

WATERFRONT HOUSING: DEVELOPMENT AND DESIGN

By

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1971

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1975

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ABSTRACT

The subject of this thesis is housing on the Boston Waterfront. The study has three components:

- (1) Identification of development issues in conjunction with:
- (2) An analysis of the decision-making process for a typical housing site, and
- (3) An architectural design which responds to the development concerns.

The thesis intends, through the discussion and analysis of one specific situation, to formulate a model which can be useful in considering housing sites in general. The work hopes to cogently organize my own experiences and to look at building from the point of view of both architect and developer.

Thesis Supervisor

Robert J. Slattery

Title:

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to Greg for abetting my fears;

to Rosemary who said on many levels there would be a place somewhere for someone like me.

INTRODUCTION

Since the Industrial Revolution and the population concentration that followed it, the dream of the autonomous dwelling on the landscape has become increasingly elusive. Unprecedented demand for housing in a dense and economical form preoccupied builders in the 19th century and by 1900, the meaning of house became immersed in the meaning of housing. Since that time housing has come to include large scale financing, planning, construction and management.

This piece of work represents an attempt to view housing as a process composed of many components which eventually result in a 3-dimensional reality. The same set of concerns; market, finance, and design determine both buildings which have a spirit as well as the uninhabitable built environments which at best provide shelter. Although the blame for unsatisfactory housing usually finds its way back to the development restraints; in my view, two factors: the vision of the participants in the building process and the interpretation of the development variables account for the wide qualitative range of housing environments available today.

This workbook of sorts summarizes a three month opportunity to organize my own thoughts and to clarify some of the preliminary issues which contribute to building. This analysis hopes to discuss the typical development issues and to present a methodology for architects interested in assessing a site for housing. On another level this study is a personal affirmation that decent housing is still a possibility in this economic system.

Chapter I discusses the contextual issues; both physical and socio-economic. The first section of the study describes the background and present situation of the Lincoln Wharf area.

Chapter II describes the development process for a typical housing site. This chapter gives an overview of the process and discusses the components for feasibility. In addition to a general point of view, this chapter deals with the specifics of finance, market, and architectural considerations for the Lincoln Wharf site.

Chapter III offers a schematic design of the project through a model, sections and plans.

Chapter IV is a short conclusion which reflects on the development process and the relationship between the development issues and the design.

CHAPTER I

BACKGROUND

The Lincoln Wharf provides an extraordinary opportunity for housing. Not only is this Wharf one of the only available properties left on the Boston Waterfront, but Lincoln Wharf lies directly in the development path of some of the most high-priced and certainly the most interesting housing in downtown Boston.

In addition to the highly marketable views on the Waterfront, this location encourages participation in many kinds of lifestyles and supports a myriad of stimulation in a complex environment. The area surrounding Lincoln Wharf allows a range of human experiences and associations in a variety of scales, textures, colors, and types of architecture. The neighborhood includes the densely packed village scale of the North End, bounded by the Southeast Expressway and Atlantic Avenue, the individual monoliths of the Navy yard and the Lincoln Power House itself, in addition to a new breed of edge dwellers at Lewis and Commercial Wharfs.

The housing rehab and warehouse conversions in this district have created both a sociological and formal tension between the old and the evolving, the

functional and the stylized. Yet, the romance of sea water, whether it be for sustenance, recreation, or the most coveted living environment has always commanded a premium. As Melville said, "No civilized man can live far from salt water."

From a design point of view it seems that housing on the Lincoln Wharf should reflect these issues of context. Inherent in any kind of new building should be that same sense of complexity and conflict between two distinct built worlds: one associated with the pragmatic industrial world of the waterfront, the other more consistent with the village landlubbers who have traditionally survived because of their association with the sea. The North End and the Waterfront presently exist in that kind of relationship and Atlantic Avenue not very long ago created a much more substantial barrier demarking a different use, a different architectural scale, and a different kind of life.

Not so unlike today, the North End and the Waterfront have always been special places subject to dramatic topographic and sociological change. The area presently known as the North End was originally a hilly pasture located north of the first Boston settlement. Gradually, it was the tradesmen and

artisans who established their businesses along the waterfront. Over the years additional land area was created by the filling of the harbor, and the tradesmen and artisans moved their operations to the new waterfront and freed up an area which became a fashionable residential neighborhood. In the early nineteenth century, mansions and cottages abutted the narrow streets and alleys which to this day distinguish the North End from other sections of Boston.

By 1800, there were mills and factories; industrial areas emerged along Commercial Street and the area became the center of the shipping trade. In the late nineteenth century, the North End-Waterfront area received thousands of immigrants and since that time the North End has continually been the home of various ethnic groups. In the 1890's, the Italians settled there and from that time on the area has been predominantly Italian.

Both geography and society have helped the North End to elude the effects of urban renewal. Massive urban renewal projects, namely, Government Center and West End clamored on while the unique quality of the North End endured behind the Central Artery. Built to facilitate commuter traffic in the '50's, this expressway afforded the necessary barrier which ironically preserved the quality of the area.

Nevertheless, in the last ten years, the North End/Waterfront area has once again been in flux and perhaps conflict. Boston's newest residential neighborhood, the Waterfront, has experienced dramatic growth with the addition of 1500 luxury apartment units, plus 300 subsidized elderly units. Although directly adjacent to the North End, the Waterfront both formally and sociologically bears little resemblance to the working class Italian enclave. In types of housing stock, forms of ownership, median income, and type of household, the two areas remain in marked contrast. Perhaps one of the only similarities between the two areas lies in the enormous non-resident, transient population. Both the North End and the Waterfront remain highly commercial with an established pattern of commercial uses on the ground floor and housing on the upper levels. This large non-resident population, lured by the newly provided amenities and the historic patrimony, creates a real need to architecturally distinguish between public, commercial and private territory..

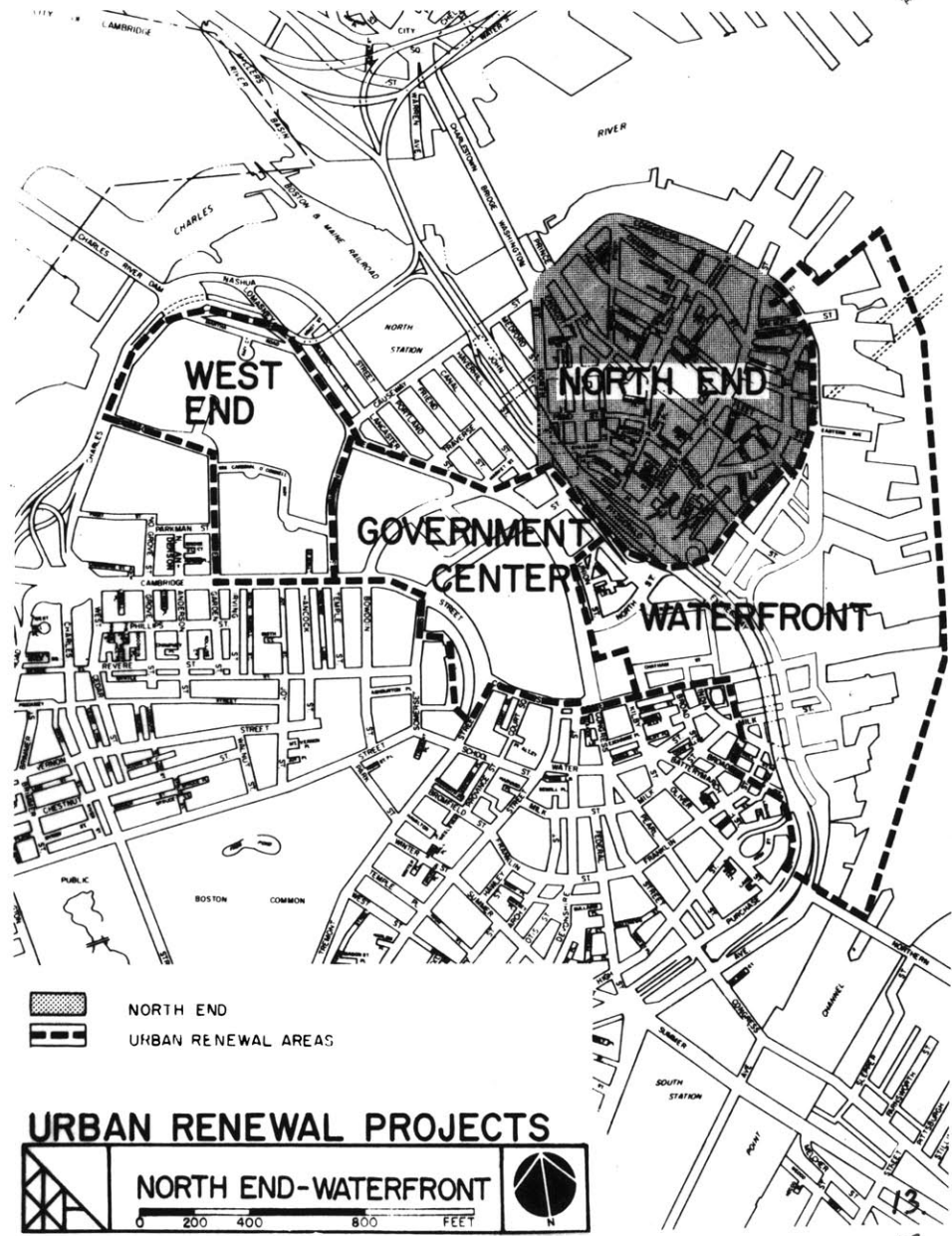
The 1970 Census recorded a population of 442 in the Waterfront area which was unable to obtain residential zoning until the implementation of urban renewal. Presently, the population numbers better than 2,000, and will peak

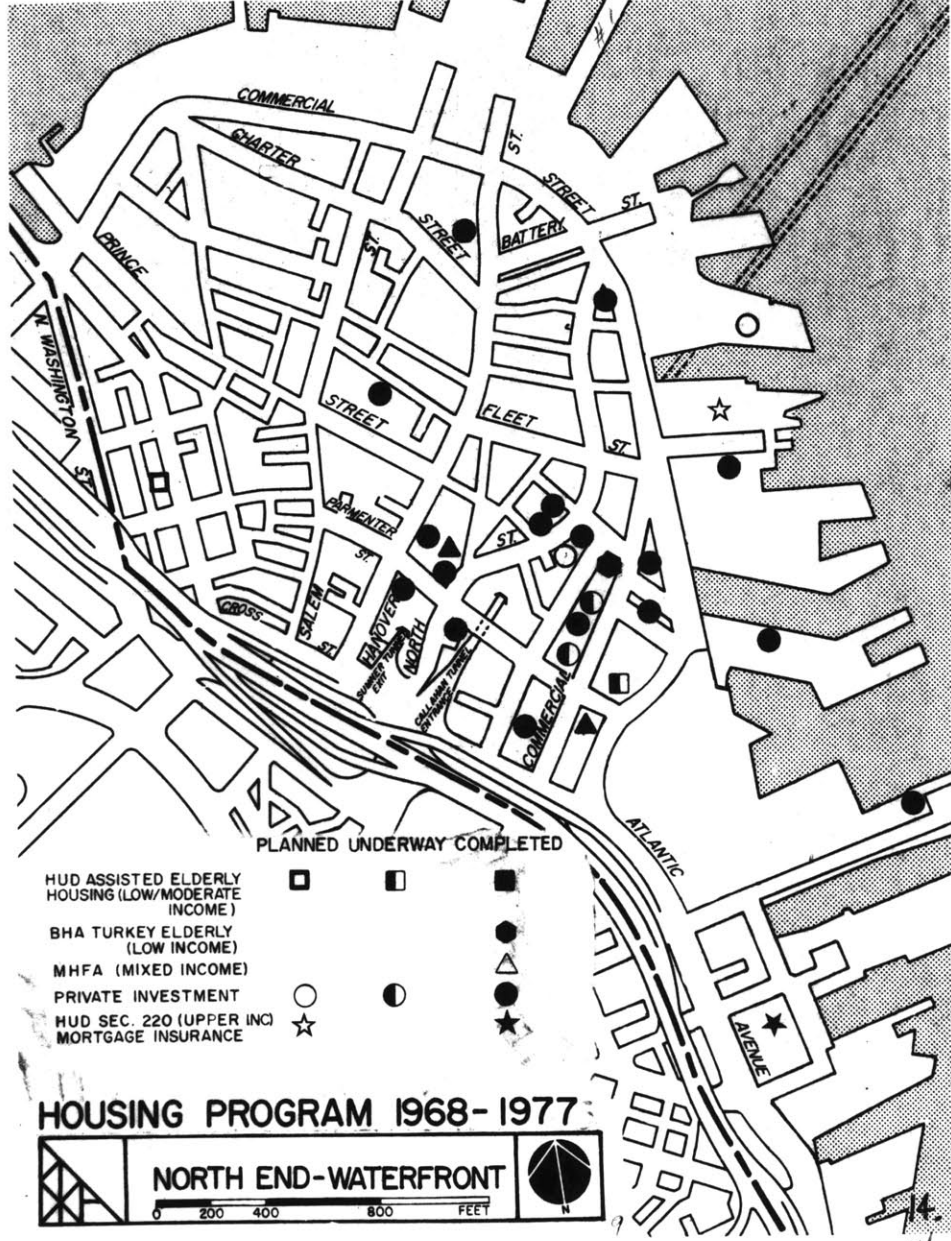
at 3,500. An astonishing 68% of the new population is professionally employed and 38% of all households had incomes greater than \$25,000. The majority of Waterfront households both in market rent and subsidized apartments are either childless or have older children no longer at home.

