

AN OPERA HOUSE FOR BOSTON:
THE DOCUMENTATION OF A DESIGN PROCESS

by

ROSEMARY DANEHY GRIMSHAW

B.A. Emmanuel College 1965

Submitted in Partial Fulfillment of the Requirements
for the Degree of
Master of Architecture
at the
Massachusetts Institute of Technology
June 1978

Signature of Author *[Handwritten Signature]* Department of Architecture

Certified by *[Handwritten Signature]* Richard Chester Tremaglio, Adjunct Professor of Architecture
Thesis Supervisor

Accepted by *[Handwritten Signature]* Chester Lee Sprague, Chairman, Departmental Committee
for Graduate Students

© Copyright 1978 Rosemary Grimshaw



AN OPERA HOUSE FOR BOSTON: THE DOCUMENTATION OF A DESIGN PROCESS

by

ROSEMARY DANEHY GRIMSHAW

Submitted to the Department of Architecture on February 22, 1978

in partial fulfillment of the requirements for the Degree of

Master of Architecture

ABSTRACT

What plots any tradition in time seems to be the products of that time; and it has been said that process controls product.

For this reason, the overall objective of this thesis is the documentation of a process with the specific intent of designing buildings which have some measure of object-like quality. Also, this study is an attempt to investigate space in addition to built definition as a way of regarding building; to recognize that what remains unbuilt can be as evocative and important as what is built. Through the design of an opera house, this thesis hopes to address the question: How does one create an object in a field organization capable of imparting cultural identity? The first section in this study, written at another time, provides the philosophical backdrop of this work. The second section deals with the method of design; the third is the design itself; and the fourth is an evaluation of the process.

This thesis makes no pretense at establishing or exhorting an exclusive method of design nor does it pretend to have a corner on the market of truth. It merely represents one more step in an effort to acknowledge myself as established in time and to encourage myself to be conscious of my own expressed view of the world.

Thesis Supervisor:

Title: Adjunct Professor of Architecture
Richard Chester Tremaglio

Acknowledgments

3

Four years ago I knew almost nothing about architecture. What I know now, in large measure, finds its source in the inspiration of the faculty of the Department of Architecture. Especially, I want to thank Maurice Smith. And, as importantly, there has not been a single fellow student from whom I have not learned.

This thesis is for my mother, Rosha Danehy, and my father, Alfred F. Danehy who once performed in the original Opera House of Boston.

Table of Contents

Page No.

4

Introduction

5

Philosophical Backdrop

8

Design Method

26

Design

31

Conclusion

In August of 1975 after one year of Architecture School, I had lunch with Ivan Galantic, a former professor and friend. In addition to being a man of extraordinary intellectual and spiritual stature, Mr. Galantic has the uncanny ability of asking seemingly simple questions which belatedly provoke unrelenting self-questioning.

The question for that lunch was, who was my father? I had no answer and he continued to stress the importance of searching for a tradition to define where I stand in time and how I view the world. To profess a tradition as simply humanistic, he said, was so general as to be meaningless.

During my architectural education, Mr. Galantic's question has periodically recurred when I have taken the time to re-assess what the last three years have meant educationally. It seems that to identify and to become part of a tradition allows for decision-making which has a substance greater than the arbitrary whim of a disconnected individual. "We do stand on the shoulders of giants."

Much of that tradition refers to the natural world as its primary reference and extracts from the natural landscape tenets

which have enormous applicability in the built environment. The principles of reciprocity, directionality and additiveness have immeasurable impact both as a way to understand and to evaluate the history of shelter and as a theoretical framework to build. These tenets have always allowed humankind to recognize natural forces such as weather and gravity in addition to marking the passage of time. To acknowledge these physical realities requires a reliance on the senses and in that way adopts an Aristotelian vision of reality.

Nevertheless, some cultures have recognized and built in a tradition that is largely Platonic. These peoples at times have invested their total energies in buildings honoring a non-physical reality. The temple cities of the Mayans, the pyramid of Cheops and the stupas of India demonstrate the yearning of a civilization to build something other than shelter.

These civilizations lived in a culture permeated by a sense of the communal. These monumental objects were genitive not only of the spiritual and economic life of the culture but offered it an identity. These buildings were non-contextural and antithetical to the notion that all buildings refer back to the landscape.

In the Yucatan, the Mayans lived in villages of simple stick and stucco dwellings and made pilgrimages to these other worldly cities for their sustenance and to witness an axis mundi.

It seems that these monumental feats of building celebrated time and what plots any tradition in time seems to be the products of that tradition. Lawrence Halprin, in *RSVP Cycles* said that process controls the product. For example, the process that a composer uses to write a concerto determines the music enjoyed by the audience in the concert hall. Process, then, if clearly analyzed and refined can control and maintain some of the early wishes of an individual attempting to create a product.

For this reason, the overall objective of this thesis has been the documentation of a process with the specific intent of designing buildings which have some measure of object-like quality. Also, this study has been an attempt to investigate space in addition to built definition as a way of regarding building; to recognize that what remains unbuilt can be as evocative and important as what is built. This thesis hopes to address the question: How does one create an object in a field organization capable of a cultural identity? The first section in this study,

written at another time, provides the philosophical backdrop of this work. The second section deals with the method of design and the third portion is the design. This thesis makes no pretense at establishing or exhorting an exclusive method of design nor does it pretend to have a corner on the market of truth. It merely represents one more step in an effort to establish myself in time with my own clearly felt and expressed view of the world.

"A pole and dagga house is built to stand for two, three, four years at most but the circumstances and character of our family kept ours standing for at least two decades. It did very well for it had been built with affection. But under the storms and the beating of the rains of the wet season, the grass of the roof flattens like old flesh into the hollows and the bumps of the poles under it; and sometimes, the mudskin fell off in particles and had to be replaced and sometimes parts of the roof received a new layer of grass. A house like this is a living thing, responding to every mood of the weather, and during the time I was growing up in it had already begun to slip back into the forms of the bush. I remember it as a rather shaggy old animal standing still among the trees, lifting its head to look out over the vleis and valleys to the mountains.

"This straightforward piece of prose by Doris Lessing points to some sophisticated notions concerning the natural landscape. The description of the pole and dagga house and its highly complex relationship with natural forces and their effect over time is clearly an undeniable reality in the natural world.

Thinking about time might be profitable in attempting to understand the physical world. When earth form changes, the witness has a tangible way to perceive what is intangible. As forces modify the landscape in predictable sequential ways, humankind has historically acknowledged the philosophical dilemma of time. The effects of time can be clearly recognized.

"Time past and time future

What might have been and always has been

Point to one end which is always present

The Four Quartets T. S. Eliot

"Over eons of chronological time, physical forces have formed the huge fertile landmass of the Mississippi River delta. We experience the cyclical notion of time in the physical manifestation of the seasons, and we study and celebrate the *additive* quality of time called history with landmarks. These monuments seem to provide us with some fragile notion of security and different civilizations have brought their own weltanschauung to the arduous pursuit. Generally, for Westerners, monumentality has been a way to mark time and has manifested itself through the preservation of artifacts. Endorsed by the culture, defended with legality and protected by landmark commissions, monuments survive to connect present society to its vanishing past.

"The East, in contrast, has venerated the concept of renewability rather than permanence. Although the Japanese, for example, could have selected permanent materials for their landmarks, wood timbers rather

than stone allow the shrine at Ise to be rebuilt every two decades. In this way, that culture not only commemorates its philosophical attitudes but could establish a predictable time increment which allowed it to participate in a longer mysterious process.

"Most cultures, it seems, in their struggle to establish monuments, to somehow concretize or regularize the ground have tried to understand their place in the layered sequence of time. Humankind's intervention in the earth has symbolized its persistent search to answer the larger questions in the hopes of defining its role in the universe.

"The landscape might be regarded as the first reference in the physical tradition. It's valuable to look at the land, not only to reaffirm that we are inextricably bound to it but because we might abstract principles from it. While it can be misleading or even dangerous to make direct translation from the natural landscape to the built world, the earth offers an evocative metaphor from which to learn, a source of wonder for imaginative souls, and a warning against the danger of hubris. Knowledge of the natural world and of tradition allows us to establish a context for our thoughts and attitudes. We stand on the shoulders of giants. Perhaps more compelling than economic or social references in the culture, studying the natural landscape allows us to orient ourselves in a primal way. It is here that we are nurtured, here that we derive sustenance, here that we can confirm the fact that we are physical beings with a potential for salubrity.

"Everything built has its antecedents. Land is a reference for buildings; and perhaps building can be envisioned as an outgrowth of the land. As a reference for the built world, the natural landscape

//

offers a collage of innumerable forms within a clarity and simplicity of organization. The earth when viewed holistically is a simple sphere which consists of alternating bodies of water and land mass.

When viewed at closer range, however, the enormous richness and complexity is revealed. There exists here an inexhaustible range of relationships, scales and sizes. A mountain, as a metaphor, might be a wall (a two sided continuous surface definition) for giants; a half inch piece of shale might serve the same purpose if the inhabitants are ants. To understand the land is to know that we are interdependent with the physical world rather than master of it.

"One way to comprehend the land is to be an observer of geomorphology or "groundshape". The shape of the land evolves sequentially and predictably over time. In looking at the ground analytically it's possible to discern two generic types---tectonic shapes and erosional shapes. Tectonic landshapes such as mountains, rocky cliffs, volcanoes, etc. are the result of the internal pressure of the earth pressing outwards. These shapes are exclusive, primal; they carry with them the memory of creation. Over eons, however, nearly all tectonic forms have been acted on by the external forces of climate and weathering to become erosional. Rocks are unstable when exposed to a wet and biologically active atmosphere. They react to pressure of 14.7 pounds per square inch in a temperature range of 0-100°. Oxidation, carbonation, thermal expansion and contraction, hydrolysis and hydration etc. transforming groundshape, changing it and moving it at speeds ranging from almost imperceptible soil creep accelerating up to sudden avalanches.

"The greatest agent of geomorphological change is water. Water equals motion whether it is surface water, ground water or snow. While it serves as the great catalyst of change through its oceans, glaciers, lakes, rivers, atmosphere and biomass, it is water that permits the earth to be life-giving. The relationship of water to the land remains special. The distribution of H₂O in the land divulges suggestions of organizations for built environments. The direction of water is informative of the history of settlement and human travel. In the Yucatan of Mexico, the location of cenotes or underground springs predicted the patterns of growth of the Mayan civilization and rivers like the Tigris-Euphrates determined the birth of new civilizations.

"Gravity, like water, is the other major agent which alters the earth shape. Gravity is the great leveller; earthquakes might trigger landslides but gravity is the destructive force. As soon as land rises from the sea, gravity and flowing water work to bring it down again. Only water and gravity carved the Grand Canyon.

"W.M. Davis, a noted 20th century geomorphologist, said a description of the landscape is complete when it includes structure, process and time. For the builder of shelter, however, this description is inadequate because it does not include a description of space.

"A single knoll rises out of the plain in Oklahoma, north and west of the Wichita Range. For my people, the Kiowas, it is an old landmark, and they give it the name "Rainy Mountain". Loneliness is an aspect of the land. All things in the plain are isolated; there is no confusion of objects in the eye, but

one hill or one tree or one man. To look upon that landscape in the early morning with the sun at your back, is to lose the sense of proportion. Your imagination comes to life, and this, you think, is where creation was begun.

M. Scott Momaday, a contemporary Kiowa

"Although space initially can be perceived as emptiness--it is that which fires the imagination to dream about what is not but what could be. If most landscapes consist primarily of complexly curved and sloping surfaces, the valley can be regarded as the basic unit of the landscape. The space is defined by the surface of the land and it is the ether necessary for dreams. Although, in itself, not perceptible, we see space by virtue of what surfaces define it and *direct* us through it. We as three dimensional beings, walk on surfaces but through space. The valley is one of the clearest examples of *reciprocity* in nature. *Reciprocity* which might be defined as the interlocking, meeting or juxtaposition of differences, is one of the strongest notions the architect can extract from the natural environment. When space exists in a reciprocal relationship with the ground or surface the landscape begins to become habitable.

"Groundshape exists as a result of relentless physical forces; and the constant action of these forces make equilibrium and stability elusive commodities in the natural world. Water is always moving as the ground is always moving. All ecological communities are perpetually in the process of change; climate, slope, aspect, soil, exposure, and the actions of man and animal on the site determine equilibrium.

Ecological communities not in equilibrium are continually progressing toward equilibrium. For example, in 1916, F. E. Clements developed a concept of plant succession in which a vegetation develops over time until a climax vegetation is reached. This is an ecological community in equilibrium and, therefore, self-perpetuating. However, climate, man and animals can change the balance in this community and enhance the probability of generating another cycle on route to equilibrium.

"When we arrived

the river ran high with rain and thaw

but the ferry was able

to float us over

and it would carry our cattle as well.

On the west bank we put the oxen under yoke

and we fell in line once more.

And drove for many miles across

Missouri and saw

slash marks on the hills

where settlers already

had cleared the land

stripping away the wood.

*This rapid cutting allowed
the rain to erode the slopes*

*so the streams overflowed-
our horses chopped the soft sod
when the trail grew narrow*

*We heard the tired trek
of the cattle at our back
shik-plok, shik-plok, in the mud*

The Donner Party George Keithly

"Groundform, as opposed to ground shape, is humans' effort to temper the effects of time, and to reduce the impact of natural forces. Through both inventiveness and sheer will, humankind has painstakingly labored to make the landscape useable, approachable. Habitation has required methods that resulted in stability of the land via building, terracing, levelling, excavating, soil conservation, etc.

"While the analysis of any human motivation is complex it seems that in some way civilizations have honored the land. Groundform developed as an element of stability, as a conscious and even sometimes obsessive motivation to minimize mass wasting and effectually delay the inevitable aging of time and

restrain the force of gravity. In that way, groundform can be regarded as an extension of, substitution for, or an inherent evolution of groundshape. Because ground form imitates some of the qualities of groundshape it permits use yet its artificial quality offers a stability not found in the natural world. "In the natural landscape form is use. Friction is not great enough to hold a rock on a slope greater than 40° and from this empirical reality we can learn. It seems that humans depend on horizontal surfaces for movement and vertical definition for enclosure. Although tectonic-like forms are closest to humans' needs for use-space, erosional landforms are characteristically supportive of life and vegetation. In these landforms, *growth* and evolution occur rapidly, naturally and effortlessly.

"The natural landscape seems to indicate the interlock of tectonic and erosional landshapes is the richest ground environment. This kind of *reciprocity* allows a world definitive of space and capable of sustaining life. This *reciprocal* arrangement suggests a richness of physical forms coupled with fertile ground that can give growth to vegetation, whose framework elements in themselves permit a new order of space and permit another kind of life.

"Long ago the good hard surface of dung, blood and mud had been protected by linoleum and this in turn had hollowed or heaved because of the working of roots or the decay of old roots. A young tree used to shoot up under my bed every wet season. There was a crack on the mud there; the linoleum began to bulge upwards and then split; and out came a pale sickly whitish yellow shoot which immediately turned a healthy green. We cut it off but it sprouted up once or twice every wet season.

Going Home Doris Lessing

"The natural world dictates the benefits of both kinds of landforms. This interlock evokes a powerful metaphor for the builder of shelter, houses and cities. Groundform as shelter provides a resting place in the earth, a refuge against time, a definition of space.

"The embodiment of two archetypal yet polar ways of dealing with the landscape were the Meso-American Indians in Pre-Columbian times and the Chinese from ancient to modern times. The Indians of Mexico and Guatemala dominated the ground. Their relationship with the ground can be characterized as almost a cultural obsession to transform the landscape. They expressed their attitude toward the landscape by flattening the ground and building the ground into completely new forms-- usually temple altars in the shape of pyramids. No ancient civilization either in Europe or Asia so transformed a piece of nature by massing up the soil. (Only the Mixtecs of Mexico were masters of the art of excavation.) Northwest of Mexico City, earth tools nearly 28,000 years old have been found, and in Mexico alone over 11,000 archeological sites have been identified. Throughout Meso-America groundform assumed idealized shapes. Early Meso-American examples were simply rounded mounds of dirt. The Pyramid of Cuicuilco (place of singing and dancing), the earliest example extant of this form, had an original height of 110 feet and a diameter of 400 feet. Not only did the dimensions increase dramatically over time but materials became important to this kind of groundform. The mound form evolved as stone covered and then a square geometry evolved which became secured with permanent materials--stone often covered with stucco and then painted. Sometimes there were exceptions such as the Soothsayer's Temple at Uxmal which is oval.

"It is difficult to overemphasize the archetypal commitment of the Meso-American Indians to groundform. Their effort was a collective cultural experience. Some archeologists contend that an enormous slave class was necessary for this undertaking; others have convincingly made the case that only the collective conscious effort of an entire population would be adequate and no slave class could be coerced to undertake such an endeavor without constant rebellion. Their effort was a total collective cultural experience tantamount to eating or sexuality. So convincing and important was this enterprise that little time could have remained for individualistic needs. Teotihuacan (place where one becomes God) is the site of the Sun Pyramid which is larger in volume than Cheops in Egypt. The base of the Sun Pyramid is larger than any pyramid in the Old World, 725 feet with a height of 215 feet.

The Meso-American Indians understood the natural environment by recreating it in a fantastic manner.

"Among the destruction and decay we can see back into the past...see the gloomy forest lighten and imagine every building in its perfection, with its terraces and ornaments carved in stone and painted, magnificent, sublime and awesome looking out over a never ending plain

J. Stephens, a 19th century adventurer

"Piling up the earth was a way of reaching another world, of developing an axis mundi. To climb these communally made structures provides, in some cases such as at Chichen-Itza in the Yucatan or Tikal in Guatemala, the only opportunity to look above the forest which is the dominant condition there, to understand space and to have the ability to see the sky.

"In Tikal, an enormous temple city, the Mayans altered the entire original landscape. What exists now is completely manmade. The natural field, a collection of things and their interrelationships, has been replaced by a manmade field. Enclosed exterior spaces are carefully articulated to control the range of vision. This extreme point of view can be approached only with humility and awe. These structures required thousands of people hundreds of years to build. At Uxmal, as elsewhere, five temples built one on another survive as relics for contemporary civilizations to understand how these people intervened in the landscape and how these structures were *additive* over time.

"The Chinese were as intuitive and sophisticated as the Meso-Americans were deliberate and industrious. The principles of *feng shui* prodded the Chinese to seek out habitable landscapes rather than impact and radically alter the natural world. This geomantic system focused on the search for *ti li* (lifegiving quality) and this criterion fashioned the culture's ideas about groundform. This approach to the ground allowed a gentle intervention into the land. As the Chinese framed their structures on wooden platforms, extensive communal dedication to groundform remained unnecessary and an individualism emerged because there was time for other pursuits.

"Chinese architecture has almost no ruins. Fewer than thirty buildings remain extant before the Ming Dynasty in 1368. The sense of history in their buildings came from the act of renewal, by rebuilding the structures, as permanent built landmarks were antithetical to the culture.

"The Chinese used groundform to establish the territory within the natural landscape. The word for city and wall in Chinese are identical as every important ensemble of buildings was a walled enclosure itself. Groundform fabricated walls which were cities and if the city mustered enough density, groundform supplied separate enclosures for further definition and *direction*.

"Both attitudes toward the ground, although polar, are clearly archetypes to understand the land. The Meso-Americans literally built their habitable landscape while the Chinese searched to find their habitable ground. While the approaches are radically dissimilar, the objective, to inhabit the earth, is the same. The Chinese tradition accepted the natural landscape in its integral form and paid homage to it. Their structures developed a sense of internal space while the Meso-Americans concentrated on the external.

"Perhaps more important than being aware of the two extremes is to be aware of the infinite variations between them. Gaudi, as a most persistent imitator of the landscape, may belong within the Meso-American tradition but he brought his own richness to it. It is in that way, with signature, that an individual can impact and influence a tradition.

"Building anything more than simple shelter represents a yearning for a greater understanding. More primitive peoples, nomadic tribes such as the Plains Indians, moved in harmony with the movement of the earth. They found the land, as it existed without modification, essentially inhabitable. As civilization grew increasingly complex, stability became important for growth. Although, probably unconscious, it seems when a culture moved into another phase of evolution, their world view asserts itself as a physical

reality.

21

"Over the plains of Ethiopia the sun rose as I had not seen it in seven years. A big, cool, empty sky flushed a little above a rim of dark mountains. The landscape 20,000 feet below gathered itself from the dark and showed a pale gleam of grass, a sheen of water. The red deepened and pulsed, radiating streaks of fire. There hung the sun like a luminous spider's egg or a white pearl, just below the rim of the mountains. Suddenly, it swelled, turned red, roared over the horizon and drove up the sky like a train engine. I knew how far below in the swelling heat the birds were an orchestra in the trees about the villages of mud huts; how the long grass was straightening while dangling flocks of dewdrops dwindled and dried; how the people were moving out into the fields about the business of herding and hoeing.

