

An Architectural Investigation of the Haptic Sense:
A Material Exploration of the Balance Between
Building, Body, and Landscape

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technic Institute and State University in partial fulfill-
ment of the requirements for the degree of

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Abstract

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Missing from much of civic/public spaces today is the potential choreography between body, imagination, and the built environment. This is often a result of a diminished sensation between ourselves and the coupling of constructed and natural spaces. It is precisely this miscommunication which led to an exploration of the haptic sense and a material investigation of the choreography between our bodies, our buildings, and our landscape.

In order to create a memorable space or in the case of this exercise, create place from path, a conservation of the spirit of the players/pieces is necessary. The experience of being in a place occurs in time, is much more than visual, and is as complex as our bodies and as immense as our imaginations.

The movement of our bodies traversing a built environment gives value to the spaces we inhabit. Through the investigation of a little league baseball park along the Potomac River in Alexandria, Virginia, a series of haptic patterns with distinct pauses and progressions in which the body and mind responds to the situation presented is created.

Composite Ideogram 03:

Two-dimensional collage overlaying the movement of a baseball pitcher's body with an automated baseball pitching machine and an illustration of the mechanics of throwing a curve ball. The resulting composite image began the investigation of the relationship between a body's movement and the mechanics of that movement.

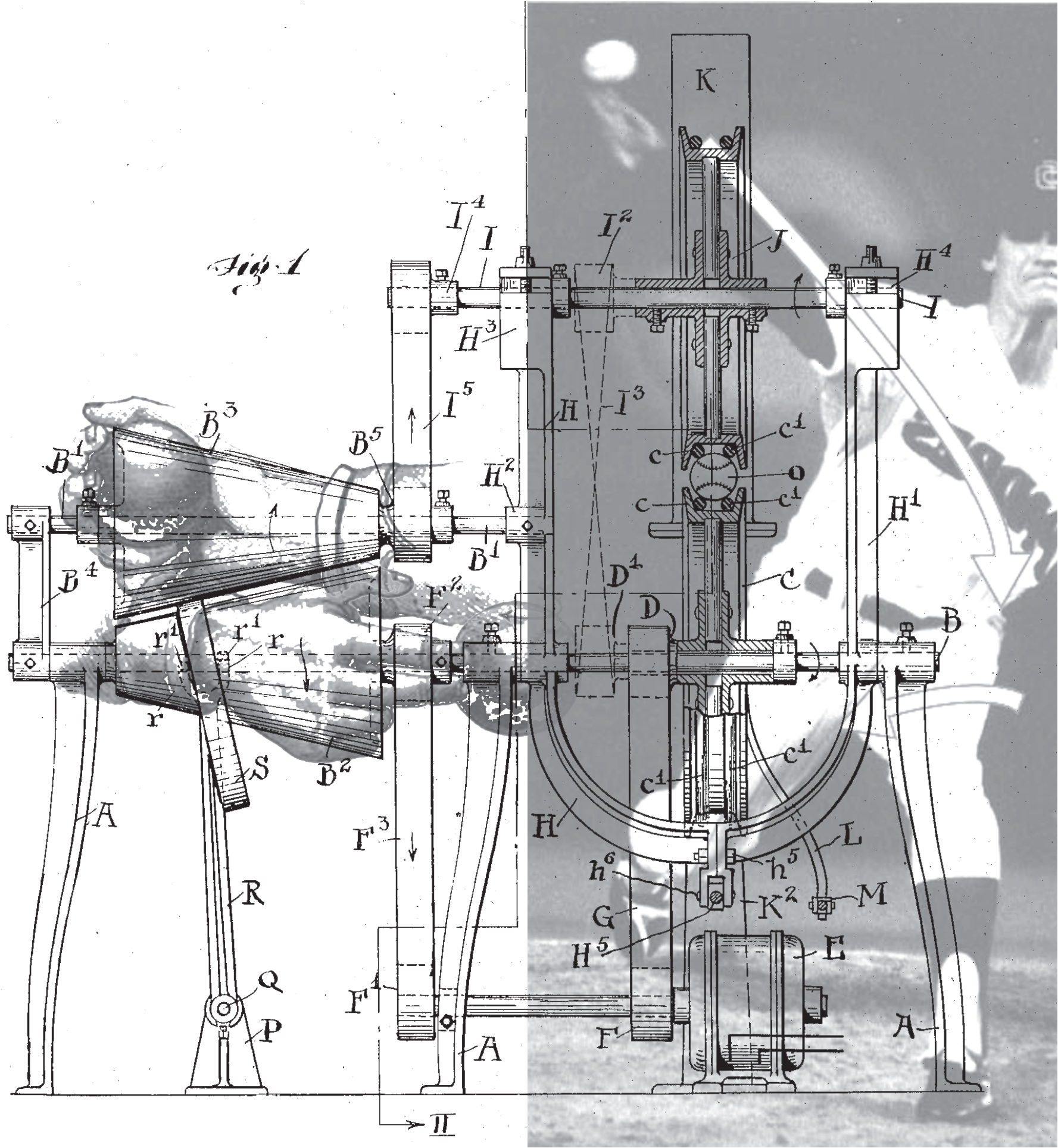


Fig. 1 Composite Ideogram 03

Acknowledgements



I would like to thank my thesis committee, friends, and family. This would not have been possible without your support.

For my father.

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Site and Program

The Greek planner Doxiadis suggested that important ceremonial sites were laid out around the human participant at the point where the individual's experience of the site began. It is at this origin point that the field of vision is enclosed on all sides except for the eastern axis. Doxiadis suggested that the buildings formed two groups which were arranged to surround the observer experiencing the space. This organization of the constructed spaces, created from void and mass, constituted an experience of the built world that was personal and immediately comprehensible.

The game of baseball contains two fields that can be experienced by the individual; the field of play and the field of vision. In both cases, the individual, both active participant and casual observer, can interact with the built space through their own unique understanding of the relationship between the body which is central to the place and the place itself.

The basic layout of the baseball diamond and orientation for the baseball field have not changed dramatically since the original Knickerbocker Rules of the 1840's. Major league baseball rule 1.04 states, "THE PLAYING FIELD: It is desirable that the line from home base through the pitchers plate to second base shall run East -Northeast." This optimum orientation is a response to the body's interaction with the built and natural environments as well as the time of day and months in which the game is played. The orientation and layout for the field is based around the point where the individual's experience with the game begins. This allows for home plate, the place of origin and the threshold for the game, to be located such that the pitcher is throwing the ball across the sun and the batter is not facing it. It also allows for center field to be open to the field of vision of the batter. This orientation gives value to the space by affording the observer, both batter and fan, a non-compromised view, closing them off from the world outside and creating a point where the experience of space can be understood as the relationship between the body, imagination, and the built space.

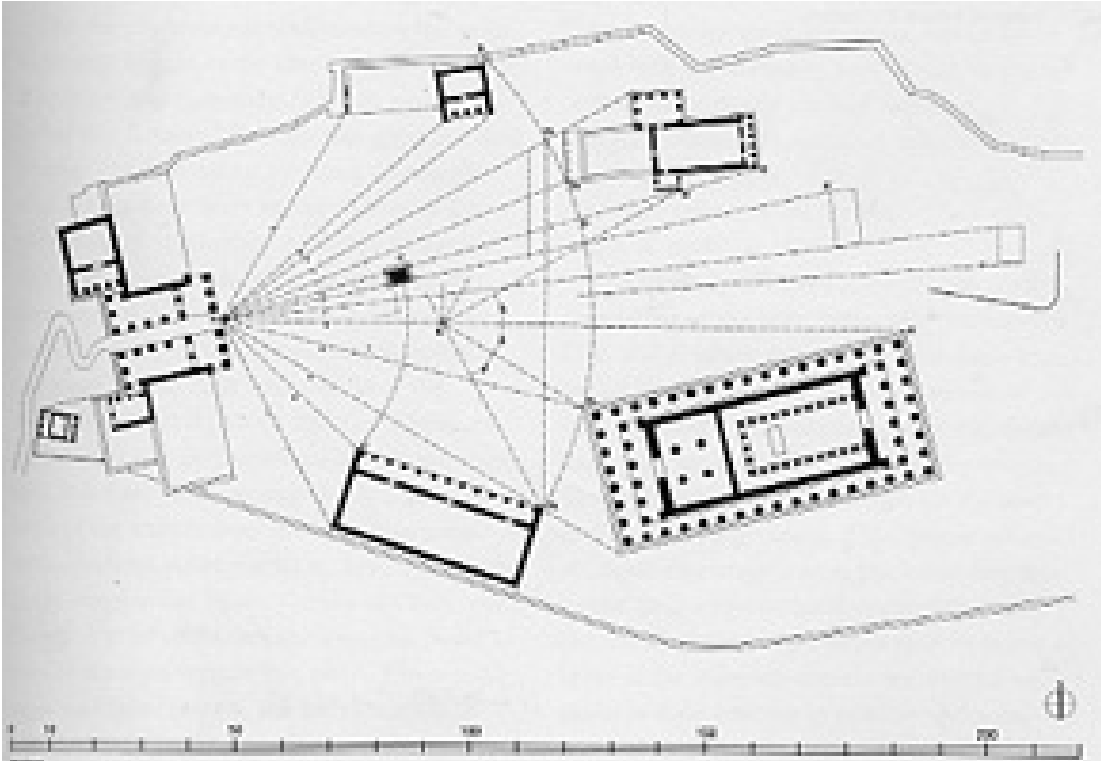


Fig. 2 Athens, Acropolis III, after 450 BC plan

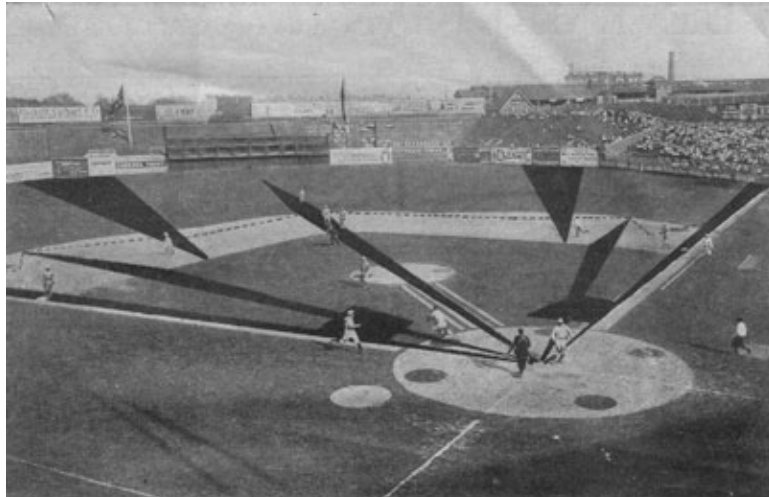
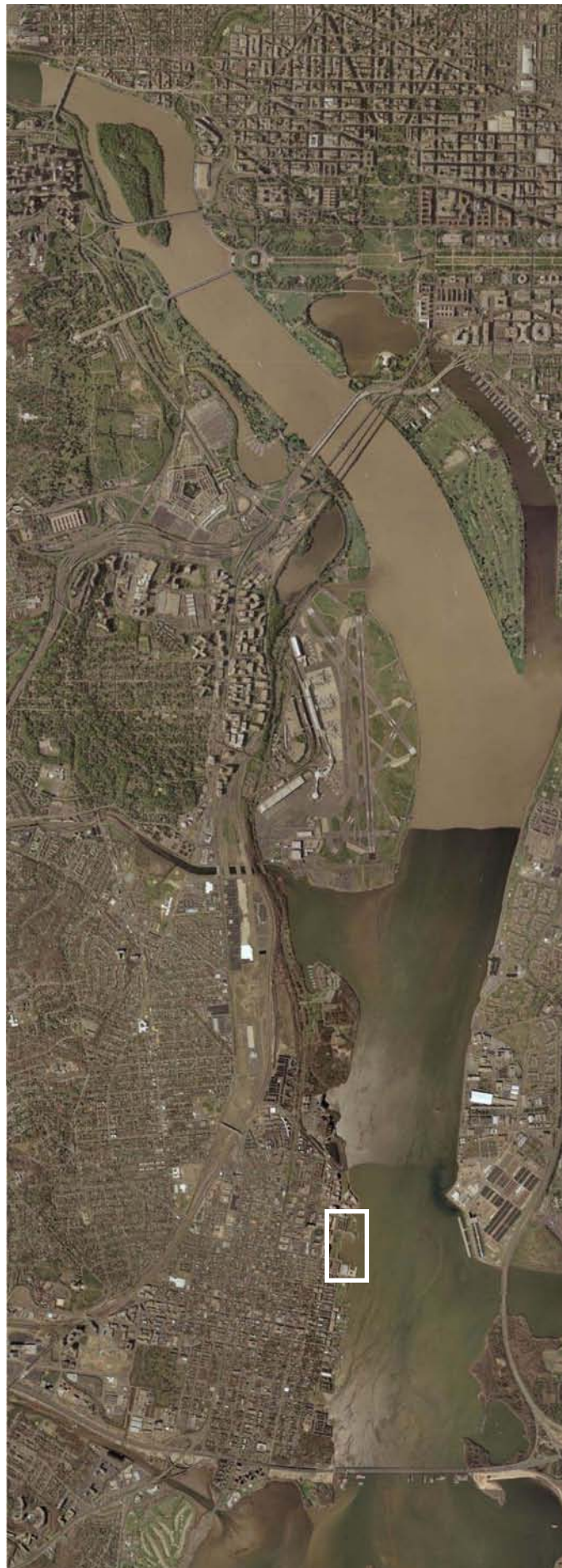


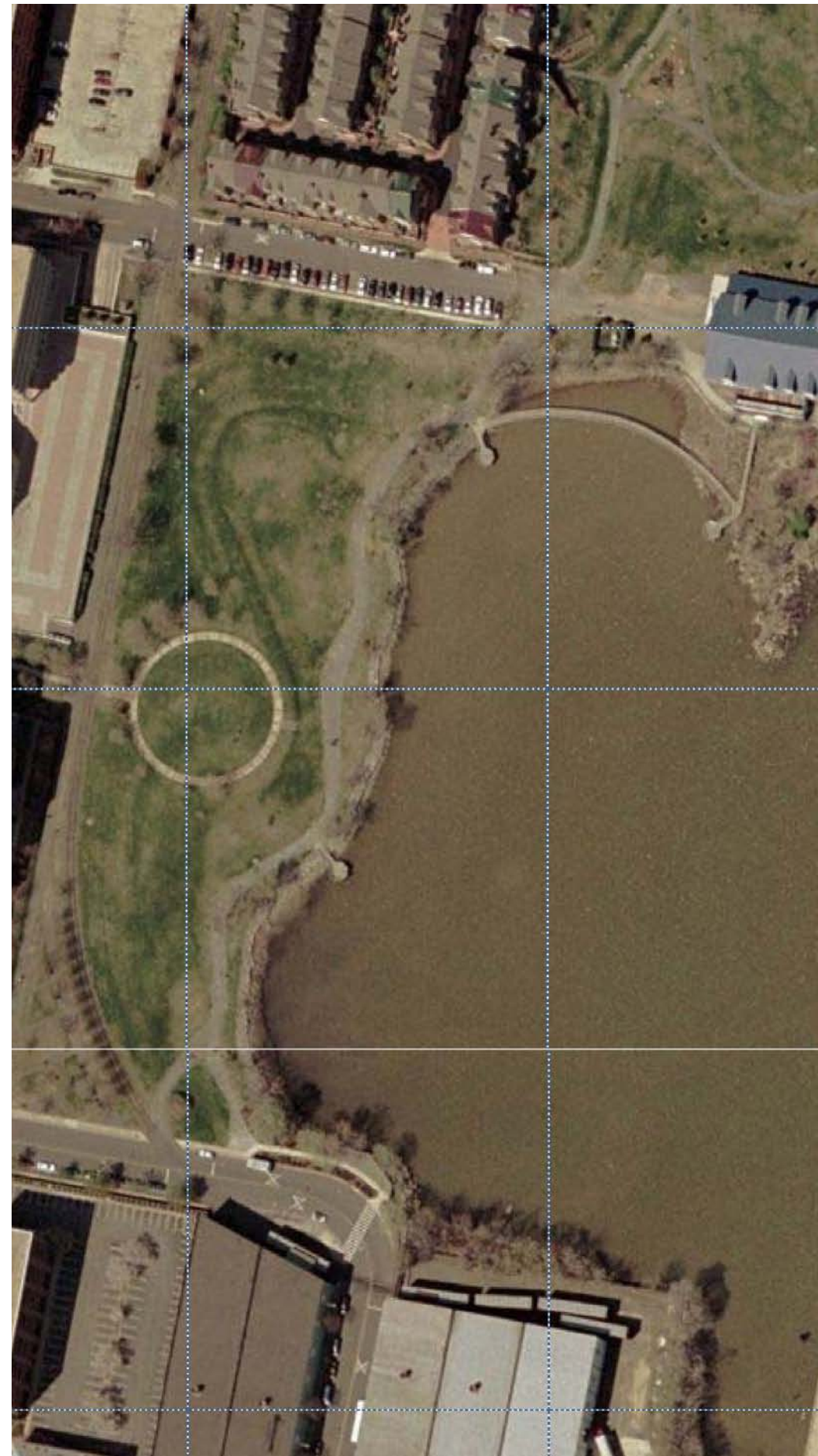
Fig. 3 Baseball field from 1910 with areas of batted balls for hits illustrated. www.baseball-statistics.com, 2004



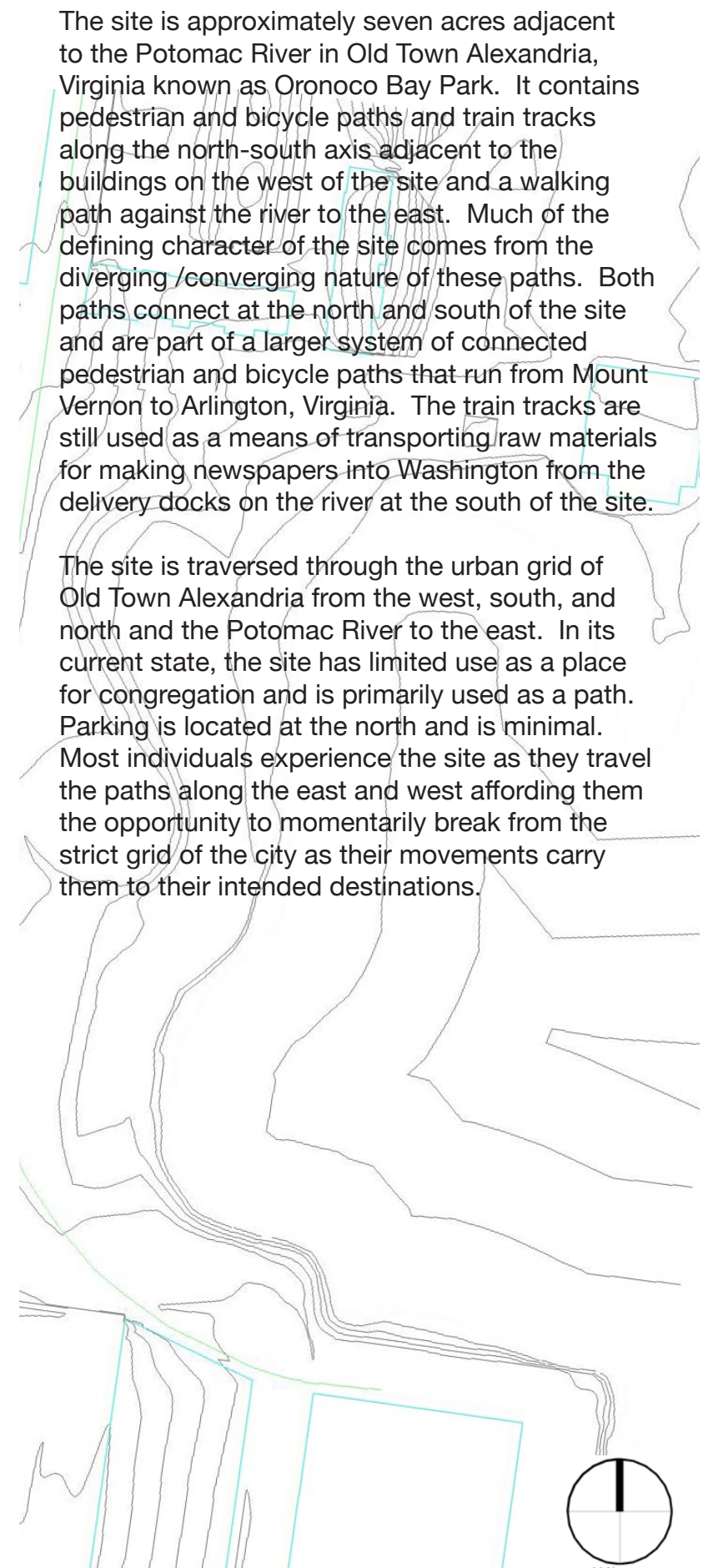
Fig. 4 Aerial perspective of Durham Athletic Park from 1930's. www.ci.durham.nc.us, 2010



Aerial Site Plan showing Potomac River, Alexandria, VA,, Washington DC, and Maryland



Enlarged Aerial Site Plan



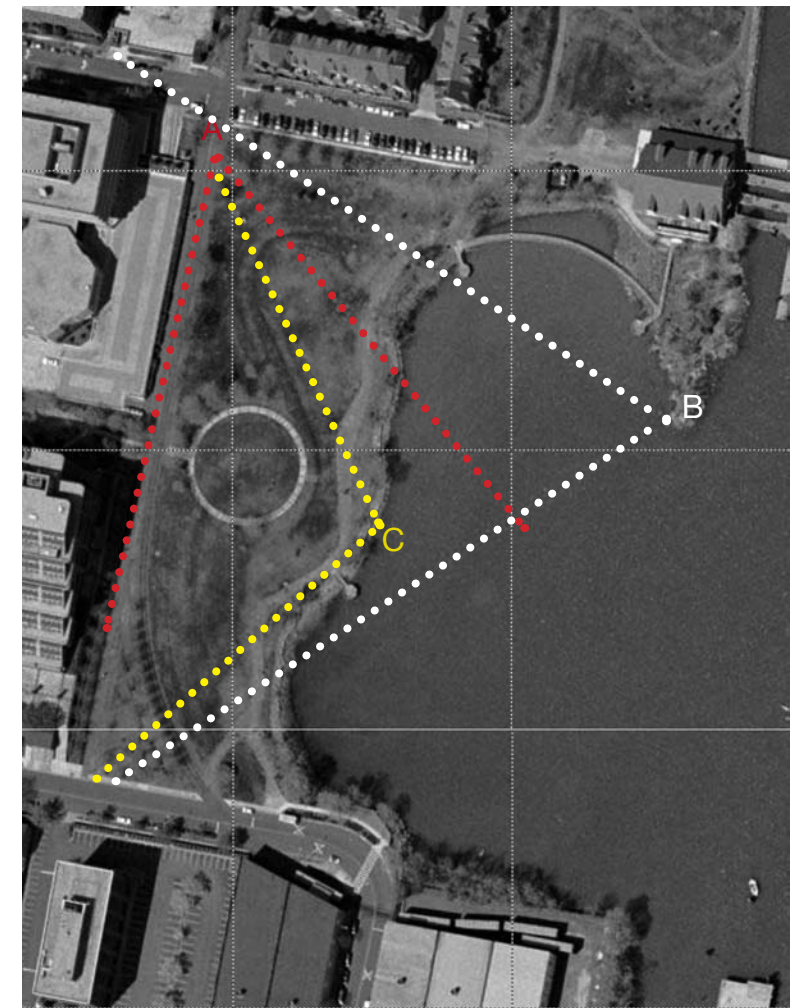
Site Plan drawing illustrating site topography and existing buildings

The site is approximately seven acres adjacent to the Potomac River in Old Town Alexandria, Virginia known as Oronoco Bay Park. It contains pedestrian and bicycle paths and train tracks along the north-south axis adjacent to the buildings on the west of the site and a walking path against the river to the east. Much of the defining character of the site comes from the diverging /converging nature of these paths. Both paths connect at the north and south of the site and are part of a larger system of connected pedestrian and bicycle paths that run from Mount Vernon to Arlington, Virginia. The train tracks are still used as a means of transporting raw materials for making newspapers into Washington from the delivery docks on the river at the south of the site.

