

Void and Beyond:
Reading Between the Void Structures

By **Kyung-A Lee**

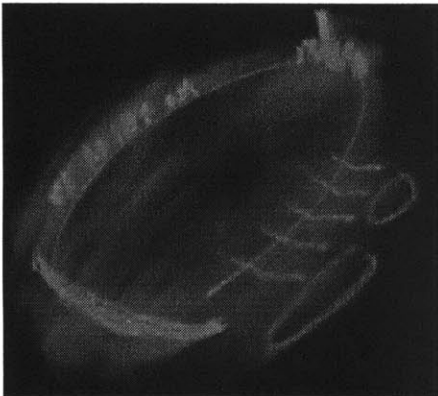
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Submitted to the Department of Architecture in partial fulfillment of the requirement for the Degree of Master of Architecture at the Massachusetts Institute of Technology, February 2002.

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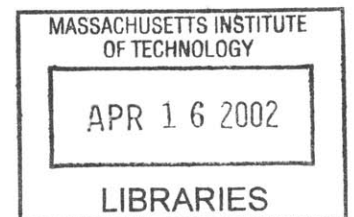
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ROTCH



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cover ; concept sketch of void structure in site

abstract ; view of site model

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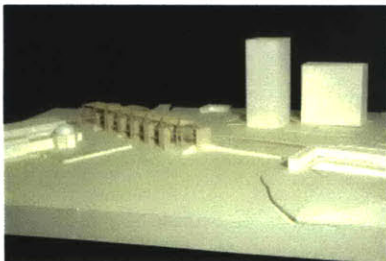
Abstract

At present, most cities confront similar issues that result from mass production, individualism, automobile-dependency and the advancement of democratic ownership. These issues have pushed our cities in a somewhat undesirable direction. Self-addressing buildings are everywhere disguised in a distorted framework of aesthetic knowledge. They are uncommunicative both to nature and their surroundings. This is the predominant feature of current cities.

Considering the aforementioned issues, this thesis proposes a building that defines an edge of architecture by the various void structures it faces. Unlike the design method based on a particular program and solid dimensions of an object, it focuses primarily on the outer forces of the site, which is called 'void structures'.

Void structures can be divided into three categories: Void structure in nature, void structure in human settlement, and the movement pattern of people. These undefined formal relationships between the void structures - the void created by the topography, human settlement, movement pattern of people and architectural elements - are the major consideration in defining architectural configuration. By relating these voids, physical and psychological boundaries are eliminated, and the architecture becomes the connector between nature and people.

Architectural investigation of this thesis is divided into four elements: First, the earth is perfected by seeking a proper foundation. Second, formation of water body is sought as a means of connection to a natural void. Third, the roof is manipulated to turn an ecological void into a spatial void to produce aesthetic pleasure. Fourth, openings are studied to strengthen the relationship between void structures.



Thesis Supervisor: William L. Porter

Title: Norman B. and Muriel Leventhal Professor of Architecture and Planning

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*note to images, all images are numbered except for original images by author

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First of all, I would like to extend my heartfelt thanks to professor William Porter for his gracious guidance and encouragement throughout the semester. Thank you Bill, whenever I had a desk-crit with you, I was enlightened by your insightful critique and suggestions.

To the school of Architecture at MIT;

It was at MIT that I learned being a decent architect was harder than becoming a great architect.

To Ann Pendleton – Jullian, for her sharp and helpful critique.

To the friends of Room 7-402, for time we spent together. “brightness-darkness-brightness” will always be remembered.

To the sisters of Berkland Baptist Church; thank you for your endless love, support, and endurance.

Especially, Mi-Kyung SMN and Shin-Jung JMN; thank you for your cheerful encouragement at the last moment with love packed in unforgettably delicious food.

To my family, parents and husband, for their indescribable support and love.

Joong Won, I still sense something in my throat, that chokes me, to make this thesis more worthwhile.



concept drawing by author

Introduction

"Molding clay into a vessel, we find the utility in its hollowness;
Cutting doors and windows for a house, we find the utility in its empty space.
Therefore the being of things is profitable, the non-being of things is serviceable.

(Tao Te Ching, Chapt. 11)

(An Investigation of INTANGIBLE CONTENT IN ARCHITECTONIC FORM, Pp 9)

Architecturally, this statement suggests that the immaterial, often overlooked, is regarded as the most useful. Because of the capability of being filled by solid, void essentially is more important.

What is the void? In a physical sense, it is a feeling of emptiness caused by the absence of people, objects, and desolation. In other words, it is the opposite meaning of a solid. Our physical world is surrounded by these two elements, solid and void. Something that is revealed could be regarded as a solid and something that would potentially help to reveal would be a void.

To recapitulate, the conception of void is difficult. As an architect, conception of space comes to our mind before the void. Space was originally regarded as innate entity as a consequence of sheltering. Yet, as an academic term it appeared first in 19th century German architectural settings as a means of aesthetical device. It was a philosophical defense for architects from the Hegelian notion of art. The term 'void' addressed here has other layers juxtaposed on top of this conception of space.



Fig.1-1 Void structure in nature



Fig.1-2 Flock of Wild Geese,
Painting on paper by Ung-No Lee

There is a difference between void and space. Space, a modern term, is an architectural invention to mean the opposite of form. However, a void is something more than space. It includes ecological aspects of nature as well as patterns of human behavior. A void is something that transforms a thing into a being. It is a spirit or a primary element that enlivens physicality. Thus, a well defined void-structure is a living relationship among a being and a thing, consequently, turning the thing into a being.

In nature, there exists a wider sense of the term. Water body, for example, can be regarded as a void. The eighteenth century French landscape architect, Jean-Marie Morel (1728-1810) once said, "Water is to the landscape as the soul is to the body." In Asian countries, for centuries, the geomancy of nature was reduced to the primary elements; water and air. Even maps for a long time were depicted by the configuration of mountains and water bodies. Such conceptualization reveals the understanding of natural law and how settings of human beings should be settled accordingly. It is within this understanding of natural void structure, ancestors believed, that one could begin to grasp the idea to link architectural voids.

People in this period of time and place believed human bodies had ecological aspects similar to those of nature. Even though bones and knuckles resembled sub-structure of the natural terrain, the flow of blood and air inside our bodies was interpreted analogous to water bodies and wind flow. What was seen was manifested; yet, people believed greater forces came from what was unseen.

Before the development of such notions, that is, regarding the unseen being more important, architecture was initiated purely out of the physical state. Yet, this understanding and adapting of the physical state into the framework of nature brought about understanding of the unrevealed.

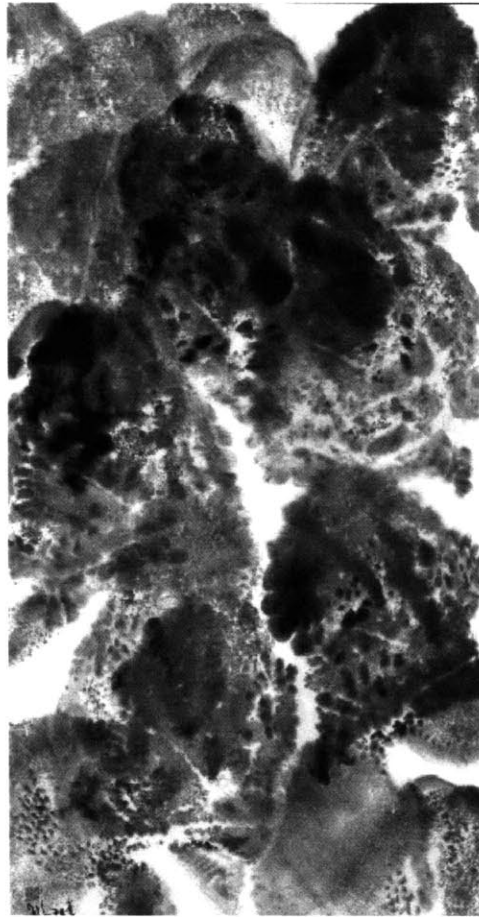


Fig.1-3 Mountain, Painting on paper by Ung-No Lee

Linking this natural void structure to an architectural void is more than mere visual connections.

As the natural void structure contains the fundamental elements of all living organism, linking that void structure means linking it properly to serve ecologically and spatially. It is to connect other innate human perceptions. For example, the sound of water and the tactile feeling of fog are as important to the body as are reflections from the serene pool that delight our sight. Setting the architectural foundation means perfecting the earth it is about to occupy. Openings – a device that controls the movement of air and sun – could be operated integrally with the formation of the foundation to perfect the flow of air inside building.

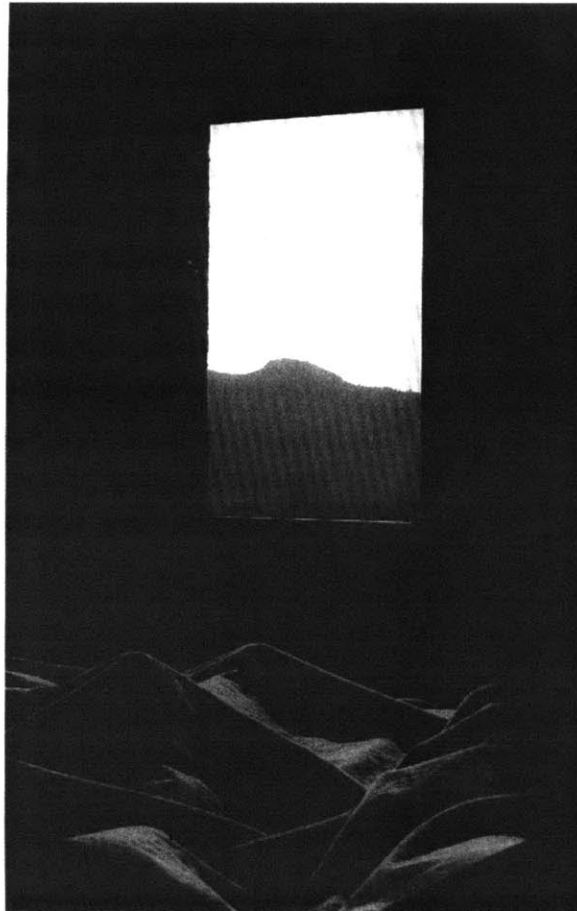


Fig.1-4 Connecting in and out

1. Void Structures in Architecture

figure and ground

Ung-No Lee's drawings indicate how a painting could be accomplished in a state of balance between the figures in motion and the left over canvas space. Eung Ro focused on the assemblage of people as a theme of drawings in his later years. He originally picked up this theme when Korea was under the military regime. At that time, college students demonstrated for the freedom of people and revival of the democratic spirit. It was the period when intellectuals struggled to obtain rightful social structure.

Ung-No's drawings, following the spirit of democratic movement, represent that voice of people. All the figures in the drawings are in motion. Each individual has different posture, yet together they constitute a structure. Moreover, that dynamic structure, when seen from distance, creates multiple readings. One might claim that they are dancing; the other might claim that they are fighting.

In Gestalt psychological terms, there is a balance between figure and ground. It is a very difficult inquiry what might have been the primary interest for him. However, for this thesis, it is the ground that brings my attention. Because I believe Ung-No intentionally created stature of a figure in such configuration to create the ground structure he wanted.

Since it was drawn calligraphically, each figure are purposefully laid out –some more blurry than others- to create overall balance.



Fig.1-5 People. Painting on paper (178 x 89cm)
by Ung-No Lee (1987)



Fig.1-6 People. Painting on paper (44 x 24cm)
by Ung-No Lee (1982)



Designing a building based on void structure of nature would be similar to this attitude. From the raw state of nature, one cognitively starts to define architectural entities to seek balance between solid and void.

Dae Dong Yeo map

When one visits traditional architectural settings of Korea, one would be perplexed by the whole different ways of seeing the world. Historically, Korea –where I am from- had a totally different conceptualization of the world from here in the US. The two main poles of socio-philosophical paradigm that guided historically are the Buddhism and Confucianism. Originally, Confucianism was a practical philosophy, it did not have a metaphysical aspects. It was the influence of the Buddhism that Confucianism began to include metaphysical and religious aspects. When they were adapted to Korea via China, there was a primary normative value that was imbedded in both of the paradigms. It was to become part of nature whatever human creation might be.

One good example that demonstrates the affinity to nature would be the Dae Dong Yeo map produce in 19C by Jung Ho Kim. Whole formation of the land is epitomized into mountains and water. In its inception, it includes Feng Shui's (movement of air and water) ecological notion inside geographical thought. Feng Shui is a theoretical framework, which in nowadays regarded as very scientific and logical, people used for their built environment. Feng Shui promised the productivity of the harvest and the welfare of the human being. It was possible because Feng Shui focused on contemporary sustainable issues.



Fig.1-7 water and mountain as elements of void structure (above)

Fig.1-8 old map of Seoul depicted by water and mountains (below)

By the Feng Shui law, human settlements are organized at the foot of encircling mountains facing south. Northern mountains protected village from cold winter wind a southern plain with the waterbody promised the production of the rice.

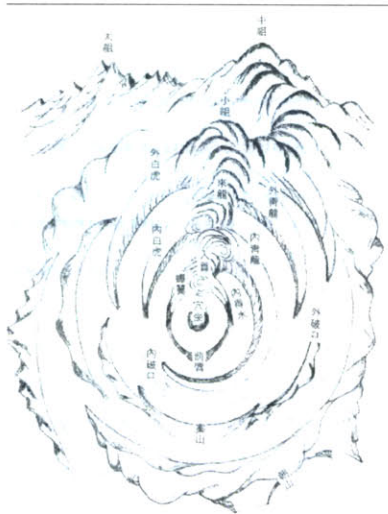


Fig.1-9 best spot for tomb from Feng Shui (right above)

Fig.1-10 the land in yang state (top)

Fig.1-11 old map of south east part of Korea made by Jung-Ho Kim (19C)(right)

Jung Ho's map is the best guide that demonstrates which place is geographically suitable for Feng shui. Seen close, all the existing towns are constructed in those spots and all the major religious monasteries are also built in well Feng Shui spots. Not only was his map useful for seeking locations of a place, but it also implied –inferring the social structure of the era- the main paradigm of that era.

More specifically speaking, similar to alternative medication, people then knew from the state of the land whether the land was in *yin* (negative) state or *yang* (positive) state. It was the equilibrium between the two that regarded the best. Anything extreme towards one of the states were regarded as dissonant. It was architects role to manage the state of the lands and other factors of nature to create the equilibrium.



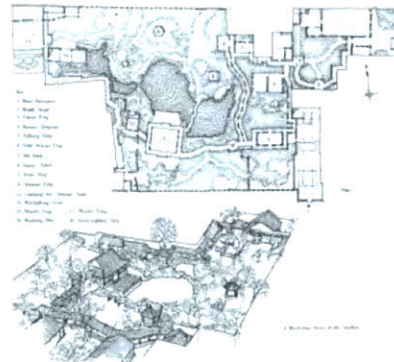
In oriental philosophy, it is the *yin* and *yang* that primary element of the nature. Among them are tree (in asians' mindset forestry and mountain was no different from trees) and water. Hence, it is no accident why for ages Asians have worshiped the mountain and water.



void structures in architecture

In China, miniaturizing of the mountain and sea (water) was thus the major interest of the landscape architecture design. Personally, traditional landscape architecture of China provided me as to how to compose void structure artificially. For example, in Suzhou, without an exception, all the gardens first focused on the configuration of the water body. Not only did the pools have many design properties, but also philosophically pools were the major *yin* state that had implicit meaning of the void. From the design point of view, landscape architects would create various necks to have more crossings and more sensational deception of sense of expansion. Sense of expansion was especially achieved by partial concealment and consequently created curiosity.

After the water body was set in place, next attention was paid at the rockeries. Formation of the rockeries provided overall sense of enclosing to the site. Sensation of human beings depended heavily on movement and the visibility of people. Hence, sometimes these artificial mountains intentionally detoured the navigation of the path and other times they were the visual focal points to serve sense of orientation.



What I believe is the best example for architecture defined by void structure is a pavilion. Pavilions are mostly located where there is a great surrounding landscape. In Asian countries, pavilions are positioned at binary conditions; i.e. where counter positions provide spectacular views to one and another. In most cases, pavilions function as a crown of a place (usually at the peak of a cliff).

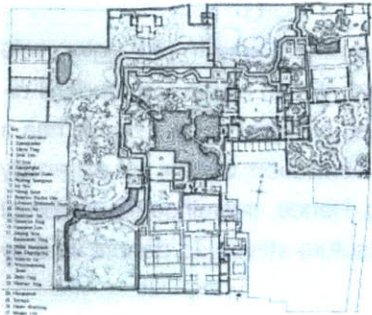
Fig.1-12 Site Plan of Yi Yuan in Suzhou
(Garden of Contentment)



Fig.1-13 townscape of Fujian, China
(left above)

Fig 1-14 Site Plan of Liu Yuan
(Lingering Garden)(left below)

Fig 1-15 Baek Wha pavilion in Korea
(right below)



Tectonically speaking, pavilions are nothing more than a Laugierian model of a primitive house. It's a roof with a wooden decking. There is no latticed fenestrations, only the floor decking and hovering roof that reaches out to create thick edge. This is purely what I believe a void-defined architecture is. Here architecture performs as a continuation of nature. It perfects the nature, and conversely, nature perfects the architecture. This notion is perhaps the reason why landscape architecture of China and traditional dwelling form of Korea are full of pavilions. In case of China, pavilions are intriguingly matrix-ed by bridges and walkways to perfect its world.

