

# PORTFOLIO

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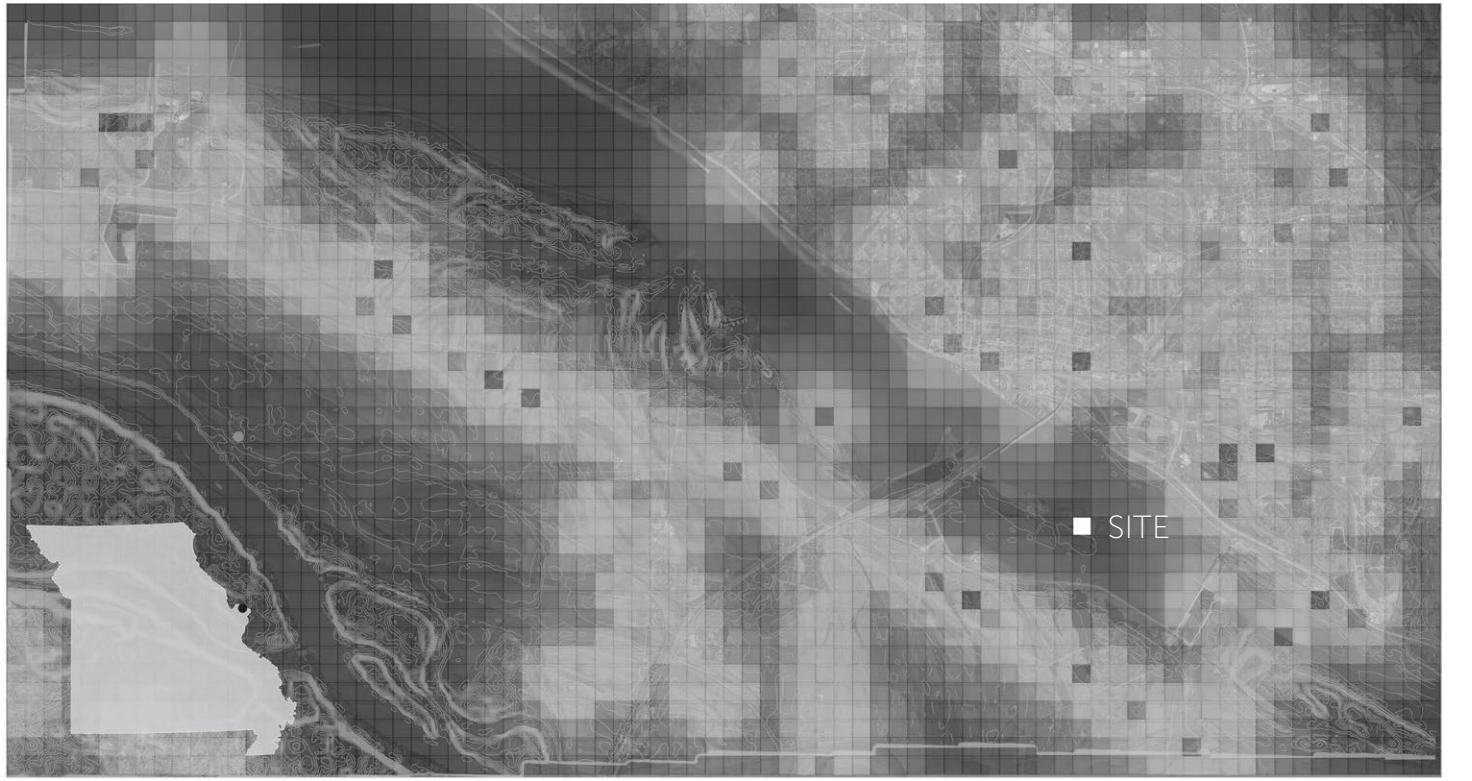
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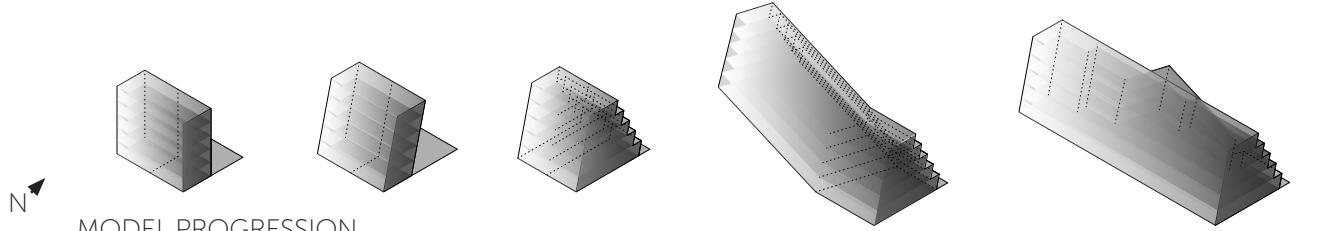
THERMAL DATA SPA

Spring Studio 2017  
Instructor: Chandler Ahrens

The data center is a recent form of infrastructure that is essential to the modern utility network but often hidden from the public sphere. This project attempts to utilize the byproduct of data centers, heat, to create a mixed use spa/ data center facility for the public.



ELECTROMAGNETIC RADIATION MAP

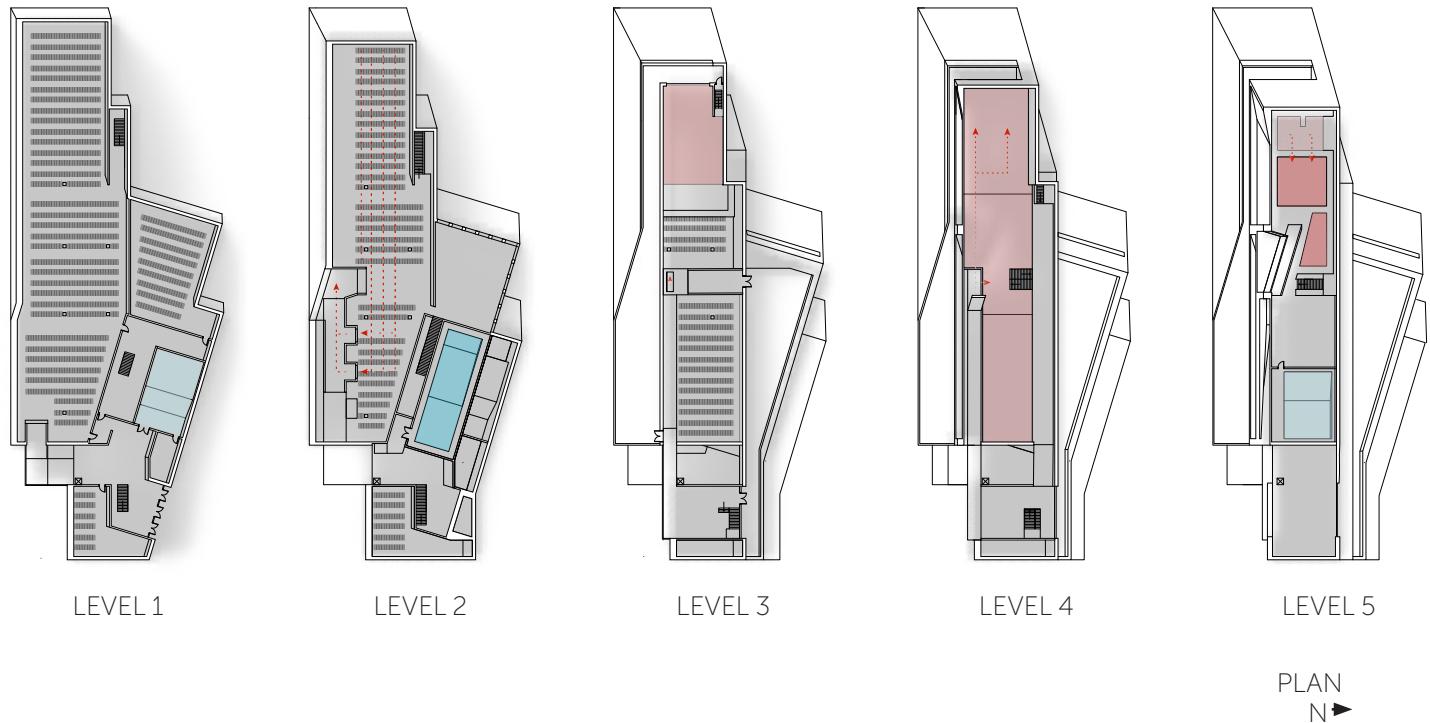


MODEL PROGRESSION  
N

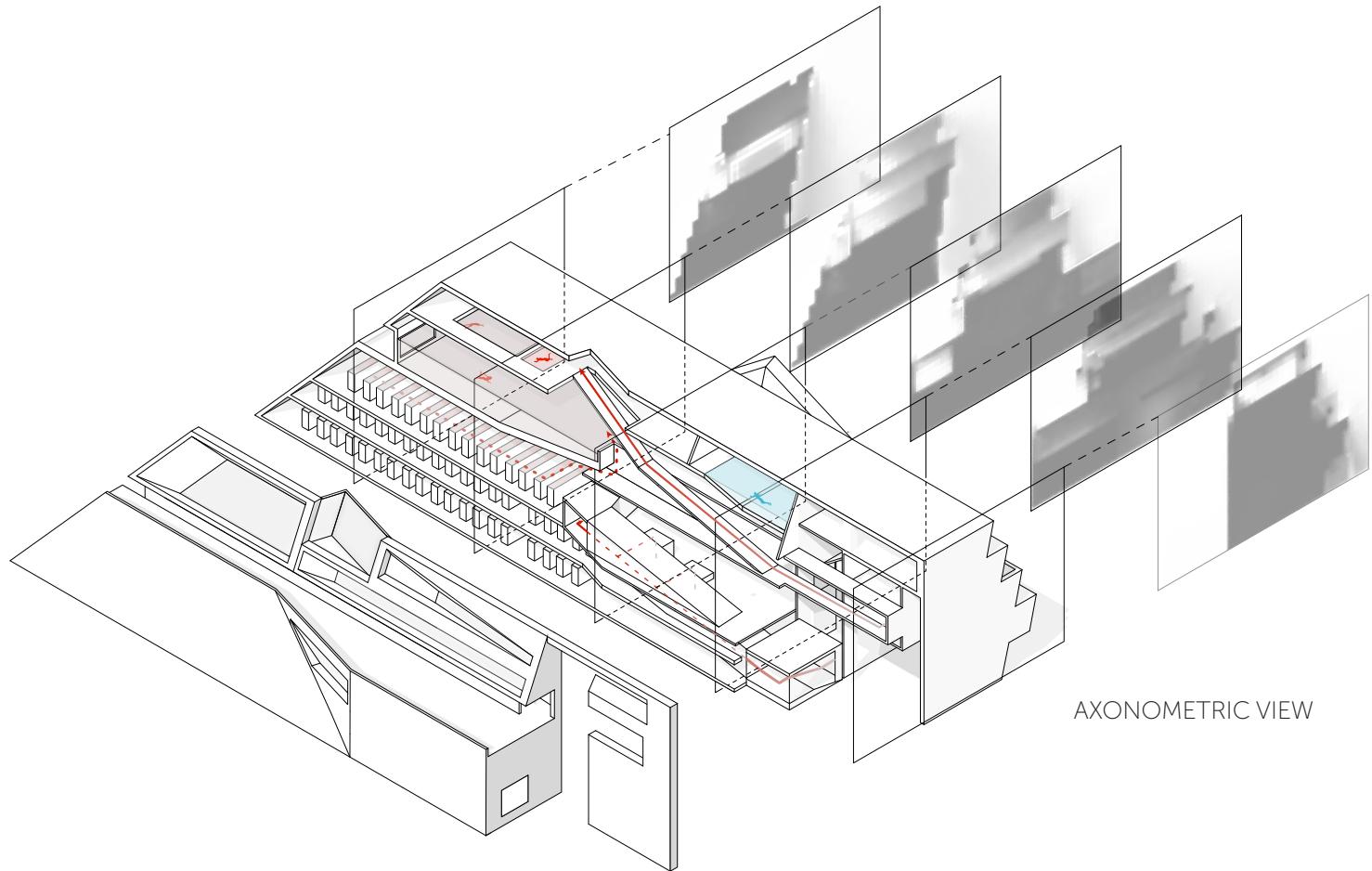
West Alton, MO, is a low occupancy area with more infrastructure than population. The main footprint created by the area's infrastructure (cell towers, power plants, and power lines) in the form of the electromagnetic radiation was plotted in context with the project location. Data centers require immense amounts of electricity necessitating its