Going Home Doris Lessing

"The physical world and everyday life remain inevitably entwined. Within that extensive field, at least two things become apparent. Firstly, a collection of physical things which are in and of themselves important. But perhaps even more important to us are their interrelationships because the interdependency of those physical things assures that the fabric of the field can continue. What one sees over the plains of Ethiopia is a *reciprocal, additive, directional* reality which allows us to place ourselves in time and space.

"Secondly, even though securely placed in time and space, and tied to a civilization, we continue to seek.

"Kilimanjaro is a snow covered mountain 19,710 feet high, and it is said to be the highest mountain in Africa. Its western summit is called by the Masai "Ngaje Ngai", the House of God. Close to the western summit there is a dried and frozen carcass of a leopard. No one has explained what the leopard was seeking at that altitude.

The Snows of Kilimanjaro Ernest Hemingway"

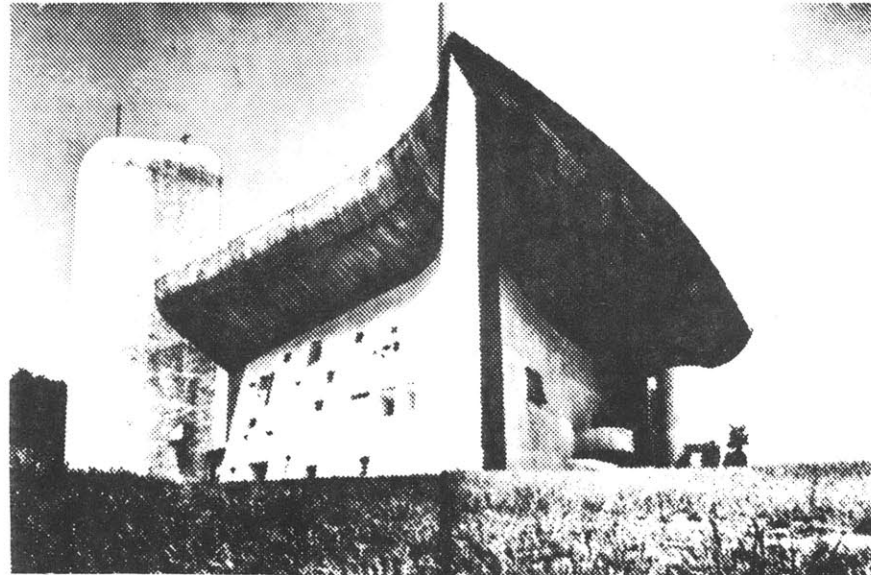
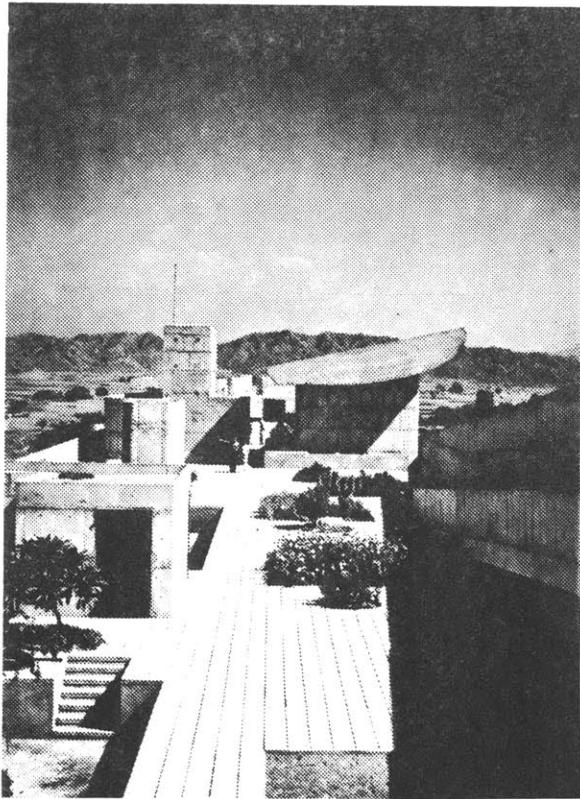
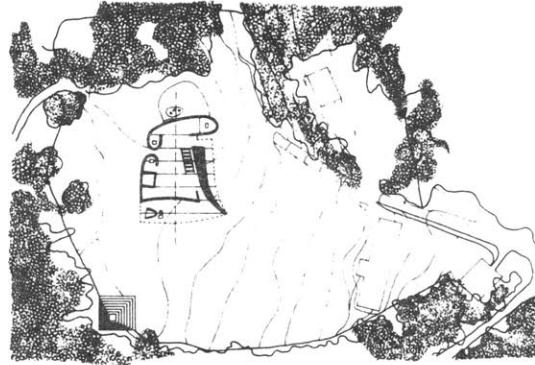
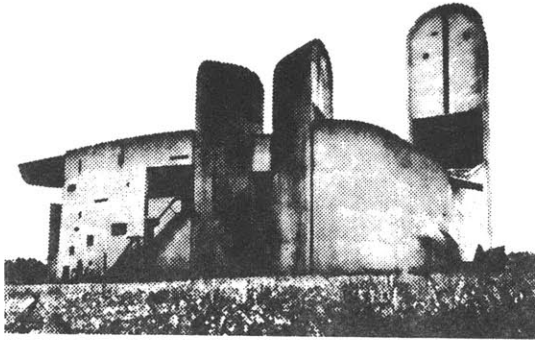
That the physical world and every day life remain inextricably entwined is, in my opinion, fact. But, as the Hemingway quote suggests, there are realities and questions which are not part of the daily vicissitudes of life but rather singular in occurrence and elusive of understanding. Any complex tradition, any full vision must acknowledge both possibilities and clearly in the history of building there are some works which more clearly address the singular situation. This second possibility has not been part of my education and for that reason it has become important for me to explore it.

To appreciate a tradition is only as important as understanding how the participants in that tradition generate its products. While process seems to constitute a multiplicity of overlaps, attitudes and methods there seems to be both a lateral and linear component to the animal. Process seems linear in the sense that it takes an author from conception to product and lateral in the sense that at any phase along a linear path, a great number of stimuli intrude.

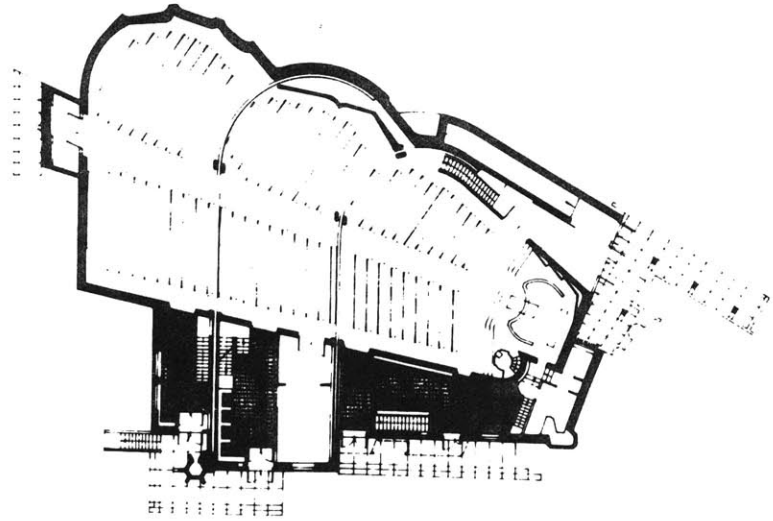
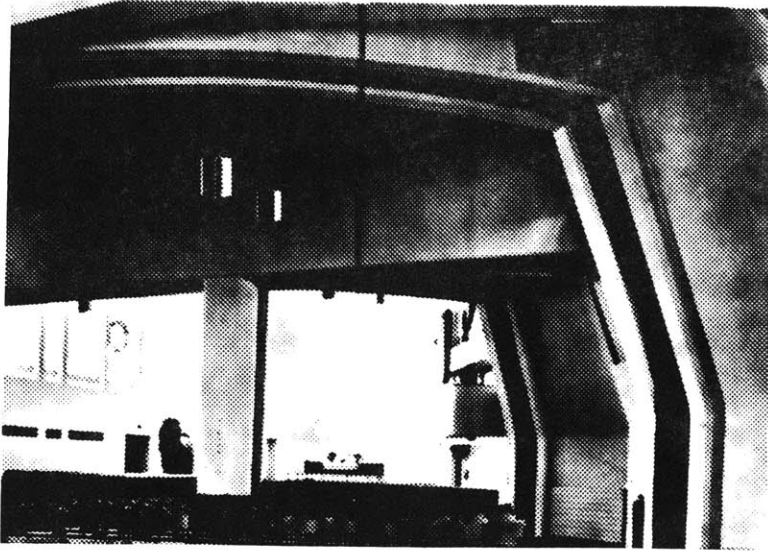
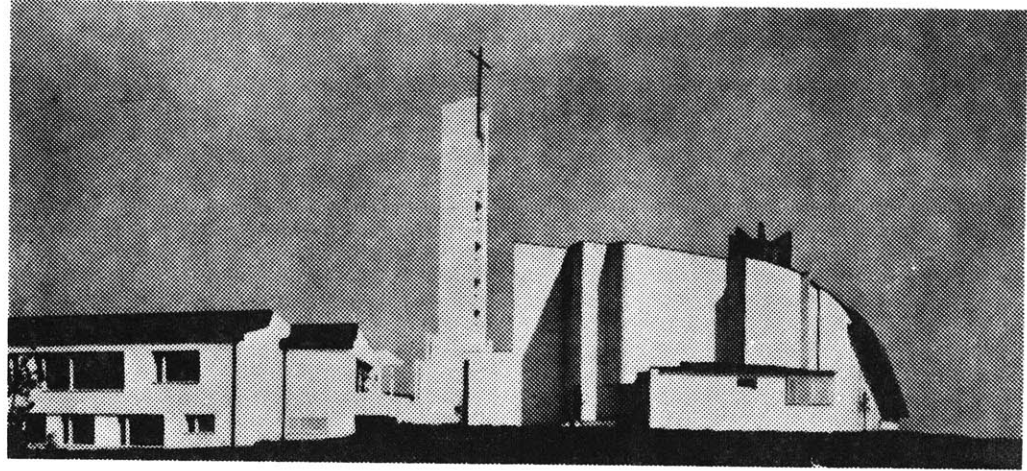
Although architects have different emphasis with reference to a working method, some of the most brilliant signatures in the profession have had the ability to conceptualize the whole of a thing more than others largely because, in my opinion, they have developed a more complete tool kit of process.

Both in *American Building and the Historical Forces that Shaped it* and in his many essays, James Marston Fitch consistently stated that the giants, Corbusier, Wright and Aalto, never surrendered to formalistic style nor frivolous fashion but did what they always did, relied on their resources and saw with their eyes. The products of these masters reflect their ability to

Ronchamp and Chandigarh are not the products of a bldg. 24 method. That fascination that Le Corbusier's bldgs have for me is based upon the question: How did he conceptualize them? What specific intellectual and physical skills permitted him to design these bldgs?



Alvaro's ceremonial bldgs. are the only
 examples with which I am familiar that
 exemplify a perfect field-ground relation-
 ship: i.e. both space and built definition
 are primary and equally strong generators of
 the overall form. I would like to know
 how he was able to do this i.e. what
 method of design permitted him to
 conceptualize in such a way...?



conceptualize the total of a built environment in a way responsive to a whole range of issues which yet have a beginning and an end in a way never possible in the vernacular expression of the Italian hill town or the Mexican pueblo. That richness bred into process has fueled the arguments of architectural historians in a futile attempt to understand whether the Aaltos and Wrights were primarily structuralists, imagists or whatever.

It is valuable to analyze attitudes and working method in order to develop a set of resources to utilize in design. To study other designers' work with an eye toward the way in which they may conceptualize their products can lead to an encyclopedia of the "hows" of doing things and maintaining design intentions. Such knowledge can lead to a harmony between process and intention which will support and maintain educated intuition.

Four of the considerations made here to examine working methods are (1) What is the given working method, i.e. its definition; (2) How can such a working method be made accessible and useful; (3) What or who are examples of a particular working method; and

(4) How can a particular working method be useful in my own process? (This is dealt with in the final portion of the thesis).

The following is a brief description of a few of many potential working methods.

1. The Volumetric-physiogy of a building has two components; the exterior component can be regarded as the massing of the building and the interior component as the formal/sculptural qualities of the buildings. Charles Gwathmey and Richard Meier take this attitude to the extreme of employing an idealized geometry to be, perhaps, the crucial generator of their work.
2. Context, as a resource, can be thought of as a source from which to extract elements from a local vocabulary. Generally, elements such as well worn circulation networks in a given site apply to the organization of a design. However, it can also be useful to refer to existing cornice lines, entry types, scale, building materials etc. Often, planning boards and landmark commissions emphasize context in the formation of design criteria.

3. A cultural method as a resource attempts to draw from the existential mind set of the user group. Such information can be gathered from interviews, surveys, sociological reports and observation of people and buildings. Robert Venturi and Denise Scott Brown are among the few architects who attempt to reflect a populations' cultural attitude in the form of their buildings.
4. A structuralist method can be characterized as the utilization of building methods and supports as the prime generator of the form of the building. A sophisticated knowledge of structures and industrialization greatly facilitates this as a working method. Herman Hertzberger is an example of an architect who works in a structuralist vein.
5. An analog is a device to extract similarities from different references. For example, a bee hive could be a potential analog for a parking garage; i.e. a single entry form with many internal cells. Bob Slattery uses this device with a great deal of facility.
6. A systematic/organizational approach such as the SAR method of John Habraken usually attempts to systematize solutions to large scale often repeated problems. Systems like this can be adopted, modified or invented and necessitate a high degree of commitment

and discipline.

7. Fantasy as a resource deals with what is not but which can be imagined. One can tap one's own dreams or can use the dreams of others as rendered in art and literature. Bruce Goff and Peter Cook are examples of architects who explore their own and other peoples' dreams.

8. Associational--one can tap one's own memory of feelings as they relate to the built environment. In all probability, most architects draw substantially though not consciously on their own memory. Jim Czajka's thesis analyzes and catalogues many of his favorite place memories and constitutes a collection of resources for his own use.

9. The kinesthesis of a building can be described as the inter-relationship between time and space. It generally refers to the rhythmic disposition of built elements that one experiences during movement through any environment. A built example of this element in the organization of a building can be seen in the summer palace at Peking where the built elements are distributed in a straight line symmetrical axis while the elements of the landscape are distributed axially though asymmetrically. A rhythm is established

by the buildings while the landscape is a counterpoint to it.

10. The Activity-Dimensional Program regarding the square footage requirements for use and qualities desired for that use necessitates research into written information, interviews and observations.

Common examples of this type of information are theatre planning guides, Time Saver Standards and American Graphic Standards.

PHASE 1:

**SITE/
PROGRAM**

PHASE 1 - Choice of Program and Site

An opera house was chosen to explore these notions of theory and process for several reasons. In addition to having an incentive after listening to Sarah Caldwell, an opera program provided an opportunity to explore problems I had never confronted in my architectural education. Namely, a highly specific program with long spans afforded a situation which was unlikely to be additive. In fact this kind of program required the assimilation of large volumes for an essentially singular purpose.

The theatre district is also on the verge of a Renaissance. For example, five years ago, the Colonial Theatre sponsored two productions and this year it boasts of twenty-four. This new activity, sponsored by a number of aggressive competent individuals like David Solomon of the Colonial Theatre is struggling to achieve identification as a theatre area. It seemed that a landmark sanction by the Opera Company of Boston would be an opportune situation to provide a physical cohesiveness for the district. In this sense, it seemed appropriate to justify a contextual object.

Phase 1 constituted the development of the program and the matching of the program with a site. There were originally two potential sites. The first lies across from Symphony Hall on Huntington Avenue and the second between Tremont and Washington Streets in the theatre district. In some ways, the first site would add tremendously to the cultural spine consisting of Symphony Hall, the Museum of Fine Arts and the Isabella Stuart Gardner Museum and could stimulate new restaurant and retail development.

However, the second site was eventually chosen because of its proximity to parking, mass transportation and the existence of other theatres. Probably as important a consideration as all the other amenities was the wish to locate the opera in an area with other theatres so enough people would exit to the street together in order to experience some sense of communal celebration.

Although many people criticized the site because of the adjacent "combat zone", I, along with one of my critics, Ben Snyder, regarded that as a positive factor. Not so unlike Greek Street theatre, where drama theoretically began, these street people comprise a cast of characters, which, in many ways, is the real



the site from Washington Street



across from site - NE Tufts Medical Center



component of what all established drama mimics. The proximity of sex and violence, like Times Square in New York, illustrates the reality of what the dramatic situation is really about.

The program was written and researched with the help of theatre planning books. The ground area of the site is approximately 85,000 square feet with the necessity of accommodating 250,000 square feet of program. The site is densely packed due not only to the large quantitative demands of the program but also due to the "L" shaped configuration of the site. The physical situation is workable but the site configuration imposed restrictions which facilitated decisions but severely limited exploration. The site configuration necessitated the rather extreme solution of removing approximately 30 feet from the stage end of the Music Hall in order to facilitate movement into the theatre complex. This decision was justified by the knowledge that the Music Hall would have to undergo extensive renovation of its stage housing, seating and accoustics in order to be suitable for opera.



the Wilbur Theatre... Tremont St.



corner of Tremont and Kneeland St.

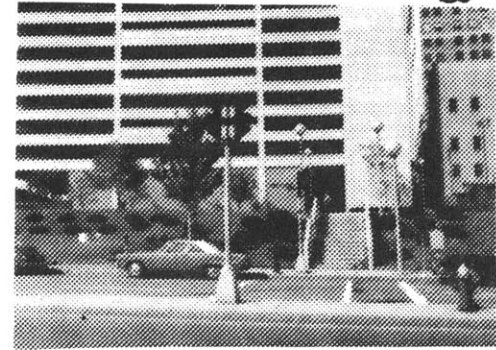


Stuart Street... the cont. of Kneeland

PROGRAM

Sara Caldwell has stipulated that an objective for the Boston Opera Company would be a complex of three theatres each designed to accommodate specific kinds of productions. The design objectives specified: one theatre capable of seating 2000 for experimental productions; a second, also able to accommodate 2000 for popular productions, i.e. Puccini and Verdi; and a smaller third theatre with a seating capacity of 800 for classical and baroque productions. In addition to the theatres the complex intends to house all the required support facilities, i.e. scenery shop and costume making plus business/management offices.

Support: Scenery shops, costume and prop shops make up the support component for the theatre complex. Many of the following such requirements were derived from existing facilities presently in use by the Boston Opera Company. The scene shop was studied and measured with the permission of Cathy Wilson, Director of the Opera Company of Boston. Barbara Devon of the costume shop permitted me to have the same opportunity. Most square footage requirements, however, have been revised based on the input of



the stairs from alleyway to Wash. St.



across Wash. St. to N.E.-Tufts Center



to continuation of alleyway

more detailed research from theatre planning literature.

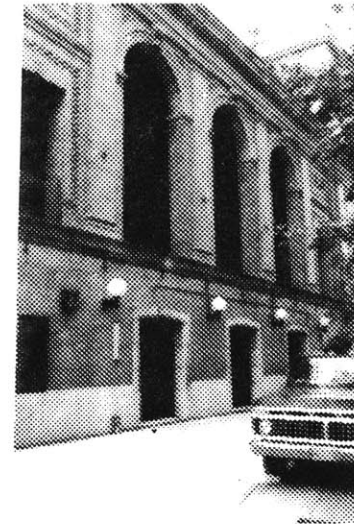
Scene Shop

The essential quality of a scene shop is the industrial nature of the space. Sensitively controlled artificial lights in addition to some natural light produce a desirable situation. Both fire-proofing because of the many flammable materials and proper ventilation because of toxic vapors are essential to a safe operating shop. Flats are generally 18 feet high and it is important that both the painter and designer can view the full expanse of the canvas. The Opera Company of Boston is renowned for its lavish and imaginative set designs.

Because leased warehouse space is so expensive and storage needs are great, as much storage area as possible must be provided. Facilities for stoves and sinks should be provided adjacent to the printing area. The shop accommodates a range from 2 to 30 workers on any given production.



down alley from Tremont Street



side facade of Music Hall on alleyway

20 ft height should be aspired to allow for as free movement of scenery and equipment as possible.

