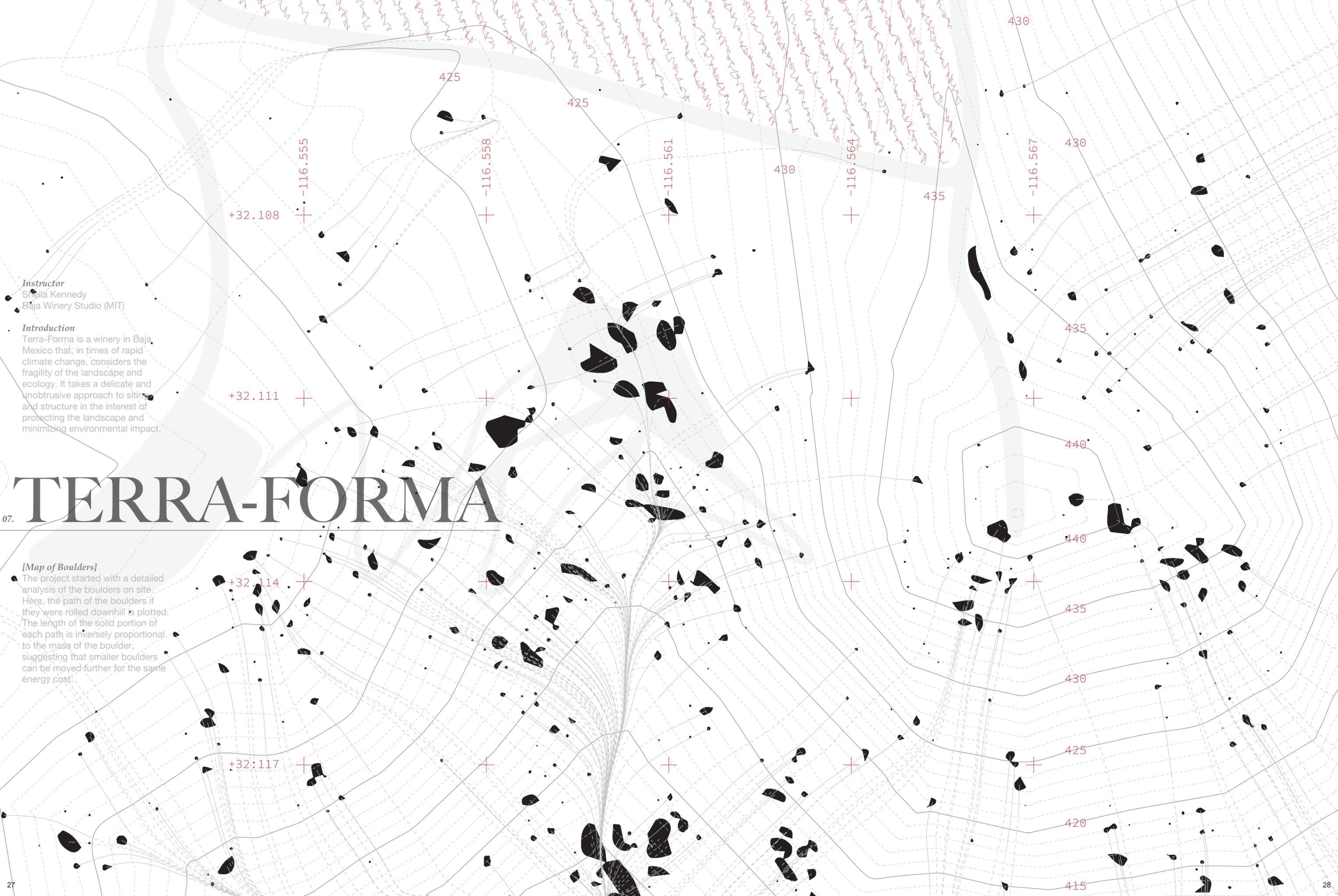


**Instructor**  
Sheila Kennedy  
Baja Winery Studio (MIT)

**Introduction**  
Terra-Forma is a winery in Baja Mexico that, in times of rapid climate change, considers the fragility of the landscape and ecology. It takes a delicate and unobtrusive approach to siting and structure in the interest of protecting the landscape and minimizing environmental impact.