Almost without an exception when one visits architectural sites built in these times, one perceives strong negative space in the center. This void center space, a courtyard, performs as a generator to connect inhabitable space to outside nature. Moreover, due to the yearly temperature shifts, spaces are divided into winter and summer zones. Summer zones are usually made out of wooden flooring and face the center space. In addition to this covered summer zone, there is a threshold that aligns with the center void space and summer zoned. These three separate voids together with the pitched roof sloping towards the center constitute a void structure within architectural setting.

When one experiences this kind of architecture, one will perceive that there are only three architectural elements that are responding to the larger natural setting. The two most important elements are the variation in earthwork and the enclosing roof structure. These two are the major factors that decide the big moves. The third element would be the fenestration.





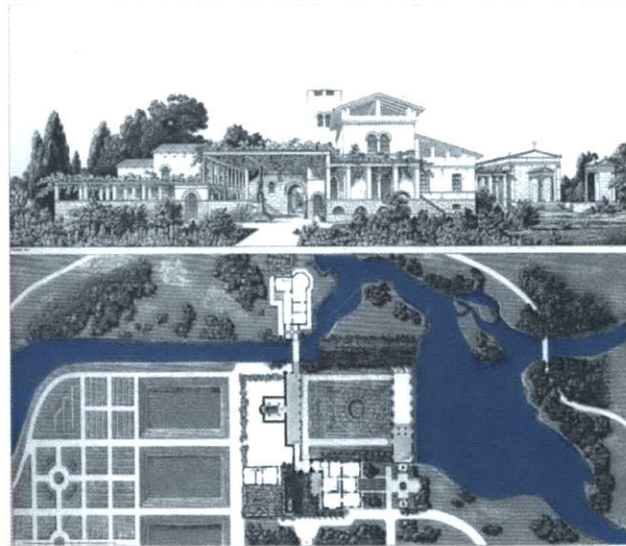
Fig.1-16 Aerial photograph showing city fabric of Kerman (in Iran)

void structure in Islamic city

Other than traditional architecture from where I am from and China, I found void structure in Islamic cityscape. My interest in Islamic architecture initiated from my interest in cross-cultural artifacts. Especially occidental vs. oriental clashing of cultures interested me. Classic Islamic architecture during Mamluk and Fatimid era in Egypt one can easily grasp what architects then strived for.

Scarcity of water and extreme heat cultivated their physicality and concept of paradise into greenery where there was plenty of water and shade. In reality, they have invented several architectural devices to overcome such severe environment. Wind catcher, screen windows, courtyards, wells and gardens were the devices invented to cope with the climate. In this part of the region void structure was invented to protect from sun.

Hence seen from above, what's perceived is the struggling void structure against piercing heat. It's an organic ecological organism represented in this part of region. Every house has a courtyard to promote passive ventilation. Streets are extremely narrow to have more shading. Hence, overall configuration of the town from above is architecture striving to denote void by its existence.



Schinkel's later works

Another architect that strove to create void structure through architecture would be Karl Friedrich Schinkel. Even though he lived in a different time and space zone, his architecture deals architecture pertaining to void structure. Schinkel's earlier ideas were more of tests of Fichtian ideas. However, his later projects, as it began to involve in more of landscape issues and Humbolts discourses, his architectural setting depended heavily on landscapes. More often than not, architecture performed as a tool to create better natural landscape.

Fig.1-17 Schinkel, Grobe Neugierde (far left)

Fig.1-18, 19 Schinkel, Court Gardener's House (left)

2. Site Information

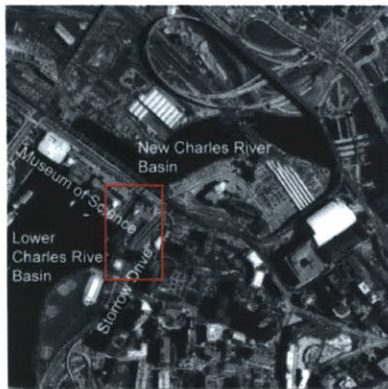
Historical Analysis

Charles River Basin and Esplanade

In 1893, when the Metropolitan Park System was created, the last nine miles of the Charles River (from Watertown to Boston Harbor) was still a tidal estuary. However, because of the pollution of the estuary from industry and sewage from the surrounding communities, a plan was formed to dam the river's mouth, creating the fresh water Charles River Basin. In 1910, construction of the Charles River Dam was completed, and shortly after the newly landscaped banks of the river became known as the Charles River Esplanade.

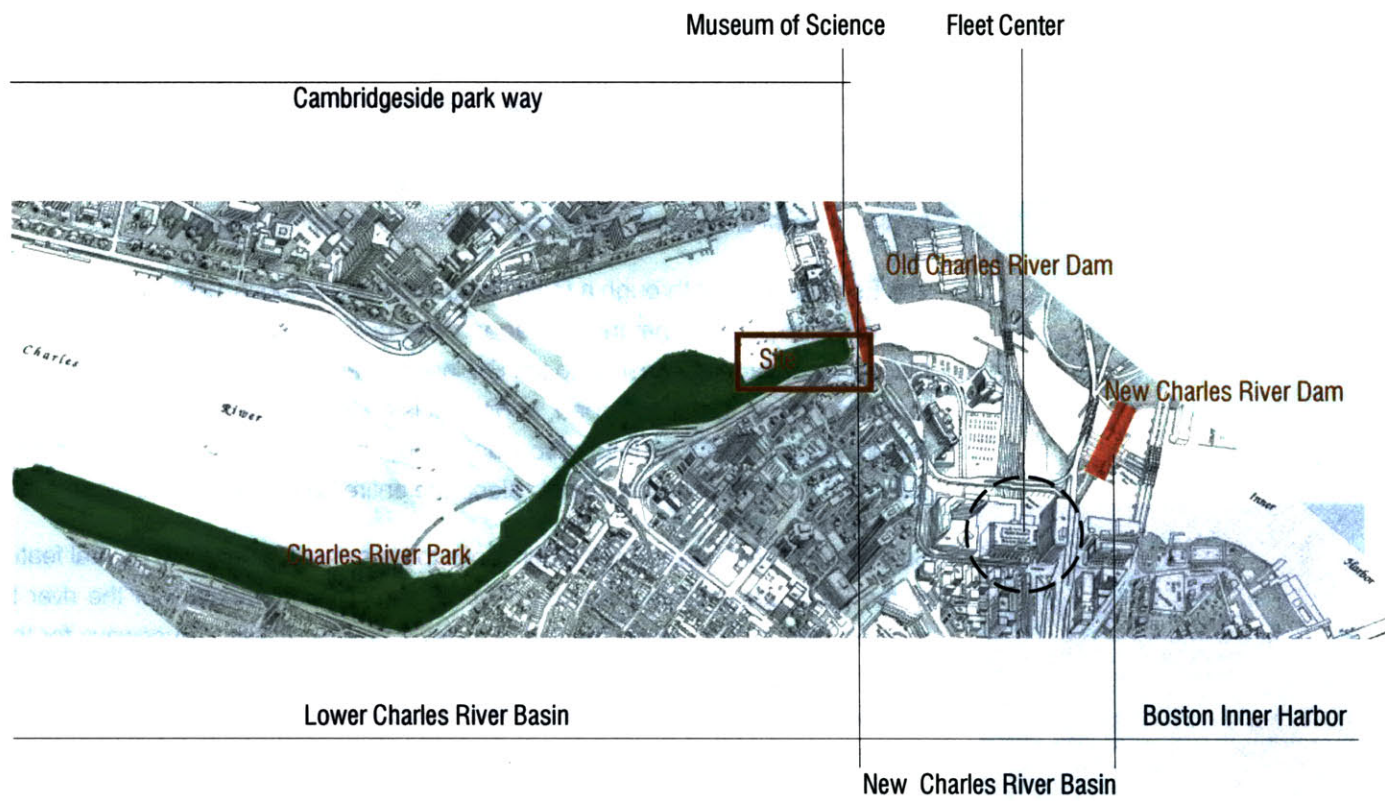
The Esplanade went through a major expansion beginning in 1928, widening and lengthening the parkland. It was during this expansion that the first lagoon was built, as well as the Music Oval, where a temporary band shell was placed. Another major change to the Esplanade began in 1949, with the construction of Storrow Drive. To make up for parkland lost to the new road, additional islands were built along the Esplanade. In the 1960's, the Esplanade was linked to Herter Park in Brighton, and other upstream parks, with the construction of the Dr. Paul Dudley White Bike path. This 18-mile path travels along the entire basin on both the North and South sides of the river.

Fig.2-1 Aerial photo

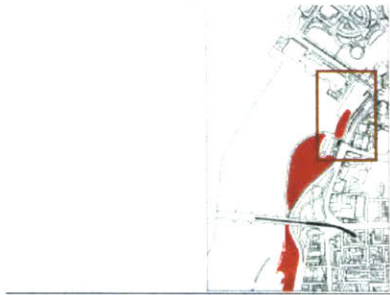


Surprisingly, the Charles River Basin looks to be carefully preserved natural feature of Boston. In fact, the margins of the Basin are entirely **man-made landscape**. The degradation of the river began with the construction of a milldam built in 1821 along the line of today's Beacon Street. Causeways for the Worcester and Providence railroads were constructed fourteen years later, further impeding the sluggish, increasingly fouled streams that flowed into the bay, and the mills failed. In 1857, the Commonwealth reclaimed its title to the polluted tidelands and converted the bay into real estate by filling it with gravel, brought by trains running around the clock from Needham to Boston for more than twenty-five years. The sanitary hazard created by the mills and railroads in the Back Bay was resolved. For a time, at least by state-funded intervention that created a whole new quadrant of the city.

(<http://www.state.ma.us/mdc/charlesr.htm>)



Axono map around the site



Charles River Park

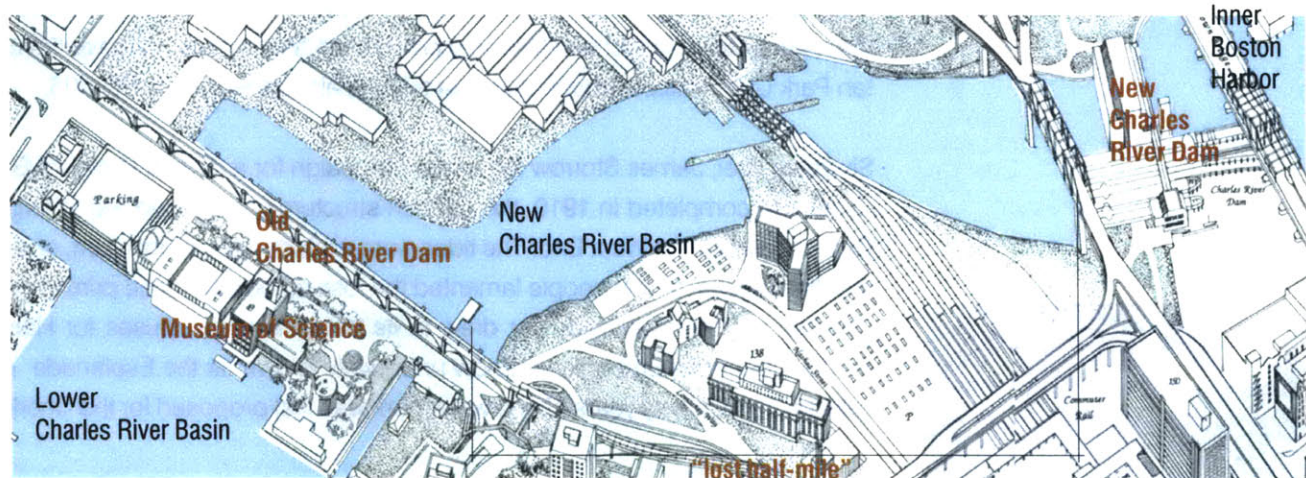
In 1893 the Boston Metropolitan Park Commission published its first report, written by Sylvester Baxter, the commission's secretary, and Charles Eliot, its landscape architect. They proposed a park system that would preserve the "rock hills, the stream banks, and the bay and the sea shores" of greater Boston. Once in the public domain, these natural features of the region would then establish the framework for urban development, not the haphazard and unplanned assemblage of streets, lots, railroads, and streetcar lines.

The first reservations were natural areas that represented as "unique and characteristic" New England scenery. The rivers and bays, with their shores reclaimed, would offer, "Permanently open spaces provided by nature with cost." In spite of the foul condition of the Basin, Eliot was certain that the Charles would become the central reservation of the metropolitan district and the most celebrated "Water Park" in the entire country. The Cambridge and Metropolitan Park Commissions made their first takings along the river in 1894-95.

Six years later, James Storrow led a new campaign for a dam at Craigie's Bridge. Finally approved by the General Court and completed in 1910, the earthen structure was graced with a large park on its surface connecting East Cambridge and the West End. The tides were excluded above the dam, and the now-stable water level covered the mudflats forever. A few people lamented the loss of the last "once primitive and beautiful salt meadows" along the Charles, but the stabilized river drew to its banks new campuses for Harvard, MIT, and Boston University. The Storrow Memorial Embankment now universally known as the Esplanade designed by Arthur Shurcliff and dedicated in 1936, ninety years after a water park was first proposed for the Charles. (<http://www.state.ma.us/mdc/losthalf.htm>)



Park way of the Charles River Park



view of the old dam (above)
Axono map around the site (below)



Charles River Dam

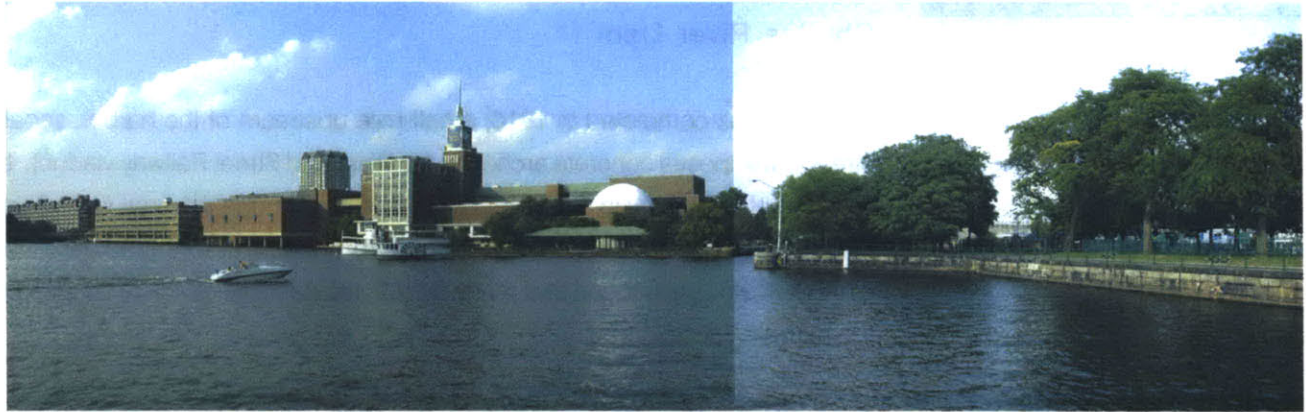
The dam was completed in 1910, a half-mile upstream of the harbor, separated from the railroad bridges downstream. It imposes concrete arches of the West End Street Railway viaduct. It was built with the purpose of creating a fresh water river basin and riverfront in Boston. Though the area was changing dramatically in several decades, the mouth of the river was not accessible to the public. In a landmark study published in 1959, the MIT urban planner Kevin Lynch found that many Boston residents were unable to explain how the Charles was connected with the harbor.

A new Charles River Dam was approved in 1962, with the intention of connecting the “lost half-mile” of the river with the Metropolitan Park System. The first parklands in the New Basin were acquired as part of the dam construction, completed in 1978. In the late 1980s the MDC acquired almost twenty acres in Cambridge, Charlestown, and Boston; construction on the first park in the New Basin began in 1995. Now, the esplanades, created more than a hundred years ago, are being connected with the harbor for the first time as a part of the central artery project of Boston. (<http://www.state.ma.us/mdc/losthalf.htm>)



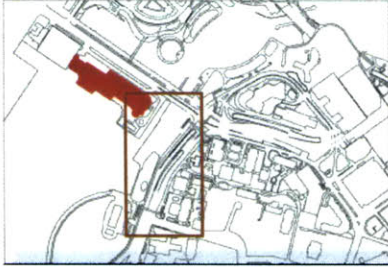
Though the role of the earlier dam is completely replaced by the new dam, it still has its importance as the terminating point of 17 miles linear park (from Museum of Science to Watertown square) and provides the great scenery toward Cambridge and Boston along the water edge.

Fig. 2-2 Current view of basin and new dam from Southeast



view of the Museum of Science from
the Lower Basin (above)
drive way of the Museum of Science
(below)





Museum of Science

The Museum of Science founded by six men interested in natural history in 1830. They first organized the Boston Society of Natural History and displayed the collections in temporary facilities. In 1864, they opened the New England Museum of Natural History at the corner of Berkeley and Boylston Streets in Boston's Back Bay. It was the former building of the Museum of Science.

