



The Renaissance of Water Culture in D.C.

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Abstract: Washington DC is seen as a center of politics, bureaucracy, litigation, legislation, and the trading of power and resources. For this reason outsiders are both attracted to and repelled from our city. For many of us transplants and government workers, a large portion of our collective self-image is dictated by the ebb and flow of our governing body. Certainly, to some observers, this is a shallow truth. When DC looks in the mirror, however, how does it see itself? Having been raised here, I was ingrained with the common native understanding that we do not "talk politics" at the dinner table or social gatherings. Outside of the workweek, citizens of this city seem to make every effort to distance themselves from party lines. This is the unseen, cooperative, leisurely side of DC. My goal with this project is to create a venue that will kindle the virtuous social underpinnings of our city, small as they are. Gaston Bachelard writes that the water's reflection embodies "a delicate touch of narcissism without pride that gives to every living thing, to the simplest flower, consciousness of its own beauty." My hope is to use our greatest untapped social resource, the Potomac River, to provide a moment of humble self-reflection to the District's unmasked character.

This book is dedicated to my mother, my father, my aunt, and my grandmother.
Your love is the reason this was possible.

The work in this book is dedicated to the people of Washington DC.
Your identity is the reason this was necessary.

Contents

Reality	1
Potential	11
Understanding	19
Creation	25
Product	45
Siteplan	48
Boathouses	50
Boatlaunch	58
Swim Pier	62
Arena	66
Channel Mark	68
Arena	70
Mooring	72
Connections	74
Appendix	77

Figures: Any image that is not the creative property of the author is numbered in the top left corner and cited in the appendix.

Reality

Sydney



Barcelona



Copenhagen



Dubai



The world's great cities are built on bodies of water.
Washington DC is one of those cities.

Washington D.C.



Zurich



Cairo



Dublin



London



New York



Singapore



Paris



Prague



Cape Town



Chicago



Helsinki



Istanbul



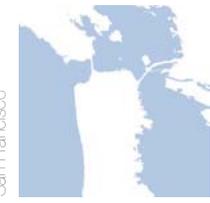
Rio de Janeiro



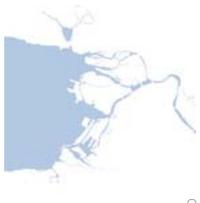
Rome



San Francisco



St. Petersburg



01

[12253 - ALONG THE POTOMAC C & O CANAL, WASHINGTON, D.C.]



Whether lakes, rivers, or oceans, these bodies of water provide an enormous benefit to their accompanying cities. Historically, the benefit was economic. Water made it easier to transport goods and people around the world. Although it may not appear so today, the Georgetown waterfront was once the heart of this trade economy with an active, thriving port. It was essentially the point farthest upstream where the Potomac river was deep enough to accommodate ships. While Georgetown and Alexandria rivaled each other in size and stature initially, Georgetown's port began to eclipse Alexandria's in importance as Washington grew. It was also eventually the terminus of the 186 mile long C&O canal. The canal, a mixed success story unto its own, was further evidence of the facility of water transport.

The convergence of the port and the canal provided for an economic and industrial center on the Georgetown waterfront whose remnants are still visible today. Evidenced by the sentinel-like vestigial smokestack that still adorns one of the canal's perimeter buildings, this waterfront area continued to be an industrial center well beyond the relevance of its port.



With the advent of steam and motorized travel, trade centers moved further from the water that no longer benefitted them financially. However, as the nature of transportation changed, so too did the importance of water to cities. While its economic importance dwindled, many cities continued to value the social benefits that their bodies of water presented. Places like Barcelona, Basel, Sevilla, Copenhagen, understood (either initially or eventually) the hidden value of their respective bodies of water.

Waterfronts shifted from the centers of industry to potential bastions of leisure.

The great cities of the world have created places to harness this potential while elevating and maintaining a water culture.

WARNING

COMBINED SEWER OVERFLOW
DISCHARGE POINT

THE RATTV Tunnels ARE ALSO THE SEWAGE TUNNELS
POLLUTION MAY OCCUR
DURING RAINFALL

CSO OUTFALL NO. 030

PERMIT NO. DC 00211

Washington DC is not one of those cities.

In 1966, President Johnson designated the Potomac river a national disgrace. Indeed, our city's sewer system has overflow valves into the river that are actuated in rainstorms. While some pollution practices have been checked, our systematic pollution remains. For this reason among others, citizens and city officials have largely ignored the nascent potential of the Potomac river. Since the inception of this project, however, the city has received funding to correct this process.

Potential

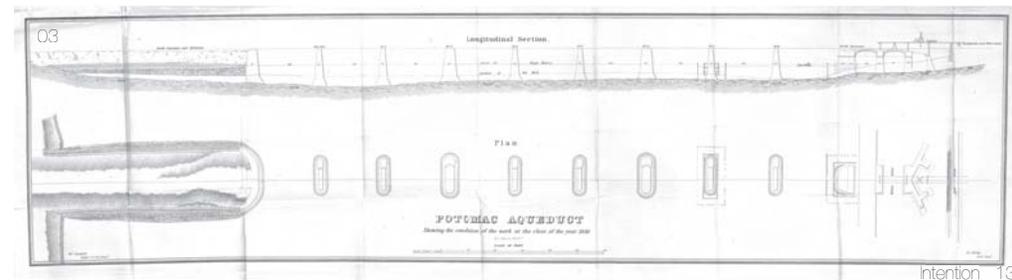


My aim with this project is to rectify our collective negligence of the Potomac. There are a number of people who have no reserve when it comes to the Potomac's waters. Rowing teams, boaters, kayakers, triathaloners consistently use the river as an ally in leisure. In no place is this more true than in the area upstream (West) of Roosevelt Island. Regattas are held here every summer. Powerboats raft-up to create a floating playland near the Three Sisters Islands. Kayakers are ubiquitous. However, the water is capable of providing calm and enjoyment for everyday citizens. The value of waterfront parks is their ability to draw the public to the water, regardless of their involvement in watersports.

My intention is to use this area to provide a series of places for people to connect to the water. Since the waters are rife with activity here, it should be able to accomodate experienced watergoers and amateur city-dwellers alike. While I studied the banks of this portion of the river extensively, one place was distinctive. On the DC side of the river, there exists a vestige of the third bridge ever to cross the Potomac river. It was an aqueduct bridge meant to transport canal boats from the C&O canal across the Potomac and into the Alexandria canal on the Virginia side. Today, all that is visible above water is the massive stone abutment on the DC side, and one stone pier resting above the water on the Virginia side.

The abutment is a local underground hangout. An irrelevant steel handrail (meant to keep people off) is only a minor inconvenience to the groups of people who walk the 140' out to its edge to enjoy the view of the Potomac and Key Bridge. At any given time I observed high school kids, lovers, picniners, photographers, joggers, and tourists all coexisting in this place.

It seemed that with the presence of calm water, active boaters, and the social and historical presence of this vestige, I had found a site to work with.





04

1843 - Canal Boat Traffic

The Aqueduct Bridge is completed, of Queen Post structure, connecting canal boats from Georgetown to Alexandria. Plans to add a second tier for rail crossing are halted by the civil war.



05

1868 - Canal Boat, Pedestrian, Wheeled Traffic

The bridge structure is improved with arching Howe trusses. A second tier is added and controlled by toll, allowing citizens to cross the river for a fee.



06

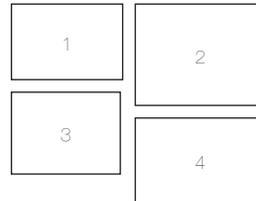
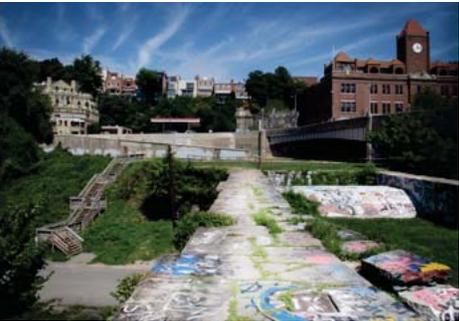
1887 - Pedestrian, Wheeled Traffic

Wood structure is abandoned for an iron truss bridge, designed and constructed for light wheeled and pedestrian traffic.

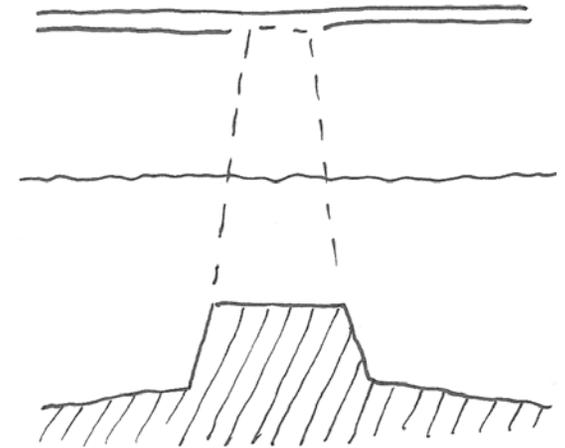


2012 - The vestiges of the Potomac Aqueduct Bridge

What remains visible today are the abutment and one pier of the demolished stone bridge. However, **there are seven piers remaining underwater** between them.