The structure was sloped to lean towards the north direction to maximize solar gain on the southern facade, reducing the amount of heating necessary to maintain warm temperatures for the upper level spas.

AIR FLOW   
WARM POOL   
COOL POOL



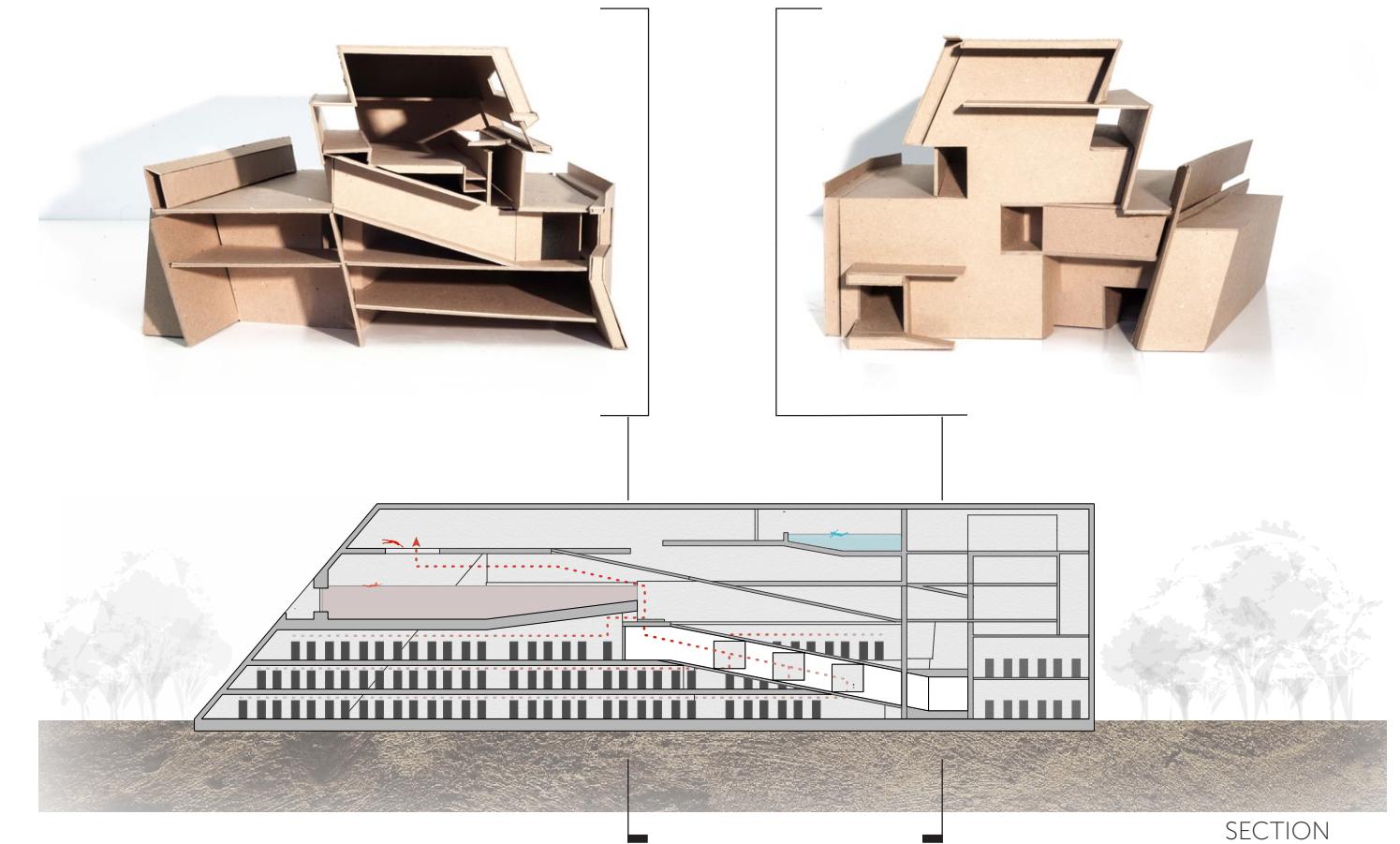
The prototype for the data center/spa utilizes an open floor plan in volumes that would benefit from air exchange. Warmer air rises upwards from the data servers in the lower levels into the warm spa area.



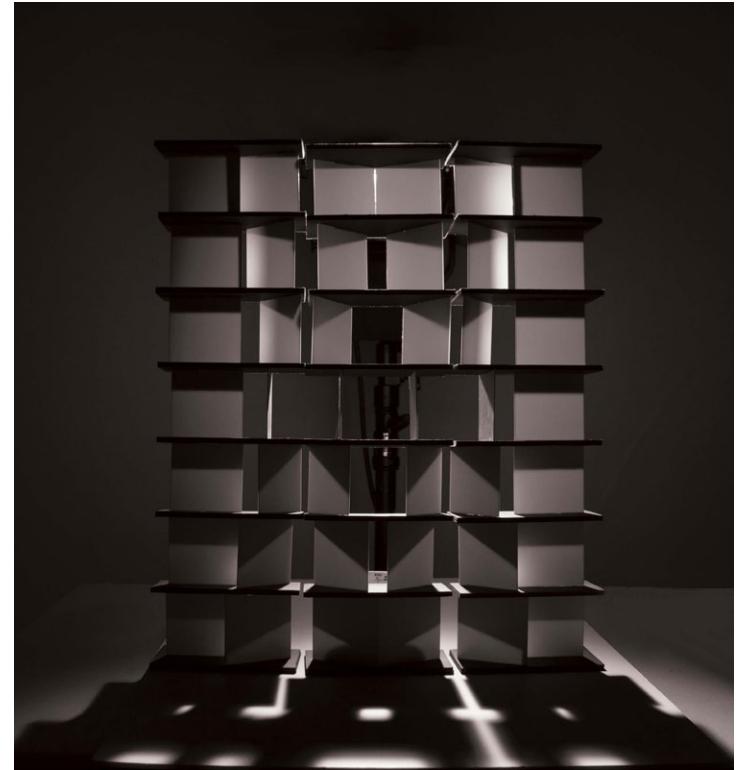
AXONOMETRIC VIEW

DIVA solar radiation simulation shows the heat gain mainly in the upper levels containing hot pools and saunas while the structural mass shields the lower levels containing cool pools and an ice bar.

The exterior concrete walls mitigate solar heat gain through the lower levels while large fenestration maximizes heat gain on upper floors.



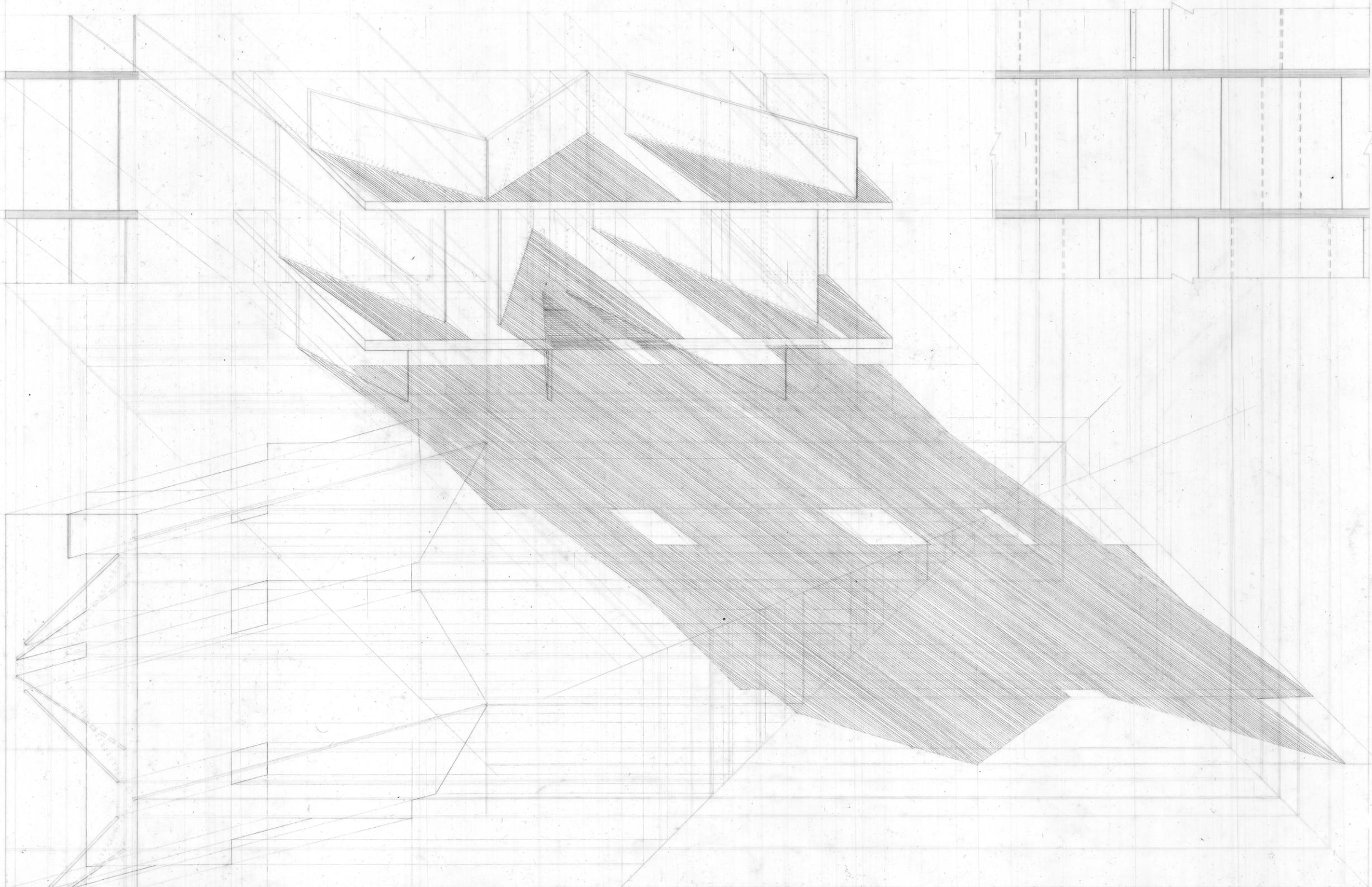
The corridors and ramps of the building function as circulatory paths for both humans and air.