After World War II, the Society sold the Berkeley Street building, changed its name to the Boston Museum of Science and negotiated with the Metropolitan District Commission a 99-year lease for the land located in the Charles River Basin, which is now known as Science Park. In 1948, the Museum designed and built the first traveling planetarium in New England to promote the development of a new Museum building. The cornerstone for the new Museum was laid at Science Park a year later, and a temporary building was built to house the Museum's collections and staff.

In 1951, the first wing of the new Museum, which was already larger than entire exhibits area of the old Berkeley building, was completed. During the next two decades, the Museum greatly expanded its exhibits and facilities. The Charles Hayden Planetarium, the Museum's west wing and Thomson Theater of Electricity opened consecutively in 1958, 1970 and 1980.

After 1980, the Museum added two more building part, the Hall Wing housing for temporary exhibits and the Mugar Omni Theater. With all of these facilities, the Museum has remained on the cutting edge of science education by developing innovative and interactive exhibits and programs. It also has been providing fun for the communities and the tourists from all over the country. According to the statistics, more than 1.6 million people visit the Museum per a year and over 4000 people weekdays and weekends. (http://www.mos.org/info/short_history.html)



view of the site (above)
site entrance from park side (below)

Site Analysis

In analyzing the site, there could be various different ways to emphasize site potentials. One could respond to different forces, depending on one's focus. For instance, one could analyze in an environmentally responsive way, one could focus on the sensations of human body in describing the site condition, or one could pay less attention to the site condition and rely more on the compositional theory or innovative ideas.

In this thesis, three kinds of void structures became the core of the attention that I described in previous chapter. The primary void structure of nature, within the designated site of this thesis, was the Charles River. Extending the Charles River into the site and let it be part of architecture was one of the goals. Another primary consideration was the human movement. Every hour, Charles River park contains joggers and rovers. These people constantly move along the bank. I wanted my site to embrace that notion of movement architecturally. The last primary consideration was the Museum of Science next to the site. The existence of the museum was important because it performed as an edge of the larger basin. Moreover, tremendous amount of people daily come to visit and enjoy the museum. Human involvement, in my view, was a dynamic state of void structure.

Program-wise, there had been a discussion with the advisor. I chose library because of the ritualistic aspect it had. Lewis Mumford once said greatest function of the city is its capacity to store knowledge. Personally, I thought this notion of storage and its function of enlightenment perfectly matched the theme of this thesis.

Characteristics

This site is located at the crossing point of various traffics. First, it is a **terminating point** of Charles River Park, second, it used to be **intersection** between Charles River and Boston Harbor. Third, it is a **bridging point** of the residents from Boston and Cambridge. Currently, this site is isolated by the automobile driveways and canal. Hence, the aim of this project is to revive and celebrate what had been isolated by automotive driveways.



Fig.2-3 Aerial view of Charles River Basin

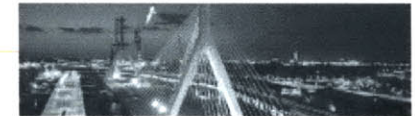


Fig.2-4 Leonard P. Zakim Bunker Hill Bridge

Museum of Science

T Station

Canal (old lock) connecting the lower basin with the new basin

Pedestrian overpass bridges

Charles River

The major void structure in this site is Charles River. It is a natural void constructed by the formation of the geographical landscape and water body.

The site provides three different views towards the Charles River. Depending on the position, the site provides different characteristics. First, towards the Cambridge side, sense of expansion is achieved by the water body. Ironically, when one is exposed to such vastness of natural landscape, one feels the sense of most private. Second, long and narrow canal presents its uniqueness, where one can feel the contraction and compactness. It serves as a joint between the museum and the site. Third, the view of the museum. It is not really a void structure, per se, however, the figurative feature of the Museum of Science could be used as borrowed landscape and perform as visual delight. Here, the existence of solid demands corresponding void.

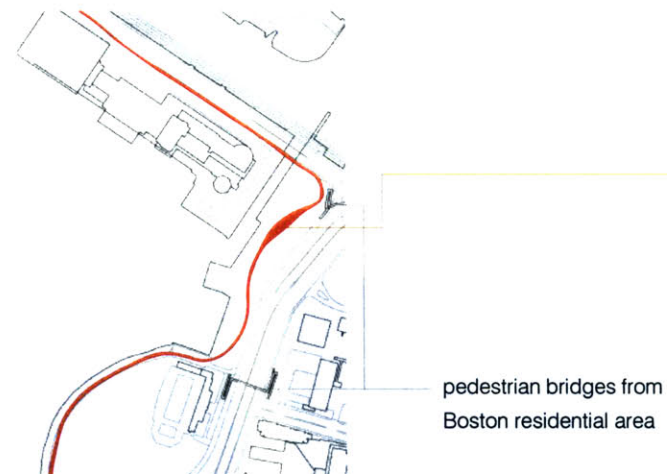
Three different views
towards the river



Spirit of activities

Charles River Park is mainly occupied by joggers and strollers. This site, functioning as multiple crossings, brings about various happenings and activities.

This place can be named in three different ways. First, it is a terminating point for joggers running along the park. They either end the jogging at this point or turn around to continue the journey. Second, it is a transiting point for joggers from the Cambridge Residential area. From this point, they join into the new surroundings. Third, it is a bridging point for the Boston residents across the overpass pedestrian bridges. Because the Charles River Park is separated by the Storrow Drive, the pedestrian bridge is the only access from the Boston residential area, therefore, the site becomes a starting gate. As shown in diagram 1, the site becomes packed of most times. In order to maintain the spirit, the initiation point had to be open space.



CROSSINGs

- : Three state of affairs are overlapped in this place
- Terminating point for joggers
- Bridging point for the Boston residents
- Transiting point for Cambridge dwellers

site diagram 1

Topography

As mentioned earlier, intentional earth work is one of the most important actions towards good void structure. Planar and sectional correspondence to nature somewhat delineates the foot of architecture.

Change of the height in land is one of the essential elements that give a void a state of living. All sorts of movement enlivened by slight changes of earth. For instance, human sensation easily gets dramatized by small changes, such as different texture and height of the land.

This site doesn't noticeably vary in elevation. It turns lower towards the edge of the water, higher towards the old dam and the edge of streets. Exaggeration of the contour would inform that the place is going to be end to the joggers' sense of body.

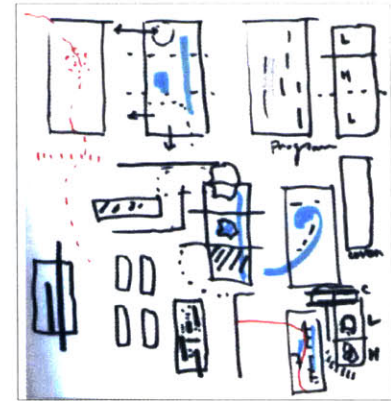
In the middle of the road, existing underground driveway makes a terrible noise around the site. From the beginning, I hoped contour could also mask the noise.

Current topographical condition

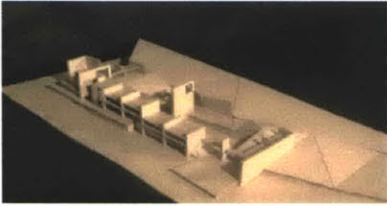


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3. Design Development



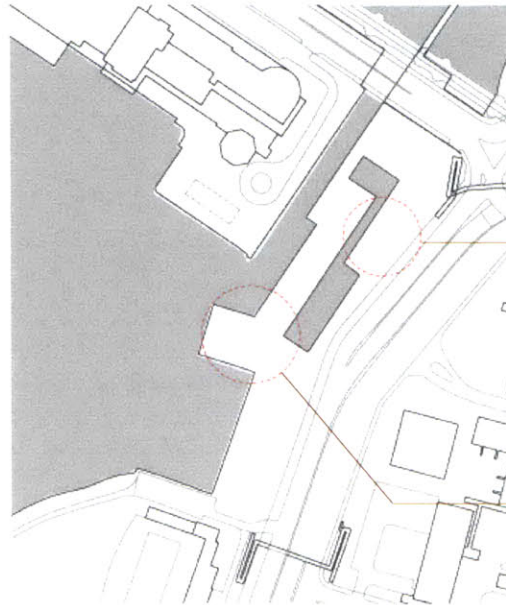
concept sketches



First iteration

Perfecting Foundation

: Placement of water body and change of contour



Water body

The major void structure in this site is Charles River. It is a natural void constructed by the formation of the geographical landscape. Hence, this project constitutes water body as an inner void structure.

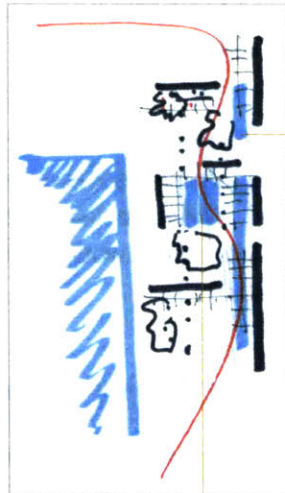
COMMUNAL space

: Enclosed by water body, higher land, and building.
Enclosed space becomes communal space because its compactness invigorates frictional intimacy among people.

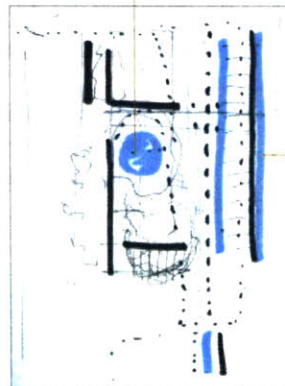
PERSONAL space

: Facing larger void
When exposed to the vastness of natural landscape, space become most private

Diagram 2

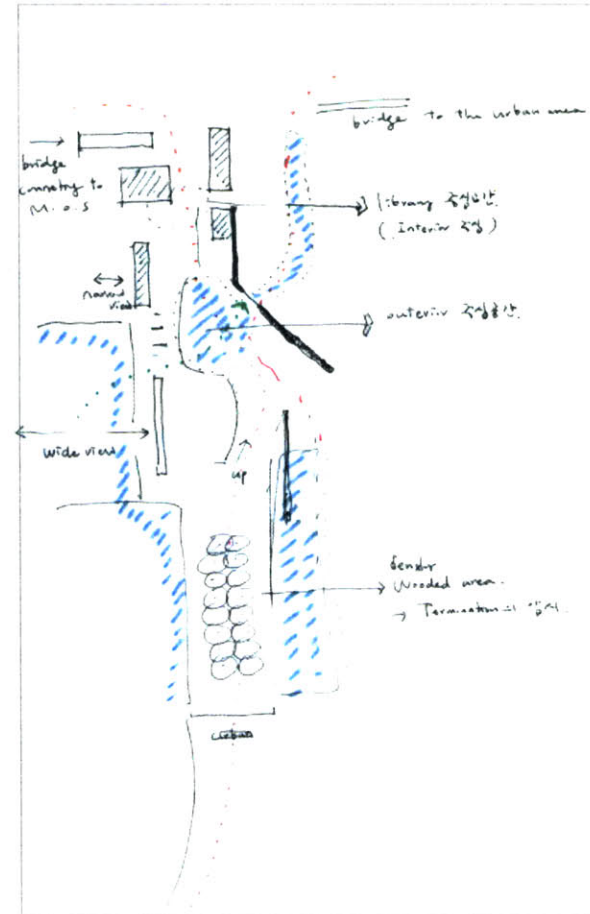


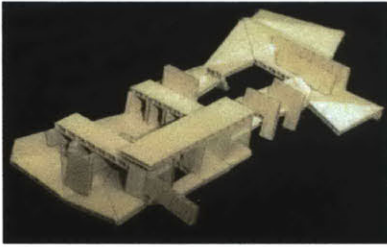
placing linear water body along the edge of the site to block noise coming out of the tunnel and road. It is a way to mask sound without disturbing the view towards the river. By putting the narrow and linear water body, the depth of field could be achieved.



the placement of water body in the center area provides communal space for both library users inside and park users outside. It becomes a center of gravity in and out of the building.

Initial sketches





Contour study

: Initial response to the aforementioned issues pertaining to the site

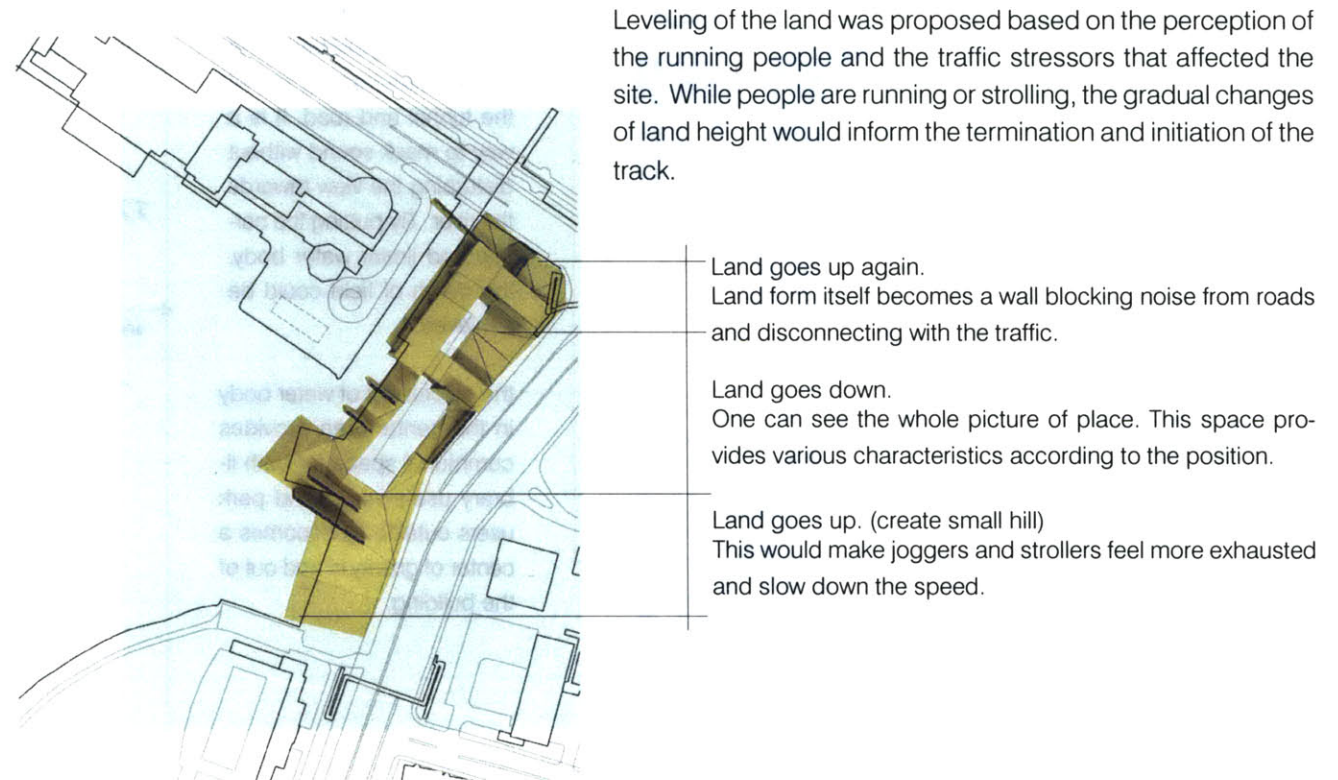


Diagram 3

Configuration of Roof

: Formation of the land (contour) and the configuration of the roof are the major elements that characterize the quality of void structure at a larger scale.

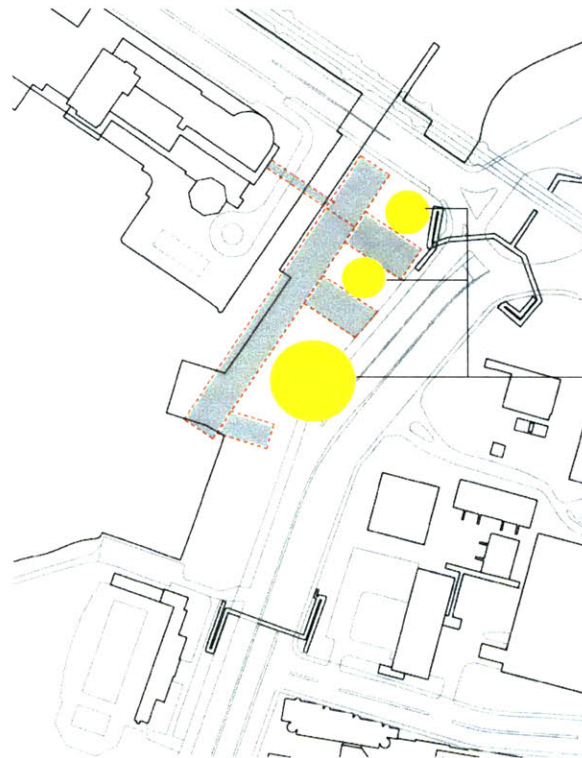
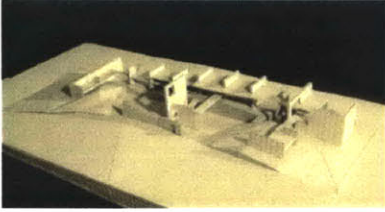


Diagram 4

Roof-wise, it was developed to respond to the scale of the void structure.

