A SYSTEM FOR LOW COST HOUSING

by

James John Wengler
Bachelor of Architecture, University of Minnesota, 1966

Submitted in Partial Fulfillment
of the Requirements for the
Degree of Master of Architecture

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
July, 1967

Signature of Author _____
Department of architecture

Certified by _____
Thesis Supervisor

Accepted by _____
Chairman, Departmental
Committee of Theses

June 17, 1967

Dean Lawrence B. Anderson
School of Architecture and Planning
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dean Anderson:

In partial fulfillment of the requirements for the degree of Master of Architecture I Hereby submit this thesis entitled "A System For Low Cost Housing."

Respectfully,

James John Wengler

ACKNOWLEDGEMENTS

The author gratefully acknowledges the advice and encouraging guidance of Professor Horacio Caminos, who was instrumental in determining the scope and general nature of this design.

Additional credit should be given to the following persons for their helpful advice during the course of this study:

Professor Waclaw Zalewski

Professor Robert Newman

I also acknowledge the staff members' valuable criticism throughout the year:

Arlo Braun

John Borrego

ABSTRACT

Title of thsis; A SYSTEM FOR LOW COST HOUSING

Author James John Wengler

Submitted to the Department of Architecture on June 19, 1967 in partial fulfillment of the requirements for the Degree of Master of Architecture.

Many of the major cities in this country are faced with the problem of inadaquate housing for a large segment of the population whose earning power is much lower than the average. The problem is compounded by the fact that the only place that these people can be effectively housed is near the urban center, where the land value is extremely high. The usual solution to these problems is a heavily subsidized "project" development using typical construction techniques which are not low cost by any means. It is the exception that an industrial standardization of components system is used as the

solution to the mass housing problem, making an attempt to reduce the amount of subsidation necessary to realize the project. It is the opinion of many architects and educators that it will be the industrial method that will eventually lead to a truly "low Cost" housing system. The same opinion is held by the author, and it is the subject of this thesis.

TABLE OF CONTENTS

I. OBJECTIVE

The objective of this thesis is to develop a prototype housing structural system that is developed by solving an actual problem in a redevelopment area in a major city. The project must be large enough so that an industrial approach is feasible. The project must typify the urban low cost housing problem at large. The project I have chosen is Castle Square, a part of the South-End Redevelopment area, located in Boston, Massachusetts. The basic prototype system should, I believe, meet the following set of criteria:

A. A structural system that utilizes the advanced technology and industrialization of the United States and other developed countries, by:
   1. making use of standardized components.
   2. minimizing field assembly and reducing construction time.
   3. taking advantage of volume production.

B. The system must conform to the codes, restrictions, minimum requirements, limitations of the typical provincial community.

C. The basic system must adapt to both walk up and elevator structures.

D. The basic system must efficiently meet the requirements of the one bedroom unit as well as the four bedroom unit in terms of: accoustic isolation, plan arrangement, sun, site orientation, and desireability by the proposed occupants.

II. BACKGROUND

A. Castle Square

Castle Square is a thirteen and one-half acre site that was totally cleared, it is located in the South End Urban Renewal Area R-56 about a ten minute walk from the geographic center of Boston's central business district.

The boundary conditions are:

North:

1. depressed freeway.
2. two way street, Castle Street.
3. access to downtown.
4. proposed development using air rights over freeway, to include high rise apartments, commercial, and parking.

West:

1. two way street Tremont, very congested, and one of the main accesses to downtown.
2. the street is now commercial mixed

with housing.

3. the proposed use is for commercial and community facilities.

South:

1. two way divided street, Dover Street.
2. the backs of row housing that are facing Dwight Street.
3. access to elementary schools and playgrounds.
4. row housing that faces Dover Street presently, will be destroyed.

East:

1. one way street, Shawmut Street.
2. mixed use.
   a. new industrial area.
   b. Catholic church.
   c. parking on grade.
   d. old industrial building.

The requirements for Castle Square as outlined by the Boston Redevelopment Authority which I have chosen to follow are:

> Land use provisions, planning objectives, and other requirements for the development of Castle Square.
>
> Parcel 1
>
> The principal use of this parcel shall be housing to be constructed under the provisions and spirit of section 221(d)(3) of the Federal program for housing moderate income families displaced by governmental action. It shall meet the rent and dwelling unit distribution provided herein. Approximately 500 units of 221 (d)(3) housing shall be provided and local shopping may be provided at ground level.
>
> **Major Design** Objectives
>
> 1/ The development shall be compatible with existing row housing in the South End and shall be related to the community of which it is a part. High rise buildings shall be designed with a respect for the human scale of the original South End Community.
> 2/ A Maximum number of the larger size dwelling units shall have access to private outdoor space either on the ground or on balconies.
> 3/ Adequate recreation areas for small children and landscaped sitting areas for adults for use of residents shall

be provided.

4/ Convenient vehicular access shall be provided to the housing. The number of curb cuts in Tremont Street, Dover Street, and Shawmut Avenue shall be held to a minimum.

5/ Local shopping shall be designed to produce an attractive street facing both Tremont Street and the new housing on the interior of the parcel. Use of arcades and small shopping courts is encouraged. Roof of the shopping space shall be attractive to the view and should be made available to the residents for appropriate recreational use.

6/ Any parking structure shall be designed to be compatible with other buildings on the parcel.

Land Use Controls

PERMITTED USES

Housing and related public and semi-public uses including parking. Local shopping and related uses may be developed along Tremont Street including parking.

NUMBER, SIZE AND DISTRIBUTION OF UNITS

Approximately 500 units of 221(d)(3) housing units shall be provided. No more than 300 of these units may be in elevator structures. The exact number, size, and distribution of dwelling units shall be submitted to the Boston Redevelopment Authority for approval.

HEIGHT AND BUILDING TYPE

Housing along Tremont Street may be

provided in elevator buildings, a maximum of seven stories high. The balance of the 221(d)(3) housing units must be in buildings two to four stories high. These must provide a maximum number of individual entries to units. The ideal shopping space shall be one story high and integrated with the housing along Tremont Street.

Any parking structure shall be no more than three stories high(30 feet from grade to top parking level.)

SET-BACK

The set-back along Dover Street shall be 20 feet from the public right-of-way. The set-back from Shawmut Avenue/Tremont Street and Herald Street may be zero, except that in order to prevent traffic hazards the Boston Redevelopment Authority, in its review of development proposals, may require a minimum set-back at traffic intersections which set-back shall be defined as a triangle with sides of 20 feet along each intersecting street.

SIGNS

Signs shall be suitably integrated with the architectural design of the commercial structures which they identify. No sign shall project above the roof of the commercial structure. No flashing or animated signs shall be permitted. The amount of surface for fixed signs and advertising shall be limited to eight (8) square feet per one hundred(100) square feet of front facade surface of commercial use.

The size, design, location and number of signs must be specified in all redevelopment proposals and approved by the Authority.

PARKING

Minimum on-the-ground parking for the 221(d)(3) housing of one car for every two units shall be provided by the Boston Redevelopment Authority. The balance of parking spaces for this housing to provide one space for each unit shall be the responsibility of the developer and may be in a parking structure. Additional parking spaces for commercial, industrial, and institutional use may be provided in a parking structure within the limitation of height permitted.

EASEMENTS

An easement for existing utilities in the right-of-way of existing Compton Street shall be maintained. Easements for utilities shall be provided by the developer for new utility lines. Electric power and telephone distribution shall be underground. Easements shall be checked and accepted by the Public Works Department.

DESIGN REVIEW

Site plans, plans and elevations of buildings and building specifications, plans and designs for signs shall be subject to design review and approval of the Boston Redevelopment Authority.

DEVELOPMENT

The developer shall undertake the development of Parcel I under a single mortage utilizing the provisions of Section 221(d)(3).

The developer shall devote not less than one percent of construction costs provide street furniture, sculpture, pools or other physical amenities to enhance the development.

PARCEL 2

The principal use of this parcel shall be housing for the elderly to be constructed by the Boston Housing Authority. Approximately 100 units shall be provided.

MAJOR DESIGN OBJECTIVES

1/ The development shall be compatible with existing row housing in the South End and shall be related to the community of which it is a part. High rise buildings shall be designed with a respect for the human scale of the original South End community, and shall be coordinated with the design of other high rise buildings to be built in Castle Square.
2/ Recreation and landscaped sitting areas for use of residents shall be provided.
3/ Convenient vehicular access shall be provided to the housing.

Land Use Controls

PERMITTED USES

Housing and related public and semi-public

uses. No parking on the site shall be permitted.

NUMBER, SIZE AND DISTRIBUTION OF UNITS

Approximately one hundred units of housing shall be provided.

HEIGHT AND BUILDING TYPE

Housing on the site shall be provided in elevator buildings, a maximum of seven stories high.

SIGNS

The size, design, location and number of any sign must be approved by the Authority.

PARKING

Off-site parking areas adjacent to the parcel shall be publicly provided.

EASEMENTS

Easements for utilities shall be provided by the developer for new utility lines. Electric power and telephone distribution shall be underground. Easements shall be checked and accepted by the Public Works Department.

Easements for public passage under the buildings shall be provided by the developer.

DESIGN REVIEW

Site plans, plans and elevations of buildings and building specifications,

plans and designs for signs shall be subject to design review and approval of the Boston Redevelopment Authority.[1]

B. Summary Of Redevelopment Projects Undertaken By The Boston Redevelopment Authority.

A summary of project characteristics for Marksdale Gardens, Charlane, Academy Homes-Washington Park Urban Renewal Project has been tabulated by Dave Myers of Boston Redevelopment Authority to determine their intensity of development. The data which is shown in table I provides an indication of possible densities in other project areas which use similar types of construction and 221(d)3 financing.