The site is traversed through the urban grid of Old Town Alexandria from the west, south, and north and the Potomac River to the east. In its current state, the site has limited use as a place for congregation and is primarily used as a path. Parking is located at the north and is minimal. Most individuals experience the site as they travel the paths along the east and west affording them the opportunity to momentarily break from the strict grid of the city as their movements carry them to their intended destinations.



View A: Southern View with existing train tracks



View B: Western View from the Potomac River



View C: Western View of existing pedestrian path adjacent to waterfront

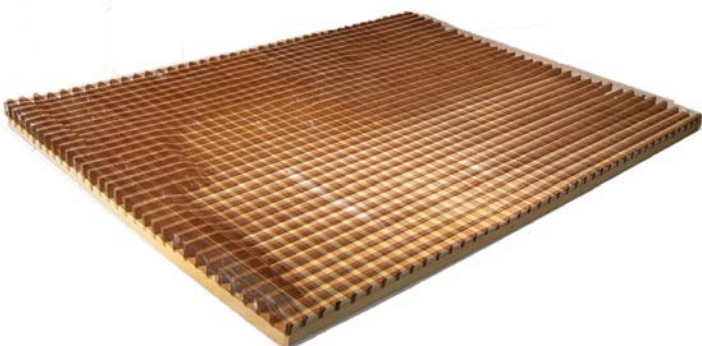
An initial investigation of the site began with a series of model studies of the existing topography. Two site models were built by analyzing section cuts of the topography on the x and y axis. These models were then combined to create a grid where the x and y site sections were overlaid upon each other.



X axis site model



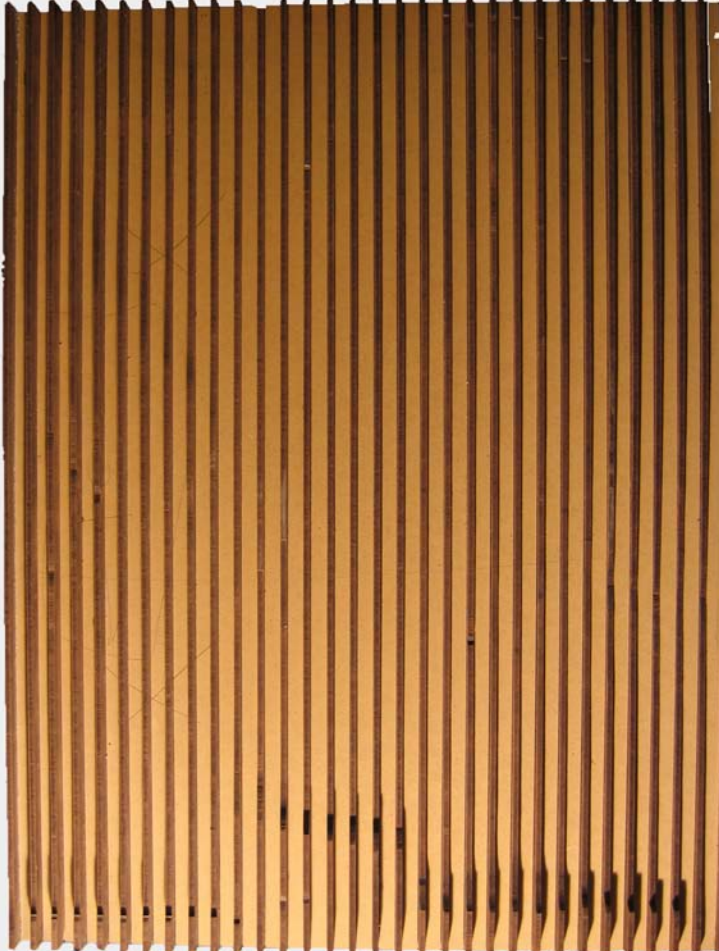
Y axis site model



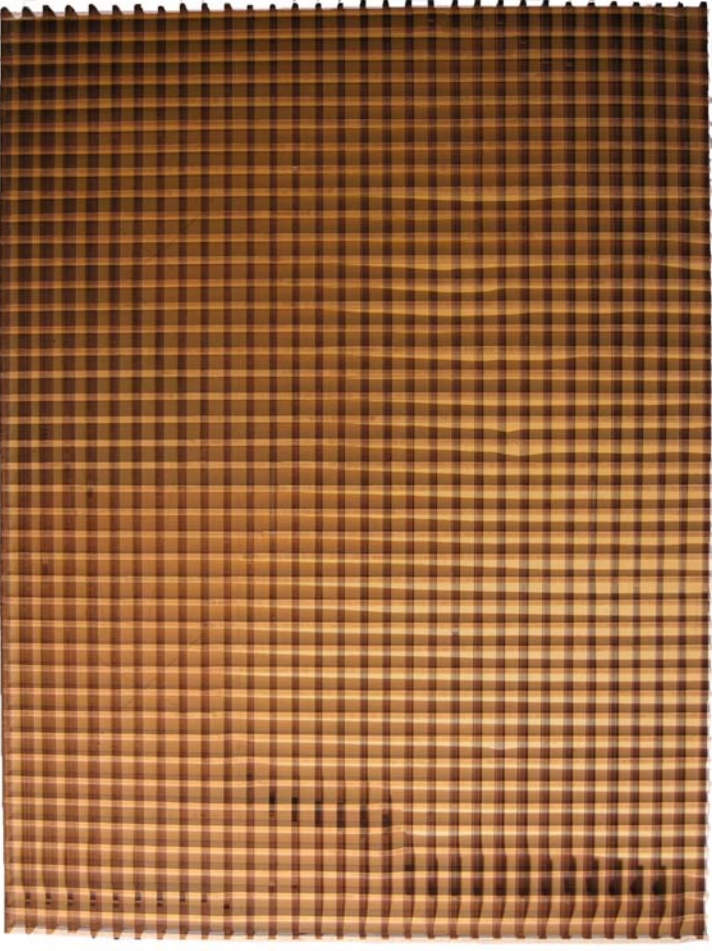
Site model with overlaid X and Y axis sections



X axis site model

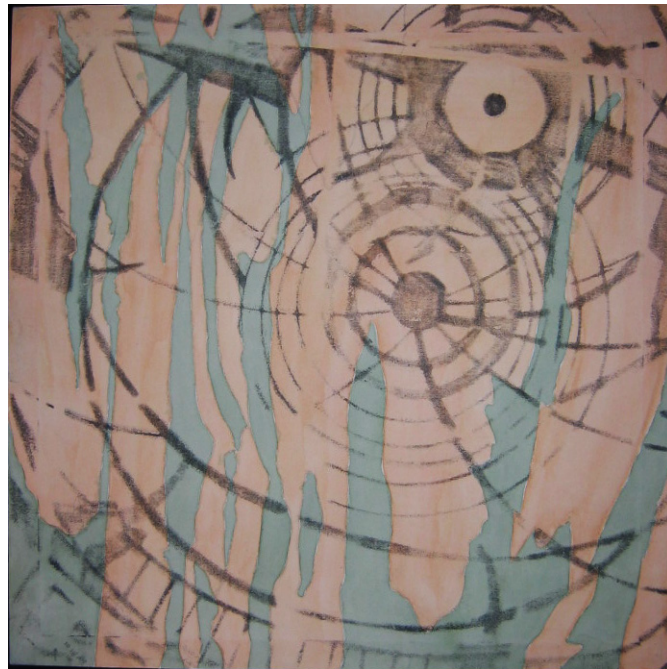


Y axis site model



Site model with overlaid X and Y axis sections

A secondary investigation of the site involved a series of paintings that captured shadows falling over four canvases which were laid on the ground at a chosen point on the site during four moments of the same day. Thirty seconds were allotted to sketch the shadows on the canvas and over the following eight months water color washes were slowly applied to the canvases bringing out the cast image of the shadows. The image of a celestial clock was then applied to the canvases uniting them into their finished layout.



10:03 AM



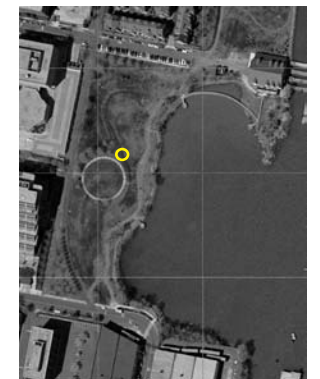
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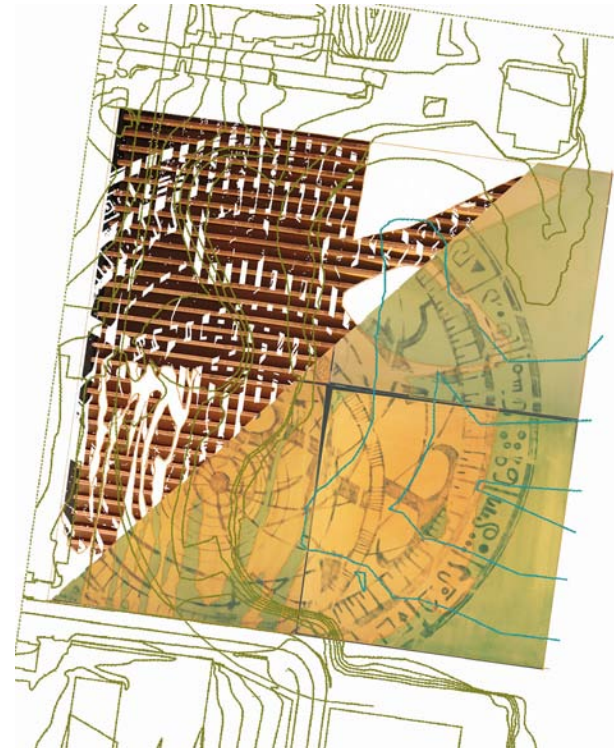
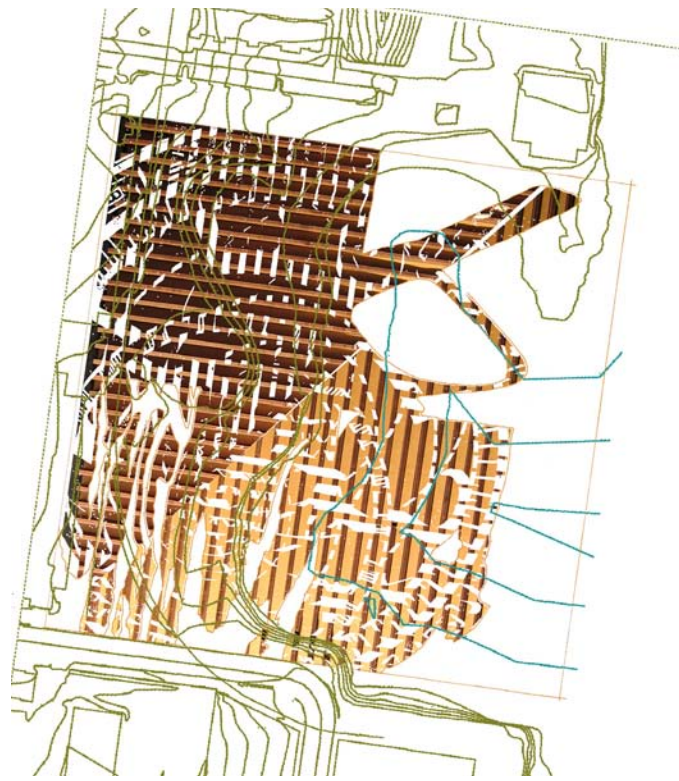
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4:00 PM

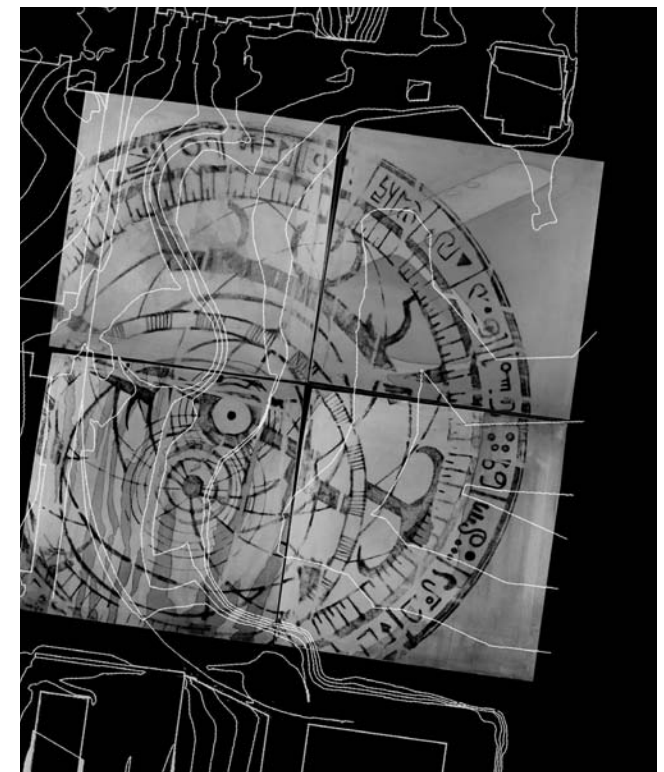
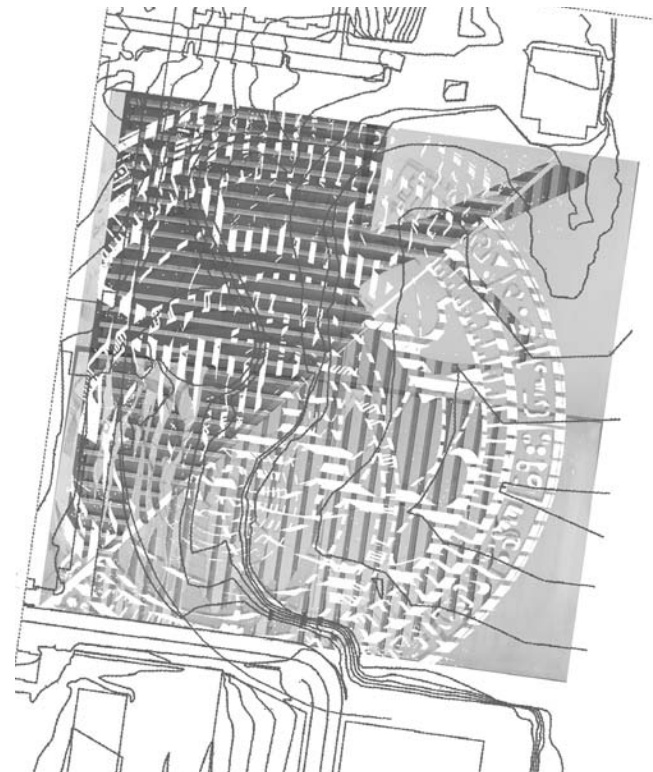
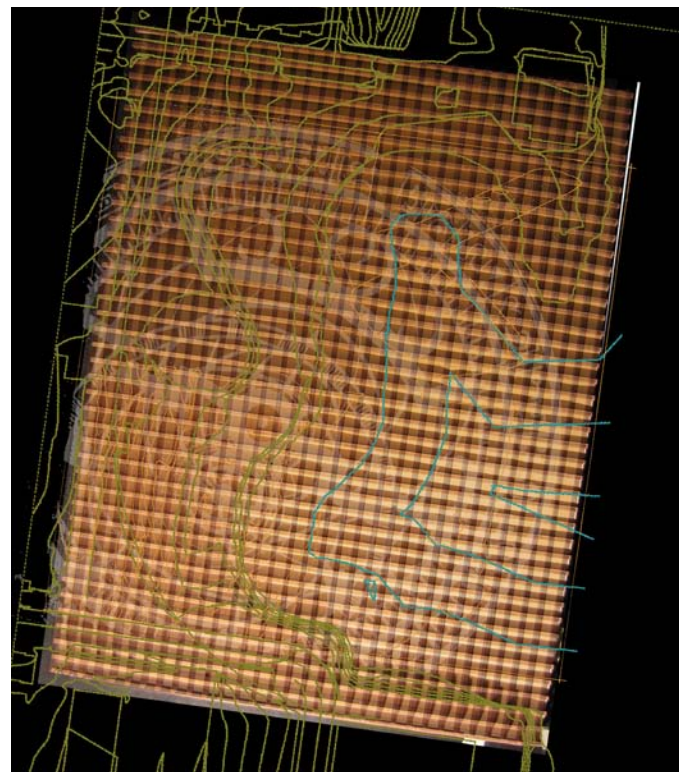






The site topography model studies and the figure ground shadow paintings were combined in a series of graphic site analysis compositions. The resulting studies, in a sense homemade composite ideograms, provide a point of origin for visualizing the threshold of creating place from path. Once rotated to the true North coordinates of the site, the strong element of the Northeast diagonal emerges emphasizing the duality of the site.

Path and Place.
Water and Earth.
Body and Imagination.
Building and Landscape.



“It breaks your heart. It is designed to break your heart. The game begins in the spring, when everything else begins again, and it blossoms in the summer, filling the afternoons and evenings, and then as soon as the chill rains come, it stops and leaves you to face the fall alone. You count on it, rely on it to buffer the passage of time, to keep the memory of sunshine and high skies alive, and then just when the days are all twilight, when you need it most, it stops.”

-A. Bartlett Giamatti
 “The Green Fields of the Mind “

“The haptic sense is the sense of touch reconsidered to include the entire body rather than merely the instruments of touch, such as hands. To sense haptically is to experience objects in the environment by actually touching them. ...As a perceptual system, it includes all aspects of sensual detection which involve physical contact both inside and outside the body.”

-Charles W. Moore

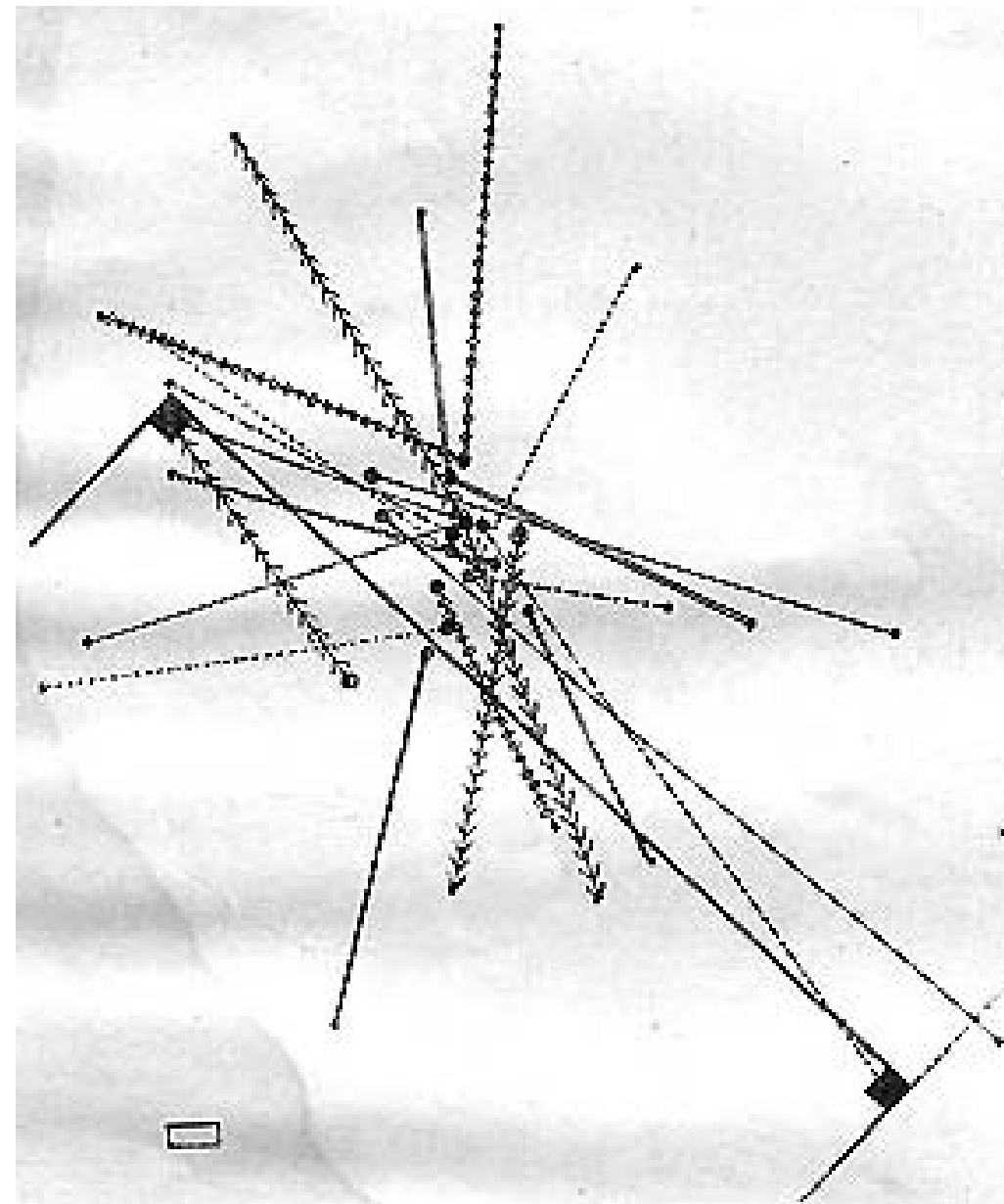


Diagram showing ground between first and second bases covered by Collins of the Athletics in the game of August 30, 1909. Only the ground which he covered in fielding balls or getting into plays is shown

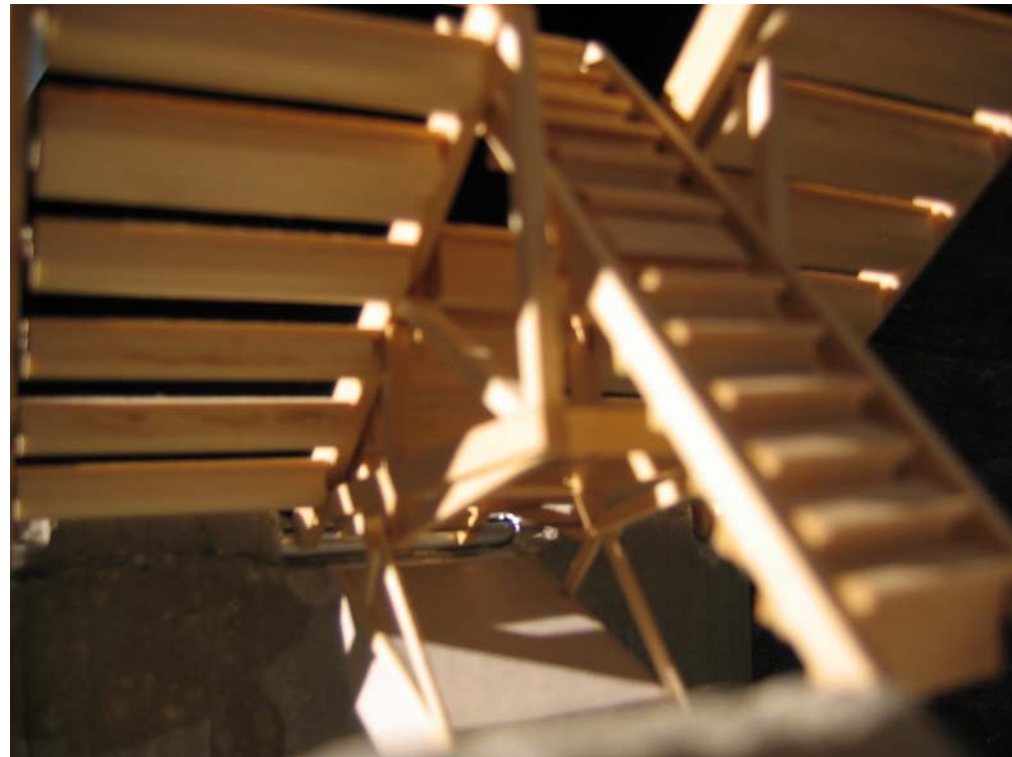
—————	First inning	Estimated distances of ground covered in plays. 1240 ft.
.....	Second inning	
.....	Third inning	Returning to posi- tion 1240 ft.
.....	Fourth inning	
.....	Fifth inning	Running and walk- ing in bluff plays. 3000 ft.
.....	Sixth inning	
.....	Ninth inning	To and from bench nine times. 3600 ft.
.....	No play in seventh or eighth innings	
		Total. 10,080 ft.

