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I am submitting herewith a thesis written by JulianyWibisono entitled "SPIRIT IN THE AGE OF INFORMATION: Rethinking Inside-Outside Relationships in Architecture as an Approach to Reflective Contemporary Practice". I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Architecture, with a major in Architecture.

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SPIRIT IN THE AGE OF INFORMATION:

Rethinking Inside-Outside Relationships in Architecture as an Approach to Reflective Contemporary Practice

A Thesis Presented for the Master of Architecture Degree
The University of Tennessee, Knoxville

Juliany Wibisono, August 1998

For my parents,

who always have loved and supported me

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Abstract

Technology at the end of the 20th century has increased complexities in our life; common uses of computers and satellites in facilitating our daily activities and productivity demand an architecture which is more appropriate for these times. Architecture needs to rethink and develop the possibility of accommodating both electronic and non-electronic supported activities with regard to the inside-outside expression and articulation of a building. The contradictory issues of universal vs. local, technology vs. nature and virtual vs. phenomenal need to be considered as convergent and intertwined with each other in creating space and enclosure. Deliberate placement and connection of architectural elements through measurement of space, distance, and time is the design method used in approaching collaboration among the issues.

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1. Introduction

Architecture can be considered as a part of the historical record that captures the realities of life and preserves them in the form of a built environment A work of architecture is a complex story that tells many aspects of human life in a certain period. Architecture of a given time and place reflects the mentality of a society, the cosmology of the world and the achievement of science and technology. Considering these purposes, designers of architecture seek to reflect their times through innovation and adjustment to historical circumstances. Being rooted in history while simultaneously searching for a vision of the future allows architecture to deliberately position itself to link the past to the future. This evolutionary process in the development of architectural language urges architecture to grow step by step, building new orders on the foundation of an older language in order to present meanings that can be widely understood within the context of time and society. This approach addresses the mission of architecture as a social art.

Architects aspire to create an ideal "world", while paradoxically their work reflects the conditions of an actual world that is never perfect. Architects, often deal with this paradox, and it is reasonable to express this paradox in the design of a built environment. In the act of creation, an ideal subjective image, in the mind of the creator often dominates and leads the design process. However, this ideal image might not be the image which other people imagine. In this age of transition and cross-cultural interaction, an objective ideal image may be impossible to achieve. To rethink architecture, we have to start by understanding our perceptions, which are often based on the concept of duality. The logocentric base of the ideal world is being questioned (Brewer). Dualistic perceptions of the world must no longer emphasize one side at the expense of the other. Bringing together the antagonists has the potential to make the world more complete, rather than oppressing the opposite. This will challenge some aspects of architecture because architecture has developed for so long under Western thinking, which from the Renaissance through the first half of the twentieth century, had a logocentric orientation. Manfred Hoffmann, a historical theologist states:

> To be sure, since we are coming from such a masculine-dominated background, we tend to stress the other side more forcefully than in normal circumstances. Yet we must recognize, and thereby be liberated, that Apollo and Dionysus are within us because of our primordial heritage, and we must not be induced by the present biological racism to forget that both masculine and feminine, active and passive, giving and receiving, conquest and suffering, domination and acceptance are dipolar forces in every human being, man and woman alike. The traditional dualism might very well break down into the wholeness of recognizing this dipolarity in each human being.[1]

Our world is in the process of evolving into a new order. The achievements of science and technology of the 20th century have forced reform in many aspects of our life. Especially the improvement of communication technologies, and increasing dependence upon computer technologies has caused a significant change in our perceptions of reality. The 'artificial intelligence', the 'synthetic images' and now the 'synthetic vision', according to Paul Virilio are the revolutionary agents that urge us to rethink the reality of the world. According to him:

> The age of the image's formal logic was the age of painting, engraving and etching, architecture; it ended with the eighteenth century. The age of dialectic logic is the age of photography and film or, if you like, the frame of the nineteenth century. The age of paradoxical logic begins with the invention of video recording, holography and computer graphics... as though, at the close of the twentieth century, the end of modernity were itself marked by the end of a logic of public representation... Lastly, paradoxical logic emerges when the real-time image dominates the thing represented, real time subsequently prevailing over real space, virtuality dominating actuality and turning the very concept of reality on its head...to the great advantage of presentation, of a paradoxical presence, the long distance of the object or being which provides their very existence, here and now. This time, ultimately, what 'high definition' or high resolution means; and it no longer applies to the (photographic, television) image, but to reality itself.[2]

Architecture has inherited marvelous works that we still admire and often learn from. However, observing the condition of the reality of our time is as important as learning from the past in order to create an "architecture of our time". Paul Virilio has shown us the tendency of the representational reality for this time. In his view, contemporary life is becoming more complex, interactive, diverse and desynchronized. Retaining linear thought will not enable us to understand the reality of this time.

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[1] Earl D.C. Brewer, editor. *Transcendence and Mystery.* New York: IDOC/North America, Inc. 1975. Page 57

[2] Paul Virilio. *The Vision Machine.* Bloomington: Indiana University Press. 1994. Page 63-64

> "Hitherto, we thought and saw things in linear manner, one thing after another, one thing hidden behind another, leading to this or that finality, and along the way dividing the world up into categories and classes of things: object with impermeable boundaries, surfaces with impenetrable interiors, superficial simplicities of vision which ignored the infinite complexities."[3]

In the age of information, the world is transparent. Everyone can attain access to the information sources in order to get information or to declare his/her own thought easily. The democratization of information is an ideal achievement of our present world. However, within this condition, a multiplicity of values flows into each individual's life, and no single ideal can summarize the spirit of our age. Informational transparency allows for all values to emerge, including repressed values. In the discipline of architecture, the idea of "perfection" has for a long time guided the principles of designing a building. This tradition is inadequate and is not in accordance with today's realities. The repressed value, "the imperfect" needs to be expressed in architecture. If perfection is the product of the designer's search for the ideal world, then imperfection is the product of the actual real world. To blend architecture to the spirit of the age is to find a balance between the individual's "subjective ideal world" in design, and the "objective real world". The spirit of the world, our fragmented and imperfect world, gives architecture its power to become a remarkable object, just as many other great buildings of the past clearly reflected the spirit of their age. It is not only beauty and socio-cultural contributions that make an architecture powerful; it is also the synthesis of life's actual complexities into the concrete form of a building that energizes architecture to become something more than just an object.

Given the above, it follows that if one wants to show the complexities of life in architecture, then one needs to bring the imperfect into the design. When clarity emerges, obscurity also emerges. Similar indications can also operate between universal vs. local, natural vs. artificial, phenomenal experience vs. virtual experience, pure geometry vs. fractal geometry, territoriality vs. deterritoriality and exploration of the sky vs. exploration of the earth. Reaching a balance between contradictions to establish a design framework results in an architecture that

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[3] Roy Ascott. "The Architecture of Cyberception." *Architectural Design (AD) magazine.* Vol. 65 No.11/12 1995. Page 39

can convey character embodied in the spirit of this age. John H. Frazer in his article "The Architectural Relevance of Cyberspace" mentions:

> ...Our emerging new world view is characterized as decentralized, desynchronized, diverse, simultaneous, anarchic, customerized...Key concepts are information, sustainability, participation, emergent properties...[4]

These characteristics appear when oppositions meet. An architectural approach that brings together the opposites of the old and the new means it is possible to both keep the innate traditions in architecture and blend them with contemporary situations. Architecture can still accommodate a human being who is born to be aware of his/her senses. The senses are gifts that enable humans to enjoy the pleasures of art. In contrast, many of today's architects seem to want observers to gain pleasure through the intellect rather than through the senses. This thesis argues that it is necessary to coordinate the intellectual and sensual in order to appreciate architecture. Again, John H. Frazer says:

> ...The instantaneity and spontaneity of communications in cyberspace cause us to revalue the significance of contact in the old world. Meeting with colleagues are now more highly valued (but less frequent), they celebrate physicality...more hand-shaking kissing, embracing, touching, a more frank and sensual enjoyment of the aromas...Virtual worlds should not be seen as an alternative to the real world or a substitute, but as an extra dimension which allows us a new freedom of movement in the natural world.[5]

In reference to functional aspects of contemporary buildings, outside-inside relationships are part of experience that differentiates them from previous generations. With the advent of the parallel worlds brought about by communication technology, we can face two realities at the same time and at the same place. These are the immediate reality that we can experience through the senses of our body and the mediated reality that is more limited to vision The anticipation of architecture toward the existence of mediated realities encourages us

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[4] John H. Frazer. "The architectural Relevance of Cyberspace." *Architectural Design (AD).* Vol. 65. No 11/12 1995. Page 76

to reconsider relationships between the interior and the exterior of a building. Both the interior and the exterior have to encourage the sensual and the intellectual.

However, while interior and exterior encourage the sensual and intellectual, they engage different worlds. The interior engages the universal world and the exterior engages the local world. They are autonomous because each of them responds to a different kind of reality. The inside of the building mainly deals with mediated reality, while the outside mainly deals with immediate reality. Different characteristics generated from those realities can be expressed evenly in the building. The demateriality, the abstract and the virtual are the elements of mediated reality which connect the interior to the universal world and anticipates the future. The material, the concrete and the phenomenal are the elements of immediate reality which connect the exterior to the local and engages tradition.

By engaging the global world, the interior frees itself of geographical restrictions. The interior can focus on the functions, systems, and users as design parameters. On the other hand, by engaging the local, the exterior ties itself to the immediate context. The exterior focuses on the observation of city and the measurement of local time and spaces as the parameters of the design. This design approach reverses and challenges previous architecture in which the exterior of a building was engaged with the world and therefore expressed universality. In modern architecture interior and exterior were closely linked and informed each other. Disconnection and making autonomous the exterior and interior expressions of a building resolve the dilemma of whether architecture should reflect universality or should be specific to location in a tolerant manner. This allows each value to have its own domain in architecture.

The abstract and the concrete are the primary instruments for design actualization that we use in generating architecture. Abstraction is known as the act of engaging universal and general ideas. *"The process of abstraction can be analyzed from another view-point. Humans can know universals because they are able to perceive the object known by the senses as limited, as not fulfilling al*

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[5] Ibid

the possibilities of its essential form...This universalizing abstraction is possible only if we in some way apprehend or reach toward the whole range of these possibilities in a dynamic movement which goes beyond every particular object without ever grasping the totality.[6]

In past times we abstracted nature so that the concrete became abstract. This tradition continues. With the advancement of technology, everyday reality becomes more abstract, and entry into the "informational world" directs us to deal even more with abstract practices and ideas in our daily activities. The inside of a building then becomes the place of accumulation for abstract things. If the exterior is concrete dealing with immediacy of context, the interior is dealing with the mediated reality. Electronic media, such as a TV screen, computer monitor or a projector's screen act as conduits that bring about the mediated reality. In contrast, the outside deals more with abstraction in order to transform tangible objects into the elements of architecture. The inside, through the electronic world, does not have intrinsic meaning, but it is giving people as many ideas as possible. The inside does not emit only one meaning; the observers create their own interpretations and meanings. The outside creates intrinsic meaning because it deals with place, tradition and nature. Therefore, the outside serves to complement and complete the inside.

The starting point of design should still begin with an observation of the concrete and real. We perceive more than one reality simultaneously. The "adjoining reality" which is in close proximity to us, and "other realities" which are at long distances, is a profound theme for our life after the 20th century. These influences of information technology can have a revolutionary effect upon architecture. Architecture then becomes a repository through which we can gain an access to the parallel world, the unphysical, intangible, mediated world. Architecture becomes an intervention between multiple realities.

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[6] James J. Bacik. *Apologetics and the Eclipse of Mystery: Mystagogy according to Karl Ranher.* NotreDame:University of Notre Dame Press. 1980. Page 80

II. Exploration of architectural issues

The issues below are chosen because of their relevance to recent tendencies of architectural design and their relation to the discourse of Modern Architecture. They are generated from the concept of dualities of our world and human perceptions of our world. They are prevalent issues that are broadly used, whether consciously or unconsciously, in relationships human beings have with their built environments. The goal is to create an architecture that is grounded to a specific place while sharing a broader collective meaning. The intriguing part of the exploration of these issues is about how to define specific relationships between them that coincides with the spirit of this time. It is not a unitary, linear, or hierarchical relationships, but rather complex, intertwined and simultaneous relationships that reflects our present realities. To create a realistic architecture then, we have to bring these abstract relationships into a concrete design realization (figure 1).

1. Universal – Local

Universal is: "...of or relating to the universe; extending to or comprehending the whole number, quantity, or space; pertaining to or pervading all or the whole; all-embracing, all-reaching...(Webster's New Twentieth Century Dictionary of the English Language, second edition, 1976). From the point of view of analogy and perception, the universal can be associated with the sky, a huge space, a broad connection, and prevalent things. In my thesis, the universal is the character of the inside. Architecturally, the inside can be designed as a universal space in several ways. The most literal way is by bringing the installation of a global network communication system into the building. Through audio-visual means, this network will bring the mediated world into presence and can make people feel the engagement with the abstract cyber-world. In a more representative way, universal space can be designed by creating a condition of indeterminate and thus infinite spaces (void and depth), openness to the sky, and the appliance of common, universal materials, such as concrete, glass, and steel.

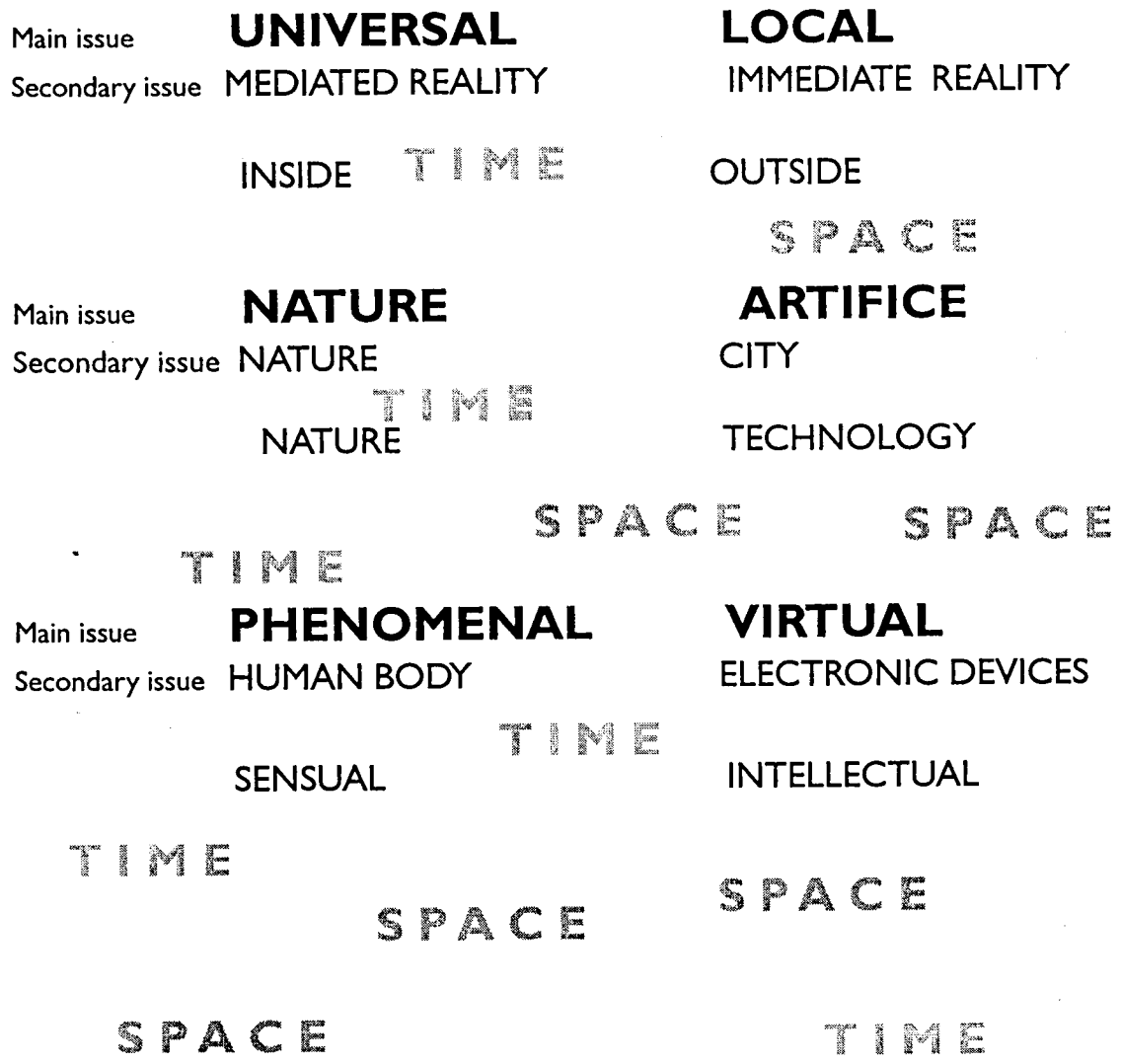


Figure 1: structure of thesis issues

Local is: "...pertaining or belonging to a place, relating to place, characteristic of, or confined to a particular place...(Webster's New Twentieth Century Dictionary of the English Language, second edition, 1976). Local is related to a particular place, which can include two different conditions. On a smaller scale, the local is the ground on which a building will be placed. On a larger scale, the local includes a surrounding, a part of a city, a city or a country that depicts a specific characteristic. The local constitutes concrete things. If we trace the word from its noun form, locality, it means:..."the state or condition of existing in a place or in a certain portion of space; position with regard to surrounding objects, landmarks, etc.; as , a sense of locality..." (Webster's New Twentieth Century Dictionary of the English Language, second edition, 1976). A given building site might have a very strong sense of locality or it might not. A place can not depict a strong sense of locality when it does not grow from a strong cultural tradition.

Whatever the situation is, the outside part of a building is an enclosure that stands on a specific location, and therefore needs to engage the local. The issue of the local is very important in creating a place with a responsive built environment. Unlike the inside, which can be more abstract and unrestricted, because it engages the universal, the outside needs to consider many aspects and parameters from the surroundings in order to bring about the sense of locality. Specific characteristics of the local, such as the landform on which the building is to be located, the connection with patterns and infrastructure of the city and the use of specific (local) material are design determinants for the outside.

The contemporary relationship between universal and local is one of indifference, but they touch and overlap with each other, revealing a tension in the whole expression of the building. The universal-local expression is meant to reflect on the socio-cultural condition of our present age. They are meant to remind people of the possible new relationships concerning the dualistic characteristics of our world. Universal and local come together to complete each other, indicating the complexities of multiple realities that we have.

2. Natural-Artificial

Natural is: "...of, forming a part of, or arising from nature; in accordance with what is found or expected in nature (Webster's New Twentieth Century Dictionary of the English Language, second edition, 1976). The natural is a topic of considerable exploration in architectural design. However, the design response to nature does not have to be an imitation or a metaphorical borrowing of natural forms. Regarding the achievement of science and the complexities of life that we have today, we can apply the natural in a more abstract and objective way. We can take natural laws or natural phenomena and embed them in design, or locate the building in a specific, even extreme condition of nature.

Artificial is "...made or contrived by art, or by human skill and labor..." (Webster's New Twentieth Century Dictionary of the English Language, second edition, 1976). Actually, any act of building is an artificial act. The issue of artificial in this thesis is about the generating process in a design which explores artificial aspects such a the city or the use of technology. As the natural is embedded into the design, the artificial also needs to be embedded into the design through an abstract and objective process. Observation and measurement of the city, and the development of systems which accommodate technology are seen as the artificial components of the building.

The goal of natural-artificial issue exploration in this thesis is to improve the condition of the built environment on a larger scale. Many contemporary buildings are located in urbanized areas. The making of architecture has a very close relationship with development of and improvements to a city. In this thesis project, the city is not abstracted in the design but directly and realistically engaged. The design recognizes that a city is built on the surface of nature that is begun with the establishment of a position upon a location. Position is realized through marks and measurements. Later in this thesis project, intimate and convergent relationships of natural-artificial, and their integration into the design, are explored through positioning, marking, and measuring.

3. Phenomenal-Virtual

Phenomenal is: "of or constituting a phenomenon or phenomena; in philosophy, apparent to or perceptible by the senses..."(Webster's New Twentieth Century Dictionary of the English Language, second edition, 1976). Architecture should give a phenomenal experience to the observer. The phenomenal experience of architecture can be heightened in the whole building by emphasizing the sensual aspects of spaces on the inside and sensual surfaces on the outside. Sensuality can be demonstrated through shape, profile, quality of material, and the effect of light. These phenomena can be experienced passively (non-moving body). Phenomenal experience also involves the active body (moving body). Circulation systems in the building can encourage sensual engagement by the observers when they move through the sensual space.

Virtual is: "...being in essence or effect, not in fact; not actual, but equivalent, so far as effect is concerned..." (Webster's New Twentieth Century Dictionary of the English Language, second edition, 1976). The spirit of the age demands that architecture include the virtual as well as the phenomenal. The experience of architecture is broadened and enriched through the inclusion of electronic and satellite technology, which allows for the creation of the virtual in addition to the phenomenal. The virtual can appear as images or texts that carry messages. The virtual limits the senses by transferring data through visual and/or aural organs in order to stimulate the mind. The virtual brings impermanent, abstract, intangible spaces to the building.

The combination of phenomenal and virtual experiences in architecture has the capacity to stimulate the senses and the mind simultaneously. The age of information produces multiple realities, multiple meanings, multiple possibilities and multiple choices. The combination of phenomenal and virtual experiences enhances awareness of and engagement with the built environment. Our physical world is now, and will be into the next century, more than just phenomenal things; it will also include virtual things. Architecture will be concerned not only with materiality, but with demateriality as well.

III. Exploration of Programmatic Issues

A library is a place which engages knowledge and information. In a library individual awareness is encouraged. Our minds are exposed to the unlimited sea of knowledge in which our curiosity drives us to seek unknown things. A library provides a place for abstract activities that involve intellectual rather than physical actions. It is a challenge for a library as a building to be able to engage people's curiosity and respect for knowledge. A library is a museum of knowledge as well as a house of production for knowledge. The library is a place to look back to earlier eras and to invent a vision of the future through individual reflections.

A library for art and science can be more provocative than a general library. Art and science are fields that ambiguously explore the untouched and that go beyond existing boundaries to achieve new understandings. Art and science change the world not in a plain way and without taste, but with color and invigoration. Within art and science, mystery, questioning, instability and imperfection can come together with their counterparts: clarity, objectivty, stability, and perfection. The creation of space in this library tries to express those statements above which explore the nature of art and science. The space flows horizontally with non-hierarchical progressions, and with unclear beginnings and unclear endings. There are divisions but also connections between the old system of using books and reading desks, and the new system of applying compact discs and computers. The program of the library is differentiated based on spatial characteristics, which are the outside and the inside, and based on public, group, and individual use.

1. Outside

The program for the outside is for it to be a place to introduce the library to the public and to encourage curiosity from people in the city. The outside activities involve the informal activities expected in a public park. On the outside, people can gather in the open plaza or café, and take promenades along the building or sit in the park. In addition to these activities, people are also introduced to phenomenal and virtual performances coming from the building. The roof profile of the library is a graphic of the sun's position at 8 a.m. at a certain day every month of a year. At 8 a.m., as the library opens for the day, the sun emerges from behind the specific point on the building that represents the month. This phenomenon can be experienced precisely from certain

marked locations in the landscape. At night, holographic projections emerge from the building. Images and text are projected onto the wall inside the building, and also onto the location in the landscape where people experience the phenomenon of the sun during the day (figure 2).

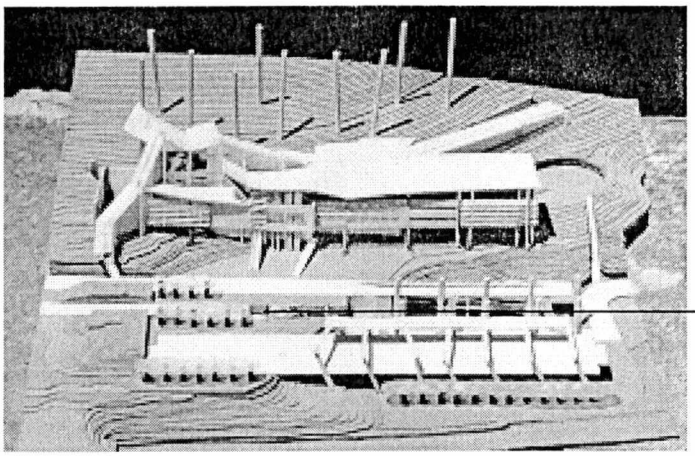


Figure 2: The outside that is designed for a public park, completed with virtual and phenomenal performance on it.

Landscape

The treatment of the outside is an important contribution of the built environment that is dedicated to the public. The aspiration for the constructed landscape is to develop a park which serves as a transition from the city to the library, and then to the hill. To make a functioning landscape that is integrated to the building, the landscape needs a developed program inserted into it. The program for the landscape is made up of road, pedestrian path, parking area, public plaza, and plantings. The activities of people and cars are organized as components of the park. They are arranged in layers of strip programs that are begun from the front edge of the site and end on the front edge of the building. This elements extend the conceptual framework of the thesis by incorporating the issues of universal - local, natural - artificial and phenomenal - virtual. For example, the universal phenomenon of the sun and the virtual holographic projections complement the local elements of the landscape.

The first layer is a long deck on top of sloping earth, looking down to the old railway. The second layer consists of two levels of parking garage that are spatially designed to become a structure that responds to the building. The third layer is a ramp for cars that cuts across the site, connecting the entry onto Chapman Highway and the exit on the hillside road. On both sides of the ramp are rows of plantings and three pedestrian bridges that cross a void, connecting the parking garage to the other pedestrian strip. There is also a translucent glass floor installed above the ramp, on which projected images are cast during the night. This floor is also the location where people observe the phenomenon of the sun emerging from behind the building during the day. The fourth layer is a pedestrian strip with a ramp that connects the lower level of the parking garage to the upper level of the landscaped area. The fifth and final layer is the public plaza in front of the building where people can take an escalator or walk up a staircase to enter the building. From the public plaza, people can also walk to the back of the building to a café or continue to take promenades behind the building. The elements of the five layers are composed in a configuration that responds to the building and that is a reflection of the concept of the building. The landscape not only maintains a harmonious relationship to the building and the city, it plays an integral role in carrying out the concept of the simultaneityof duality. (figure 3).