Definition Of Terms Used In Table I

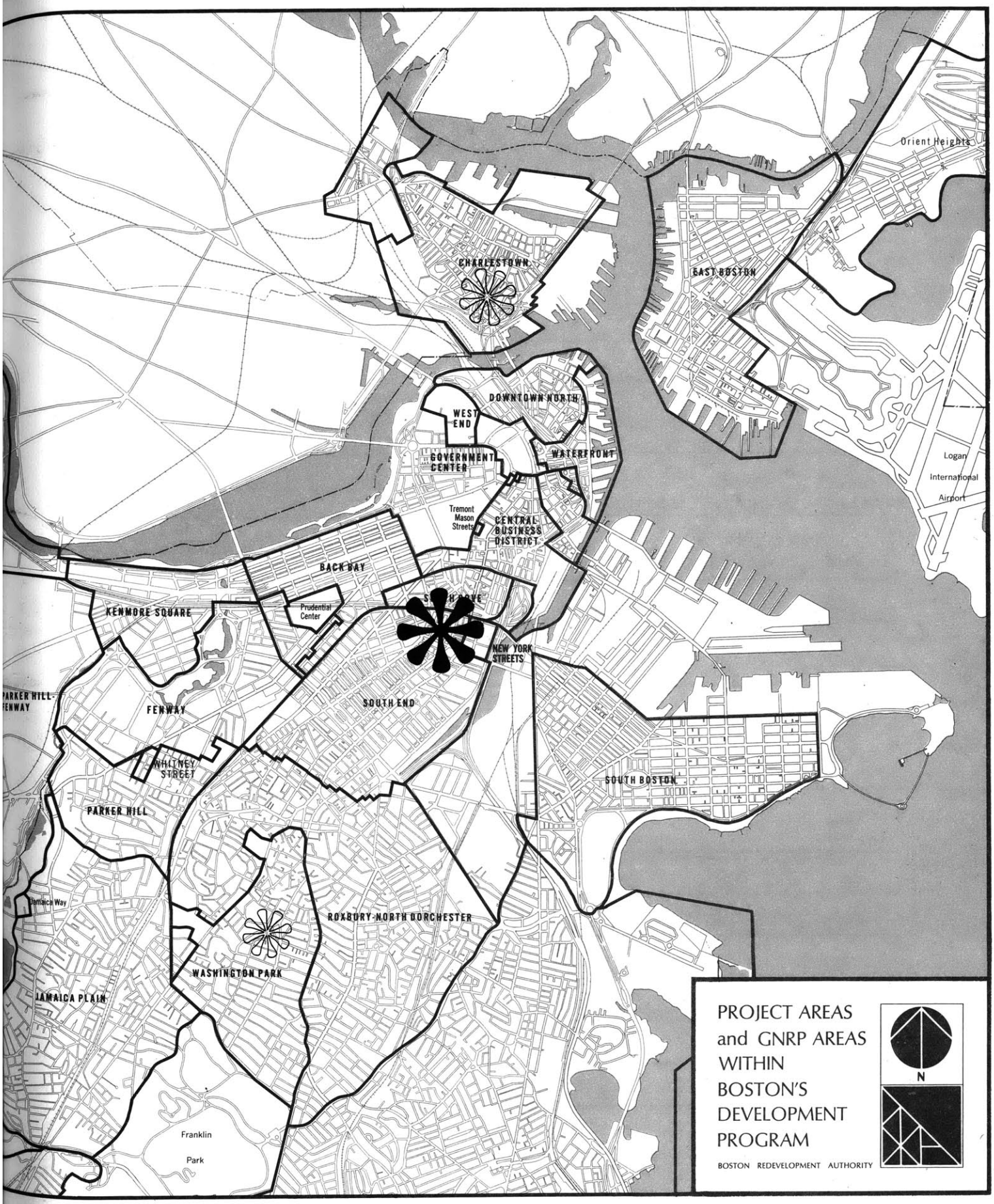
1. Area of right-of-way (R.O.W.)-includes interior roads and parking.
2. Net area - total site area less R.O.W.
3. Estimated population - assumes two persons for first bedroom and one person for each additional bedroom.
4. Gross F.A.R. (floor area ratio) - total floor area divided by total site area.
5. Total rooms - based on F.H.A. room count.

Table I

	Marksdale Gardens	Charlane	Academy Homes	Castle Square
Total site area: (acres)	3.731	4.951	7.485	13.49
Area of R.O.W.: (acres)	23.1% .863	38.1% 1.885	38.6% 2.895	30.4% 4.05
Net buildable area: (acres)	2.868	3.066	4.590	9.44
Number of dwelling units:	82	92	202	596
Dwelling units per net acre:	28.6	30.0	44.0	63.1
Dwelling units per gross acre:	22.0	18.6	27.0	44.2
Estimated population:	298	368	793	1808
Persons per net acre:	103.9	120.0	172.8	191.5
Persons per gross acre:	80	74	106	134.0
Population per unit:	3.6	4.0	3.4	3.3
Building coverage: $ft.^2$	41,186	45,763	70,337	194,427
Gross coverage:	.2534	.2126	.2161	.3315
Net coverage:	.3302	.3432	.3524	.4736

Table Continued

	Marksdale Gardens	Charlane	Academy Homes	Castle Square
Total Gross floor area: $ft.^2$	82,362	102,426	220,400	507,936
Gross F.A.R.	.5077	.4758	.6772	.8659
Total rooms:	506	558	$1,328\frac{1}{4}$	NA
Rooms per gross acre:	13.6	112.7	117.4	-
Rpoms per net acre:	176.4	182.0	289.3	-
One bedroom:	-	-	23	144 96 elderly
Two bedroom:	42	24	40	165
D.U. breakdown 3 bedroom	28	44	80	122
D. U. breakdown 4 bedroom:	12	24	47	69
D.U. breakdown 5 bedroom:	-	-	12	-
Total number of bedrooms:	216	276	591	1,212


CHARLESTOWN
EAST BOSTON
Orient Heights
DOWNTOWN NORTH
WEST END
GOVERNMENT CENTER
WATERFRONT
Logan International Airport
Tremont Mason Streets
CENTRAL BUSINESS DISTRICT
BACK BAY
KENMORE SQUARE
Prudential Center
NEW YORK STREETS
SOUTH END
FENWAY
WHITNEY STREET
PARKER HILL
SOUTH BOSTON
Jamaica Way
ROXBURY-NORTH DORCHESTER
WASHINGTON PARK
JAMAICA PLAIN
Franklin Park
PROJECT AREAS and GNRP AREAS WITHIN BOSTON'S DEVELOPMENT PROGRAM
BOSTON REDEVELOPMENT AUTHORITY
N

III. THE PROGRAM

A. HOUSING

Unit type	Elevator Structures		Walk up		
Apartment type	One bedroom	Two bedroom	Two bedroom	Three bedroom	Four bedroom
Distribution %	35.5%	12%	17%	25.5%	10%
Number	252	84	126	180	72
Min area ft.^{2}					
Living	160	160	160	170	180
Living dining	NA	NA	NA	NA	NA
Kitchen dining	120	120	120	120	120
Bedroom 1	120	120	120	120	120
Bedroom 2	NA	80	80	80	100
Bedroom 3	NA	NA	NA	80	80
Bedroom 4	NA	NA	NA	NA	80
Bath	40	40	40	40	40
½Bath	NA	NA	NA	NA	25

Apartment type	One bedroom	Two bedroom	Two bedroom	Three bedroom	Four bedroom
Personal closet	10	16	16	22	28
Common storage	50	70	70	90	100
Storage (lowest level)	100	130	130	160	200
Net area/storage	500/100	610/130	610/130	740/160	910/200
Plus 20%	100	120	120	150	180
Gross bsmt. area/storage	600/100	730/130	730/130	900/160	1100/200
Total area apt. type	594	720	720	1056	1280
Total Gross area	149,600	70,400	90,700	190.000	92,100

B. COMMERCIAL

The proposed commercial area (66,500 square feet) is to be located along Tremont Street.

I believe that office space should be provided above the commercial space, instead of apartments, as I feel that there will be a large market for office space in

this area.

C. PARKING

1. Commercial - one square foot parking for every square foot of commercial, 66,500 feet^2 commercial equals 220 cars.
2. Housing - one car per housing unit of the 221(d)3 type housing, of 602 cars
3. Total parking 822 cars.

IV. CONSTRUCTION SYSTEMS

A. Typical Systems

Typical housing construction systems presently used in Boston are: poured in place concrete, and precast concrete.

Examples of poured in place concrete are familar to most people living in Boston, as it is the most common system currently being used. A typical example of this type construction system can best be exemplified by the following photographs taken at the Castle Square development currently under construction.

One of the examples of a precast concrete system used for housing is the Tech-Crete System developed by Sepp Firnkas and Carl Koch in 1964. The system was developed and used on a 202 unit low and middle income housing complex in the Boston suburb of Roxbury. A typical Tech-Crete building

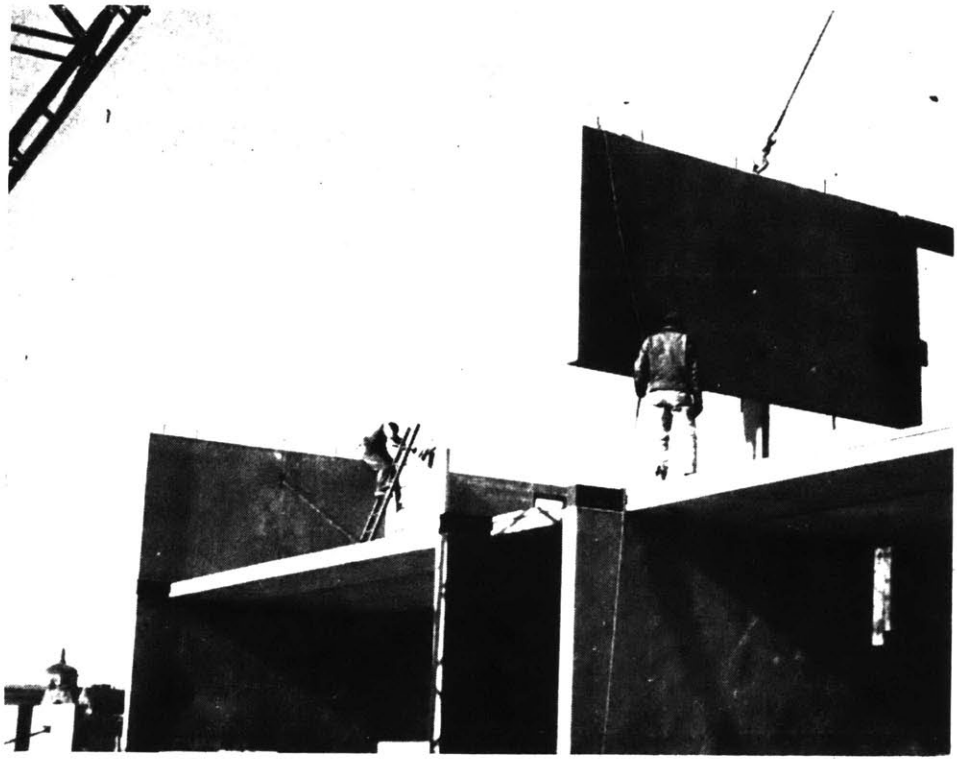
(32 ft. span module). is assembled from 8 inch thick wall panels extending the full depth of the building and the height of one floor; a 4 inch thick prestressed shear wall placed at right angle to the bearing walls; and 8 inch thick floor and roof slabs spanning 32 ft. from wall to wall.