Fig. 5 Diagram of Ground Covered, www.baseball-statistics.com, 2004

Respecting the existing spirit of the site and its location as a path between the urban grid of the city and the fluid nature of the river suggested a responsibility to enhance rather than revise the current program of the site. In this effort of conservation, the game of baseball and it's program were introduced as material aids and imagined constructs in creating a choreography of occurrences in which the potential for personal interaction with the built environment gives value to the relationship between the body and the space.

The game of baseball is charged with a unique cosmology in which the player and observer are able to recognize the alliance between our bodies and the built environment. It contains a relationship between form and void that allows the senses a comprehension that our three dimensional world has the potential to be altered in the way that it is perceived through the understanding of our bodies' movement.

In this exercise the game of baseball and it's codes, both constructed and imagined, were used to create a choreography of occurrences in which the inhabitant may gain a better sense of the place by their haptic understanding of their position within it. Base Architectural elements, wall, floor, roof, and column, were re imagined and oriented within the context of the program to create a material choreography between the body, building, and environment.



Perspective of Stair and Bleachers at Visitor Seating

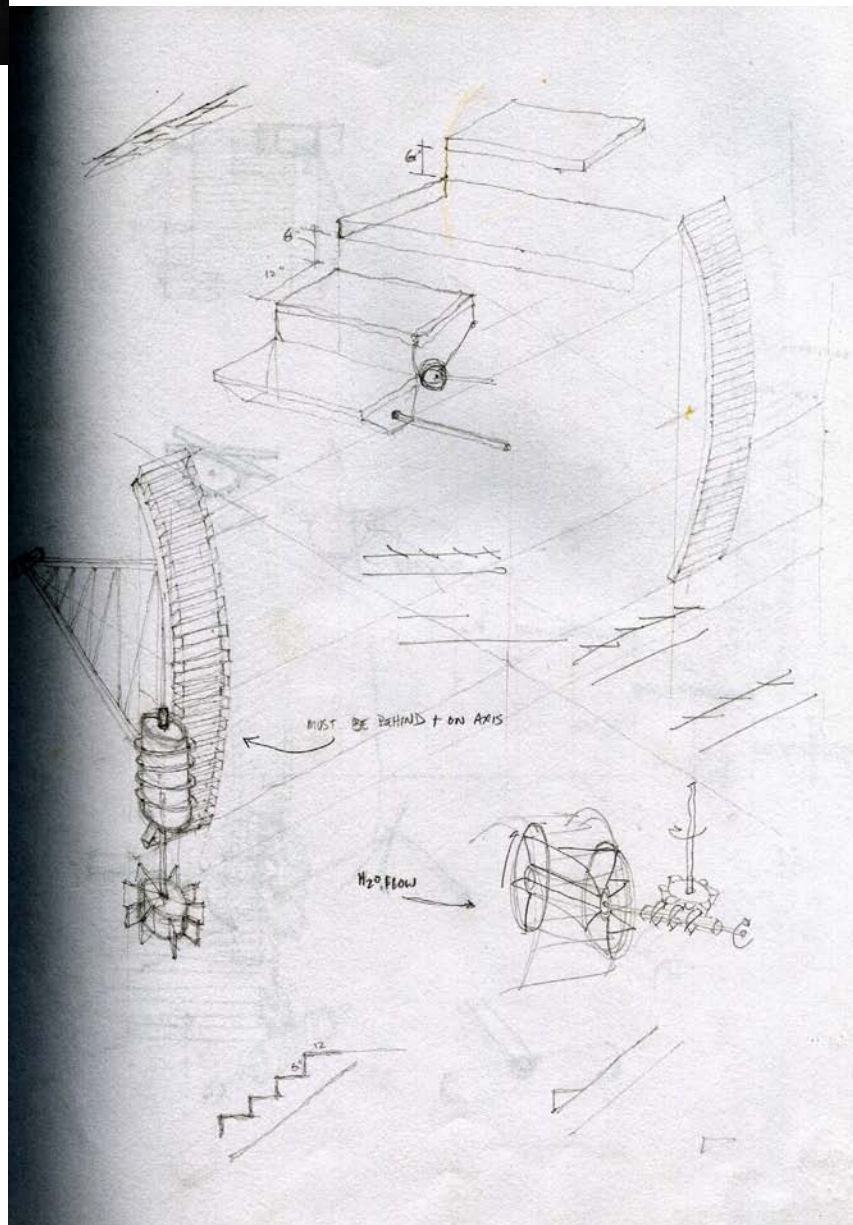
Floor and Wall

Visitor Seating

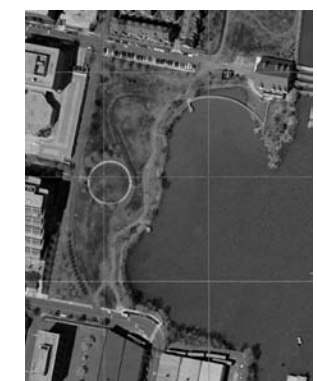
The two sections of seating (visitor and home) were conceived as material opposites that would serve as contrasting architectural elements.

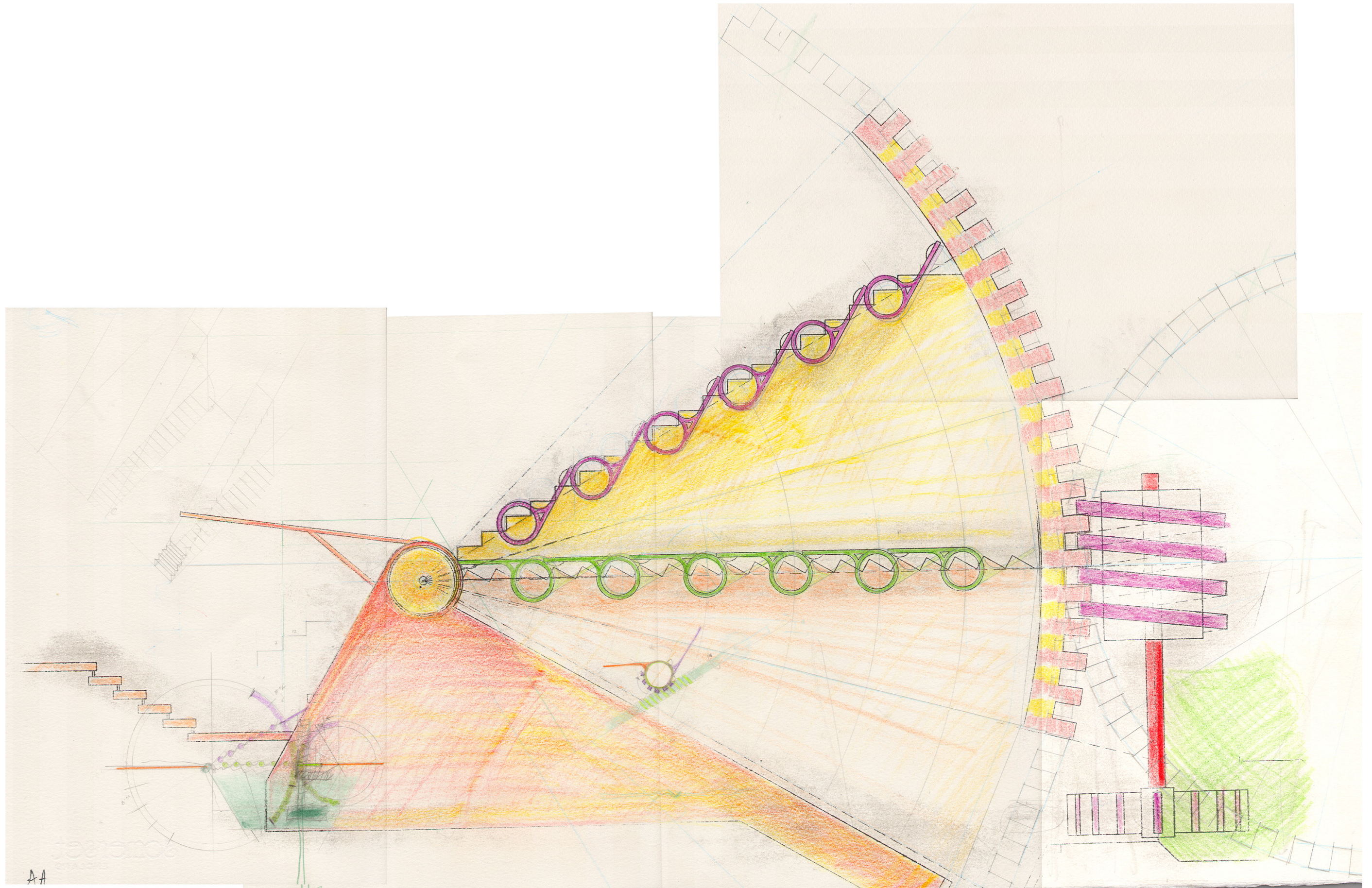
The visitor seating, located along the first base side of the field, on the East /West axis of the site, takes it's cues from the river. It expands and contracts based on it's function of use. In the off season, when the game of baseball is at rest, it lays flat and becomes a material extension of the floor of the city allowing the hardscape to extend it's reach into the site. During the spring and summer months, when the game is active, it rises with the river and creates an expanse of seating for the visiting team's fans.

The construction of the visitor's seating is meant to convey a sense of uneasy anticipation as the inhabitants feel the sense of the water beneath them.

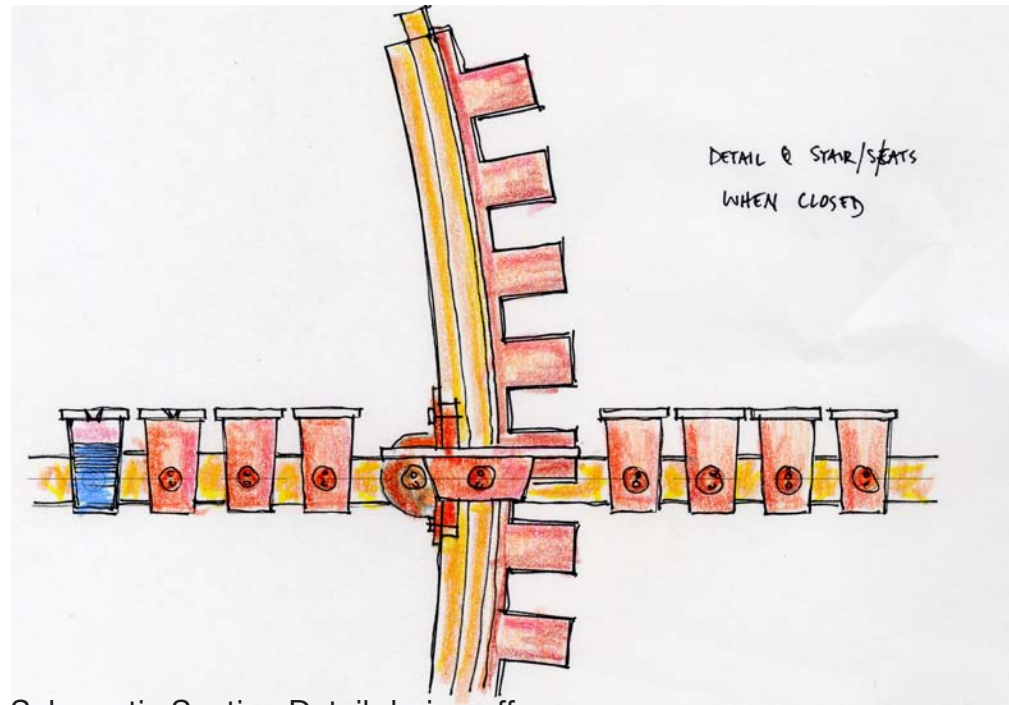


Schematic Sketches of Visitor Seating





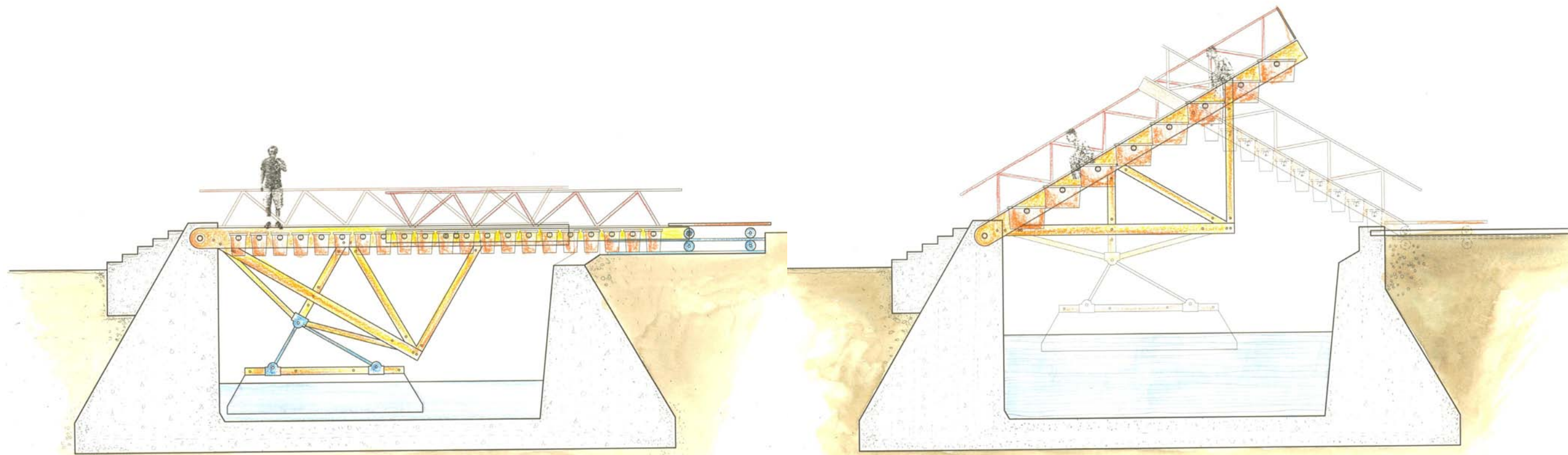
AA
Schematic Section at Visitor Seating



Visitor Seating Schematic Section Detail during off season



Visitor Seating Schematic Section Detail during game play



Visitor Seating Section during off season

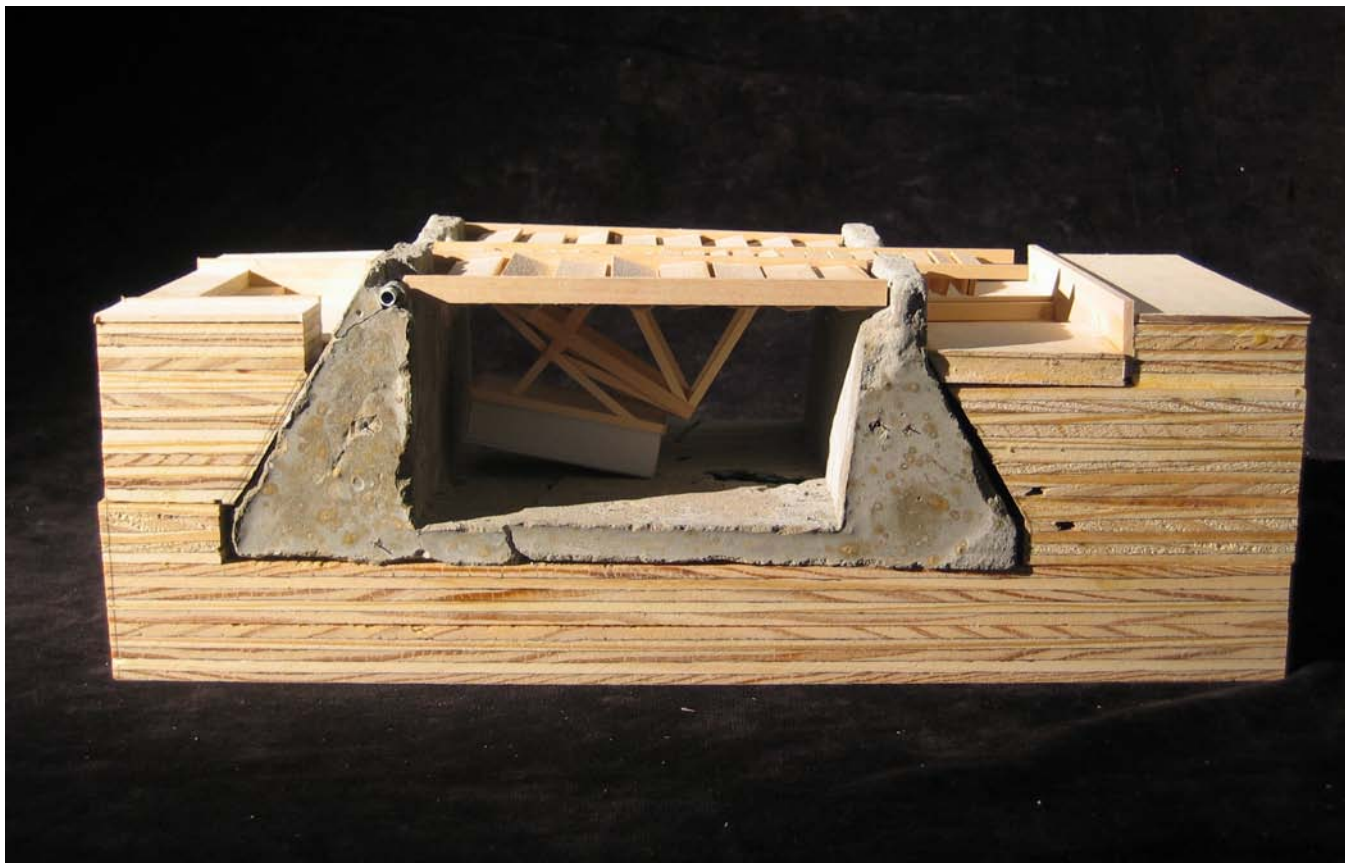
Visitor Seating Section during game play



Visitor Seating Section Model during game play



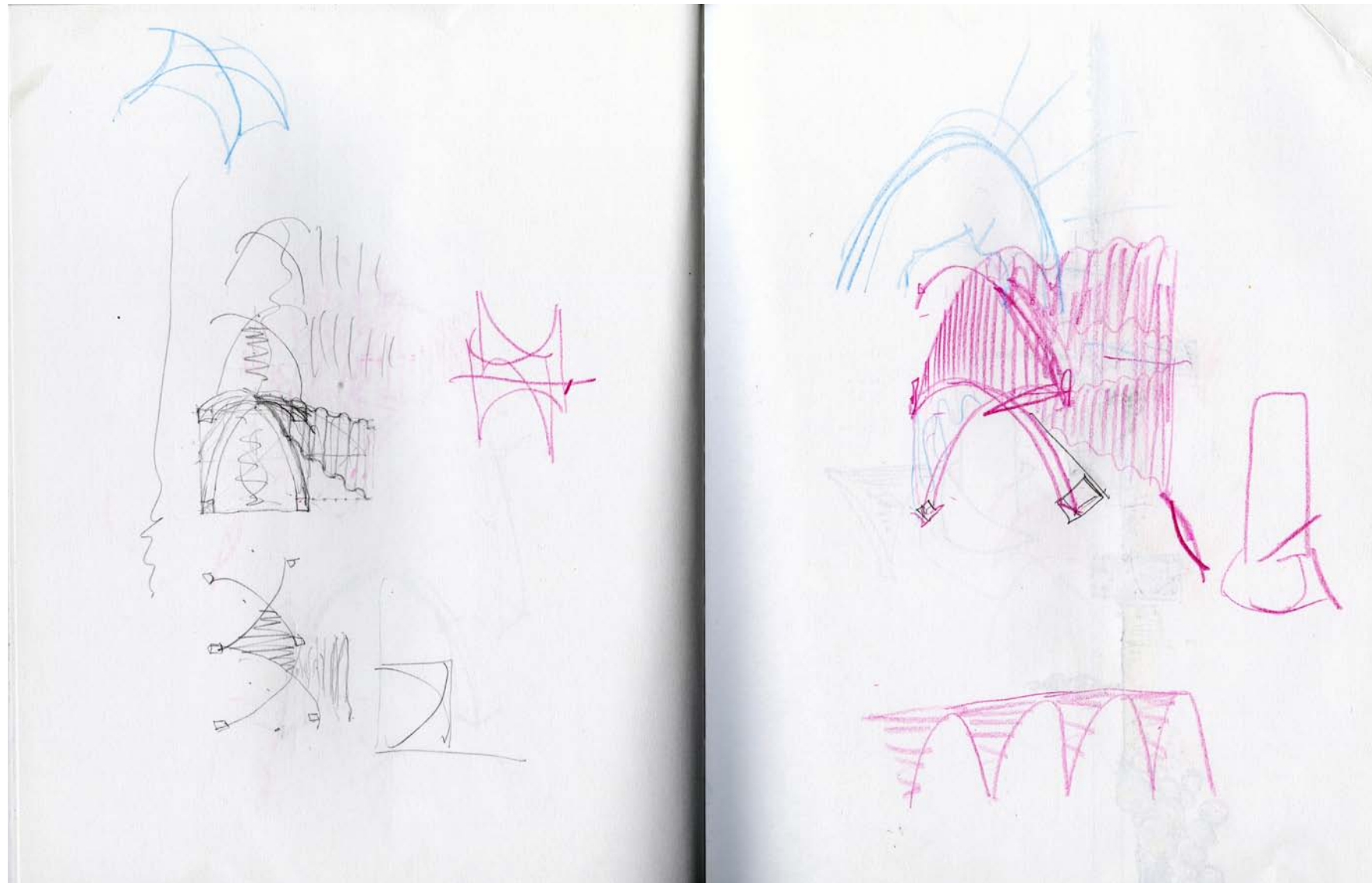
Visitor Seating Section Model during game play



Visitor Seating Section Model during off season



Visitor Seating Section Model during off season



Sketches of Home Seating

Floor and Roof

Home Seating

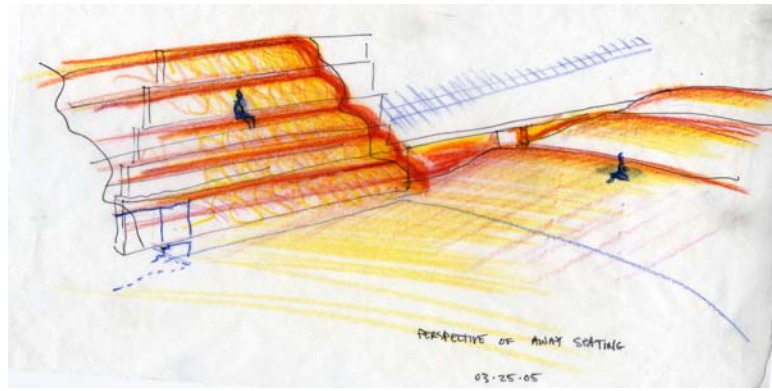
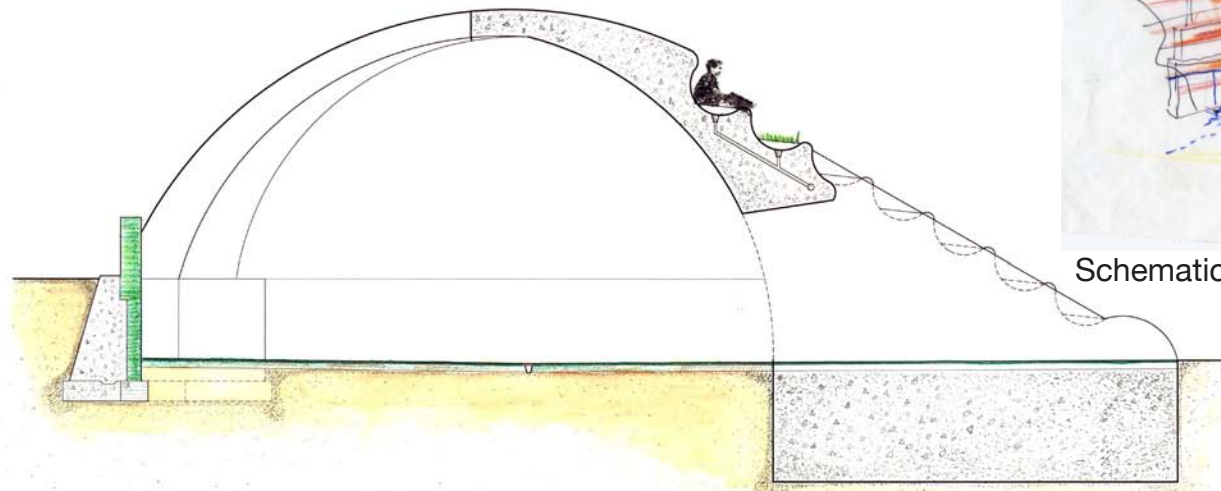
In contrast to the visitor's seating, the home seating was conceived as creating a permanent sense of stability through material form and multi-seasonal function.