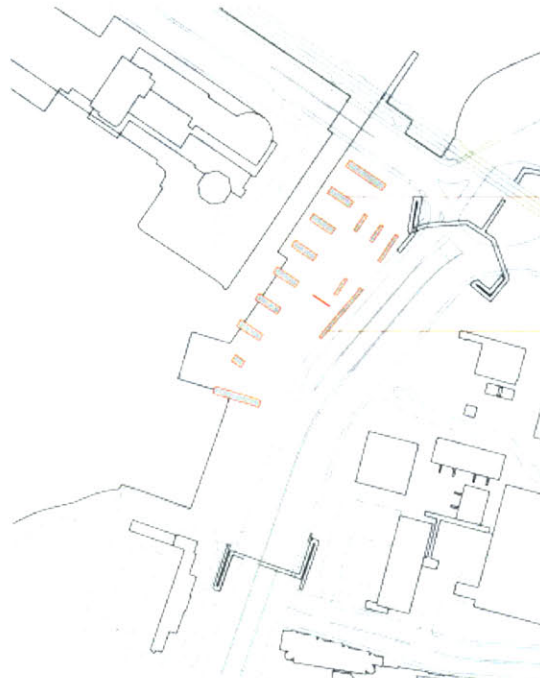
Museum of Science's side is the larger void structure, Charles river, so each roof had to be read collectively from a distance. On the other hand, Storrow Drive's Side is responding to the residential area on the other side of the highway. Hence, articulated roof didn't matter.

the formation of roof create smaller void inside of the site, responding to the streetscape. From the above, it corresponds to the void structure of built environment.



Structural Stacks

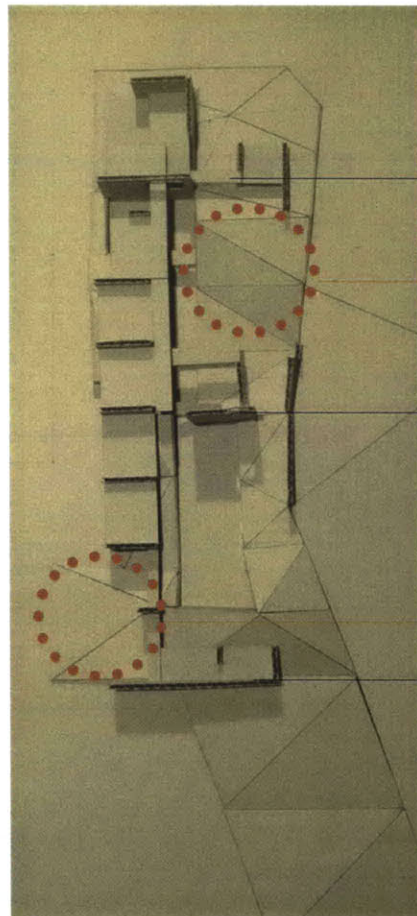
:Library is a storage for knowledge. It is a place where one takes out a book from the stacks and reads. In deciding initial gestures to the site, the program itself was not the primary consideration. However, from the beginning, the stack wall was suggested as a major structural wall to give an order to the overall site, in contrast to the irregular height of the earth.



Walls are perpendicular placed so that they could embrace the larger void structure to the inner part of the site.

Walls are placed parallel to the street so that they could exclude the noise from the tunnel and street

Diagram 5



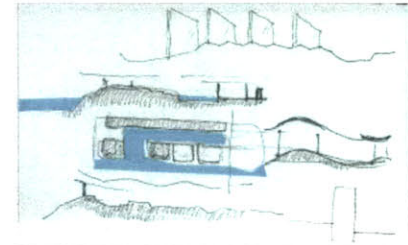
gate towards the center piazza from the museum

second piazza
: collective space for both library and park users

Central wall that contains time and light

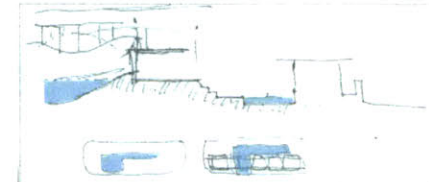
first piazza
: private space for meditation and rest

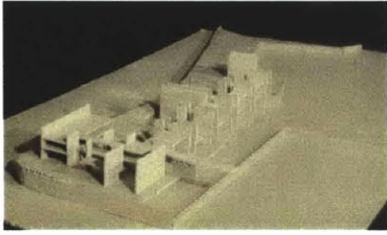
gate wall welcoming joggers from the park side



sketch showing design development of stack wall, contour and roof

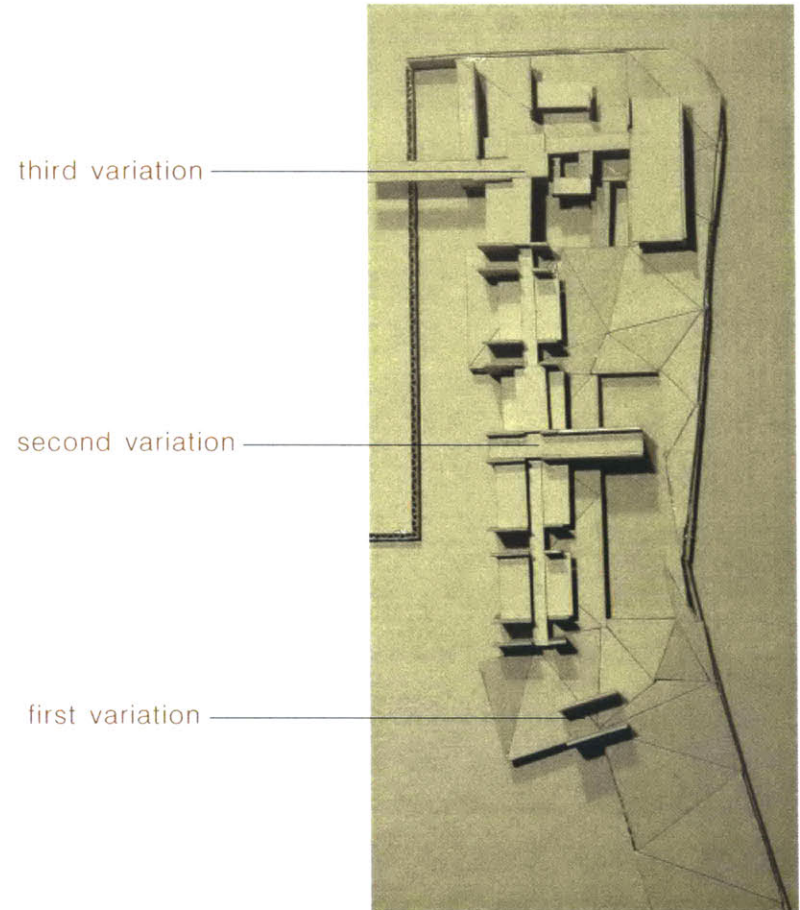
water body and building layout development





Second iteration

At this stage, the structural stack wall was more developed as stack areas. The program started to fit into the building layout and gave influences to one and another. The formation of the earth was tied together by the order of stack zones. The order of the stack zones broke down to three points responding to the different surroundings. First part was the bottom stack area facing to the Charles River Park. The orientation of the wall rotated to fully face to the park, welcoming the joggers and strollers. Second breakdown happened at the middle part dividing the central water body and the open space into two. The protruded stack zone functioned as an entrance towards the second plaza, which in my mind is the center of the gravity. The last part was the most upper part of the library, where the bridge from the Museum of Science located. The bridge protruded out and terminated as a block.

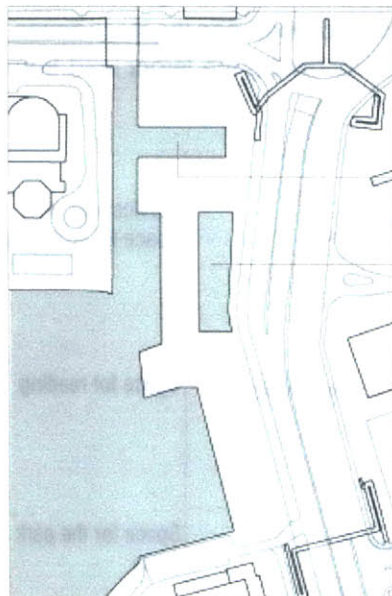


Contour / Water body as inner void

Compare to the previous stage, the change of contour height became more moderate. However, human body would still perceive the difference. The first plaza, private open space facing the larger void stood as the highest point to maximize the openness towards the big water body. The second plaza, collective space positioned as the lowest point to create more closed atmosphere.

The central water body, which had been one linear body in the beginning, was divided into two, making their characteristics more distinctive.

The water body next to the canal made terminating gesture. The other water body inside the site became inner void. This water body as inner void made relation with the street and create a depth of the field. The building between the large void and inner void became an interdivisional land which interrelates and connects them.



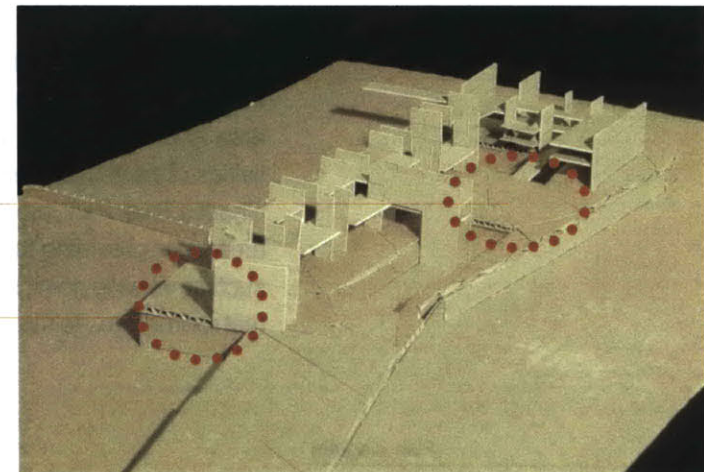
water body as continuation and termination of larger void

water body as inner void

second plaza (collective open space)

first plaza (private open space)

Diagram 6



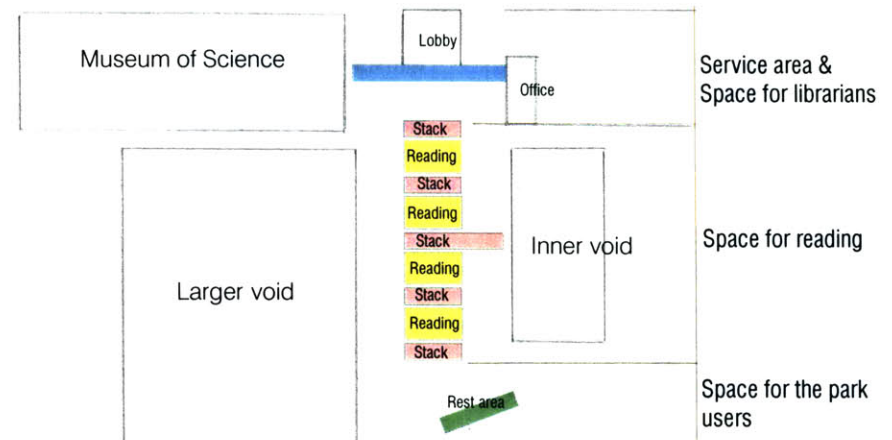
Program

As a library, this building is largely divided into three parts.

First part is an area before the control point, such as lobby, display area, retails, office for librarians etc. In this project, this area is placed in the upper part, which is facing the old Charles River Dam across the O'Brien highway. Since this area is next to the heavy traffic and noisy road, opaque exterior finish was suggested. The lobby and display area is open to the sky and water body.

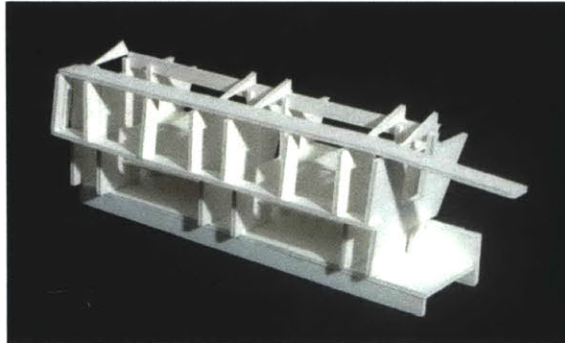
After passing the control point, there is reading and stack zones. As suggested from the beginning, stack areas themselves are closed rooms serving as structural elements. Reading space are placed inbetween the stack zones. In contrast to the stack rooms, the reading zones are very open to the outside, containing the larger void from outside. It performs as a filter or threshold.

Third part is functionally separated from other parts of the library. This area is mostly related with the activities of park users, extending the Charles River Park into the site. This area is for providing the rest areas, such as viewing point, snack corner, rest rooms, etc., to the visitors.



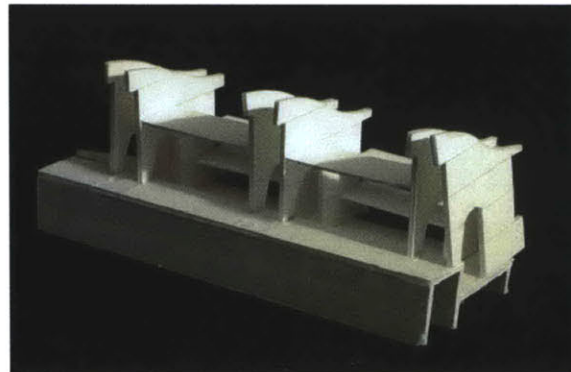
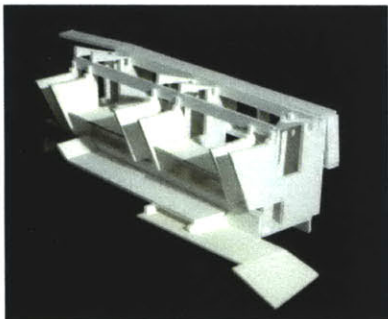
Plan diagram

Roof / Unit study



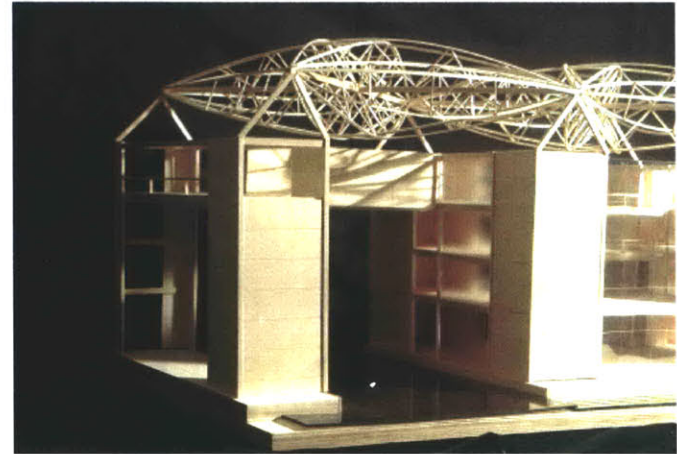
Kanian concept of integration of service area came to my mind as I tried to tie program, structure, and HVAC. I wanted stack zones to become focused points of contacts. This would allow actual left-over rooms to perform intermediate void that communicate with natural void and artificial void (which I designed).

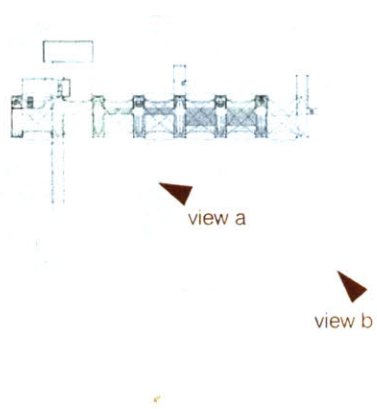
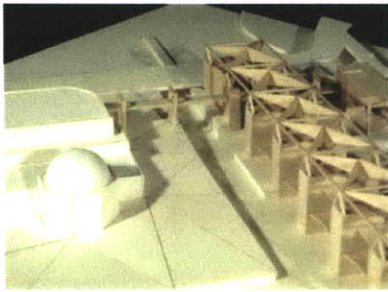
These models show that stage of endeavor. While I was designing these models, edge condition and roof configuration was also at the back of my thought.



