



A MULTIPLE STORY URBAN OFFICE BUILDING

A thesis submitted in partial fulfillment of the requirements for the degree of Master in Architecture at the Massachusetts Institute of Technology

August 22, 1960

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ABSTRACT

A MULTIPLE STORY URBAN OFFICE BUILDING

CHARLES THOMAS STIFTER

SUBMITTED FOR THE DEGREE OF MASTER IN ARCHITECTURE IN THE DEPARTMENT OF ARCHITECTURE OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY ON AUGUST 22, 1960.

This thesis is concerned with an investigation of the factors which influence the design of the urban office building. Special attention is given to the relationship of the office tower to the urban environment and to the spatial and organizational requirements of the office building tenant.

Specific areas of study include:

The urban land use pattern and its effect upon the siting and character of occupancy of the office tower.

An analysis of a site in the central business district of Chicago.

An analysis of the requirements and operating procedures of both the investor and office building tenant.

The possible roles of recent technical innovations in the areas of structural design and mechanical equipment.

August 22, 1960
6 Platt Road
Brighton 35
Massachusetts

Dean Pietro Belluschi
School of Architecture and Planning
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Cambridge 39, Massachusetts

Dear Dean Belluschi:

In partial fulfillment of the requirements for the degree of Master in Architecture I hereby submit my thesis entitled: A Multiple Story Urban Office Building.

Sincerely,

Charles Thomas Stifter

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THE PROBLEM

Many of the fundamental planning and engineering concepts of the urban office building have remained unchanged since William LeBaron Jenney's Home Insurance Building of 1883. Although each of the great building booms of New York and Chicago prompted technical refinements of elevators, fireproofing methods, curtain walls, and ventilation systems, the steel frame and open plan are as often employed today as in Jenney's time.

The Unity Building (Figure 1), designed in 1892 by Clinton J. Warren, and a portion of the Penn Center Development by Perry, Shaw, Hepburn & Dean, 1956, (Figure 2) illustrate this development. Behind the facades of each are found identical framing systems and nearly the same floor plans; their siting in the urban environment is remarkably similar. Since these buildings are typical products of their times, it would seem that many of the technical and social changes of the last seventy years are either of minor importance or totally unrelated to the problems of the office building. Neither of these assumptions is true.

The organization of commercial and professional offices today differs from the practice of the nineteenth century. Office operations are larger and more complex; greater social responsibility is assumed in corporate employment policies. Advances in the theory of structures and mechanical equipment also indicate that current design practices

may be equally dated. Once the symbol of the distinctive character of the urban environment, the office building has now become one of the prime generators of urban chaos. Even those buildings which constitute a major architectural effort by both architect and client differ from their neighbors only by the choice of materials and percentage of lot coverage. The fundamental problem remains; to reevaluate the urban office building in a manner that fully recognizes and utilizes the social and technical resources available.