1600 sq. ft. woodworking and carpentry

700 sq. ft. painting dock

100 sq. ft. tool room

100 sq. ft. welding area

100 sq. ft. vacuum press

600 sq. ft. lighting storage

800 sq. ft. flat storage - height should allow for storage of largest props used

700 sq. ft. large prop building area

300 sq. ft. three designers office

100 sq. ft. kitchen sink area

100 sq. ft. receiving area

5200 sq. ft. approximate amount of space now used by the Boston Opera Company. A comparison of their existing facilities with other scene shops indicate that 10,000 sq. ft. is a more appropriate target figure.

10,000 sq. ft. target

Costume Shop - Space Requirements

38

Most costumes will be designed, cut, sewn and fit at the Costume Shop. There is a need for a great deal of natural light as most of the work will be done during the day and much of the hand-work is fine. The wet and craft areas should be kept separate from the dry and sewing areas.

100 sq. ft.	receiving area
100 sq. ft.	kitchen (for drying fabric, cooking glues, etc.)
300 sq. ft.	sewing area
150 sq. ft.	fitting area
350 sq. ft.	storage (temporary storage - long term storage will be kept in the basement)
150 sq. ft.	accessories
200 sq. ft.	designers' offices
100 sq. ft.	wet area
<u>250 sq. ft.</u>	craft area
1700 sq. ft.	total

Theatre Facilities: The theatre program in general is comprised of facilities for the performers and the theatre proper (i.e. lobby, auditorium, stage, etc.). Since one of the three proposed theatres for the complex is a rehab of an existent theatre already equipped with its own lobby, public rooms, etc., the space requirements have been primarily generated by the needs of the two new theatres.

Facilities for the performers - space requirements

- 300 sq. ft. green room - natural light is desirable here
- 5600 sq. ft. two rehearsal rooms - full rehearsal space should duplicate stage

- 300 sq. ft. three directors offices
- 100 sq. ft. kitchen
- 500 sq. ft. restrooms
- 300 sq. ft. lounge
- 150 sq. ft. office for travelling company
- 50 sq. ft. vestibule area for entry in performers area
- 30 sq. ft. doorman's booth for stage door
- 3200 sq. ft. dressing rooms - one set/theatre - 16 sq. ft./performer and chorus (dressing rooms for principles

should be back stage)

(lighting conditions should duplicate the stage/
theatre as closely as possible)

200 sq. ft. wardrobe maintenance room

Facilities for the public

Marquee should be clearly lighted and should also
afford rain protection as auto drop off

100 sq. ft. box office - 5 windows - rule of thumb is 1/1250 seats

2000 sq. ft. foyer to serve entire complex

lobby should be part of a ceremonial entrance with
control points to the various theatres

1600 sq. ft. for classical and baroque theatre

4000 sq. ft. for the experimental theatre

Lounge space - including restrooms, bar, refreshment
area etc. - the rule of thumb for operas is 8 sq.
ft./per seat lounge space. It is considerably more
generous than for other types of theatres due to the
extended length of the performances

6400 sq. ft. classical and baroque

1600 sq. ft. experimental

Checkrooms for coats

250 sq. ft. classical and baroque theatre

350 sq. ft. experimental theatre

Rough area for Auditoriums

13,500 sq. ft. classical and baroque theatre

33,500 sq. ft. experimental theatre

Lavatories should be easily accessible to each theatre. Rule of thumb - mens' room - 5 urinals, 3 sinks, 2 toilets/1000 seats
 womens' room - 5 toilets, 5 sinks/1000 seats
 The rule of thumb should be expanded by 4x where performances exceed 3 hours.

Stage

3000 sq. ft. classical and baroque

3500 sq. ft. experimental

Acting area: depth of acting area usually equals stage width

2

9000 sq. ft. classical and baroque

9000 sq. ft. experimental

Stage housing - ideal conditions would allow for space on either side of acting area equal to acting area; adequate crossover space behind the cyclorama must be left for easy

passage of actors; space should be high enough for stage hands to walk on rigging and to work pulleys; all stage drops must be able to be lifted completely out of view.

1400 sq. ft.	classical and baroque	A full orchestra for an opera is 90 to 120 musicians.
1400 sq. ft.	experimental	Space planning requires 10 sq. ft./musician except for 20 sq. ft. for a harp, 50 sq. ft. for a standard grand piano and 50 sq. ft. for the timpani.
200 sq. ft.	classical and baroque	Electricians' room
200 sq. ft.	experimental	
<u>Off-Stage Area</u>		
150 sq. ft.	classical and baroque	Office and incidental space for travelling companies
150 sq. ft.	experimental	
160 sq. ft.	classical and baroque	stage manager's office
160 sq. ft.	experimental	
5000 sq. ft.	classical and baroque	understage area for cross underspace, equipment, storage, etc.
5000 sq. ft.	experimental	
400 sq. ft.	classical and baroque	musicians rooms
400 sq. ft.	experimental	

400 sq. ft.	classical and baroque	stage hands locker rooms
400 sq. ft.	experimental	etc.
100 sq. ft.	classical and baroque	ushers rooms
100 sq. ft.	experimental	
100 sq. ft.	classical and baroque	doorman's room
100 sq. ft.	experimental	
150 sq. ft.	classical and baroque	maintenance storage
150 sq. ft.	experimental	
800 sq. ft.	classical and baroque	extra storage space for
800 sq. ft.	experimental	musicians and stage hands
		etc.
1600 sq. ft.	additional rehearsal area	
200 sq. ft.	classical and baroque	directors office
200 sq. ft.	experimental	
600 sq. ft.	classical and baroque	dressing rooms for
600 sq. ft.	experimental	principles in productions
100 sq. ft.	classical and baroque	stage door and vestibule
100 sq. ft.	experimental	

Management: In general, this will be a business, conference and public relations area. It should be accessible to natural light and efficiently located with regard to the theatres.

150 sq. ft. general manager's office

100 sq. ft. secretary

150 sq. ft. bookkeepers

150 sq. ft. stenographers

100 sq. ft. subscription area

200 sq. ft. conference room

200 sq. ft. conference room

100 sq. ft. kitchen

3500 sq. ft. library

300 sq. ft. toilets and restrooms

Miscellaneous:

Distribution - estimated to be $\frac{1}{4}$ of total square footage

Loading dock - 1800 sq.ft. for entire complex

Shipping area - 2400 sq. ft.

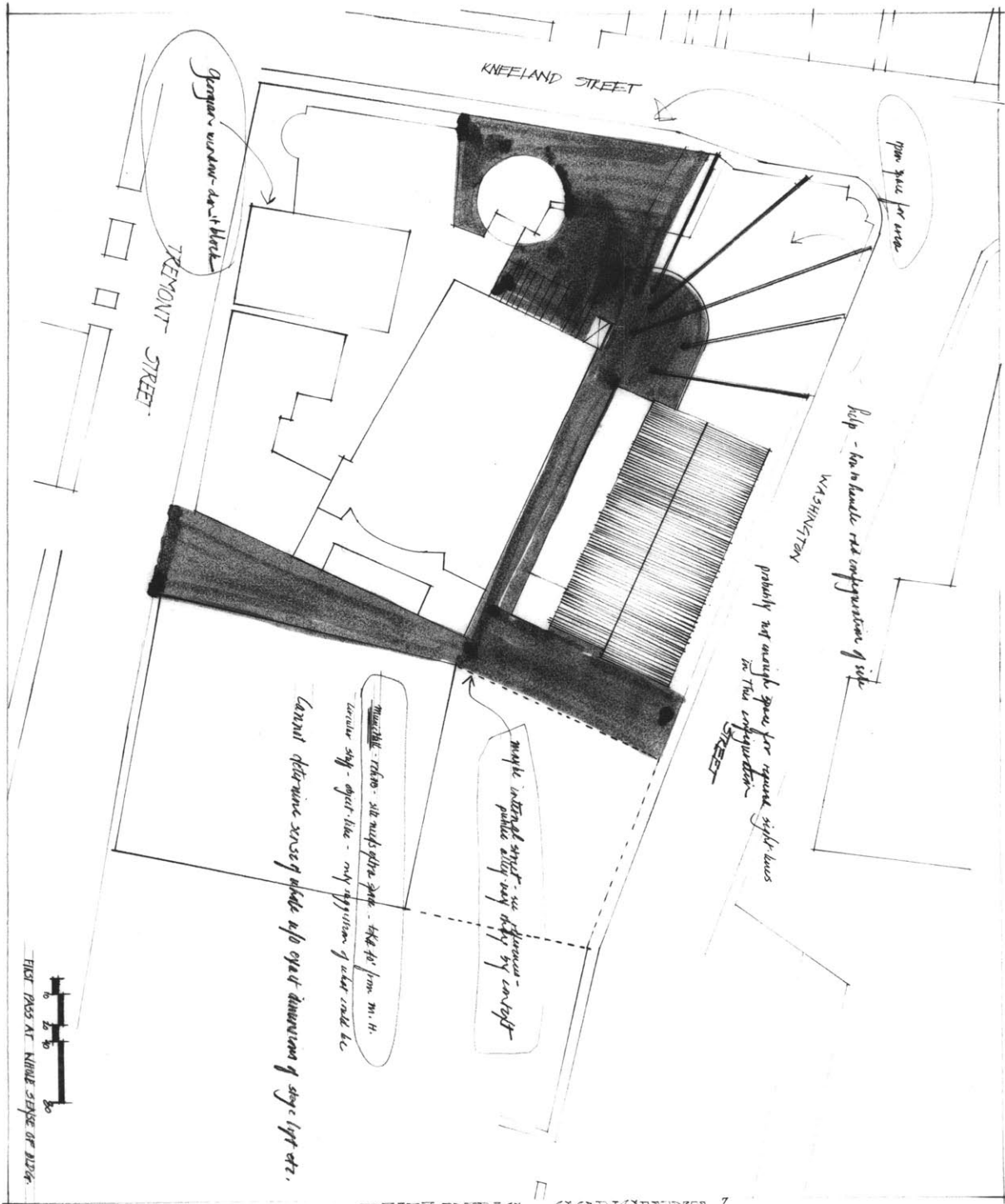
Mechanical Room - 4800 sq. ft.

Special Note on Fire Code: Every class A place of assembly (capacity 1000 people or more) shall have at least 4 separate exits as remote from one another as possible. Total distance of travel from any point to an exit cannot exceed 150 feet for unsprinklered space or 200 feet for a sprinklered area.



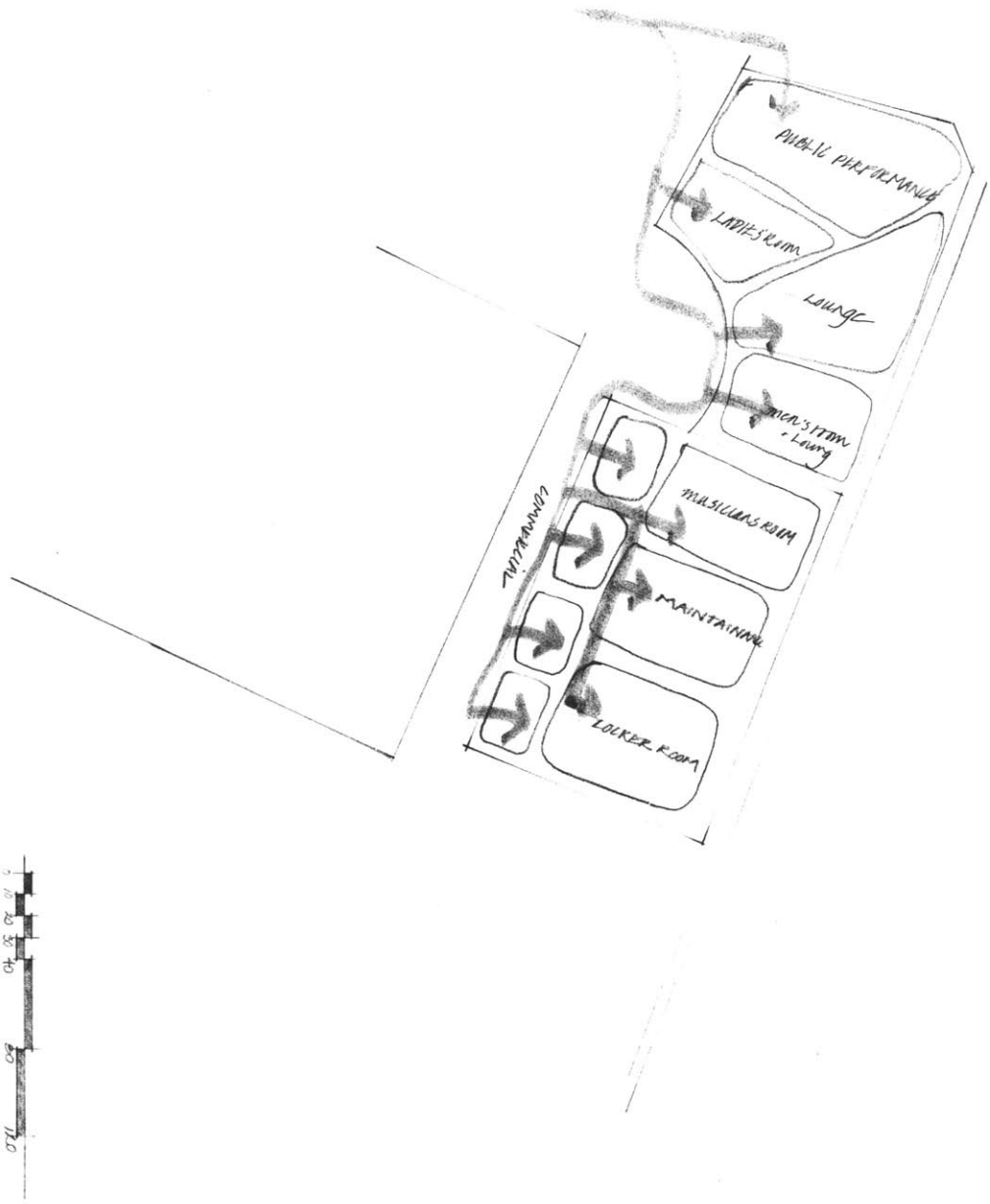
Parking
 Pedestrian and Secondary Vehicular
 Proposed Alley
 Proposed Parking



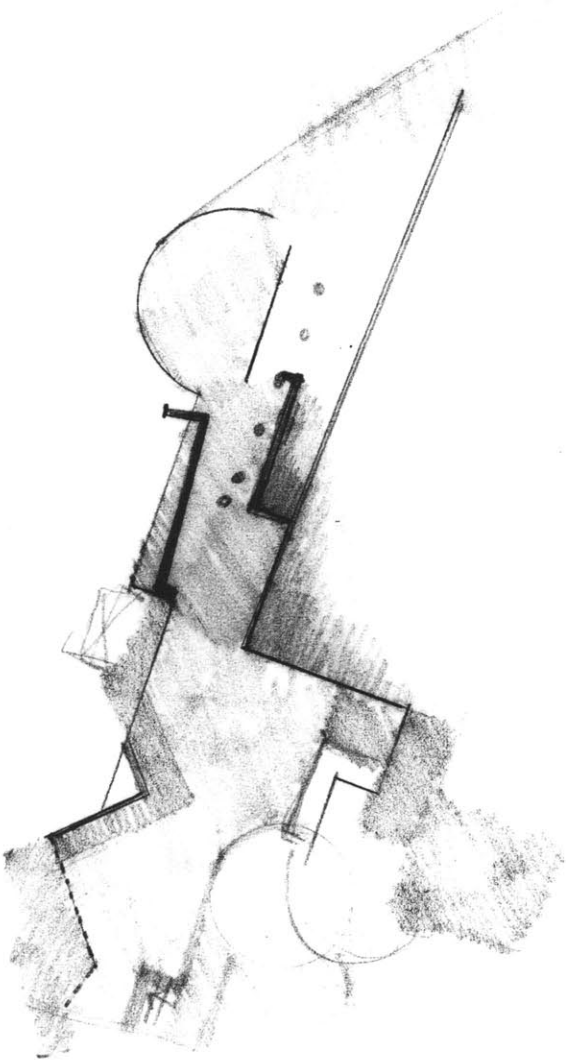


PHASE 3: BUILDING CONCEPT / ORGANIZATION

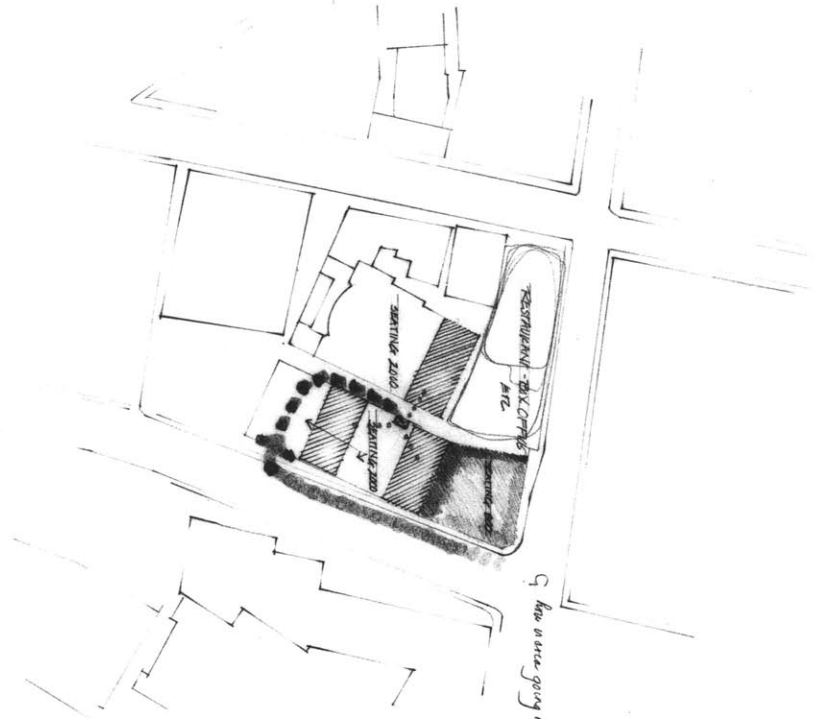
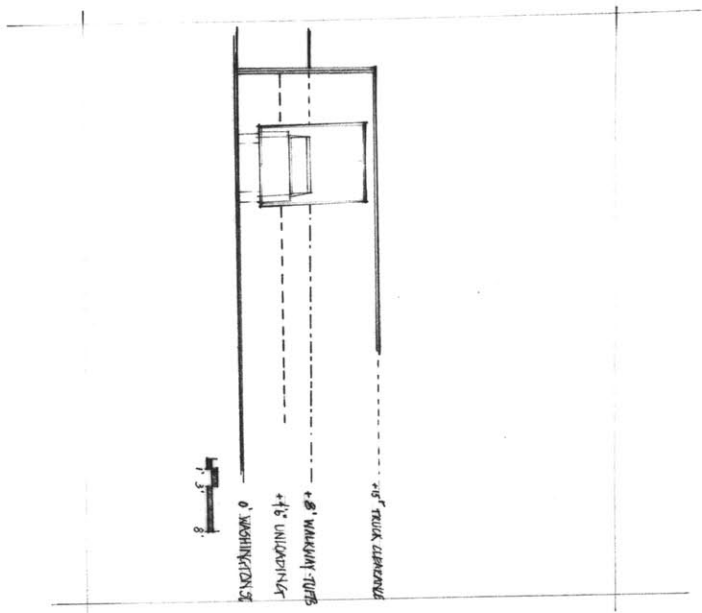
A