- 1 View from the stone abutment to Georgetown
- 2 View from abutment to Potomac River
- 3 View under neighboring Whitehurst Freeway
- 4 View of the site from the riverbank in Virginia



The materialization of the site presented me with an opportunity:
Why would I design a waterfront park when I have the structure in place to develop a park in the water?

Using the given arena, I became determined to create a space that did the following:

- Enhance the activities already present.
- Allow people to uniquely connect to the water.
- Connect to the ruins on site.

Understanding

Convenient Truths - People, Public Space, Water

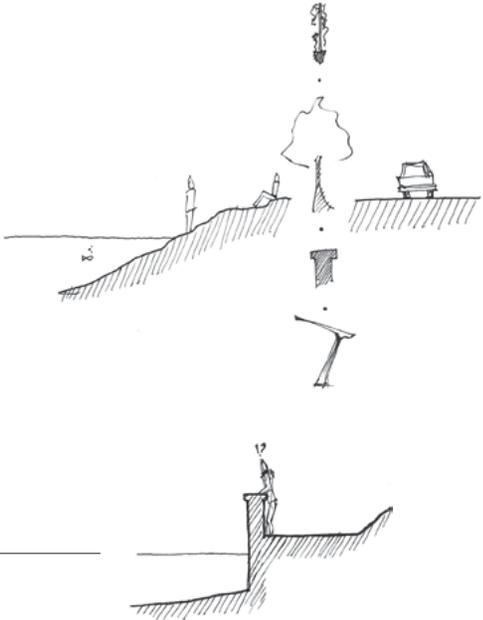
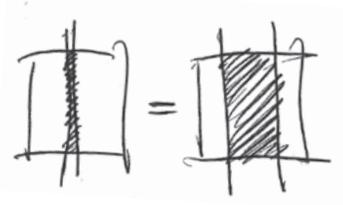
Inspiration for this project came from travel through a number of cities worldwide that embrace their water culture, whether extant or nascent. Running through the water-minded designs of these cities, I discovered a number of consistencies about people, public spaces, and their relationships with water.

Scale - is of virtually no importance. Large rivers with small parks cutting through dense cities, small streams through grandiose parks, all provide different types of enjoyment, all have similar value to the park's constituents. As long as the population exists, they will fill the appropriated space.

Distinction - Inevitably, there is a road between the water and its accompanying town. The park land between road/water will always benefit from being perceived as owned by the water, rather than the road. Typically, the sloping grade at the water's edge will facilitate the distinction between the two; but in its absence, a barrier is appropriate.

Temporary Ownership - For users, the greatest importance is being able to find a spot and make it your own - even if you're only a foot away from the next person down the line.

Uninhibited Proximity - Having a wall (physical or natural) that prevents people from getting at least a little bit wet is only distancing them from the true attraction. People are there for the water... let them touch the water.



Convenient Truths - Amphitheater Effect

Careful study of public spaces led me to the belief that - for a number of reasons - the amphitheater is the strongest social architectural gesture we can make. Therefore, its implementation would be essential in the success of any designed public space. In its simplest form, the amphitheater is a slope. By changing nuances in this slope, however, the designer is able to extract a number of its inherent architectural advantages:

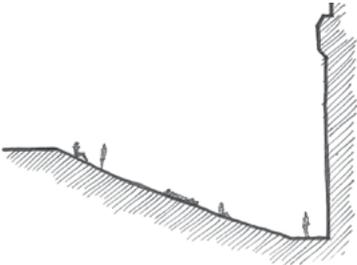
Consistently changing vantage points allow people to see and be seen, which -- despite its assumed vanity -- is a factor of chief importance in the success of a public place.

In an appropriately sized amphitheater, places will be equally as appealing. Expressly, what one seat lacks in proximity (to the stage), it will provide in overall view. Stratification allows for differentiation of space.

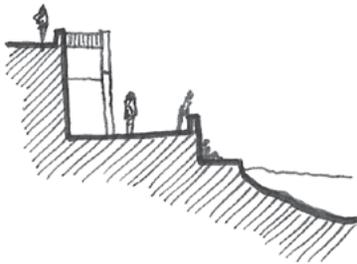
A well designed amphitheater allows people to distance themselves from the main entrance and connect more closely to the main focus, according to their will. It is both a transitional space and a reflective space.

The gradual slope facilitates seating in one direction only. It is rare to find someone sitting in decline, facing uphill. Thus, the amphitheater form implies a focal point, which is invaluable in an attempt to influence a collective mind-set. **Certainly, In a world where media is increasingly forced upon us, it seems the value of an arena suggesting the subtle spectacle of everyday life is exponential.**

Armed with these understandings, I set out to design.



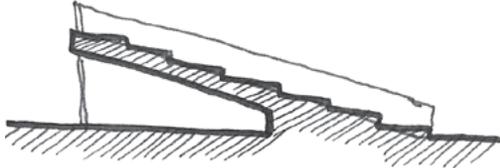
Campo, Seina // Pompidou, Paris



Riverfront, Sevilla

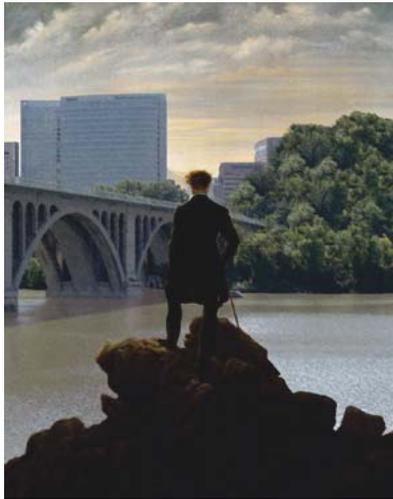


Spanish Steps, Rome



TKTS, New York

Composition



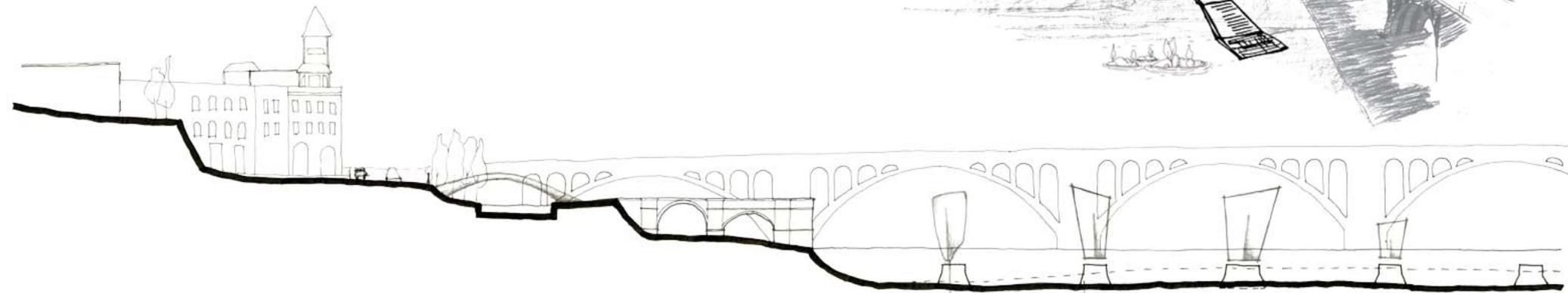
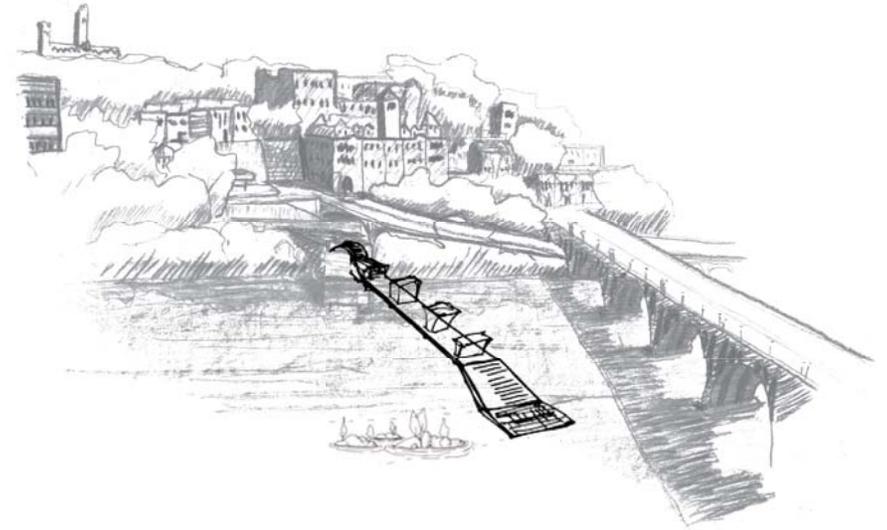
Interpretation of Caspar David Friedrich's *The Wanderer*