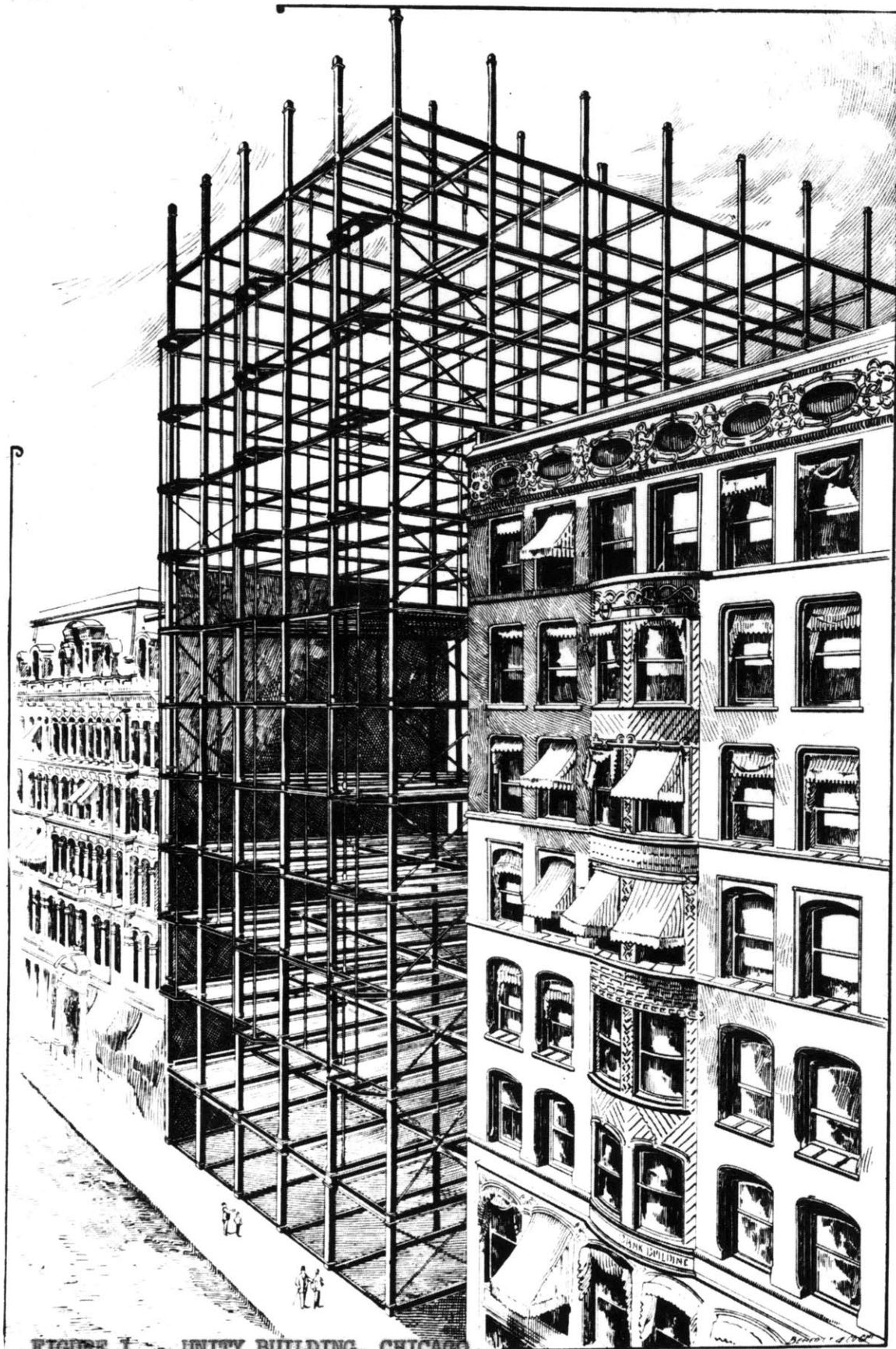


FIGURE I. UNITY BUILDING, CHICAGO

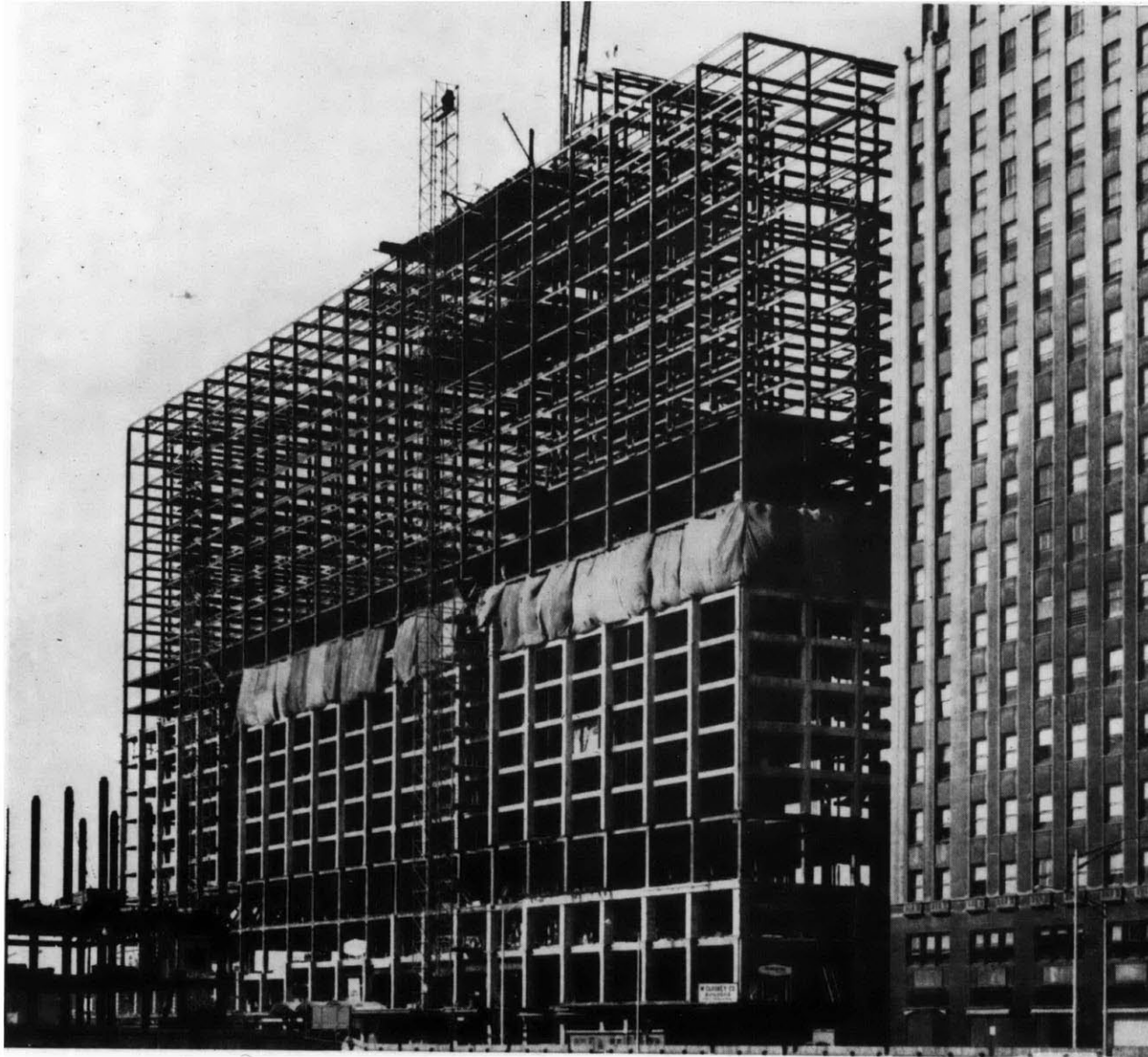


FIGURE 2 PENN CENTER DEVELOPMENT

THE OFFICE BUILDING IN THE URBAN ENVIRONMENT

The development of the large American city as a center for trade and commerce, with its rising land costs and decreasing land availability, inevitably dictated the tall building. By the 1870's New York and Chicago were pushing masonry construction to its limit. With the invention of the steel frame and gearless electric elevator heights were limited only by the ratio of rentable area to service area. The resultant concentration of the largest possible buildings on the smallest possible sites indicates that the skyscraper is rapidly choking the city it helped create. Those buildings which have attempted to alleviate the congestive pattern by utilizing less than the maximum possible lot coverage, such as Lever House or Seagrams, gain their major distinction from the fact that only a few corporations can possibly afford to donate land for the public welfare. Needless to say, this kind of aesthetic altruism does not appeal to the private investment builder.

But the problems of urban design must be considered in a larger scope than in terms of individual buildings. Proposals by architects and planners for economically reasonable building and zoning codes, frequently practical in long range terms, often go unheeded. At best these codes cannot control the relationship of one building to another or of one lot to the next. The quality of the volumes and spaces created are beyond legislation.

THE OFFICE BUILDING IN CHICAGO

The site selected for this thesis is located in Chicago, two blocks north of the "loop" area (Figure 3). Initially the majority of commercial buildings of the city developed in the southern sector of the loop, combining retail, wholesale, and mercantile activities within a relatively small compact area. The investors of the Chicago School greatly depended upon the income from retail stores on the ground floor to establish a base rental rate. The homogeneous character of the urban environment of the nineties encouraged this approach, but the ensuing land use patterns changed the situation considerably.

Between the two World Wars the financial and commercial center grew west and north toward the west branch of the Chicago River, while retail stores and hotels moved northward along State Street. This growth resulted in a segregated land use pattern that gave to Chicago building groupings of uniquely different characters. The ground floors of office towers in the LaSalle Street district were either fully assigned to public circulation or contained a few restaurants and other small services. Some attempts were made to house retail establishments within tall buildings, but the idea lost impetus when shopkeepers realized the importance of physical proximity to their markets and were willing to pay premium rentals to obtain it.

Lined with department stores, specialty shops, and cinemas, State Street developed as Chicago's "great white way". LaSalle Street, in

contrast, became a financial center similar to New York's Wall Street, with densely-sited office towers that denied the existence of daylight (Figure 4). Although sociologists and planners often extoll the homogeneity of the city, the growth of the central business district has clearly been in the opposite direction.

But a large population generated by the office tower and the merchants' willingness to pay premium rentals for heavily trafficked locations can be a mutually beneficial combination. High densities, with a mixture of land uses, are not necessarily undesirable features of the urban pattern. Less than optimum lot coverage may also allow a reasonable economic return. The open plaza, utilized as a series of shopping malls, affords another potential type of development in the urban environment.



FIGURE 3 AERIAL VIEW OF CHICAGO LOOP



FIGURE 4 MASALLE STREET, CHICAGO

SITE CONSIDERATIONS

Relationship of Site to Surrounding Area

The land adjacent to the Chicago River, neglected since the great fire of 1871, is the most recent area being privately developed for office occupancy (Figure 5). In the last three years five projects have either been proposed or built on both banks.

One of these projects is the headquarters of the Chicago Sun-Times. Immediately east of the selected site, this building utilizes its river frontage as a pedestrian walkway from Michigan Avenue. Because the north bank of the River is free of automobile roadways, there exists a potential promenade along its full length. Other buildings on this bank are the Merchandise Mart, The Central Office Building of the City of Chicago, a large storage warehouse, and a loft office building.

Public Transportation

Public transportation serving the Chicago downtown area is of four kinds: buses, elevated trains, subways, and commuter railroads. The subway and elevated systems carry the majority of traffic, discharging passengers at two-block intervals along the length of the loop area (Figure 6).

Bus transportation is utilized mostly along the major arteries, including State and Dearborn Streets, and is geared to shorter travel distances. The railroad terminals for commuter traffic are all located on the extreme fringes of the downtown area and rely upon a system of shuttle buses to reduce walking distances from the terminals.

Parking

In recent years the City of Chicago has built a series of parking garages at the perimeter of the downtown area. Although these garages are not sufficient to handle the entire existing requirements, they do alleviate the problem by furnishing parking for a major percentage of automobiles entering the downtown area. Two of these garages are within a two-block vicinity of the site.

Railroad Right-of-Way

Presently the site is owned and occupied by the Northwestern Railroad as a minor freight and storage yard. Two beds of track connect the main Northwestern right-of-way with the facilities at Navy Pier and must be maintained in the design.

Zoning

Zoning limitations effecting the site are found under the classification "Restricted Central Business Districts" of the Chicago Zoning Ordinance. The purpose of the classification is to implement projects of this nature, and therefore does not present any problem. Height limitations are developed by the Floor Area Ratio system, but grant premiums for setbacks and buildings facing public parks and waterfronts. It would theoretically be possible on this site to have 90% lot coverage with a building height of seventy-five stories.