2. Inside

The inside is a more formal place than the outside, and involves various activities. It is an autonomous space independent from the outside and its connection to the local. When an observer steps from the outside to the inside, it is an abrupt transition because there is no transitional space between the different atmospheres of inside and outside. In the inside, the sensual and the intellectual, and the phenomenal and the virtual, come together, but they engage the universal instead of the local. The feeling of engagement is emphasized in the main lobby and along the main circulation. A large void and a zigzag corridor give feelings of an unexplored space, the universe, absence, and undiscovered knowledge. However, the library delivers some answers to those feelings through a TV screen that broadcasts many news and knowledge based programs, and through rooms along the corridor which contain library facilities. Inside, juxtapositions between phenomenal-virtual, sensual-intellectual, concrete-abstract, and materialized-dematerialized begin

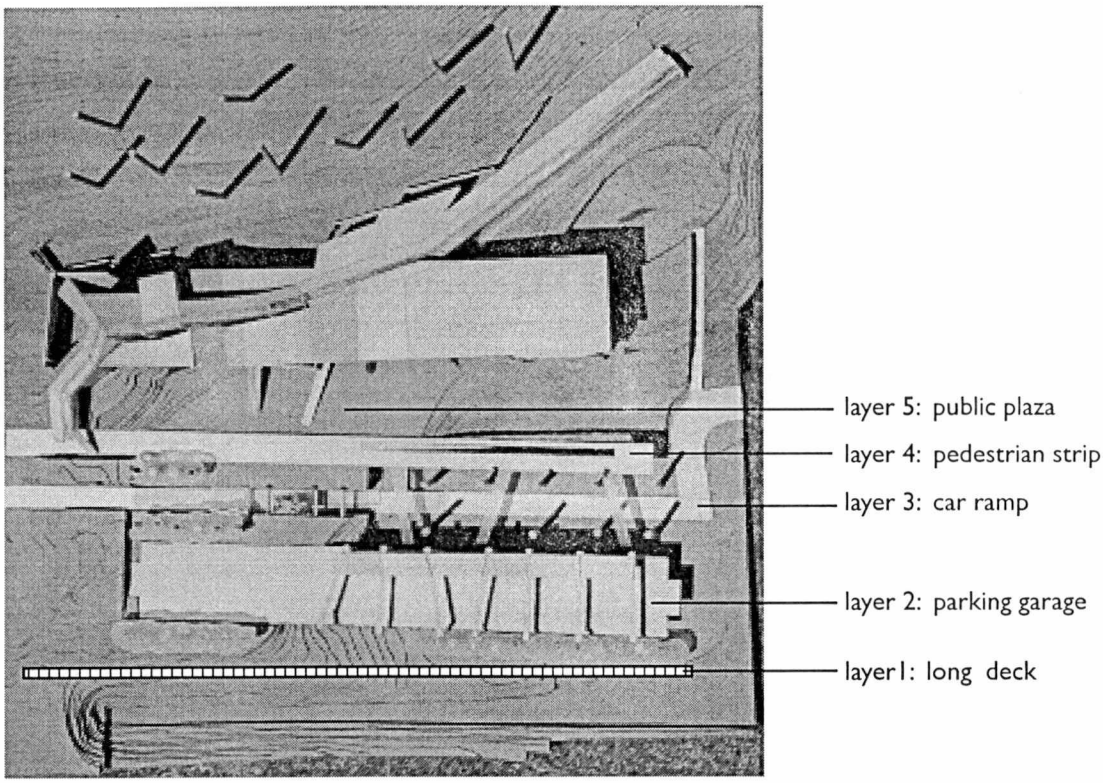


Figure 3 : Structure of the landscape constructed of five layers.

to happen. For example, the large void is cut with the heavy concrete zigzag wall, and meets the waving profile of the ceiling above it. The concrete zigzag wall has staircases attached to it and TV screens imbedded into the wall. The natural-artificial effects also occur in the library. During the day, the phenomenon of the sun at 8 a.m. penetrates into the zig-zag corridor through the skylight. During the night, the holographic projections to the outside pass above people who are walking in the corridor, piercing through the transparent wall onto a specific spot on the landscape (figure 4-5).

a. Resolving "past" - "future" activities for a library

In this library, activities are grouped into two separate divisions according to the different systems, the different tendencies of growth, different levels of the abstract, and different engagement to the universal. Even though both of those activities are current activities in a library, in this thesis one is called "past" activities and the other is called "future activities", in order to emphasize

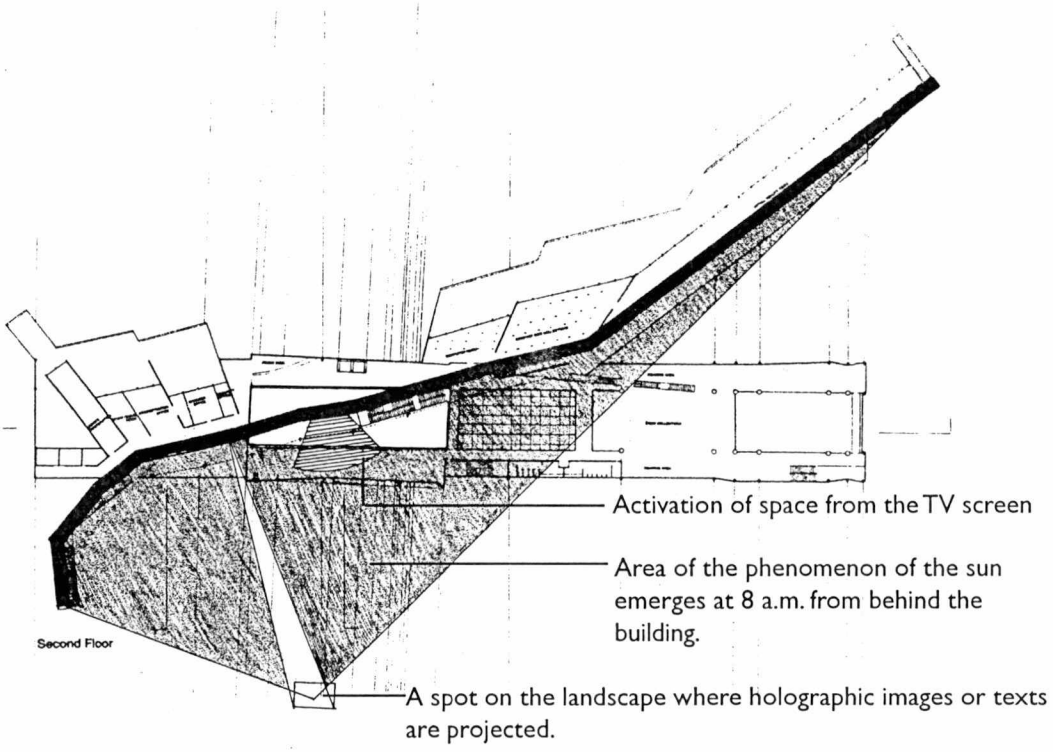


Figure 4: Interface between the virtual and the phenomenal in plan(horizontal section).

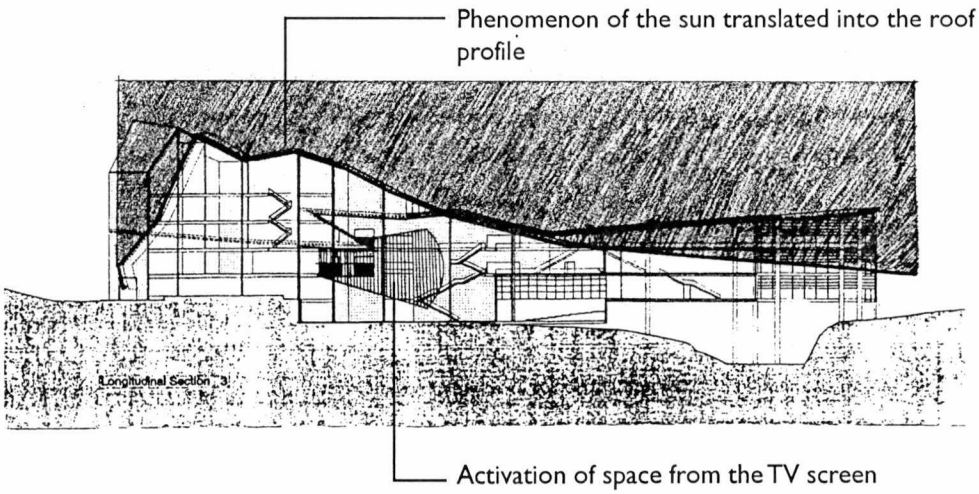


Figure 5: Interface between the virtual and the phenomenal in vertical section.

the tension between them and the role of time in the tension. The "past" activities include reading and carrel activities. The "future" activities include use of the computers, virtual reality, audio-visual equipment, and micro film.

The "past" activities are the non-electronic supported activities. They require a large space to store books and furniture, but they tend to grow slowly, even possibly becoming a museum in the future. As use of computers becomes more common, compact disks replace books for many purposes related to knowledge, storage, and use. The "future" activities are the electronic supported activities. They require a large amount of energy to run the equipment, but less space to store them. These "future" activities are currently growing in numbers of equipment and user demand. The different character of the electronic activities and the non-electronic activities require a different design attitude regarding building systems and flexibility. They are accommodated in two boxes. A less expandable rectangular box contains the "past" activities and an expandable zigzag box contains the "future" activities. There are tensions between the activities and their boxes and between the two boxes themselves. The "past" activities box appears as a high-tech, light box, and the "future" activities box appears as a low-tech, heavy box. These expressions are intended to remind people of the continuity of life. When they are engaged in doing the "past" activities, they are encouraged by the design to think of the future. When they are doing the "future" activities, they will are reminded of the past.

The activities collected in the two boxes of the project relate to and support each other. Spaces to accommodate them are to be connected through the overlapping and intersection of the two boxes. User circulation, activity grouping, and systems applications are major considerations in achieving the programmatic solution for the library. In the overlapping space between the two boxes, staircases, escalators and corridors are located to provide horizontal and vertical connections between all the functional rooms (figure 6).

b. Flexible and modifiable system

The library provides for a standard mechanical-electrical system and for additional wiring systems for the computers. The wiring system has become a necessity for current libraries that has to be packaged in a flexible and modifiable system... *Libraries are in state of flux. Once storehouses of*

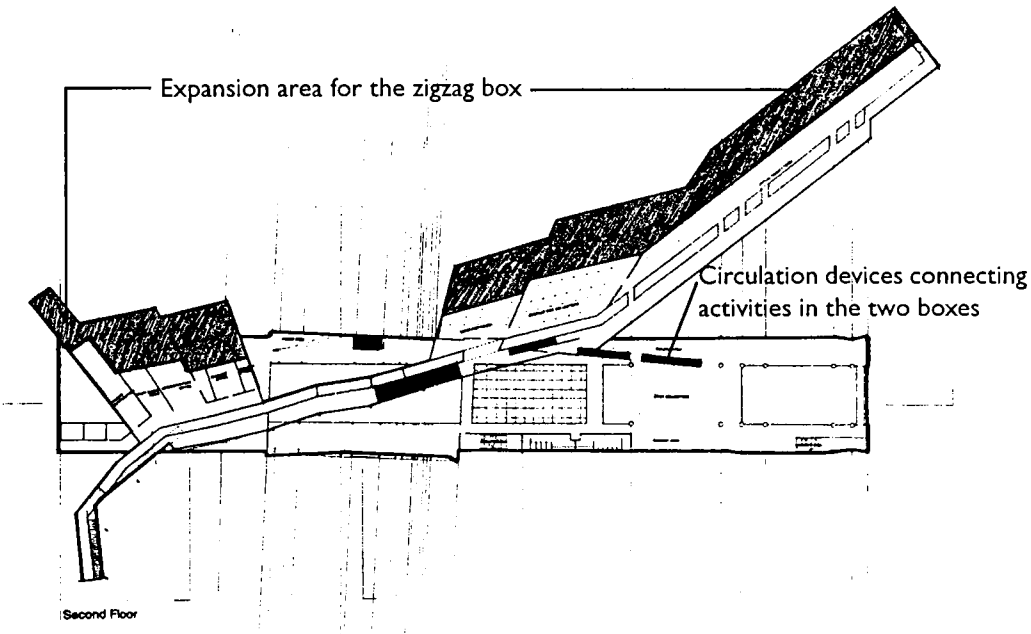


Figure 6: Expansion area for the zigzag box: Intersection between the xigzag (electronic sup ported) box and the rectangular (non- electronic suported) box.

printed material, they are increasingly incorporating electronic media to provide the public with the most timely information and research tools. As a result, architects equipping libraries with power and data receptacles at strategic locations so that staff can set up equipment as needed, patrons can plug in their own laptops at study carrels, and teachers can wire up hardware in conference rooms... Other architects have relied on alternative approaches that yield varying degrees of flexibility: running cable through spaces design between floor beams; threading wire through prefabricated channels within steel decking; and mounting conduit within off-the-shelf cable trays attached to the underside of a concrete pour slab. (Nancy B. Solomon, *Architecture* magazine, October 1995, page 115).

The mechanical-electrical system in this library is integrated to the structure of floors and walls. The flexible and modifiable system is proposed for use in the library and for expansion and changes in the future. The floor is made up of steel construction with a system of grid layers installed with as many electrical outlets as possible, so that it can be moved flexibly, and be accessible from the surface of the floor. It also allows the building to expand or contract depending on the future demands. All the rooms that contain electronic devices are one story or more above ground, providing easy access from below to the electronic network.

For the mechanical-electrical system, the building provides a doubled sided "negotiation wall", which crosses the "past" and the "future" activities boxes. The wall houses the major pipes, ducts and wires. The room between the two walls is about 6' wide and accessible for repairmen to walk inside it. From inside this wall, pipes, ducts and wires are distributed below the floors or above the ceilings so as to reach all rooms in the building. In some larger areas, steel columns enclose ducts and wires (figure 7).

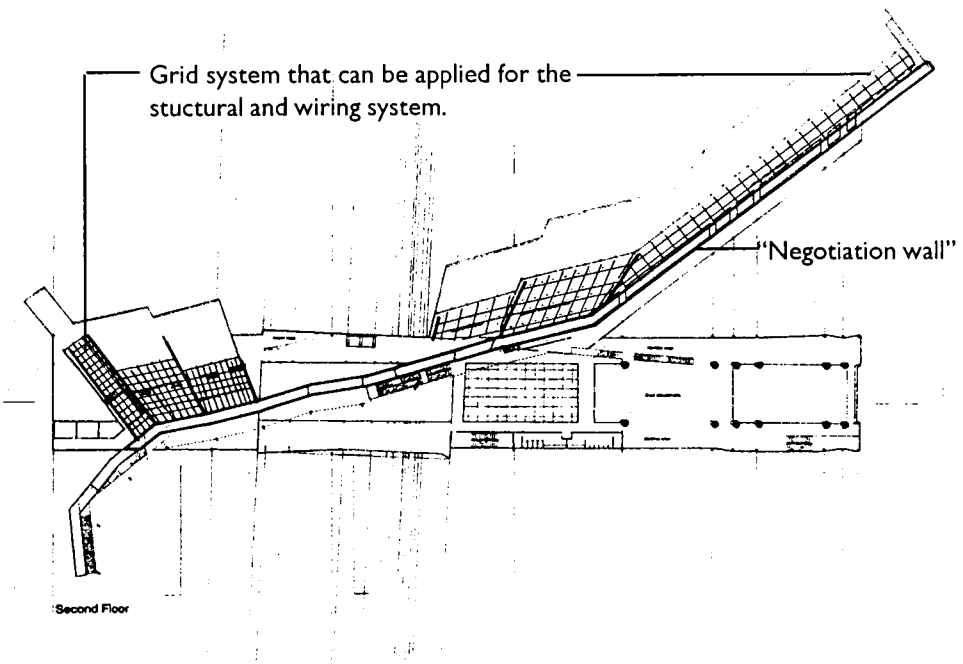


Figure 7: The "negotiation wall" contains mechanical-electrical devices to support the two boxes.

3. Square Footage Program

categorization:

- public library specialized in the subjects of art & science
- single control operation

task:

- answers the desires and needs of the contemporary society in finding their identity through the process of learning and expressing as the nature of human being.
- shows an enthusiasm and appreciation ofculture and civilization.

service range:

- assumption of 25.000-30.000 users from all around the neighborhood, the city and the world.

space classification:

- for library users
- for library collections
- for library staff
- for group meeting
- for mechanical operations

space estimation:

For library's users

SPACE OF ORIENTATION

activity	requirement	square-feet area
get information	counter (front) desk directory and TV screen	120 wall mounted
catalogue search	6 computer desks	180
entering collection's rooms for: books CD video & record microfilm	hall	500
relax	sitting room	200

SPACE OF "NON ELECTRONIC" ACTIVITIES

activity	requirement	square-feet area
reading	reading area for 50 people	1500
researching	carrels for 25 people facilitated with computers	1500 connected to the computer room

SPACE OF "ELECTRONIC" ACTIVITIES

activity	requirement	square-feet area
searching networks	computer desks for 10 people	300
using computer for 2D images	computer desk for 20 people	600
using computer for 3D images	virtual reality room for 20 people	800
using computer for research	carrels	(see the list above)
using audio-video tools	audio room for 10 people, possible for a group of users	300
	video room for 10 people, possible for a group of users	600
using microfilm	microfilm operating devices for 10 people	300

For library collection

SPACE OF "NON ELECTRONIC" COLLECTION

activity	requirement	square-feet area
finding periodicals	periodical section for approx. 20,000 volumes	2,000
finding books	book shelves area for approx. 30,000 volumes	3,000

SPACE OF "ELECTRONIC" COLLECTION

activity	requirement	square-feet area
finding microfilm	microfilm cabinets for approx. 1000 volumes	25
finding CD	CD shelves area for approx. 50,000 volumes	1,500
finding VCR and records	VCR shelves area for approx. 10,000 volumes	500
	record shelves area for approx. 10,000 volumes	500

For library staff:

SPACE OF ADMINSTRATION AND MANAGEMENT

activity	requirement	square-feet area
supervising	security control room	100
servicing users	counter (front) desk	(see the list above)
	reproduction room	200
administration	office room for 1 executive and 3 administrative staffs	400
resting	lounge, dining room and pantry	200
collection's circulating, cataloguing, duplicating, post and packing		600

For group meeting

SPACE OF FORMAL MEETING

activity	requirement	square-feet area
regular meeting	4 classroom with capacities of	600

	10 people each	
irregular meeting	auditorium with a capacity of 300 people	4,500

SPACE OF INFORMAL MEETING

activity	requirement	square-feet area
exhibiting the works of scientists and artists from around the world	exhibition room	3,000
refreshing body and mind	cafe shop	500
	public square and non-programmed space	determined by the design
	total :	24,525
	circulation 20%:	4,905 +
		29,430

For mechanical operation

requirement	square -feet area
mechanical-electrical room	as needed
fire stairs	as needed
restrooms	as needed
storage for stationery	as needed
storage for furniture	as needed
house keeping	as needed
parking area	as needed

IV. Site Analysis

Since computers free us of geographical restrictions, the traditional conception of strategic location with its emphases upon physical accessibility, topographical features; the surrounding district, etc was not a decisive consideration in choosing the location of a building. In the context of the city, physically and psychologically the hill on which the site is chosen is intriguing. It is part of the city, but it is not. Therefore, it is not too local. It has the best view of the city, but being forested, it is a site where nature has a strong presence. It is surrounded by the infrastructure of the city, but it has no clear access to it. The hill belongs to the city, but it is not yet developed. If the library is to be built on this hill, it is a challenge for the building to architecturally maintain the original character of the site while meeting the functional aspects of the building.

The program contained in the library occupies only a small part of the hill that is on the side of the foothill that faces the city. The hilltop remains empty in order to emphasize the existence of the hill. The existing topographical condition of the site is one of the definitive factors influencing the library. It gives inspiration to free forms and creates opportunities to demonstrate how present technology can address land. Removal of some vegetation and modification of contour lines are part of the design considerations.

The character of the site which primarily deals with the search for a form for this project is the landform. A distinct landform creates an interesting and unique relationship with an architectural object, creating a platform, where many possibilities of the complex relationship between nature - technology or nature - artifice can be explored. The convergent relationship between nature and technology in this project admits a cooperation and enhancement between the two in producing desired interactive spaces and programs for the inside and the outside parts of the building.

1. Existing Condition

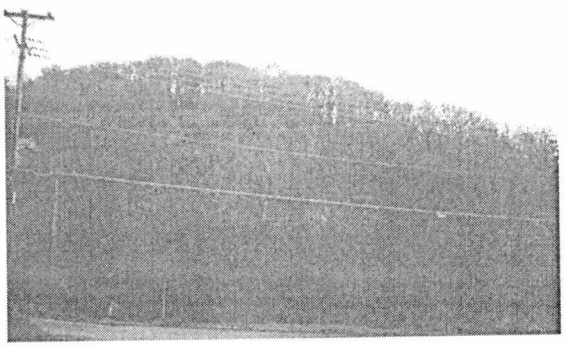
visual constraint between the city and the hill



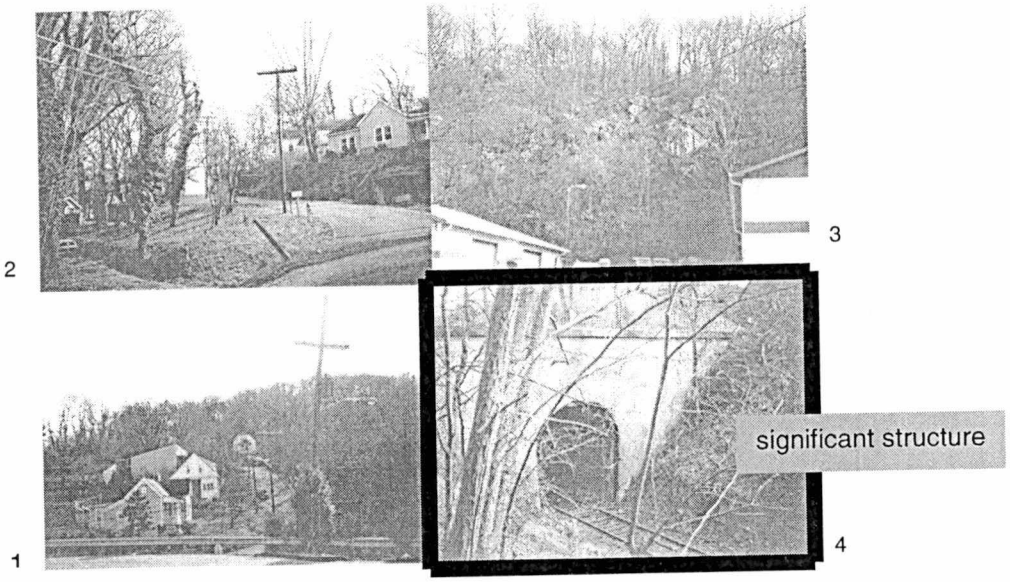
CITY

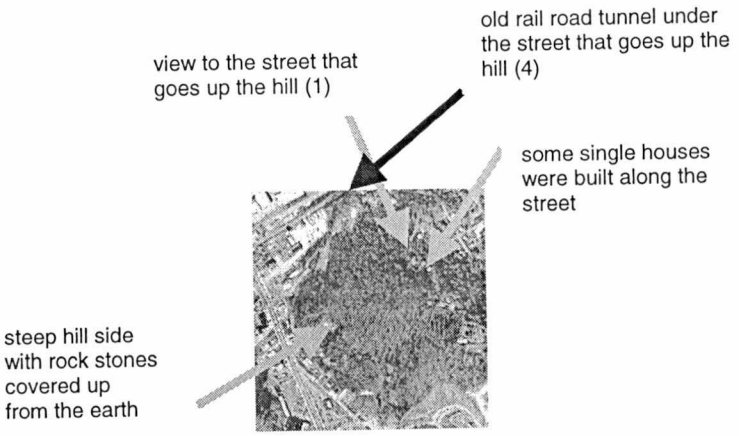
versus

HILL



Observation of the hill





Observation of the city



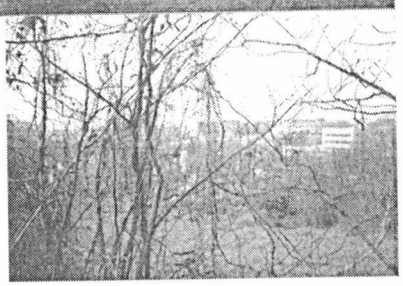
1

2

screened view

buffered sound

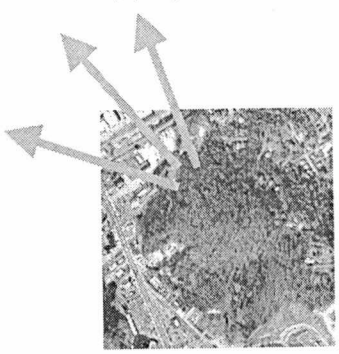
filtered light



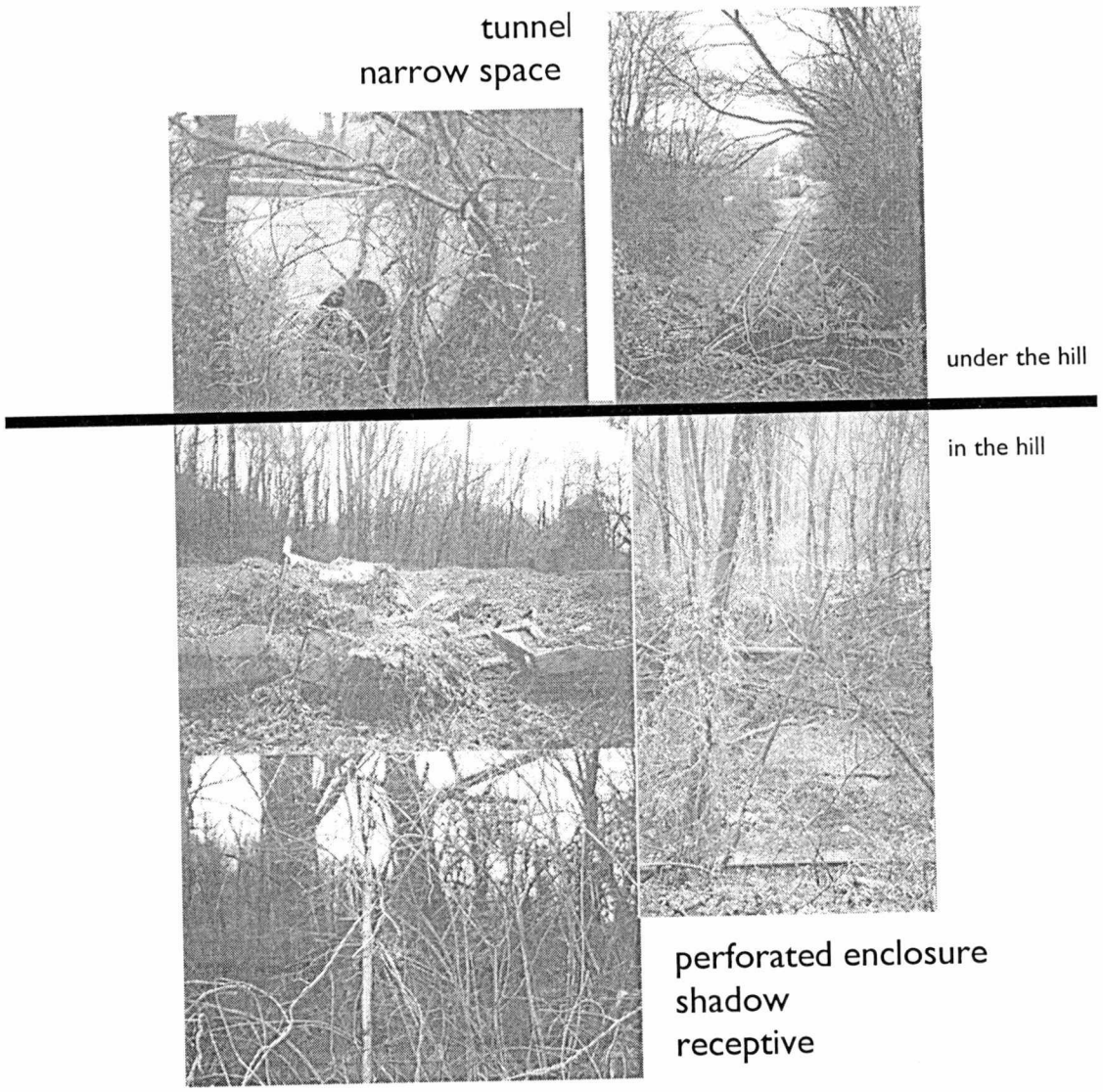
3

view to the city (2,3)