# TERRA-FORMA

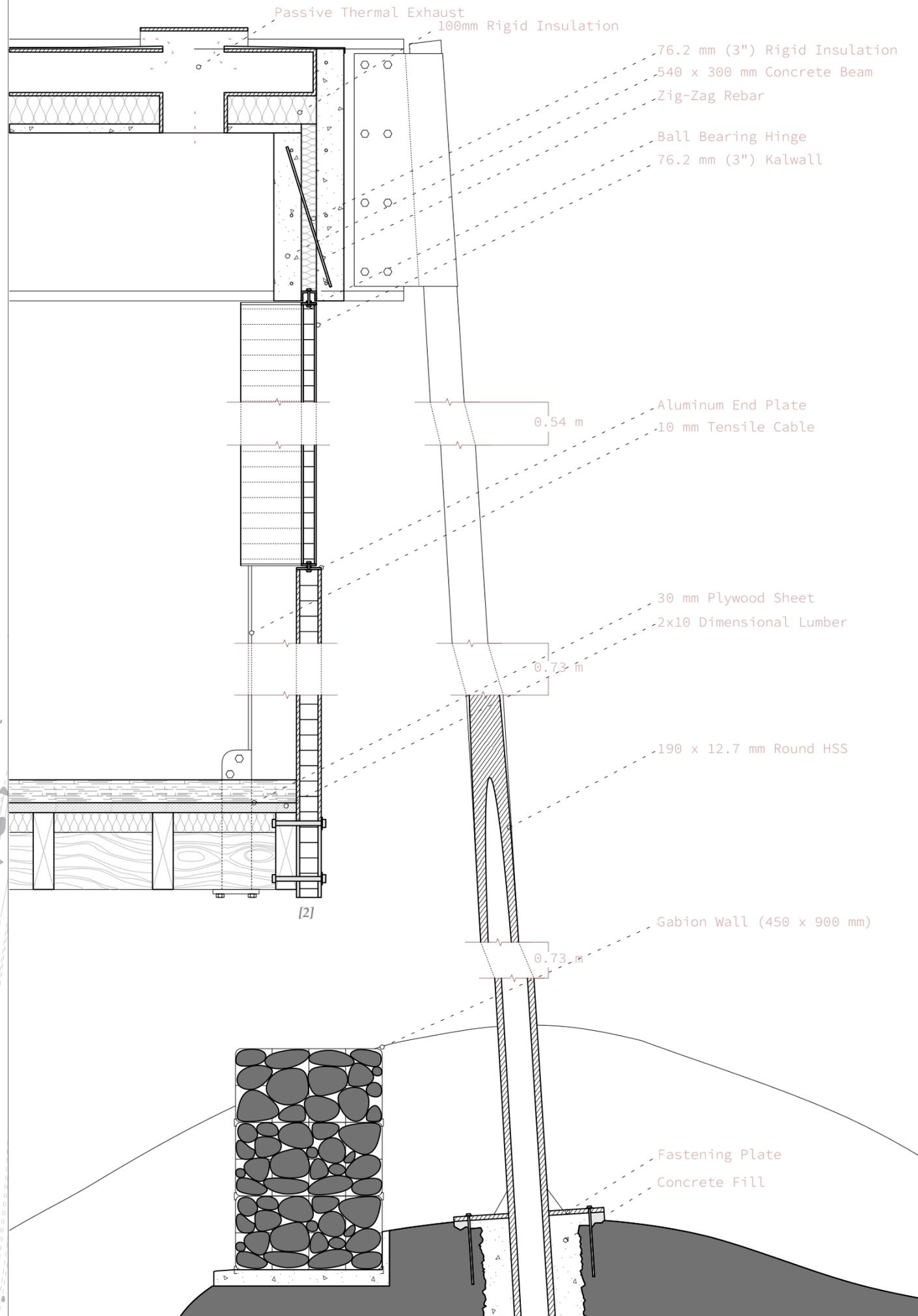
**[Map of Boulders]**  
The project started with a detailed analysis of the boulders on site. Here, the path of the boulders if they were rolled downhill is plotted. The length of the solid portion of each path is inversely proportional to the mass of the boulder, suggesting that smaller boulders can be moved further for the same energy cost.



[1] Terra Forma is sited at the start of a fold in the valley, on top of cluster of large rocks.

[2] The building does not actually touch the ground, but rather uses the rocks as natural footings and is suspended above the landscape. This not only removes the need to drive piles, but also avoids leveling and reshaping the site.

[3] Clustered columns spring upward from the rocks and support a network of beams. As a result, the rest of the building, with the exception of the gabion walls, are suspended from the roof and are necessarily as lightweight as possible.