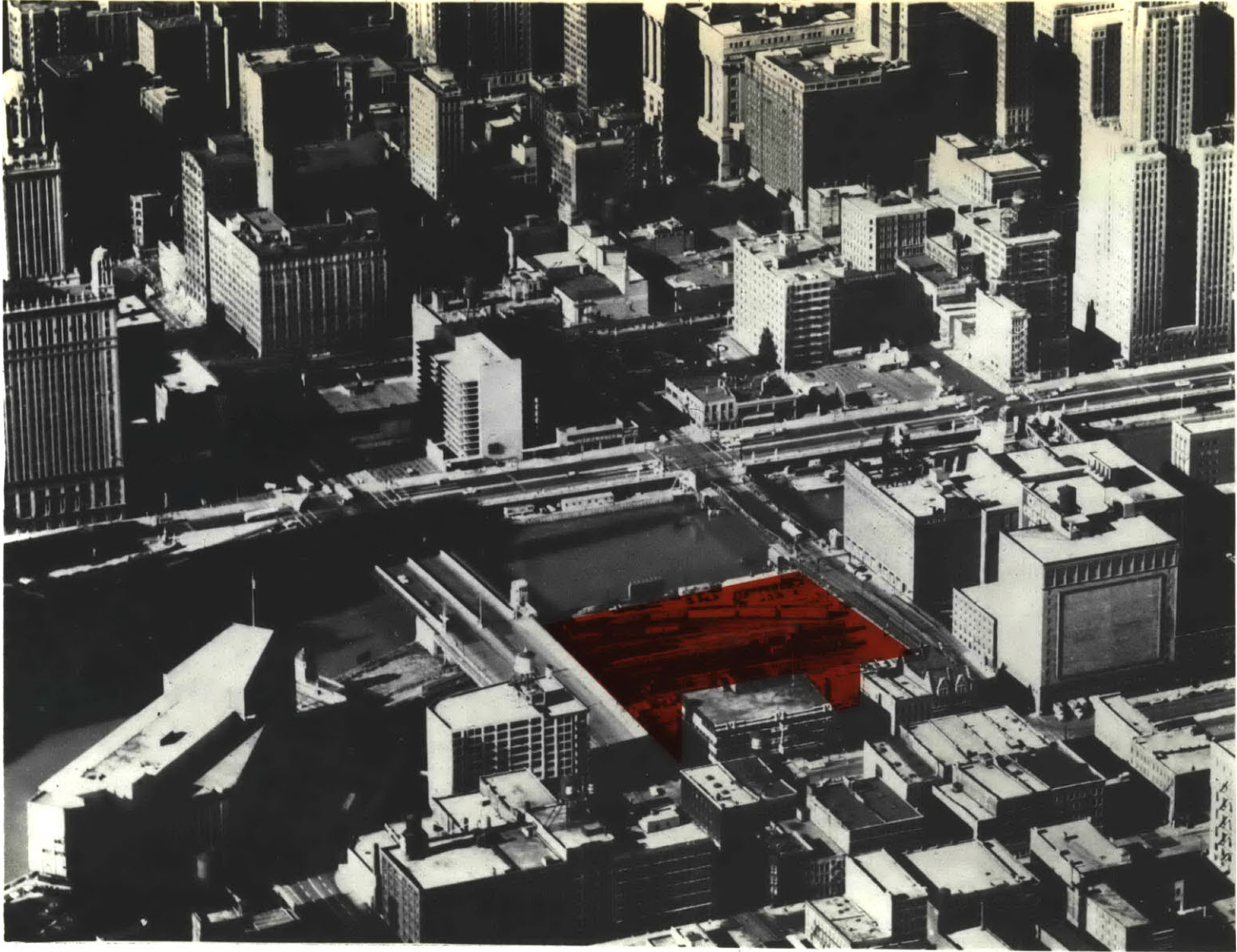


FIGURE 5 AERIAL VIEW OF SITE

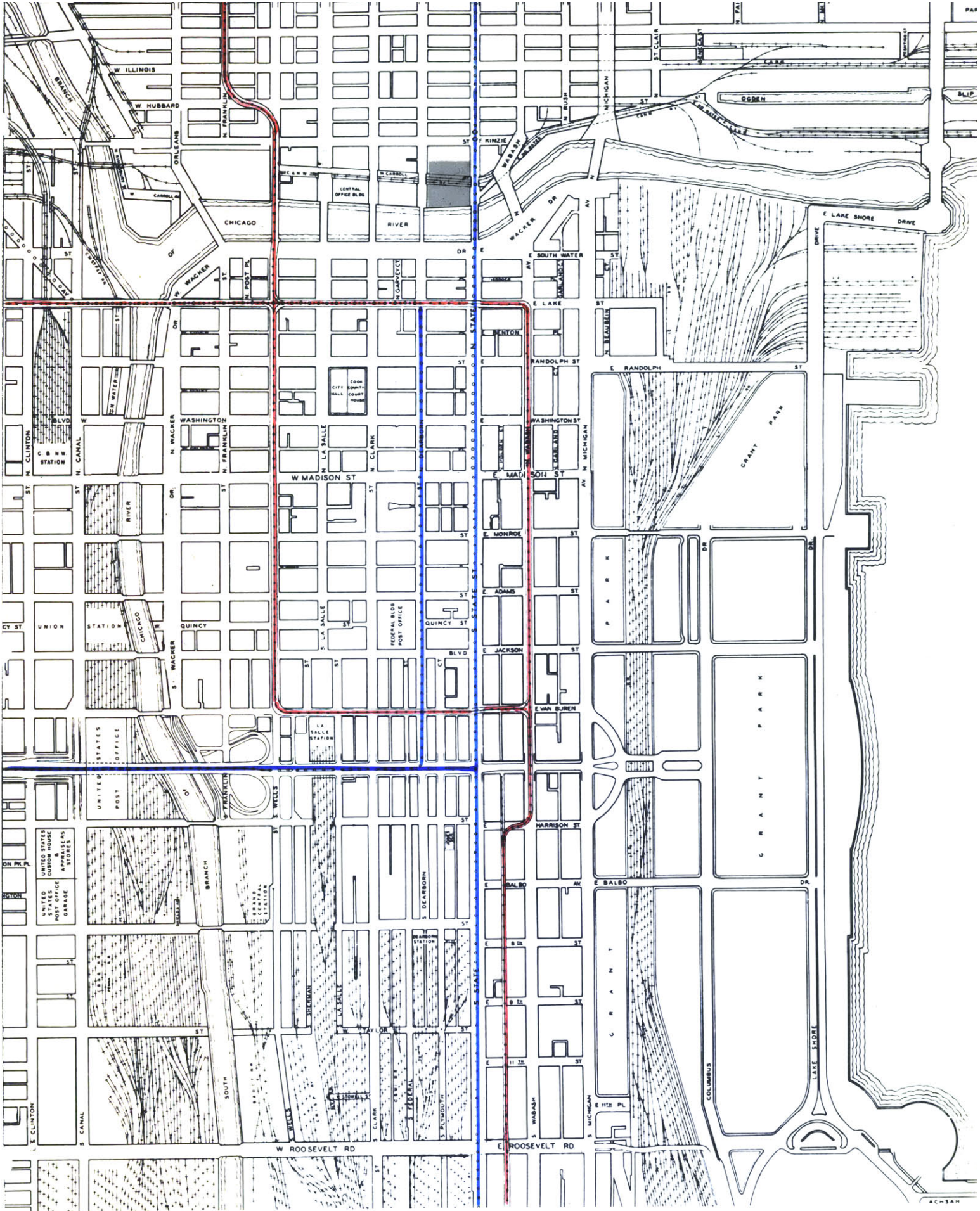


FIGURE 6 PUBLIC TRANSPORTATION IN THE CHICAGO LOOP

ELEVATED

SUBWAY

TYPES OF OCCUPANCIES

The possible types of office buildings can be generalized into three categories: the governmental or municipal building, the corporation headquarters, and the private investment building for public rental. Although each of these occupancies perform similar managerial and clerical operations, their purposes vary.