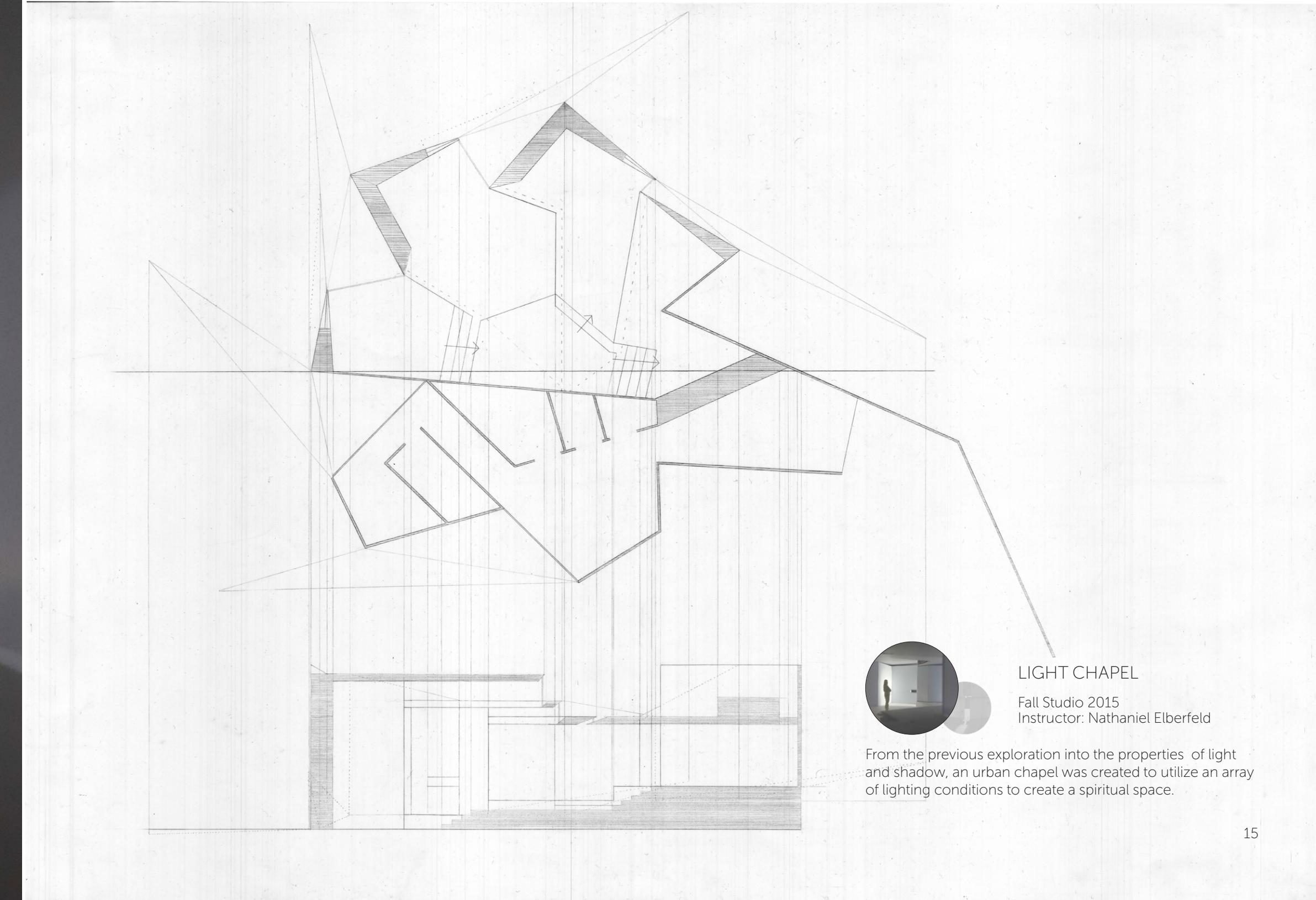
### LIGHT CHAPEL DEVICE

Fall Studio 2015  
Instructor: Nathaniel Elberfeld

The most striking characteristic of light is the array of intensities it can produce. The light device captures all the diverse effects using a series of panels set to radially shifted angles. The result is a spectrum of ambient to direct light.



The graphite drawing on mylar illustrates the shadows created by directional light. The specific shadow that is captured highlights that shadows are the main experience of the model, and not the structure.

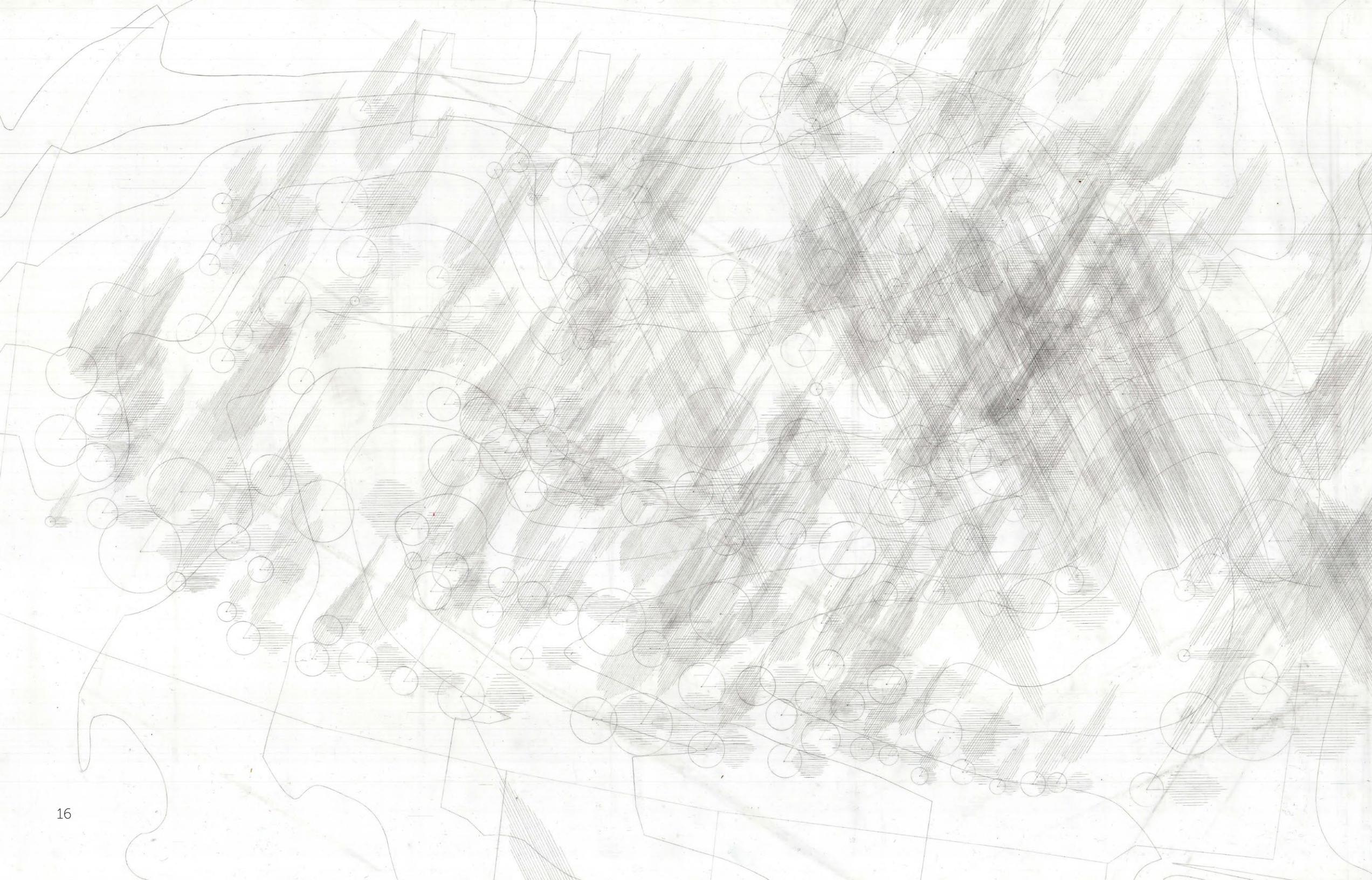


### LIGHT CHAPEL

Fall Studio 2015  
Instructor: Nathaniel Elberfeld



From the previous exploration into the properties of light and shadow, an urban chapel was created to utilize an array of lighting conditions to create a spiritual space.



The site of Concordia Seminary Park possesses a natural landscape and scenery in the urban St. Louis.

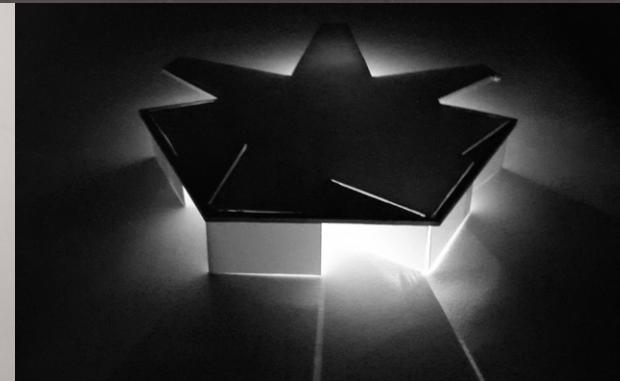
The site drawing uses the topography and solar angles to map tree shadows that reveal areas of light contrast. The chosen site has the greatest contrast in lighting conditions throughout the day.