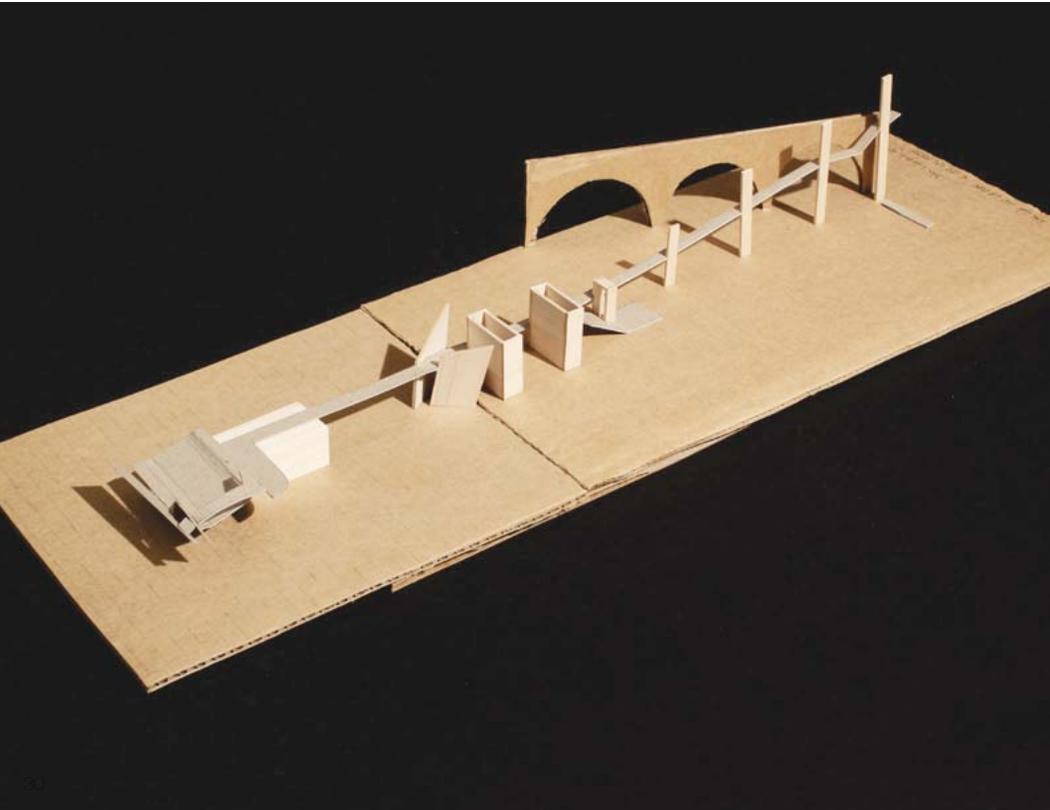
Nothing about the design of this project was linear. The process spiraled for months while I attempted to finally find a form that could accommodate closed, conditioned buildings, open park spaces, powerboats, racing shells, kayaks, eating, drinking, swimming, sunbathing, a bicycle path, and hundreds of people. On the ruins of a bridge pier. In a moving river. All the while, adhering to the rules I set up for public spaces involving water. Try as I might, I couldn't find precedents for my idea. As the design for one element would evolve, it would begin to neglect others. When I thought I had found an appropriate form for a few, the rest wound up lacking. The next chapter attempts to convey that convoluted design process in as clear and chronological a method possible. Throughout, the search for a common gesture was what drove the design.

Initially, the typology of a pier was foremost. To me the success of the project lay in its ability to create places for people to dwell across/above/within the river. It seemed that I could use the existing bridge supports (12' underwater) as a foundation for buildings that promote an active water lifestyle.

The design would include: **boathouses** (for crew) - all of which would be connected by a pedestrian bridge/walkway.
public boat rental
cafe
swimming hole
boat mooring

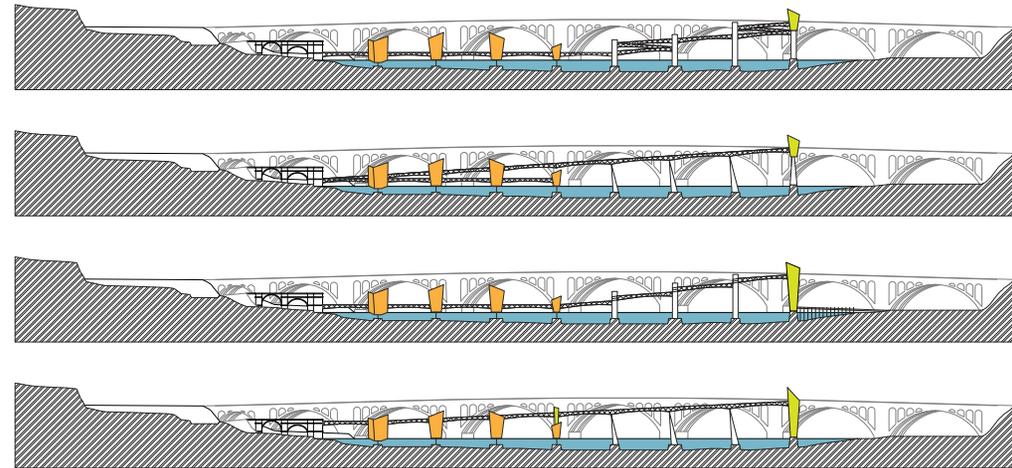
The individual towers would be centers of aquatic activity, mounted on the stone supports of the vestigial aqueduct bridge. The connection would be made on the Georgetown side, thanks to the convergence of the canal, the abutment, the bike path and the added benefit of room for parking.

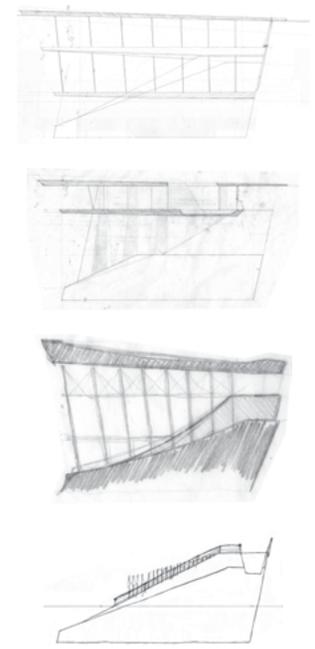
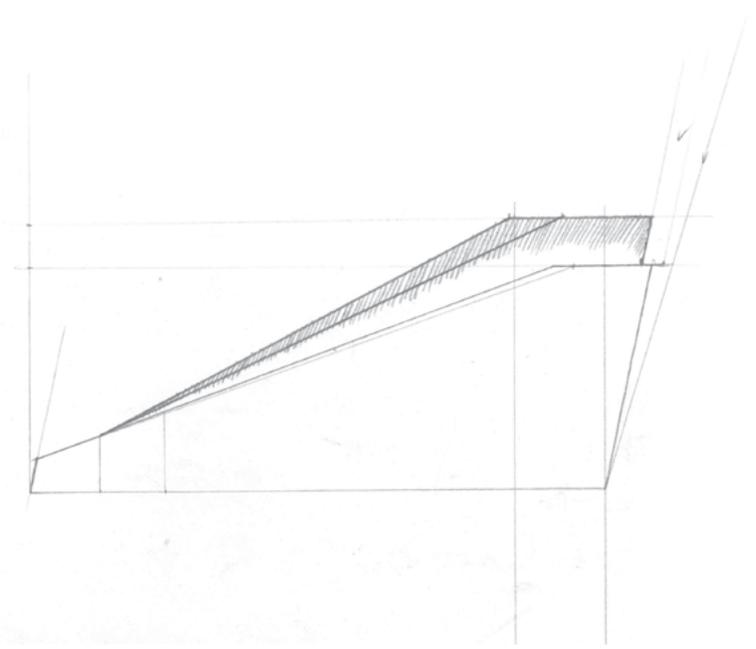




Georgetown has one major fault: it lacks a metro stop. On the Virginia side of the river, however, Rosslyn metro is within walking distance of Key Bridge (the replacement to the aqueduct bridge). Since the paths of Key Bridge and the Aqueduct Bridge converge at the Virginia side, and many pedestrians use key bridge to cross the river, it seemed logical to connect to Key Bridge on the Southern (VA) side. This set in motion a drive to create more than a leisurely destination; rather a functioning connection between two urban entities.

Despite the addition, I was steadfast in the notion that **this project would not succeed as a bridge between two points, but as a bridge between a city and its water.**





Finding Form

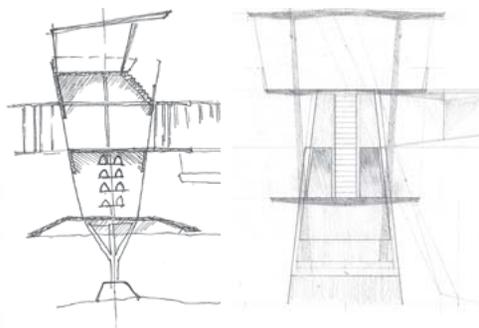
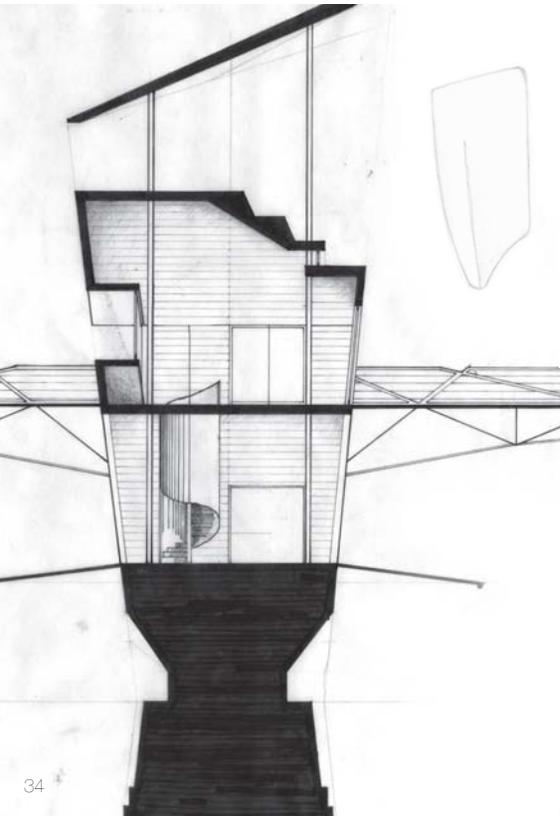
Initially, I thought the presence of so many functions, obstacles and guidelines would provide me with a clear but intricate path to a design. It turned out that building in water, on a ruin, with varying program, across eight buildings made for a dizzying array of architectural constraints. I would have to work on tangents, developing one element of the design in order to progress, then check it back with input from the design.