The municipal building, housing the bureaucratic functions of governmental agencies, usually requires a greater diversity of spatial organization than each of the other types. Police traffic courts, council chambers, taxing and licensing agencies, are a few of the numerous functions requiring accessibility by the general public. This building type probably contains the largest itinerant population and must be designed with a generosity of public spaces to meet that requirement.

Building for corporate ownership involves a large investment of corporate capital compared to the alternative economy of leasing. Some companies offset the limitations imposed by the initial investment with the advertising benefits obtainable from a monumental corporate building. Many dangers are inherent in this approach, for there is no guarantee that the building will be successful or suitable for resale. Location, flexibility of space, and the quality of available services will ultimately determine the value of the building for future tenants.

The argument advanced for the corporate tower is the advantage obtainable from custom design. In reality, however, buildings erected by large corporations perform the same primary function as the investment-

rental building. The requirements of flexibility and an efficient transportation system are applicable to both types.

The majority of office towers erected today are built by private investors for public rental. The purpose these buildings serve range from the speculative building, in which a maximum return is expected from a minimal investment, to a variation of the prestige building, in which tenants are known for their distinctive address and affluent neighbors.

Normally, design and construction precede before the building is fully rented. Efforts are made to commit one or two major tenants, each occupying from 100,000 to 300,000 square feet. Because the investment building represents the most diversified and typical building type, it will be the focus of this thesis.

TENANT CONSIDERATIONS

A basic problem in the design of an office building is the determination of the correct relationship between net floor area and vertical services. Before the construction of the Empire State Building it was believed that extreme height was desirable; today the limits range from twelve to sixty stories; net floor areas from 10,000 to 35,000 square feet. Although these factors are important, they are often reduced to a formula, eliminating from consideration many of the inherent spatial and organizational potentialities of the tall building. Interior vertical space, for instance, has totally disappeared from the skyscraper.

By an analysis of the types of tenants within the investment building it is hoped that some of these potentialities can be realized consistent with the needs and organization of these occupancies.

The Large Corporate Tenant

Necessary for the efficient operation of any large corporate body is a clear hierarchy of organization to effectuate and guide the aims of the company. The most widely adopted method for obtaining this organization is by the application of mass production techniques to clerical routines. In all but very small offices there is considerable specialization of clerical skills, such as the grading of typists in a typists' pool. In bigger companies large volume clerical routines are organized on an assembly line basis, so that each clerk specializes in a few operations. Benefits accruing from the specialization of labor are the same as those gained in the manufacturing plant: shorter training periods, grading of skills and rates, and proficiency in performance. As in industrial assembly lines, the full benefits of speed and economy can be gained only if personnel and equipment involved are arranged so as to minimize the distance and time consumed in the transfer of paper work from job to job (Figure 7). For instance, in a large company the processing of a customer's order from receipt to fulfillment may require multiple transfers between departments. Within each of these departments several persons may be involved in handling the order. A simplified example is the following movement of a customer's order from receipt to fulfillment:

1. Mail Department:

Receives, opens, and arranges transmittal of order to Order Department.

2. Order Department:

Records receipt of order.

Reviews order for clarity, if necessary refers to Sales Department for verification.

Refers order to Credit Department for checking.

Pulls from master file IBM customer name and address cards.

Pulls from master file IBM item description cards for each item ordered.

3. Tabulating Department:

Performs auxiliary machine operations to sort, collate, and compute data.

Prepares shipping documents and forwards them to Order Department.

4. Order Department:

Checks shipping copies.

Routes shipping documents to plant or warehouse for fulfillment.¹

As this example demonstrates, the communication's network of a large corporation is the backbone of its organization. Other factors that influence the network are the location of managerial and supervisory staffs, proximity of departments, the organization of work space, use of office equipment, and sufficient flexibility for future modifications.

Although the single floor is usually considered the most efficient working unit, larger corporations require many stories to house their operations. The resultant load on the vertical transportation system often creates awkward and undesirable situations. In the Inland Steel Building any worker wishing to talk with someone on another floor must pass by a series of managerial offices, through a reception lobby, into a public elevator lobby, up a fire stair, into another elevator lobby,

¹Based on analysis of office procedures by Beryl Robichaud, Selecting, Planning, and Managing Office; New York, 1958.

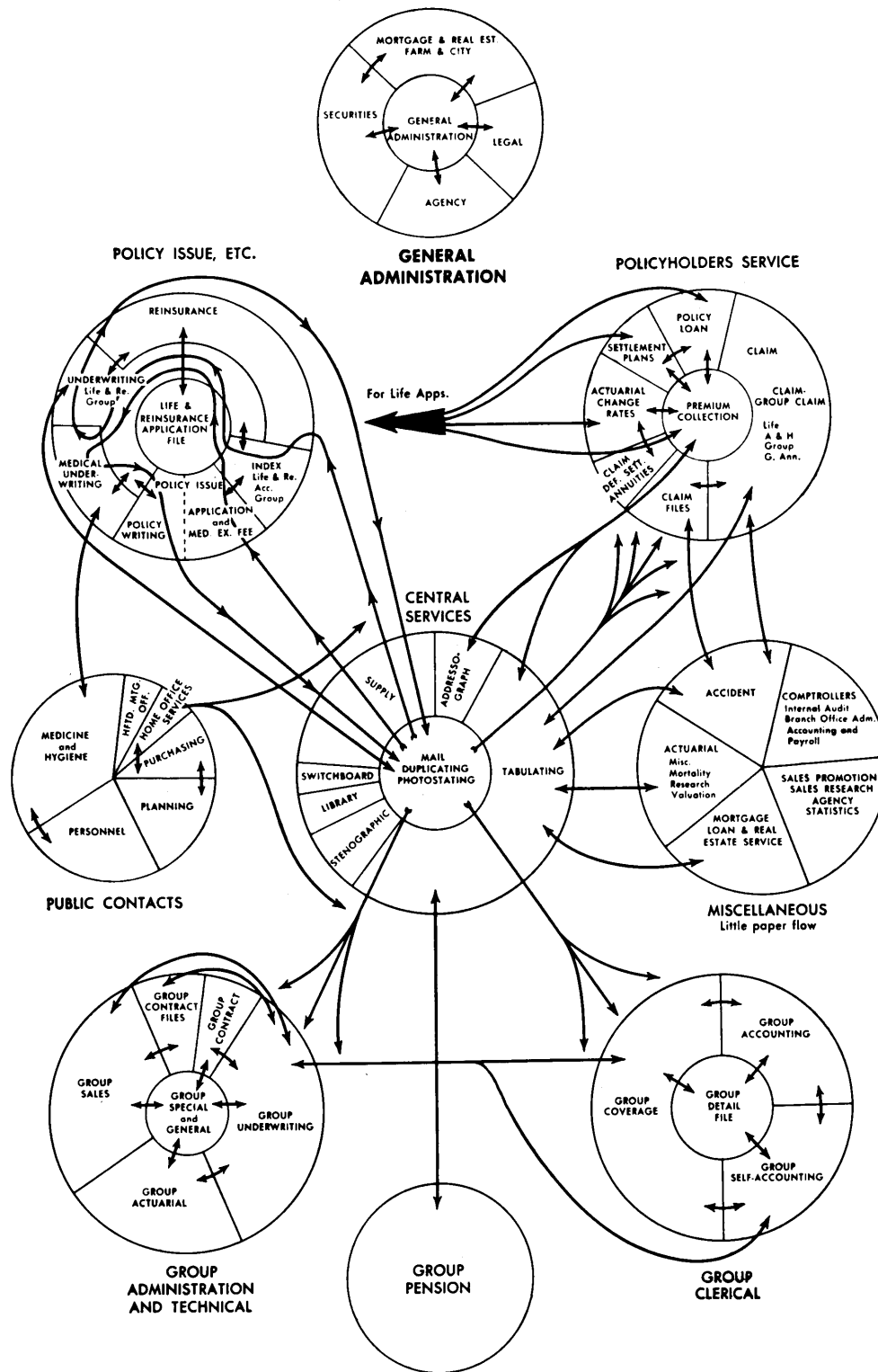


Fig. 7-3 Interdepartmental Work Clusters—Analysis Made to Determine Space Assignments in Planning of Connecticut General Life Insurance Headquarters (Reprinted from the AMA Office Management Series 137)

reception space, and office area. To return to his desk the process must be repeated.