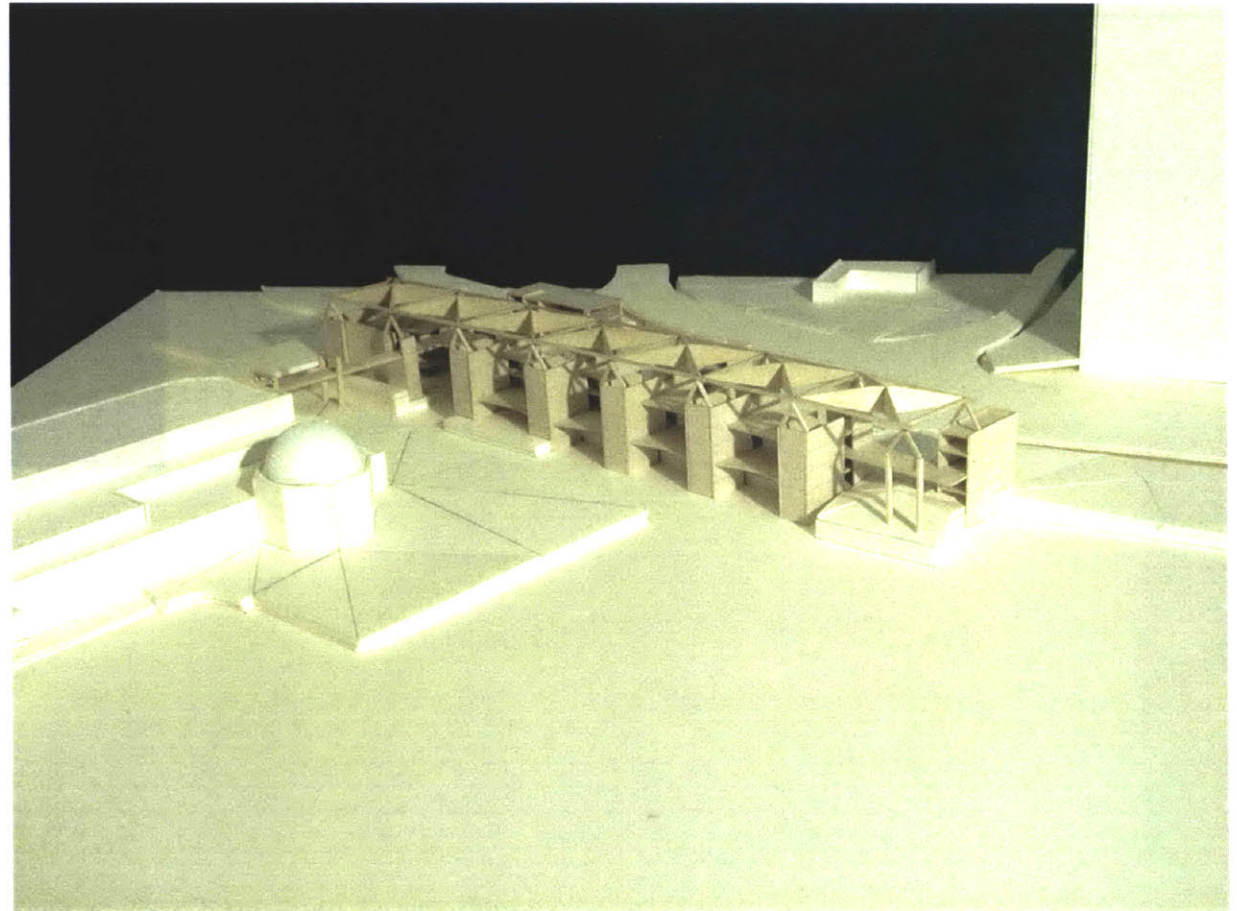
unit study models

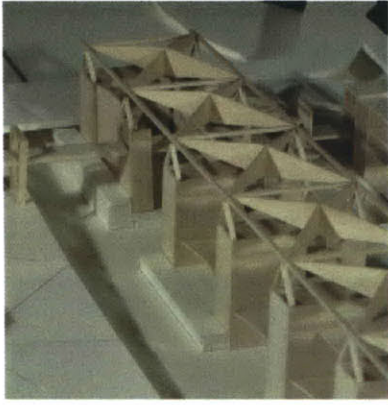
4. Final Design



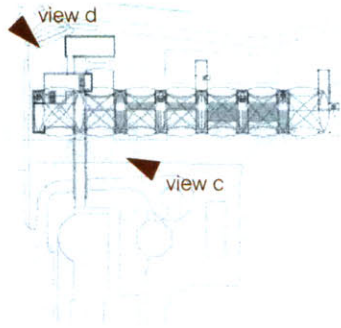


picture of view a (left)
picture of view b (right)



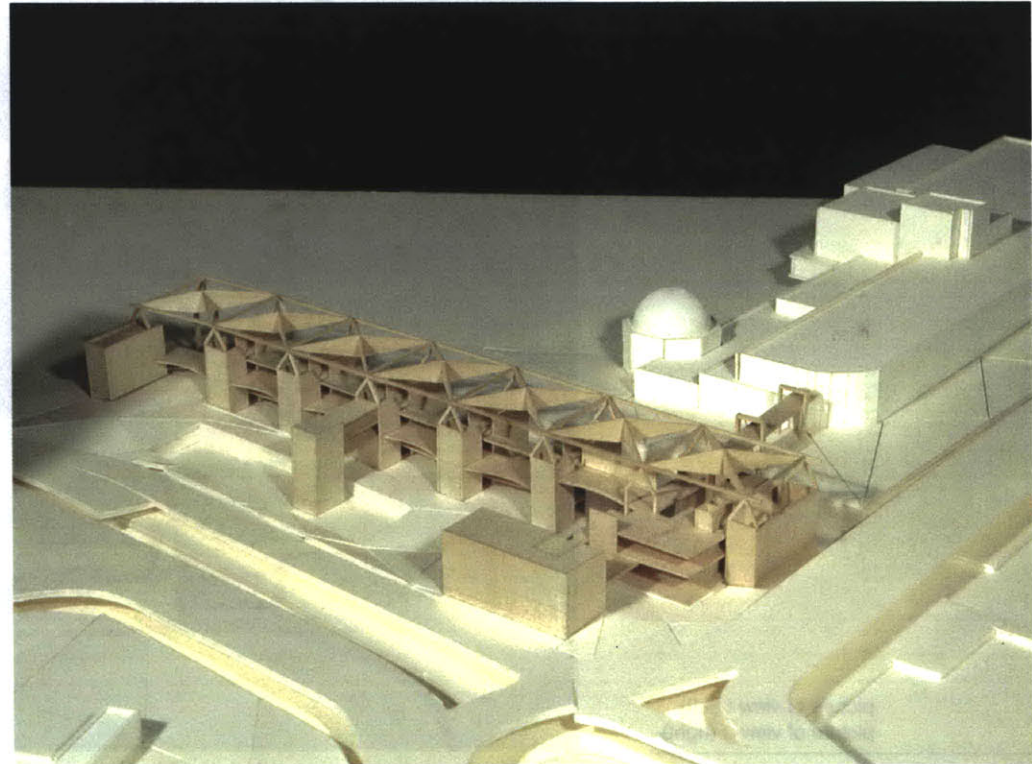
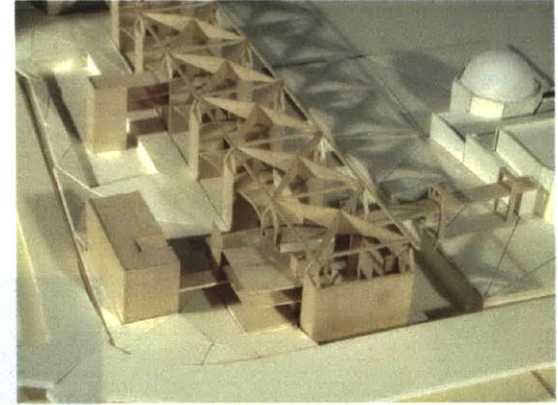


view e

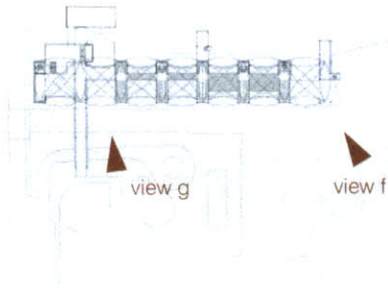
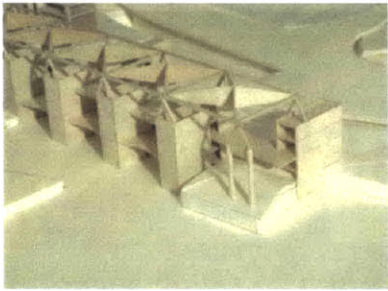


view d

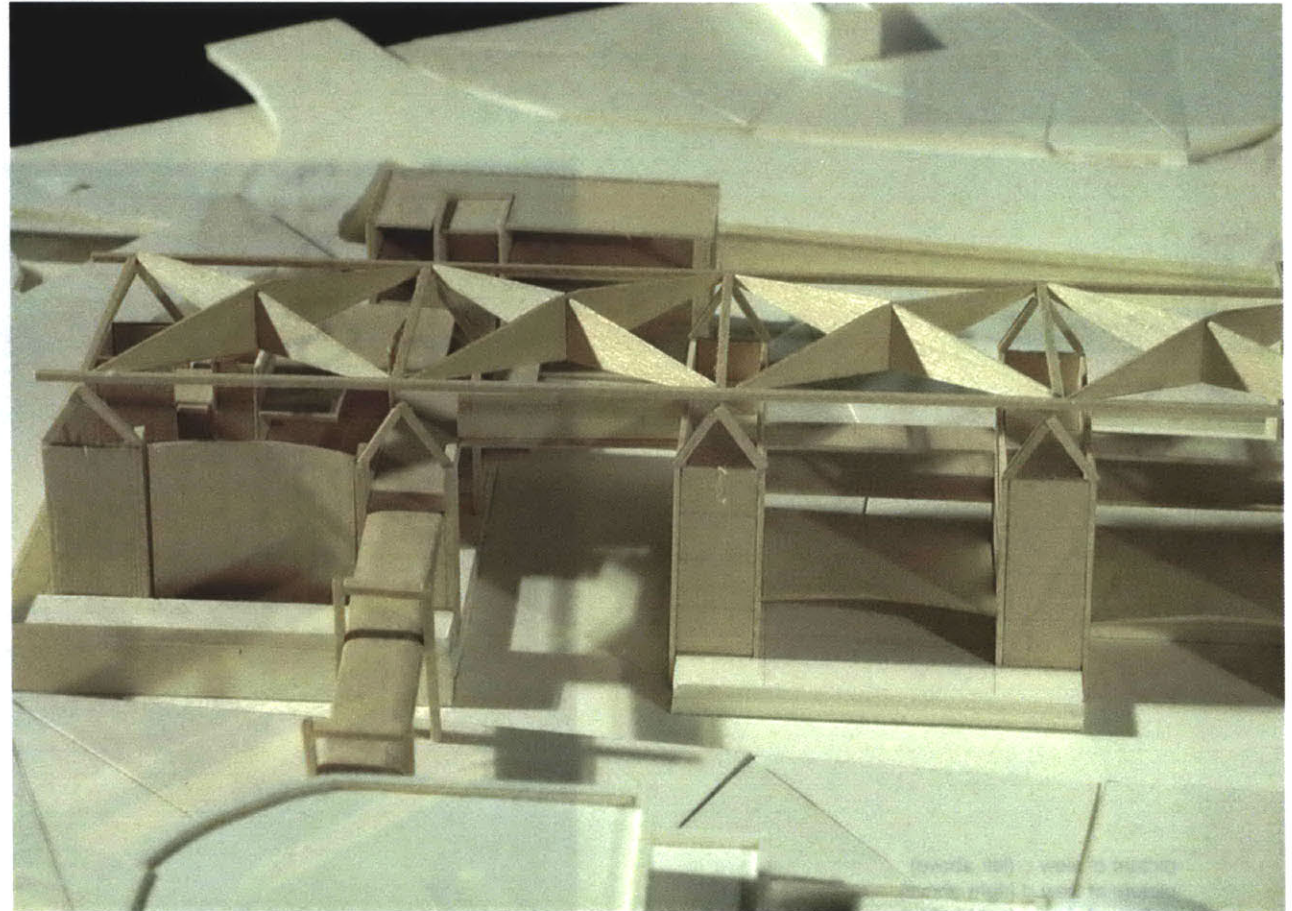
view c

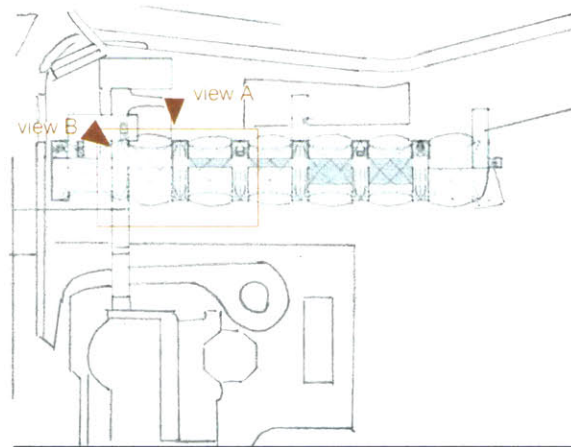


picture of view c (left above)
picture of view d (right above)
picture of view e (right below)

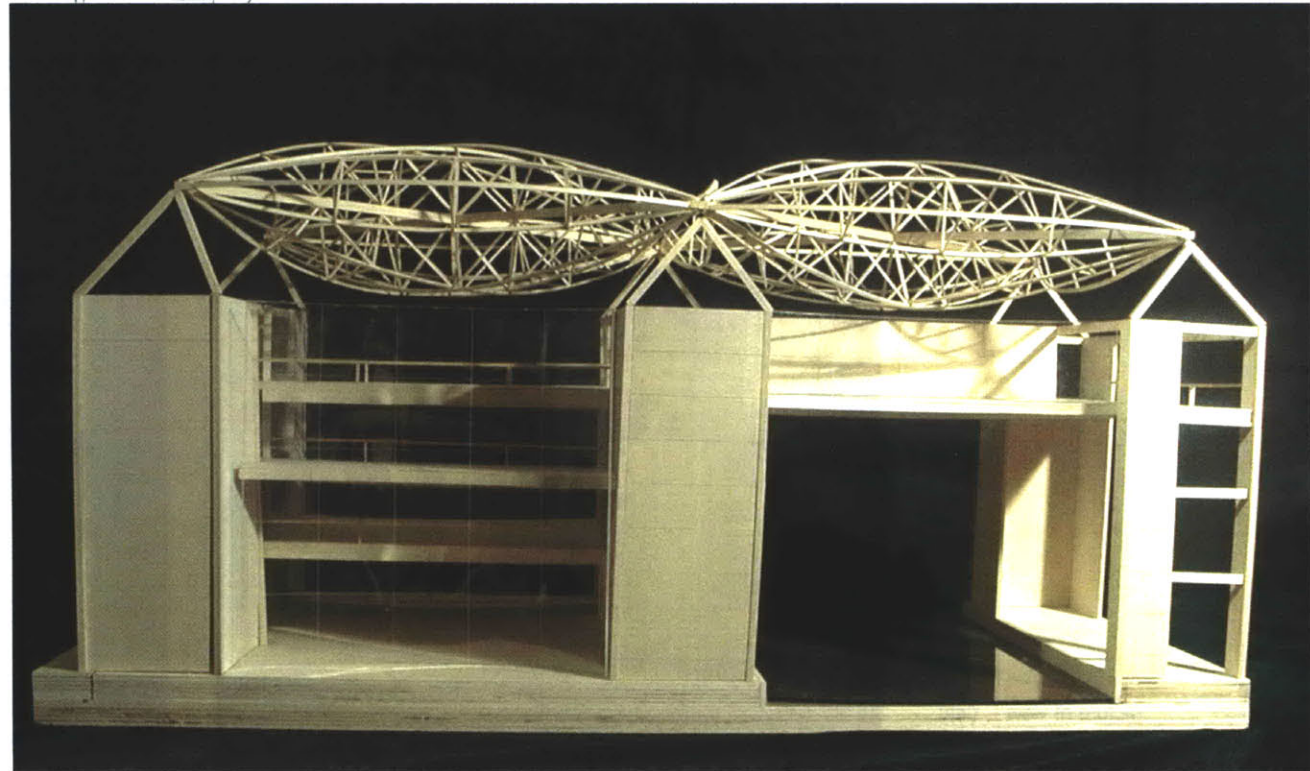


picture of view f (left)
picture of view g (right)

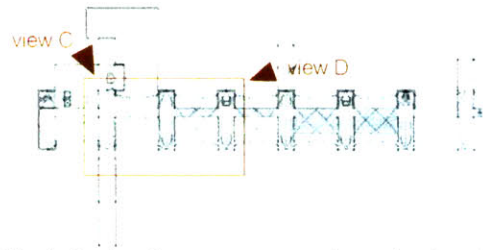




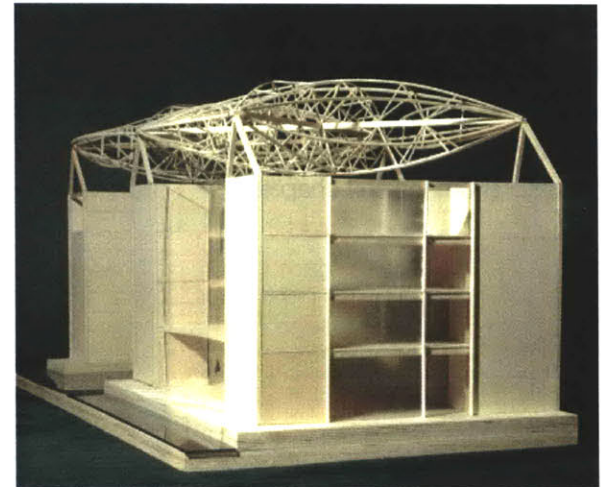
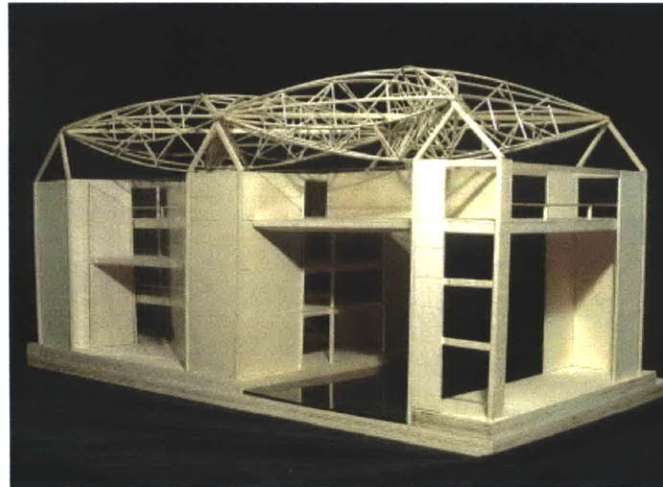
.....What I believe is the best example for architecture defined by void structure is a pavilion. Pavilions are mostly located where there is a great surrounding landscape. In Asian countries, pavilions are positioned at binary conditions; i.e. where counter positions provide spectacular views to one and another. In most cases, pavilions function as a crown of a place.....(from the first chapter)



picture of view A (below)
picture of view B (above)



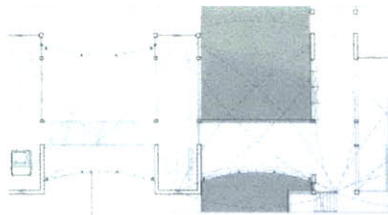
Final design is a representation of what I have struggled to achieve within the given time. It is not elaborately constructed as a coherent argument, but for long, I have struggled with my advisor as what the formation of the roof wanted to be. I didn't want any structural supports to obstruct the reading space. Since I considered reading space as interior void structure, I wanted it to be permeable. Hence, through various iterations, pillow shape was devised to accomplish a thick zone in proportion to the soild stack zone and create monumental image. Towards the final presentation, anything subtle was eliminated to more emphasize on the shape of roof itself. Curved glazing wall inbetween stack zones was suggested from the consideration of material finishings and air leakage.