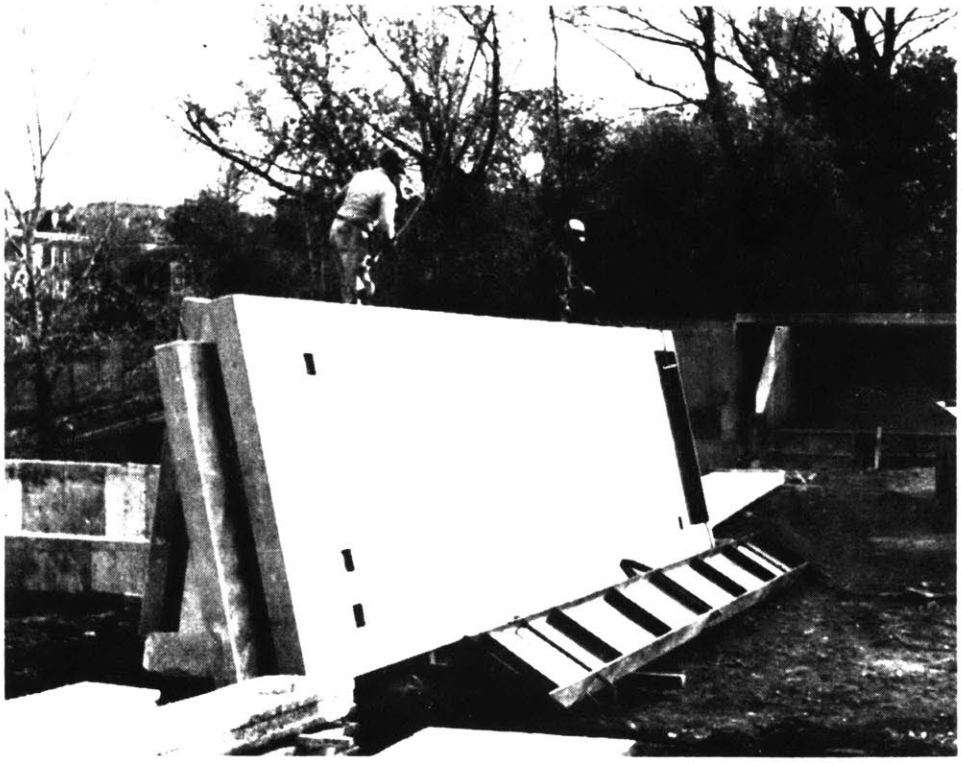
The basic 6000 psi wall panel is 36 ft. long and weighs between 12 and 14 tons. It is cast in the conventional flat position with a tilt-up form for stripping.

Only two different lengths of floor slab are required; 32½ ft. for the clear span and support on each side, plus 8 ft. for stair landings.

Shear walls are 6 ft. wide and are uniform except for length. Up to six floors long on low-rise buildings, they are replaced by precast elevator tower units on high-rise structures.

San-Vel Concrete Corp. of Littleton, Mass., Tech-Crete's supplier and erector, presently is turning out 12 wall panels and about 6,000 to 8,000 sq. ft. of floor slab a day.





Two-inch diameter conduits are set in the wall panels to accommodate the post-tensioned rods which connect them to the floor units. The length of the rods is equal to the floor height. They are connected at each floor level by couplers and serve as rough alignment and as a placement guide for the panels.

After being positioned with the help of the shear walls or braces, the rods are post-tensioned to stabilize each panel and allow the floor slab to be set on bearing pads. Then the coupling for the post-tensioning rod and the next rod of floor height is installed to accommodate placement of the next panel.

Floor to wall connection is through prestressing forces plus continuous or hooked rods placed in the shear keys of the floor slab and into the grout space between wall panels.

Final connection and protection of the post-tensioning and reinforcing steel is done by pumping 3,000 psi expansive grout into all openings.

Tech-Crete's basic floor plan for one or two bedroom units can be changed by reducing the depth of the building from 32 feet to 28 feet or 26 feet and reducing the bearing wall length to 32 feet. Distance between the bearing walls and the floor spans remains the same to ensure the most efficient use of the units.[2]

B. STANDARDIZATION OF COMPONENTS

The theory of standard pre assembled or pre cast components is not new; the auto industry is a perfect example of how a mass ploduced item can be less expensive than the one of a kind. It has been pointed out that the cost of an auto engine is only slightly more than the cost of its weight in steel, and yet the auto engine is one of the most sophisticated machines produced in our society.

If some of these same principles can be applied to the building industry, even on a smaller scale, large savings could be made.

These Principles are:

A. Standardized structural components should be as large as possible. The limitations being:
   1. weight; it is not practical to have some components that weigh 20 tons if you have smaller components that weigh 2 tons, unless of course the project size can justify a large crane and a small crane. But to tie up a 60 ton crane most of the time with a 2 ton floor system, is not efficient.
   2. size; the transportation of the components from the factory to the site imposes limitations on the physical demensions. The maximum size being 50 feet plus or minus in length, 10 feet plus or minus in width and 10 feet plus or minus in height.

B. Components should combine the function of structure, stability when placed, enclosure, mechanics, and finish within the limits of production.

C. Components should be immediately stable when placed, sophisticated field joints, and difficult placing, only add many man hours to the job cost.

D. The enclosing elements, doors, windows, and panels must be well integrated into the structural components. The "fit" must be exact, so that these elements within their tolerances can be placed without any fussy field alterations.

E. The mechanical components, plumbing, heating and exhaust ventilation cannot fight the structural system but must be married to it. These components can be manufactured so that the field connections are minimized.

F. The service elements, such as the kitchen and bathroom, can be unitized so that an entire bathroom is installed as a unit. And likewise, a kitchen; counter, sing, cabinets, refrigerator, stove, oven, etc. can be installed as a unit. [3]

V. PROPOSAL

A. Systems:

The basic system is a precast concrete structural system made up of the following sub systems:

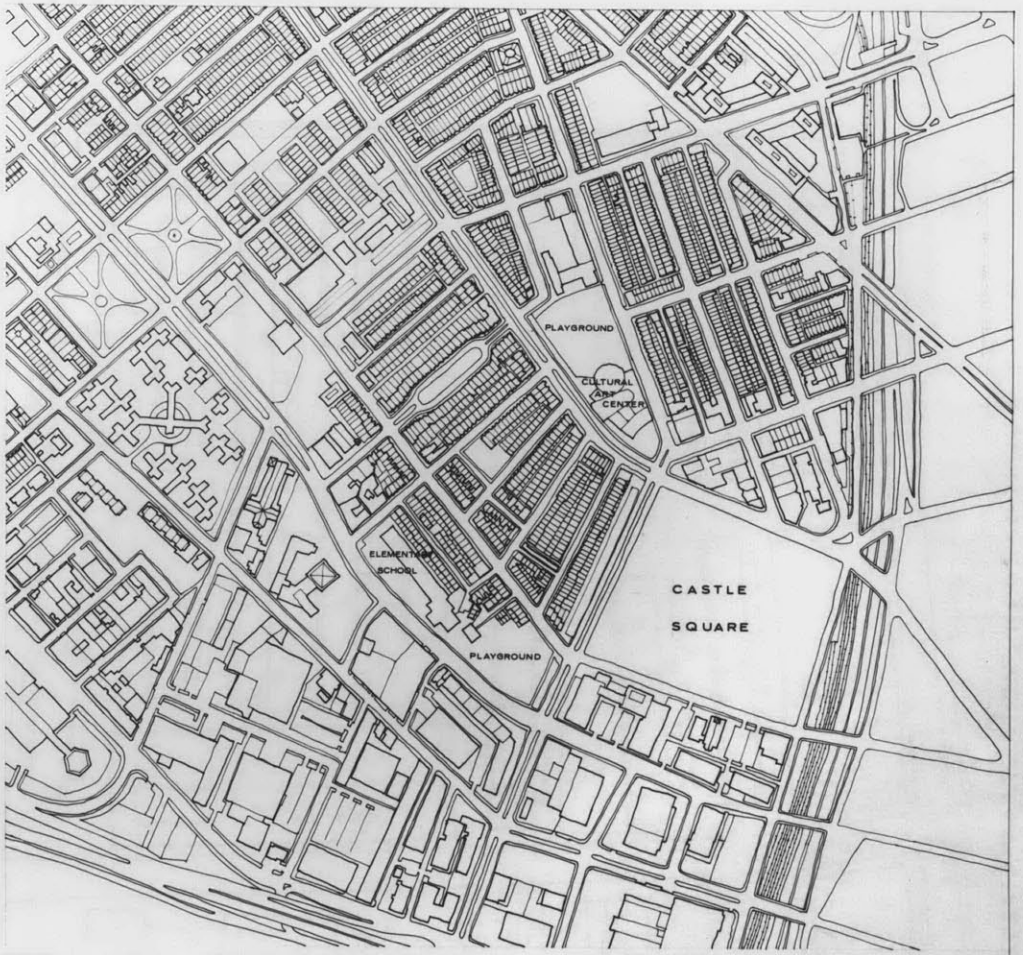
1. Walls are pre cast tee's,both in plan, and in vertical section, so that stability is achieved when placed. The two parts vary from 16 feet to 21 feet in length and from 10 to 15 tons in weight. The entrance doors are cast into the front part of the tee to simplify the spandrel detail.
2. The floor system consists of pre cast, pre-tensioned, commercial products such as span crete, which is cast by the extrusion method in 600 foot lengths, and is then cut to the proper length depending upon the unit. Three different spans are used: 16 feet for the

one bedroom unit, 18 feet for the two bedroom unit, and 26 feet for the three and four bedroom unit.

3. The enclosing system consists of spandrels that are designed to accept the exterior partitions and windows with minimum tolerances. The spandrels are used, because the inherent curveature of the span crete makes partition and window placing difficult. The windows and enclosing panels will be existing commercial sizes.
4. The stair system consists of three pre cast pos tensioned parts; the two stair runs, and the roof. The stairs will be enclosed with corrugated fibreglass panels that will keep the stairs free from moisture, rain, leaves, and snow.
5. The mechanical system consists of hot and cold water exhaust vents from bathroom and kitchen, and hot water heating

controled by individual thermostats. The heating system consists of a central steam generating plant, with steam pipes to the lowest level of all structures, the steam then heats the heating reservoir which is kept at high pressure. Individual pipes to each unit, with thermostatically controlled valves, insure that maximum confort for each unit is achieved.