By considering a work unit larger than one story it is possible to develop a local communications network which will more effectively provide service between adjacent floors. In turn, some of the load will be relieved from the major elevator system, thereby increasing the efficiency of the total vertical transportation network.

The flexibility requirements of multiple story occupancies are of two kinds: long range flexibility, in which the number of possible spatial arrangements is maximized by the basic planning system, and short range flexibility, which involves the periodic adjustment of local office arrangements. The application of these two systems is related to their frequency of use. Moveable partitions, although extremely expensive, currently are widely utilized. A flexible planning system of varied story heights with adjustable floor construction would find application during the initial design and at several year intervals during the life expectancy of the building.

Since office towers require a variety of spaces for different functional requirements, the limitations imposed by a uniform ceiling height rarely produce architecturally pleasant spaces. Often contained within a single floor are rooms of 100 and 10,000 square feet, each with the same ceiling height. The psychological and visual impressions of well proportioned rooms, besides being aesthetically desirable, could affect the efficiency and rate of turnover of the working personnel.

Smaller Tenants

Smaller tenants, such as professional offices, insurance agents, or brokers' offices, often employ the same organizational principles found in larger offices. Planning for these occupancies is analogous to the problems of departmental organization in larger corporations. Vertical planning is also applicable to the smaller tenant. A professional firm occupying 25,000 square feet may find a vertical office arrangement more profitable than being spread over one floor.

Public Services

Many buildings containing large working populations house service facilities such as restaurants, barber shops, and pharmacies. The desirability of these occupancies often depends upon the amount of investment required. For instance, the investment in equipment necessary for the operation of a roof-top restaurant, including extra elevator service, may be prohibitive.

STRUCTURAL DESIGN AND MECHANICAL EQUIPMENT

Structural Design

The growth of structural theory in the post war period has greatly improved the design of many building types. To date it has found only limited application to office towers.

In recent years techniques of pre-casting and a need for longer spans have put concrete in a more competitive position with steel. Recent long span concrete office towers include the Pirelli Building, Milan, and the Norton Building, Seattle, the latter employing pre-cast pre-stressed floor girders. Heavier erection cranes, a minimal number of field connections, and the absence of fireproofing requirements are some of the advantages of concrete construction. Because long spans require fewer pile clusters, additional economy is possible.

Other considerations necessary for the selection of a structural system are:

1. The relationship of bay size to office layout.
2. Possibilities for the integration of mechanical equipment.
3. Location of fixed elements, such as stairs, elevators, and duct shafts.
4. Proportion of tower and its relationship to wind loading.
5. Degree of flexibility desired in office spaces.

Mechanical Equipment

Generally, the primary considerations in the choice of a heating and ventilating system are:

1. Size of area to be serviced.
2. Nature of functions to be serviced.
3. Initial versus maintenance cost.
4. Degree of control and sensitivity of system thought necessary by owner and tenant.

Most office buildings of the last twenty years employ a uniform heating and ventilating system on all floors. Once the choice of a system is made, it must be incorporated into the rental charges, equally shared by all tenants.

A possible alternative is that developed by the Arthur Rubloff Company for the Hartford Fire Insurance Building in Chicago. By providing space for a mechanical system at intervals throughout the height of the building, the tenant is able to select the mechanical system of his choice. The system may be rented or tenant owned, allowing him to fix his overhead charges accordingly.

SUMMARY OF OBJECTIVES

Consideration of the downtown area as an admixture of land uses, thereby allowing a greater variety of densities and more favorable siting opportunities for both retail and commercial operations. Application of this principle can be achieved by the development of the north bank of the Chicago River as a continuous pedestrian promenade, containing stores, services, and offices.

Within the office building, to develop a variety of occupancies, recognizing a hierarchy of the planning and organizational needs of all tenants. Necessary qualities are an efficient work unit larger than a single floor and a complementary system of local vertical circulation. An additional requirement is a flexible system of space allocation that reflects the anticipated needs of current and future tenants.

The development of a structural and mechanical system that supplements the organization of the tower. Possible utilization of more recent materials and techniques for a wider range of adaptability and greater efficiency.

A P P E N D I X

BUILDING: R.C.A. BUILDING, 1933

ARCHITECT: REINHARD et al

<u>% SITE COVERAGE</u>	<u>GROSS FLOOR AREA</u>	<u>% OFFICE</u>	<u>NUMBER OF FLOORS</u>	<u>AVG. SQ. FT. OFFICE FLOOR</u>
85%	2,610,000 sq. ft.	76%	68	24,000

<u>FLR TO FLR. HEIGHT</u>	<u>FLR. TO CEIL. HEIGHT</u>	<u>BAY SIZE</u>	<u>MULLION SPACING</u>	<u>SKIN</u>
11'-6"	10'-10"	27' x 18' 27' x 24'	--	Limestone & opening sash

STRUCTURAL SYSTEM

Steel frame

MECHANICAL SYSTEM

Perimeter fin radiation,
high velocity ventilation

MAXIMUM DISTANCE FROM DESK TO:

<u>STAIR</u>	<u>ELEVATOR</u>	<u>TOILET</u>	<u>WINDOW</u>
180'-135'	290'-160'	220'-180'	27'

BUILDING: MILE HIGH CENTER, 1955

ARCHITECT: I.M. PEI & ASSOCIATES

<u>% SITE COVERAGE</u>	<u>GROSS FLOOR AREA</u>	<u>% OFFICE</u>	<u>NUMBER OF FLOORS</u>	<u>AVG. SQ. FT. OFFICE FLOOR</u>
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22%	457,000 sq. ft.	82%	23	20,000
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<u>FLR TO FLR. HEIGHT</u>	<u>FLR. TO CEIL. HEIGHT</u>	<u>BAY SIZE</u>	<u>MULLION SPACING</u>	<u>SKIN</u>
---------------------------	-----------------------------	-----------------	------------------------	-------------

11'-2"	9'-0"	25' x 25'	4'-2"	Al. & porc. enamel
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STRUCTURAL SYSTEM

Steel frame

MECHANICAL SYSTEM

Air conditioning & hot water heating

MAXIMUM DISTANCE FROM DESK TO

STAIR

120'

ELEVATOR

120'

TOILET

120'

WINDOW

60'

BUILDING: COLGATE PALMOLIVE

ARCHITECT: EMERY ROTH & SONS

<u>% SITE COVERAGE</u>	<u>GROSS FLOOR AREA</u>	<u>% OFFICE</u>	<u>NUMBER OF FLOORS</u>	<u>AVG. SQ. FT. OFFICE FLOOR</u>
100%	617,000 sq. ft.	82%	25	24,500

