

Water Pavilion

Katlin Bentley

Thesis submitted to the faculty of the Virginia Polytechnic  
Institute and State University in partial fulfillment of the  
requirements for the degree of

Master of Architecture in Architecture

Paul Emmons, Chair

Susan Piedmont-Palladino

Jaan Holt

June 27, 2013  
Alexandria, Virginia

keywords: event, experience, part, water, whole

## Water Pavilion

Katlin Bentley



Illus. 1 A Couple Under Tree Canopy Daingerfield Island Alexandria, VA image by Katlin Bentley. Fall 2012

## Abstract

Architecture consists of parts that make a whole.  
These parts can be defined as decisions, details, joints, spaces, forms.  
But what if these parts are experiences, specific encounters woven together to create the whole?

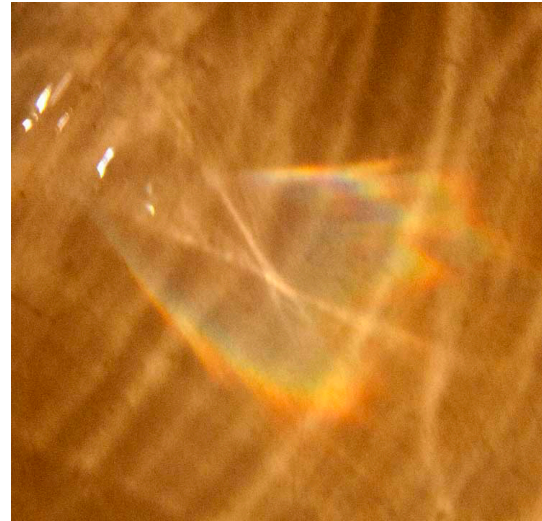
This project is a whole, assembled by episodic moments.

The pavilion is designed on Daingerfield Island, located south of Ronald Reagan National Airport along the Potomac River in Alexandria, Virginia. The site offers a panoramic view across the water of the airport, Washington Monument, Jefferson Memorial, and the U.S. Capitol. The Washington Sailing Marina and the Mount Vernon Trail define Daingerfield's edges. Despite its name, the now peninsula is a delightful place full of potential activity for sailors, bicyclists, and visitors who want to be near the water.

Along the eastern edge exists an array of trees that provides a natural canopy for visitors who sit along the waterfront and watch the planes arrive and depart from the airport. The project proposes to design a pavilion with a second floor restaurant within these trees, anchored to the water's edge. The project removes the existing restaurant on the tip of the peninsula to create space for a park and open up the view across the water of Washington, D.C. In the project, the Mount Vernon Trail extends around Daingerfield Island along the waterfront.



Illus. 2 **Waterfront Panorama** Daingerfield Island Alexandria, VA images by Katlin Bentley. Fall 2012



Illus. 3 **Water and Light** images by Katlin Bentley, Fall 2012

## Table of contents

Site	1
bikes	7
dock	11
steps	15
boats	19
tower	23
curtain	29
garden	37
nest	39
Pavilion	41

## Illustrations

Illustration 1: Bentley, Katlin. *A Couple Under Tree Canopy*. Daingerfield Island Alexandria, Virginia. Fall 2012

Illustration 2: Bentley, Katlin. *Waterfront Panorama*. Daingerfield Island Alexandria, Virginia. Fall 2012

Illustration 3: Bentley, Katlin. *Water and Light*. Alexandria, Virginia. Fall 2012

Illustration 4: Bentley, Katlin. *Woman Facing Marina*. Daingerfield Island Alexandria, Virginia. Summer 2013

p.1 Illustration 5: Bentley, Katlin. *View of the Washington Monument, Jefferson Memorial, Ronald Reagan National Airport, and the U.S. Capitol*. Daingerfield Island Alexandria, Virginia. Fall 2012

p.3 Illustration 6: Bentley, Katlin. *Existing Restaurant*. Daingerfield Island Alexandria, Virginia. Fall 2012

Illustration 7: Bentley, Katlin. *Existing Restaurant II*. Daingerfield Island Alexandria, Virginia. Winter 2013

Illustration 8: Bentley, Katlin. *Existing Parking*. Daingerfield Island Alexandria, Virginia. Winter 2013

p.5 Illustration 9: Bentley, Katlin. *Site*. Daingerfield Island Alexandria, Virginia. Fall 2012

p.8 Illustration 10: Bentley, Katlin. *Southbound on the Mount Vernon Trail*. Daingerfield Island Alexandria, Virginia. Summer 2013

Illustration 11: Bentley, Katlin. *Northbound on the Mount Vernon Trail*. Daingerfield Island Alexandria, Virginia. Summer 2013

Illustration 12: Bentley, Katlin. *Existing Bike Rental in the Cafe*. Daingerfield Island Alexandria, Virginia. Summer 2013

p.10 Illustration 13: Bentley, Katlin. *Snapshots for the Potential Bike Trail*. Daingerfield Island Alexandria, Virginia. Summer 2013

p.11 Illustration 14: Bentley, Katlin. *Marina I*. Daingerfield Island Alexandria, Virginia. Fall 2012

Illustration 15: Bentley, Katlin. *Marina II*. Daingerfield Island Alexandria, Virginia. Fall 2012

Illustration 16: Bentley, Katlin. *Marina III*. Daingerfield Island Alexandria, Virginia. Summer 2013

Illustration 17: Bentley, Katlin. *Docks on the Eastern Edge*. Daingerfield Island Alexandria, Virginia. Fall 2012

p.15 Illustration 18: Bentley, Katlin. *Waterfront View*. Daingerfield Island Alexandria, Virginia. Winter 2012

p.19 Illustration 19: Bentley, Katlin. *West Marina*. Daingerfield Island Alexandria, Virginia. Summer 2013

Illustration 20: Bentley, Katlin. *West Marina II*. Daingerfield Island Alexandria, Virginia. Summer 2013

Illustration 21: Bentley, Katlin. *Sailing by the Monuments*. Daingerfield Island Alexandria, Virginia. Summer 2013

p.20 Illustration 22: Bentley, Katlin. *Boats by the Shoreline*. Daingerfield Island Alexandria, Virginia. Summer 2013

Illustration 23: Bentley, Katlin. *Existing Kayak Racks*. Daingerfield Island Alexandria, Virginia. Summer 2013

Illustration 24: Bentley, Katlin. *East Marina*. Daingerfield Island Alexandria, Virginia. Summer 2013

p.39 Illustration 25: Bentley, Katlin. *Waterfront Panorama*. Daingerfield Island Alexandria, Virginia. Fall 2012



Illus. 4 **Woman Facing Marina** Daingerfield Island Alexandria, VA image by Katlin Bentley. Summer 2013

I would like to thank

Ed Pease  
Shelley Martin  
Kay Edge  
Hunter Pittman  
Frank Weiner  
Patrick Doan  
David Lever  
Paul Emmons  
Jaan Holt  
Susan Piedmont-Palladino  
Robert Gurney

for giving me a strong architectural foundation.



Illus. 5 View of the Washington Monument, Jefferson Memorial, Ronald Reagan National Airport, and the U.S. Capitol Daingerfield Island Alexandria, VA image by Katlin Bentley. Fall 2012



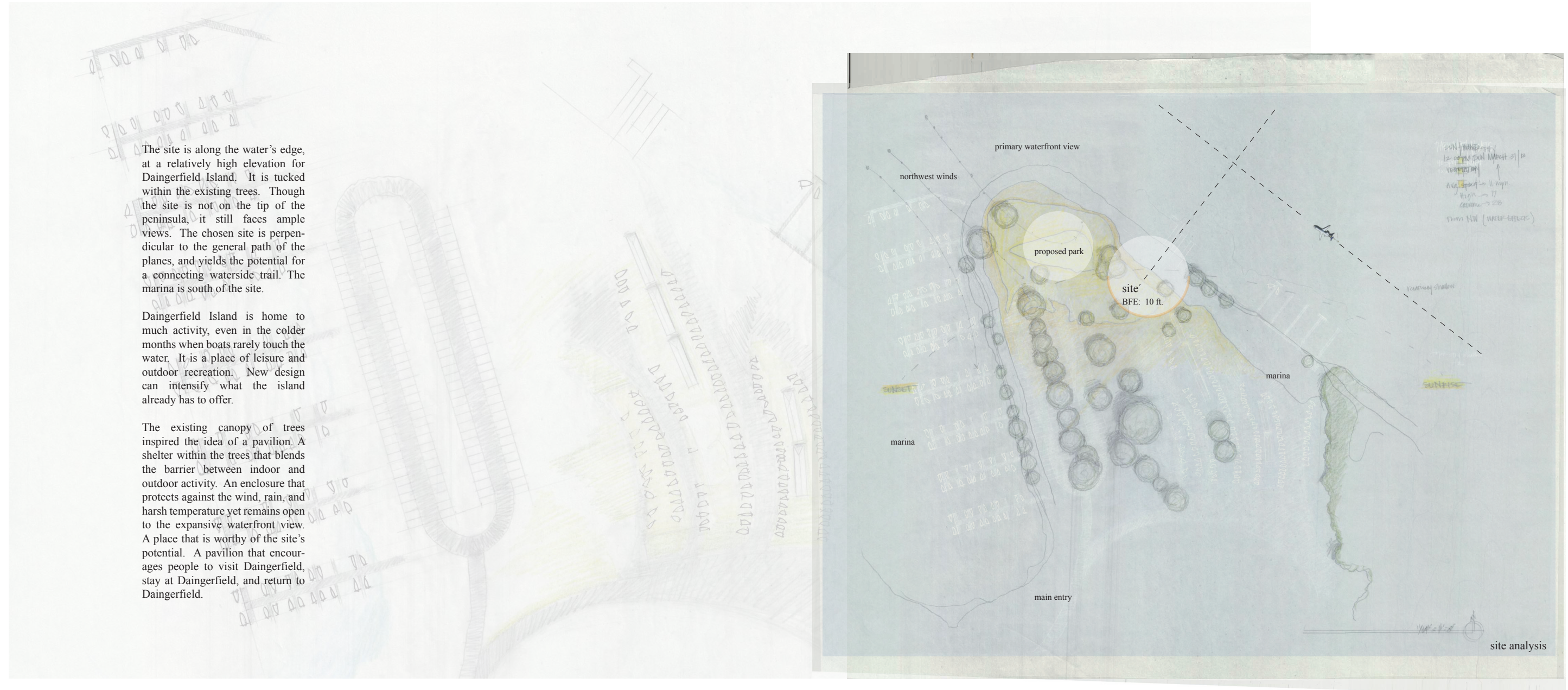
Illus. 6 Existing Restaurant Daingerfield Island Alexandria, VA  
image by Katlin Bentley. Fall 2012



Illus. 7 Existing Restaurant II Daingerfield Island Alexandria, VA  
image by Katlin Bentley. Winter 2013



Illus. 8 Existing Parking Daingerfield Island Alexandria, VA  
image by Katlin Bentley. Winter 2013



The site is along the water's edge, at a relatively high elevation for Daingerfield Island. It is tucked within the existing trees. Though the site is not on the tip of the peninsula, it still faces ample views. The chosen site is perpendicular to the general path of the planes, and yields the potential for a connecting waterside trail. The marina is south of the site.

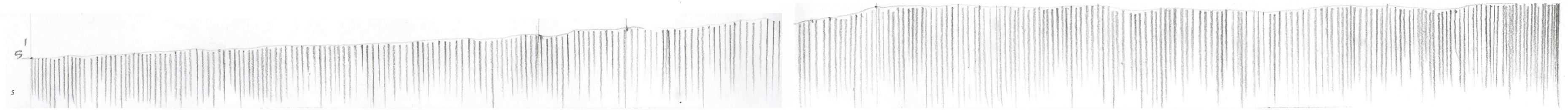
Daingerfield Island is home to much activity, even in the colder months when boats rarely touch the water. It is a place of leisure and outdoor recreation. New design can intensify what the island already has to offer.

The existing canopy of trees inspired the idea of a pavilion. A shelter within the trees that blends the barrier between indoor and outdoor activity. An enclosure that protects against the wind, rain, and harsh temperature yet remains open to the expansive waterfront view. A place that is worthy of the site's potential. A pavilion that encourages people to visit Daingerfield, stay at Daingerfield, and return to Daingerfield.





Illus. 9 Site Daingerfield Island Alexandria, VA image by Katlin Bentley Fall 2012







Illus. 13 Snapshots for the Potential Bike Trail Dangerfield Island Alexandria, VA images by Katlin Bentley Summer 2013



Illus. 14 Marina I Daingerfield Island Alexandria, VA image by Katlin Bentley. Fall 2012



Illus. 15 Marina II Daingerfield Island Alexandria, VA image by Katlin Bentley. Fall 2012

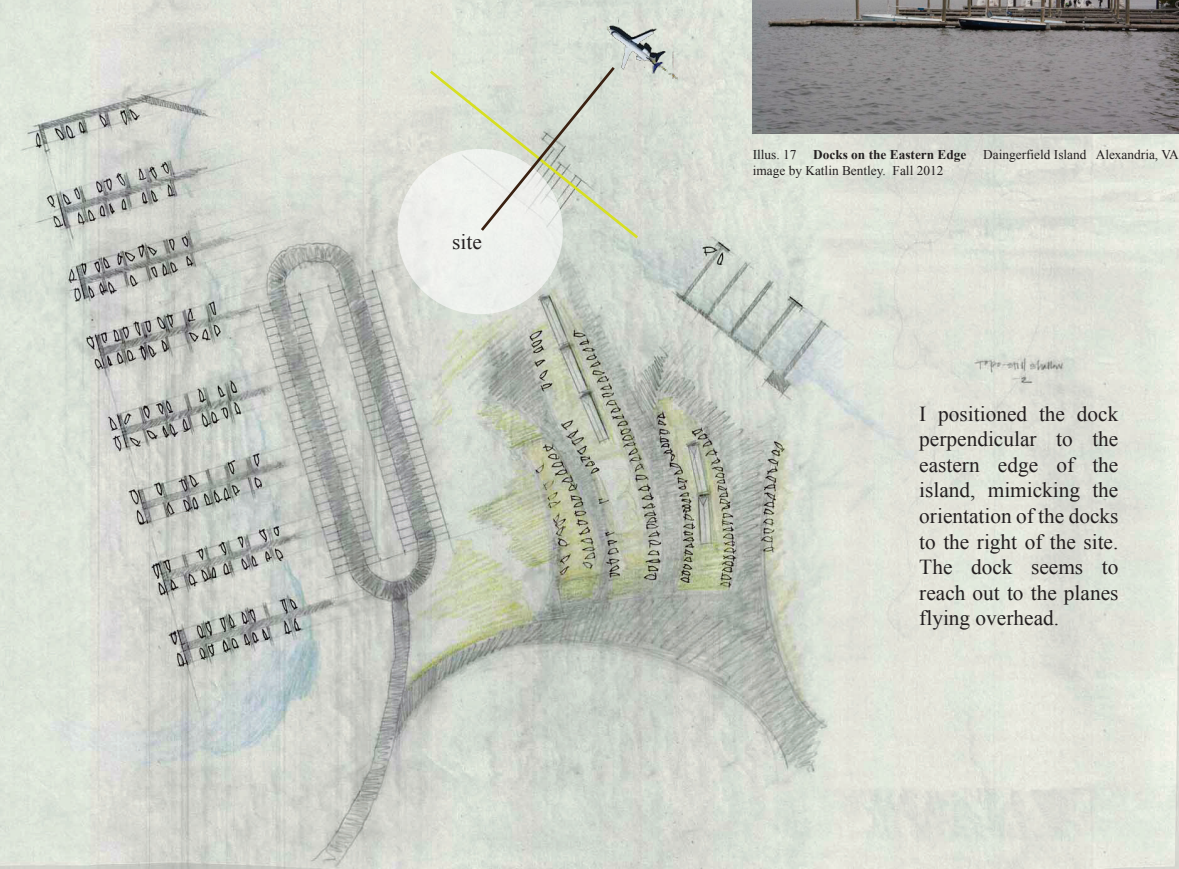


Illus. 16 Marina III Daingerfield Island Alexandria, VA image by Katlin Bentley. Summer 2013