The great struggle was to extract a form that could:

- withstand water and ice
- respect the flow of the river
- be a base for superstructure
- support a pedestrian bridge
- allow access to water
- provide space for activity
- create unity among the disparate functions

And all of this would have to fit on a 17' x 65' footprint.

Naturally, it would have to be concrete. Based on the nature of the demolished stone piers, it would taper in. It would be 15' above high water to accommodate boats and flooding. It would slope backwards towards the pedestrian bridge it held at that height. Its slope would provide the desired amphitheater effect as well as reveal different levels depending on the tide. Its shape would be slightly enhanced in order to support conditioned buildings above the 15' mark. Most importantly, its form would be clearly recognizable among the subtle programmatic shifts.



Boathouse Design

More than any other element, the boathouse drove the design of the piers. The presence of a full, competitive boathouse grounds the active nature of the project. As such, it would need to house bathrooms, locker rooms, workout space and boat storage as well as launching areas.

Given the minimal footprint of the existing bridge piers, accommodating massive racing shells proved to be the most difficult design challenge. Luckily, the footprint was long (65') and slim (17'), mirroring the nature of the boats.

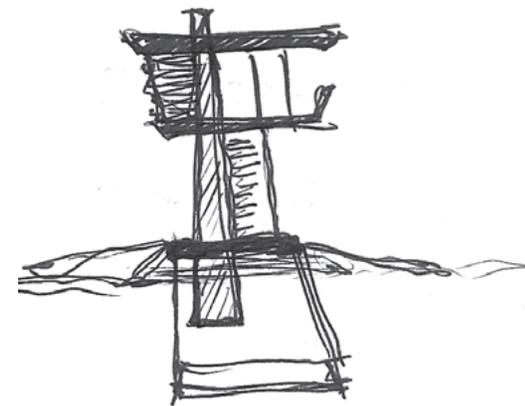
Initially, I worked with an inverted wedge shape, allowing more space in the upper floors. Directionalizing this shape also suggested the form of the hatchet oar.

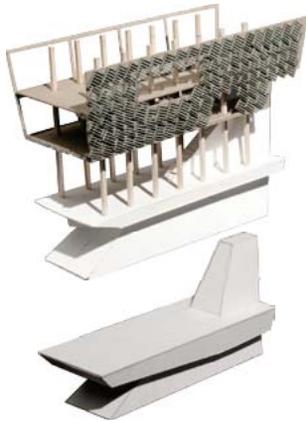


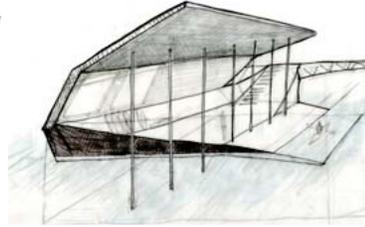
The nature of a 55' boat in a 65' space meant that the shells would have to be launched sideways. Floating docks rotating on pins would be developed to facilitate this process. However, a wall of boats is an impassible thing. As such, different models were made with a central core (boats on either side of a set of pillars), split posts (an arcade with boats on either side).

Thanks to the limited space, the structure of the boat racks would also be the structure for the upper floors of the boathouse. Therefore, as the structure of the base changed, so too did the nature of the boat rack. Eventually I decided to have the boathouses be directional... two towers facing in to each other. Thus, the structure would be handled by a 3' vertical fat wall. This wall would be structurally sound enough to allow a healthy cantilever of the 2nd floor while providing enough space to run systems through. Boat housing - and consequently launching - would be unilateral, allowing six boats per pier.

With two piers committed to the boathouses, we would have a total of twelve boats, one pier servicing locker rooms, and the other servicing a gym.







Boatlaunch / Cafe Design

The boatlaunch developed out of a desire to acclimate the project's aquatic rookies to water sports. The concrete foundation houses a small rental bay for kayaks and canoes while the downward slope towards the front of the mass serves as a launch ramp. Impressions in the concrete provide better footing. The second floor holds the bar / cafe. It houses a fully functioning kitchen, bar and bathrooms. This level, cantilevered from its giant concrete mooring, shifts from interior restaurant to exterior deck. Throughout the design process, great attempts were made at having the ability to enclose space, while still allowing people to feel the cooling breeze off the river. Collapsible glass walls are implemented to allow the cafe to open completely. Being the southernmost of the enclosed buildings, it faces south to give people unimpeded views of the swimming and boating piers dotted across the rest of the river. The cafe roof is accessible by a stair leading up from the deck.





Swim Pier Design

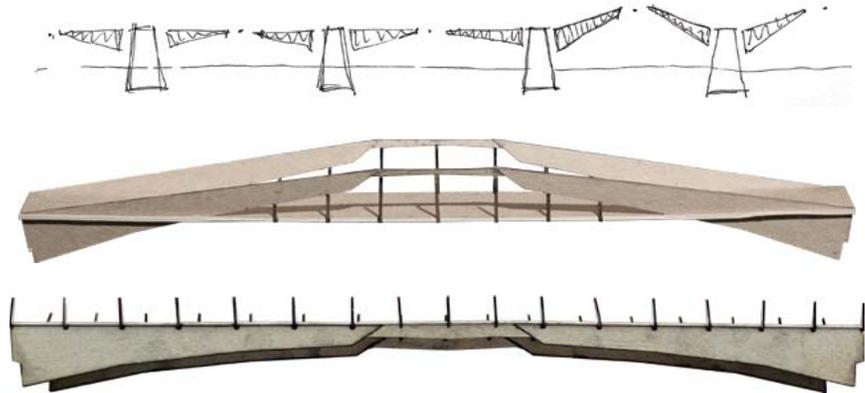
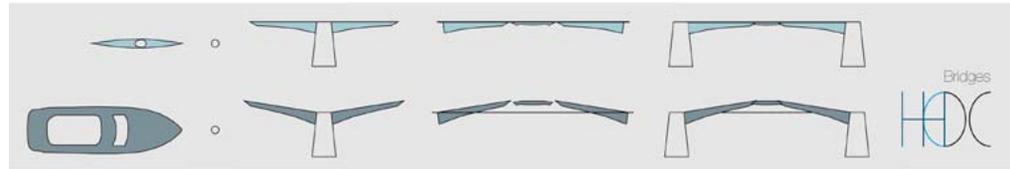
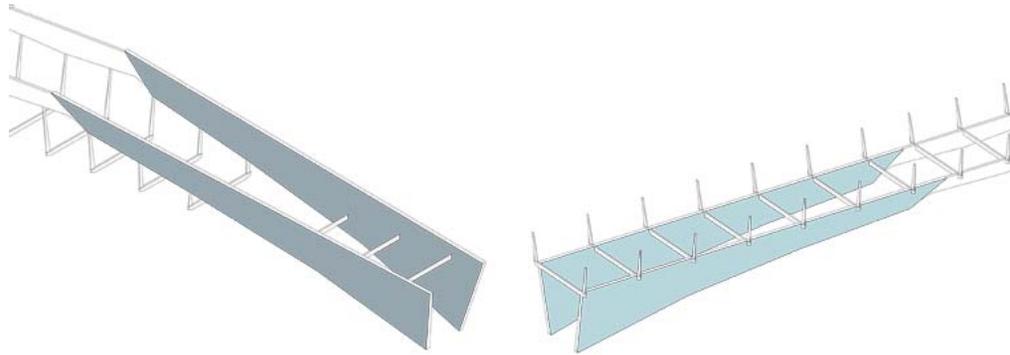
Regardless of the design stage, the swim pier has always embodied the descent to water. Located in the middle of the river - and the project - it is a simple set of stairs. The quintessential theater: it provides patrons with an uninhibited view upriver. The stairs are scaled up to provide seating, with a smaller set for walking running down the left side. Widening slightly, their rhythm is monotone as they drop into the river flowing towards you. **This is where we find the baptism of the city-dweller.** In touching the river, we find a connection that was obscure from a distance:

He finds himself outside once more. Although he was able to oversee the world beneath him from his perch, he was unable to inspect the fine grain of his surroundings. Crossing the bridge to the next island, each step brings him closer to his true destination, the water. Descending to its level, he realizes his unique position: so often the river is seen as a barrier, something that separates one side from the other. However, looking upstream he is flooded with an awareness of everything that is connected to the water we so strive to build over. The ports downstream bear witness to the river as a lifeline to the city. The farms upstream bear witness to the river as a lifeline to the country. He is at the divide. The tide is up, inundating the bottom levels of the platform. What was a concrete stair earlier in the day has become a shallow pool for him to inhabit. Here too, he is at the divide. As he drops gently into the pool, he aligns himself with the flow of the river, reaching out a hand to touch the rippled mirror flowing past. From above, he could hardly discern its movement. Here, he can feel the force created by miles of moving water. In some places, rushing, in this place, calm.