B



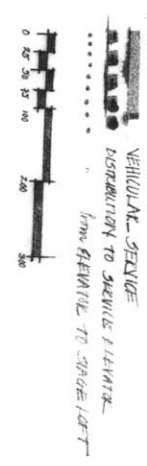
D

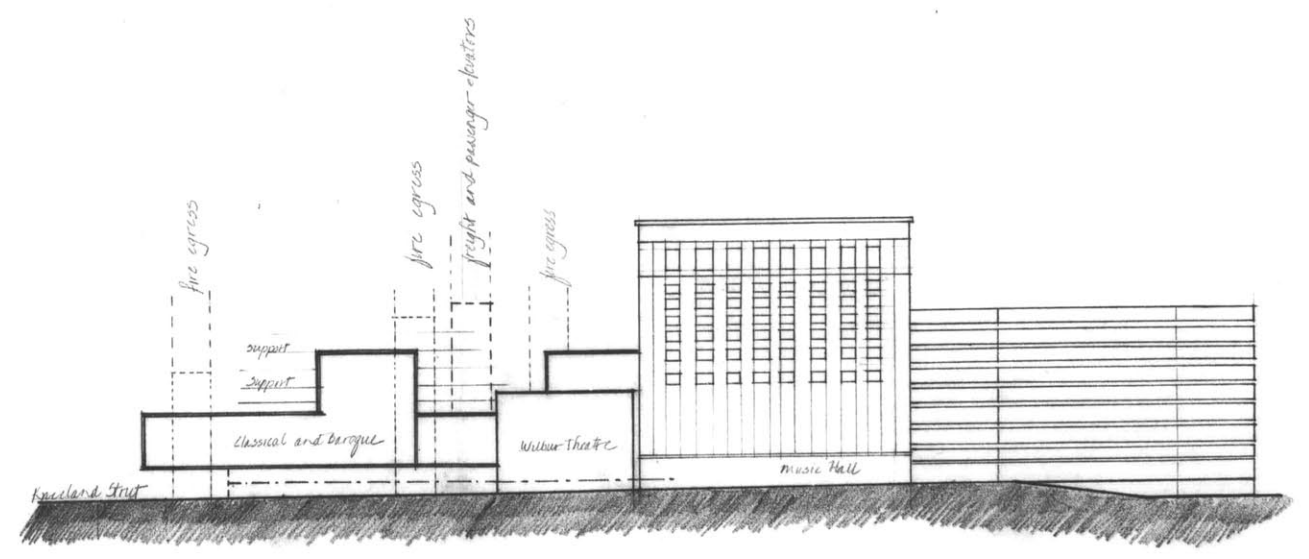
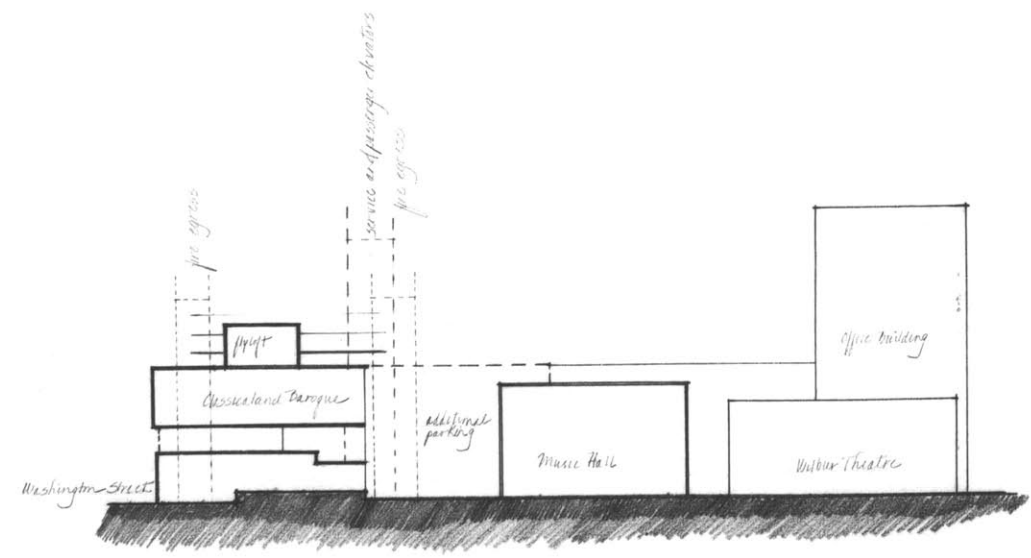
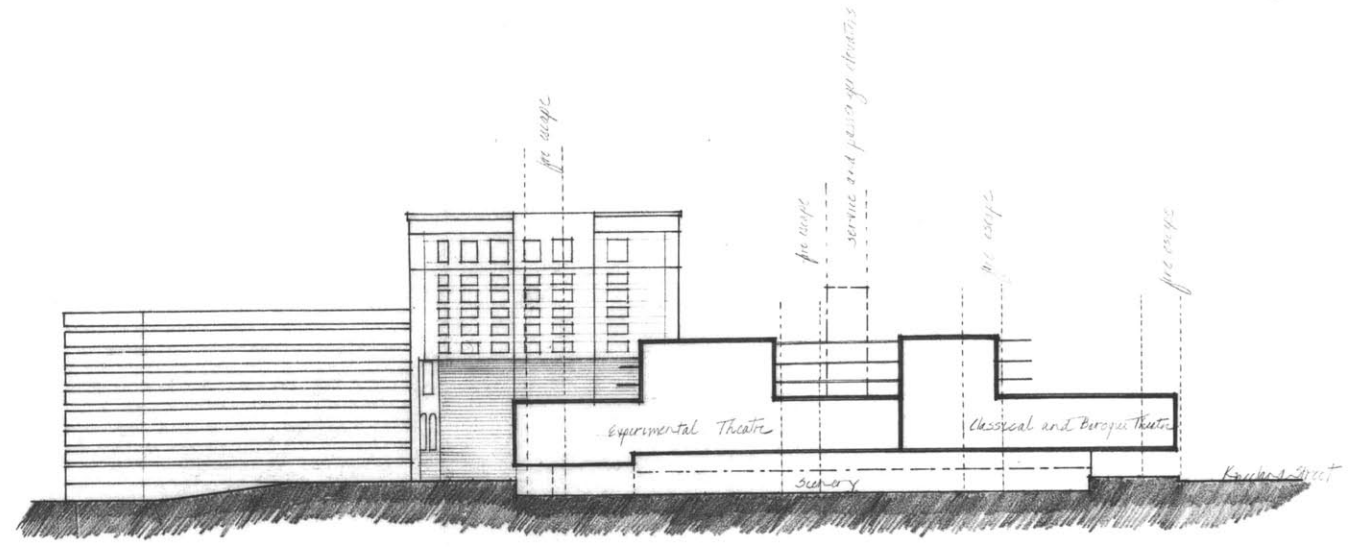
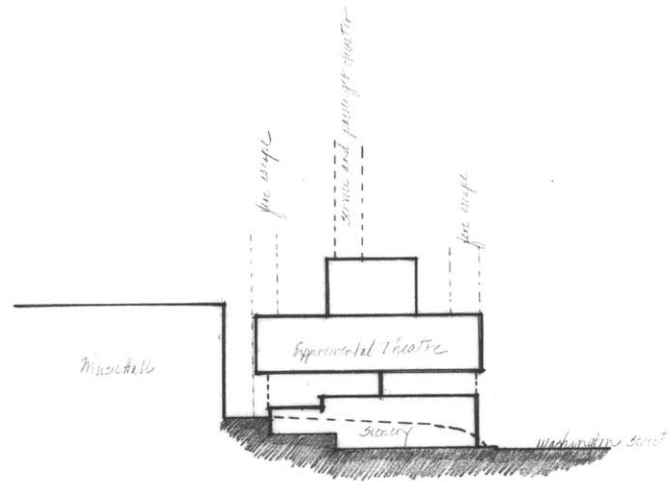


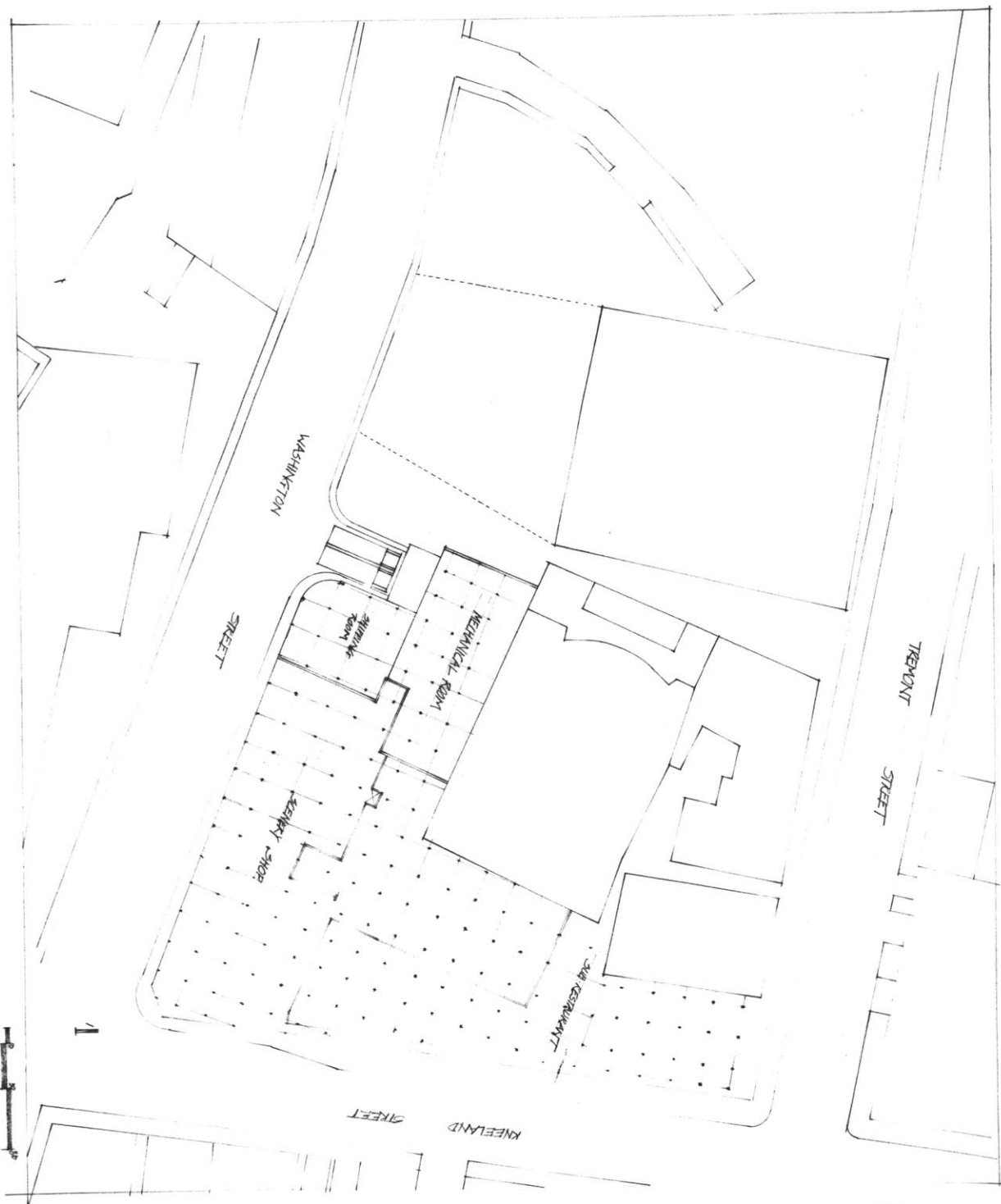
How a user going to be perceived by people who don't go in there?

a typical route... means of a wayfinding...
 are they a bit in confusion...

Close alignment of users' sense of orientation & security services



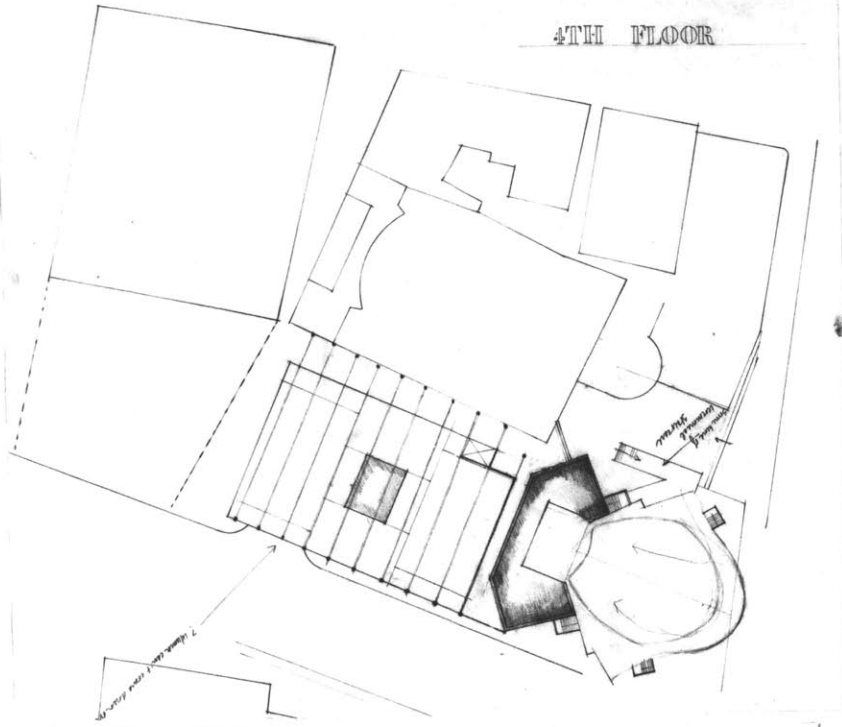




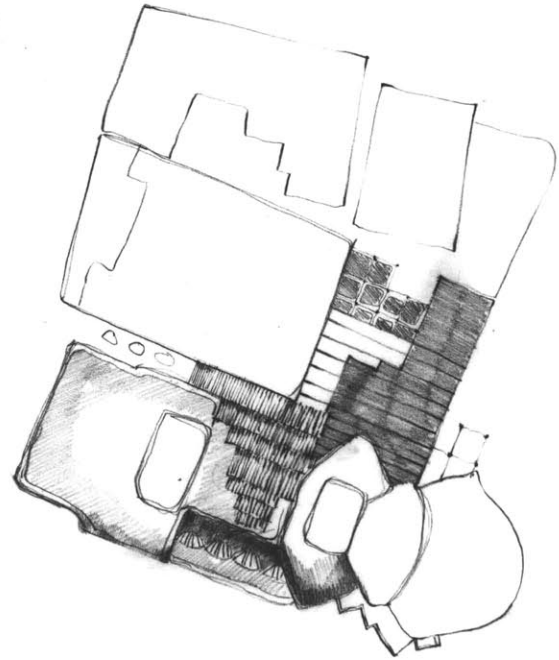
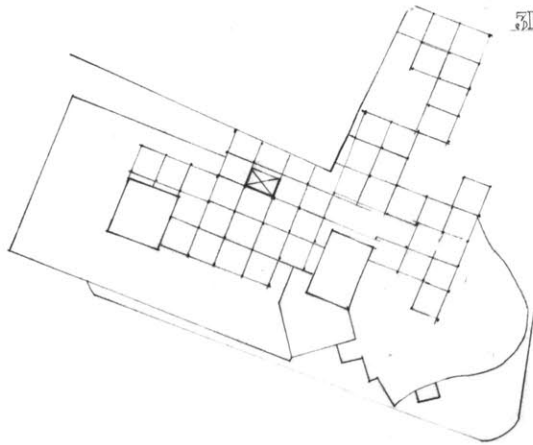
B

54

4TH FLOOR



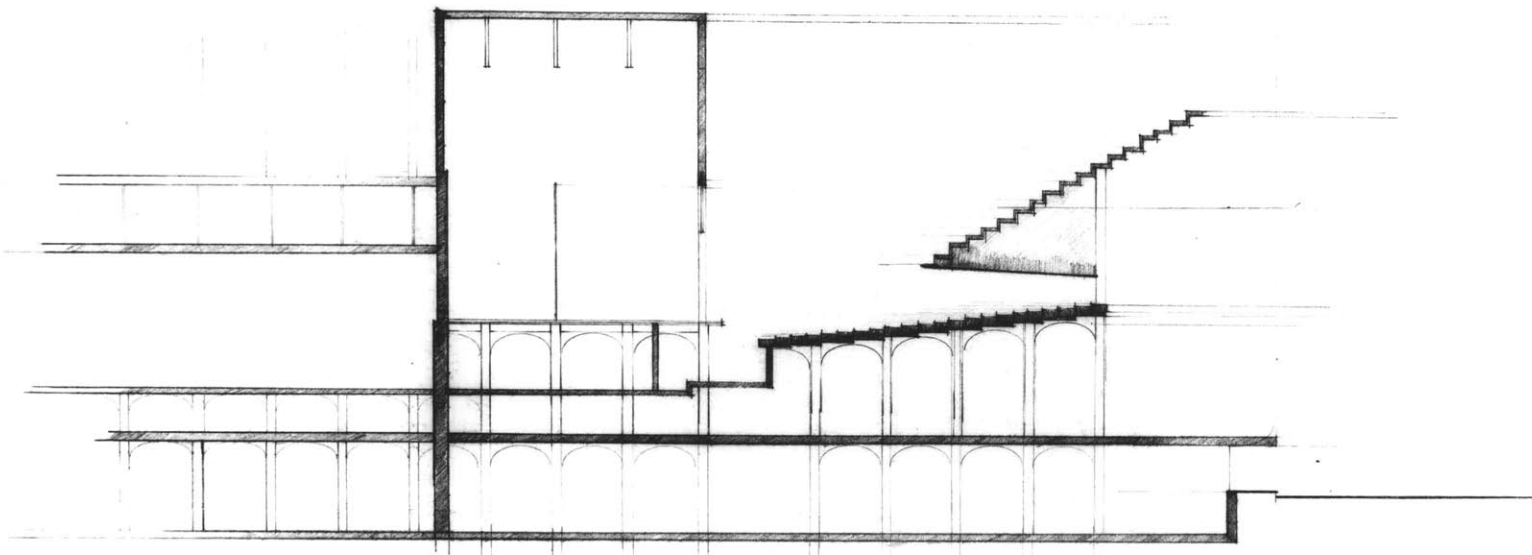
3RD FLOOR



ROOF

5b

D

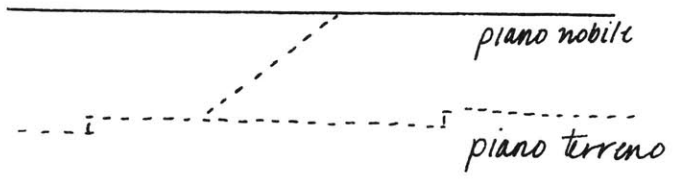


50' max
clearance
to street

Note - what's indicated
get to be lower ex.
too high to get in
ground level

An Historical Analog for organization:

The constricted site requires the location of the theatres on the upper levels. Such placement duplicates the organization of Renaissance palaces where opera was originally performed i.e. the notion of a piano terreno, the bottom floor as a continuation of the street, and a piano nobile, an upper floor for the more specialized and important activities



Looking at historical precedent for hints to solutions for site problems was extremely helpful but its important to note that it might have been more valuable to also look for this organization in other places for keys to form sources eg. A rain forest is a kind of Renaissance Palace...