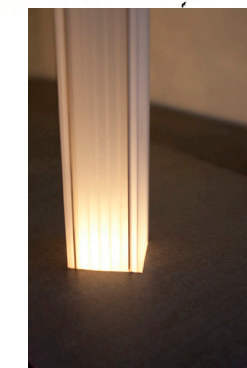
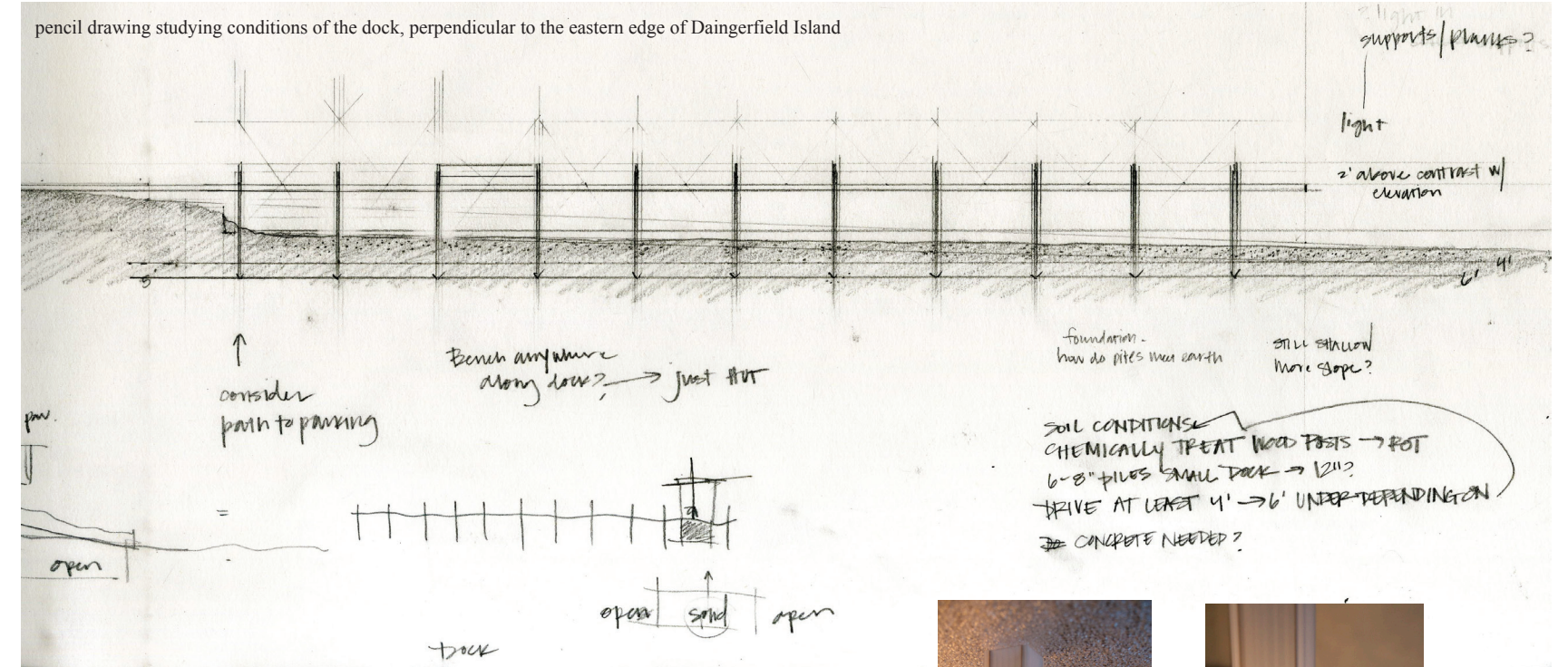
There are many docks along the edge of the peninsula for the Washington Sailing Marina. The new pavilion should feature a dock that stretches far out over the water for visitors to walk to the end, enjoying the view of Washington, while watching the planes fly above. Sailboats could pull up to the dock and smaller vessels such as kayaks would be able to pass underneath. At night, the dock becomes a lit path over the water.



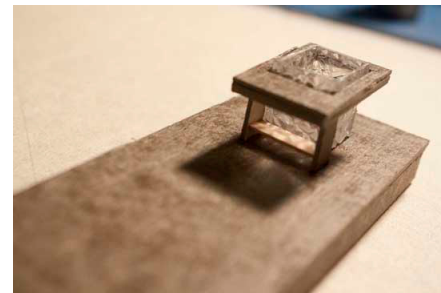
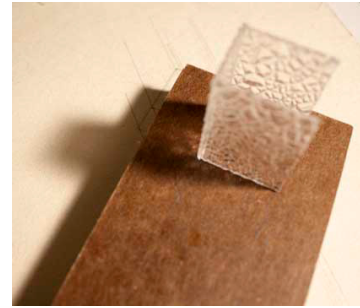
Illus. 17 Docks on the Eastern Edge Daingerfield Island Alexandria, VA image by Katlin Bentley. Fall 2012



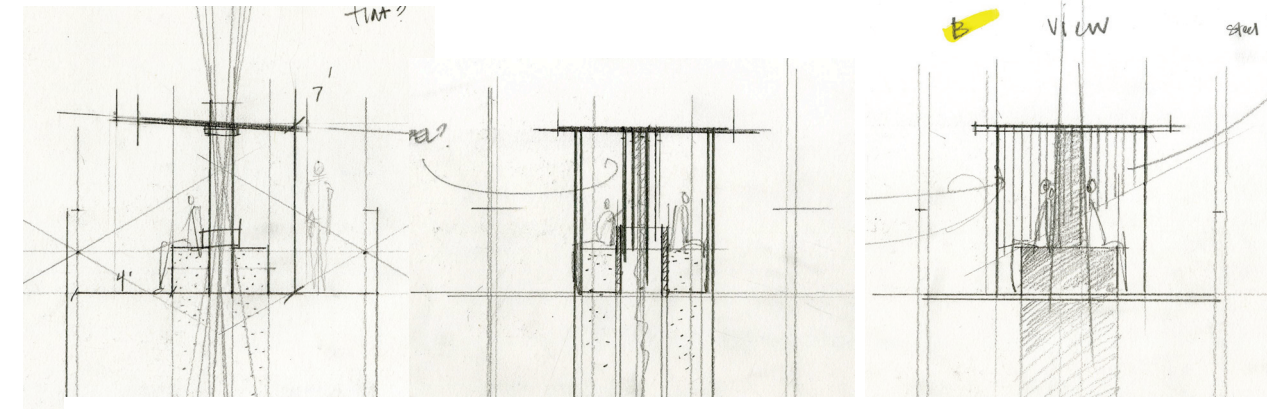
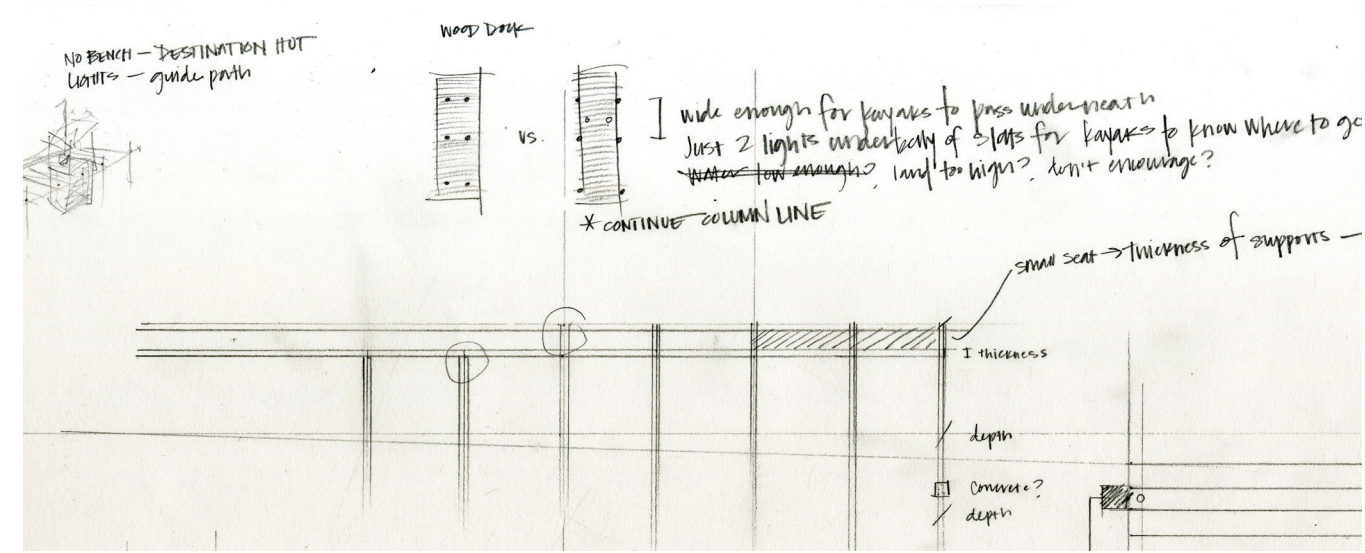
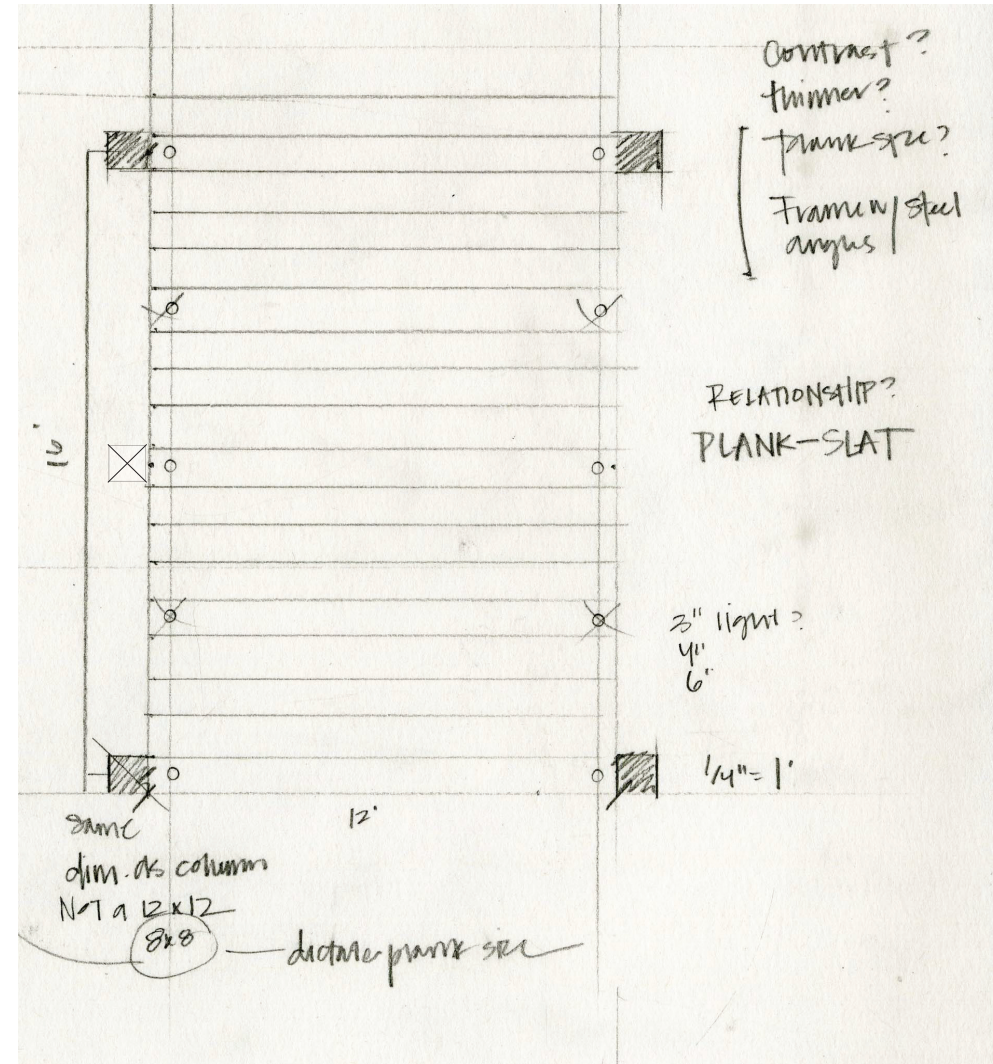
site plan of the marina



models of the dock study an idea about shelter and light



early dock study models



hut sketches



dock

The dock is constructed with wood planks and wood piles. In its earlier design stages, I studied the dock as a concrete solid form.

The dock is lit in the evening from beneath the planks. As people walk along the dock, the planes fly overhead and the boats pass by in the water. At any point along the dock, the visitor can take a moment of pause to look toward the monuments across the water.

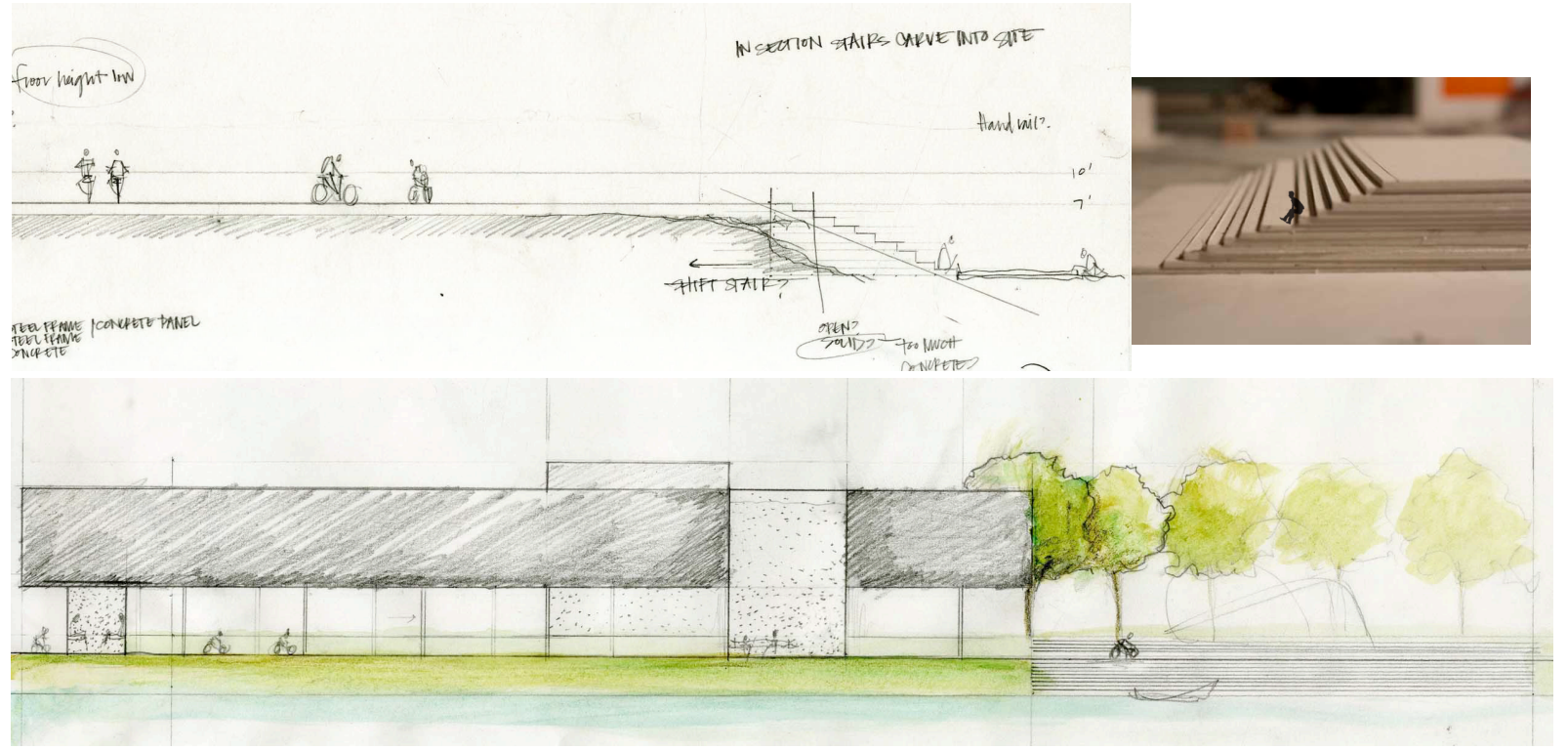
As one approaches the end of the dock, there is a moment of arrival. Throughout much of the design's development there was a small hut at the end of the dock.