B. Drawings.



A SYSTEM FOR LOW COST HOUSING

CASTLE SQUARE BOSTON MASSACHUSETTS

THE SOUTH END OF BOSTON

0 200

1

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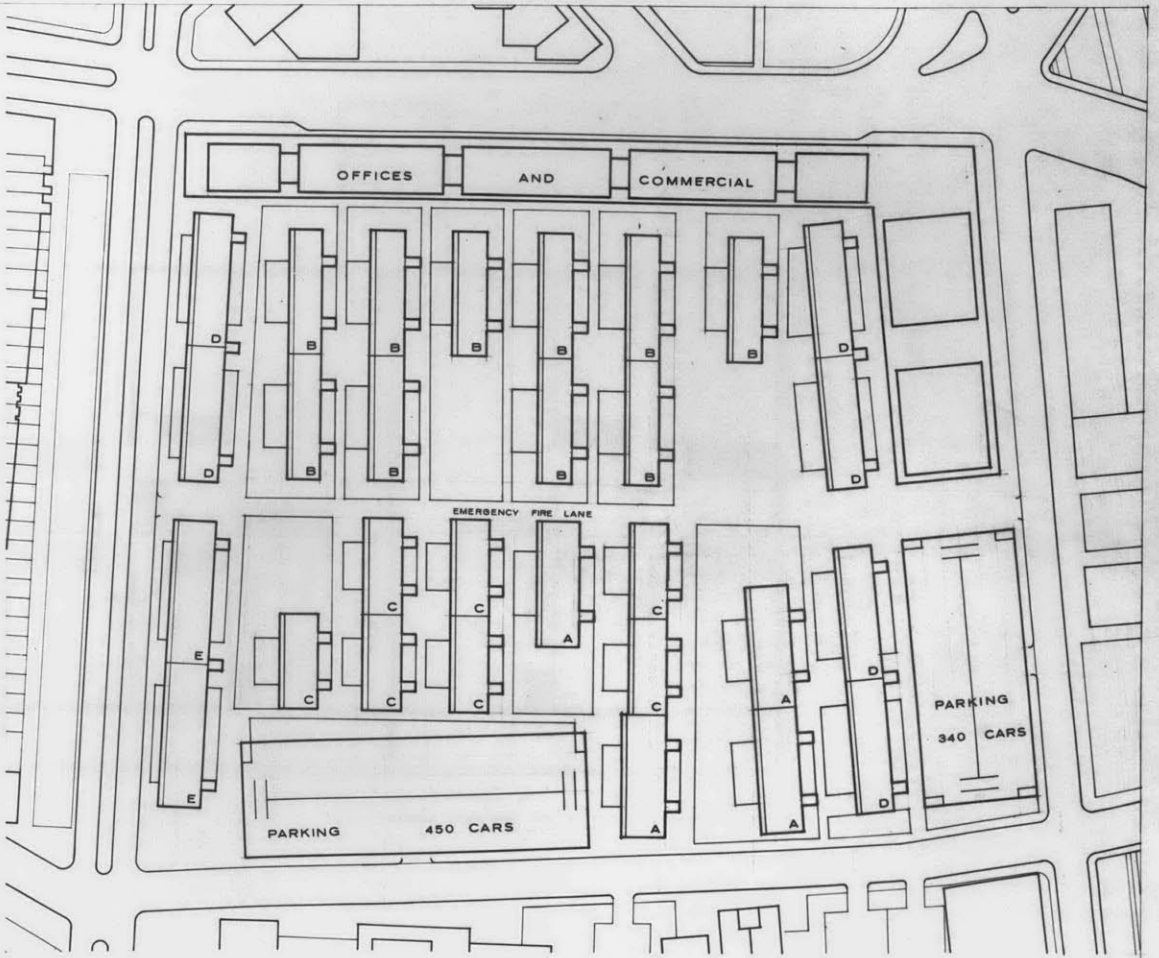

A SYSTEM FOR LOW COST HOUSING

CASTLE SQUARE BOSTON MASSACHUSETTS

BOSTON'S C.B.D. & SITE PLAN

2

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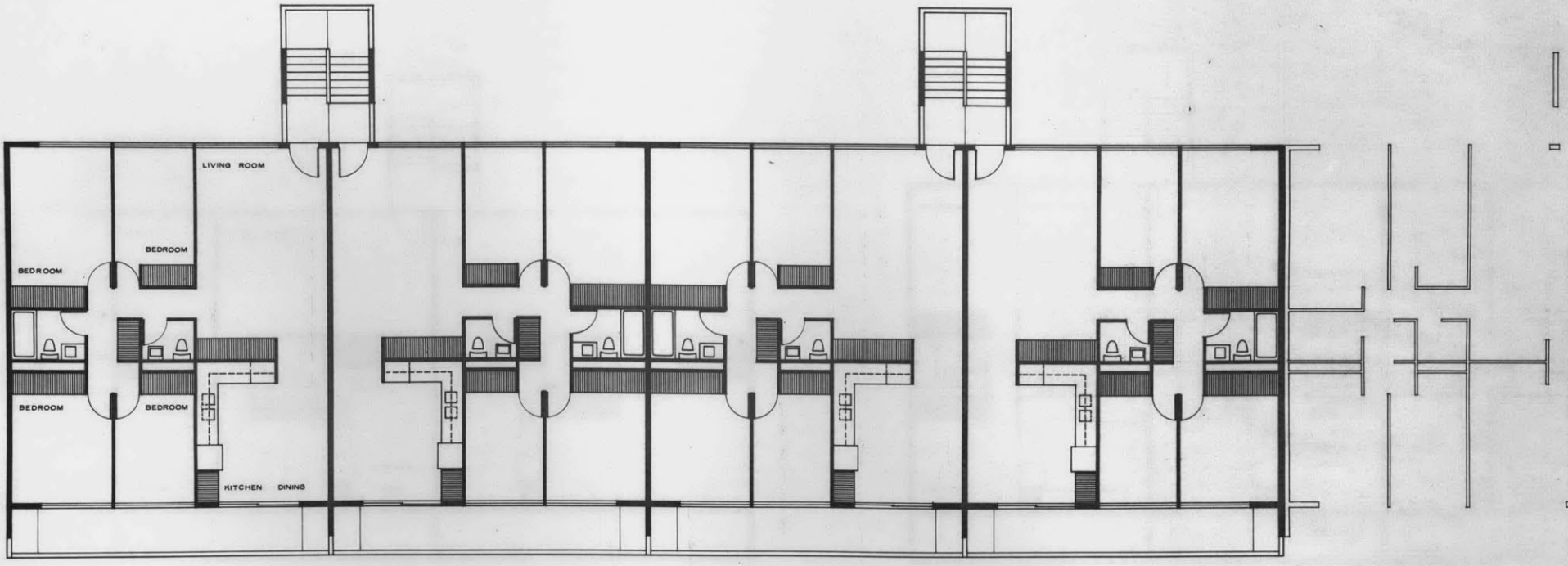

UNIT A four bedroom 1280 sq. ft.

GROUND LEVEL END UNIT IS STORAGE LAUNDRY & UTILITY ROOM

A SYSTEM FOR LOW COST HOUSING

CASTLE SQUARE BOSTON MASSACHUSETTS

UNIT PLANS

0 2 4 8

3

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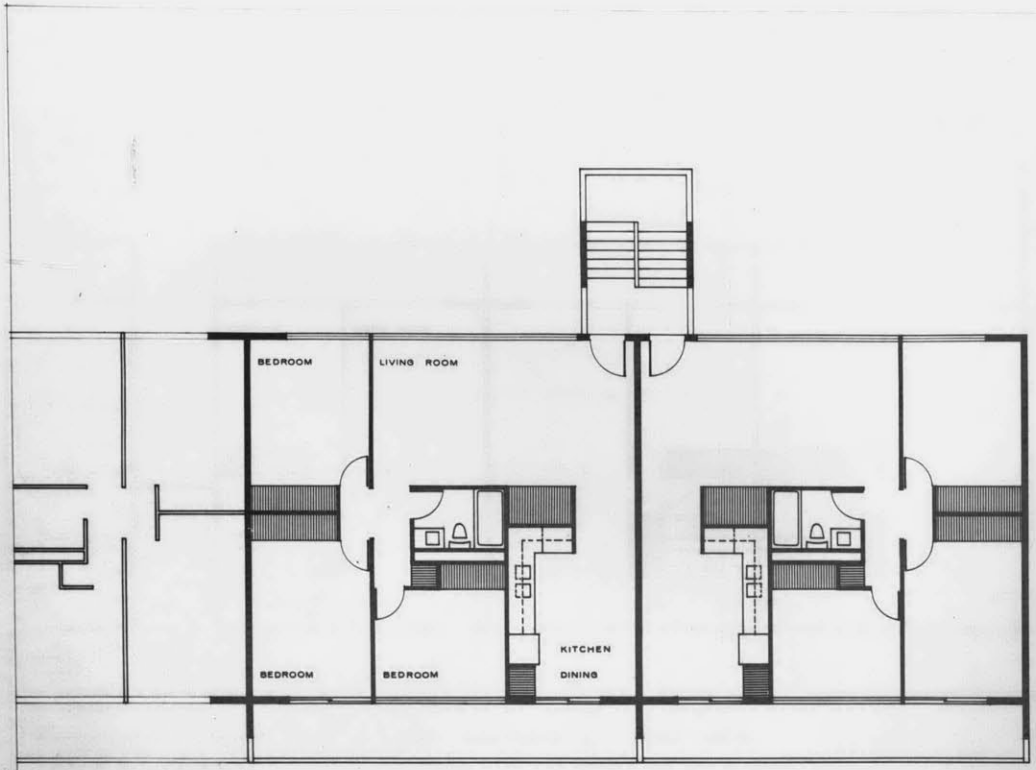
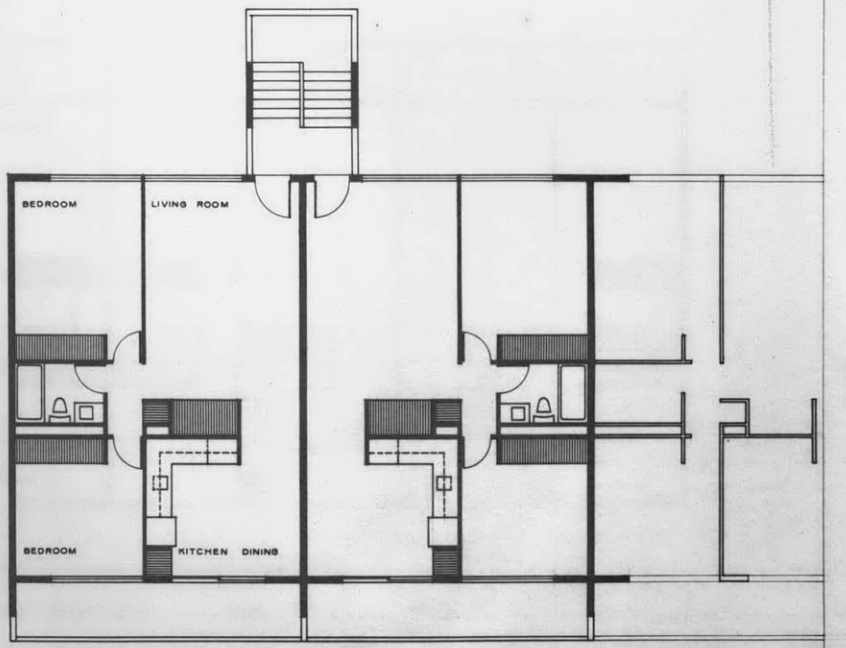


UNIT B three bedroom 1056 sq. ft.