The light chapel uses both changing floor elevations and wall angles to provide the most diverse lighting conditions on the site. The main atrium provides a meeting space along the steps for the passersby or long-term visitor.

Within the interior environment, the lighting conditions dictate the private and public space. Dynamic lighting filled lively spaces while softer light bathed areas of refuge.

A series of prototype models using an array of angled walls reveal a variety of light conditions during the night and day.

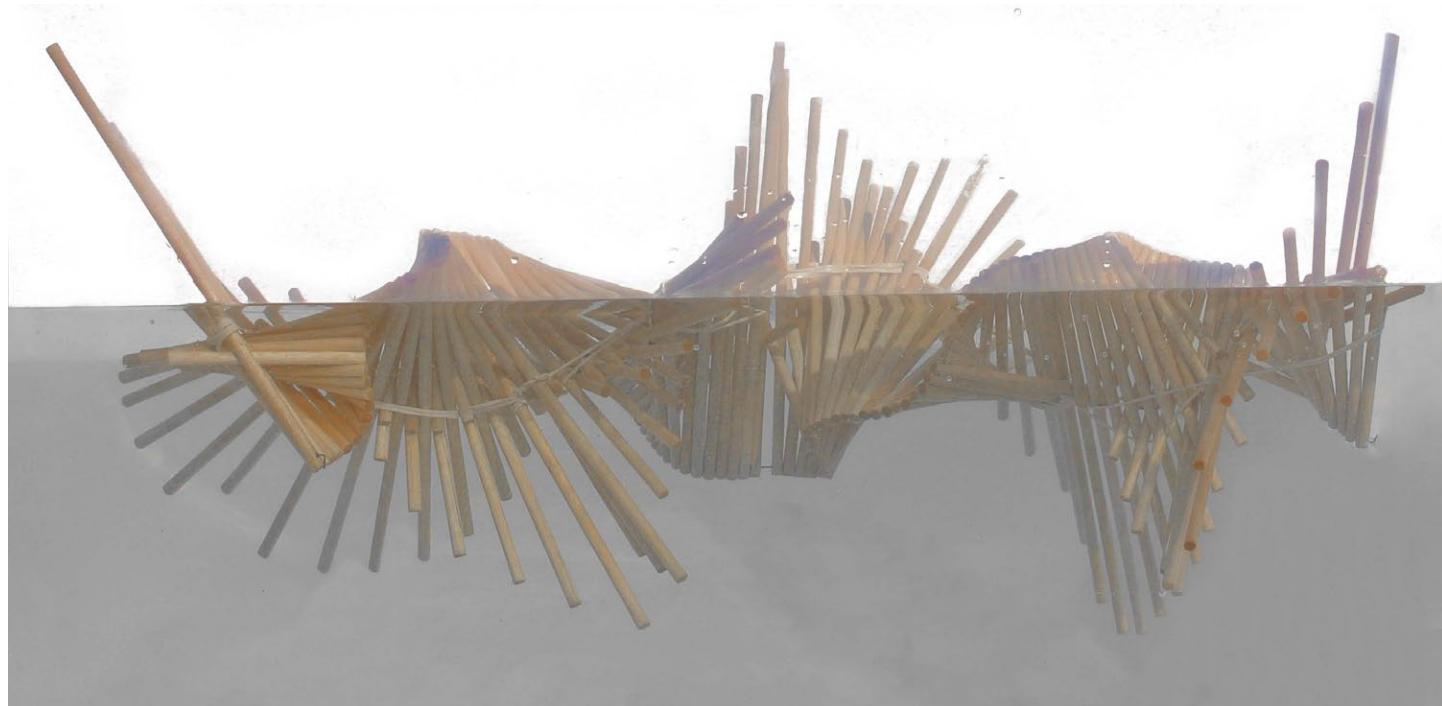




### FLOOD CENTER: DEVICE

Fall Studio 2016  
Instructor: Jason Ward

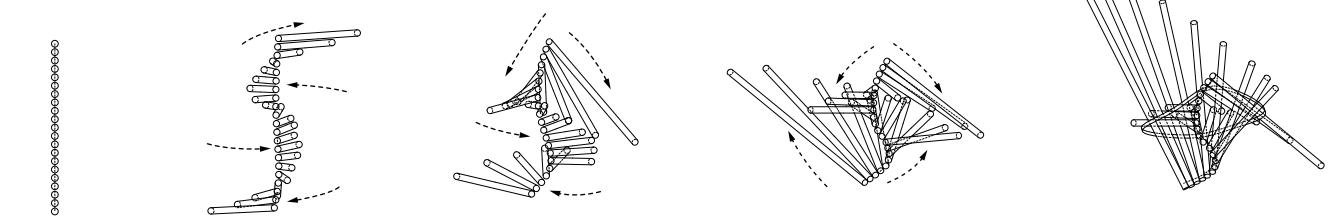
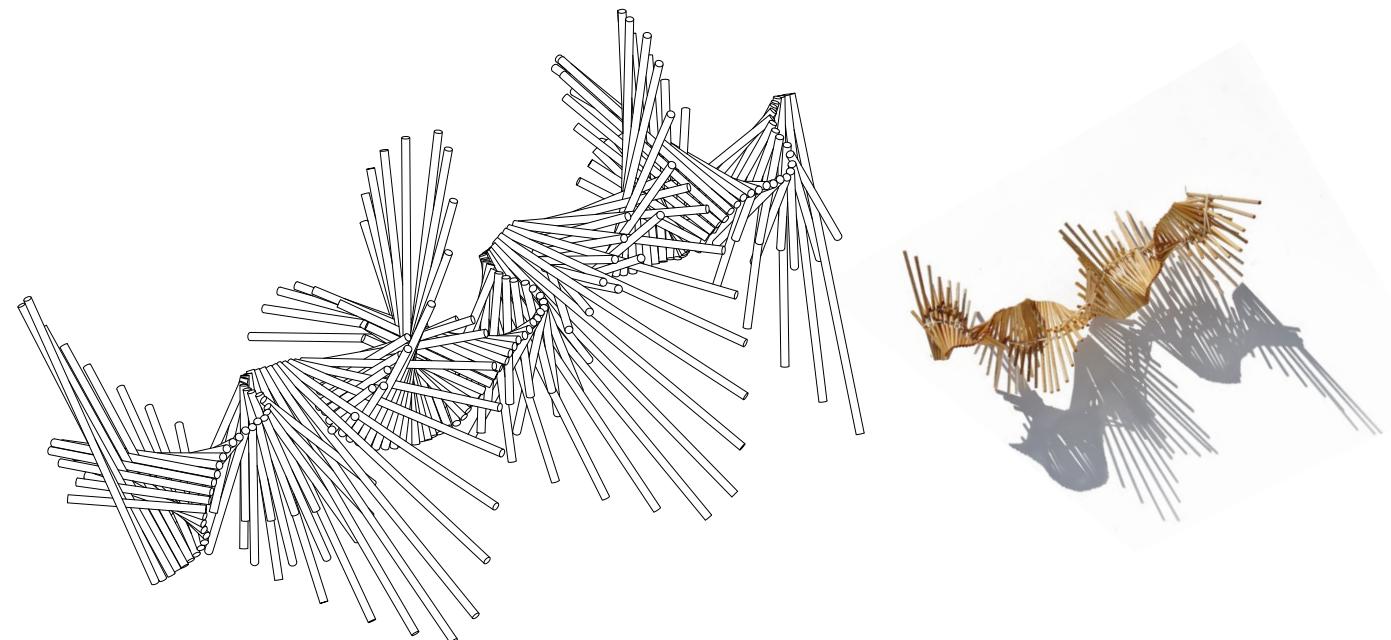
Hydrological infrastructure manifests in many forms to engage with water.. Wood serves as a buoyant material that allows for the form of a model to dictate specific movements while floating in water.



FLOATING POSITION



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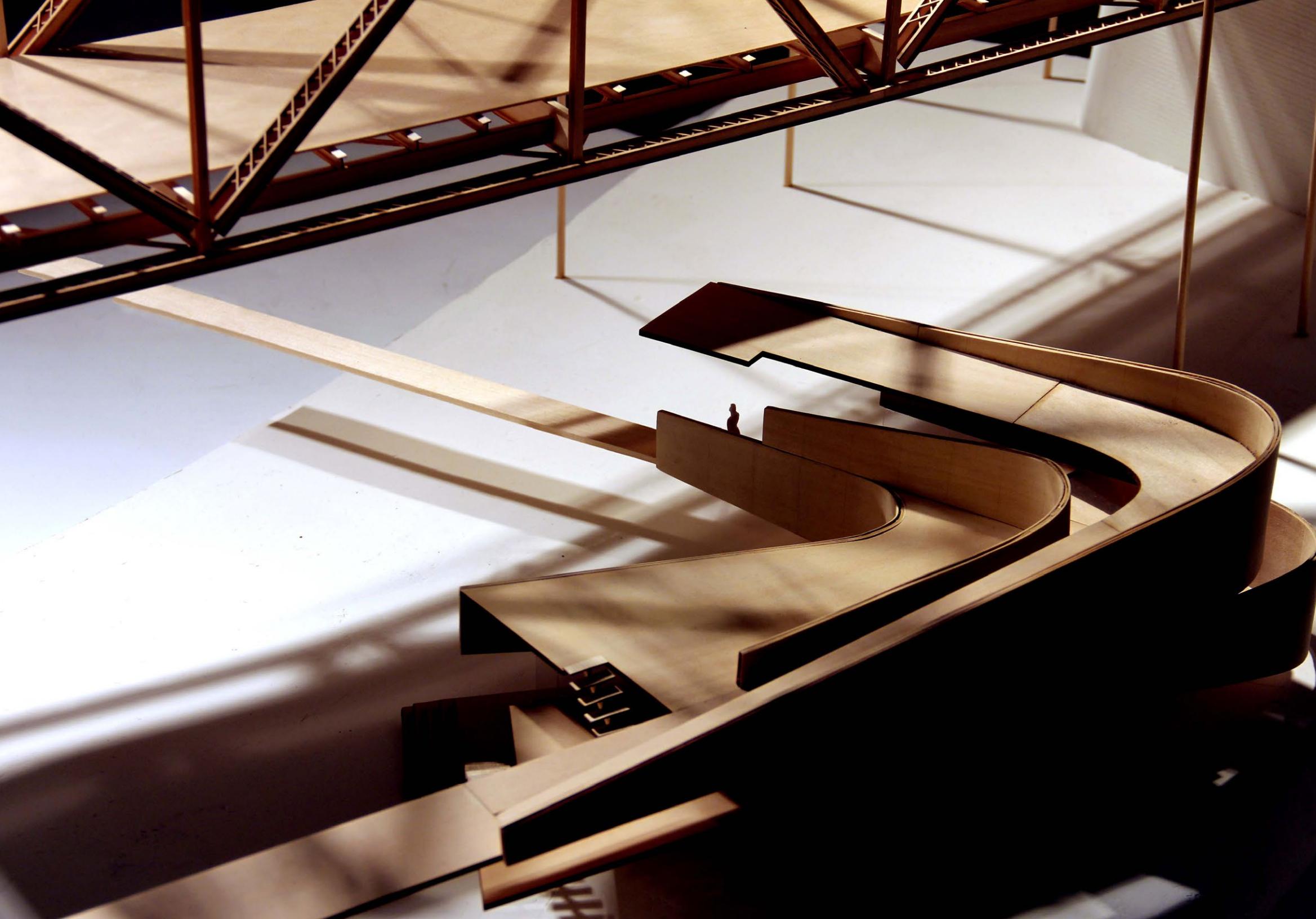


MODULE ASSEMBLY



Modules are constructed out of basswood dowels that are threaded by wire and then bound in tension by bands. The use of a single material places the resting position in water constant, regardless of external stimuli.