The home seating, located adjacent to the third base side of the field on a North /South axis, borrows its form from the flight of a batted ball in play. As a permanent expanse of seating formed from excavated on site materials it creates both covered gathering space for all season recreation. The form of the seating was created to conform to the shape of the human body allowing for the potential of a sensory memory of reclining on the grass of a park.

The static form of the home seating allows for an area of congregation during all seasons and allows for a view of the river that enhances the memory connection between the seasonal tide and the constant earth.

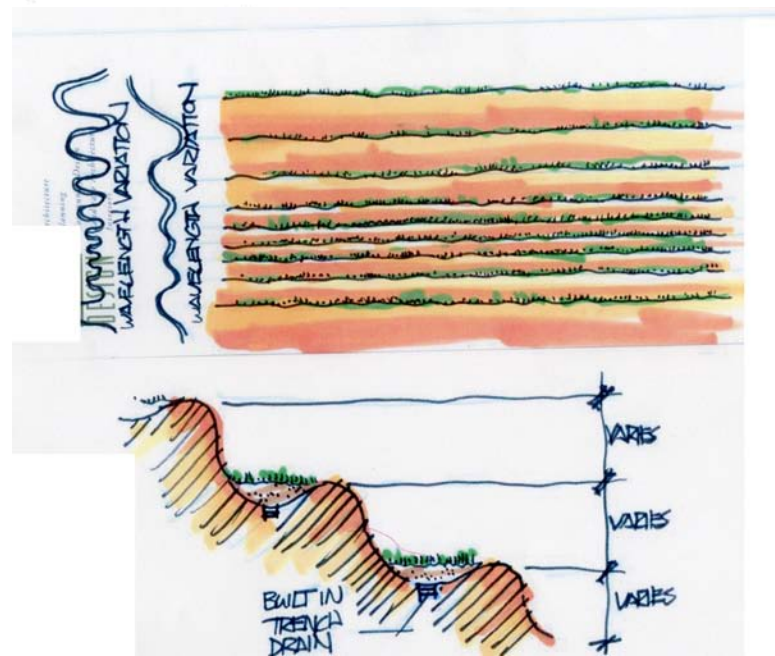


Schematic Study Models of Home Seating

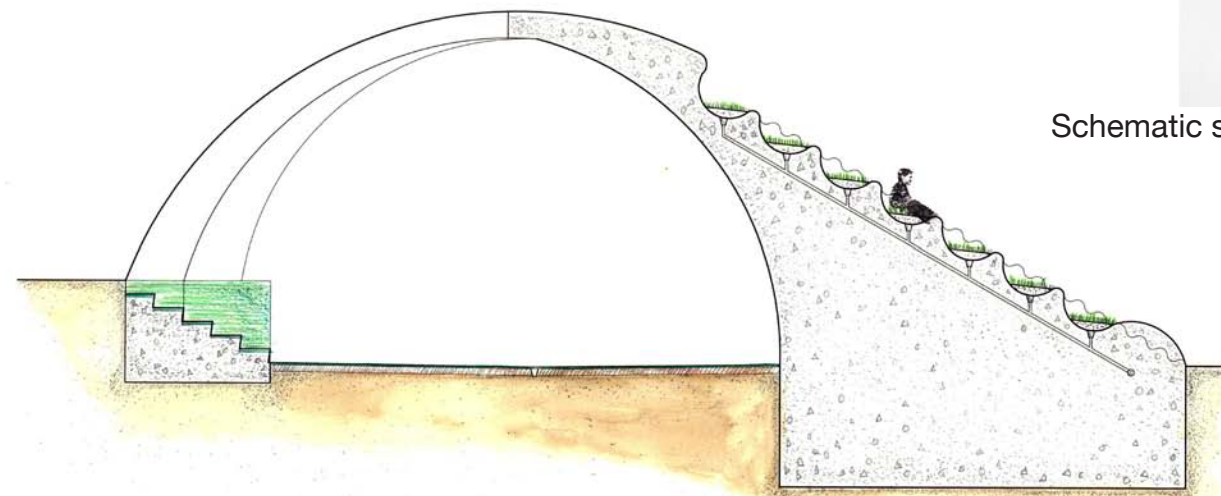


Schematic sketch of Home Seating

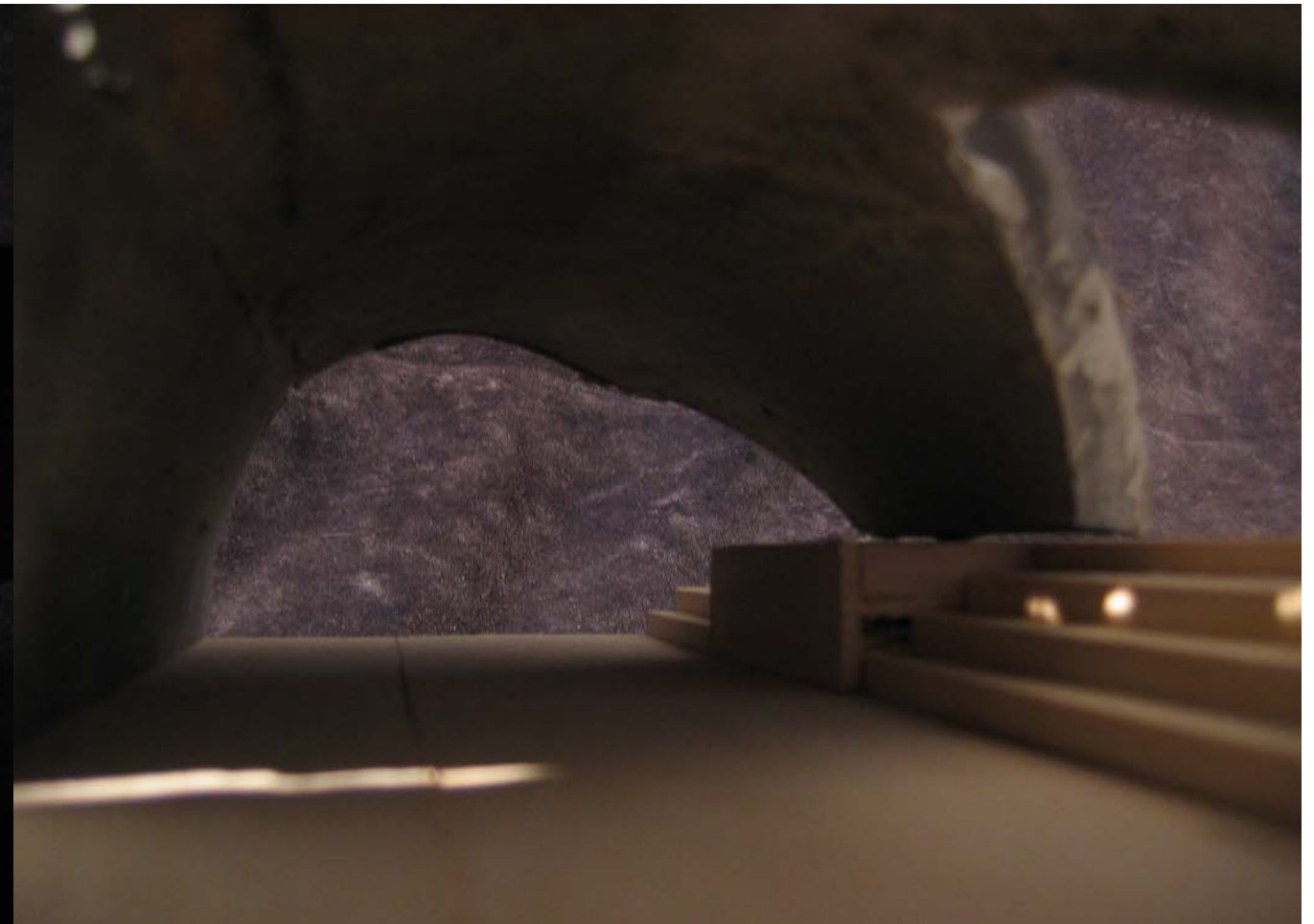
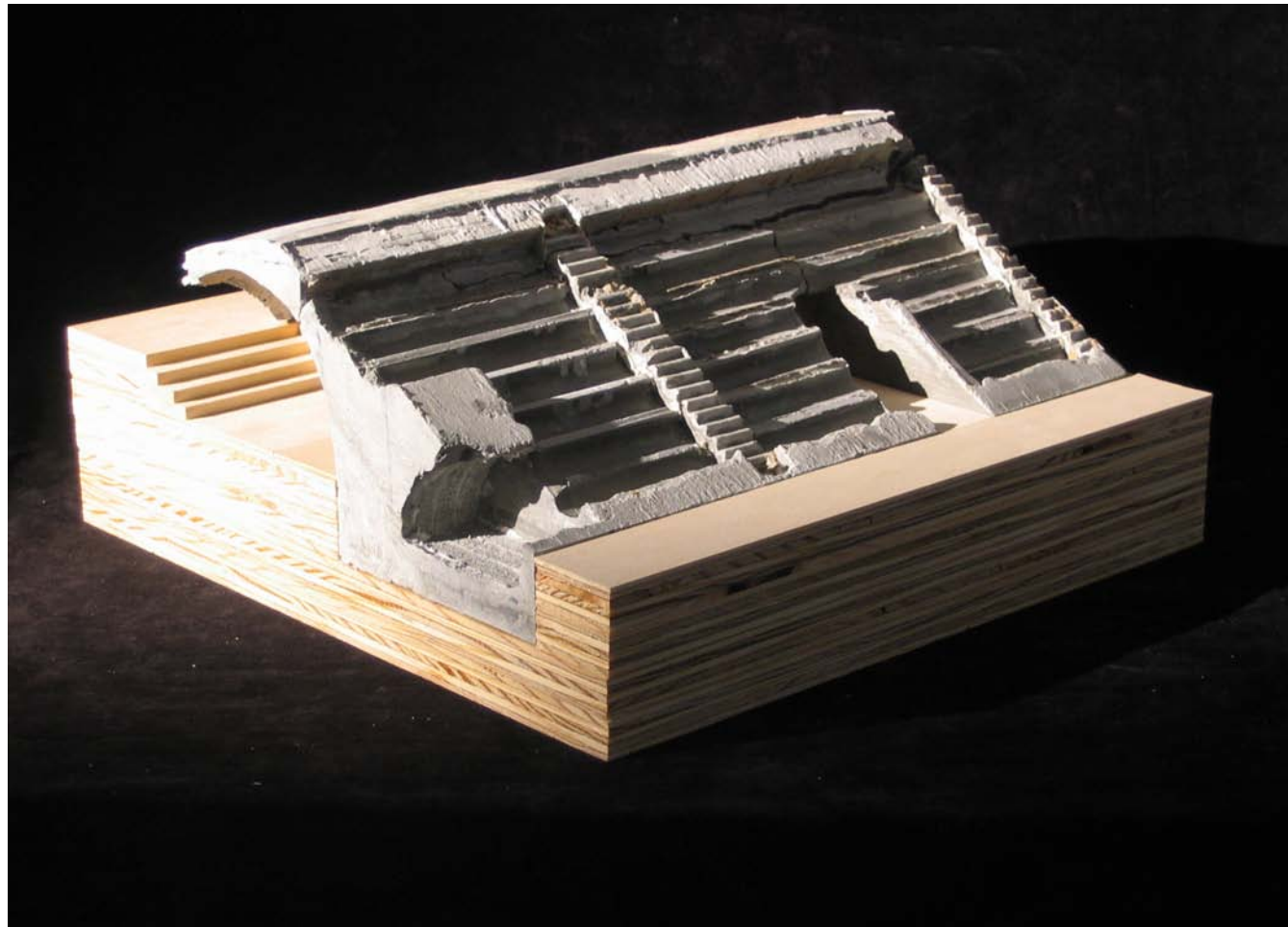
Section through Home Seating at dugout



Schematic sketch of Home Seating



Section through Home Seating

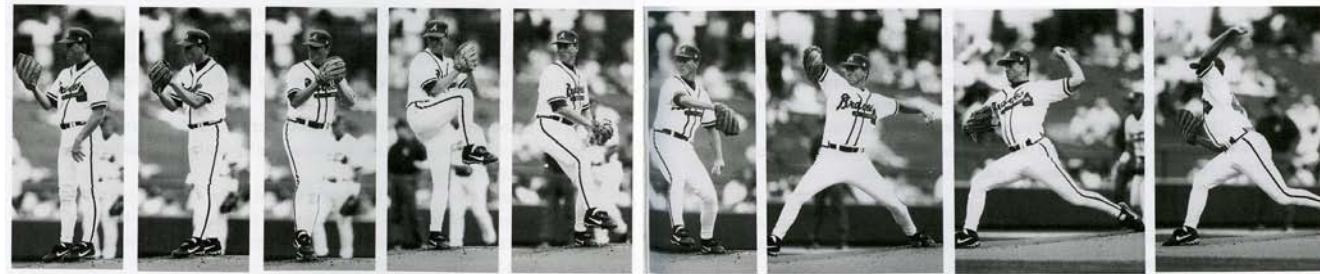


Wall

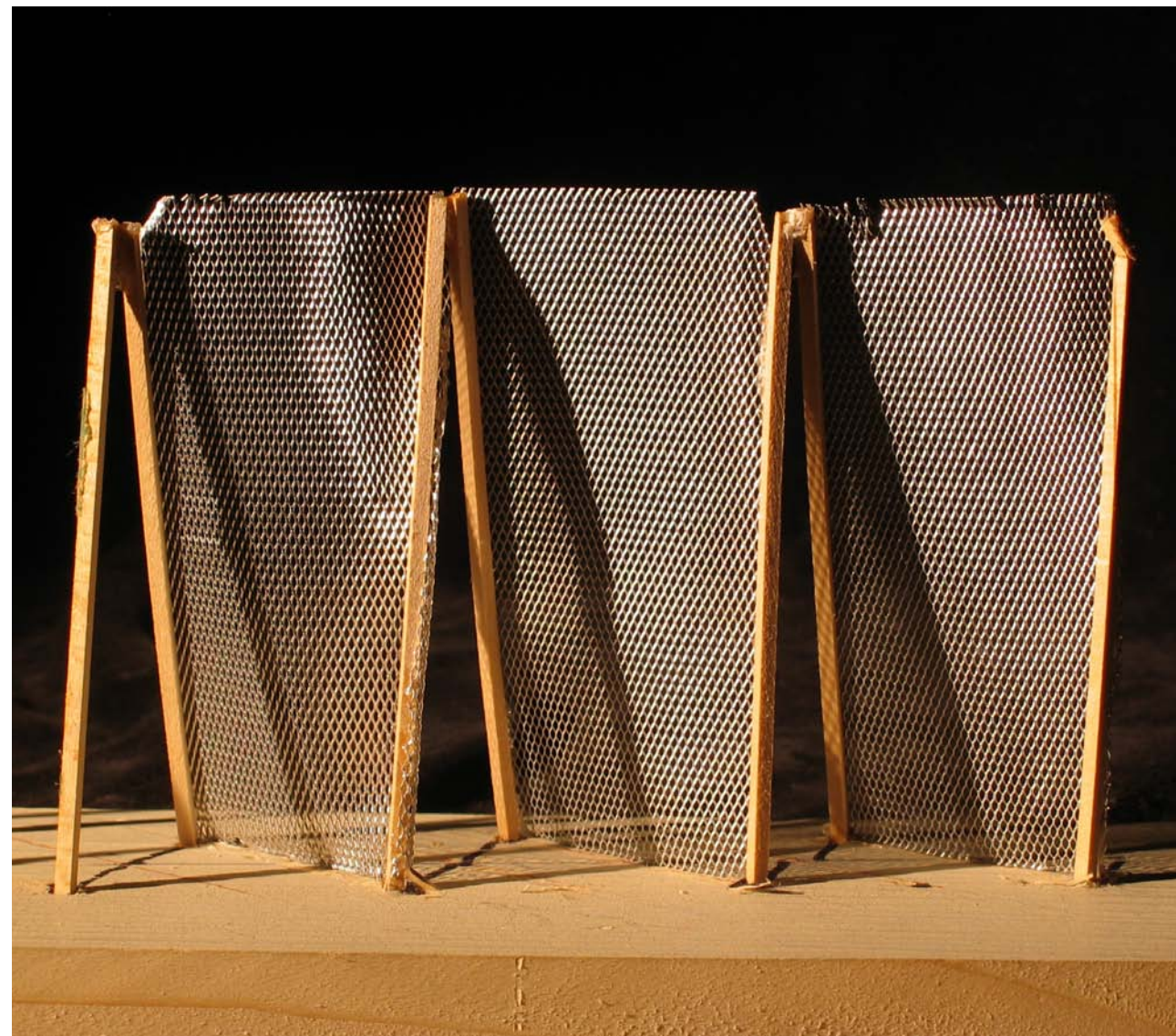
Fence

Much like the visitor's seating, the fence that separates the field of vision from the field of play was designed within the seasonal constraints of the site and it's revised program. As constructed, it can be seasonally removed and stored or ultimately replaced when necessary.

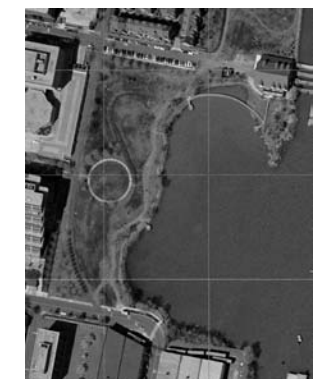
The form of the fence is derived from the body motion of a pitcher analyzed when a ball is thrown. The torque of the body takes material form in the twisting nature of the fence and provides two functions simultaneously. Players can pass through the fence and are provided access from the dugouts to the field of play. In contrast, batted balls are not afforded the same opportunity and are prevented from accessing the seats.