In sharp contrast to Waterfront residents, the North End records a non-professional population with a 34% decline in population and no new or replacement housing stock. Immigration figures show that since 1920 Italians moving to the North End have decreased by 50%, so has the total amount of available dwelling units. A 1975 BRA study also revealed that 40% of all dwelling units were lacking in some or all plumbing facilities. The 1970 median income was \$8,300, below that of the City's other working class neighborhoods, and the market rents reflected the depressed income. Forty percent of all households paid less than \$100 towards rent on a monthly basis. In general, from both a statistical and qualitative point of view, this ethnic community has been struggling for survival.

Massive public and private investments in the Waterfront area have increased the pressure on the North End housing market. Capital improvement dollars, Federal block grant funds, and housing subsidy allocations in the Waterfront

have amounted to an input of approximately \$37 million since 1968. This investment activity has resulted in sharply increased demand and higher rentals in the North End with landlords partitioning to smaller modernized units, and the threat of sudden influx by a young, professional non-Italian population. Capital improvement to the existing housing stock in the last couple of years in order to comply with building codes has resulted in higher rents, and an increased vacancy rate for traditional Italian tenants.



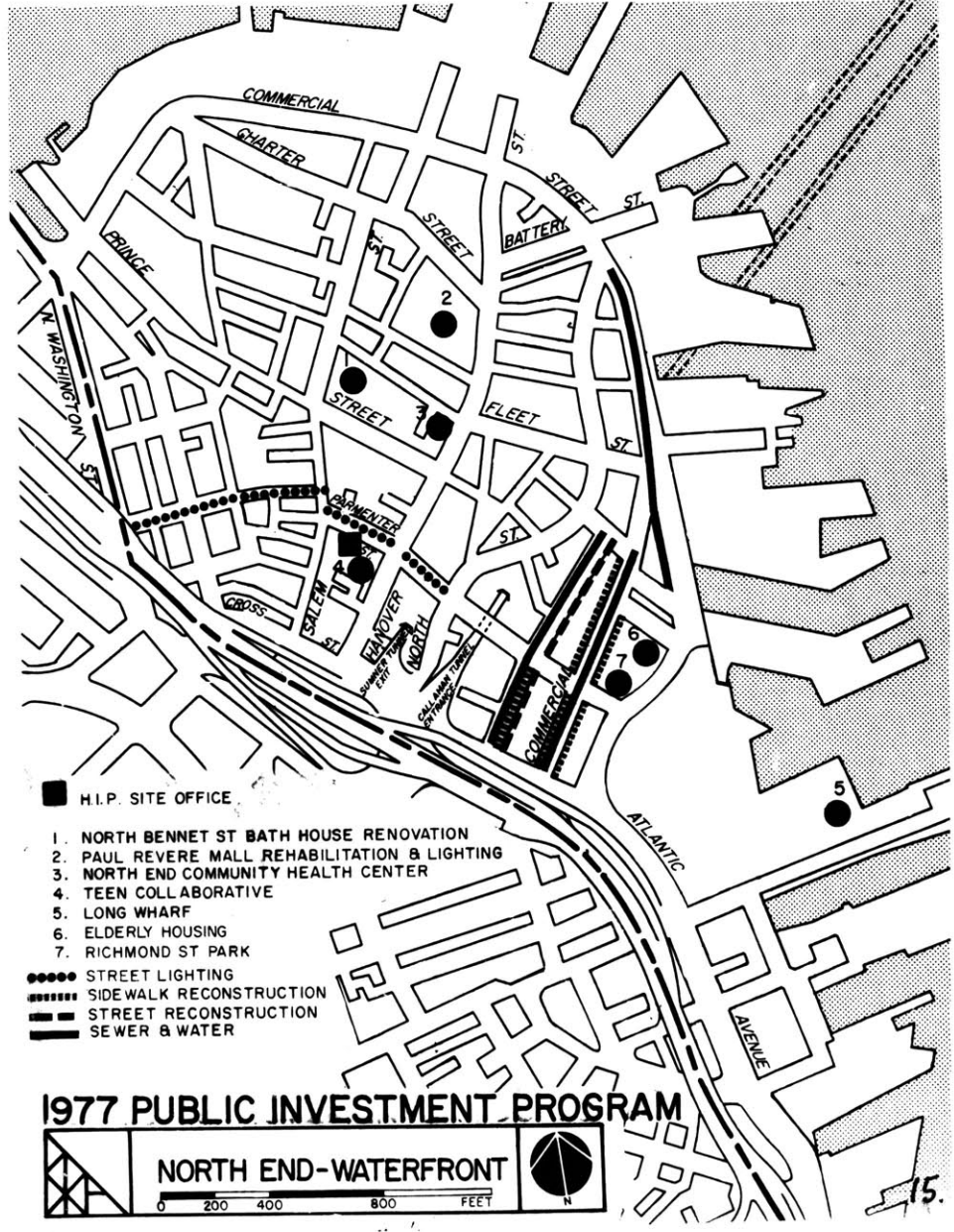


- PLANNED UNDERWAY COMPLETED
- HUD ASSISTED ELDERLY HOUSING (LOW/MODERATE INCOME) □ ◻ ◼
 - BHA TURKEY ELDERLY (LOW INCOME) ● ◐ ◑
 - MHFA (MIXED INCOME) ▲ ◔ ◕
 - PRIVATE INVESTMENT ○ ◐ ◑
 - HUD SEC. 220 (UPPER INCI) MORTGAGE INSURANCE ☆ ☆

HOUSING PROGRAM 1968-1977

NORTH END-WATERFRONT

0 200 400 800 FEET



■ H.I.P. SITE OFFICE

- 1. NORTH BENNET ST BATH HOUSE RENOVATION
- 2. PAUL REVERE MALL REHABILITATION & LIGHTING
- 3. NORTH END COMMUNITY HEALTH CENTER
- 4. TEEN COLLABORATIVE
- 5. LONG WHARF
- 6. ELDERLY HOUSING
- 7. RICHMOND ST PARK

- STREET LIGHTING
- SIDE WALK RECONSTRUCTION
- — — STREET RECONSTRUCTION
- — — SEWER & WATER

LAND USE MAP

RIVER **HEAVY COMMERCIAL/
INDUSTRIAL**

HOUSING

SITE



A. THE SITE

Lincoln Wharf lies at the interface of the North End/Waterfront area and in that way, it is a critical site. At this juncture, on Atlantic Avenue, Hanover Street, "the main street of the North End," and Battery Street charge down the hill into another kind of world. On the other axis, Lincoln Wharf represents the real transition between the chic, residential, development approaching from the south and the industrial zone, the Boston Navy Yard, etc. to the north.

Lincoln Wharf, like all the harbor piers, has a clear direction; and building moves from the west on Commercial Street, to the east into the harbor. Across the harbor the flight tower of Logan Airport is visible and to the south, South Boston. The site has the benefit of offshore seabreezes and the prevailing wind direction is from the southwest. With excellent southern and eastern exposure, no shadow problem exists as no large buildings have been erected in the neighborhood.

Parking in both the North End and the Waterfront Area has been an increasing problem. Both increased density and new development has exacerbated

vehicular problems on the Waterfront and the North End with essentially no off-street parking, intensified because of an active retail/commercial area, has always endured this problem. New parking lots at Sargeant's Wharf, only 150 yards south of the site, and the temporary lot at Fulton and Harris Streets have helped alleviate the problem. Shuttle bus solutions to garages have been proposed, but a solution to the parking requirement is critical to the development of any fairly dense housing.

Lincoln Power House, built at the turn of the century, dominates the western edge of the site and Atlantic Avenue. This neo-classical structure is the most massive building on the Waterfront and has over time acquired a symbolic (landmark) value in the North End/Waterfront community. Built originally to burn coal, the plant now uses oil to generate power. As of 1978, the Power House no longer is operable as a power generating facility, but its physical presence in the landscape must be recognized in any new design. Its huge Piranesi-like volume would be adaptable as commercial or institutional space at another time.

Another existing structure on this site is a 6-story coal bunker previously used as a storage bin for fuel. A proposal has been made to convert this tipple to a fire station for the area, but the proposal has never materialized. The coal tipple could be disassembled and partially rebuilt elsewhere as a piece of archaeology but the economics for a housing project require the entire parcel for development. Presence of the tipple, however, is a testament to the loading capacity of the pier in general.



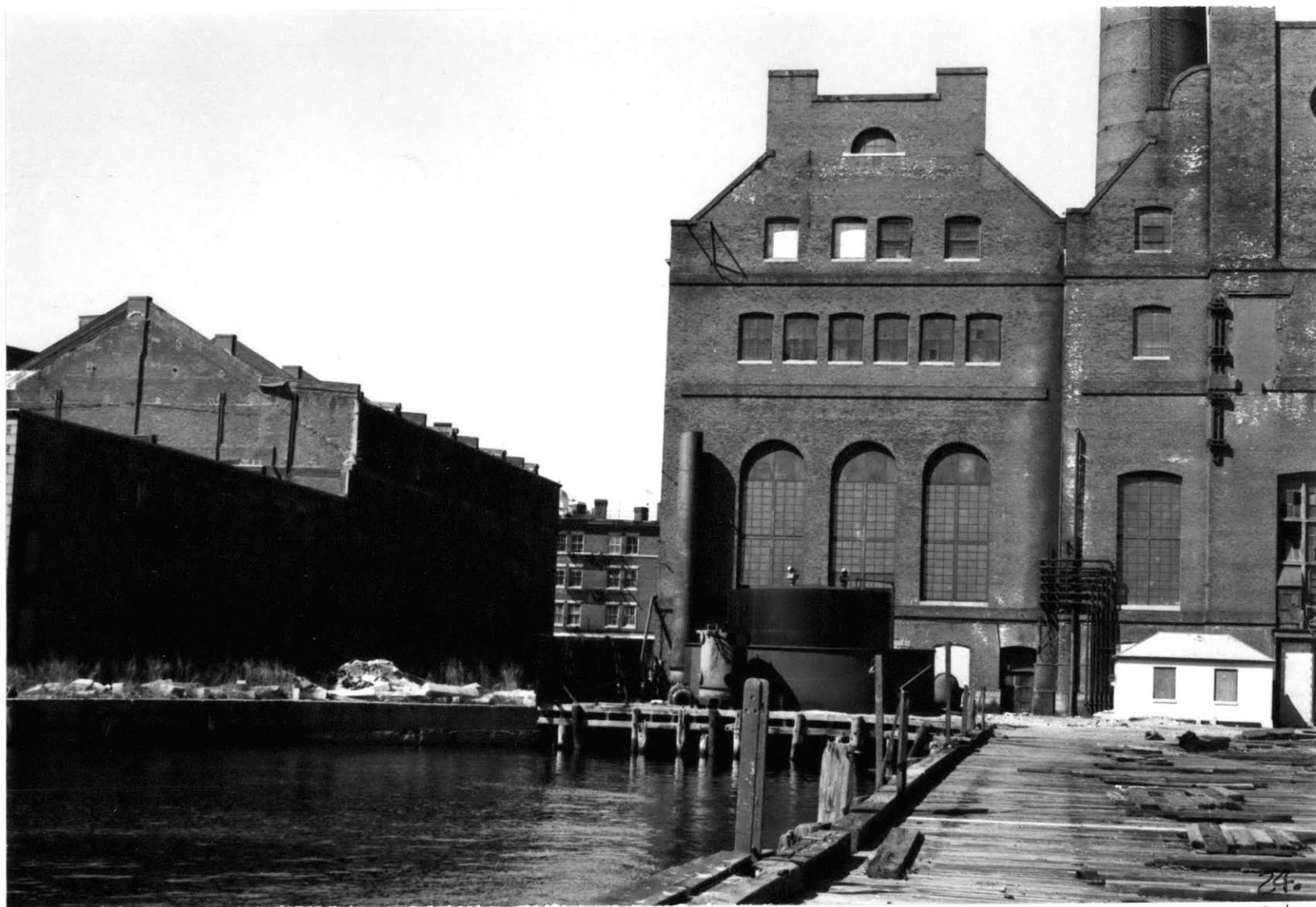


21.