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FLOOD CENTER  
Fall Studio 2016  
Instructor: Jason Ward

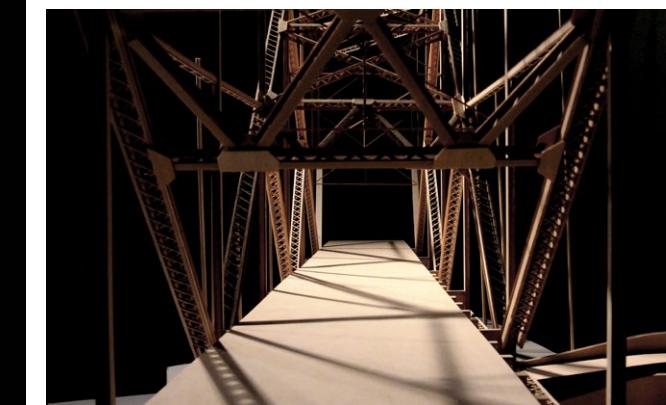
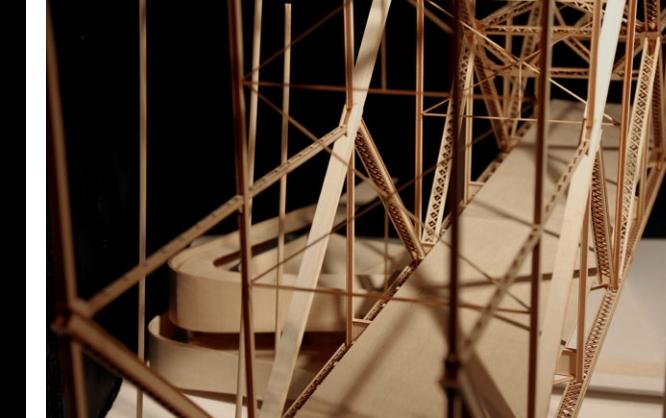
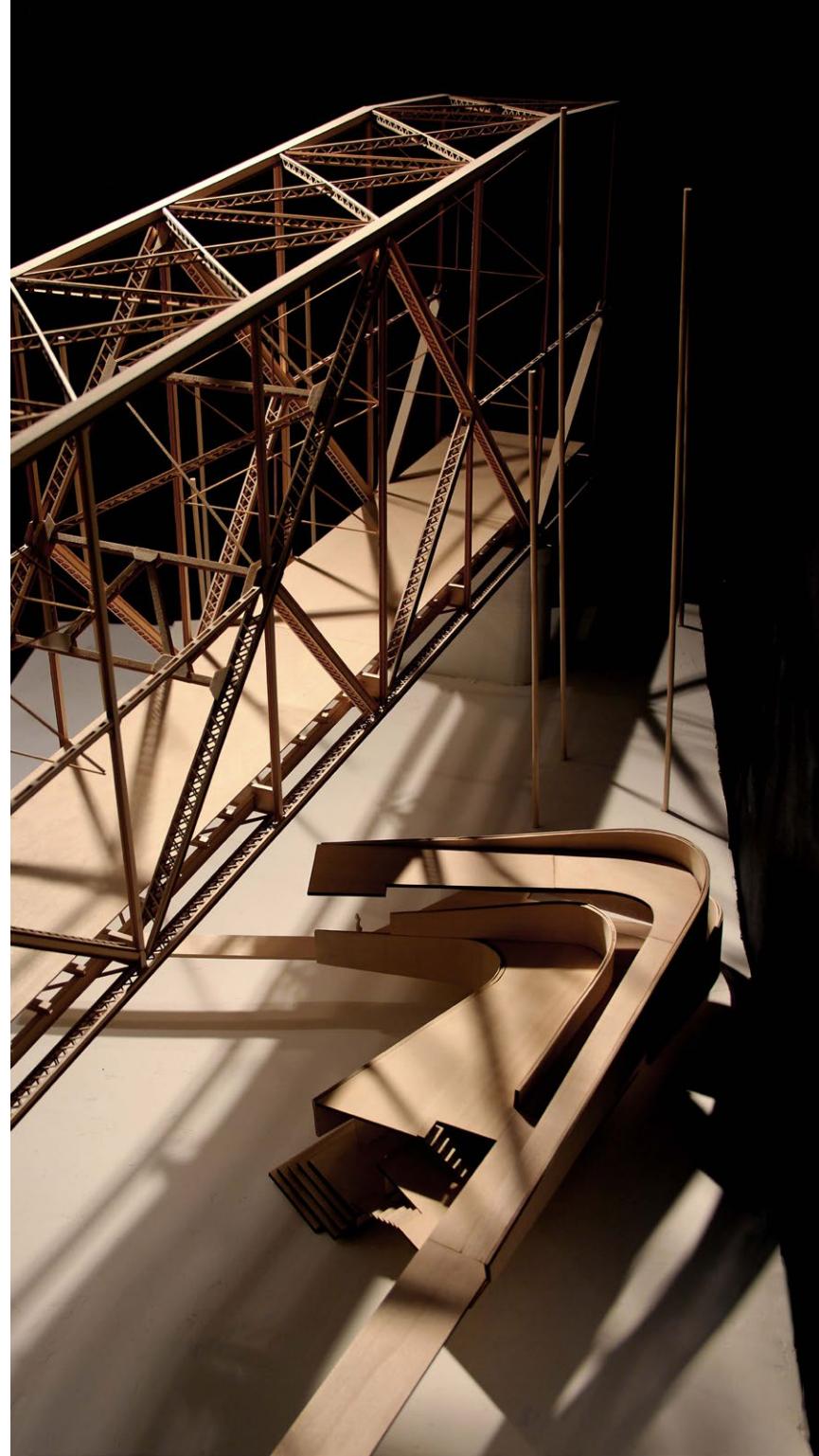
Flooding is most powerfully experienced at the level of the flood plain. Branching off from the Chain of Rocks Bridge, the flooding research lab occupies the 500 and 100 year old flood plains.



Located north of St. Louis, the Historic Chain of Rocks Bridge spans across the Mississippi River to bridge Missouri and Illinois. Underneath the bridge exist flood plains that flood every 10 year to 500 years.

Using a dot density map and string to track different flooding elevations, a site was chosen at the steepest change in topography near the bridge. At this location, flooding is most frequent and varied.

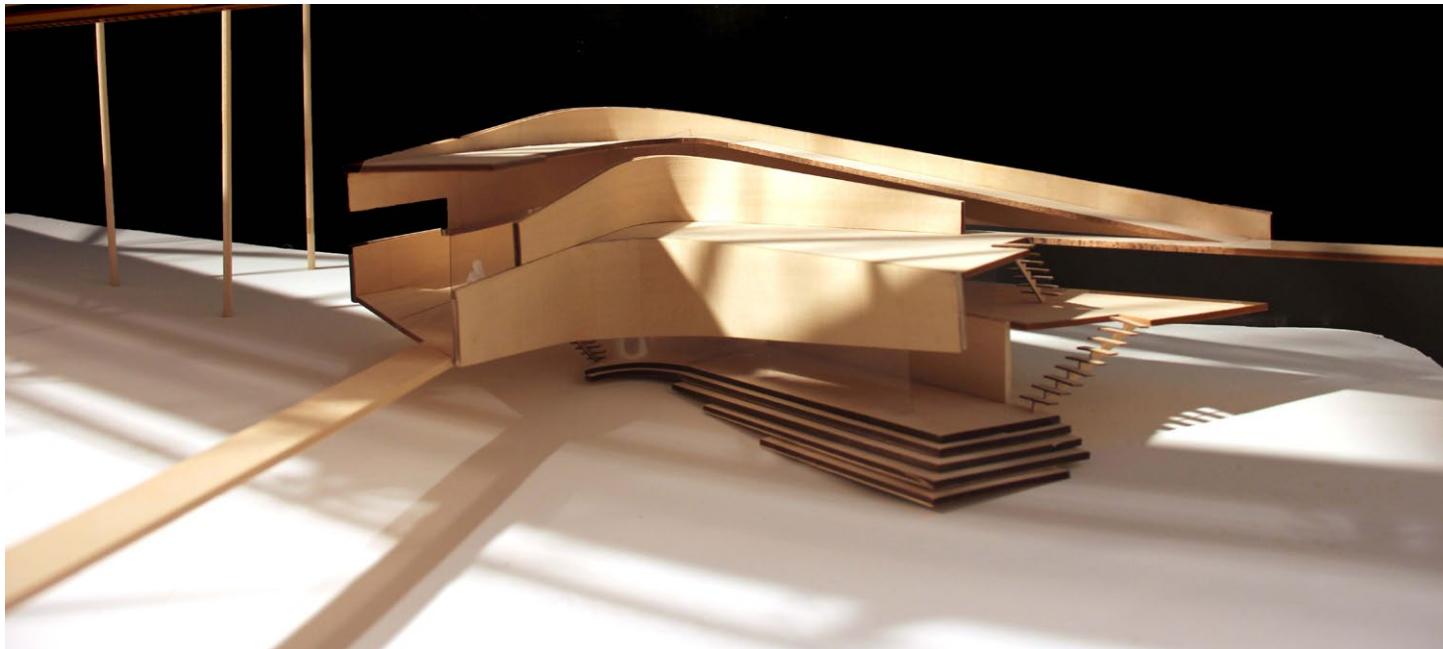
To access the site at the level of the 100 year and 500 year flood plain, a ramp spanning from the bridge was constructed.



