

# A CONTRIBUTION TO URBANISM :

## The Tall Building as a Multi-Dimensional Framework for Additive Growth and Change

by David J. Nelson  
Bachelor of Science, Architectural Engineering  
University of Colorado, 1981

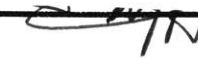
Submitted to the Department of Architecture  
in partial fulfillment of the requirements of the  
degree of **Master of Architecture** at the  
**Massachusetts Institute of Technology**

June 1987


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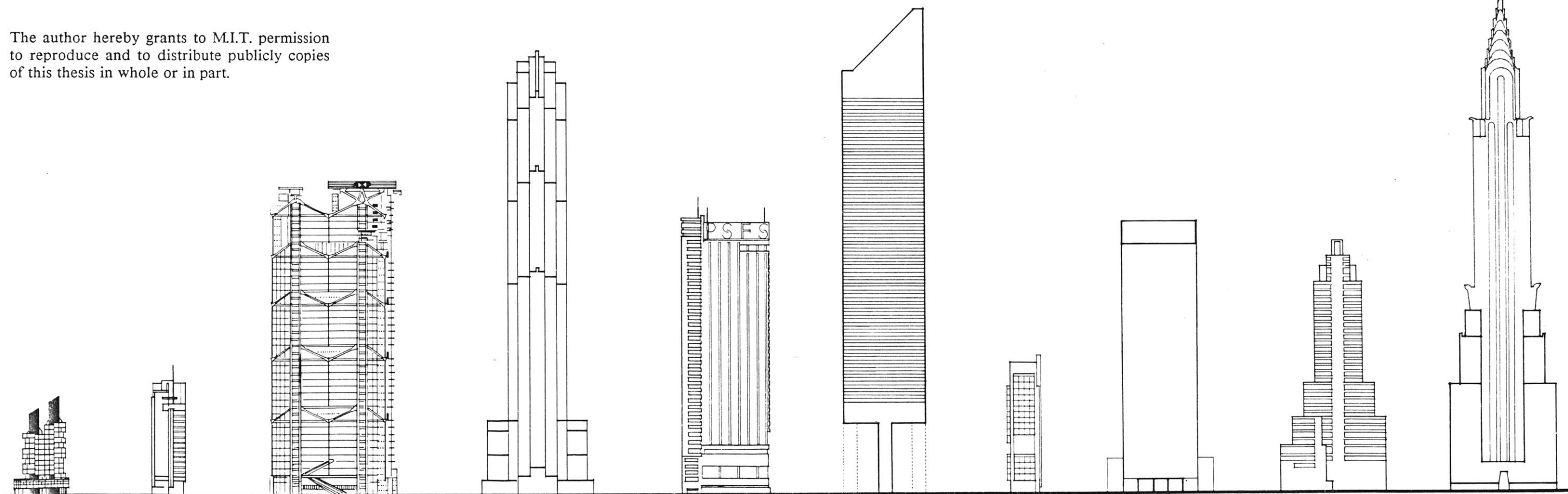
  
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MASSACHUSETTS INSTITUTE  
OF TECHNOLOGY  
**Rotch**  
JUN 08 1987





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Submitted to the Department of Architecture on May 8, 1987 in partial fulfillment of the requirements of the degree of Master of Architecture at the Massachusetts Institute of Technology

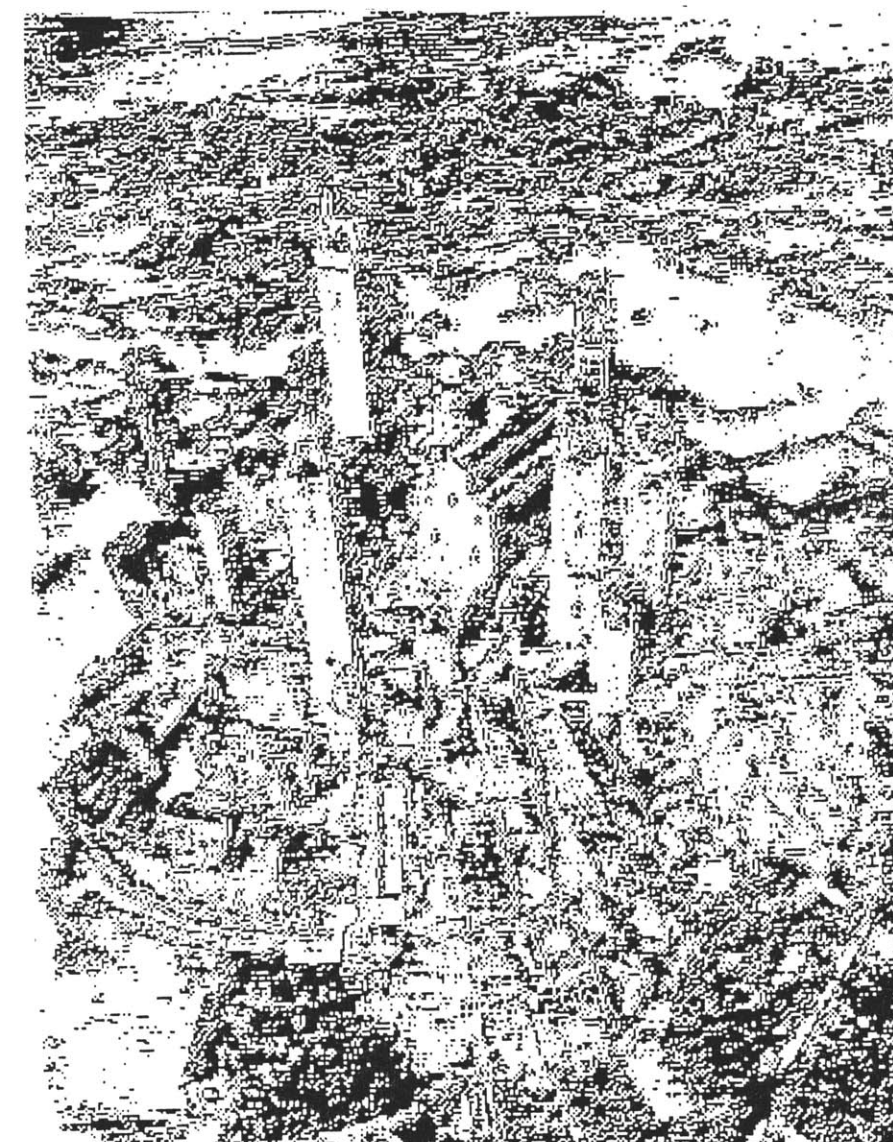
## ABSTRACT

Skyscrapers do not destroy cities; they make them look different and they make the urban space more crowded, but they have not yet put an end to the urban environment. Many of the problems with the early tall buildings have been resolved. For example, we now know how to make structures of great height. This thesis turns its attention and design focus toward the integration of more conventional architectural concerns of skyscraper design and towards the elaboration of the high density framework that follows from it.

For the tall building to make a positive contribution to urbanism, it must be responsive to the multitude of variations that exist within the complex urban environment, not merely a neutral background or an exclusively self-defined structure. Among designers, there are differing attitudes towards physical definition. This thesis provides frameworks for speculation and research about the future of physical form, style and spacial organization in buildings of this type. These frameworks, ranging from the primary structure to closure and detail, will provide the existing urbanism with a mechanism to accommodate growth and change.

The work is divided into three sections. The first section, **The Project**, is a design proposal for a specific site in downtown Boston. While these studies do not aim at producing an actual proposal for the extensive site, they do propose a new formal organization and diagrammatic transformation of the existing fabric. **Architectural Comparables**, section two, examines some tall buildings in the urban environment and identifies positive compatibilities between common design intent and built physical reality. The final section, **Observations**, examines implementation strategies, adaptability, and feasibility for the design proposal.

Thesis Supervisor: **Thomas Chastain**  
Title: Lecturer, Department of Architecture



*The medieval towers of San Gimignano. Digitally transformed image from a color slide. Courtesy of James Anderson, M.I.T. Department of Architecture.*



# ACKNOWLEDGMENTS

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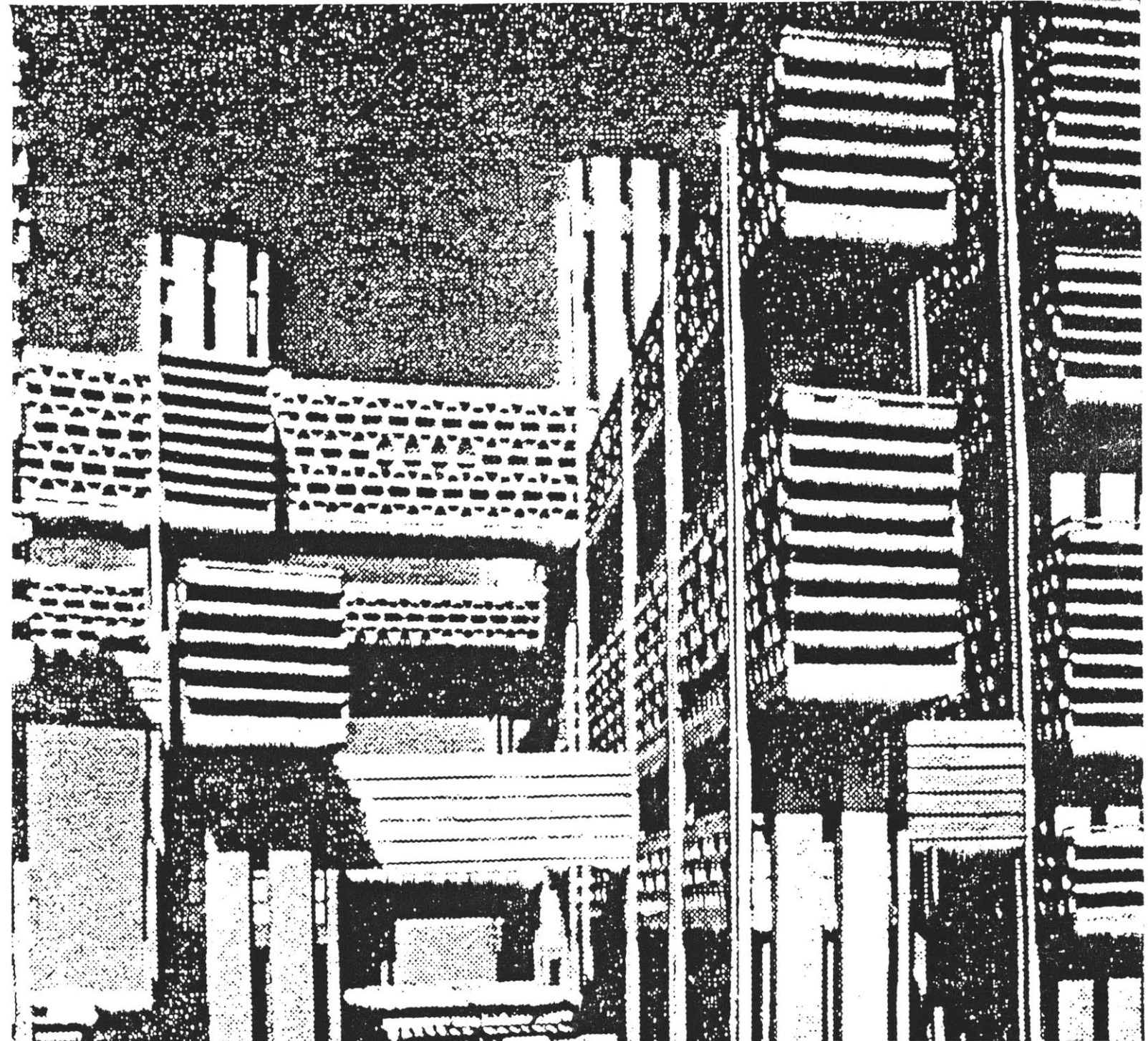
I would like to thank the following people who generously shared their time and suggestions :

Thomas Chastain  
John de Monchaux  
William Le Messurier  
Frank Miller

My friends :

Andy Bennett  
Barry Stanton  
John Felix

This thesis is dedicated to my parents Nancy and Ken for their unwavering inspiration and generous support throughout my education. And to Laura who put up with me through all the madness.



*Kenzo Tange & URTEC; Development of one segment of the plan for Tokyo introduced vertical core shafts and major bridge elements linking the towers.*





My interest in tall buildings first surfaced while I was pursuing a degree in Architectural Engineering. Skyscrapers were often a major topic of discussion in structural analysis classes. In my course work at M.I.T., I participated in design studios exploring a variety of architectural issues and building types. I worked on projects ranging from the single family residence to the medium scale multi-use project. I decided to complete my academic experience by exploring the issues, questions and design, of a tall high density structure.

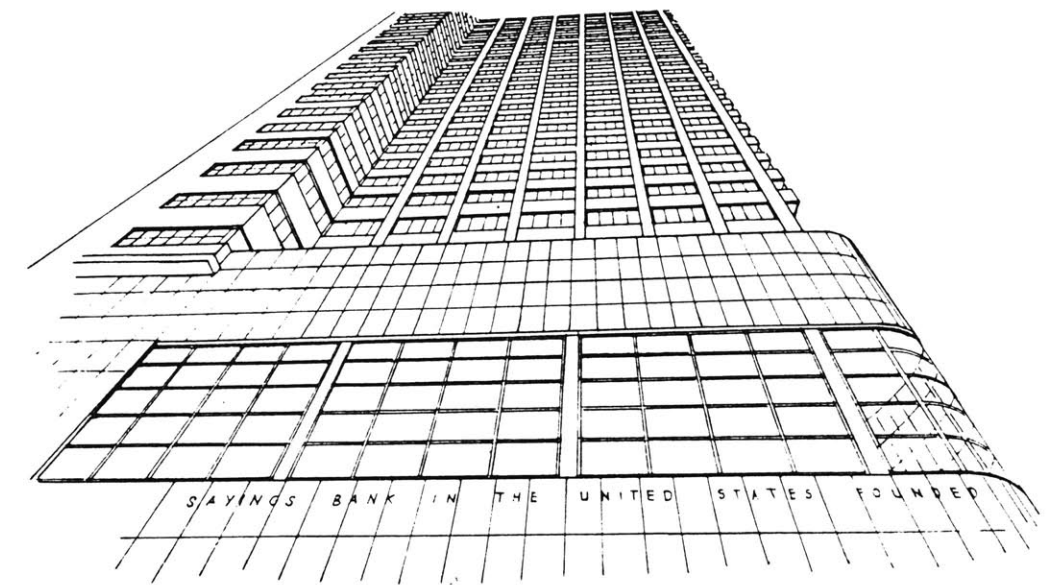
In the Fall Term of 1985, I participated in a course entitled "Implementation Strategies for Urban Design" taught by John de Monchaux and Roger Simmonds. The course often examined issues surrounding the skyscraper in the urban environment. For instance, there was an on-going discussion which questioned the tall building's role in shaping the public realm. Confronting issues like this was at times a frustrating task, but the instructors forced the participants to accept some of the realities associated with major development. Realities such as zoning regulations, height restrictions, economics, real estate values and so forth were examined. As one might expect, much of the class material was negative in its response to present day development and its architectural and urban consequences. However, there was also material that identified positive aspects of large scale urban design projects. By the end of the term, an attitude or an idea of how to make a positive contribution to urbanism slowly emerged. It is this attitude of a "positive contribution" which guides this thesis.

This work is based on a number of propositions: First, tall buildings can be better understood by examining the design frameworks from which they evolved. Second, different design processes lead to dissimilar frameworks which respond to the urban environment in different ways. Finally, an Aggregative approach to the design of the skyscraper responds well to additive growth and change in the urban environment by setting up layers of variable, habitable, multidimensional frameworks. From the stated propositions there are some apparent questions to be addressed: What are the basic types of design methods, processes or frameworks that can be identified for this building type and what are their differences? What properties or values is the design framework composed of? How specifically would a tall building designed with an aggregative approach respond to additive growth and change in the surrounding urban fabric?

Tall structures have been discussed and written about countless number of times. Still, it is my hope that by focusing on fresh issues and debates, new insights into the physical form and design process for tall buildings will emerge.

*... Our cities do not have enough opportunities for shared experience, a situation that won't change without a revised approach to the design of building, particularly the tall building ... One has to begin with the point of view that the skyscraper has the potential of making a contribution to urbanism. Before 1930 it certainly did. The tall building is a salient component of the urban landscape as we know it today. Anyone interested in urban architecture has to focus primarily on the development of the tall building. I'm dismayed by the lack of concern within the schools of architecture for developing a theoretical point of view toward this building type.*

*William Pederson : Architecture Now*

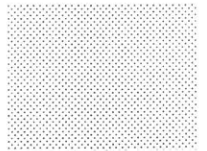


*Philadelphia Savings Fund Building was designed and constructed with the belief that the skyscraper could make a strong contribution to urbanism.*

**P.S.F.S. BUILDING**  
Howe and Lescaze  
Philadelphia, PA, 1931  
491 feet



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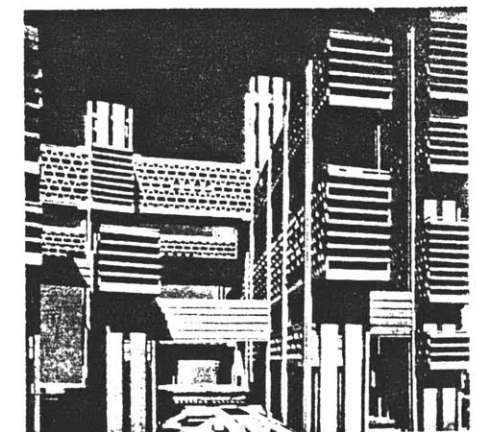
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## SECTION I : THE PROJECT

DESIGN PREMISE

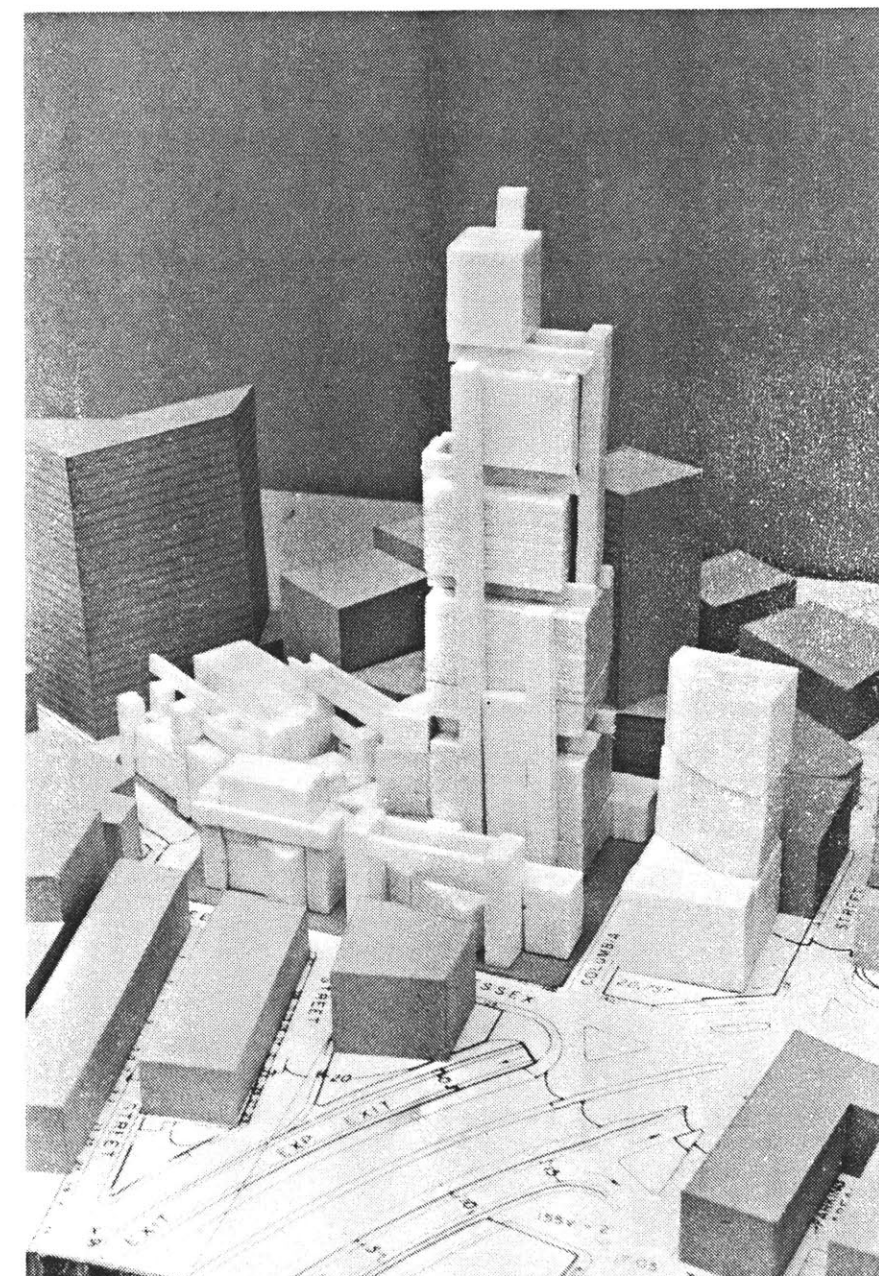
SITE

PROGRAM

PROJECT GRAPHICS

*... It's easy to suggest there's something wrong with the high-rise. I don't find working on the fortieth floor of a high-rise inferior to working in a sweatshop in the basement of a building of human scale.*

*Moon Landrieu : "The Livable City"*



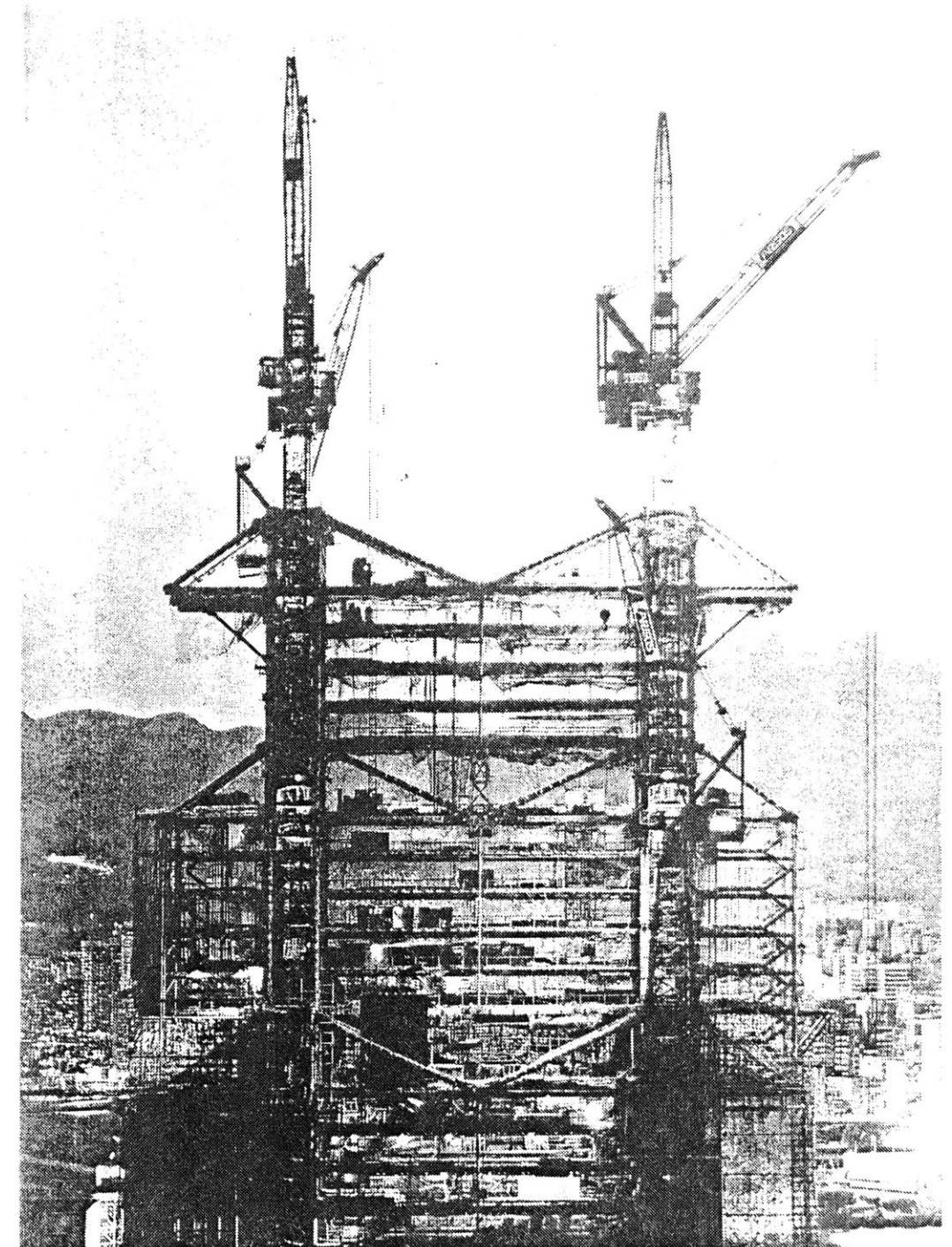
*Early massing model studies for the Bedford Crescent site.*



# DESIGN PREMISE

---

The tall building can be defined as layers of multidimensional, variable, habitable frameworks. These frameworks occur in a range of scales from the primary structure to the closure and detail systems. By emphasizing the differences in the overall system of frameworks, variety is introduced which allows for flexibility in use and provides the mechanism necessary to accommodate growth and change in the urban fabric.

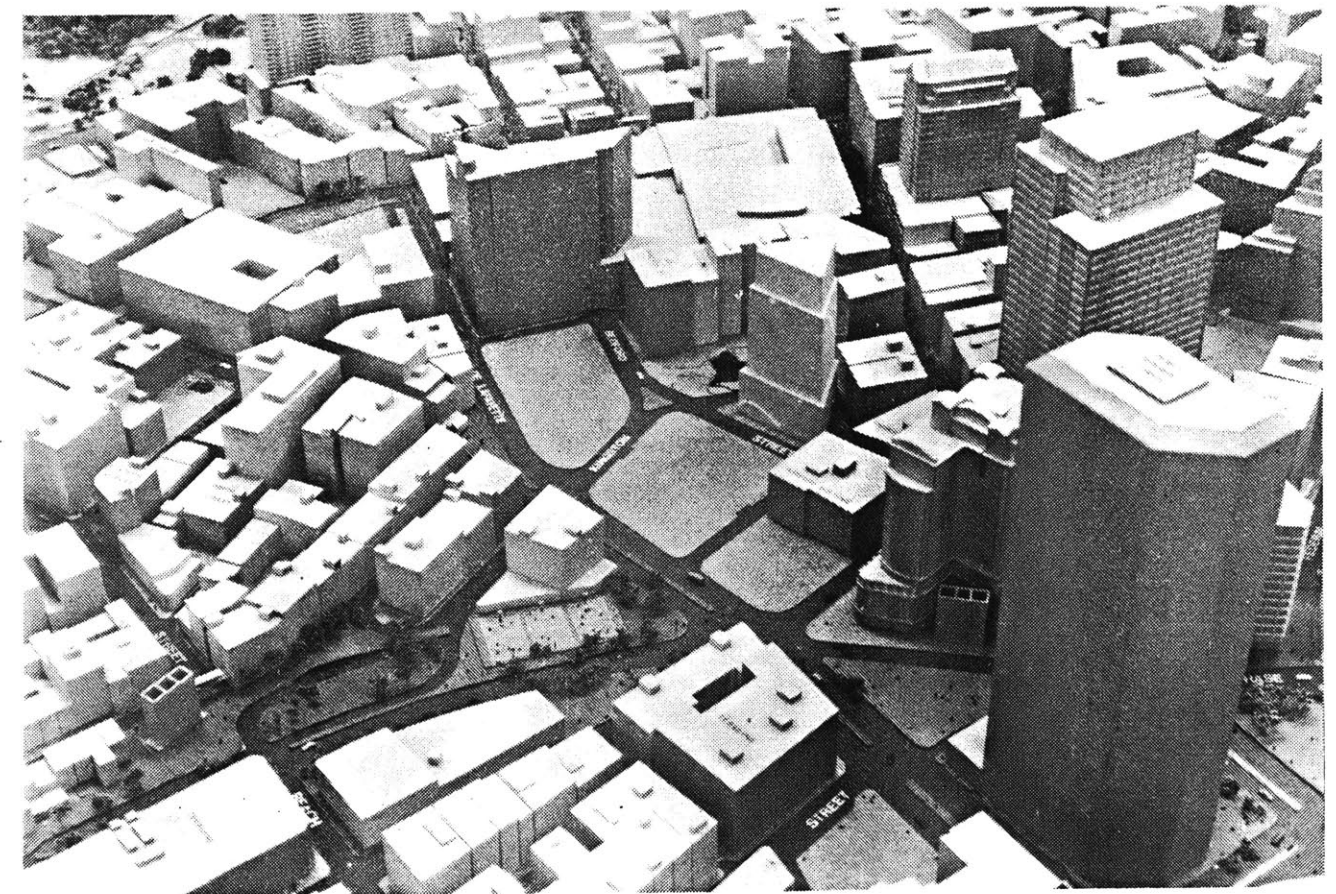


*Norman Foster's HongkongBank as a framework under construction.*



The site chosen for the design section of this thesis is located near Downtown Crossing in Boston. The Bedford Crescent Development extends east from Lafayette Place toward South Station. This area includes a string of parcels boarded by Bedford and Essex streets. Collectively, these parcels present a prime opportunity for a major improvement to the eastern end of Boston's Central Business District and to the linkages between the existing retail core and Chinatown. Retail expansion, as well as office, housing and parking has already been targeted for this area. Among the existing historic structures on or near the site are the Bedford Building, the Church Green Building and the Procter Building.

Like many other cities, Boston's surging growth has brought its urban problems out into the open with a sense of urgency. The city is struggling to put together a comprehensive development plan while the wave of questions about major development continues to grow.



*View of model from above. Open parcels are the Bedford Crescent blocks.*





The Bedford site is part of a nearly continuous path along Essex Street. The Essex Street corridor is a prime location to support retail users as well as office and residential development. The "Bedford Crescent" project, located directly South of Church Green will be a large mixed use development. A sizable development parcel is obtained by combining the two existing larger parcels and linking them to the Bedford Building Block. This will provide a parcel large enough to accommodate a tall office and residential tower.

## PURPOSE :

- Intended to provide a quality office and residential development with supporting commercial activities.
- Encourage pedestrian linkages and traffic flow between the Downtown Crossing's retail core and Chinatown
- Sets up framework and clues for future development and allows for additive growth and change in the urban fabric
- Enliven the streetscape and provide an entryway to the retail district
- Preserve historic structures

## USES ALLOWED :

- Office : general and technical
- Residential : Townhouse, Multifamily, Hotels, Motels
- Retail
- Restaurants and Food Services

## USEABLE OPEN SPACE :

- 25% of development parcel is open space
- Includes parks, plazas, landscaped areas open to sky, balconies, roofs, decks, etc. ...

## BUILT FORM :

- Office / residential building with an aspect ratio of 6-8. Approximately 400,000 to 600,000 square feet
- Retail framework of 50,000 to 100,000 square feet
- Parking for approximately 300 cars

*...Bedford Building is significant as an example of high Victorian Gothic commercial architecture in polychrome masonry. The Church Green Building, located at the intersection of Bedford, Summer, and Lincoln Streets, is significant architecturally as one of the finest of the granite mercantile buildings built immediately after the Great Fire of 1872. The Proctor Building is a small, elegant commercial structure, "a piece of urban jewelry", with a beautifully detailed terra cotta facade. The preservation of these buildings should be assumed in any development concept for this area.*

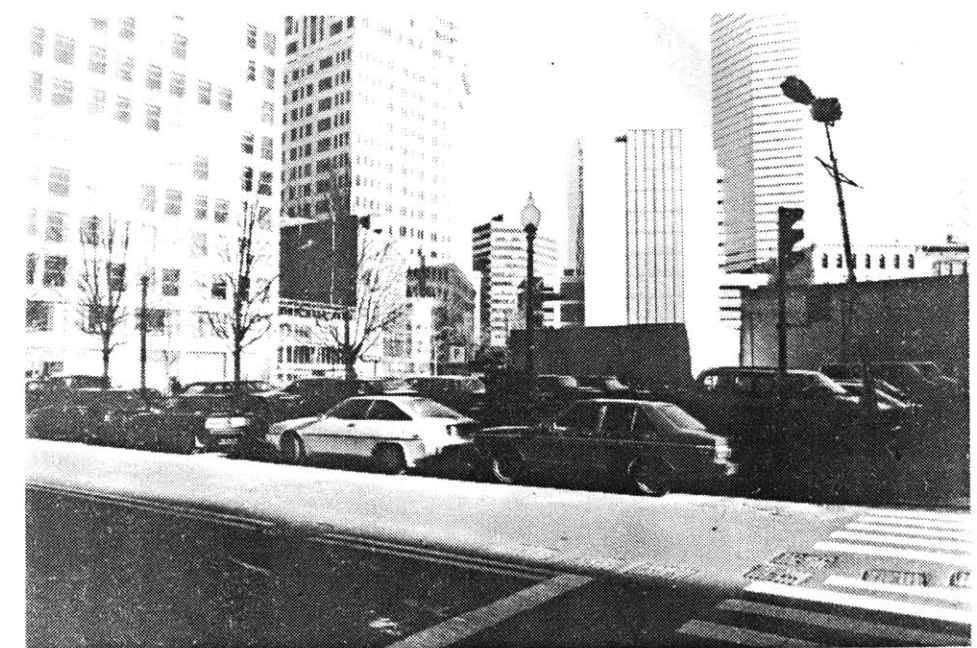
*Downtown Crossing : An Economic Strategy Plan*

*...Analysis of the retail mix shows that the district as a whole does not fully satisfy the needs of many higher price or quality oriented shoppers, particularly with specialty wares and apparel.*

*Downtown Crossing : An Economic Strategy Plan*



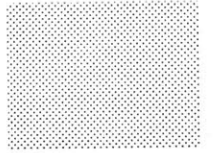
*View of site from Lafayette Place.*



*View of site from Chauncy Street.*

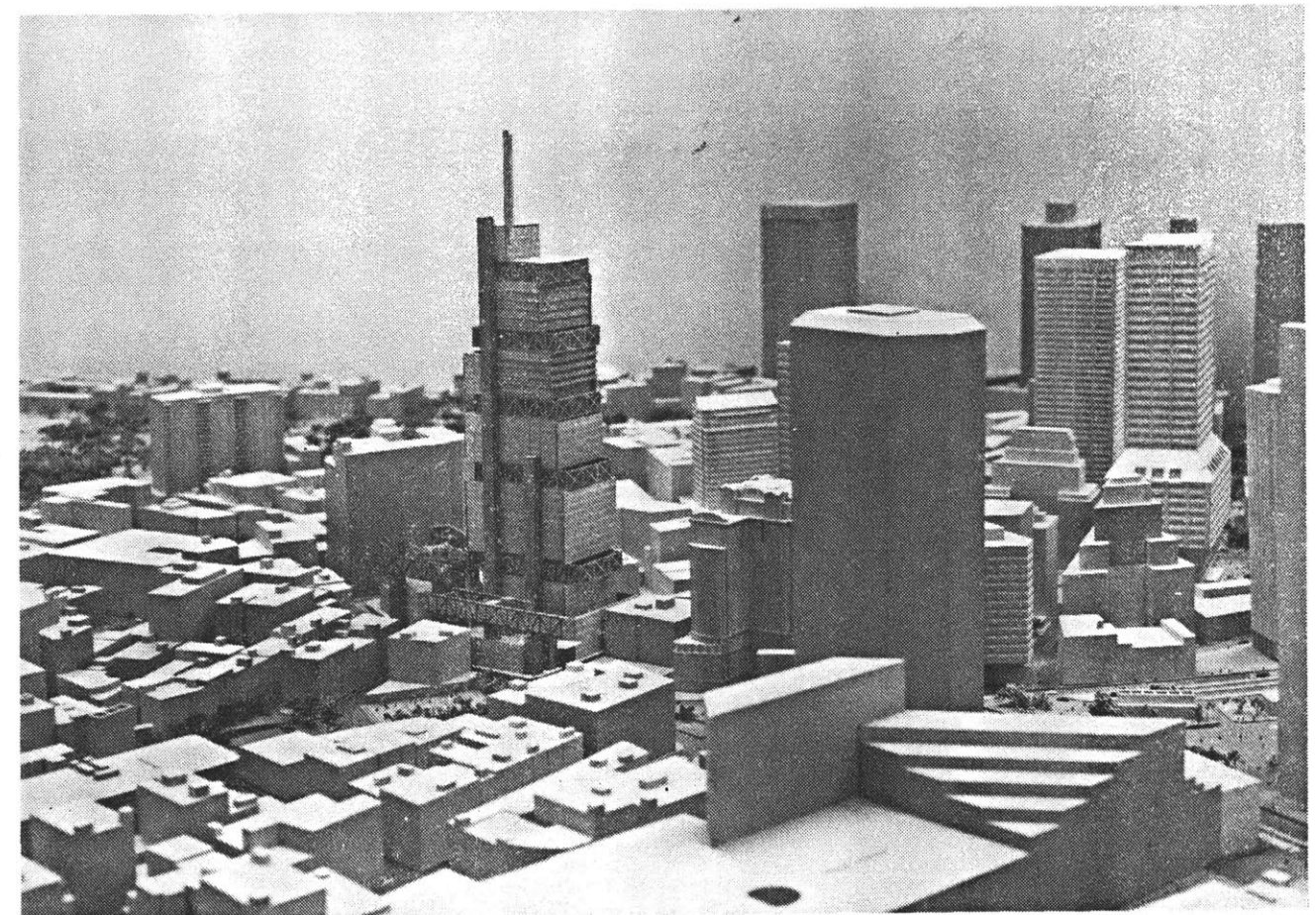




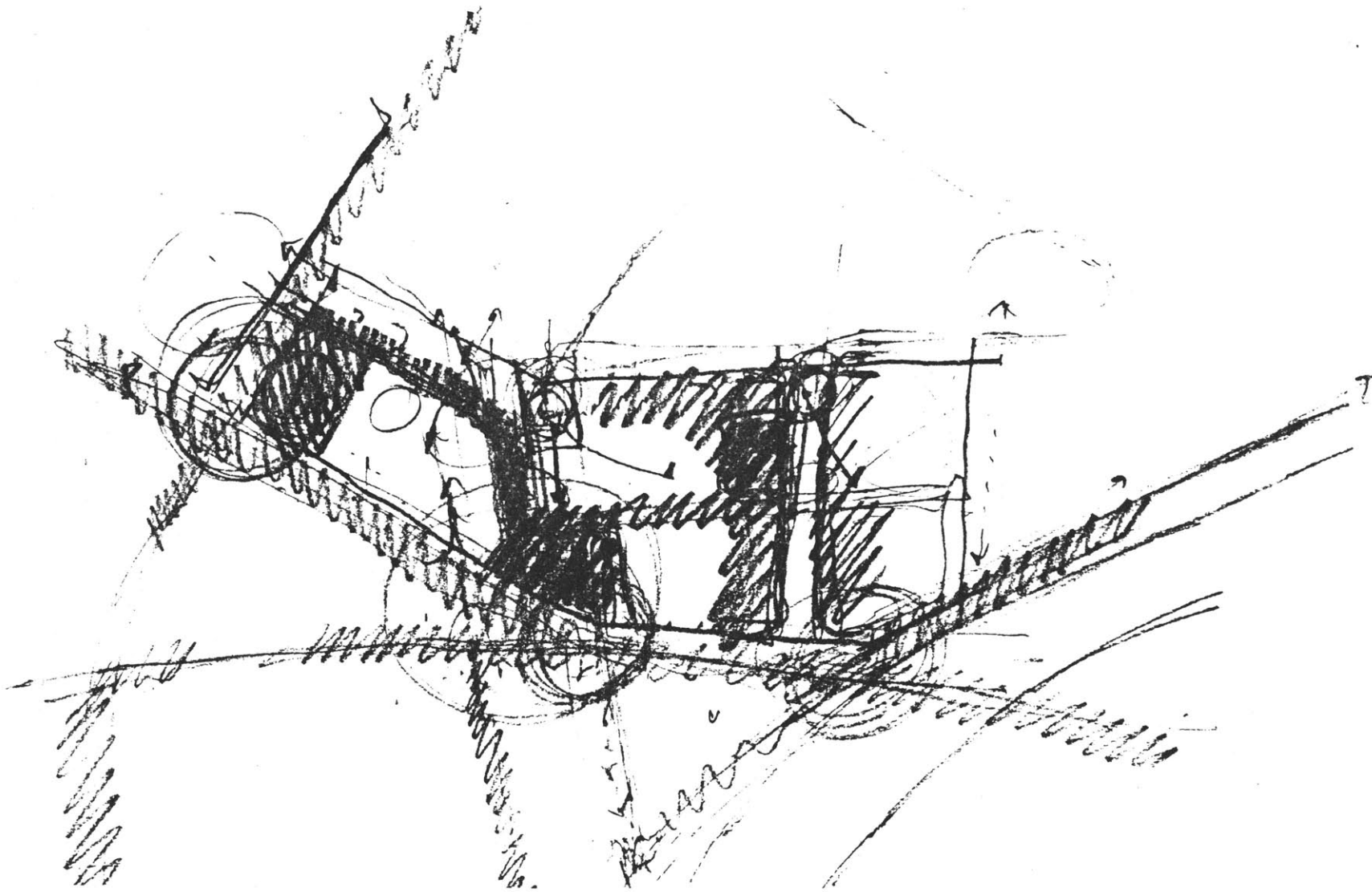


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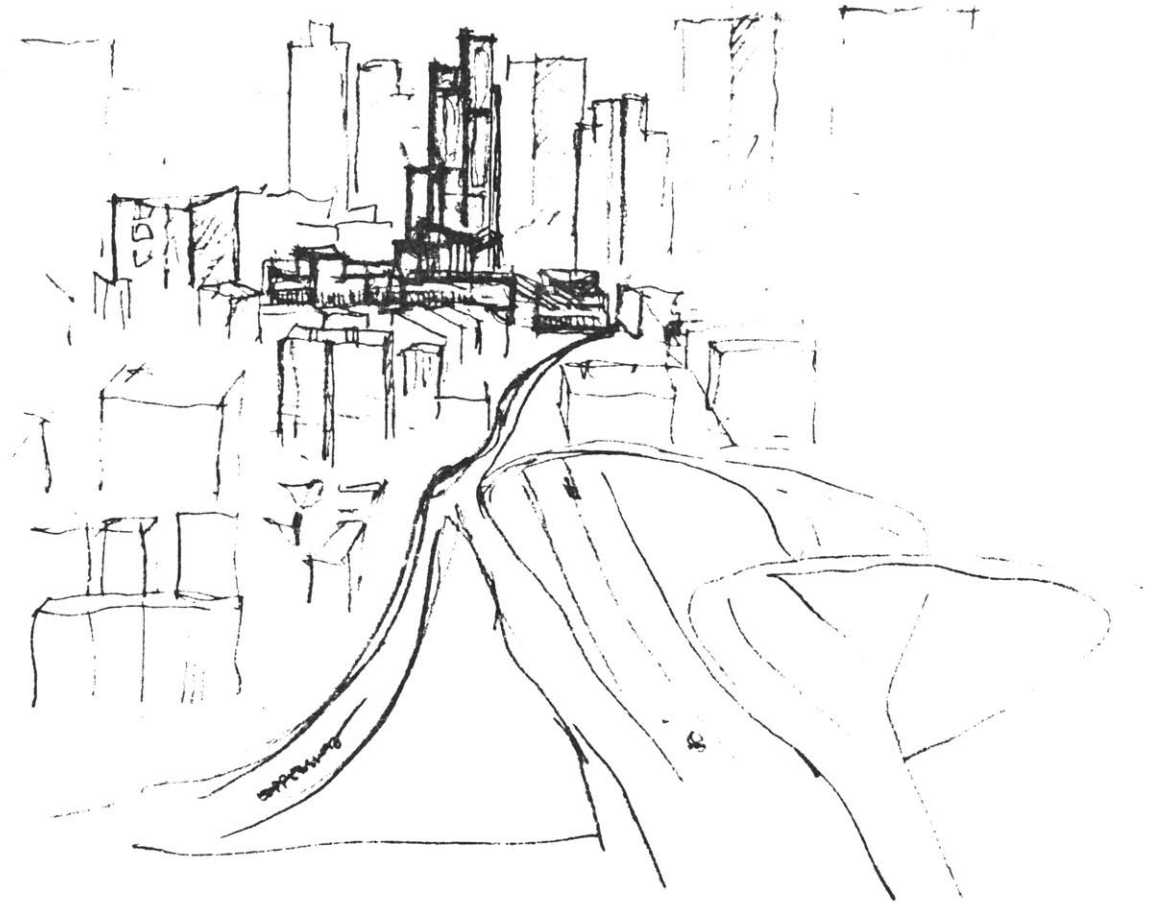
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*Working model photo of the Bedford Crescent project. View from South.*



*Site Analysis: Paths, Movement, Places.*



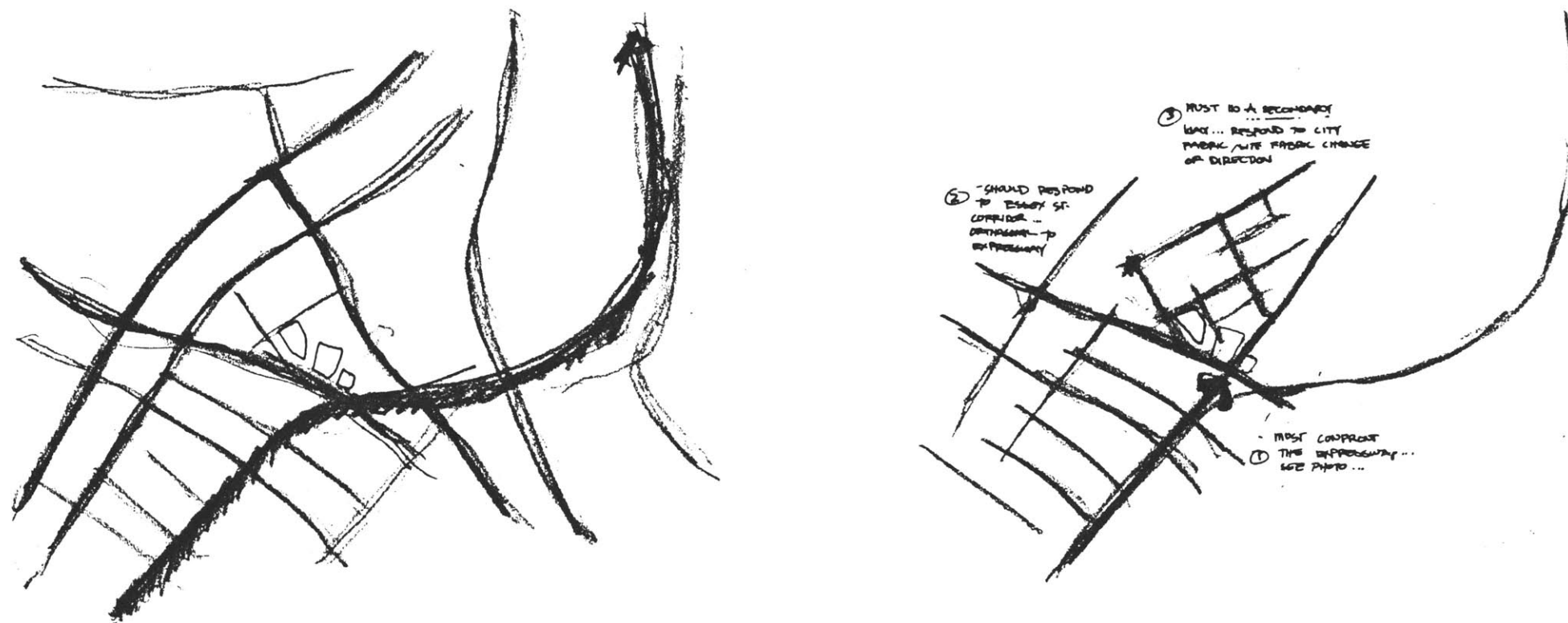
*FROM EXPRESSWAY*

*Early sketch of tower showing expressway heading directly toward the site.*

### SITE ANALYSIS

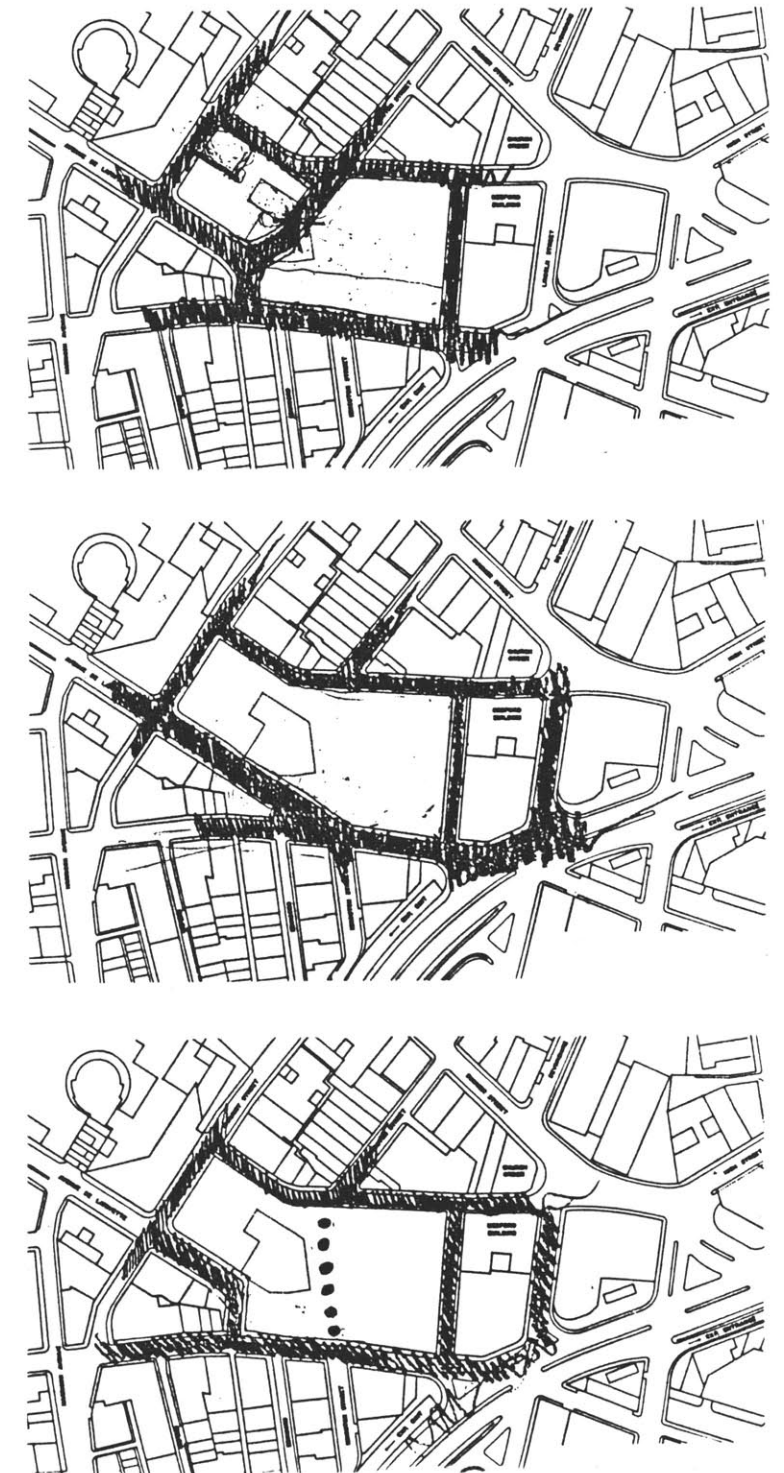
The Bedford site is multi-directional. The primary site direction aligns itself with the orthogonal city grid on the south side of the Essex Street Corridor. The tower can then confront the incoming Southeast Expressway, providing the downtown with an indentifiable gateway. The secondary site direction responds to the city fabric of the Downtown Crossing, located to the North and West of the site.

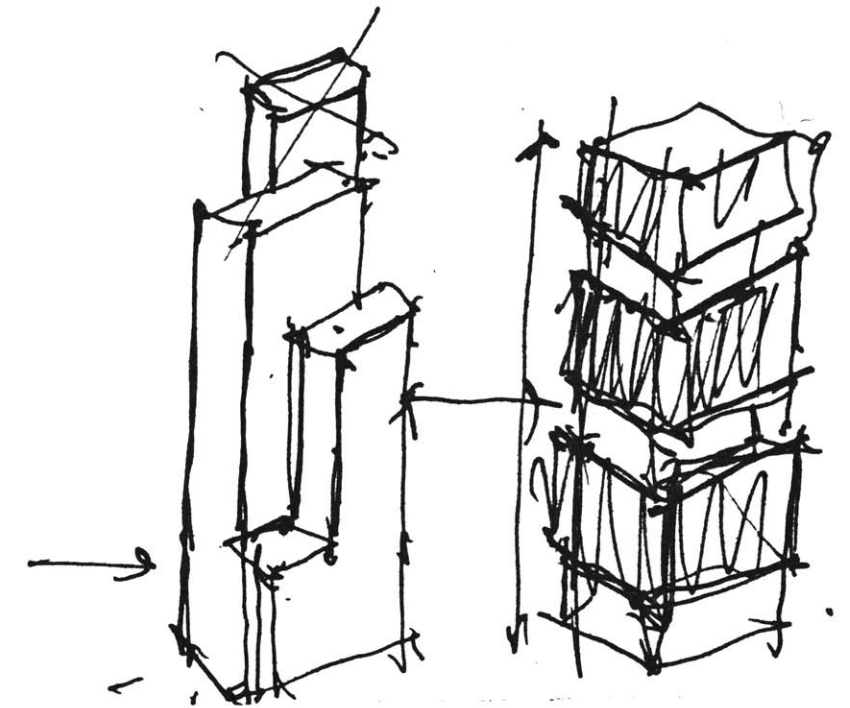
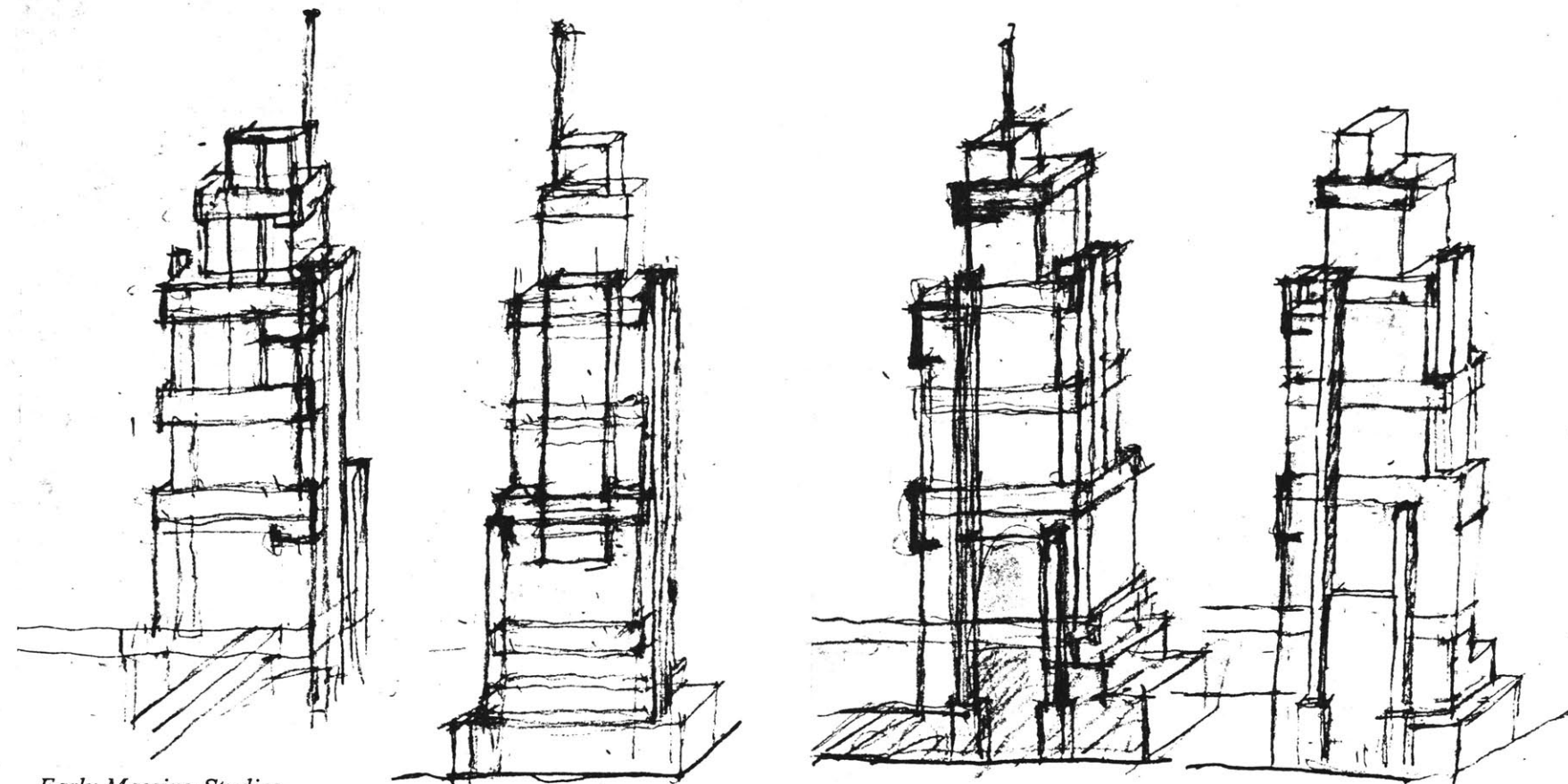
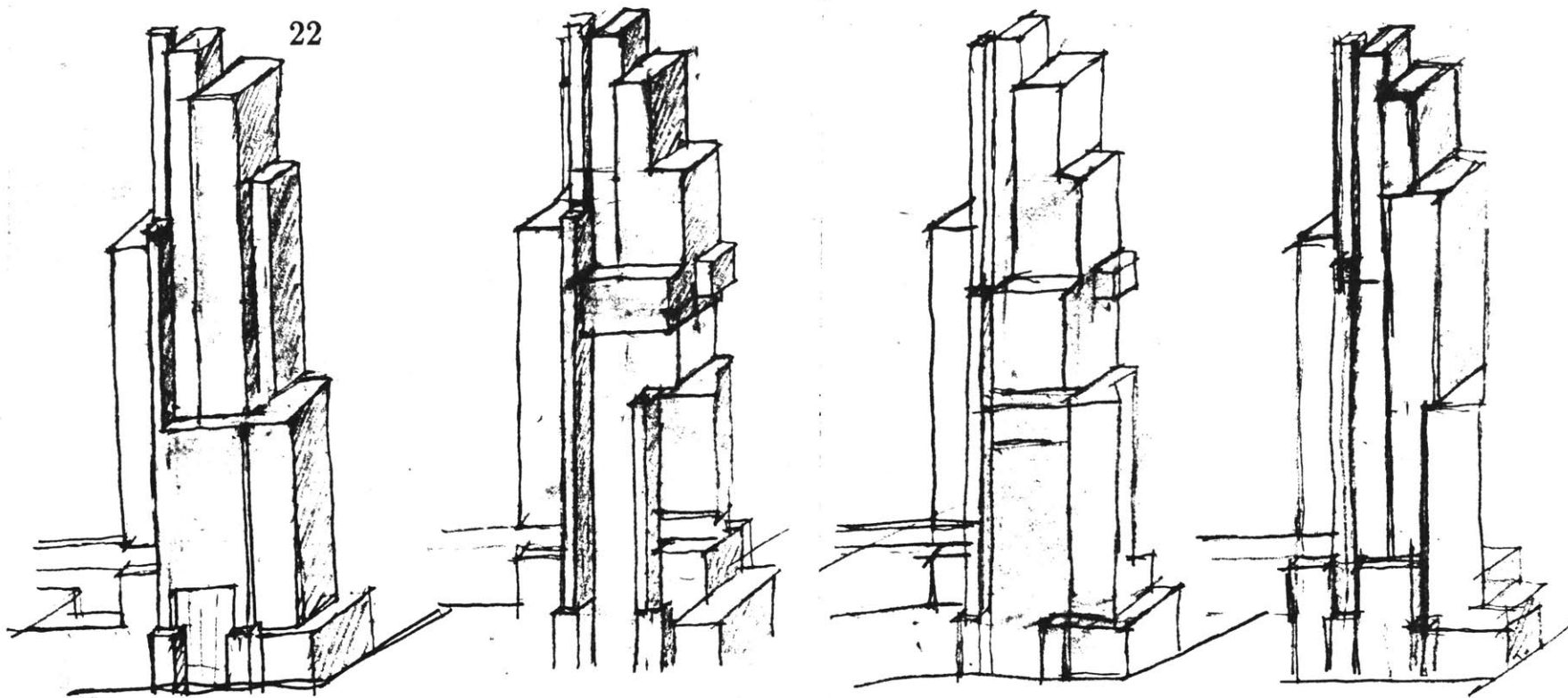
Traffic is not allowed to continue through the site; Kingston Street becomes a pedestrian path. The indoor-outdoor nature of the pedestrian way helps resolve the change of direction within the site.



Site Analysis: larger urban fabric directions and relative position of site.

Traffic and site movement studies.