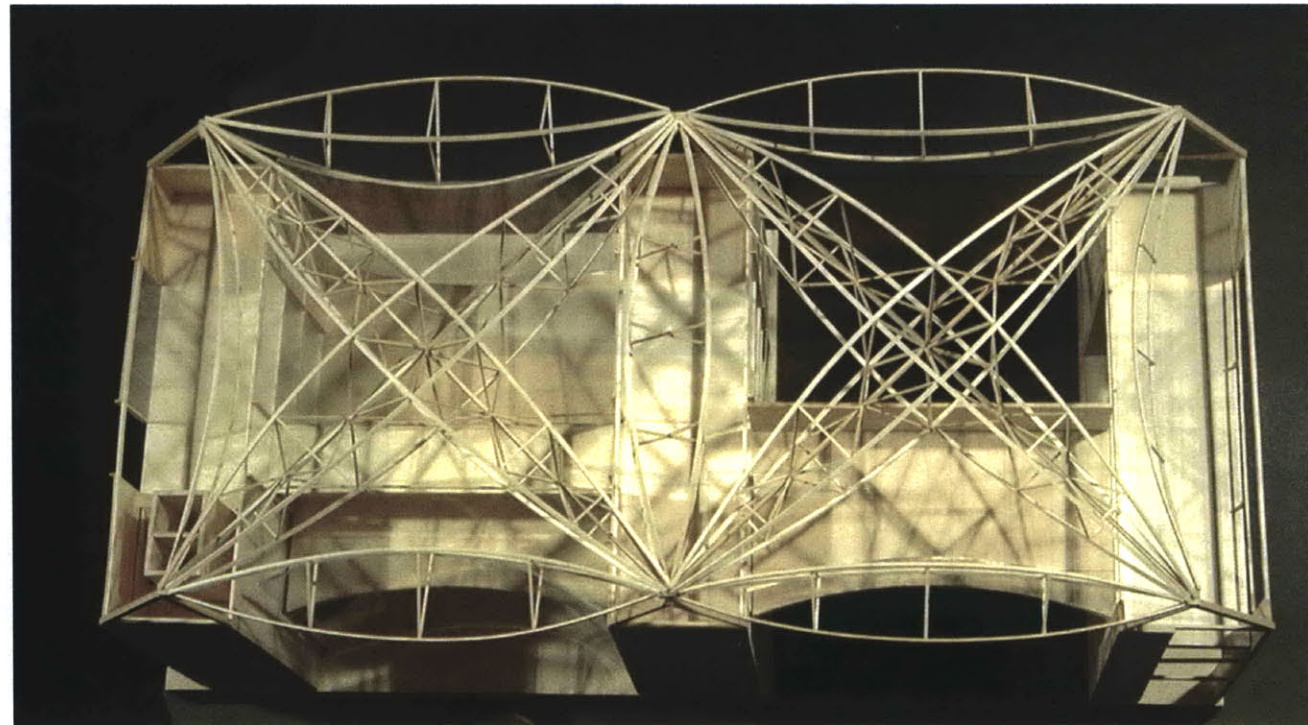
picture of view C (left)
picture of view D (right)



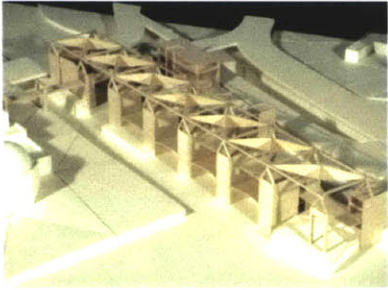
Crowning of a structure, although it happens at last, requires rudimentary concern. Especially, when one is designing based on void structure, as Semper has theorized in his four elements of architecture, art of roof work should always be the deriving force to the end product of the design. In that sense, my thesis salutes to structural rationalists who have strived to create tectonic voids.



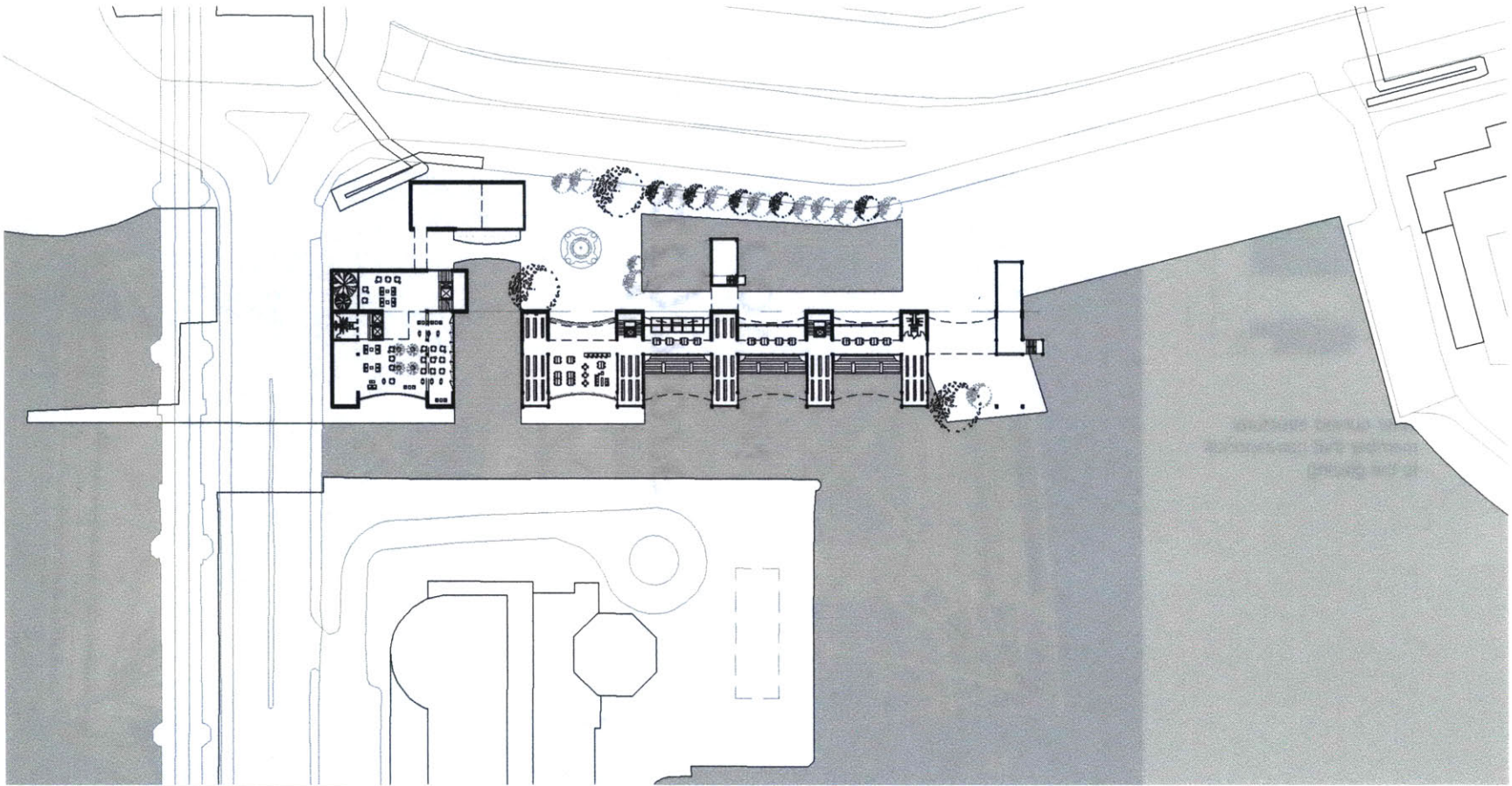
Inner curved structural member that corresponds to the glazing

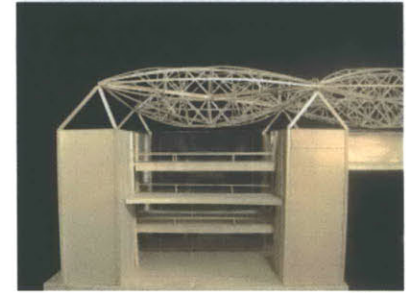


Roof views

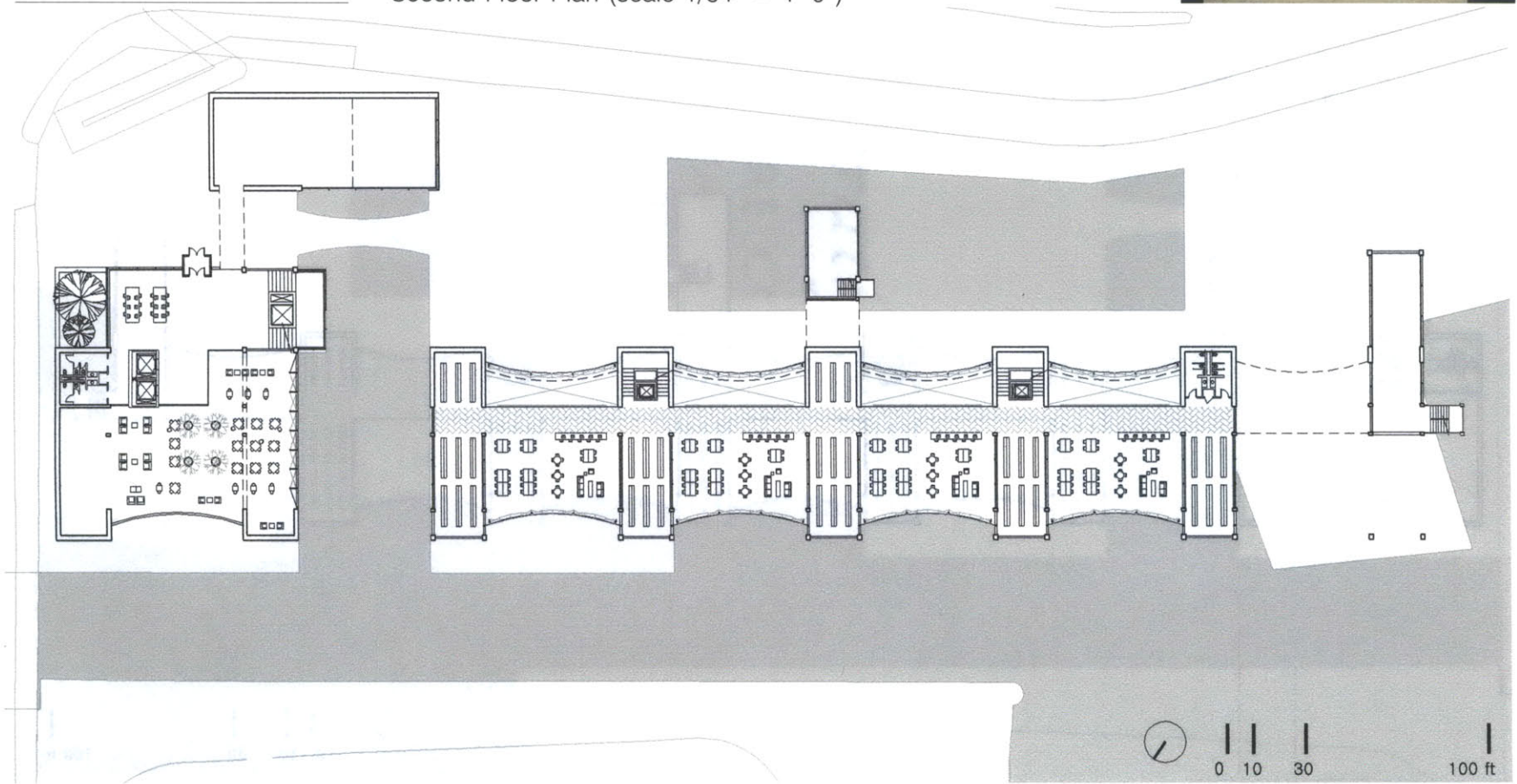


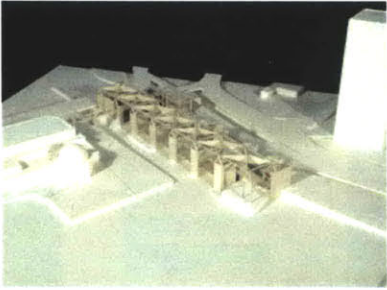
First Floor Plan / Site Plan (scale 1/128" = 1' 0")



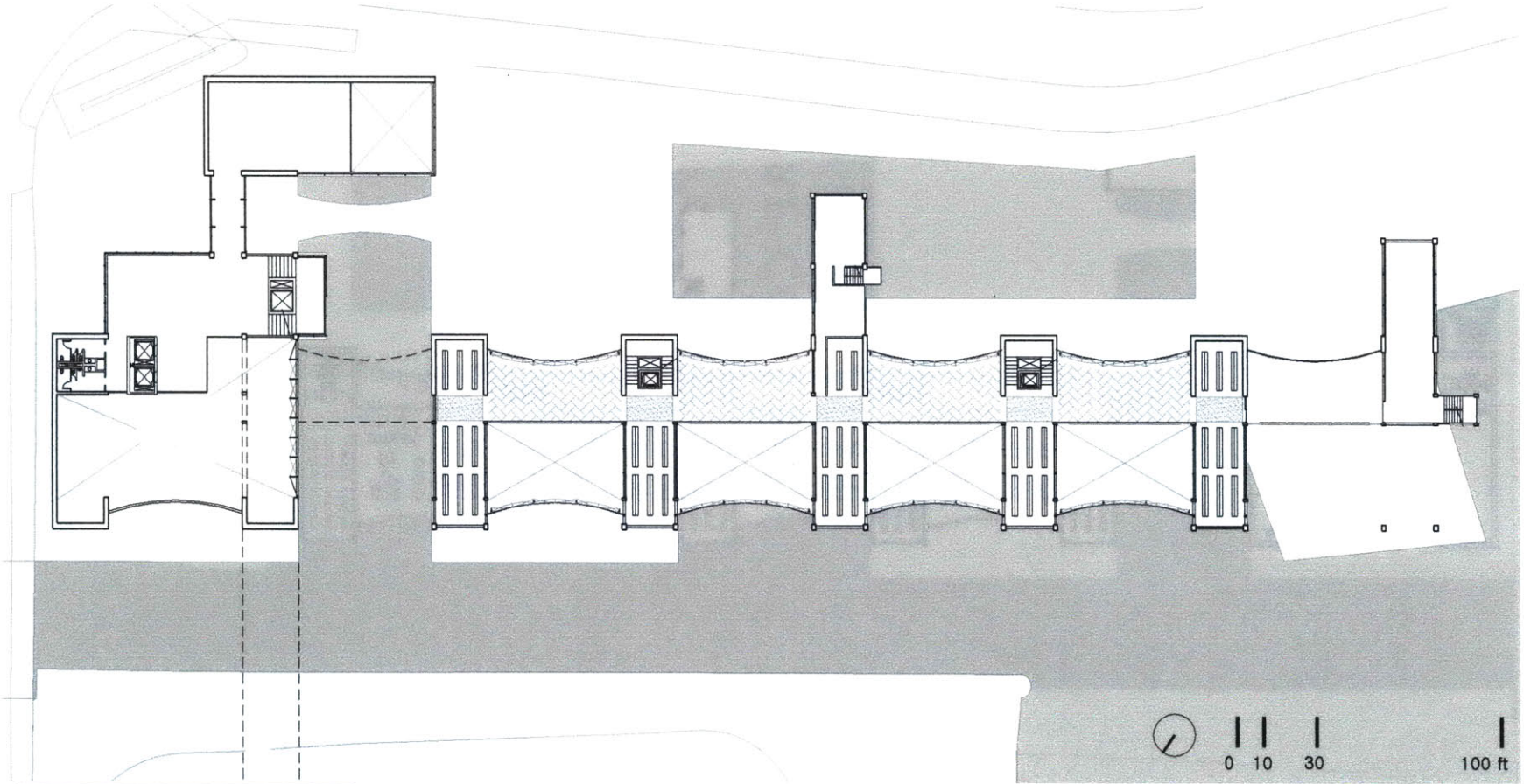


Second Floor Plan (scale 1/64" = 1' 0")