<u>FLR TO FLR. HEIGHT</u>	<u>FLR. TO CEIL. HEIGHT</u>	<u>BAY SIZE</u>	<u>MULLION SPACING</u>	<u>SKIN</u>
11'-6"	not available	22' x 22'	4'-6"	Glass spandrels & fixed sash

STRUCTURAL SYSTEM

Steel frame

MECHANICAL SYSTEM

Fan coil

MAXIMUM DISTANCE FROM DESK TO

STAIR

105'

ELEVATOR

150'

TOILET

115'

WINDOW

65'

BUILDING: SOCONY MOBIL, 1956

ARCHITECT: HARRISON & ABROMOVITZ

<u>% SITE COVERAGE</u>	<u>GROSS FLOOR AREA</u>	<u>% OFFICE</u>	<u>NUMBER OF FLOORS</u>	<u>AVG. SQ. FT. OFFICE FLOOR</u>
100%	1,650,000 sq. ft.	76%	45	36,500

<u>FLR TO FLR. HEIGHT</u>	<u>FLR. TO CEIL. HEIGHT</u>	<u>BAY SIZE</u>	<u>MULLION SPACING</u>	<u>SKIN</u>
11'-9"	9'-0"	25' x 30' 15' x 20'	9'-8"	Stainless steel & fixed glass

STRUCTURAL SYSTEM

Steel frame

MECHANICAL SYSTEM

High velocity
steam cooled

MAXIMUM DISTANCE FROM DESK TO

STAIR

175'

ELEVATOR

100'

TOILET

240'

WINDOW

60'

BUILDING: INLAND STEEL, 1958

ARCHITECT: SKIDMORE, OWINGS, & MERRILL

<u>% SITE COVERAGE</u>	<u>GROSS FLOOR AREA</u>	<u>% OFFICE</u>	<u>NUMBER OF FLOORS</u>	<u>AVG. SQ. FT. OFFICE FLOOR</u>
100%	297,000 sq. ft.	80%	19 office 25 service	10,500

<u>FLR TO FLR. HEIGHT</u>	<u>FLR. TO CEIL. HEIGHT</u>	<u>BAY SIZE</u>	<u>MULLION SPACING</u>	<u>SKIN</u>
13'-0"	8'-11"	26" x 60"	5'-2"	Stainless steel & green glass

STRUCTURAL SYSTEM

Steel beam & girder

MECHANICAL SYSTEM

5 dual duct
high velocity

MAXIMUM DISTANCE FROM DESK TO

STAIR

180'

ELEVATOR

190'

TOILET

210'

WINDOW

30'

BUILDING: SEAGRAMS, 1958

ARCHITECT: MIES VAN DER ROHE

<u>% SITE COVERAGE</u>	<u>GROSS FLOOR AREA</u>	<u>% OFFICE</u>	<u>NUMBER OF FLOORS</u>	<u>AVG. SQ. FT. OFFICE FLOOR</u>
50%	854,000 sq. ft.	58%	38	20,000

<u>FLR TO FLR. HEIGHT</u>	<u>FLR. TO CEIL. HEIGHT</u>	<u>BAY SIZE</u>	<u>MULLION SPACING</u>	<u>SKIN</u>
12'-0"	9'-0"	28' x 28'	4'-6"	Extruded bronze & gray glass

STRUCTURAL SYSTEM

Steel frame

MECHANICAL SYSTEM

Double duct
high velocity

MAXIMUM DISTANCE FROM DESK TO

STAIR

70'

ELEVATOR

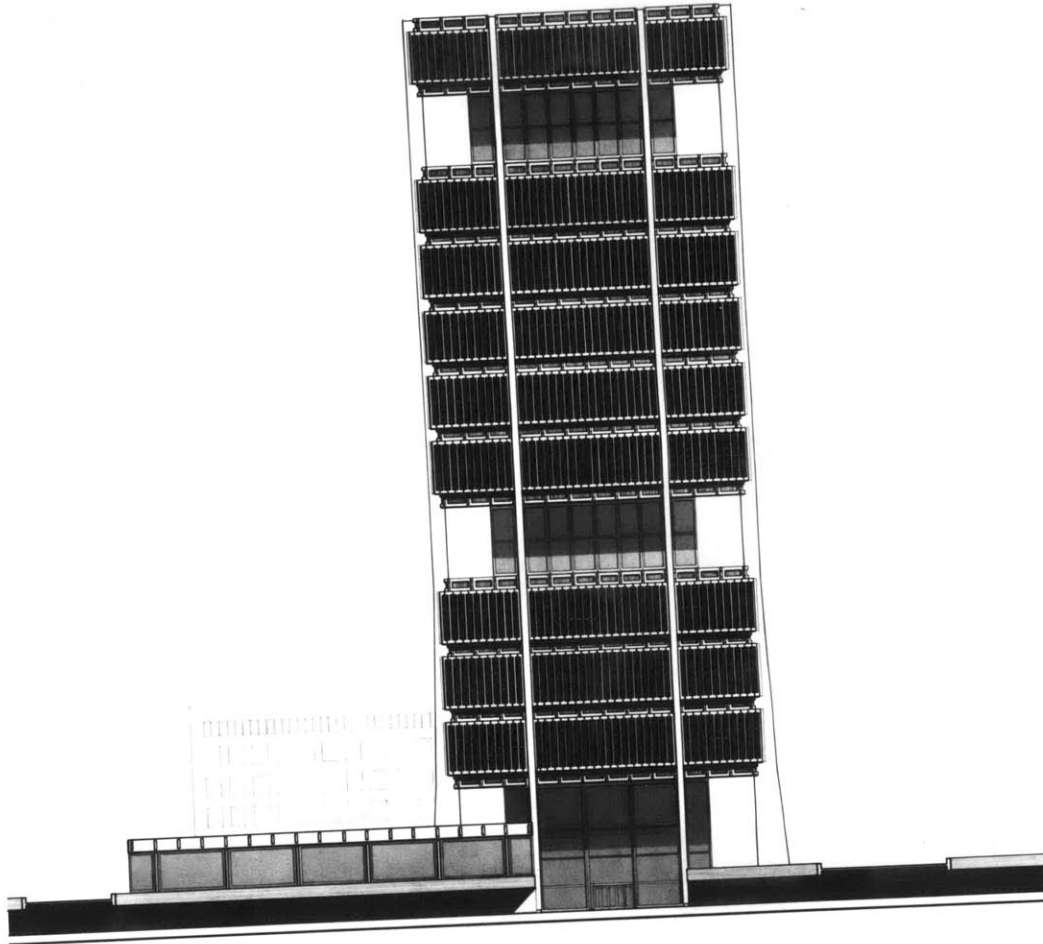
70'

TOILET

70'

WINDOW

35'



MULTIPLE STORY URBAN OFFICE BUILDING
ELEVATION
1/30" = 1'-0"
AUGUST 30, 1960
CHARLES T STIFFER
MASTER'S THESIS

BUILDING: BLUE CROSS, BLUE SHIELD, 1960

ARCHITECT: PAUL RUDOLPH; ANDERSON, BECKWITH & HAIBLE

<u>% SITE COVERAGE</u>	<u>GROSS FLOOR AREA</u>	<u>% OFFICE</u>	<u>NUMBER OF FLOORS</u>	<u>AVG. SQ. FT. OFFICE FLOOR</u>
46%	141,000 sq. ft.	89%	12	17,500

<u>FLR TO FLR. HEIGHT</u>	<u>FLR. TO CEIL. HEIGHT</u>	<u>BAY SIZE</u>	<u>MULLION SPACING</u>	<u>SKIN</u>
10'-11"	9'-6"	32' x 32'	5'-0"	Mosaic spandrels & fixed glass

STRUCTURAL SYSTEM

Concrete

MECHANICAL SYSTEM

High velocity;
perimeter dual duct

MAXIMUM DISTANCE FROM DESK TO

STAIR

70'