*Different tall building structures require very different massing techniques. The massing type on the left is linked to a "bundled tube" structural arrangement; while the one on the right is based on a stacked horizontal, cross-braced structure.*

*Early Massing Studies.*

E

S

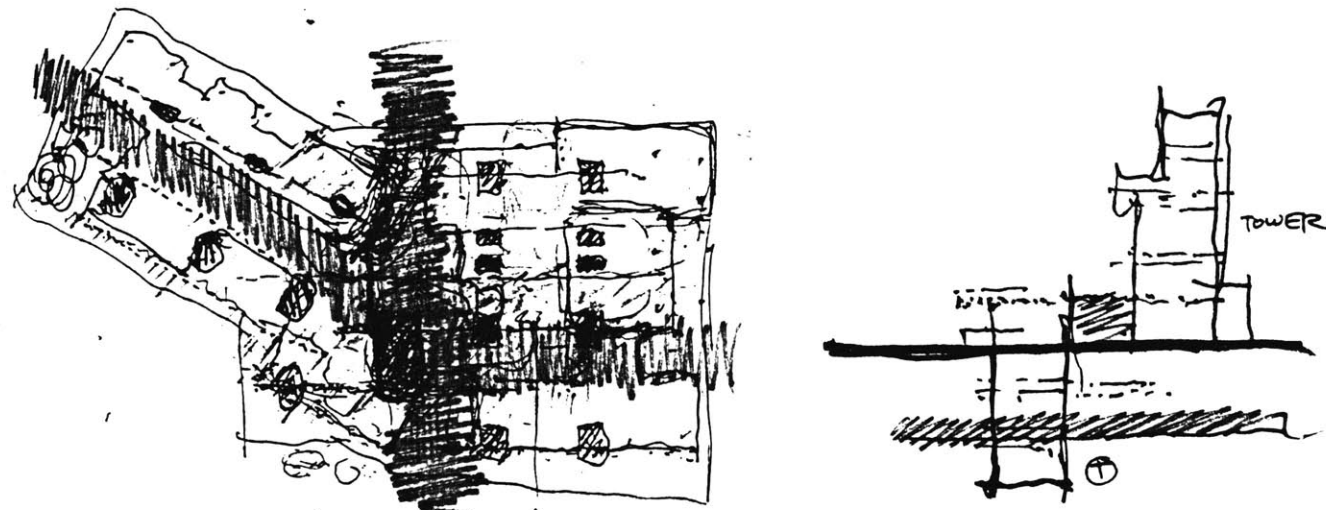


## MASSING

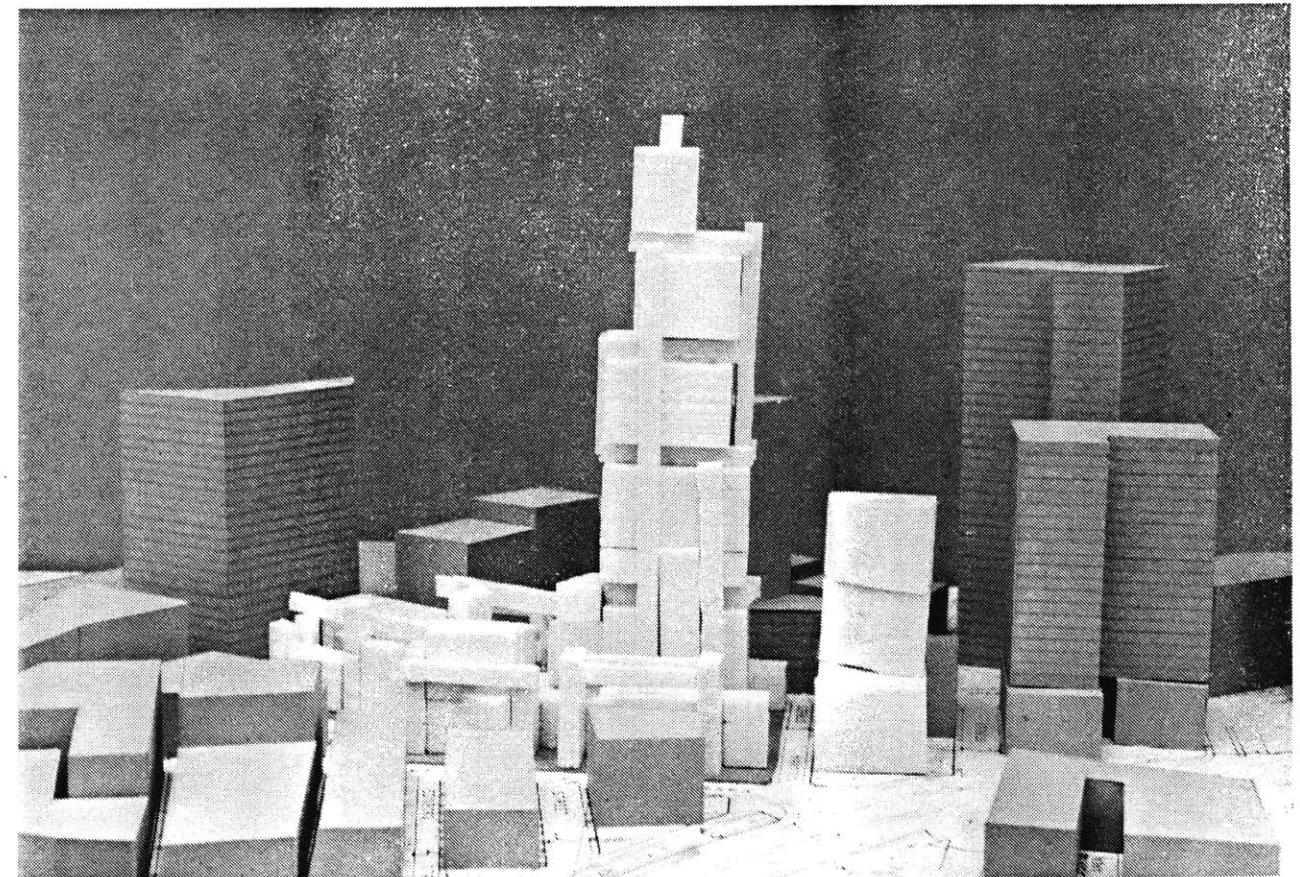
The tower is located on the northeast part of the site for several reasons. There is easy access to underground parking and support facilities from Kingston, Bedford, Columbia and Essex streets. A natural, continuous indoor-outdoor pedestrian way is created through the site along both directions. Smaller, sun and air oriented commercial and office support structures are located on the south side of the tower. An above and below ground public transportation station is opposite the tower and establishes a similar type of continuous vertical movement below ground. The "T" station would be an addition to Boston's Red Line.

There is an open space plaza on the Chauncy-Avenue de Lafayette corner, directly opposite of the Lafayette Place development. This small plaza provides for those traveling to the site from the Essex Street Corridor or the Downtown Crossing and establishes an indoor-outdoor linkage to the nearby commercial and office spaces.

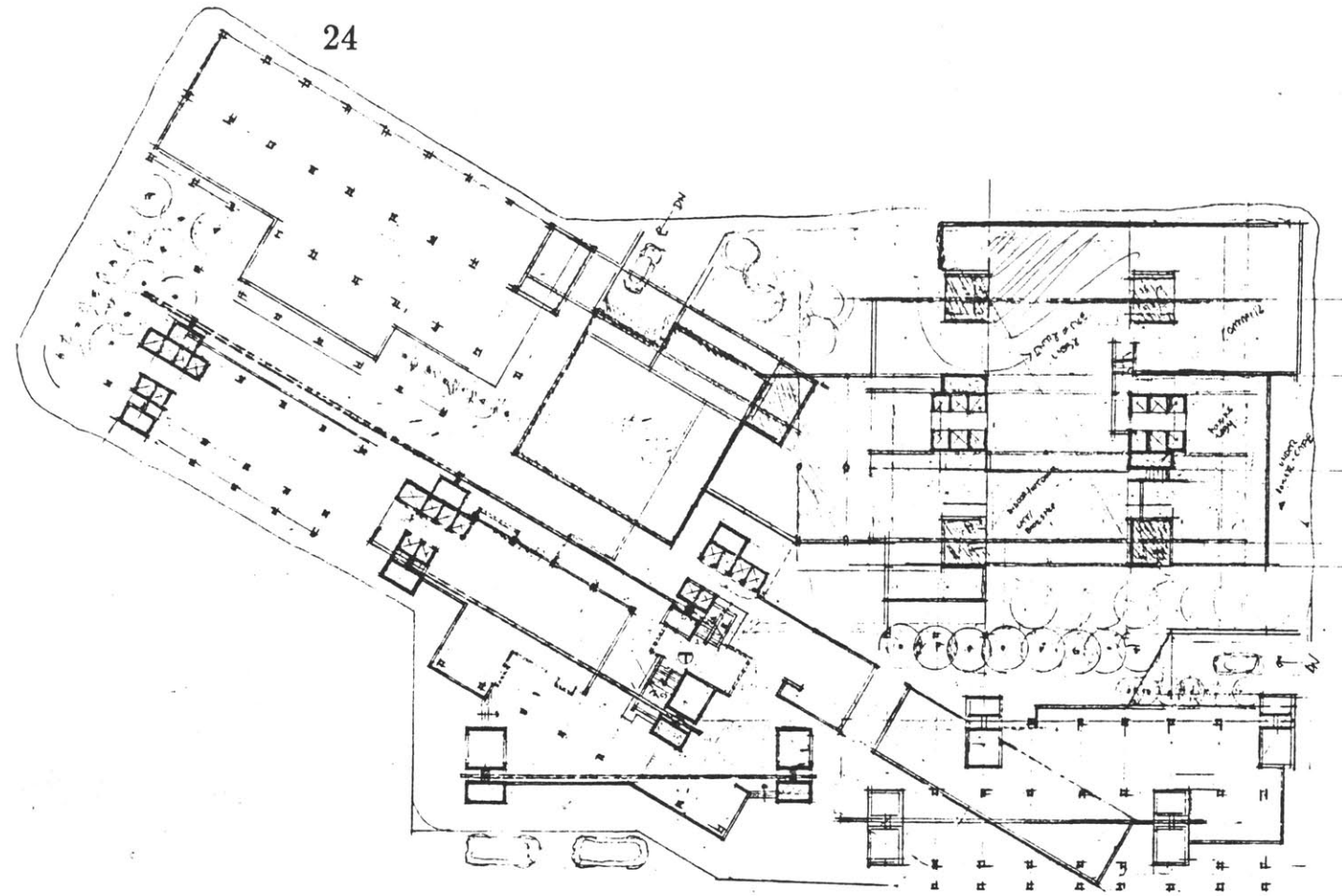
The tower itself is speculative and mixed use, with commercial, office and residential activity. The lower levels can provide for commercial activity while the main part of the building is for office use. The narrower upper piece of the structure is primarily residential.



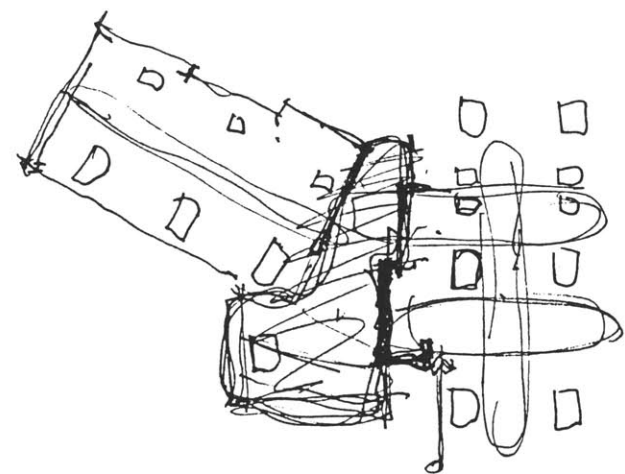
*An above and below ground public transportation station is opposite the tower and establishes a similar type of continuous vertical movement below ground.*



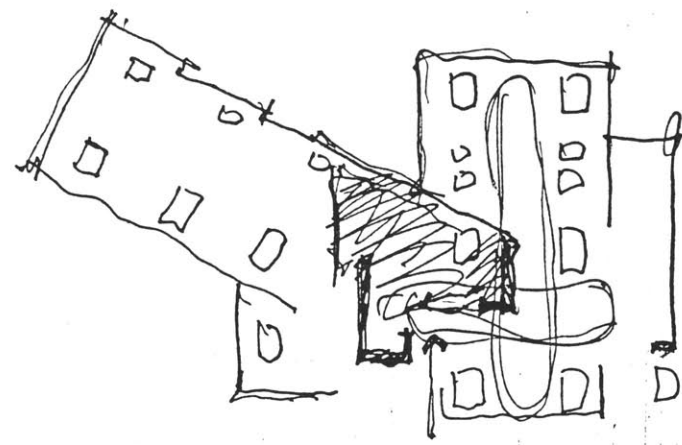
*Early massing studies for the tower.*



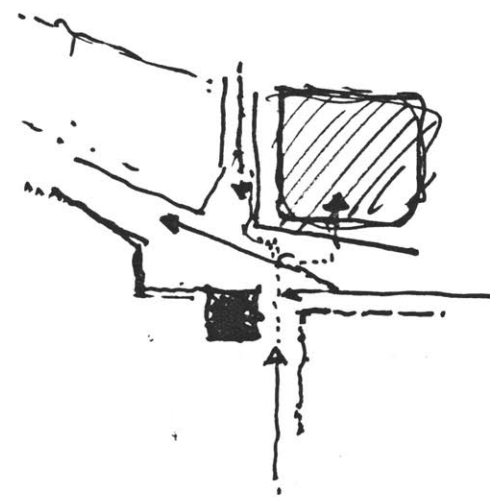
Early site plan working with the resolution of the two directions.



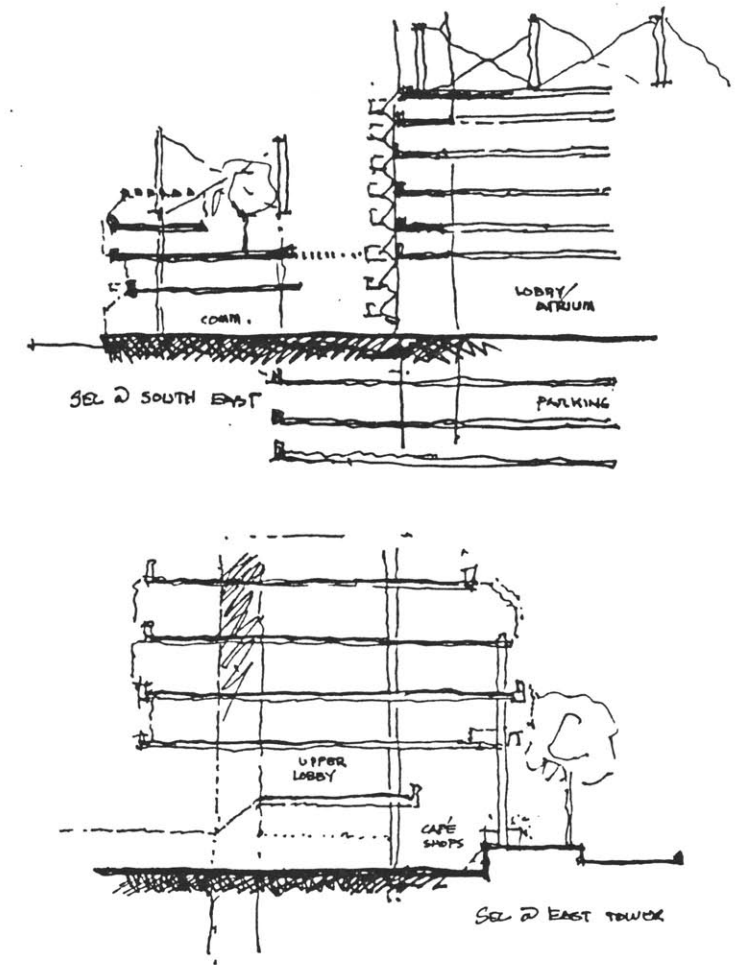
Two directions in site resolved within an open space.



Two directions in site resolved with open passing built linkage.

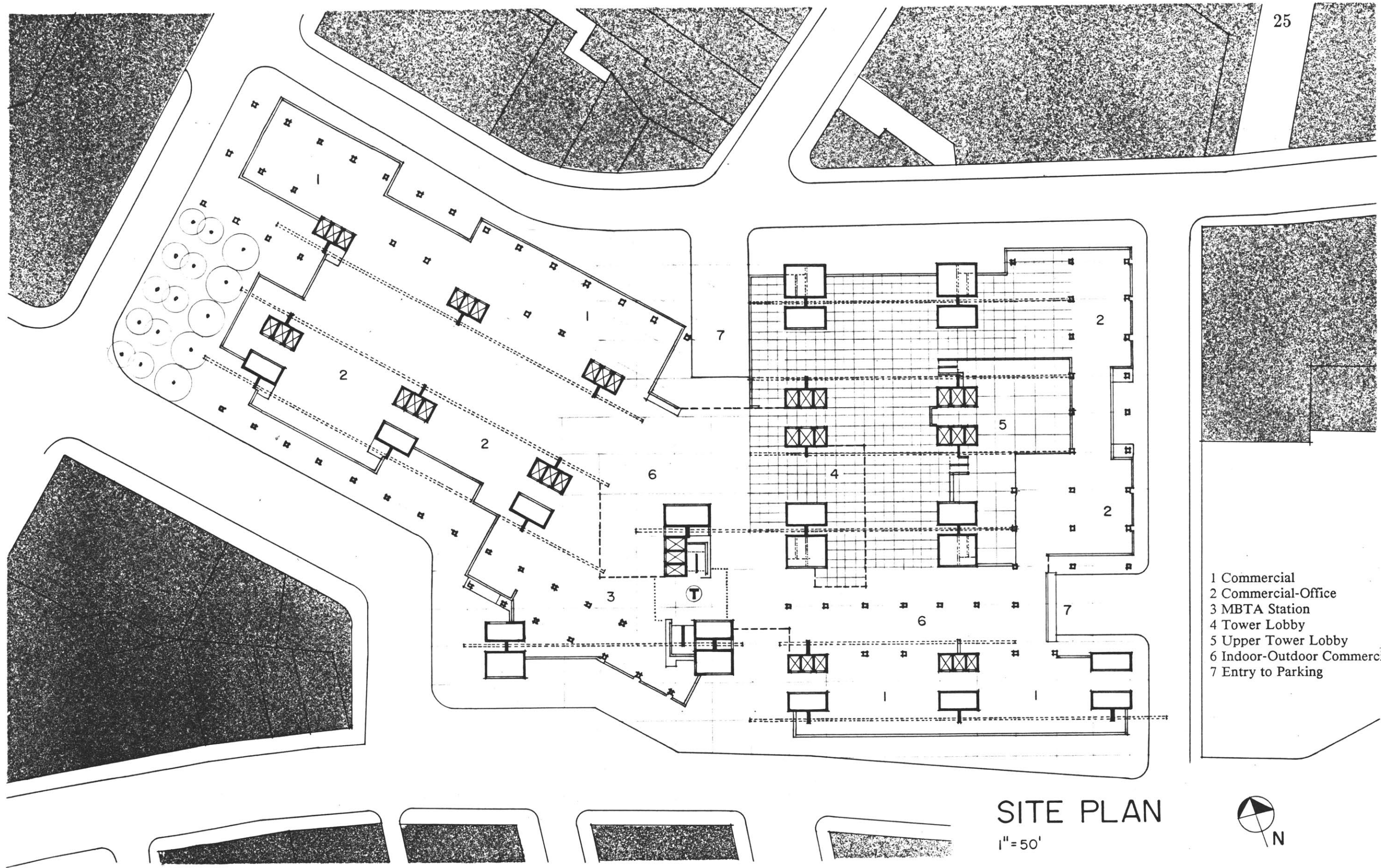


Two directional branching form with secondary access. From analysis of San Gimignano; Courtesy of Tom Chastain, M.I.T. Department of Architecture.



Partial site sections.



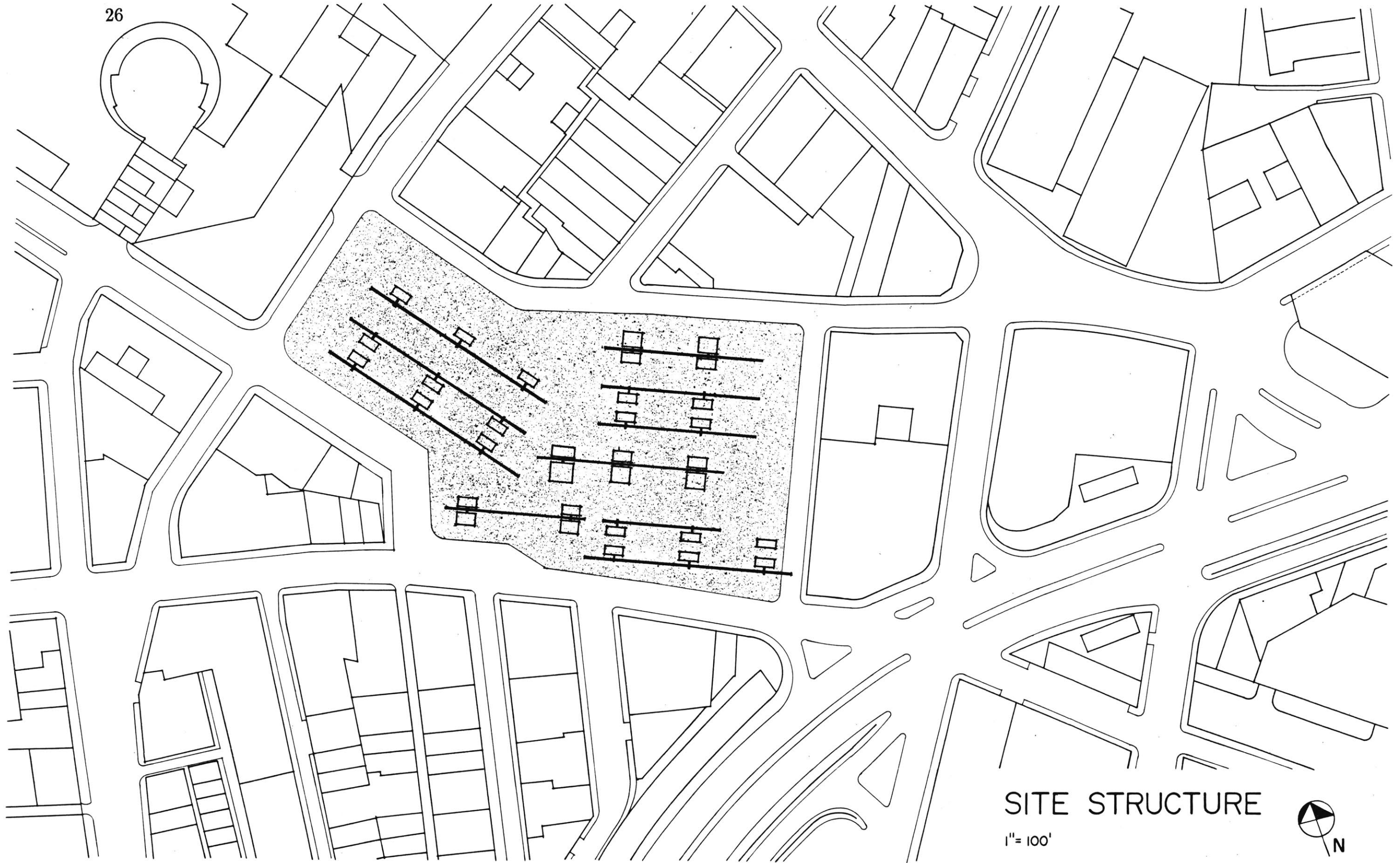


25

- 1 Commercial
- 2 Commercial-Office
- 3 MBTA Station
- 4 Tower Lobby
- 5 Upper Tower Lobby
- 6 Indoor-Outdoor Commercial
- 7 Entry to Parking

SITE PLAN  
1" = 50'





SITE STRUCTURE

1" = 100'





## BUILDING STRUCTURE

This is a list of general assumptions regarding the structure for this particular building. Following the list is an assemblage of notes from several meetings with William J. Le Messurier, a well known Structural Engineer who specializes in this particular building type.

Meetings with William Le Messurier JAN-APRIL 1987

"Good structural design is purity ... The integration of structure and architecture with the greatest clarity and simplicity."

### METHOD(S) ...? (FOR STRUCTURE BASICS)

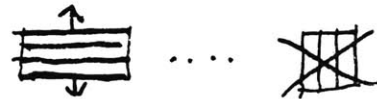
Working in diagram ... in plan & section ... especially in plan. Don't worry about spaces initially just figure where you might want the core. How will people move to the core. Remember everyone gets two methods of egress.

The core location is the most difficult issue with mixed use structures. You really need a separate core for the housing ... but this tends to eat up too much letable space.

"If you must have housing, get it way up in the air. People want the views in the tall building. They want to see France for God's sake! Not the trash in the alley next door." People are not uncomfortable living way up in the air? "I like to ride across the ocean in big ships. There is a hell of alot more movement on that boat than in any of these tall buildings ... and people just love these boats."

Make sense of the core as structure ... then apply the columns to the diagram.

The tall building is vertical. Divide the functions with the form ... not against it.



Direction change ... easy to accomplish in the 20 story concrete cantilever slab tower. The 35-50 story building is a different type. Its more strict. (As is the 100 story structure.)

"The bigger the object becomes the less arbitrary it should be. A change of direction that no one will really understand ... do an elegant slender structure."

This is an EARTHQUAKE ZONE - (1 big quake every 100 years - we're due anytime.) A BIG QUAKE ZONE when you get wildly dissymmetric you end up playing too many games ... and you never really know what you have ... until the QUAKE.

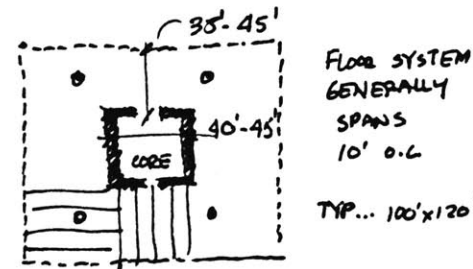
"Setbacks should be done very intelligently with regards to structure."

Floor to Floor	13'-0"
Office Space	9'
Floor Beam	16"
Concrete Topping	6"
Lighting	8"
Mechanical	18"

Single Floor Plate Minimum	15,000 sq. feet
Single Floor Plate Preferred	20,000 sq. feet

Methods of structure for the skyscraper:

- 1) Mobilize the outside (TUBE)
- 2) Cross-brace the inside



Basic dimensions for today's typical cost-efficient structural system.

Why is the core so often in the center?

- 1) To act as structure in bending and gravity
- 2) If possible get the office and use spaces to the light. The core does not have to be in the center, but it is free and should help if possible.

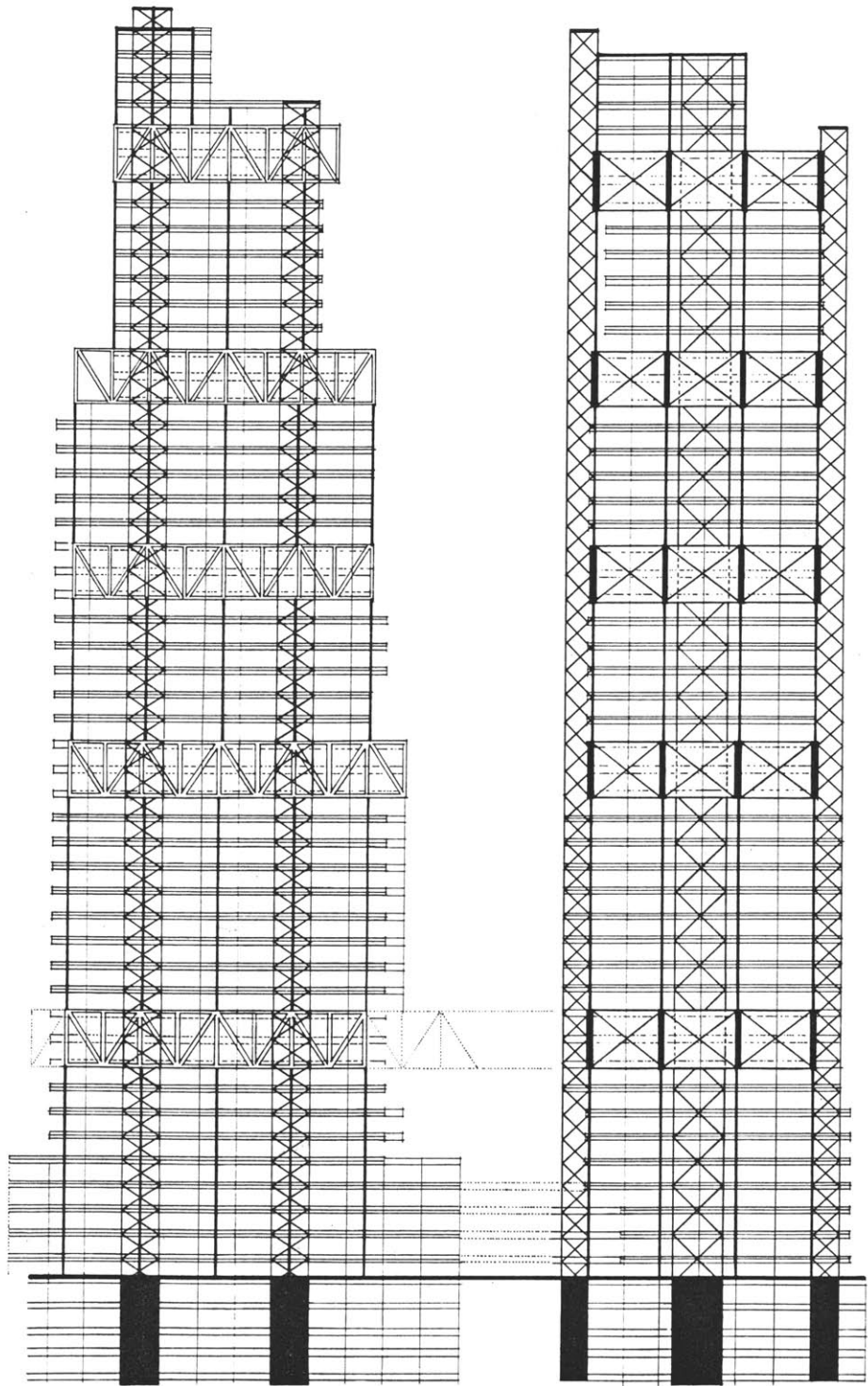
From: LeMessurier "super-tall structures"

1) WHAT ARE THE CONCEPTS... "FIRST WHAT ARE THE PARTS" ...

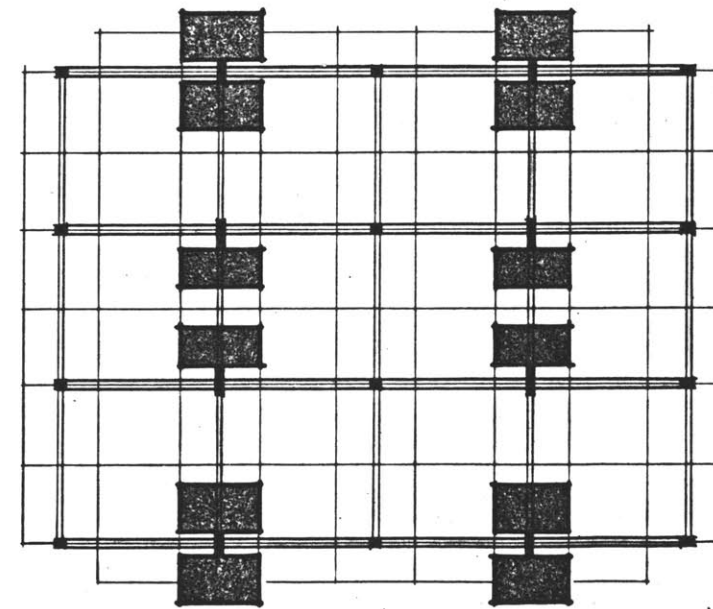
ALTHOUGH ECONOMICS IS THE SINGLE TREMENDOUS VARIABLE  
 10... 303 MANHOLE ARE KPP -> EBY SAVE 4 MILL... TAKE UP 2000... COST 10500... 10 MILL...  
 16... THE SPECIALS, BUT NOT THE COST BASICS - (UNPAID STATE)

A) BAY SIZE IN' AND SKYSCRAPERS THE BIG SYSTEM WAS BASED ON TIMBER DIMENSIONS... WELDED CONNECTIONS WERE NOT TO BE USED... BUT THE SPATIAL EXPERIENCES WERE OF THE COLUMN GRID.

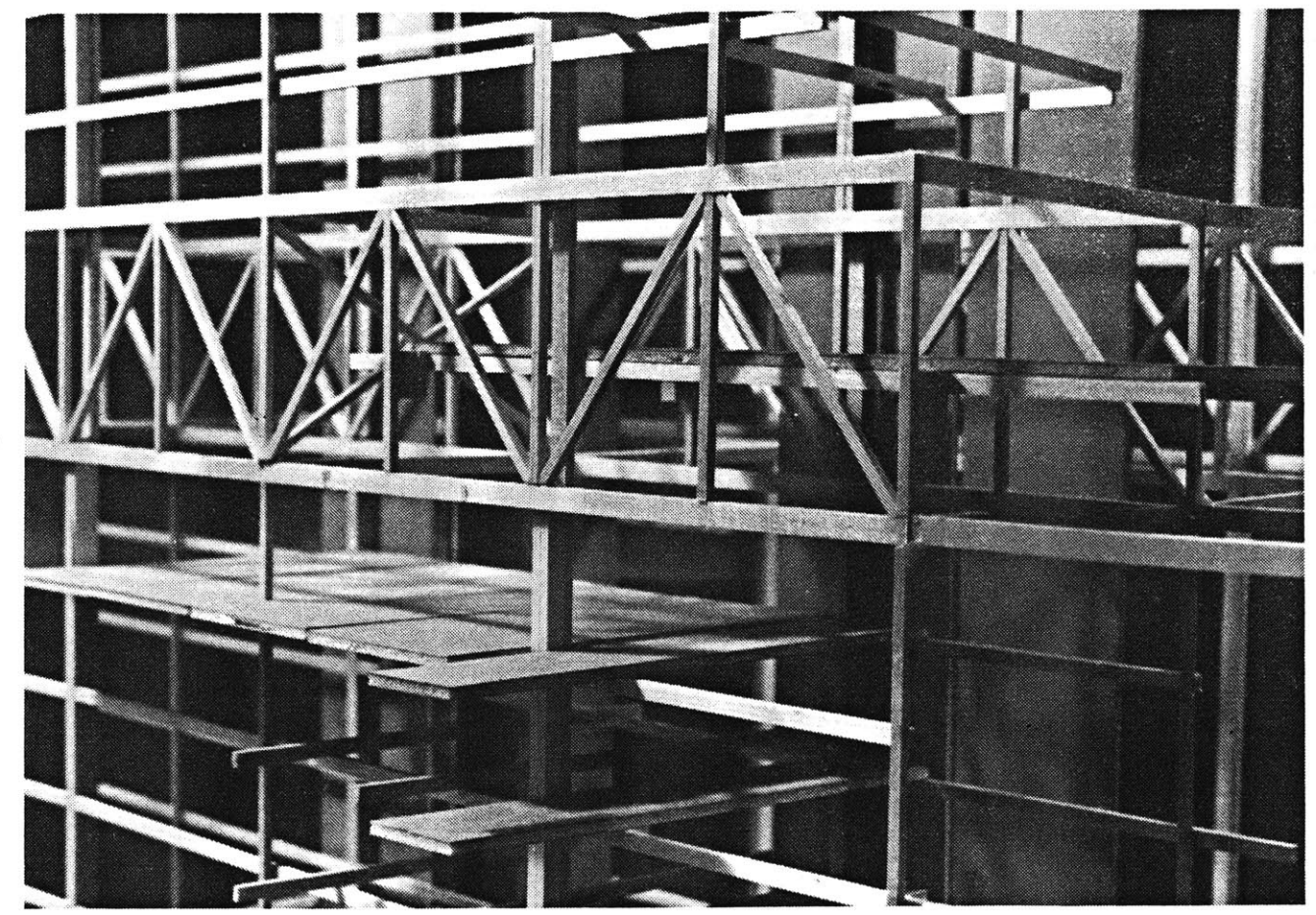
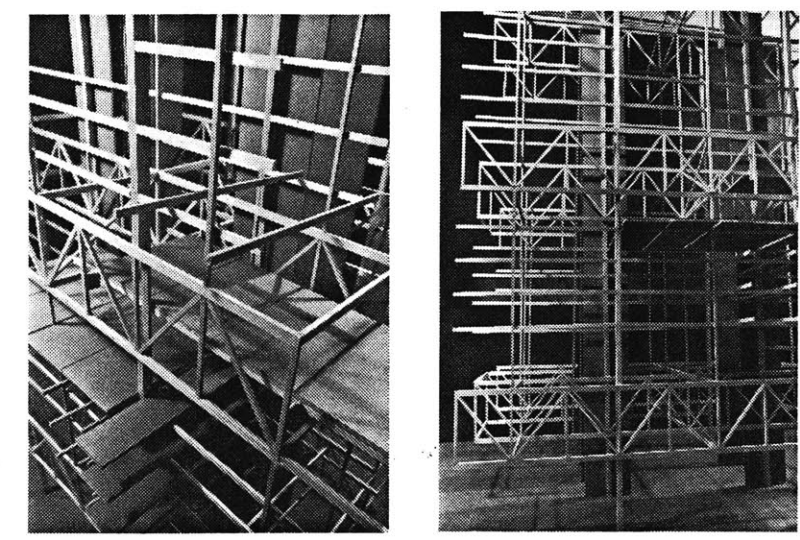
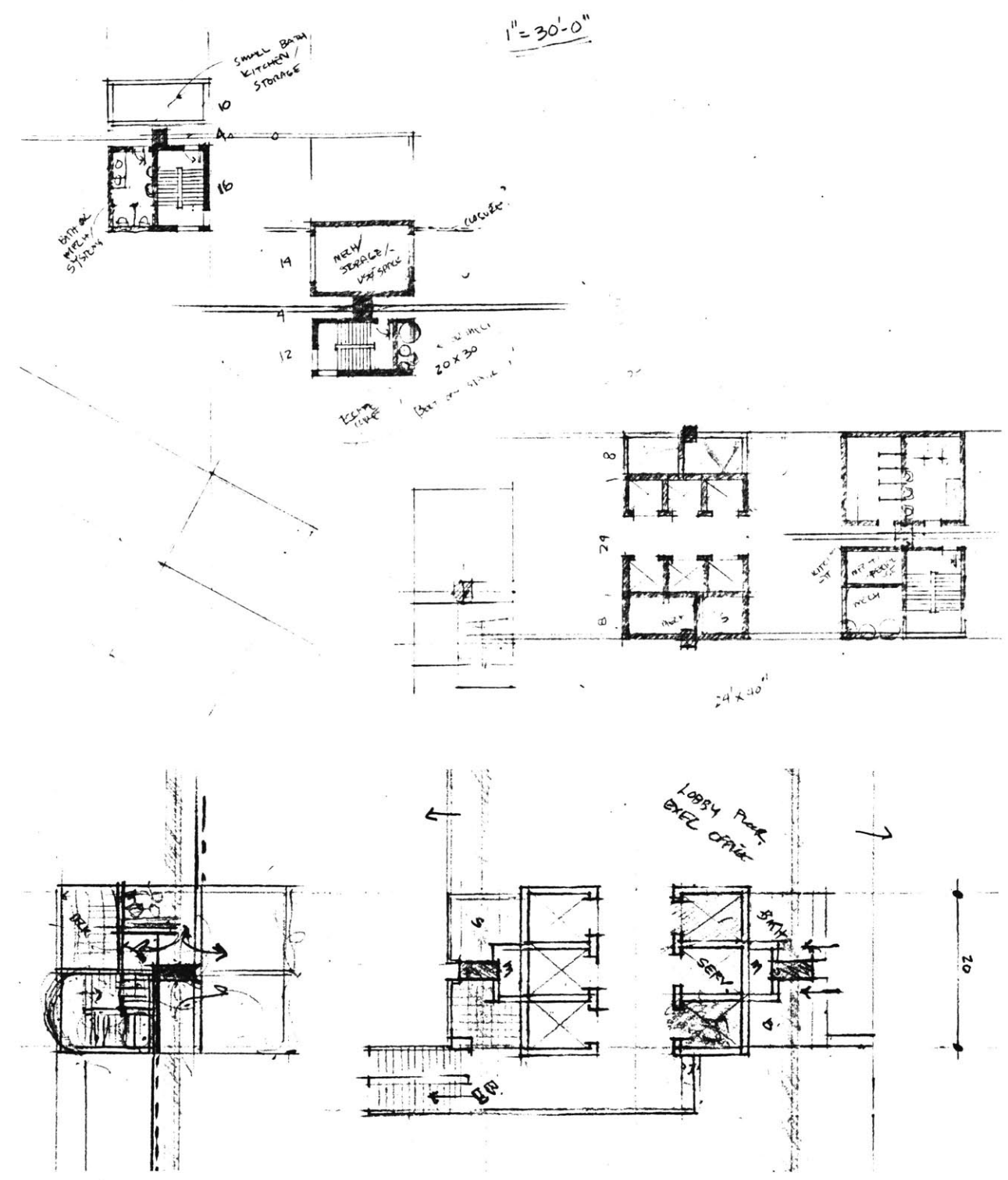
From William J. Le Messurier: Comparison of different building structures.



BUILDING STRUCTURE  
1" = 100'



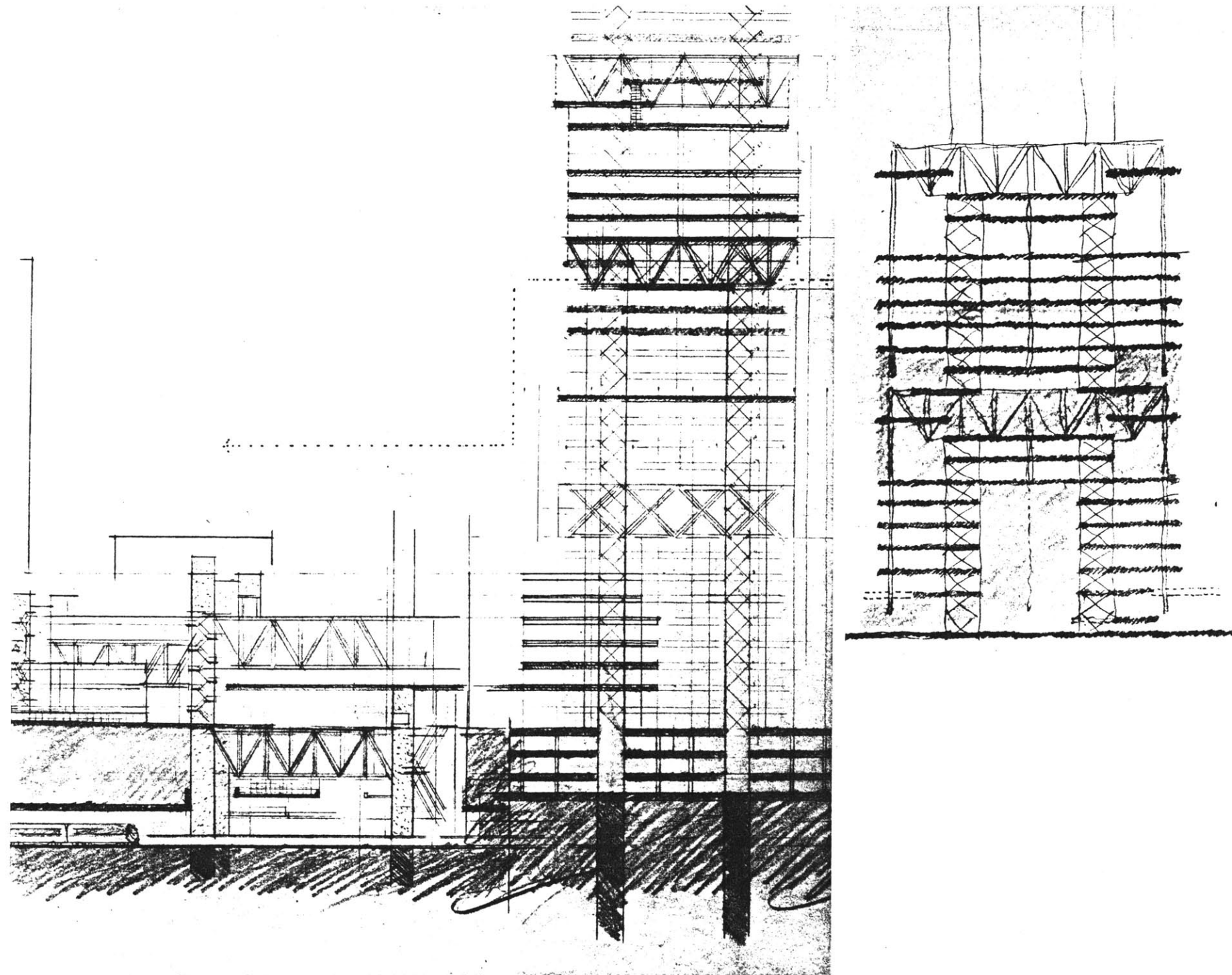
STRUCTURAL PLAN  
1" = 50'



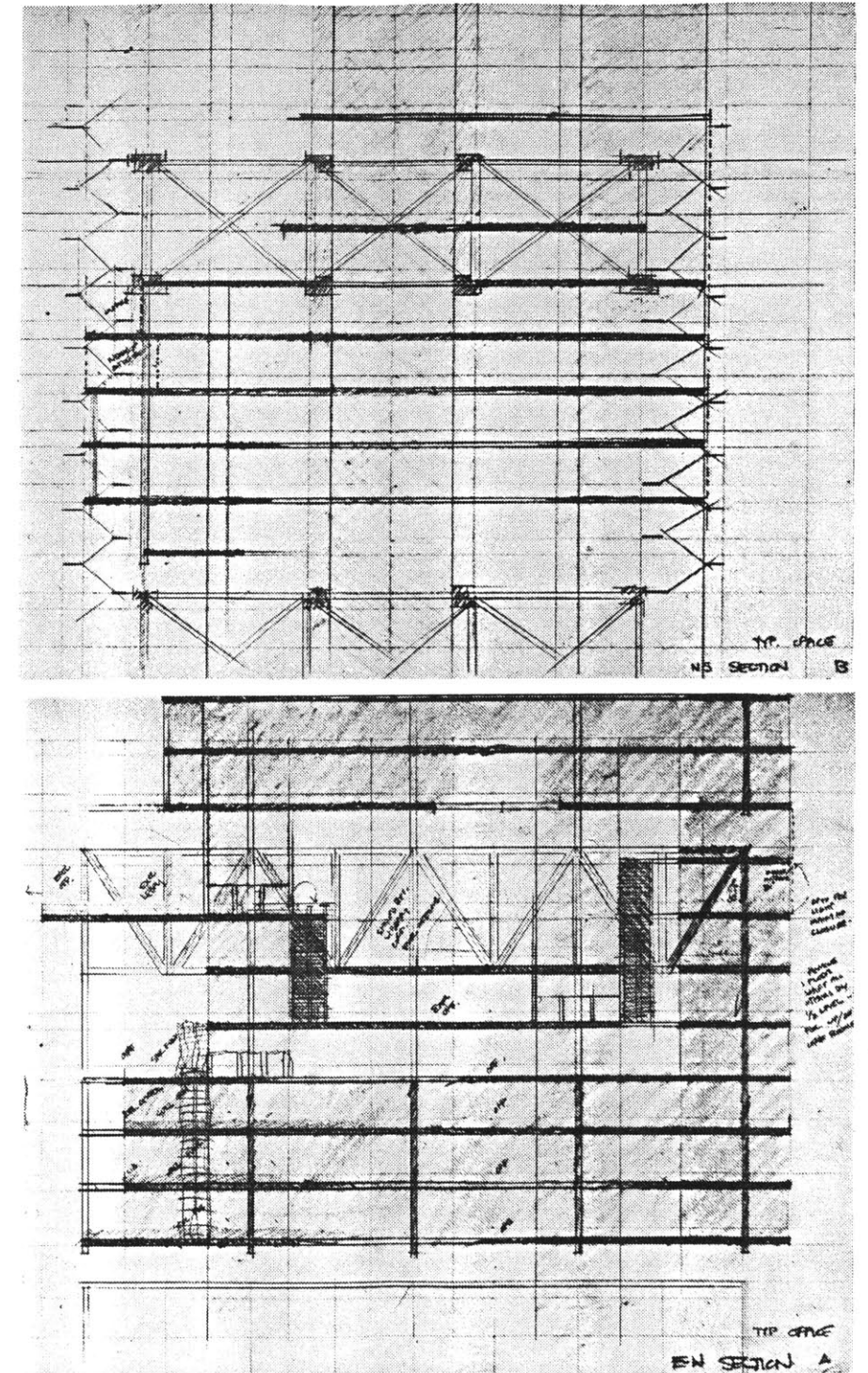
Service and Structural Core Studies.

Photos of Structural Study Model for the Tower.

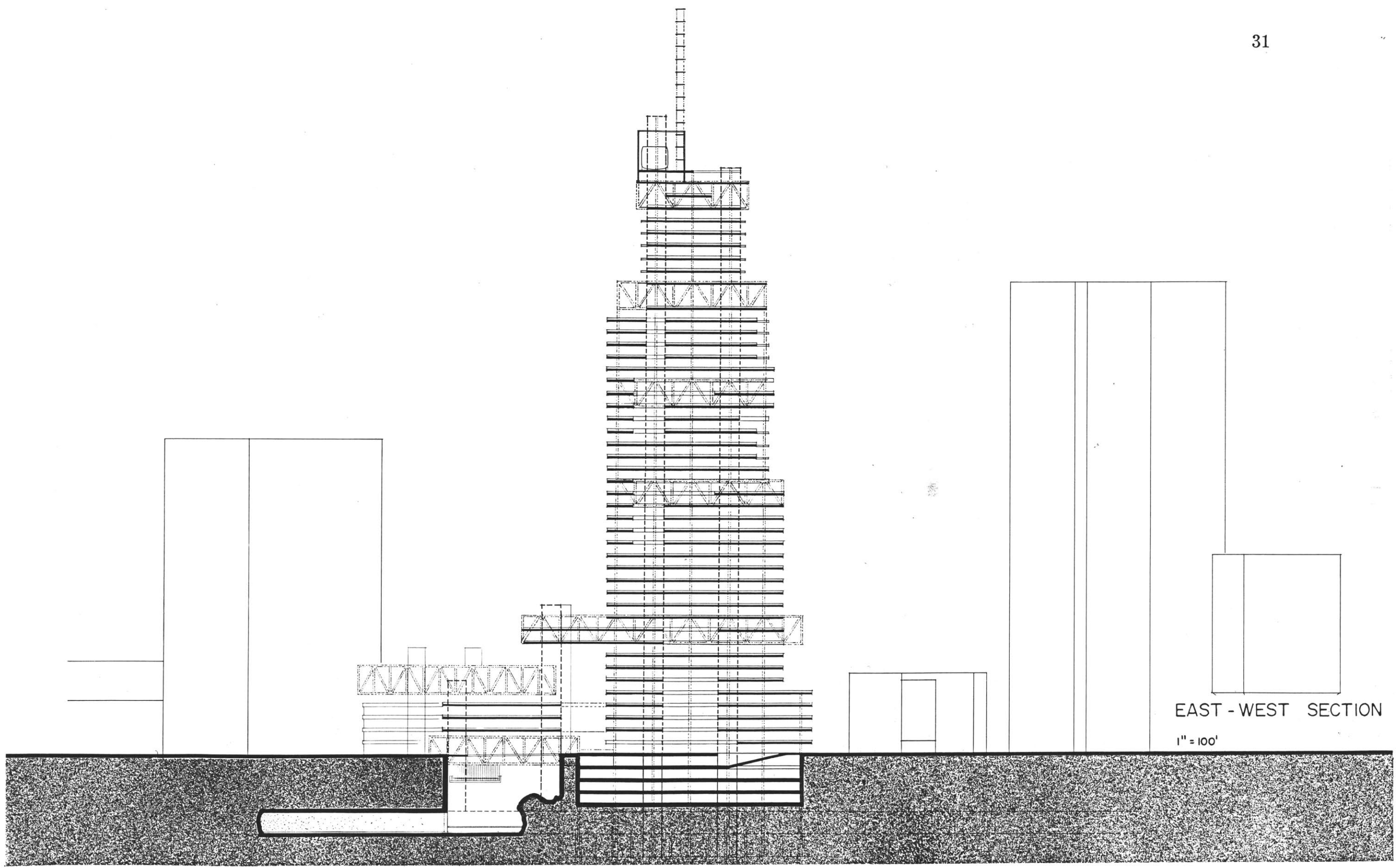




Working sections through atrium and "T" station.

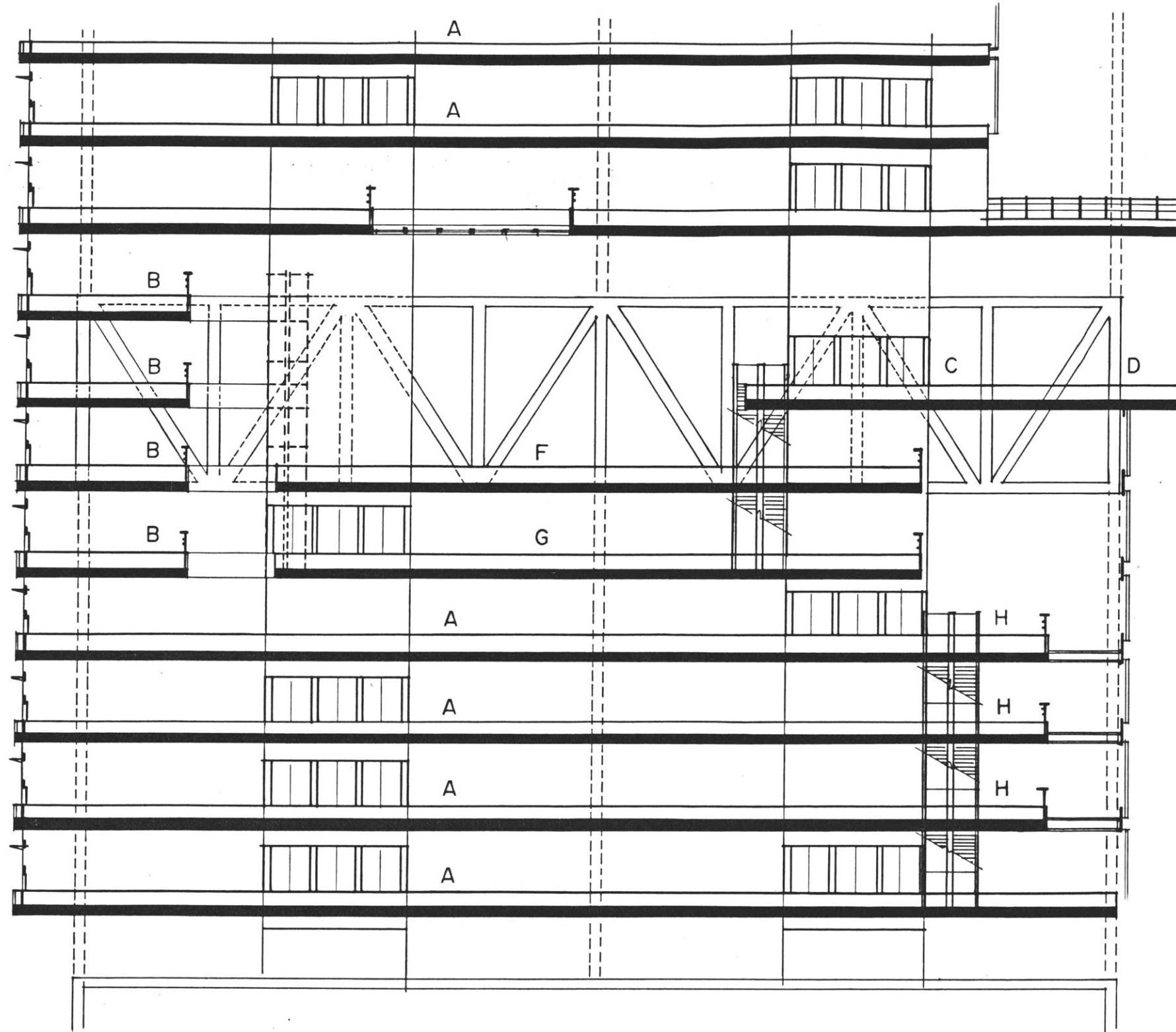


Working Sections of Typical Office.



EAST - WEST SECTION

1" = 100'



- A Typical Office Floor
- B Conference & Exec. Office
- C Exec. Lobby
- D Exec. Office
- E Special Functions Floor
- F Library & Resource Center
- G Conference & Office
- H Special Functions Area

TYPICAL OFFICE SECTION

1" = 20'



### TYPICAL OFFICE FLOORS

The office section of the building is organized in vertical zones. Each vertical territory is defined by a double or triple height space which corresponds to the structural frame and is apparent in the facade.

Smaller offices would be encouraged to lease the compact but additive floors located around the central atrium, floors one through eleven. Larger companies could rent one of the two eight story territories, an eleven story territory or a combination of these zones.

The double or triple height structural spaces give each piece of the building an opportunity to be identified individually. They are also more open in allowing light and air to pass through to the more standard floors below.

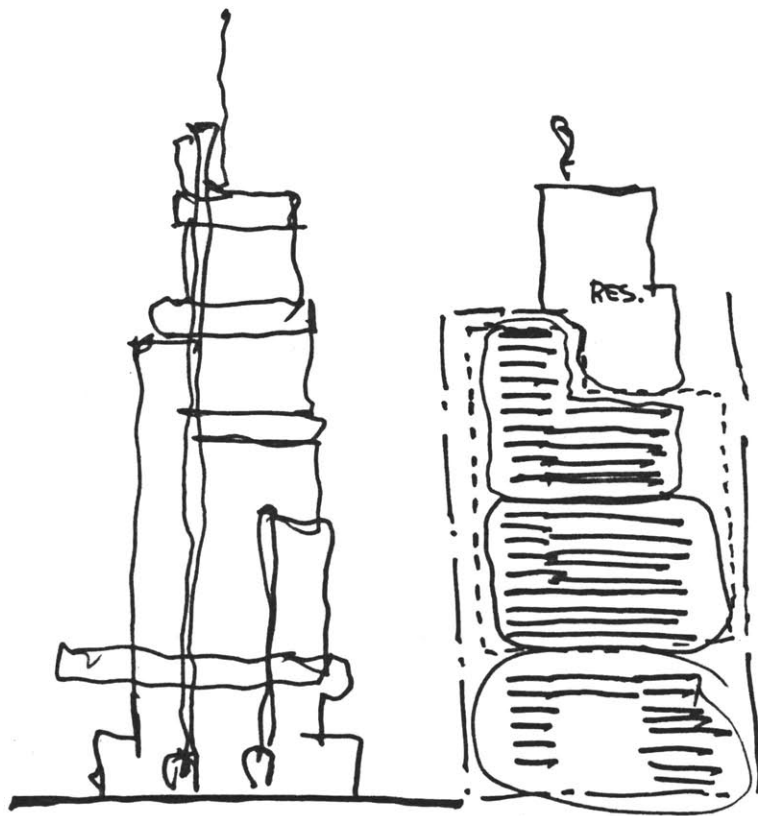
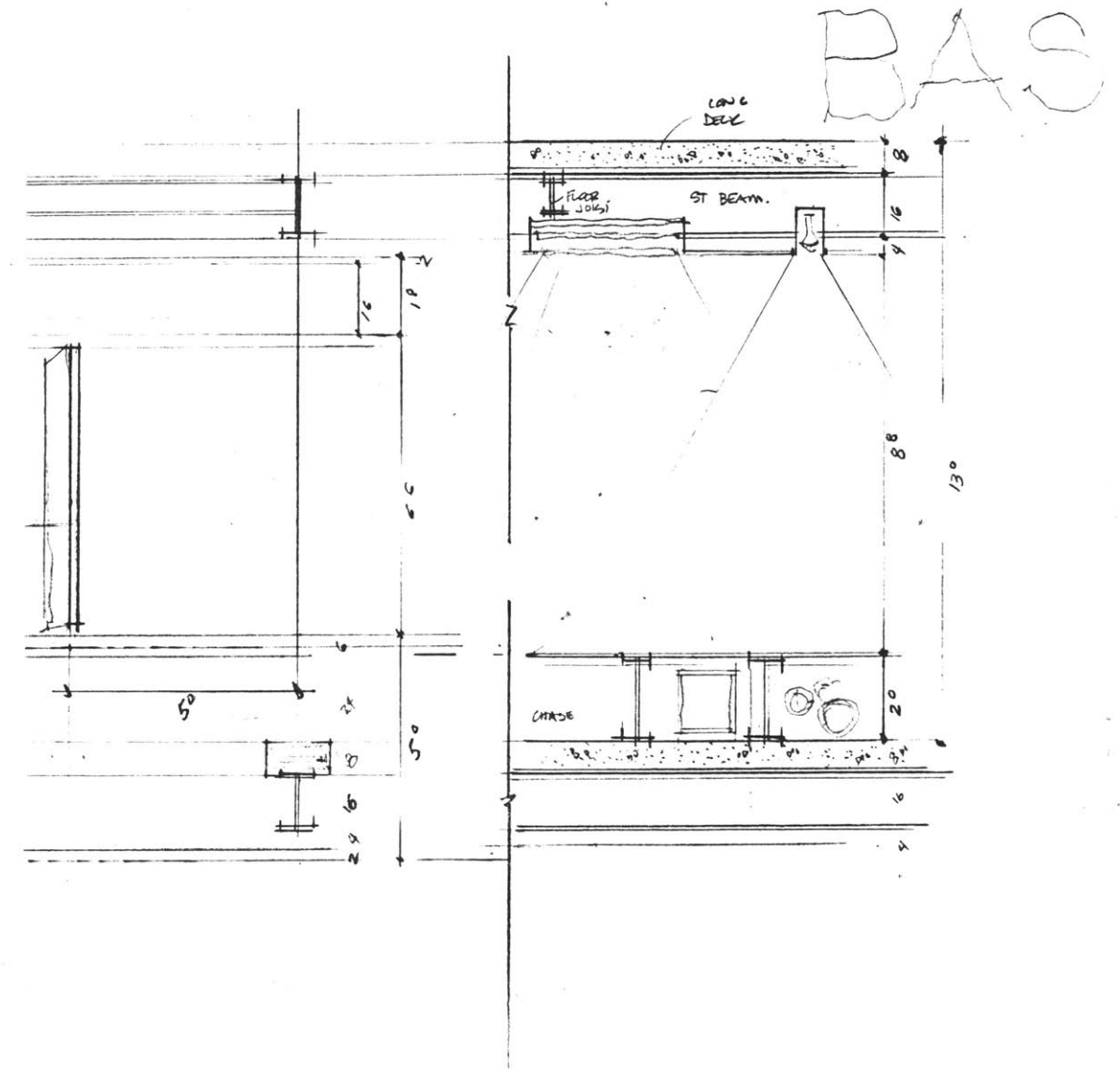
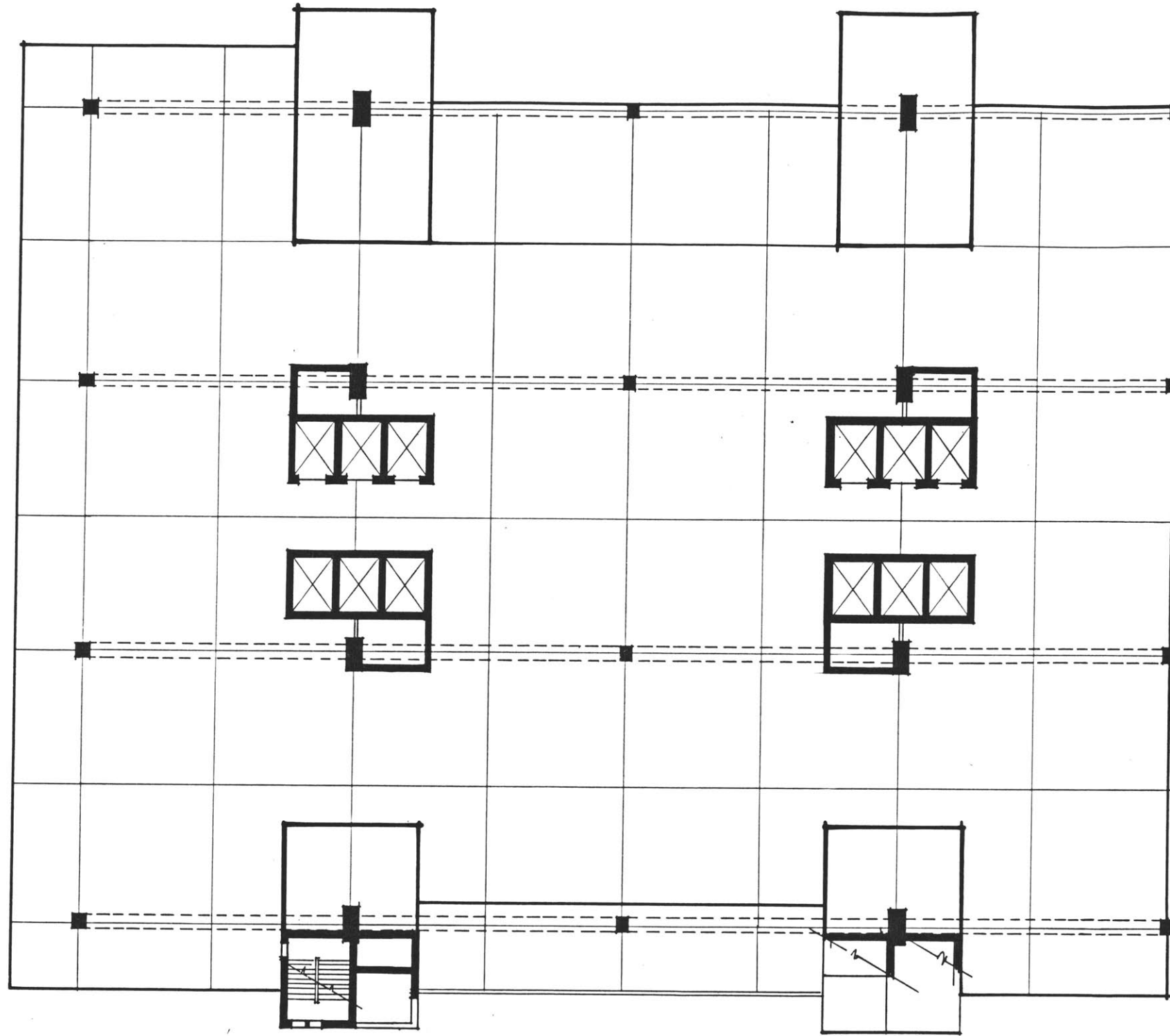


Diagram showing potential leasing arrangement.