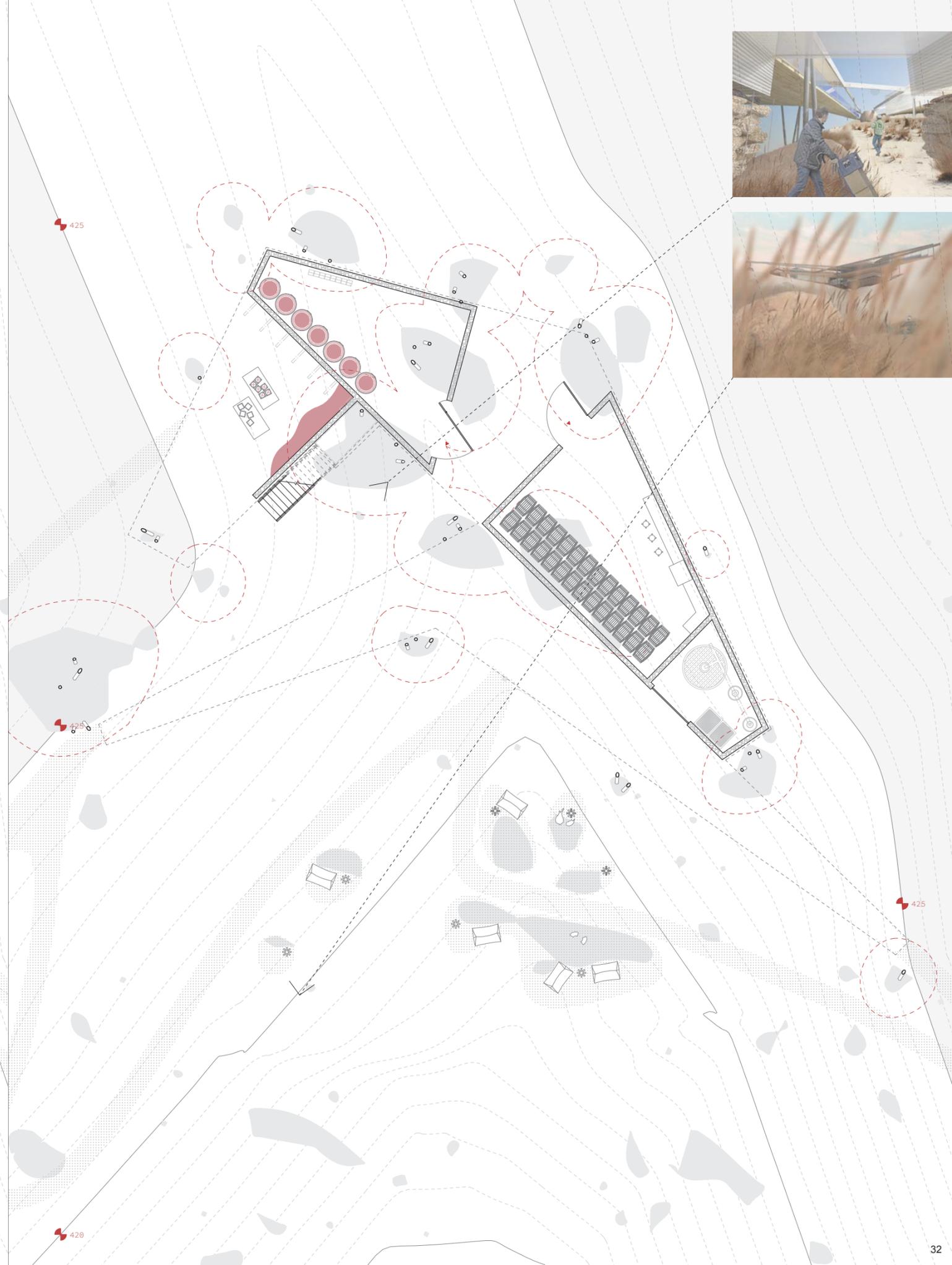
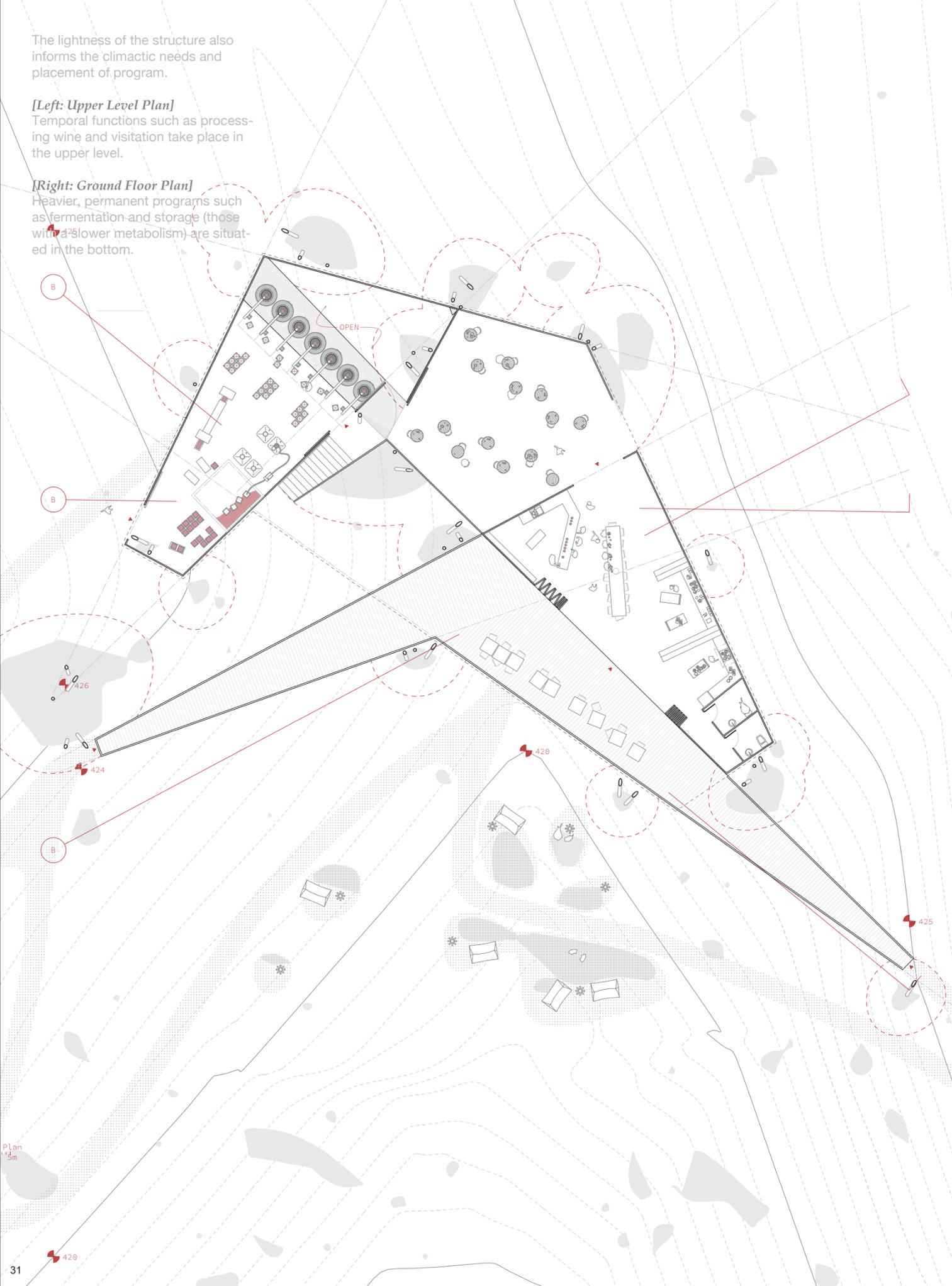
The lightness of the structure also informs the climactic needs and placement of program.

**[Left: Upper Level Plan]**

Temporal functions such as processing wine and visitation take place in the upper level.

**[Right: Ground Floor Plan]**

Heavier, permanent programs such as fermentation and storage (those with a slower metabolism) are situated in the bottom.



[1] Large boulders provide thermal mass to regulate the conditions required for fermentation.

[2] A superheated air channel above the insulation of the roof draws air from below. This inductive process allows the lower level, with a higher thermal mass, to balance the upper.

[3] Detail of structure meeting roof

[4] Detail of corner of floor

[5] Detail of thermal vent

[6] A quick test to compare distance moved by rock and cost of additional structural material required to account for cantilever shows that the embodied energy in moving the rocks is negligible.

[7] Initial form finding and optimization to test which rocks to use for columns and how far each column leans outward.

[8] Structural model showing flexible J-bracket to interface with beams.