Illus. 18 Waterfront View Daingerfield Island Alexandria, VA images by Katlin Bentley, Winter 2012

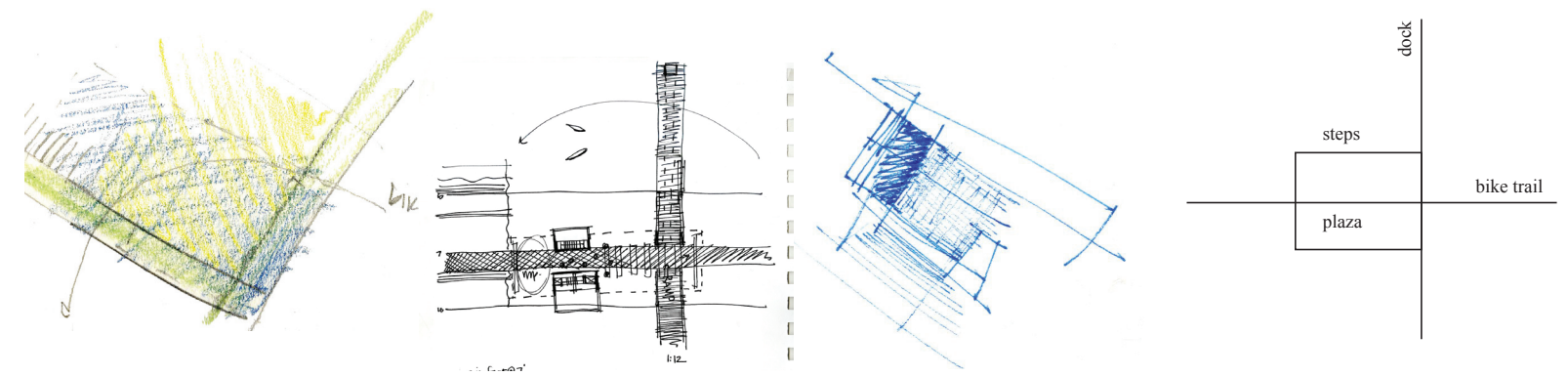


When I first visited Daingerfield Island, I noticed that people often sat beneath the trees facing the water, the monuments, and the flying planes. I began to imagine the site as an amphitheatre. The water was the stage and the city was its backdrop. A plaza and steps could provide seating for the waterfront's audience.



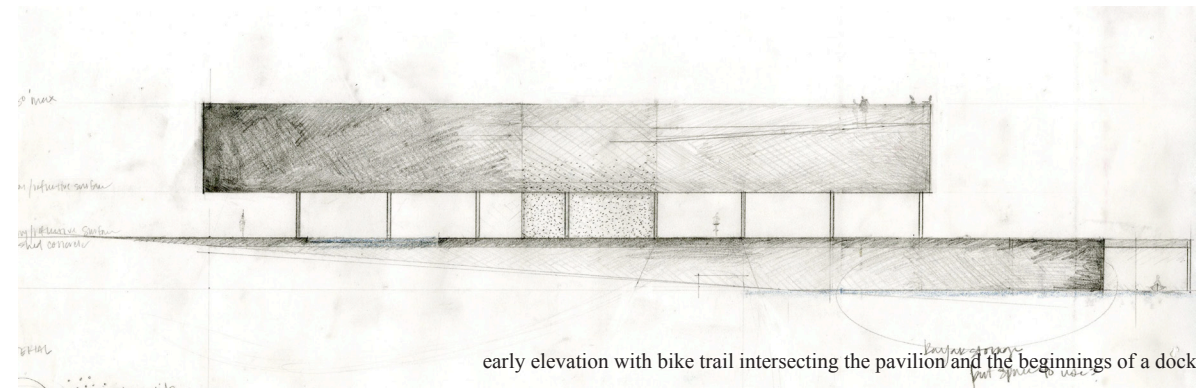
early elevation with steps

diagrams illustrating the potential intersections of the trail, dock, and steps

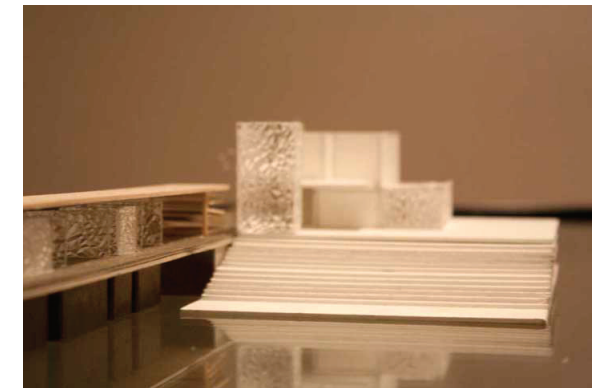
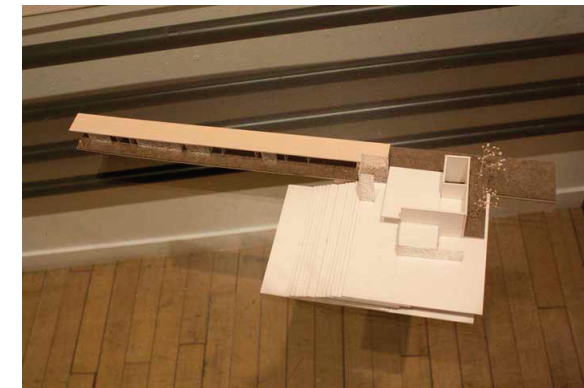
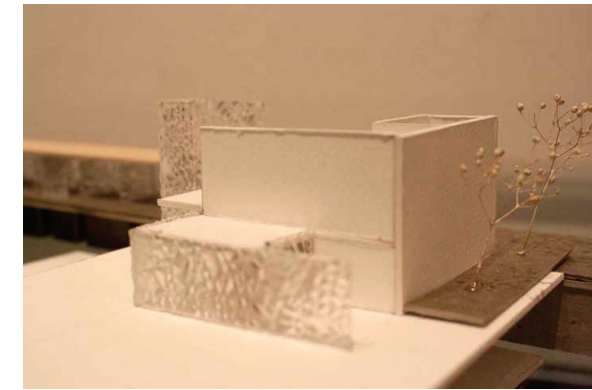
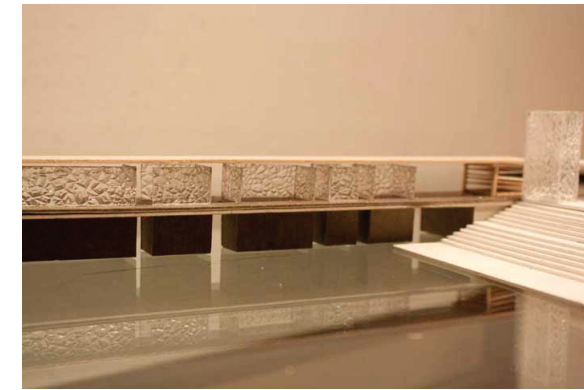


The bike trail, dock, and waterfront steps were the key parts and initial experiences that inspired the early phases of the pavilion. Since each of these parts could occur along the water's edge, I studied their potential intersection in the design.

I became attached to an axial relationship between the dock and the bike trail. I wanted to provide a larger space in the middle of the trail for bicyclists to ride freely or park their bikes to sit along the waterfront. The plaza could become a place for outdoor leisure and dining.



early elevation with bike trail intersecting the pavilion and the beginnings of a dock



early study model



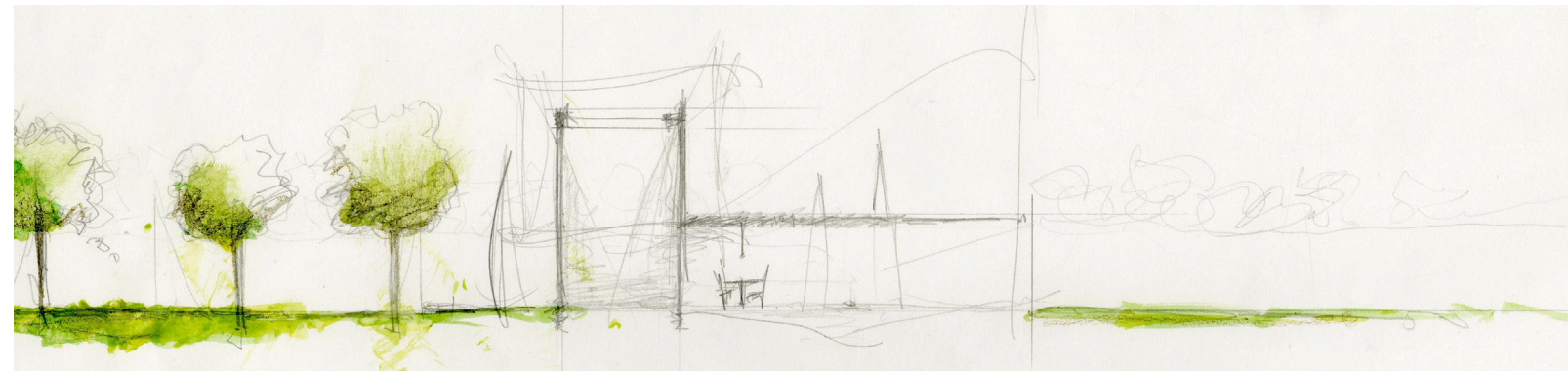
Illus. 19 **West Marina** Daingerfield Island Alexandria, VA  
image by Katlin Bentley. Summer 2013



Illus. 20 **West Marina II** Daingerfield Island Alexandria, VA  
image by Katlin Bentley. Summer 2013

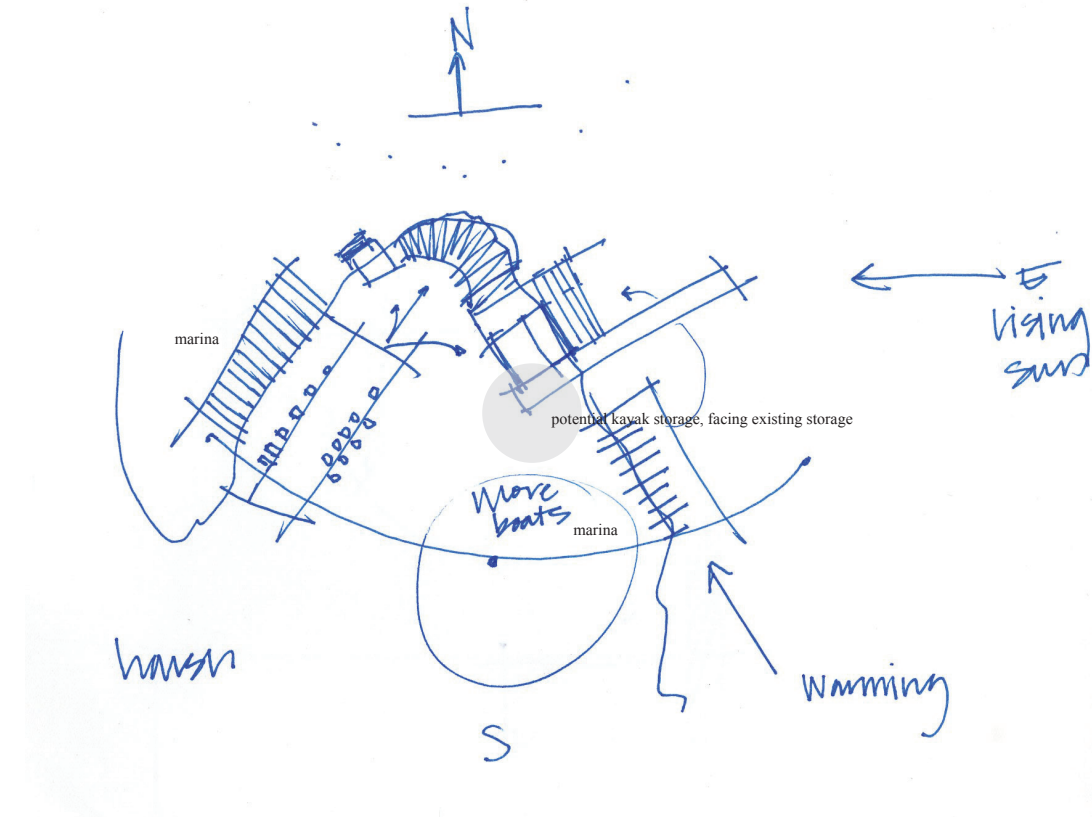


Illus. 21 **Sailing by the Monuments** Daingerfield Island Alexandria, VA  
image by Katlin Bentley. Summer 2013

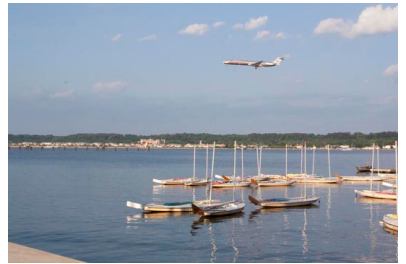


early section sketch by the west marina

Daingerfield Island is filled with boats year-round. The Washington Sailing Marina stores sailboats on both sides of the peninsula. There are also three sets of kayak racks, seemingly plopped next to the east marina. The pavilion should provide additional boat storage for kayaks facing the existing marina on the eastern edge.



site sketch showing orientation of pavilion to existing marinas



Illus. 22 **Boats by the Shoreline** Daingerfield Island Alexandria, VA  
image by Katlin Bentley. Summer 2013

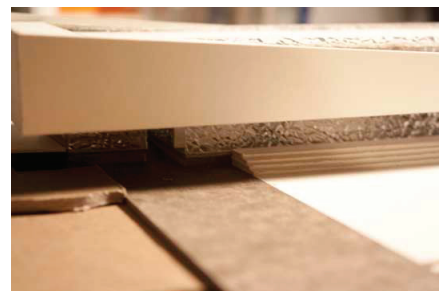
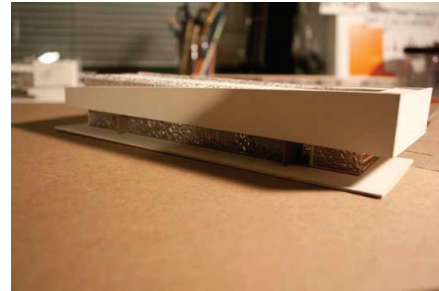
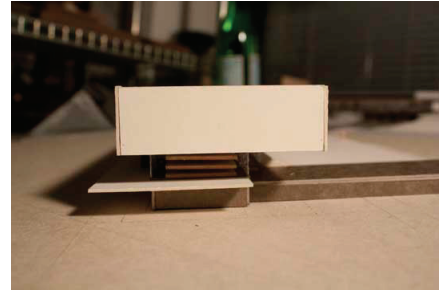


Illus. 23 **Existing Kayak Racks** Daingerfield Island Alexandria, VA  
image by Katlin Bentley. Summer 2013

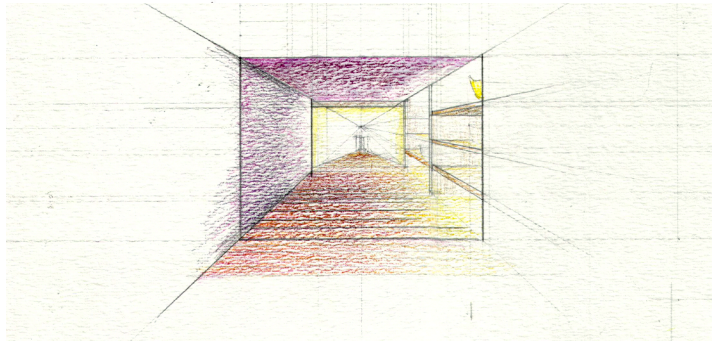
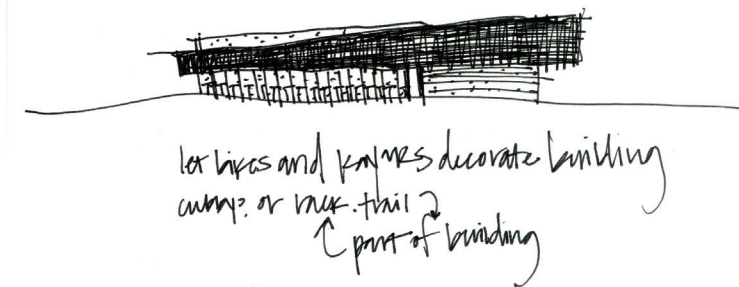
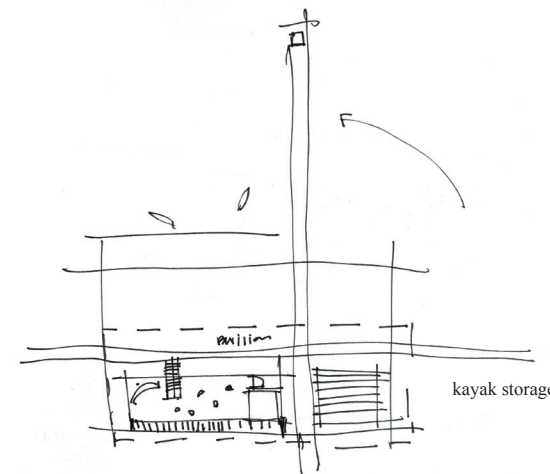