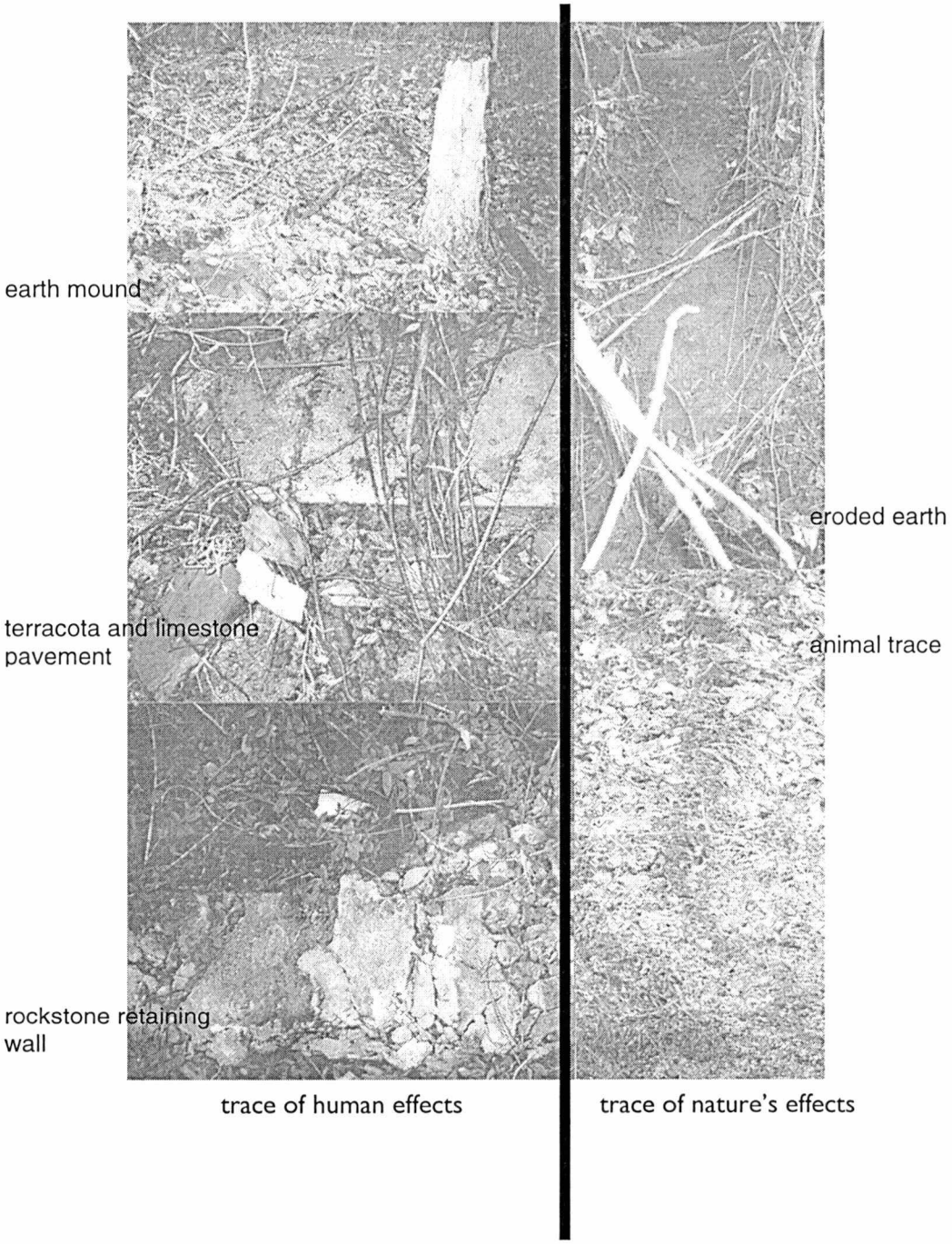
view to the university (1)



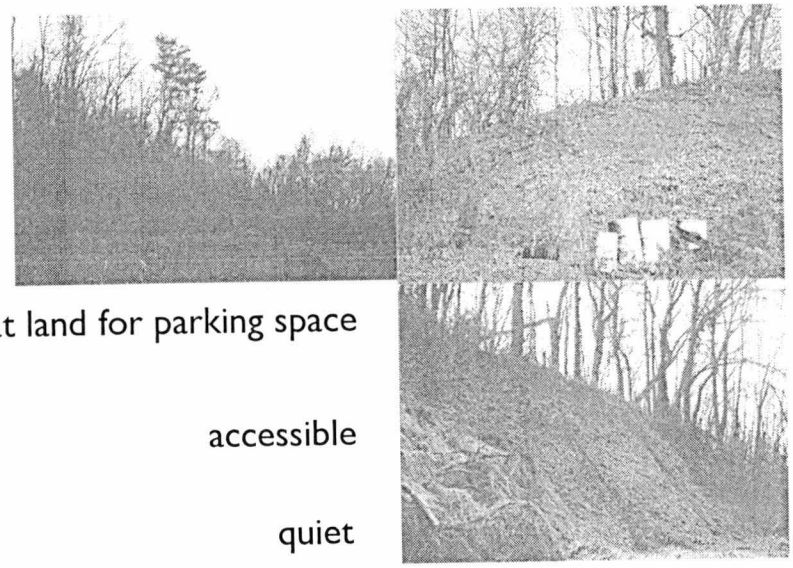
Characteristics of the hill



Detailed observation of the hill



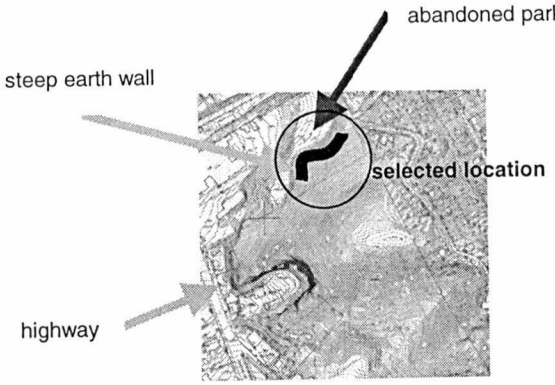
Selected location



flat land for parking space

accessible

quiet



2. External Forces

The strategy for analyzing external forces is to first make phenomenal observations of physical conditions in the surroundings. These perceptual understanding of its space are then translated into graphic representations through a measurement process. This process is based on the movement or non movement of the human body through space, the sensual perception of conditions by the human body and the intellectual understanding analysis and abstraction of sensual perception by the human mind. Distance, speed and time are components which generate the graphic translation.

The external forces come from nature and city which surround the site. Nature and city are considered as preexisting conditions that inform the development of order in the built environment (figure 8). In the analysis, the city is observed horizontally through a slow (walking) and a fast (driving a car) movement of the body. The observation examines the relationship of the site to the events in the city within the framework of distance and speed (figure 9 - 12). The graphic transformations of the city generate rhythms and volumetric manipulations of the building. The grid framework of the graphic representation generates the form and proportion of the rectangular box, while the rhythm lines generate the rhythm of the columns and the roof profile of the non-electronic box. Nature is observed vertically through the phenomenon of the sun. Based on a contour line that marks the line between natural and artificial land, the vertical measurements are taken on twelve points on the contour line. The height of each point marks the height of the sun at 8 a.m. for a specific day in every month (figure 13 - 14). These measurements generate the form and profile of the electronic zigzag box.

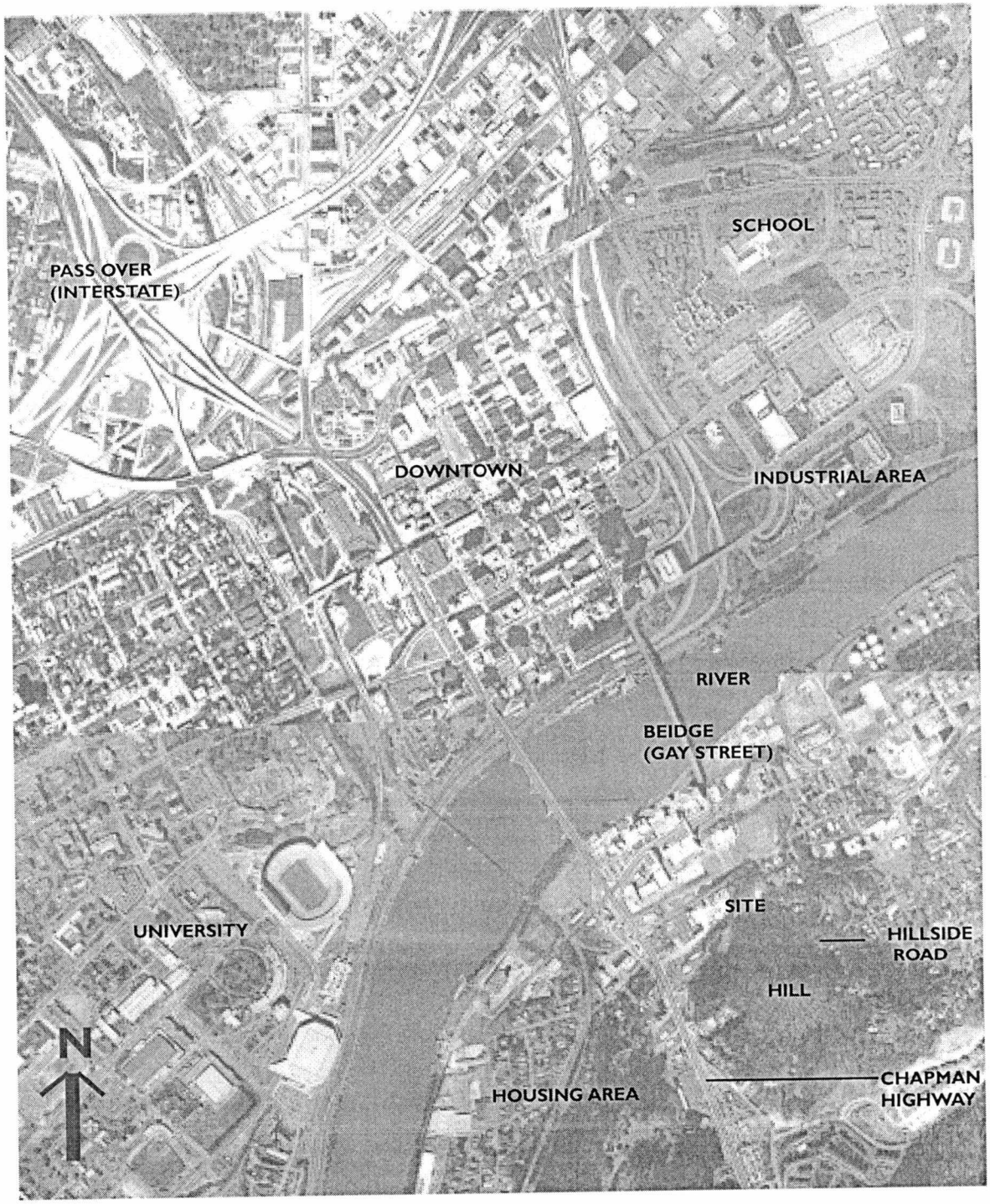


Figure 8: Areal photograph showing the location of the site in the city

a. Horizontal measurement of the city

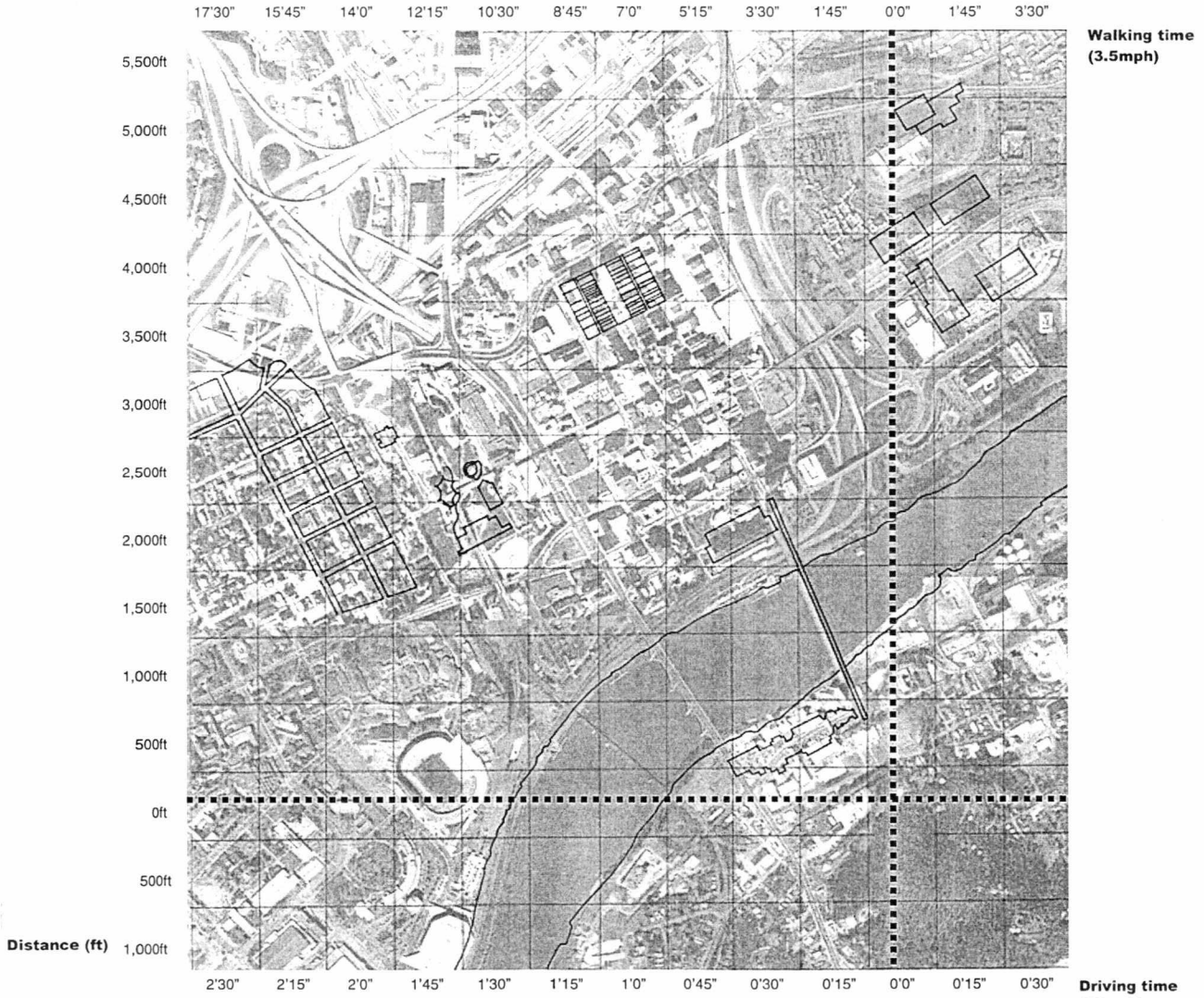


Figure 9: Events in the time-distance frame

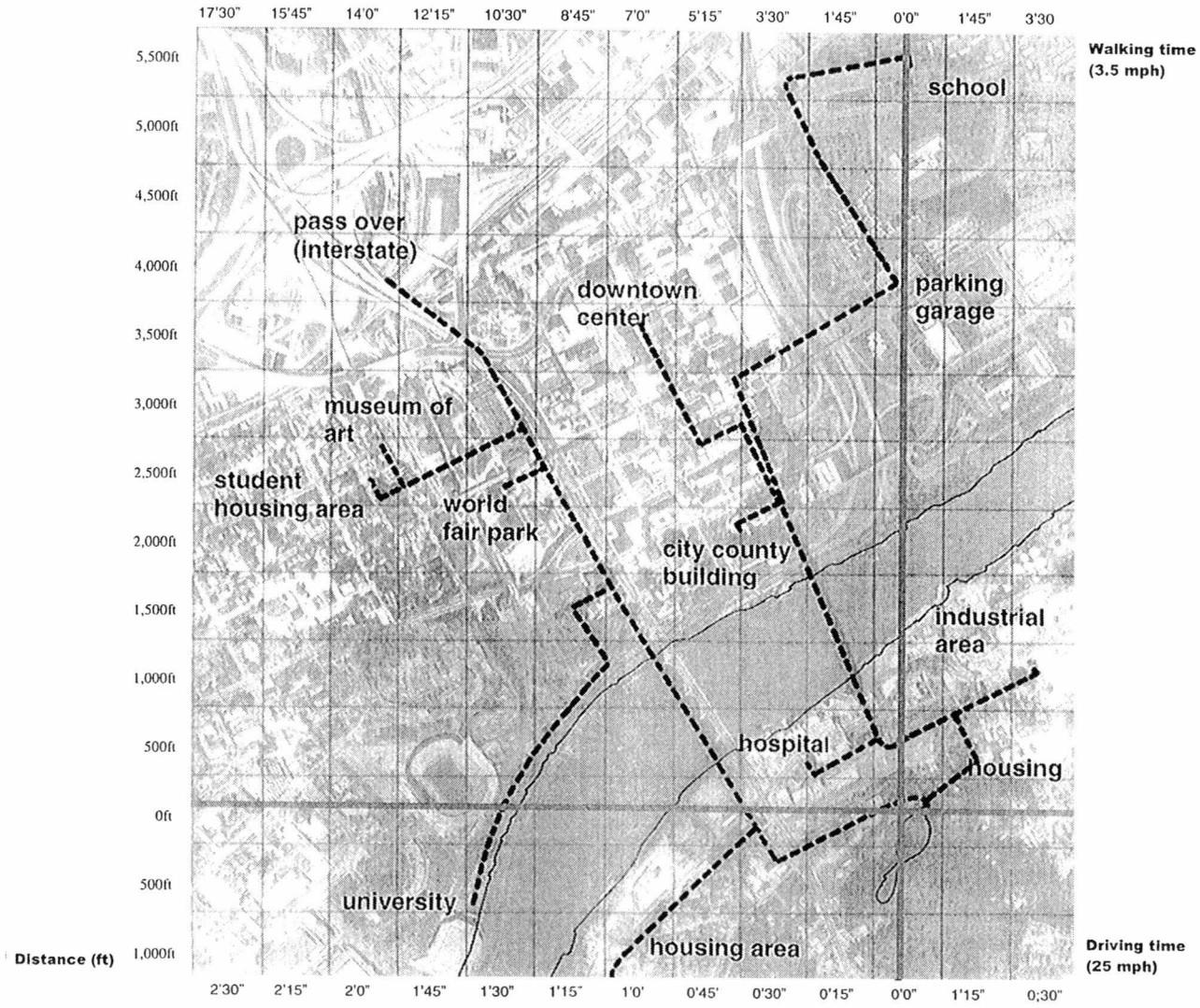


Figure10: Routes from the site to the important events in the city.