UNIT C two bedroom 720 sq. ft.

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UNIT PLANS

0 2 4 8

4

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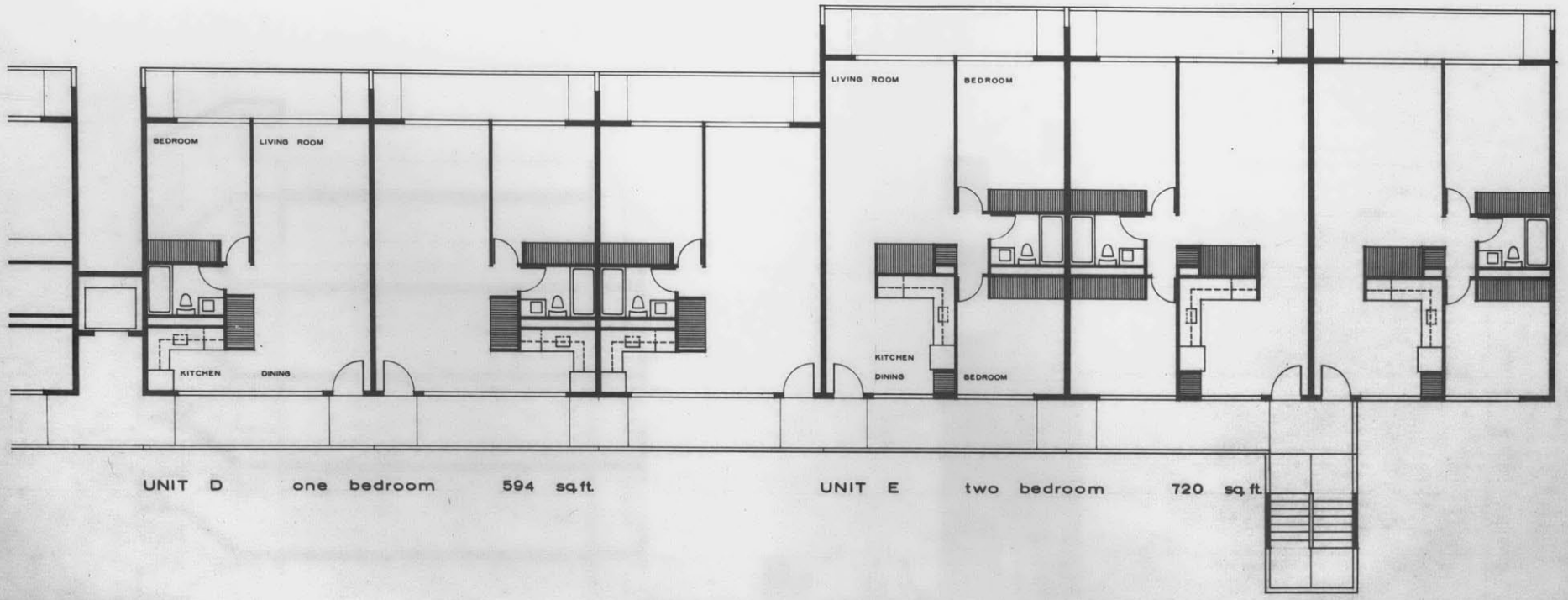

UNIT D one bedroom 594 sq.ft.

UNIT E two bedroom 720 sq.ft.

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EIGHT STORY ELEVATOR UNITS

0 2 4 8

5

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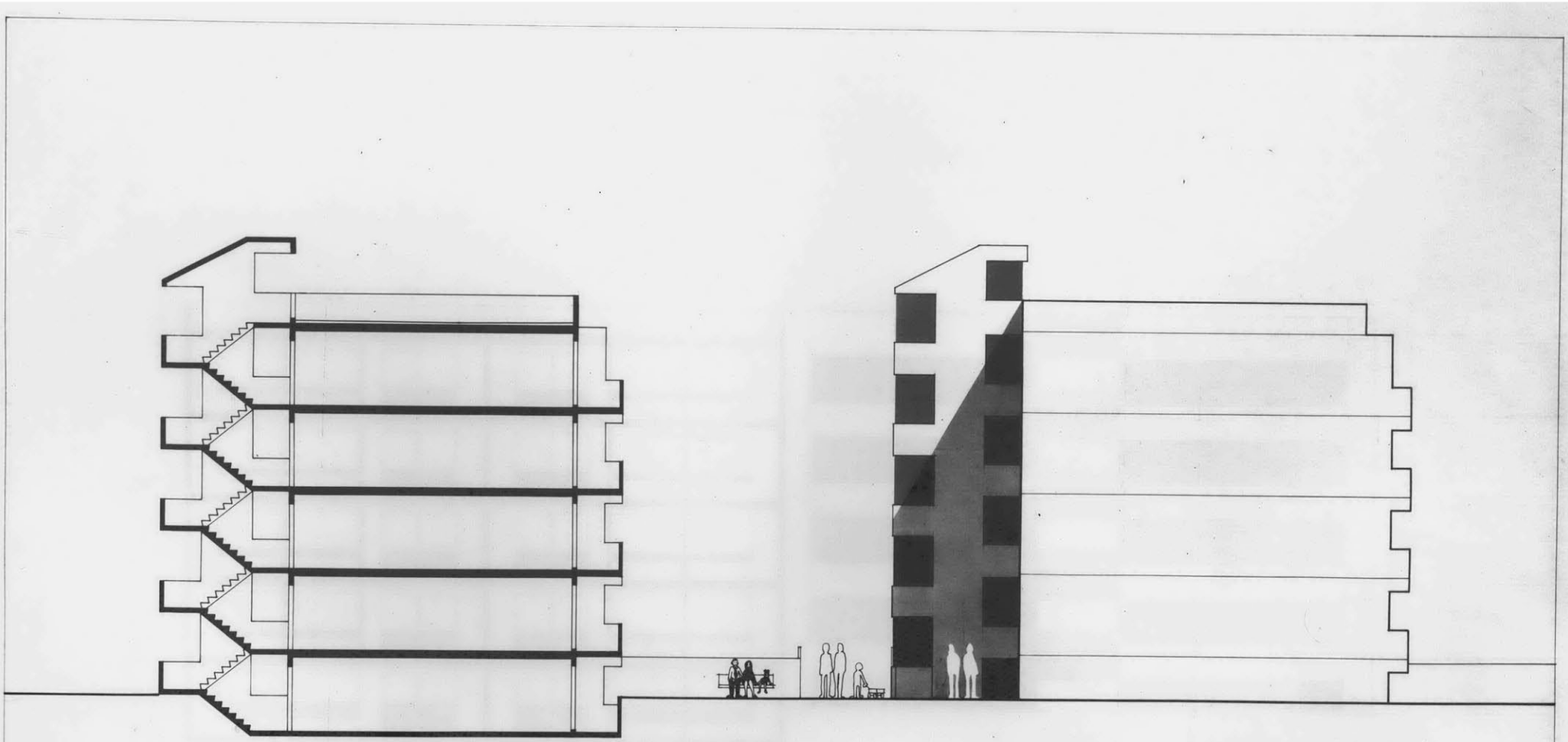

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SECTION ELEVATION

0 2 4 8

6

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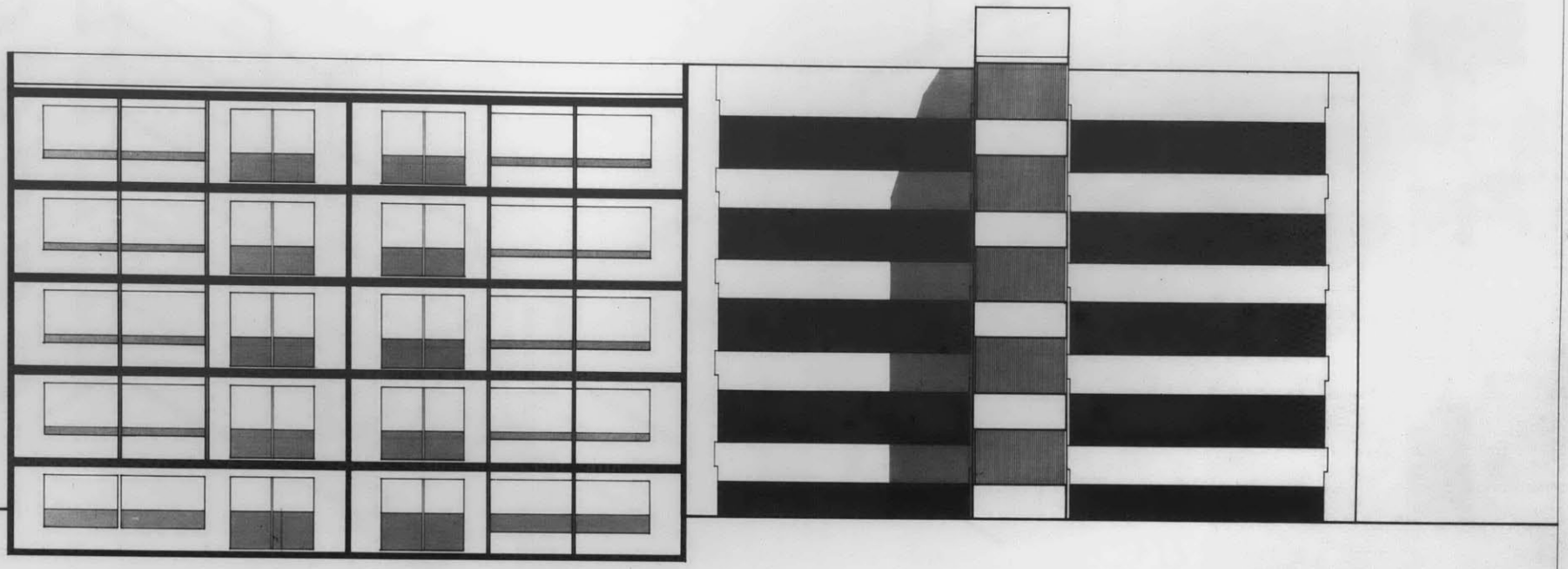

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CASTLE SQUARE BOSTON MASSACHUSETTS