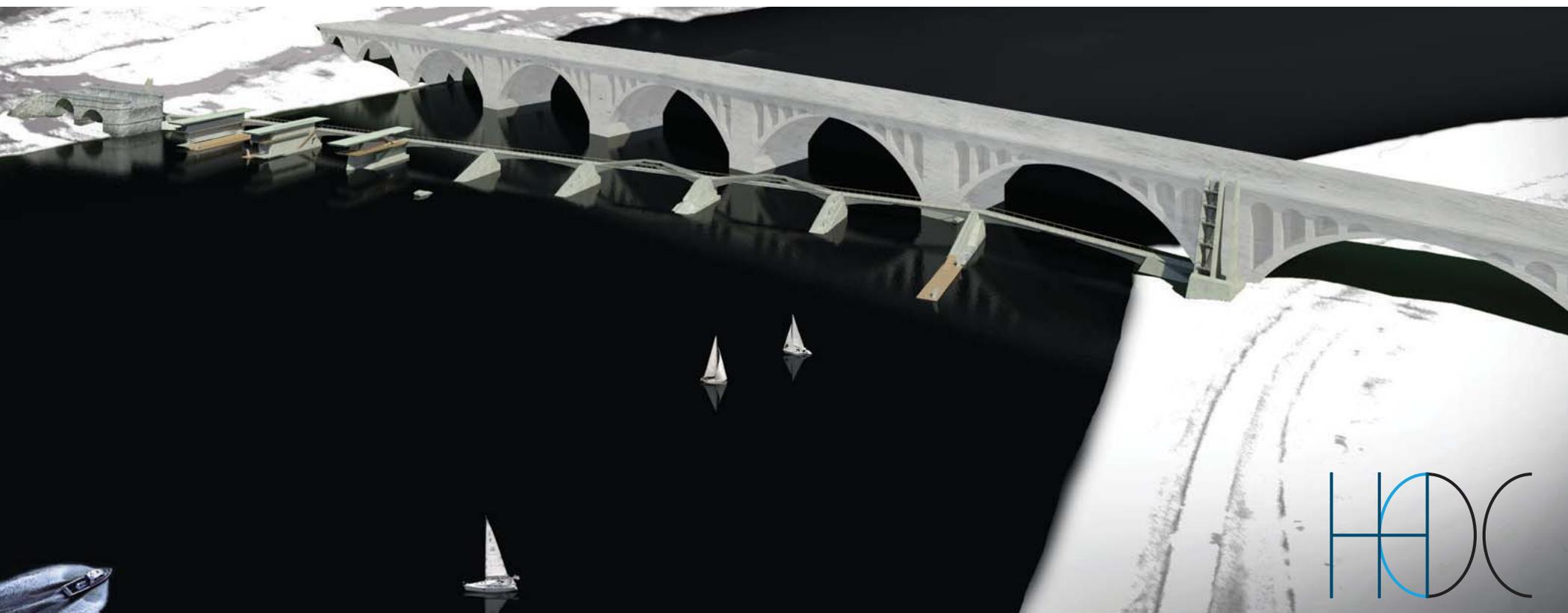


Circulation Design

Despite continually telling myself that this project was not a bridge, the full design never truly came together until the bridge was completed. Being both the connecting element and the negative space between the piers, the bridge affects the project visually as much as the piers do programmatically. Their structure is such that, rather than acting as a beam between two points, each pier hosts one set of wings. Thus, they counterbalance each other. Where the wings meet in the center of the span, there is a steel pin connection. Concrete decking is placed on top for the walkway. Two 6" steel supports are set in the concrete of each pier, angled out from the base. They taper from a depth of 8' to a depth of 1.5' in the center of the span, allowing a 13' clearance. The rhythm of the bridge changes as it reaches the river's channel; the arms lift and the deck remains level. This provides greater clearance for the larger boats travelling in the channel. The symbol of the drawbridge is a simple marker.



Product



HOC



8 Mooring

7 Arena

6 Channel Mark

5 Arena

4 Swimming

3 Boatlaunch

2 Boathouse

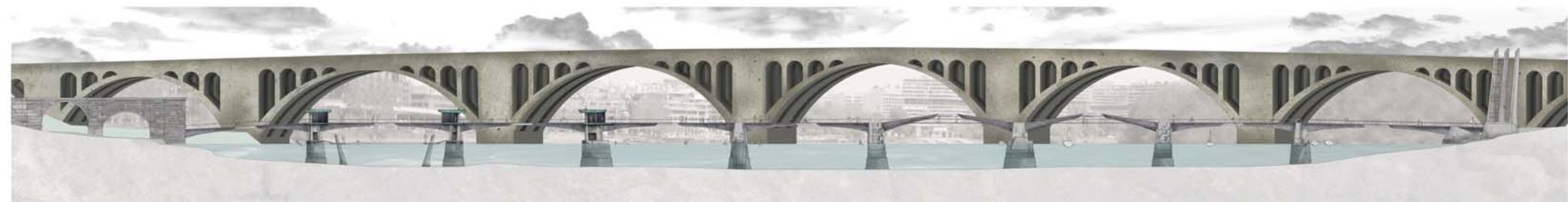
1 Boathouse

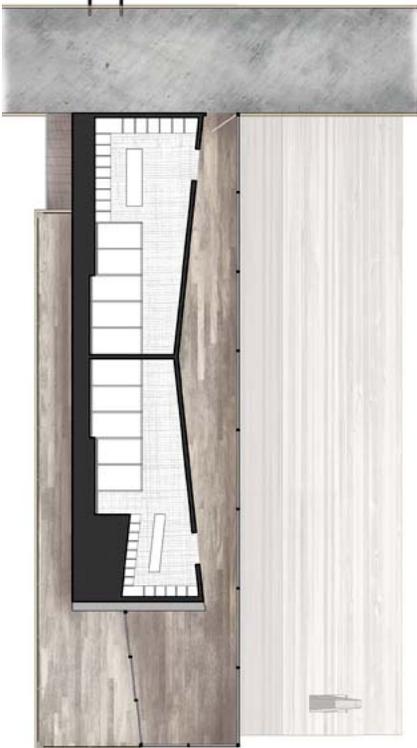
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Pier 1