### BASIC DIMENSIONS



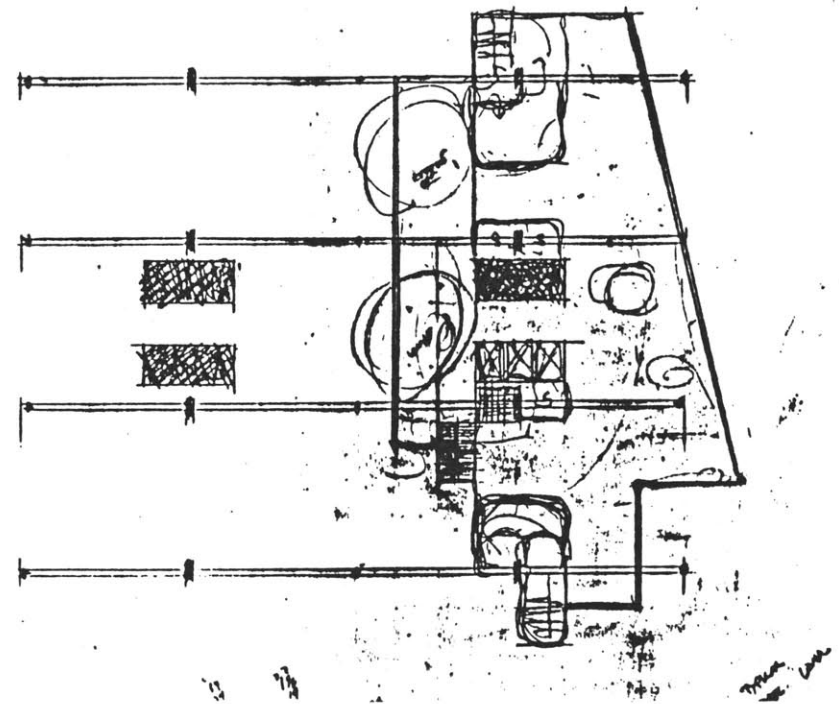
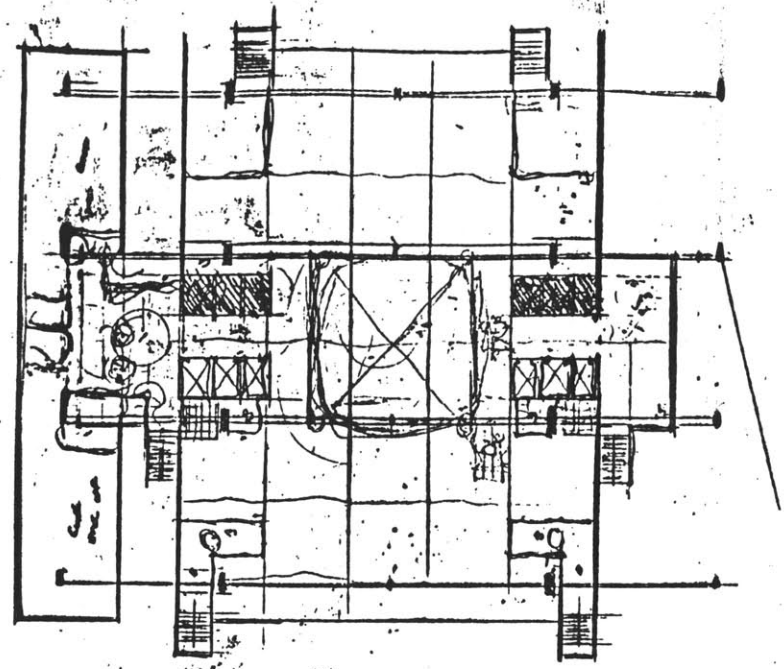
Sketch of basic floor to floor dimensions within the typical office.



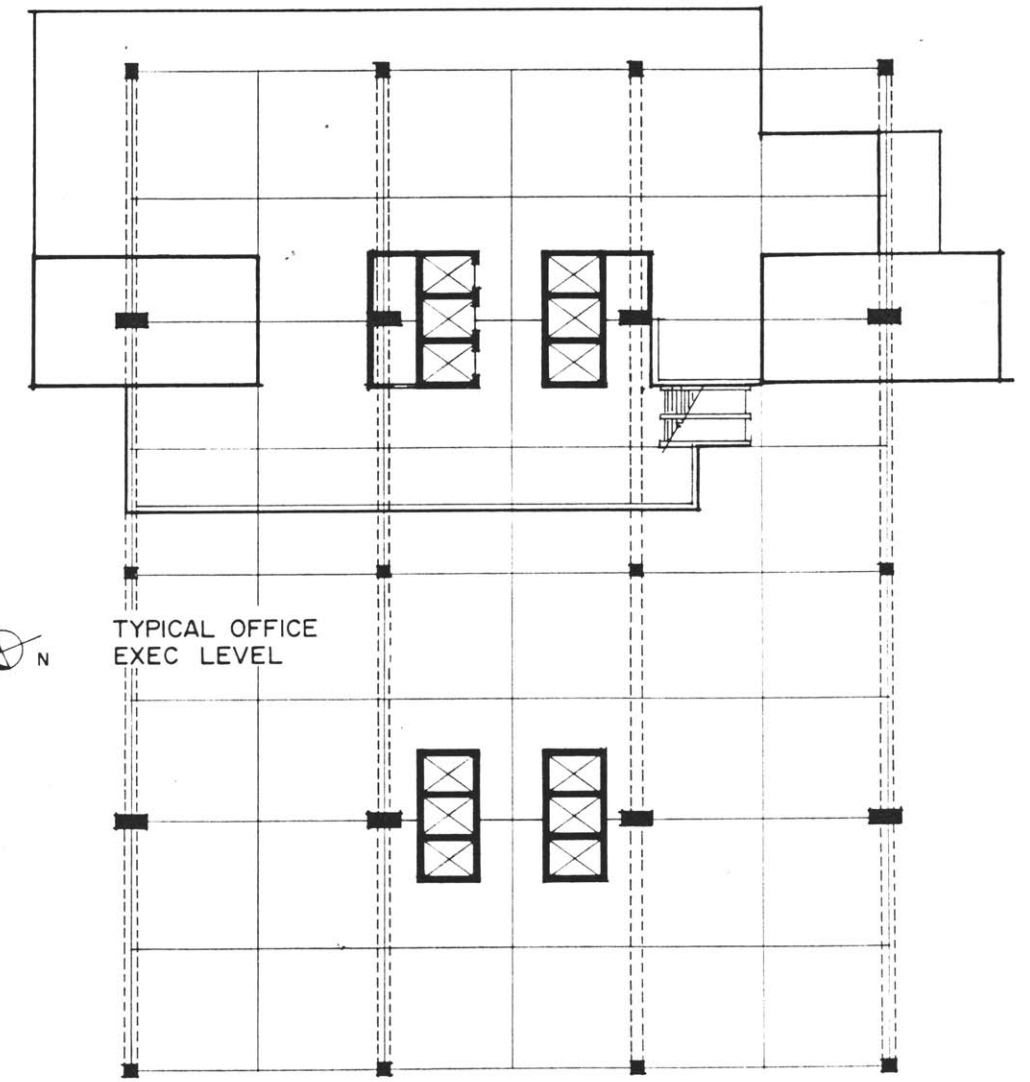
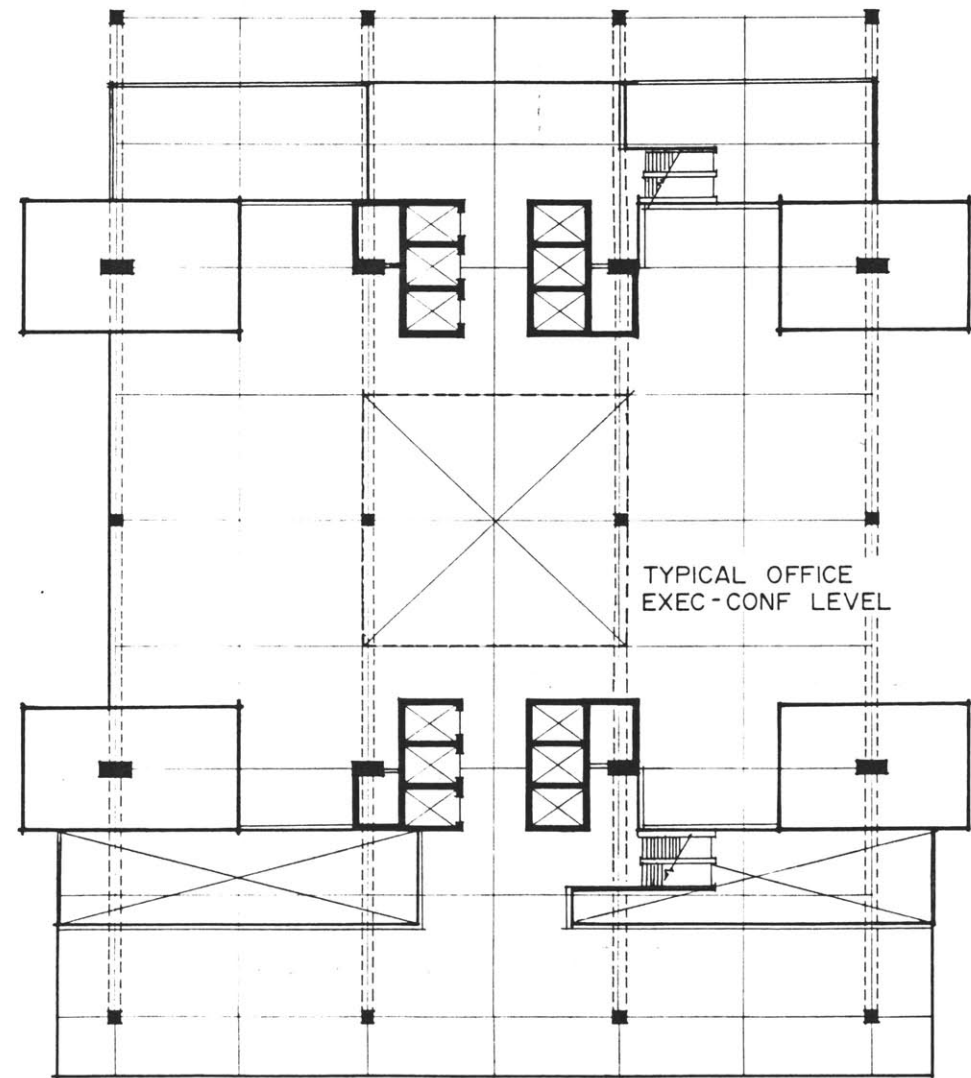
TYPICAL OFFICE FLOOR  
1" = 20'

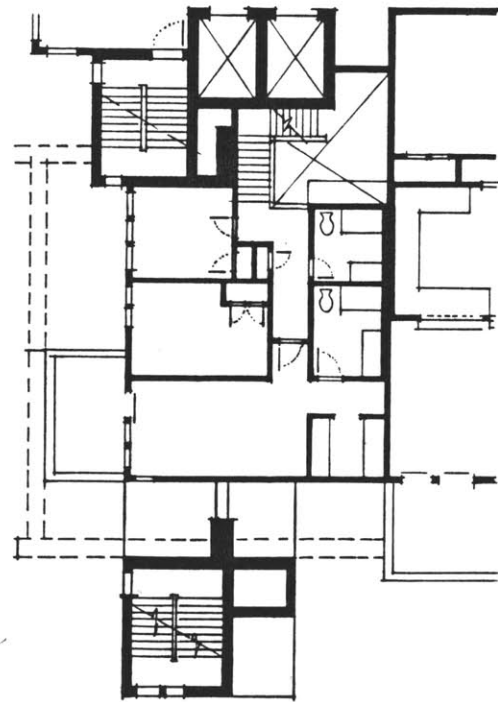




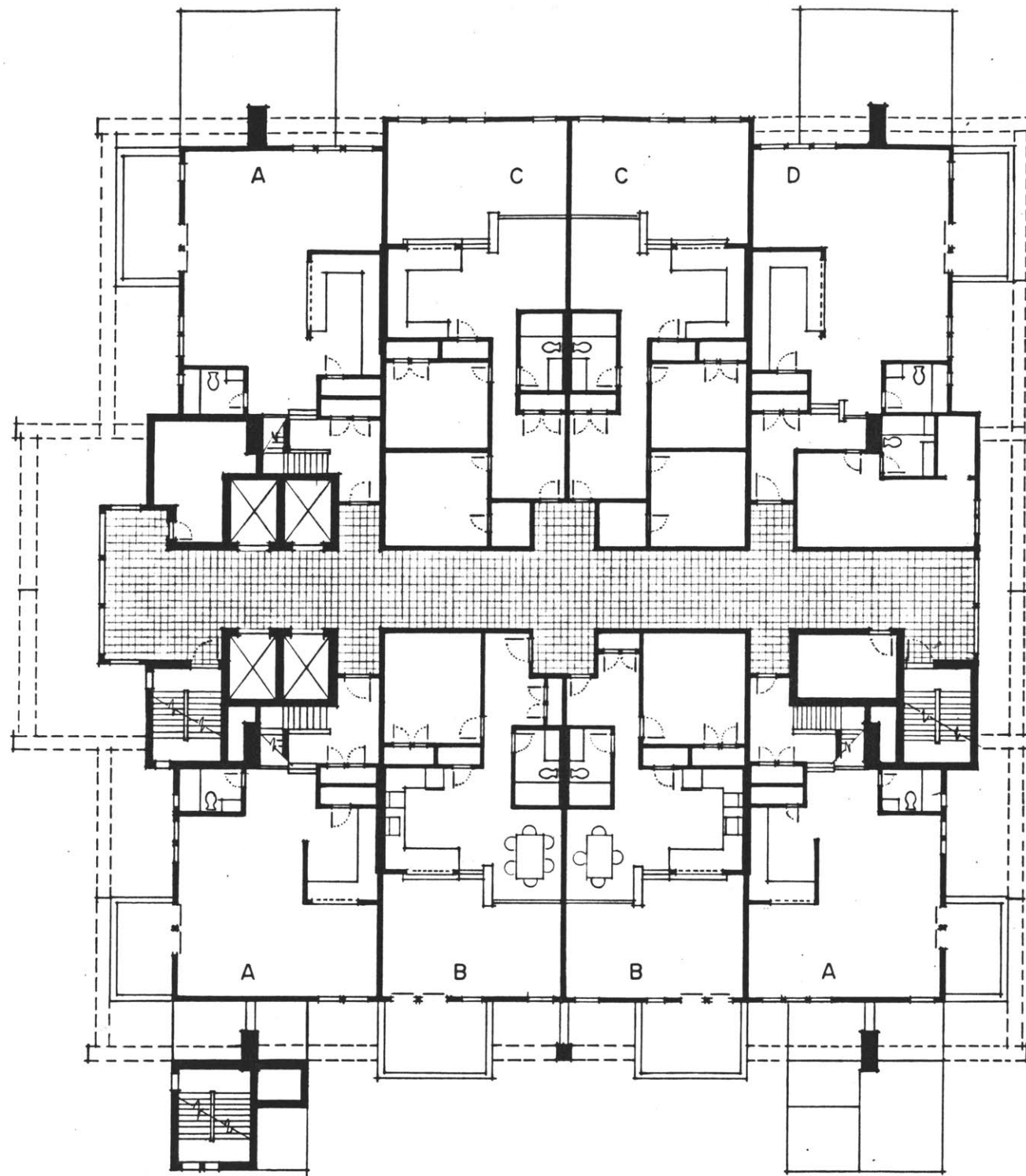


Working sketches of typical office floor plans.





SECOND FLOOR "A" UNIT  
1" = 20'



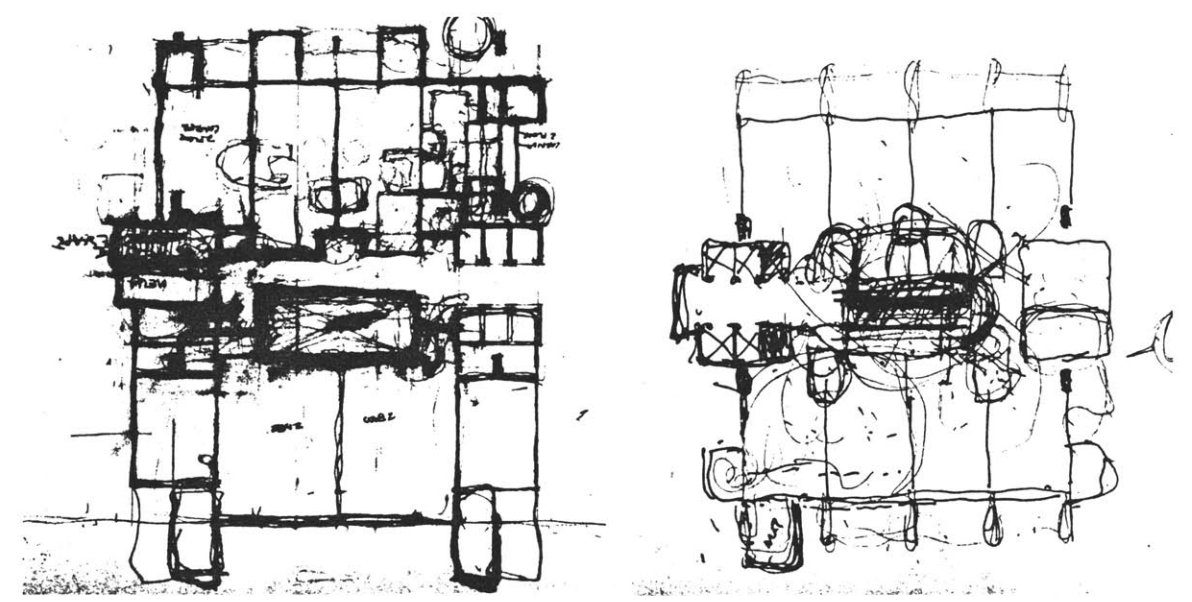
- A 3 Bedroom, 2 Floor
- B 1 Bedroom, 1 Floor
- C 2 Bedroom, 1 Floor
- D 1 Bedroom, Suite

TYPICAL RESIDENTIAL FLOOR  
1" = 20'

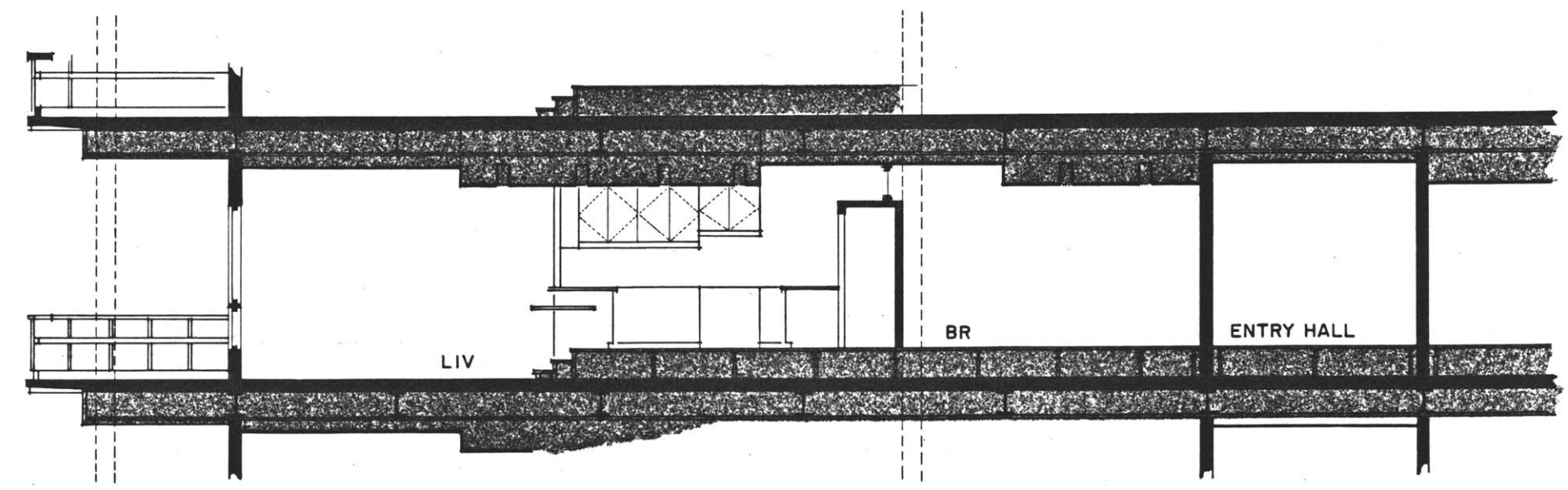
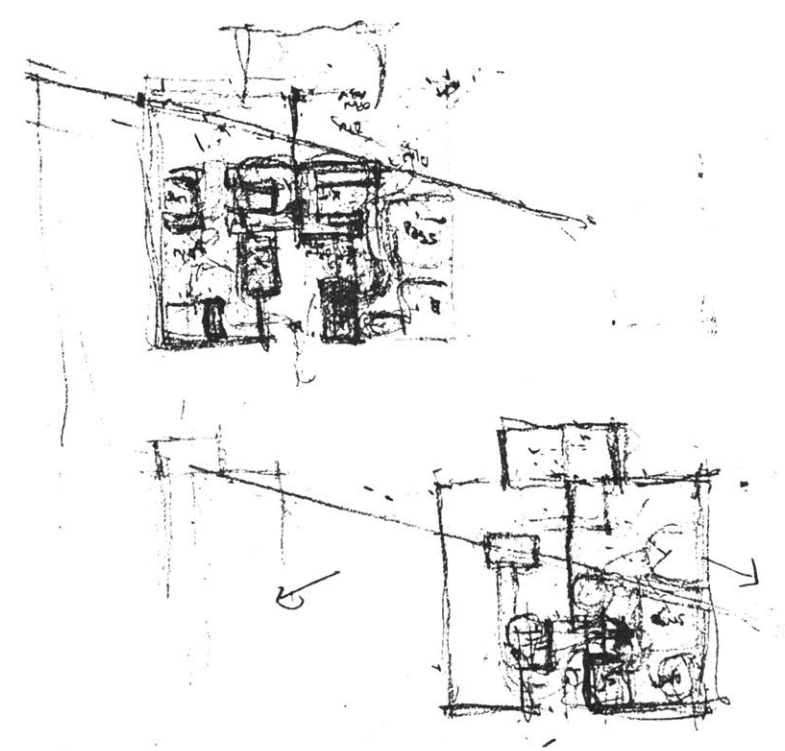
### TYPICAL RESIDENTIAL FLOOR

These drawings show how a typical residential floor of the tower could be designed. There are eight units shown on this floor. Two are different types of one bedroom apartments and there is one two bedroom apartment as well as a two floor, three bedroom unit.

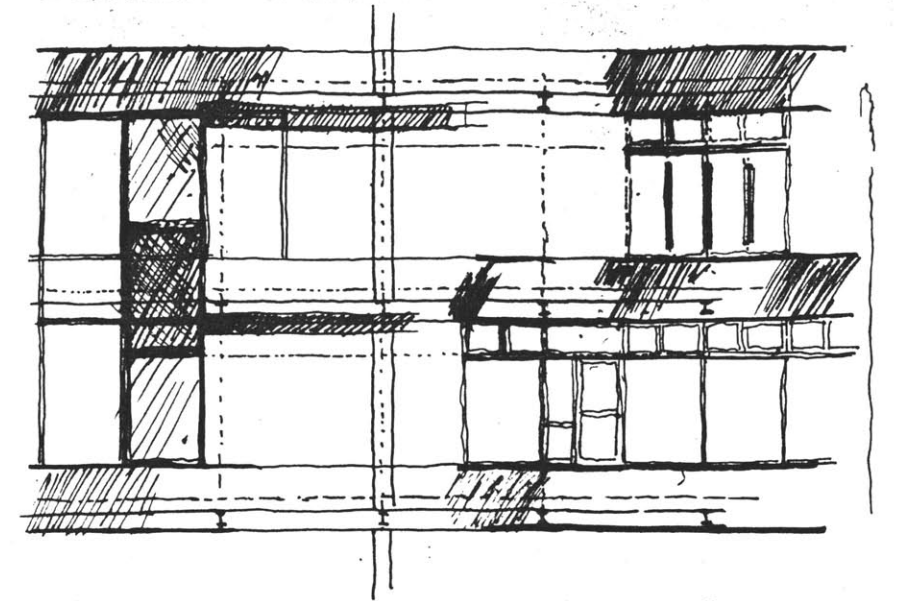
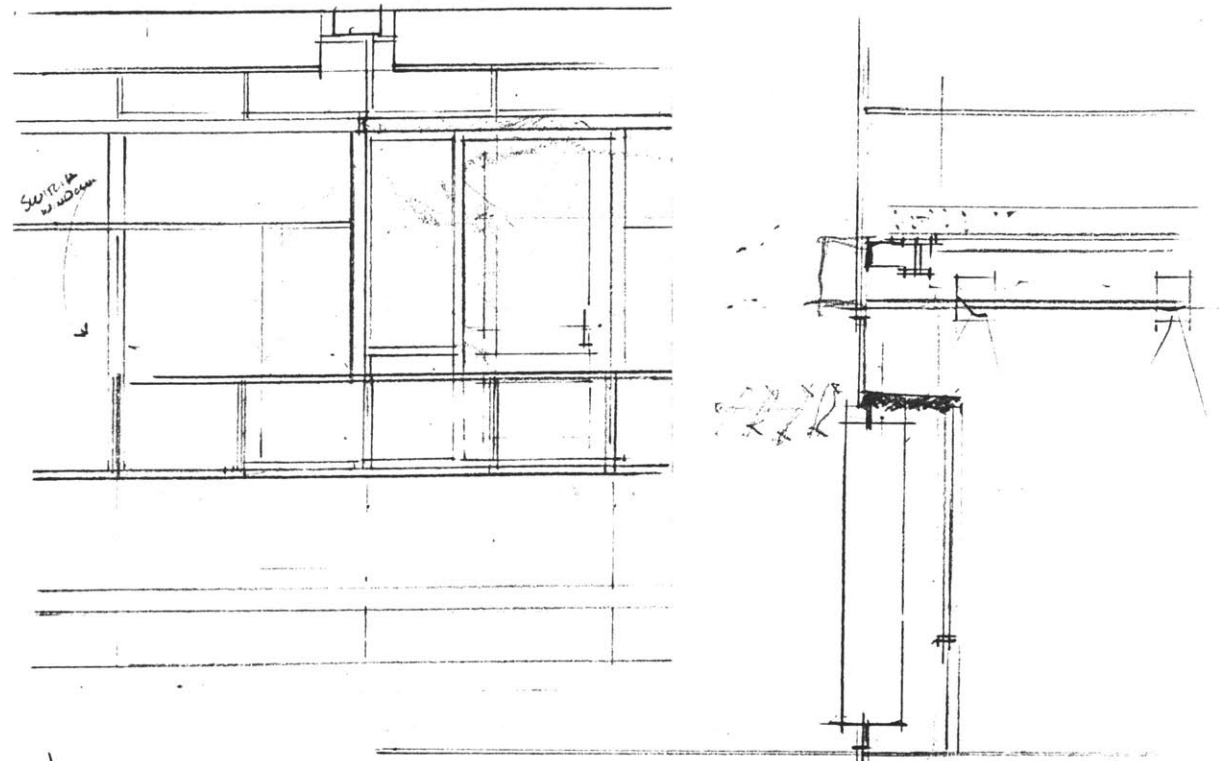
An interesting aspect of the design concerns the level change within the individual units. If the 13' floor to floor height required by the offices on the floors below is maintained, the residential units can easily accommodate a change in level. The residential floor requires much less mechanical space and a lower floor to ceiling height than do the office floors. The problem with the level change and the resulting increase in spacial quality within the residences would no doubt be the added cost. The additional cost of the extra materials for many floors could be quite substantial. Economically it is preferred to minimize the floor to floor height in the residential tower.



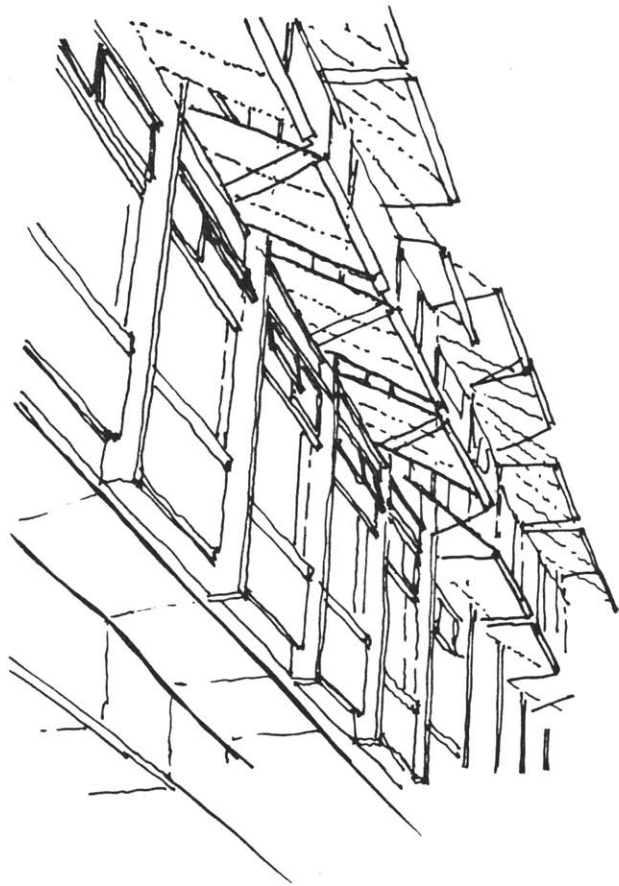
*Working Sketches of Residential Units.*



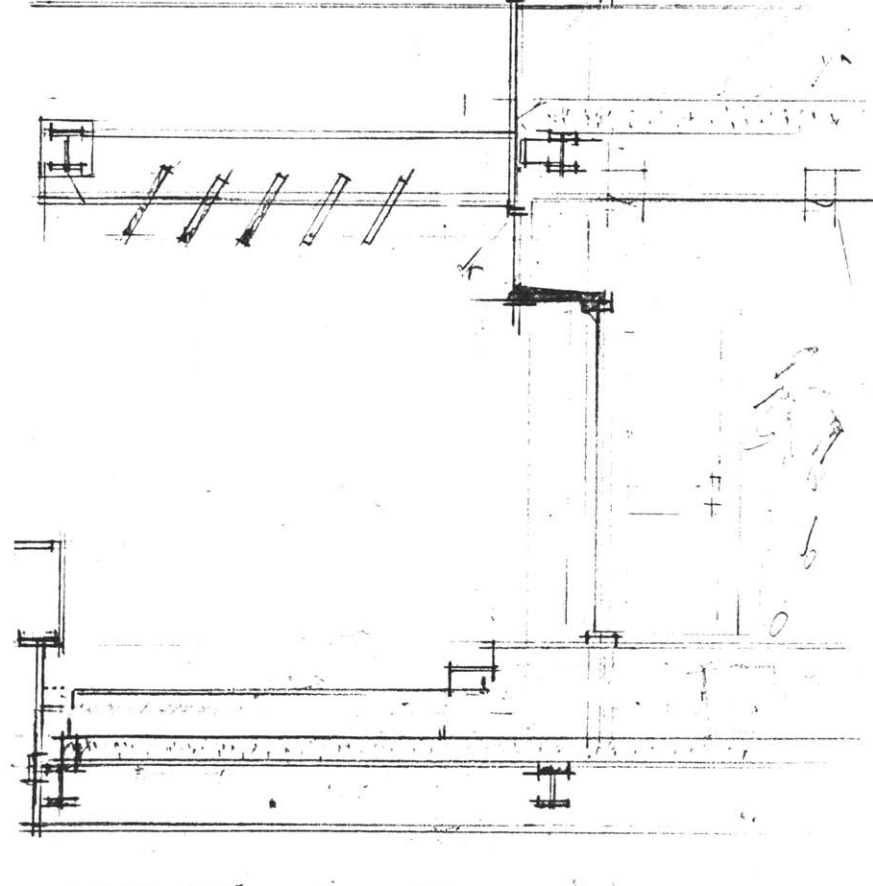
TYPICAL SECTION "B" UNIT  
1/8" = 1'-0"



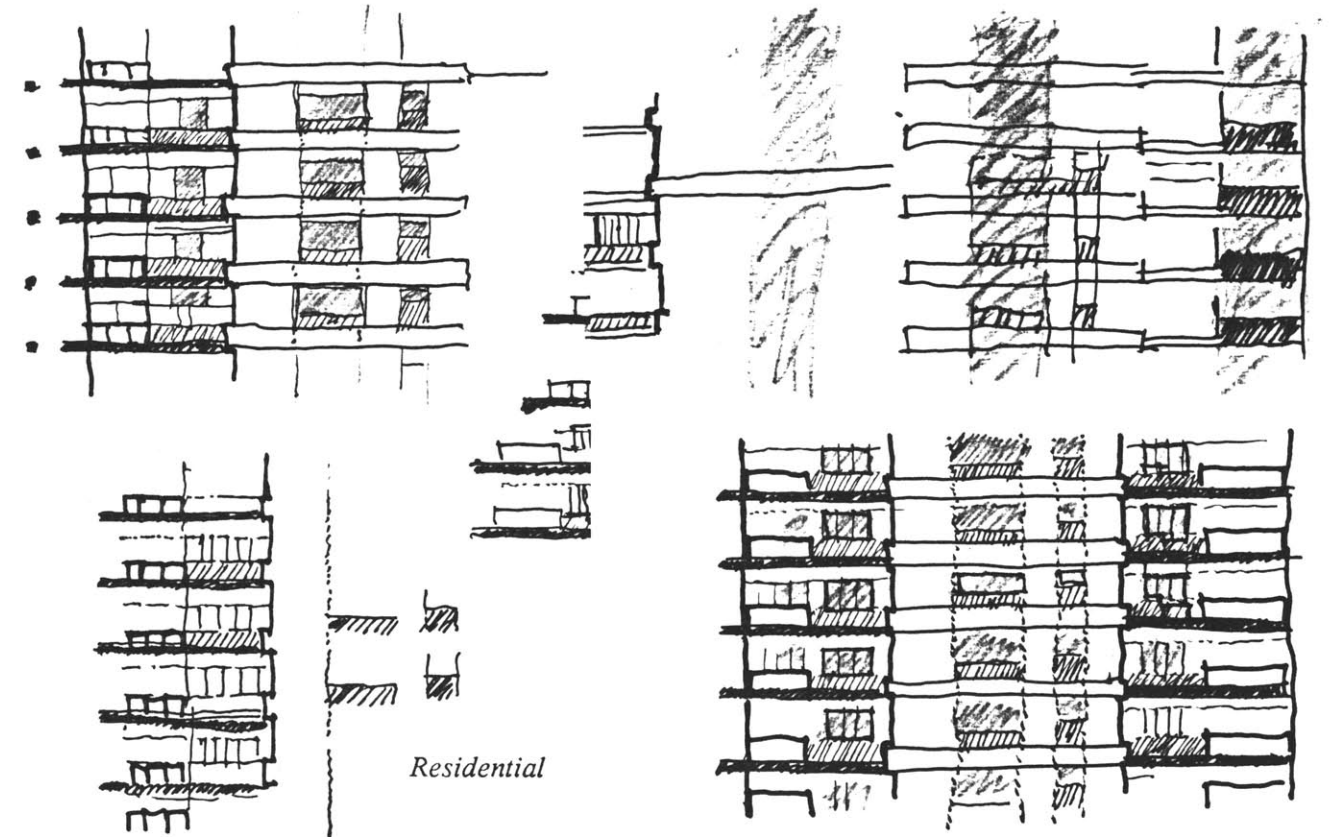
Early facade and closure study.



Transformed screen: Awning closure detail from Gatwick Airport, London. Architects: Yorke, Rosenberg and Mardel.

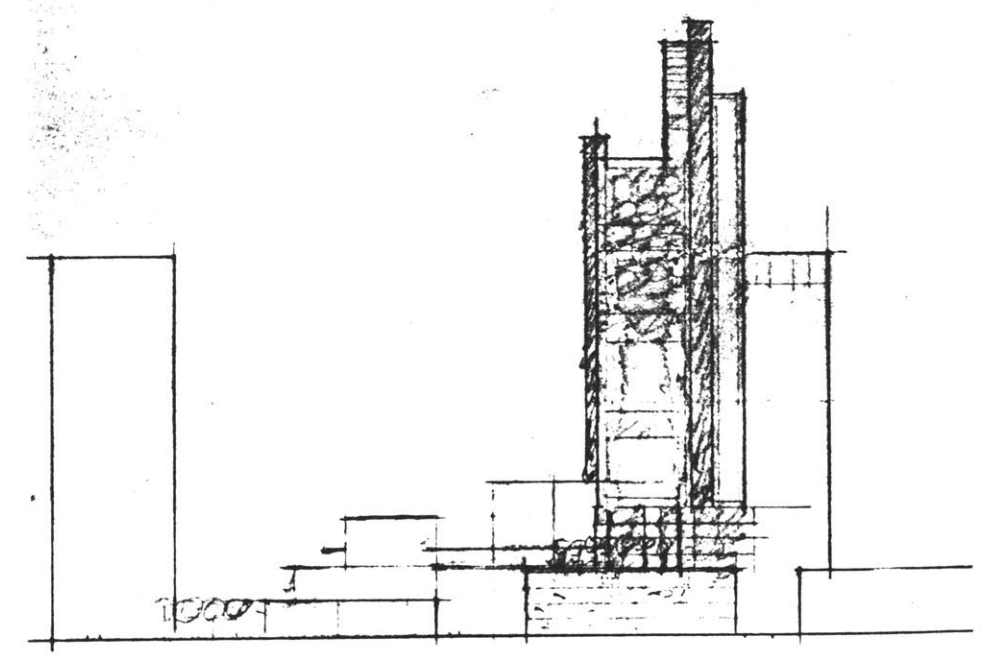
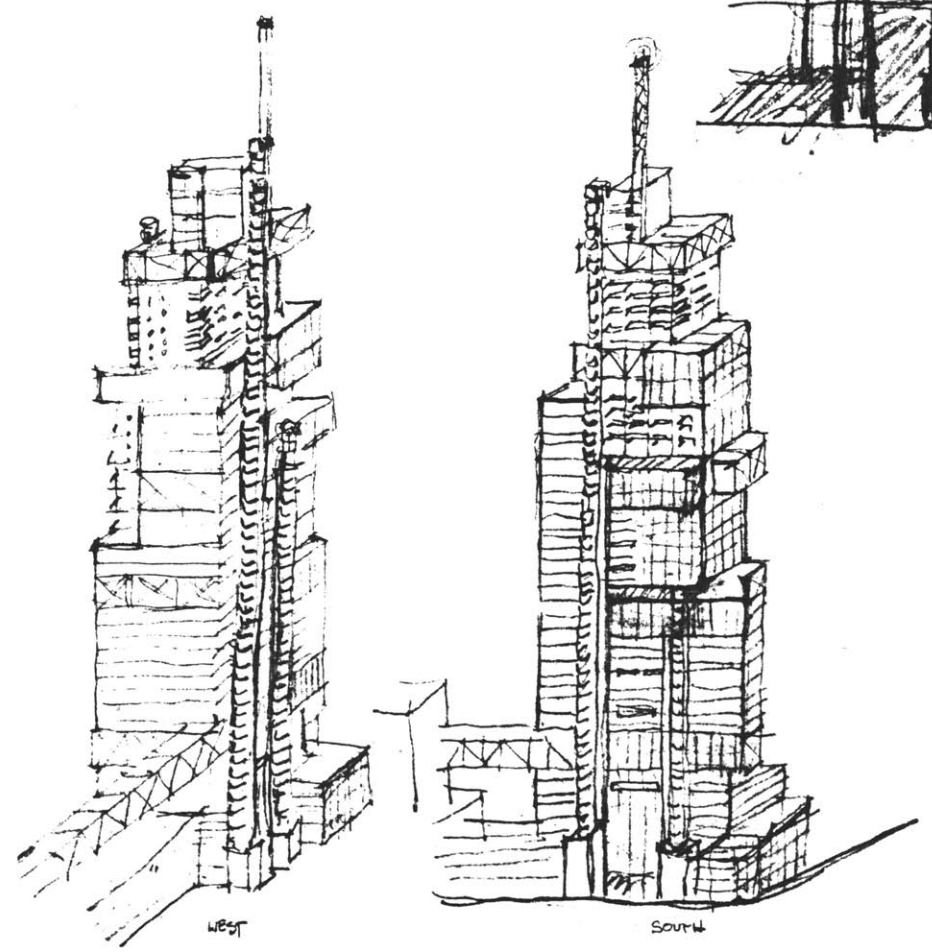
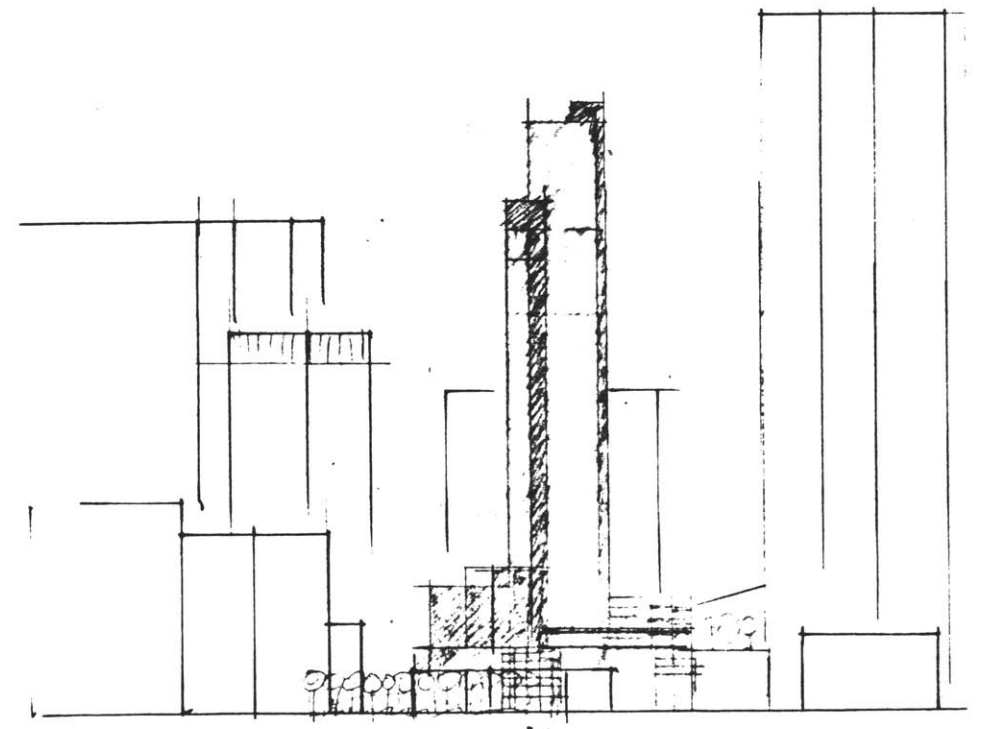
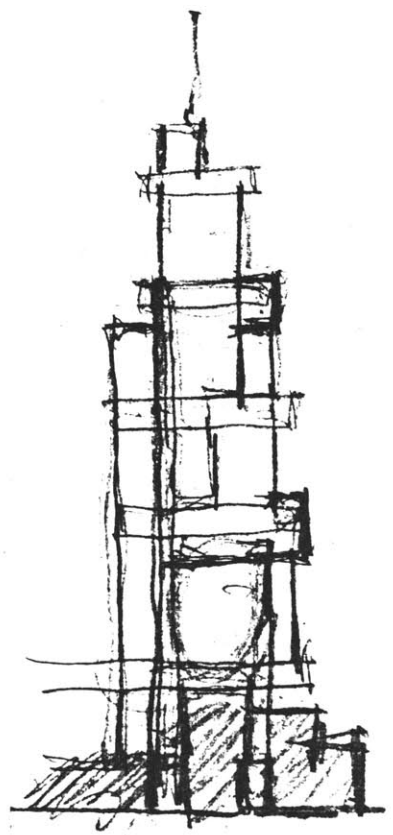
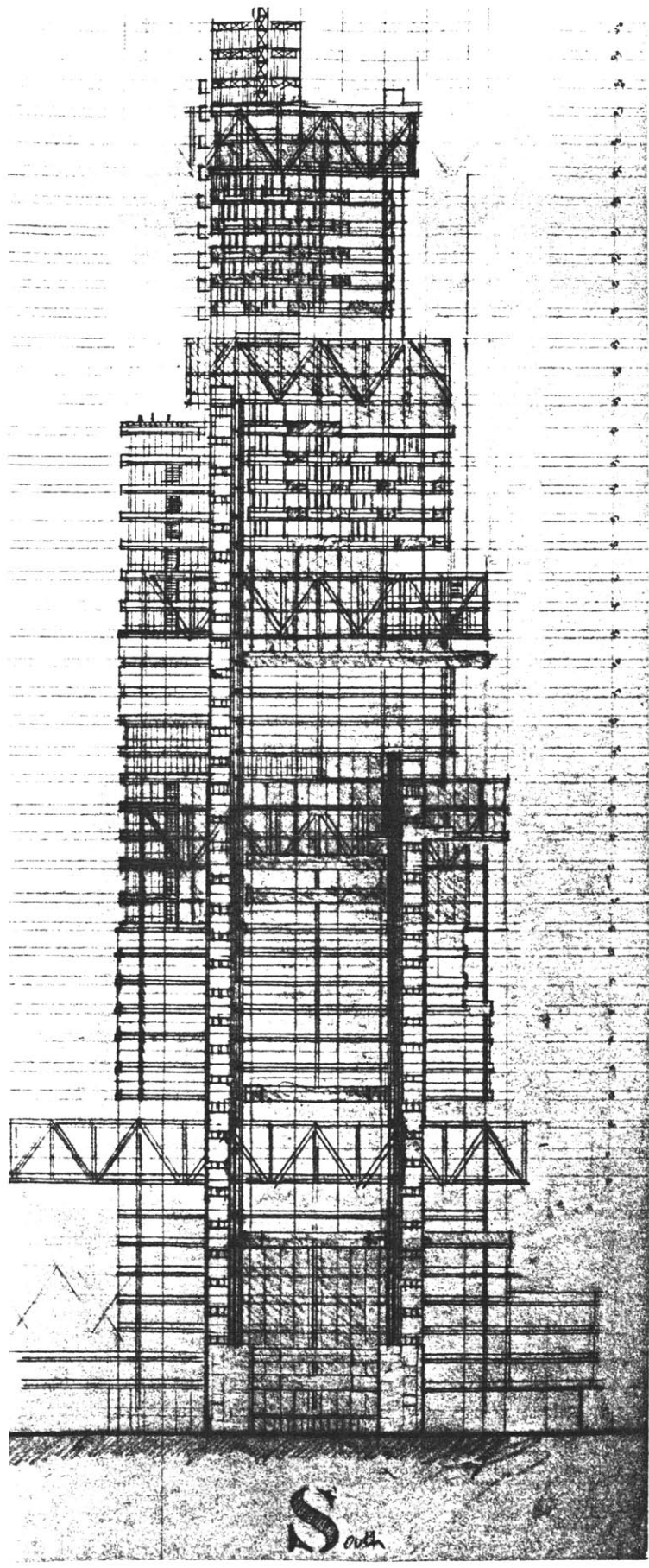


Closure and detail study at office balcony.

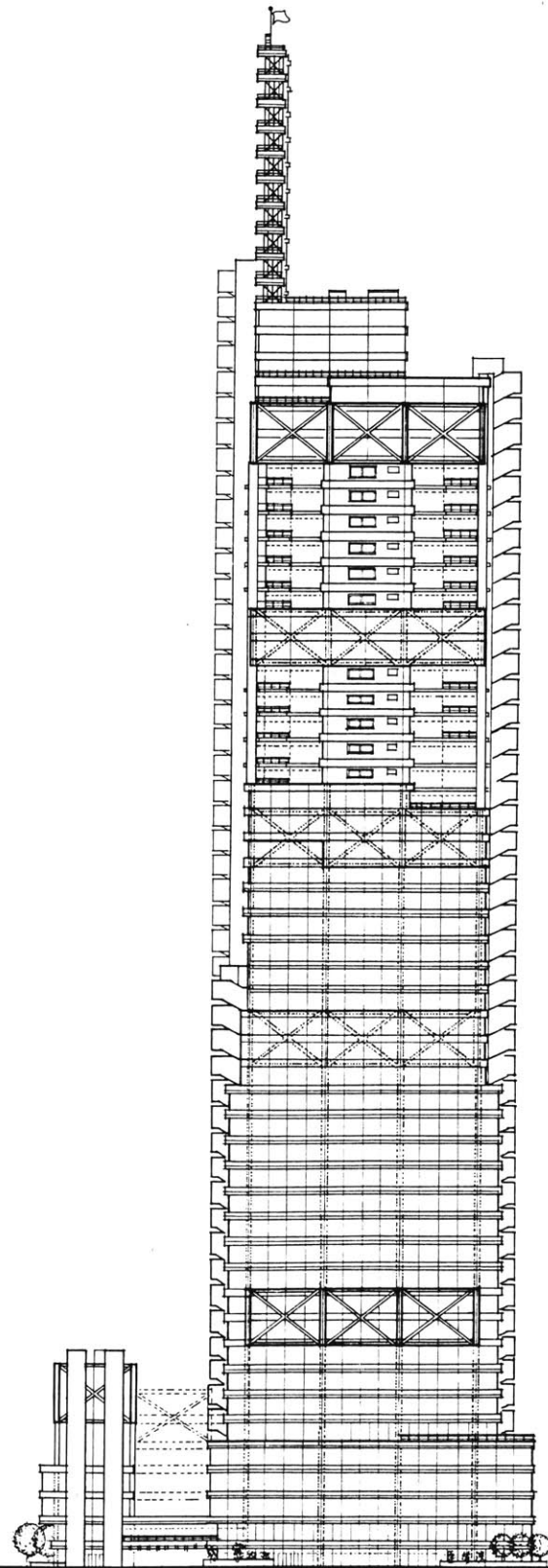


Elevation and closure details.





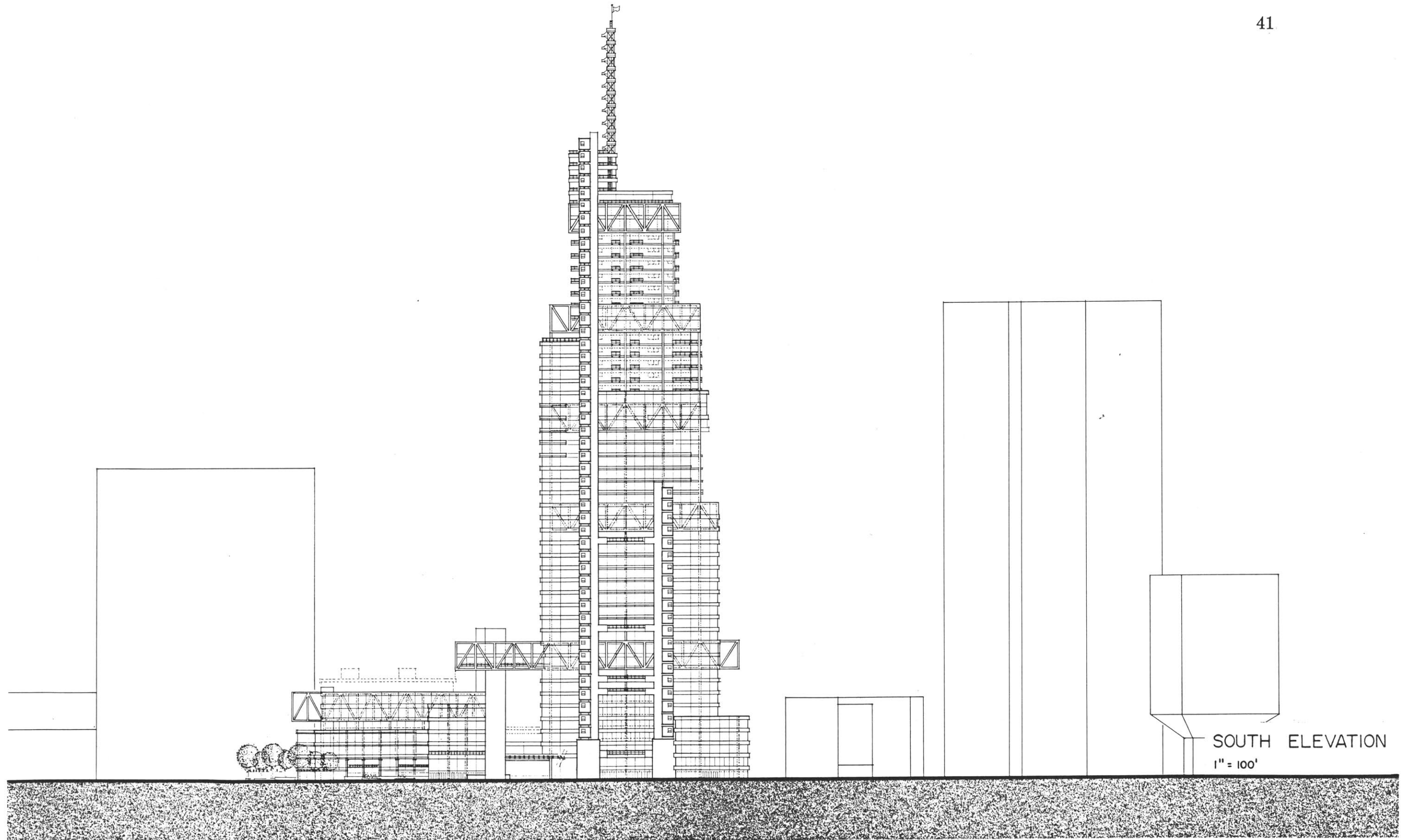
Early Elevation Studies.



EAST ELEVATION

1" = 100'





SOUTH ELEVATION  
1" = 100'

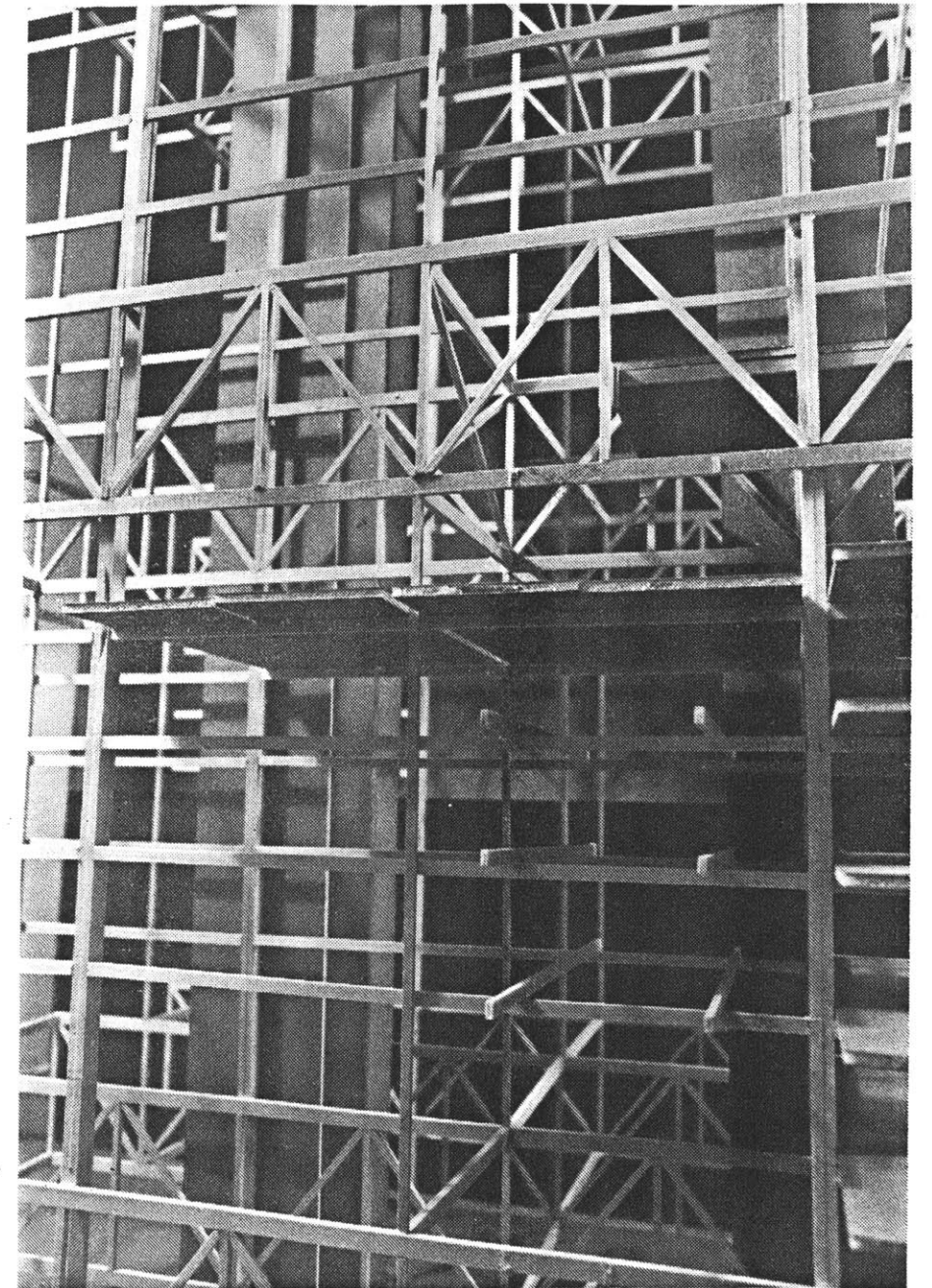
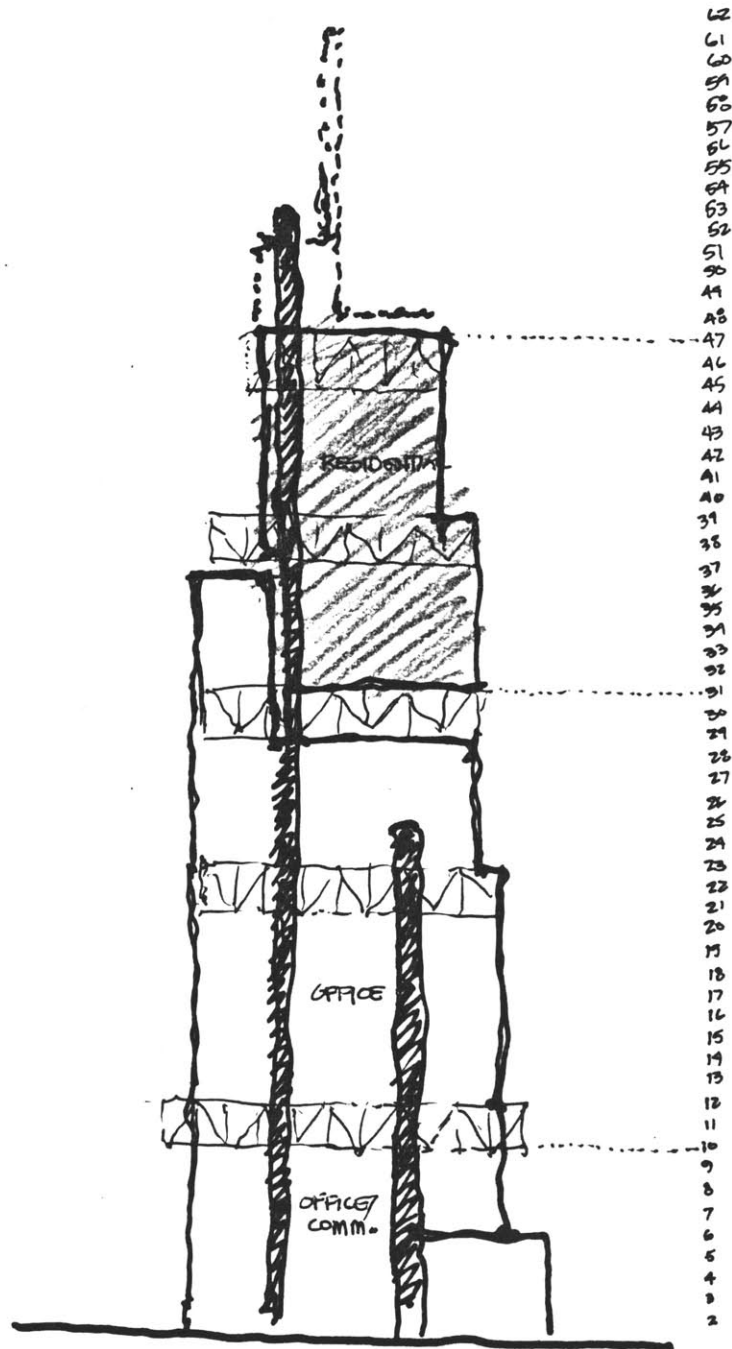


**BUILDING SPECS**

- 47 Floors Total
- 32 Floors Office
- 5 Floors Office & Residential
- 10 Floors Residential

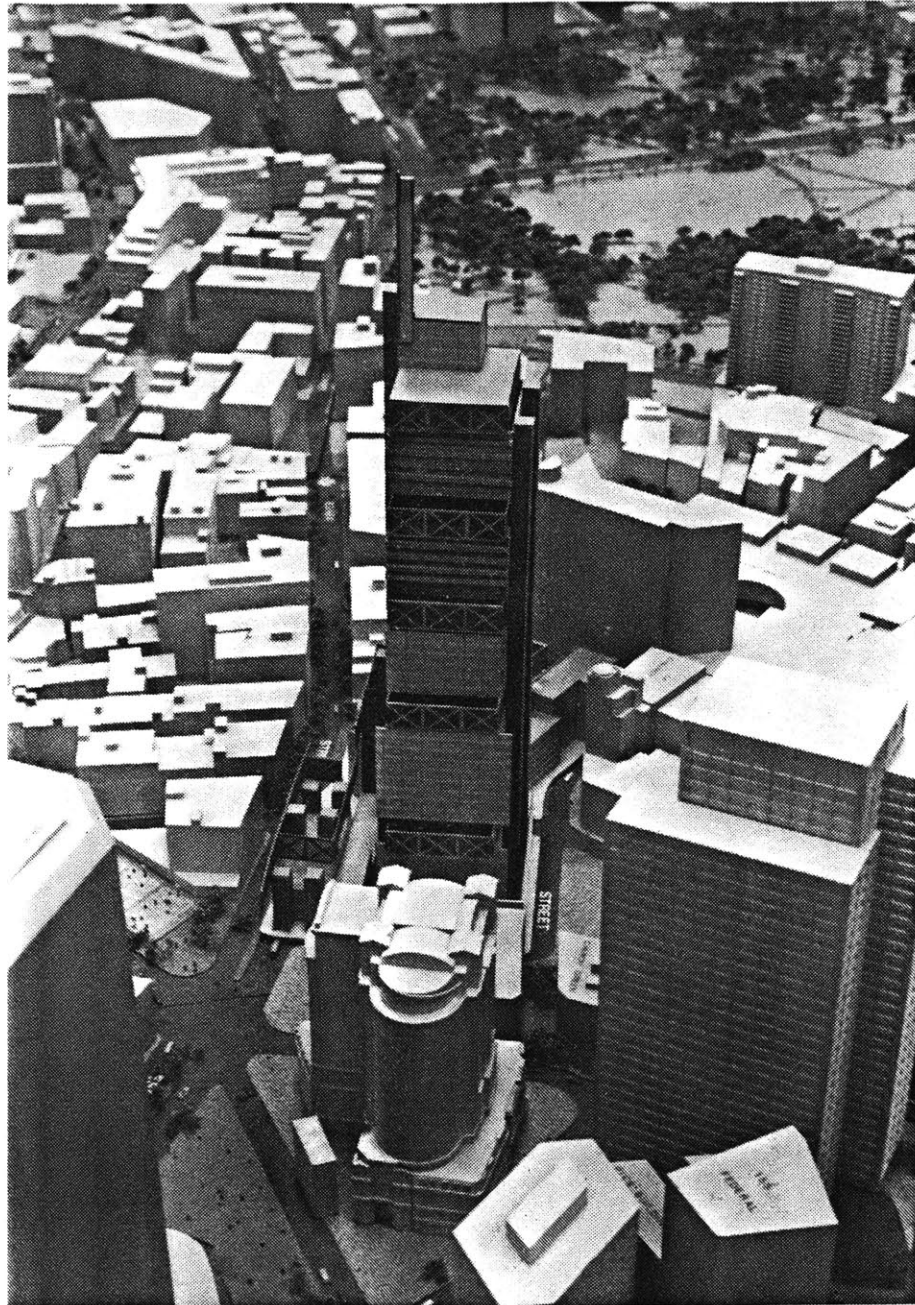
Height To The Top Of Residential Floors 611 ft.  
 Height To The Top Of Communications Tower 806 ft.