23.



24.

24.

CHAPTER II
THE DEVELOPMENT PROCESS:
AN OVERVIEW

The development strategy for a housing site requires an understanding of all the preceding contextual issues. In addition to general demographics and sociology; marketability, availability of financing, economic feasibility, and architectural parameters become the looming variables which determine the overall impact.

Several questions must be answered to satisfy the most broadly defined objectives for housing.

1. The project must be financially sound, i.e. capable of sustaining its own life by generating adequate cash flow, if not profits.
2. The project should provide a supportive environment for human development.

The primary task for the architect/developer lies in the tension between conceptual model and economic determinants. The resolution between these two sets of considerations influence the decision-making process from market

identification, to site selection, to design and construction.

The objective or concept, whether it be to develop 150 units of suburban moderately priced housing, or 300 units of high density luxury housing will solidify over time when overlaid with development parameters. The concept, whether or not motivated by high profit, should score high marks in terms of:

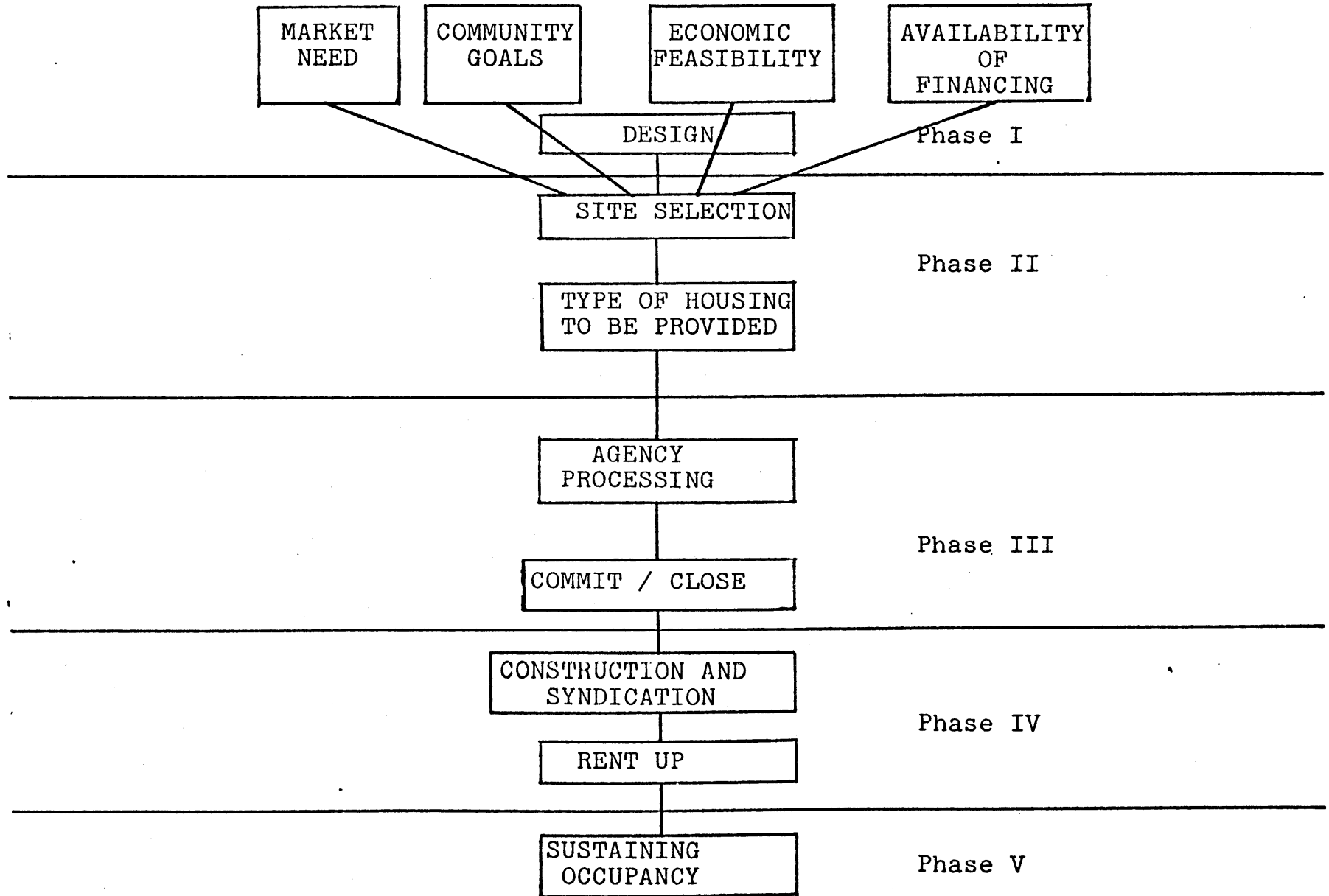
1. Market ability.
2. Economic feasibility.
3. Compatibility with a lender's policies and priorities.
4. Compatibility with community policies and priorities.
5. Engineering and architectural feasibility.

With even a fledgling concept, several issues must be addressed prior to land acquisition:

1. Where is mortgage financing available?
2. Are subsidy funds available?
3. What type of housing, how much, and in what location can a project be financed?
4. Is the developer convinced a market for his product exists?

5. Can the lender, Housing and Urban Development, State Agency, be convinced of marketability?
6. Is the conventional rent structure or fair market rents adequate to sustain costs?
7. If number 6 cannot be answered affirmatively, what components of cost, can be altered to permit feasibility?
8. What, if any, housing does the community desire?
9. Are community goals consistent with goals of the lender and the developer?
10. Are sites available which have the necessary characteristics of location, size, zoning, price, physical amenities?

GENERAL FLOW CHART



SUBSIDIZED HOUSING DEVELOPMENT PROCESS

Inputs

Market Data
 Local Housing Policies
 Funding Availability
 Economic Factors
 (rents, costs)
 Design Constraints

Supporting data:

Development Team
 Site Characteristics
 Market Characteristics
 Local Approvals
 Design Applicability

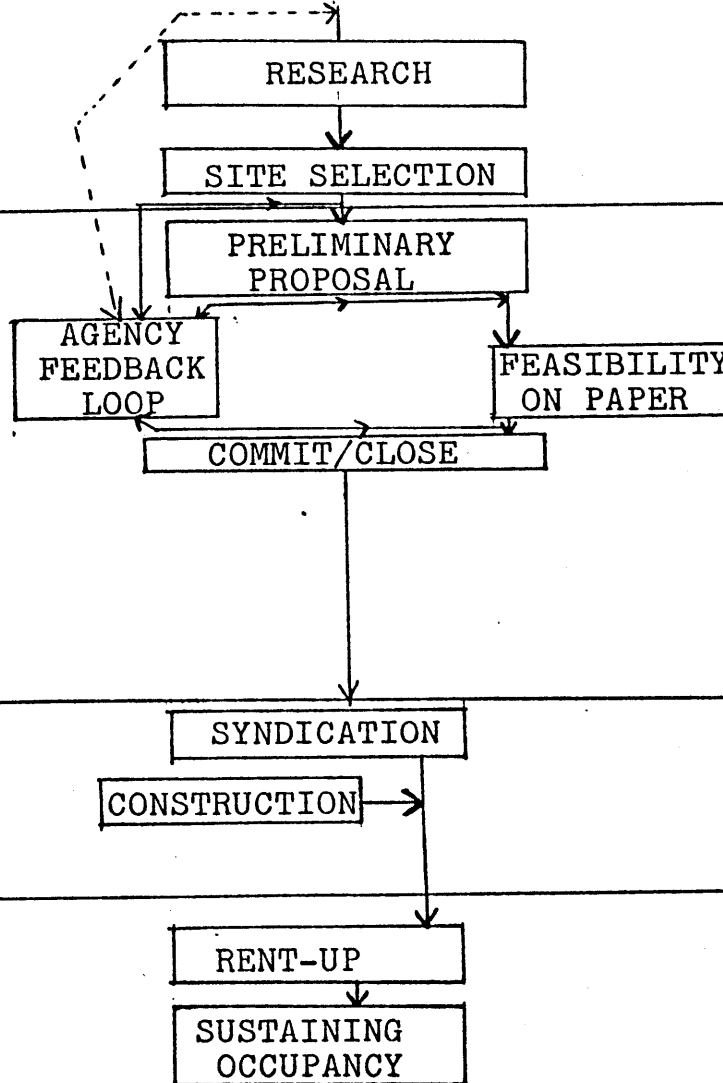
Economics and Finance

Rents
 Operating Expenses
 Construction Costs
 Operating Capital Costs
 Interest Rates

Investor's needs and goals
 Developer's needs
 "Fine-tuning" of design and internal finance

Field Marketing Support
 Management Plans
 Continuing Monitoring and Control

PROCESS



Outputs

Development of Concept
 (Convince developer of feasibility)

Finalization of Concept I:
 Proving it on Paper
 (Convince Government of Feasibility)

Finalization II:
 Proving it in the Field
 (Convince investors & mother nature of feasibility)

Finished Product
 (ultimate proof of feasibility)

ECONOMIC DATA

Operating Expenses - local variables

Fair market rents by structure type and bedroom count

Tax Comparables

Utilities (electricity, oil, gas, water, sewer and rubbish removal) - rates and availability)

Special factors (e.g. high insurance rates due to volunteer fire department; ability to split fixed costs such as payroll with other comparable sites)

Capital Costs - local variables

Davis-Bacon or Union Wage levels

Utility tap-in fees

Price of land

Key Financial Assumptions From Agency.

Interest rates - permanent and interim

Fees

Replacement and painting reserve rates

Vacancy allowance

Allowance for laundry and other income

Utility policies (tenant-paid?)

Miscellaneous Special Factors

Arbitrary "operating ratio" set by Agency

Comparative mortgage per unit at Agency comparables

Extraordinary costs (off-site work; shuttle bus service, etc.)

Constraints on project size

A. DETERMINING MARKET

Determining the market, both in terms of its size and characteristics, becomes the common denominator for developer, lender, and the community. Kent Colton describes market strength as "the relative number of households desiring to move into, stay in, or leave that neighborhood." In a strong market area, there are more applicants than vacancies; or more households who wish to live within a neighborhood than there are available dwelling units. In a stable market, supply and demand balance out, whereas in a weak market, there are fewer households seeking to remain than available dwelling units.

Data for market analysis is generated by a few limited sources. Basic statistics concentrate on the metropolitan (SMSA) or city level. General census data records the nature of households and rate of formation. The significant components needed to delineate market type are: (1) age profile; (2) income profile. These two factors, their net change over time, and their comparative strength in comparison to other SMSA's or cities become key indicators.

Several other sources provide demand information. Probably the most important single document is a community's Housing Assistant Plan. HUD

requires this information as part of a community's block-grant application. This report solicits supply and demand statistics plus a reasonable projection of both current and three year housing goals. Not only are total housing goals for rehabilitated and new construction units sought, but neighborhood areas are also delineated and a general attitude towards housing is surfaced. This source, better than any other instrument, quickly sensitizes the developer to a community's needs, both in terms of type of housing stock, projections, and attitude. Other potential sources for demand information are state regional planning offices and metropolitan agencies like the Council of Governments in Washington, D.C., SMSA, or the Massachusetts Department of Community Affairs.