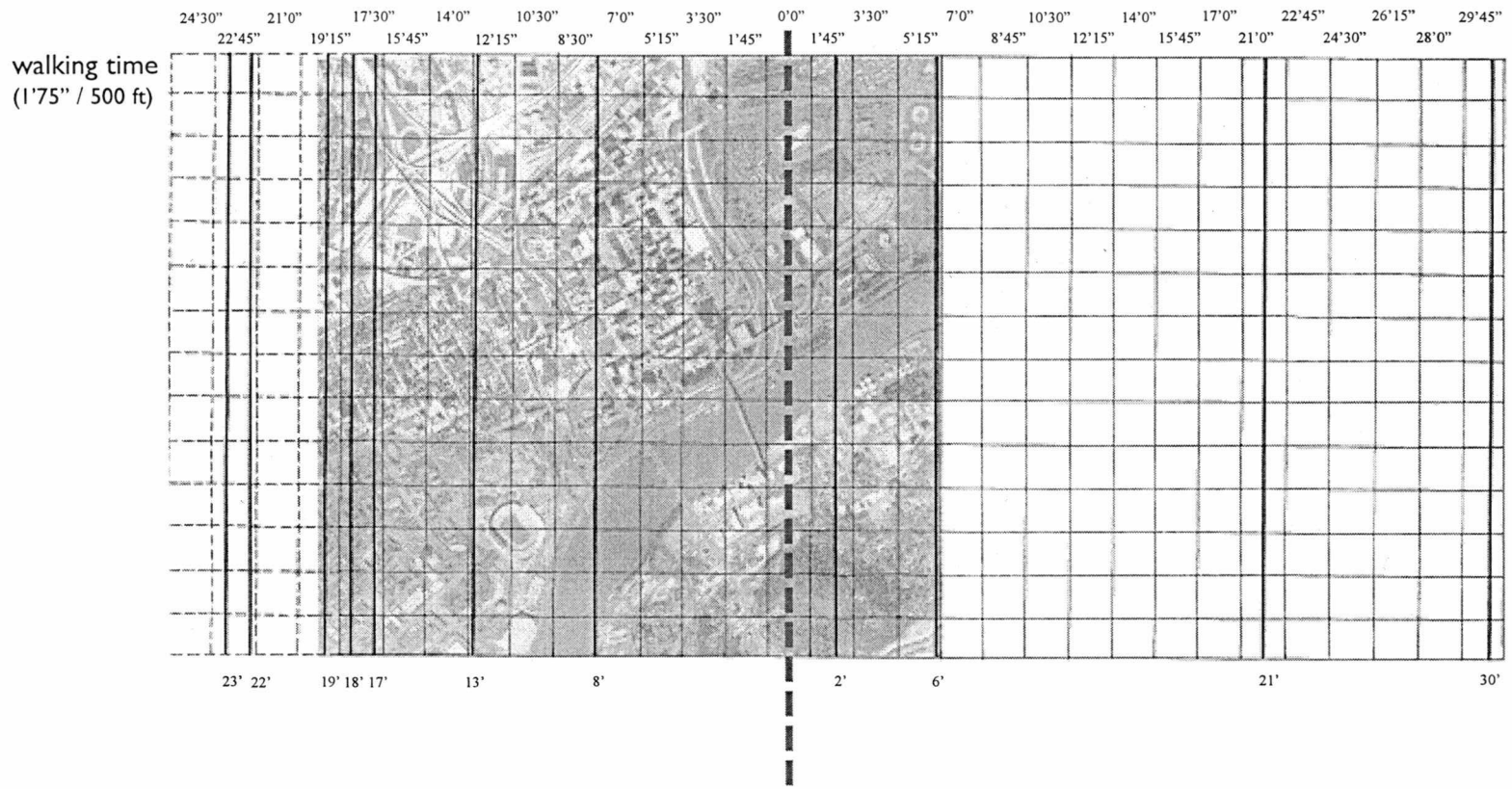


Figure 11: Rhythm of walking speed

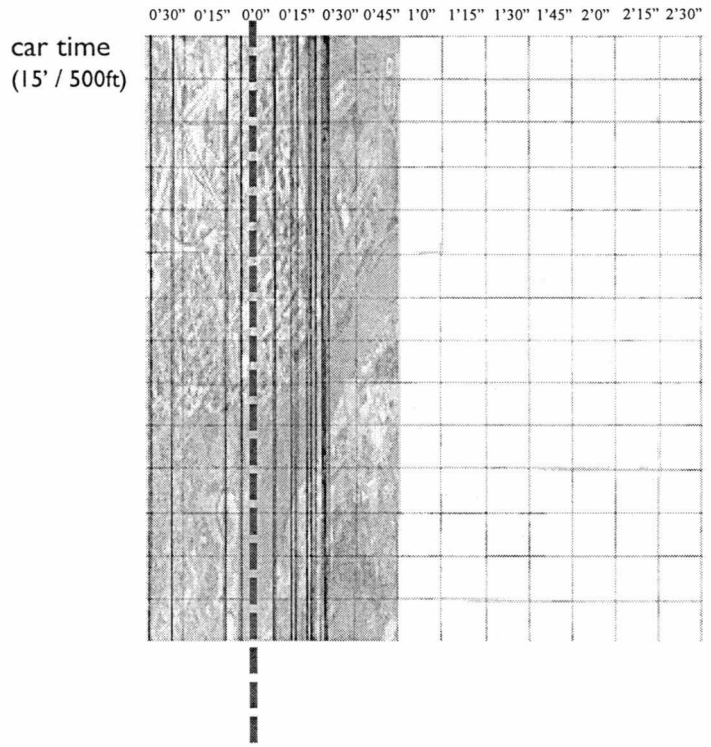
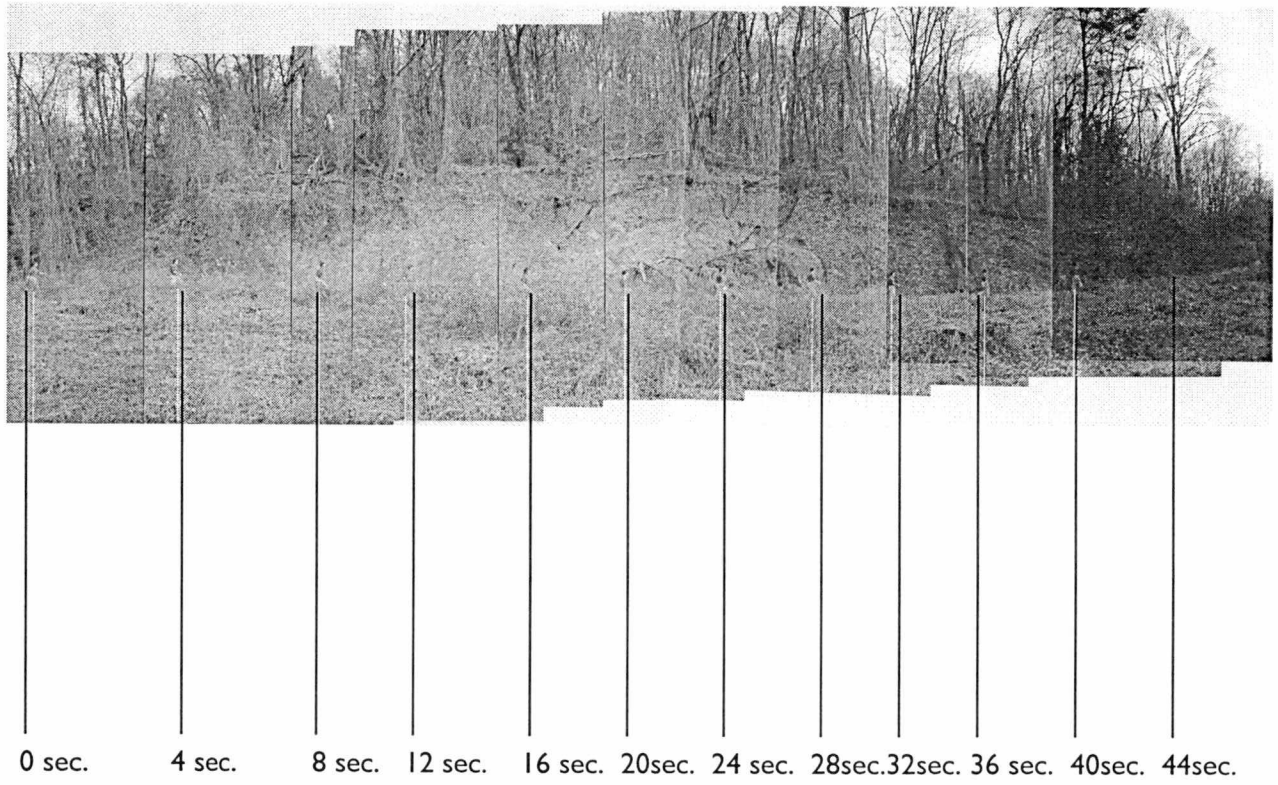


Figure 12: Rhythm of car speed

b. Vertical measurement of the sun

Vertical measurements are generated from the parameters of the universal and the natural, which are represented by the sun. The site is measured through one point of an observer's position with twelve points of experiencer's positions captured in photograph every 4 seconds along the site.



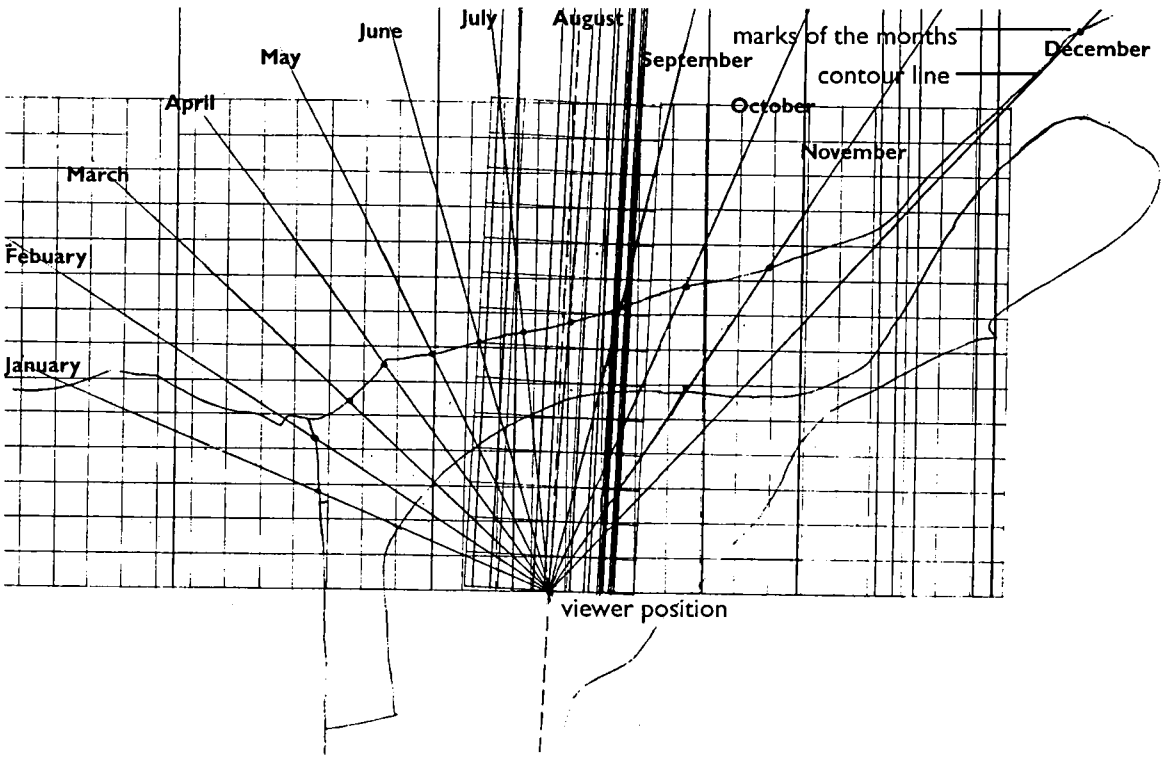


Figure 13: Marks of the twelve months on the contour line generated base on the same width of angle's divisions from the point of viewer position.

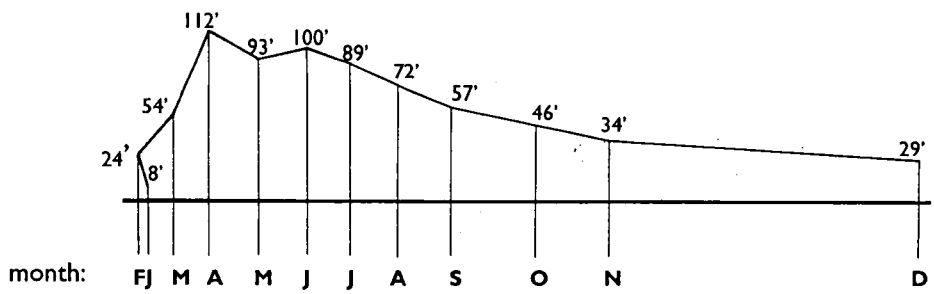


Figure 14: Graphic of the height of the sun at 8 a.m. from the viewer position

3. Internal forces

Internal forces are inherent in the idea of innovation and improvisation of the library as a place to engage knowledge and information. The analysis is focused on specific ideas which have the capacity to bring new meaning to the library.

a. Anticipation of a Global World

A library's purpose is to bring enlightenment to a society. In this project, the enlightenment is achieved through a progressive act of openness towards information around the world. Unlike the library of the past, the contemporary library is no longer a solid entity that contains permanent information from books. The library has to become a place to reach out to the world in its most actual moment. Therefore, the contemporary expression of the library explored in this thesis breaks down the idea of solidity, becoming transparent and penetrable. This library is not a passive storehouse of information that people to come to only if they need to collect some information. It actively invites people to come through its projection of the inside outward, offering unexpected knowledge and new experiences every time they are in the library. This mission demands that the library become more than a warehouse of information and knowledge: the library should be enriched in order to become a place for the engagement of information and knowledge. Regarding the location of the library, it is expected that the library can become a new source of energy that motivates people, and brings the city into the network of a global world (figure 15).

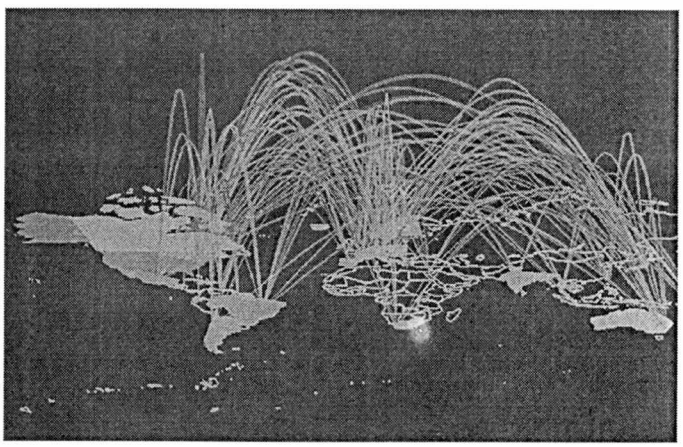


Figure 15 : Internet network in all around the world that enable us to reach the global world from a particular place.

b. Movement of Users in the Building

The human being as the user of a library is an important internal force that helps generate the design of the library. Users in the library are grouped as visitors or staff. They have different purposes and motives for their movements and activities in the building. Movement of the staff is more limited to specific areas around the administrative office, and they need a practical solution for circulation. On the other hand, movement of visitors is more complex and requires variations and multiple choices.

In this library, visitors are given the choice of using many kinds of circulation devices, especially for the vertical connections between spaces. There are elevators, escalators and staircases. According to the idea of bringing together nature and technology, there are a mix of human powered and mechanical types of movement in the building. Elevators and escalators are types of mechanical movement and staircases and corridors are types of human powered movements. These circulation devices are directed to become facilities that enhance a visitor's experience of the space. With staircases and corridors, visitors are encouraged to sense their body movements while experiencing the space. In contrast, visitors can also rest their body while using elevator and escalator in experiencing the space. All those circulation devices are wrapped with transparent materials or open structures to allow for the widest visual range to the space as possible (figure 16).

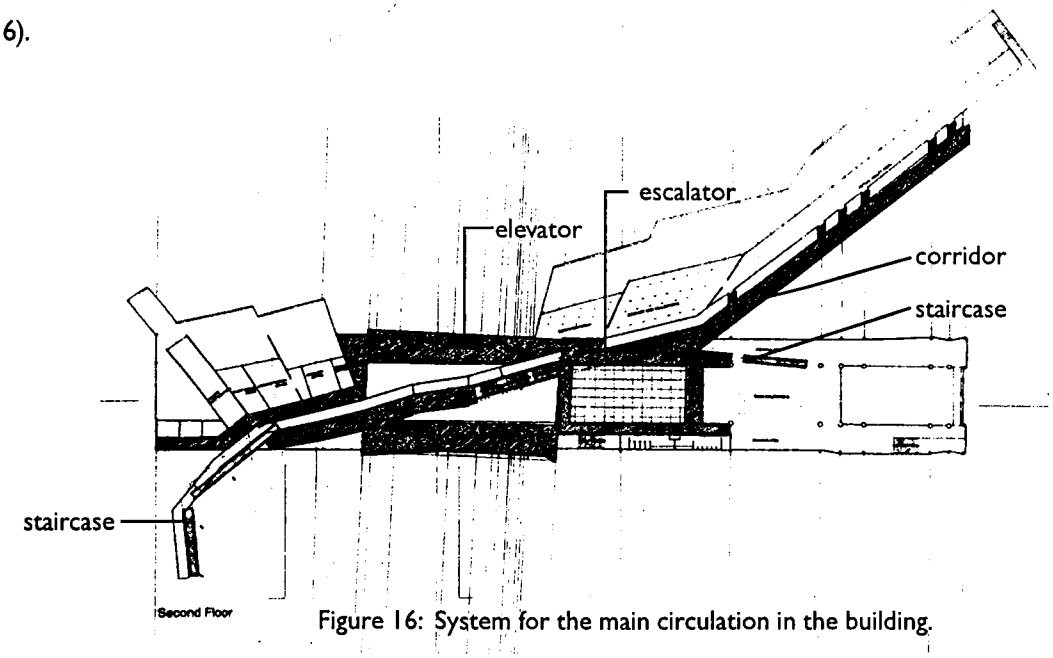


Figure 16: System for the main circulation in the building.

V. Design Investigation

The design investigation is done through a process which involves imagination (object study and spatial study), interpretation (underlying structure) and deliberation (placement and order). This method of design attempts to integrate the architectural issues, programmatic issues and site analysis into a formal actualization. In reference to the thesis idea of separation between the inside and the outside, the investigation primarily separates the study of the exterior surface of the building from the interior space.

1. Object Study

The object study is a means for obtaining inspiration about the three dimensional form of the building. During this study, the focus is only on the exploration of the outside. This study is done by building an object that has a particular function, exploring conceptions and ideas possible for the library project. This conceptual model intends to extract personal ideas for better understanding and for translating the imagined into the reality. During this process, the energy involved is mainly for creation. There is no restriction on thinking about the volumetric requirements of the spaces or building codes. During the study, materiality, tectonics and shape are brought about and experienced through the process of making and constructing. Treatments for the ground, for the wall, for the roof, for the back and for the front are experimented within this model (figure 17).

2. Spatial Study

The spatial study explores spatial quality in relationship to the activities accommodated in the building. The process is done by drawing and constructing images of the spaces while imagining the activities happening there. The drawings depict major spaces, programs and equipment embedded in the building. The goal is to capture the complexities of space, program, movement and installation in bringing life to the inside of the building (18 - 22).

3. Underlying Structure

Three underlying structures are generated from the site, program, and issue analysis pro

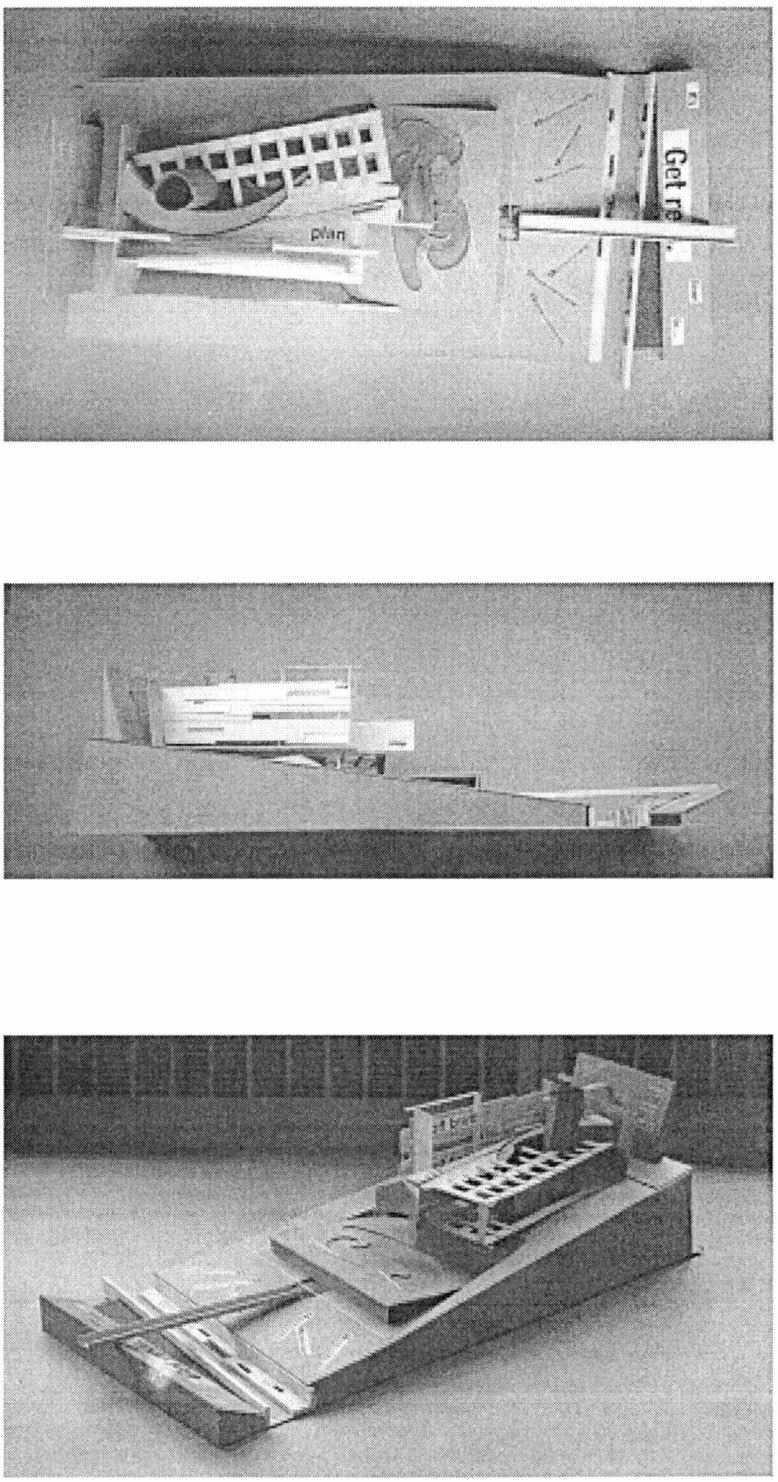
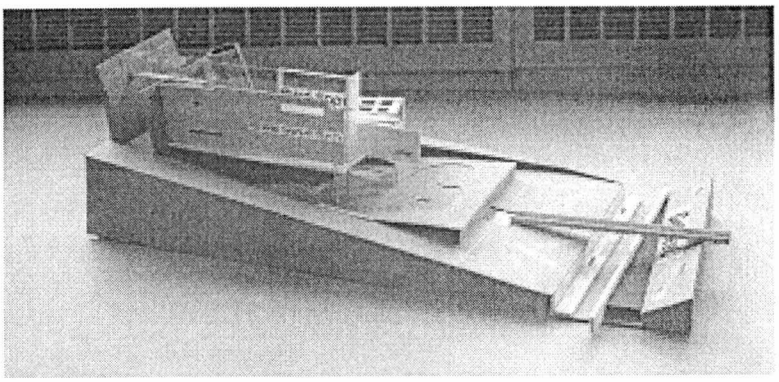
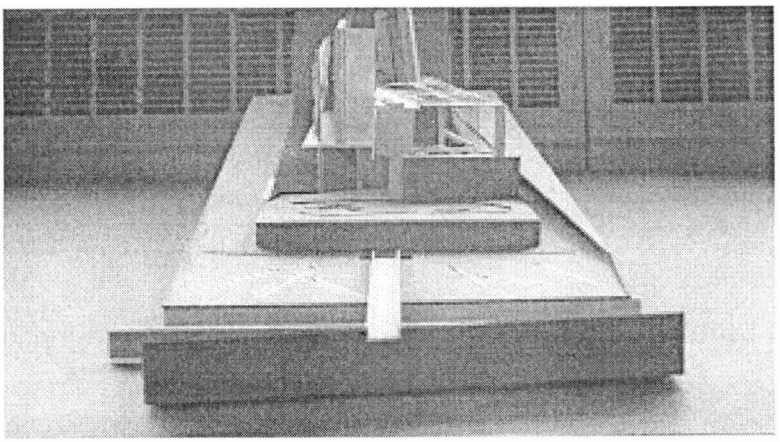


Figure 17: Three dimensional model of the object study from many different angle of views.





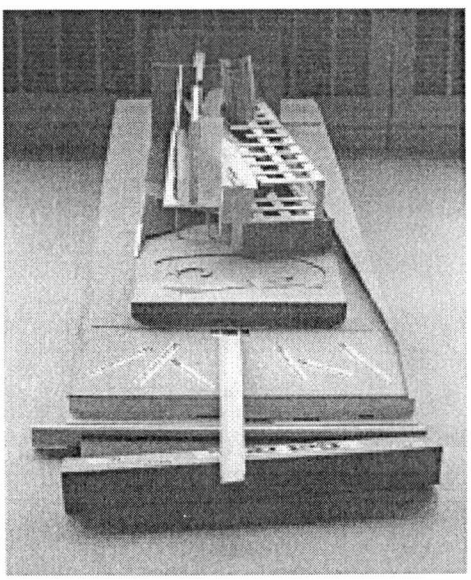


Figure 17: (continued)

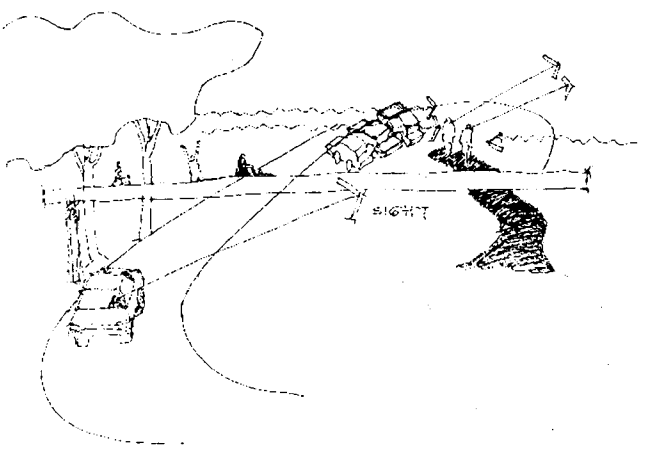


Figure 18: Outdoor arrival space.

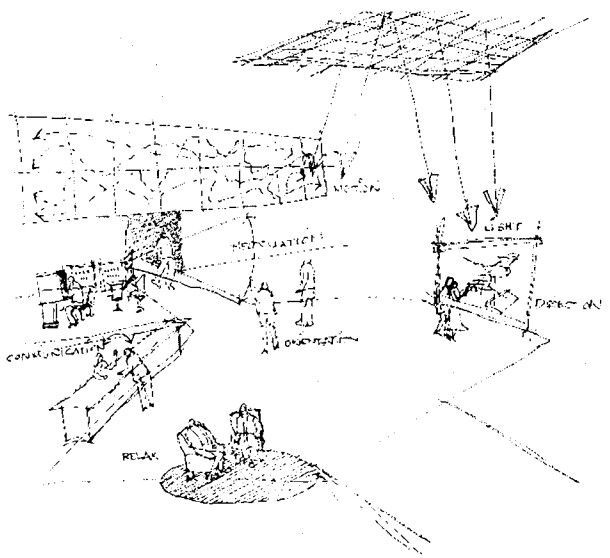


Figure 19: Indoor arrival space

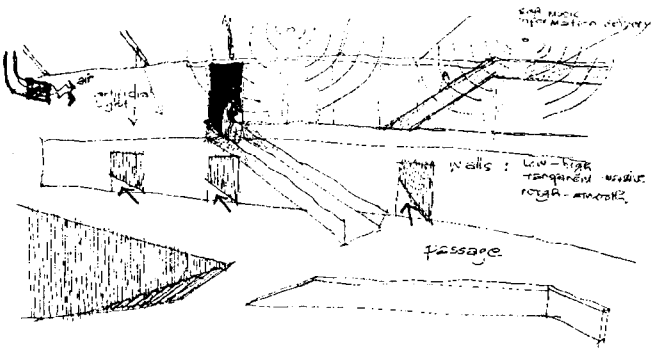


Figure 20: Movement, destination and space activation.