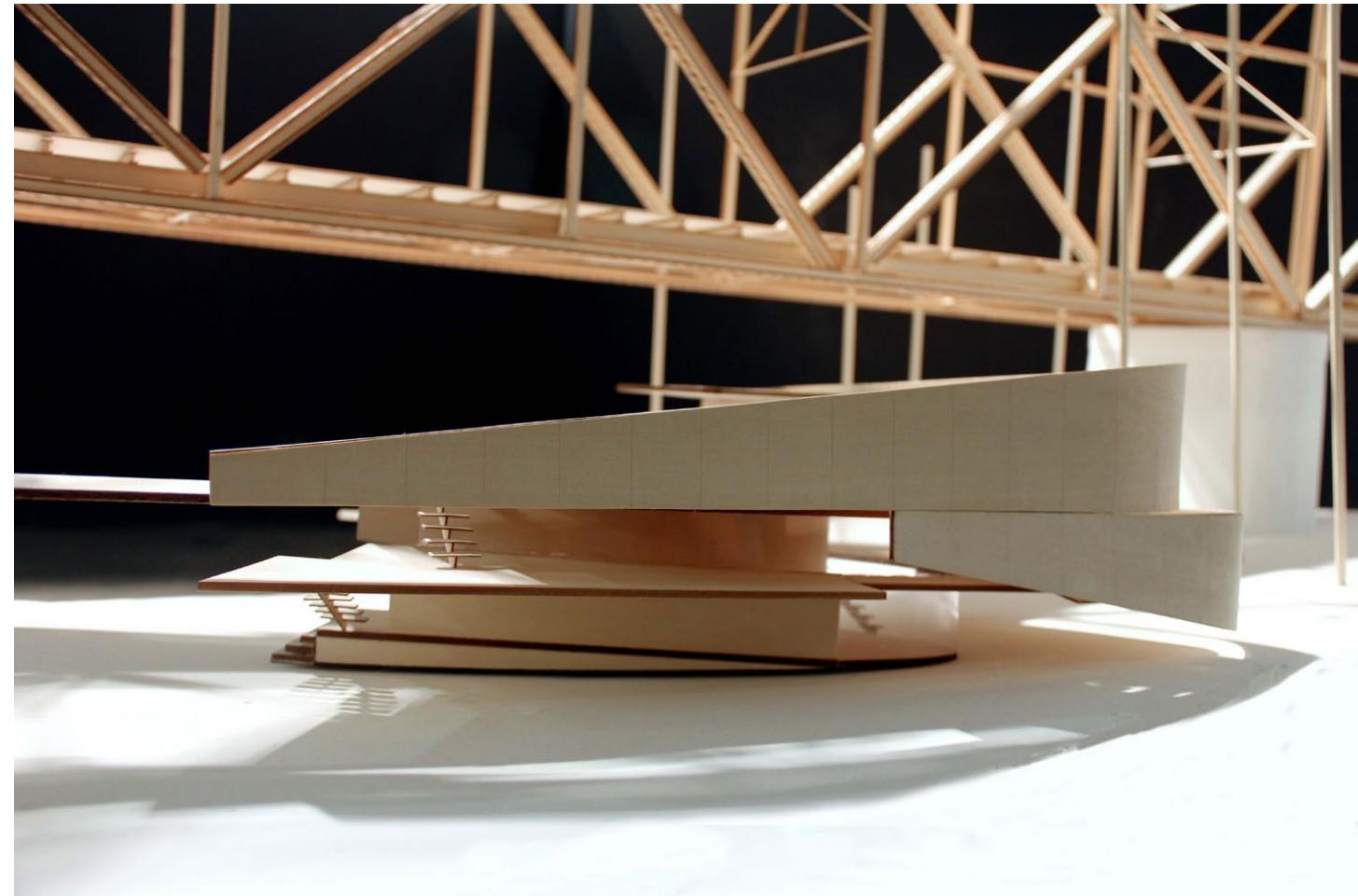
1:4 MODEL



Whereas the bridge seeks to connect people from land to land while avoiding water, the flooding center seeks to connect people to the intersection of land and water: at the floodplain.



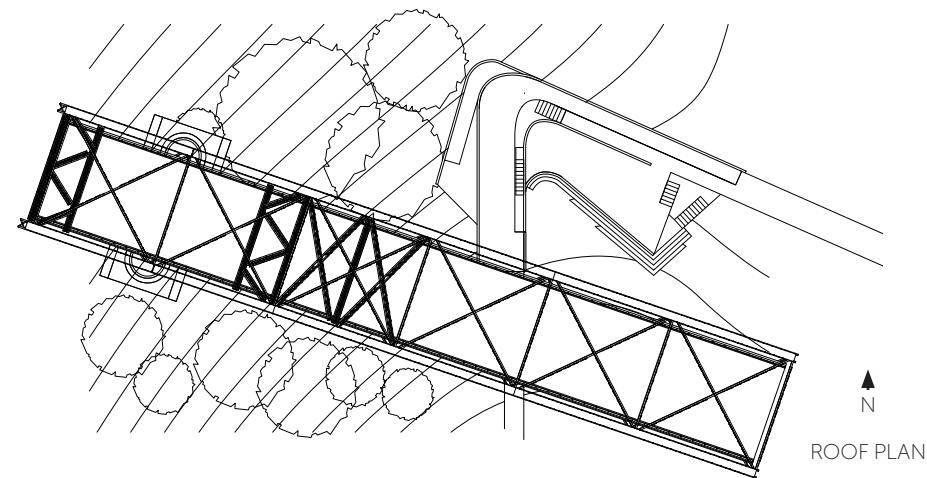
SOUTH ELEVATION



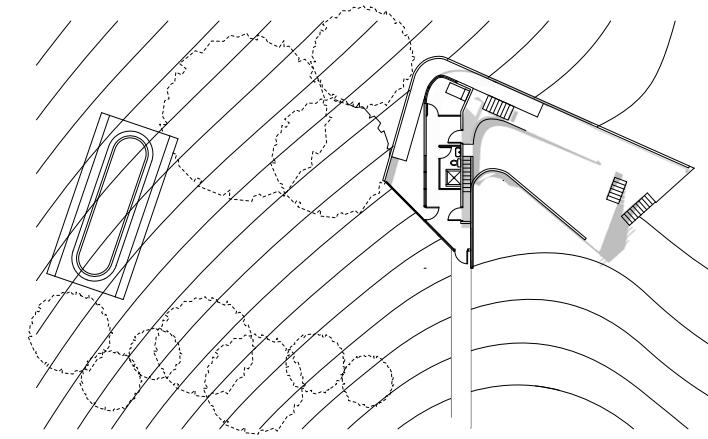
NORTH ELEVATION

The sloping concrete walls frame the observers' views below the horizon, focusing on the 100 year and 500 year flood plain elevation. The bridge also functions as a framing tool from the top-level observation deck while also providing solar shade.