Housing supply can be regarded as the available competitive units in the same market area. Generally, the most discriminating look at supply focuses on the newest units with comparable rent structure and amenities. Studying supply in a subsidized market can be deceptive, however, because some markets have older housing stock which competes with new subsidized units. The typical northeastern "triple"decker town exemplifies this kind of competitive housing stock which can distort a supply curve.

Housing supply data is also documented by local Housing Authorities who build and operate housing financed through municipal bond issues (Public Housing). State Agencies and HUD both publish an inventory of all subsidized projects whose mortgages they have serviced. Leased housing and Section 8 existing housing administered through local Housing Authorities must be recognized as this factor can also affect supply.

Additional information which must be gathered to define a market are rent limits for subsidized programs and income limits. Both income limits and fair market rents (the top allowable rent HUD will authorize) define what percentage of a specific demographic profile can be a realistic target for a project. For conventional market housing, comparable rents in the market area (plus additional factors, inflation, increase in CPI, comparable amenities) provide a base for rent structure. In this situation, median income averages, rather than HUD authorized income limits, establish the rent structure.

Census tract impact analysis further determines market. Especially with regard to subsidized housing; impact analysis reveals both the concentration of subsidized housing and also existent racial and economic characteristics.

General market need provides the raw input for a housing project program. In the most simplistic sense, a program is a reflection of market need; a need which will comfortably absorb in a predetermined rent-up period. In addition to total dwelling units and unit distribution, market analysis reveals local characteristics and amenities, and in that way informs the design.

MARKET NEED

MARKET NEED = Census Bureau Data (age, income, type of household)
general demographics

+

Income Limits for subsidized housing
Median Income for market housing

=

Gross Eligibility for subsidized housing
Gross Market Capture for market housing

-

Existent Supply
(Public Housing Authority, State Agency, HUD,
projects under construction or proposed)

=

NET DEMAND

The Net Demand then is compared against other SMSA's or cities for comparative strength. In addition, projected net demand is measured against H.A.P. and market data sources.

The Boston Market

In Housing Policy Considerations for Central City In a Metropolitan Context, the major trends in the Boston housing market are summarized with great clarity. These major demographic and housing trends perfectly underscore the situation in the North End/Waterfront area. In concert with general trends, this area exemplifies the gap between professionals returning to the core area and the non-professionals who have maintained urban neighborhoods for the last half century. The following demographic trends will shape current future demands for housing in Boston and in the Metropolitan area.

1. Stabilization of the city's population level after two decades of decline.
2. Projection to 1980 of modest growth in population.
3. Anticipated population increase within the 25-34 age group, a significant proportion of whom are expected to be professionals with higher wage employment.
4. The city's continuing role as a houser for the bulk of racial minorities living in the metropolitan area, thereby exacerbating

the social imbalance between the central city and its suburbs.

5. The relatively large concentration of low income households currently residing in the central city, a concentration reinforced by aggressive city implementation of housing subsidy and urban renewal opportunities over more than three decades and by failure to achieve any significant opening of housing opportunities for low income families in the more affluent suburbs.
6. A significant and worsening gap in the median family income between the central city whites and minority blacks and Puerto Ricans, and within the metropolitan area between the population of the central city as compared with that of most of the suburbs in the SMSA.
7. The growing differences between the central city labor force and the labor force in the metropolitan area in job skills, educational levels and accessibility to employment which reflect relative difficulties of young adults and adults in the central city, particularly those of racial minorities, to compete successfully for jobs both within the central city and throughout the labor market area.

As for available housing resources, including market economics, condition, cost and accessibility, the following trends and patterns have important implications for new housing policies in Boston:

1. The housing stock in the central city consists mainly of old structures containing six or fewer dwelling units. Most of them are over 50 years old and of wood-frame construction, factors which create major and continuing need for maintenance and operating.
2. Analysis of housing conditions in Boston suggest the bulk of the city's housing stock is sound. However, there are discernible signs of physical deterioration in the remainder of the stock. Housing maintenance and up-grading needs are greatest in the black ghettos and the older ethnic neighborhoods in the city.
3. The majority of Boston's residential structures are owner-occupied, and owner-occupancy in certain neighborhoods is declining steadily, a sign of a weakness in housing. In some cases, resident owners are being priced out of the market.

4. Housing ownership patterns are highly skewed.
 - a. The percentage of black home ownership is far below their relative numbers in the city's population; and
 - b. Relatively large proportions of home owners are elderly who occupy dwelling units in excess of shelter requirements.
5. There is a relatively large number of rooms per dwelling unit for the average household reflecting the steady decline in the average household size in the city.
6. The city of Boston has a higher rate of housing vacancies than in the SMSA as a whole, partially due to an aging housing stock, some of it obsolete; housing abandonment is on the rise in certain neighborhoods; a significant portion of such abandonment was financed through the mortgage risk pool known as the Boston Banks Urban Renewal Group.
7. Property values and rents are lower in Boston's SMSA as a whole and their increase in Boston during the '60's lagged behind those of the SMSA; despite these comparisons, many of the city's households are spending a high proportion of their current resources

for housing, due to the relatively low average incomes in many neighborhoods.

8. The major factor in housing cost in Boston is a level of property taxes far in excess of the national average.
9. The average rate of house construction has remained relatively unchanged over the past 14 years -- 2,000 units per year. The dramatic shift has taken place in recent years away from privately financed residential construction (the housing start pattern of the '60's) to publicly-subsized housing during the early '70's, located mainly in intercity urban renewal areas. Non-subsidized residential construction was largely restricted during the early 70's to close in; more affluent neighborhoods are contrasted with the bulk of housing development in the outlying areas for more moderate income families during the two prior decades. This trend is partially explained by the drying up of available land for new housing, except in scattered urban renewal sites.

Simple supply and demand, basic demographics, impact analysis, and the Housing Assistance Plan more than suggest an attitude about the Lincoln Wharf site. Both present market conditions and projections indicate a strong need for low and moderate income housing both in Boston and in the North End/Waterfront area. This market trend in conjunction with high demand from the Waterfront Urban Redevelopment demands a mixed market situation.

Projects either planned or in construction confirm this point of view. Both the Sargeant's and Union Wharf Developments plan to develop nearly 400 units for the market, and the BRA has coerced the developers to seek subsidy components for some percentage of units. Precedent for subsidized elderly and small family units already exist in the area with the completion of the MHFA Mercantile Wharf conversion, the Boston Housing Authority Turnkey Project, and the two newest subsidized elderly new construction developments of 110 and 150 units are parcels C-2.

Demand, then, exists for both high priced market units which have shown high absorption at 12 units per month and vacancies consistently under 5%. This sub-market has demonstrated the ability to capture more than its share

of the total Boston luxury rental market. Census tracts 301, 302, 304, 305 (North End) are now witnessing spin-off pressure from housing activity on the Waterfront. Building turnovers and "flipping" now occur on the North End boundaries. Yet there exists a tremendous demand for subsidized housing. The North End has the highest percent of elderly than in any other planning district and a median family income of \$8,300.

Based on existing supply and absorption rates for conventional apartments, one and two bedroom units would market easily, conservatively within a rent-up period of 10-12 months. Subsidized units, when overlaid with the enormous need evidenced by the Boston Housing Assistance Plan equally present little market risk. Demographic and market trends because of this schizophrenic Lincoln Wharf location promise no sign of change. In fact, the influx of new white professionals to the core area strengthens the conventional market while the North End is experiencing a growing need towards stabilization.

BOSTON HOUSING ASSISTANCE PLAN
(A SUMMARY)

CURRENT YEAR GOAL		All Households	Elderly or Handicapped	Family	Large Family
New	HUD	500	300	150	50
New	State Agency	500	300	150	50
New	Total	1000	600	300	100
Rehab	HUD	1650	800	700	150
Rehab	State Agency	500	200	200	100
Rehab	Total	2150	1000	900	250
New & Rehab Total		3150	1600	1200	350
Existing Rental Units		1000	250	500	250
All Housing Assistance Goals		21825	9555	8475	3795
<u>THREE YEAR GOAL</u>					
New	HUD	500	500	--	--
New	State Agency	3400	1900	1000	500
New	Total	3900	2400	1000	500
Rehab	HUD	1000	300	400	300
Rehab	State Agency	2750	1100	1100	550
Rehab	Total	3750	1400	1500	850
New & Rehab Total		7650	3800	2500	1350
Existing Rental Units		5500	1200	3100	1200
All Housing Assistance Goals		62750	25425	25450	11875
Percent of all Households		100%	41%	41%	18%

HUD FAIR MARKET RENTS (BOSTON)

<u>Unit Type</u>	<u>Authorized</u>	<u>10%</u>	<u>25%</u>
Efficiency	325	357	406
1 Bedroom	396	436	475
2 Bedrooms	467	514	560
3 Bedrooms	567	624	680
4 Bedrooms	627	690	752

10% and 20 contingencies are awarded for housing which contributes to the greater good of the community and carries accompanying construction hardships. The 10% Fair Market Rent increased allowance is not unusual.

WATERFRONT RESIDENTIAL CONSTRUCTION

Development	Units	Type	Status
Harbor Towers (2)	624	New	Completed, September 1972
Lewis Wharf Condominiums	102	Rehab	Completed, October 1973
Commercial Wharf South	46	Conversion/Rehab	Completed, August 1973
Commercial Wharf	100	Rehab	Completed, February 1974
Prince Building	45	Conversion/Rehab	Completed, September 1969
Parcel C-2 (12 buildings/Fulton Street)	54	Conversion/Rehab	Completed, December 1974
Parcel C-2 Elderly Housing			
Site 1	110	New	Completed, 1976
Site 2	150	New	Underway, completion December 1977
Parcel C-2 (18 buildings/Commercial Street)	80	Conversion/Rehab	Underway, completion December 1977
Sargeant's Wharf Galleria	344	New	Planned, start 1978
Other C-2 Rehab	90	Rehab	Planned, start 77-78
Commercial Block	37	Conversion/Rehab	Planned, start 77-78
Union Wharf	50	Rehab	Planned, Spring 1978

NORTH END/WATERFRONT
TOTAL POPULATION OVER TIME
 (1970 Census)

Census Tract	1950	1960	1970	Average Change (%)		Average Change (%)	
				50 - 60	60 - 70		
301	4,234	3,423	3,204	-21	-7		
302	3,020	2,150	1,920	-33	-11		
304	4,935	3,595	3,033	-31	-17		
305	3,161	2,673	1,977	-17	-30		
303- (Urban Renewal Area)	N/A	N/A	432	N/A	N/A		
Total	15,350	11,841	10,134	-23	-14		

POWER HOUSE APARTMENTS
UNIT DISTRIBUTION AND TYPICAL SIZES

<u>Number of Bedrooms</u>	<u>Gross Square Feet</u>	<u>Net Square Feet</u>
1	750	675
2	1150	1000
3	1400	1100
4	<u>1500</u>	<u>1300</u>
Total	132,550	113,550

<u>Type of Unit</u>	<u>Number of Units</u>
Efficiencies	8
1 Bedrooms	42
2 Bedrooms	43
3 Bedrooms	24
4 Bedrooms	<u>8</u>
Total Dwelling Units	125

% Subsidized: 25% = 32 units distributed throughout the project

Typical Room Sizes

Dining Room	120 square feet
Bedroom	120 " "
Living Room	224 " "
Kitchen	80 " "
Bath	75 " "
Closet	16 " "

B. FINANCIAL CONSIDERATIONS

Financial parameters do not disqualify Lincoln Wharf as a site capable of development. Nevertheless, some subjective, political assumptions have to be made in order to consider development in a "real life" situation. The first of these manifests itself in the search to secure financing. Because a Housing Finance Agency operates in a highly political context for developers neighborhood interest groups, and politicians who lobby for limited amounts of mortgage money; funding for any particular site is never a certainty. Previous agency commitments, prior proposals in the same census tract, changes in administrative policies and personnel, typify a few of the many possibilities for an Agency's seemingly frivolous choice of site. This uncertainty makes landbanking for housing sites not only a high risk venture, but usually a suicidal course.

A reasonable lender for a mixed market development in Boston would be Massachusetts Housing Finance Authority. As conventional lenders have retreated from residential multi-family construction, State Housing Finance Agencies have assumed the burden of financing housing supply. The Agency supplies mortgage

dollars through revenues acquired via bond issues, and carries a professional staff to evaluate the proposals of developers. MHFA would be a sympathetic lender to approach for financing for more than one reason. Firstly, financing is available here at a less than market interest rate. If a portion of the project (at least 25% of the total d.u.) maintain a subsidy component.