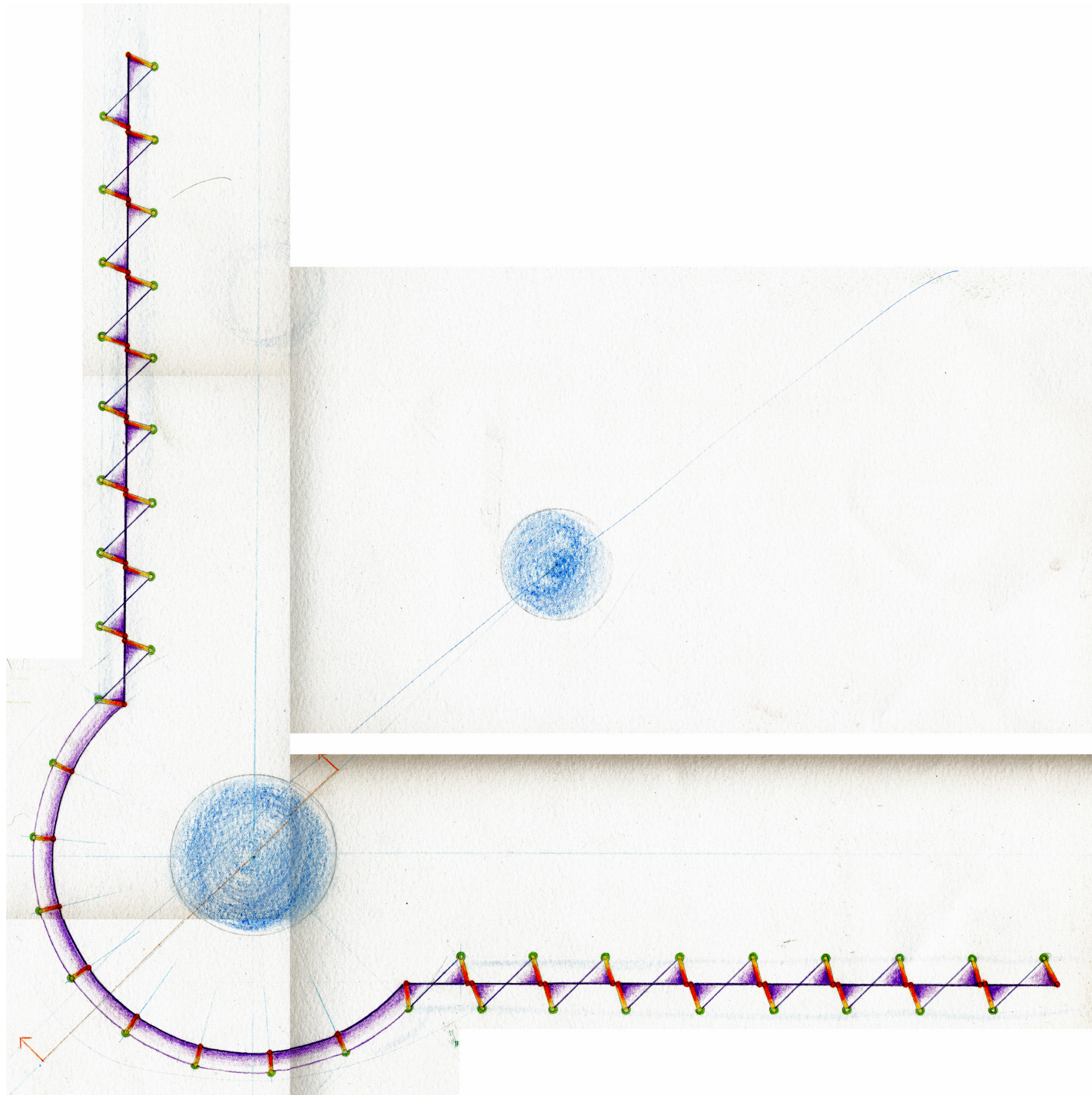


Analysis of pitching motion

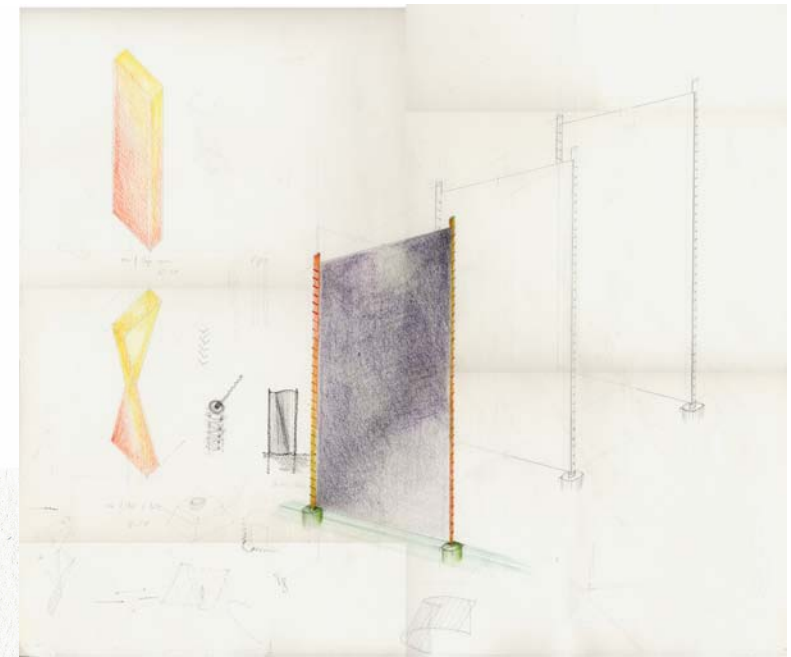


Schematic Section Model of Fencing

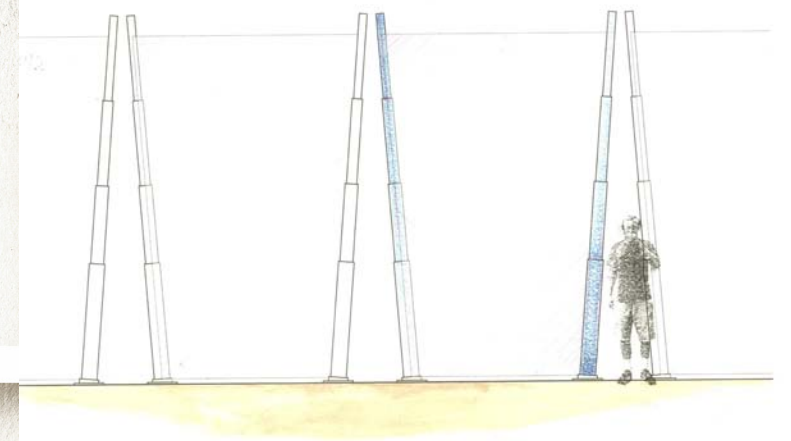




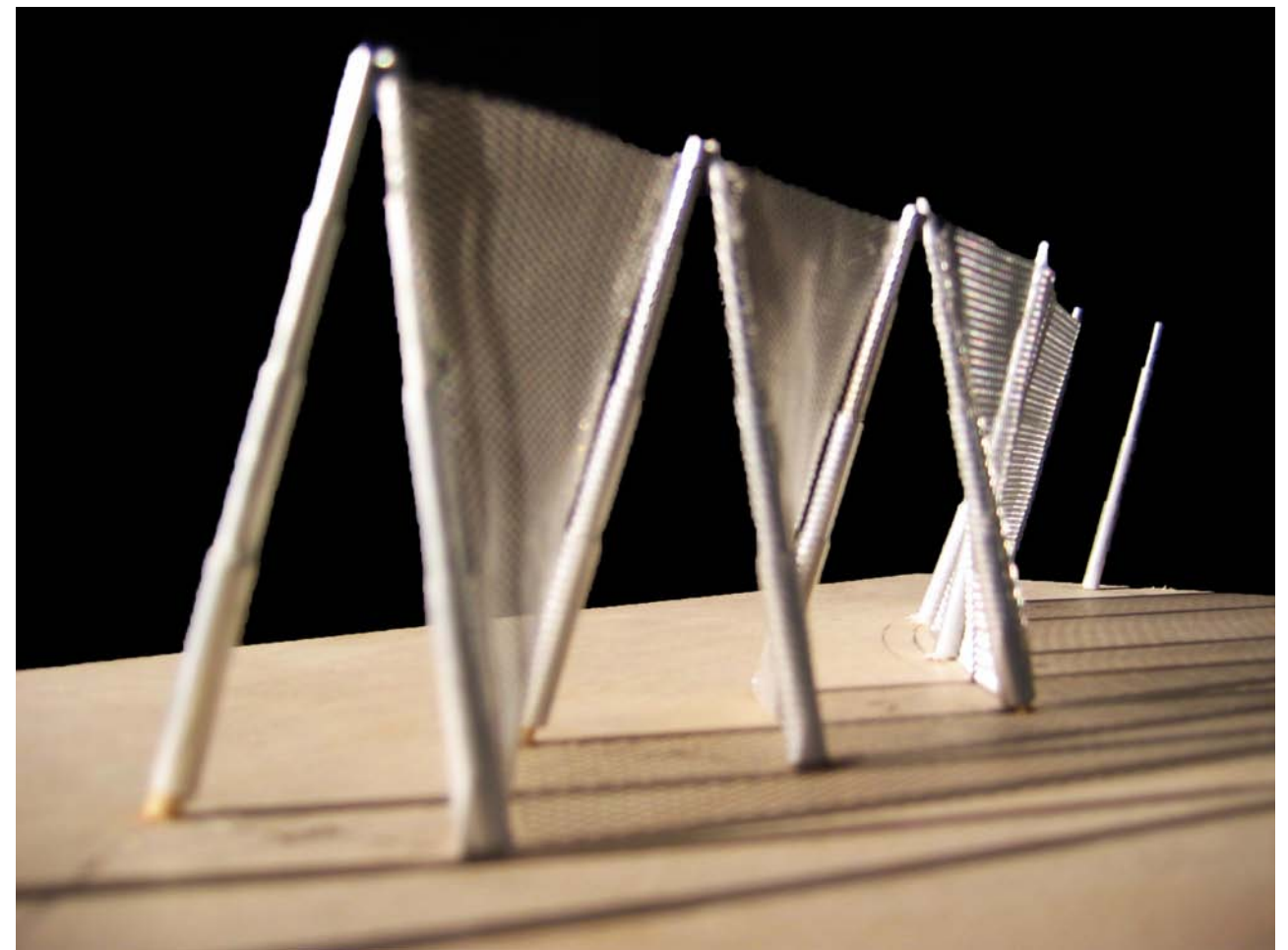
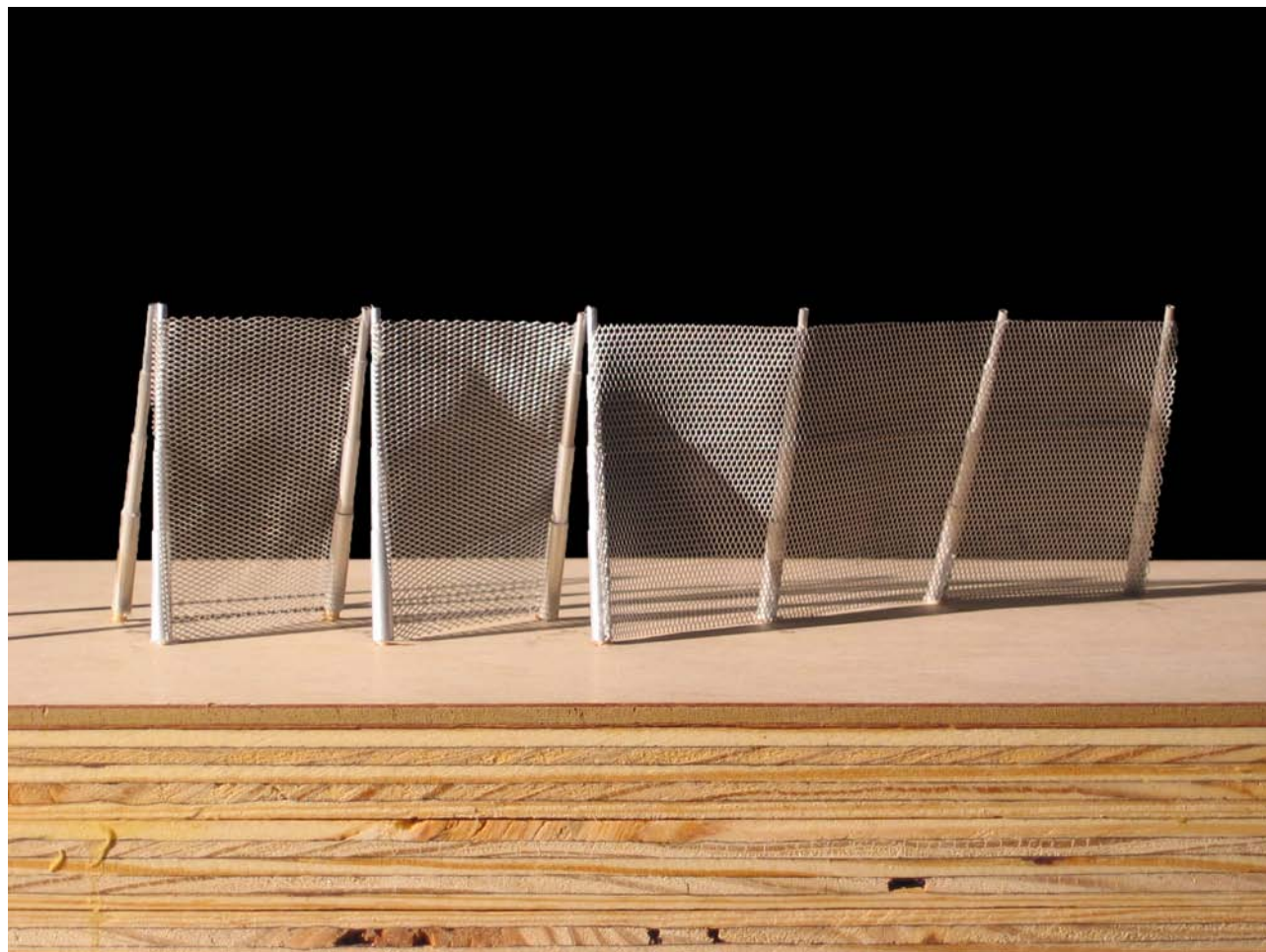
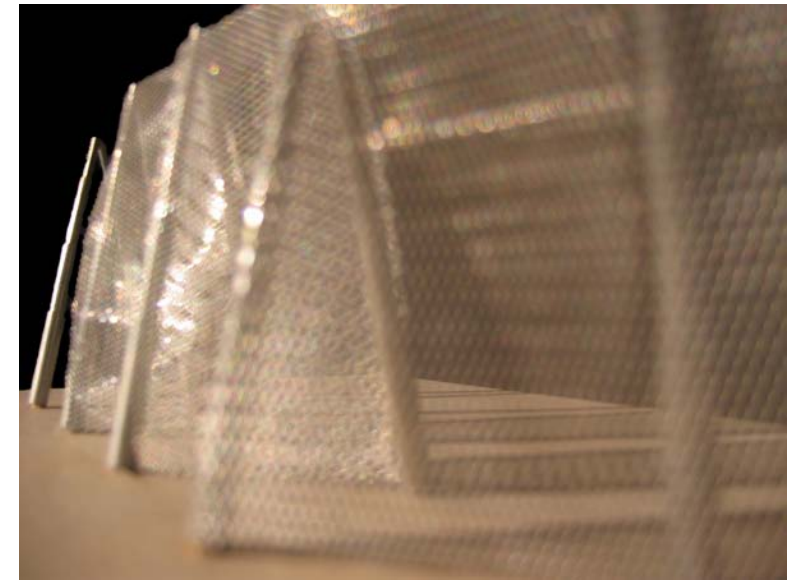
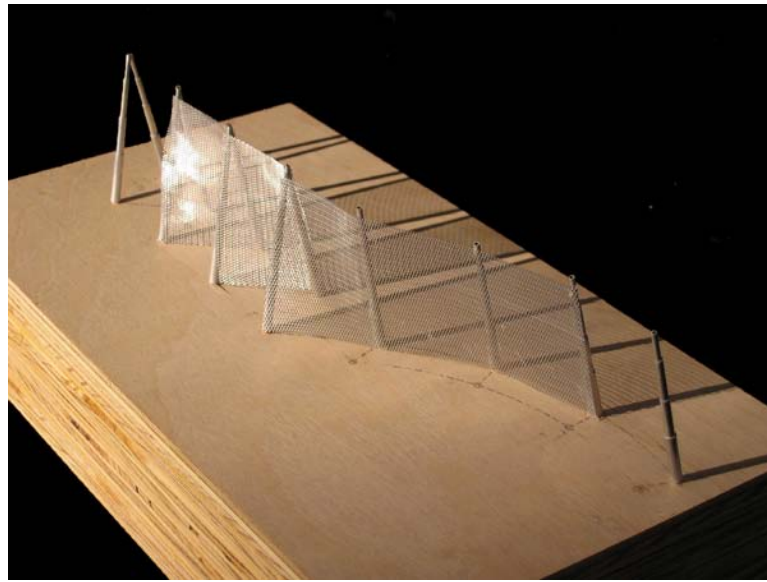
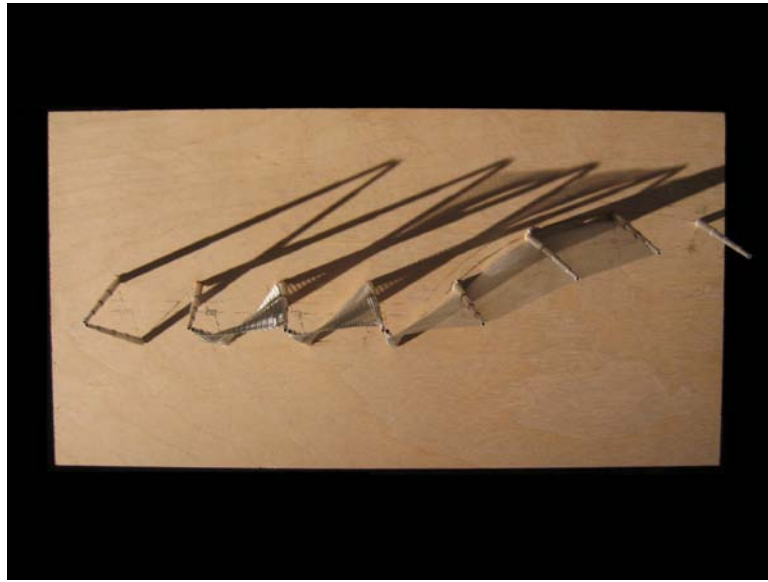
Plan of Fence between field of play and field of vision



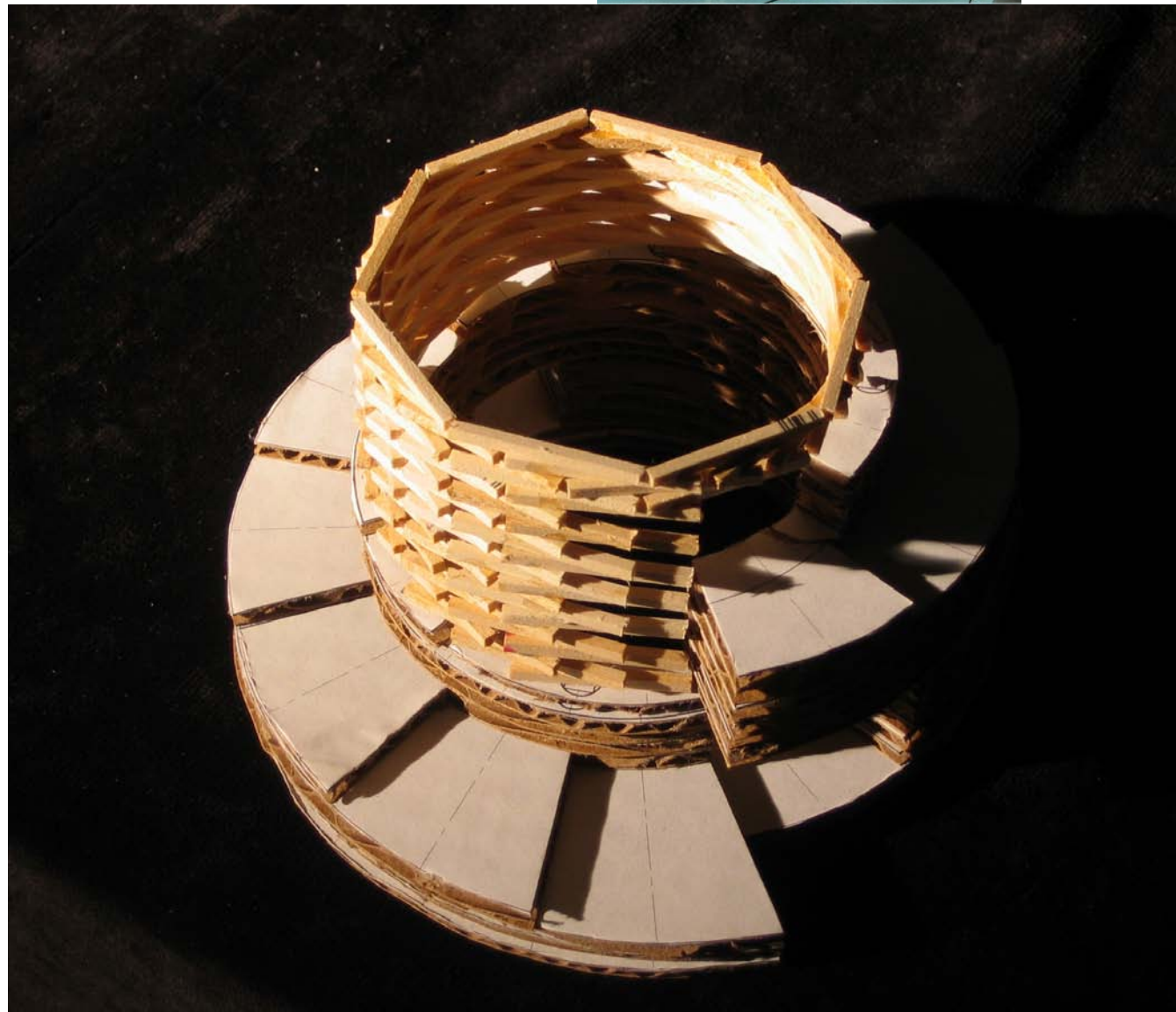
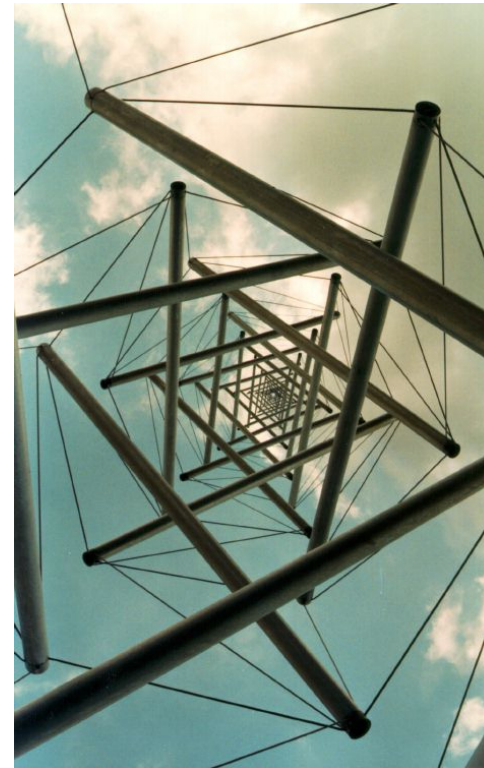
Schematic Sketches of Fence



Elevation of Fence



Models of Fence between field of play and field of vision



Floor and Column

Observation Tower

The observation tower was conceived with the idea of allowing for the opportunity for a variable understanding of the site and the body's place within.

As a material representation of the umpire, an omniscient figure in the game of baseball, it reorients the viewer within a greater sense of place. The base of the tower is solid stone, grounding the tower in the site. In material contrast, the top 3/4ths of the tower are stacked wood posts constructed in tension.

The bodies' movement within the tower creates a choreography of occurrences in which the inhabitant may gain a better sense of place within the site. At the base, the tower can be entered on the northeast axis and a view of the strike-zone that is usually only felt through the body of the umpire can be experienced. The tower is traversed vertically by first walking up the exterior on the stacked stone steps in a clockwise motion. At the point of material transition the inhabitant crosses within the tower and entrance to the top is experienced in a counter clockwise path. This body movement allows the inhabitant to experience a similar path to a player running the bases as landings are located at the four corners of the inner diamond of constructed stairs.