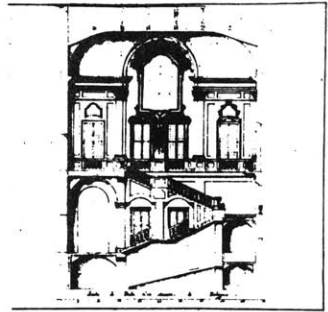
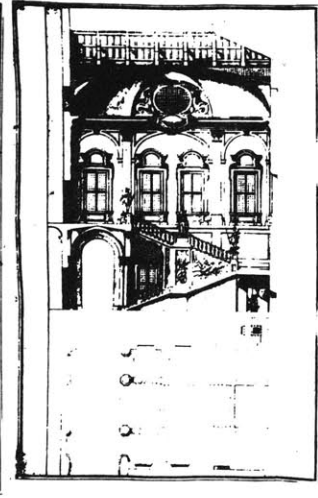
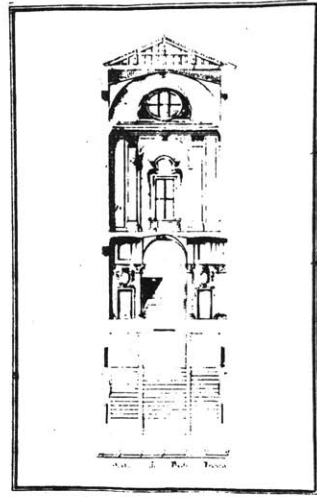
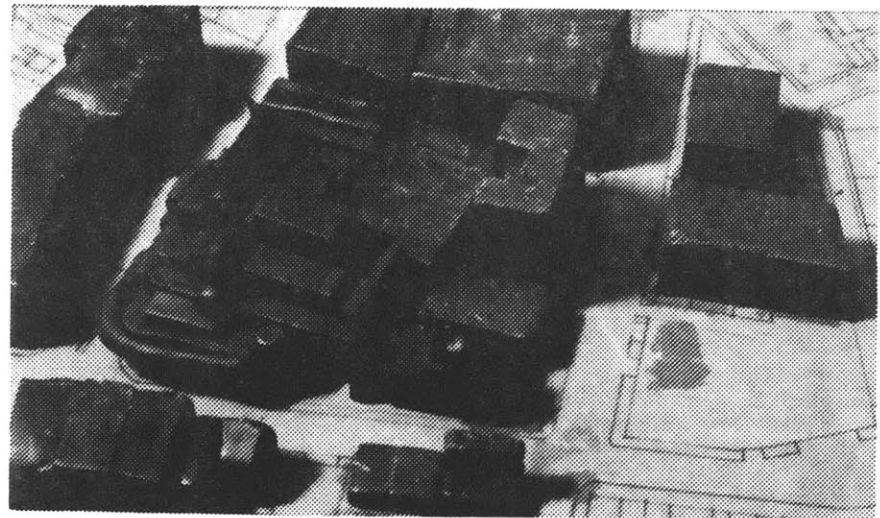
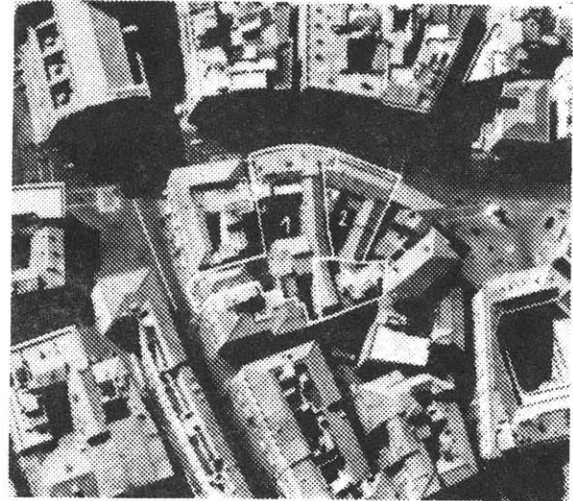
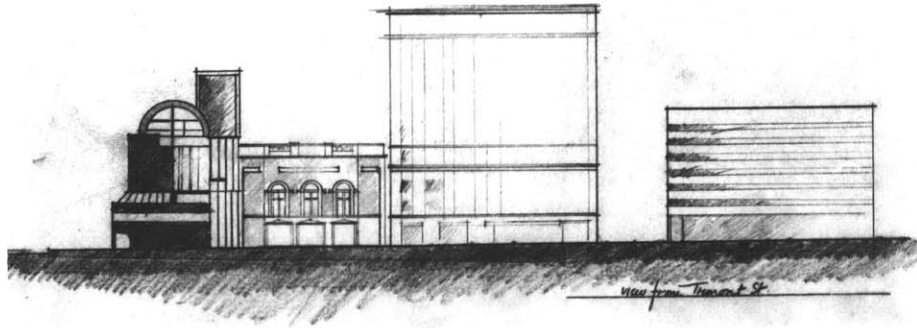
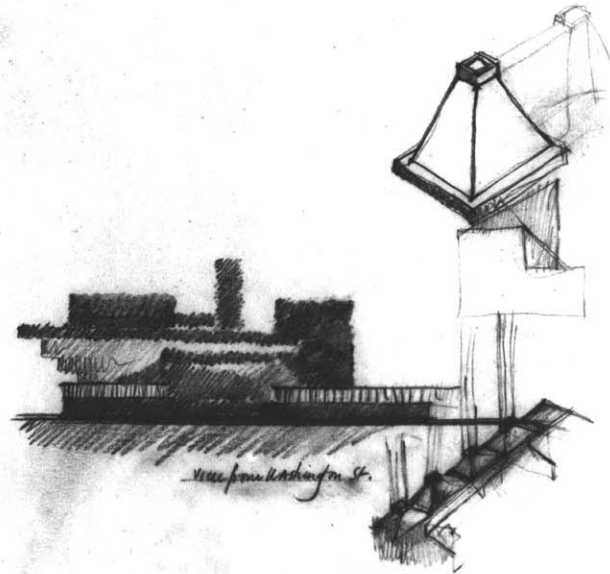
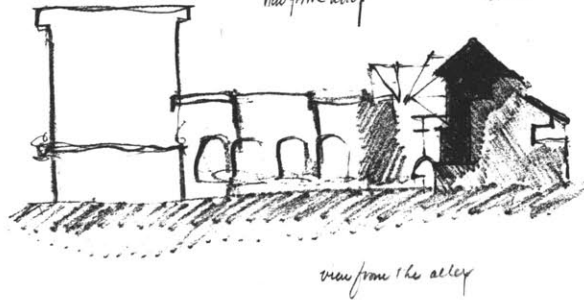
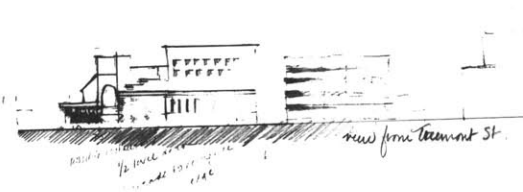
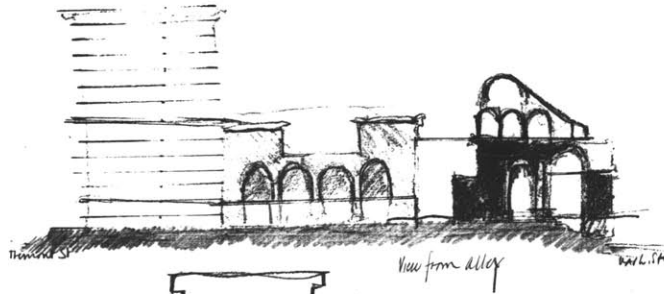
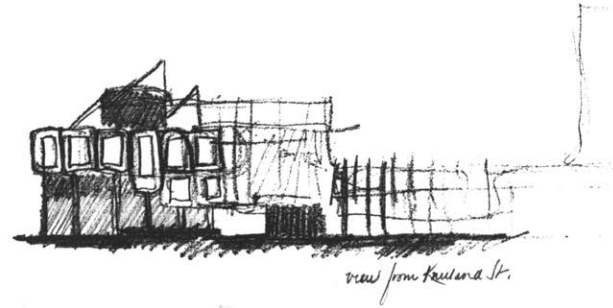
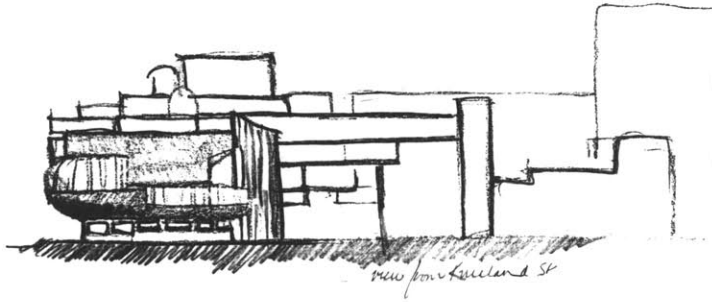


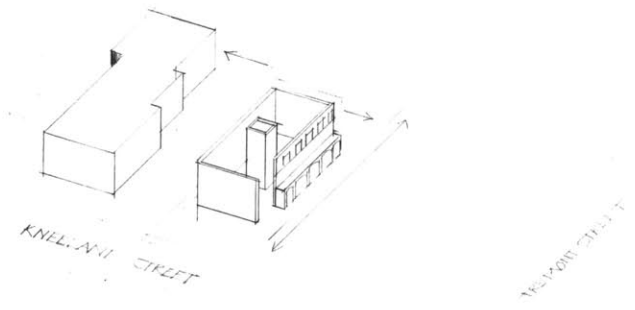
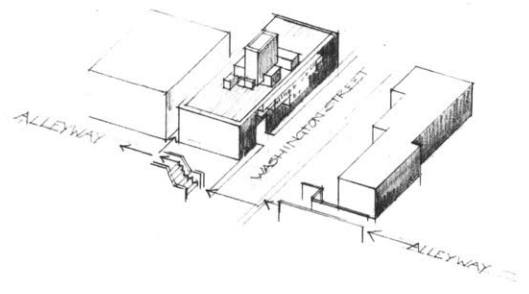
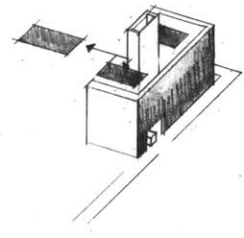
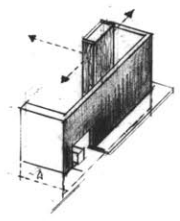
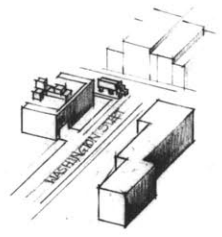
Fig. 100 Palazzo Bergellini: progetto per lo scalone (Francesco Dotti).
Fig. 101 Palazzo Bergellini: progetto per lo scalone (Francesco Dotti).
Fig. 102 Palazzo Bergellini: progetto per lo scalone (disegno del Conti) (tutti i disegni relativi allo scalone sono nell'Archivio Davia Bergellini).

Sometimes an extrusion of the perimeter of
the site seems to be the most reasonable
solution to a difficult site configuration
coupled with a demanding and dense program.





PHASE 5: EXTERNAL IMAGES



Washington Street - a hard edge with
vehicular congestion - give for
service entry... no windows on
N.E. - Tuffi Medical Center Bldg until
+15 - respect above

Security Shop on bottom - central
freight elevator for service

all 3 stages must be centrally located
to facilitate moving of scenery,
costumes, props, lights etc.
∴ a single service core to 3 stages

what does a hard edge mean to people
in hospital?

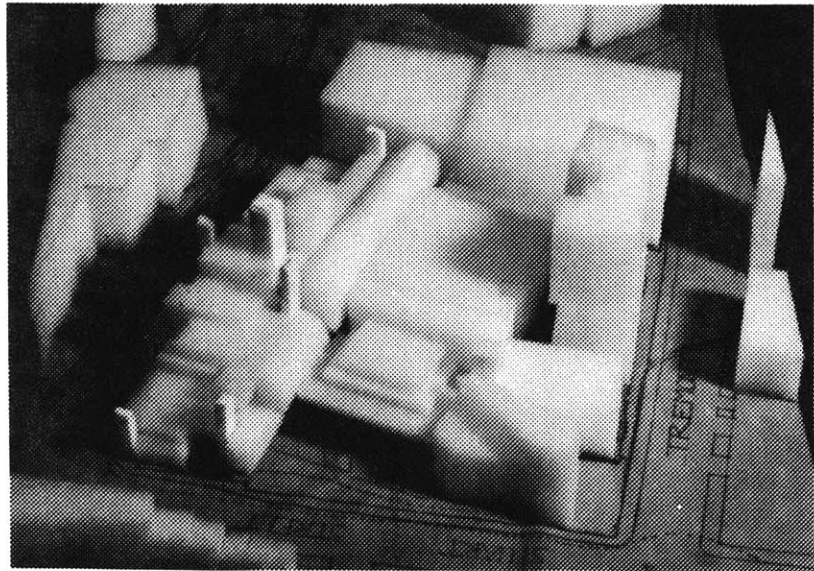
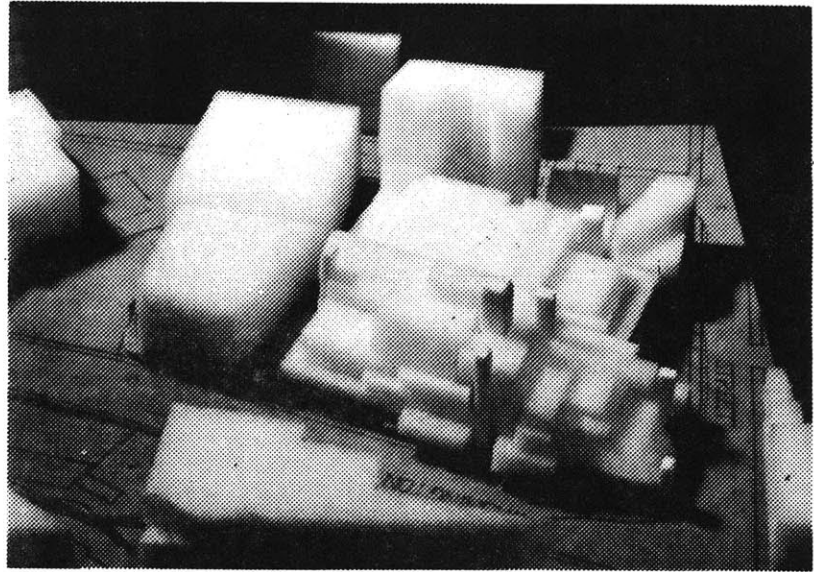
maybe the actors can have an external
access to the stages so that patients
at Tuffi can have something
to look at...

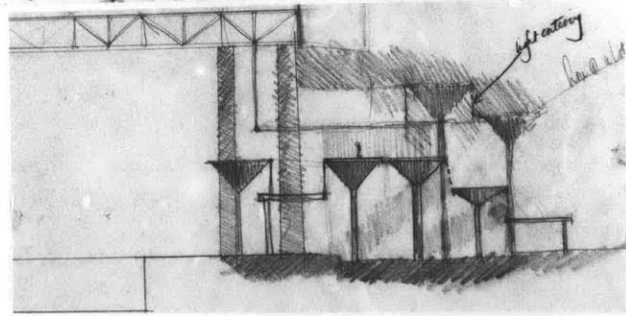
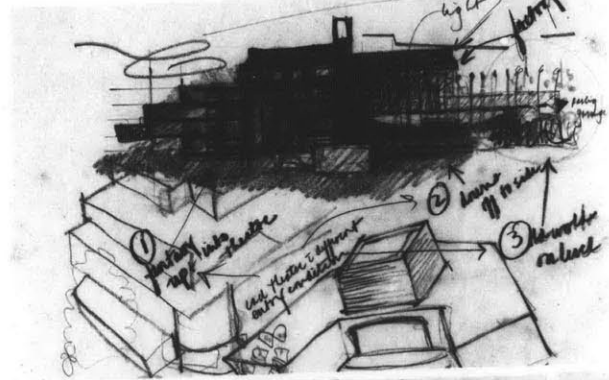
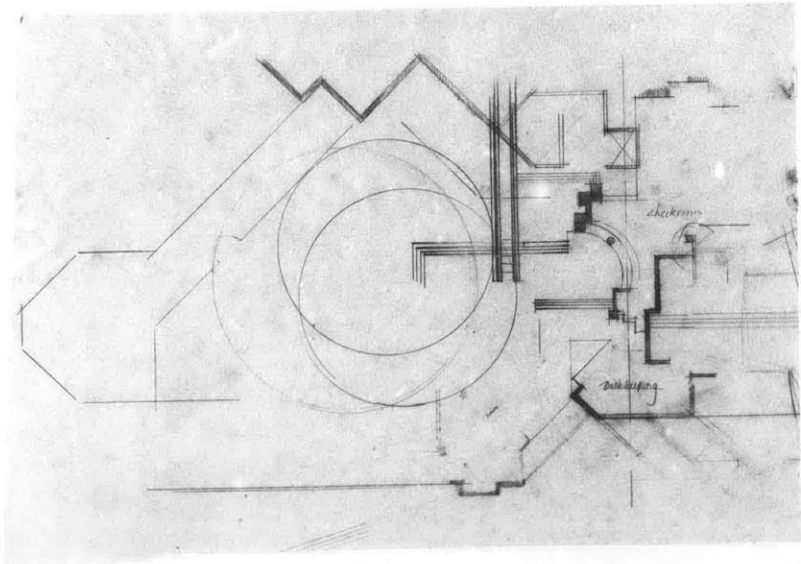
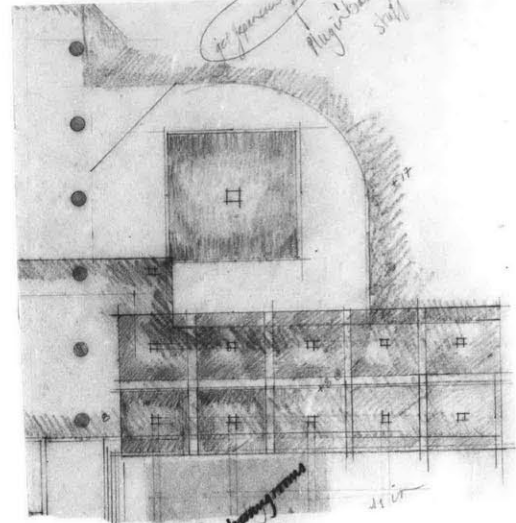
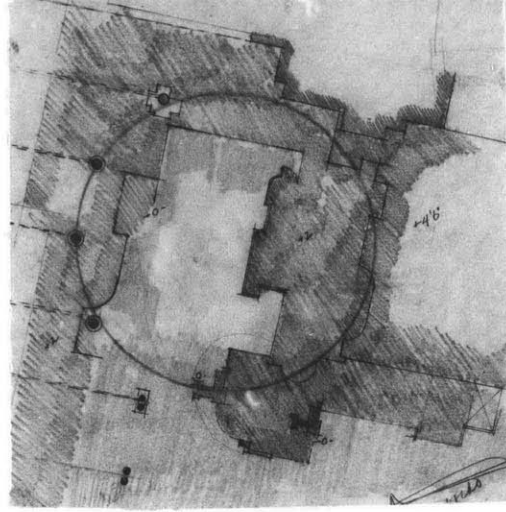
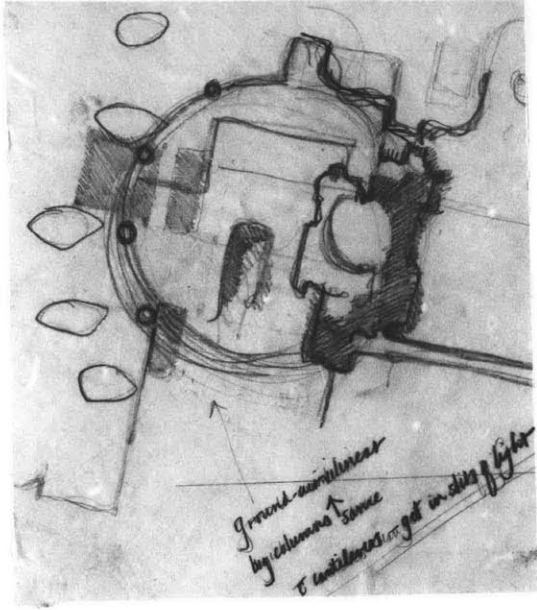
hard on 1 side, soft on the
other... a metaphor...
building like a sea shell with
Crystal Palace on soft side

what does a metaphor-image give
me? a key to texture, a hint at
other scale decisions

An image deals not only with what is 'pleasing' to the eye. Image contributes to orientation, identity, symbol etc. What is contextual and what is not become primary questions in the image of an urban landscape. Early in the site analysis, it became clear that the theatre district needed some recognizability i.e. a landmark. At this stage in the development of the design it seemed important to articulate the internal volumes as a means to identify as almost all the other bldgs. in the vicinity are exact vertical extrusions of their foundations. Volumetric articulation is only one way to establish recognizability. Another could be the use of materials.

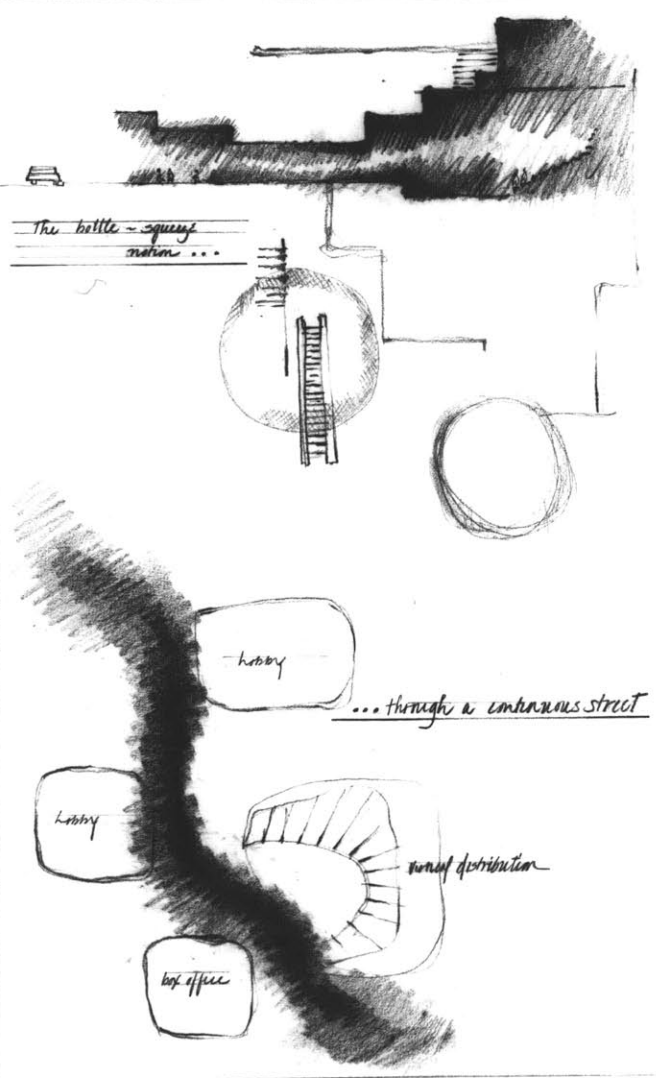
One question that emerged at this stage and which I would like to explore at another time is — would this building be better if it were built inside something like Memorial Hall at Harvard i.e. highly articulate internally and much less so externally.