Secondly, a mixed market project has been consistent with the social goals of State Agencies and MHFA in particular.

With a competent developer who clears prequalification requirements, a commitment could potentially be secured. The developer would have to demonstrate control of the site and demonstrate market strength. Operating versus construction budgets would be negotiated in addition to interest rate, agency fees, replacement reserves and all contingencies.

ECONOMIC PRO FORMA
 (ANNUAL OPERATING BUDGET)
 POWER HOUSE APARTMENTS

Income

Gross Rental Income	765,000
Tenant Metered Utilities	<u>29,000</u>
	736,000
Vacancy and Contingency Allowance	<u>37,000</u>
	699,000
Other Income	<u>2,000</u>
Total Income	701,000

Expenses

Taxes (12% gross rental income)	84,000
Insurance	7,000
Marketing	1,000
Management Fee	20,000
Office Expenses	4,000
Payroll	50,000
Maintenance	10,000
Utilities and Water/Sewer	19,000
Heating and Hot Water	<u>40,000</u>
Subtotal	235,000
Reserves	<u>16,000</u>
	251,000
Debt Service	<u>449,000</u>
Total	700,000
Return on Investment	1,000

CAPITAL BUDGET

POWER HOUSE APARTMENTS

(Mortgage @ 7% plus ½ of 1% Agency Fee)

Availability for Debt Service	449,800	
+ .08 C.A.P. =	5,622,500	Mortgage
+ Equity	<u>624,700</u>	
Total Cost	6,247,200	
- Land Cost @ 4000/D.U.	<u>500,000</u>	
	5,747,000	
- Building Sponsor's Profit and Risk Allowance	<u>522,500</u>	
Total Improvements	5,225,500	
Interest	250,000	
Financing Fee	57,000	
Taxes and Insurance	50,000	
Architect's Fee	125,000	
Surety Bond	35,000	
Permits, Tap Fees etc.	25,000	
Construction Costs (@ 35.00 sq. ft. or 37,000.00/unit)	<u>4,632,500</u>	
Total Improvements	5,224,500	

C. ARCHITECTURAL AND SITE CONSIDERATIONS

While engineering feasibility, e.g. loading capacity, soil conditions, strength of materials, are quantifiable; architectural feasibility is more difficult to define. The bulk of architectural feasibility is qualitative and determined by judgment. Architectural considerations reflect the designer's attitude towards the inhabitants, with regard to light, air, views, etc. Architectural feasibility represents the tension between the designer's wishes and the constraints of site and program.

The entire Lincoln Wharf parcel has a gross land area of 190,000 square feet. Approximately 50% of the ground area, however, is covered by the Lincoln Power Station. This parcel is not an acquisition parcel, nor has it ever been part of the Waterfront Urban Renewal area. The MBTA maintains ownership of the western portion of the site bounded by Atlantic Avenue. The eastern half of the parcel is owned by the City of Boston, Public Facilities Division. On the Lincoln Wharf site, a proposal has been made for a fire station to service the area, but after two unsuccessful bids, it seems that this venture will never materialize. Access, both pedestrian

and vehicular, to the water part of the wharf can be gained by Battery Street on the north or the alleyway between Lincoln Power House and Union Wharf on the south. Land here can be priced by comparable values at 4,000 per dwelling unit.

The wharf itself is built on a series of piles driven into the harbor. Beneath the power station, these supports are driven nearly every two feet on center, providing almost continual bearing. As the pier moves eastward, bearing is less continuous, with support coming approximately every 20 feet in the east/west direction and nearly continuous in the north/south direction. The loading characteristics of the pier therefore require a framework structural system. It has been assumed that loads will be transferred to the existing pier structure; piles will be tested and capped. Some new piles will be driven, if needed.

Zoning in this area is generally by 121A variance. The parcel presently lies in the M2 industrial zone. The zoning is not inclusive and housing is therefore a conditional use. The code, however, is flexible and difficult constructional problems along with the desire to build subsidized housing

not only contributes to the public good but constitutes a hardship.

Some developers have attempted to obtain the necessary zoning by application through the Zoning Board of Appeals, but the 121A avenue with BRA support is the more viable course. This alternative allows a proposed FAR and a negotiated tax agreement usually based on a percentage of gross rental income (usually 12%). This procedure has a great precedent in the Waterfront Redevelopment Area as many of the wharves have been redeveloped and granted conditional use permits for housing. In this case, a proposed density of 125 dwelling units/acre or an FAR of 2.1 is reasonable for an urban area. The zoning restricts height only as to the highest structure on the wharf. The power house itself has a height of 10 normal stories and its stacks soar to nearly 200 feet.

Sewage flow into the harbor has not been a problem in the northern half of the Waterfront Urban Renewal District. The waterfront has a separated sewage system; the North End has a non-separated system. Presently, the North End system is under conversion. Both sewer and water tap-ins are easily accessible on Atlantic Avenue. The BRA has encouraged one dwelling unit per one unit parking space ratio for market or family units and one to

.65 spaces for elderly use. That ratio has been flexible, however, because parking lots have been available near developments in the urban renewal area. A new garage will be constructed at Sargeant's Wharf and a shuttle bus system from the Waterfront to the Government Garage has been proposed.

Architectural Objectives and Considerations

1. Formal issues (massing) should be an important factor in establishing FAR.
2. The new structure should be in sympathy with the power station and existent architecture.
3. Climactic issues should be reflected in the formal vocabulary and materials of the new building.
4. The site should be thought of as an end-point for housing development in the transition to an industrial area.
5. The form of the building should convey both a public exterior sense (as it houses communal facilities) and also must maintain a sense of privacy.
6. Internal organization should limit conflict between disparate user

groups, but at the same time offer support.

7. There must be some outside space for the small number of larger family units.
8. Attempts should be made to maximize harbor views as much as possible and if not possible to compensate with other amenities to achieve outside space.
9. In general, the units should recognize a range of different needs for different user groups. For example, low income families should have larger kitchens, etc. while elderly units should have an opportunity for greater visual activity.

CONCLUSION

The housing development process in this country requires both sensitivity and command of a wide range of issues in order to produce a quality product. Despite governmental incentive and increased technology, architects and builders have been unable to satisfy the nation's housing need, both in terms of number of dwelling units and quality of environment. Many have insisted that the housing shortage is the most critical issue facing the construction industry today. The fact that experienced and responsible builders have enormous problems in developing good housing indicates the severity and complexity of the housing sector. The greatest problem lies in directing participants from different disciplines towards the achievement of a common goal.

The case study in this paper surfaces the typical development issues. Its purpose is to familiarize architects or architect/developers with the parameters of the process. If this study has a theme, it is the importance of a dialogue among participants. Housing is a result of many factors; government regulation, budget, politics and design all practiced by a group of protagonists usually operating in isolation. The absence of a real

dialogue between participants has resulted in the inability to manipulate a set of relatively neutral variables.

What destroys housing is not necessarily the economic constraints, but the insufficient knowledge of the actors to use the available resources in other ways. In short, no one participant is ever made aware of the real possibilities in this series of adversary relationships. If a dialogue between development and design could be established, the process will have a clarity resulting in more control over the end product.