Illus. 24 **East Marina** Daingerfield Island Alexandria, VA  
image by Katlin Bentley. Summer 2013

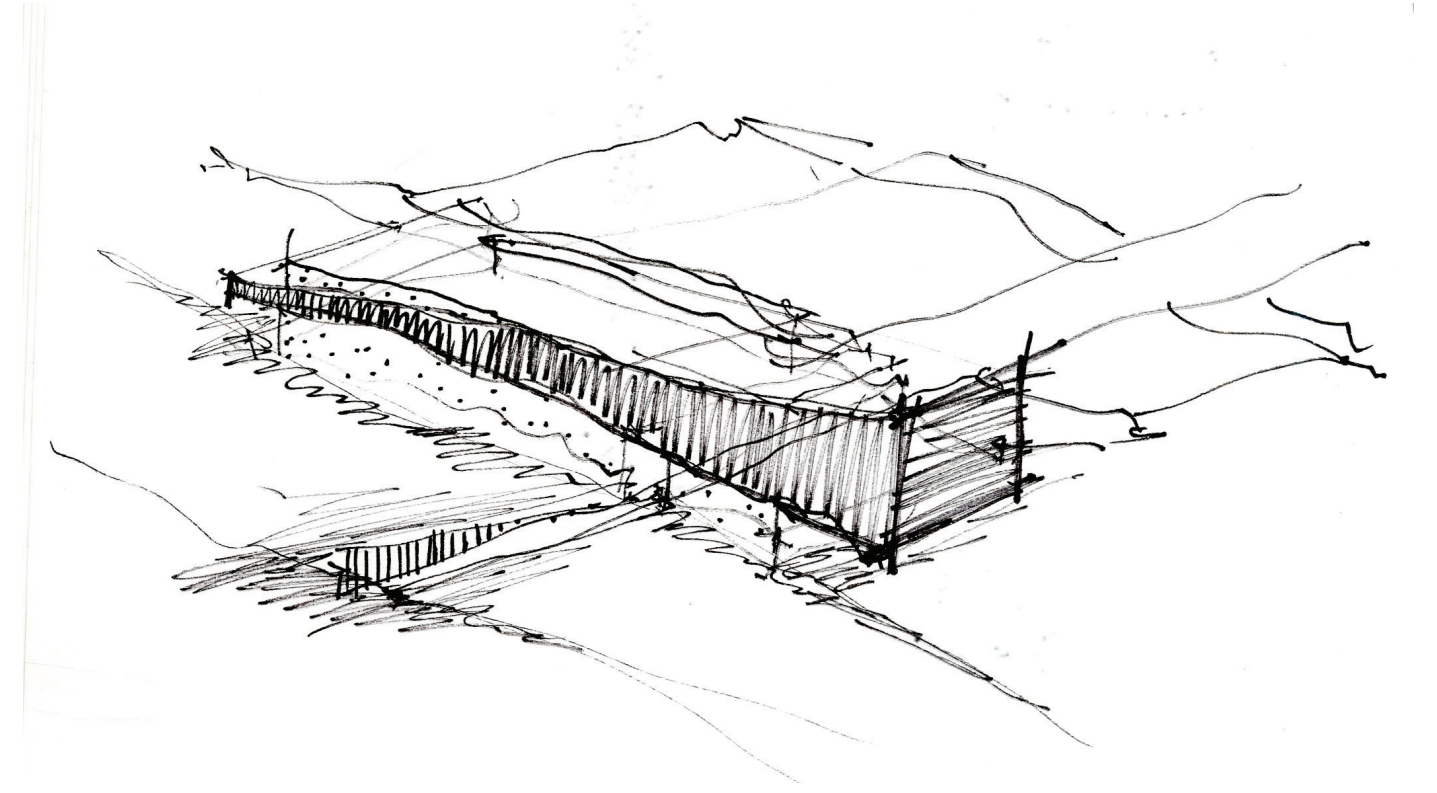


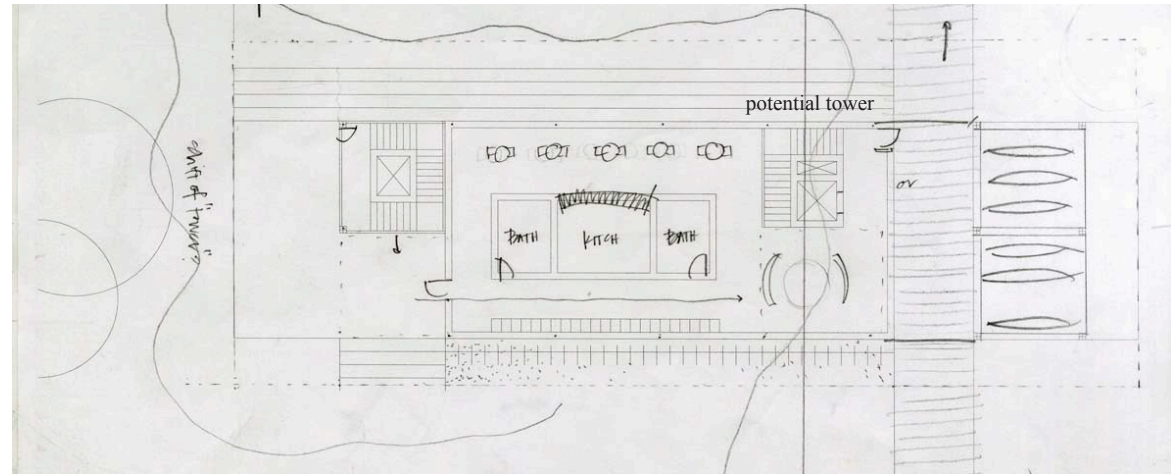


study model



The study model and sketch illustrate the intersection of the dock, steps, and boat storage. The dock became a direct path through the pavilion, passing by the kayak rack and leading out to the water. The bike trail intersects the dock and the plaza just as the dock cuts through the pavilion. The steps begin underneath the cantilevering second floor. The overhang provides a few feet of shelter for those sitting on the steps. The restaurant is located on the second floor of the pavilion.

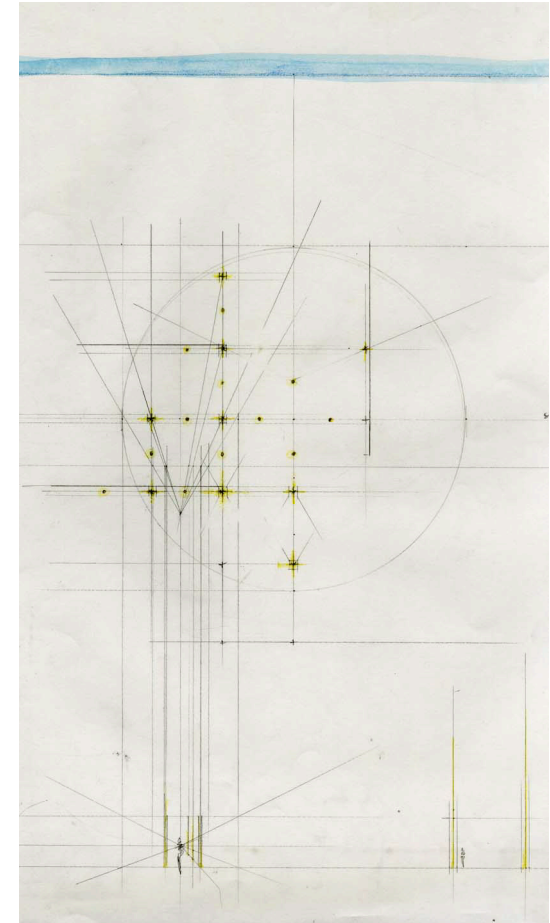
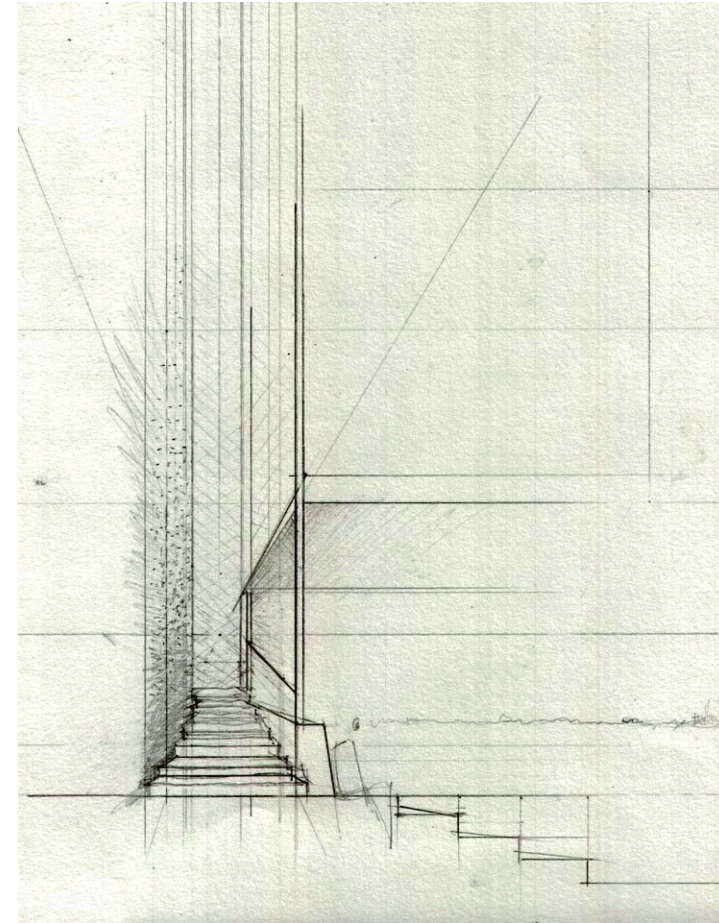
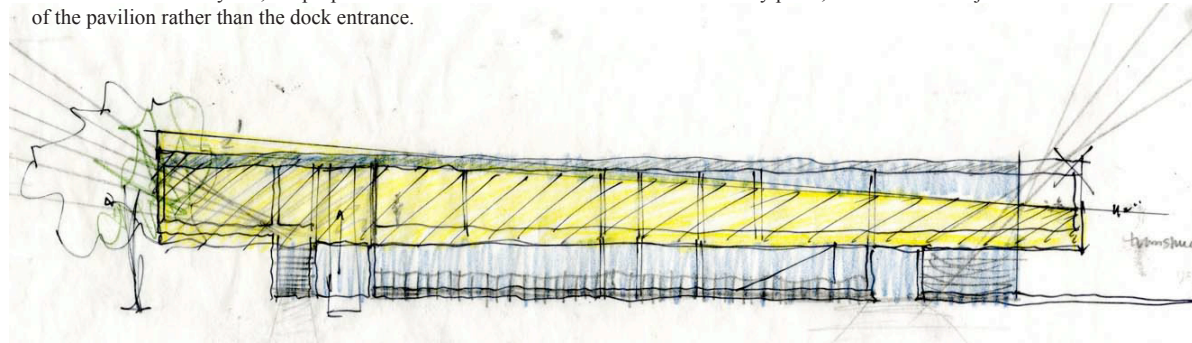




early ground floor plan

At this point in the project, the trail, dock, steps, and the kayak storage seem to have found their place in the pavilion. The ground floor of the pavilion went through many stages, each with subtle changes in entry. I liked the idea of the dock providing a formal access to the ground floor of the pavilion with a secondary, more casual entrance, on the opposite side. Those who want to rent bikes or boats enter the pavilion to find a small administrative desk for rentals. After renting a bike or a boat, visitors can store their extra personal items in the central cubbies or they can grab a bite to eat at the waterfront cafe.

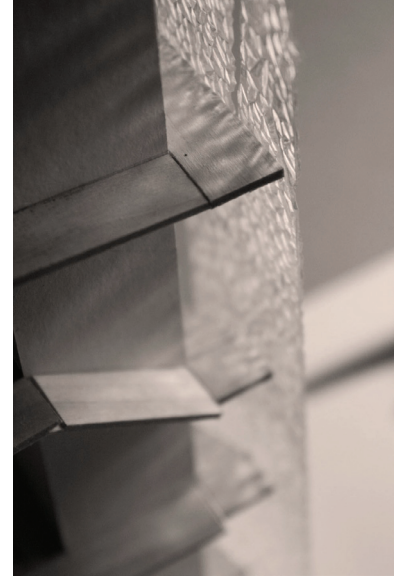
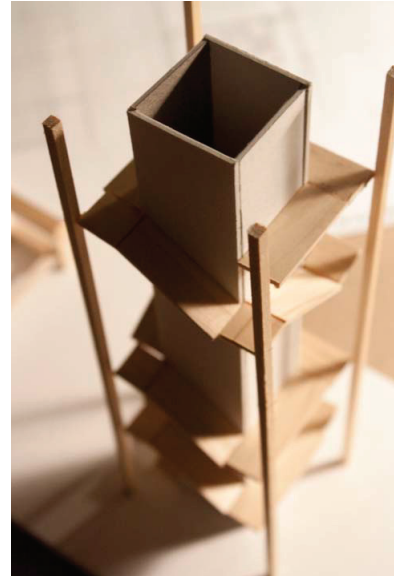
The entrance from the dock leads people into the ground floor of the pavilion and also to the restaurant reception on the second floor. I began to consider how to give the restaurant entrance more presence. The design seemed to demand a vertical element. A more pronounced service core could provide a fire stair and an articulated symbol enticing visitors to wander upstairs. Although the stair core did not need to be very tall, the proportions of the core made it tower like. In the early plans, the tower was adjacent to the northern side of the pavilion rather than the dock entrance.



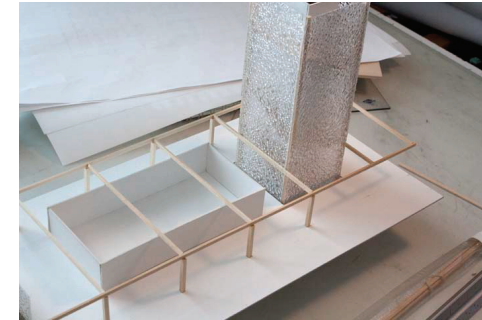
an early thought about column like lanterns



lantern like stair tower models



Even in earlier stages of the design, I was interested in the idea of a lantern like element. When I thought about the material and structure of the stair tower, I imagined it like a glowing lantern within the pavilion. The transparency of the design would optimize the views of the waterfront.



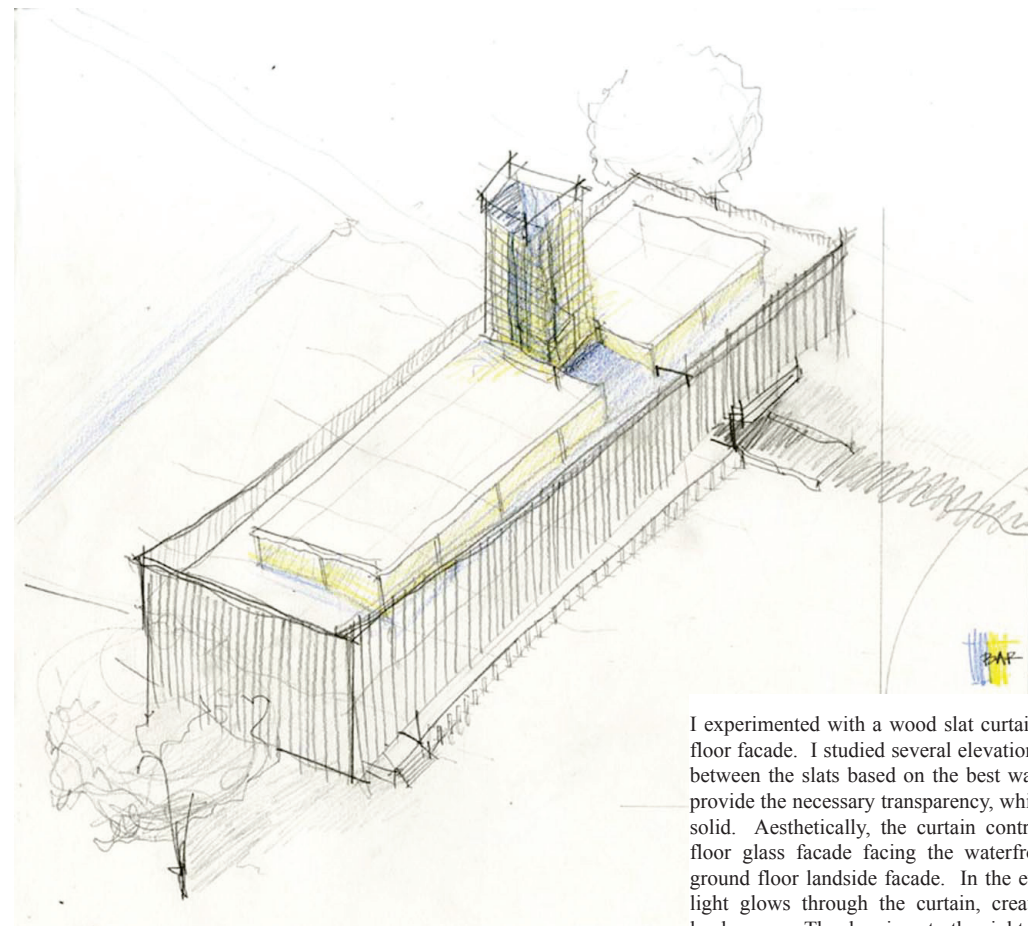
These early study models test the placement of the tower within the design and how the stair core would be incorporated in the structure of the building, particularly if the tower was constructed with columns and glass.