INTERNAL
IMAGE/
FANTASY

PHASE 6:



Internal fantasy:
 "the bottle - squeeze" motion ...

An image-fantasy extracted from the Bottle Party, a short story by John Galsworthy... a man buys a bottle, which contains a juve, from a junk store "he pulled out the sipper. but flew a prodigious quantity of greasy smoke which immediately solidified into the figure of a gross and fleshy orientated, six feet in height, with rolls of fat, a hook nose, a wicked white to his eye, vast double chins, altogether like a film producer, only larger. Frank, striving desperately for something to say, raised shoulders, kebabs and Turkish delight. These were immediately forthcoming."

Fantasy requires progressive removal from and isolation from outside stimuli ... less and less natural light and stimuli ...

"... "condemned only", said his servant. "to close your eyes for the space of a single minute, and opening them you shall find yourself surrounded by the agreeable objects you have described." He closed his eyes as requested. A low musical humming, unobtrusive, serene and fell about him. At the end of the minute he looked around. There the arches, pillars, murals, hangings etc. of the most exquisite palace imaginable, and wherever he looked he saw a tiger-skin and on every tiger-skin there reclining a young woman of surpassing beauty who were artfully not vulgarly overdressed."

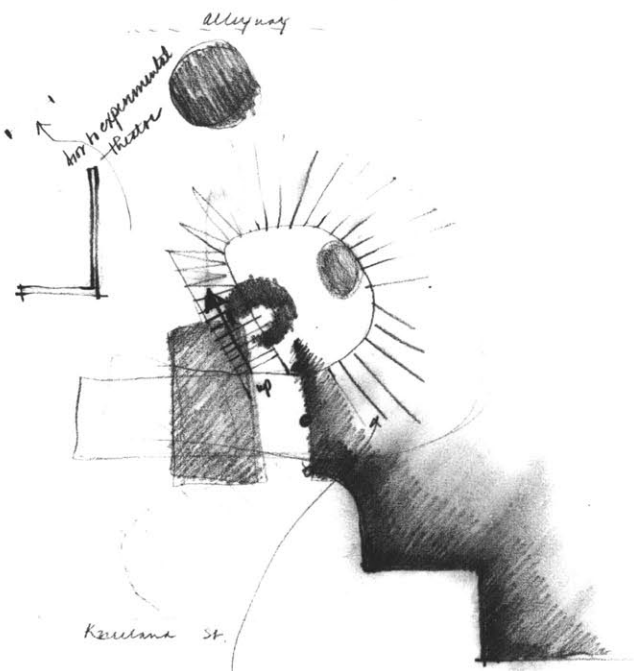
The narrow mouth (entry) to the bottle (the theatre) is the passage way to the realization of the fantasy (the drama; the theatre-going)

Space manipulated to encourage opera patrons to share in a common lateral fantasy - ie. tight entry by box office to open space of lobby & tight passage to theatre.

... through a convoluted street ...

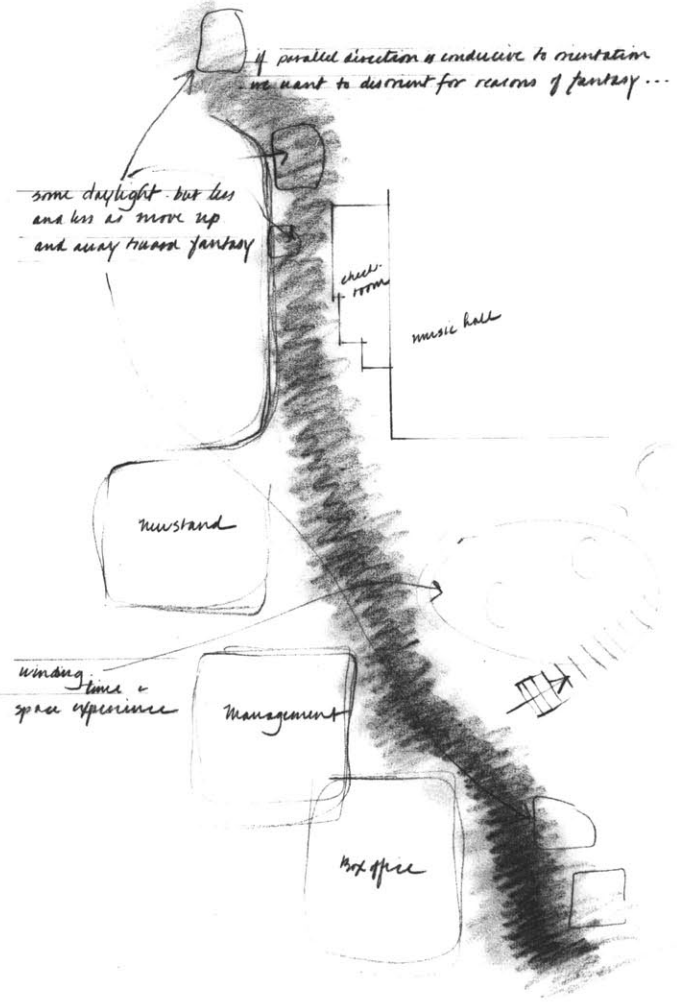
Internal street environment from Auckland to Alleyway-fantasy must be encouraged as people move vertically and sideways to the theatre

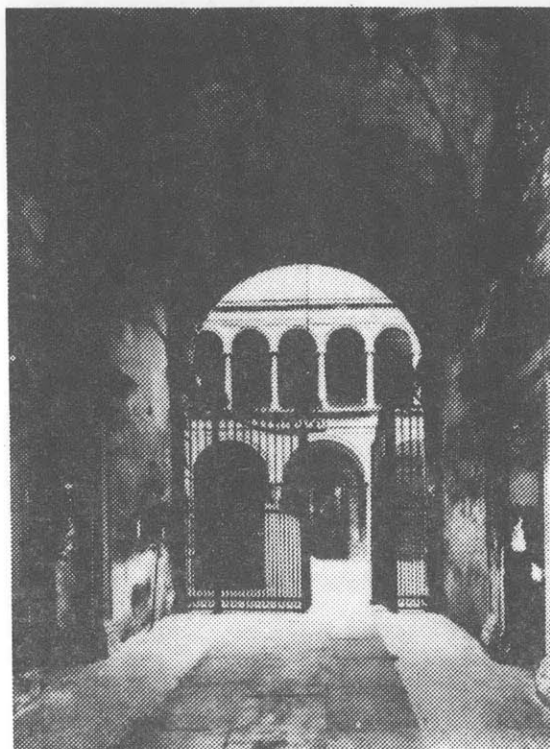
... what happens to the notion of an internal street??



how about a reverse loop to get up to entry to theater? disorient patrons from a physical world to help them participate in another kind of reality

Time and Space Notions...
 linear distance to be covered from Kaulana to alley substantial but not much volumetric dimension available for spatial experience ∴ attempt to get lots of orientation on passageway ...

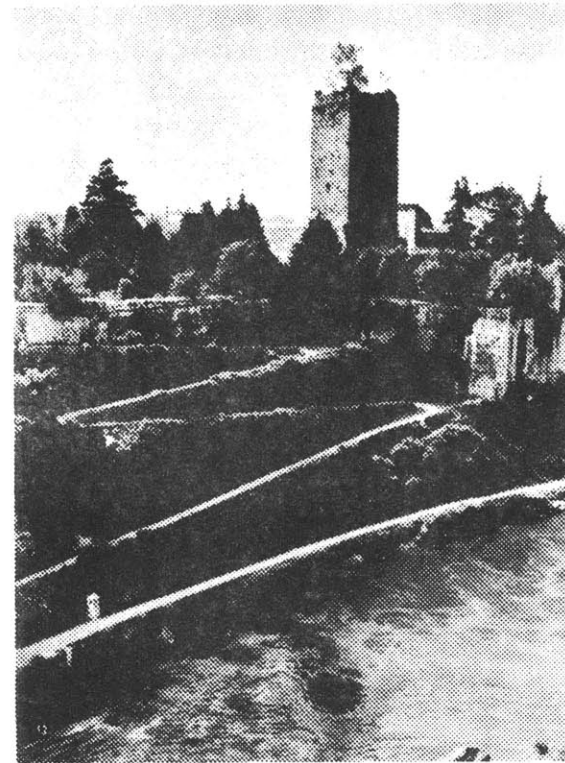
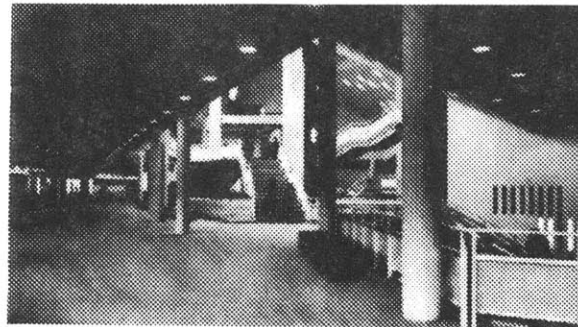
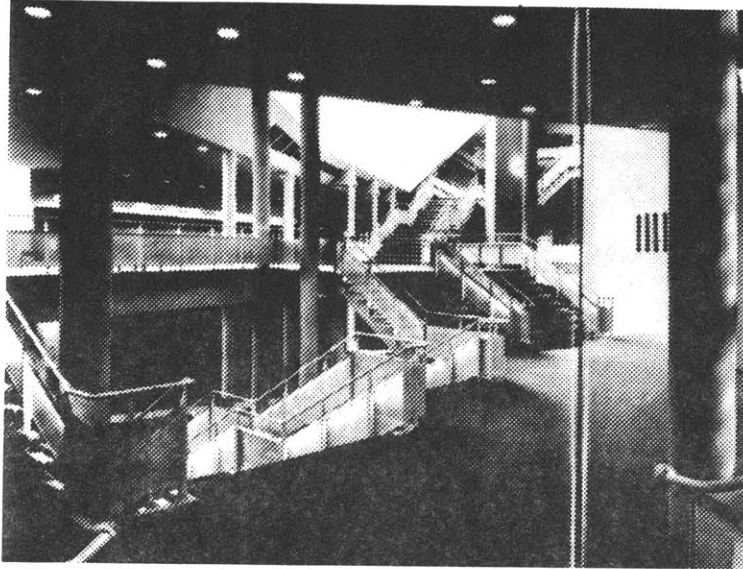




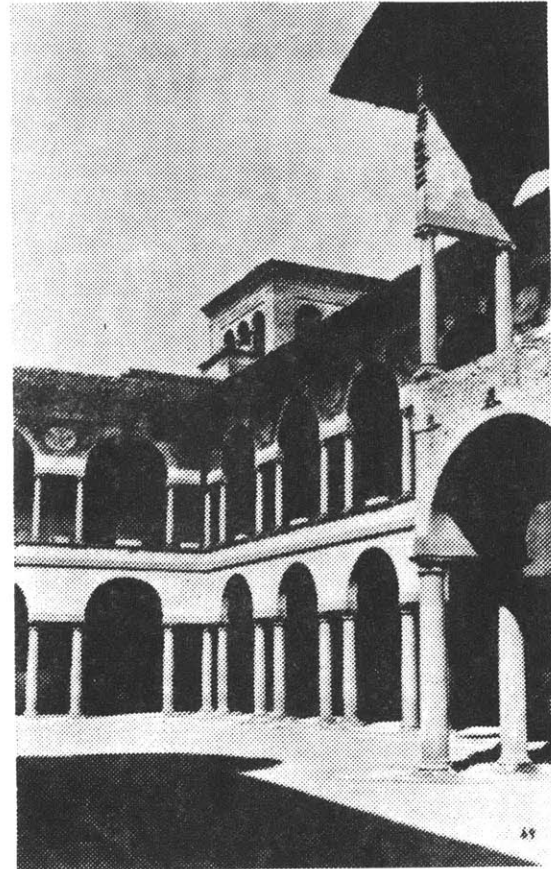
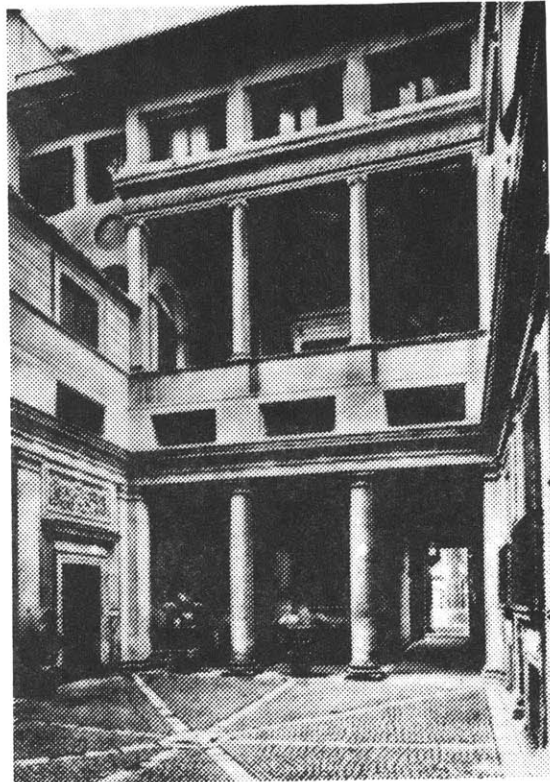
65



Built examples of fantasy from literature...
a constricted passageway entry to
a large open space

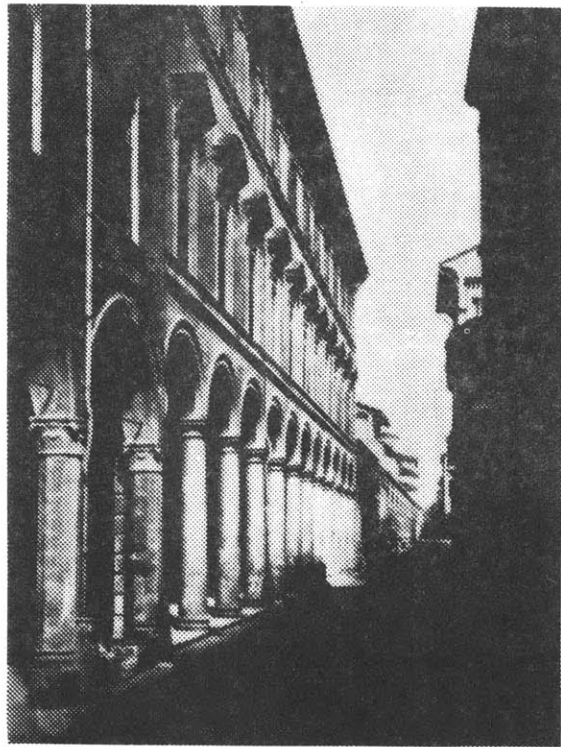


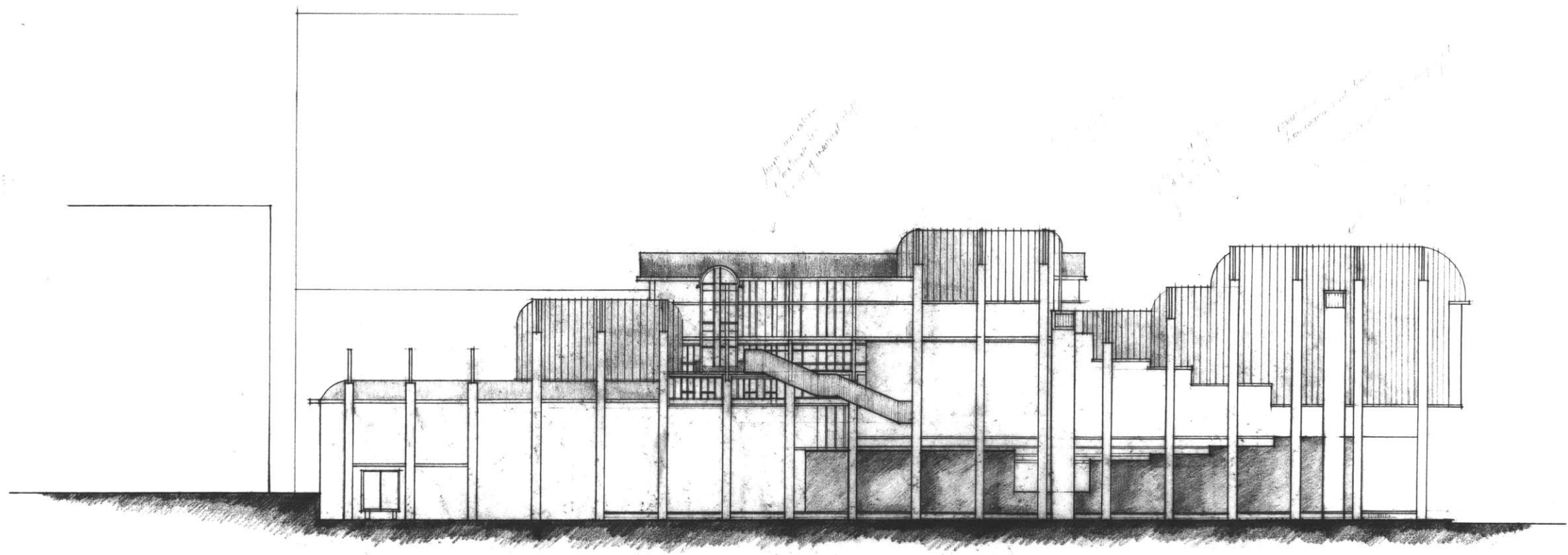
a processional upward and away from 'street'



a 'spatial' lobby open on a number of levels

termination of the fantasy gradually... exit
through a narrow passage way...