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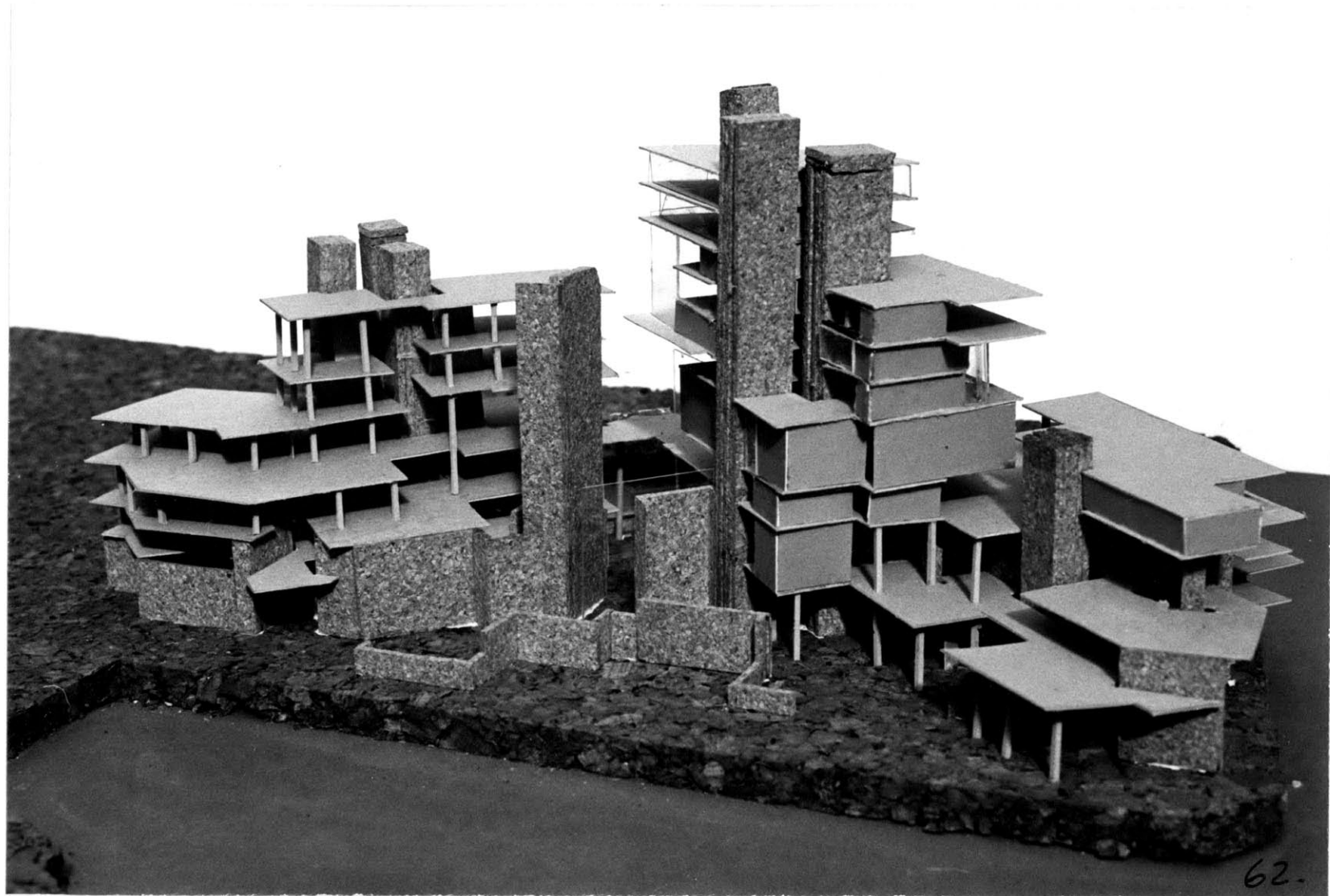
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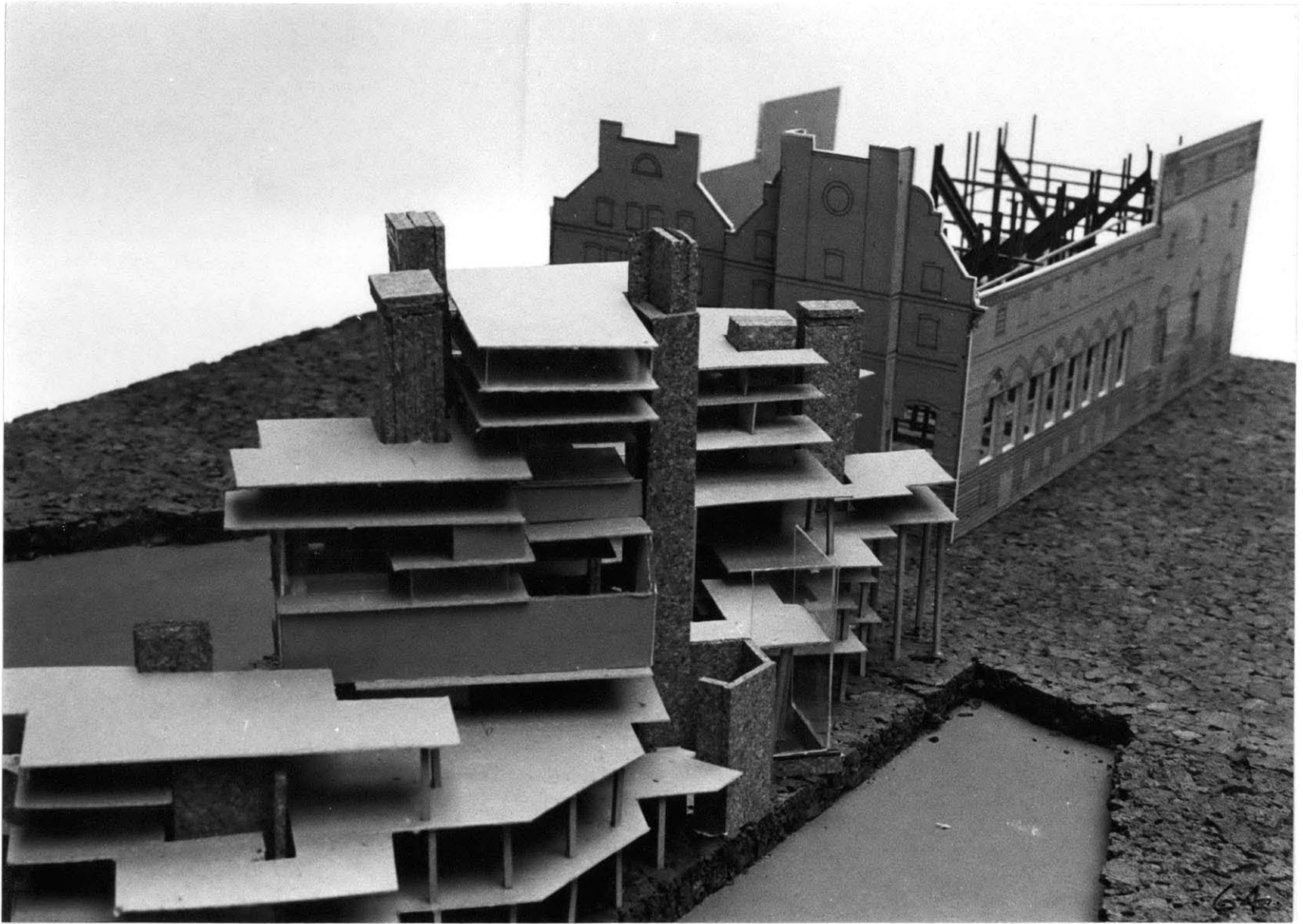
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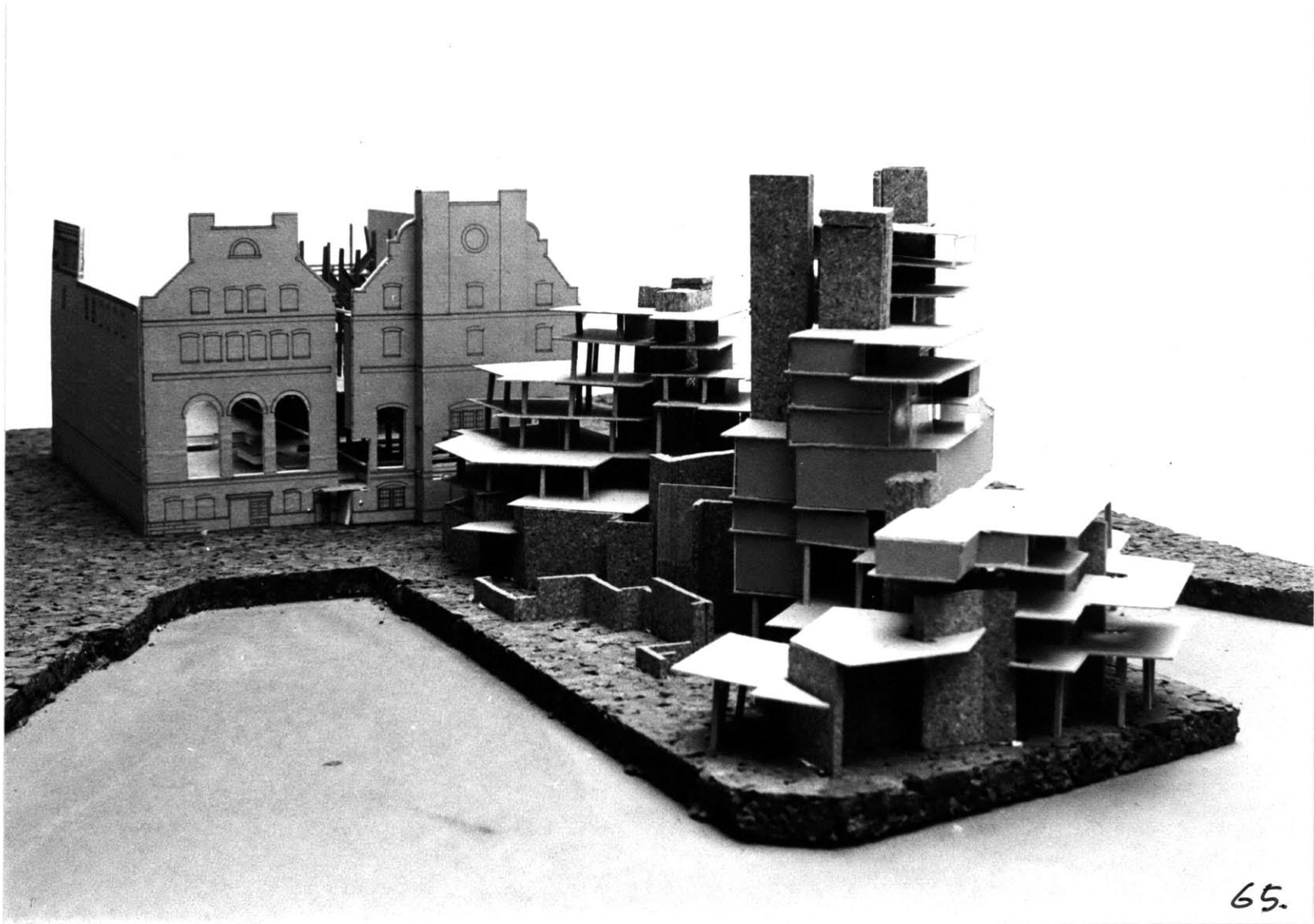




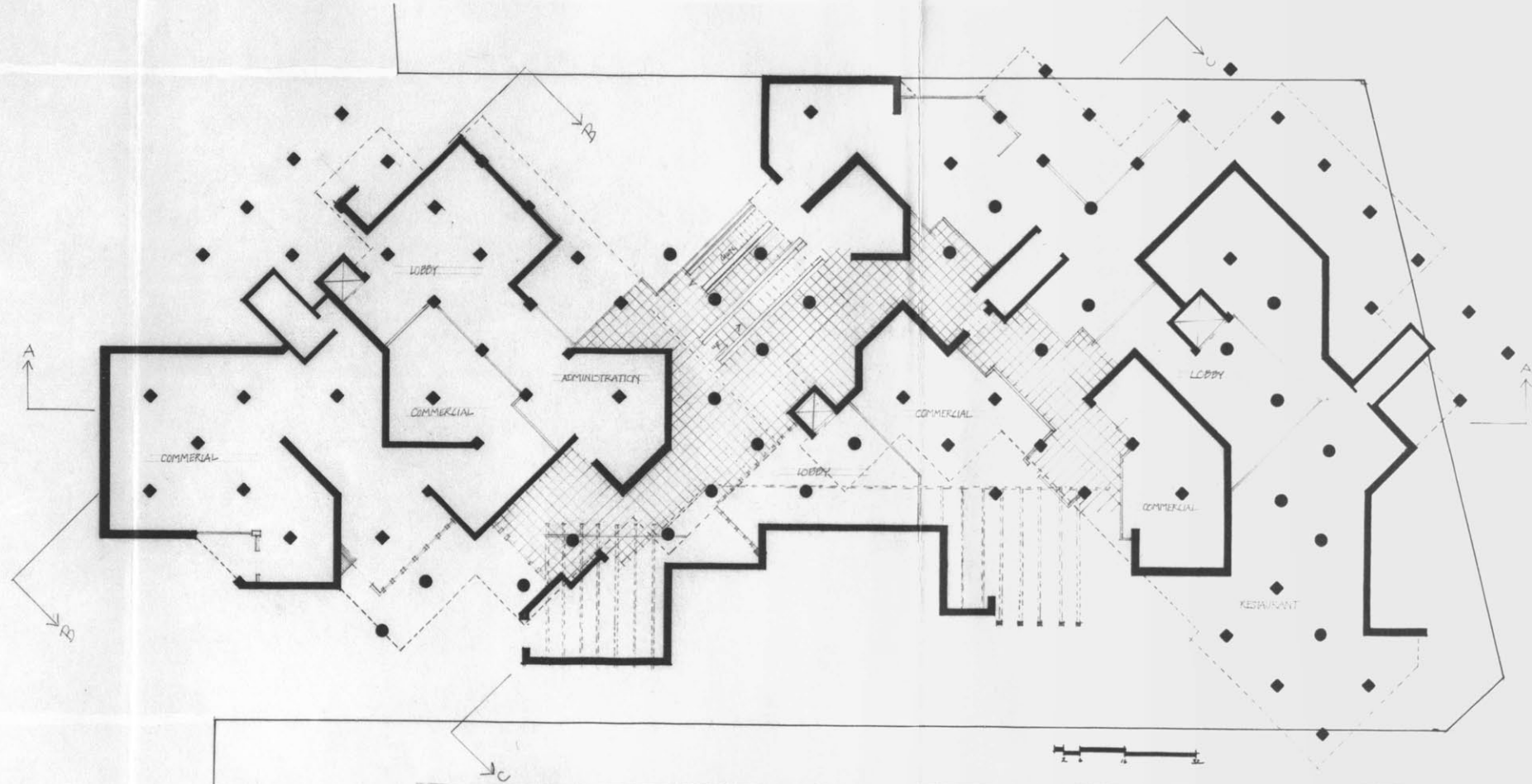
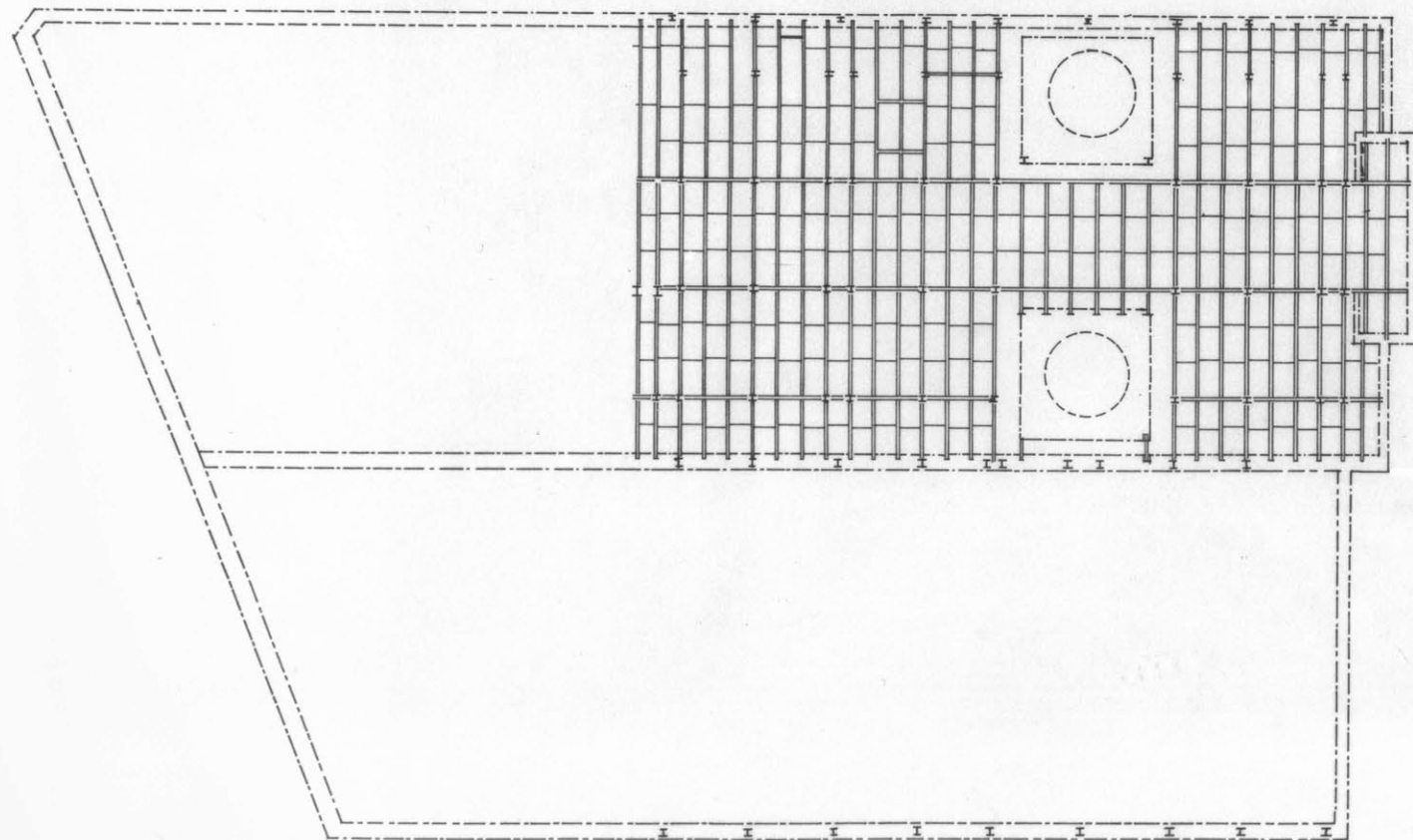
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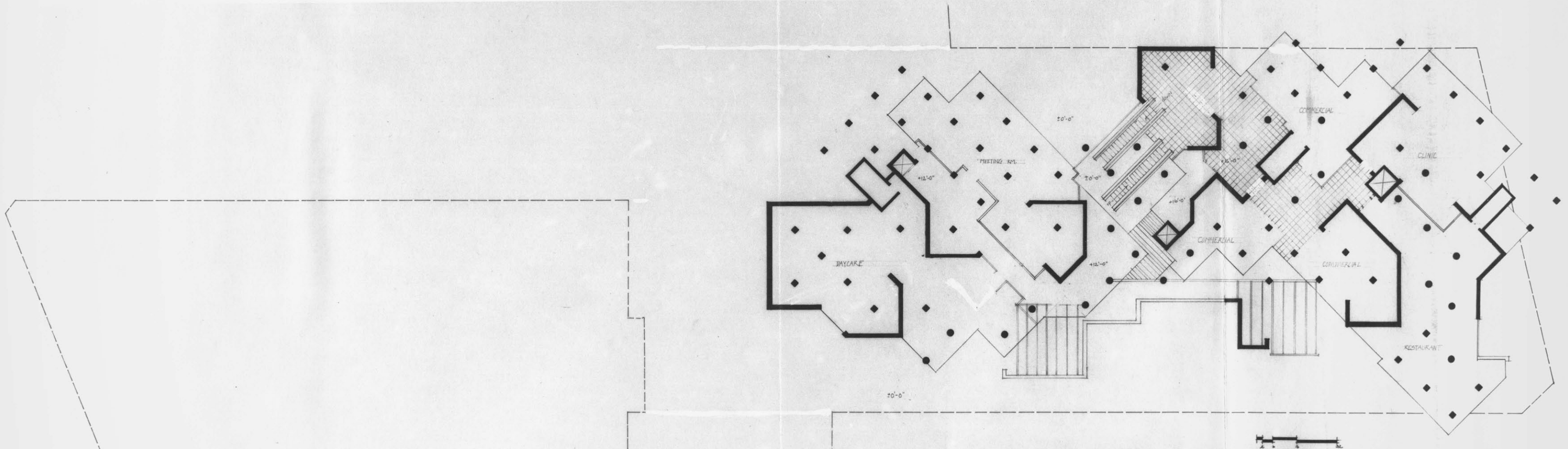