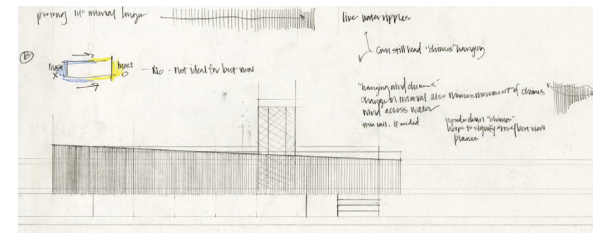
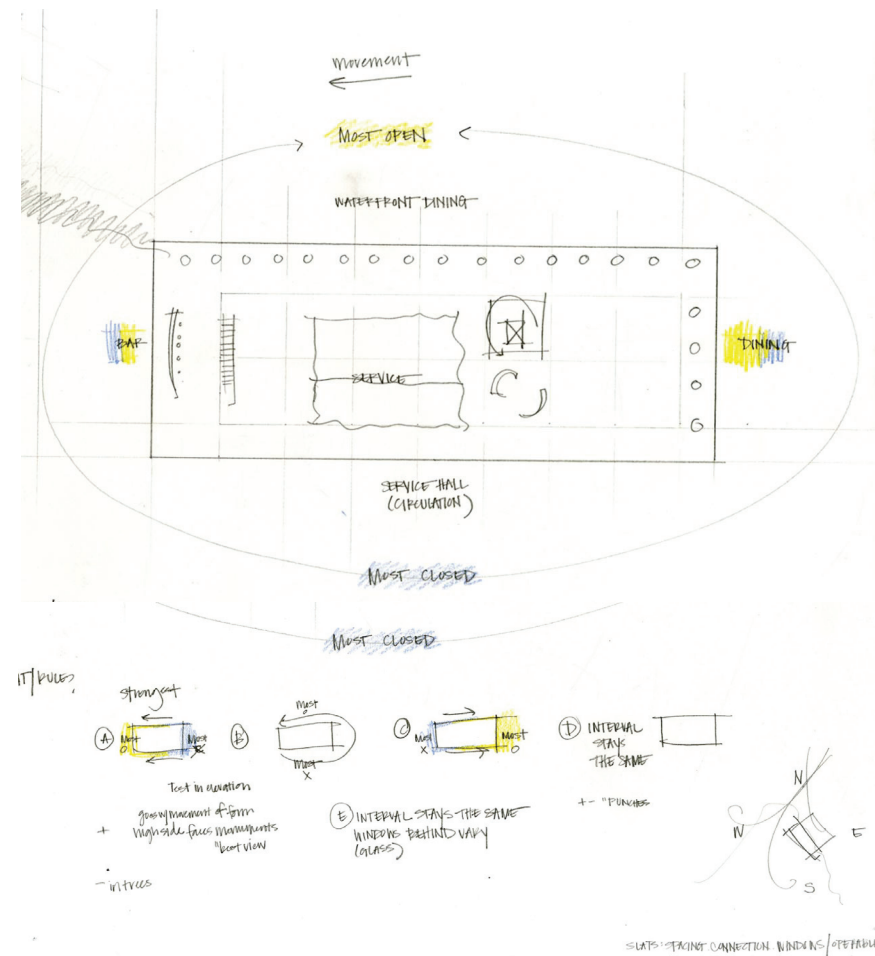
This phase of the design focuses on the development of a curtain wall for diners to experience the view from the second floor restaurant. With decisions about view and transparency came decisions about material. Since there are multiple opportunities for the waterfront view, it was difficult to create a hierarchy in transparency, providing the views on both floors of the pavilion, while attaining a material balance between solid and void. From the beginning of the design, I had considered a general strategy characteristic of a pavilion: a solid core with a transparent curtain.



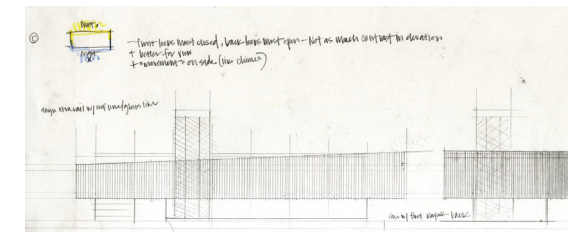
early study model



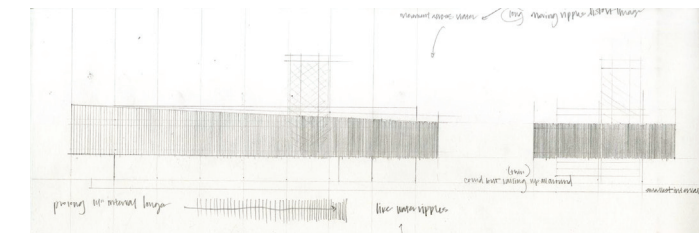
I experimented with a wood slat curtain wall for the second floor facade. I studied several elevations, testing the spacing between the slats based on the best waterfront views. Slats provide the necessary transparency, while seeming somewhat solid. Aesthetically, the curtain contrasts with the ground floor glass facade facing the waterfront and the concrete ground floor landside facade. In the evening, the restaurant light glows through the curtain, creating a lantern in the landscape. The drawings to the right test where the curtain wall should be most open and where it should be less open based on the views and the functions of the spaces it shields.



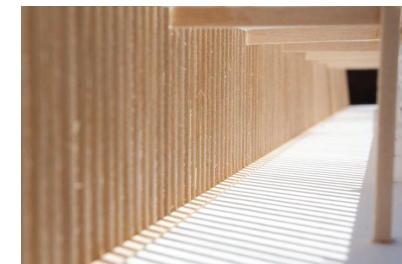
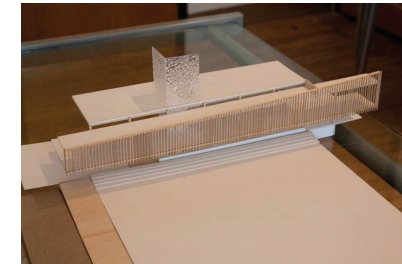
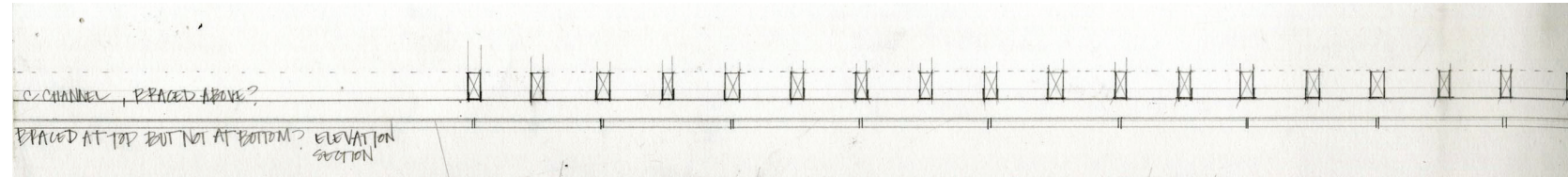
wood slats farther apart on the south side maximizing the view of the marina



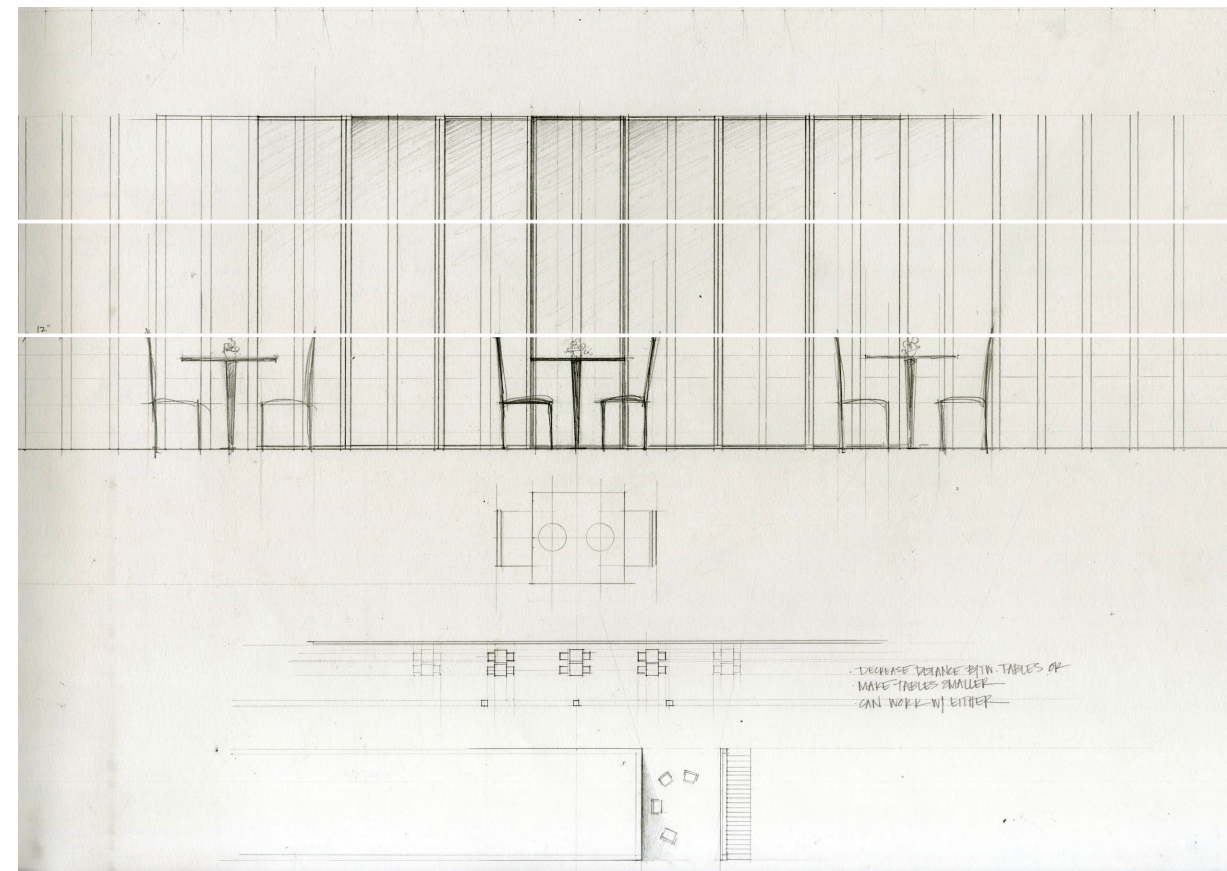
wood slats farther apart for the waterfront view maximizing views of the potomac river, planes, and monuments



wood slats farther apart on the north side maximizing view of the monuments

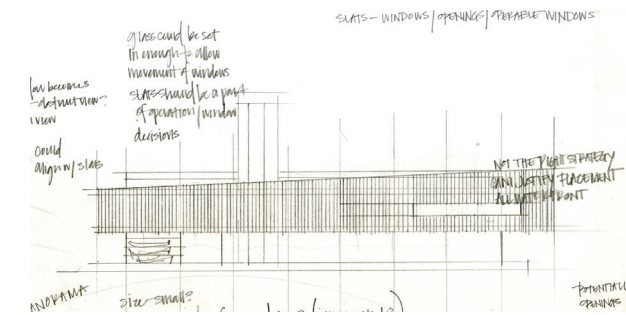
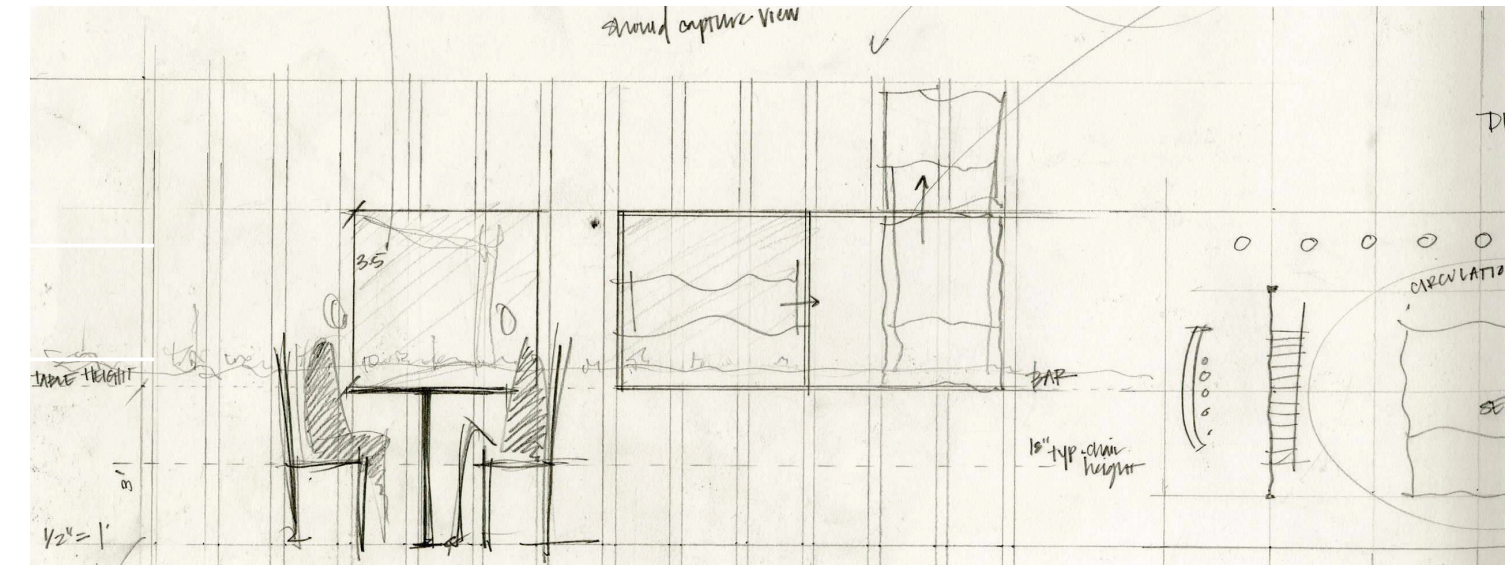


study model

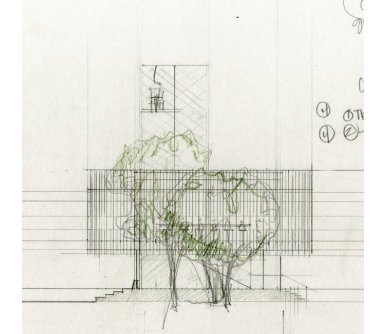


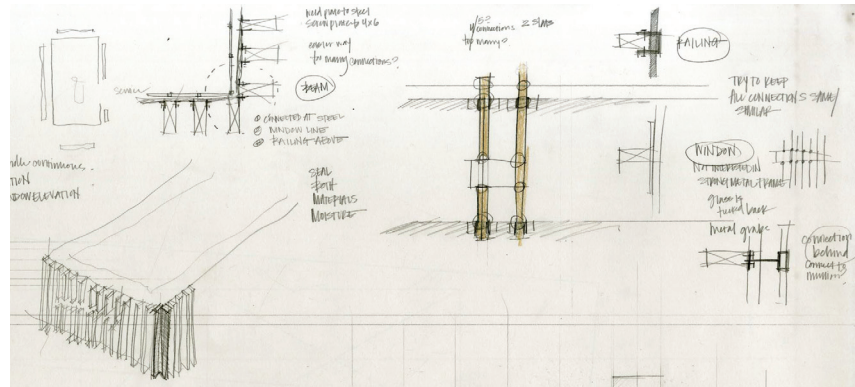
waterfront dining

Even though the spacing between the slats allows for a waterfront view, I wanted to open up the view even more for people dining along the curtain wall. I created a linear band of windows that stretches around the curtain wall of the pavilion. I studied ways in which these windows and slats could be operable. In the final phase of the project, I designed sliding glass doors behind the slats in place of the window wall on the northern and southern ends of the second floor. In warmer temperatures, the doors should be opened for breezes to pass through the pavilion from the north end.