Pier 2



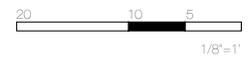




52 Boathouse 1



1/8"=1' 20 10 5 Boathouse 2 53



Pier 1

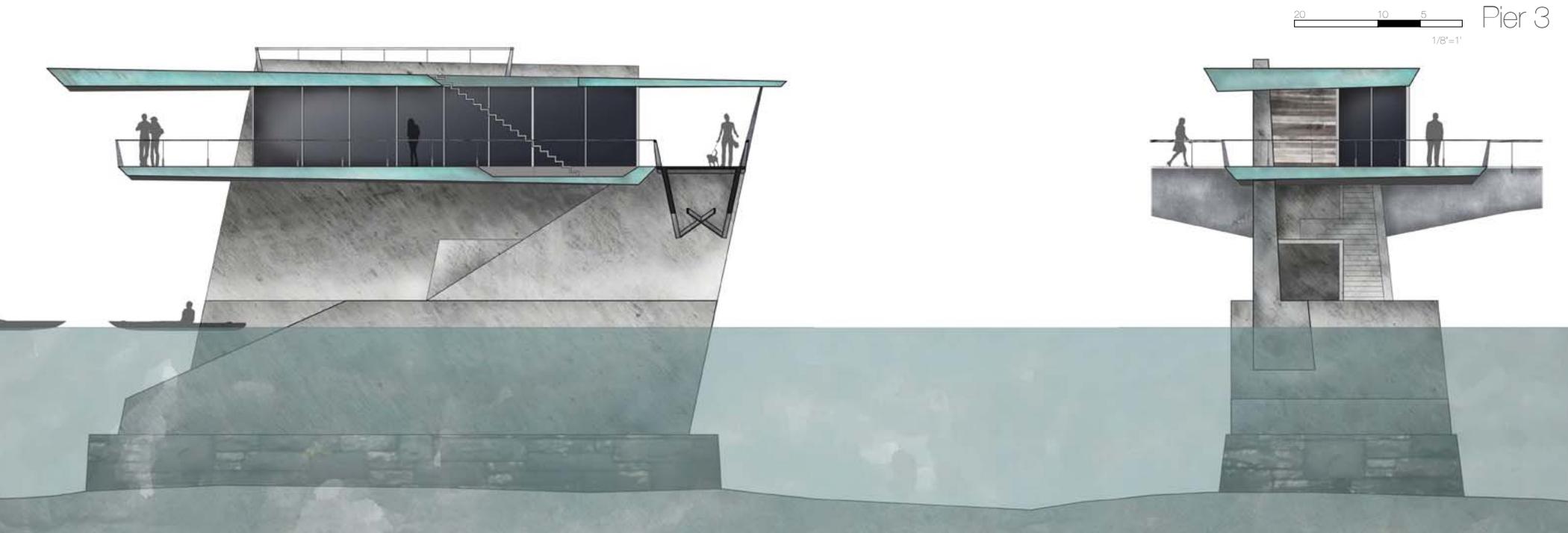


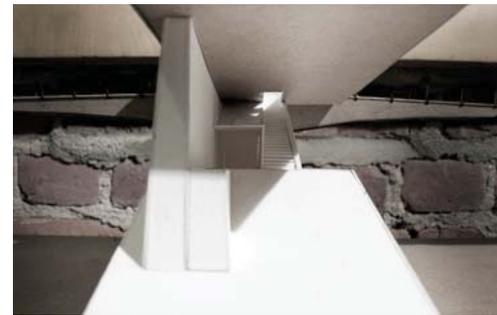
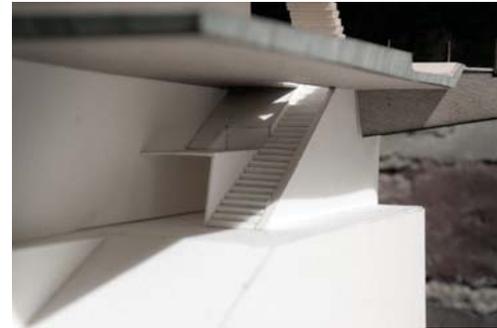
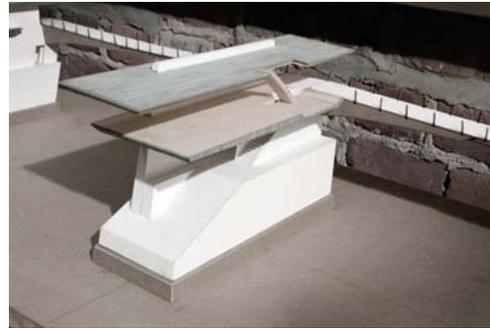


20 10 5
1/8"=1'

Pier 2

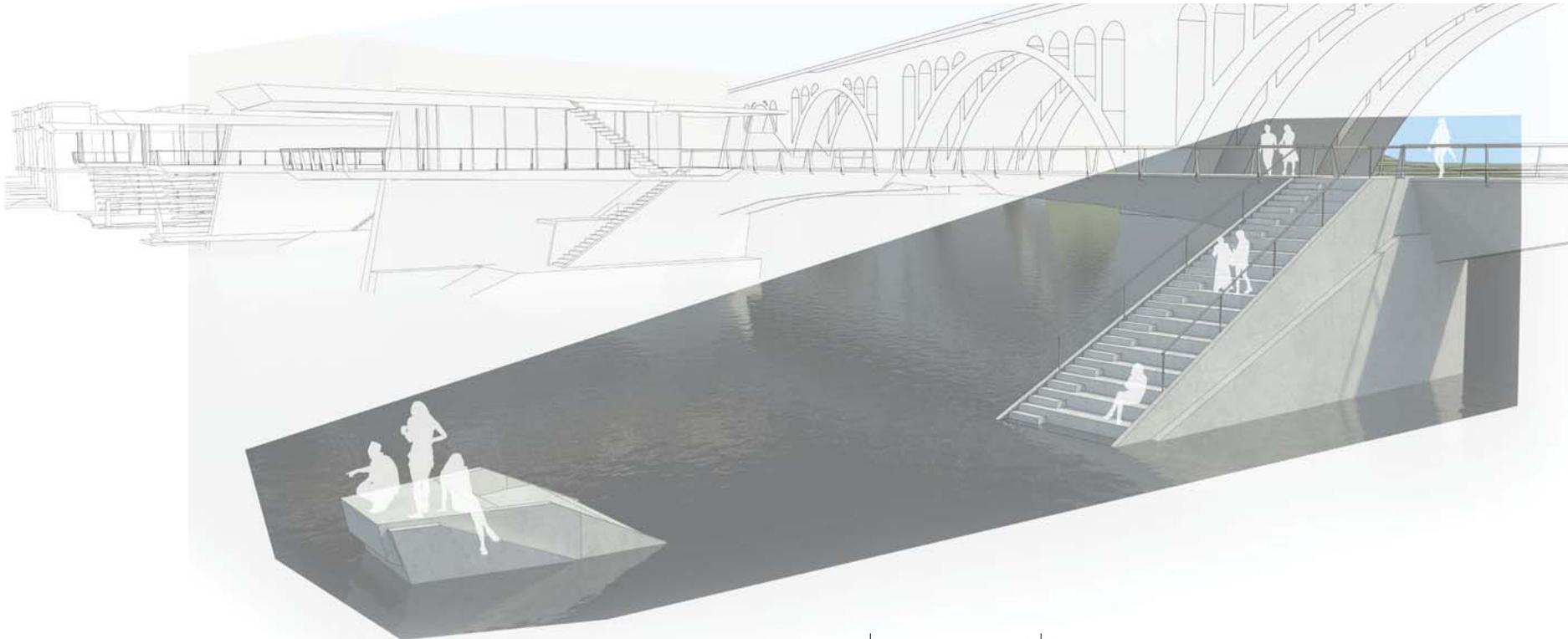




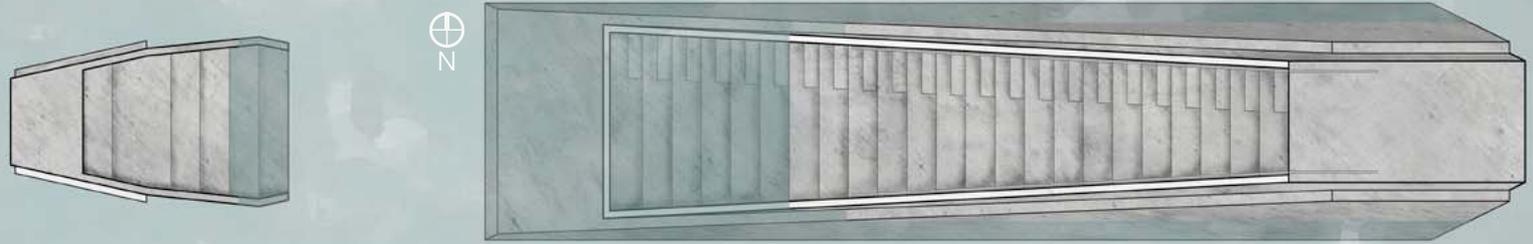
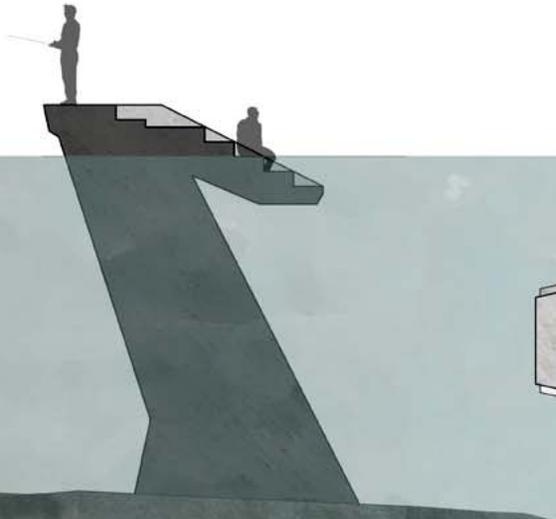