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WATERFRONT HOUSING**

**MIT THESIS
SPRING 1978
PLAN - GROUND**



MICHAEL GIULIANO
WATERFRONT HOUSING

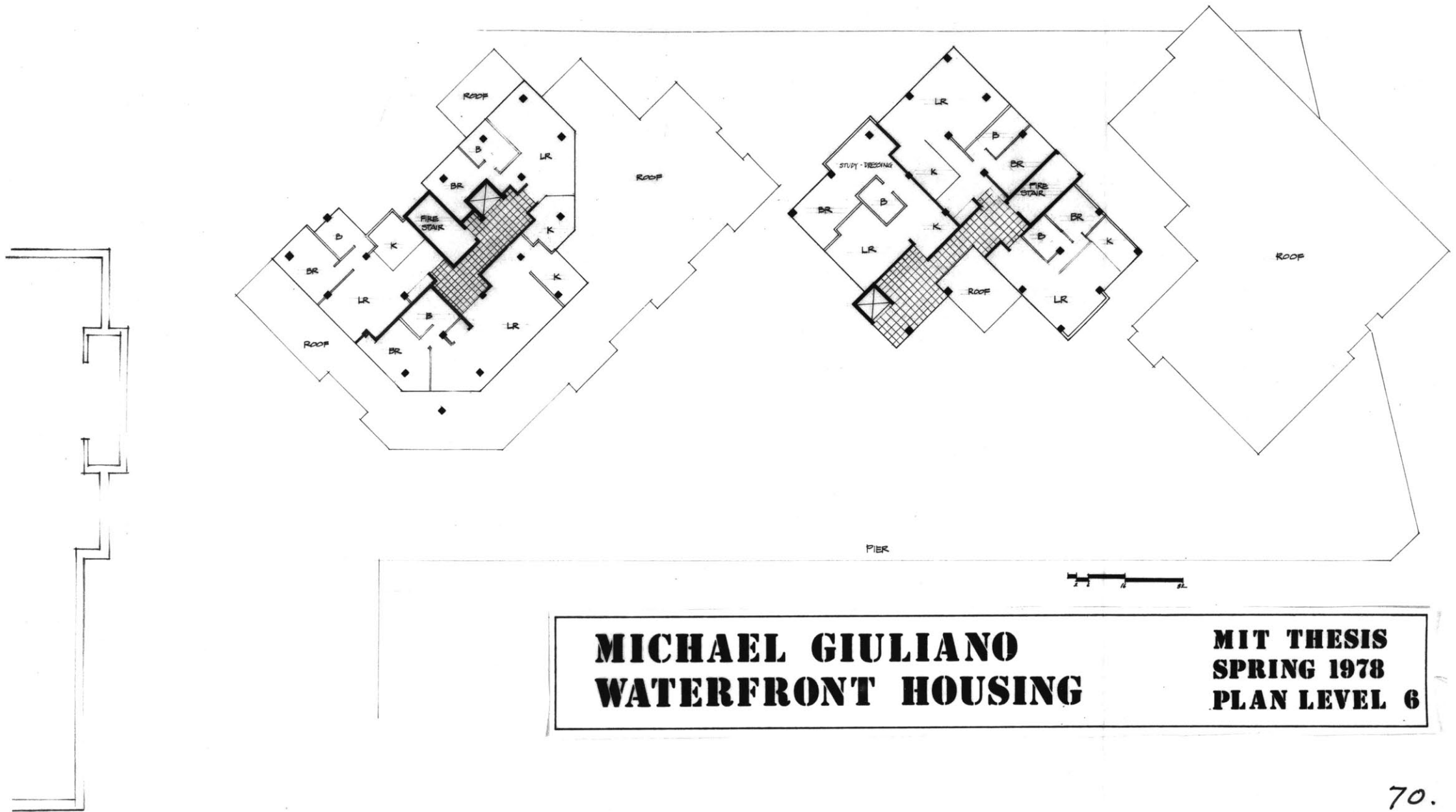
MIT THESIS
SPRING 1978
PLAN LEVEL 2

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**MIT THESIS
SPRING 1978
PLAN LEVEL 5**



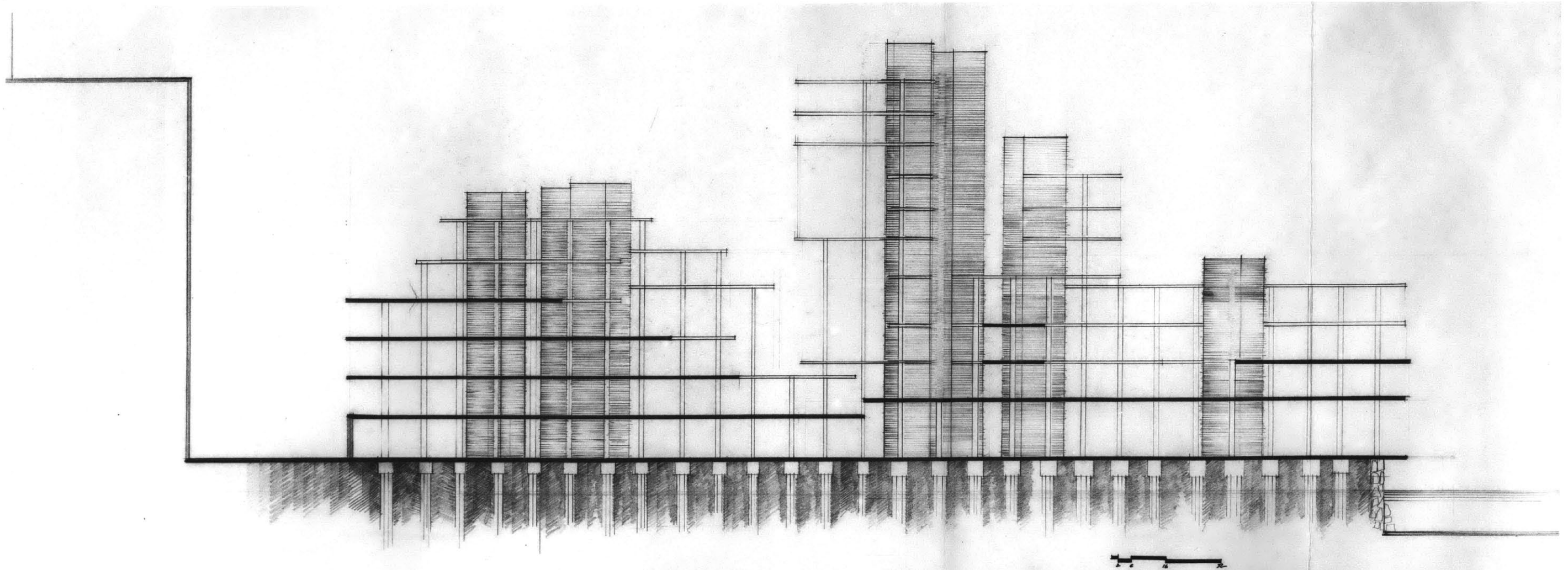
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**MIT THESIS
SPRING 1978
PLAN LEVEL 6**