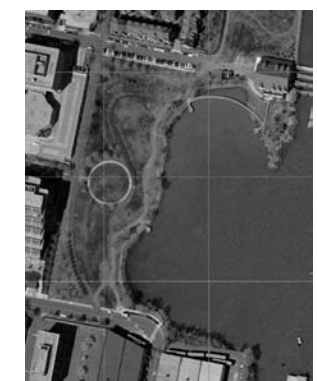
Counterclockwise

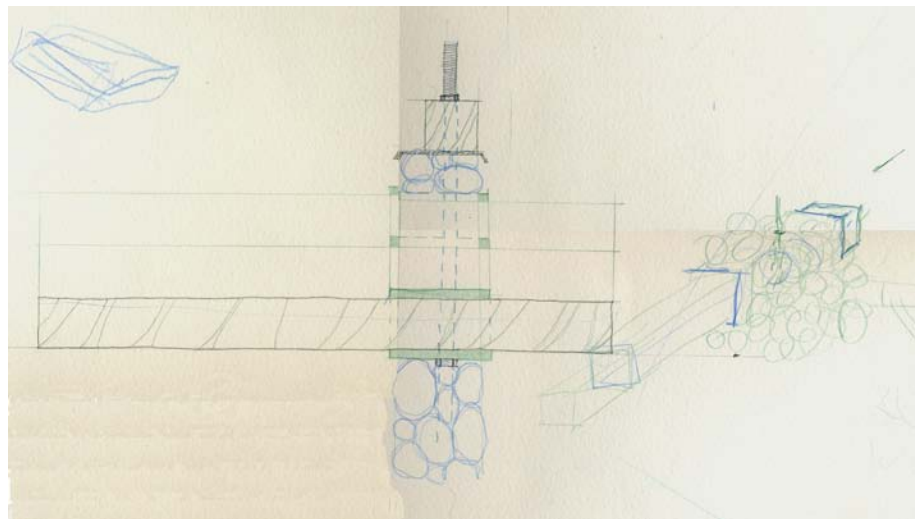
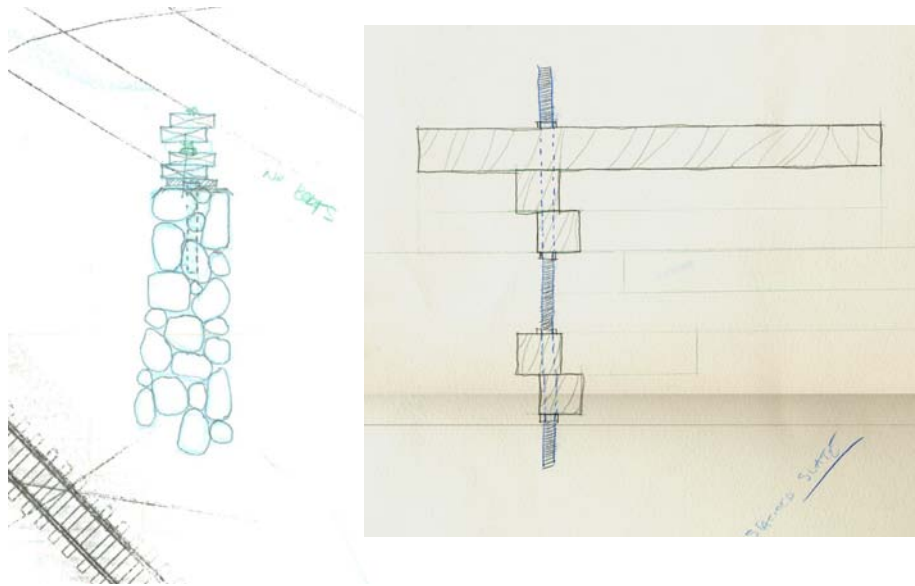
Study Model of relationship of materials between stacked slate tower base and stacked wood tower.

Schematic sketch of tower.

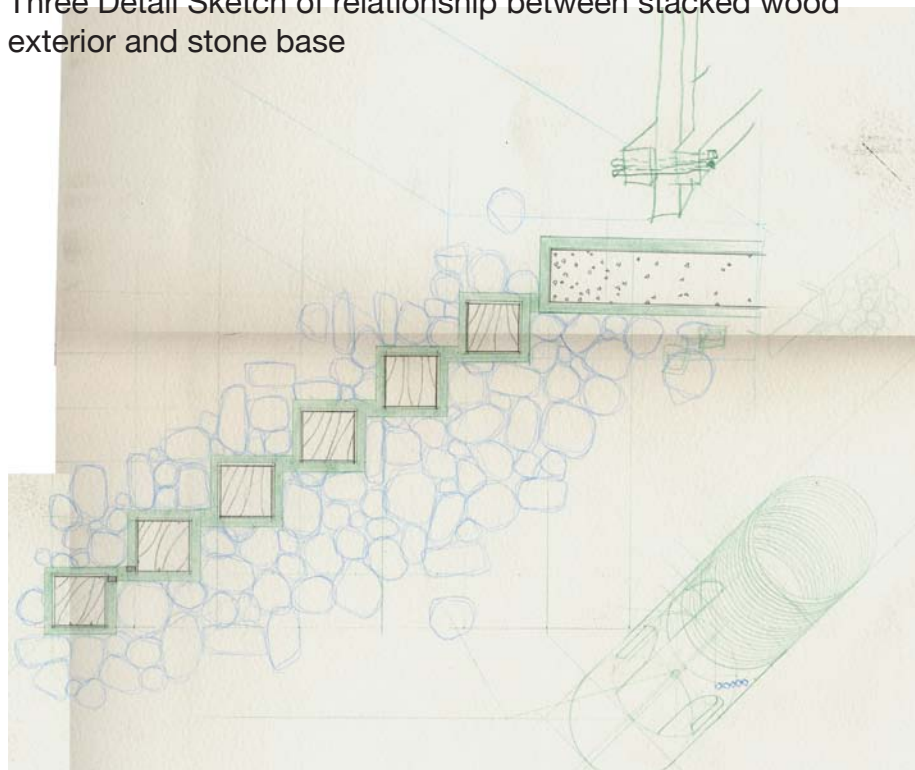
Study sample image of Tensile structure.

Talin's Tower or The Monument to the Third International

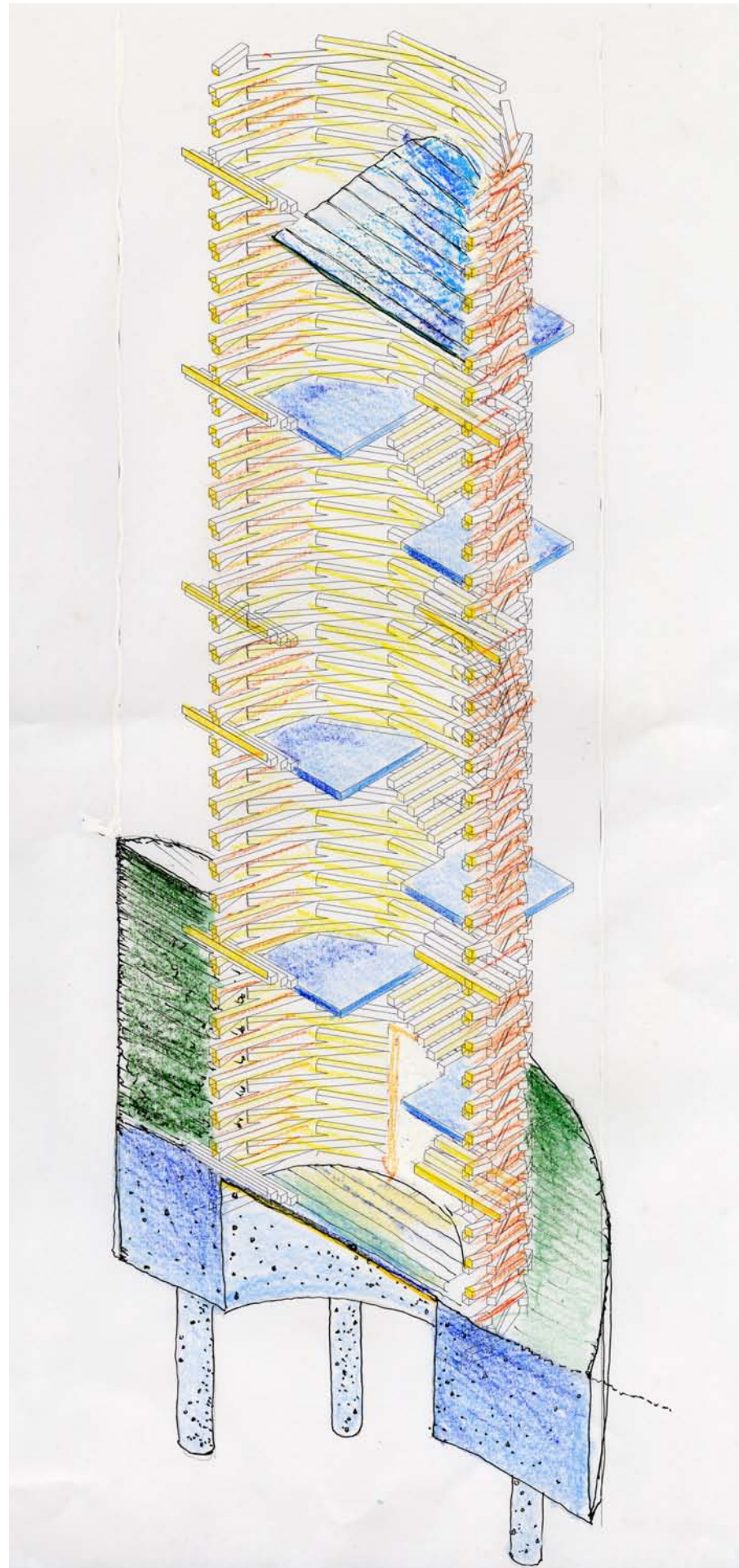




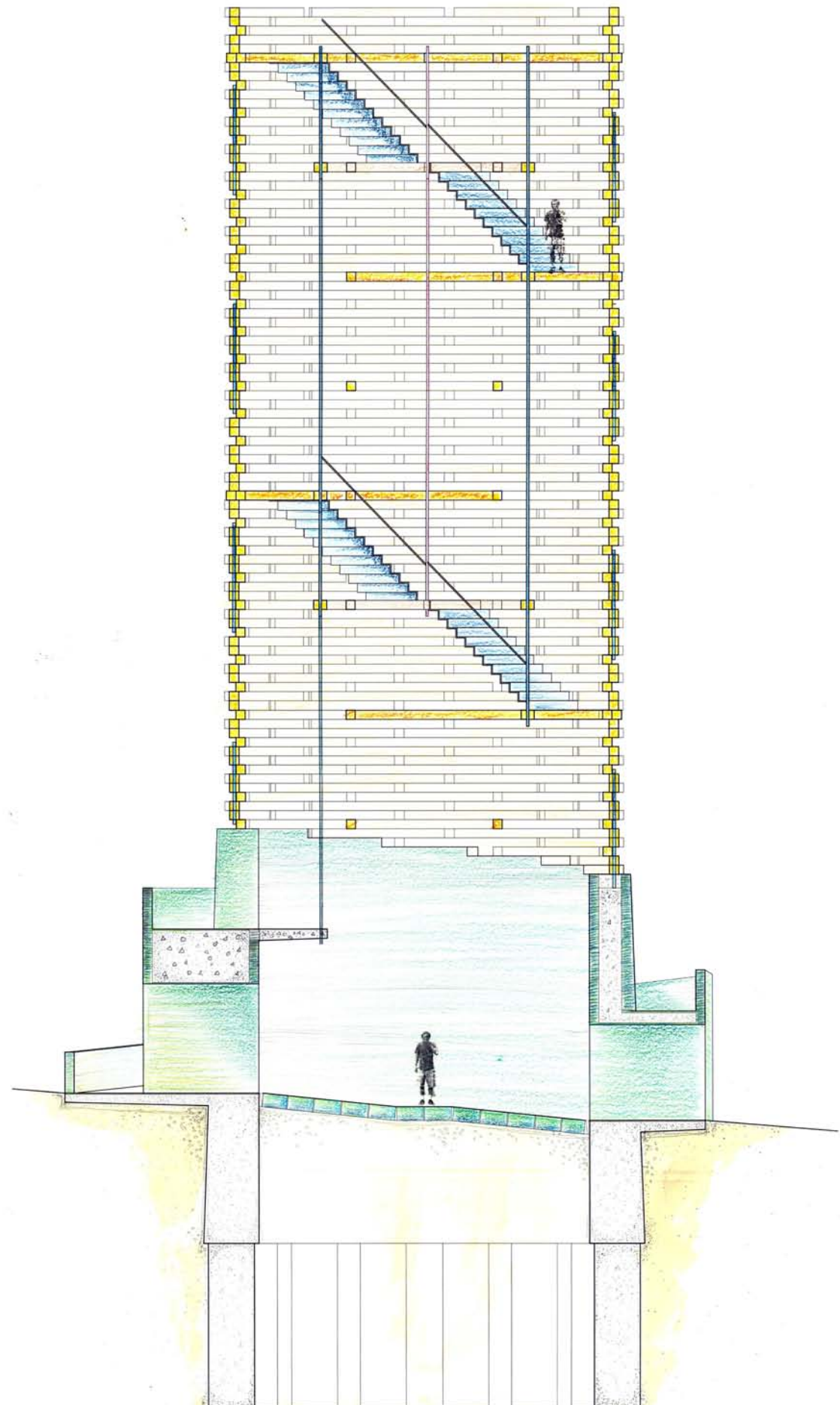
Three Detail Sketch of relationship between stacked wood exterior and stone base



Detail Sketch of wood post stairs within Tower center



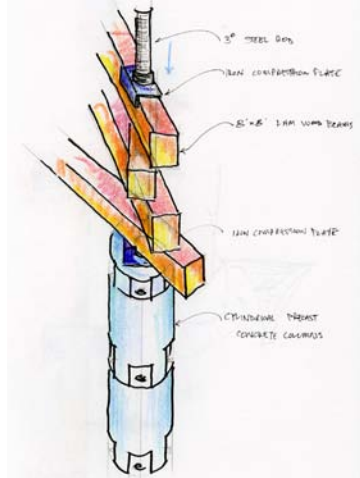
Schematic Section drawing of Observation Tower



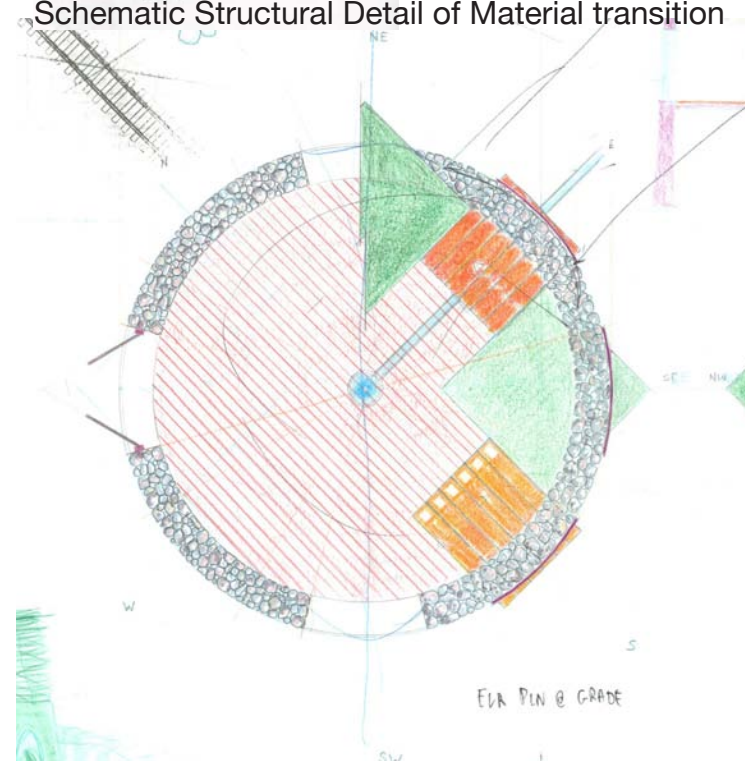
Section through Tower



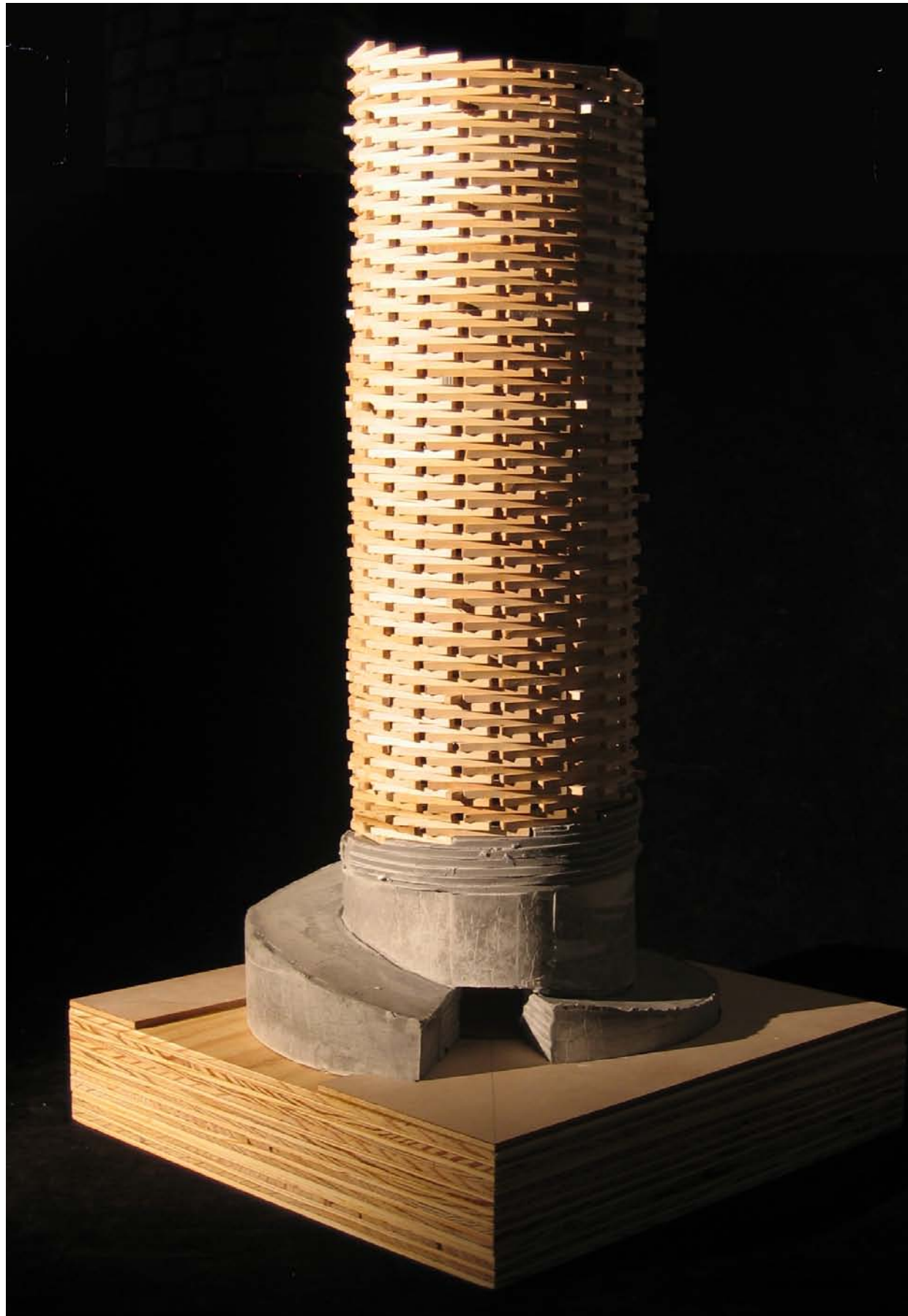
Floor Plan of Tower at Observation Deck



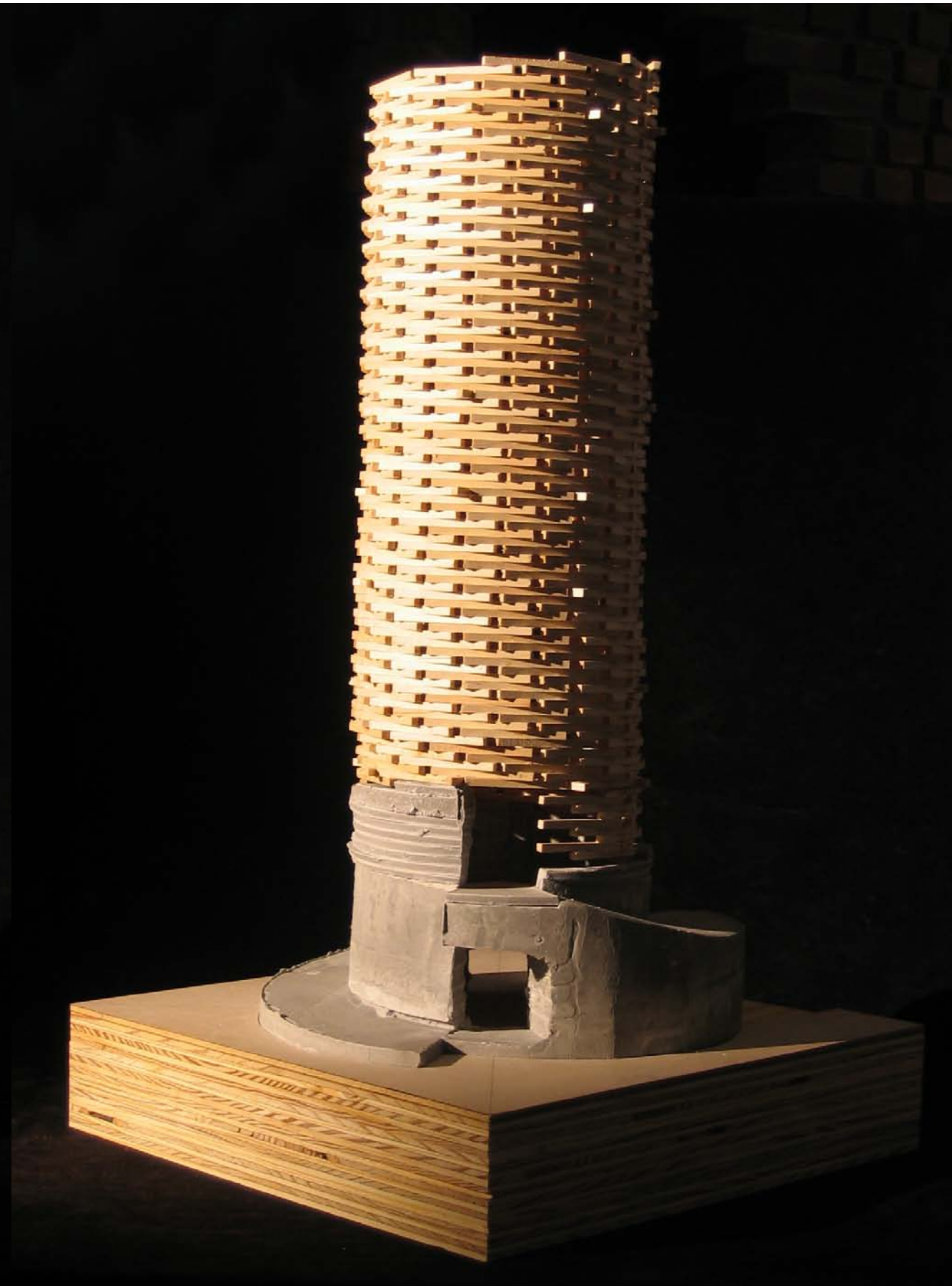
Schematic Structural Detail of Material transition