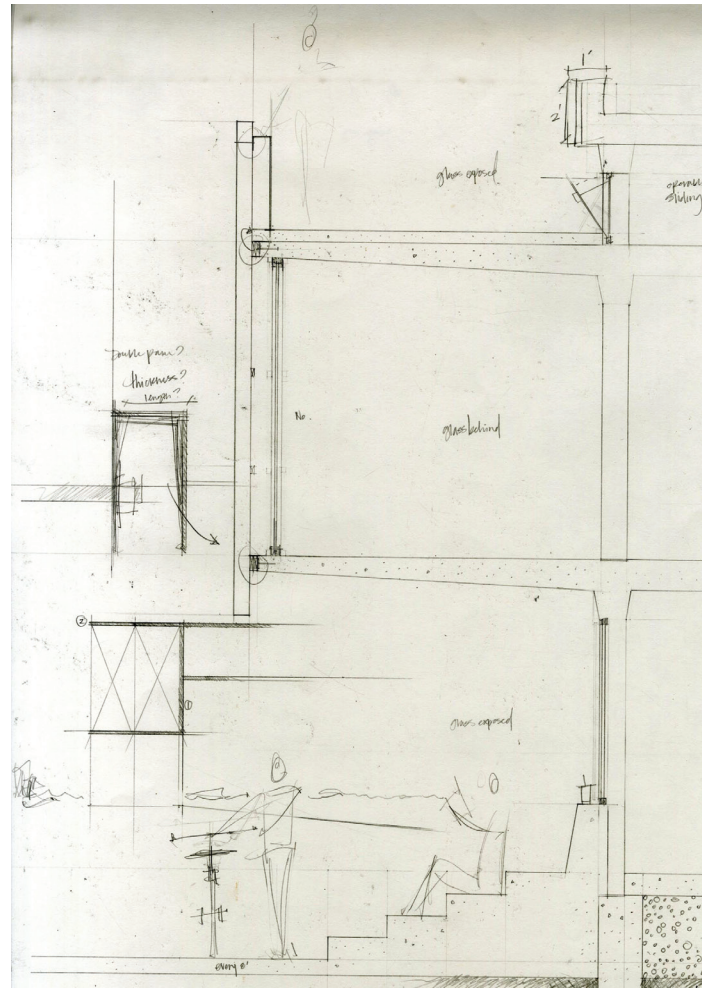
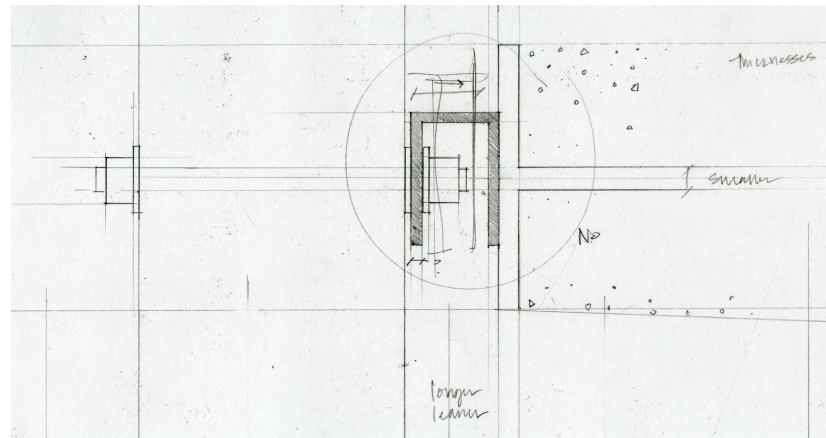
northern facade, view from the bar



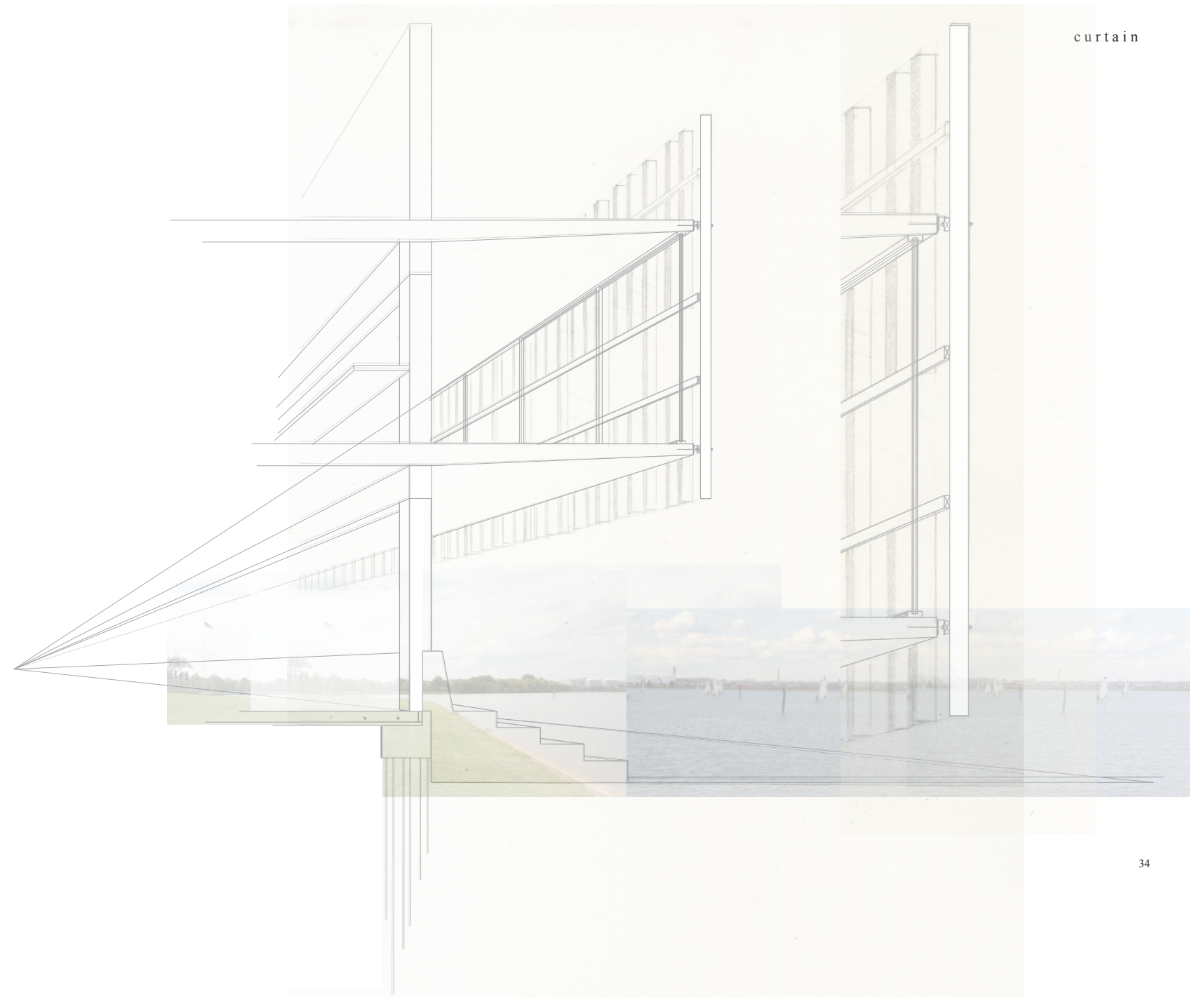


turning the corner

In order to connect the wood slat curtain wall to the concrete floor slabs, I needed to introduce a steel c channel like piece in between the two materials. A metal plate would be embedded into the concrete and the steel channel would connect the wood slat to the embedded plate. This metal piece allows some tolerance in the wood slat connection.



early wall section

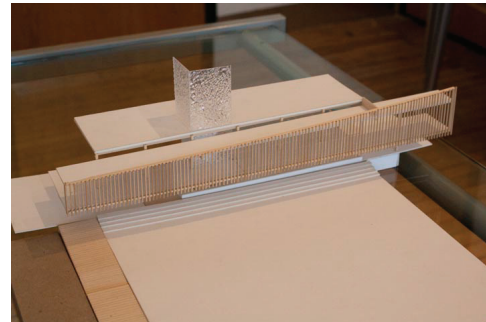


curtain

The idea of the angled facade transformed throughout the project. In the earliest study model, the wood slats increase in height towards the south. In later study models, the wood slats increase in height towards the northern side of the pavilion. In the final model, the slats resemble the angle of the earliest study model. The slats increase from 42 inches on the northern end, serving as a handrail for visitors taking in the view on the the pavilion's roof. As visitors walk around the roof top the slats increase toward the southern end, creating a wall between the viewer and the waterfront. The slats, spaced nine inches on center, still provide a view, but create a more intimate space on the pavilion's south side. This end is an ideal solution for the southern sun exposure, creating a potential outdoor dining area.



early study model  
slats increase toward the south



later study model  
slats increase toward the north



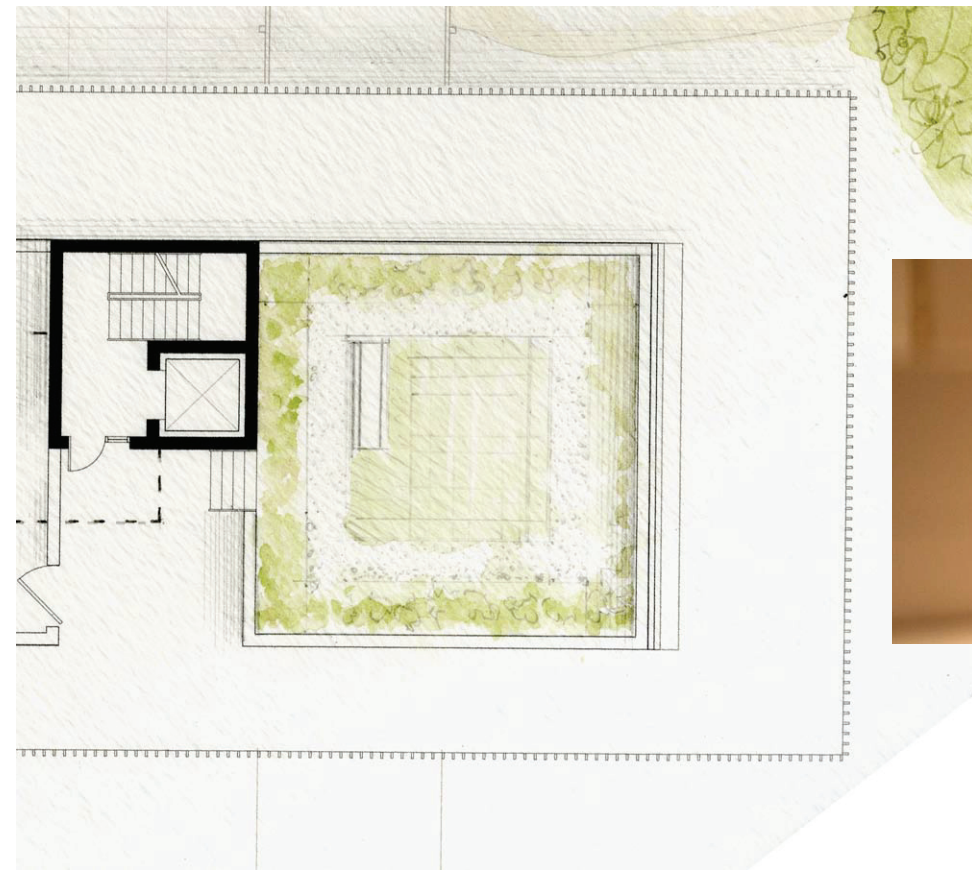
low end-final model  
view of the monuments north side



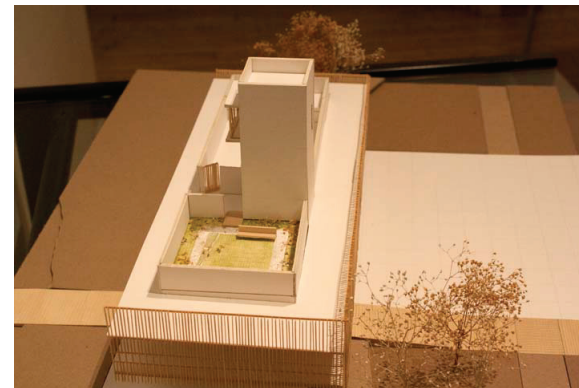
high end-final model  
south side





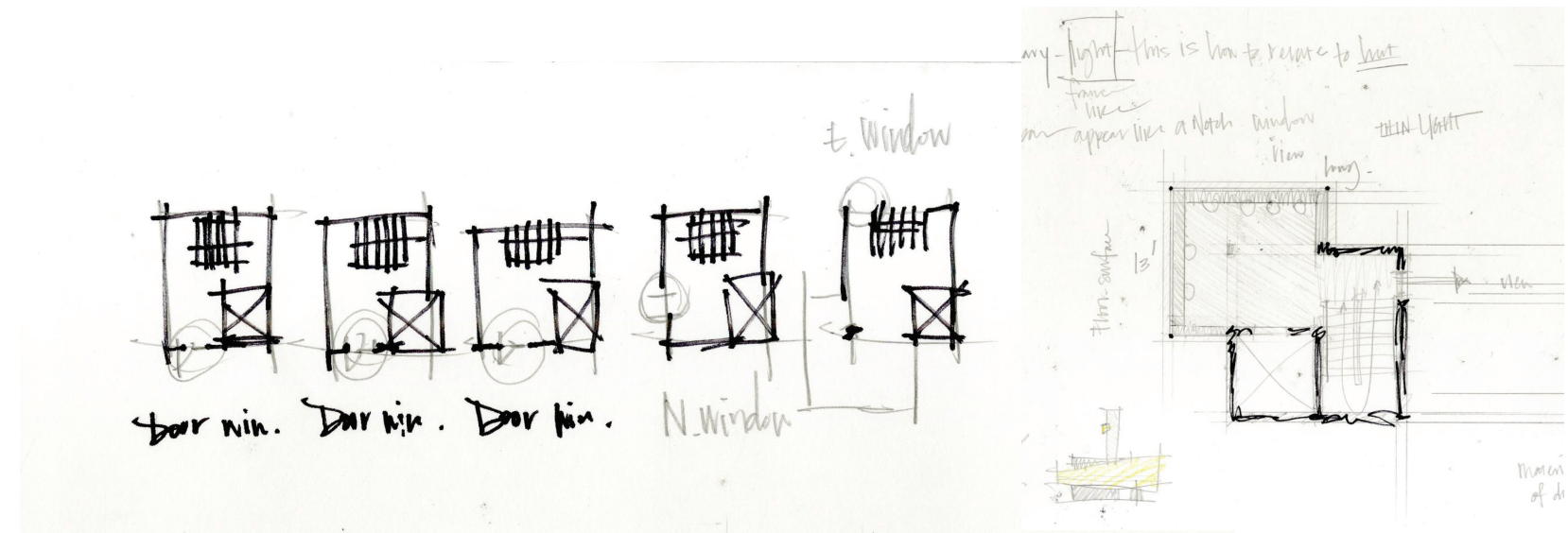


Within the eight and a half foot tall concrete parapet walls on the southern end of the pavilion, is a small garden for quiet reflection. The restaurant could use the garden for fresh herbs and table top flowers.