Building Total 700,000 sq. ft.  
 Typical Residential Floor Plate 11,000 sq. ft. 8 Units per Floor  
 Typical Off Floor Plate 20,000 sq. ft.  
 Total Residential Floor Area 120,000 sq. ft.  
 Total Office Floor Area 580,000 sq. ft.

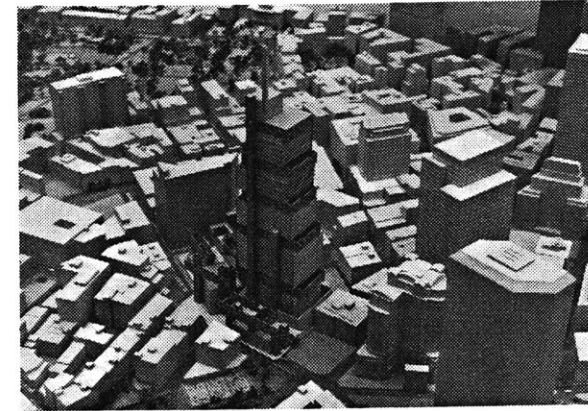


*Photo of structural study model for the tower.*





*View of the Bedford Crescent Project from the East.*



*View of the Bedford Crescent Project from the South.*



## SECTION II : ARCHITECTURAL COMPARABLES

### INTRODUCTION

ISSUES AND QUESTIONS

MULTIDIMENSIONAL FRAMEWORKS

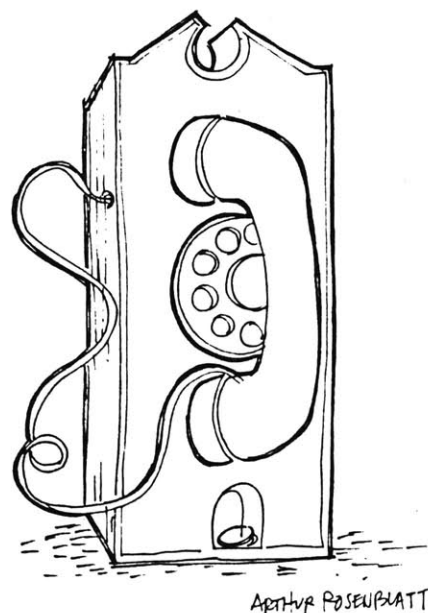
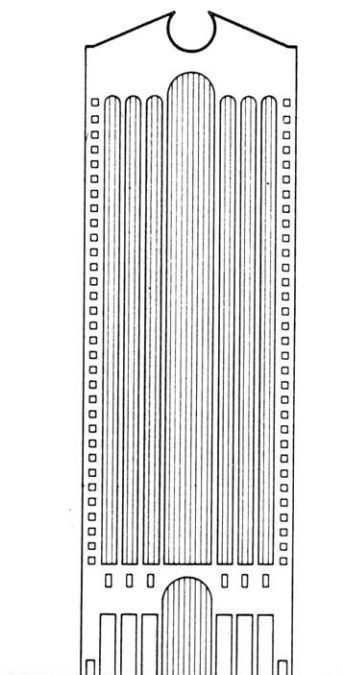
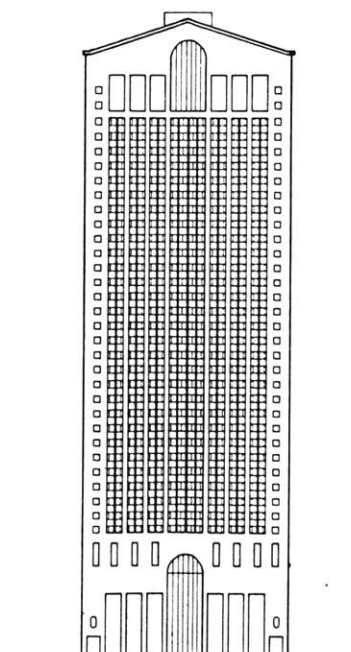
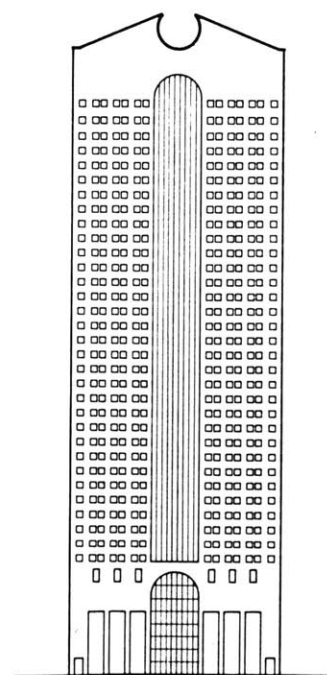
STRUCTURE

CASE STUDIES

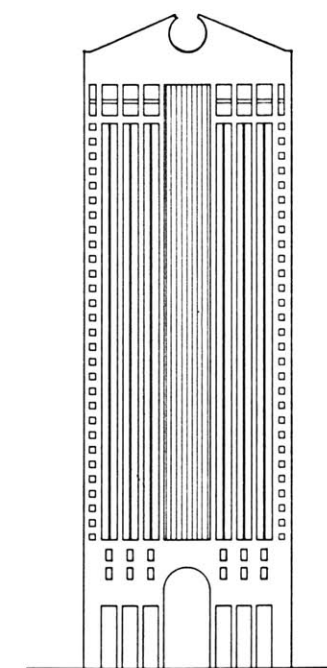
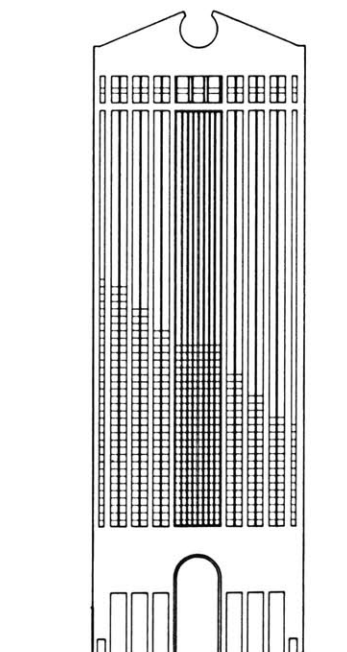
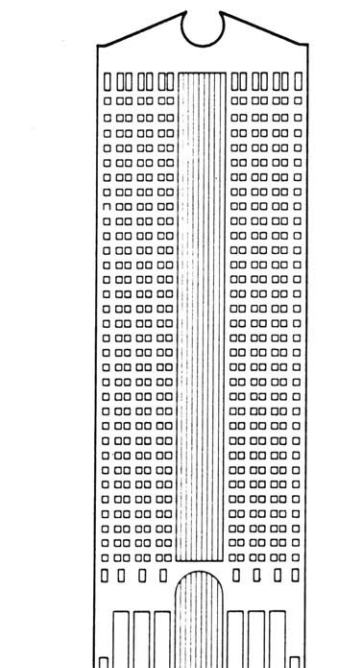
*... about skyscrapers ... we are forced to come up with something new, something marketable, and something different from other buildings.*

*Helmut Jahn*

*Elevation studies for Phillip Johnson's AT&T design. Something new, something marketable, and something different ... ?*



*A cartoon of proposed AT&T design by Arthur Rosenblatt.*







## ISSUES AND QUESTIONS

This is a time of passionate interest in skyscrapers, but there is some confusion about what role the tall building should play in the future of urbanism. The confusion is clearly illustrated by the current lack of direction in the architecture of building type and the surrounding urban design issues. There is a preoccupation with the arbitrary, purely visual aspects of tall buildings as the main generative consideration in their formation. In general, there are no clear rules in these formalistic and visual games. The design motivation often comes from the desire to shock or from whim, humor or boredom. The formal basis for this architecture does not appear to be connected to any consideration of use or lifestyle, let alone to the processes, materials and physical form on which construction is based.

Although the tall building was a salient component of the urban landscape before 1930, most of our recent architectural prototypes were developed in a remarkably short time after World War Two. Service industries went through a period of rapid growth and expansion. Urban environments developed an urgent need for housing and office space.

During these past forty years cities have experienced unprecedented growth and the associated problems of overloaded infrastructures, social troubles and political conflicts. Unfortunately, neither the architectural profession nor the opportunistic developers show much interest in examining or exploring any alternatives. Indeed, present day development policies pay handsome dividends.

Why was the skyscraper developed? The most widely recognized reason is that it satisfied the needs of big business. Its development coincided with and acted as a catalyst for corporate expansion. The tall building has become both a symbol of corporate power and a symbol of urban troubles.

The tall building is blamed for a number of urban problems. Skyscrapers clustered together drastically affect the amount of light and air which reaches the street. Large "Super-Blocks" can destroy the delicate fabric and range of human scale in a neighborhood. We are often able to make acceptable buildings today, but seldom good public realms. Robert Campbell ...

*... When we think of great cities we think first of their great public streets, of the Ramblas of Barcelona, the Via del Corso in Rome, Commonwealth Avenue in Boston. But where in our own time have we created a single great street? To make good streets, buildings have to be more than good in themselves, they have to work cooperatively and harmoniously together to shape good outdoor space.*

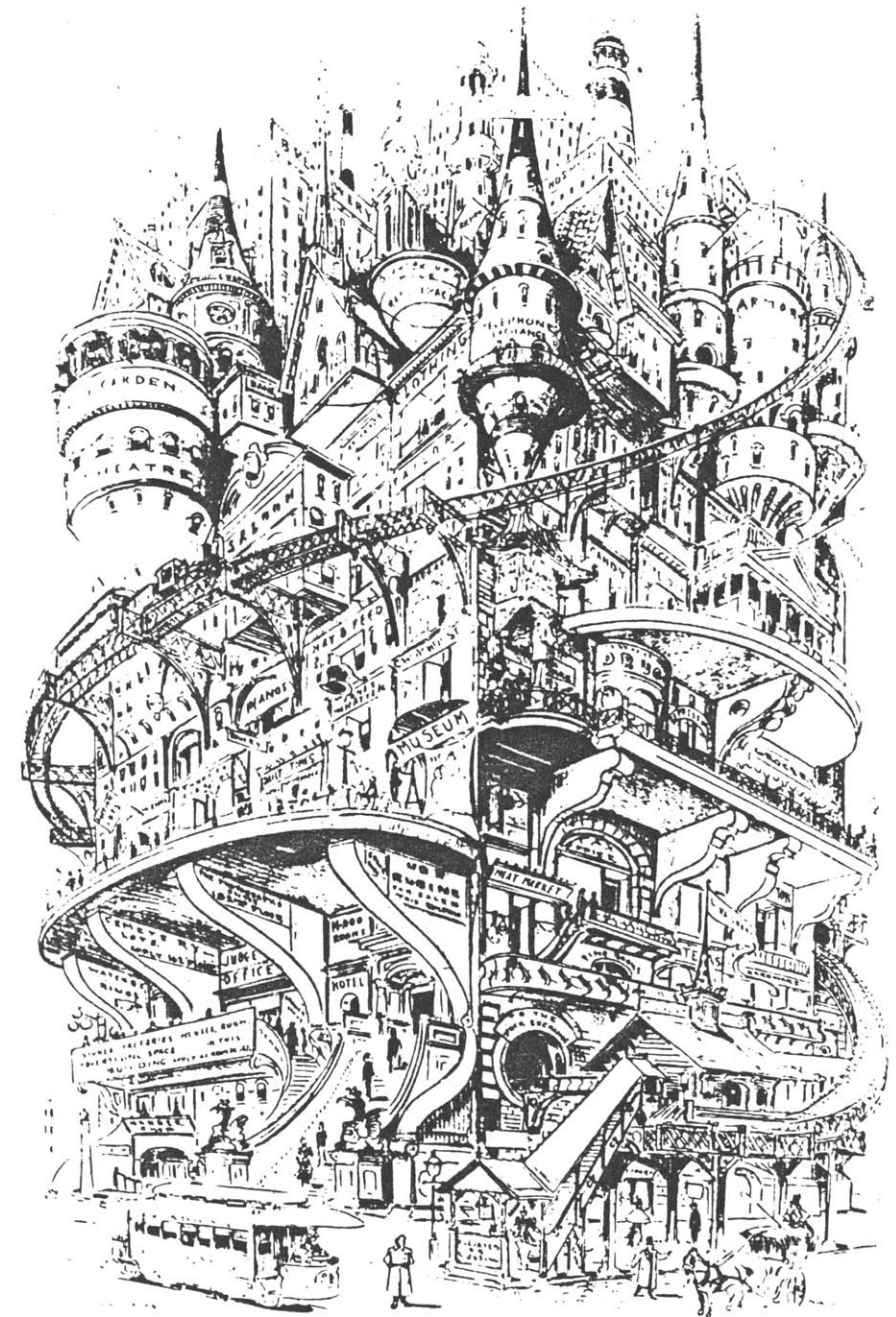
There is no question that skyscraper debates have forced people to be more explicit about the items and issues which they greatly value in their cities. However, if the skyscraper and the debates it spawned were a barometer of people's understanding of city form, why has that understanding not

*... Although it was influenced by European models and theory, the skyscraper type developed almost completely in two American cities: Chicago and New York. Today the skyscraper remains preeminently American building form; nowhere else is its presence as natural and its type as well understood.*

Cesar Pelli "Skyscrapers"

*... that for a city to be successful, it must have a well-defined public realm, meaning the streets and squares. That realm has to be dominant with a city; the private realm, as represented generally by the buildings themselves, should not dominate the public realm. Every individual building must contribute in shaping the public realm. The tall building must begin at its lower levels by acting as a facade that can join with other facades to create the urban walls that define a street. Once it meets that need, the tall building can rise as a freestanding object to fulfill the demands of its own program. ... This attitude, that a building stands as an object in space, has been prevalent for fifty years. While this attitude was originally well intentioned, it has decimated almost all of our American cities. Presently, urban buildings, as representatives of the private realm, are visually dominant over the spaces that represent the public realm. I consider that condition to be anti-urban. Consequently, our primary objective is to design urban high-rise buildings in such a way that they help shape the public realm.*

William Pederson



"What We Might Come To," an unknown artist's vision of the skyscraper's future.



developed and matured into a greater role? Jane Jacobs in her book, "The Death and Life of Great American Cities" writes;

*...Why have cities not, long since been identified, understood and treated as problems of organized complexity? If the people concerned with the life sciences were able to identify their difficult problem as problem of organized complexity, why have people professionally concerned with cities not identified the kind of problem they had? The history of modern thought about cities is unfortunately very different from the history of modern thought about the life sciences. The theorists of conventional modern city planning have consistently mistaken cities as problems of simplicity and of disorganized complexity, and have tried to analyze and treat them thus. ... I think these misapplications stand in our way; they have to be halved out in the light, recognized as inapplicable strategies of thought, and discarded.*

The tall building is the urban phenomenon of the twentieth century. Given the current direction of the real estate market and zoning regulations in our cities today one can be quite certain that the tall building is not only here to stay, but with recent technological advances its limits will certainly be extended even further. In order to successfully integrate individual structures into the urban fabric we must explore and understand the process by which we design and build. There must be a link between theory and process, design and construction. Even skyscrapers can possess common denominators and respond to both individual and collective needs.

*... During the Depression and World War II the teaching and diffusion of untested architectural ideas continued to such an extent that when commissions for new buildings started again, the only one prepared with architectural theory were those architects who had migrated from Europe with an artistic or intellectual reputation but no tall building experience. The new commissions went to them or their disciples.*

*The new buildings were based on what architects had learned from books and not on previous responses to similar problems. The skyscrapers of the thirties were forgotten and an answer for the type was sought in new terms. These terms conformed to an architectural theory that had not been developed with very high buildings in mind. Tall buildings were seen as a special case of a general condition, as normal, low buildings that happened to have grown tall. The name skyscraper was abandoned and eventually it was replaced with "high-rise building".*

Cesar Pelli "Skyscrapers"

*... What the critics lacked was a coherent sense of what a complex organism the city really was. Each of them offered a different solution - Le Corbusier wanted to change the city into rigid, widely separated towers in open space, Wright wanted to demolish the city altogether, Corbett wanted to create rational transportation systems - but in each case there was an assumption that a rational structure could be created to solve all problems. Physical order could be imposed, and with it, each critic asserted, all problems would recede.*

Paul Goldberger : *The Skyscraper*



"King's Dream of New York," by Harry M. Pettit.  
From *Views of New York*, 1908-09.





## MULTIDIMENSIONAL FRAMEWORKS

Alternative models of spacial organization for the tall structure can be derived in large measure from the set of values brought to the design process. The skyscraper can be defined as a multidimensional building made up of systems of frameworks which occur in a variety of sizes. The term "framework" is fairly broad and abstract as it applies to this concept, concerning both issues and ideas:

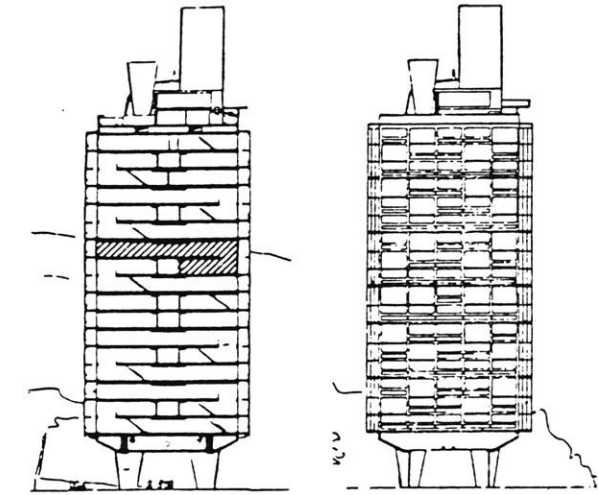
**frame · work 1a:** a skeletal openwork, or structural frame  
**b:** a basic structure (as of ideas)  
**2: FRAME OF REFERENCE**  
**3:** the larger branches of a tree that determine its shape.

The specific types of frameworks that the designer sets up influence the way decisions are made. Different design frameworks often result in buildings which are alike in use, but very different in form. The huge scale of many of today's controversial tall buildings calls attention to the need to rethink some of the architectural practices associated with the building type.

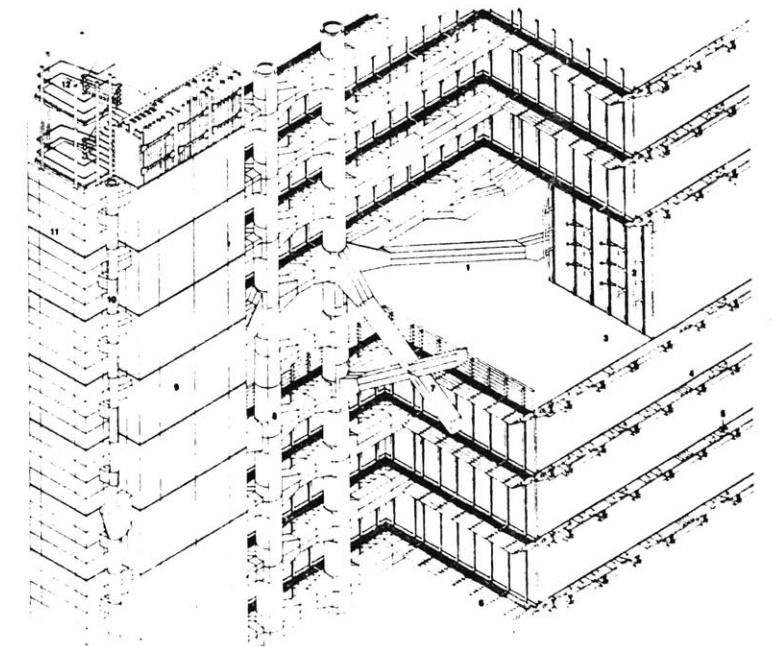
Although it is difficult to stereotype and categorize specific methods of design; the way architectural design decisions are made can be understood as specific processes with different philosophical bases. Different combinations of these processes are visible in our cities. The tall building is a young building type, less than 100 years old. Because of its youth and the large number of economic and physical constraints placed on the building type, the skyscraper seems to have developed along specific design avenues. The following body of text is not intended to be a historical account of skyscraper development, but a brief look at some design processes which effect today's tall buildings.

In the early days of the tall building, the facade was treated primarily as a stacking of smaller buildings, a direction which changed quickly with Sullivan's dictate that a skyscraper should "look tall." Subsequent developments attempting to humanize the high-rise have examined the buildings internal organization breaking vertical zones into a collection of identifiable parts. In Le Corbusier's *Unite d'Habitation* for example, an attempt was made to break down the social scale of the tall building by distributing public activities vertically within the structure. Even more recently, "skylobbies" have become a necessity because of the now common practice of stacking elevators. In his *Humana Building*, 1985, Michael Graves takes an even more humanistic approach by providing kitchens and lounges for employees on every floor, with views overlooking the city of Louisville. Norman Foster's *HongkongBank* uses the "stacked village" approach, with double height spaces dividing the building up into five vertical zones. Elevators travel to each zone, but escalators are used to circulate within each "village." Unfortunately, far too few tall buildings constructed in the past thirty years have used changes in their architectural organization to help establish associative qualities and linkages with their surrounding environment.

As with most building types in the architectural field, there have been numerous attempts to classify and categorize skyscrapers. The most common



*Le Corbusier's Unite d'Habitation, 1946, where an attempt is made to breakdown the social scale of the tall building by distributing public activities vertically, within the structure.*



*Norman Foster's HongkongBank, 1986, with double height "public spaces" dividing the building up into five vertical zones.*



system is to break tall building development down into time periods. There are also those who classify according to size, small, medium, supertall, etc.. Tall buildings are often discussed as objects and use is almost never an issue. Office towers are grouped with residential towers. The few multiple mixed use towers that occur are placed in the same "skyscraper" category.

In looking at the development of the tall building, I discern two distinct attitudes leading to dissimilar design frameworks for the building type. These attitudes do not necessarily correspond to a specific time period; although one may be more prevalent than the other during certain era's. A Composition oriented design method emphasizes a discrete structure and generally produces buildings which are singular, but can exhibit strong, rigorous clarity and definition. The Aggregative design process is more open and additive by nature and can associate much more easily with its surroundings. There is more self-definition in building components although a hierarchy still exists.

### COMPOSITION

In his writings on architecture, Louis Sullivan called the skyscraper "a proud and soaring thing" and he went on to state that this effect is accomplished by providing the building with a base, middle, and top. Although not all tall buildings based on the principles of Composition strictly adhere to the early notions of a tripartite arrangement, each size is still controlled in a hierarchical way. Activity is usually defined by the next largest size. Skyscrapers designed within the principles of Composition tend to be controlled, self-defined and singular, but do exhibit strong, rigorous clarity and definition.

Eliel Saarinen's Chicago Tribune Competition Entry of 1922 is a good example of a tower design based on the principles of Composition. Resting on a strong base the tower has an upward thrust. The top is apparent and there is control exhibited in the hierarchical relationship of the parts. The building setbacks emphasize the discrete structure and the ending of elevator cores while at the same time they help establish a size related hierarchical control.

The modernist skyscraper of the past forty years is different in form from prewar tall buildings, but its design principles can be linked to Composition. Since the Second World War the Miesian prototypical skyscraper has been packed into our cities. Mies van der Rohe, believing visual thought is as powerful and instrument as verbal thought, presented the tall building primarily as a symbol instead of an object of use, a symbol of a technically oriented future society. Although Mies designed skyscrapers in the 1920's and 1930's, it was not until his move to America in 1938 that he was able to design and construct large steel and glass buildings. Schools of architects have followed the principles Mies founded. Unfortunately, most have by and large been unable to achieve the proportioning of profiles and clarity of form which won Mies acclaim.

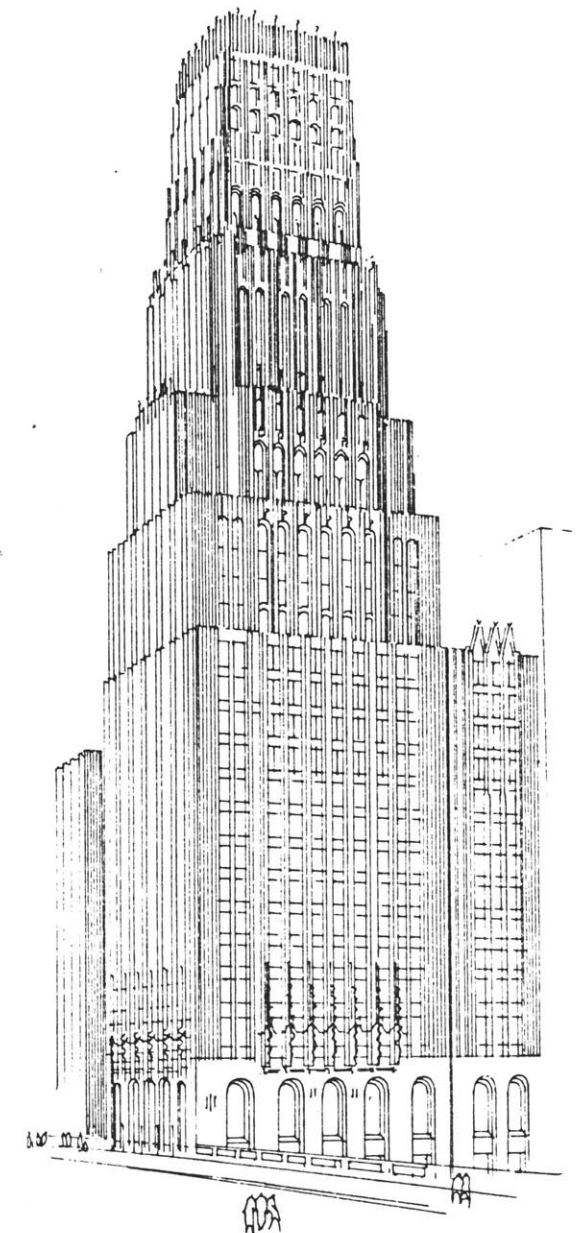
The early prewar skyscrapers are, in general, much richer than the Miesian prototypes. Although the design principles of both types can be linked to Composition they clearly represent diverging agendas. While Sullivan and Saarinen were concerned with strong hierarchical control of size, Mies was interested in the repetition of the grid. More importantly, modernists are concerned with minimalism, "Less is More"; while the prewar architect was

*... It is interesting to me that, although Saarinen's design was intended to be the tallest building in Chicago, in reality he ended up producing an extremely good prototype for medium tall skyscrapers. Medium tall skyscrapers are buildings of substantial height, higher than most surrounding structures, but not the highest in their area. They play an important but different role from that of the tallest skyscrapers within a group formed by masses of buildings, such as those in downtown Manhattan. Such skyscrapers may be minor spires, but for me they are most successful when the upward movement is somehow arrested so that it is in closer balance with the downward movement to the ground. These medium tall skyscrapers are more like high buttresses of the total massing of a city.*

Cesar Pelli "Skyscrapers"

*... Ten years ago, the answer to the tall building was fairly simple - it involved the development of an efficient rectangular floor plan following a modular grid and a structural system that was on the same grid. The resultant building form was that of a vertical rectangular prism sitting, if at all possible, on a plaza.*

Cesar Pelli "Skyscrapers"



**CHICAGO TRIBUNE COMPETITION**  
Eliel Saarinen  
Chicago, 1922  
445 feet





concerned with proper articulation. Some of the design principles for the modernist high-rise are summarized below.

#### Urban Context:

The Miesian high-rise is completely removed from its context. It is an object in the landscape, any landscape. It is truly singular in form.

#### Form:

The form is generally derived from a symmetrical grid pattern (Mies called it the "united bay system"). Every space, every use, is based on the same dimensional grid. The profile is then compositionally proportioned.

#### Organization:

The organization is the "free-plan" with its maximum openness and minimum architectural definition. Vertically the building is a stacked slab arrangement with identical floors.

#### Structure:

The structure is idealized as an expression. The opposition occurs between structure and sheathing. Clarity and honesty are not always the issue as structure is sometimes used as decoration.

#### Variation:

The only variations that are achieved occur in building length, width, height or in the patterning of the exterior panels.

#### AGGREGATIVE

The Pravda Tower, designed by the Vesin Brothers in 1921 is labeled as a work of Russian Constructionism. A difference in design principles is immediately apparent when this structure is graphically placed between Saarinen's design and Mies' Seagrams Building. In the aggregate design approach used for the Pravada Tower, a hierarchical relationship between many of the parts still exists. However, much more self-definition is possible. There is a clarity of use with a range of spacial options and dimensions which are apparent in the facade. The resulting design is less formal and less stately with what can be termed as a more accessible decentralized hierarchy.

Very few tall buildings constructed recently appear to have been designed with a totally aggregate approach. There are those which successfully exhibit certain additive characteristics. For example, both projects by Jose Luis Sert shown in the "Case Studies" section are modern interpretations using these design principles. The most important aspect of the aggregate design approach as it applies to the tall building lies in the fact that the skyscraper can be resolved without depending on aesthetic forms borrowed from other building types from historical conditions.

We have now over forty years experience constructing tall buildings with design principles based on postwar modernist notions. A number of problems with the building type and the urban environment have become clear. The

*... S. Gideion described the spatial-architectural character, firmly embedded in the Charter of Athens, of the emerging prototypes: "... architecture takes on a sculptural character. Though sculpturally related, the buildings are spatially distinct. They stand free in space." He proceeded to invoke a second critical element of the urban design concepts upon which the prototypes were based: "The separation of functions, so that each has its own sphere of operation as well as its clear relation with the totality, can be applied to the organization of the single building." Indeed, by 1957 in the Hansa Quarter of Berlin a whole residential settlement could be built in which architectures had designed some fifty "objects" (so identified in their publication) as free-standing artifacts without reference to, or perhaps interest in, the intervening spaces. Each residential building clearly represented one of five categories of prototypes, culturally shared and understood by the hosts and the architects who had been invited from countries ranging from Brazil to Finland. An equally widely accepted canon for the office building also emerged and, over the years, acquired only skin deep variations -- from the corporate headquarters of the Lever Brothers to the buildings for speculative enterprises on the Montparnasse. More recent attempts at re-editing the prototypes emphasized the contradiction even further by employing idiosyncratic historical costumes. As a result the already discrete nature of these building types gained an inappropriate monumentality, further accentuating discontinuities in the urban fabric. Although the new-fangled packaging of the old urban prototype aspired to novelty, the more the surface changed, the more the substance remained the same.*

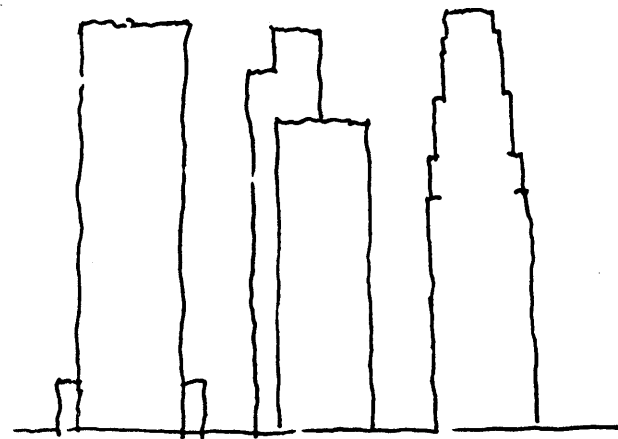
#### Aggregations



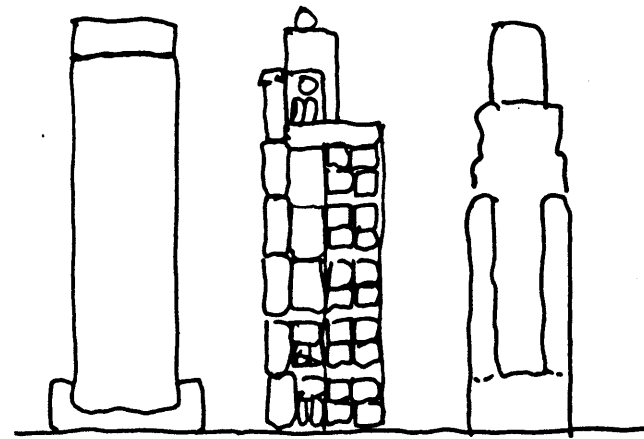
*The additive nature of San Gimignano can be seen in the plan and photo. Composition and completion are clearly shown at the small sizes. However in the overall range of size the aggregation is incomplete and additive.*

The term framework is fairly broad and abstract as it applies to this thesis. It concerns issues and ideas ...

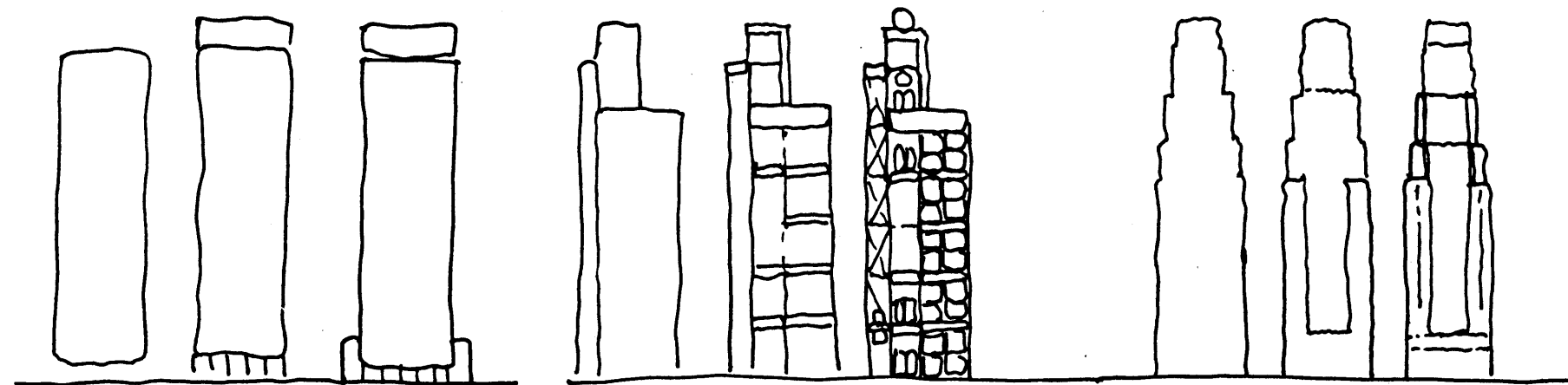
FORM	USE	MATERIAL	ORDER
Structure	Mixed Use(s)	Forms	Clarity
Primary	Privacies	Materials	Consistency
Secondary	Organizations	Colors	
Screens	Linkages	Texture	
Closure	Registration	Light	
Dimensions			



*Building Form*



*Composition - Base, Middle, Top*  
*Aggregation - Additive Size*



*Hierarchical Relationships*

following aggregate design framework, which was derived largely from the publication "Aggregations" (listed in the Bibliography), addresses the problems.

#### Urban Context:

The singular nature of many of today's multi-story structures reduces contextual possibilities. The Aggregate design method attempts to understand the tall building's role in the urban fabric by understanding the structure as a mass. The establishment of the more contextually important smaller sizes, upon which the vitality of good cities has always depended, are an integral part of the design process.

#### Continuity:

At every step of the design process a decision must be made whether continuities, linkages and intensifications are being established or discontinuities or contradictions. The singularity of individual structures has led to fragmentation of city centers. Public open space performs as a buffer instead of becoming a true territory for collective use. For the tall building, vertical spatial continuities need to be linked to horizontal continuities at the lower levels. Larger continuities are formed with the city through the use of collective spaces and internal networks.

#### Range of Size:

A true range of size in the skyscraper helps introduce a clarity, legibility, and identity of the whole. The skillful assemblage of a dimensional range of size is an indispensable attribute of good architecture.

#### Hierarchy:

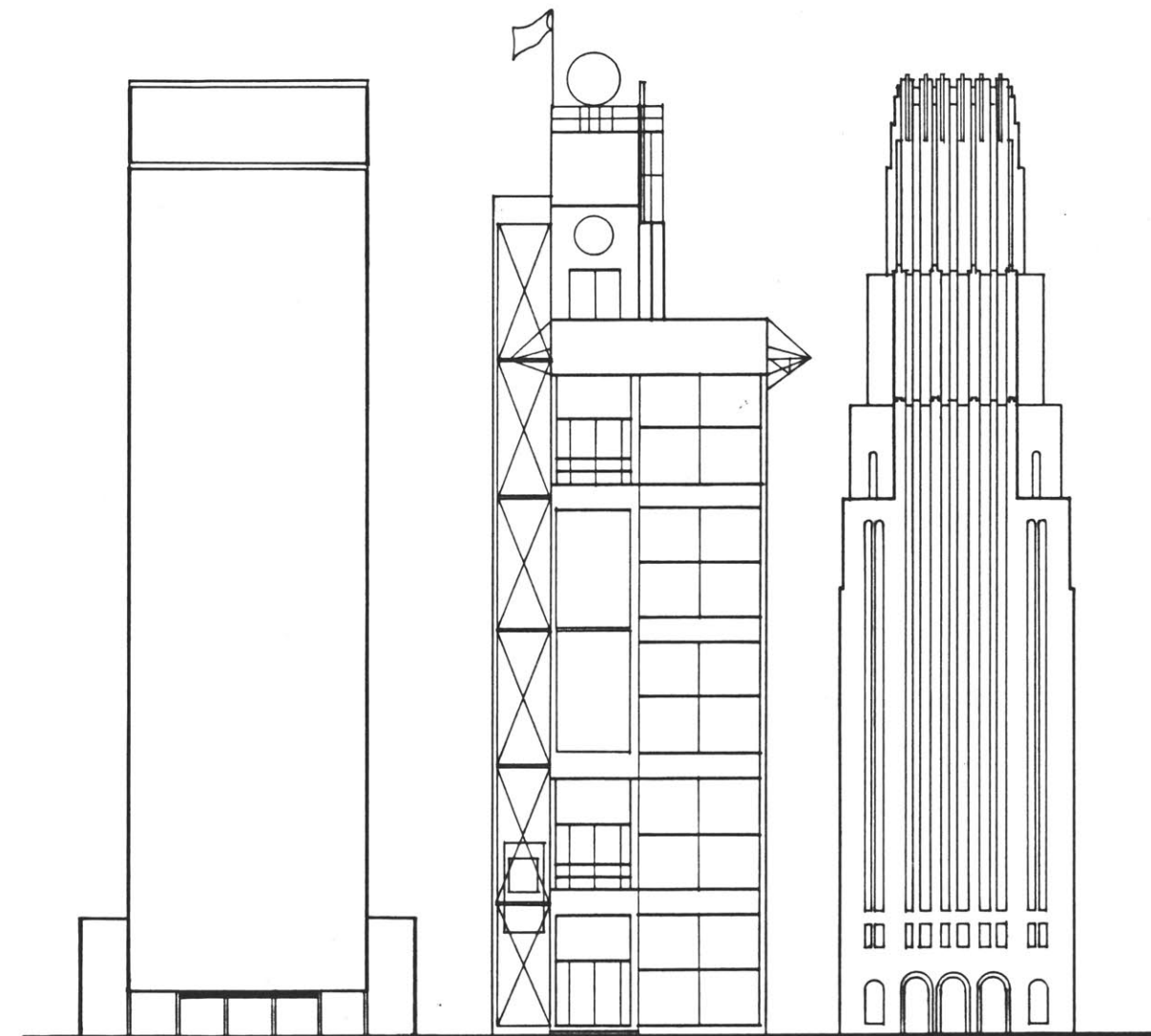
The hierarchical relationship between parts exist in the Aggregative design is decentralized. Relationships that exist between building components are based on the associative assemblage of dimensionally stable parts. The dimension of each part is understood as it relates to its immediate context. The additive nature of building components works to establish the next range of size.

#### Associative Form:

Form is not generated singularly, but built up from an inclusive, deeply associative vocabulary producing linkages and lateral development clues for different parts of the urban fabric.

The problems that both design methods have centers around the issue of "Completion". The Compositionally based design is often singular and so complete that there are no clues on how to produce lateral developments. Additive construction was not designed with the idea of future growth and change.

The Aggregative framework is often too incomplete. A certain level of completion must be established for there to be a recognizable building type. Without recognition there are no clues for use. Clearly there is a "critical mass" that must be reached before the framework can be recognized as a habitable form.



**SEAGRAM TOWER**  
Mies van der Rohe  
New York, NY, 1958  
576 feet

**PRAVDA TOWER**  
Vesin Brothers  
Leningrad, 1921  
95 feet

**CHICAGO TRIBUNE COMPETITION**  
Eliel Saarinen  
Chicago, 1922  
445 feet





## STRUCTURE

The economic feasibility of skyscrapers is so related to engineering considerations that the topic of structure must be engaged early in the design process. This is neither a thesis about the structural engineering required in tall building design, nor a history of structure and the skyscraper. However, the design implications are so great for the building type that there is a need to define some basic structural concepts as they relate to the notions of the design framework.

The use of technology for the tall building, with regards to structure, can be looked upon as progressive. However, technical innovation need not characterize the design, but rather, the way a concern for certain social-spacial relationships is transformed into physical form. Technical innovation often follows theoretical exploration. As William Le Messurier stated for the 1986 Engineering News Record conference on super-tall structures;

*... There is more fun than anything else in doing a more elegant solution for an ordinary 75-story building. We have a long way to go to make the skyscraper what it really can be, and it doesn't have to be super-tall to do this. There are ways to open up space, to make it more economical and face the problems of fire and transportation and pedestrian joy at the bottom. These are more interesting problems.*

Structure for the skyscraper has been defined as;

*... The resolution between the forces of nature; the character of concrete and steel; the requisite form of function; and the imperatives of economy.*

In architectural terms, buildings with an "Aspect Ratio" (Height/Width) of 5 or more are generally regarded as super-tall. To the engineer, the super-tall building is one in which the lateral loading and the response to wind dynamics dominate the structural aspects of design. The purity in structural design results from the solution to the integration of structure and architecture which produces the greatest clarity and simplicity. Although skyscrapers do not lend themselves to treatment as "Billboard Architecture", the volumetric form of each structure does not have to strictly outline the final massing. Facades of tall buildings can have a clear expression of the rhythm of their structure. More importantly, the structure itself can escape the building facade.

We now have the technology to construct huge "megastructures", much larger than any existing tall building. The tower can be part of a much larger structural field which encompasses more of the urban fabric. This notion that the tall building can be part of a larger field can help answer the following questions concerning structure.

- How can the tall building be made to look like it is in process?

*... We cannot build without thereby creating a structure, but that structure may be at the heart of the basic concept or only peripheral to it.*

Roland J. Mainstone

*... Technology, writes the social philosopher John Ogilvy, has come "to play the same role as nature, namely that of a hostile environment out of which man must carve enclaves to make his home." The response to that condition among architects in the last decade has been twofold. Some have looked to natural means - to the passive heating and cooling of buildings, for example - for solving technological problems, an inversion of the traditional relationship. Others, Modernists and Post-Modernists alike, have retained technology's nature-taming role, but have minimized its expression and form-giving potential.*

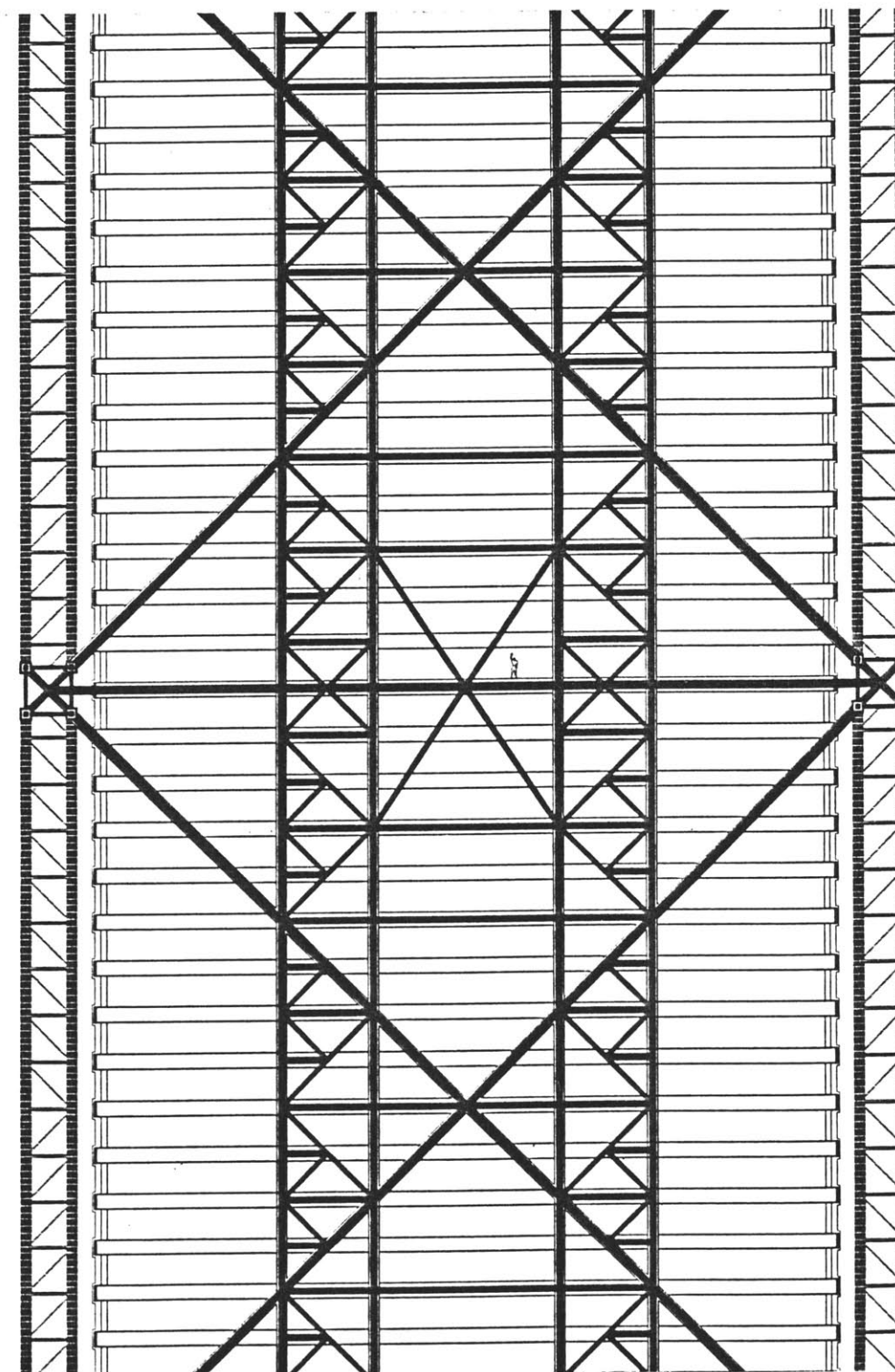
*Ogilvy suggests a third approach. "To transcend one-sided dependence on either nature or technology," we must "demystify" and "decentralize" technology "to return man's tools to the men and women who now see only products."*

David Bonavia

*... There is more fun than anything else in doing a more elegant solution for an ordinary 75 - story building. We have a long way to go to make the skyscraper what it really can be, and it doesn't have to be super-tall to do this. There are ways to open up space, to make it more economical and to face the problems of fire and transportation and pedestrian joy at the bottom. These are much more interesting problems.*

William Le Messurier

*Erewon Center  
Architect and Engineer: William J. Le Messurier  
Stories: 207  
Height: 2760 ft. above grade*





- What mechanisms can the structure provide to accommodate future growth and change of the surrounding urban fabric?
- How can the structural framework provide clues for future development?

The primary structural system which supports not only the tower, but other larger pieces of the urban fabric can have a clarity and dimension which makes it readably distinct from the secondary "in-fill" materials. Neither the primary support system nor the secondary structure, closure and detail systems need to be complete at all levels of the project. It is this incompleteness which can help provide clues for growth, change and future development. The clear use of primary and secondary systems as well as incompleteness can also help make the tall structure and its surrounding environment appear to be "in process".

A structural comparison, which illustrates some important concepts is the Sert, Gourly and Jackson Associates' Peabody Terrace Housing Project and Erro Saarinen's John Deere Headquarters Building. As with much of Serts work, Peabody shows clarity and distinction between primary and secondary materials. Clues for use, growth, change and future development are apparent. (For more information see the Case Study Section.) In Saarinens building there is no primary and secondary legibility. The system of screens on the building facade grows directly from the support structure and while the structure itself is a thing of great beauty, the building remains singular with its uses unclear.

*... In simple terms, you could say that building order is the unity that arises in a building when the parts taken together determine the whole and, conversely, when the separate parts derive from that whole in an equally logical way. The unity resulting from design that consistently employs this reciprocity in a sense may be regarded as a structure.*

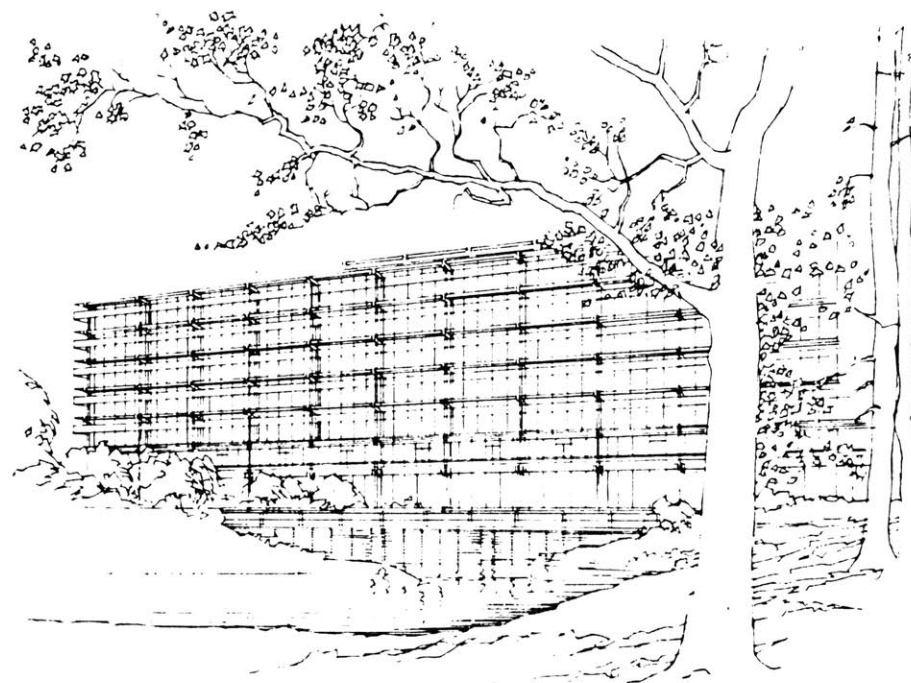
*Herman Herzburger : "Building Order"*

*... The expressive potential of raw structures ... Buildings under construction look nicer than buildings finished. ... when you start being interested in architecture, you walk down the street and you say, " Oh look at that great structure. Isn't that great. Too bad they can't leave it like that.*

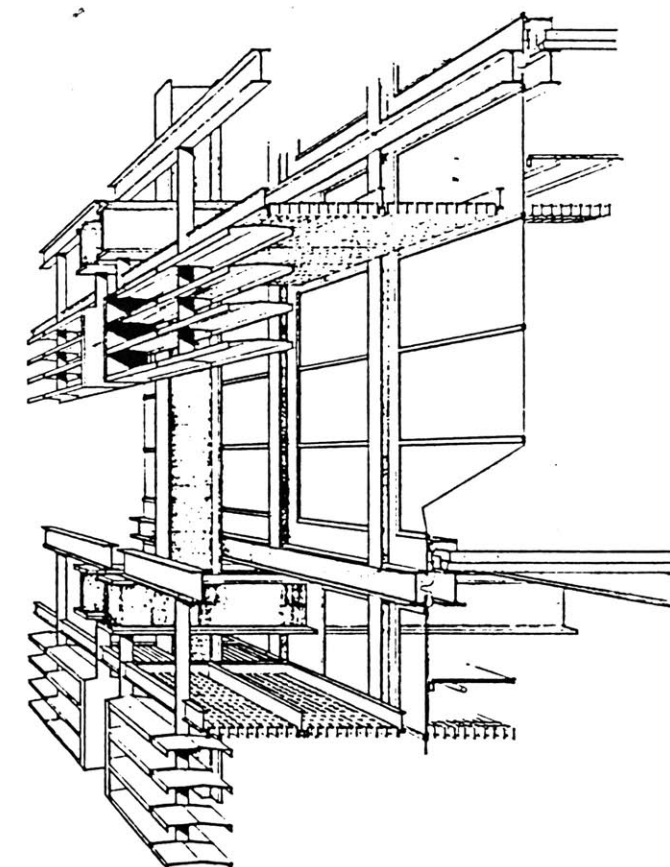
*Frank Gehry*



*Peabody Terrace: Sert, Gourley Jackson, 1962.*



*John Deere Building: E. Saarinen, 1962.*

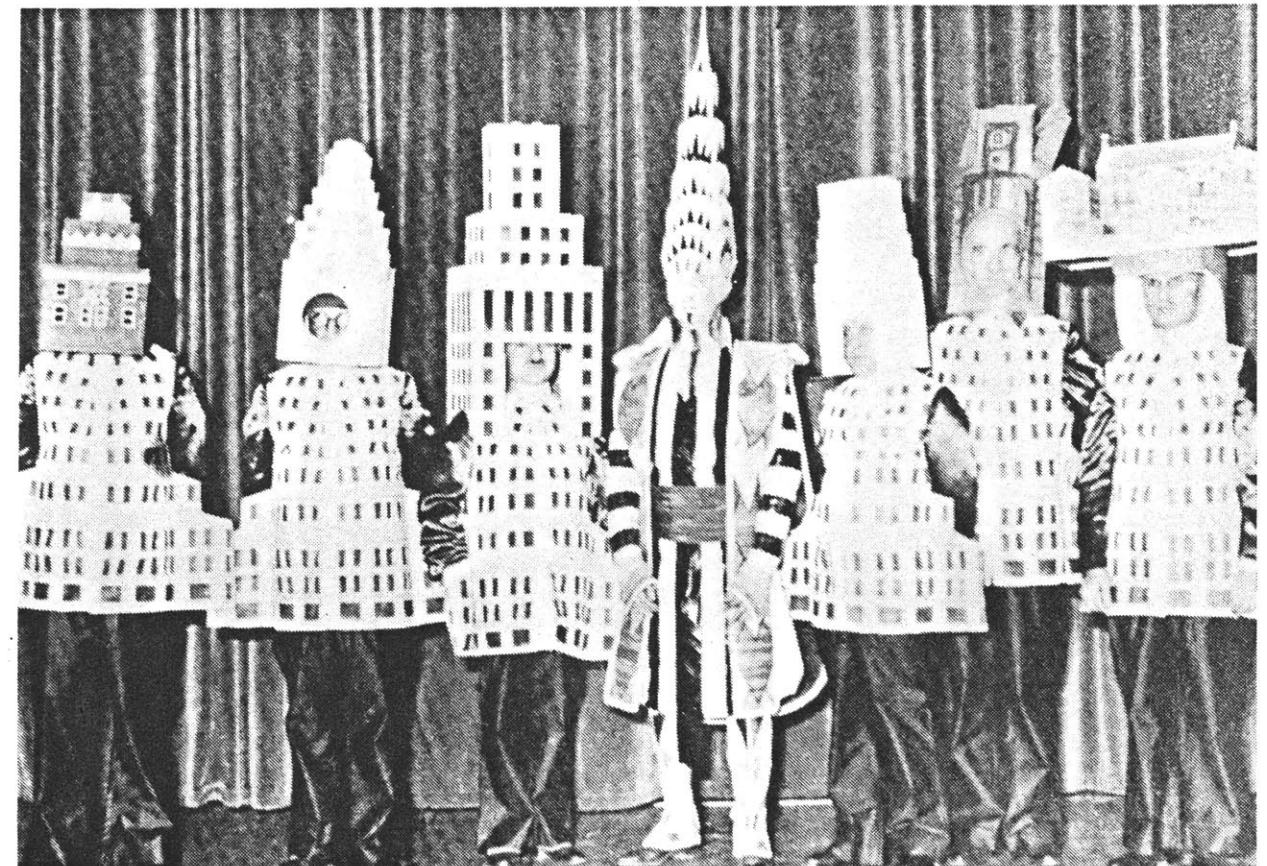






The following selection of case studies vary considerably in their content. Some are chosen for their philosophical intent, while others are noted for their built reality. References are used throughout this thesis but the case studies are to help understand specific problems. Both written and graphic material are extracted from its source and although an attempt is made to provide a clear focus and comparative analysis, much room is left for personal interpretation.

Each building is chosen for a specific reason. For example, Sert's Peabody Terrace deals with a secondary system of screens, closure and detail in a unique way. An examination of Sert's design systems provides valuable insights into similar closure problems addressed in the design section of this work. Not all of the case studies prove valuable in the end, but the comparative process by which they are analyzed is valuable. As an analytical tool it facilitates the understanding of the building type. The final result is a rich mix of different tall buildings. At the end of the section are drawings comparing the case studies and many other well known skyscrapers at the same scale.



*A scene from the "Skyline of New York" ballet at the 1931 Beaux Arts Ball at the Astor Hotel. The theme was a "Fete Moderne," and the architects are dressed as their skyscrapers. From left to right: A. Stewart Walker, the Fuller Building; Leonard Schultze, the Waldorf-Astoria Hotel; Ely Jacques Kahn, the Squibb Building; William Van Alen, the Chrysler Building; Ralph Walker, Number 1 Wall Street; D.E. Ward, the Metropolitan Life Tower; J.H. Freedlander, the Museum of the City of New York.*



# NAKAGIN CAPSULE BUILDING

## KISHO KUROKAWA

In late 1972 Kisho Kurokawa unveiled his Nakagin Capsule Building. This residential building was to be a prototypical part of a much larger urban megastructure; attempting to reassert the viability of large-scale urban structuring methods.

The building itself is composed of precast concrete towers connected at various levels by pedestrian bridges, forming what Kurokawa believes is a type of megastructure which could act as a framework for a multilevel city. The towers act as service cores, housing elevators, mechanical equipment and stairs. The prefabricated capsules which are attached to the tower core offer a complete living environment in a space no more than 8x12 feet. In the small efficient volume of the capsule is a bathroom, an HVAC unit, double bed, desk, chair, storage space, TV, tapedeck, typewriter, desk calculator, clock radio, and space for a two burner stove.

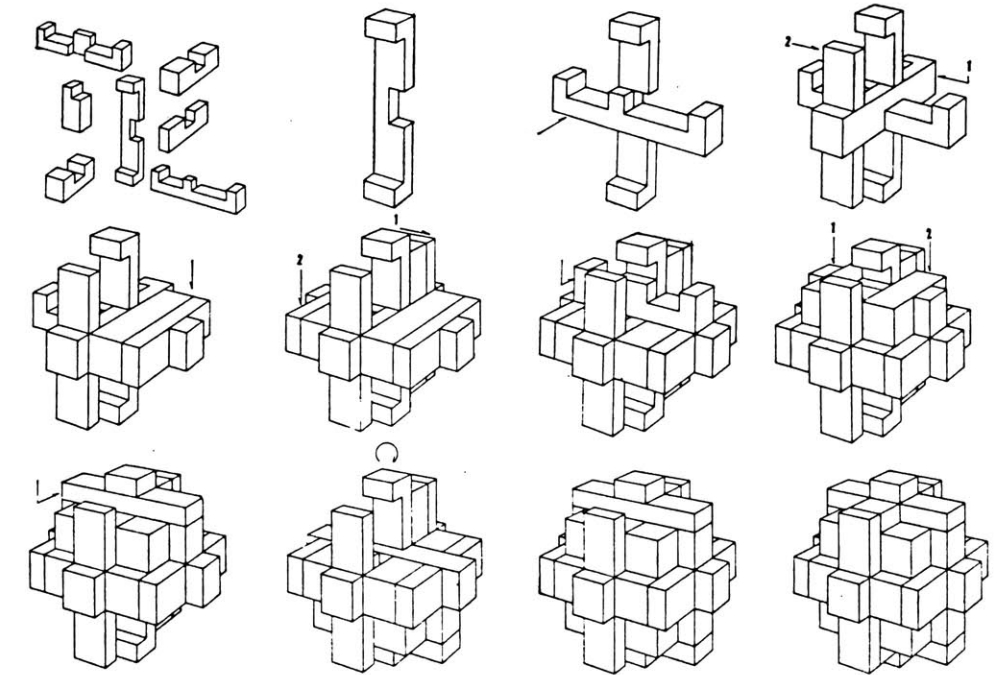
The aesthetic form of the building attempts to resemble a complex, additive, interlocking puzzle not unlike the systems of bracketing employed in the early Buddhist temple architecture. The system of construction, utilizing both traditional construction techniques and industrialized, prefabricated components, is very flexible. The architecture is no longer restricted to traditional construction technology, but aggregates and synthesizes elements from a broad industrial base.

One problem with the building is its connection to the street. Although connections were planned between structures, there is little linkage or built connection to the street. In fact, other than the larger open modules at the base of the structure there is no public or community space. An even larger problem with this "metabolist" structure concerns the myth about change. Kurokawa, along with others thought that predictable change would occur at a certain specific environmental and building level; the size of the single 8x12 capsule. Time has proven that this is not the type of change that occurs. No one has actually ever changed a "living cube", but technological innovations lead to the update of the mechanical systems which were hopelessly buried in the core!

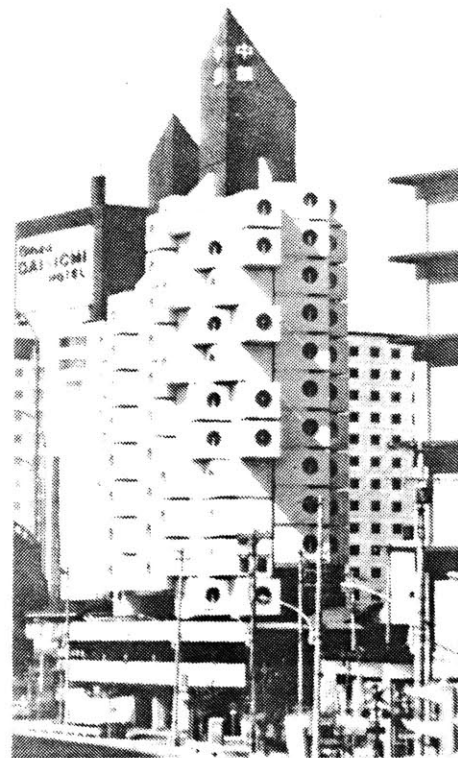
The limited success of the Capsule Building at least proves that such additive changeable structures can be built and marketed in dense downtown Tokyo, where land and development costs rival those of any city in the world.