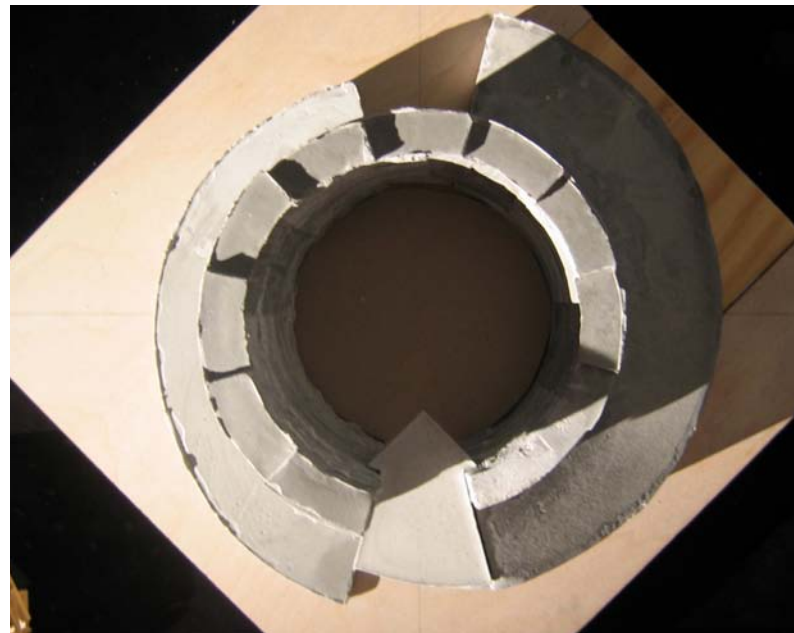
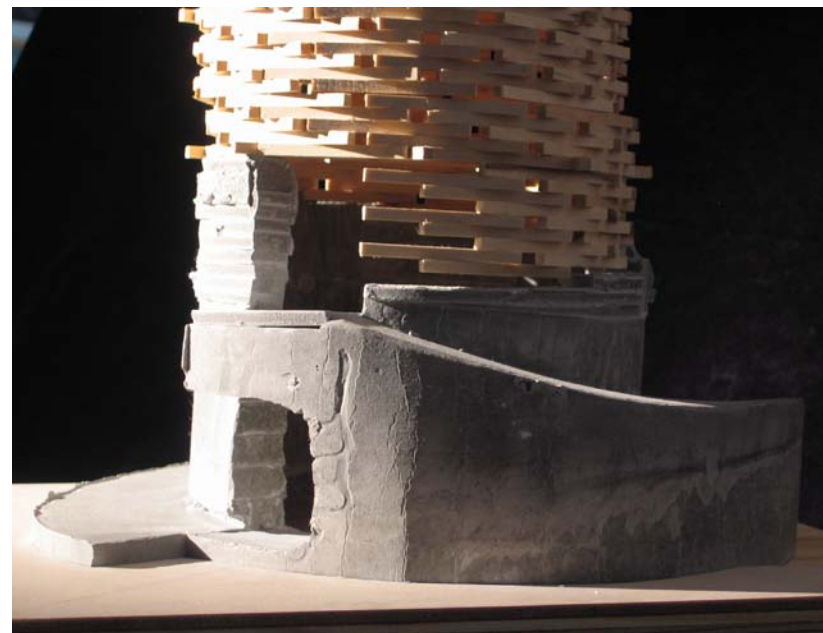
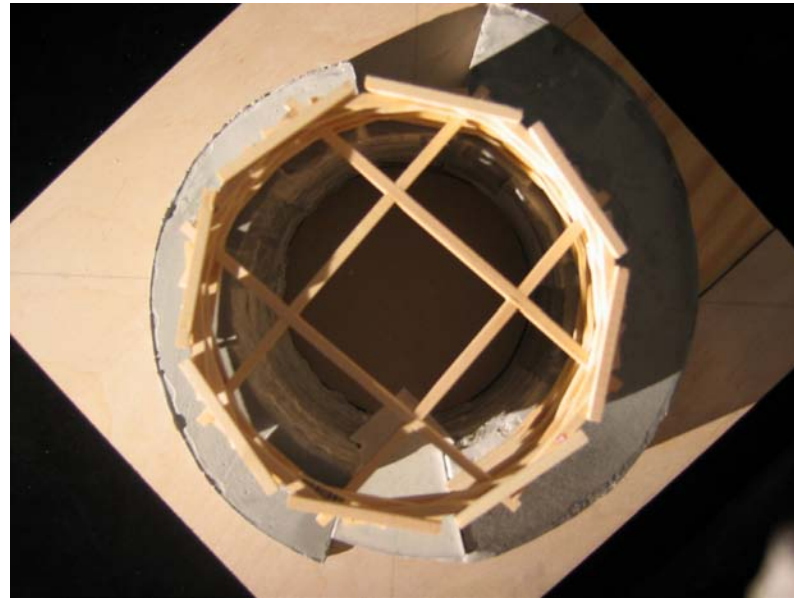
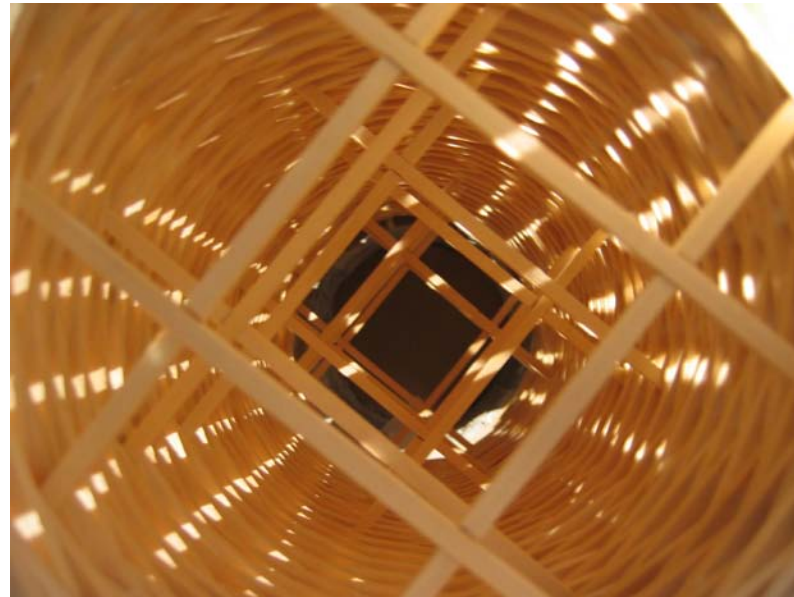
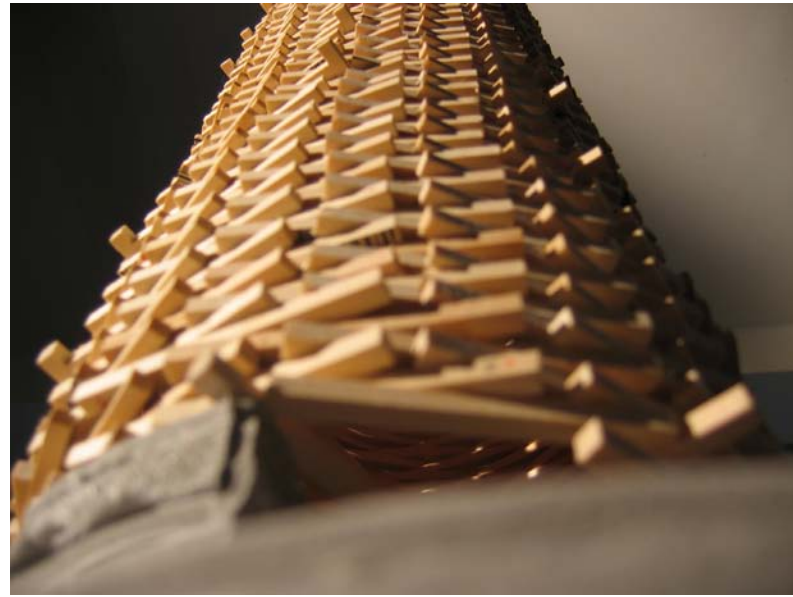
Floor Plan of Tower at Grade



Model Perspective on NE Axis from ball field to site



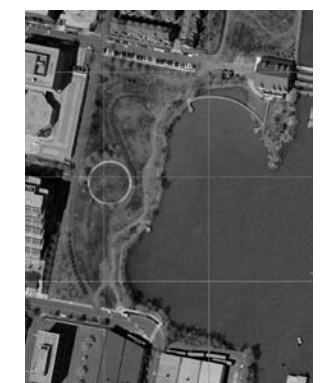
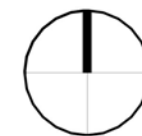
Model Perspective on NE Axis from site to ball field

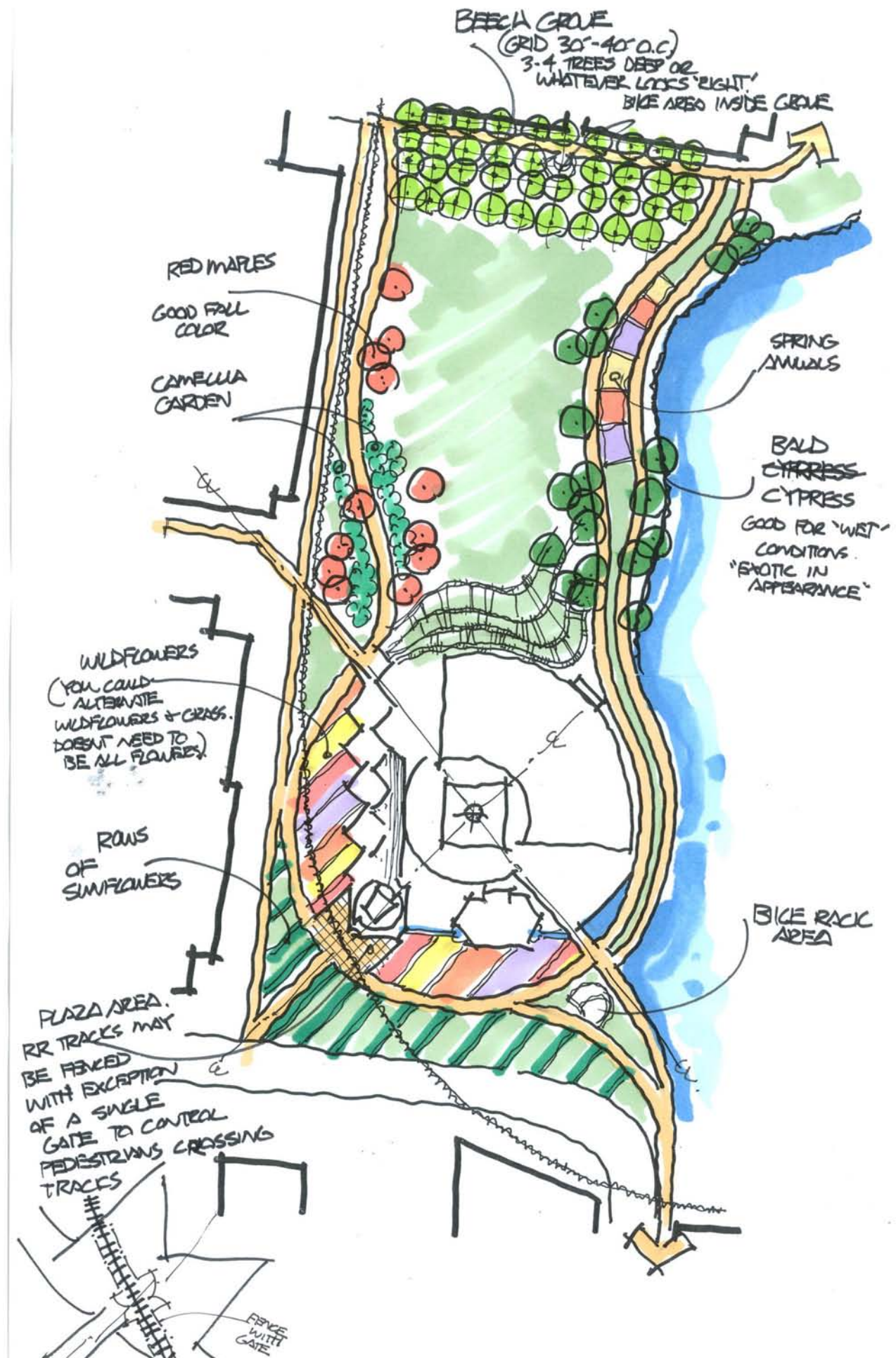


Tower Model Details

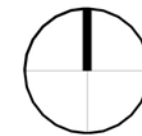
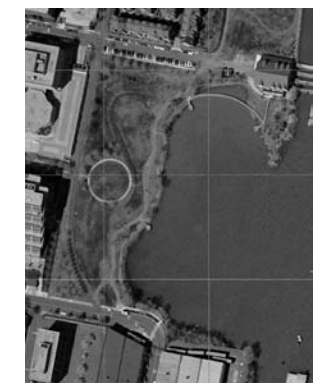


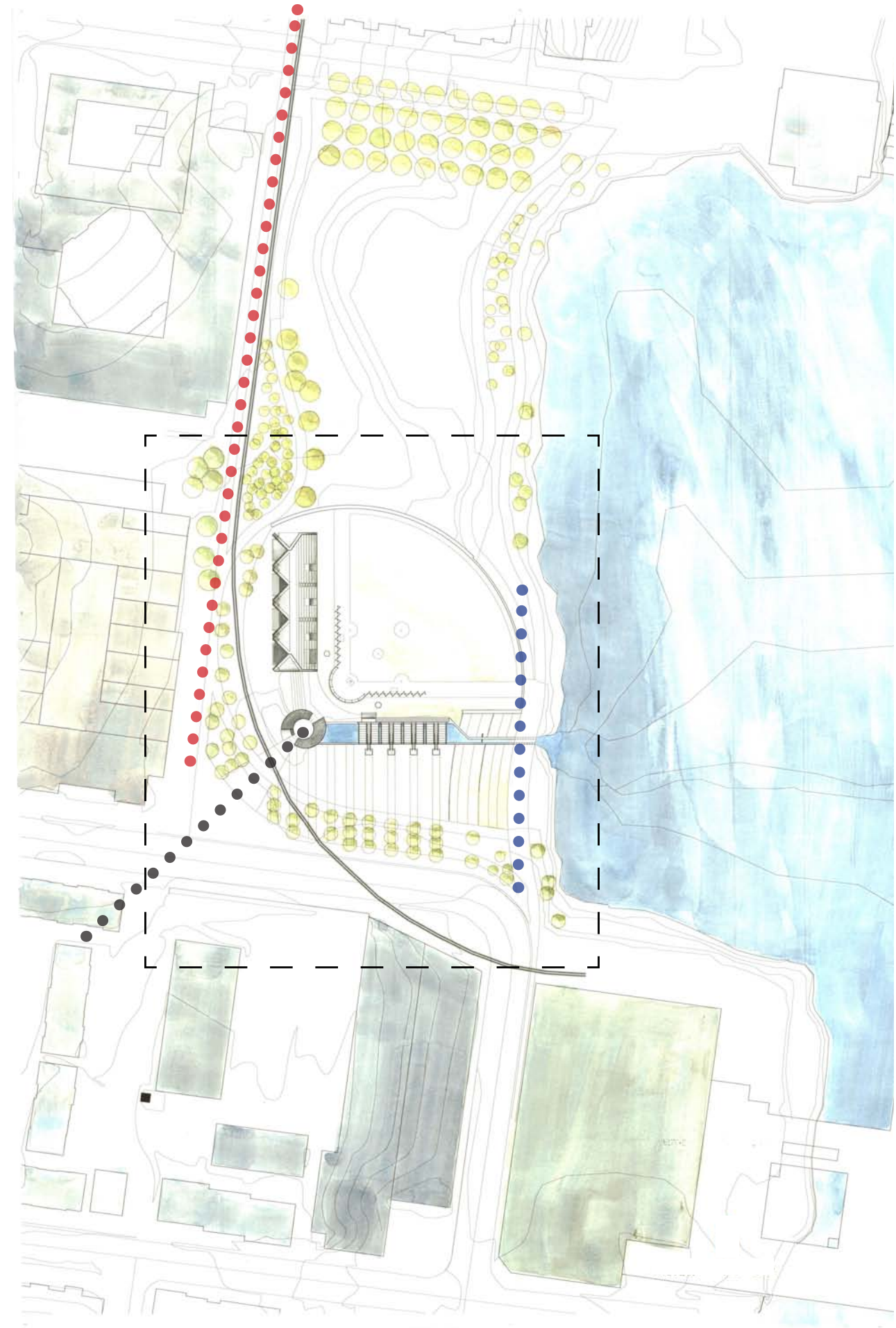
Schematic Site Plan





Schematic Site Plan

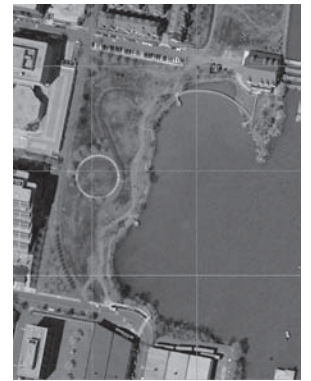
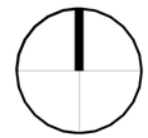
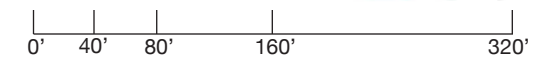


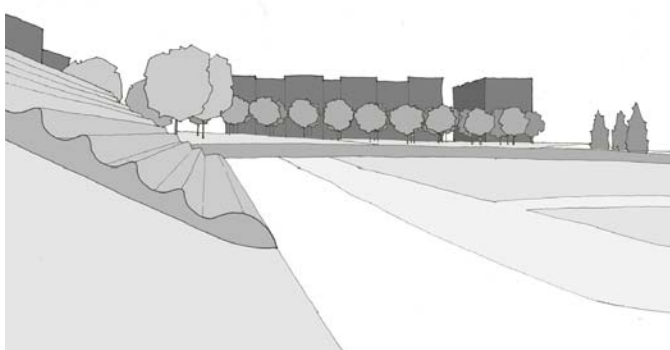
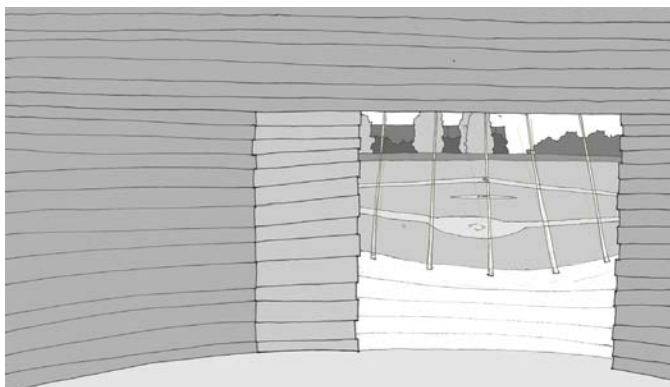
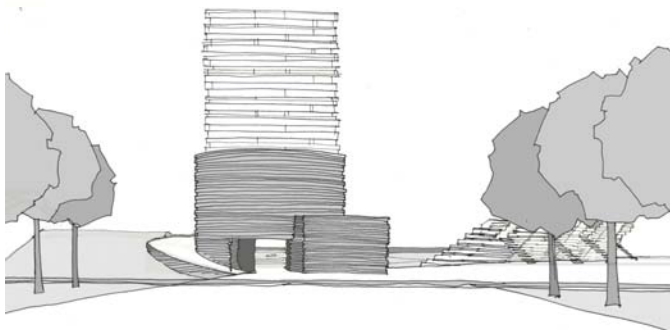
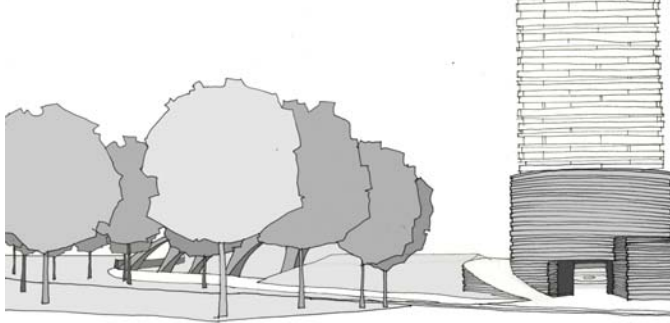
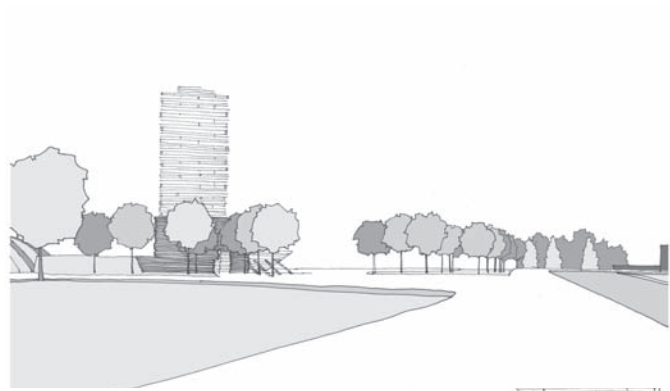


Final Site Plan with illustrated paths of progressive views of the site.

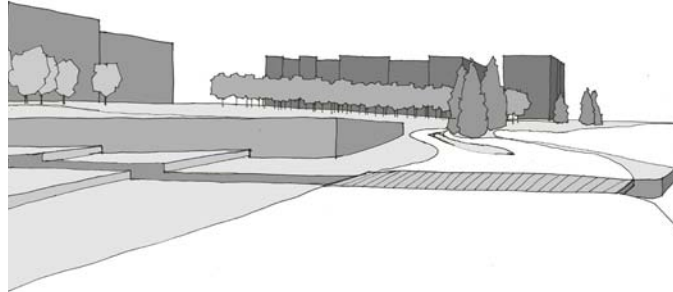
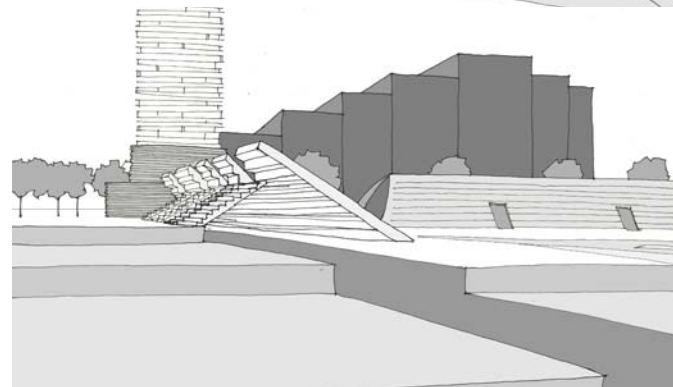
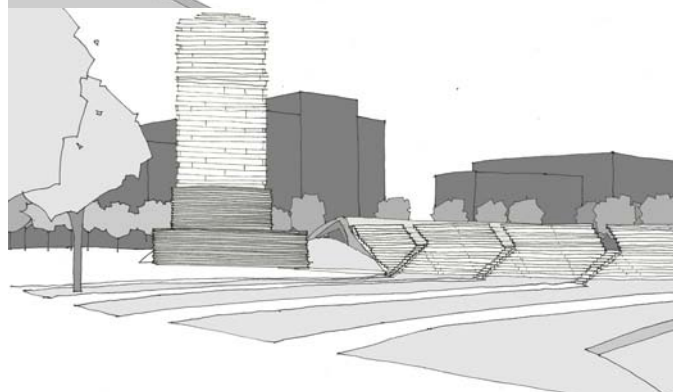
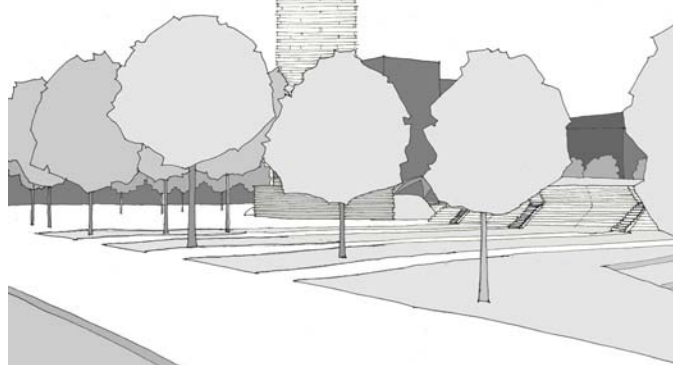
- Progressive View through site along Path A
- Progressive View through site along Path B
- Progressive View through site along Path C