ELEVATOR

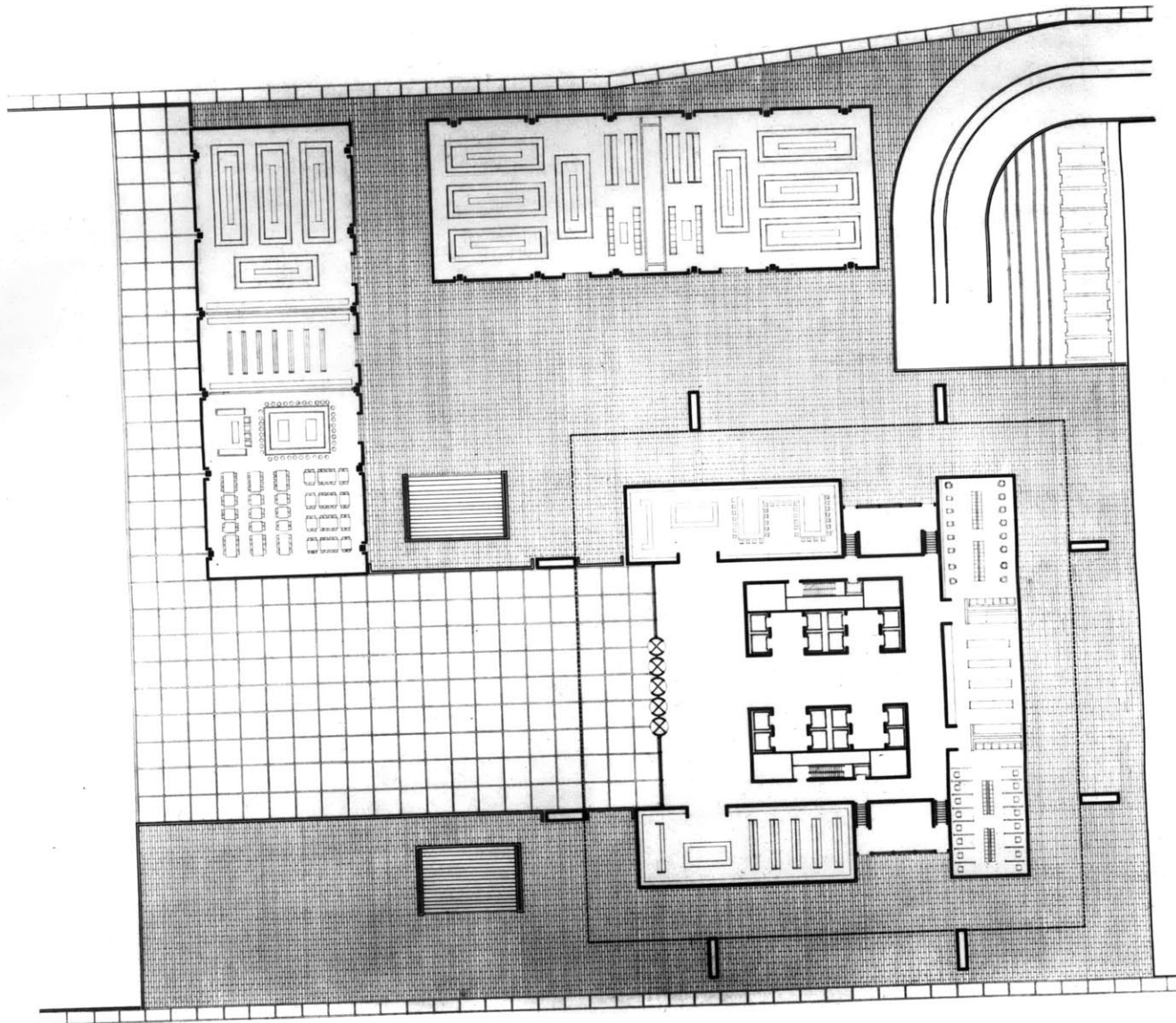
80'

TOILET

95'

WINDOW

45'



MULTIPLE STORY URBAN OFFICE BUILDING
FIRST FLOOR PLAN
1/16" = 1'-0"
AUGUST 20, 1960
CHARLES T. STIFTER
MASTER'S THESIS

BUILDING: TIME & LIFE, 1960

ARCHITECT: HARRISON & ABRAMOVITZ & HARRIS

<u>% SITE COVERAGE</u>	<u>GROSS FLOOR AREA</u>	<u>% OFFICE</u>	<u>NUMBER OF FLOORS</u>	<u>AVG. SQ. FT. OFFICE FLOOR</u>
86%	1,900,000 sq. ft.	79%	47	32,000

<u>FLR TO FLR. HEIGHT</u>	<u>FLR. TO CEIL. HEIGHT</u>	<u>BAY SIZE</u>	<u>MULLION SPACING</u>	<u>SKIN</u>
Not available	Not available	28' x 28'	4'-8" 4'-0"	Clear glass, limestone, & aluminum

STRUCTURAL SYSTEM

Steel frame

MECHANICAL SYSTEM

Central distribution

MAXIMUM DISTANCE FROM DESK TO

STAIR

120'

ELEVATOR

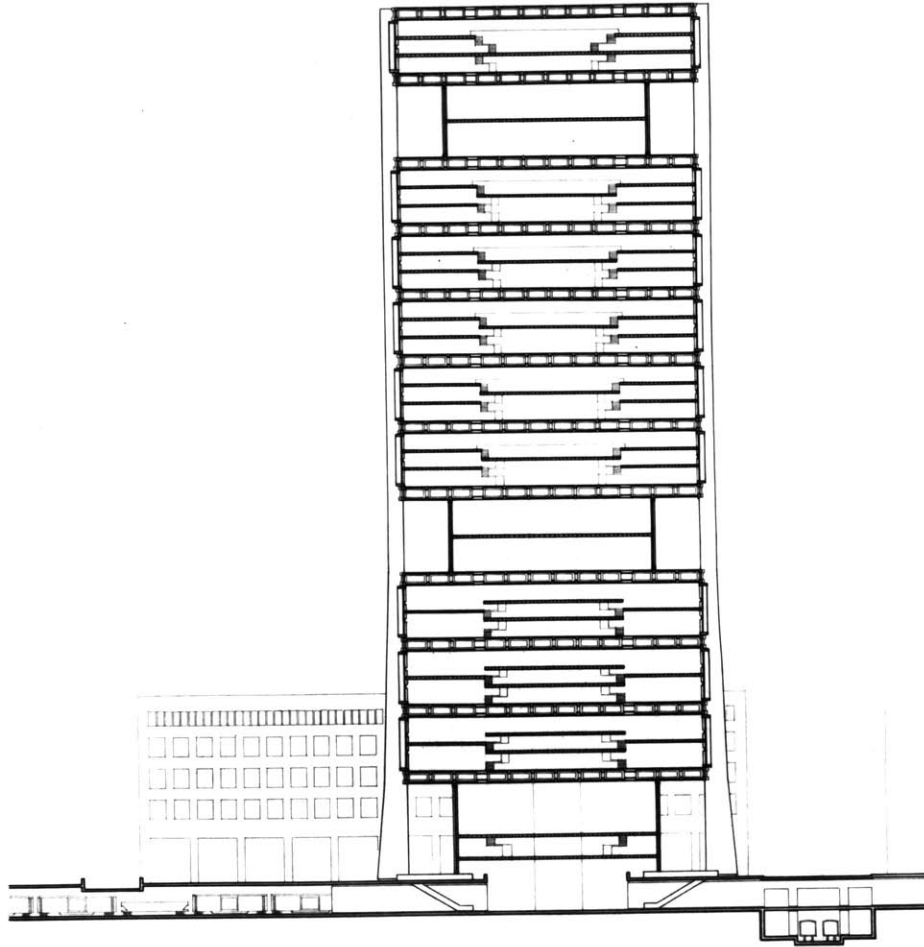
175'