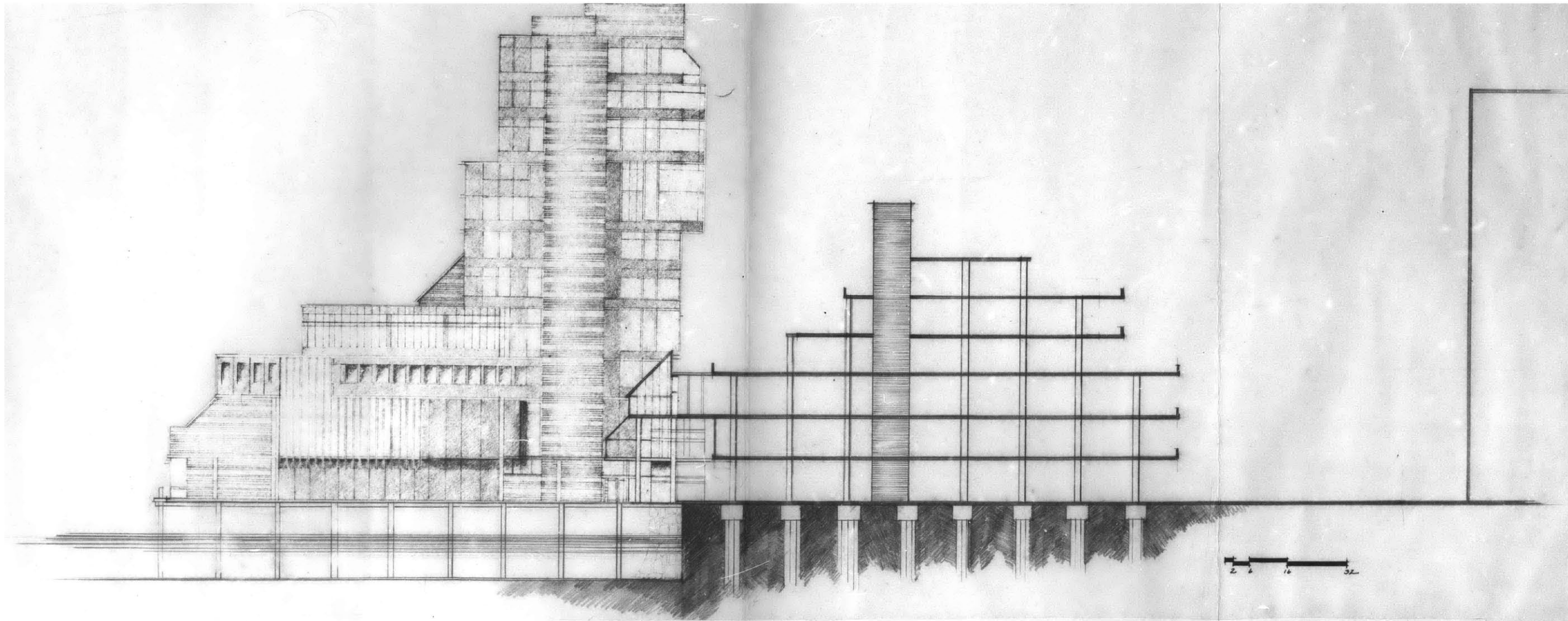
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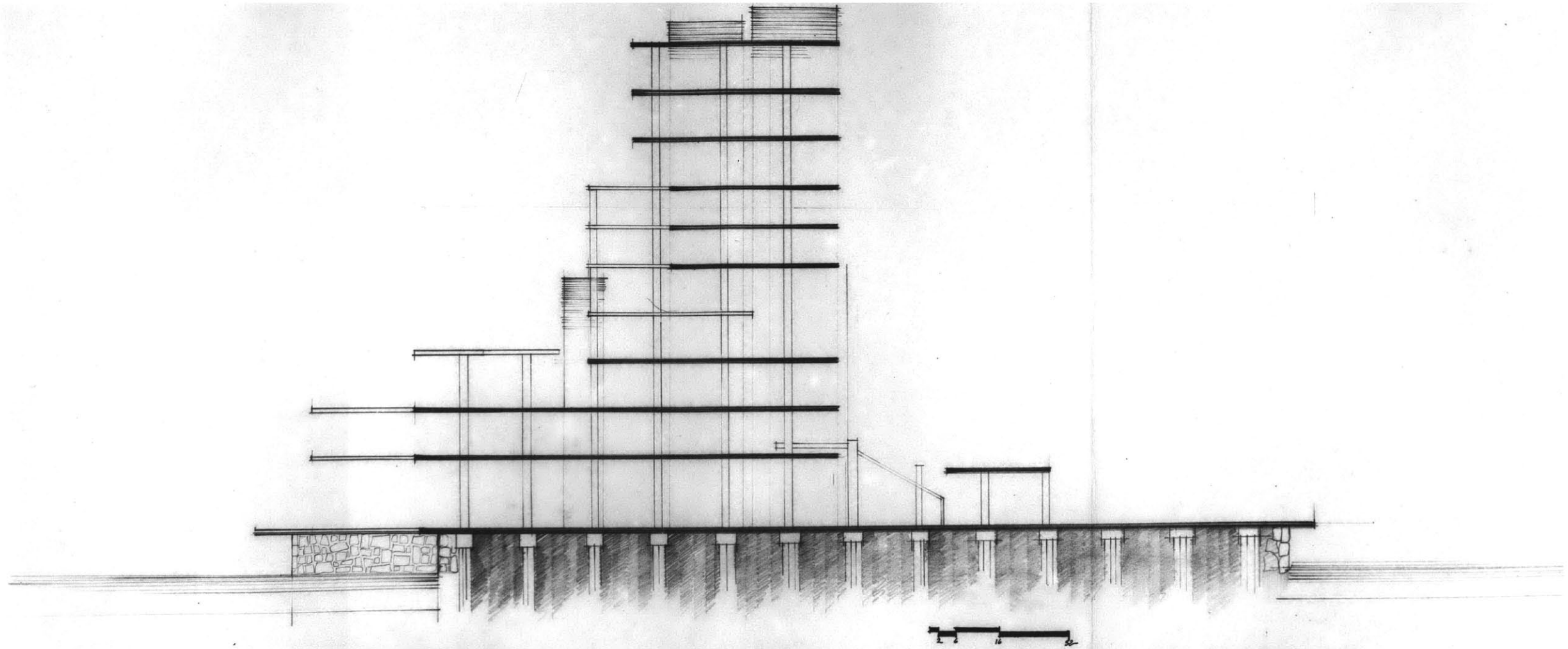
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**MIT THESIS
SPRING 1978
SECTION :A A**



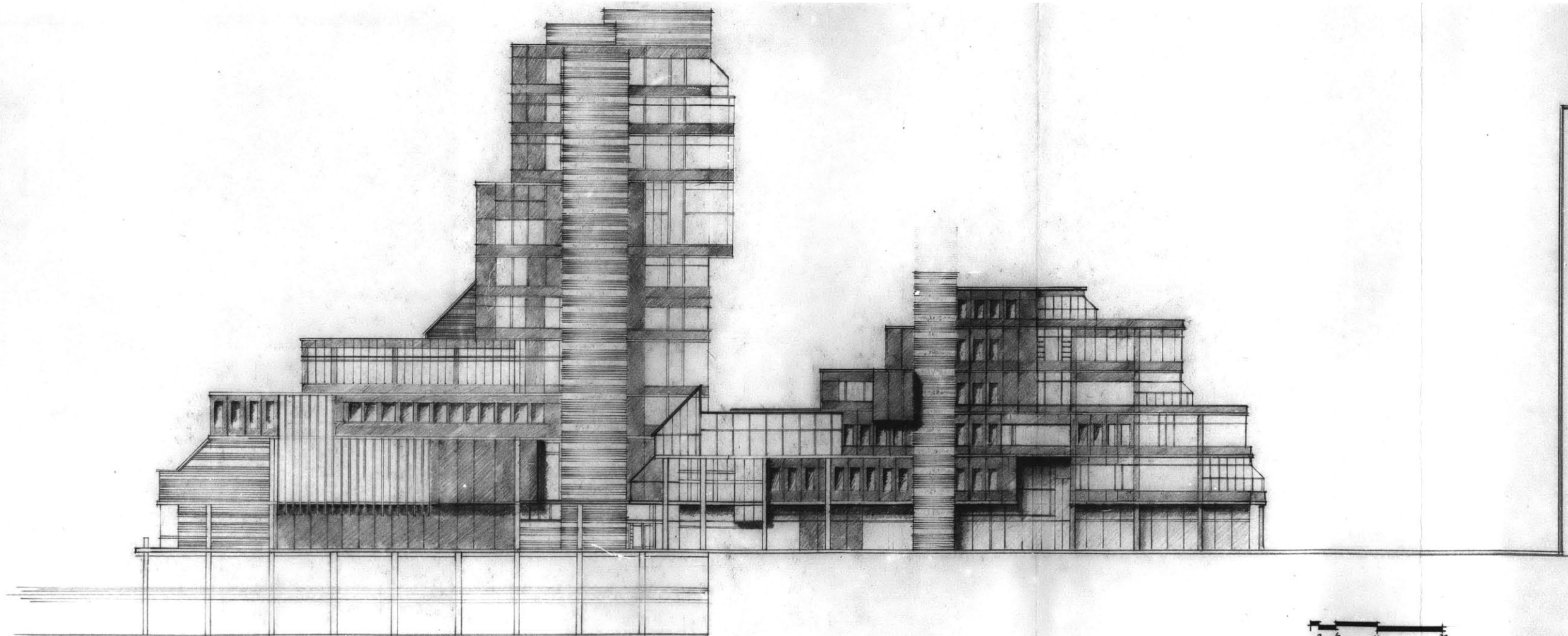
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SECTION : BB**



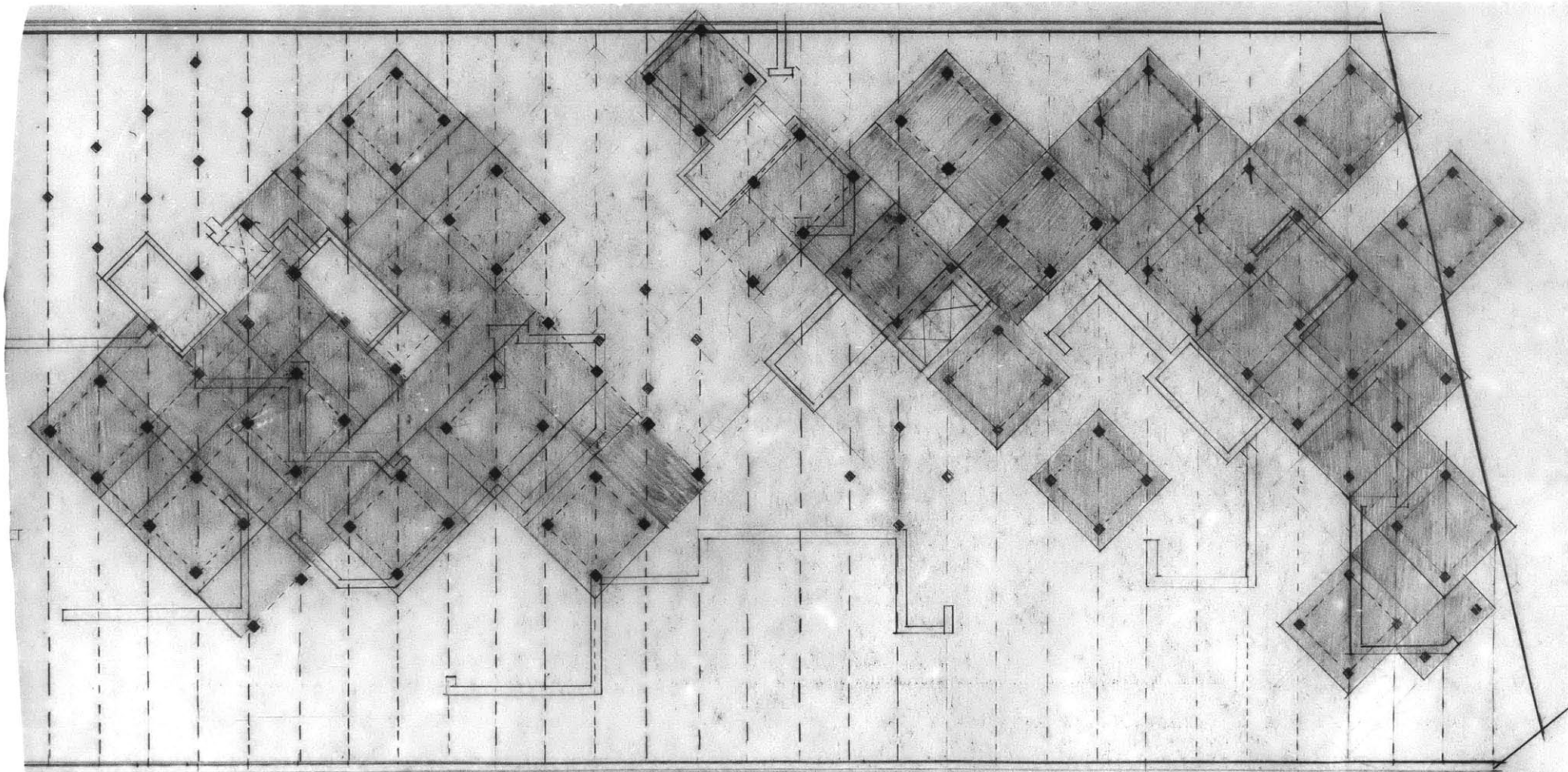
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**MIT THESIS
SPRING 1978
ELEVATION: BB**



**MICHAEL GIULIANO
WATERFRONT HOUSING**

**MIT THESIS
SPRING 1978
STRUCTURE**