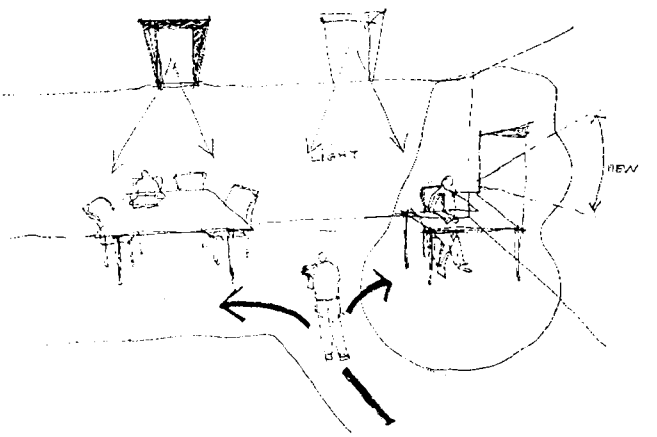


Figure 21: Space of the "non-electronic supported" activities.

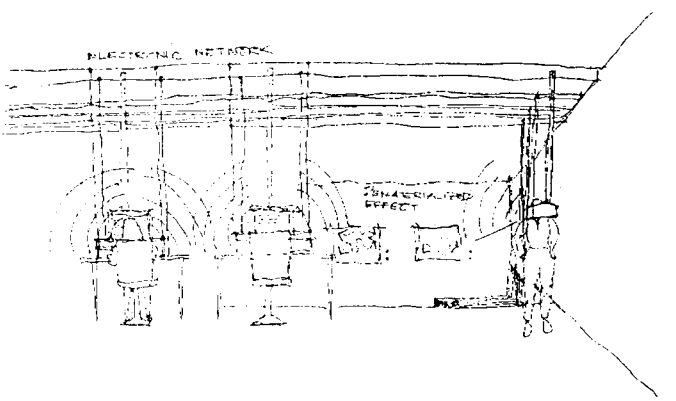


Figure 22: Space of the "electronis supported" activities.

cess: the grid framework, the rhythm lines and the sun-graph. These structures are applied to the design through superimposition, shifts, and enlargements to establish appropriate dialogue within the existing conditions. The grid determines the proportion of the rectangular box that contains non-electronic activities for the library. The enlarged grid pattern establishes the order for the landscape. The sun-graph determines the roof profile of the zigzag box that contains electronic supported activities. The rhythm of walking speed extends roads in the old city and the rhythm of car speed extends the bridge axis (Gay Street) that points to the hill (the site). They become the rhythm of columns in the building (figure 23-27).

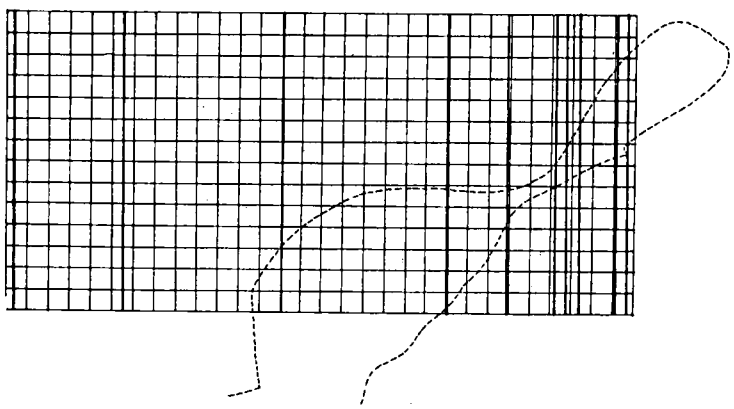


Figure 23: Rhythm of walking speed on the grid framework

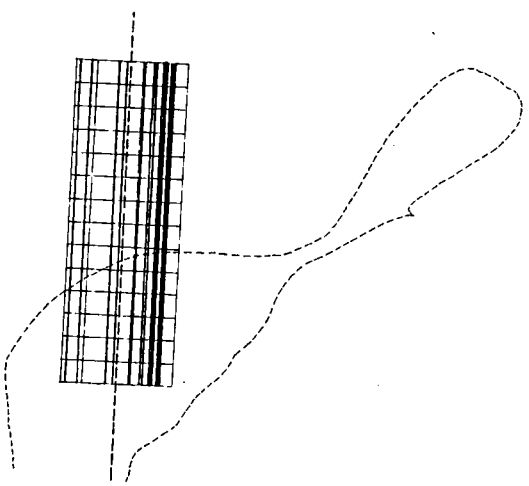


Figure 24: Rhythm of car speed on the grid framework

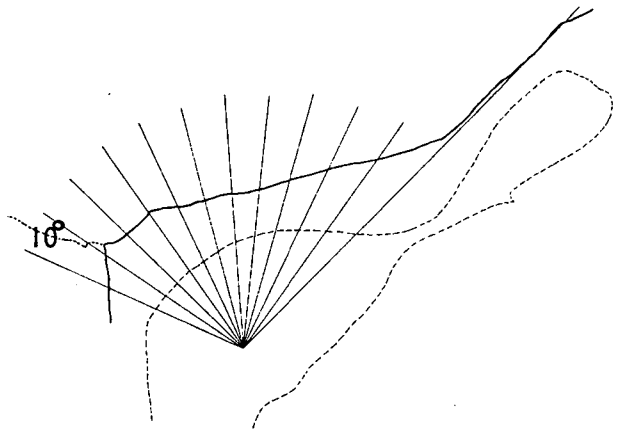


Figure 25: Twelve markers of months on the contour line.

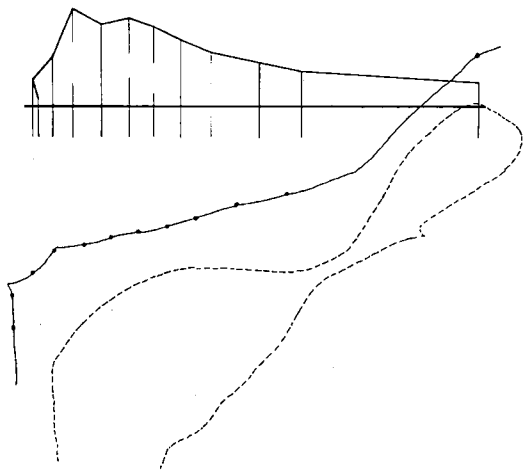


Figure 26: Roof profile generated from the measurement of the sun angle.

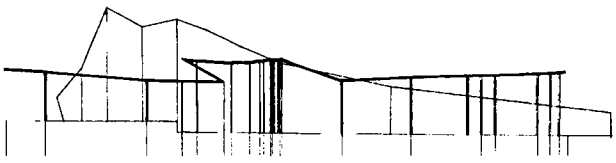


Figure 27: Roof profile generated from the measurement of the walking rhythm and the car rhythm.

4. Placement and Order

Each box delivers information in a way that is appropriate to its placement in time and technology. The building is placed at the top of a steep cut at the edge of the hill which marks the line between the disturbed (artificial) and the undisturbed (natural) areas of the site. This placement creates a space of approximately 40' between the first floor of the building and the landscape in front of it. The landscape is experienced as a patterned rug from the building, and the building is experienced as a huge wall from many spots in the landscape. This relationship of wall and land allows the building facades to be developed as patterned and engraved screens which deliver information from the library to the outside. On the electronicly supported box, the information screen is made of two layers. This screen wall is animated by the projection of images on its concrete wall and a transparent layer in front of the concrete wall. Its surface is a highly animated display that delivers messages during the night. In contrast, it becomes a non-animated qualitative surface in the daytime. On the non-electronicly supported box, the information screen is printed with permanent, fixed messages and has fixed openings to allow symbolically for asorption of information from the outside of the library. These fixed openings are round in shape and appear like peepholes from the inside. The peepholes on the rectangular box are a door to local phenomena, whereas the zigzag box needs no peepholes since the universal world transmits information through supra-human means, such as through satellites. (For example, through means of the 85 foot diameter satellites of the Very Large Array at the National Astronomical Research Laboratory in New Mexico, astronomers are able to learn much about the universe).

The positioning of the building between the natural and the artificial part of the hill makes a stitch on the land. The zigzag box (electronic supported box) is placed on the line which marks the boundary between the natural and the artificial. The rectangular (non-electronic supported box) is placed across this line. The stitch interlocks the natural and the artificial, and units them in a concurrent manner. The zigzag box emerges from the land as a heavy mass made of concrete while the rectangular box is expressed as a light mass made of steel frame and aluminum sheet, floating above the ground. The composition of the masses, perceived as light on the bottom and heavy on the top, reverses the natural order, revealing the possibilities of the operation of a new technology and the spirit of displacement (figure 28 - 30).

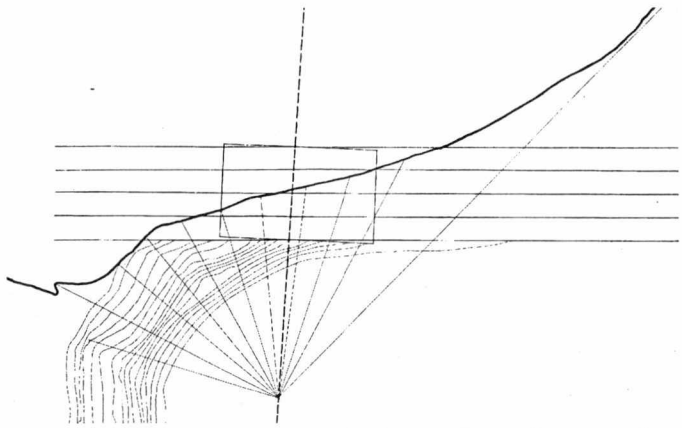


Figure 28: Marks for the position of the boxes that makes a sticth on the land.

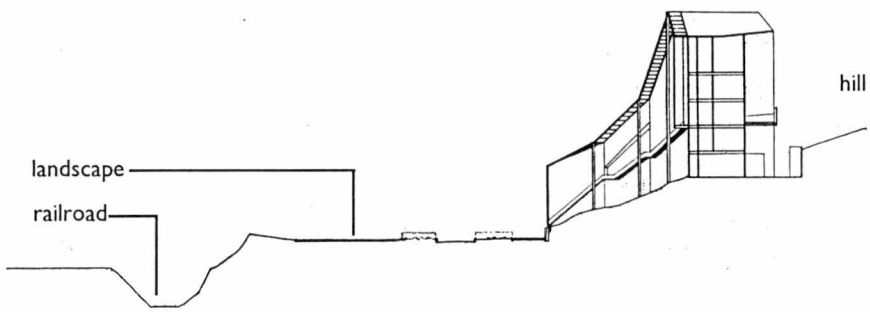


Figure 29: Cross section of the building shows the visual relationship between building and landscape

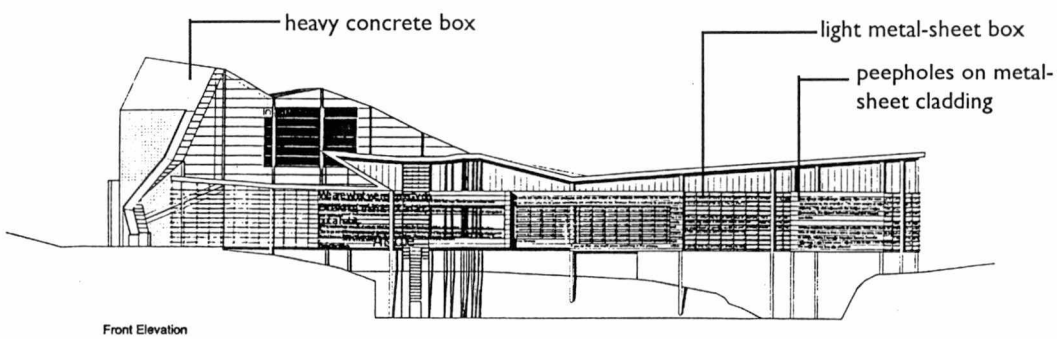


Figure 30: Heavy vs. light expression of the two boxes that against the gravity perceptually.

VI. Study case

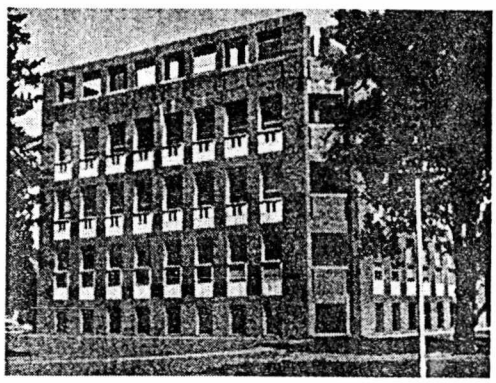
1. The Library of The Phillips Exeter Academy

Exeter, New Hampshire (1966-1968)
Architect: Louis I Kahn

This library explains the design's attitude of Kahn as a critical modernist architect. His works are the least imitated ones compared to the other pioneers of Modernism such as Mies Van der Rohe, Le Corbusier and Frank Lloyd Wright because of his willingness to search for a new language for each of his buildings. His work always starts by identifying the aim of the project, and tries to capture its essence and soul by letting them inspire the design. The importance of meaning, function and form together are more important in generating the rich expression of his building, than are a simplicity and flexibility of language which could encourage imitations. For Kahn, form is the final result of an architecture that synthesizes the architect's understandings and aspirations about making a building and is shown in a private visual language. According to his words:

> *Form is what. Design is how...Design is a circumstantial act; how much money there is available; the client; the extent of knowledge. Form has nothing to do with circumstantial conditions...It characterize a harmony of spaces good for a certain activity of man.*

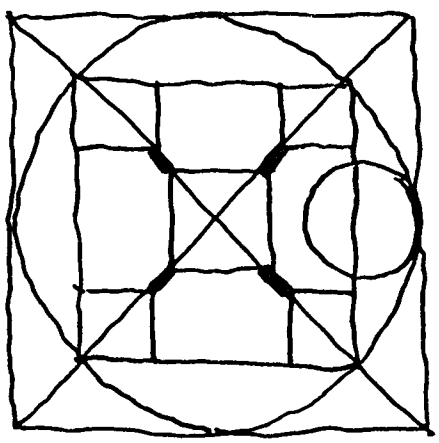
A library for Kahn is an inspirational home for both books and reader and plays a role as a storehouse of books and learning. Some old pictures and his admiration of medieval libraries influenced his recognition for the spirit of library. It was because of his big interest in the values of ancient aspects and his effort to reveal them in his architecture that his works are often categorized as having a primitive quality. History combined with intuitions are the source of inspirations and contemplation for Kahn.Vision of the future and critical condition of the circumstances could also be sources. However, as we learn from Kahn, the important thing is how to transform our personal recognition of the building's soul into a language of architecture that is in accordance to the circumstantial time. Material chosen, articulation of structure and orchestration of light are major aspects of Kahn's vocabulary development that have always been seen in all of his built projects. Form is his framework in which he can apply his vocabularies within architectural grammar, and compose a poetic architecture.

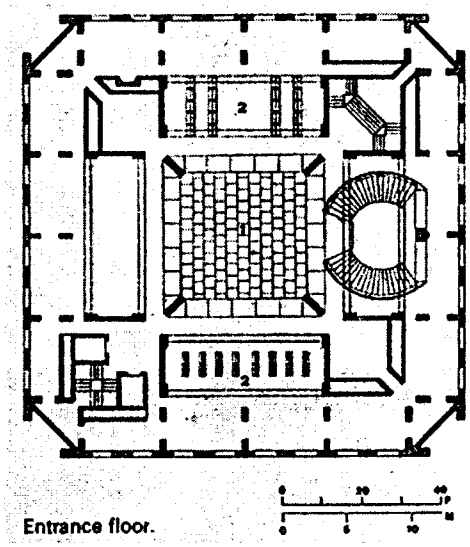


Form and Language

Using his ideal formula of a ceremonial central space surrounded by smaller more private spaces, the library was developed through a manipulation of pure geometrical forms to fulfill his aspirations of what a library is. His form is generated from intersperses between square and circle. Not only the figure of geometry appears as the physical component of the building, but the principles of that geometry also generate the ordering of the components. The influence of classical orders apparently emerges in his arrangement of columns, symmetry and strong central organization. However, through a new concept of material and light penetration, the classical language has been able to be transformed into the personal language of Kahn.

His language is somehow developed under the Modernist spirit of the time in which everything has to be reinvented and the origin found. Primitivism and especially the ancient symbol of light in Egypt became the beginning of his architecture. Through his meditation of light then came the presence of material and the search for the soul of a building. The form was then coming through his intuition, his ideal imaginary and his spatial experience to be manipulated by his talent to create an extraordinary space. All the elements of his architecture are then speaking in his language.





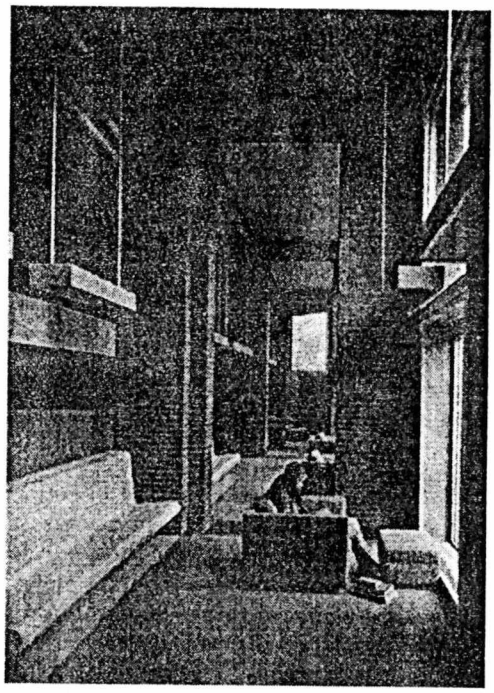
Entrance floor.

Material

In the Philips Exeter Library, the use of two major materials of brick and concrete is an expression of a tension between past and present that Kahn believed to be the essential components of his library. According to him:

> *Wall-bearing masonry with its niches and vaults has the appealing structural order to provide naturally such spaces (for reading). Concrete and steel, the obvious economical form making system of our time, are natural to big openings, not harbored little spaces.*

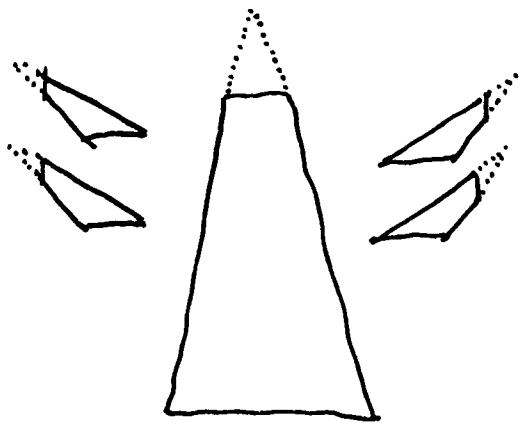
Material is one of the expression tools for Kahn that speaks for the soul. The understanding of materials and their sensitive impacts work together with his intuition in building "a space" He said: *We see what is beautiful in the material first in wonder, then in knowing, which in turn is transformed into the expression of beauty that lies in the desire to express.* Brick walls become the outer doughnuts for the building in which carrels providing private study space for students are set behind them. Concrete walls are the inner doughnuts that carry the rows of book stacks in them. The logic of construction and the nature of material are the objective behind those decisions.

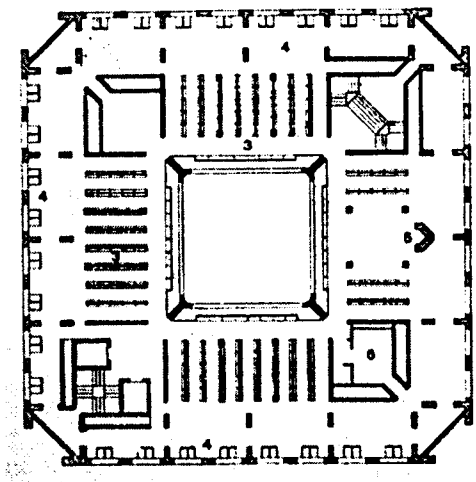


Light

Light is critical in bringing about the religious overtones of the central hall and the dormant nature of the study carrels, where the play of natural light contributes a dramatic effect. Kahn distinguished the direct "white light" that penetrates through the windows to the study carrels and tables along the outer sides of the central hall from the "blue light" that penetrates to the hall through the skylight. The color tones and the direction of where the light comes from determine the quality and sensual effects of the space. Kahn meant for the blue light to dramatize the student's encounter with knowledge and truth, as an individual is alone when he/she is in the hall. After the student chooses a book from the stack, he/she emerges in the more prosaic white light of the study carrels, as Kahn described it.

Light is the qualitative part that works together with the structure and order of materials in generating a room. The structure gives a substance to the light and the order of material animates the light. Shapes, repetitions and solid and void in the structure illustrate the light, whereas textures, depth, thickness and relief of the material excite the light.





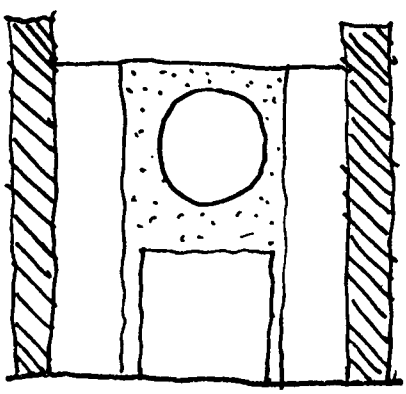
Third floor.

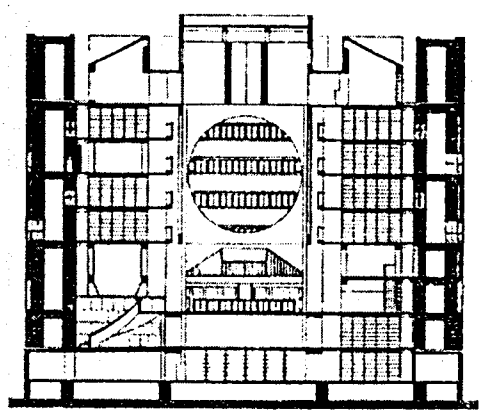
Structure

Kahn's language is very direct and pure, which goes along with the spirit of Modernism; however, his honesty in the expression of structure makes him distinct and personal in his architecture. His originality in treating structure and working out of natural light in the buildings has taken him beyond Modernism. His comment for Mies' Seagram Building in New York has explained that part of him is confronting ideas in Modernism. He called the building ***"a beautiful lady in corsets"*** in reference to the way Mies had concealed its diagonal wind-bracing members under the exterior skin. For him, the uniformity and perfectness in the appearance of the Seagram Building is dishonest. He said:

> ***The columns, which are on the top, should be dancing like fairies, (and) the columns that are below should be groaning like mad, and not have the same dimensions.***

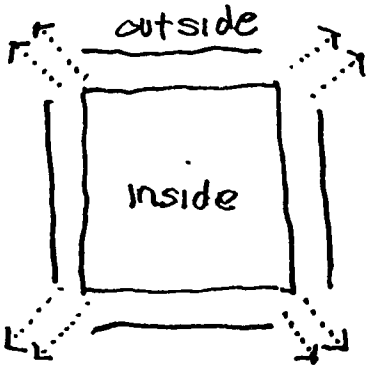
Structure for Kahn should reflect the logic of natural phenomena. Gravity effects, force distribution and material strength determine the constructional logic, structural tendency and dimension of the over all system of structure.

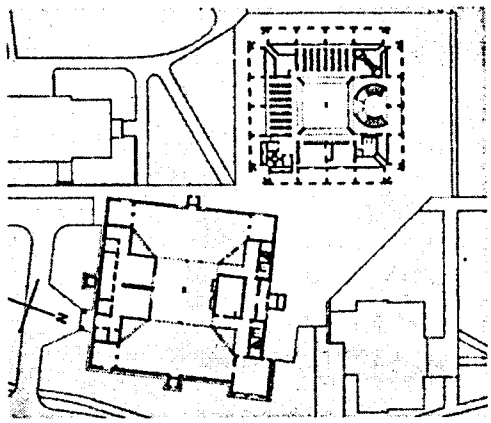




Wall and Enclosure

Kahn's treatment of the walls is ingenious. In the concrete walls of the inner doughnuts, big circles cut out the walls, reflecting the effectiveness and efficiency of the modern construction. Behind the circle voids are concrete slab floors and rows of book stacks that give a piranesian effect of the space. The effect works as well as the ornamentation that might appear if the library is a classical building. The corners of the brick walls are treated in a very special and subtle manner that results in a very sophisticated detail. The cutting corners offer a curiosity and also give clues to the viewers of what is behind the brick walls. The noticeable thickness of the space behind the brick walls gives an impression of the tension in the narrow study carrels where students struggle for their individual effort of gaining knowledge.





Expression and Meaning

The central hall that forms the heart of the library is very direct and honestly stands as the soul of the building. This large square space is filled with sunlight from above, partially hidden rows of books seen through four perfect circle openings on the wall, and people standing on the ground. This fusion of function, representation and expression demonstrates a high quality creation of space that makes it look simple but is actually very rich in meaning.

Kahn worked with analogy and the understanding of needs to generate meaning for his building. The library is "an invited place" where "the desire to meet" and "the desire to learn" are fulfilled. Book and user are of the same importance for the library, which he successfully synthesizes in the design concept. According to him: *Exeter began with the periphery, where light is. I felt the reading room would be where a person is alone near a window, and I felt that would be a private carrel, a kind of discovered place in the folds of construction...it's just the entrance where books are visible all around you through the big circular openings. So you feel the building has the invitation of books.* Books give him an associative meaning upon knowledge, tradition and history that he translates into the appearance of the spaces. The static hall in the center is a place to pause that carries values of the timeless and universal.[1] He relies on abstraction and is strict with pure geometry in making both the interior and exterior expression of the building. This effort corresponds to the spirit of that time which was concerned with ideas of universality, purity and functionalism and minimalism.