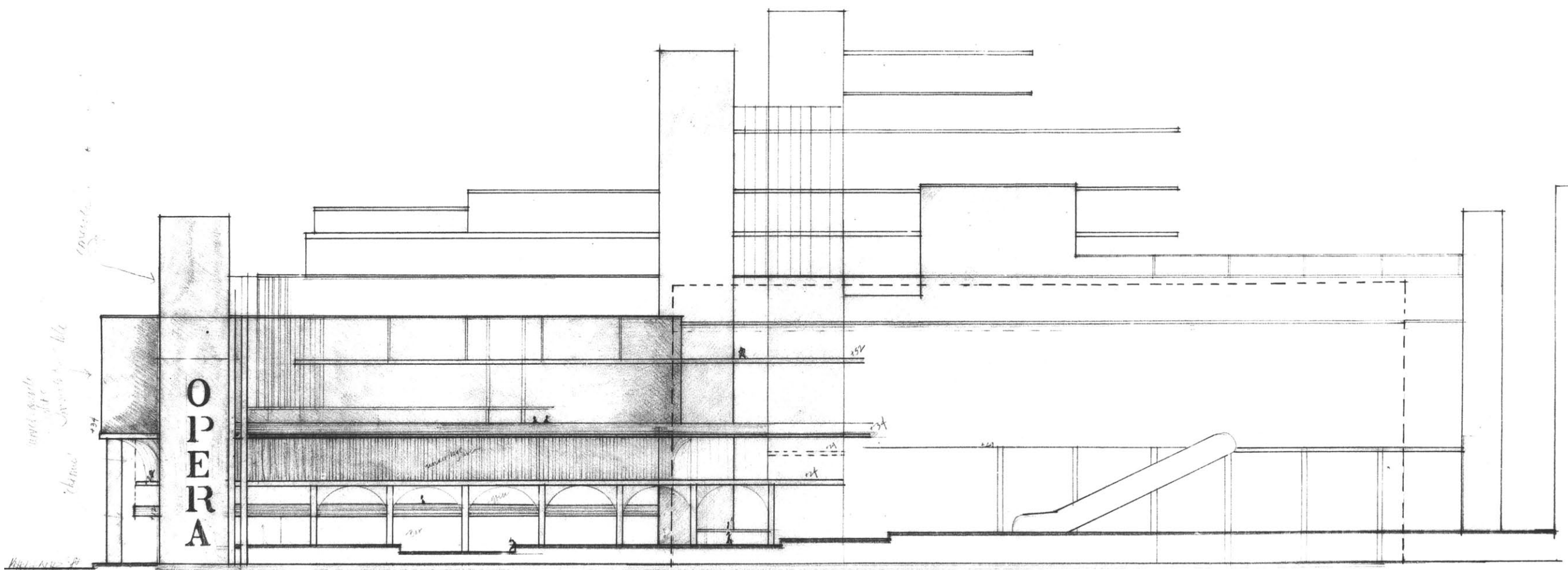


Place not points

Back to island & landing first

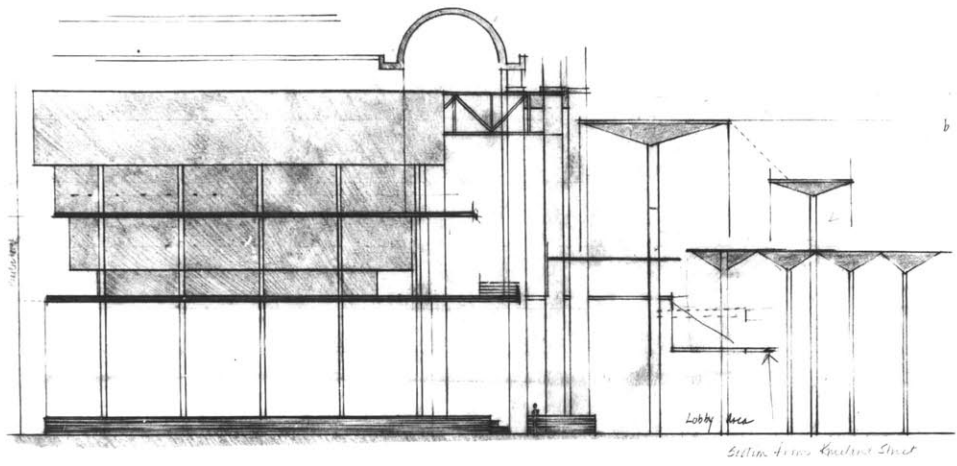
Keep this column & increase size of horizontal slabs

Keep this column & increase size of horizontal slabs

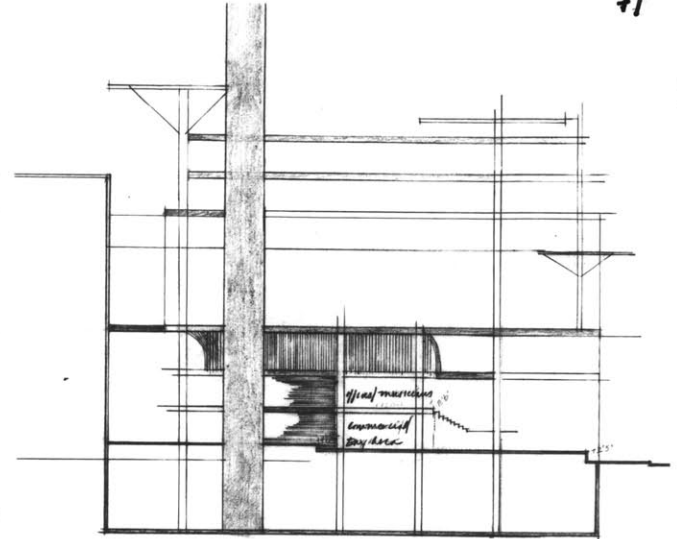


section from island street
walking section

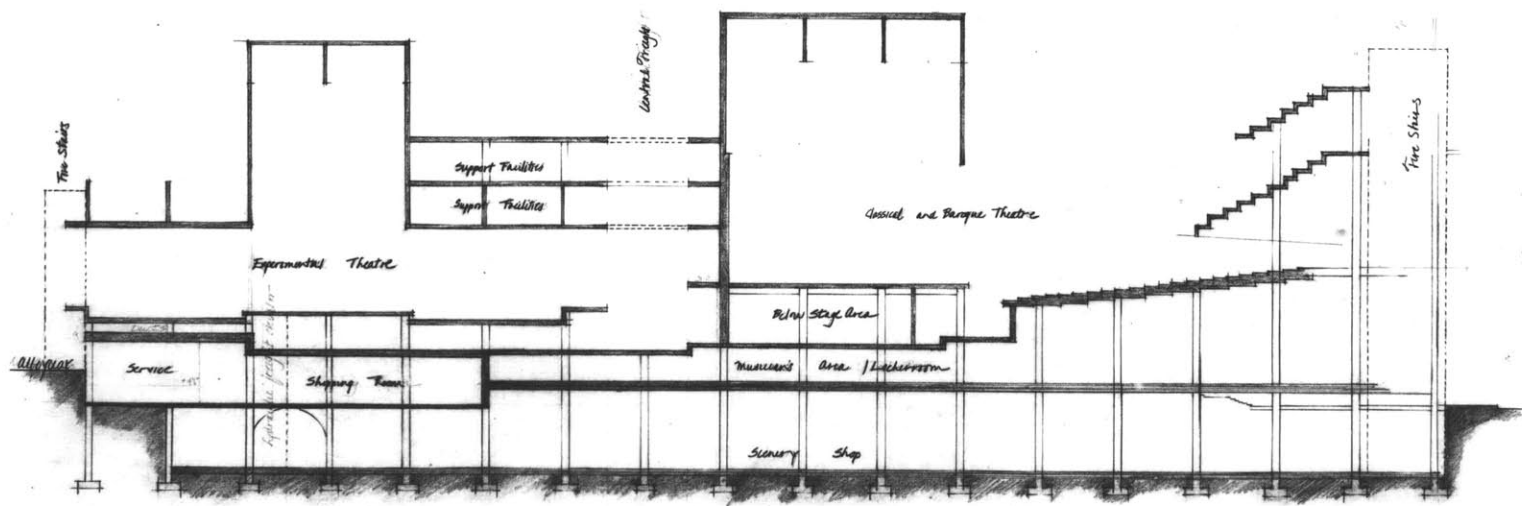




Section From Kipling Street



Section 10/10/10



Engineering ground level at base of

PHASE 8

Rosemary Grimshaw

I didn't find Carnegie
Hall images, but in
the process found the
answer to your problem

COURAGE

which is exemplified in this
slide although you will
obviously have to find it
in the slide collection



I'm still troubled by your

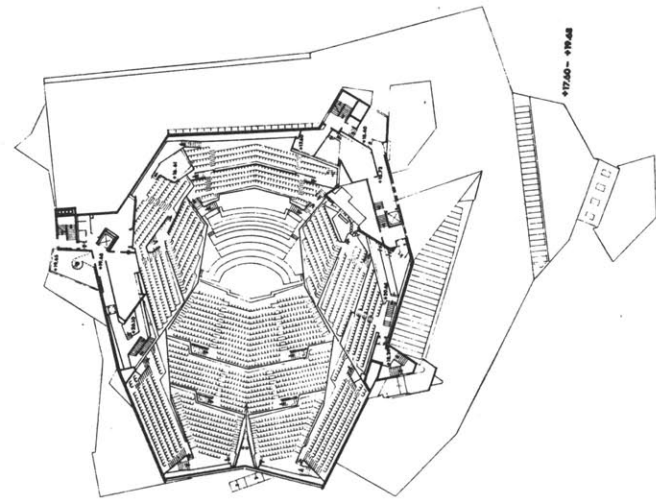
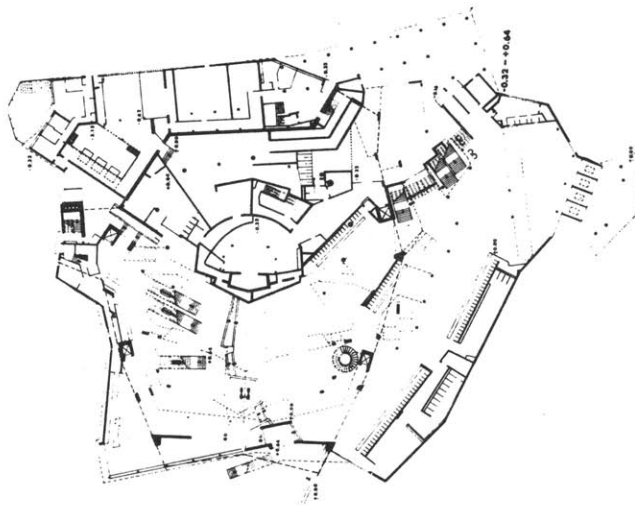
"Baroque" theater seeming more experimental in general spatial configuration and access (physical pattern and your "disorienting" attitudes) than your "Experimental" theater. Meyer is a model of clarity of conventions — not disorientation of entering the other world of the theater. I would exchange problem/solution attitudes. A Schrammian exper. theater and a simple configuration for the Baroque theater.

Red = Static

Professor Stan Anderson, in the criticism of the previous page, was firstly responding to the elevation (Phase 7) and questions that I directed to him about it. But secondly and more importantly, he pointed out a basic misconception I had about the organization of the bldg. from the conception of the project; namely that the smaller classical and baroque theatre could be located at the front of the site with a 'disorientating' access to it. His reference to Scharron's Berlin Philharmonic alludes to the fact that I had used that bldg. as an early reference. However, its usefulness as a reference for an opera house was severely limited due to the fact that a concert hall is not restricted by sight lines as an opera house is.

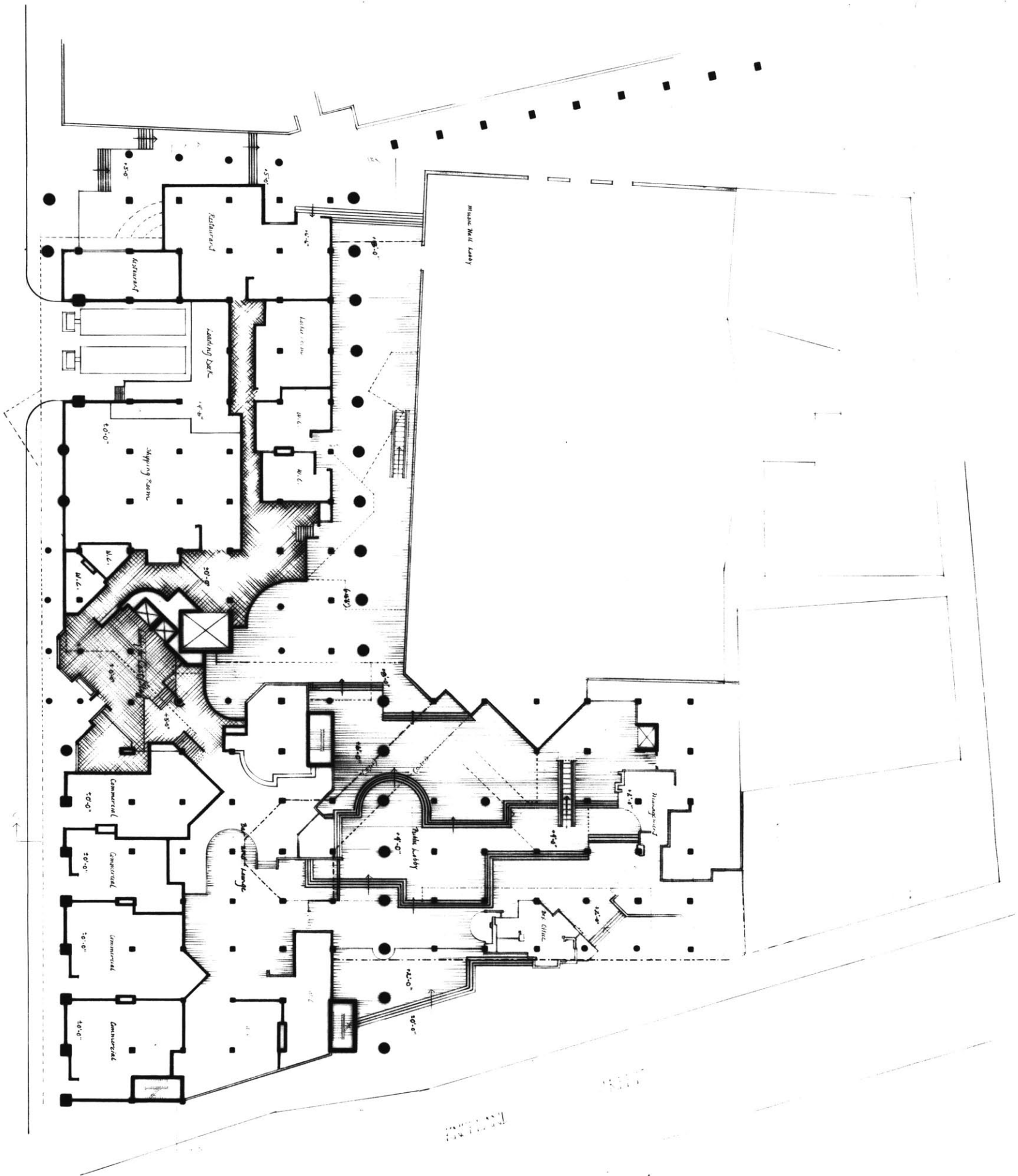
Furthermore, based on Prof. Anderson's criticism, the first level commercial facilities were moved to be accessed by Washington Street.

As a result a considerable amount of organizational changing was done in phase 9.




PHASE 9

75

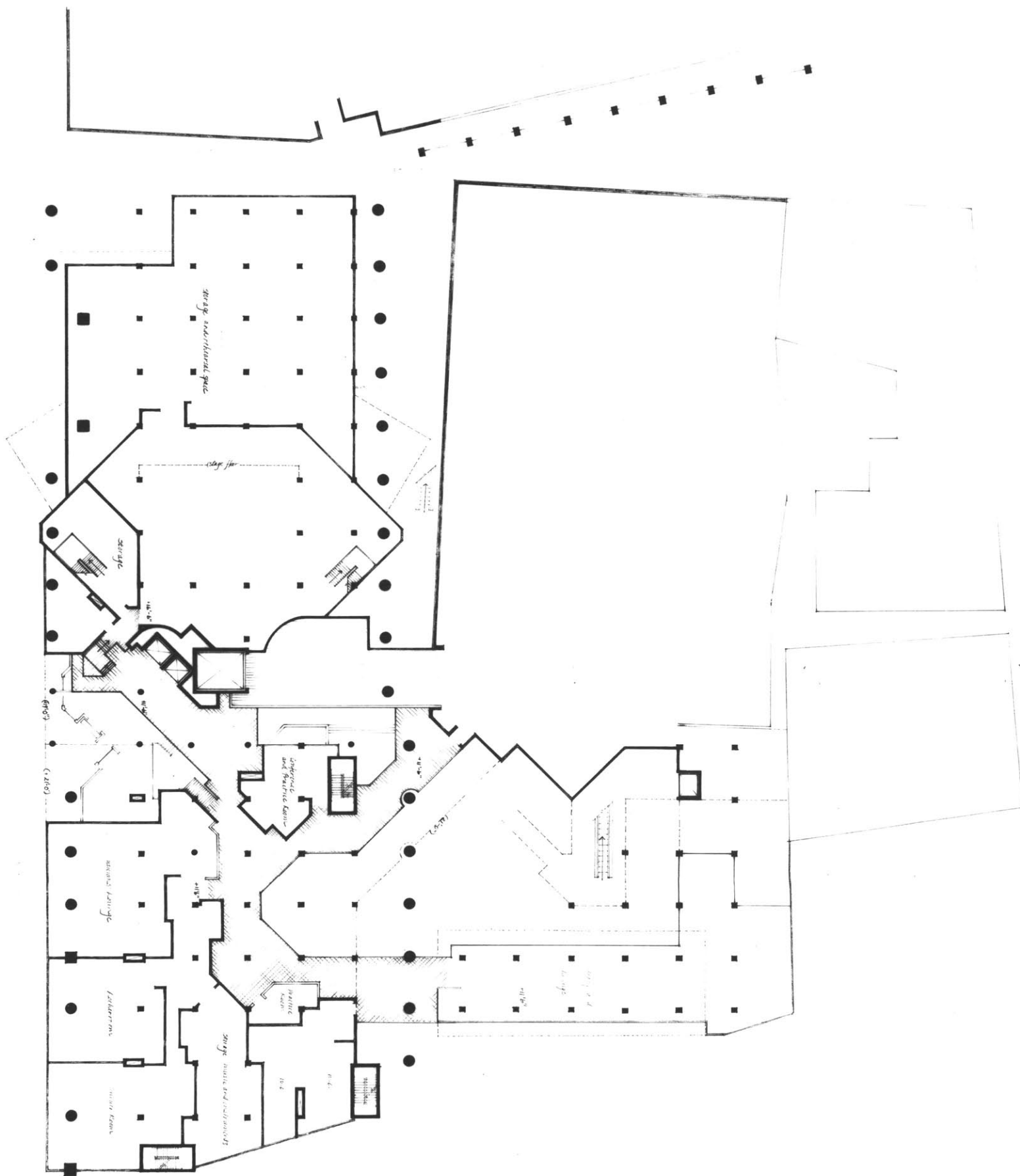


FRONT
 CRUIT

AN OPERA HOUSE FOR BOSTON

SCALE: 
 PLAN: 1/20 = 1/8"

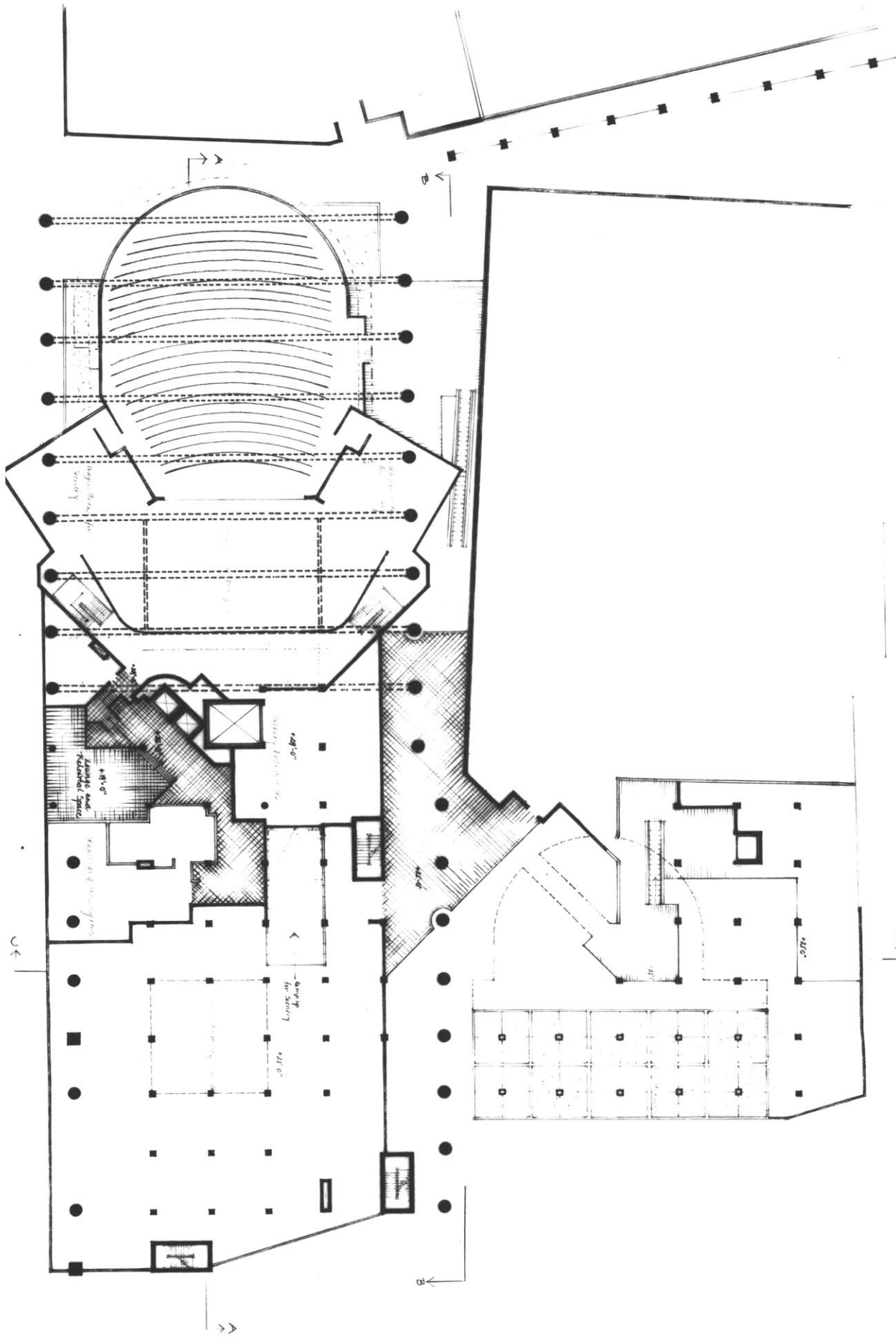
ROSEMARY D. GRIMSHAW
 M.ARCH. THESIS FALL 1977



AN OPERA HOUSE FOR BOSTON

SCALE: 
 PLAN: 