*... Metabolism was developed into the concept of metamorphosis, which was concerned with changes in the physical form and structure of cities that could respond to the needs of a dynamic society. ... By incorporating elements of space, speed and drastic change in the physical environment, we created a method of structuring having elasticity and changeability.*

*Kenzo Tange : Beyond Metabolism*



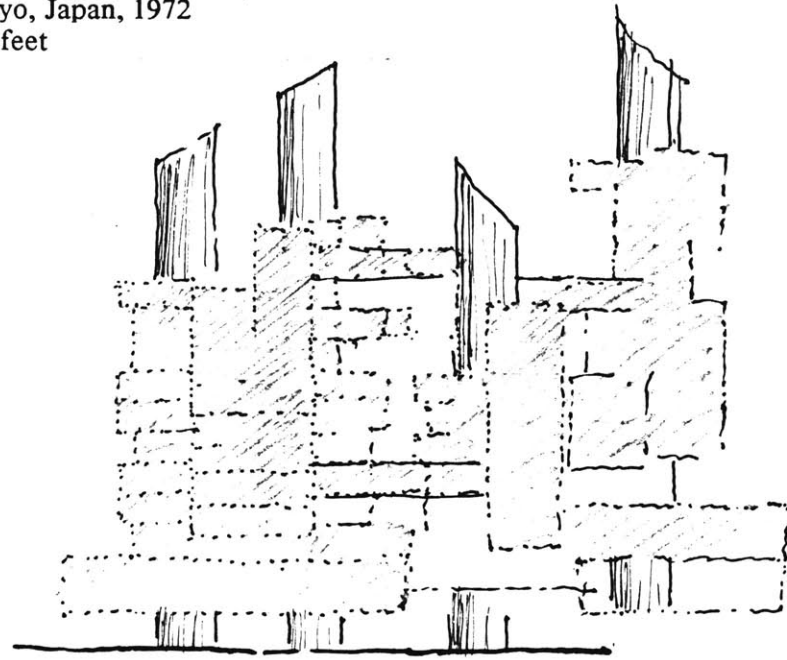
*Japanese Puzzle Instructions: The interlocking components form part of an ancient closed system familiar to all Japanese school children.*



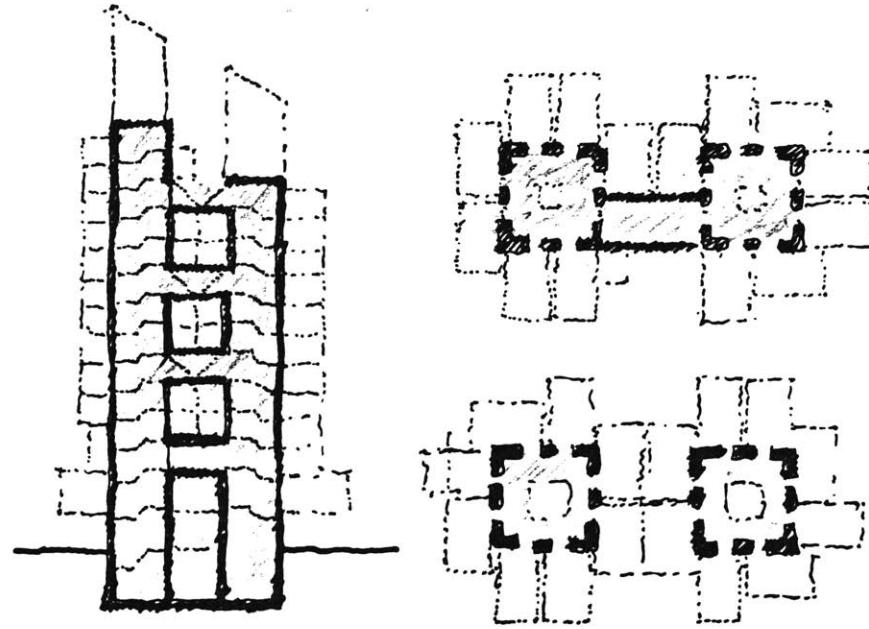
*Nakagin Capsule Building, based on outer space precedents, is a total living environment attached to a structural service core.*

**NAKAGIN CAPSUL BUILDING**

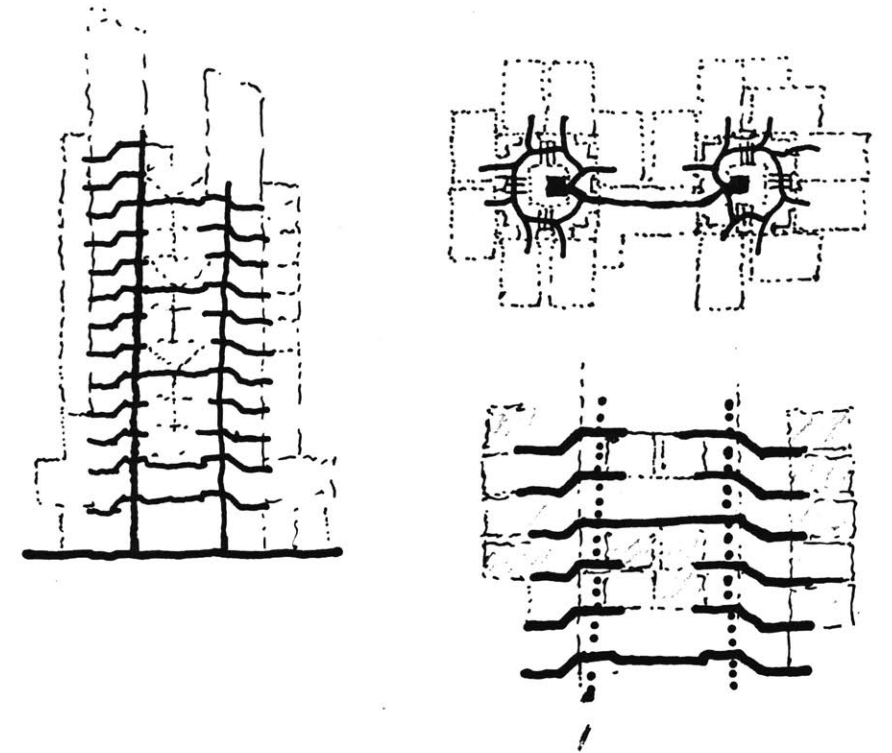
Kisho Kurokawa  
Tokyo, Japan, 1972  
180 feet



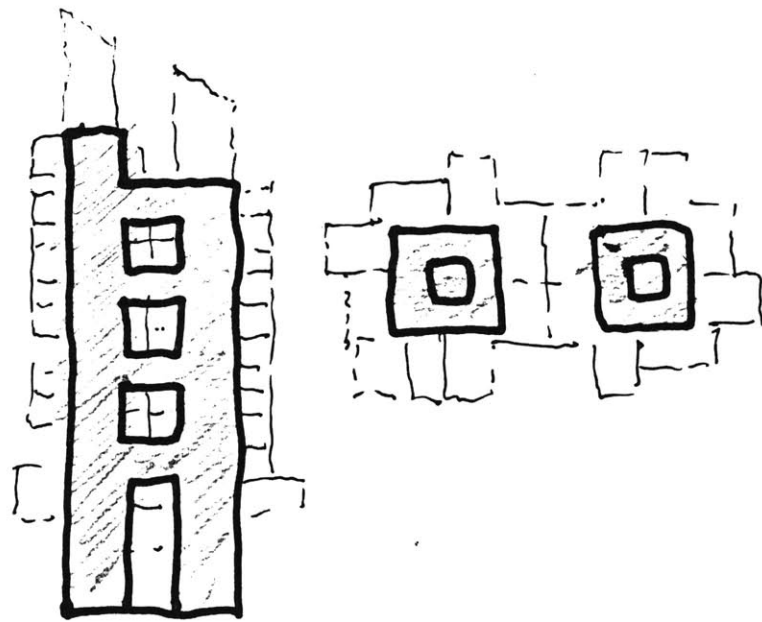
URBAN CONTEXT



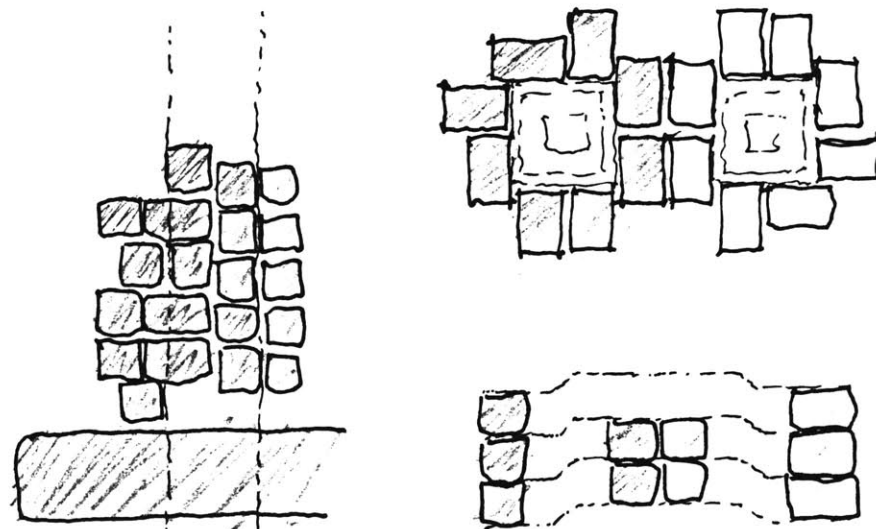
STRUCTURE



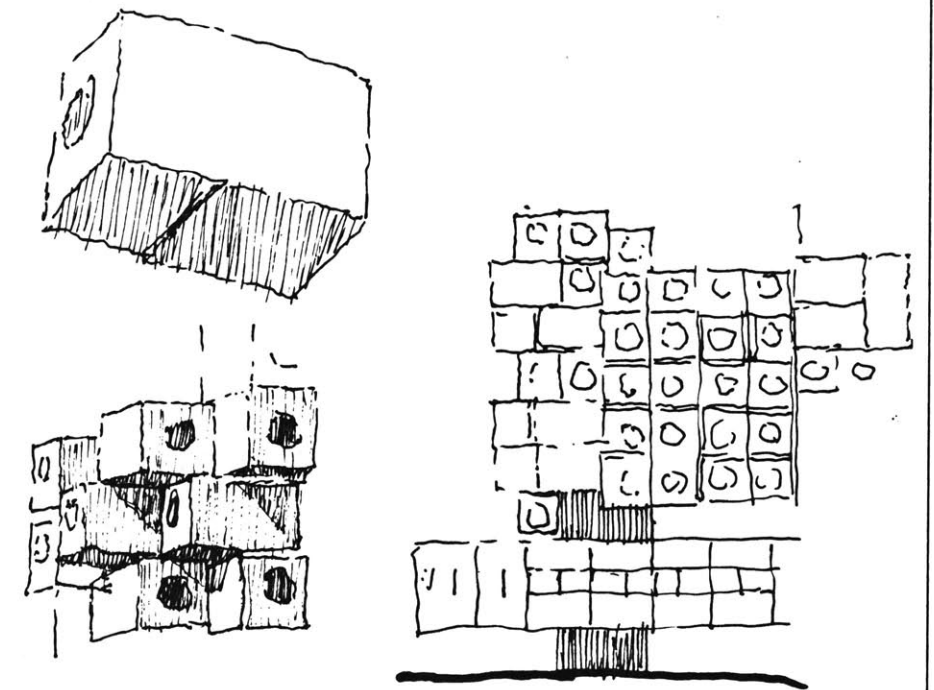
ACCESS



SERVICE/MECH.



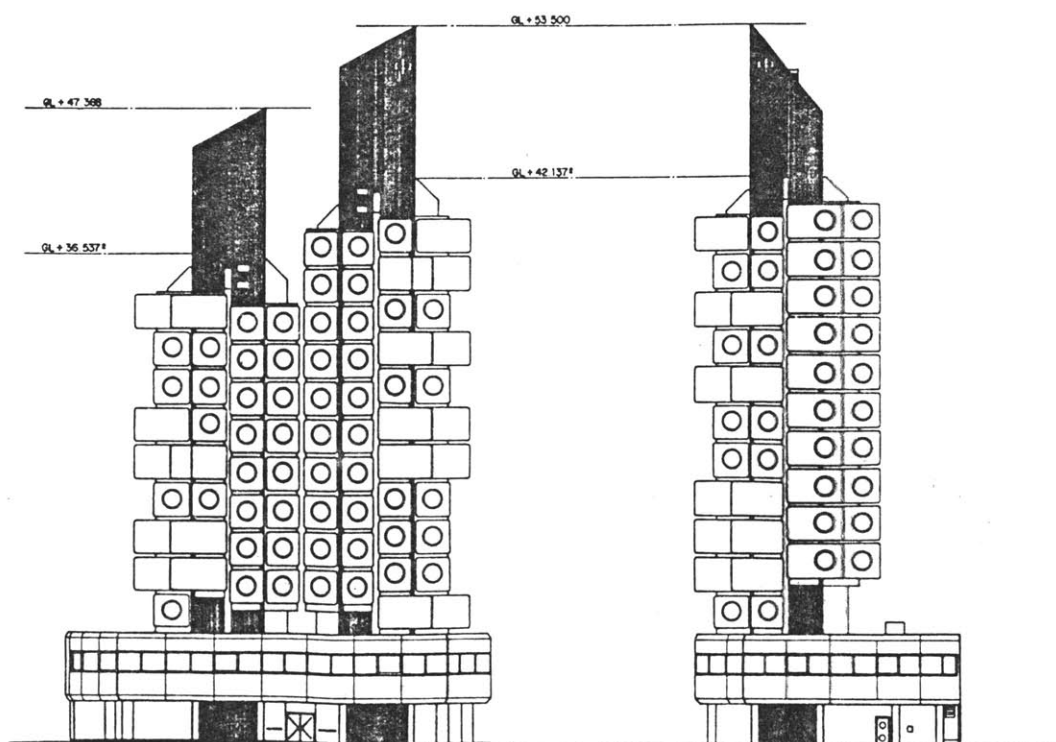
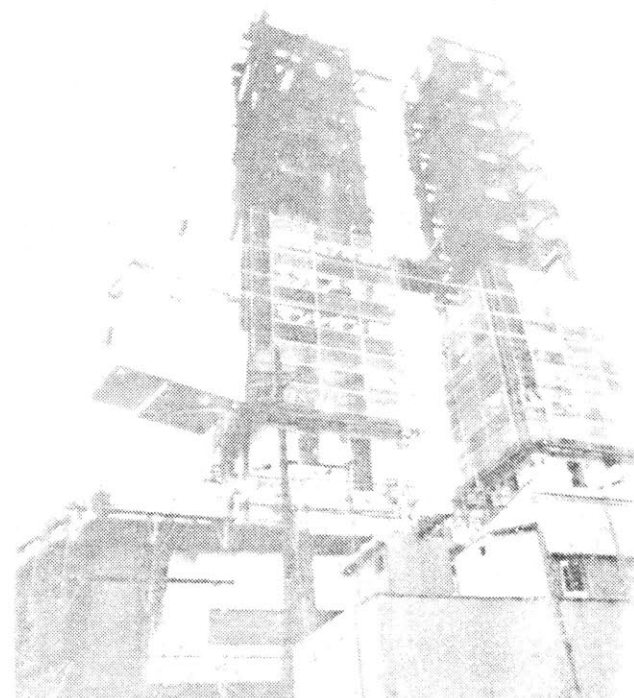
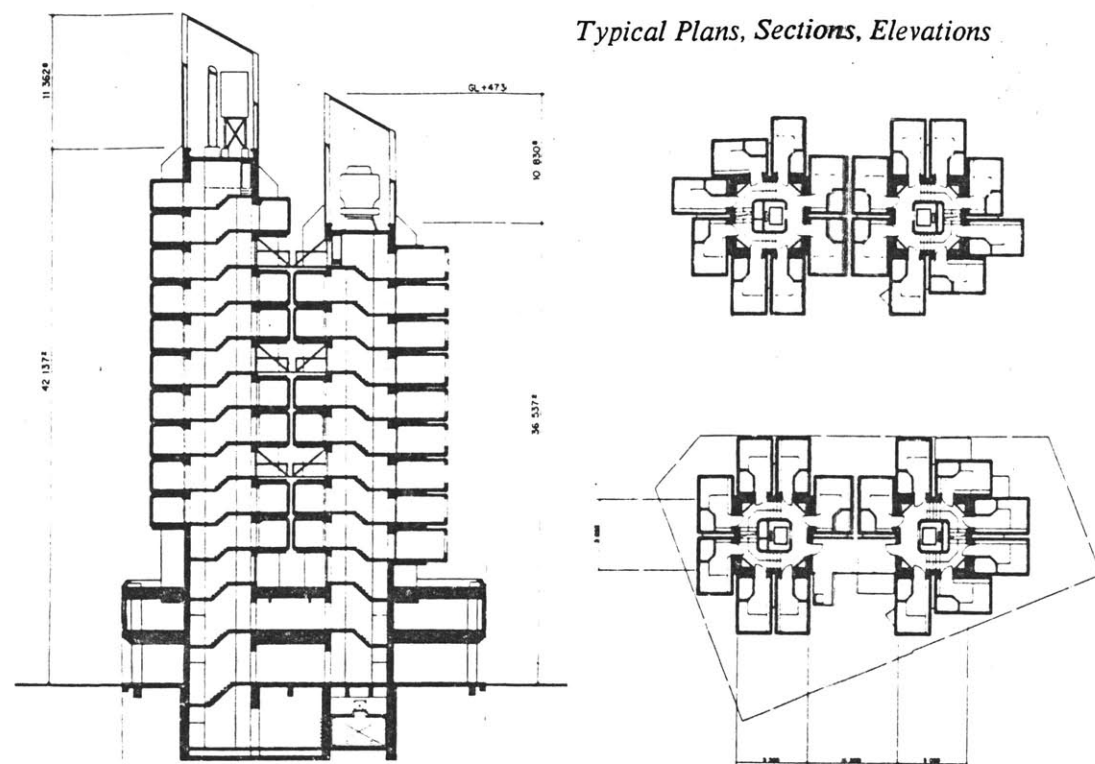
ORGANIZATION



CLOSURE-DETAIL

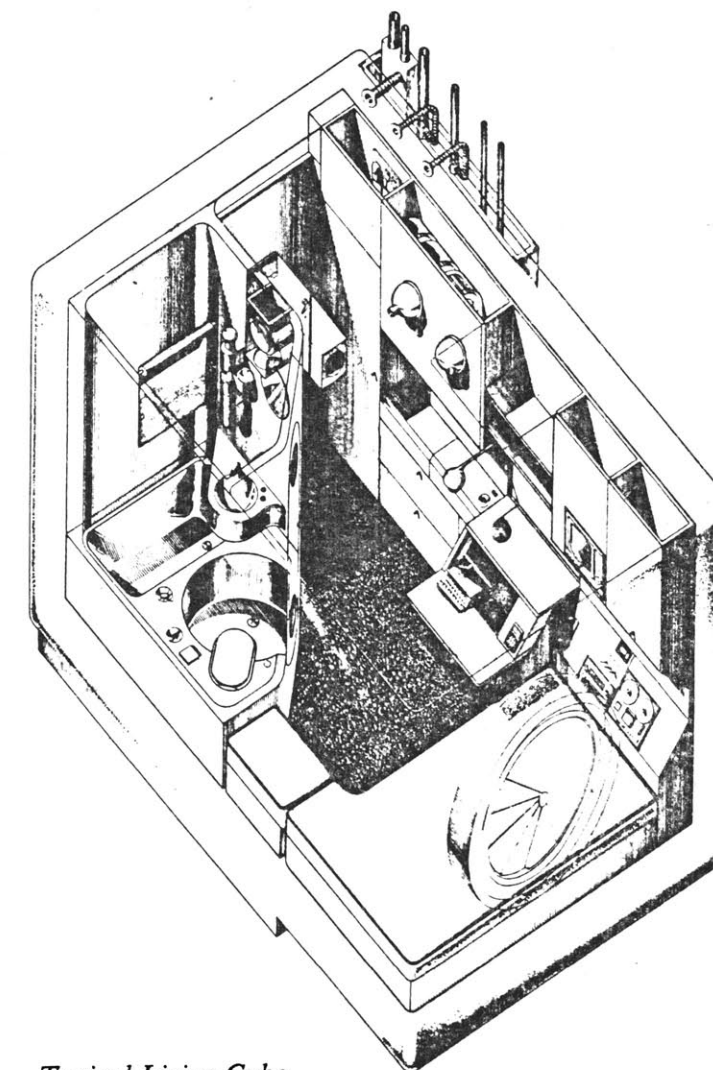


Typical Plans, Sections, Elevations



... The main objective of capsule architecture is to achieve one hundred percent mass production of living units by creating a new understanding of the house as a community of individuals. The Nakagin Capsule Building represents the first link in such an architectonic community; one that would be composed of towers of variable heights interconnected by pedestrian bridges, with personalized capsules clustered around each tower. To achieve such a community of individuals it is necessary to give a life to the capsule by joining it to a mother-ship that will provide the water, oxygen, and power supply essential for its functioning. This need generated a system of construction that combines prefabricated components with the more familiar elements of traditional construction. We call these "mixed systems."

Kisho Kurokawa : Beyond Metabolism



Typical Living Cube



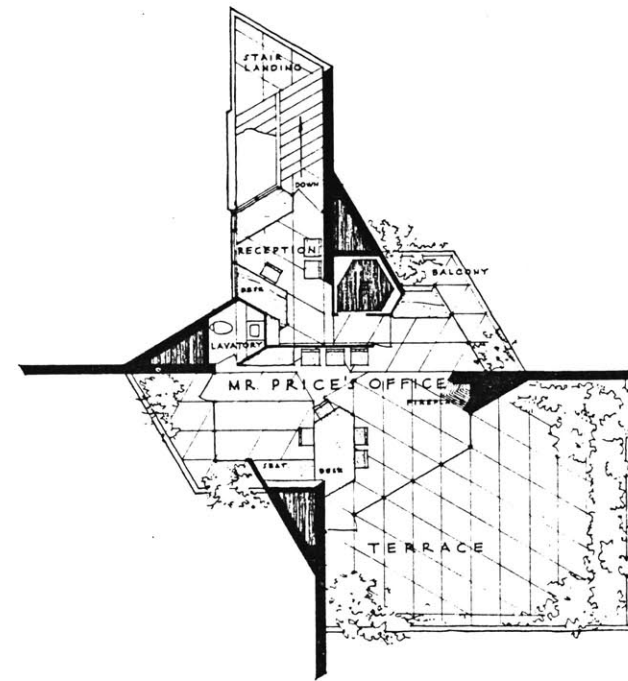
# THE PRICE TOWER

## FRANK LLOYD WRIGHT

Although the Price Tower was completed in 1956, Wright had developed the idea in 1929 for New York City's St. Marks Tower. Wright continued to experiment with similar designs in the Grouped Apartment Towers for Chicago, 1930 and Broadacre City of 1934. In 1940 still another version of St. Marks appears in the Crystal Heights project for Washington D.C.. However, the Price Tower remains the only derivation of the St. Marks design concept that was actually constructed.

As with most of Wright's designs, the Price Tower is idiosyncratic and not prototypical. It does not represent one of his best buildings; it was too small and constructed at a time when architects were concerned with other issues, such as the spacial expression of the Miesian grid. The design is specialized, with expensive detailing and a structural system which functions well only on projects of similar size. Although this design is difficult to use as a model there are still many useful lessons to be learned.

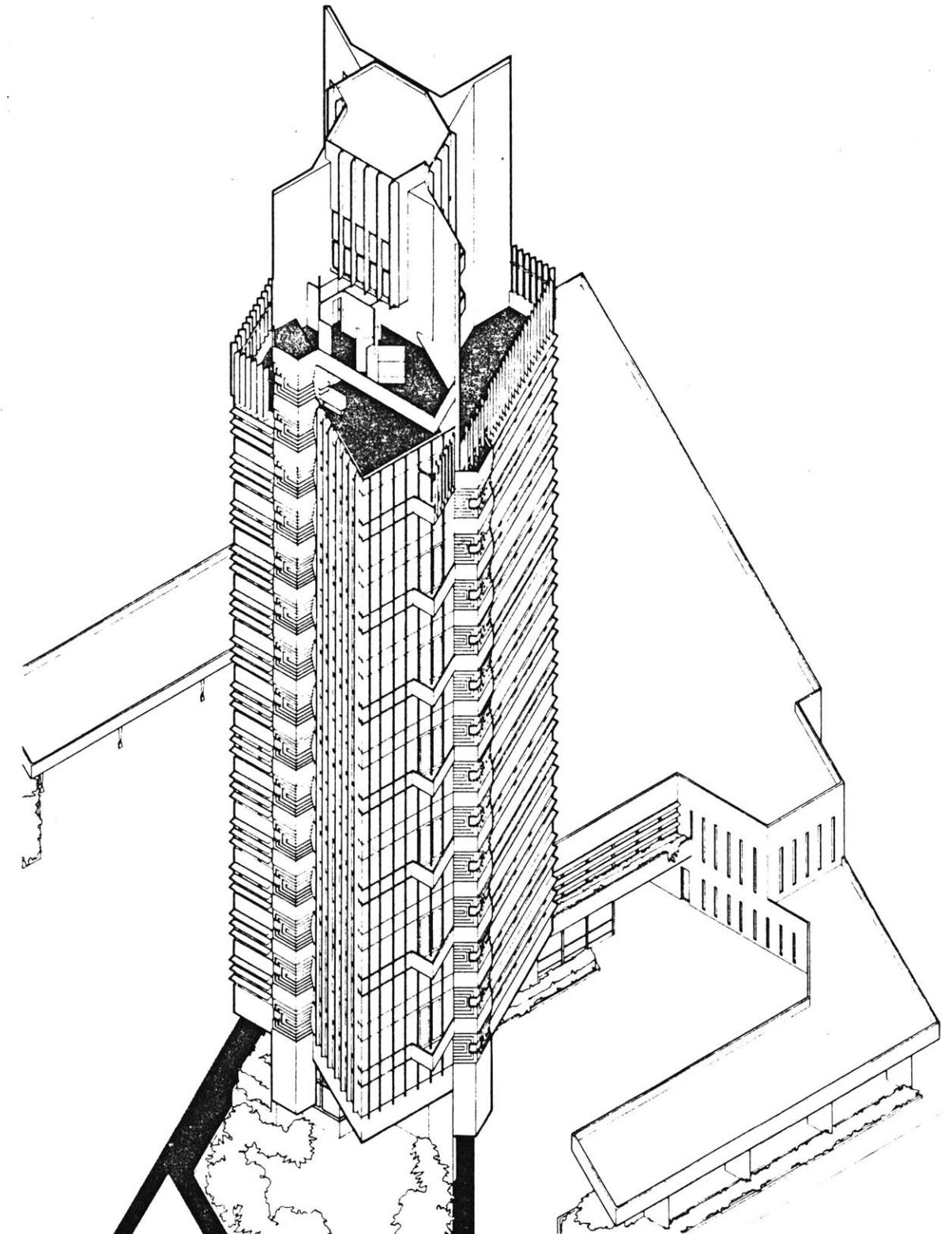
The essential design concept is for a freestanding tower with cantilevering floors from a central core. The plan is a rotated square resulting in the superimposition of a diagonal organization. Wright resolves the two directions within the same site with great delicacy. Unlike the St. Marks project which has a two story apartment in each corner, the Price Tower has only one corner residential and three corners of office. The addition of offices makes for a stronger "mixed-use" program and the spacial units are combined in an interesting way on the same floor (see diagrams). Unfortunately the Price Tower apartments and offices are all identical in size and do not yield well to additive growth or change. However, this work does represent great clarity in its use of materials and structure. The usual problems of a tall and slender tower meeting the ground are avoided by building up the surrounding ground level structure. This adjacent structure houses offices, shops, and parking.



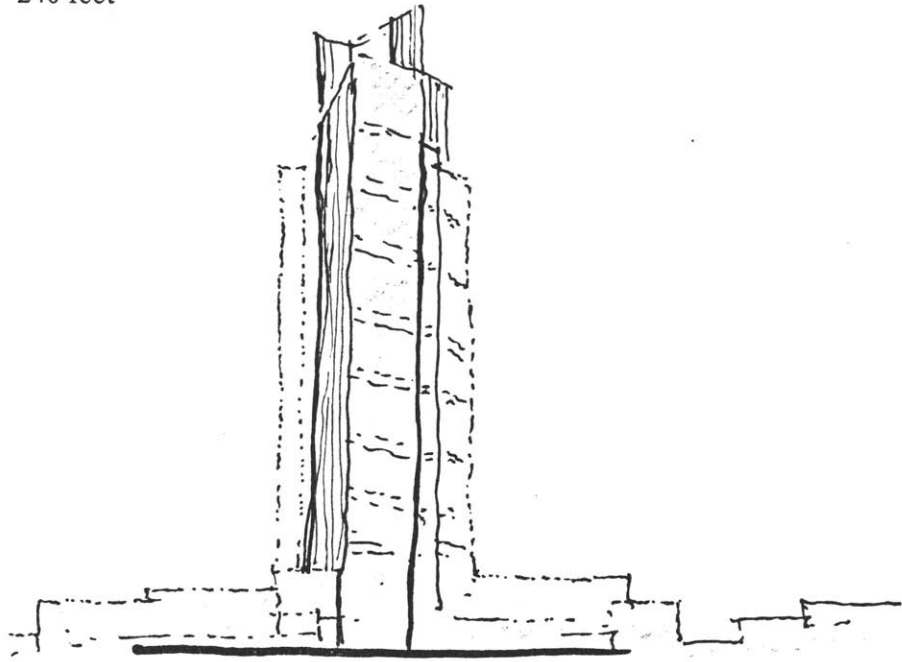
Upper Tower Plan

... The first expression of a tree-like mast structure was designed in a project for St. Mark's-in-the-Bouwerie, New York, 1929. The skyscraper is indeed the product of modern technology, but not suitable if it increases congestion. It inevitably would unless it could stand free in the country. This was the one planned as a feature of the model Broadacre City - so those from the city wouldn't feel lost in that vision of the country, and the Johnson Laboratory Tower is another such. ... The urban skyscraper, unintentionally, has hastened the process of decentralization. But, to the rolling plains of Oklahoma it goes as a fresh realization of the advantages of modern architecture yet unknown to the great city. As a tree crowded in the forest has no chance to become a complete entity-standing free, it may establish identity and preserve it.

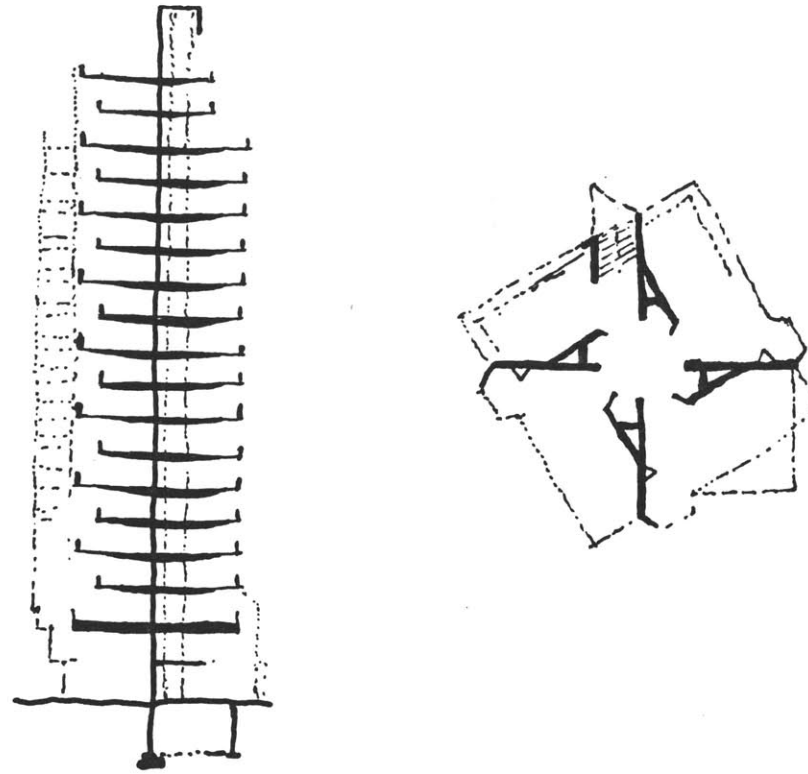
Frank Lloyd Wright : The Story of the Tower



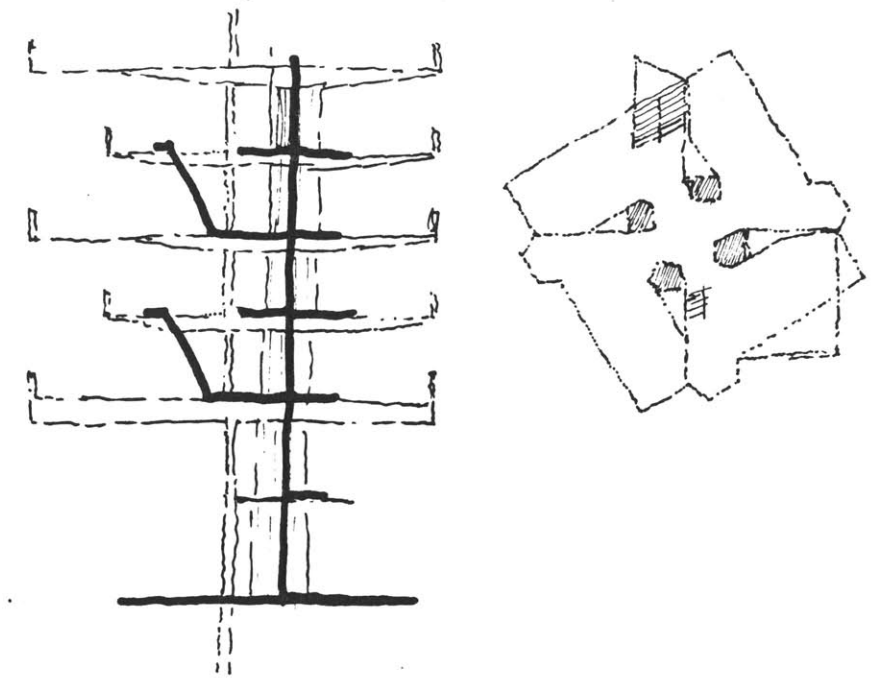
**PRICE TOWER**  
Frank Lloyd Wright  
Bartlesville, OK, 1953  
240 feet



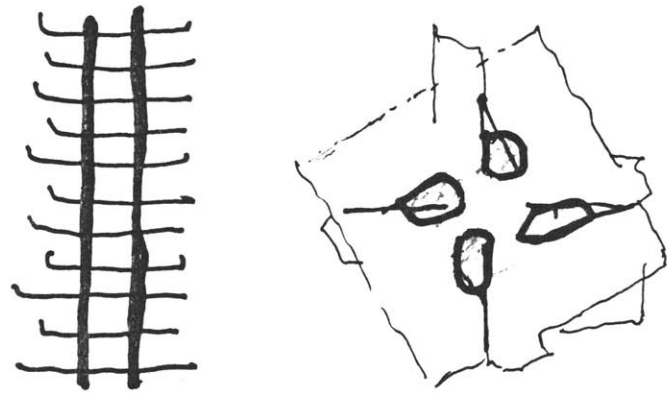
URBAN CONTEXT



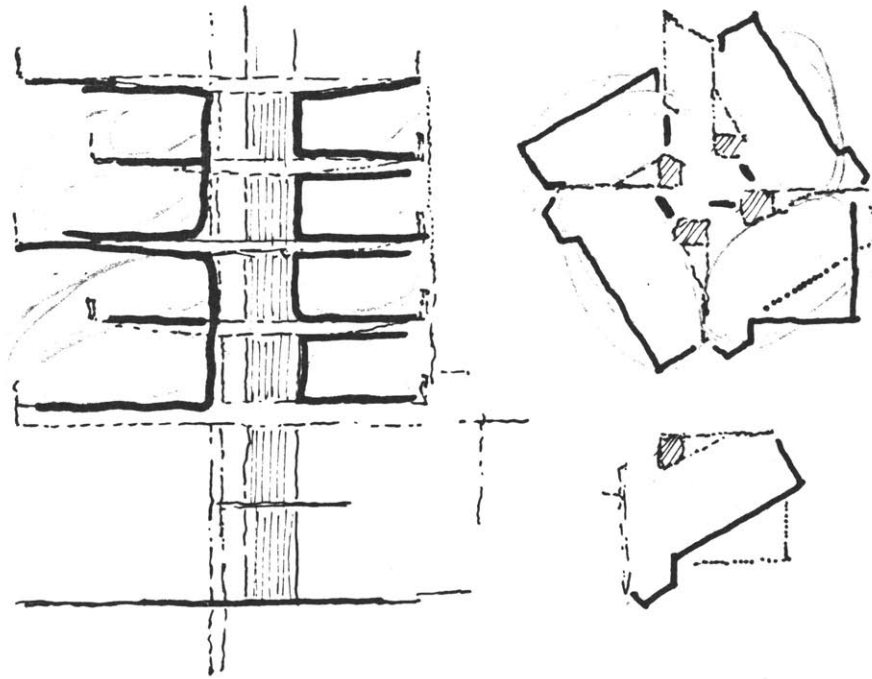
STRUCTURE



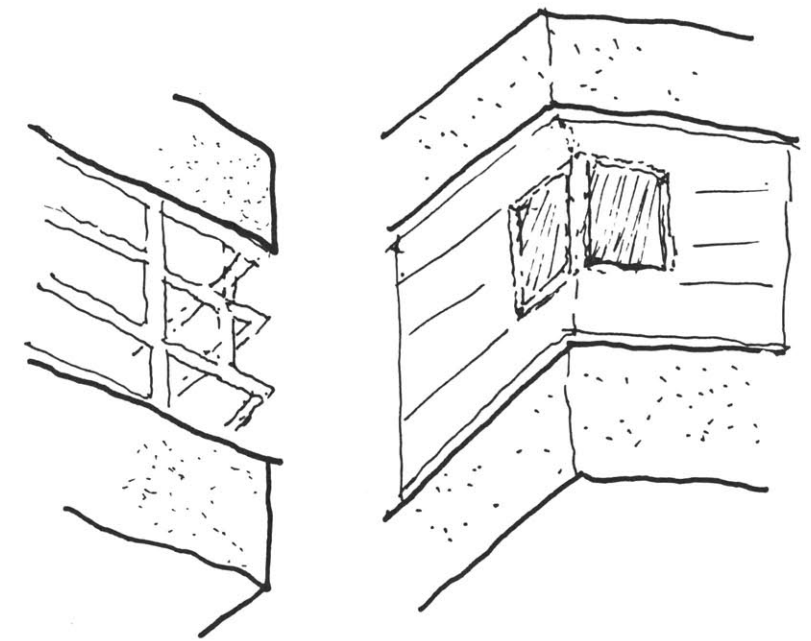
ACCESS



SERVICE/MECH.

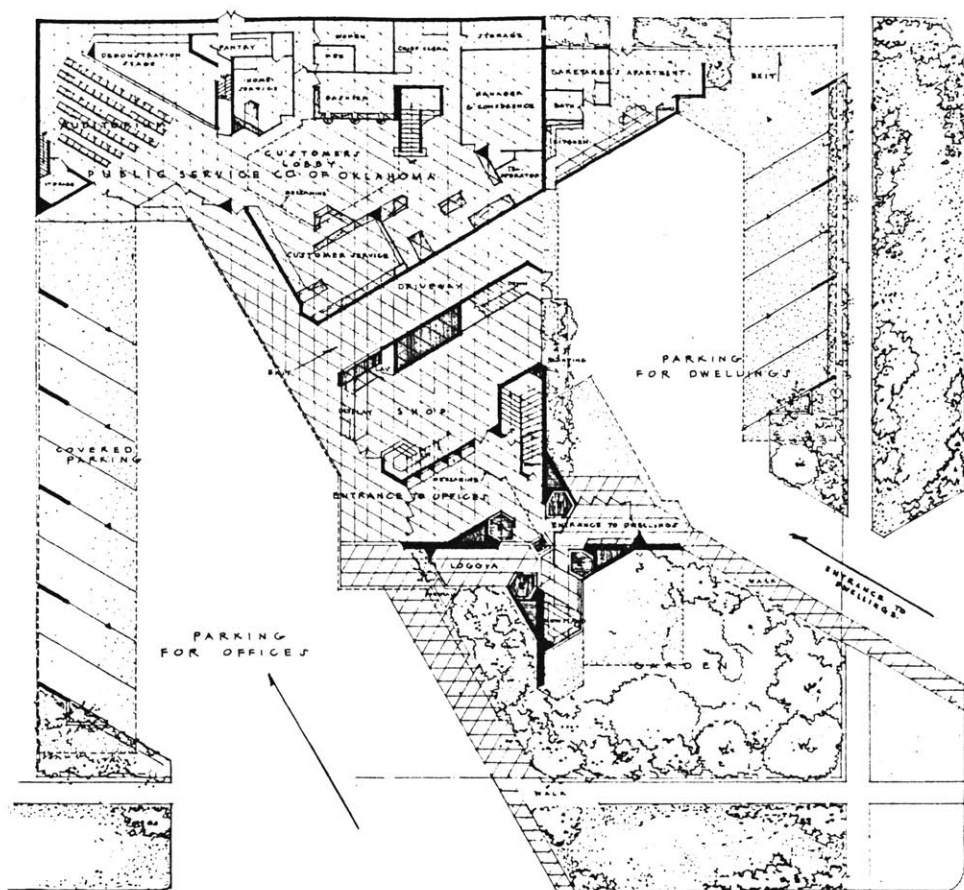


ORGANIZATION

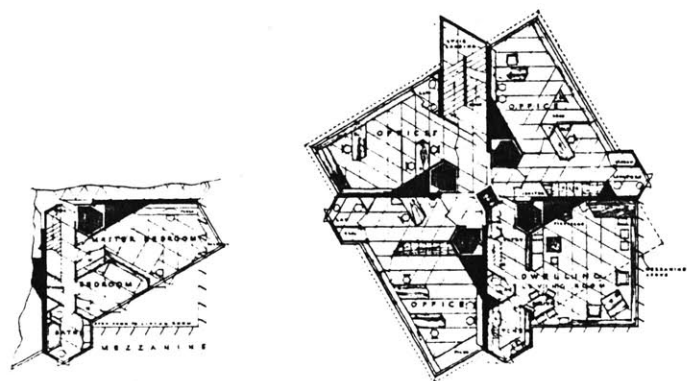


CLOSURE-DETAIL





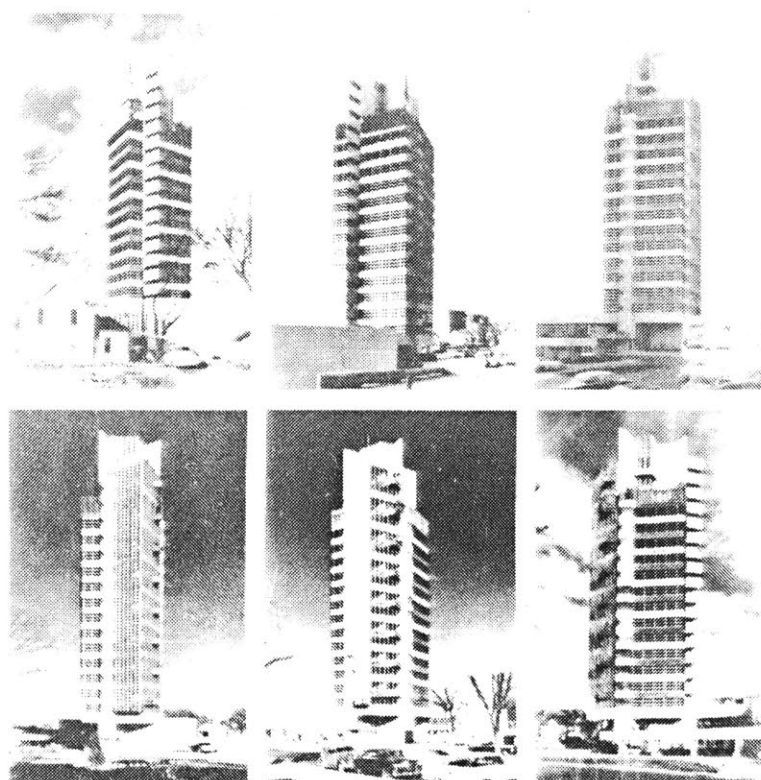
Entry Level Plan



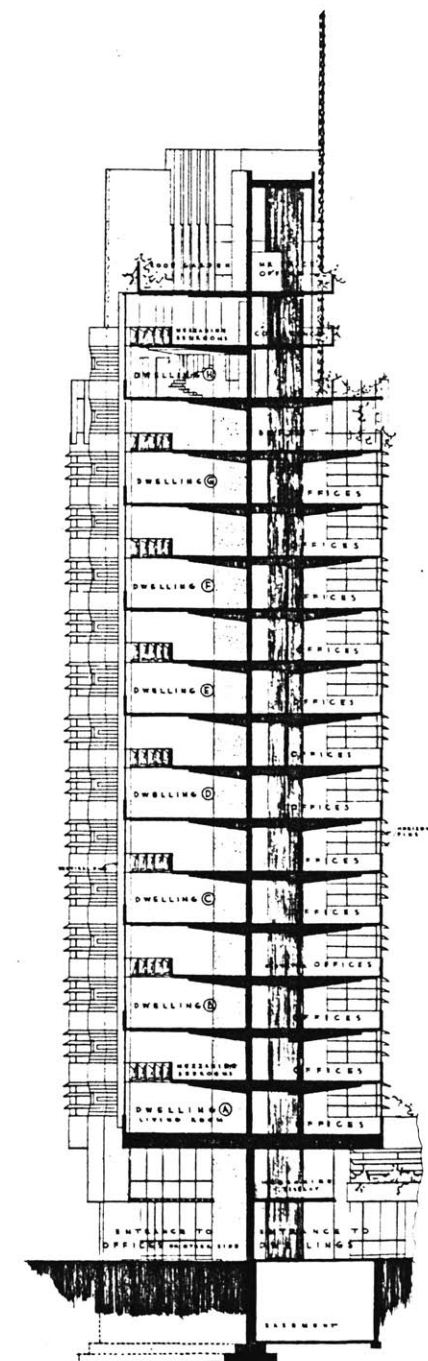
Typical Tower Plan

... Should tall buildings be allowed to cluster together, or should they be kept wide apart, guaranteeing light and air for everyone in each tower? ... Frank Lloyd Wright was particularly certain. He rejected the gathering of skyscrapers in business districts as a violation of the essential spirit of any tower, and cared little about the forces of the real estate market that would be thrown asunder by a system that would permit skyscrapers on one block and not on a site a block away.

Paul Goldberger : *The Skyscraper*



Typical Section





## NORMAN FOSTER

The HongkongBank designed by Foster Associates and completed in 1986 will without a doubt have a tremendous effect on the architectural profession for many years to come. Already known as one of the great buildings of its time; every aspect of the glass and aluminum-clad building, from its unusual pin-connected suspension structure to its precise robot-made cladding has been rigorously custom designed and detailed with an intensive investigation into every aspect of each architectural problem. This high tech structure represented by Foster assumes some of the tenets of Modernism, but pushes on to take its place as an opposite stylistic alternative to the Post-Modern pole.

The structure is perhaps the most striking aspect of the building. Four mast towers, each composed of four steel columns connected by haunched beams, act as large trusses which rise on the outside of the building envelope. Suspension trusses then hang the weight of the floors in the zone below, at five intermediate levels. These structural levels correspond to functional zones within the building. The overall structural effect is one of great tectonic clarity. The floors are virtually column-free which allows clear views of the harbor from almost all points, as well as flexible office planning.

The building is organized vertically in five above-ground zones, each served by a double-height truss floor. These additive zones help break down the anonymity of the tall facade. Horizontally all the transportation and mechanical shafts are kept to the east and west sides of the building allowing open space and light to the south, and views to the north.

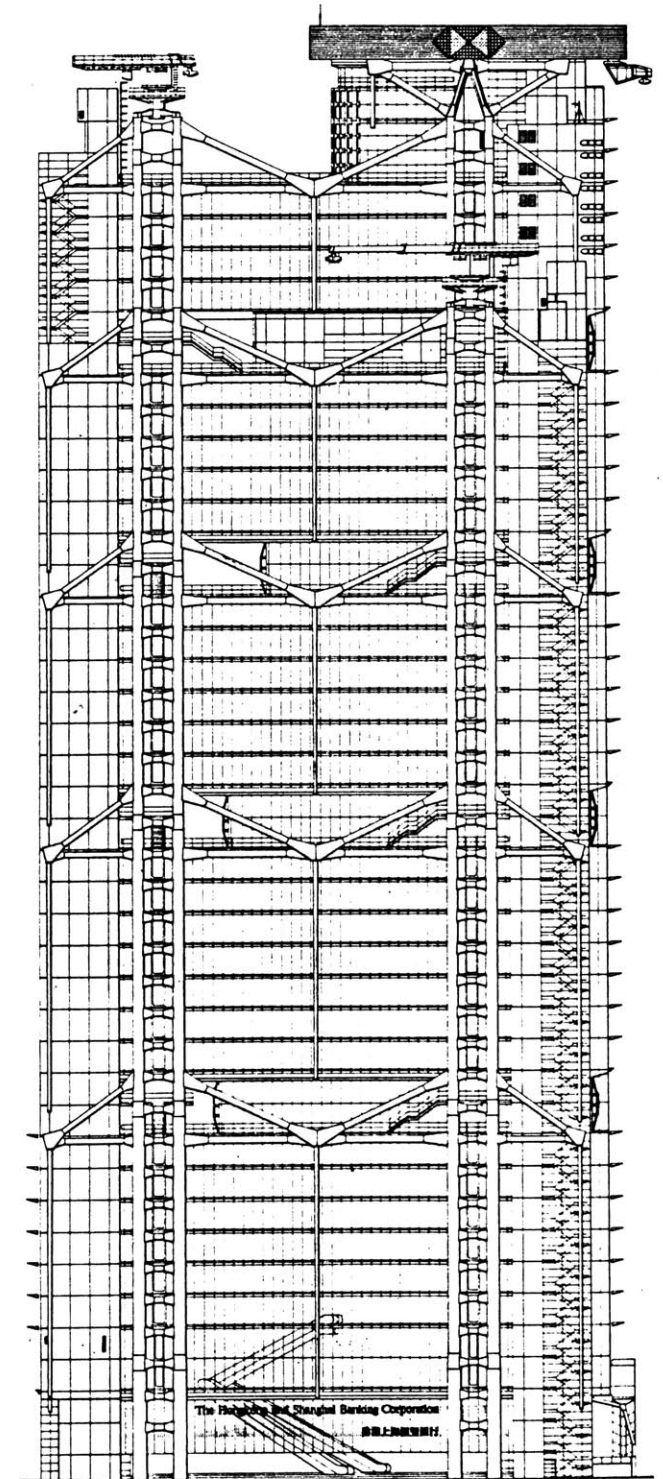
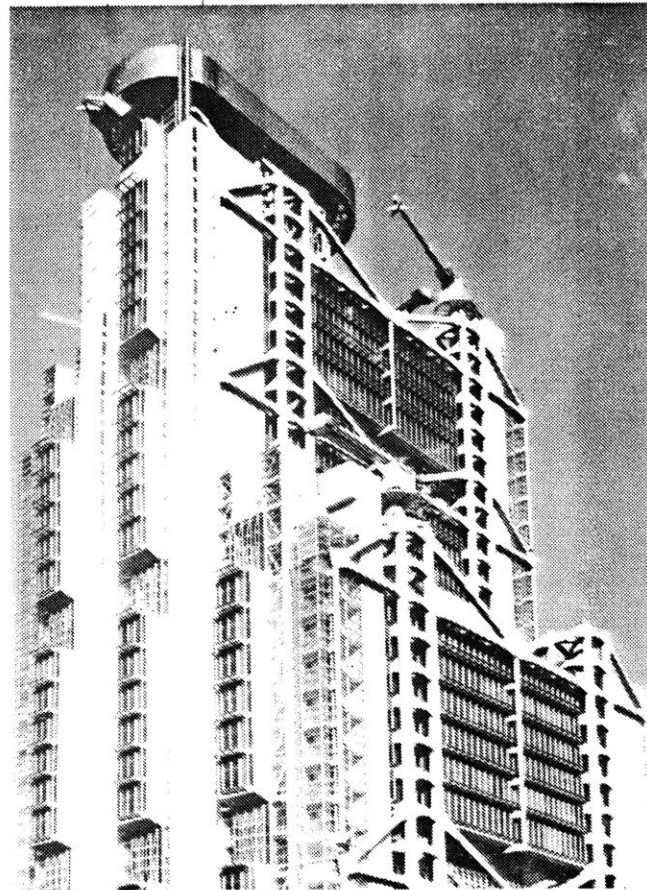
The mechanical services on each floor occupy prefabricated modules. It is interesting to note that the modules were manufactured by a consortium of Japanese companies. The capsul technology developed by metabolists like Kisho Kurokawa (see Nakagin Capsul Building case study) is still being refined and applied.

Both elevators and escalators are used for vertical transportation. High speed elevators, located on the west side of the building stop at the large double height structural zones which have special common functions. From these floors vertical circulation is by escalator, providing a more sociable and efficient way of moving through zones.

Urbanistically the HongkongBank is a framework building incorporating some of the earlier Japanese Metabolist attitudes of buildings as frameworks to accommodate growth and change. However, the structure already fills the envelope allowed by code so future alterations depend on unlikely changes in the Hong Kong Building Code. The major disappointment occurs at the ground level plaza. Once again the problem of the tall building meeting the ground has not been dealt with effectively. The problems with the plaza are conceptual as well as architectural. There is no understandable entry. The

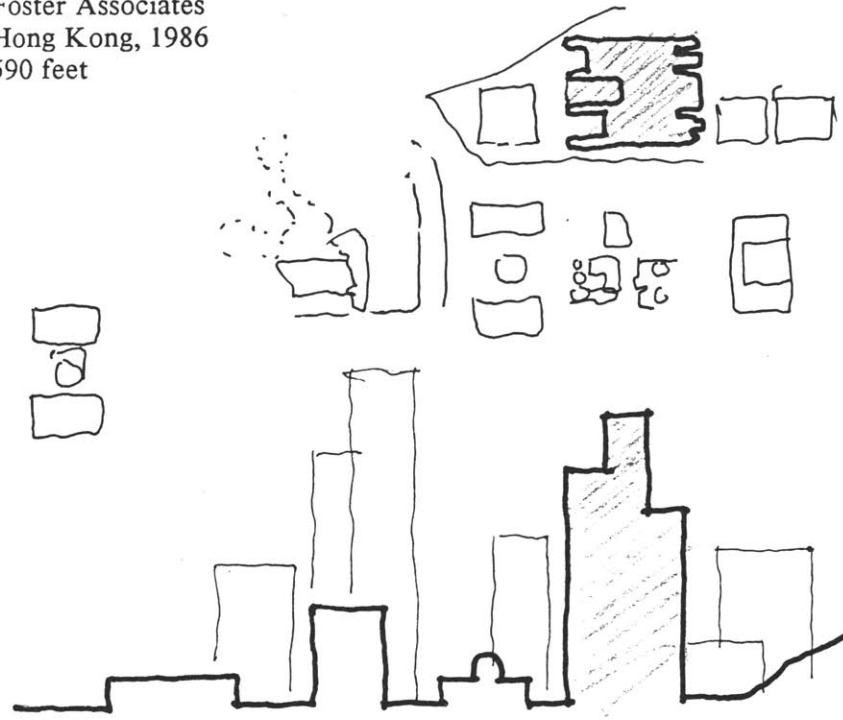
*... The HongkongBank's suspension structure is actually several suspension structures stacked on top of one another. Suspended high-rise construction is not a new idea, although no building has used it to the extent or in the configuration here. Nor is suspended construction the most efficient for high-rise structures, since loads must travel farther up a hanger, along a truss, and down a column to reach the ground. But Foster Associates and Ove Arup Partners have used suspension to best advantage. By stacking several smaller suspension structures on top of each other, they have reduced the travel distance of most loads while retaining the benefits of suspended construction: opening up the ground level, minimizing the foundation area, and reducing the floor space devoted to structure.*

*Susan Doubilet, Thomas Fisher*

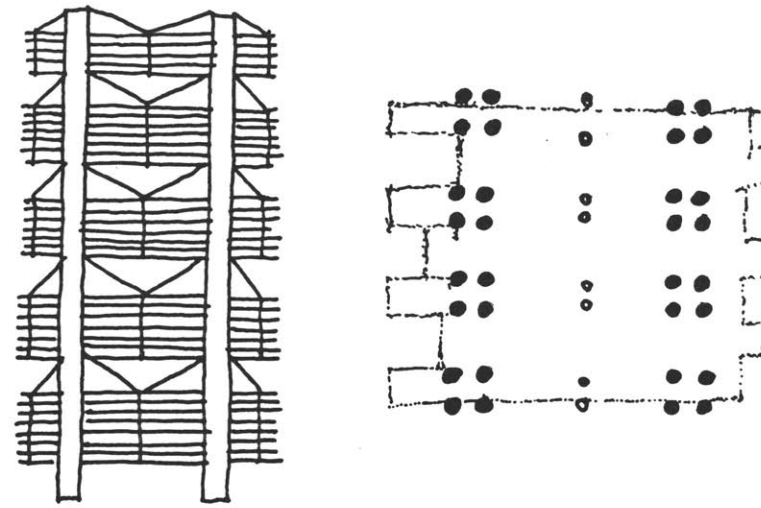


North Elevation

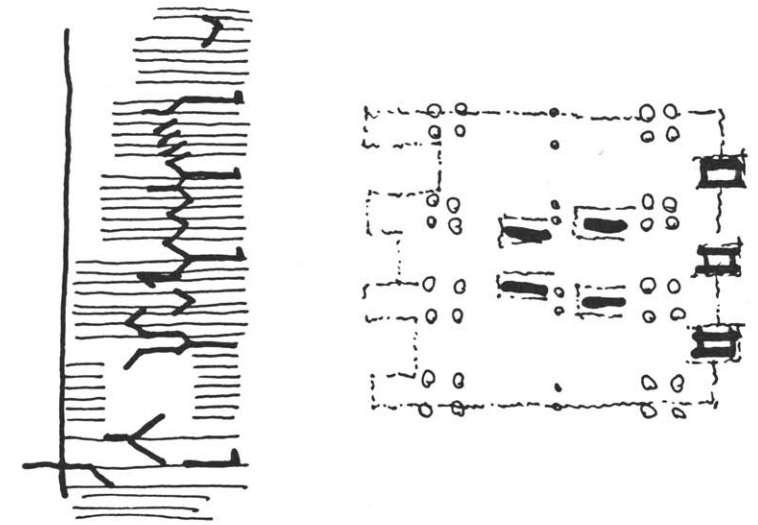
**HONGKONG BANK**  
Foster Associates  
Hong Kong, 1986  
590 feet



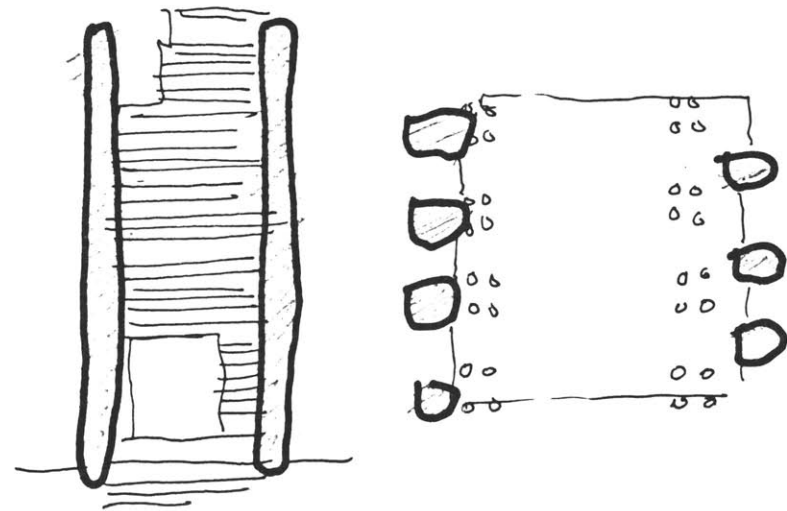
URBAN CONTEXT



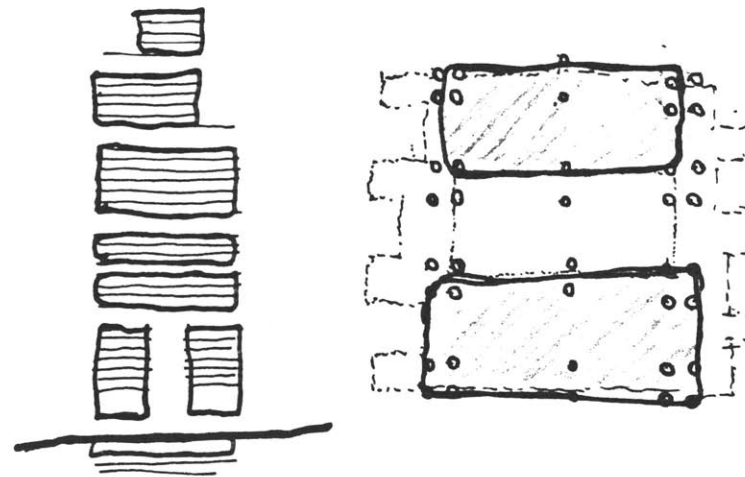
STRUCTURE



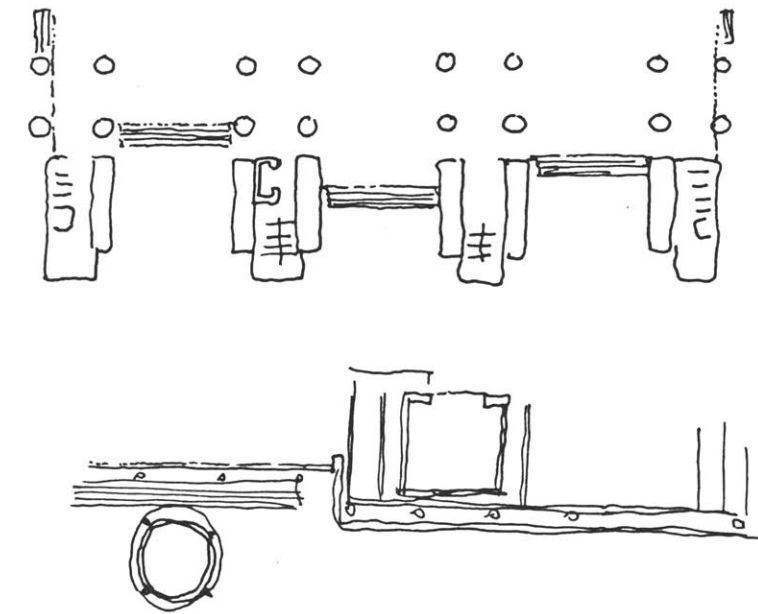
ACCESS



SERVICE/MECH.



ORGANIZATION



CLOSURE-DETAIL



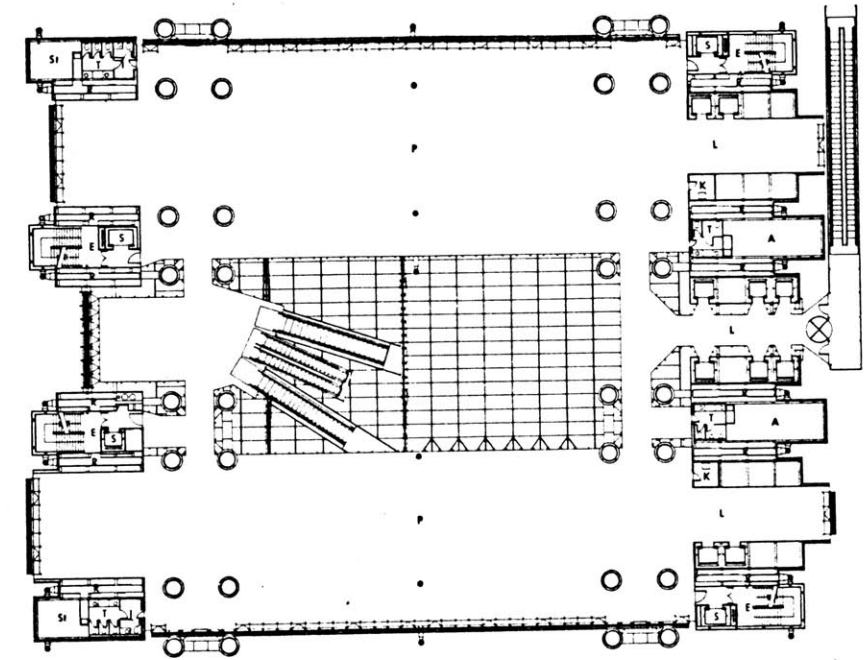
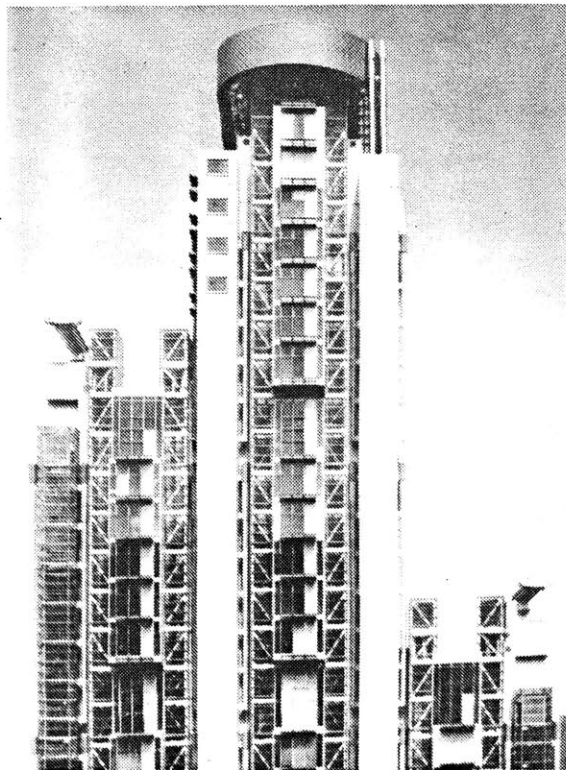
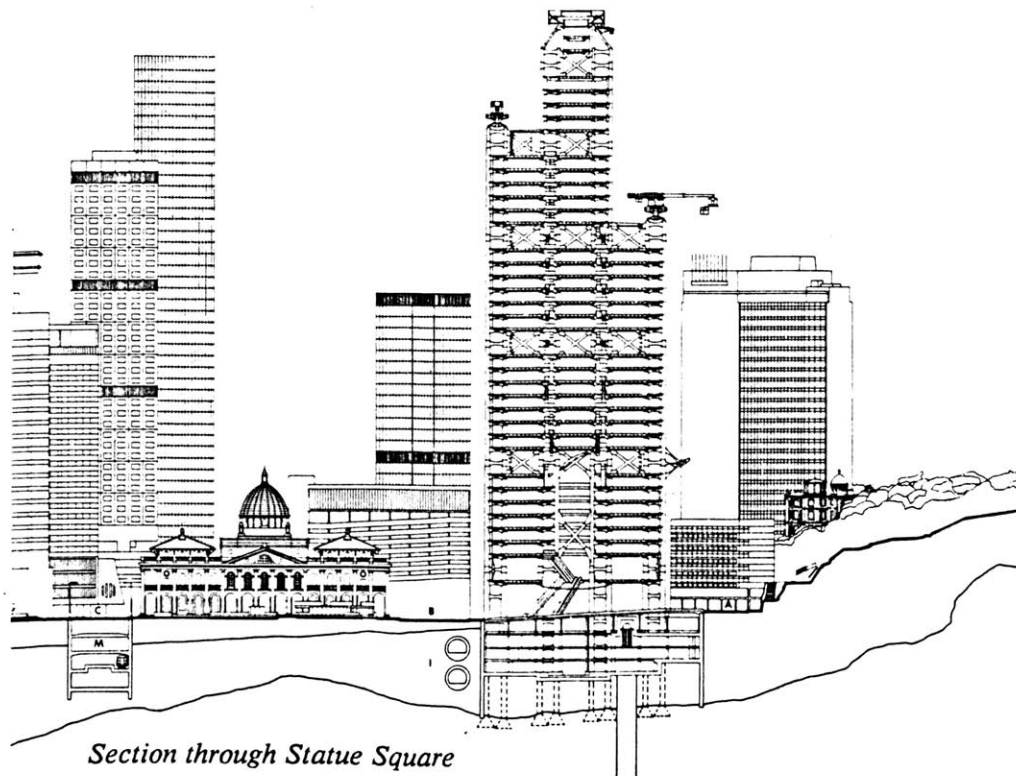
uninterrupted public passages at the base of the building lacks any commercial or architectural interference; thus the plaza becomes uninhabitable and the entry undefined. Why does some of the structure not escape the building and help define the open plaza under and to the north of the building? The structure remains a singular form.