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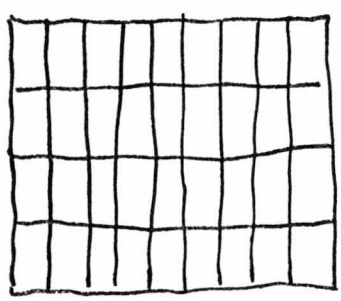
[1] Kahn Libraries Bibliotecas. Barcelona: Publications del col.Legi d'arquitectes de Catalunya.. Article by Peter Kohane. page 104

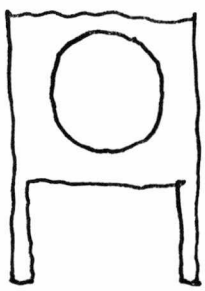
Space

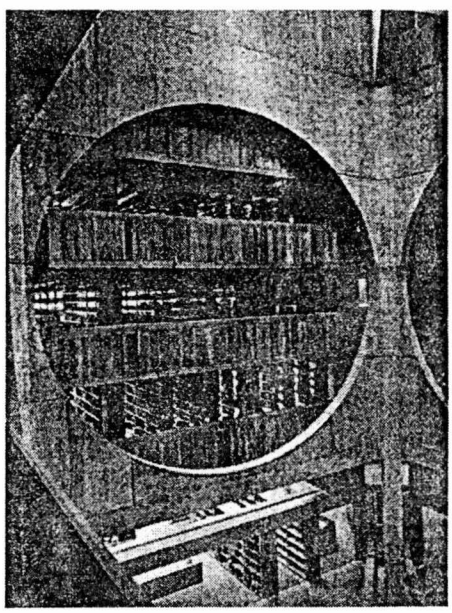
Space is first of all considered for a convenient use of the space which supports well the activities. A grasp of the nature of activities and finding an appropriate environment for them within the constructional form is the strategy that compromises between expression and function where space stands. According to his words:

> *In the...design for (the) building...thoughts were centered around the desire to find a space construction system in which the carrels were inherent in the support which harbored them. Reading within a cloistered space with natural light in nearness to the building surfaces seemed good.*

In this library, there are quite rigid hierarchies of huge spaces and small spaces as a result of his regular ordering of geometrical patterns. Derived from the classical order, the center then becomes the most important part, which functions as a communal space for this library. However, the rigidity has made the space imprisoned and burdened with status. According to an essay by Peter Kohane, the existence of a communal space for a library is quite unreasonable. Kohane wrote: ...*One senses an insecurity in the definition of generating ideas. Certain activities are almost randomly located within the all-pervasive structure. Perhaps this can be attributed to a failure of imagination. Intuitions that could delineate an appropriate hierarchical order have not yet cristallized. For instance, the "desire to meet" was not deemed essential to a library; consequently, no grand space devoted to public activities can galvanize the design.* The key of his impressive spaces is in a scale and proportion that sometimes emphasizes monumental feeling and sometimes is warm and human scaled. Inside the building the space provides traditional learning activities, and outside the building responds to the world. The space in between where the study carrels are located builds a connection between the past and the present. This space has views both to the inner space and to the outside. The small openings to the outside along the study carrels and the simple grid pattern of them, which have no obvious interconnection with the inside part seem to protect the activity inside from the reality outside. There is still a dillemma whether to connect or to separate the two realms of interior and exterior.





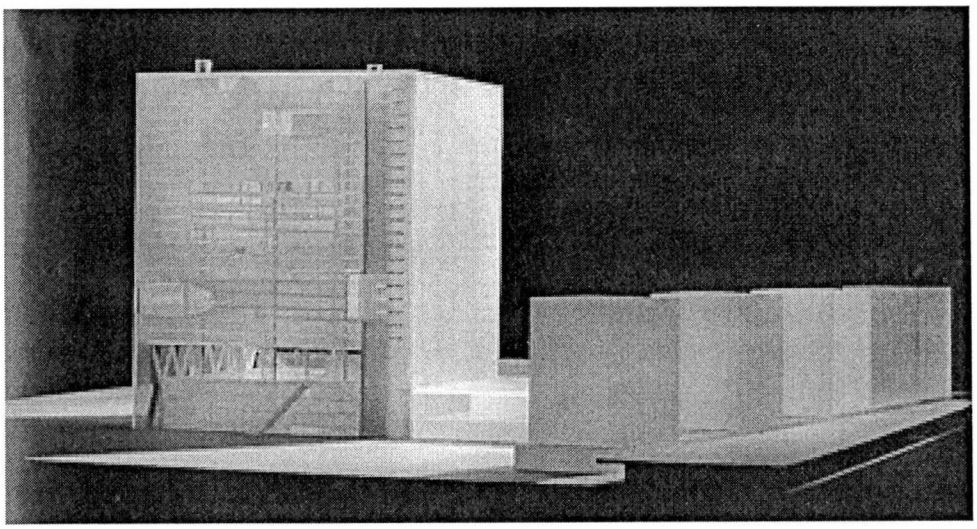


2. Bibliotheque de France

Paris, France

Unbuilt competition project

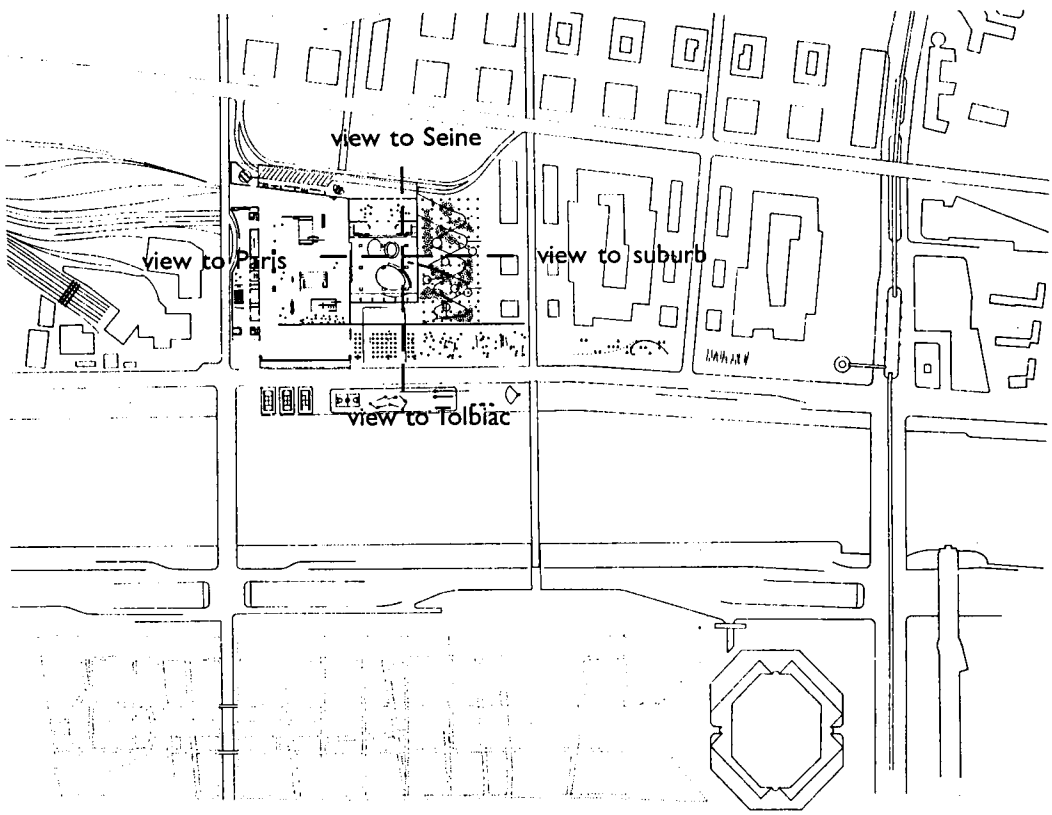
Architect: Rem Koolhaas



SITE and CONTEXT

This project is a large sized of 250.000 sq.m public library located on the east side of Paris. The site is an almost square shaped land on the periphery of the city. In Koolhaas' design proposal, the surroundings are not a major issue for this project. The program is the main issue which generates the design of the building. In this project, internal forces are stronger than the external forces in accomplishing the mission of the project. Depending on the setting and condition of the city in which a building is built, a project can be more or less attentive and absorbent to the surroundings in order to establish a strong connection to the city. Unlike the condition of this "bibliotheque" in Paris, in my thesis project, both the external and internal forces are in balance in order to establish a strong connection to the city and to elaborate the issue of the local. In this "bibliotheque" by Koolhaas, the building appears as a semi-transparent box from the outside. The four sides of the box respond slightly differently to the four directions they are facing. Facades facing Paris and the suburb appear as transparent cloud patterns on the translucent glass wall, a façade facing the Seine appears as transparent geometric patterns on the translucent glass wall and a façade facing Rue de Tolbiac appears as rows of office windows.

These facades are reflections of the inside of the building which is a very special and distinct condition different from that which we experience commonly in a city. The inside condition, which goes against gravity, is the realization of the ambition of this project which is to rid architecture of responsibilities that it can no longer sustain and to aggressively explore this new freedom. (El Croquis 53, page 68)

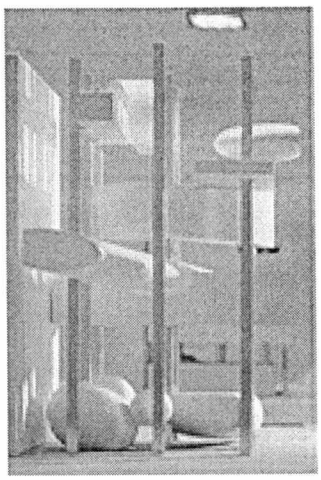


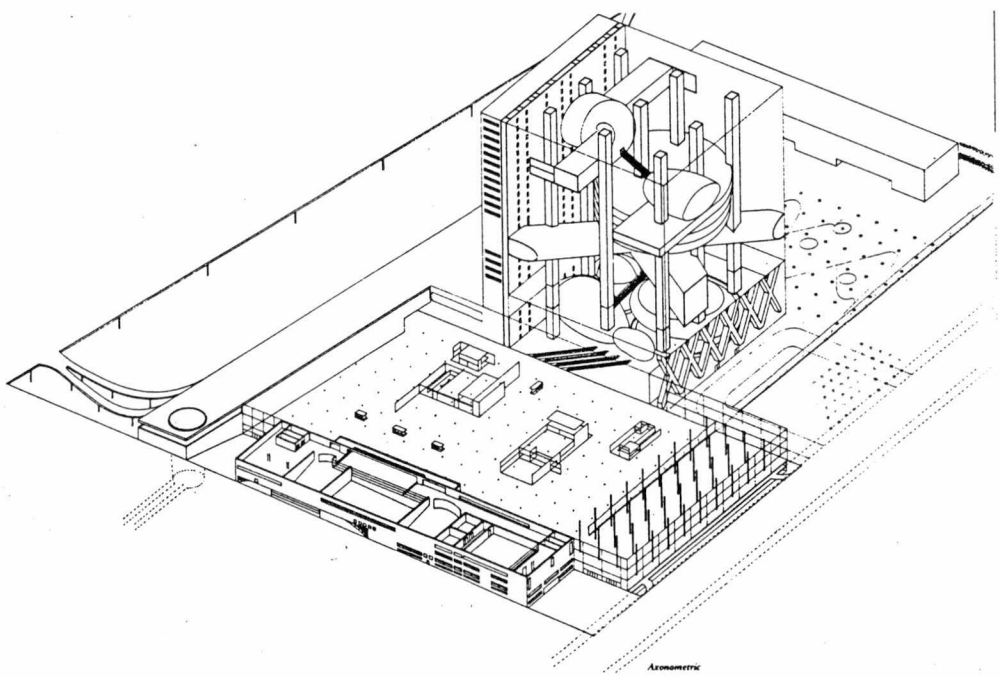
Plano de situación / *Site plan*

PROGRAM and FORM

Koolhaas separates the huge program of the project into five separate and autonomous libraries. Public space and storage are the biggest requirement to be programmed into the "bibliotheque". Koolhaas organizes them by packaging the five spaces for specific activities of the autonomous library into peculiar shapes suspended in the air, and inserts the public space and storage into the residual space within the glass box. According to the review on El Croquis 53, his conception for the library is as follows:

The library is interpreted as a solid block of information, a repository of all forms of memory, books, optic discs, microfiches, computers, etc. In this block, the major public spaces are defined as absences of building, voids carved out from the information solid. Floating in memory, they are like multiple embryos, each with their own technological placenta. Since they are defined as voids, the individual libraries can be spaces defined strictly according to their own logic, independent of each other, of the external envelope and of the classical obstacles of architecture, even partly gravity.

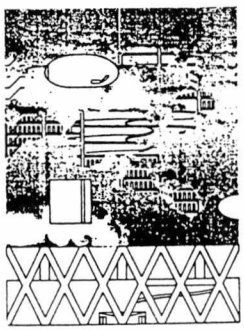




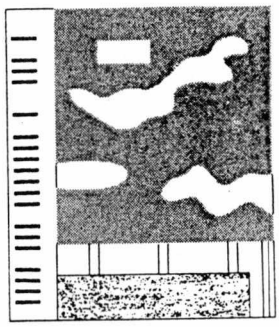
His conception about solid-void, presence-absence and multiplicity are contemporary design issues which respond to the age of information allowing us to have more alternatives in perceiving spaces. Virtual experiences in the building are encouraged in the design through fragments of texts, titles, names and songs which appear on a vertical electronic billboard. Transparent and dematerialized effects saturate the entire space, either to be experienced from the inside or

from the outside part of the building. The use of glass as the main material for the building is celebrated. It is used not only for the walls, but also for the floors and cladding for elevators.

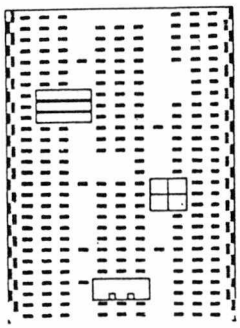
Koolhaas named the five peculiar shapes for what they look like: The Pebbles which is The Sound and Moving Image Library, The Cross, which is The Recent Acquisition Library, The Spiral, which is The Reference Library, The Shell which is The Catalogue Room and The Loop which is The Research Library. The shapes are generated according to the characters of the activities and movements happening in each types of the library. They are suspended on different levels, free of classical orders in organizing and arranging spaces. The five autonomous libraries are connected to each other through nine elevators that penetrate them. The use of elevators as the main circulation in the building reverses the old condition in which space was experienced through a horizontal progression. In contrast, when riding an elevator, space is experienced vertically and at a speed that human body cannot approach. In this building, the condition against gravity is not only perceived through the composition of masses, but also can be experienced in a very real manner by the observers when they are riding the elevators.



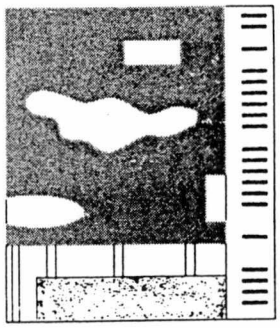
Fachada al Sena
Facade overlooking the Seine



Fachada hacia la periferia
Facade facing the suburbs



Fachada a la calle Tolbiac
Facade towards rue de Tolbiac

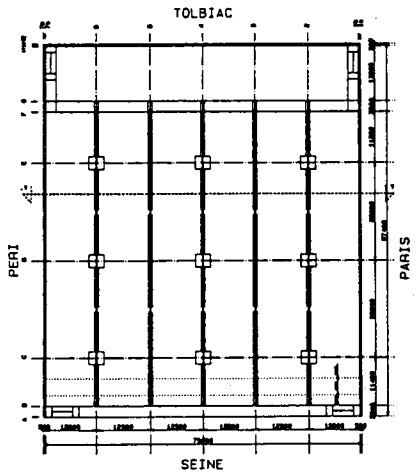


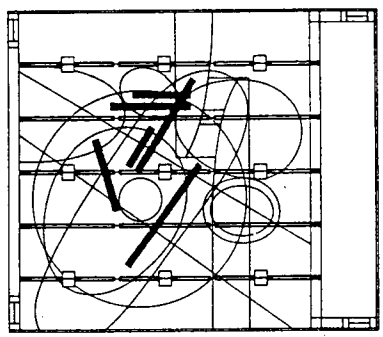
Fachada a Paris
Facade facing Paris

TECHNOLOGY and STRUCTURE

The main structure of this building is very modular and integrated to the mechanical-electrical system of the building. The nine elevators work structurally to support the floating compartments. The elevators act as columns and are composed in a grid configuration. The five

walls are added into the grid. The five walls are hollow and function to supply cables to all compartments, which structurally support the compartments and the public spaces. There are two kinds of structural systems that are used independently in the building: the traditional system of column and walls generates the box of the external container, and the new system of folding generates the curve, loop and mobius-strip of the five autonomous libraries.



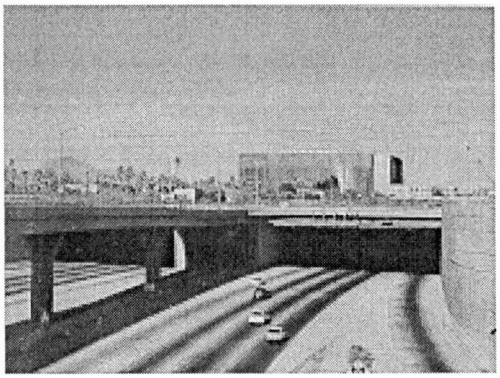


Superposición de espacios públicos
Superposition of public spaces

3. Phoenix Central Library

Phoenix, Arizona

Architect: bruder DWLarchitect

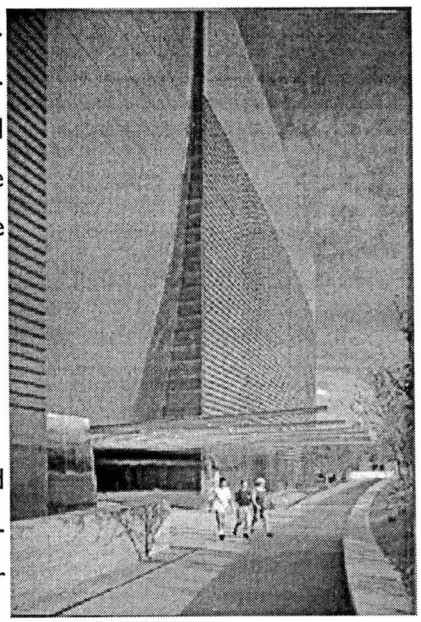


SITE and CONTEXT

The library is located in the desert-city of Arizona. The urban situation around it is flat, mainly composed of buildings and highways, which express the natural beauty of the surroundings. Will Bruder anticipated the physical environment of the city and took it into account in the design of his library. The library has a rectangular shape that is tied to urban typology and to the shape of the site. Within the rectangular form, he developed interesting surfaces on the four sides of the building that respond to the city and reveal the beauty of the nature. His choice in using materials and detailing the construction results in dramatic surface effects. Colors, textures, reflections and opacities of the materials are transformed from nature. In this case, Bruder is dealing with external forces by transforming nature, as a concrete phenomena, into the poetic of architecture.

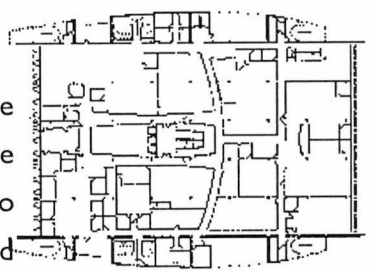
The severe sun of the desert is the theme of the exterior. Corrugated coopers, which stand on the two sides of the building, are parts that blend the rectangular box to nature. The simple curves of the corrugated cooper walls are a statement that emphasizes the existence of hill and valley around the city. The other two sides of the walls are transparent. They protect the building from the heat by installations of motorized aluminum louvers on the south façade and fabric sails on the north façade. The effects of shadows and lights upon the surfaces always

change, making the simple shape of the box very rich in phenomenal experiences, especially, during the transition from daytime to nighttime, when the translucent effect of the glass wall becomes more transparent, revealing the interior part of the building, which is a different condition and conception from the outside part.

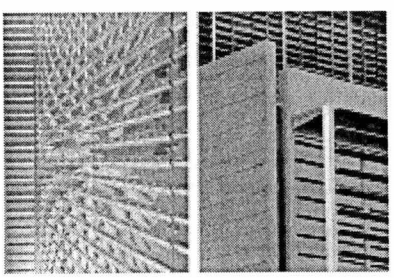


PROGRAM and FORM

The program of this library is extensive and is expected to accommodate future change and growth. Bruder's conception of the library is simply a warehouse for books and other media, for the purpose of transferring knowledge. He distributed the program in the library into five stories based on the convenience and frequency of use. In the center is the core, where the main vertical circulation is located.

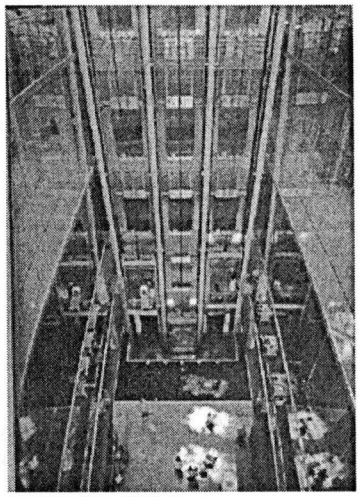


On both sides, behind the corrugated cooper walls, are service cores for the building. Functions and facilities for the library are arranged encircling the core and in between the two service cores. Efficiency and practicality are the concepts involved in placing the program into the library. However, delicate details and technologies enhance the spatial quality of the inside, distinguishing it from the outside part. The inside does not reflect the local or nature; it is a high-tech space addressing the future.



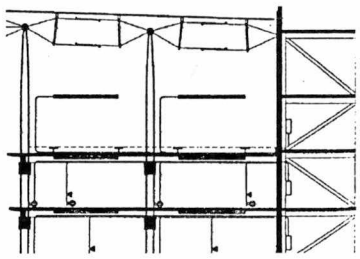
In addition to his conception of a library as a warehouse for book, similar to that of Louis I Kahn for his Philips Exeter library, Bruder also opened a void with a skylight above in the center of the library. A light well will come into the center of the library as the symbol of knowledge and enlightenment.

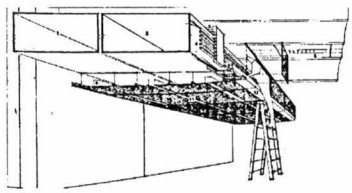
TECHNOLOGY and STRUCTURE



Innovation of structural system and energy efficiency might be the internal forces of this future oriented library. The structural system to provide flexibility for the distribution of the mechanical-electrical system and the structure of the flat roof are innovative and elaborate.

The mechanical-electrical systems are stored in the two attached curve walls on the east and west sides of the building. These service cores also contain restrooms and fire stairs and therefore are accessible, making it easy to reach the mechanical-electrical components for their maintenance and modification. Under the floor through out the building, the mechanical electrical components are distributed. Floor decks are raised on top of the concrete slab in order to run wires and air ducts. Perforated aluminum panels are installed along the perimeter walls to store the main air ducts and many kinds of wires and conduits.





His strategy for the sophisticated mechanical technology of the building develops a reliable and efficient system that form the integral part of the building's artistic elements. The round precast columns, the cable system for the roof, the motorized aluminum louvers and the fabric sails are all very artistic and crafted. Will Bruder acts as a sculptor in applying recent technology for his building.

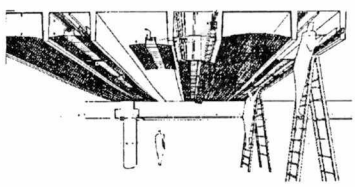


Table of Case Study Comparison

Criterions	Philips Exeter Library	Bibliotheque de France	Phoenix Central Library	Thesis Project
Conception for the library	An inspirational home for books and readers.	A solid block of information, a repository of all forms of memory, books, optic discs, microfiches, computers, etc.	A warehouse of books and other media.	A place to engage knowledge and information.
External forces.	Materials expression that speak for the soul	Expression of a high-tech building that responds to the surroundings.	Anticipation of the specific local conditions, which includes the natural beauty of surroundings and the severe sun of the desert.	Anticipation of the physical components of the local, which includes the city and nature.
Internal forces	Light to bring about the religious overtones and the symbol of the enlightenment.	Exploring new freedom in architecture	Inovation of structural system and energy efficiency for the building.	Anticipation of the global information in the world and the presence of mediated realities
Program	A classical library involving activities of reading and study carrel. The spatial solution is a central ceremonial space surrounded by smaller more private spaces.	Five autonomous libraries packaged in a transparent box. They are connected each other mainlt through vertical circulation systems. Public spaces and storages are inserted into the residual space within the box.	Practical organization of activities with regard to accommdating future change and growth.	Separation of the containers for the "electronic supported" and "non-electronic supported" activities, but they are physically connected to each othe in the inside.
Form	A perfect cube with a delicate proportion and tectonic layers of wall and structural elements.	Five peculiar shapes floating inside a transparent cube, declaring a condition against the gravity.	A simple cube enhanced with deliberate materials and tectonic solutions to produce a dramataic effect of the surface.	A tension between the heavy zigzag box versus the light rectangular box.
Technology	The structure reflects the logic of natural phenomena. Mechanical-electrical components are housed in the servant space.	A modular structural system integrated with the need for mechanical-electrical distribution in the building.	Large service cores on both sides of the building that are nicely designed to house and distribute the mechanical-electrical system through out the building.	Main structures of zigzag box and the rectangular box are designed to house mechanical-electrical components.

VII. Recapitulation of Project

The examination and consideration of the conception of dualities in this thesis demands that architecture bring together the inherent dualities that it already has or will have in the future. By recognizing the usefulness of dualities and their long tradition in western thought, but by treating them differently than we have in the past – by not supressing one or another aspect of the duality, an architecture can emerge which is more complex and reflective of our times, allowing for an architecture that can engage multiple ideas simultaneously. Architecture should consider the new opportunities the world is offering, by taking benefit of the recent technology we have gained, opening broader connections to the world, recognizing a world with multiple realities, and encouraging intellectual and abstract interpretations of this contemporary condition. However, these new opportunities should not erode our old traditions, our indigenous culture or our sensitive capacities. The new opportunities coupled with a living tradition which is a useful, dynamic history, have the capacity to improve and enrich our lives, and our architecture. In regard to this aim, the issues of universal - local, nature - city, virtual - phenomenal are brought together in architecture in an intertwined and convergent relationship.