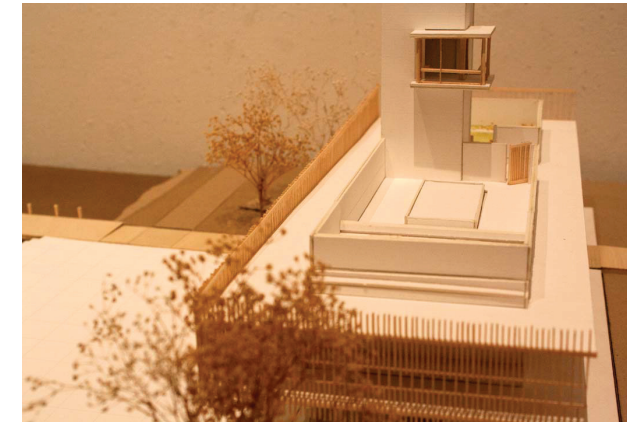


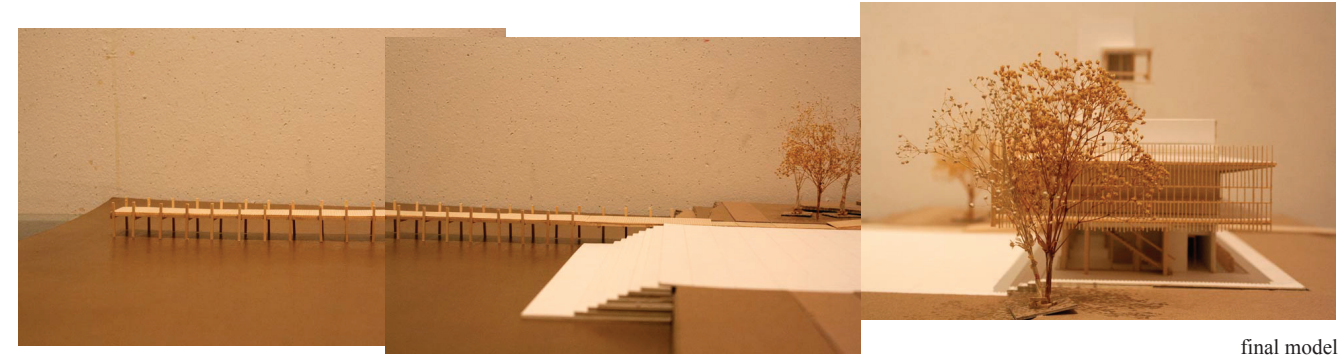


Illus. 25 Waterfront Panorama II Daingerfield Island Alexandria, VA images by Katlin Bentley. Fall 2012

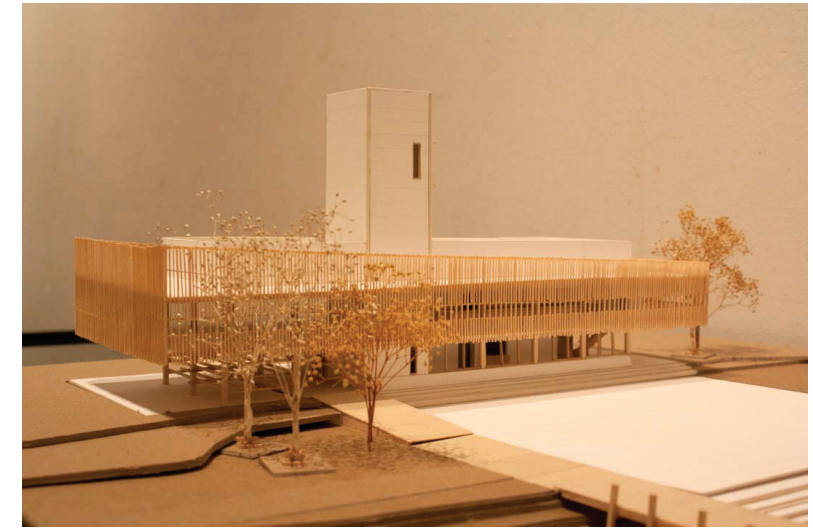


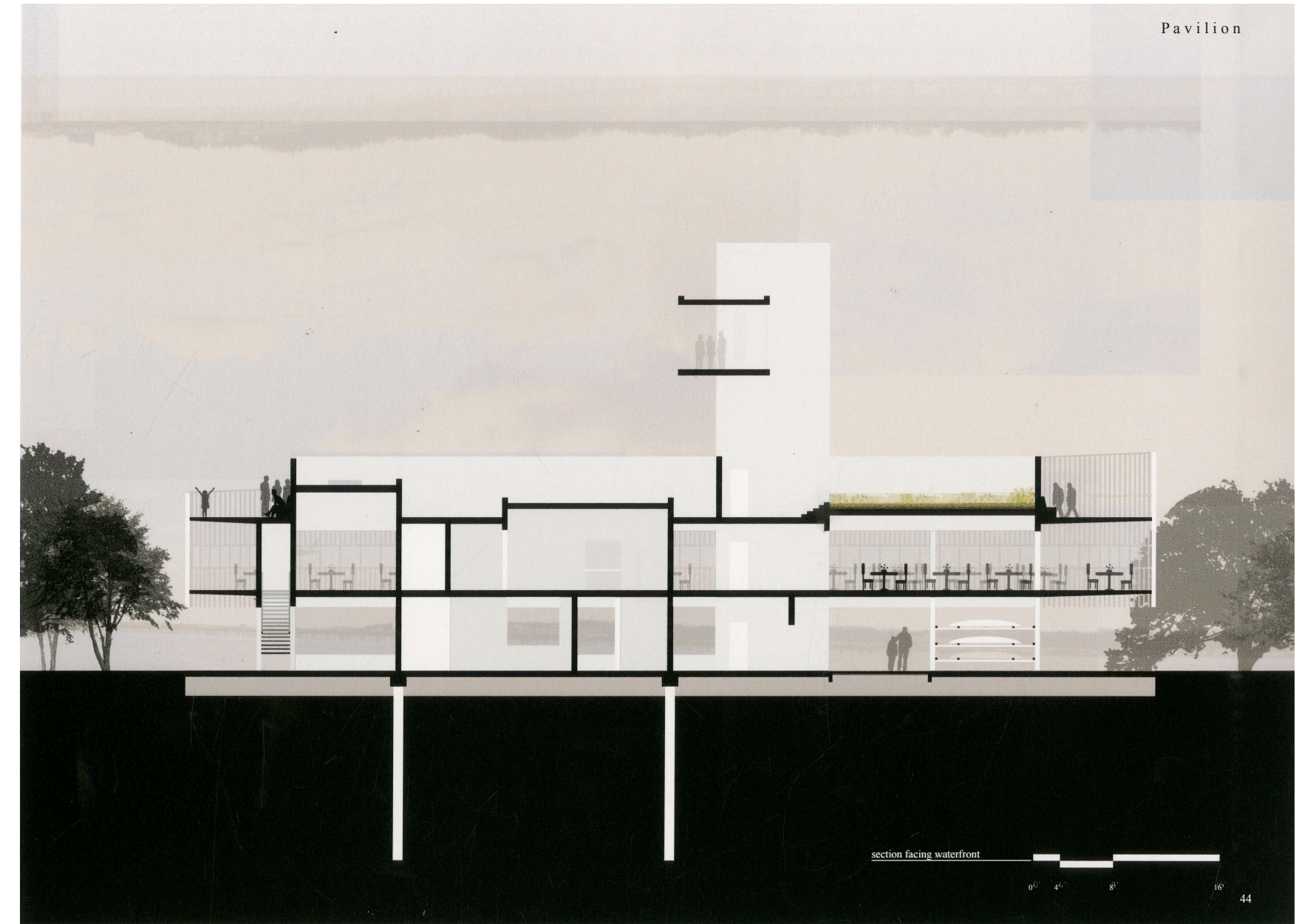
As I designed the tower, I thought a lot about an intimate space at the very top. It is a special moment for visitors to take in everything the site has to offer from another perspective. To make the space unique and worth while I designed a cantilevering nest, an observation deck with a small bar that extends out towards the northern view. The facades of the nest are made of glass, framing the view of the waterfront and the sunset over the marina to the west (illustrated in photo below).

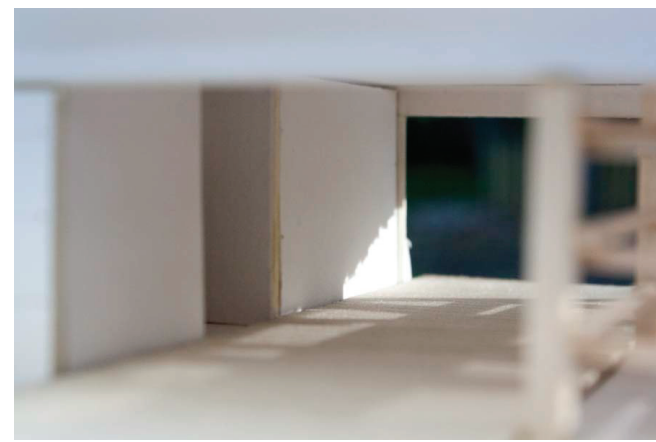
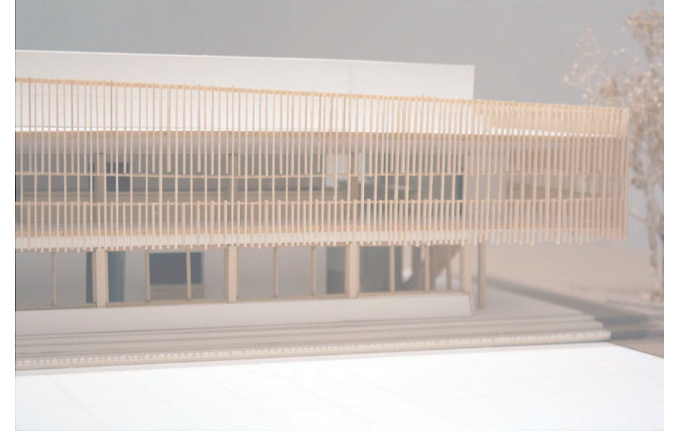
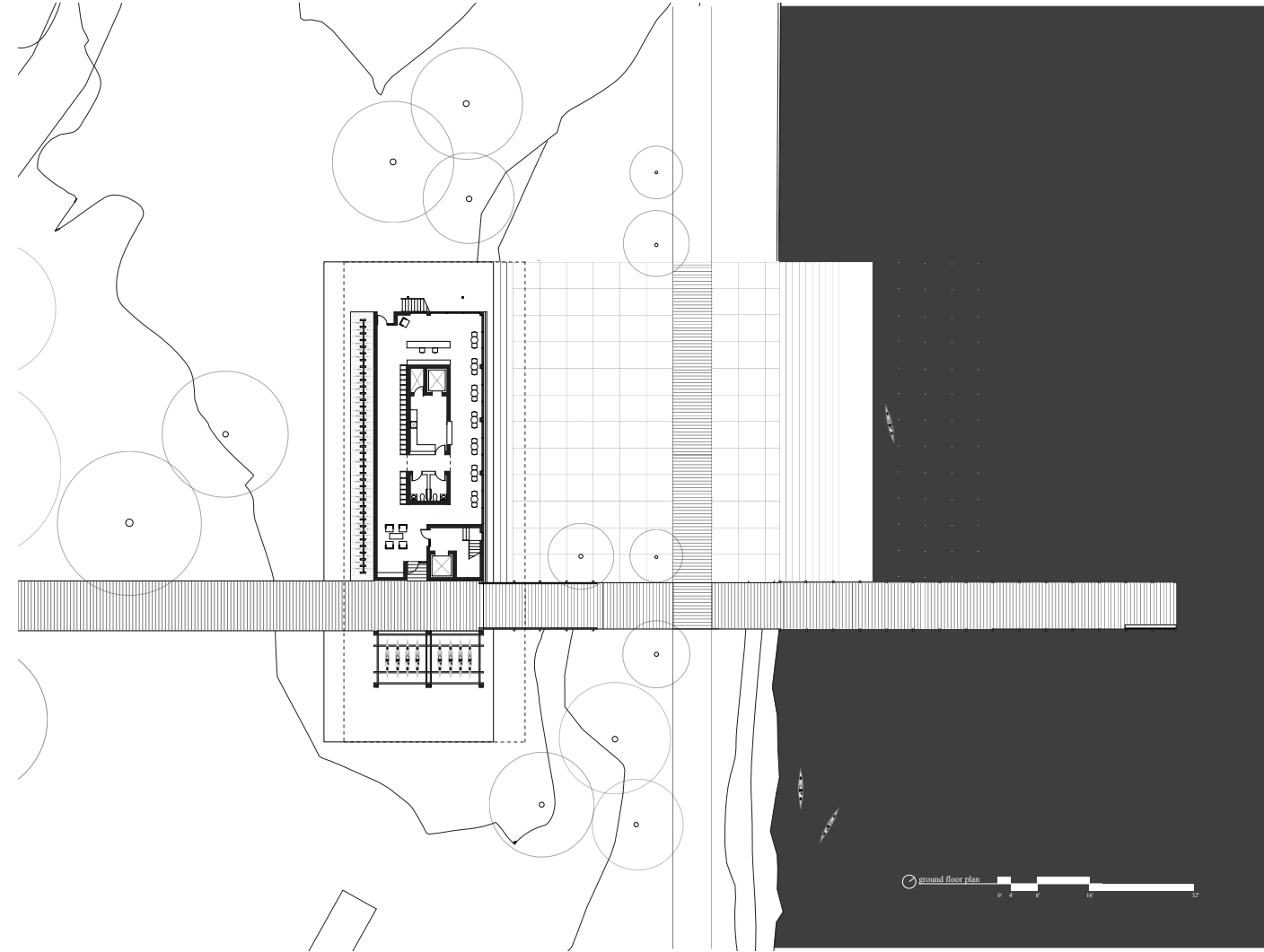