SECTION ELEVATION

0 2 4 8

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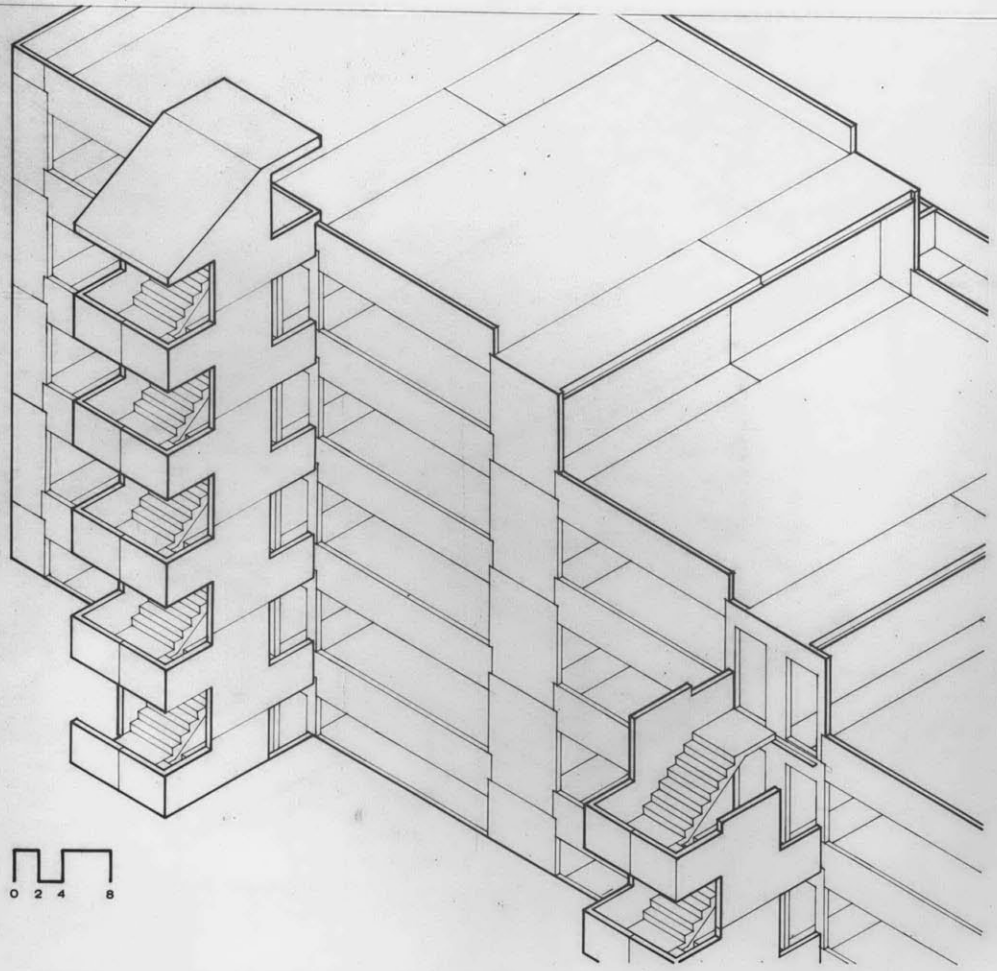

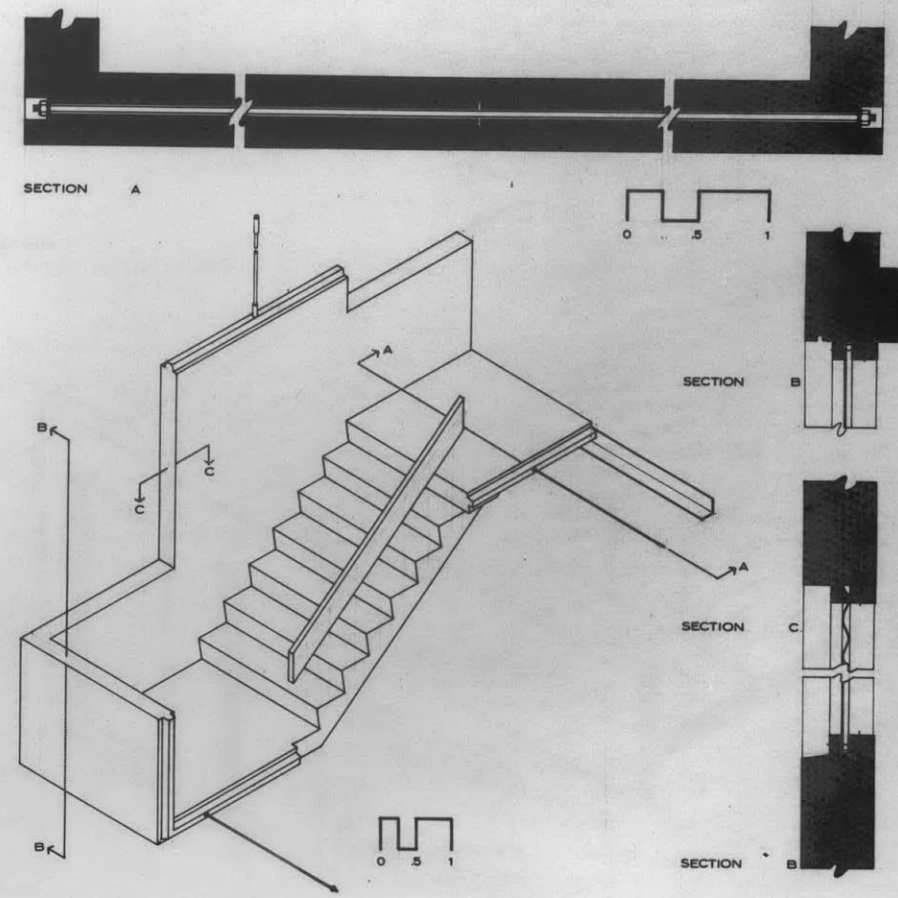

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ISOMETRIC & STAIR DETAILS

8

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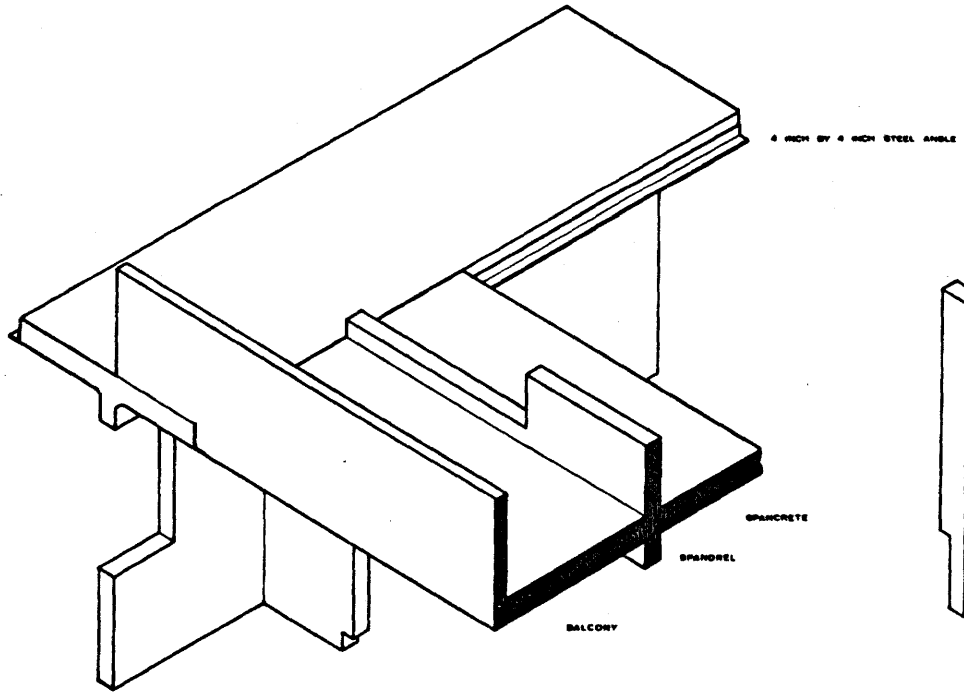
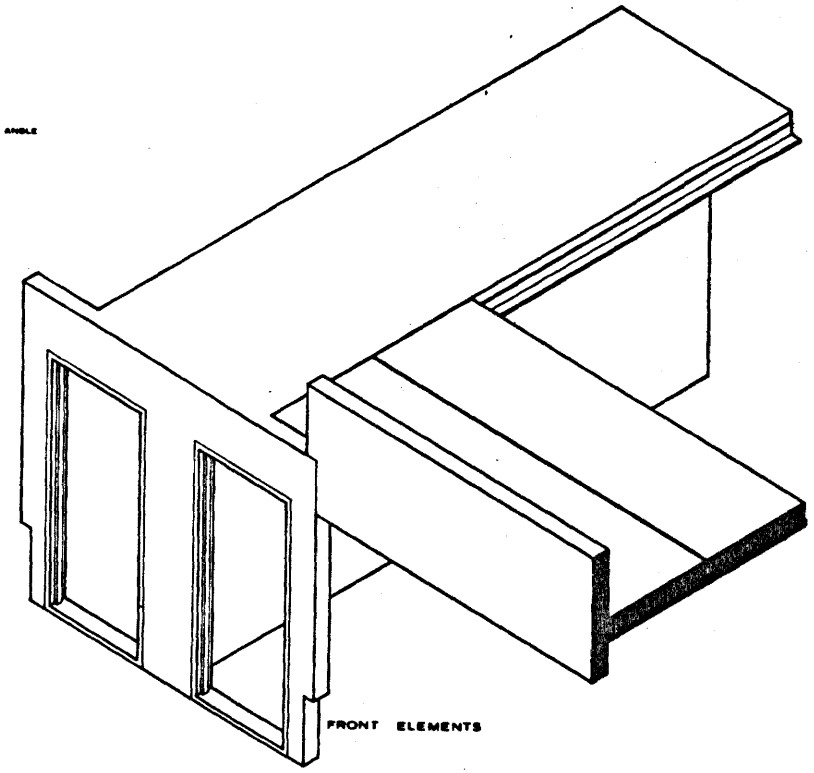