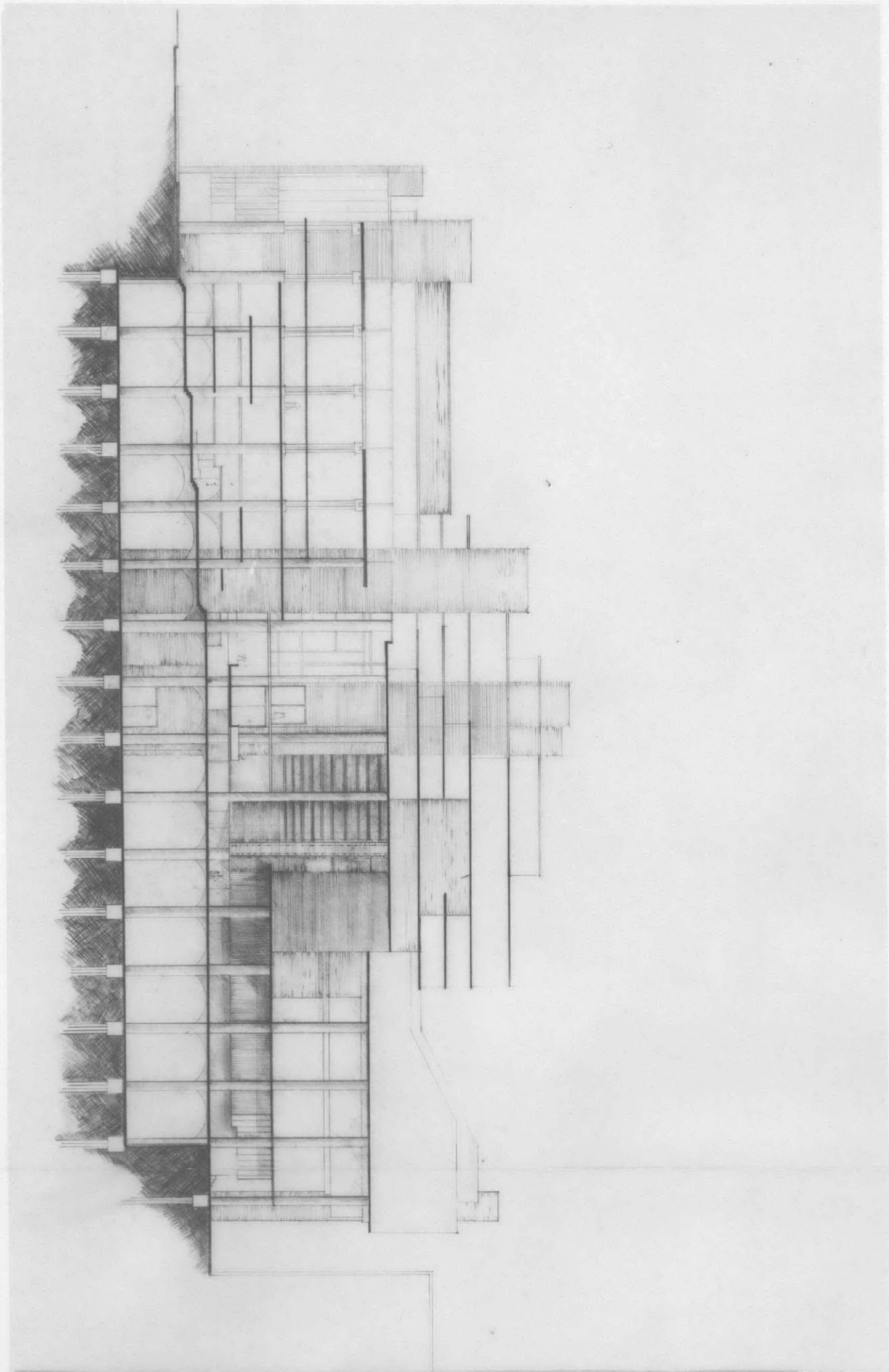
ROSEMARY D. GRIMSHAW
 M.ARCH. THESIS FALL 1977




AN OPERA HOUSE FOR BOSTON

SCALE:
PLAN: 

ROSEMARY D. GRIMSHAW
M.ARCH. THESIS FALL 1977

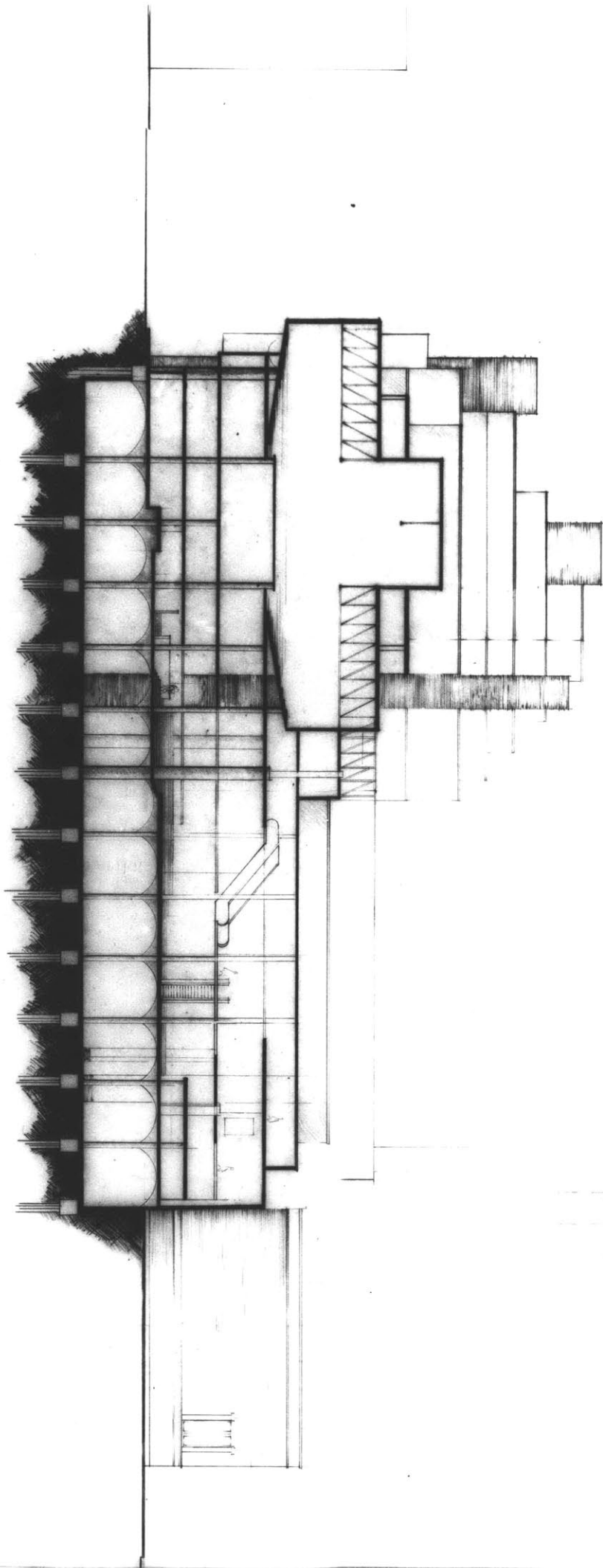


AN OPERA HOUSE FOR BOSTON


SCALE: 
SECTION: B-B

ROSEMARY D. GRIMSHAW
M.ARCH. THESIS FALL 1977

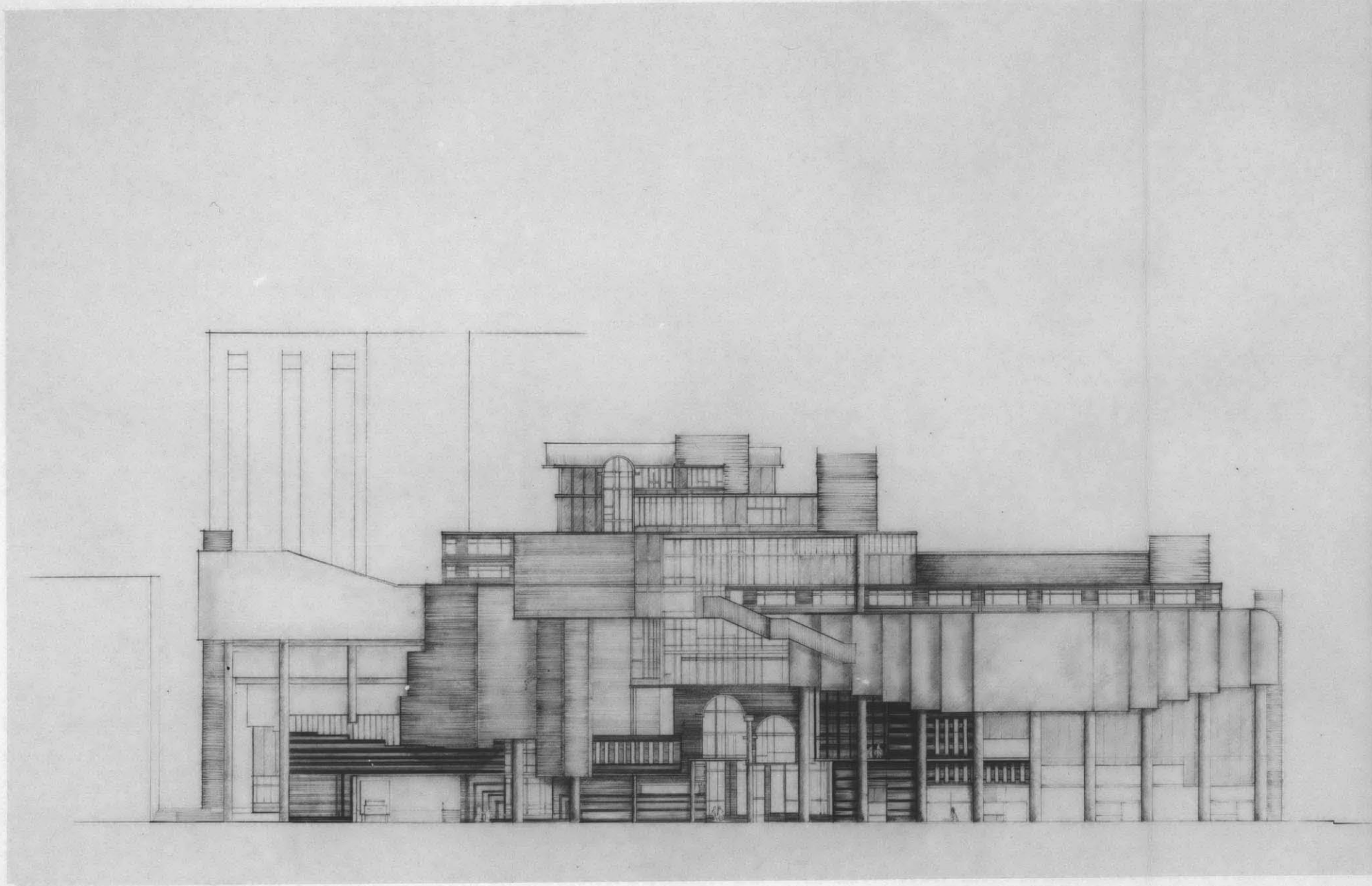
OB





AN OPERA HOUSE FOR BOSTON

SCALE: 
SECTION: C-C

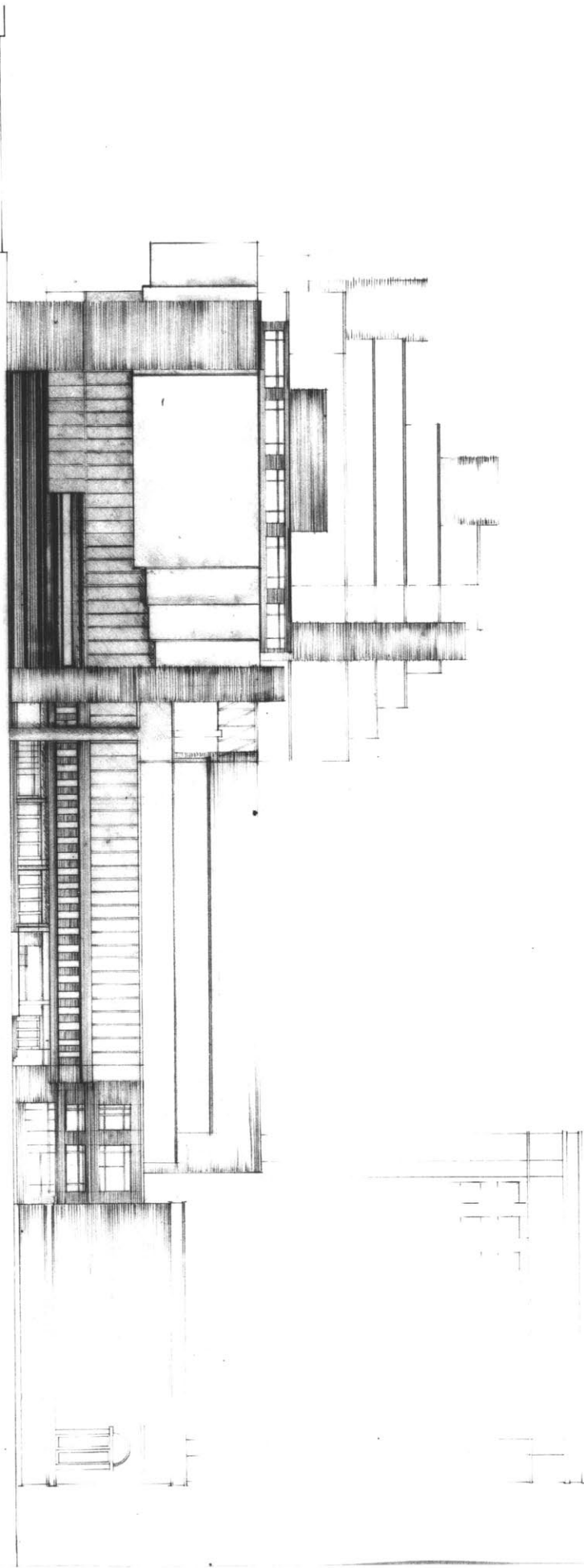
ROSEMARY D. GRIMSHAW
M.ARCH. THESIS FALL 1977



AN OPERA HOUSE FOR BOSTON

SCALE:  1" = 20'
ELEVATION:  Washington Street

ROSEMARY D. GRIMSHAW
M.A.RCH. THESIS FALL 1977



AN OPERA HOUSE FOR BOSTON

SCALE: 
ELEVATION: *Kneeland Street*

ROSEMARY D. GRIMSHAW
M.ARCH. THESIS FALL 1977

Evaluation and Conclusion

The approaches used to the design varied in their usefulness and applicability.

The most useful were:

1. The activity-dimensional program was highly generative of the gross form of the building and particularly in its internal organization.
2. The use of a literary fantasy in relation to the design provided a useful guide to the inter-relationship between the organization of the building and the spatial experience. In all probability, a similar use of fantasy could be used for other design concerns as well, e.g., color, materials etc.
3. The use of an analog comparing historical precedent to existing conditions provided a built example of a solution in which a similar site configuration was dealt with by building an extension of the site. In addition, this analog provided a hint as to how to design the internal organization in the renaissance approach of piano terrano and piano nobile.
4. An analysis of the context provided a safeguard that the organization of the building would comply and reinforce the organization of the site: i.e., the location of entrance to reinforce the street edge, the maintenance of the alleyway to provide a secondary connection between the medical center and Bay Village etc.

5. The volumetric-physiognomy became, internally, the spatial expression of the fantasy and externally, the massing of the building as it differed from the surrounding buildings in order to make it identifiable as a landmark for a district.

Least useful was:

1. The system approach does not seem to apply to a "1-shot" building. However, a system of design which included in it a method of site analysis would probably be highly useful for any project. In addition, it is important to note that my knowledge of system-design is highly limited.

Somewhat helpful was:

1. The kinesthetic approach helped in the location and configuration of the approaches to the individual theatres. However, such an approach, to be really useful, requires adequate space on the site to explore placement of forms and uses. On such a tight site it was difficult enough to fit everything let alone to explore placement.

Not adequately explored:

1. The cultural approach was severely limited by the fact that limited time allowed me only to speak to users I knew previously, primarily friends. These people were too like me in attitude, class, etc. to be acceptable as a fair sample of a user group. I really needed to explore attitudes of different user types.

Most problematic was:

1. The structuralist approach is one method which I have consciously used before. A serious problem which I have always encountered with it is that it, as a primary method, tends to dominate the entire design. One, as primary generators of form, building/structural pieces are difficult to control and may not be appropriate to specific use. Second, and as importantly, it tends to propound an additive solution which is not appropriate to all situations, i.e. it is more appropriate to housing than to an opera house which is restricted by the technical implications of its program and has some attributes of a landmark.

Having explored methods other than a structural one and having aggregated more information, employing a structuralist method would now have more significance. When the structural method is not the primary generator but comes later in the design process, the pieces can, in a direct way, take on the quality of the building as a whole. It is, without question, one of the most critical components of any integrated method of working. And it is at this point in the design, the present status of the study drawings, that the design of the pieces would be most critical and useful.

Very difficult to assess:

1. The Associative method is not easily assessed due to two reasons:

(1) I have heard a fair amount of opera but certainly not in the great opera houses of the world and this fact somewhat limited direct association between my design and the memory of my own experiences.

(2) My own architectural memory is limited due to inexperience and I would assume that as my experience and awareness of building grows, so too will my ability to work associatively.

Although the methods and attitudes laid out here have been exploited with various degrees of adequacy, nevertheless, a conceptual framework of decision making has been formulated. While some of the methods were less helpful because of my own inexperience or because they were less pertinent to the problem, the opportunity to utilize them in a somewhat sequential and cohesive fashion, has provided for me a valuable educational experience. The thesis time has allowed me to begin to answer my own questions about where and how I stand in a tradition.

"What we call the beginning is often the end

And to make an end is to make a beginning.

The end is where we start from.

*. . .
We shall not cease from exploration*

And the end of all our exploring

Will be to arrive where we started

And know the place for the first time."

T. S. Eliot

"The Four Quartets"

Bibliography

- Aalto, Alvar, Alvar Aalto, Praeger Publishers, New York, 1971.
- Baird, George and Yukio Futagawa, Alvar Aalto, Thames & Hudson, London, 1970.
- Barker, Bruce, "Housing on the Boston Waterfront", MIT Master of Architecture Thesis, 1976.
- Brane, Michael, The Sidney Opera House Affair, Thomas Nelson Ltd., Melbourne, Australia, 1967.
- Burris, Meyer and Cole, Theatres and Auditoriums, Robert F. Krieger Publishing Co., Inc., Huntington, New York, 1975.
- Czajka, James Vincent, "Architecture and Awareness of Self", MIT Master of Architecture Thesis, 1975.
- Cuppini, Giampiero, I Palazzi Senatoria Bologna, Zamchelli, Bologna, 1974.
- Gideon, Sigfried, Architecture and the Phenomenon of Tradition, Harvard University Press, Cambridge, Mass., 1971.
- Halprin, Laurence, The RSVP Cycles, Creative Processes in the Human Environment, G. Braziller, New York, 1969.
- Ham, Roderick, Theatre Planning, Association of British Theatre Technicians, Balding and Mansell Great Britain.
- Jeudwine, Wynne, Stage Designs, Country Life Books, The Hamlyn Publishing Group Ltd., Gt. Britain 1968.
- Izenour, George, Theatre Planning, McGraw-Hill Book Co., New York, New York, 1977.
- Labo, Mario, I Palazzi de Genova di P. P. Rubens, Italy, 1965.

Leung, Joan H.Y., "Exploration of Additive Method Towards Large Scale Habitable Frameworks,"

MIT Master of Architecture Thesis, 1977.

Orgel-Köhne, Lisolette und Armin, Berlin Philharmonic, Lettner-Verlag, Berlin, 1967.

Pawley, Martin and Yukio Futagawa, Le Corbusier, Simon & Schuster, New York, New York, 1970.

Perogalli, Carlo, Castelli della Pianura, Electra Editrice Industrio Graffiete, Milano.

Sanoff, Henry, Architectural Programming, Douden, Hutchinson and Ross Co., Stroudsburg, Pennsylvania.

Societa Tipographia, Accademia di San Luca, Castaldi Roma.

Theatre Check List, a guide to the planning and construction of proscenium and open stage theatres,

prepared by and published for the American Theatre Planning Board, Inc., ^{Western} ~~Western~~ University

Press, Middlet~~on~~^{on}, Connecticut, 1969.

Wurm, Heinrich, Palazzo Massimo, Walter de Gruyter & Co., Berlin, 1965.