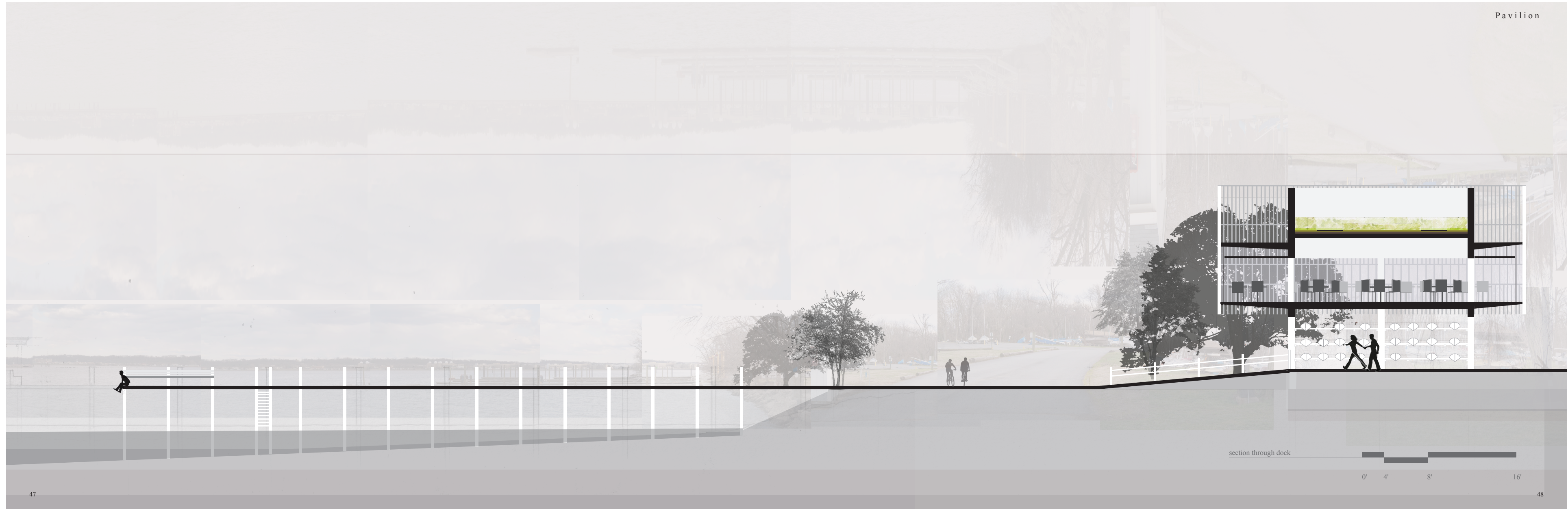


final model





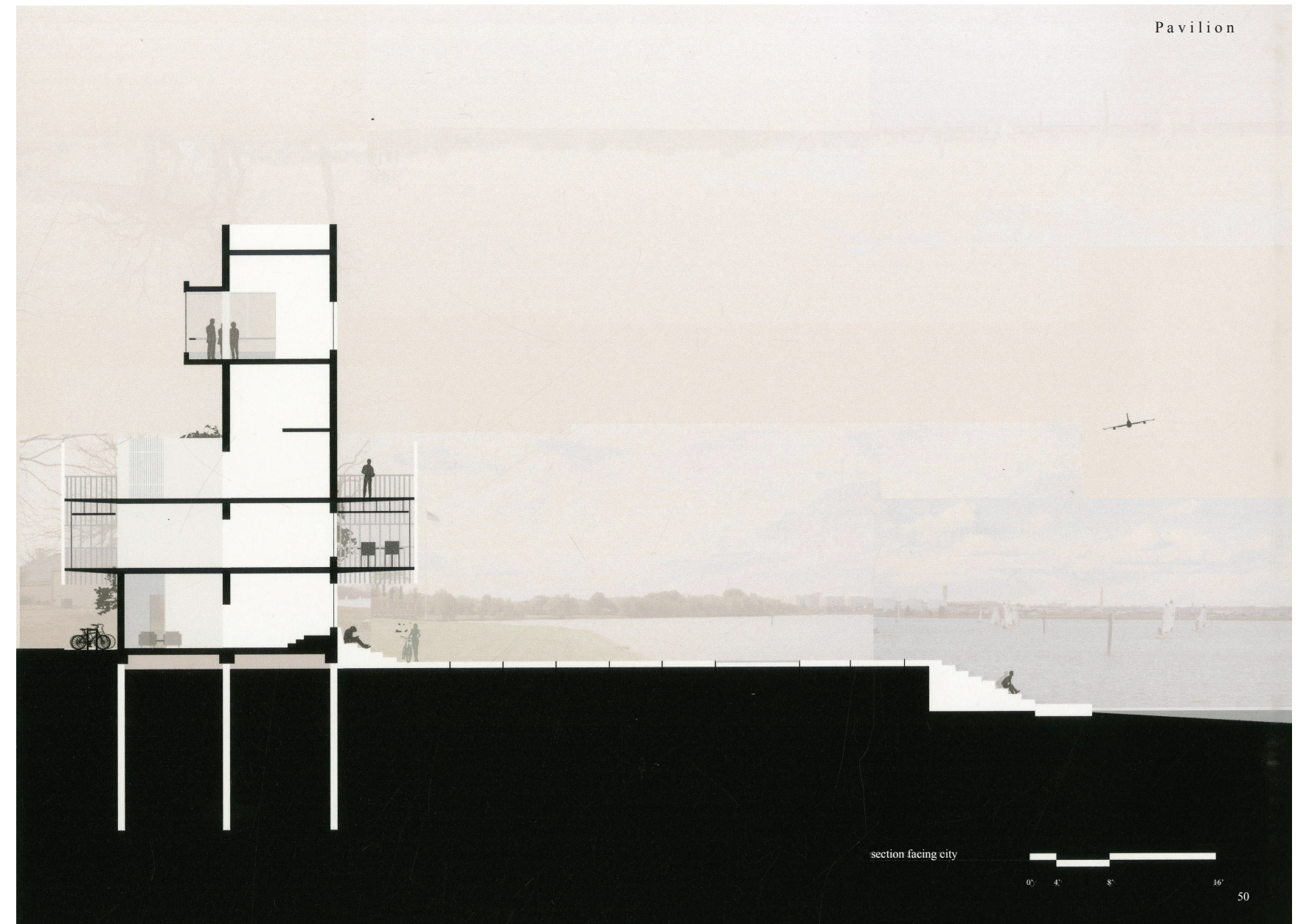
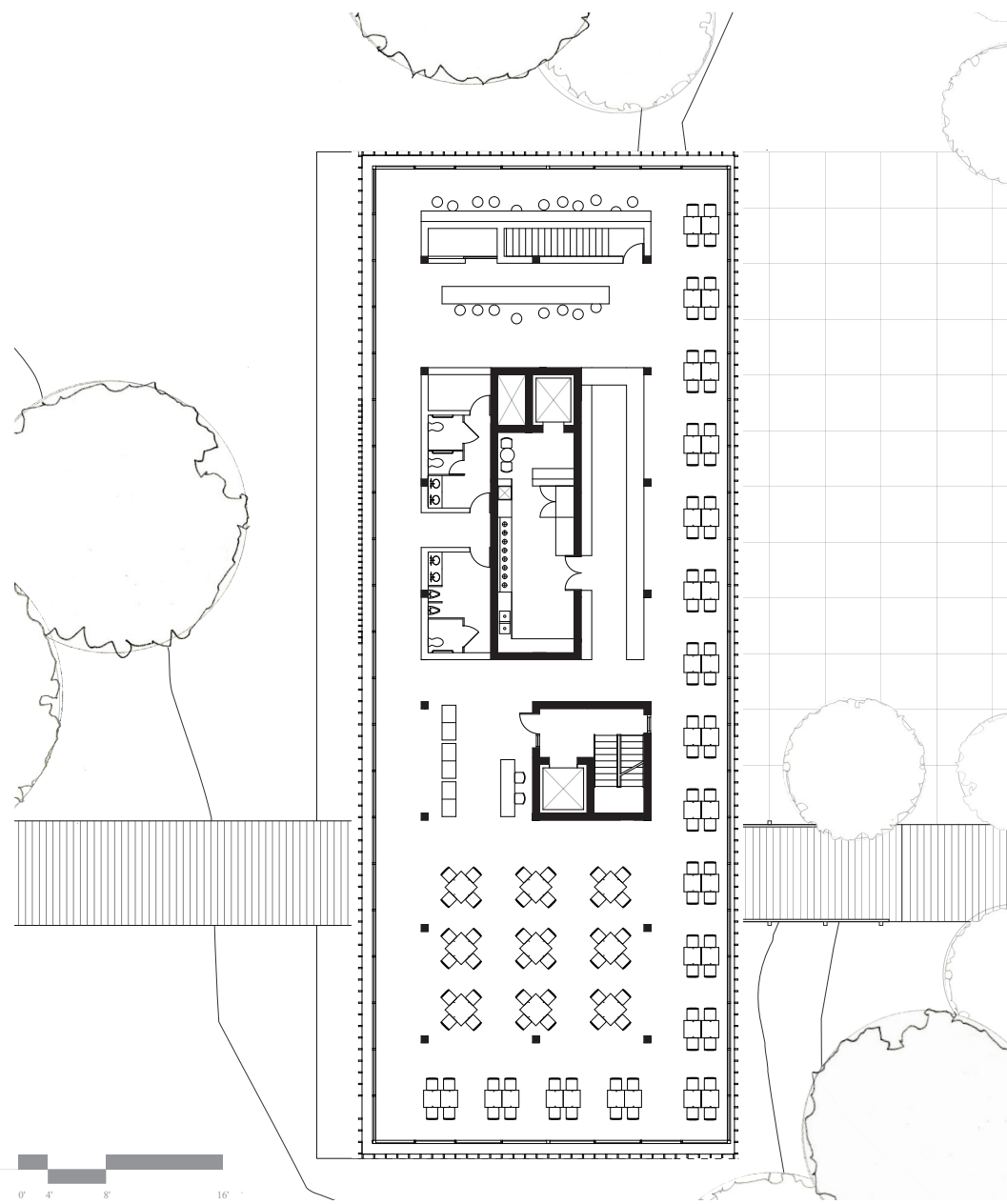


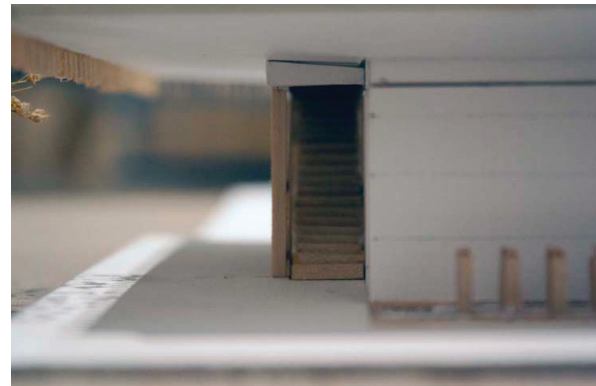
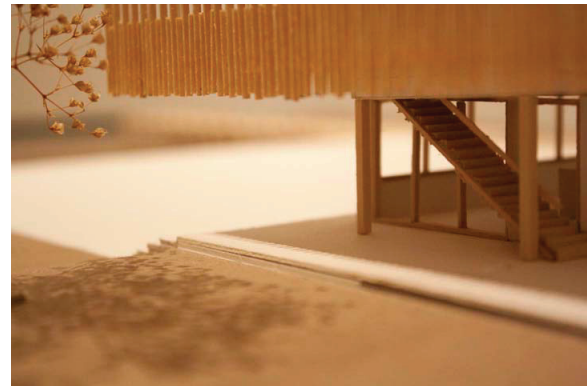


section through dock

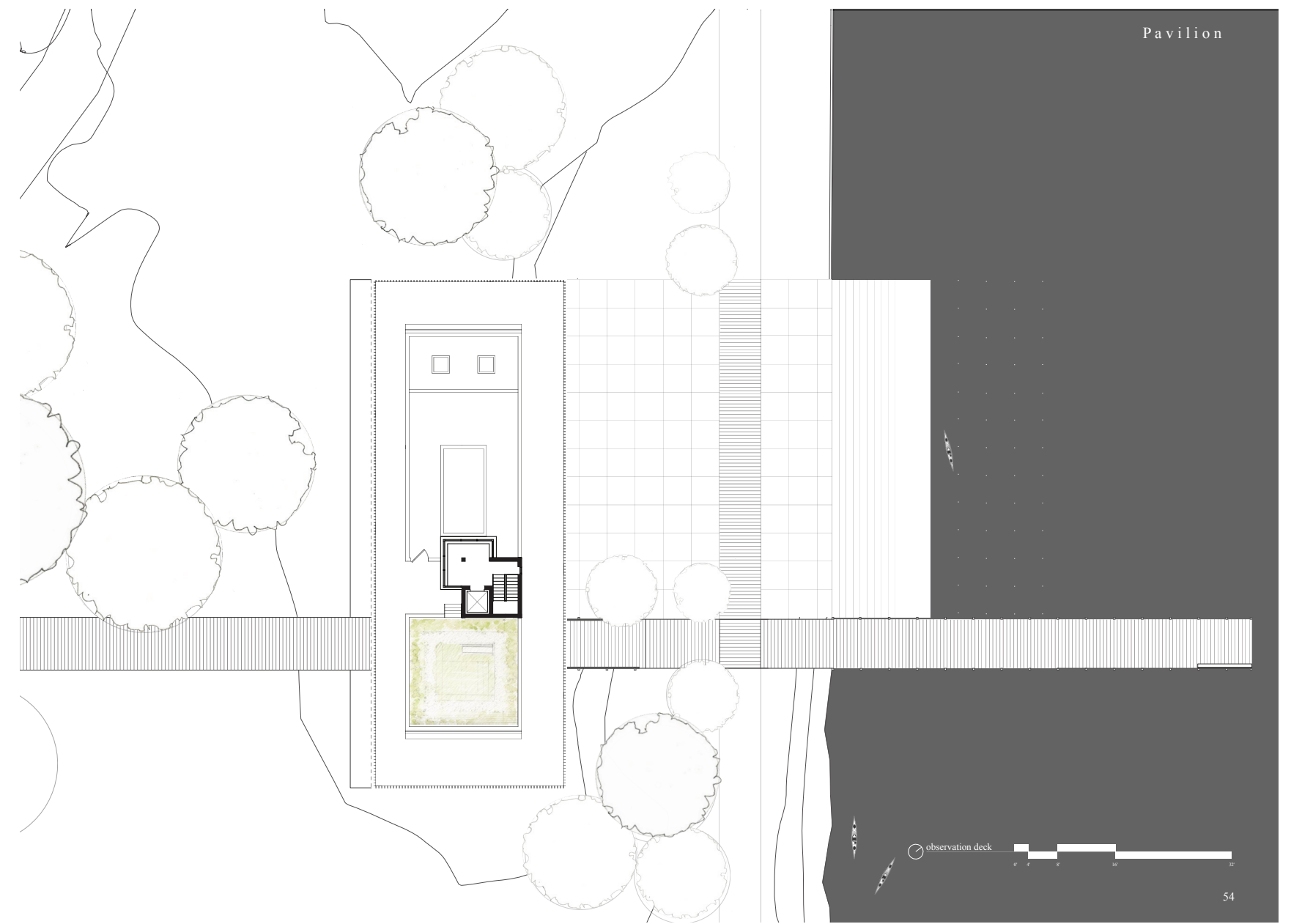
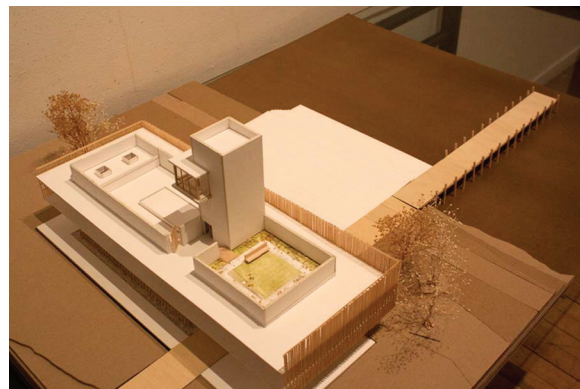
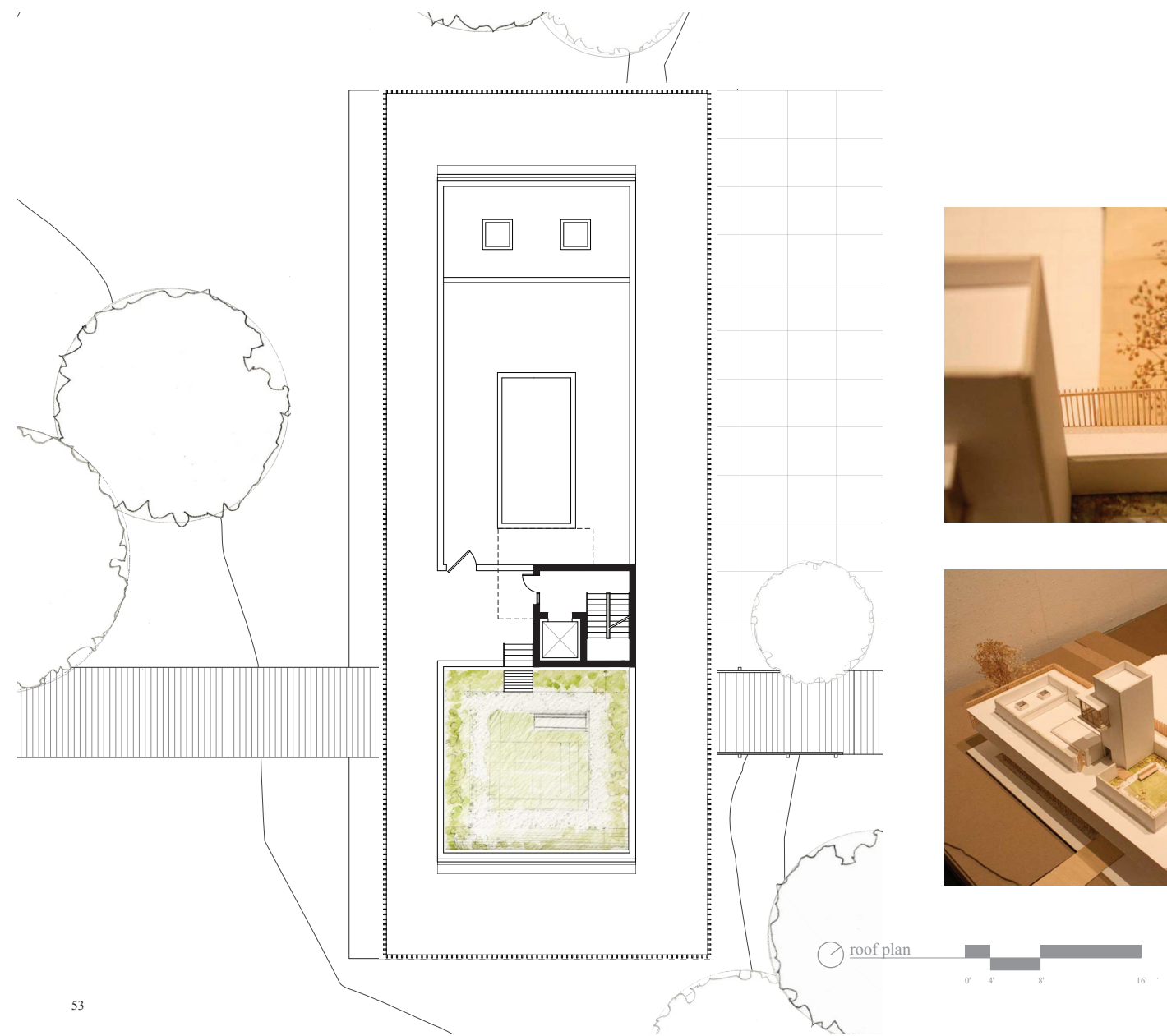
0' 4' 8' 16'

second floor plan











Bibliography

"Paul Graham Photography Archive." Paul Graham Photography Archive. N.p., n.d. Web. 30 Aug. 2012.

Zumthor, Peter. *Atmospheres*. Basel: Birkhauser, 2006. Print.



Illus. 2 **Waterfront Panorama** Daingerfield Island Alexandria, VA images by Katlin Bentley. Fall 2012