REAR ELEMENTS



FRONT ELEMENTS

A SYSTEM FOR LOW COST HOUSING
CASTLE SQUARE BOSTON MASSACHUSETTS

STRUCTURAL COMPONENTS

0 1 2 4

9

MASTER OF ARCHITECTURE THESIS
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
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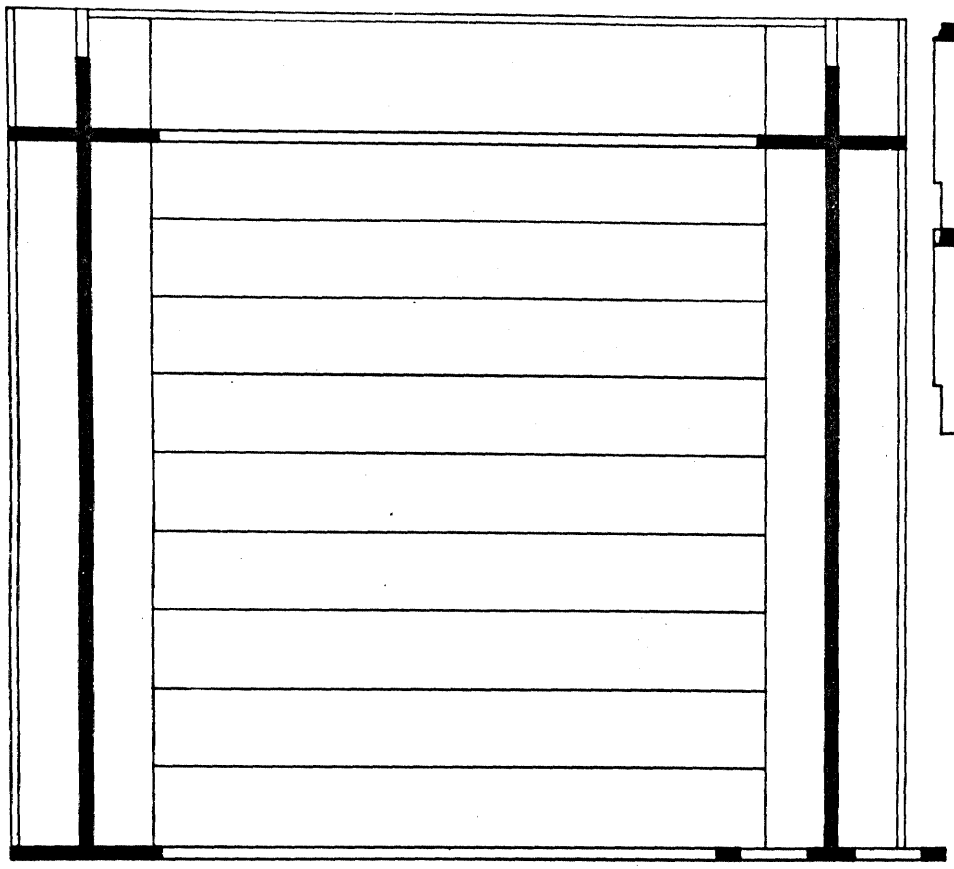
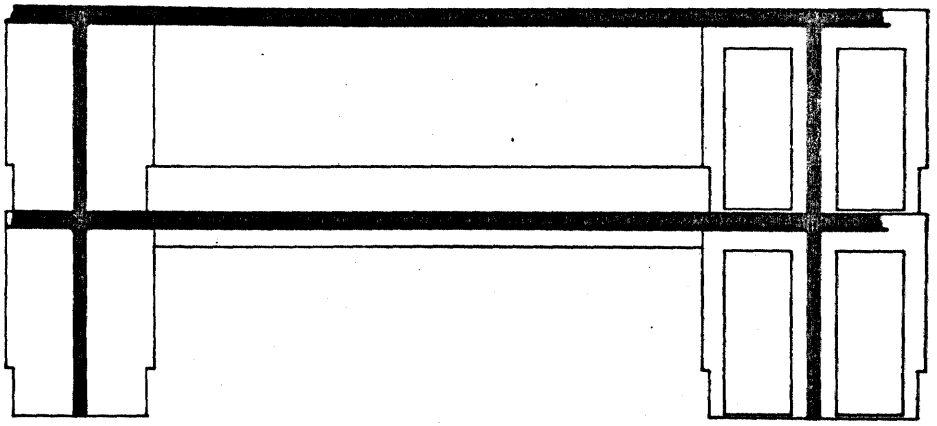
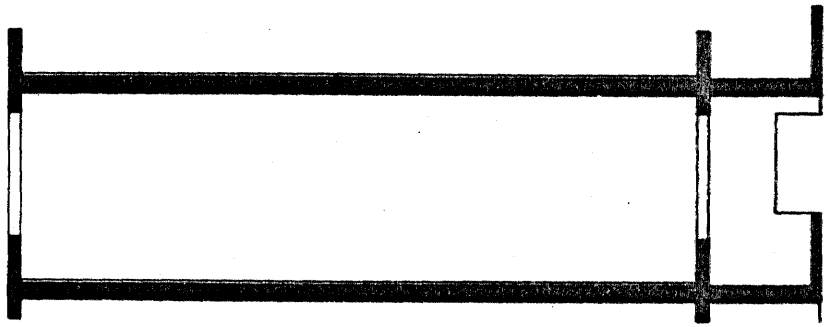






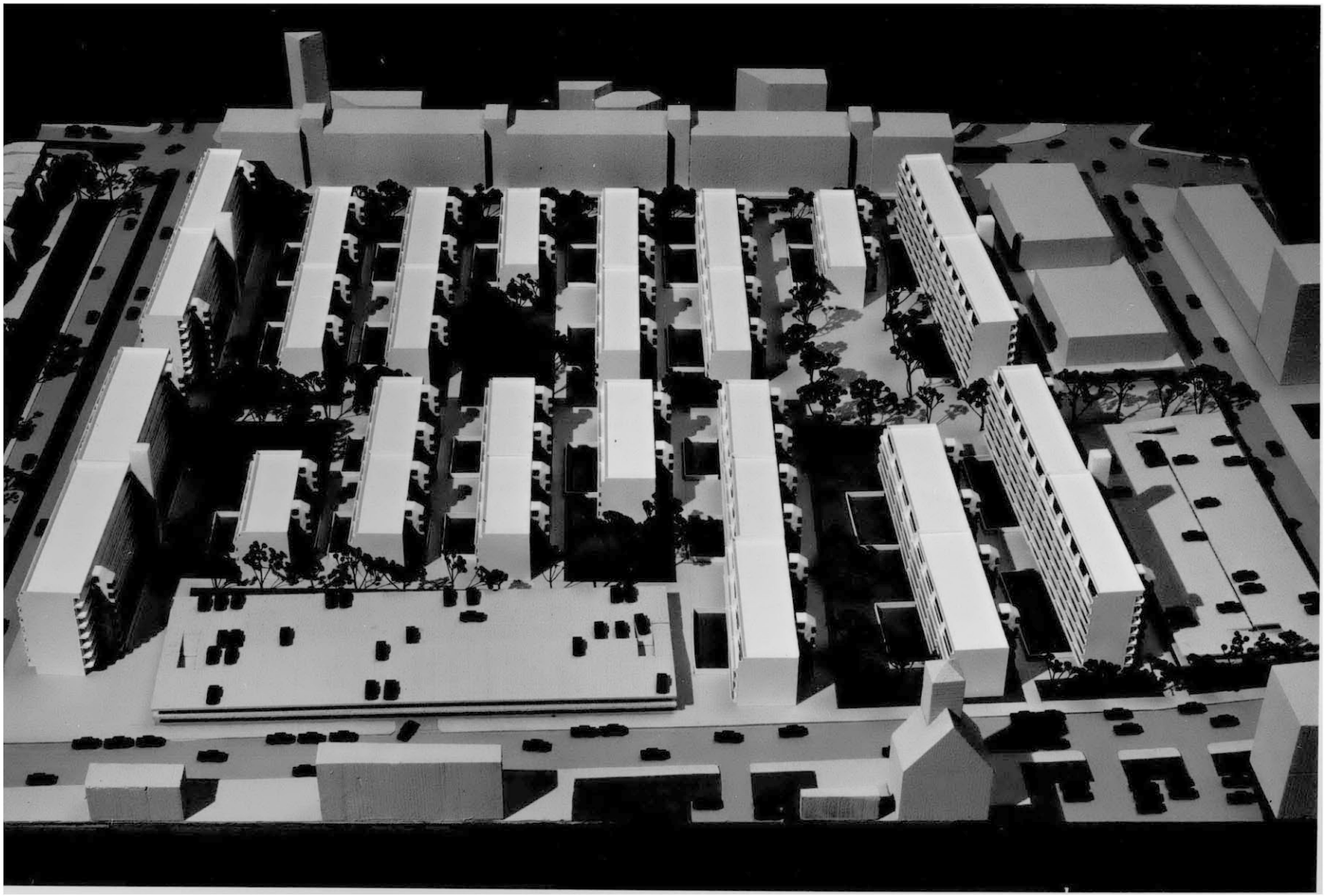
A SYSTEM FOR LOW COST HOUSING
CASTLE SQUARE BOSTON MASSACHUSETTS

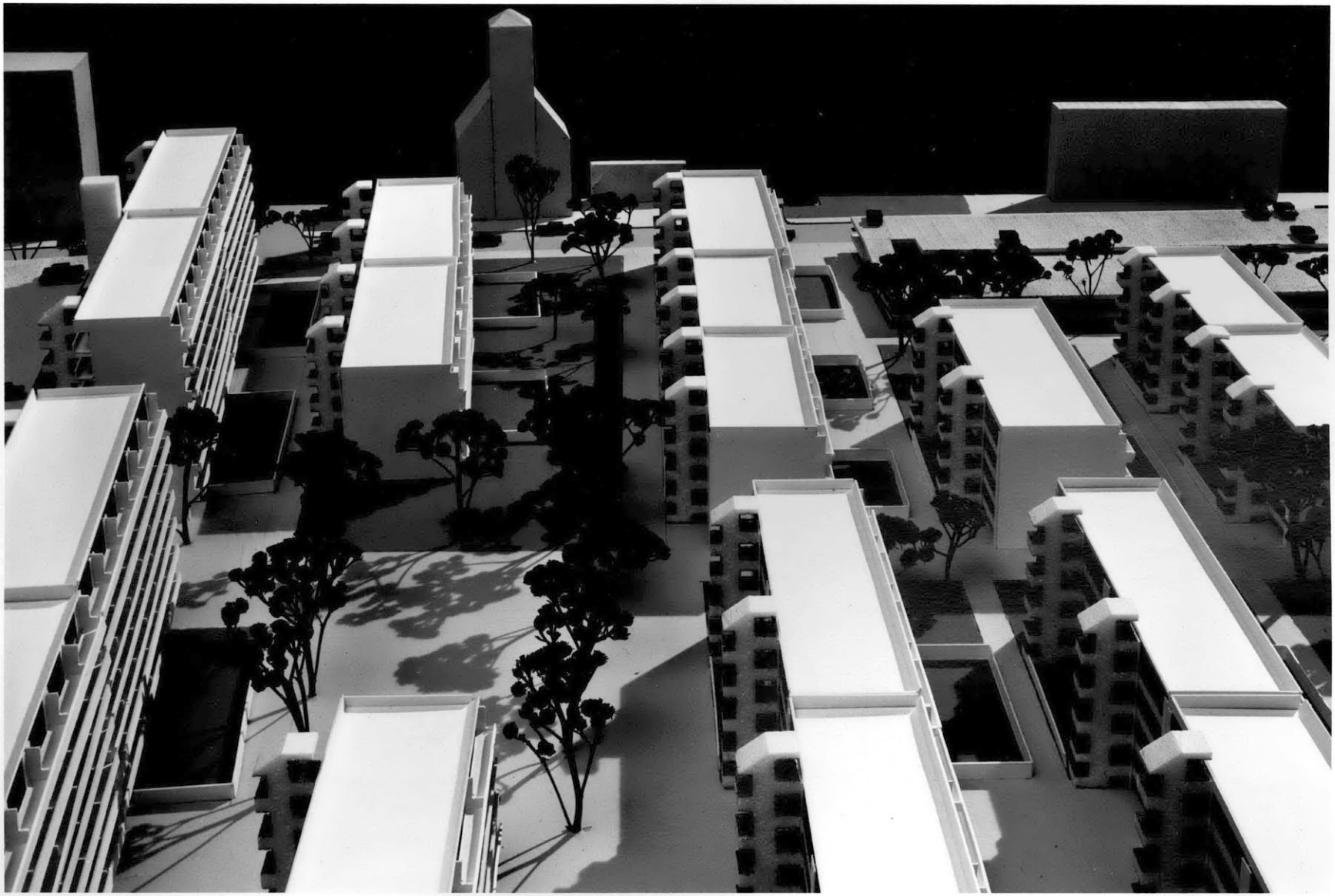
STRUCTURAL PLAN & SECTIONS

0 1 2 4

10

MASTER OF ARCHITECTURE THESIS
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
JAMES WENGLER JUNE 1967





APPENDIX A.