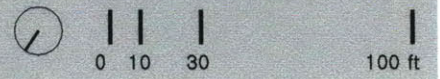
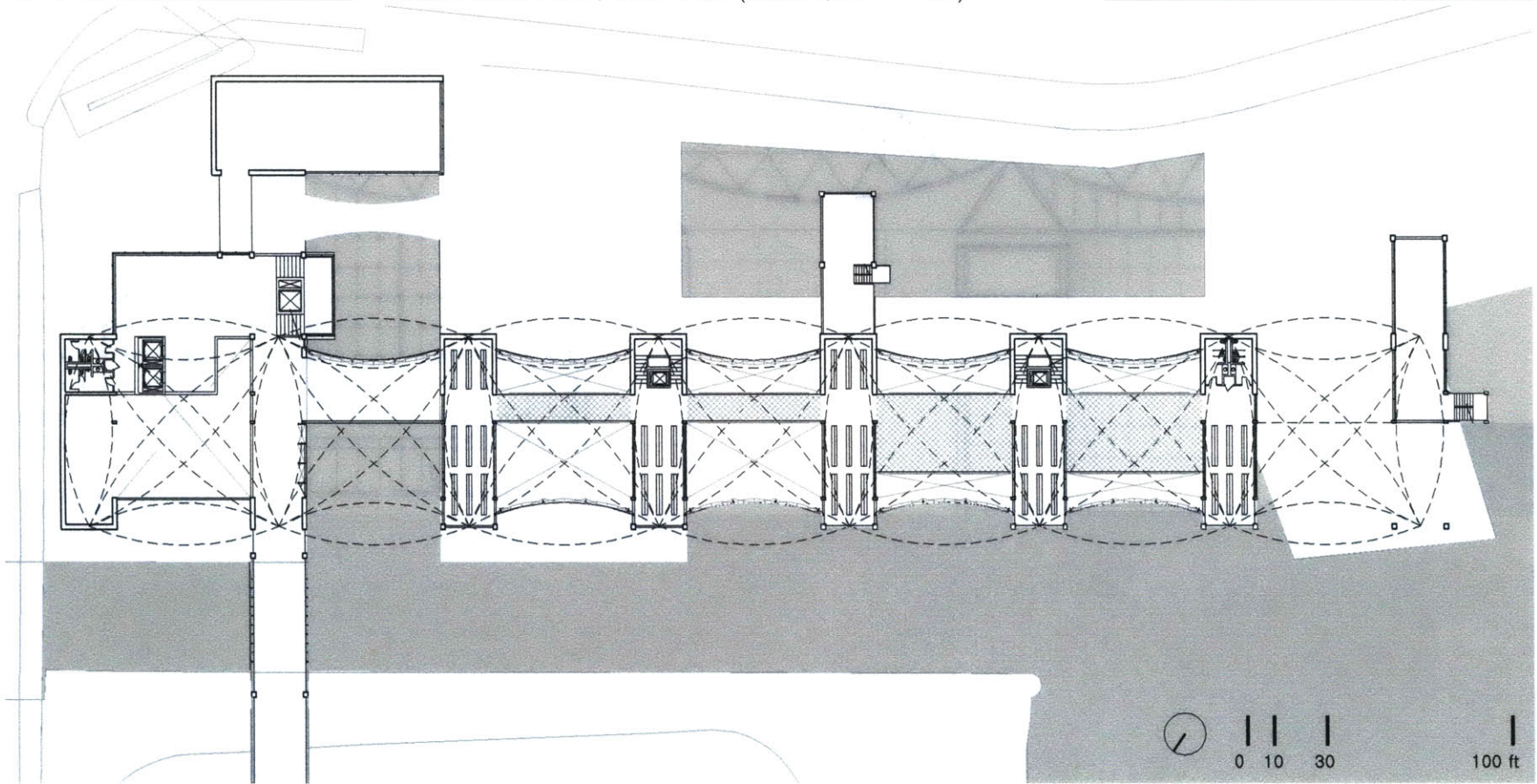
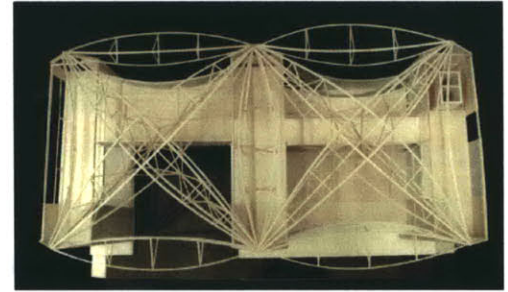




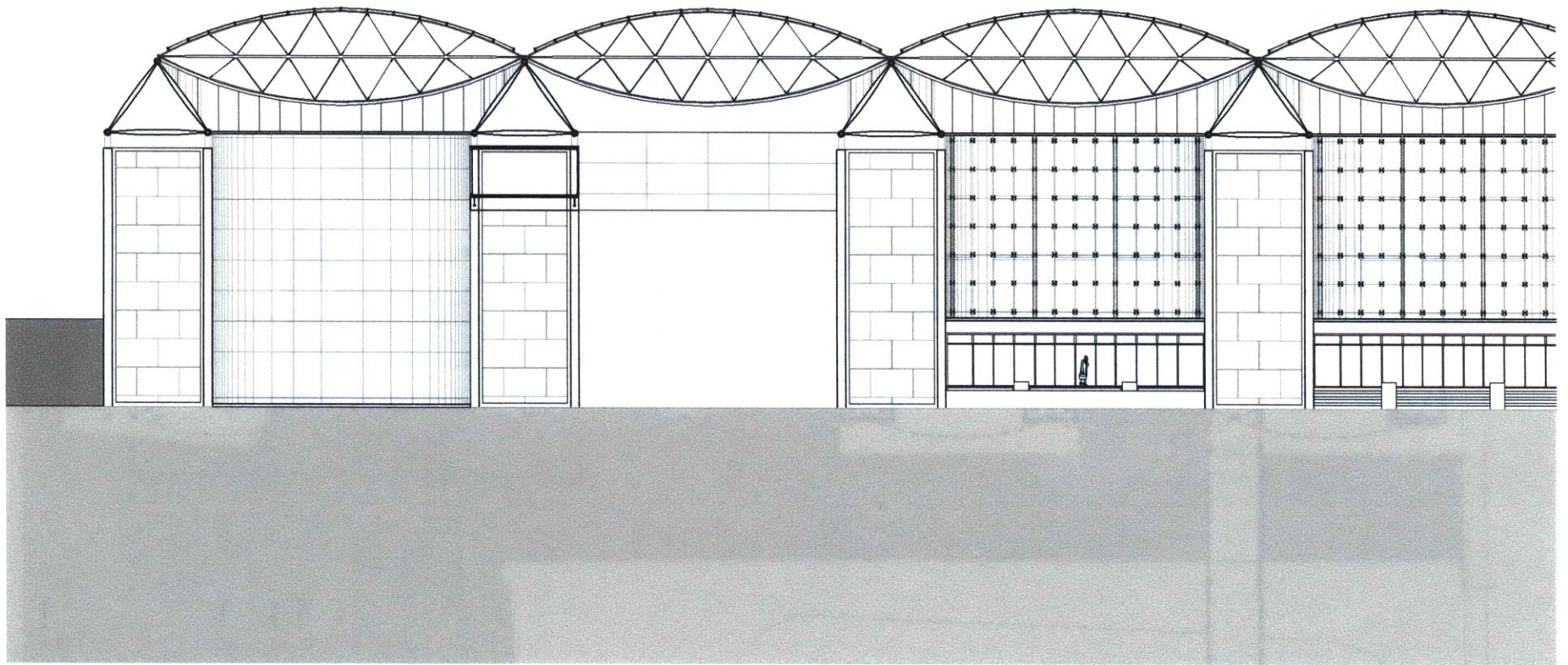
Third Floor Plan (scale 1/64" = 1' 0")

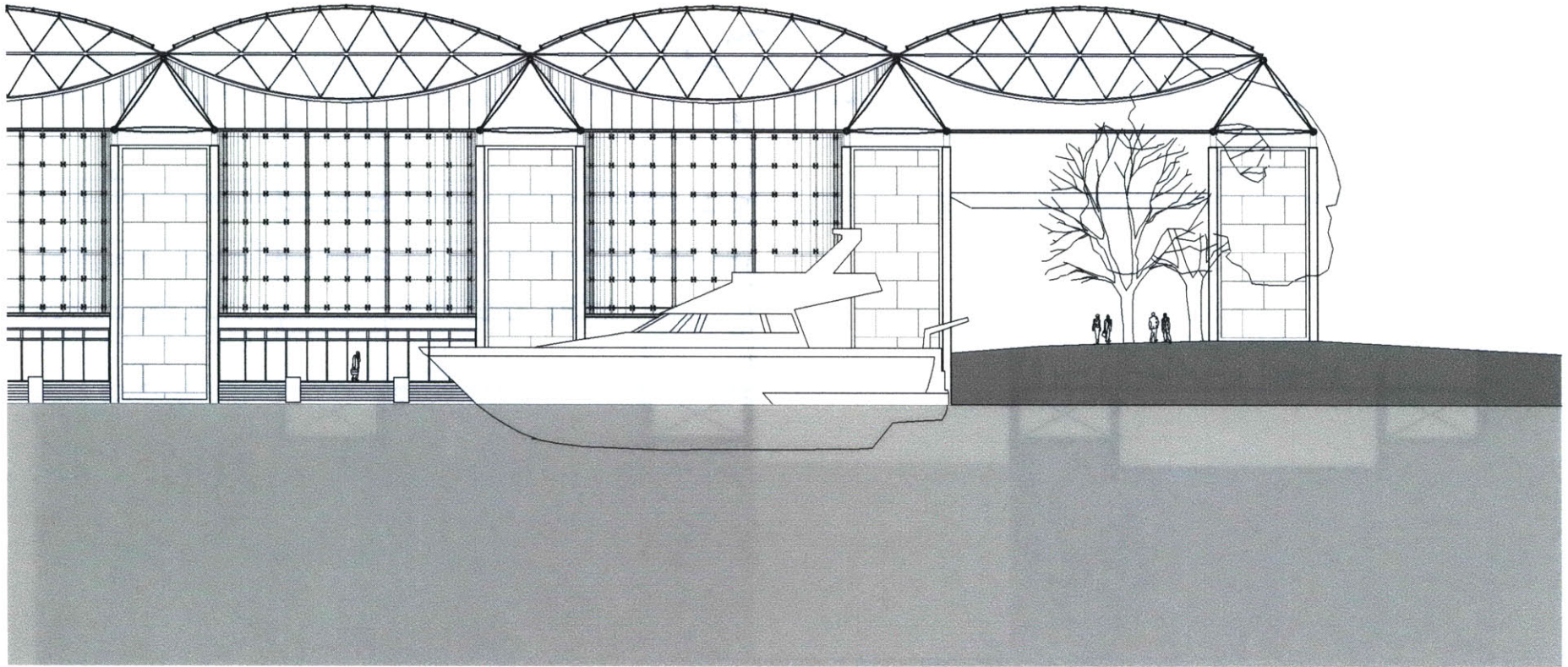
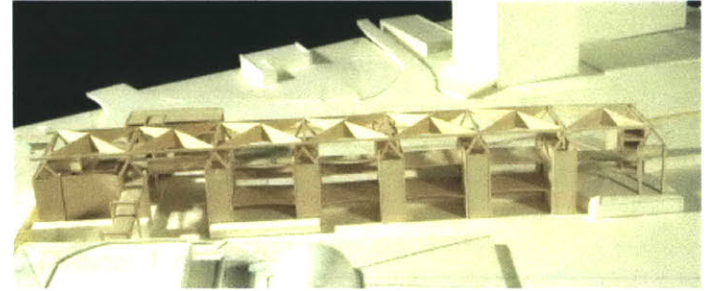


Fourth Floor Plan / Roof Plan (scale 1/64" = 1'0")