The issue of universal - local reacts to the socio-cultural forces of this time. Architecture needs to anticipate the technology of media electronics that we have, and be ready to enter the cyber world. However, architecture also needs to maintain and enhance the character of the local. The challenge is how to make architecture simultaneously universal and local through its physical form. The issue of nature - artificial reacts to the external forces on the project. This thesis reacts to the physical elements of the city and the condition of nature that are specific and mark the existence of a place. The observation of the city and nature through measurements which use parameters of time and space produces graphic representations which help to provide for the underlying structure of the design. The relationship between natural - artificial is unique, and intertwined, they interface with each other and explore new possibilities in architecture. The issue of virtual - phenomenal reacts to the internal forces of the project. The use of electronic media, and its impact on the human body and the building is one challenge that generates the internal forces which help shape the building

and its spaces. The value of human senses and the exploration of materiality in architecture is another internal force. Efforts to bring together the virtual and the phenomenal creates a quality of space which enhances the current activities in a building.

The design method allowed for a personal approach in developing the theoretical issues into architectural design determinants. The intention of the methodology is also to repress the subjectiveness that often generates a design. This methodology entails the detailed observation of the surroundings and measuring the parameters of the thesis issues. The measurements intend to bring architecture into an objective process that is the part of architecture. Traced from its root word, "archi-tecton", measurement is the important part of the "tecton". In this thesis, time, space, distance and movement of the human body are the subjects of the measurements. They produce diagrams and graphic representations that are used for the underlying structure for the design.

The graphic representation of these diagrams helps to determine the exterior of the building. The exterior appears as long surfaces of façade which correspond to the hill as its background and to the city as its foreground. The outside deals with surface, profile and rhythm. The façade can be read abstractly as a superimposition of sun-graph and city-graph. Within a strategic location of the site in the context of the city, it allows for a strong dialogue between the façade and the city. The underlying structure creates a discentered character for both the building and the landscape. The placement and positioning of every object on the building and landscape are considered in enhancing the project's connection to the city.

The interior of the building appears as void as well as a place of occupation. Activities and movement of the human body are emphasized in the interior and they have no obligation to reflect the immediate surroundings or the project's connection to the city. The inside is facilitated with electronic communication devices which allow it to connect to the world. A flexible mechanical and electrical system provides energy, together with convenience and sensual and intellectual experiences of body and mind are the criterions for the inside.

In the end, the disconnection of the inside from the outside, the simultaneity of universal and local and the juxtaposition of virtual and phenomenal experiences in the building declare the collapse of time and space. Distances are bridged and time compressed through the use of computers and satellites thereby challenging our traditional understanding of space and time.

In order to reflect the spirit of this time, this place, and unify rather than repress the dualities and multiplicity of values and expression, architecture and architects can, as this thesis exploration has suggested, reconsider inside – outside relationship so as to reflect the spirit of this age.

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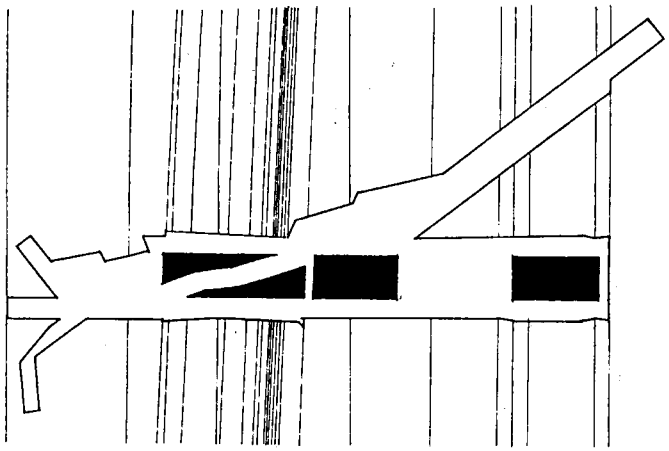
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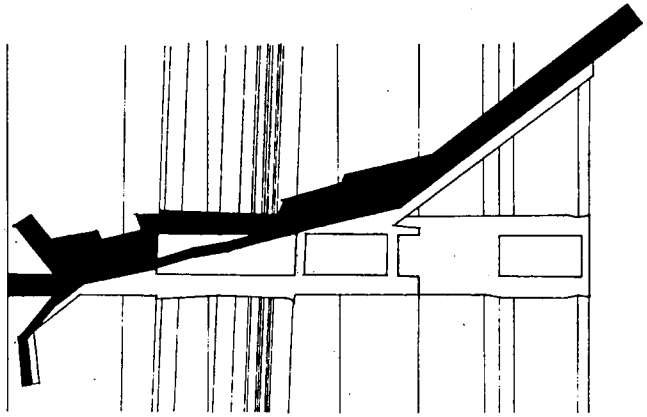
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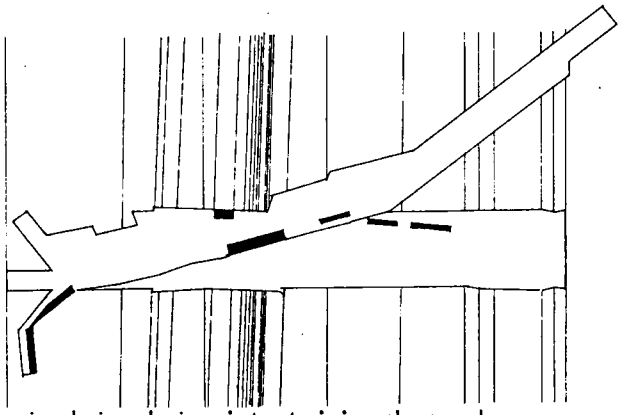
Appendix



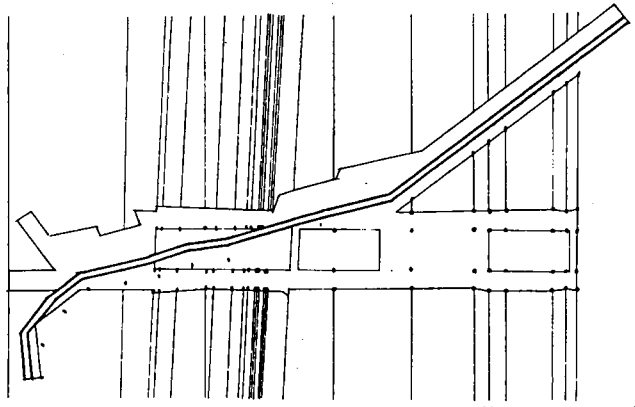
solid vs. **void** of the space



"electronic" vs. **"non-electronic"** boxes

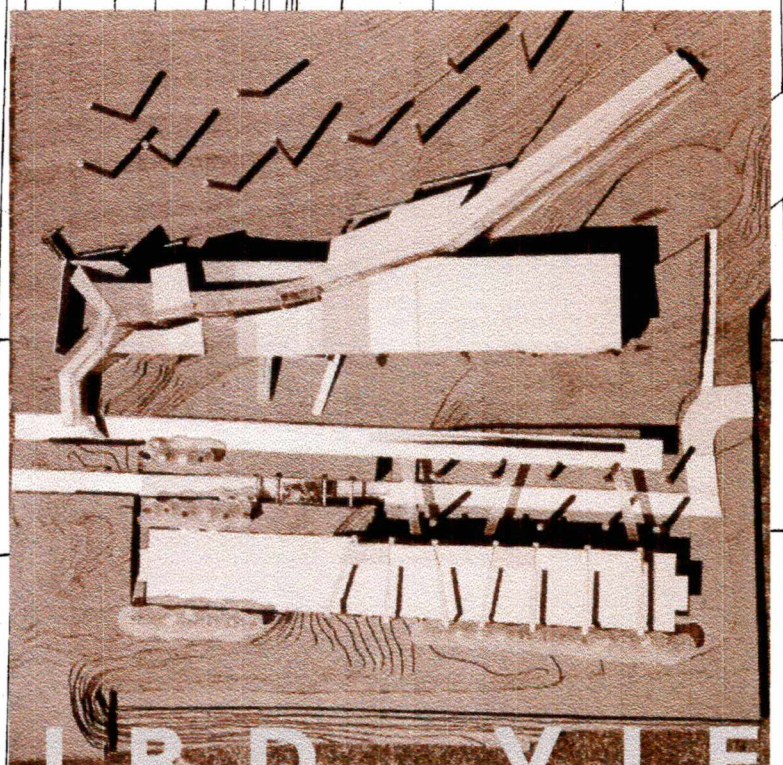


circulation devices **intertwining** the two boxes



"negotiation wall" and **"pipe columns"** as structural system and storage mechanical-electrical devices

CONCEPTUAL DIAGRAMS



BIRD VIEW

model

FRONTAL VIEW
model

BACK VIEW
model

SIDE VIEW
model

COLLAGE
model

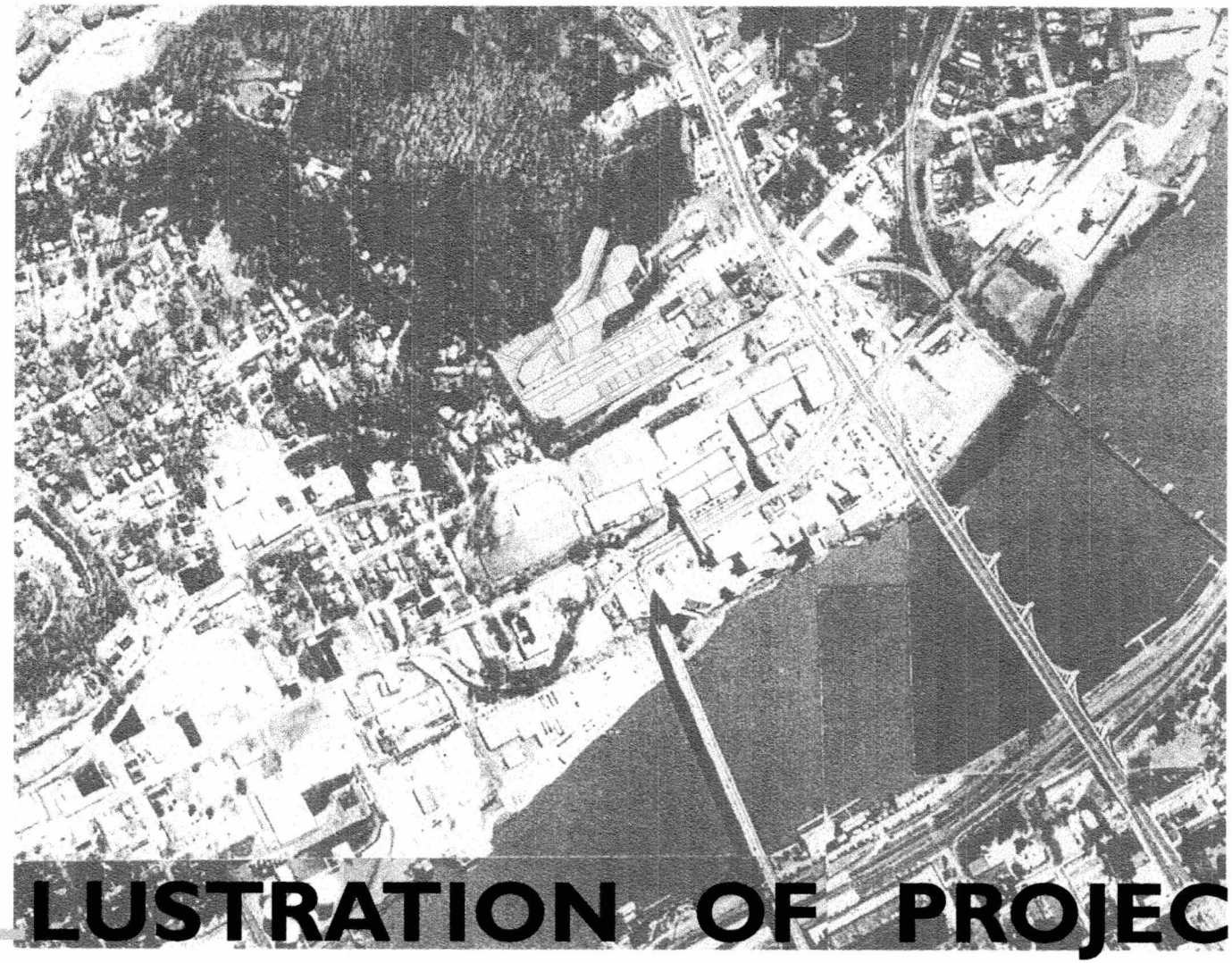


ILLUSTRATION OF PROJECT ON SITE (I)

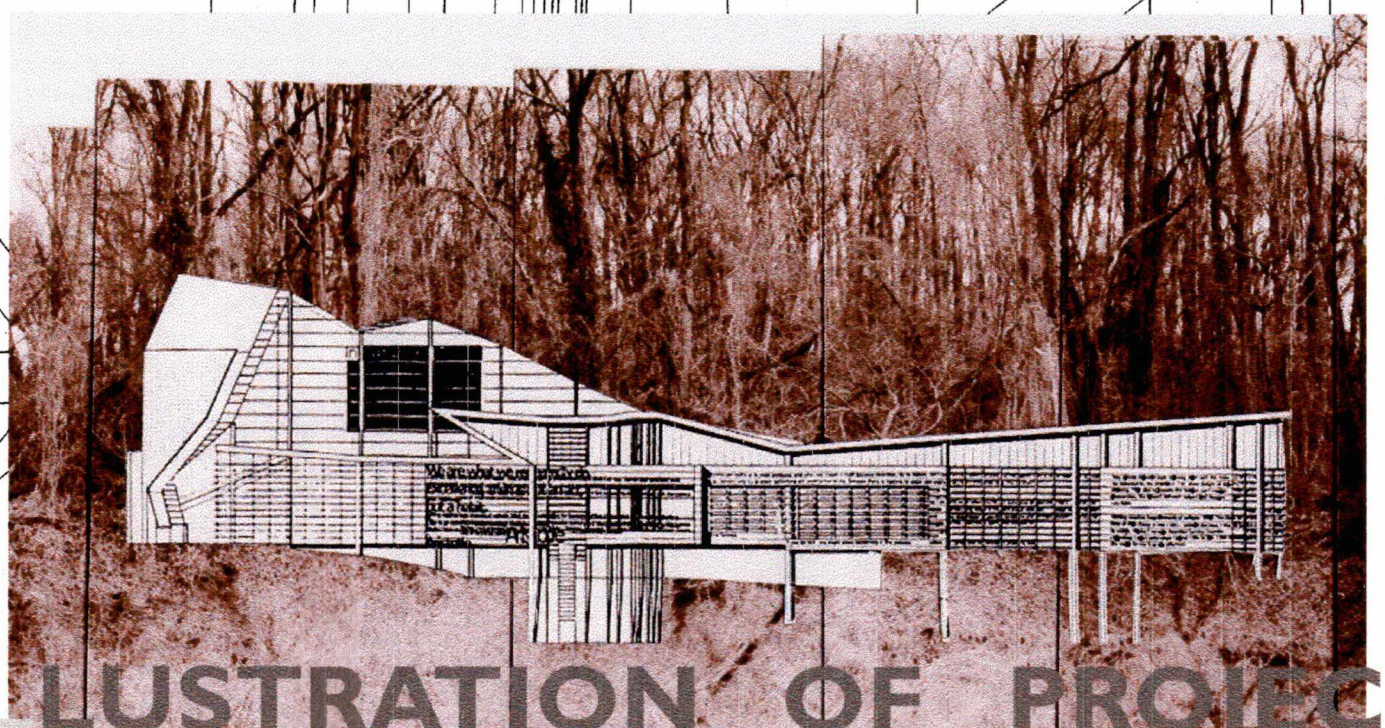


ILLUSTRATION OF PROJECT

ON SITE (2) continued

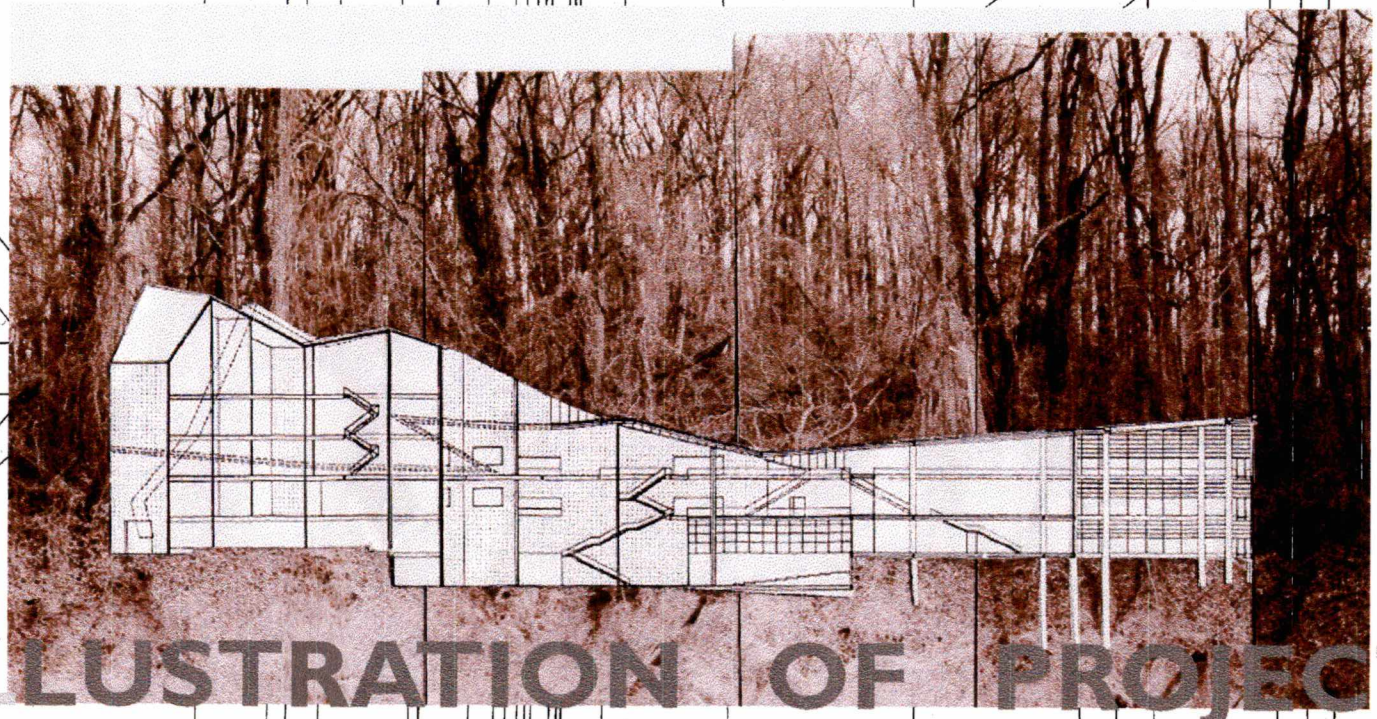
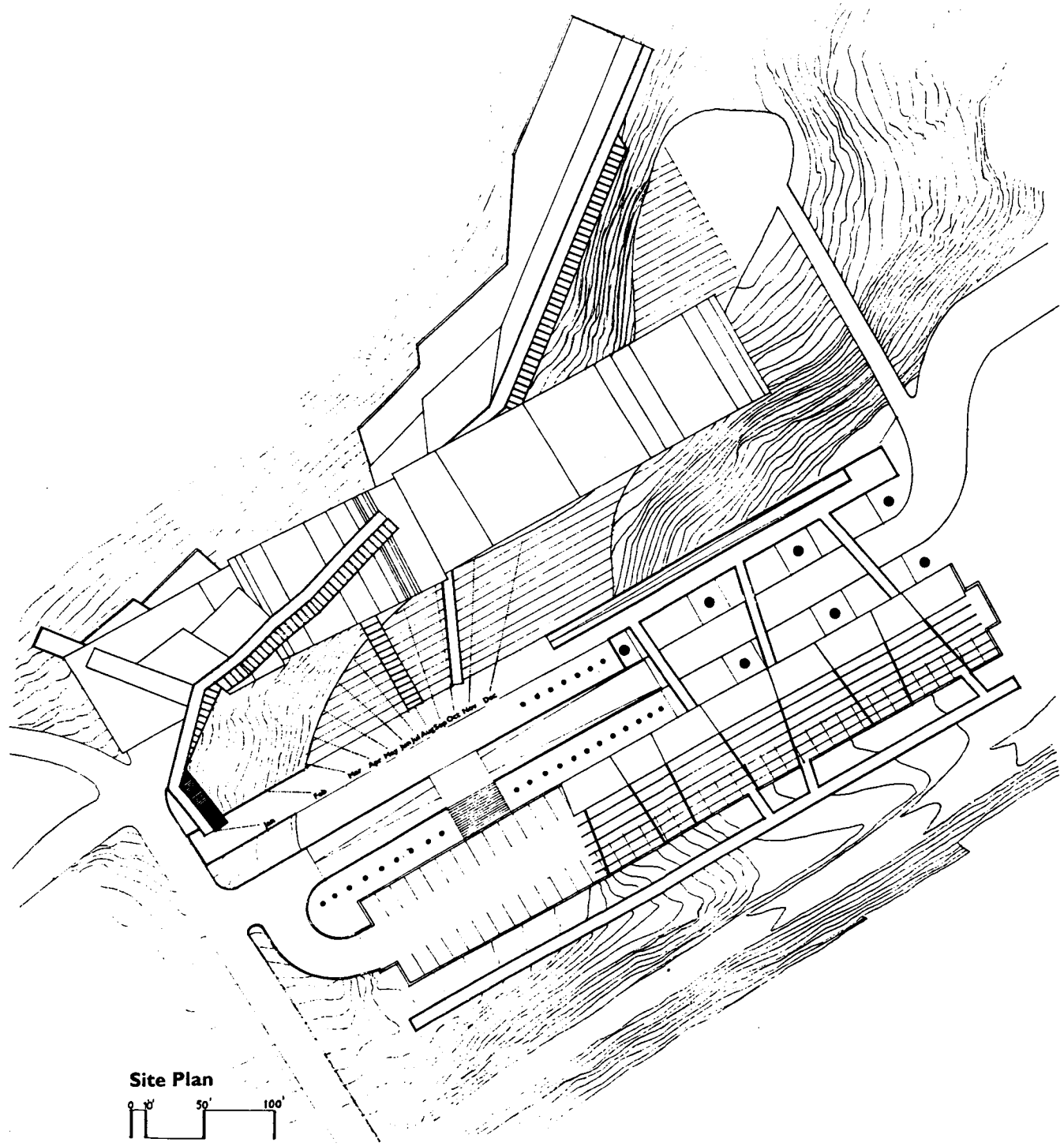
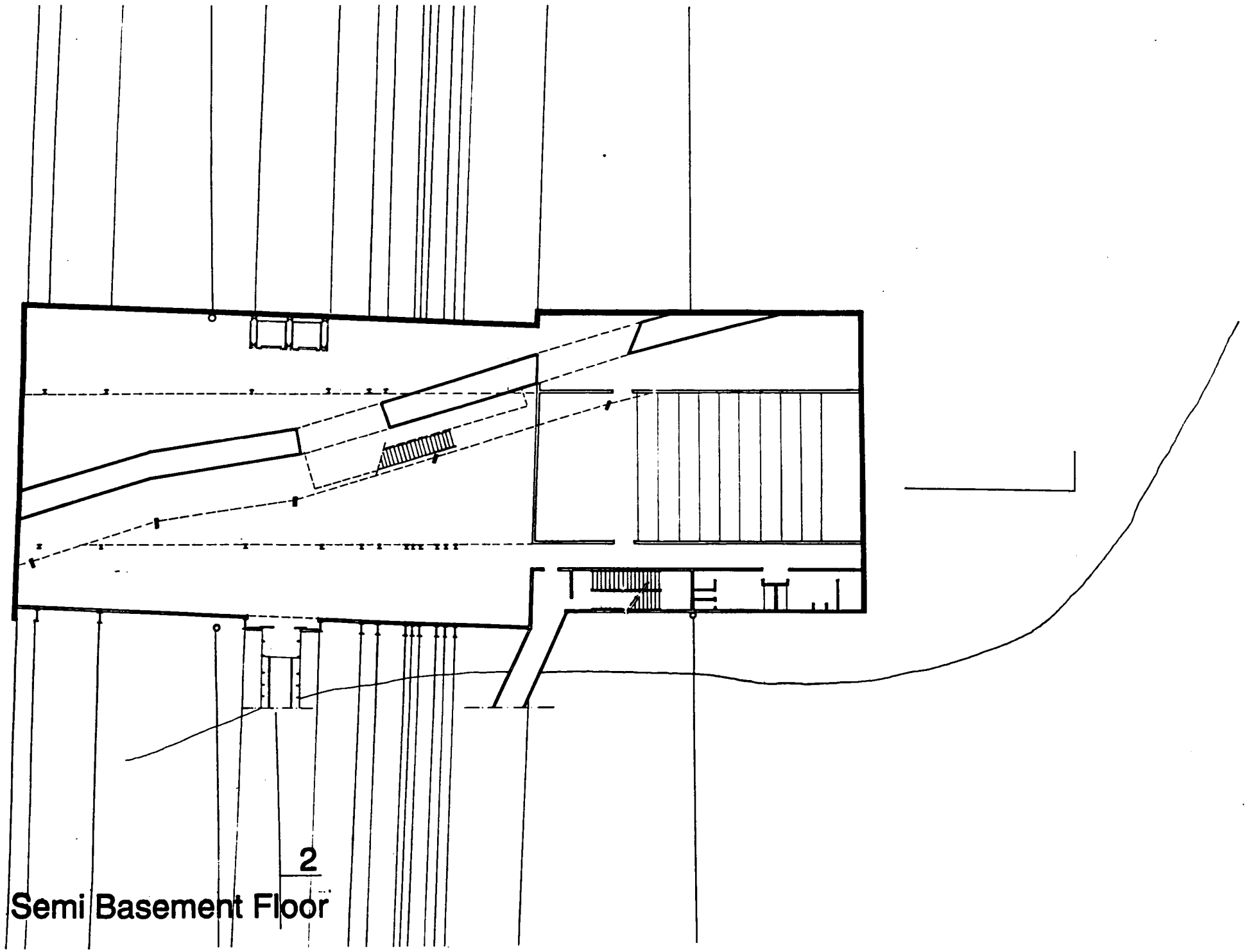