Note References

1. Boston Redevelopment Authority, South End Urban Renewal Plan, B.R.A., 196_, section 604.

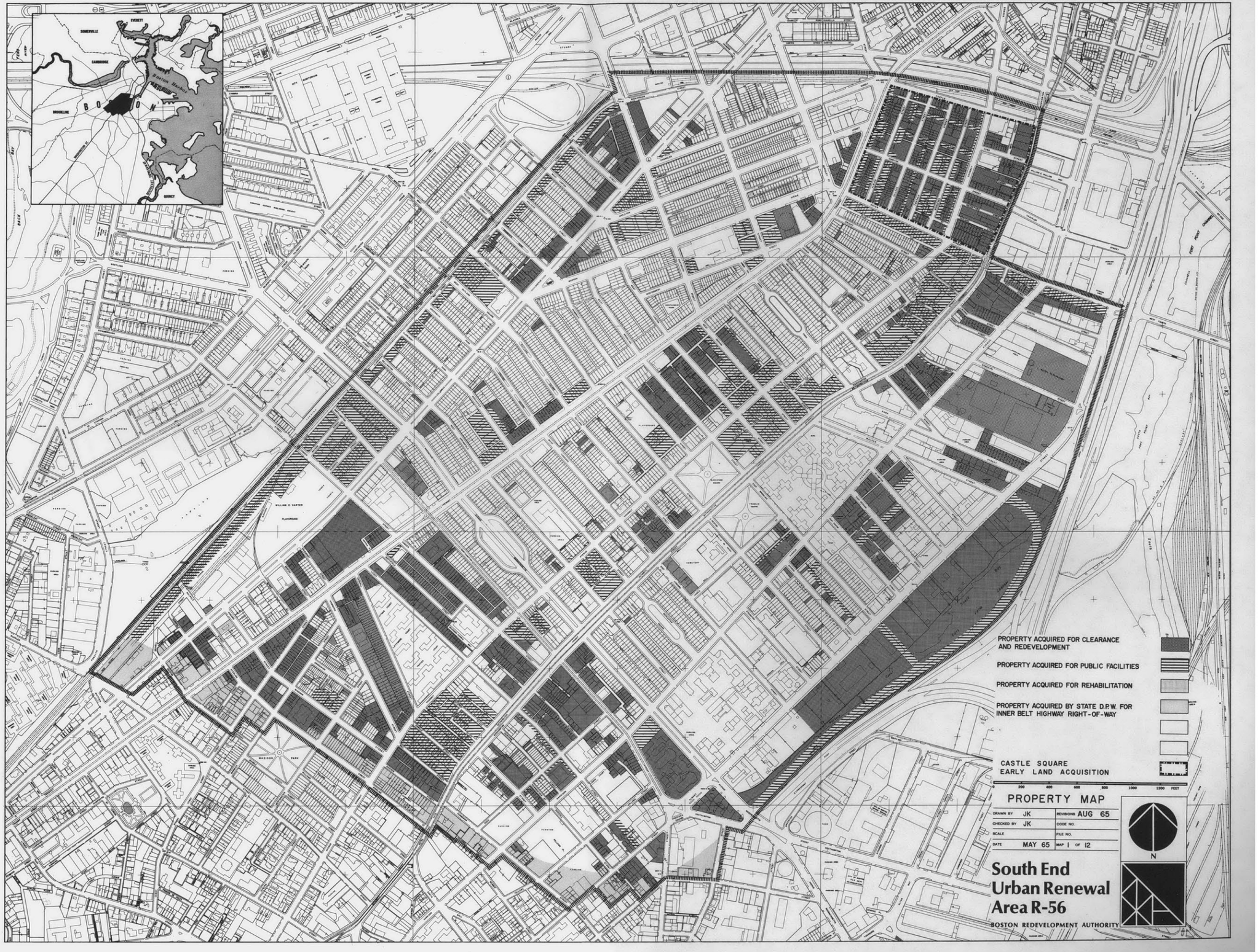
2. Concrete Products, Tech-Crete Thrives In New England, Reprint, October, 1956.

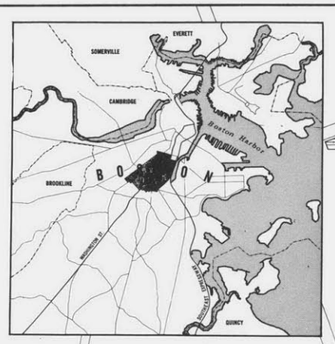
3. Koch, Carl and associates, Housing Study For The Boston Redevelopment Authority, Draft Report, 196_. p.p. 15, 16.

APPENDIX B.

Maps.


Massachusetts Turnpike
Berkeley Street
Franklin Institute
Y.W.C.A.
Police Station #4
Holy Trinity Church
Dover Street
Dwight Street
Milford Street
Hanson Street
Waltham Street
Bond Street
Taylor Street
New Rotch Playground
Briggs Place
"Eight" Streets Playground
Ringgold Street
Shawmut Neighborhood Center
Shawmut Avenue
Bradford Street
Perry Street
New Elementary School


SOMERVILLE
EVERETT
CAMBRIDGE
Boston Harbor
BROOKLINE
B O S T O N
QUINCY
PROPERTY ACQUIRED FOR CLEARANCE AND REDEVELOPMENT
PROPERTY ACQUIRED FOR PUBLIC FACILITIES
PROPERTY ACQUIRED FOR REHABILITATION
PROPERTY ACQUIRED BY STATE D.P.W. FOR INNER BELT HIGHWAY RIGHT-OF-WAY
CASTLE SQUARE EARLY LAND ACQUISITION
0 200 400 600 800 1000 1200 FEET
PROPERTY MAP
DRAWN BY JK
CHECKED BY JK
SCALE
DATE MAY 65
REVISIONS AUG 65
CODE NO.
FILE NO.
MAP 1 OF 12
N
South End Urban Renewal Area R-56
BOSTON REDEVELOPMENT AUTHORITY



RESIDENTIAL
COMMERCIAL
OPEN SPACE
INSTITUTIONAL
INDUSTRIAL

0 200 400 600 800 1000 1200 FEET

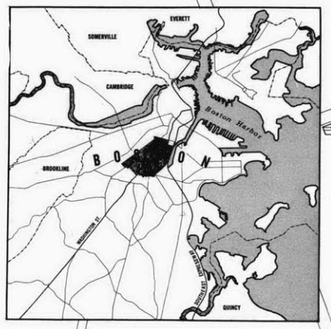
PROPOSED LAND USE

DRAWN BY	DWH	REVISIONS	AUG 65
CHECKED BY	JK	CODE NO.	
SCALE		FILE NO.	
DATE	MAY 1965	MAP 2 OF 12	

N

South End Urban Renewal Area R-56

BOSTON REDEVELOPMENT AUTHORITY



REUSE PARCELS

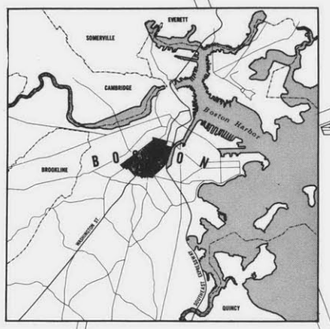
DRAWN BY	JK	REVISIONS	AUG 65
CHECKED BY	JK	CODE NO.	
SCALE		FILE NO.	
DATE	MAY 65	MAP	3 OF 12

0 200 400 600 800 1000 1200 FEET

N

South End Urban Renewal Area R-56

BOSTON REDEVELOPMENT AUTHORITY



RESIDENTIAL H
LOCAL BUSINESS L
GENERAL BUSINESS B
RESTRICTED MANUFACTURING M
GENERAL INDUSTRIAL I

0 200 400 600 800 1000 1200 FEET

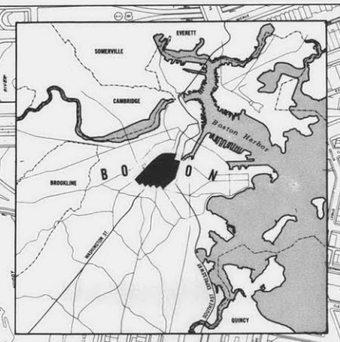
ZONE DISTRICT CHANGES

DRAWN BY	DWH	REVISIONS	AUG 65
CHECKED BY	JK	CODE NO.	
SCALE		FILE NO.	
DATE	MAY 1965	MAP 4 OF 12	

N

South End Urban Renewal Area R-56

BOSTON REDEVELOPMENT AUTHORITY



EXISTING CITY STREET TO REMAIN

EXISTING CITY STREET TO BE CLOSED

NEW RIGHT – OF – WAY

EASEMENT

NEW MEDIAN

NORTHERN BOUNDARY OF PROPOSED INNER BELT

0 200 400 600 800 1000 1200 FEET

PROPOSED RIGHTS – OF – WAY

DRAWN BY	JK	REVISIONS	AUG 65
CHECKED BY	JK	CODE NO.	
SCALE		FILE NO.	
DATE	MAY 65	MAP	5 OF 12

N

South End Urban Renewal Area R-56

BOSTON REDEVELOPMENT AUTHORITY

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Meyerson, Martin Terrett, Barbara Wheaton, William, Housing, People, and Cities, Mc Graw-Hill, New York, 1962.