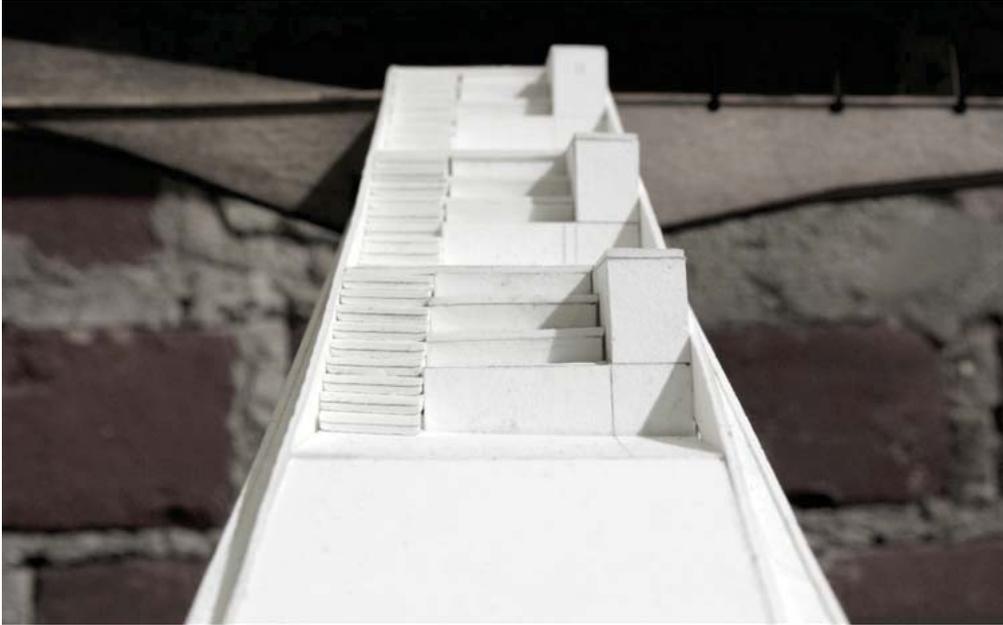
1/8"=1' 20 10 5 Boatlaunch // Cafe 61

Pier 4

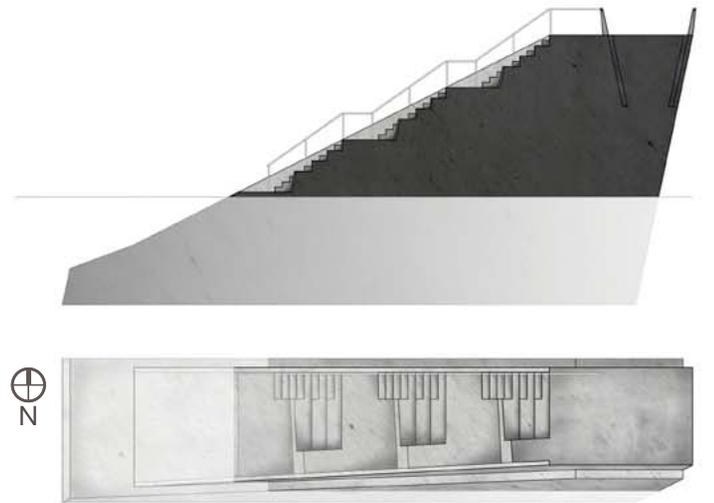


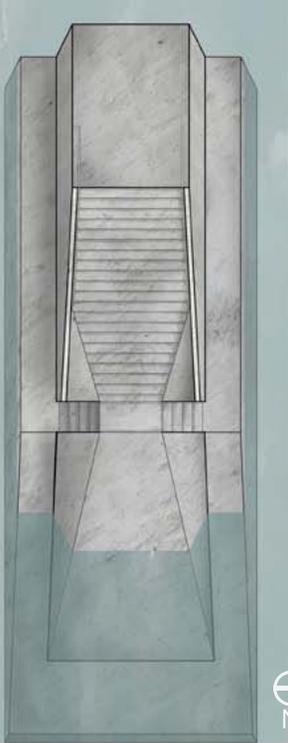
Pier 4  1/8"=1'



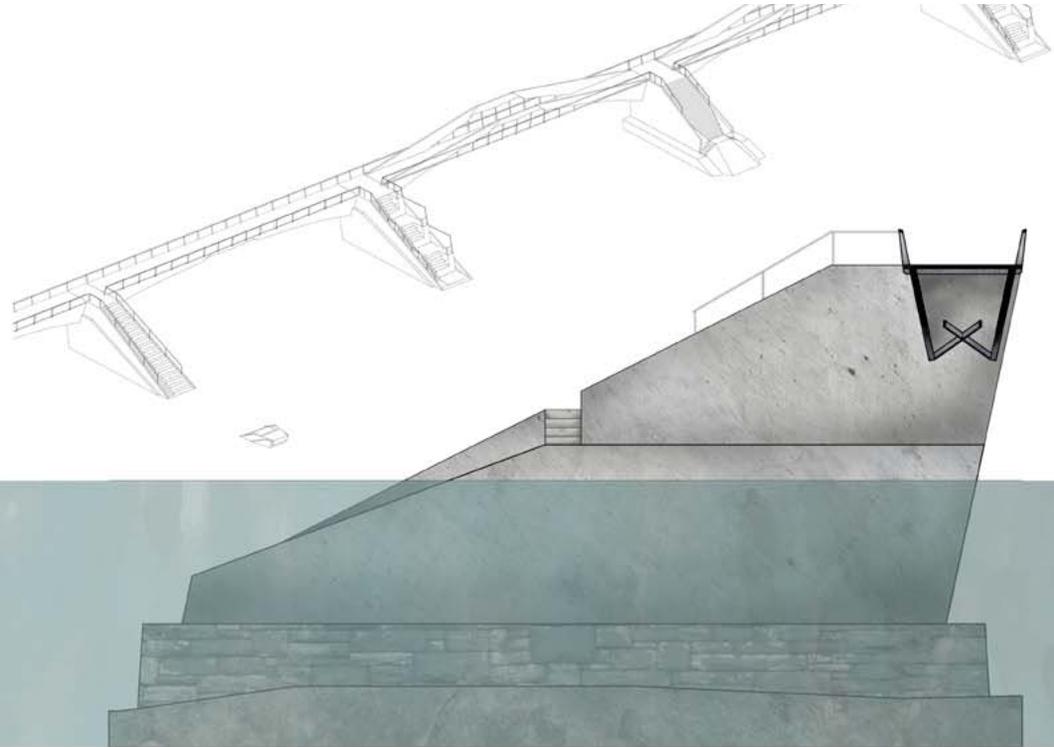
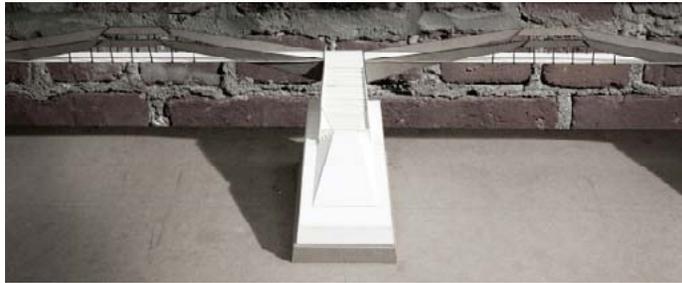


20 10 5 Pier 5
3/32"=1'

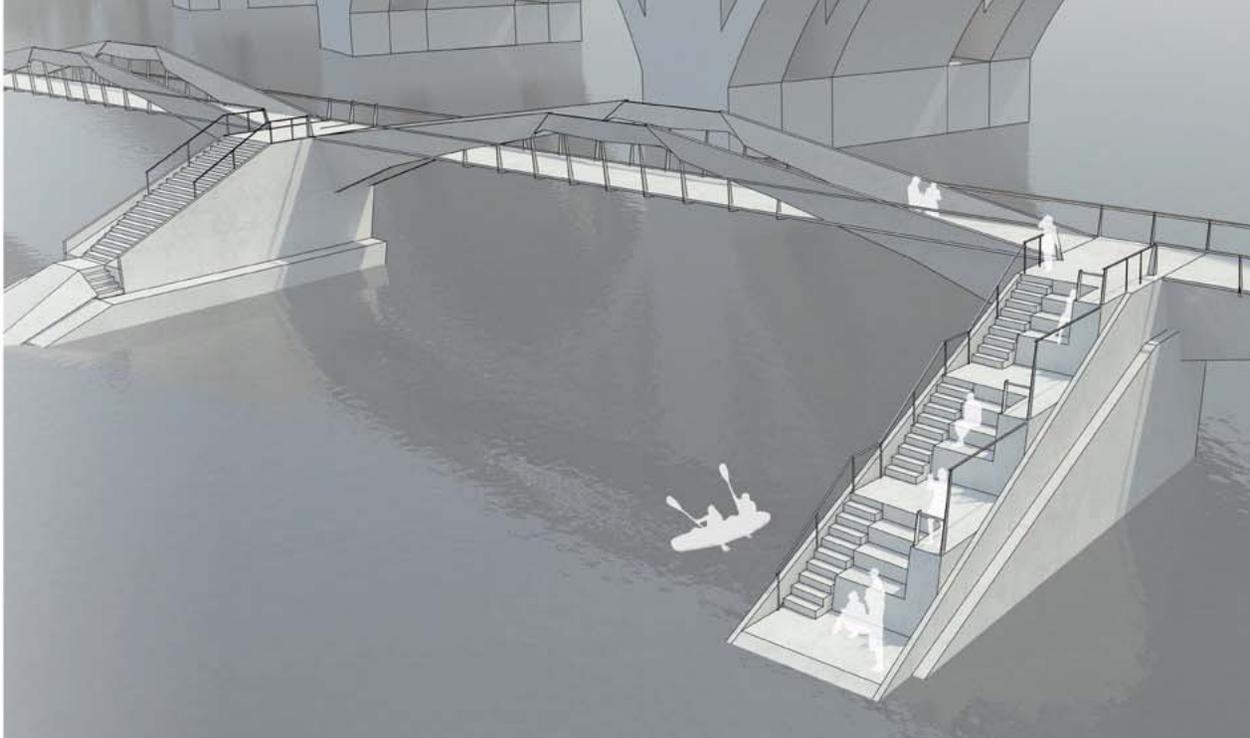
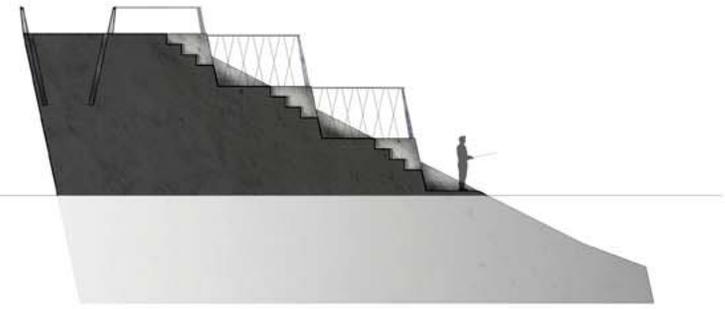