ILLUSTRATION OF PROJECT ON SITE (3) continued



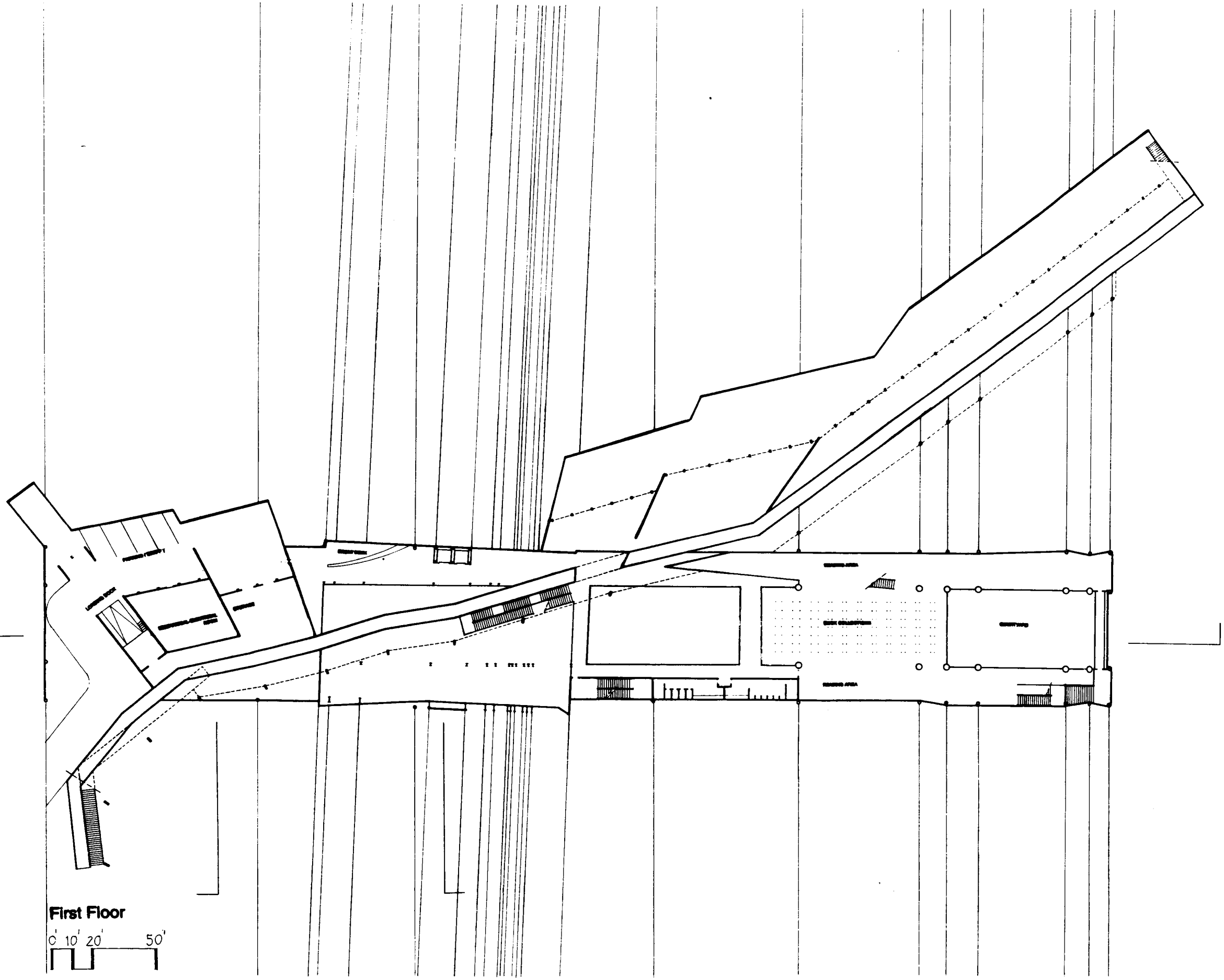
Site Plan

0 10' 50' 100'



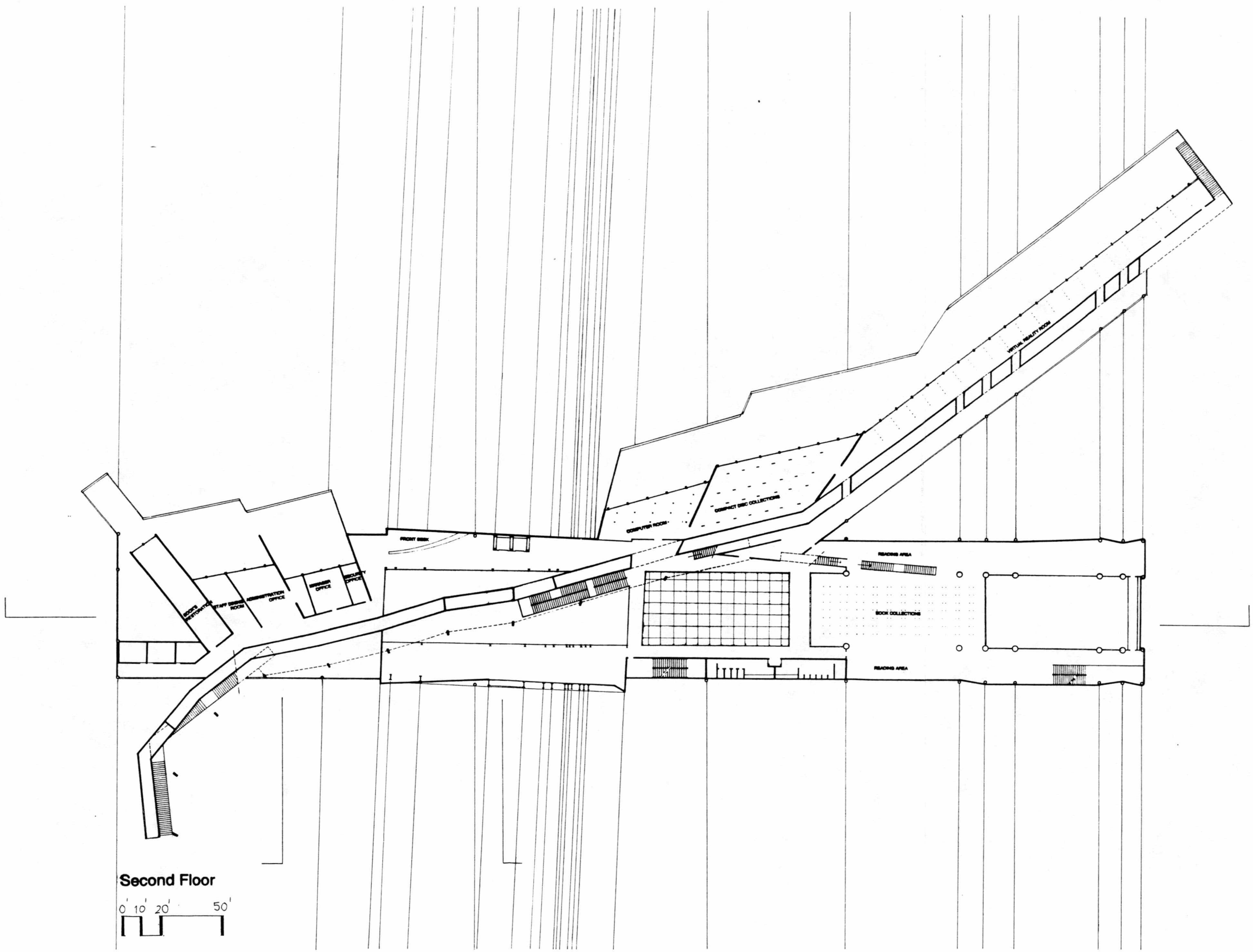
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Semi Basement Floor



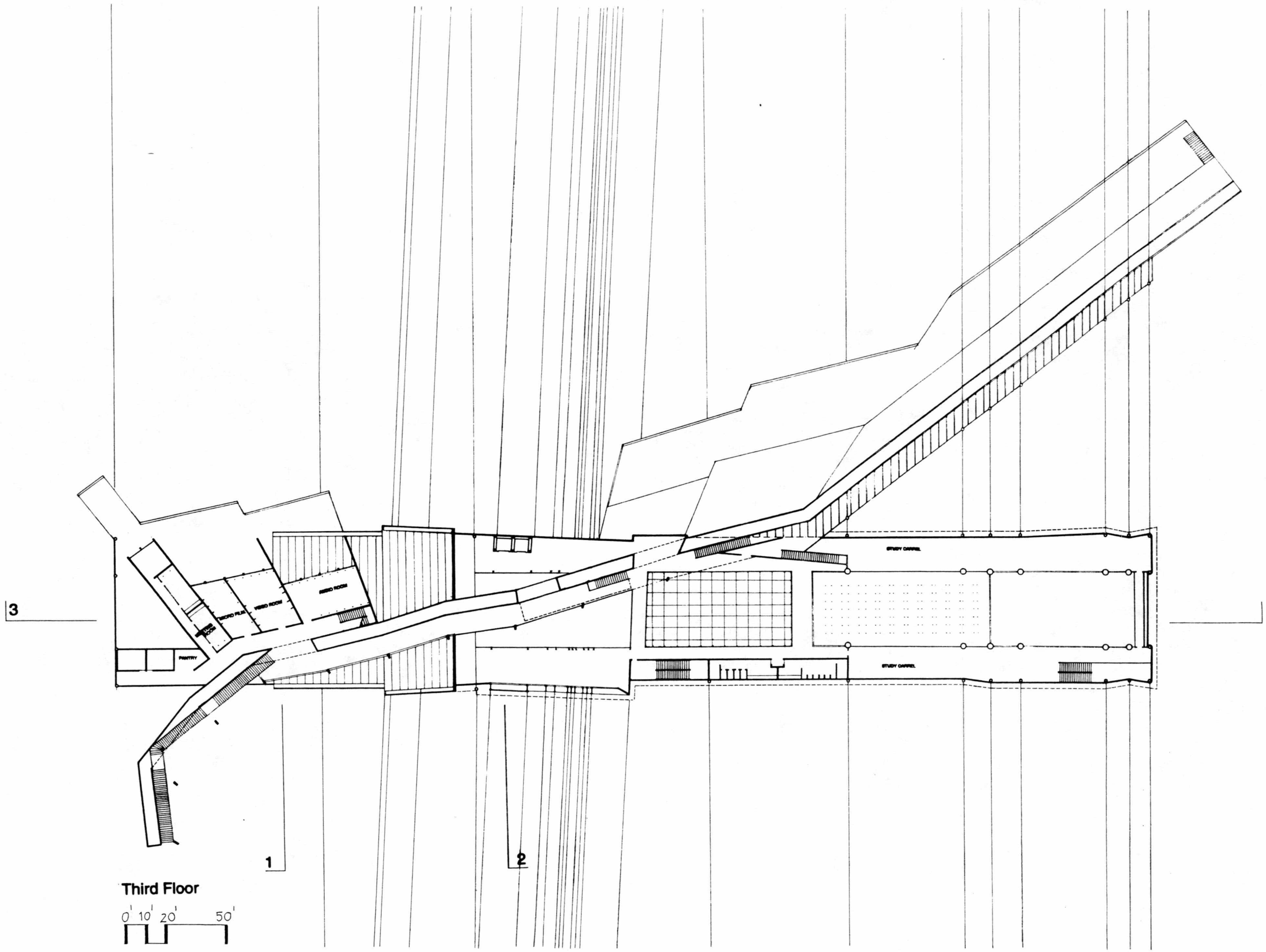
First Floor

0' 10' 20' 50'



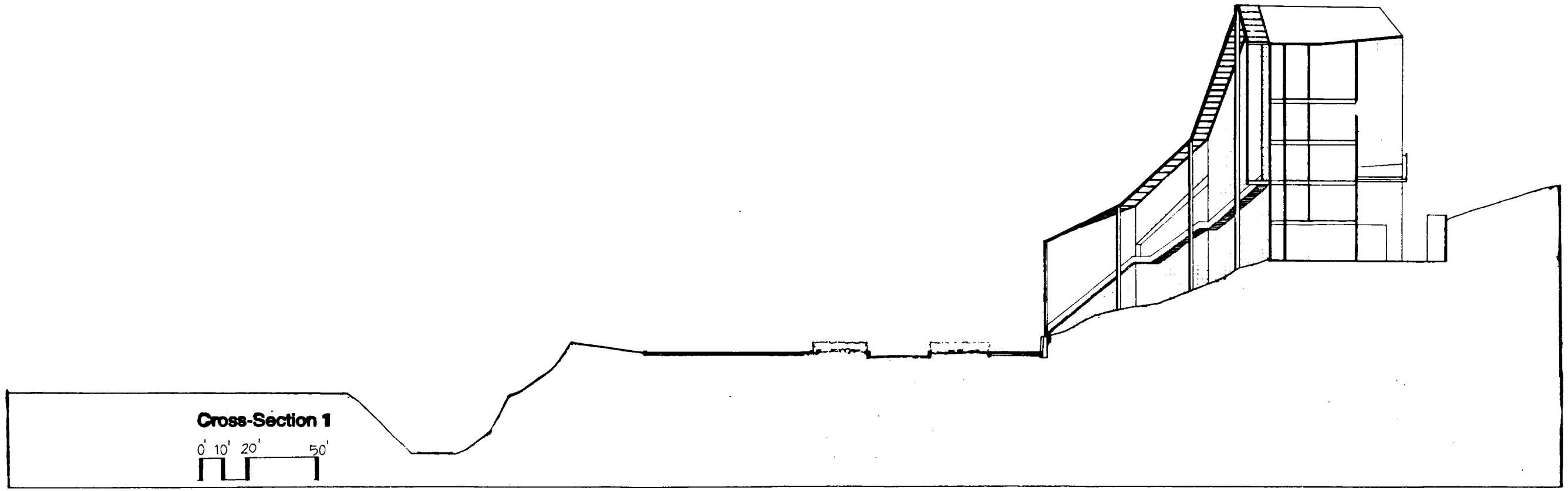
Second Floor

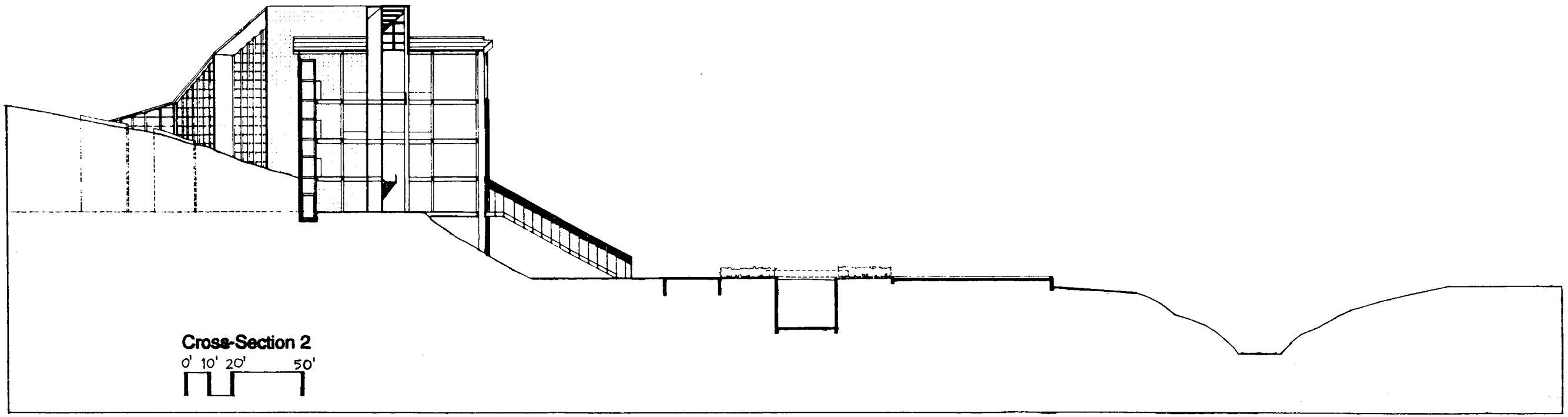
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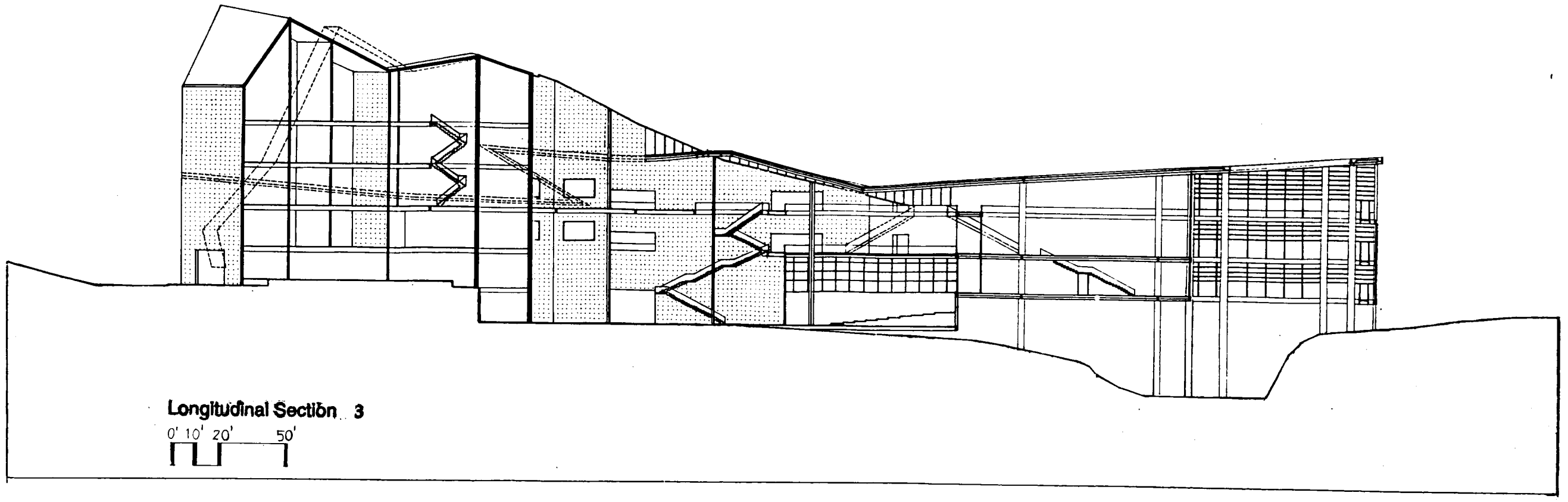
Third Floor

0' 10' 20' 50'


Cross-Section 1
0' 10' 20' 50'

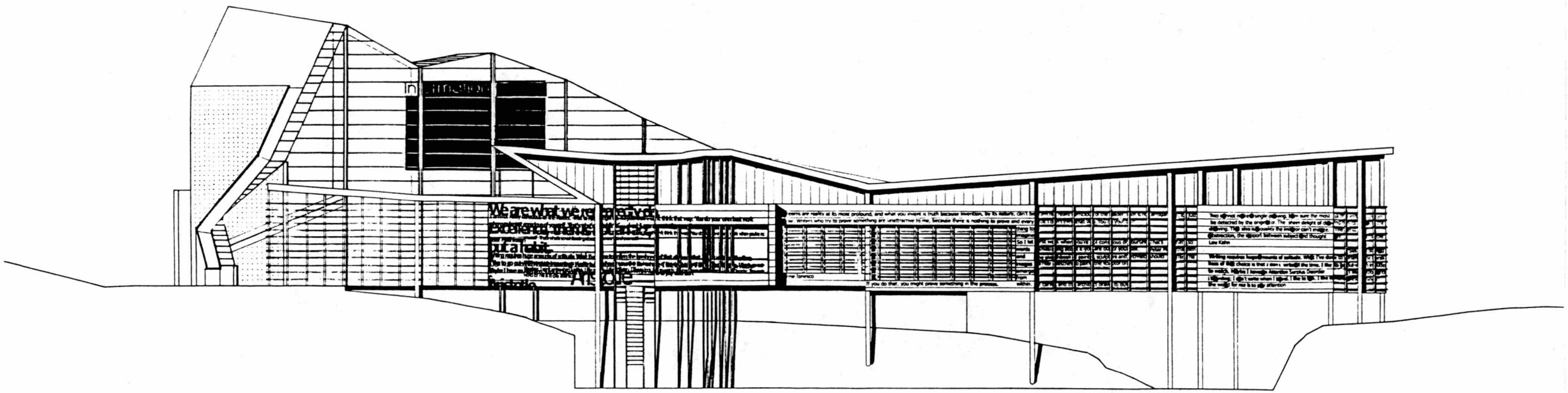


Cross-Section 2



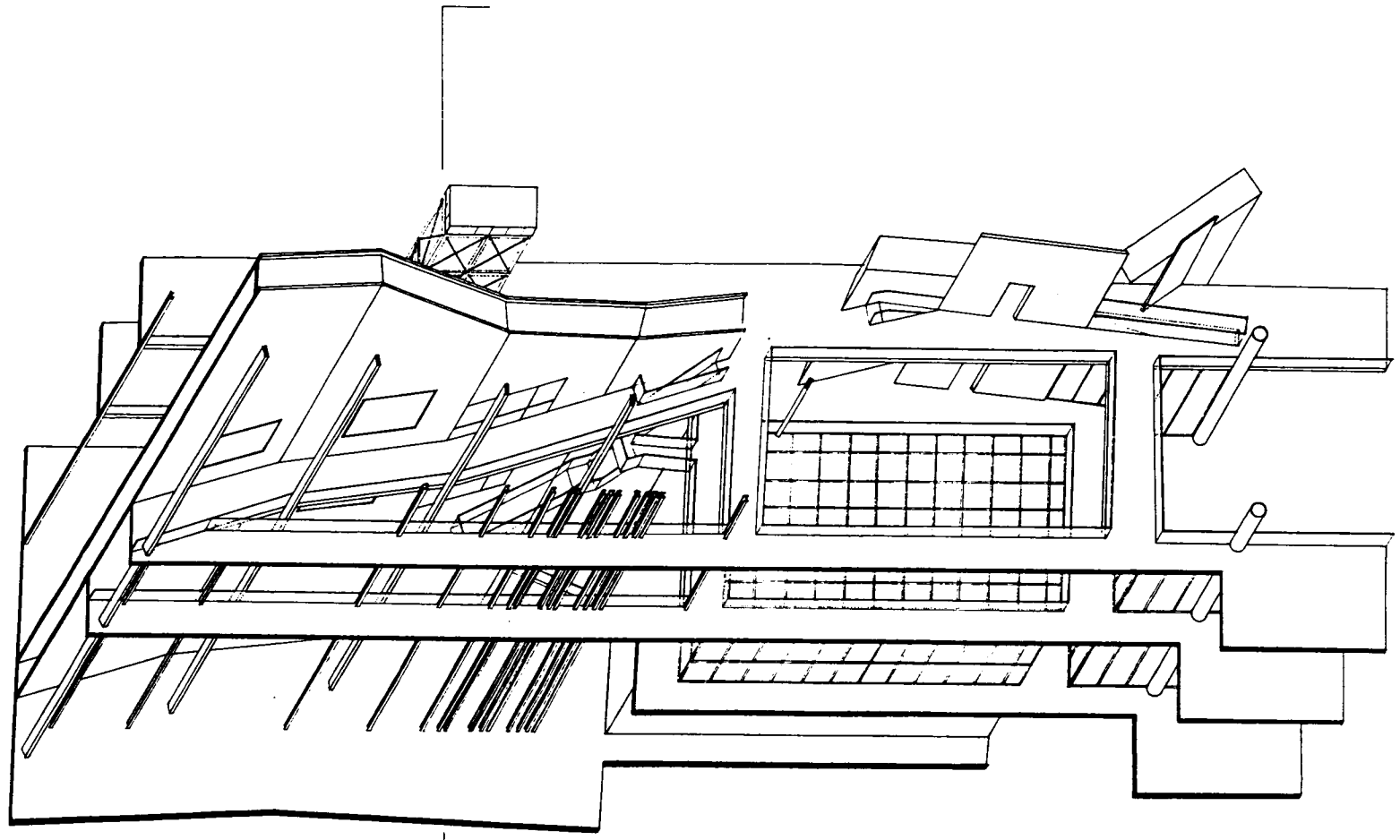
Longitudinal Section 3

0' 10' 20' 50'



Front Elevation

0' 10' 20' 50'



2

Interior Axonometric

Vita

Juliany Wibisono was born July 23, 1969 in a small city called Magelang, Central Java, Indonesia. She moved with her parents to the capitol-city of Central Java, Semarang, when she was five years old, and went to school there. She went to catholic schools from kindergarten through high school and was recognized for being among the best students several times. She wanted to become a painter when she was a little girl and won some local competitions for drawing and artistic lettering. She finally decided to come to architecture school, with the hope of developing her talent and creativity. She entered Tarumanagara University in Jakarta, Indonesia in 1988 and graduated in 1993 with B. Arch and achieved a grade of A for her comprehensive project. She worked from 1993 to 1996 in an architectural firm in Jakarta and was given the opportunity to realize some of her design and ideas. She also became a professor's assistant for a design studio class at her alma mater for two semesters. Her eagerness to learn more deeply about architecture made her come to The University of Tennessee, Knoxville in 1996. She was able to write a thesis and obtained her M. Arch degree in 1998.