As an interior environment the HongkongBank reaches superb levels and the stylistic, social and technological implications of this tall building will perhaps help reshape our thoughts concerning the high density tall structure. While we are no longer involved in heated debates over Post-Modernism, the issues of "style" have yet to be resolved. The HongkongBank will certainly add some degree of clarity to the debates.

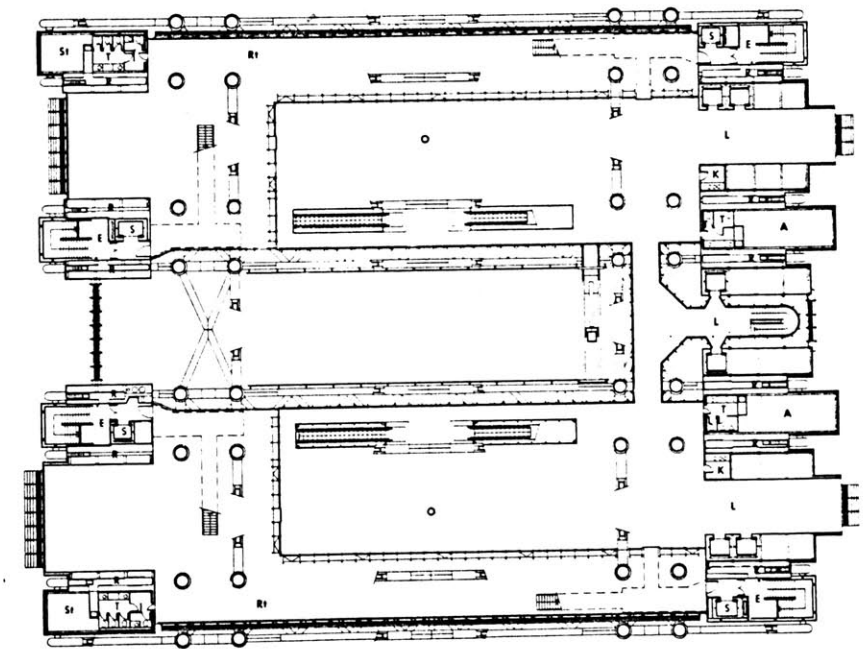
... University of London economist Marion Bowley has written that "the traditional organization of the (architectural) profession is not appropriate for providing the design services required today," and a "new profession is required in addition to, or in replacement of, the existing one."

Foster Associates have demonstrated a possible model for that "new profession": In designing the bank, they involved engineers even as they developed their schematic design, and the solution was as much an engineering solution as a design solution. Appearance and technology were closely wed, down to the finest details. Each of the various architects in the firm specialized in some aspect of the building - the sunscoop, the cladding, the flooring - which greatly increased accuracy in detailing, costing, and scheduling of the project. If the building industry is to advance, says Bowley, "designers (should be) taking positive steps to initiate innovation," and in the bank, the architects took an active role in developing new products.

David Bonavia



Level 3



Level 11/12

Typical Floor Plans



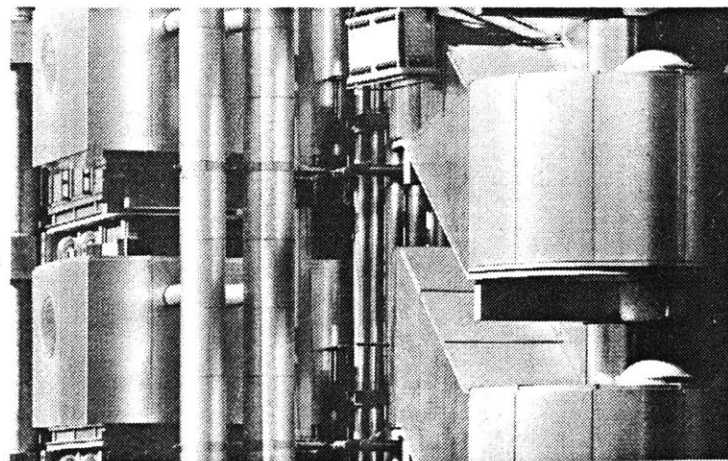
## RICHARD ROGERS

Like Norman Foster's HongkongBank, to which Lloyds will inevitably be compared, Richard Roger's building is a superbly detailed high-tech environment. Both Rogers and Foster share a common belief in the rationalism of prefabricated components and exoskeletal structure, often achieved in close collaboration with the same engineers.

Rogers design uses a rectangular clear span at the center of the site. The plan is of the traditional "donut", but the services and core elements have been removed from the center of the building and placed in six locations on the exterior. The deceptively simple plan focuses inward to a large atrium.

As with the Pompidou Center in Paris, Rogers attempts to enliven the ground floor of Lloyds with public activities, such as a cafe and book shop. However access to the ground floor activities is made from a walkway which is a half level below grade, creating a loss of continuity with the street. The activity at the ground-plaza does help the entry into the building, but again with so much primary and secondary structure, one might expect some to escape the building setting up clues and opportunities for change and additive growth in the larger urban fabric. Although not to the same degree as the HongkongBank, Lloyds remains very singular in form, but it is certainly a step in the right direction. Another problem would seem to be the immensely over-scaled 240 foot high atrium. Due to the atrium's slender proportions, it would seem unlikely that natural illumination could make any serious contribution to the interior environment at the lower levels.

Both Foster's Bank and Rogers' Lloyds have been met with a good deal of skepticism. Opponents of the two works continue to dismiss the high-tech mechanization as expensive and devoid of any real innovation. However, the strength of both projects lives in their rigorous application of the most current engineering and construction technology. From these two structures new forms for the high density structures can be visualized. Frameworks of primary and secondary systems could link larger parts of the urban fabric and creating larger and more habitable continuities.

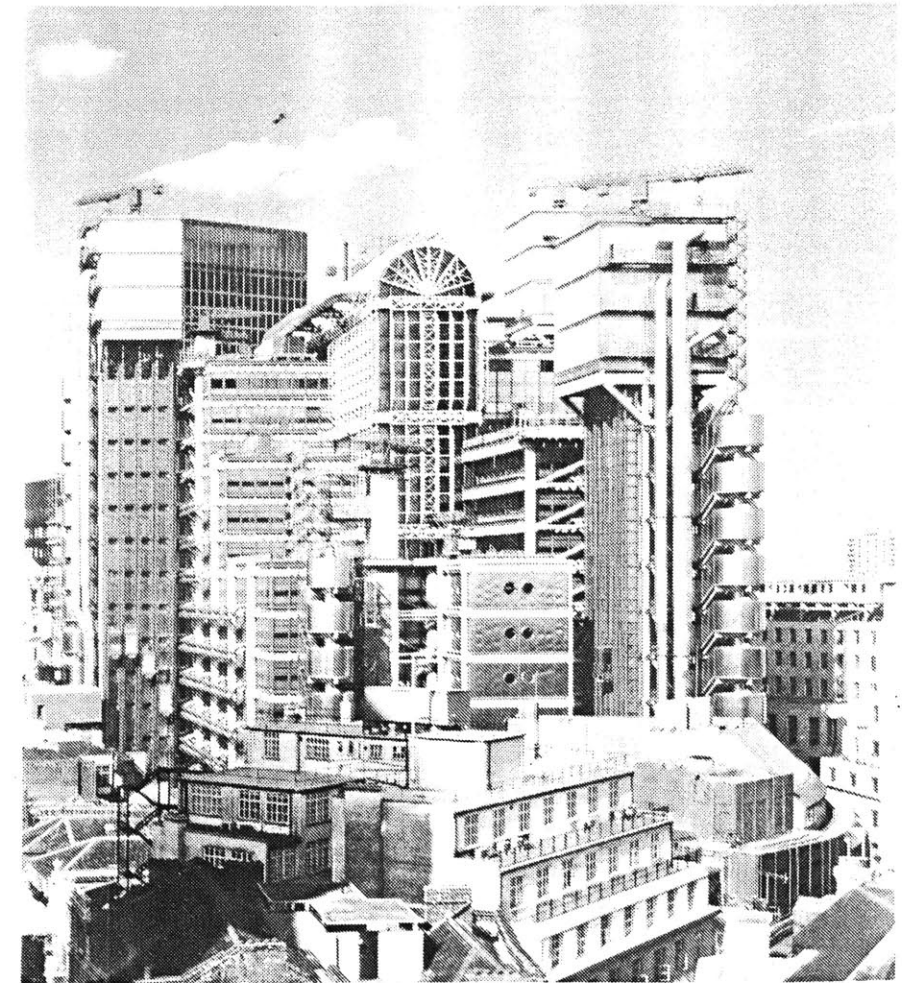
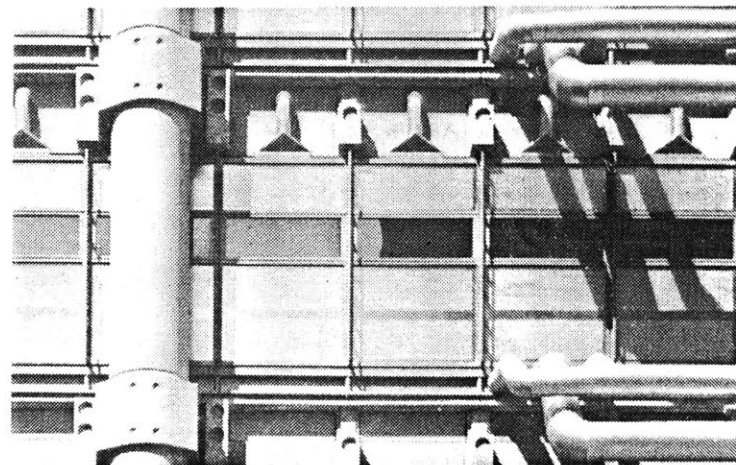


*... It is a building that maximizes the site envelope and looks inwards on its own environment, while seeking to open up the ground level for public use and so present a human scale to passers-by. Rogers' have brought services from the core to the perimeter, making possible a complex and finely detailed facade that echoes the structural honesty of Victorian buildings such as G.E. Street's Law Courts. They have also provided large, clear floor areas that will be able to take on a variety of architectural styles and layouts as the needs of individual users change. Finally with Lloyd's, Rogers' have reflected the reality of today's offices, which use as little as 30 per cent of the lettable space for people and need the rest for machine rooms, meeting space, reference areas and amenities.*

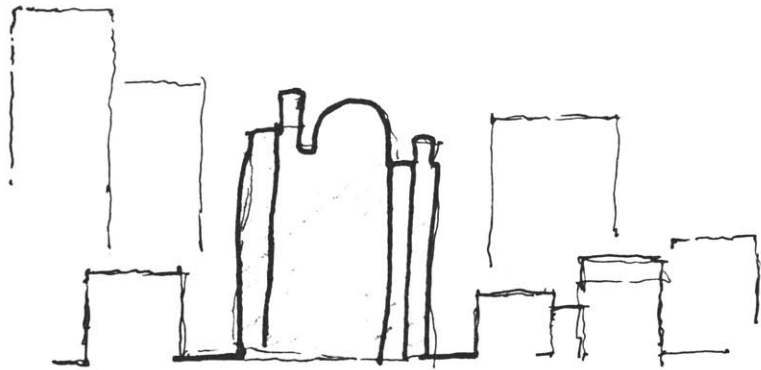
*John Worthington : "Beyond The City Limits",  
Designers' Journal*

*... While Foster concentrates on single-mindedly devising the perfect object with Miesian elegance and restraint, Rogers assumes a more ad hoc approach to a changeable kit of parts that gives his building a less finished look. "Norman has the wonderful magic of making everything look absolutely completed and wrapped," states Rogers, who characterizes his own creative process as "a more open-ended proposition between transformation and permanence."*

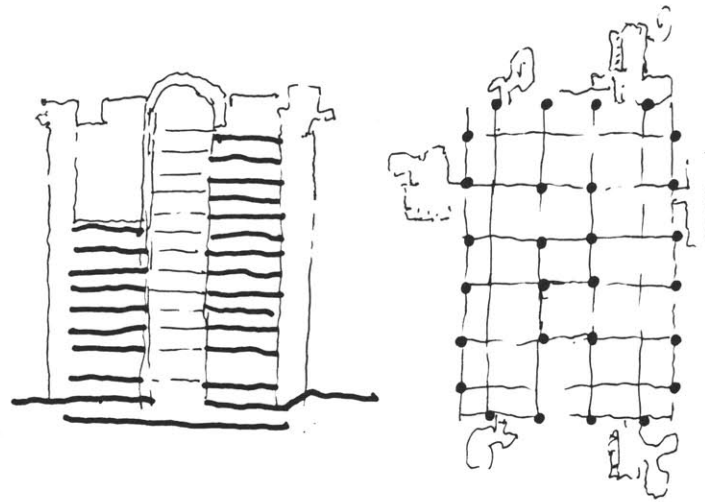
*Deborah Dietsch : Architectural Record*



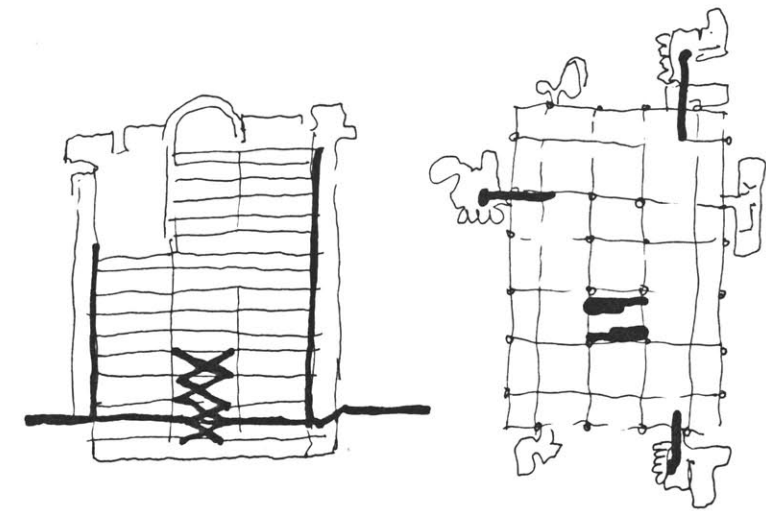
**LLOYDS**  
Richard Rogers  
London, England, 1986  
260 feet



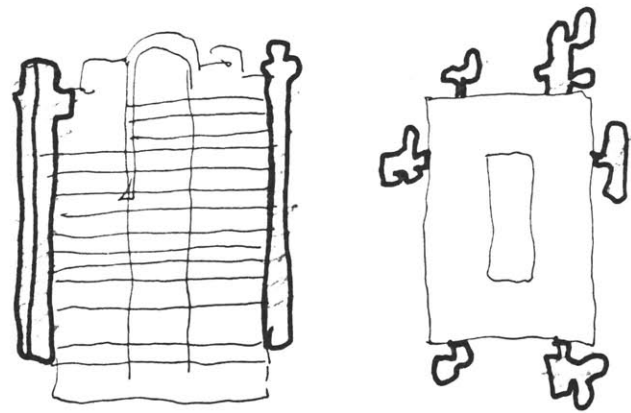
URBAN CONTEXT



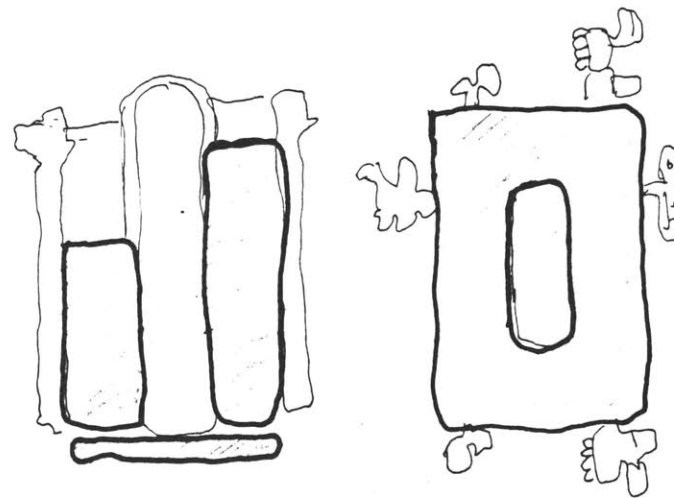
STRUCTURE



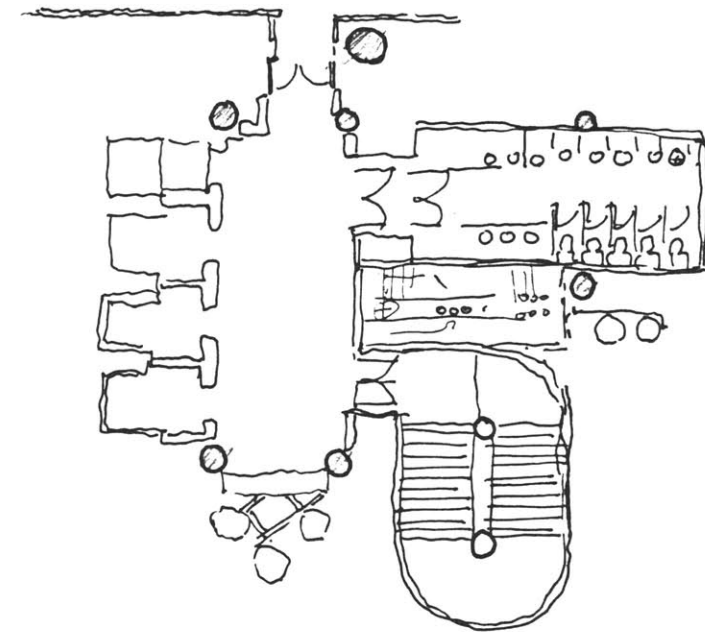
ACCESS



SERVICE/MECH.

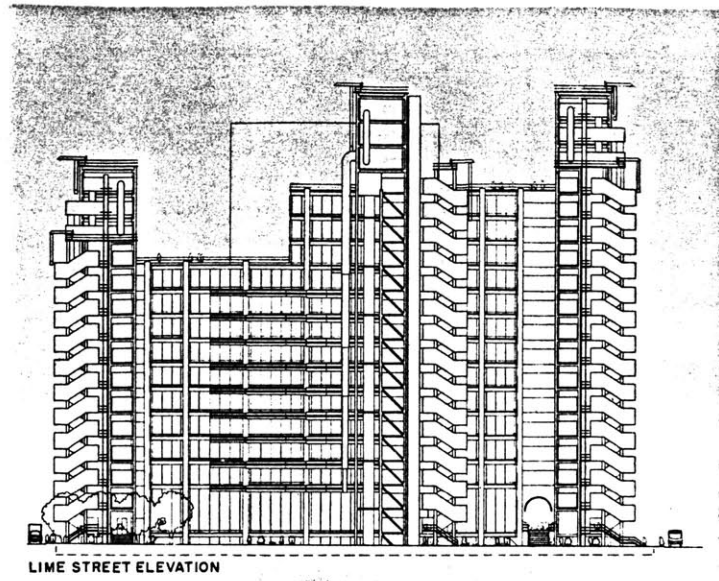


ORGANIZATION

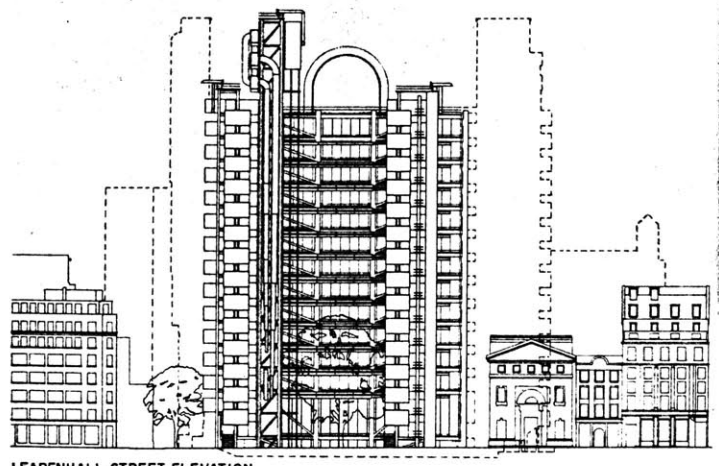


CLOSURE-DETAIL





LIME STREET ELEVATION

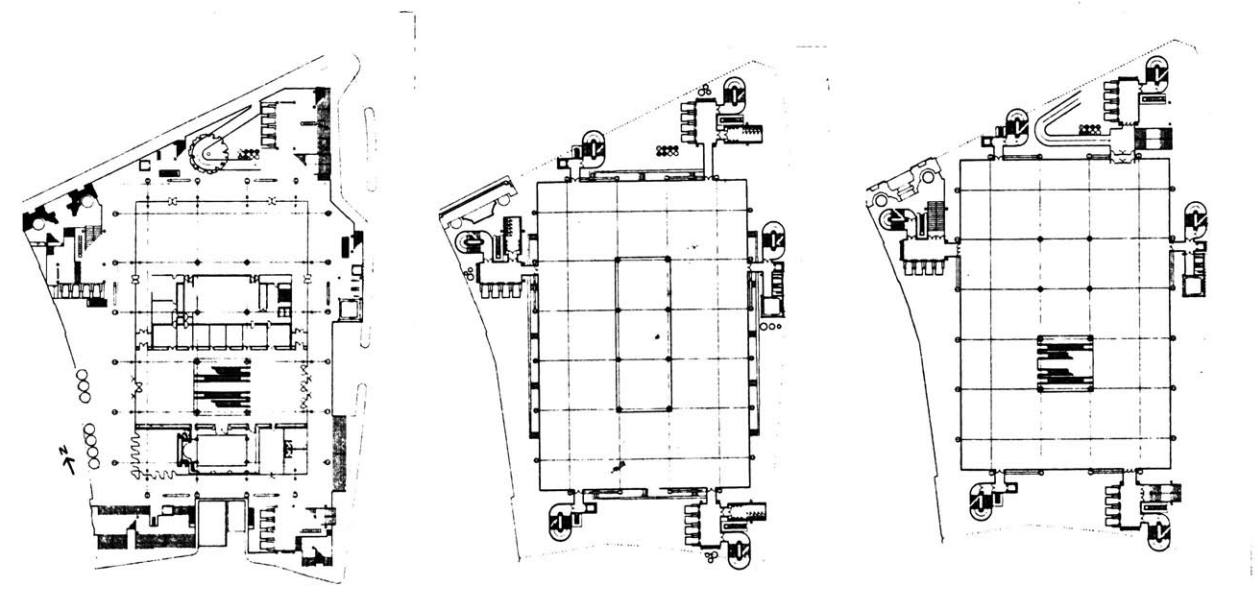


LEADENHALL STREET ELEVATION

Elevations

... Lloyd's takes the conventional thinking of the real estate market of the late '60s and '70s, and turns it on its head. It is the perfect diagram of building form to match the needs of the emerging financial services market: large floor plats of medium depth giving continuous space, undisturbed by vertical service shafts or structure, and able to absorb hot spots and clumps of cabling wherever they occur. It is the prototypical building for the financial revolution, ...

John Worthington : "Beyond The City Limits", Designers' Journal

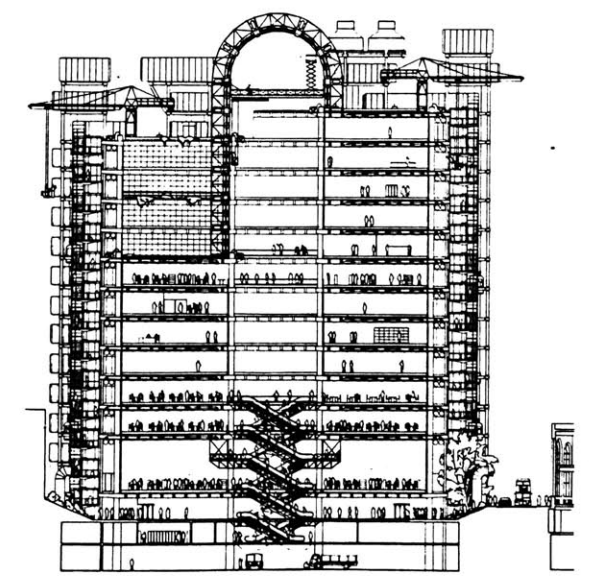


LOWER GROUND FLOOR

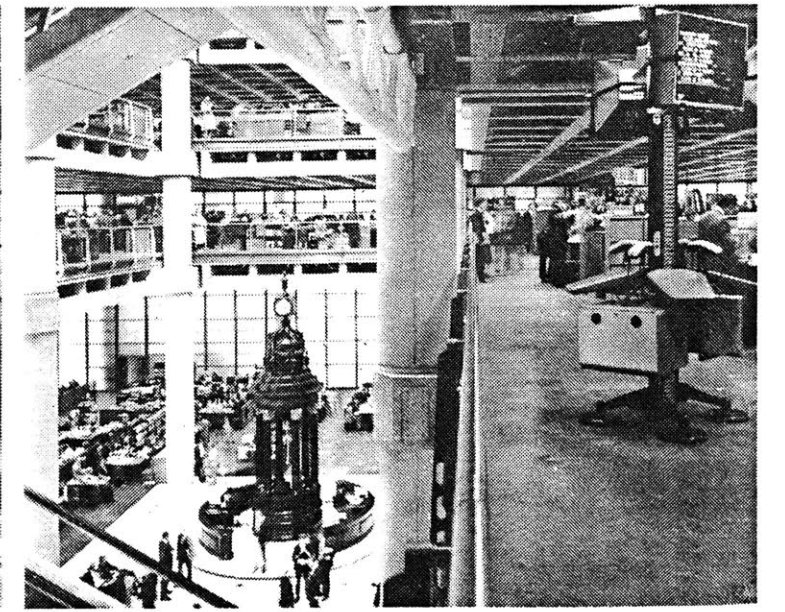
GALLERIES 3, 4, 5 AND 6

ROOM LEVEL

Typical Floor Plans



East-West Section





## JOSE LUIS SERT

Sert, Jackson and Gourley Associates were commissioned to design a Student Union for Boston University Charles River Campus in 1959. In choosing a site for the Student Center, it became apparent that a study of the Central Campus was necessary. The result was a new campus plan and scale model which made the University aware that some high-rise buildings would help solve its problems.

The Law and Education Tower, 1960-1965, is part of a series of buildings on the B.U. campus which have been carefully designed and treated as an urban complex. The architects tried to give a feeling of continuity and an animated skyline to the whole. Although none of the buildings stand alone, the Tower is, in itself, quite remarkable. Perhaps Boston's best tall building, this structure is outstanding in its massing and its use of secondary detail and closure systems.

Elevator shafts divide the building into two vertical sections, while large classrooms determine the horizontal breaks. Changes in fenestration occur where called for by special research areas or darkrooms. Although the large vertical volume of the Tower dominates the other buildings on the surrounding campus, Sert's clear and additive use of the secondary closure systems completely humanize the scale. There are several different types of glazing in the building ranging from clear to opaque. Concrete panels and screens are also used for closure. All the different volumes, shapes, textures and variations are related to a strict dimensional system which is based on an individual module of human dimension.

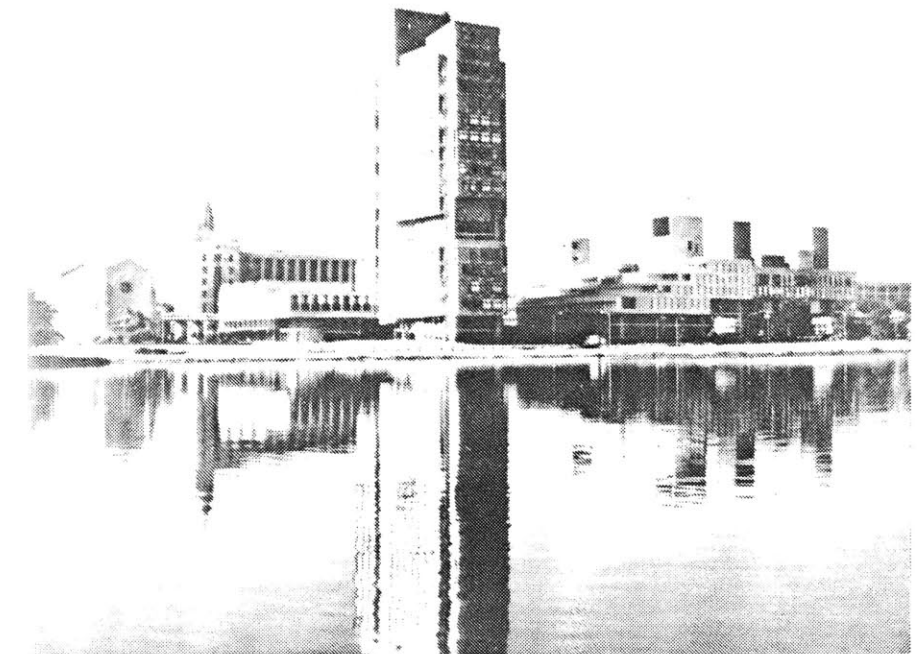
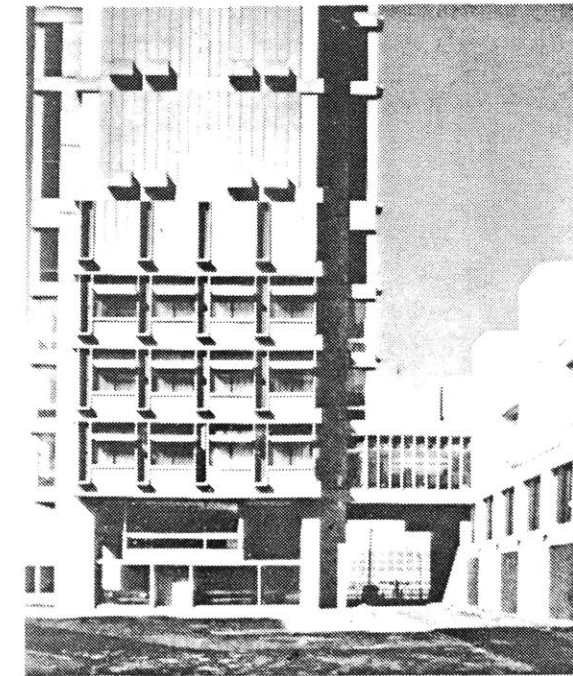
On the west, the Tower is linked at the third level with the Law Library. On the east side, there is a plaza at the second level linking the Tower with the Student Union. On the south, there is an open courtyard at ground level. Variations in space and entry at the ground level are also successfully accomplished.

If this building has a weakness it is in the interior spaces. Here the building loses its associative quality and the use of materials, primarily concrete, seems cool and unfriendly. Unfortunately the same excitement that is found on the exterior is not apparent in the interior spaces. The same warmth in secondary closure should also be expressed in the interior. The classroom, office and research spaces have not been easily changed and adapted with time.

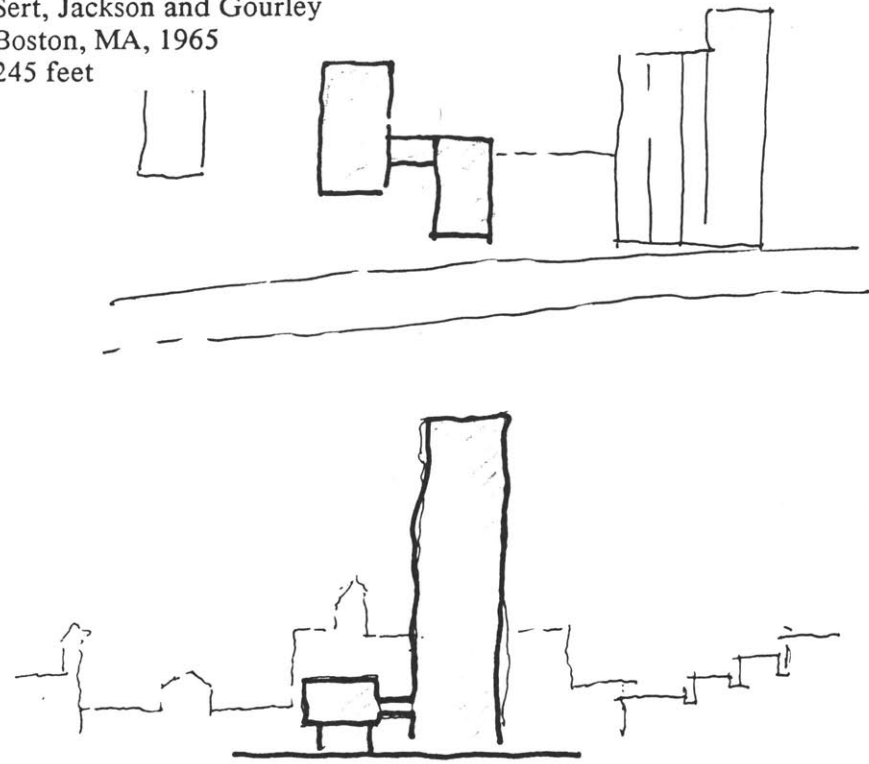
Many areas which are trying to grow within our tightly congested cities present special urban design problems, not unlike those Boston University has faced. The B.U. Law and Education Tower and surrounding buildings provide us with an outstanding example of how to establish linkages and continuities between independent structures on the urban scale. The Tower itself is an outstanding example of a thoughtfully designed and detailed tall structure which adds much to its immediate urban surroundings.

*... The curtain walls of metal and glass have made the rounds of the world by now. They are visual evidence of U.S. influence in the remotest cities, like "Coke" ads and blue-jeans. Curtain walls for office buildings, with modules that repeat from bottom to skyline (even masking mechanical equipment on roofs), have wide acceptance. They are the facades of anonymity. They serve the average bureaucrat, whatever his work is, whatever his likes or dislikes for privacy, view, or sunlight. They are grouped in continuous lines or checkerboard patterns. The architect selects one window type then repeats it in all directions. The resulting music has the limitations of that which could be played on a guitar with one string.*

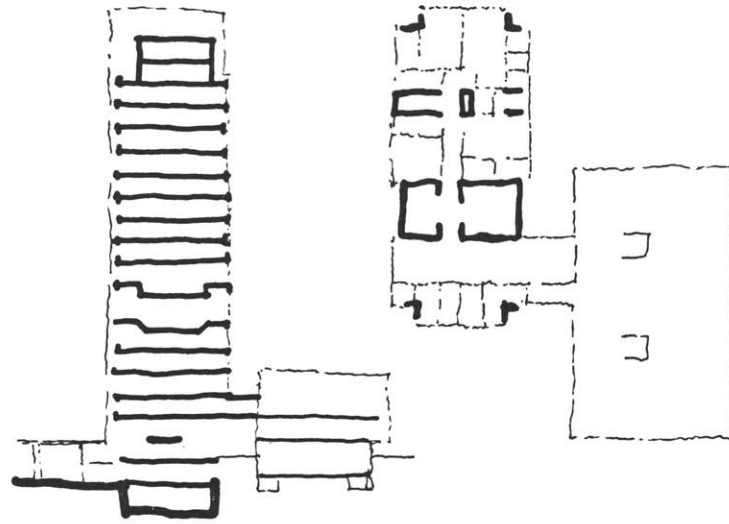
Jose Luis Sert : "Windows and Walls"



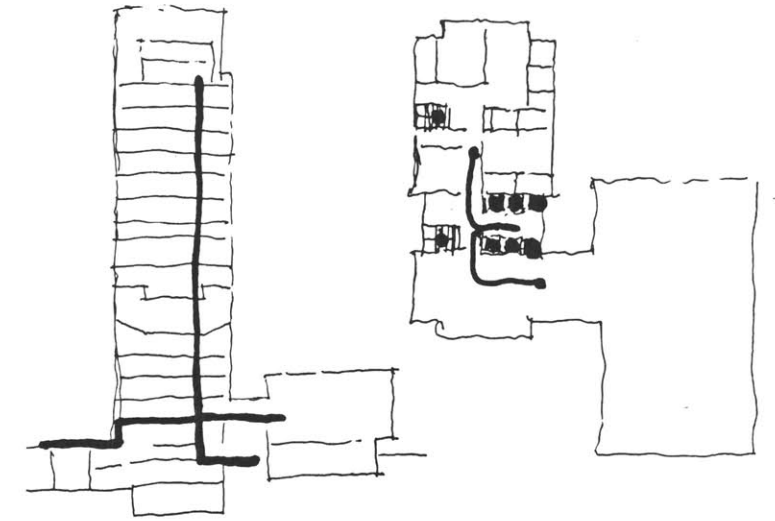
**B.U. LAW TOWER**  
Sert, Jackson and Gourley  
Boston, MA, 1965  
245 feet



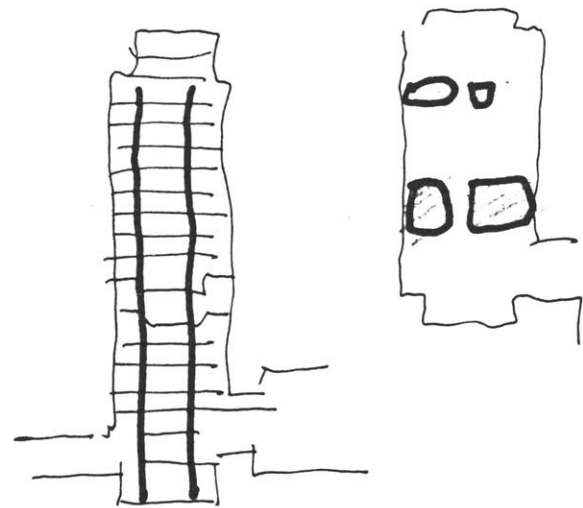
URBAN CONTEXT



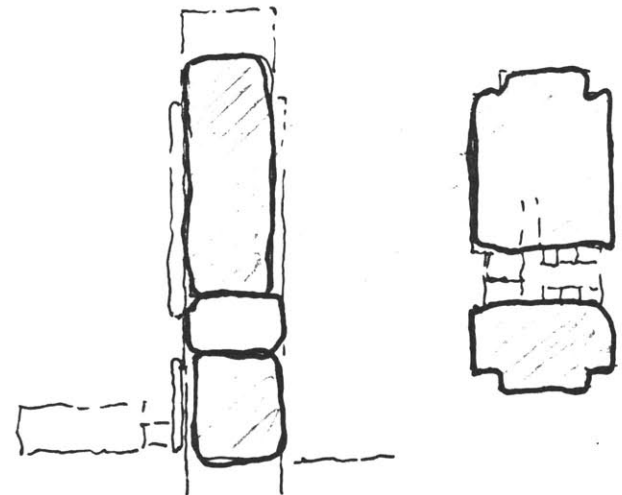
STRUCTURE



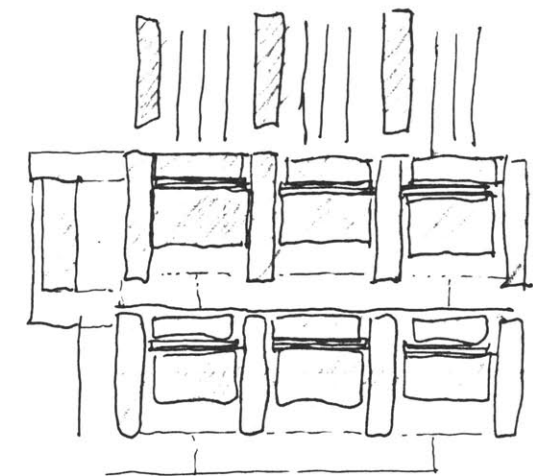
ACCESS



SERVICE/MECH.



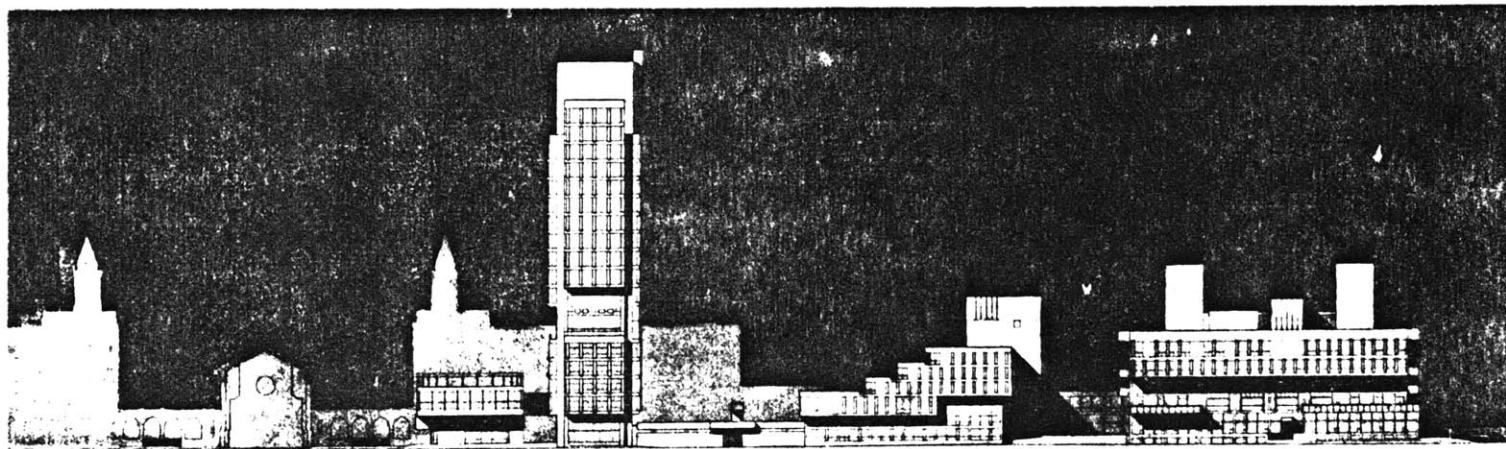
ORGANIZATION



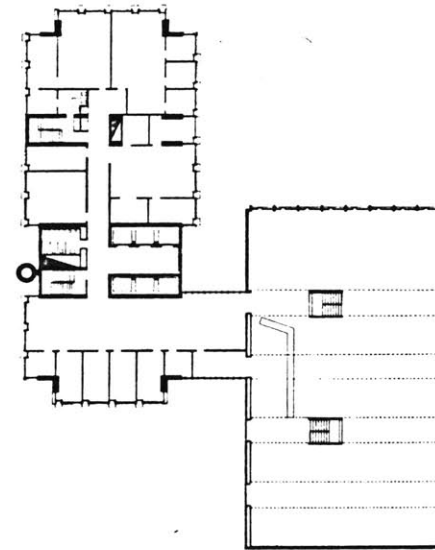
CLOSURE-DETAIL



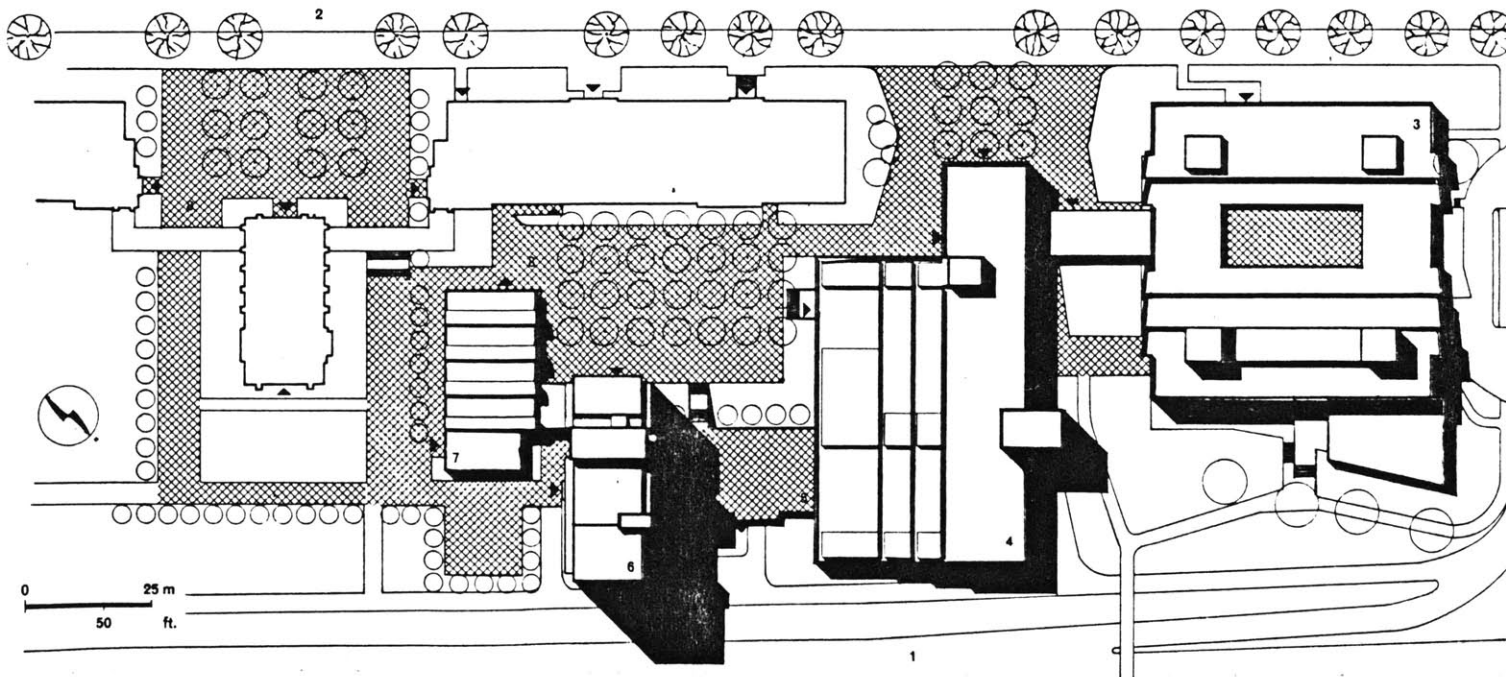
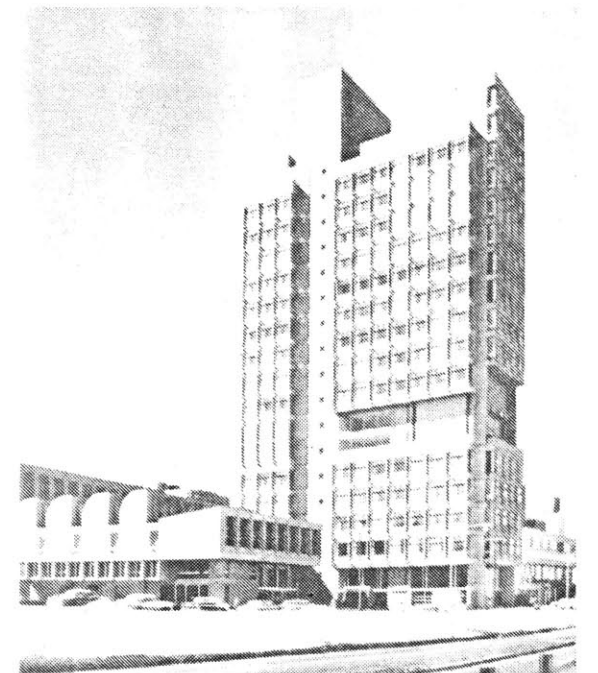
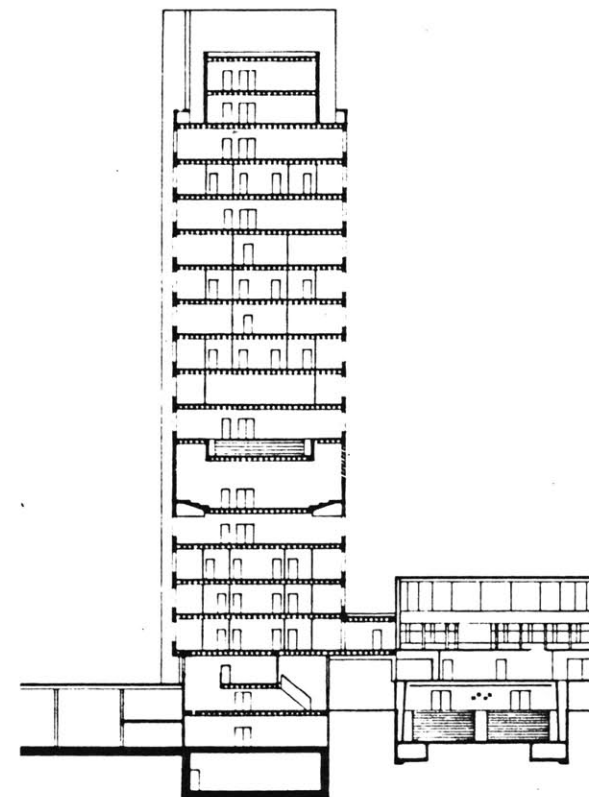
Site Plan, North Elevation



Lower Level Plan



Typical Section





# PEABODY TERRACE

## JOSE LUIS SERT

In 1962 Sert, Jackson and Gourley designed the Peabody Terrace complex for Harvard University. The building complex which is mainly married student housing consists of three towers of twenty-two stories connected to eight-story wings which are arranged to form small quadrangles. The site planning follows the existing pattern of housing along the Charles river. Larger spaces at the perimeter of the site provide the complex with an off-street parking garage and recreational spaces.

One of the few examples of skip-stop planning in the United States, the complex is an innovative solution to the problem of making alternative level access corridors meet the national fire code. The balconies of the apartments solve the fire code problem by providing alternative exits for adjacent apartments. The aggregative influence in the design of the towers and supporting structures can be seen in the balcony structure which is attached to the surface of the buildings as a three dimensional matrix of screens.

Although there are several types of apartments all the units are quite small. Through apartments are not feasible at the corridor level so small studio units are provided. Noncorridor floors have one and two bedroom units. The disadvantage of the scheme would seem to be the skip-stop arrangement. The alternative level design is perhaps more appropriate to double height apartments where the stair can be more incidental within the individual unit. In Peabody the stairs up and down from the corridors are enclosed by fire walls and doors.

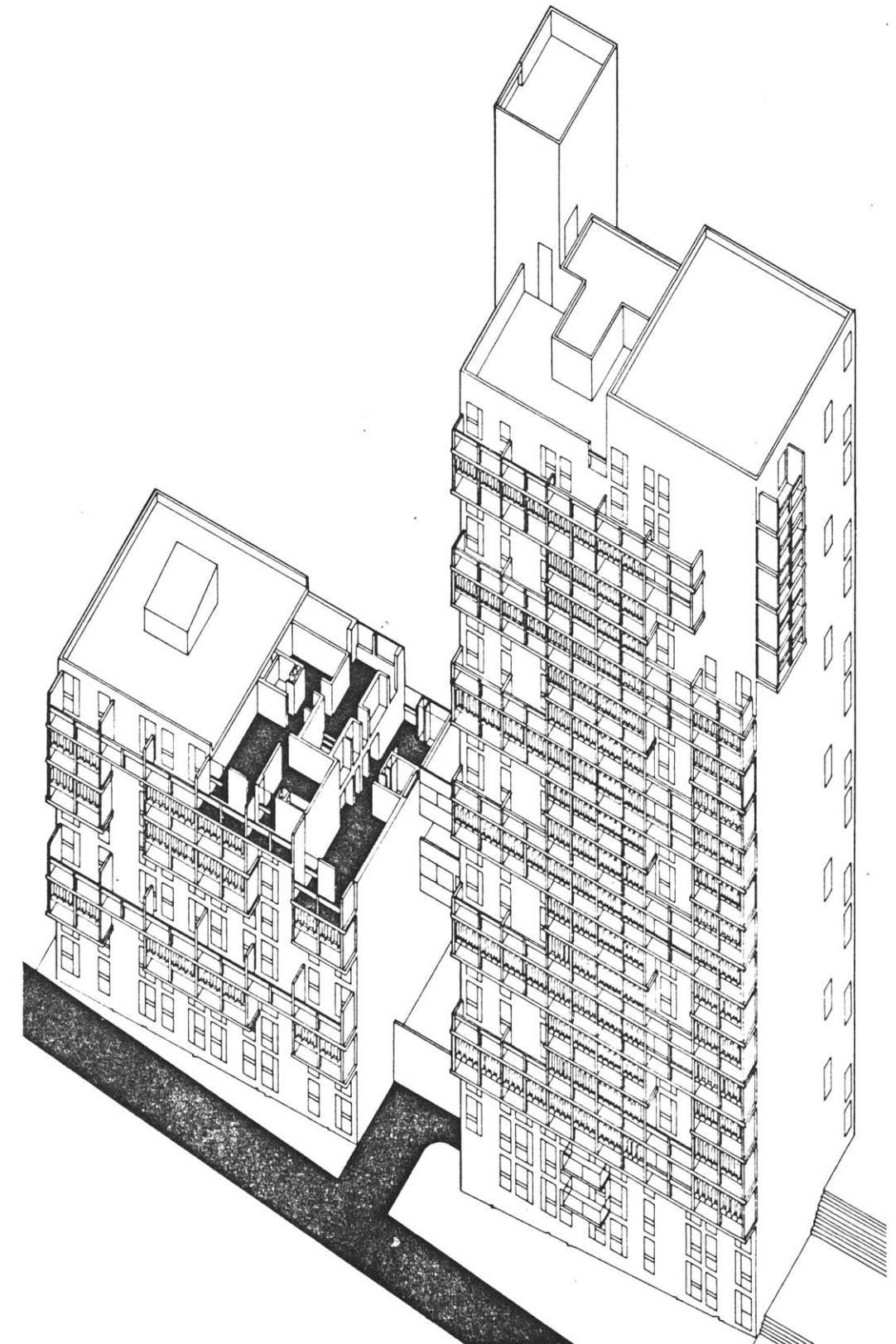
The importance of the project lies in Sert's use and stability of dimension and materials. There is great clarity in the distinction between the concrete primary structure of the building and the secondary screen systems of wood, metal and glass. The associative use of dimension can be seen in ground definition at the site level as well as in the personal size balcony systems. The linkages, continuities and openness created between the towers and lower structures give the entire complex the appearance of being additive and generative.



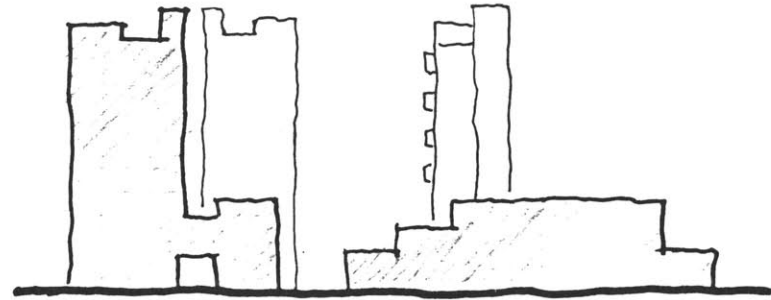
Secondary Closure / Details Systems

*... It is interesting to observe the freedom in fenestration in the farms and villages, where no architect was at hand and human needs dictated the positioning and sizes at openings in walls. There is in these buildings a relation between such openings and the best views, the sun, the prevailing winds, and the nature and use of rooms. Their shapes and proportions are generally determined by the human figure, standing or seated and looking out. They open to the beauties of the landscape, to life and pedestrian movements in the streets, to the quiet of the cloister or the garden, to the distant horizon and the setting sun. They are the eyes of the buildings. Life comes to the interiors through them with daylight, sun, or moonlight, breezes and noises and the smell of things alive.*

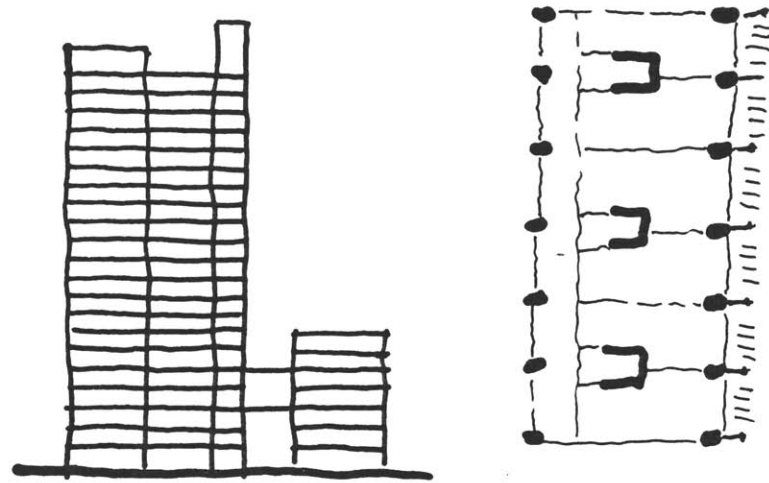
Jose Luis Sert : "Windows and Walls"



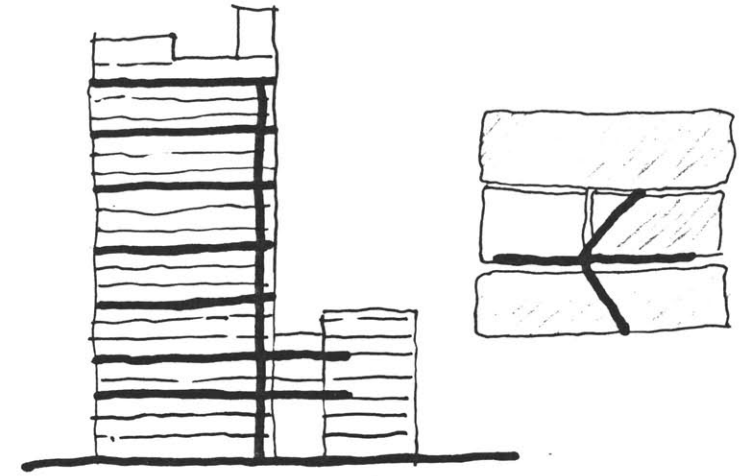
**PEABODY TERRACE**  
Sert, Jackson and Gourley  
Cambridge, MA, 1964  
250 feet



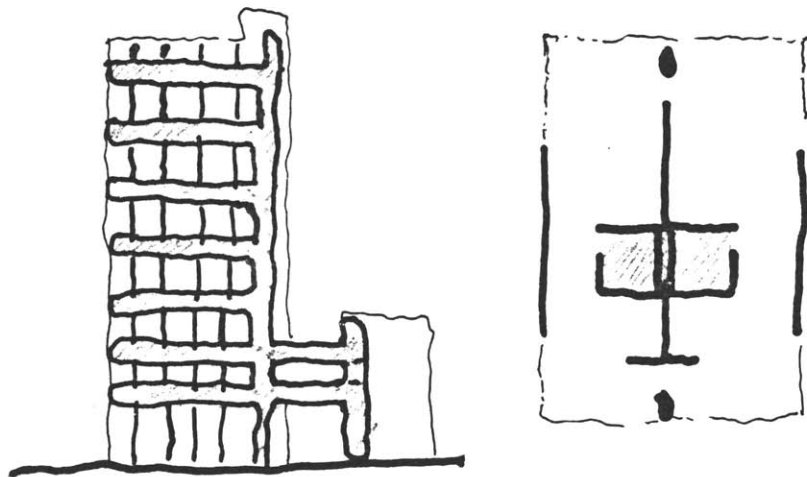
URBAN CONTEXT



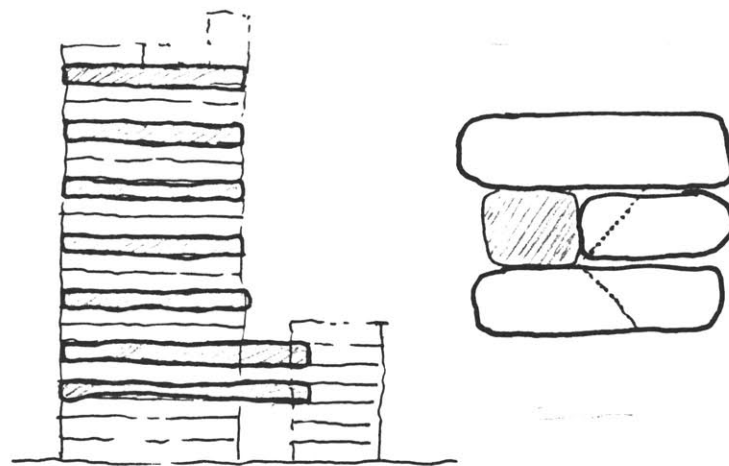
STRUCTURE



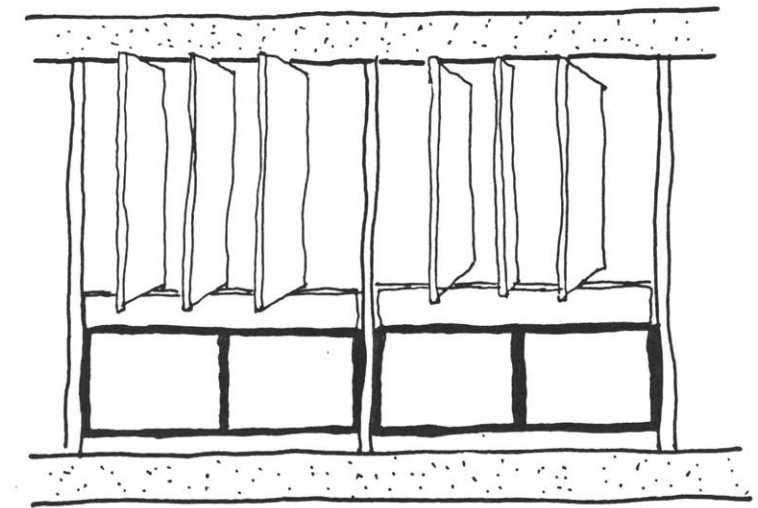
ACCESS



SERVICE/MECH.