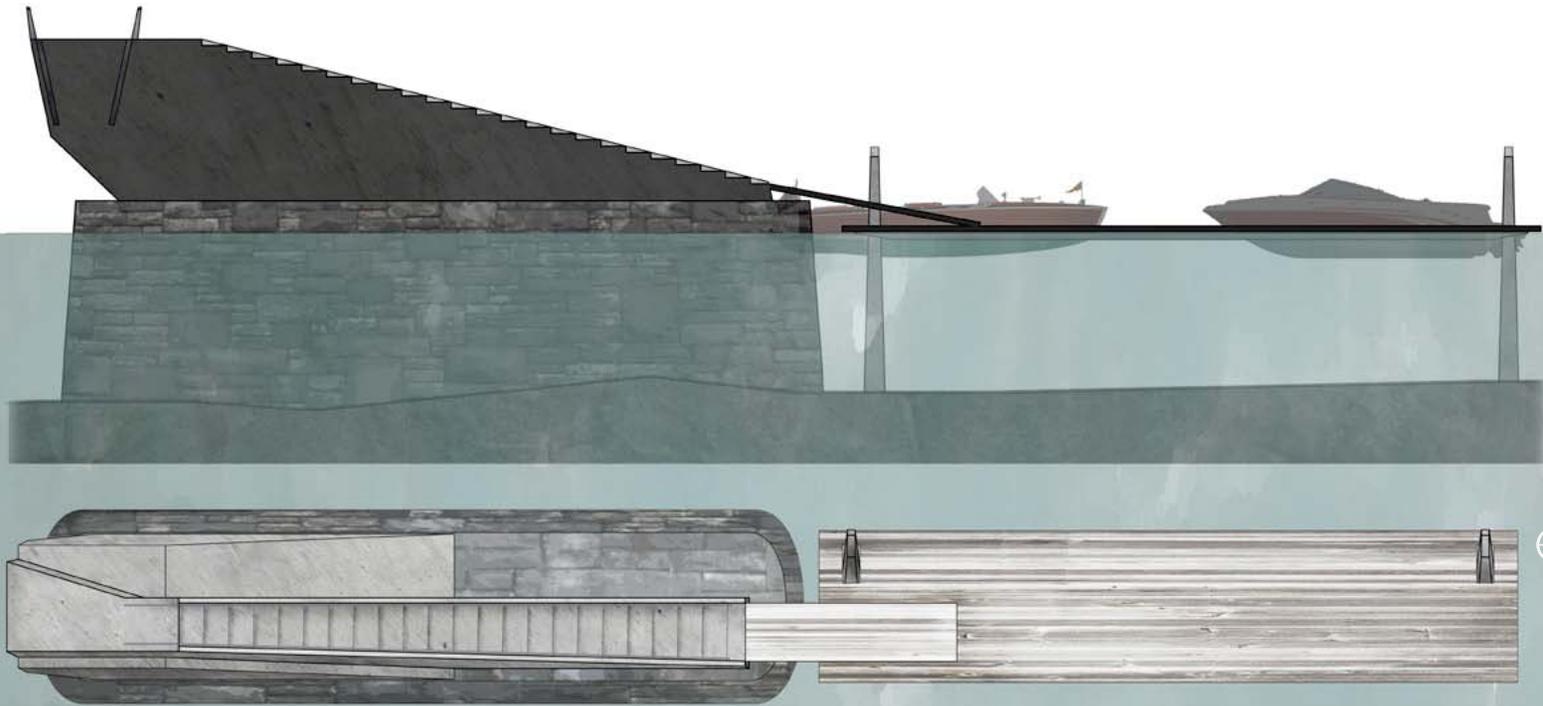


Pier 6



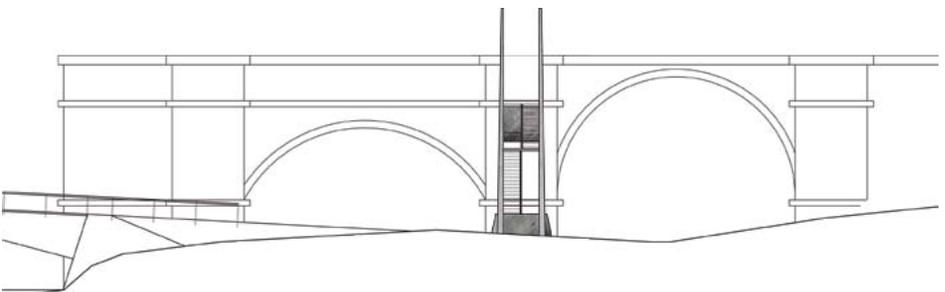
Pier 7





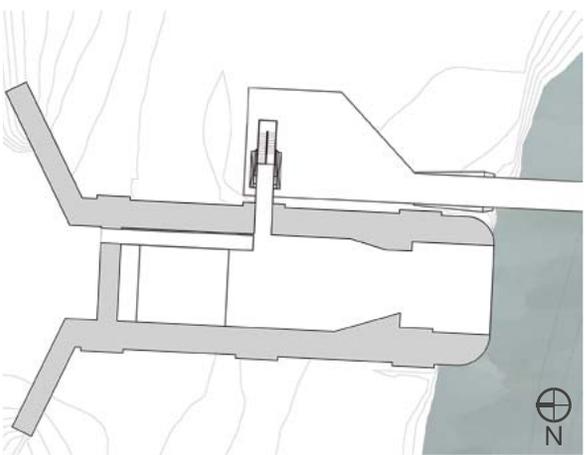
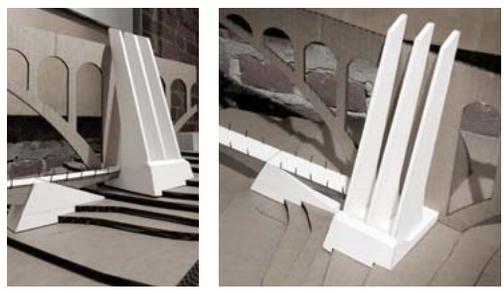
20 10 5 Pier 8
3/32"=1'



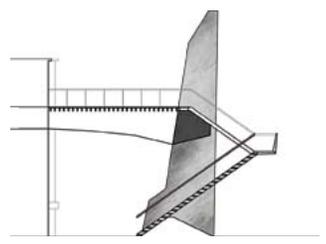


Connection at Key Bridge
Rosslyn, VA

5 10 20 1/16"=1'

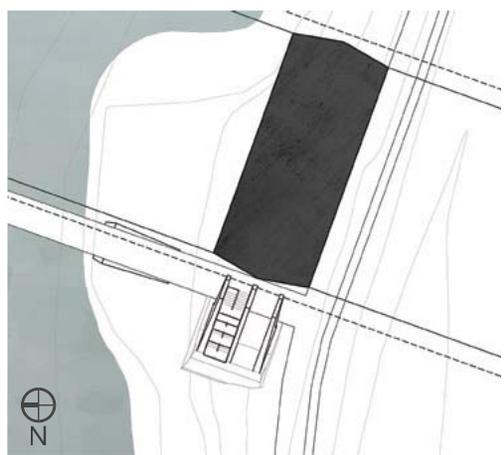
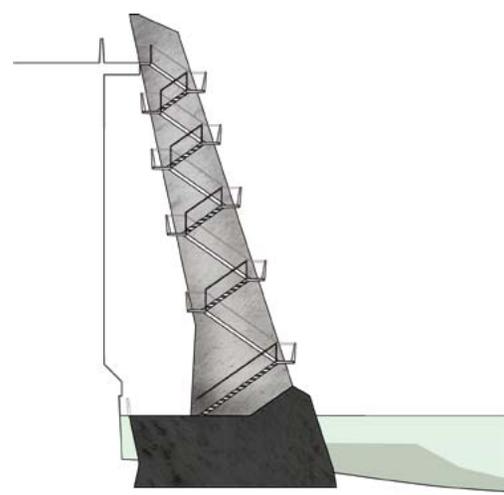


74 Aqueduct Connection



Connection at Abutment
Georgetown, DC

1/16"=1' 20 10 5



Key Bridge Connection 75

Appendix

- 01 - Along the towpath, C&O Canal, Washington, D.C., 1915. Detroit Publishing Company Photography Collection. Library of Congress, Washington, D.C.
 - 02 - "Copenhagen Harbour Bath / PLOT." ArchDaily 05 January, 2009
http://ad009cdnb.archdaily.net/wp-content/uploads/2009/01/1668480784_bad-casper-dalhoff-01.jpg
 - 03 - 25. Aqueduct Bridge, Plan of 1841 Senate Document 178. Historic American Buildings Survey. Library of Congress, Washington, D.C. -- <http://www.loc.gov/pictures/resource/hhh.dc0967.photos.025250p/>
 - 04 - 15. Potomac Aqueduct, Georgetown Abutment, 1868-1877. Historic American Buildings Survey. Library of Congress, Washington, D.C. -- <http://www.loc.gov/pictures/resource/hhh.dc0967.photos.025240p/>
 - 05 - 16. Potomac Aqueduct, Georgetown Abutment, 1879-1887. Historic American Buildings Survey. Library of Congress, Washington, D.C. -- <http://www.loc.gov/pictures/item/dc0967.photos.025241p/>
 - 06 - 19. Potomac Aqueduct, Georgetown Abutment, 1924-1933. Historic American Buildings Survey. Library of Congress, Washington, D.C. -- <http://www.loc.gov/pictures/resource/hhh.dc0967.photos.025244p/>
- Bachelard, Gaston. Water and Dreams: an Essay on the Imagination of Matter. 1942. Dallas Institute of Humanities and Culture Publications. Dallas, TX.