TOILET

130'

WINDOW

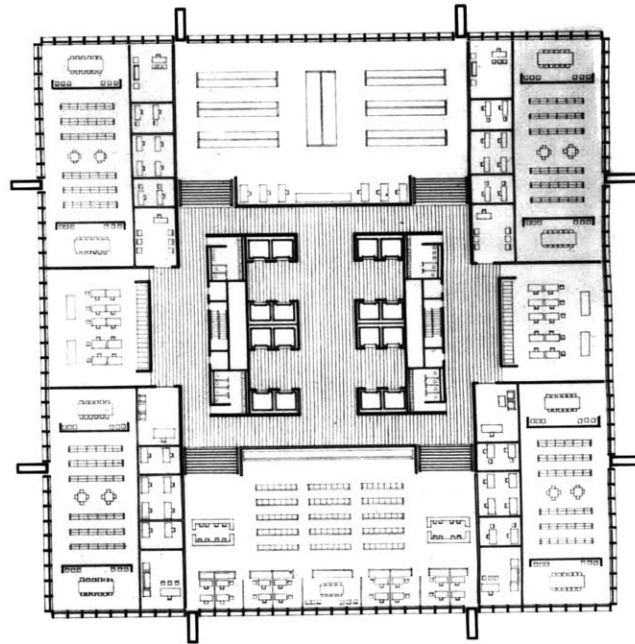
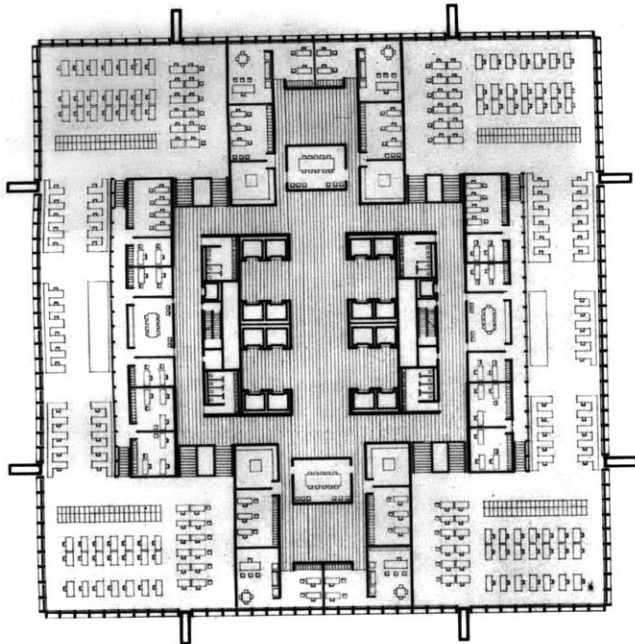
35'



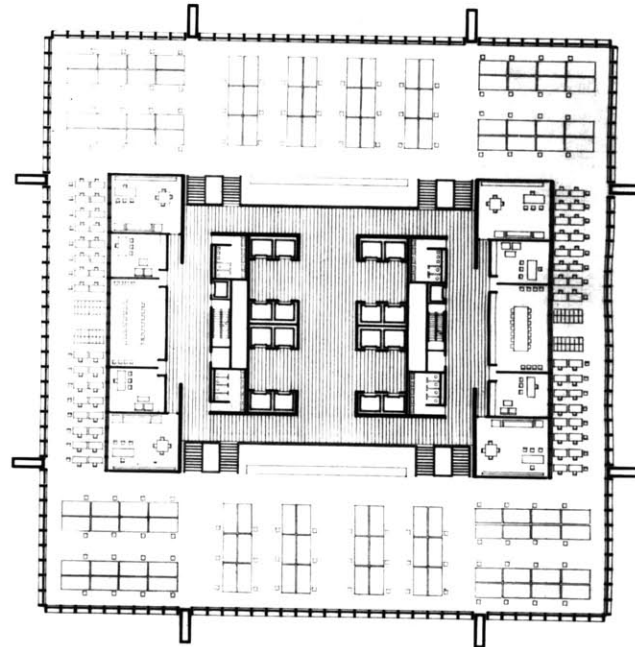
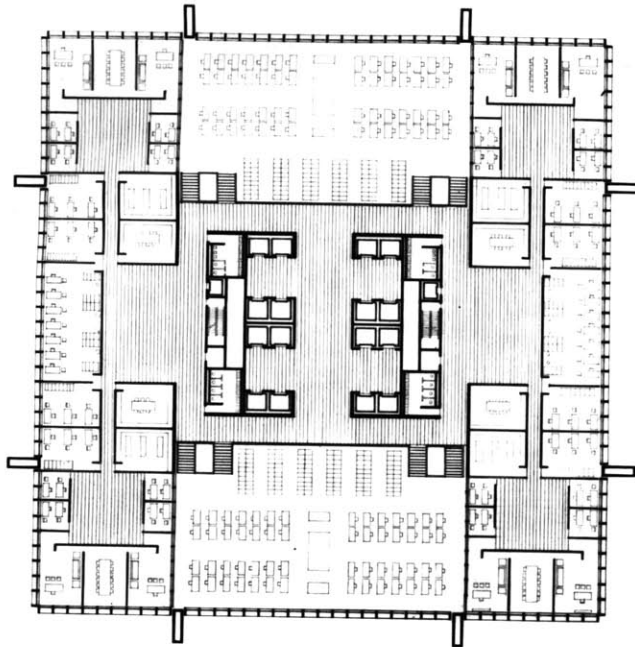
MULTIPLE STORY URBAN OFFICE BUILDING
SECTION
1/30" = 1'-0" AUGUST 30, 1960
CHARLES T. STIFTER MASTER'S THESIS

BIBLIOGRAPHY

- Chicago Building News
Building Code and Zoning Ordinance
of the City of Chicago
Chicago, 1959
- Condit, Carl
The Rise of the Skyscraper
Chicago, 1952
- Editors of Fortune Magazine
The Exploding Metropolis
New York, 1957
- Gusrae, G.B.
Space Requirements for Electrical Equipment
in Office Buildings
Architectural Record, November, 1953
- Hornbeck, James S.
Review of the New Skyscraper
Architectural Record, March, 1957
- Huxtable, Ada Louise
Towering Question: The Skyscraper
New York Times, June 12, 1960
- Ketchum, Morris
Shops and Stores
New York, 1948
- MacDonald, Gordon R.
Office Building Construction in Manhattan, 1901-53
New York, 1954
- Miller, Richard A.
A Key to Open Cities
Architectural Forum, February, 1958
- Mumford, Lewis
From the Ground Up
New York, 1956
- "Office Air Conditioning"
Progressive Architecture
July, 1958



- "Office Buildings"
Architectural Record
April, 1954
- "Office Buildings"
Royal Institute of British Architects
London, 1956
- "Office Building Experience Exchange Report"
National Association of Building Owners and Managers
Chicago, 1951
- Pryke, John K.
Air Conditioning; Principles, Systems,
and Applications
Progressive Architecture, March, 1958
- "Real Estate Appraisal Practice"
American Institute of Real Estate Appraisers
New York, 1958
- Robichaud, Beryl
Selecting, Planning, and Managing Office Space
New York, 1958
- Shultz, Earl, and Walter Simmons
Offices in the Sky
Indianapolis, 1959
- Talmadge, Thomas
Architecture in Old Chicago
Chicago, 1952



MULTIPLE STORY URBAN OFFICE BUILDING
 TYPICAL OFFICE FLOORS
 1/8" = 1'-0" AUGUST 30, 1980
 CHARLES T. STIFTER MASTER'S THESIS