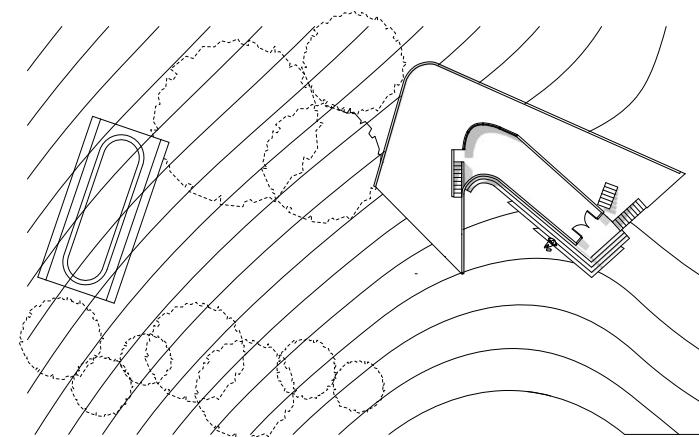




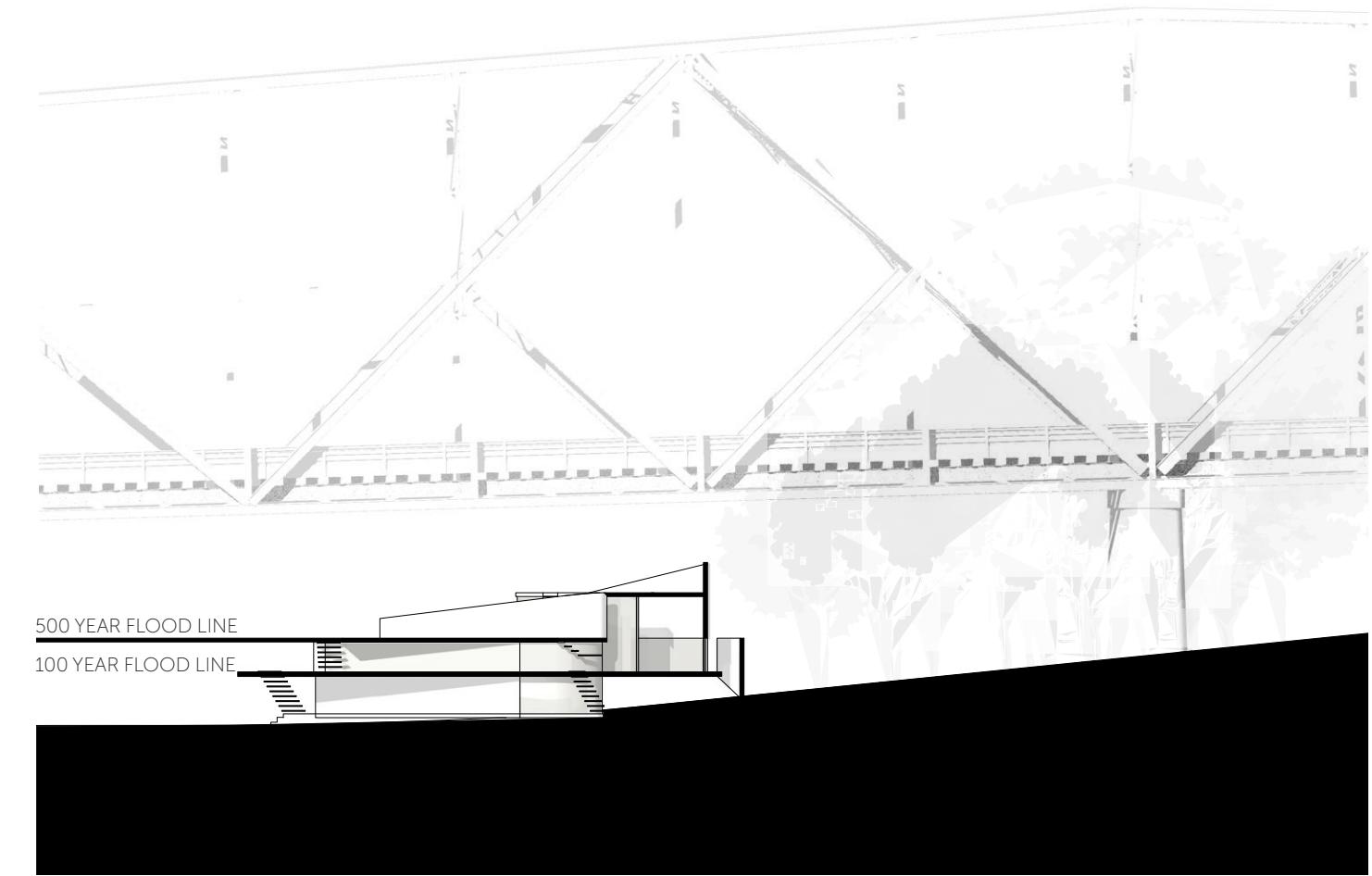
N  
ROOF PLAN



500 YEAR FLOOD LEVEL PLAN



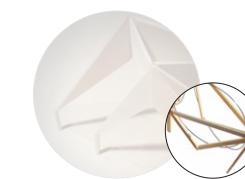
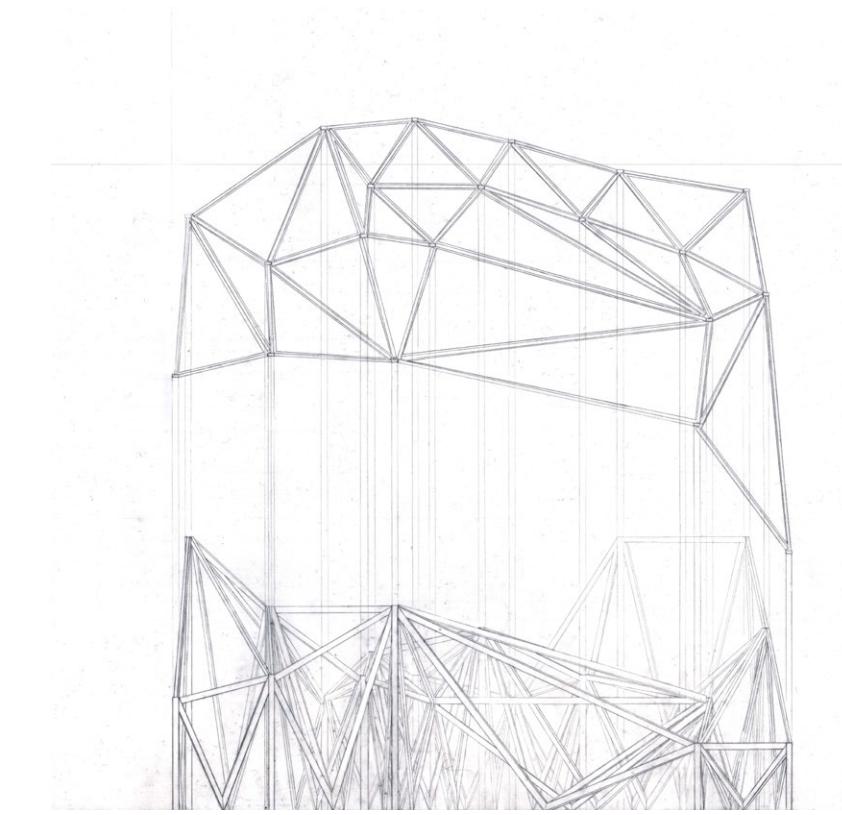
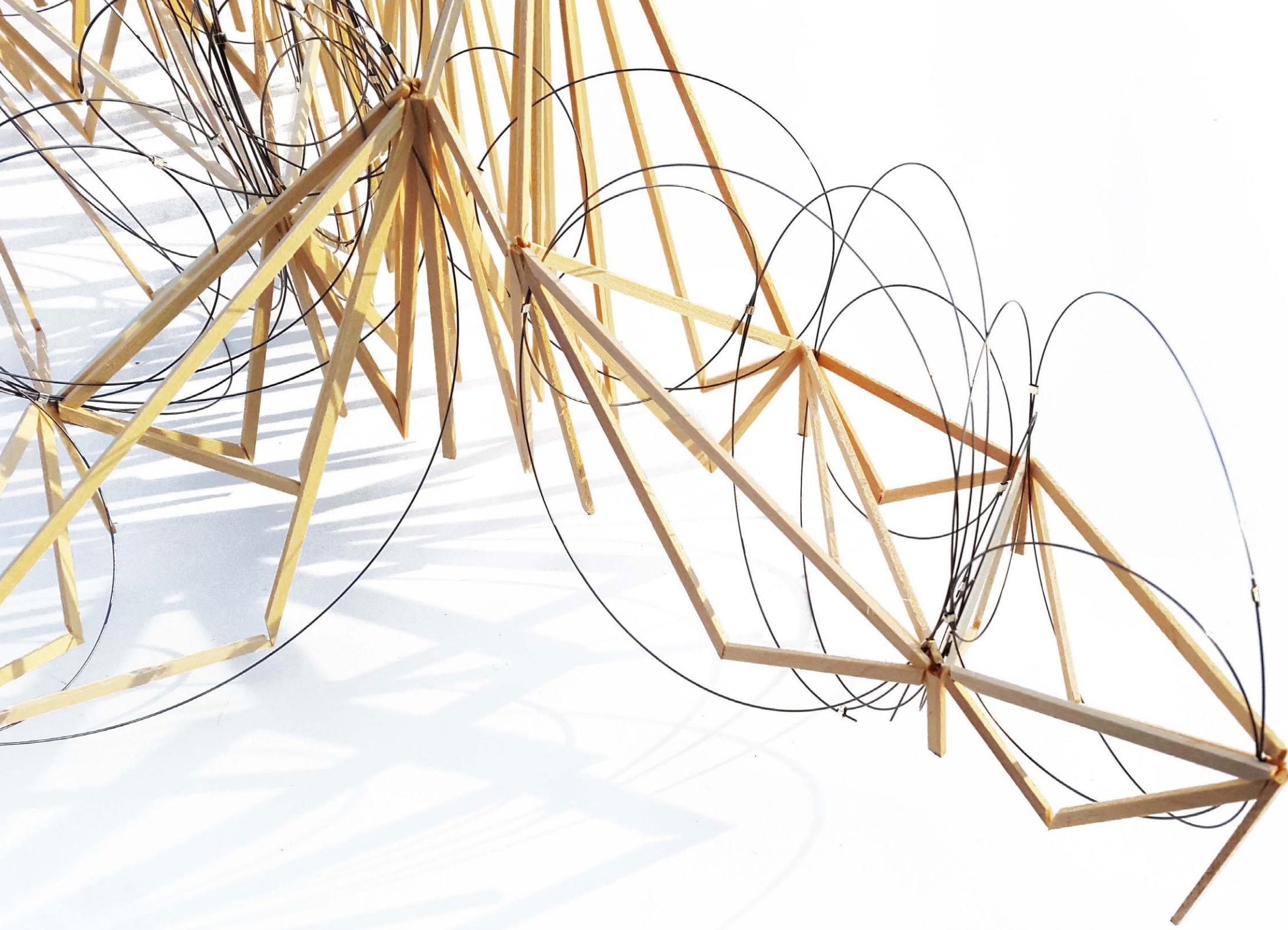
100 YEAR FLOOD LEVEL PLAN



500 YEAR FLOOD LINE  
100 YEAR FLOOD LINE

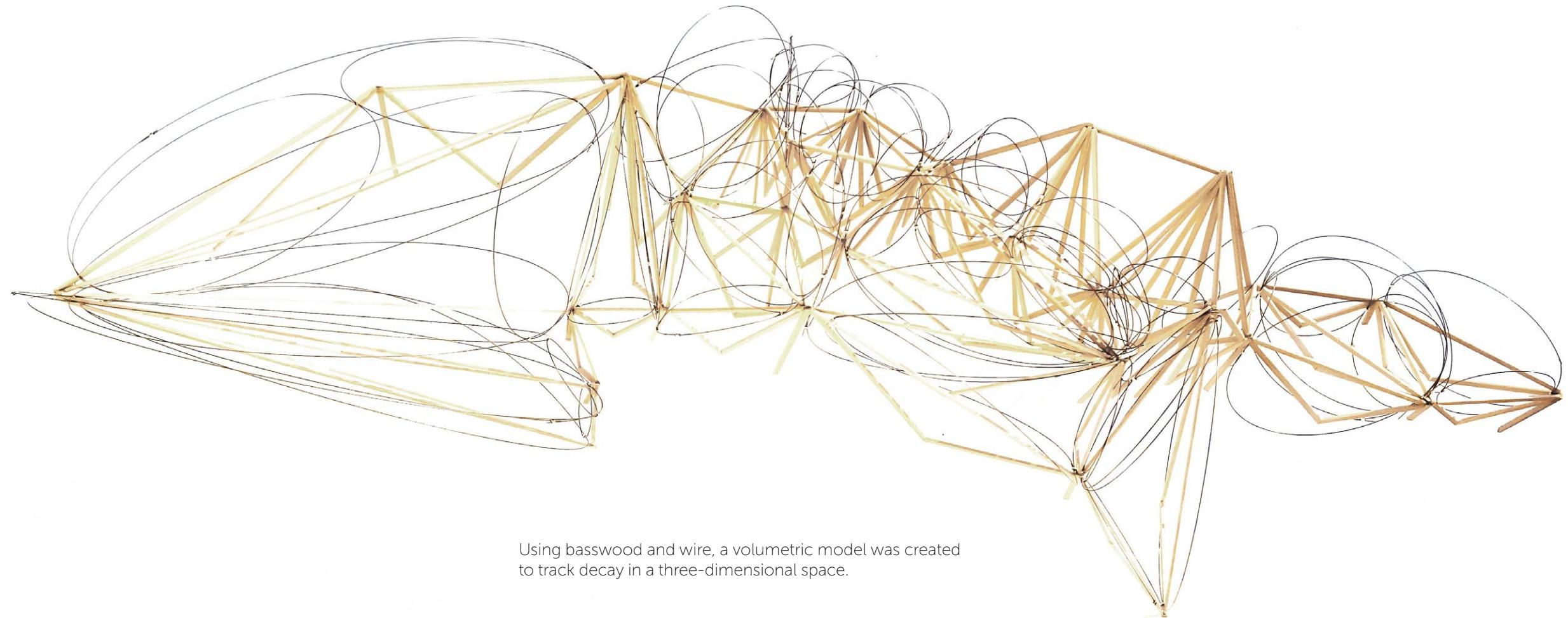
At the base of the center is an outdoor pavilion space where the public can congregate on steps to encounter the flood plains.

From the dwelling, a walkway extends to the south along the 100 year flood plain elevation to provide researchers with an uninterrupted experience of the site.



DECAY OBSERVATORY: DEVICE  
Fall Studio 2014  
Instructor: Elisa Kim

Growing out of the natural pattern are basswood structure and wire volumes. The 2D drawing is transformed into 3D structure that is then filled to become a solid.