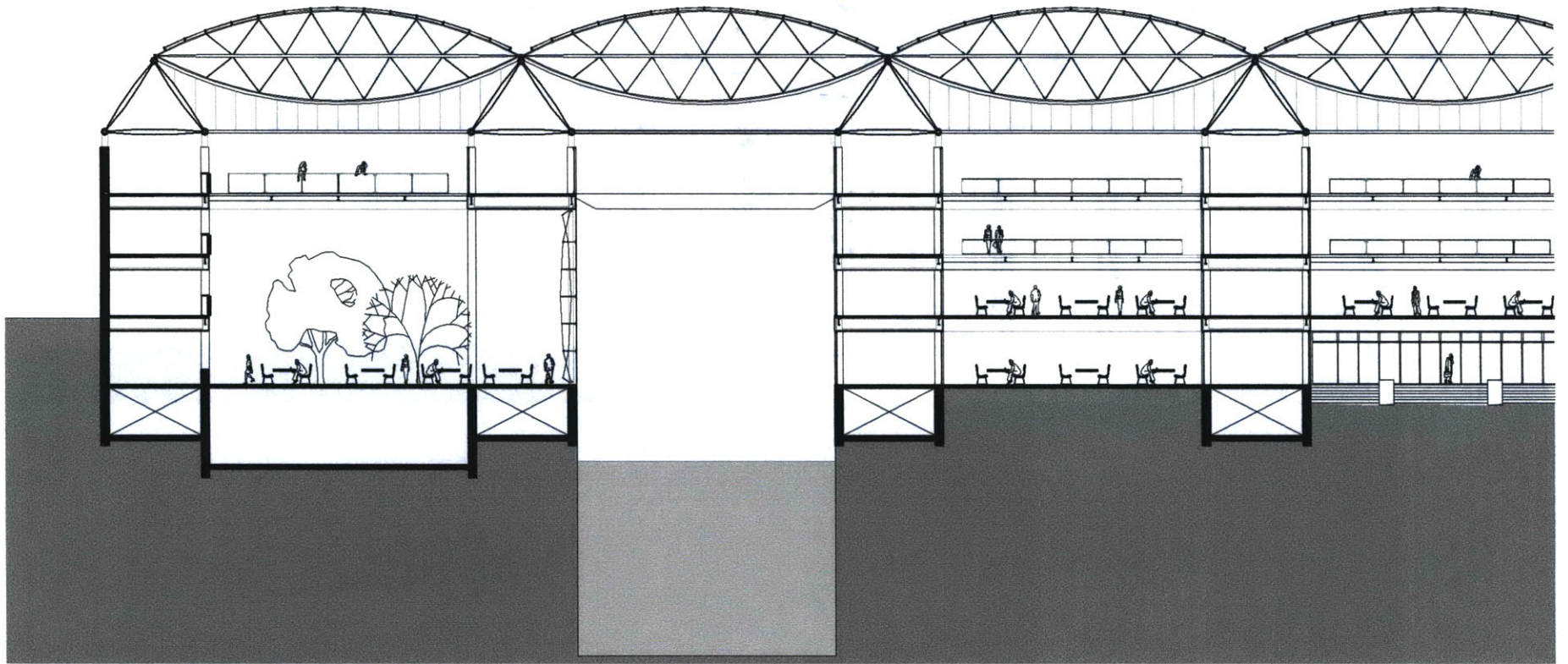


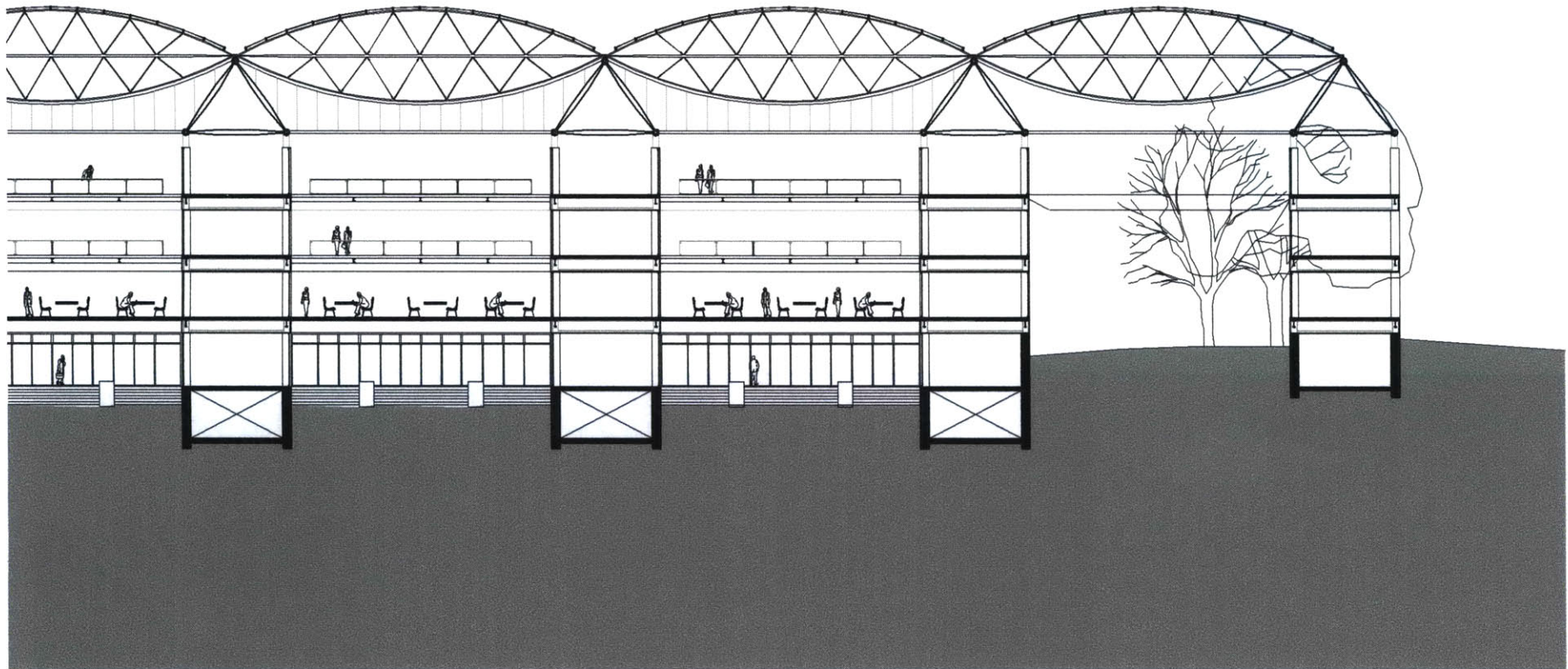
Elevation (scale 1/32" = 1' 0")





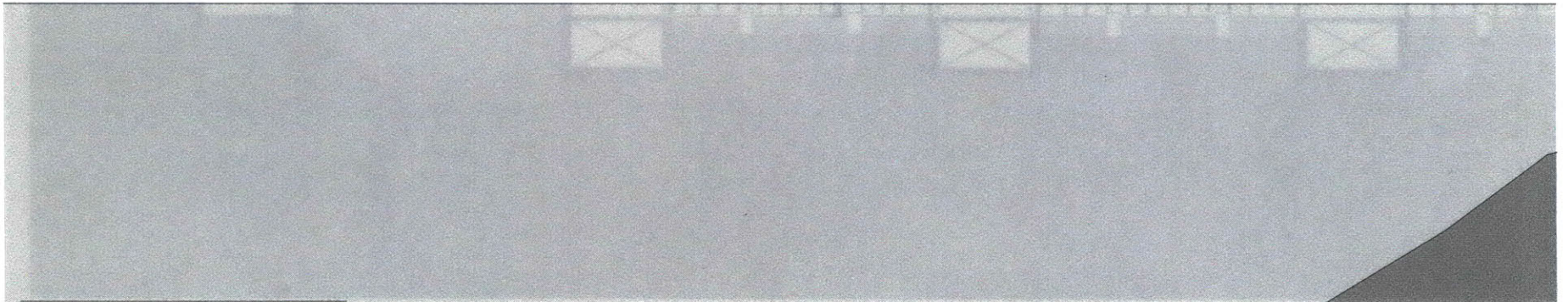
Section 1 (scale 1/32" = 1' 0")

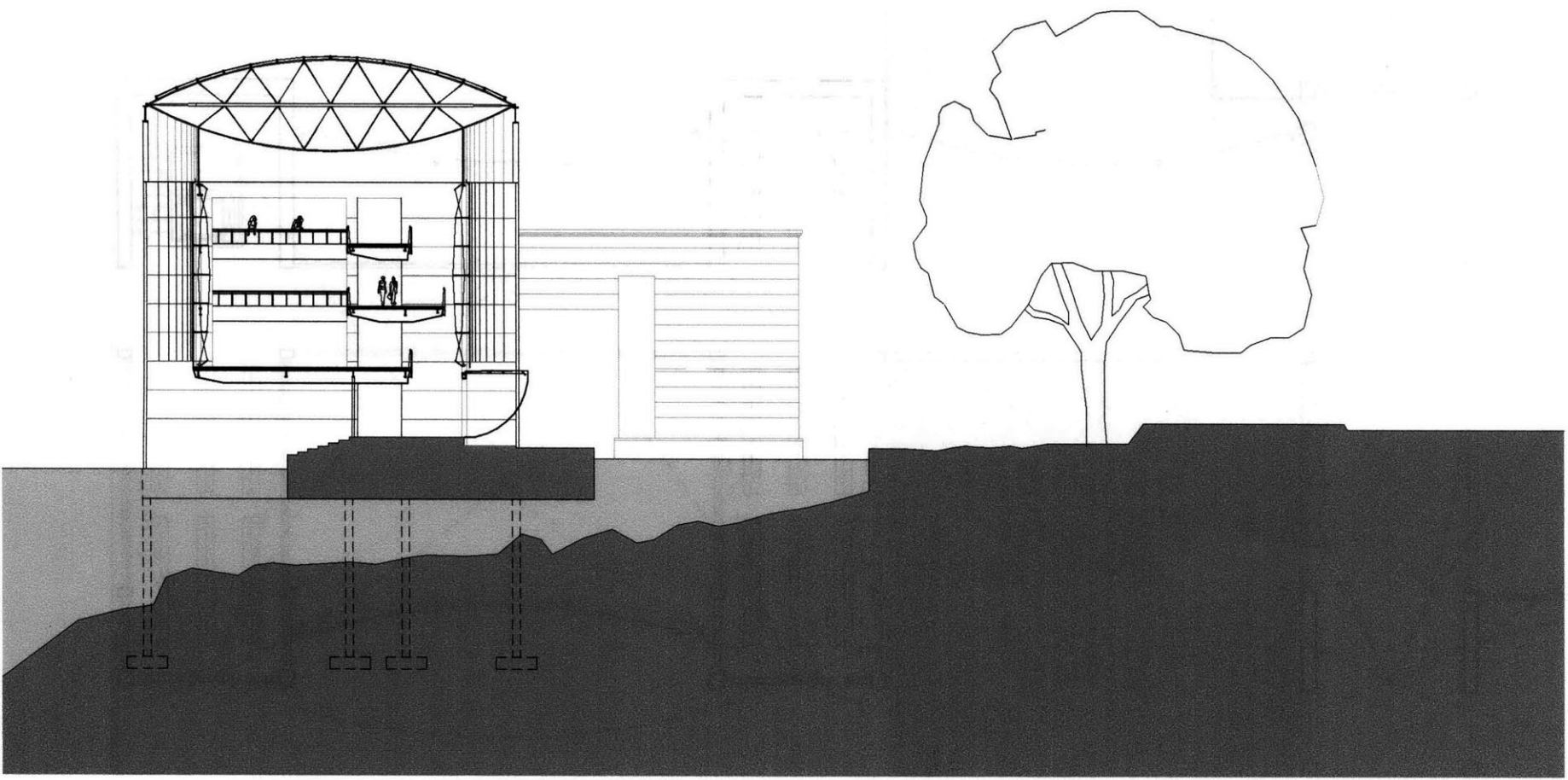




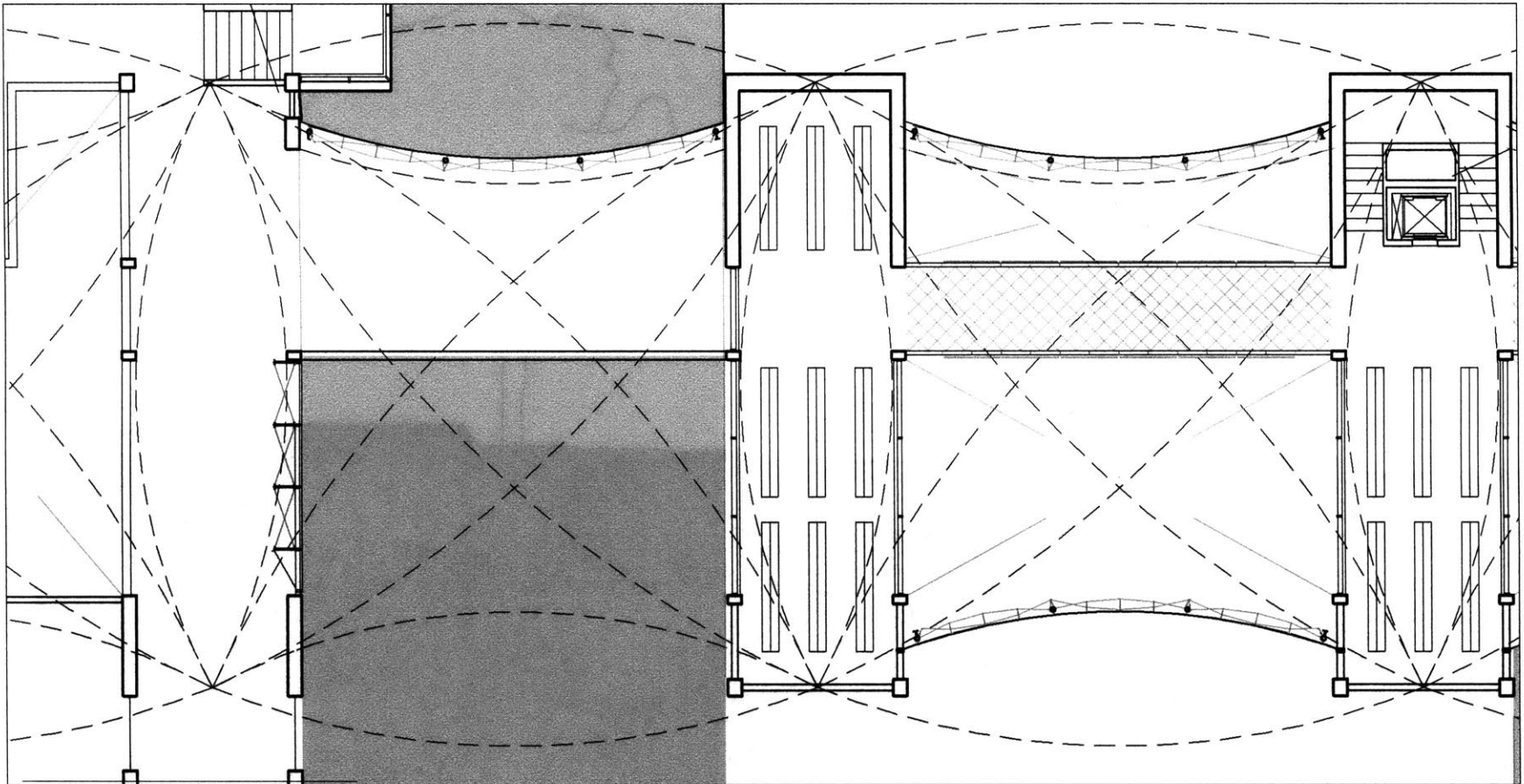


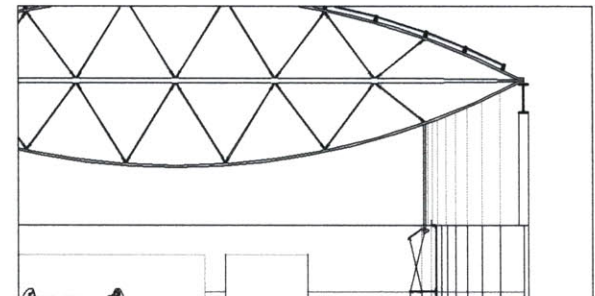
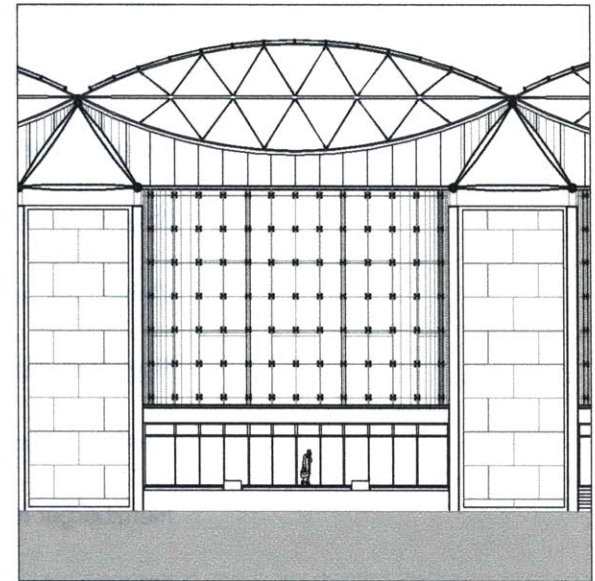
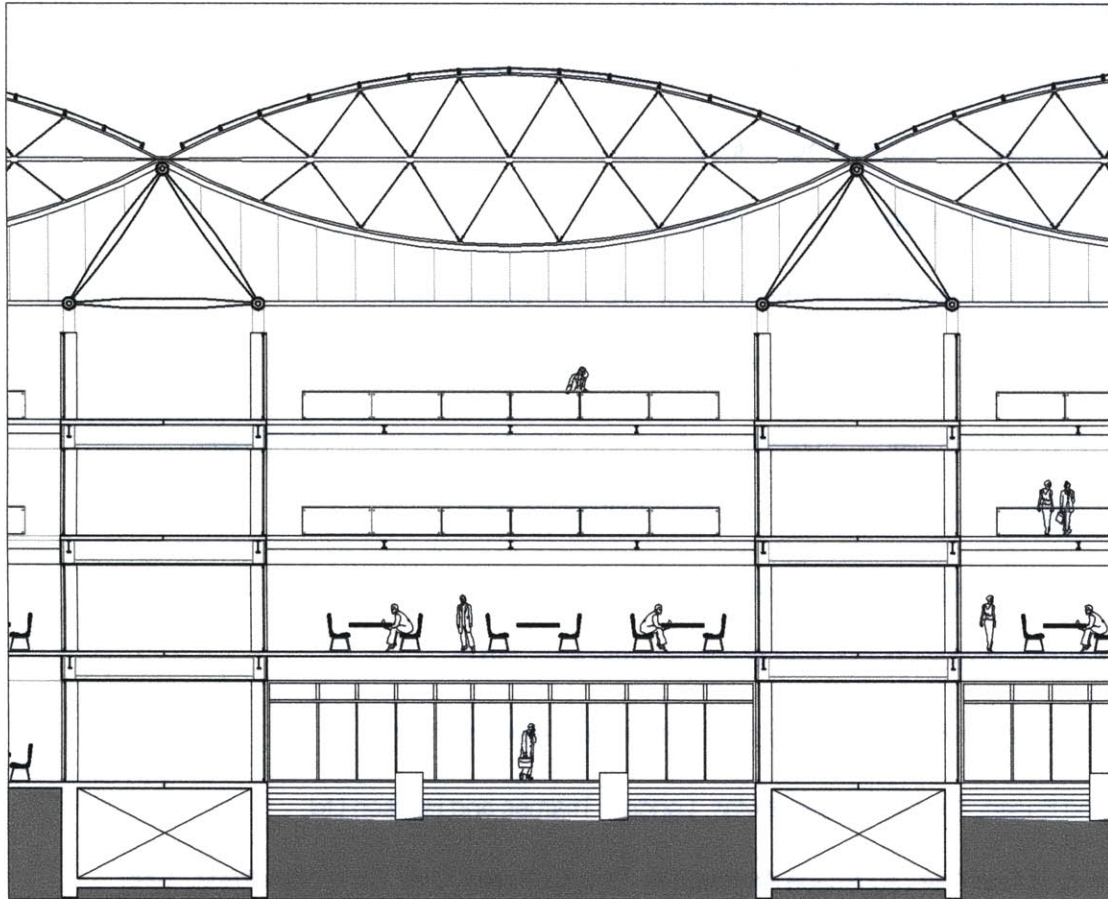
Section 2 (scale 1/32" = 1' 0")





Details





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Image Sources

- Fig. 1-1 Man San Valley from northside
Hiltmann, Jochen, *Miruk-Die heiligen Stein Koreas*, trans. Kim, Kyung-Yeun, Seoul, Hack-Go-Jae Press, 1997, p82
- Fig. 1-2 Flock of Wild Geese, Painting on paper, 124 x 68cm, 1985
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