Final Site Plan

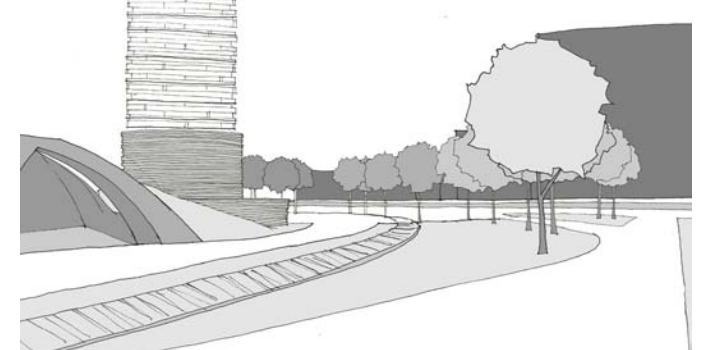
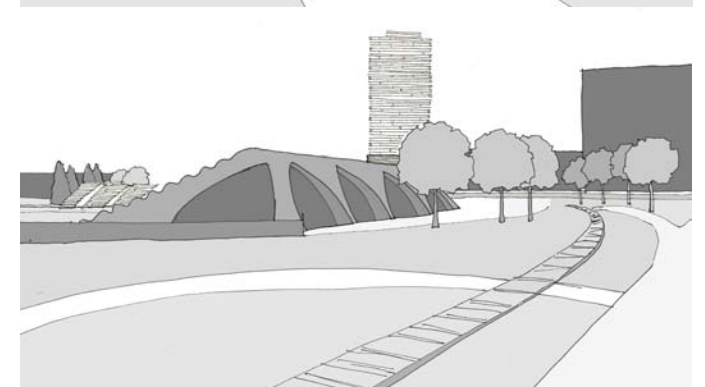
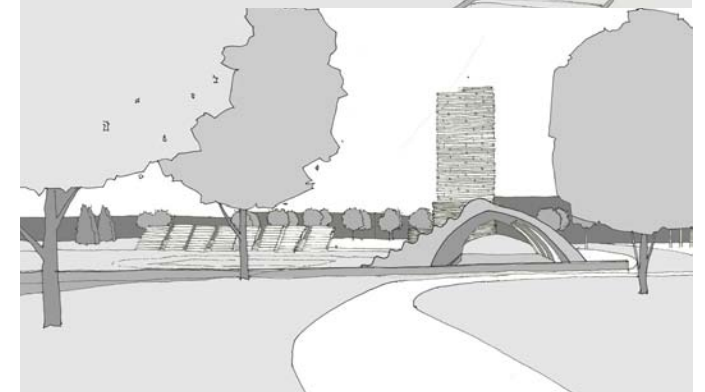
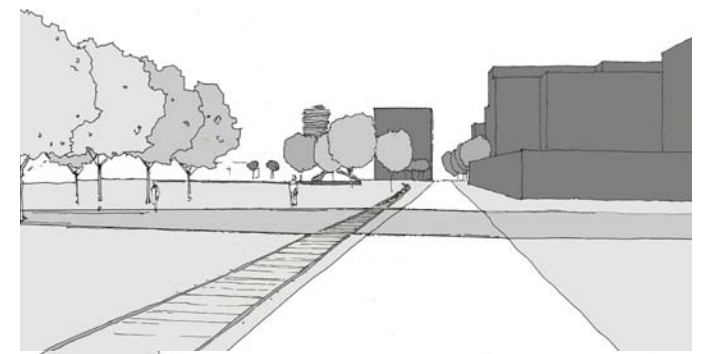




Progressive View through site along Path A

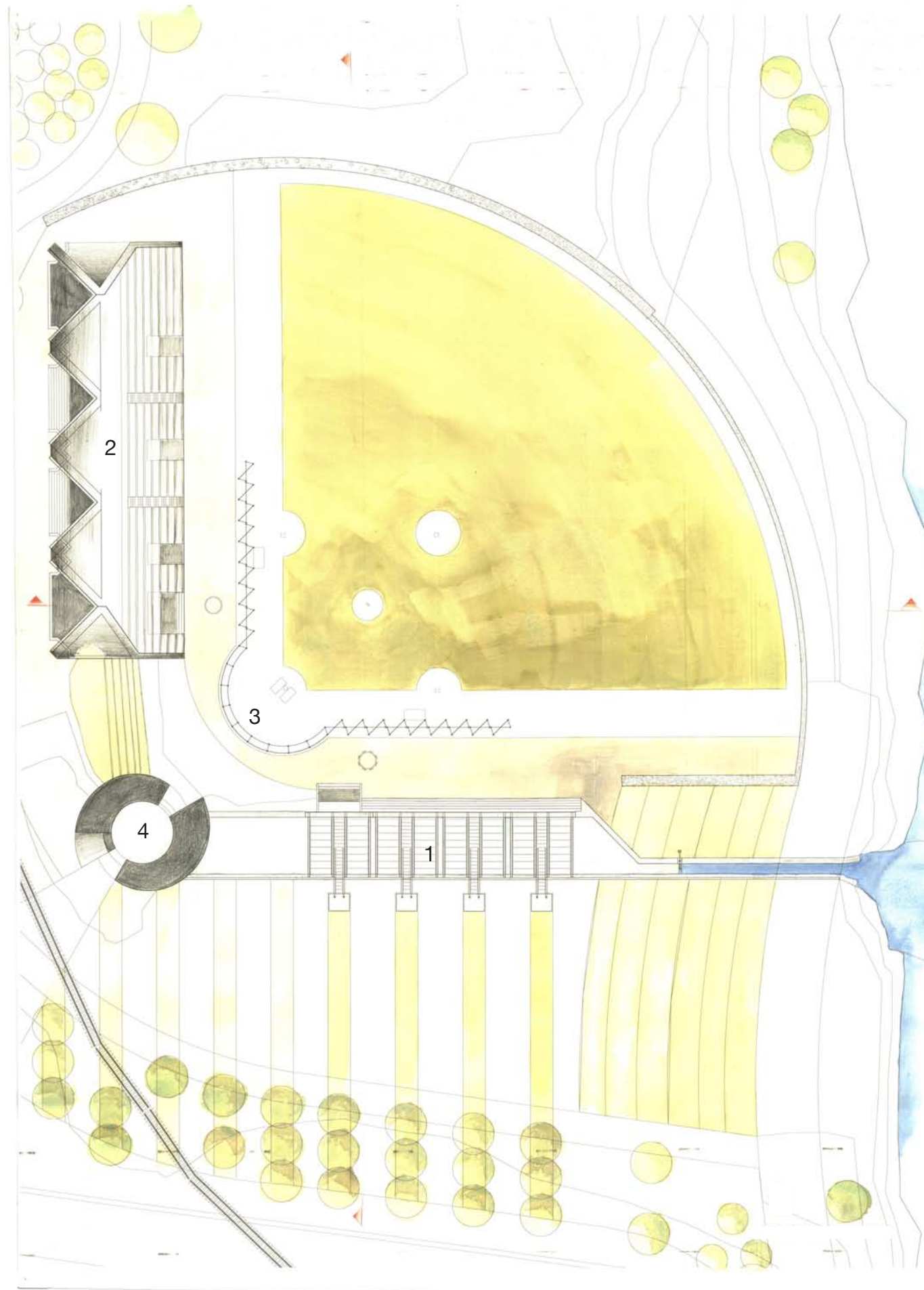


Progressive View through site along Path B



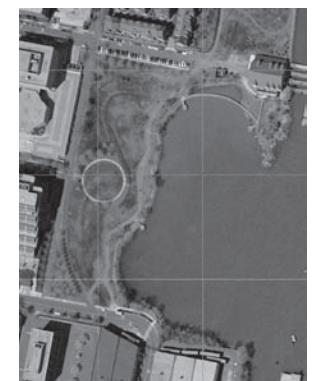
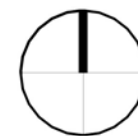
Progressive View through site along Path C 27

- 1. Visitor Seating
- 2. Home Seating
- 3. Fence
- 4. Observation Tower

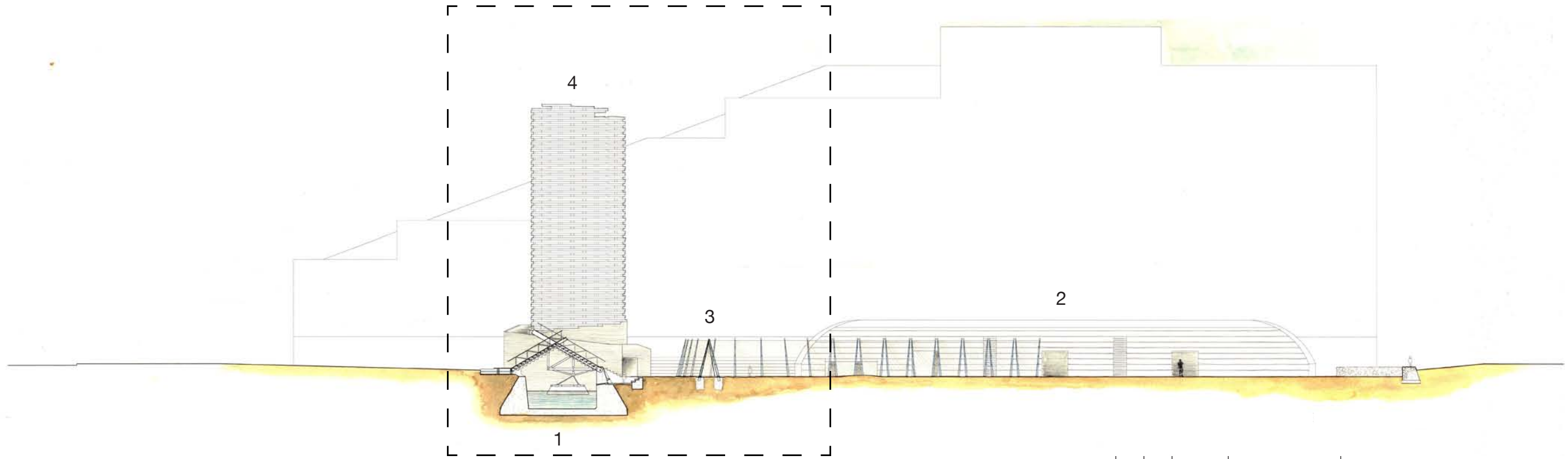


Final Enlarged Site Plan

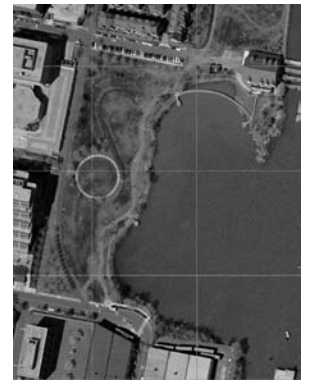
0' 20' 40' 80' 160'



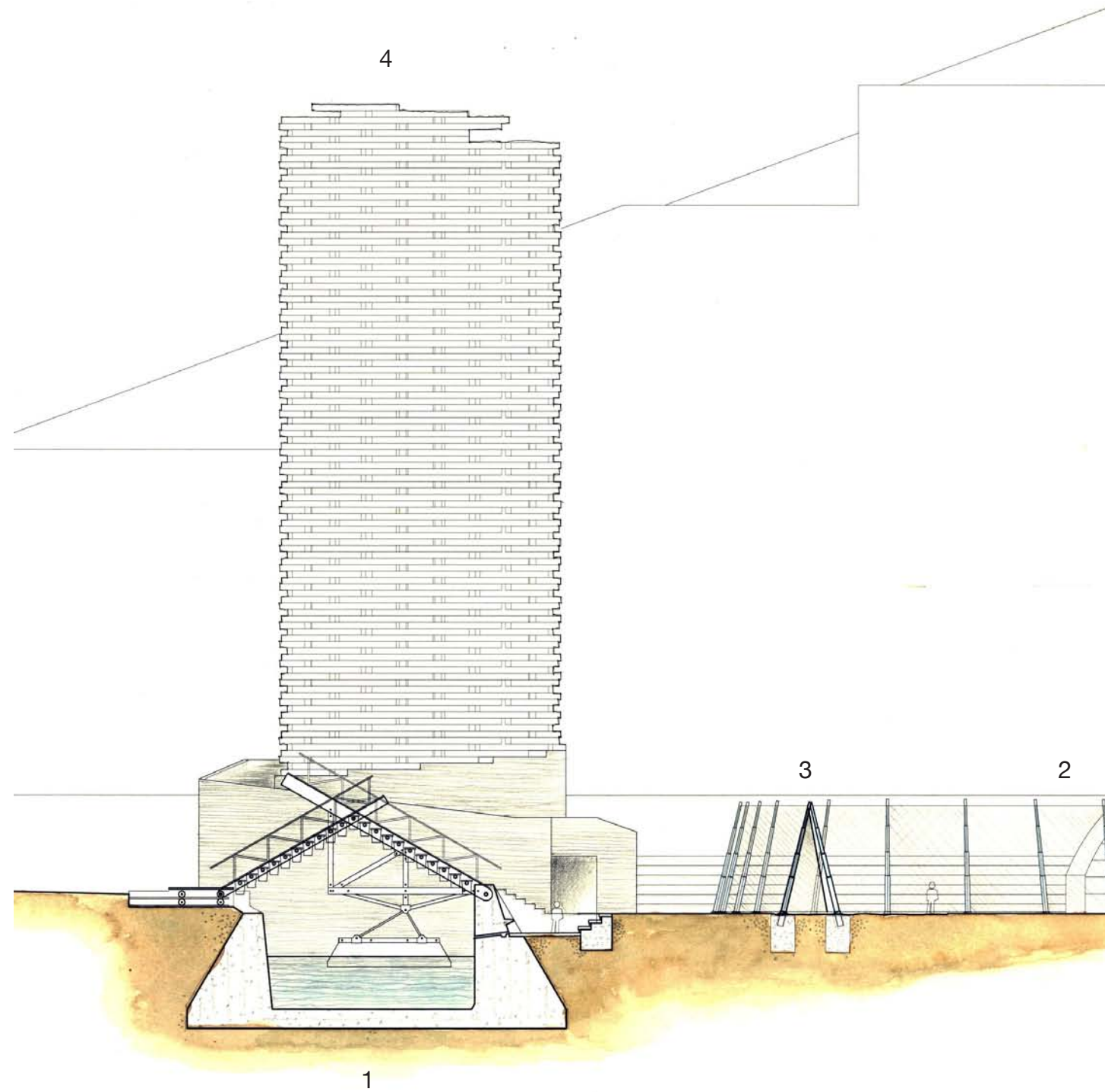
- 1. Visitor Seating
- 2. Home Seating
- 3. Fence
- 4. Observation Tower



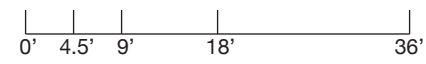
Site Section North - South



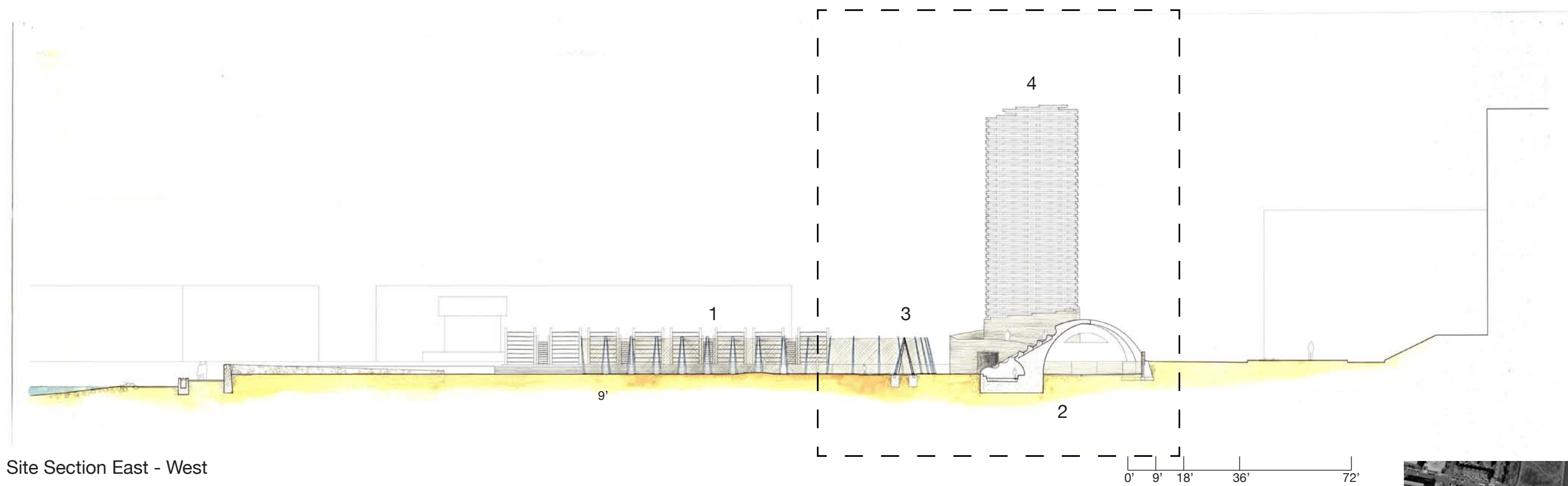
- 1. Visitor Seating
- 2. Home Seating
- 3. Fence
- 4. Observation Tower



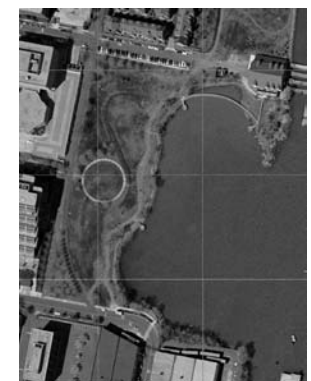
Enlarged Site Section North - South



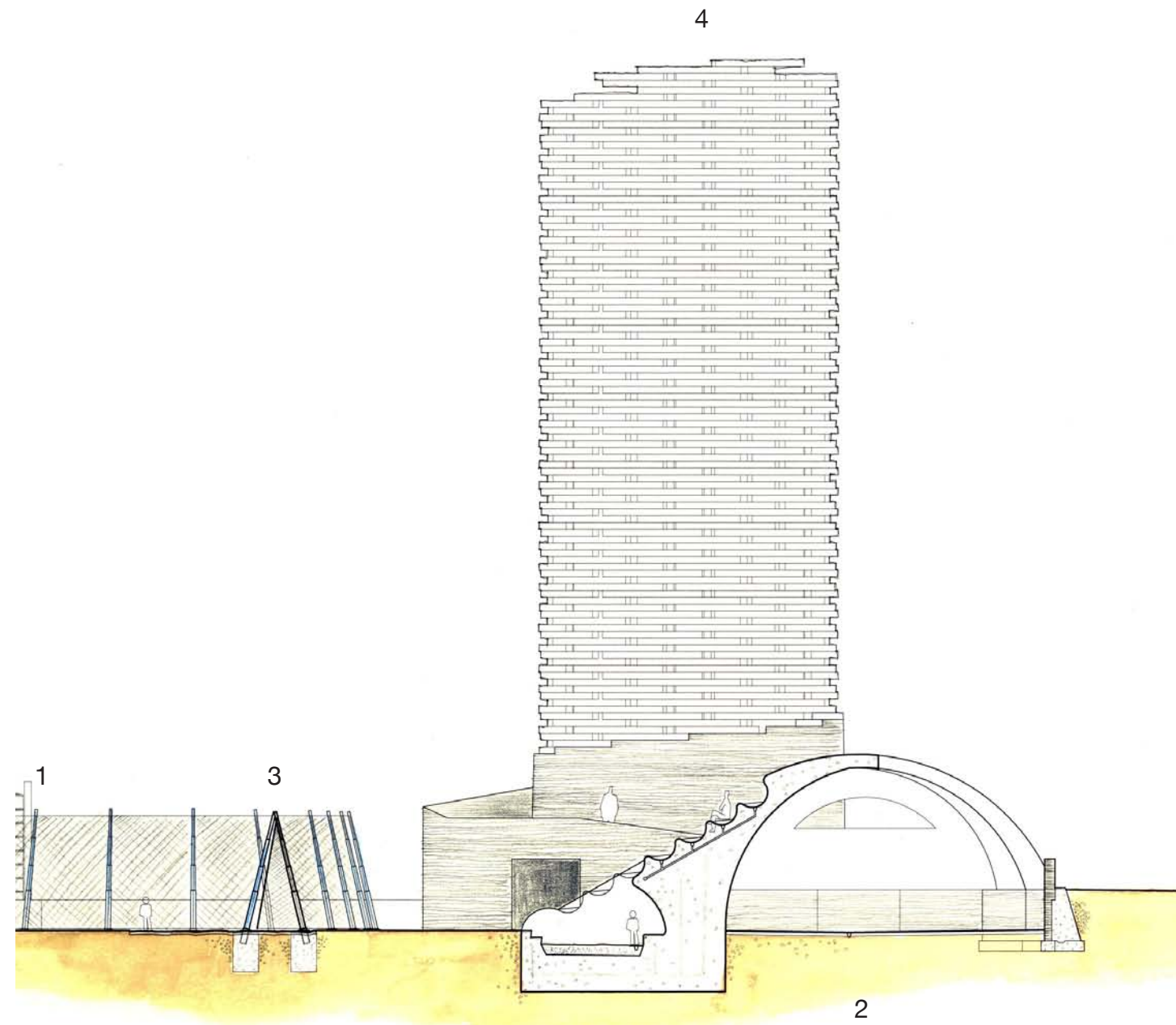
- 1. Visitor Seating
- 2. Home Seating
- 3. Fence
- 4. Observation Tower



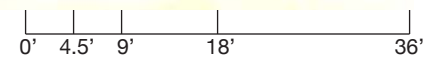
Site Section East - West



- 1. Visitor Seating
- 2. Home Seating
- 3. Fence
- 4. Observation Tower

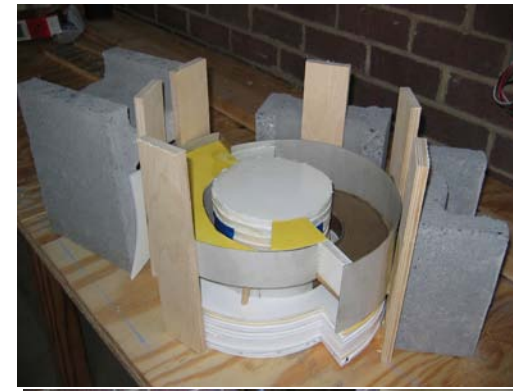


Enlarged Site Section East - West





Final Model Process Photographs



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Unless otherwise noted, photos and work are by the author.
 Aerial photographs on pages 2,3,5,9,13, 16, 19, 24-26, 28, 29, 31
www.maps.google.com, 2005

Fig 1: Composite Ideogram 03
 Image by author created by coupling the following found images or photographs:
 -Photograph of Dave Dravcky www.nationalpitching.com, 2004
 -Construction Drawing of Pitching Machine
 Patent No.1,204,468, Nov. 14, 1916 by B.N. Marty
www.uspto.gov, 2004
 -Image of a Hand Drawing of
 "Cut B: Diagram of the Method of Grasping the Ball in Delivery"
www.thediamondangle.com, 2004

Fig 2: Athens, Acropolis III, after 450 Bc plan
 Bloomer, Kent C. and Moore, Charles W.
Body, Memory, and Architecture p. 98

Fig 3: Baseball field from 1910
www.baseball-statistics.com, 2004. No known author.

Fig 4: Aerial of Durham Athletic Park from 1930's
 City of Durham, North Carolina
www.ci.durham.nc.us, 2010

Fig 5: Diagram of ground covered
www.baseball-statistics.com, 2004. No known author.