ORGANIZATION

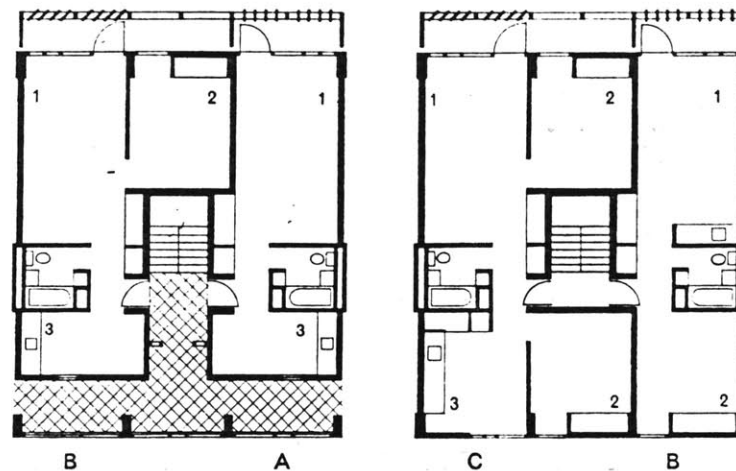
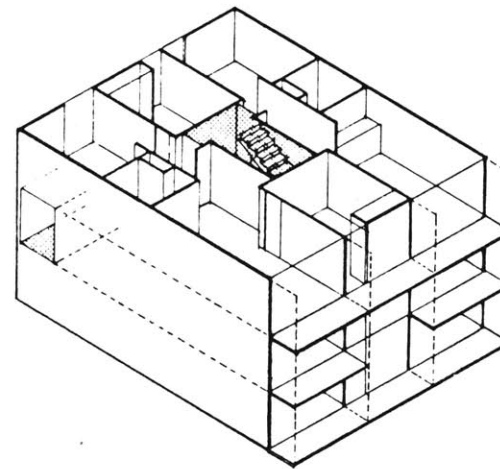
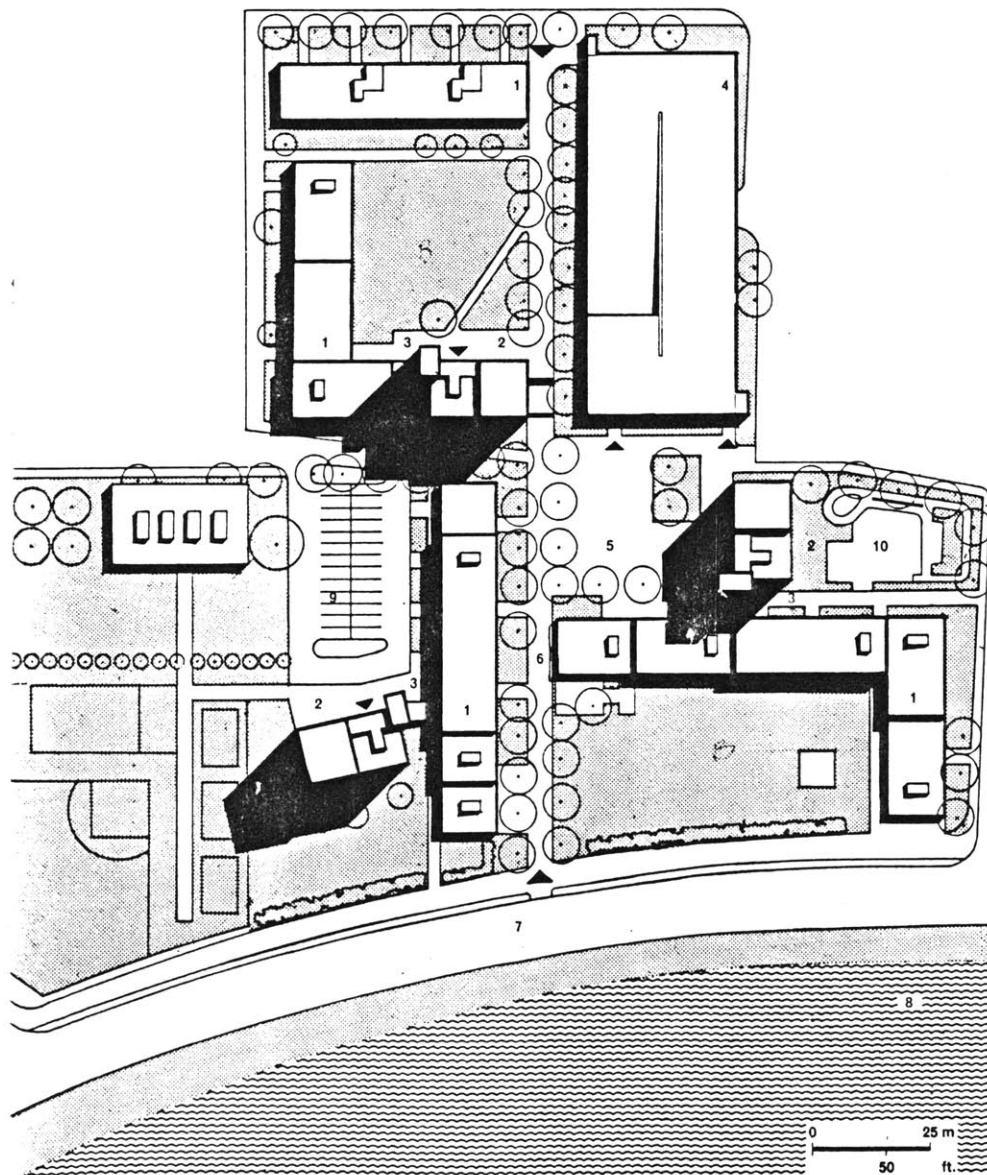


CLOSURE-DETAIL



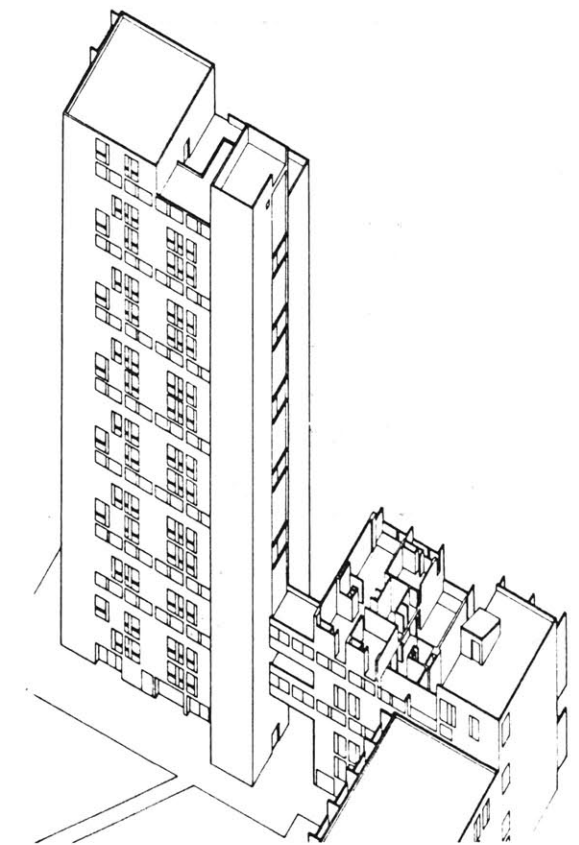
*Site Plan*

- Plan of married-student dormitories:  
 1 Apartment blocks (3, 5 and 7 stories high)  
 2 Towers (22 stories high)  
 3 Bridges between lower apartments and towers  
 4 Parking garage  
 5 Main square  
 6 Pedestrian promenade  
 7 Memorial Drive  
 8 Charles River  
 9 Guest parking  
 10 Playlot



*Typical Unit Plans*

- A Efficiency apartment  
 B One-bedroom apartment  
 C Two-bedroom apartment  
 1 Living room  
 2 Bedroom  
 3 Kitchen-dining



*Axonometric from North*

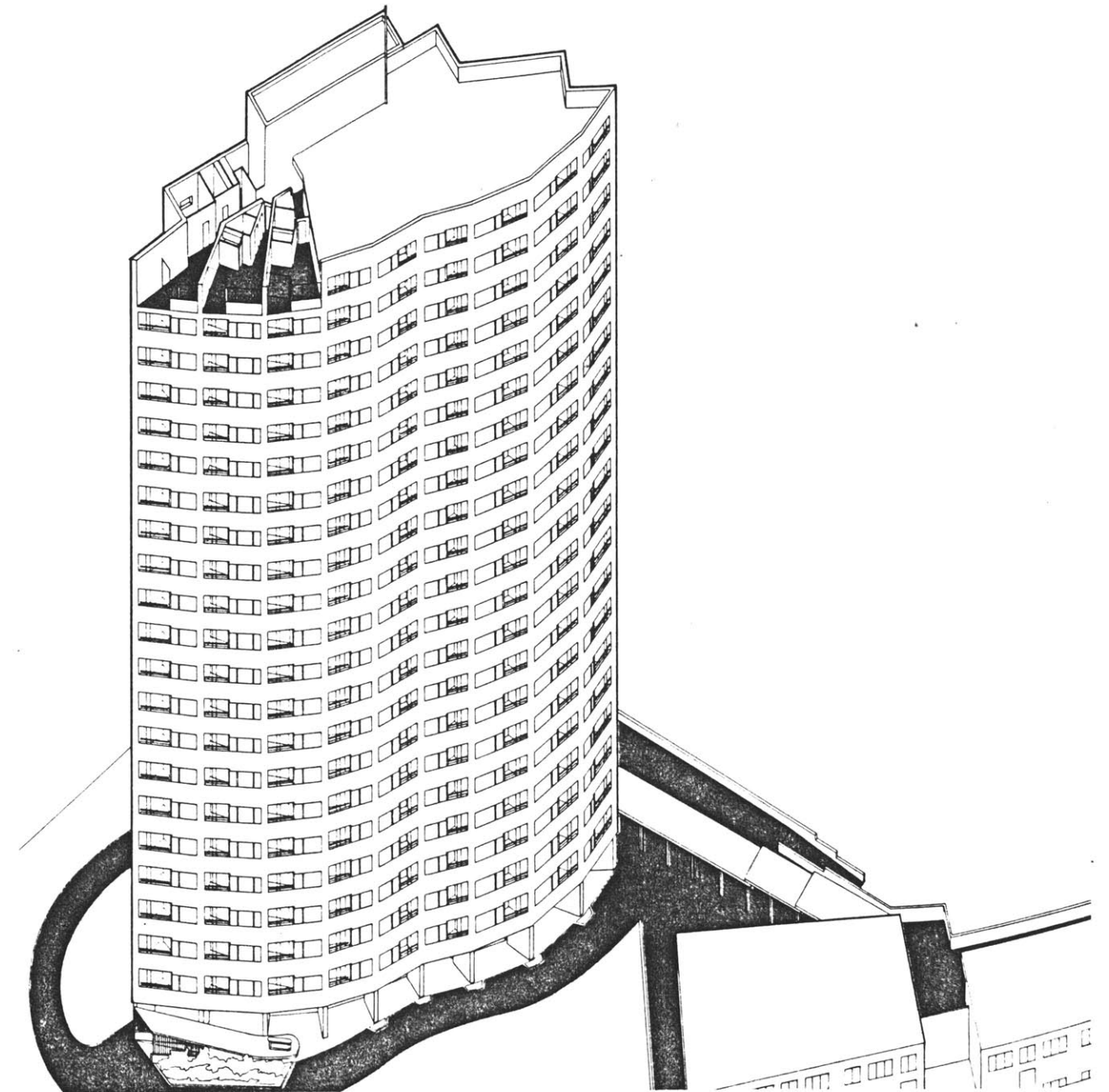


## ALVAR AALTO

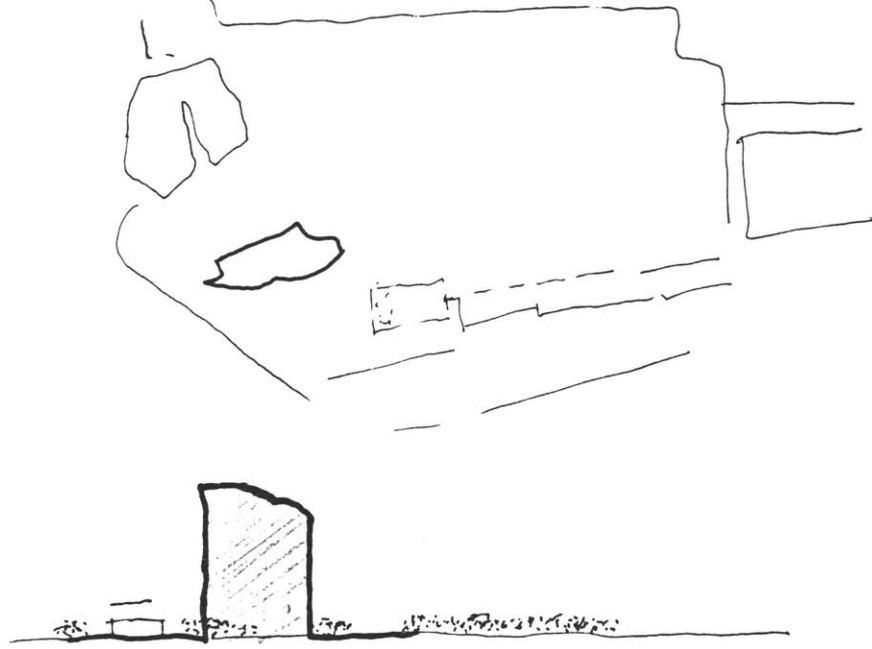
Alvar Aalto's twenty-two story high-rise apartment building, "Neue Vahr" in Bremen, Germany reveals much about the architect's design process. Aalto uses a combination of the Composition and Aggregative design methods. The early diagrams of the building read as a type of fan shaped composition, but final drawings look somewhat additive in their generation.

The fan shape tower plan is conceived so that each room receives maximum sun exposure. Individual apartments widen out toward the light and thus appear larger and more comfortable. The building is also an example of Aalto's continued preoccupation with architecture comprised of expanding radial fan shaped elements attached to rectangular solids.

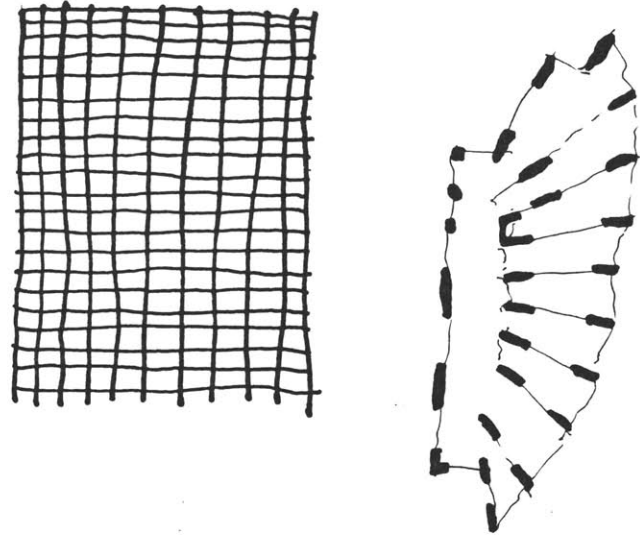
The fan shaped single loaded corridor plan is perhaps better suited to an urban site. The tower is freestanding and although it presently is a singular object, one could easily imagine a much longer, extended service corridor resulting in a continuous serpentine building form. The Neue Vahr apartments represent an approach toward maximizing the living environment while minimizing the service core activities.



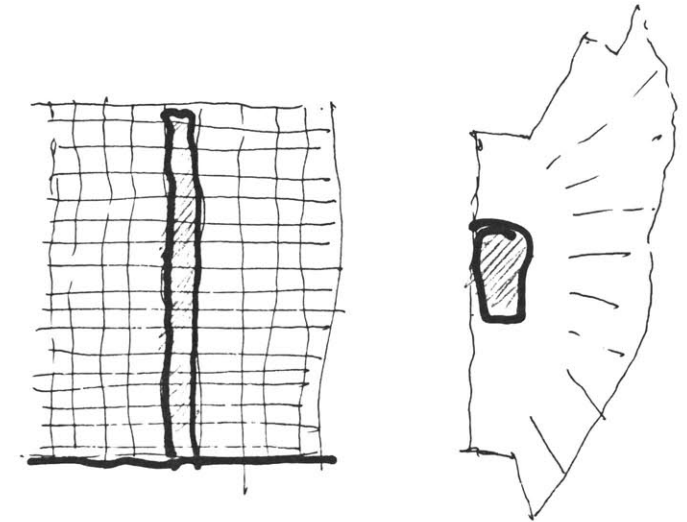
NEUE VAHR  
Alvar Aalto  
Bremen, Germany  
235 feet



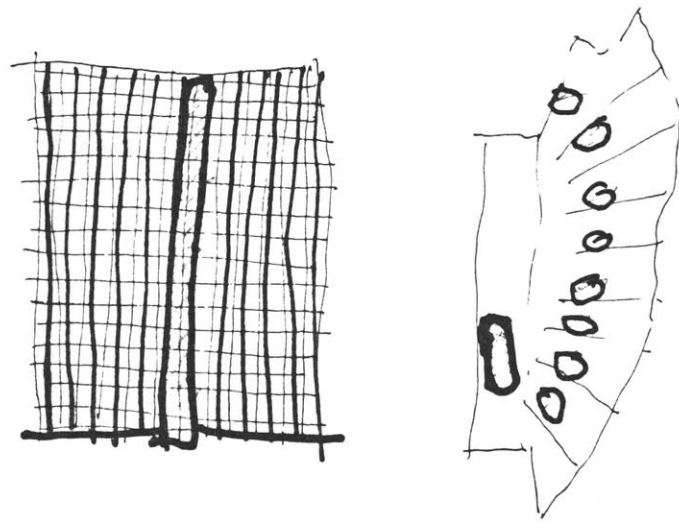
URBAN CONTEXT



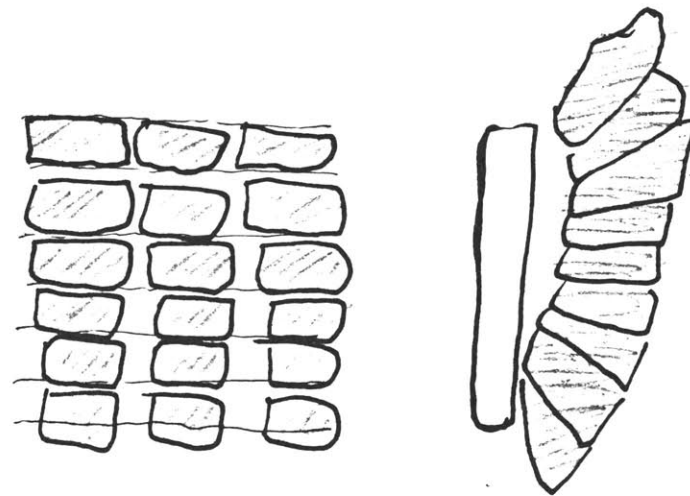
STRUCTURE



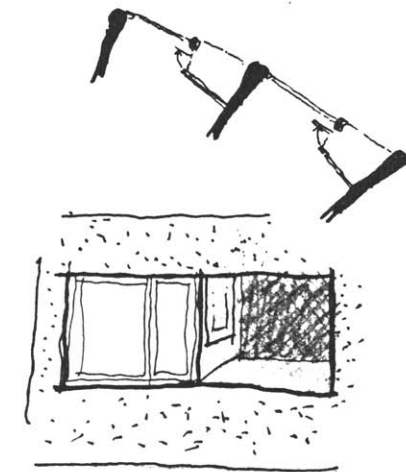
ACCESS



SERVICE/MECH.

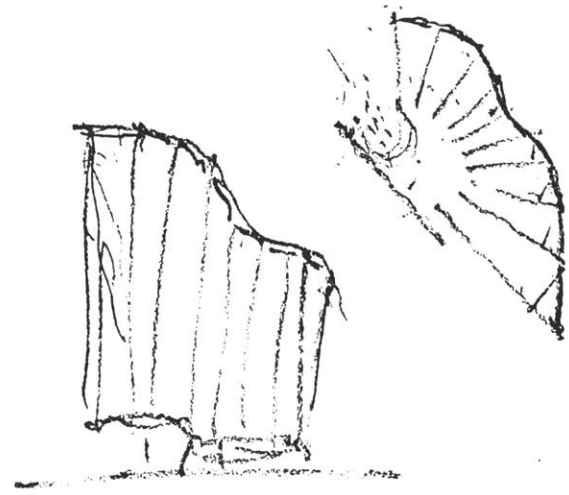


ORGANIZATION

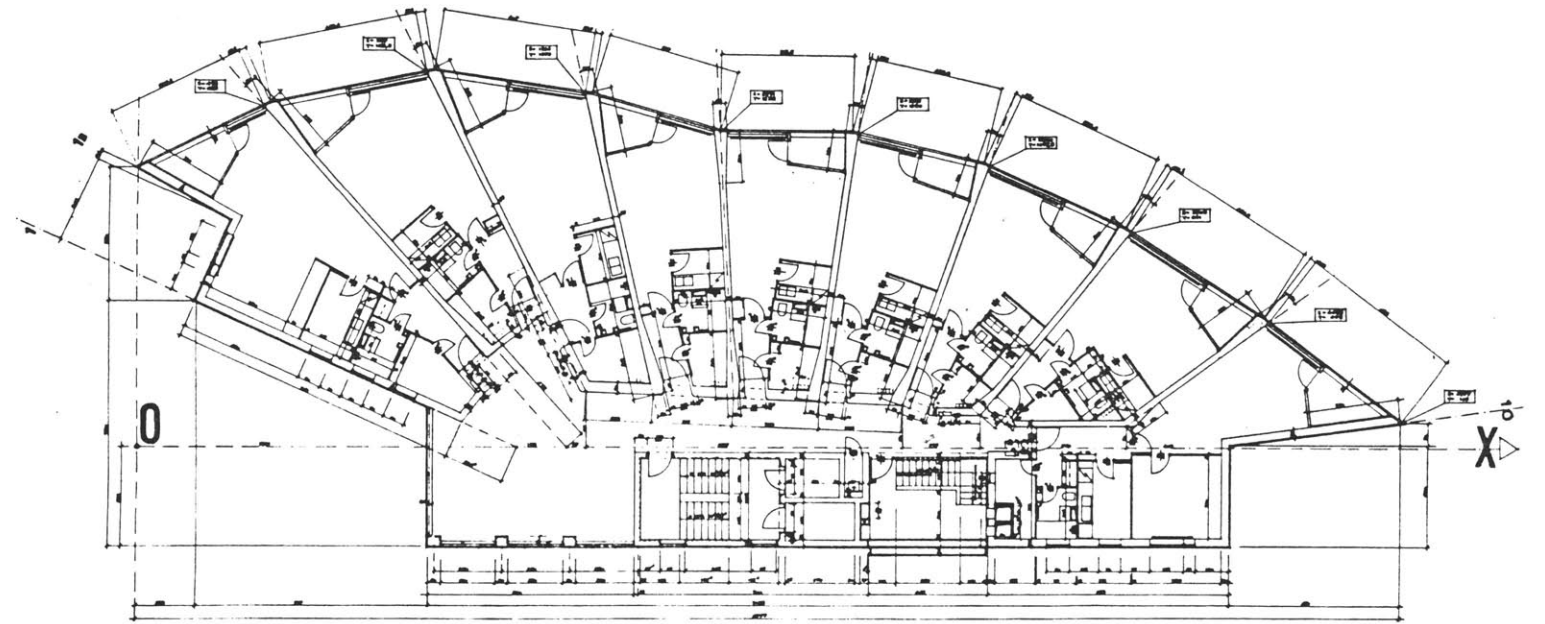


CLOSURE-DETAIL

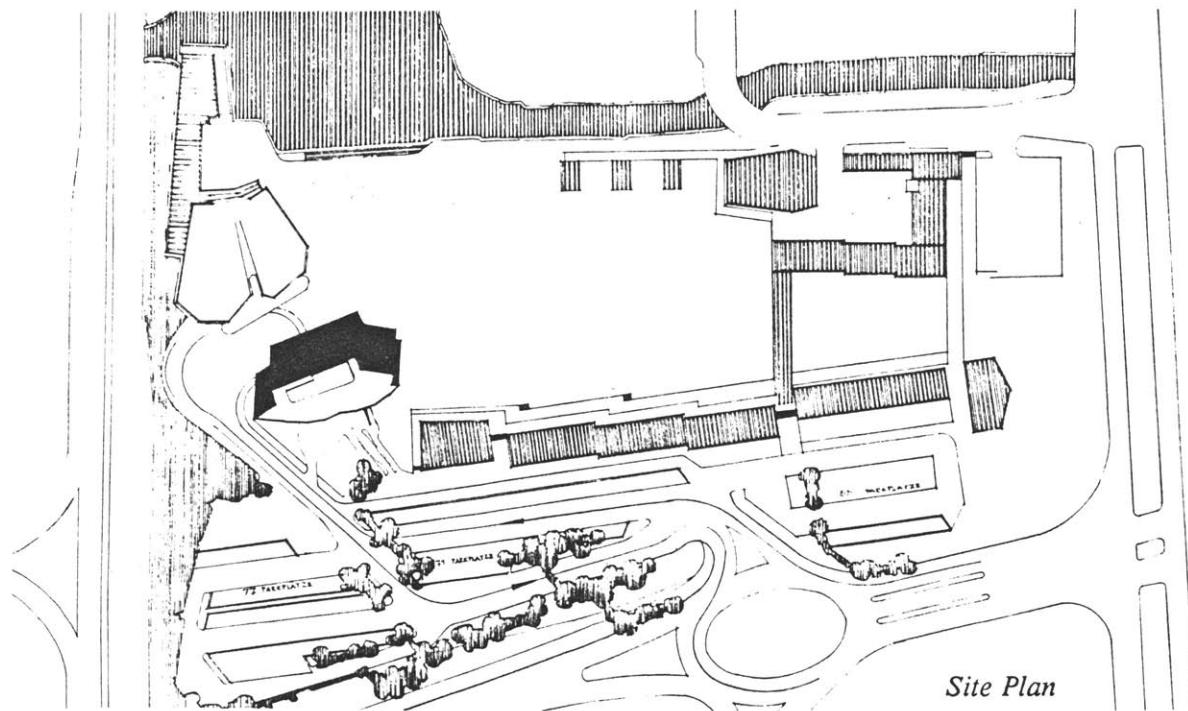




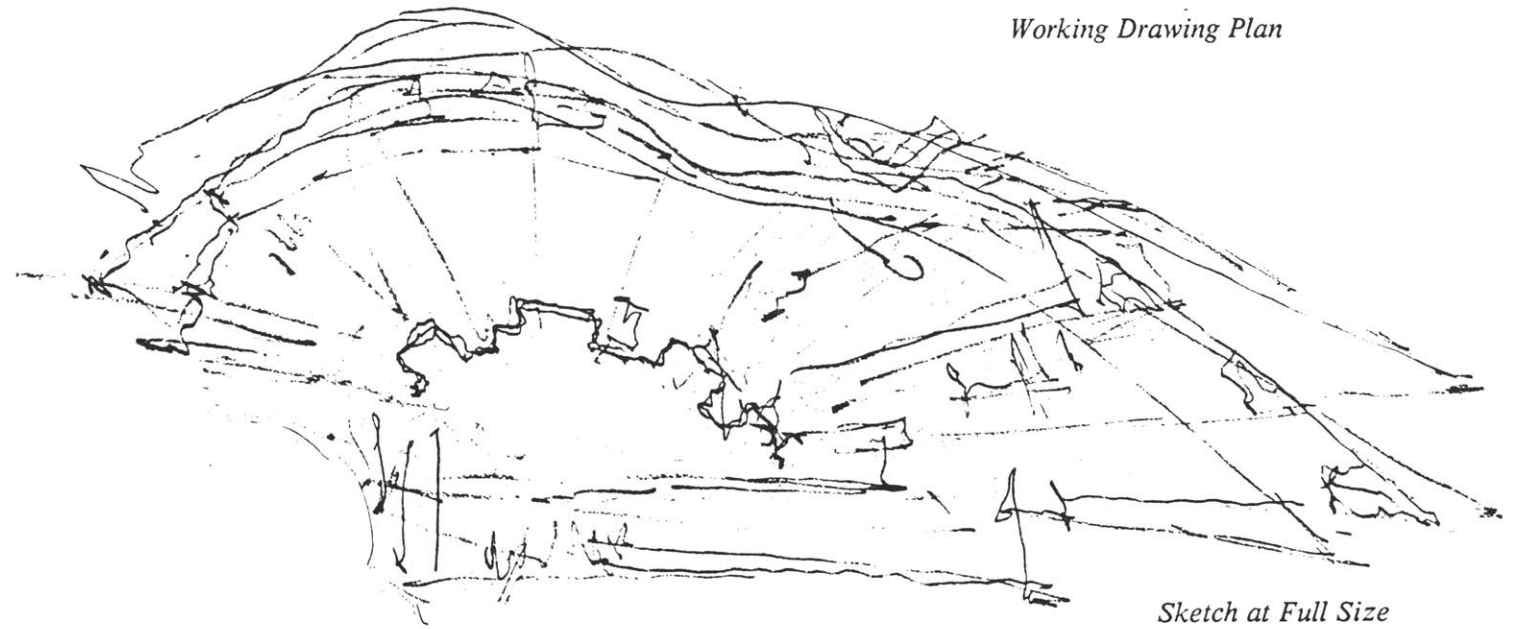
*Original Sketches*



*Working Drawing Plan*



*Site Plan*



*Sketch at Full Size*



## RAYMOND HOOD

The design and construction of the seventy story RCA Building, 1931, marked one of the first full realizations of a building type which has since become almost universally used. The RCA building type, often called a "slab", is tall and narrow on the East and West elevations, but is much wider on the North and South sides.

The service and mechanical equipment are grouped in a line at the center of the structure. Because of the narrowness of the building there is no more than 27 feet between the service facilities and the light and air at the building's edge. This arrangement was an improvement over the towers of the time because it provided a building section in which all leasable space could be naturally lit and ventilated.

Perhaps the most interesting aspect of the RCA project is the setbacks of the facades. The stepping back of the facades along with the strong, base, middle and top arrangement clearly show Hood's compositional design process. However, it is interesting to note that the preliminary design of the tower was for a rational slab form without setbacks. Hood chose to modulate the facade in order to dramatize its appearance and although he claimed the setbacks occurred only as an honest response to function, he was clearly interested in the "poetic excitement" of the setbacks.

Functionally the setbacks occur as each elevator shaft ends. The structure is cut back at this point to maintain the same 27 feet from the building's core to the exterior walls. This idea was clearly taken from another project designed with the Compositional process, Saarinen's Chicago Tribune Competition Entry. The building facades of the RCA are also modulated and articulated horizontally and vertically. The horizontal divisions occur at the levels where the elevators drop off. The vertical divisions reflect the building's plan and structure. Both the horizontal and vertical articulations help establish a hierarchical size relationship among building pieces. The subdivisions eventually break the building into elements that correspond to human scale.

The RCA tower is clearly one of the best of the early skyscrapers. The structure makes the most of the tower plaza arrangement and the Compositional design process. Modernist buildings of similar size appear to be regressive in their design. The design of architectural form from the early 1930's through the present has often been a process, at least in commercial structures, of continual simplification. This simplification has not lead to better tall buildings.

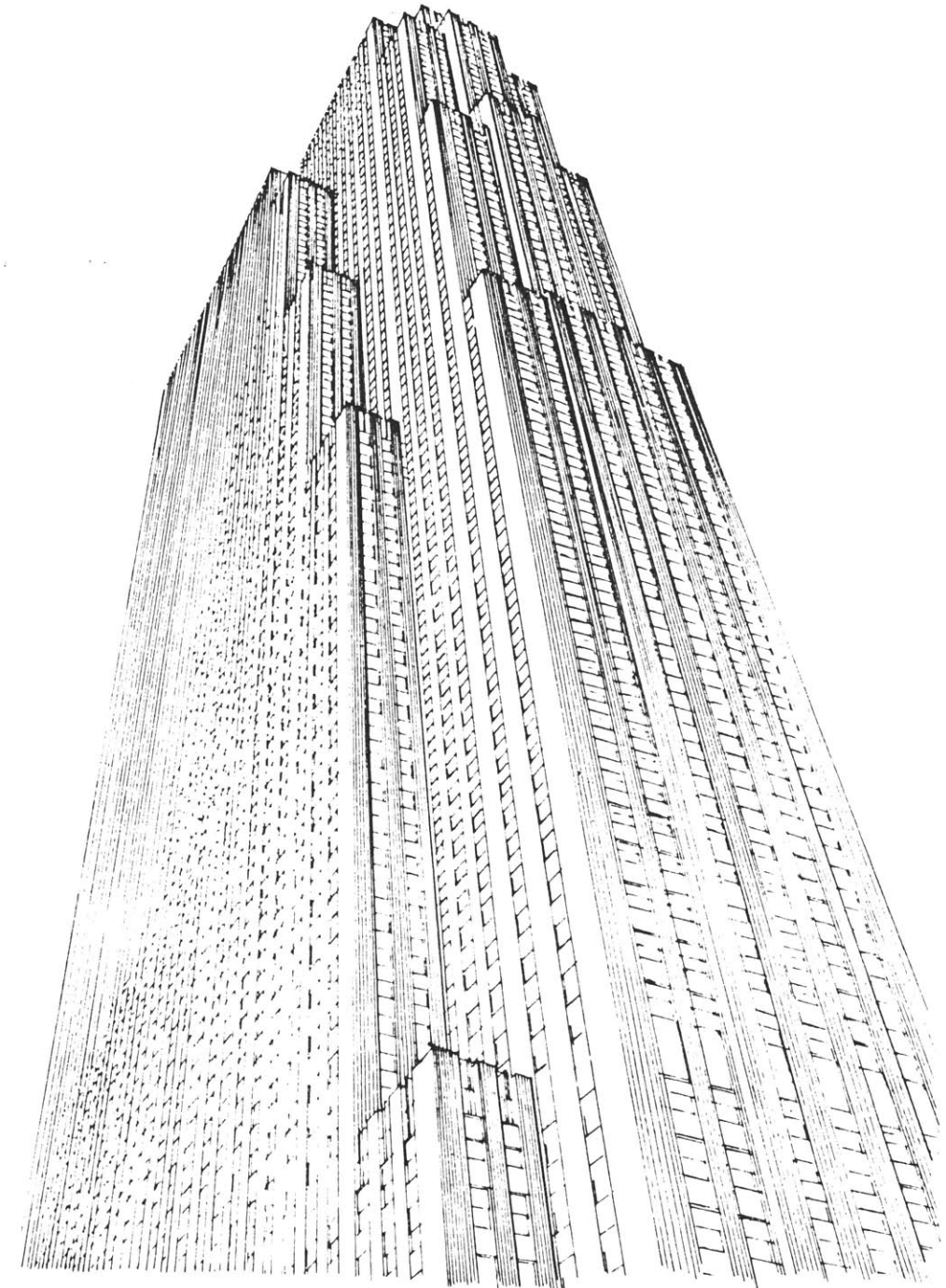
*... The RCA is likely to have an important bearing on all future commercial buildings.*

*The essence of the arrangement is the grouping of elevators and service facilities in line and surrounding them on each floor are stretched 27 feet of lighted space that experience has proved is the maximum to be allowed to provide adequate light and air to all parts of the building.*

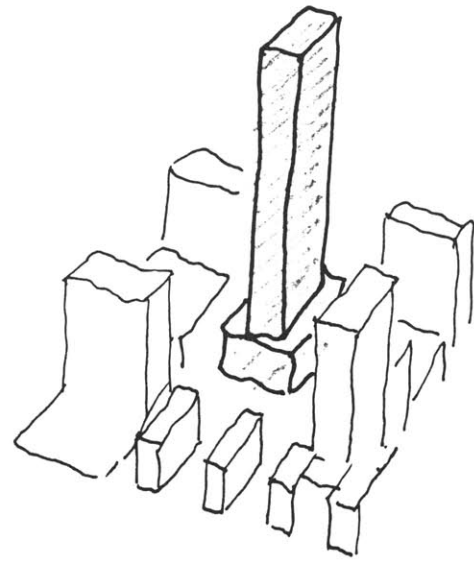
*Raymond Hood*

*The logic of the RCA Building evolved from the pragmatic qualities of the project. The aesthetic theory grew out of the correct understanding of the needs of the problem. Built in 1934, the RCA Building does not have a pure skyscraper form because it is a slab rather than a point tower. However, it transcends the quality of a slab through a masterful use of setbacks. The thin articulated edge, seen from the set viewpoint of Fifth Avenue between the two flanking lower buildings across the Promenade, enables it to soar up as proud and as thin as any skyscraper. The building is not only beautiful, but it is also fresh and logical, a modern masterpiece.*

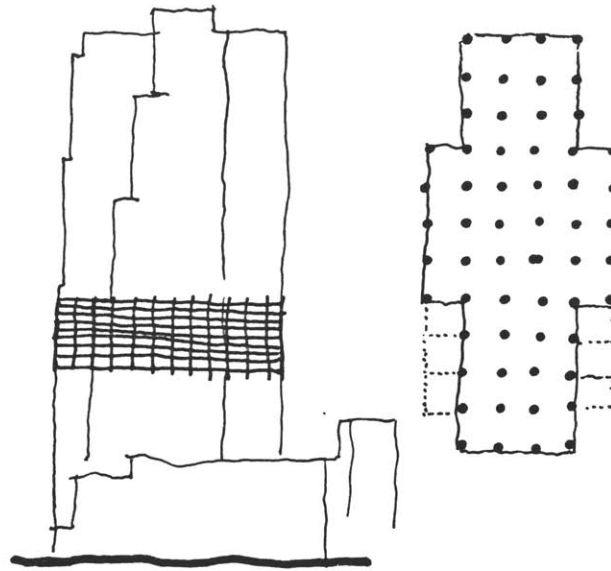
*Cesar Pelli "Skyscrapers"*



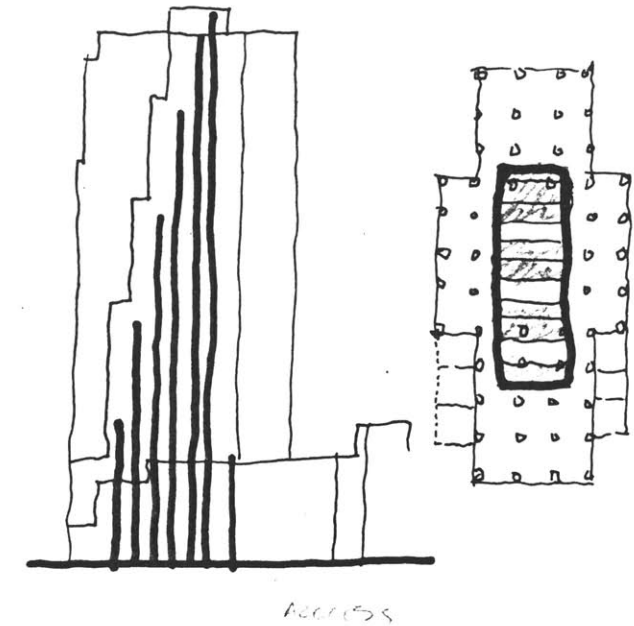
**RCA BUILDING**  
Hood, Harrison, etc.  
New York, NY, 1932  
850 feet



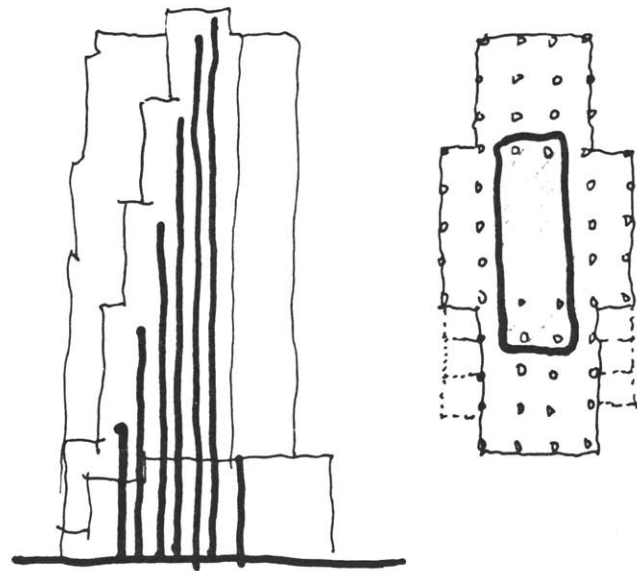
URBAN CONTEXT



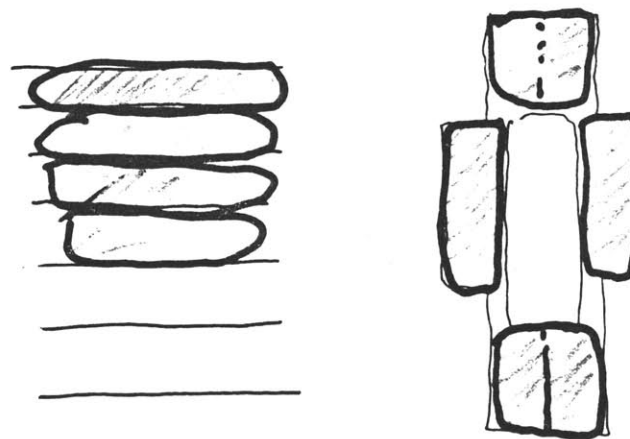
STRUCTURE



ACCESS



SERVICE/MECH.

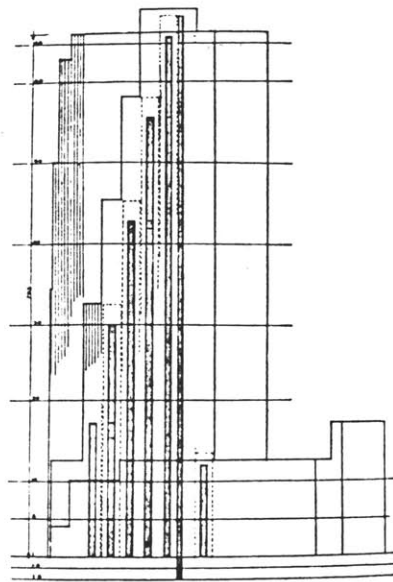


ORGANIZATION

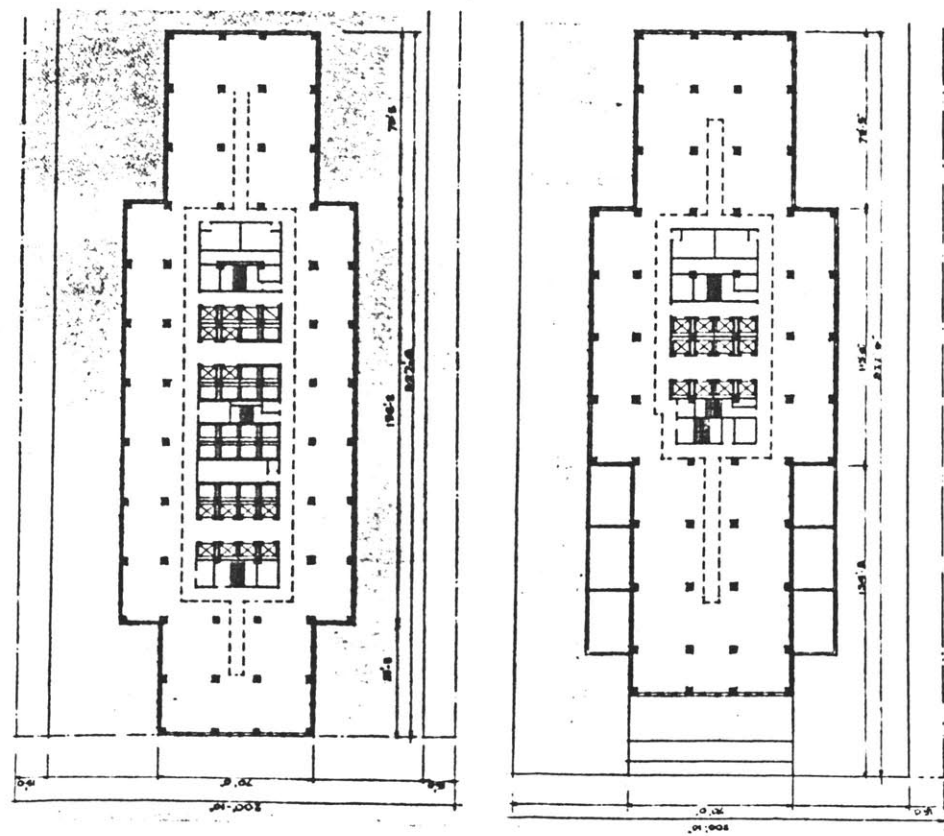


CLOSURE-DETAIL

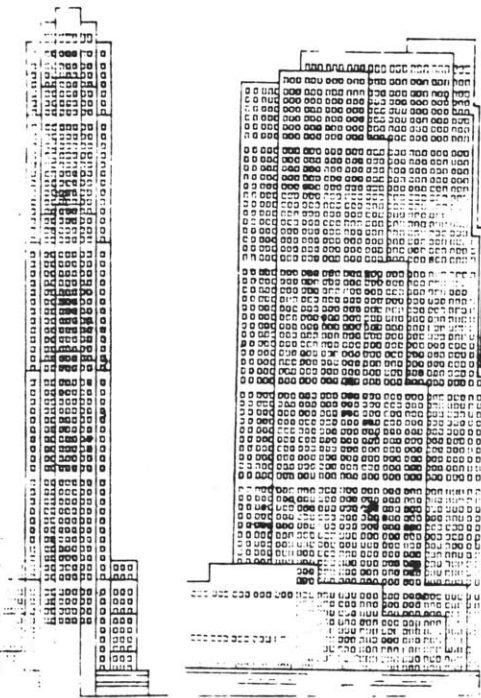




Section



Typical Floor Plans



Elevations





Some members of the architectural community question the direction that our civilization is headed. They believe we are a society headed for disaster; one faced with the convergence of deteriorating cities, population increase and ecological blight. These critics place a large portion of blame on modern urban society and the way our cities are built. Few propose any serious alternatives. Paolo Soleri is an exception.

In recent years Soleri has focused his attention on developing a comprehensive philosophy of urban man. He has thought deeply about the critical urban problems we face and has envisioned a redirection of urban life.

Paolo Soleri is an optimist. He believes that there is a future that can be "prodigiously affirmative." He is aware of the need to think and perceive the future and is constantly moving ahead with alternatives to the present, using a solid working process. He critically examines a wide range of urban problems identifying causes, effects and related issues. Then he proposes a specific methodology to reshape the preconceived problem. The methodology for a single problem is generally linked to a larger methodological framework which proposes a radical restructuring of the urban environment. Finally he tries to illustrate his proposed solution both graphically and philosophically.

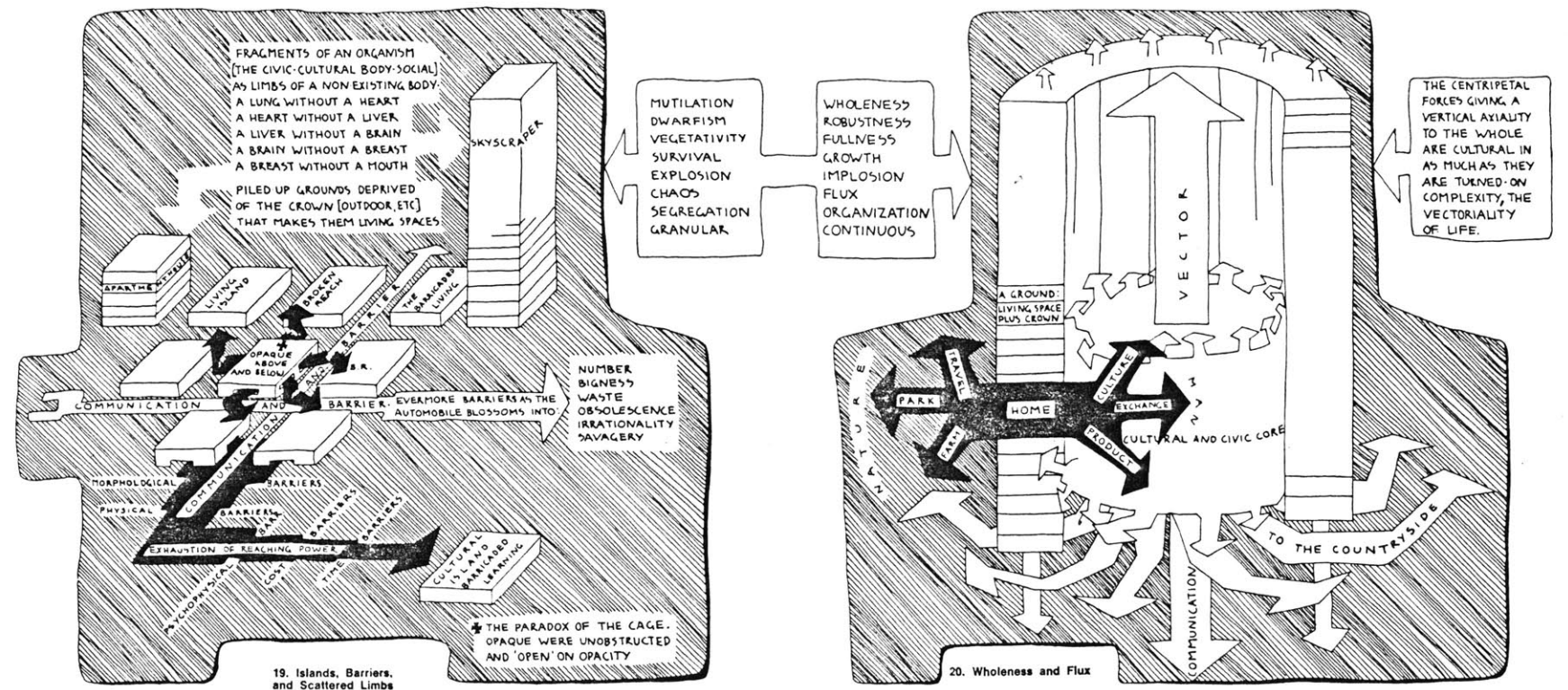
Beginning in 1958 with the Mesa City project and continuing in the present with the building of Arcosanti, Soleri's main interest has been to ...

*investigate a remaking of the man-made landscape of the earth, not for the sake of novelty (nor against it), but because it is the time for man to reassess his urban position within the natural order of things on a non-expedient basis ... Sheer number has made man a doer or undoer of cosmic dimensions. Unloaded on man is the responsibility of the whole planet, and the betterment of the conditions of man and of nature conservation now depends, to a large degree, on our ability to create new and radical urban patterns ... Today's society is an awkward gingerbread man suffering from a flat gigantism that nails it to the surface of the earth, with suburban entrails spilling out over the land.*

### Documenta

To Soleri, urban design is not a matter of planning distribution systems which many others cast into building types. The city itself is regarded as a legitimate subject for Architectural thought. His Complexity - Miniturization - Duration credo presents a formidable humanistic rationale for a high-density living far away from the "one-level" city concept.

*... The most commonly held mistaken opinion about my work is the belief that some years of introspection have produced a take-it-or-leave-it package solution to the urban problem. Rather I am proposing a methodology while at the same time trying to illustrate it.*



12. Arcology: The City in the Image of Man

The concept is that of a structure called an arcology, or ecological architecture. Such a structure would take the place of the natural landscape inasmuch as it would constitute the new topography to be dealt with. This man-made topography would differ from natural topography in the following ways:

1. It would not be a one-surface configuration but a multi-level one.
2. It would be conceived in such a way as to be the carrier of all the elements that make the physical life of the city possible—places and inlets for people, freight, water, power, climate, mail, telephone, places and outlets for people, freight, waste, mail, products, and so forth.
3. It would be a large-dimensional sheltering device, fractioning three-dimensional space in large and small subspaces, making its own weather and its own cityscape.
4. It would be the major vessel for massive flow of people and things within and toward the outside of the city (Figs. 15, 16).
5. It would be the organizing pattern and anchorage for private and public institutions of the city.
6. It would be the focal structure for the complex and ever-changing life of the city.
7. It would be the unmistakable expression of man the maker and man the creator. It would be diverse and singular in all of its realizations. Arcology would be surrounded by uncluttered and open landscape.

The concept of a one-structure system is not incidental to the organization of the city but central to it. It is the wholeness of a biological organism that is sought in the making of the city, as many and stringent are the analogies between the functioning of an organism and the viability of a metropolitan structure (Fig. 18). Fundamental to both is the element of flow. Life is there where the flow of matter and energy is abundant and uninterrupted. With a great flow gradient the city acquires a dynamic character. The interacting of its components erases the space and time gaps that outphase the action-reaction cycles and ultimately break down the vitality of the system. (Figs. 18, 20)

These are mechanical but fundamental premises for a functioning metropolitan life. In reality the idea is that of a very comprehensive "plumbing system" for the social animal, which the city is. The plumbing system consists of the previously mentioned man-made topography (Fig. 48). Social, ethical, political, and aesthetic implications are left out, as they are valid and final only if and when physical conditions are realistically organized.

To dispel the aura of cerebralism or utopianism from the concept presented, there is another way to see the central problem of the city. The degree of fullness in each individual life depends on the reaching power unequivocally available to each person (Fig. 21). In turn this reaching power is in direct proportion to the richness and variety of information coming to and going from the person. Information means not only sounds, sight, and so forth, but all the sensorial data, all the physical intermediaries that make any sensitivity possible, all kinds of inorganic, organic, organized, or man-made matter or material or instruments, from footstuffs to wireless, from toilets to television, from mothers' reprimands to theater. This wholeness of information must include packaged and

remote information such as television, radio, telephone, and the communications media, as well as environmental information. Environmental information calls in the technology of transportation, distribution, and transfer, and calls for the no less fundamental quality of the environment itself.

This combination of remote and synthetic information and environmental information is indispensable to the nature of metropolitan life. In physical terms it means that the distance, the time, and the obstacles separating the person from all civilized institutions have to be scaled down to the supply of energy available to the person himself.

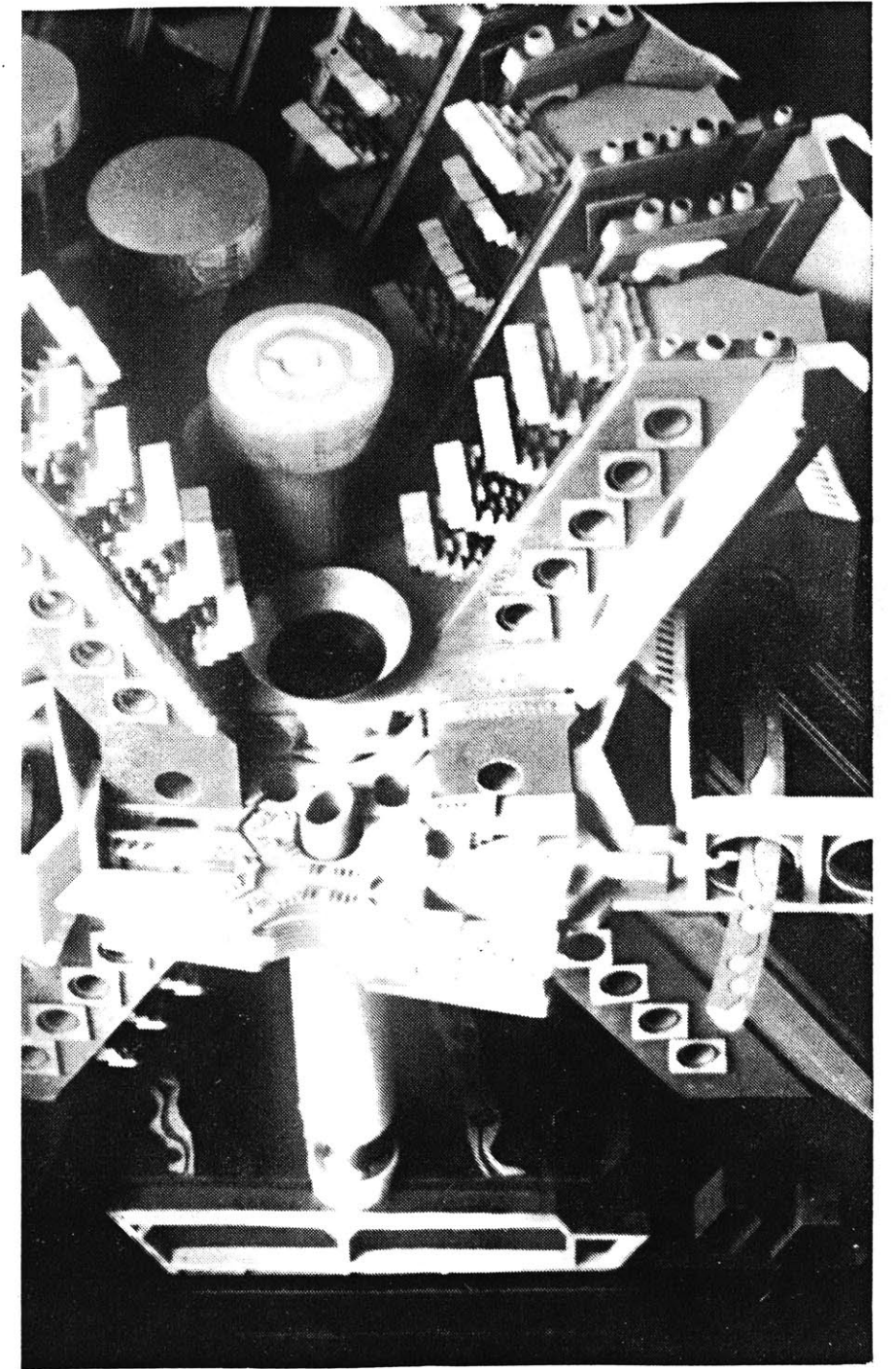
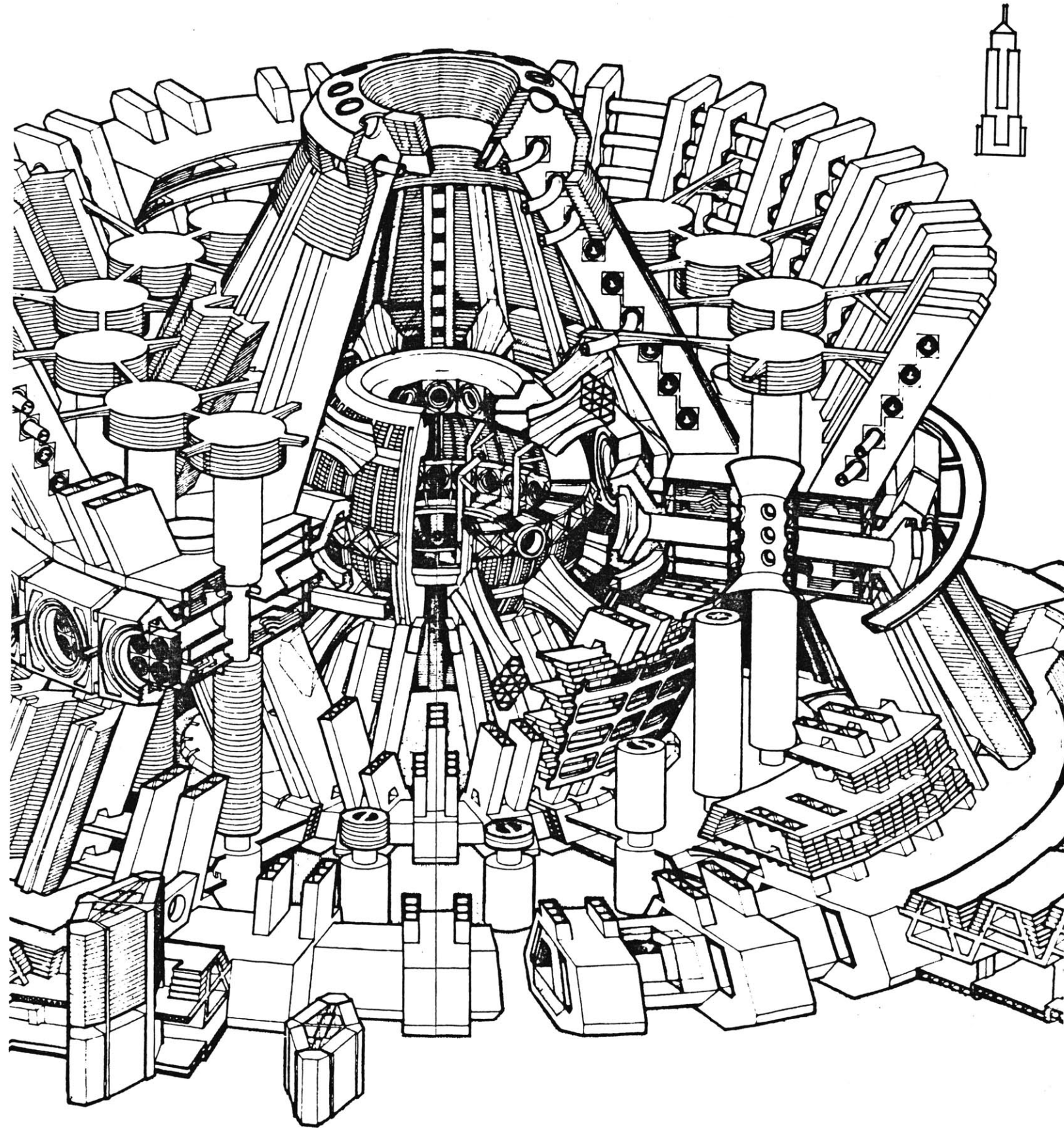
If we inject into the picture the sheer bulk of products and devices wanted by and forced upon each man, we can see the dimension and the absolute priority of the logistic problem. The burden of matter, part of the environmental information weighing on every man, is impressive and also irrational. This matter has to be transformed, manipulated, moved, serviced, stored, exchanged, rejected, and substituted—the warehouses of arcology will

be enormous. One thing nomadism has not been able to teach us is frugality. (Fig. 22) What is the mechanism by which the rich and complex life of society can flow back into the structure of the city?

In a society where production is a successful and physically gigantic fact, the coordination and congruence of information, communication, transportation, distribution, and transference are the mechanics by which that society operates. It is not accidental that these are also dynamic aspects of another phenomenon, the most dynamic of all: life.

In every dynamic event of physical nature the elements of time and space, and thus acceleration, speed, and deceleration, are crucial. The speed of light, a space and time shrinker, well serves the communication of information of the packaged kind—television, radio, telephone—the synthetic information. Thus a good supply of synthetic information can reach even the scattered suburbs (for him environmental information is and remains monotonous, bone stripped).





*Model and Drawing for 3-D New Jersey. Note the relative scale of the Empire State Building.*



**THE COMPLEXITY-MINUTURIZATION-DURATION IMPERATIVE**

... From bacteria to God, three basic parameters are present:

**COMPLEXITY**

Many events and processes cluster wherever a living process is going on. The make-up of the process is indefinitely complex and ever intensifying.

**MINUTURIZATION**

The nature of complexity demands the rigorous utilization of all resources; mass-energy and space-time, for example. Therefore, whenever complexity is at work, minituration is mandated and part of the process.

**DURATION**

Process implies extension in time. Temporal extension is warped by living stuff into acts of duration. A possible resolution of such "living time" is the metamorphosis of time into pure duration, i.e., the eventual "living outside of time."

... A community meant to become a "living organism" succeeds if it is congruent with the complexity-minituration-duration paradigm. If it is not, it will not continue to improve itself. Although the paradigm is very general, it is also clear, forceful, normative light for any living process to follow ...

Although it is difficult to analyze Soleri's early work with conventional diagrams, many of his philosophical thoughts and principles pertaining to urban design are very understandable and are shared by other designers and planners, past and present. Since the early 1970's Soleri has been building his visionary city of Arcosanti. It is in the examination of this latest work that Soleri's principles and contributions can be most easily understood.

**ARCOSANTI**

Arcosanti is located approximately halfway between Phoenix and Flagstaff at Cordes Junction, Arizona. It is a small city originally designed for 1500 people on 7 acres; although it still numbers less than 500 people. It is through the building of Arcosanti that Soleri is investigating and experimenting with his arcological concepts.

... Architecture is in the process of becoming the physical definition of a multilevel, human ecology. It will be arc-ology. Arcology, instrumented by science and technology, will be an aesthetocompassionate phenomenon. Its advent will be the implosion of the flat megalopolis of today into an urban solid of superdense and human vitality.

... The Arcology or "ecological city", is one such instrument. It is a complex instrument, but it is a medium which is in itself also a message, in as much as it is tangibly and pragmatically part of the transpersonal nature of life, (that part which is of a theological nature). In fact, ultimately Arcology must be stone made into spirit or it will be a simple mechanism of economic, political and logistical expediency. It has to be the spirit moving the mountains not so much because of the physical manipulation of the mountain (mining, etc.) but because of an inner flame elicited within the stone itself by design and grace ... the process of esthetogenis.