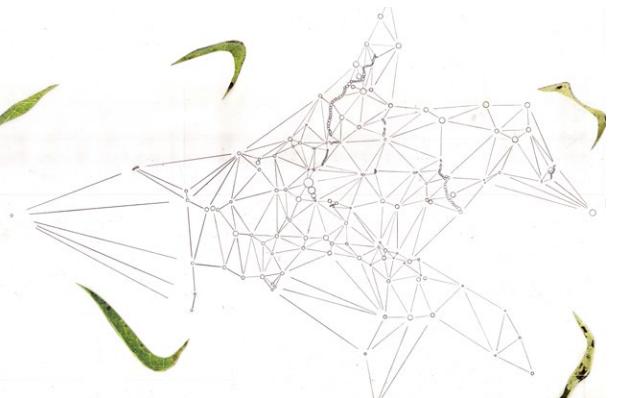
Using basswood and wire, a volumetric model was created to track decay in a three-dimensional space.



LEAF IN AUGUST



LEAF IN OCTOBER

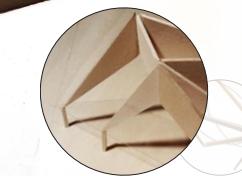


GRAPHITE DRAWING ON MYLAR



### DECAY OBSERVATORY

Fall Studio 2014  
Instructor: Elisa Kim



The park observatory allows for park-goers to appreciate the benefits of the public space. However, it is important to recognize the costs as well.

ART MUSEUM



MONUMENT



BIKE PATH



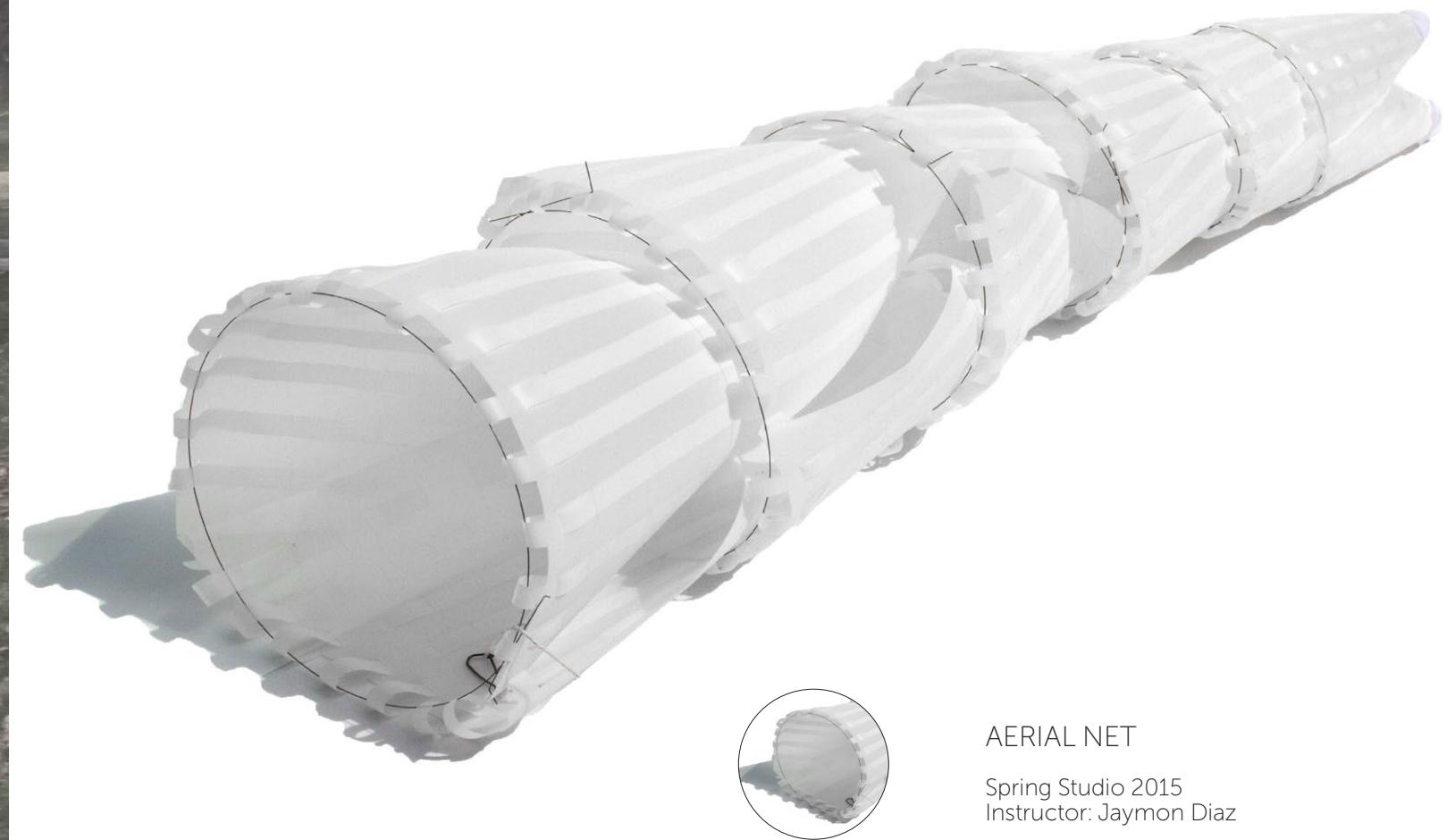
SEATING



In Forest Park, St. Louis, the park observatory sits along the main path through the scenery.

Using the form of the previous device, the sloping walls provide shade to observers while pointing towards instances where the park begins to "decay" into artificiality due to human intervention.

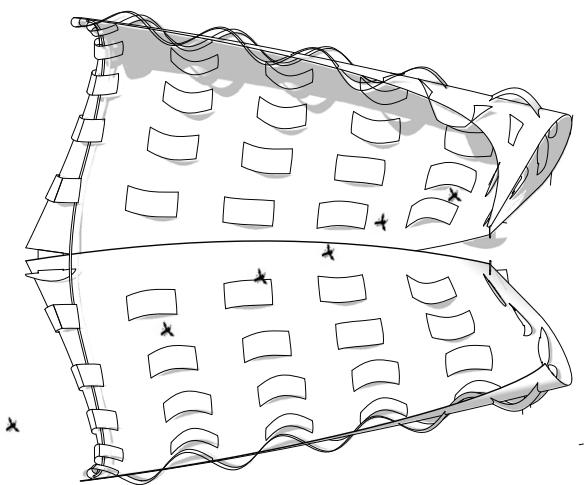
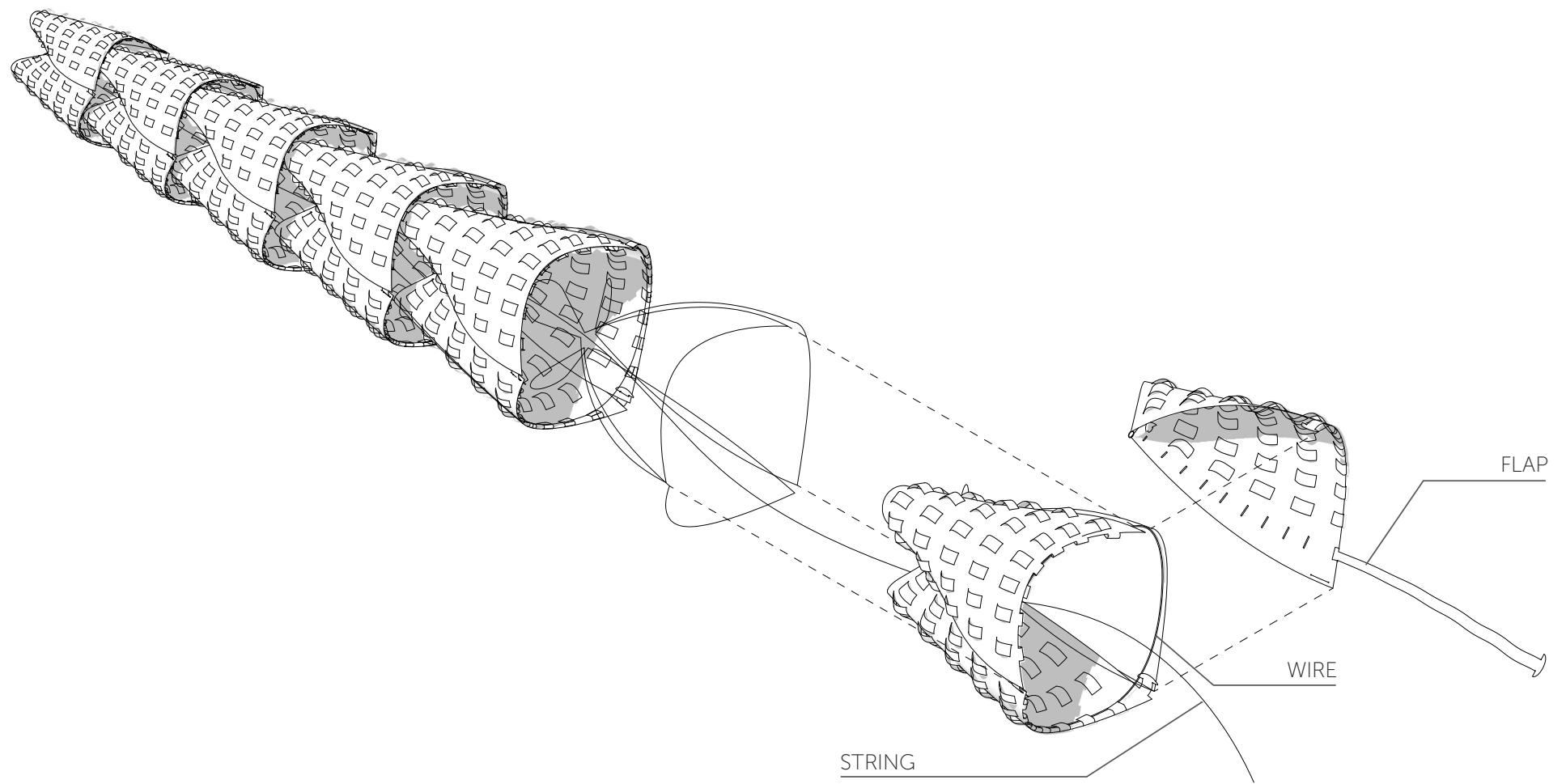
The observatory is elevated off the ground to distance the viewers from natural elements near the ground (shrubs, grass, fallen leaves) that may distract from observing the artificiality of the park..



AERIAL NET

Spring Studio 2015  
Instructor: Jaymon Diaz

Constructed from mylar and wire, the aerial net catches insects while in flight in its aerodynamically shaped, ribbed shells.



The spiraling flight path places the net at oscillating positions that are unexpected to both the user and surrounding insects. By the time insects are aware of the net's presence, it is already too late to escape.