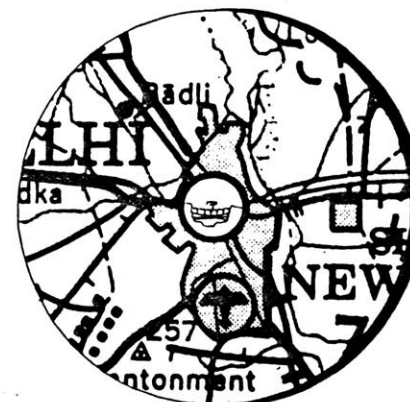
Comparative Density studies with models of "HEXAHEDRON CITY".



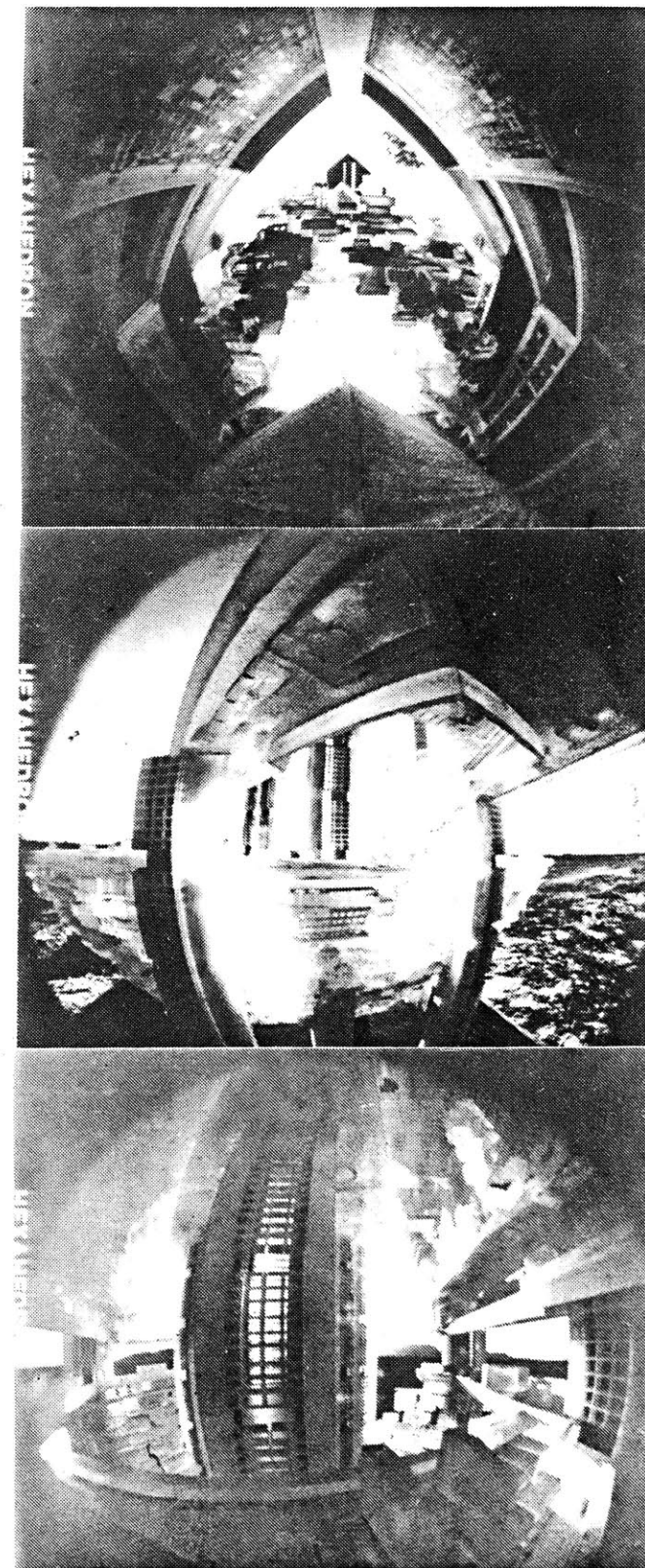
New York City Hexahedron  
82/hectare 33/acre  
2,364/hectare 1,200/acre

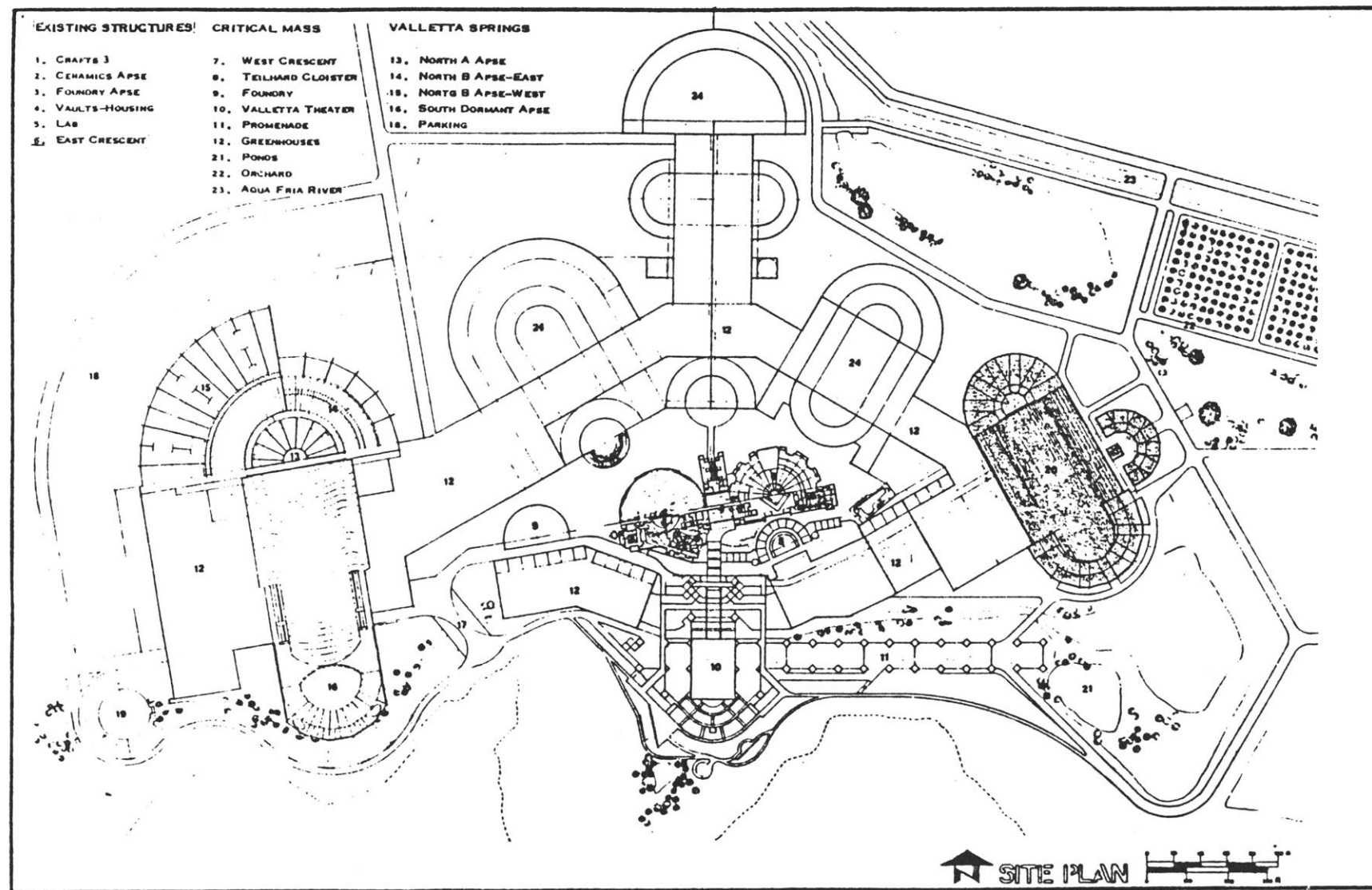


Phoenix 8.3/hectare 3.3/acre  
Babel 10 662/hectare 268/acre (Dec. 1988)

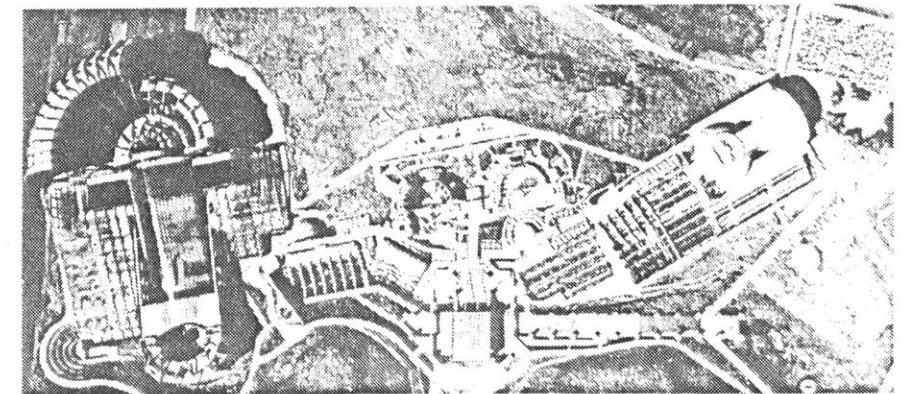
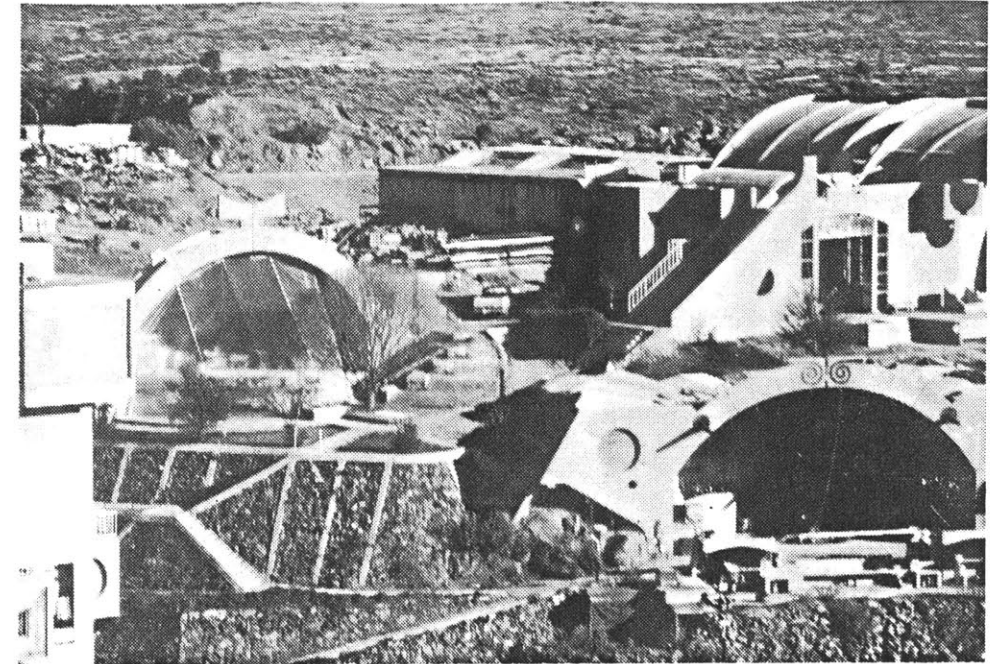


Delhi Arcology 179/hectare 73/acre  
Arcology 1,251/hectare 526/acre





ARCOSANTI



ARCOSANTI CRITICAL MASS



## OPPOSITION TO URBAN SPRAWL

Strongly opposing urban sprawl, arguing that "sprawl is a pathological event", which has been caused in large part by the automobile. Soleri has not included planning for the auto in Arcosanti. He believes designing for the auto is not always designing in man's best interest. Few city planners would disagree.

## HIGH DENSITY MIXED USE

Soleri is a high density advocate and with this density comes mixed use. His designs mix living, shopping, working, and entertainment within a relatively small area. He attempts to build basic continuities and establish associative behavior of form. Most urban malls are not positive examples of cities in the future. They are not environments with a true range of experience and are generally not of a multi-dimensional scale. They often represent urban sprawl. The modern shopping mall represents new and unique combinations of consumerism and fantasy, but not the built continuities and true mixed use experiences that promote and stimulate education, intellectual creativity and quality of life.

## PRODUCTION AND CONSUMPTION

Drawing as much food and energy from the immediate surrounding, greenhouses, gardens and fields surround the site. Garbage and water are recycled. The aim is the creation of an efficient and humane city.

## FRUGALITY

Resources cannot be consumed at the present rate. In a society sold on consumerism, frugality can become anecdotal. "To cut into the bulk of the needs and extricate a lean way of life is to respond forcefully to the quest for equity."

## TECHNOLOGY

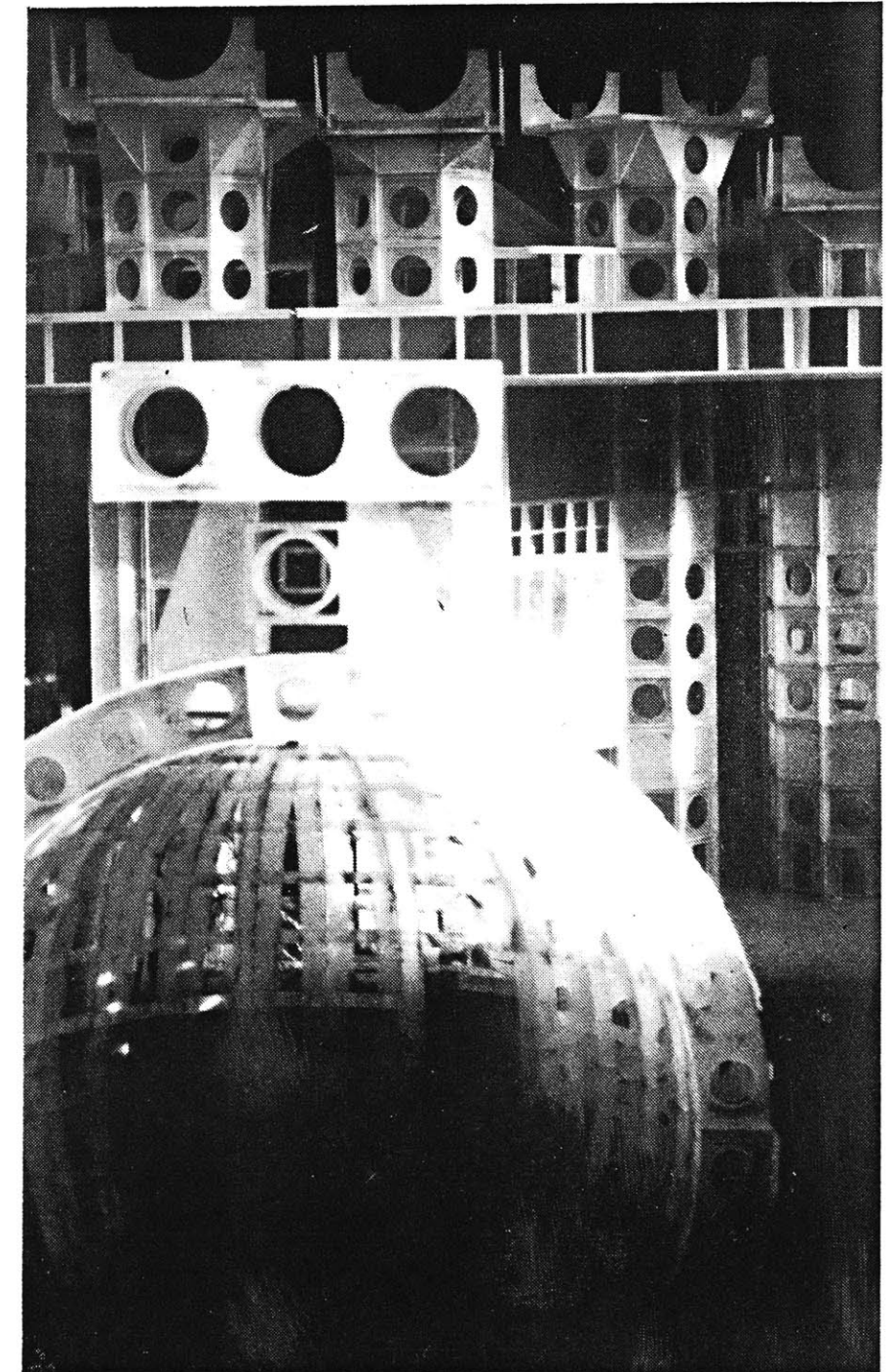
The Complexity-Miniturization-Duration credo supports many technological advances; more capabilities in less space. In the city, as in the brain where incredibly dense processes take place; there is no consciousness until a certain level is reached.

## ARCHITECTURE

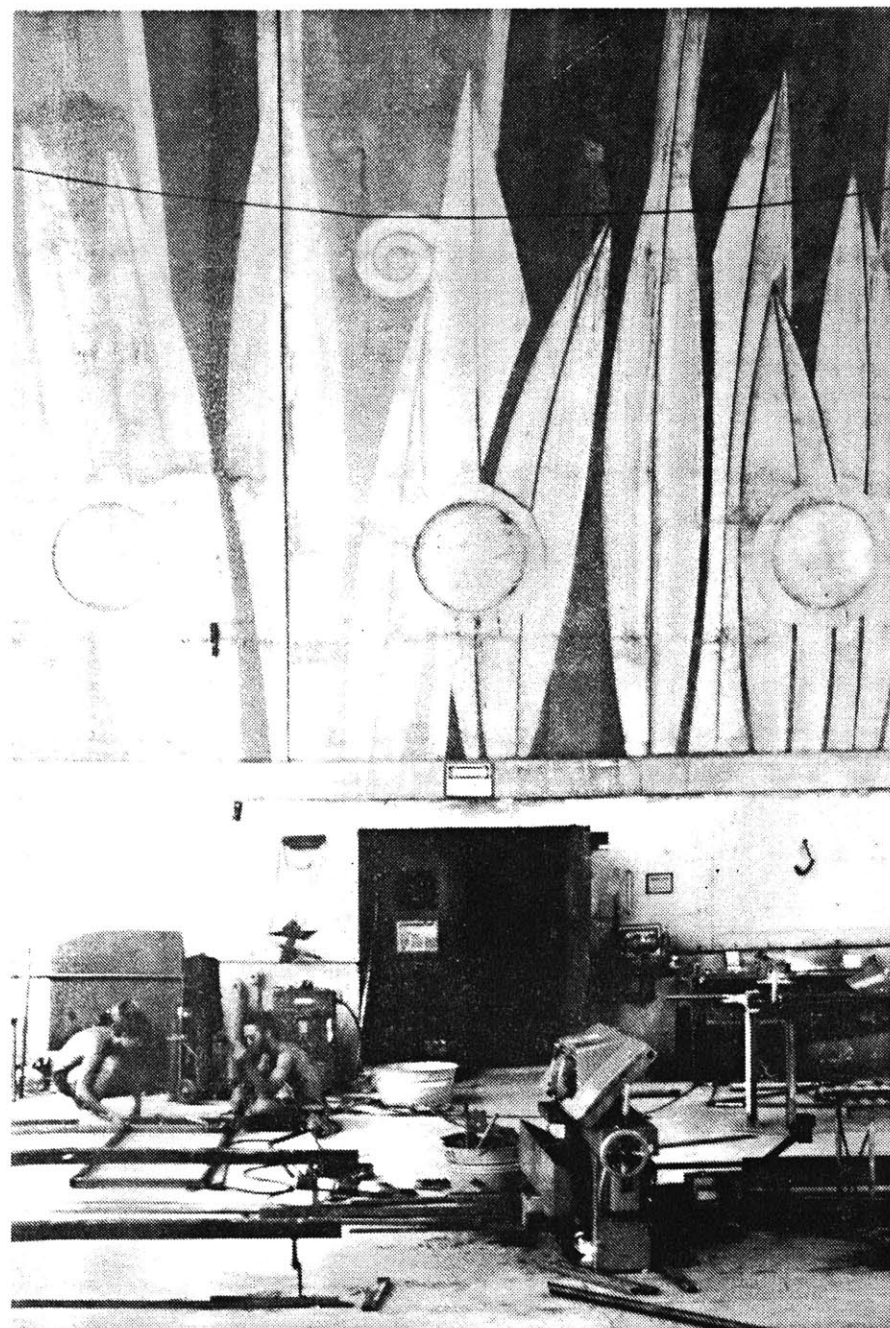
The forms of Arcosanti are arbitrary with regards to the principles. Although Arcosanti is really a collection of closely built objects, rather than a single megastructure, it is still structure on an urban scale with built continuities at the human scale. Perhaps as it becomes more dense it will become more three dimensional.

The problems with Soleri's work are not unlike those of the metabolists or any other visionary group. The proposed changes are so radical that they require an entirely new way of life, often without options. For the most part, this is not the type of gradual additive change that occurs in the evolution of an urban fabric. This is why so many futurists start from the beginning and ignore any or all existing context. Soleri, however, is the first to admit that Arcosanti is not for everyone.

*... The premises of Arcosanti are the complexity-minituration-duration paradigm. It says that given an equal number of people, given an equal amount of space-time, resources, investment, and labor, Arcosanti will produce more social, cultural, mental, aesthetic, and environmental wealth ... a move toward the spirit. This is not simply an asset for the benefit of a limited planet. It might well be, and critically so, a teleological necessity for the reality of organism.*



*Early model of Arcosanti.*





Arcosanti is important because it is a place where people can go and learn about alternatives. People can contribute at their own level. It is an intellectual crossroads for people with remarkably different backgrounds. If we all agree that we can improve the existing urban environment, there must be strong support of alternatives.

**PAOLO SOLERI**  
**COSANTI FOUNDATION**

6433 E. DOUBLETREE RD. SCOTTSDALE ARIZONA 85253

PH. 602 948 6145

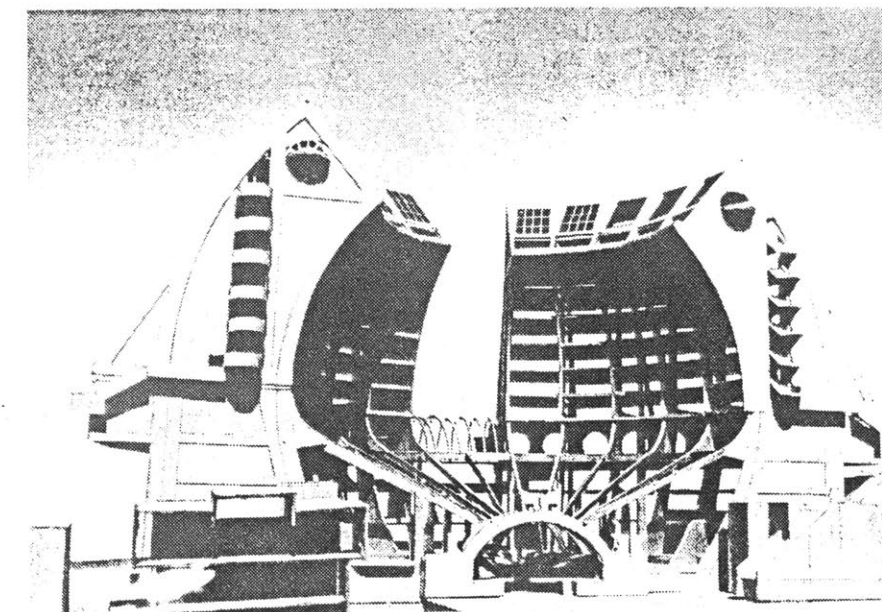


#### HIGH TECH AND URBAN IMPERATIVE

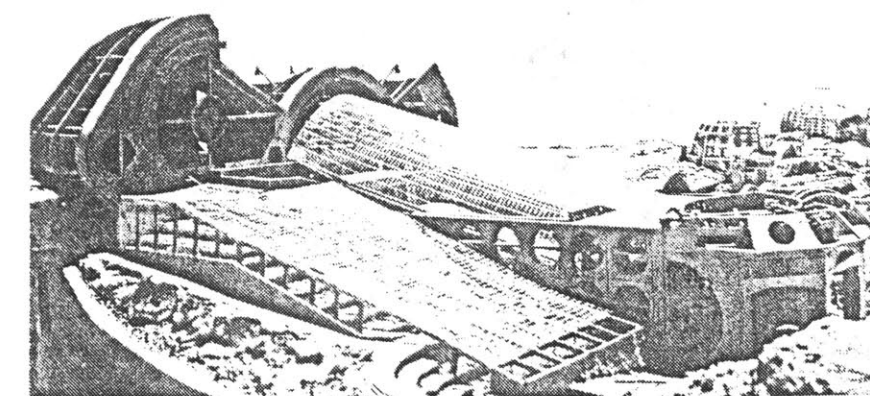
*... The telling convergence of technology and urbanization is that for both, the imperative of complexity and miniturization is real. The liberating, indeed the transcendental window opening into the future of life is the complexity-miniturization window. By way of it we will eventually be able to transform the nature of time-space itself. The effects of such a metamorphosis will be a "Big Bang" of the spirit. For now, it is more than just elegant to find the fit of high tech and habitat. It is the predisposition for a quantum leap in human culture.*

#### THE URBAN EFFECT

*... All these topics are under the aegis of what I call the urban effect. The urban effect as universal effect is the transformation of mineral matter into mind via the potentially unlimited power of complexification and miniturization. Such is the ease of organisms: single, composite, associative. In eschatological terms, the upper limit of the process could be the concluded esthetogenesis in a cosmic seed, the onega seed.*



WEST CRESCENT COMPLEX, ARCOSANTI



VALLETTA SPRING COMPLEX, ARCOSANTI

*Comparison of tall buildings at same scale  
(1"=200') From left to right:*

**NAKAGIN CAPSUL BUILDING**

Kisho Kurokawa  
Tokyo, Japan, 1972  
180 feet

**CITICORP CENTER**

Stubbins Associates  
New York, NY, 1979  
914 feet

**PRICE TOWER**

Frank Lloyd Wright  
Bartlesville, OK, 1953  
240 feet

**B.U. LAW TOWER**

Sert, Jackson and Gourley  
Boston, MA, 1965  
245 feet

**HONGKONGBANK**

Foster Associates  
Hong Kong, 1986  
590 feet

**SEAGRAM TOWER**

Mies van der Rohe  
New York, NY, 1958  
576 feet

**RCA BUILDING**

Hood, Harrison, etc.  
New York, NY, 1932  
850 feet

**McGRAW-HILL BUILDING**

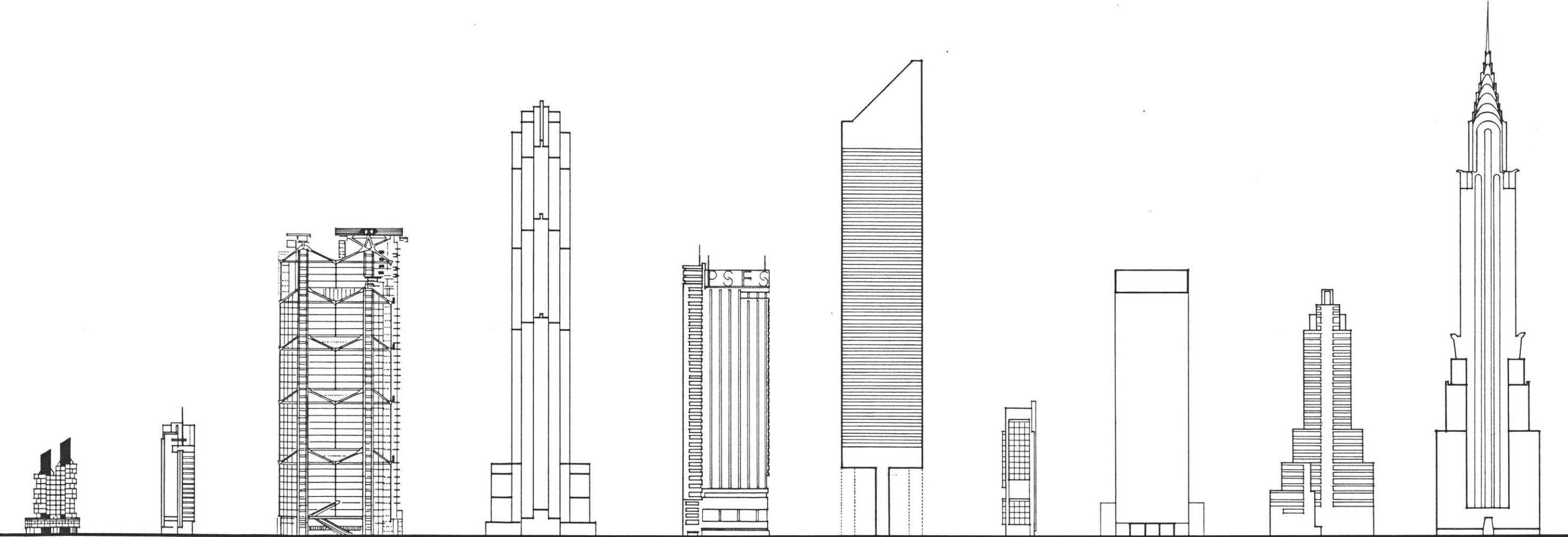
Raymond Hood  
New York, NY, 1930  
485 feet

**P.S.F.S. BUILDING**

Howe and Lescaze  
Philadelphia, PA, 1931  
491 feet

**CHRYSLER BUILDING**

William Van Alen  
New York, NY, 1930  
1048 feet



*Comparison of tall buildings at same scale  
(1"=200') From left to right:*

**LLOYDS**  
Richard Rogers  
London, England, 1986  
260 feet

**NEUE VAHR**  
Alvar Aalto  
Bremen, Germany  
235 feet

**CHICAGO TRIBUNE COMPETITION**  
Eliel Saarinen  
Chicago, 1922  
445 feet

**PEABODY TERRACE**  
Sert, Jackson and Gourley  
Cambridge, MA, 1964  
250 feet

**MONADNOCK BUILDING**  
Burnham and Root  
Chicago, 1885  
202 feet

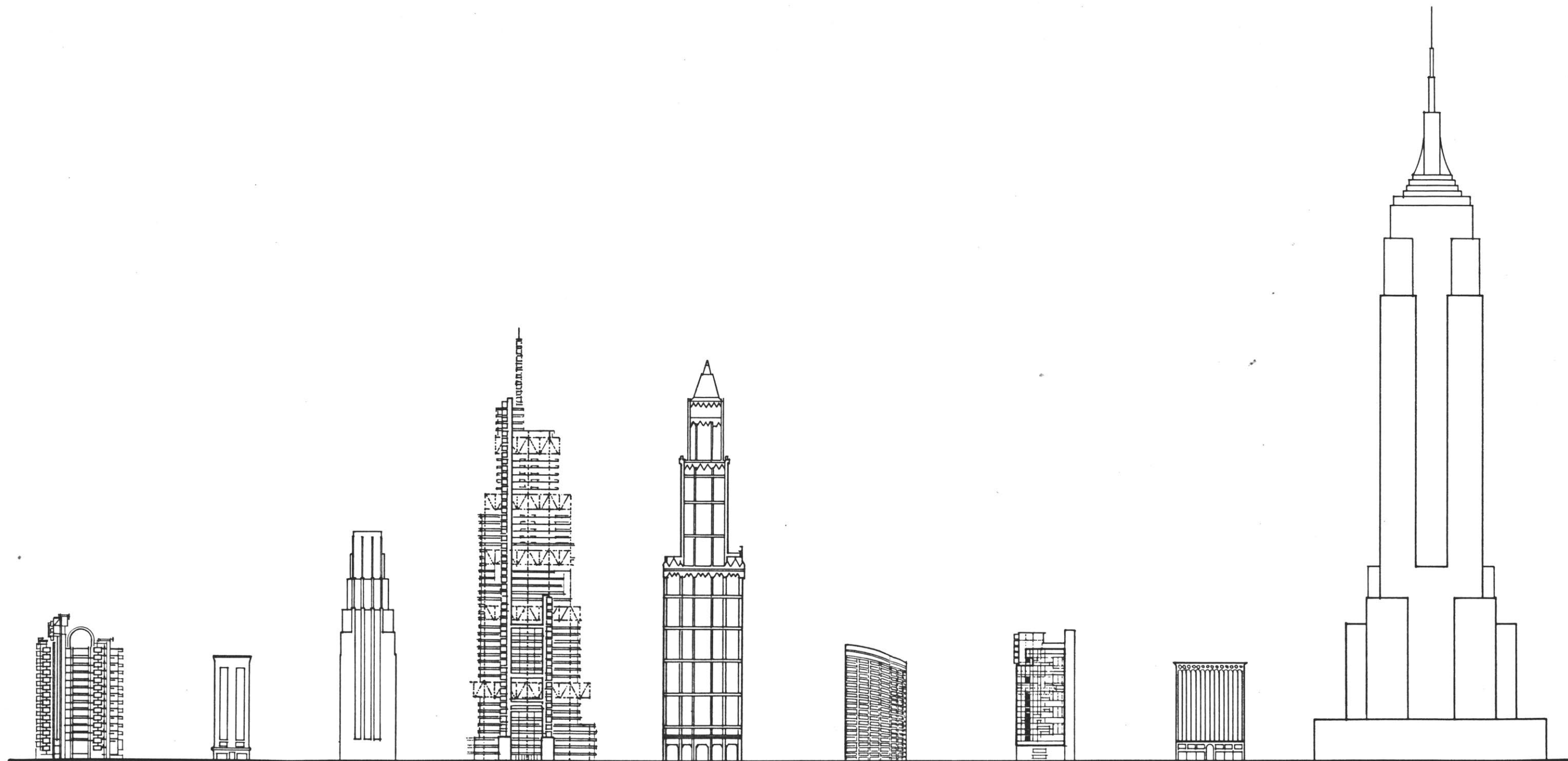
**GUARANTY BUILDING**  
Louis Sullivan  
Buffalo, NY, 1985  
195 feet

**BEDFORD CRESCENT PROJECT**  
David Nelson  
Boston, 1987  
806 feet

**EMPIRE STATE BUILDING**  
Shreve, Lamb and Harmon  
New York, NY, 1931  
1472 feet

**WOOLWORTH BUILDING**  
Cass Gilbert  
New York, 1913  
796 feet







## SECTION III : OBSERVATIONS

### IMPLEMENTATION STRATEGIES

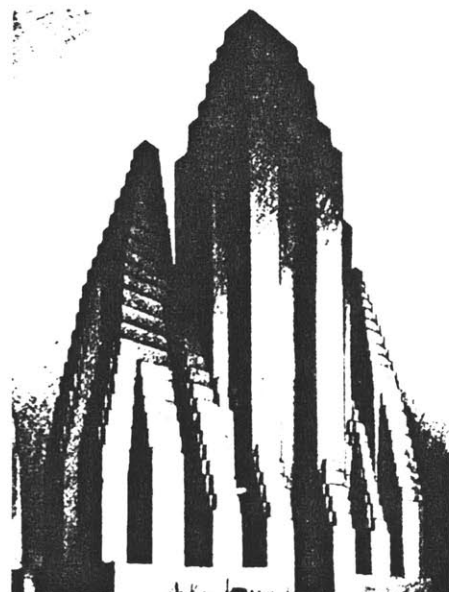
ADAPTABILITIES

FEASIBILITIES

CONSTRAINTS

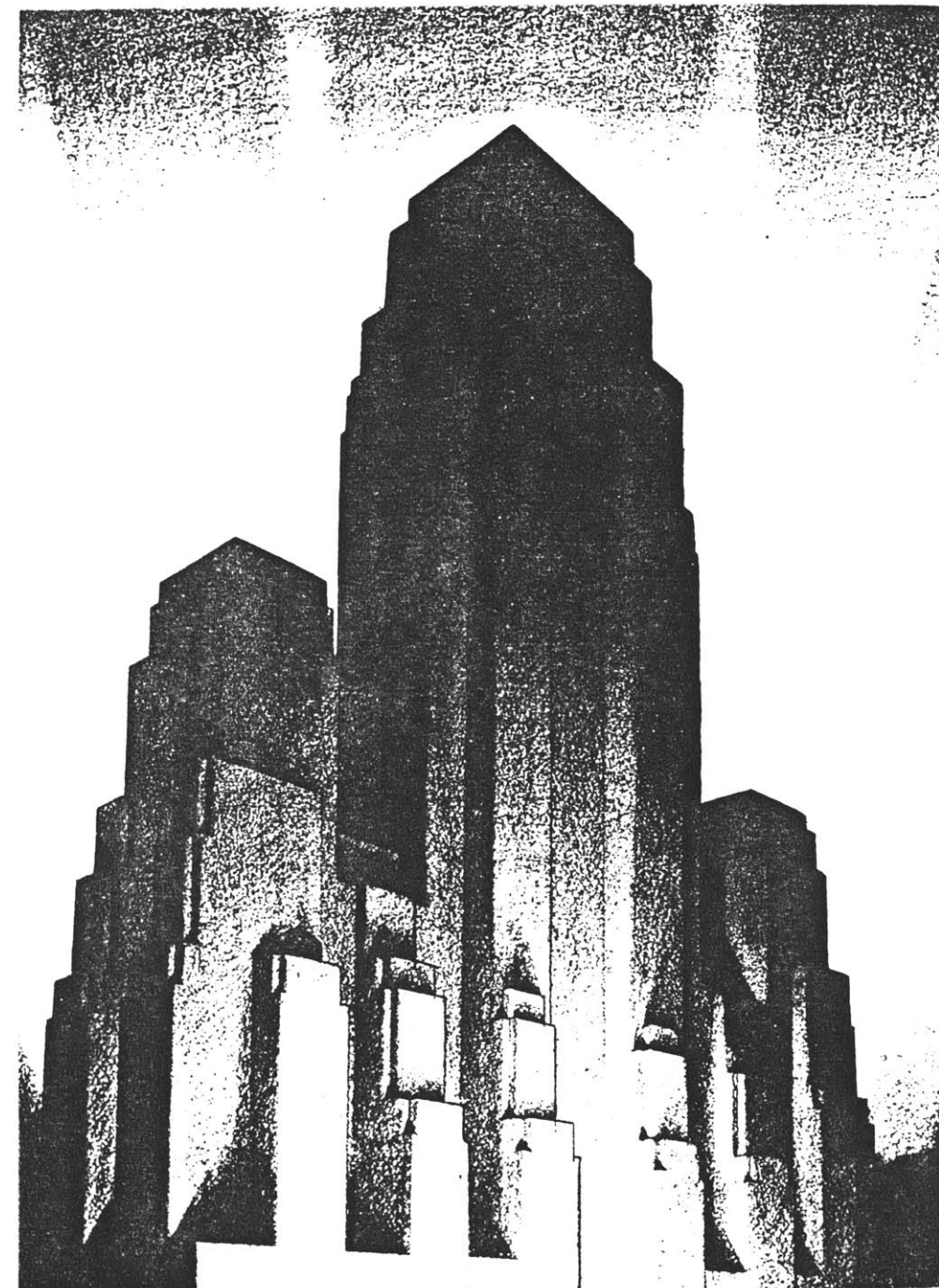
CONCLUSION

### BIBLIOGRAPHY



*... The essence of the skyscraper in that period (the early thirties) was best captured in the images developed by Hugh Ferriss ... . He was perhaps the first architect to see the skyscraper as its own building form. Ferriss's skyscraper drawings combined sober power with great optimism. There was a subtle change of emotional and formal content from the base that sat on the ground to the tower that soared up into the sky.*

*Cesar Pelli "Skyscrapers"*







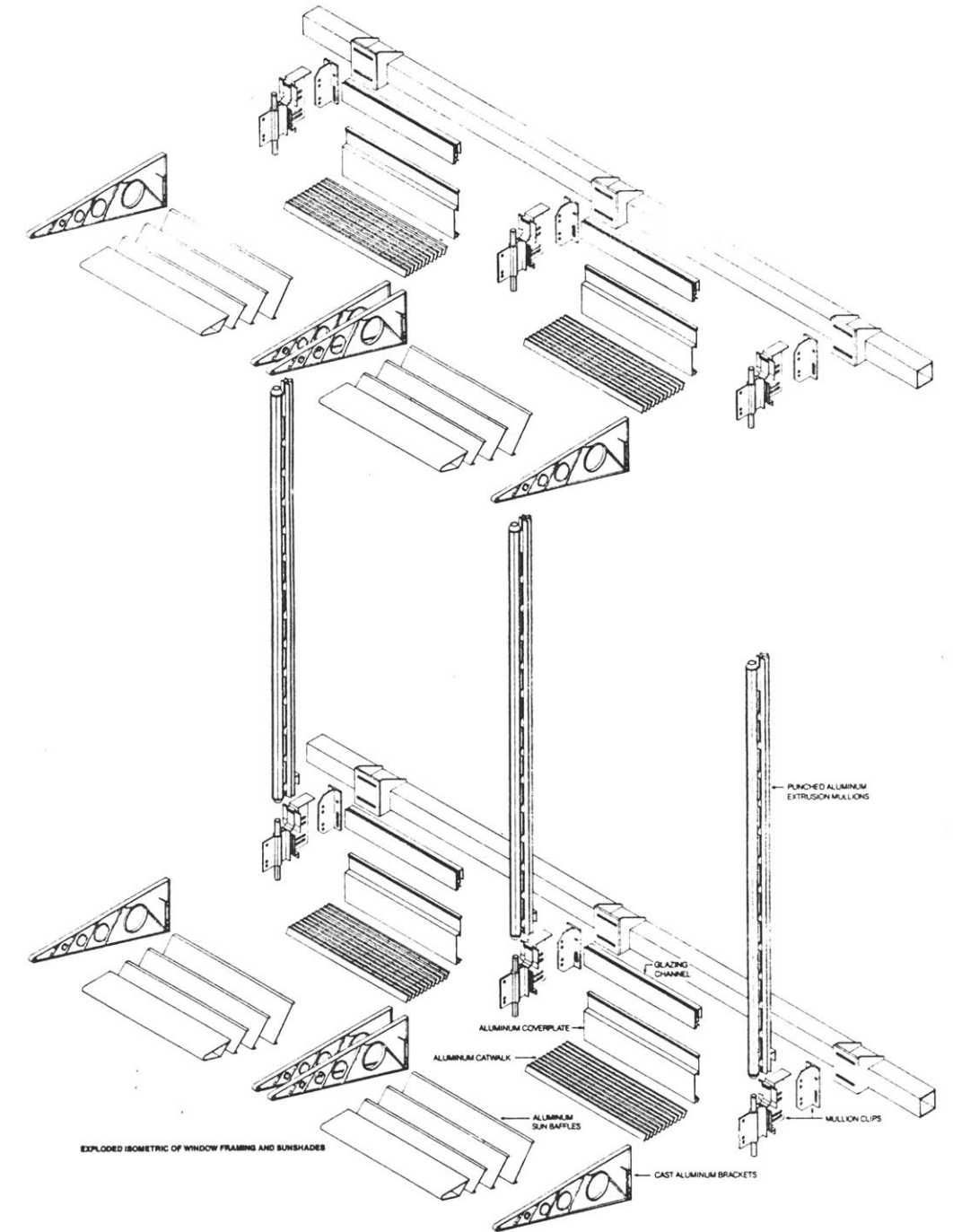
## ADAPTABILITIES

Tall buildings, by their nature, are difficult to adapt. The overall size and organization of the building type sets limits on the types of uses which can naturally occur within the large structural frame. Because the building type is still relatively young, we have not reached a point where super tall skyscrapers have required extensive renovation. One solution to the problems of future adaptability is to assume that these expensive structures will be torn down or stripped of their basic frames and re-skinned. An alternative framework approach to adaptability and additive growth attempts to make gradual change more feasible.

The aggregative frameworks attitude toward the design of the tall building will better provide for future adaptability than the more singular, closed, compositional approach. The issue of "completion" which is discussed in the Frameworks section is also important. Closed, complete objects are more difficult to additively adapt than more associative open-ended structures.

Perhaps the single most important design issue with regards to adaptability is the integration of a range of different sizes into a harmonious piece of urban fabric. Specifically defined zones and sizes imply not only use, but also possibilities for growth, change and adaptive inhabitation.

In order to maximize the opportunities for adaptability and different occupancies, there must be a legibility of parts through clarity of the physical organization. Internal networks and collective areas with overlapping "multi-use" spaces need to be designed. Most importantly, vertical zoning with reference levels at intermediate points need to replace conventional slacked slab arrangements.



*Secondary closure and sun protection system for Norman Foster's HongkongBank helps to establish a range of dimension in the facade.*



## FEASIBILITIES

Building larger continuities in the urban environment is, at the least, a long and difficult process. The political and market realities of today's major development process place enormous constraints and limitations on new design and construction.

Large privately owned parcels are perhaps the most difficult to develop into continuous, mixed-use frameworks. Multiple property ownership and unknown future market values make incremental phased development appear more lucrative. At any one time a level of completeness is achieved making the total financial investment less risky. Debates about the quality of the architecture in a new major development are often defused by hiring well-known firms which have the desired reputation. Although big names do not guarantee quality in the built environment, many people seem to prefer "name-brand" shopping.

Large open-ended megastructures which are additive and adaptive are not easily imagined. Illustrations tend to be open-ended with the specific architectural outcome harder to visualize. Incremental, singular development has the illusion of safe predictability.

Large parcels of land which are owned by the city offer more of a chance for framework oriented developments. The city can negotiate a package with potential developers which insures larger built continuities.

The city, as a landholder, is primarily interested in long-term predictable sources of income. However, a problem arises in organizations like the Boston Redevelopment Authority. The B.R.A. experiences a potential conflict of interest when it acts as both owner and regulator of a property. As the owner, the B.R.A. is trying to maximize monetary profit; but as the regulator its aim is to provide the city with quality development. The city must take a stand. Support should be given to quality development or monetary gain but closed door compromises and incentive negotiations have not elevated the quality of major development. Instead they have muddled the issues and pushed the public toward a state of confusion.

*... If (midtown Manhattan) ceases to be a milieu in which people can exist in reasonable contentment instead of as prisoners perpetually plotting to escape a concentration camp, it will be unprofitable to discuss architectural achievements - buildings that occasionally cause people to hold their breath for a stabbing moment or that restore them to equilibrium by offering them a prospect of space and form joyfully mastered.*

*L. Mumford : "The Two Way Flood", The New Yorker, 1955*

## A Catalog of Techniques for Urban Environmental Design

Preceding chapters provided notions about the settings, participants, organization and desirable outcomes of urban environmental design. The many skills required of the designer in local government have been noted, and we have observed that effectiveness depends upon a combination of personal abilities and techniques employed. Few professionals have the magnetism or stamina to succeed without the proper tools and working methods.

By "techniques," we mean replicable activities or procedures that may be employed to foster environmental changes that are desired. In one case, the term may refer to a type of report; in another, to an ordinance requiring certain actions; in others, to a set of management procedures ensuring qualitative concerns are attended to.

More than 50 techniques were observed in use in the communities we studied. These range from administrative or regulatory procedures to financing techniques, from communication/community participation techniques to design review methods. Not all have worked successfully in every city. Economic development pressure, citizen awareness, the long-term role of the private sector and other conditions may affect the efficacy of any method. Some cities have erred by wedging themselves to techniques for designing while losing sight of the desired purposes.

Selection of the appropriate techniques is obviously an essential ingredient of effective design administration. In the following catalog, they are organized by the types of results they enable. This may or may not allow a manager to find easily what he needs. Thus, in Part 5, an index of techniques is provided, organized by the type of activities implied. This is done by posing common activities in citywide design administration as well as project management.

This catalog includes:

- A. Techniques for Mobilizing and Coalescing Design Attention
  1. Goals programs
  2. Citywide development policies
  3. Advisory committees
  4. Design charrettes
  5. Neighborhood marketing campaigns
  6. Promotional brochures
  7. User response surveys
- B. Inventories of Environmental Assets
  1. Architectural inventories
  2. City image studies
- C. Planning Techniques
  1. District urban design plans
  2. Special interest planning
  3. Urban design standards
- D. Techniques for Integrating City Initiatives
  1. City development coordinator
  2. Joint powers agencies
  3. Reorganization
  4. Executive action memoranda
  5. Facility design review
  6. Code enforcement programs with built in incentives
  7. Management support information systems
- E. Contracts and Agreements to Achieve Design Goals
  1. Master agreements for joint development
  2. Disposition and development agreements
  3. Design controls through leasehold development
  4. Blind purchase agreements
  5. Facade easements
- F. Regulations for Environmental Quality
  1. Zoning
  2. Sign ordinances
  3. Interim ordinances
  4. Anti-demolition ordinances
  5. Mandatory facade improvement programs
  6. Design control districts
  7. Historic districts with design reviews
  8. Environmental assessment with design reviews
- G. Public-Private Participation Methods to Achieve Environmental Quality
  1. Development competitions
  2. Local development corporations
  3. Homesteading
  4. Shopsteading
  5. Home-ownership counseling
- H. Financial Techniques to Support Environmental Improvement Efforts
  1. General obligation bonds
  2. Revenue bonds
  3. Transient occupancy tax
  4. Special assessments
  5. Tax-increment financing
  6. Inner-city value estimation models
  7. Tax abatement strategies
  8. Buyback land fund
  9. Community investment funds
  10. Equity participation loans
  11. Municipal loans for rehabilitation
  12. Revolving loan funds
  13. Capitalizing non-profit groups
  14. Manpower training programs with retraining





## CONSTRAINTS

One of the major questions that arises during many parts of this work concerns the acceptance of the realities associated with today's major development process. Specifically, how many of the actual "real-world" constraints should one accept when studying and designing a theoretical project of this type? It is clear that no real innovation is possible if one eliminates all constraints. However, given the very limited time frame for this thesis it would be easy to get caught in an endless web of logistics and political realities.

My Advisors and Readers are divided on the issue of constraints. Some feel that I should not accept any of the existing constraints and attempt to discover an entirely new building type. Others feel the design process should be closely linked with all the existing architectural and development strategies for the tall building.

One purpose of this thesis, which is stated in the Preface, is to gain knowledge and experience by examining the issues surrounding the tall building in the urban environment. With little knowledge of the existing building type it is doubtful that a student of architecture is going to develop a new building type or even reach a comprehensive understanding of the issues involved. There are still other problems with "visionary" building concepts and many of these are pointed out in the Soleri case study. I made the decision to work within the existing framework of rules from skyscraper construction.

Perhaps the most difficult issue is that of the Program. I feel that in some ways speculative multi-use projects, which are without specific clients and are programatically less specific, are difficult. So much of the design must be left "open-ended", so as to appeal and function for the widest possible range of clients. Uses often become little more than suggestions. Multi-use constraints also add to the list of difficulties. For example, towers combining offices and apartments have not only different structural loading conditions, for the various functions, but different floor to floor height requirements.

The largest real world constraint is usually money. Dollars determine most design issues. I have not addressed cost issues directly, but used my more experienced readers and advisors to guide me along the path of realism. It is clear that strict cost constraints placed on architects by current development strategies have put a serious bind on the architects' ability to be innovative in skyscraper design.

Custom buildings, such as Norman Foster's Hongkong Bank and Richard Rogers' Lloyd's of London, are criticized for their relatively high costs. Yet as our society is spending less and less of its gross income on its architectural environment, it seems a welcome change for any client to put so much money, time and energy into a high density urban structure. Good design is not inexpensive.

The form of the skyscrapers can never be far removed from the pragmatic considerations. The economic, technological and legal constraints of this



*The skyscraper, being much taller than the average surrounding urban fabric, began to assume a more public role, that of primary contributor to the city silhouette and image. With this understanding that the skyscraper was part of the sky, many architects started looking for appropriate references, models and precedents. Here the RCA Building appears as an airship high above the city.*



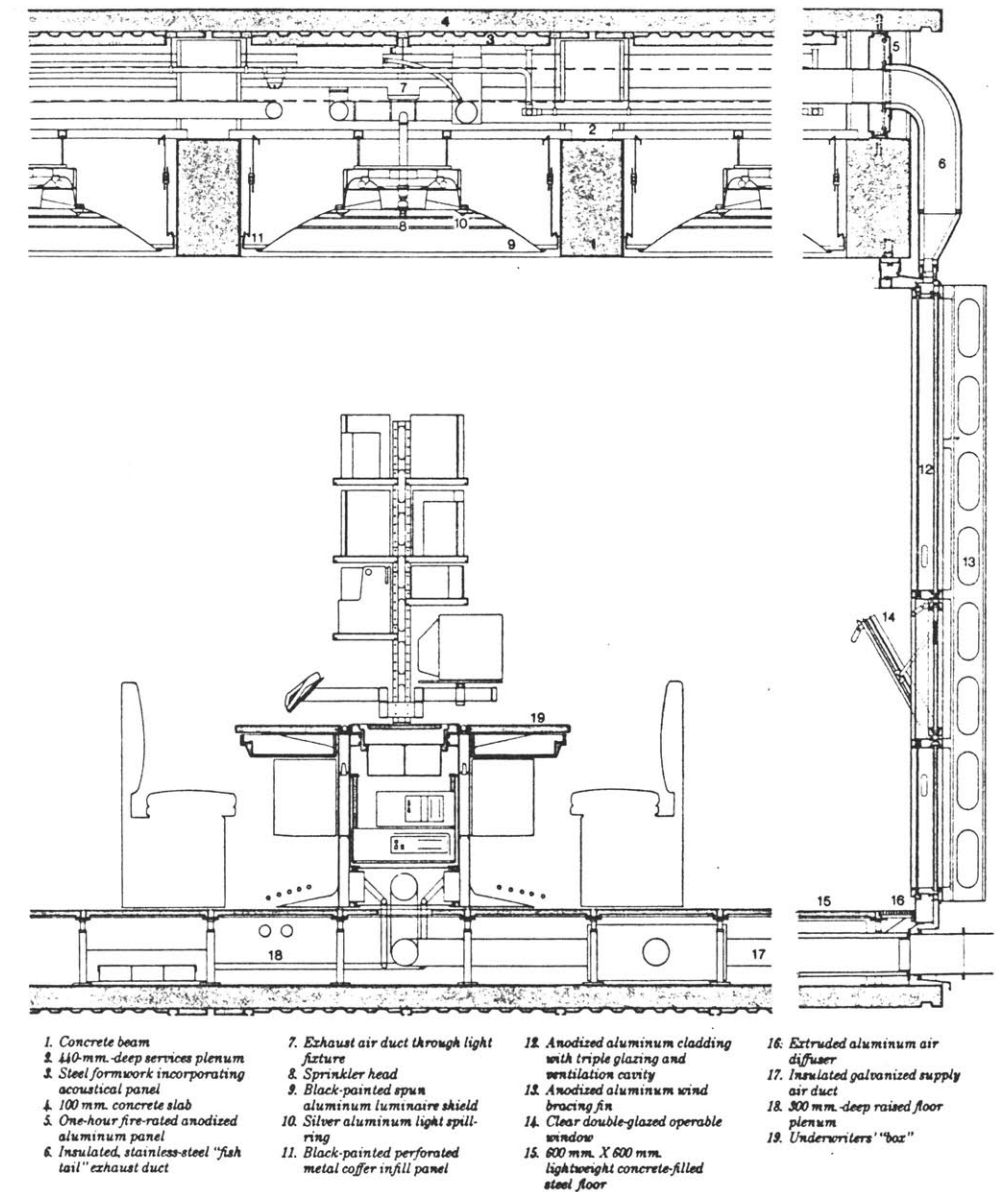
building type are considerable. However pragmatic requirements by themselves do not give or determine form; an architectural process, theory or aesthetic intention is still necessary.

After examining some tall buildings in the urban environment, I still think there are immeasurable improvements that can be made on what is still a new and important building type. I remain primarily interested in changing some of the intentions and theories, leading to a better understanding of the tall buildings ability to contribute to urbanism. I cannot believe we have exhausted the range of possible transformations of the tall building and are in need of an entirely new "visionary" building type. There are far too few skyscrapers which have been acclaimed successful in all aspects of built form and function.

*... To what degree is this situation tenable? It is perhaps an exaggeration of the architect's importance to assume that the solution for the office environment must derive in part from "architectural" strategies and not simply rely on better furniture design.*

*To a degree, a rethinking of the building envelope is now being forced upon architects. Both Burolandschaft and office furniture systems recommend themselves to the kind of deep spaces that depend on a mechanically controlled environment. As energy issues become more important, the reliance on these types of buildings becomes questionable.*

*Linda Gatter "The Development of the Modern Office"*



*Detail office section of Richard Rogers' Lloyds building. An excellent example of a flexible, well detailed, modern office environment.*





## CONCLUSION

Throughout this thesis there has been a continuous development in my attitude toward skyscrapers that has resulted in what I believe is an increased understanding and a new position. In this work I have used the words, "skyscraper", "tower", "tall building" and "highrise" almost interchangeably. However the use of these terms relates to an important question: How tall must a building be to be called a skyscraper?

Skyscraper is a word used to describe a very tall building, where the comparative adverb "very" depends on the place, time period and context. Some early tall buildings such as Chicago's twelve-story Home Insurance Building by William LeBaron Jenny, 1898, were no doubt considered skyscrapers at one time. These early buildings are no longer even considered to be tall.

The drawings at the end of the "Case Study" section show twenty-one buildings side by side. Each is a skyscraper in its own context, yet when compared at the same scale many of the buildings appear small. If we seek to understand a building's role and its attempted accomplishments in the urban environment we can then decide how the structure is acting as a mass and whether or not it is truly a skyscraper.

After this relatively brief study of the tall building and the issues surrounding its contribution to urbanism, my greatest concern is not the legitimacy of the building type, but the direction the latest wave of skyscraper construction seems to be headed. Many modern large scale developments like Boston's Fan-pier Project feature large buildings as separate, singular, theatrical events. Different architects have a different artifact all within one "fantasy park." Each structure is built seemingly without reference to the intervening continuous spaces which make up the delicate urban fabric.

In an increasingly complex and image oriented society, there is little doubt that we are progressing along a path leading to tall buildings as media events. Predictions of the future in recent movies such as "Blade Runner" (1982) and "Brazil" (1986) show not only large scale skyscrapers as architectural media, but the city itself is seen as an architectural media event, where images and fantasies predominate the built landscape. Recent skyscraper projects by leading corporate architects seem to confirm the singular, object-like direction which is shaping the modern urban environment. Tall buildings by Helmut Jahn and Phillip Johnson for example, are image-theme oriented and unfortunately are becoming increasingly popular. Even cities are now searching for their own identifying theme. Indianapolis is now the "Medical Capital of the Midwest"; Denver is the Mile-High city and the list goes on.

While the theme is becoming increasingly important for the tall building and its surrounding environment, the notions of image, media or theme are not by themselves dangerous. The problem lies in the fact that most of the new skyscrapers are little more than a re-packaging of the old Miesian or "Composition" prototypes. Although the surface has changed, the substance



*A 5th Avenue view of the RCA tower at night.*

*... No architecture is ever invented. There is only gradual or radical development starting from viable modules.*

*Cesar Pelli*

*... But whatever the serious architectural intent of any new construction, in New York and elsewhere, it may not matter very much if the insistence upon forcing one 50 story tower next to another continues much longer.*

*Paul Goldberger : The Skyscraper*



has remained exactly the same. There is little or no difference in the structural or built spacial relationships and there are no stronger continuities created by larger frameworks or linkages between buildings.

It may be uncomfortable to imagine an urban future based on media, entertainment and technological information systems, but there are positive aspects in such a vision. Tremendous amounts of money will be spent on new amenity rich environments. There is the potential for increasingly rich and varied built environments made possible by advancements in architecturally related technologies.

It is now clear that the interior environments of the tall building also require a more thoughtful investigation into the organization of space. Linda Gattter in her thesis entitled "The Development of the Modern Office", writes;

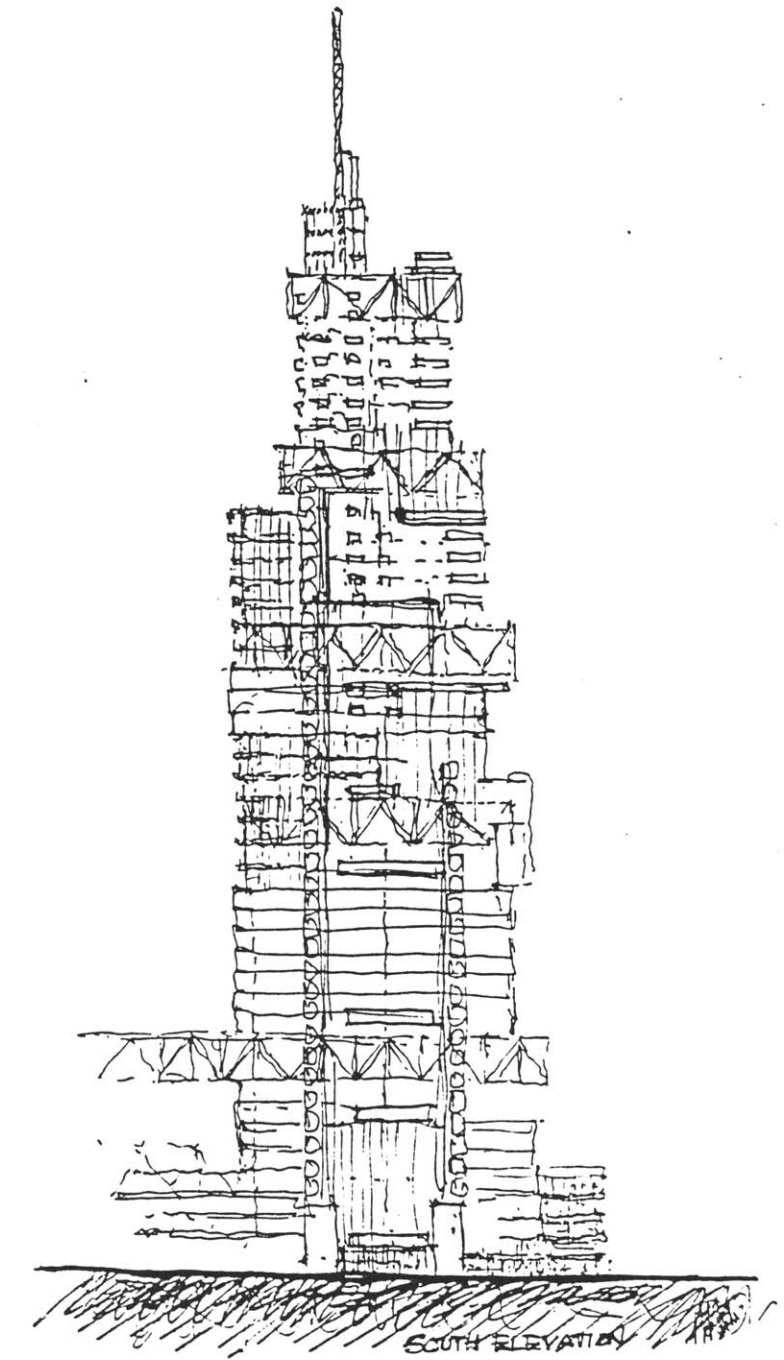
*... The architectural community, in general seems fairly disinterested in contributing to a more thoughtful investigation of the organization of space in the office. The current office buildings which are considered the most interesting by the architectural press, like Helmut Jahn's work in Chicago, certainly are richer in imagery and massing than the office towers of the 60's and 70's, but at the same time one wonders to what degree things have changed in the interior of these buildings, aside from the provision of atriums that are often incredibly overscaled.*

Interior design slips off as a separate activity in the design of the tall office and in the absence of design criteria, flexibility becomes the supreme goal. However, if one looks beyond the issues of status and image, the work environment presents a complex field of needs for territoriality, privacy and communication. Norman Foster's HongkongBank and Richard Rogers' Lloyds of London (both are recent projects shown in the "Case Study" section), prove that interior design can work hand in hand with the image and theme of a building to provide a structure with spacial options, organizational differences and a great clarity in the detail.

The directions of land costs support the notion that the future of the tall building lies in the high density environments and not, as Frank Lloyd Wright had thought, the suburban sprawl. As cities of the future become increasingly more dense and interactive, the skyscraper will be forced to respond, developing complex frameworks which help the buildings serve better as media and information systems. We must decide at every juncture whether we are responding appropriately to the needs of the urban fabric by building with a clear and continuous associative vocabulary, or whether we are contributing only contradictions and discontinuities.

*... I have thought a great deal about all this and I am still thinking about it. I have passionately hoped that some picture would remain out of its frame, I think it can even while it does not, even while it remains there ... That is to say the first hope of a painter who really feels hopeful about painting will move that it will live outside its frame ...*

Gertrude Stein : "Lectures in America"



Early Elevation study of the Bedford Crescent Tower.





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