

A Physical Form Exploration: Mixed-Use Conversion
of Several Downtown Commercial Buildings

by

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1964

submitted in partial fulfillment of the requirements
for the degree Master of Architecture,

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June, 1977

Signature of Author _____

Department of Architecture

Certified by _____

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Thesis Supervisor

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Wayne V. Anderson, Chairman, Departmental
Committee on Graduate Studies

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ABSTRACT

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submitted to the Department of Architecture on May 12, 1977
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The thesis is a design proposal to convert a group
of commercial buildings in downtown Boston to mixed
uses: retaining some commercial space, introducing
some conventional housing, some artists' housing and
work spaces. The focus is on developing a distribution
network, on designing the collective spaces, and on
the interface between the shared and private worlds.

Thesis Supervisor: Richard C. Tremaglio
Title: Adjunct Professor, Department of Architecture

To Don

whose selfish demands made me keep my thesis in
perspective.

ACKNOWLEDGEMENTS

I am grateful to Maurice Smith for having taught me much design.

I wish to thank

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for their special help with my thesis,

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INTRODUCTION

Boston has many older under-utilized but basically sound buildings which have outlived their original uses. Some near the waterfront were built in the late nineteenth century for heavy warehousing; others in the central business district were built as large office space. Today companies opt for industrial parks or the prestigious modern office tower. Whole districts or blocks of buildings are vacant or minimally used: parts of Bromfield St., Temple Place, the leather district, the old financial district. Yet the buildings are conveniently located, are substantially built, have wonderful facades. The interior spaces are generous. On the other hand, they are often deep and narrow, with only the narrow sides exposed, and embedded in districts with high buildings, conditions which result in inadequate natural light and ventilation. When I began my thesis, in the fall of '76, the Boston Redevelopment Authority was studying the feasibility of converting these under-utilized buildings into residential uses.

One of their case studies involved a group of buildings in the Fort Hill - Broad St. area built in the 1870's. They include:

- 109 - 127 Broad St. -- four buildings of small span brick bearing wall construction sharing a common granite facade,
- 141 - 149 Broad St. -- brick facade, steel post and beam construction
- 176 - 186 High -- well knitted brick facade, subtly paired

windows, arcaded effect,

172 - 174 High — patterned brick exterior with texture
of rough stone, brownstone, and terra cotta ornamentation.

The neighborhood was once part of an active downtown commercial and financial district. Now the buildings, no longer economically viable, are partially vacant, inviting increasing deterioration of the district. The area is in need of intervention, of having new uses programmed, and of having the buildings physically altered to make possible those new uses. For my thesis, I took the gross programmatic assumptions of the B.R.A. — that these buildings should be converted to mixed uses, consolidating those commercial uses which are now scattered throughout the buildings, introducing some housing, work spaces for artists, and possibly some retail shops. I did not probe the validity of these assumptions, nor did I concern myself with the development process. I was guided not by reverential respect and literal application of the Boston Building Code, but by a reasonable regard for public safety.

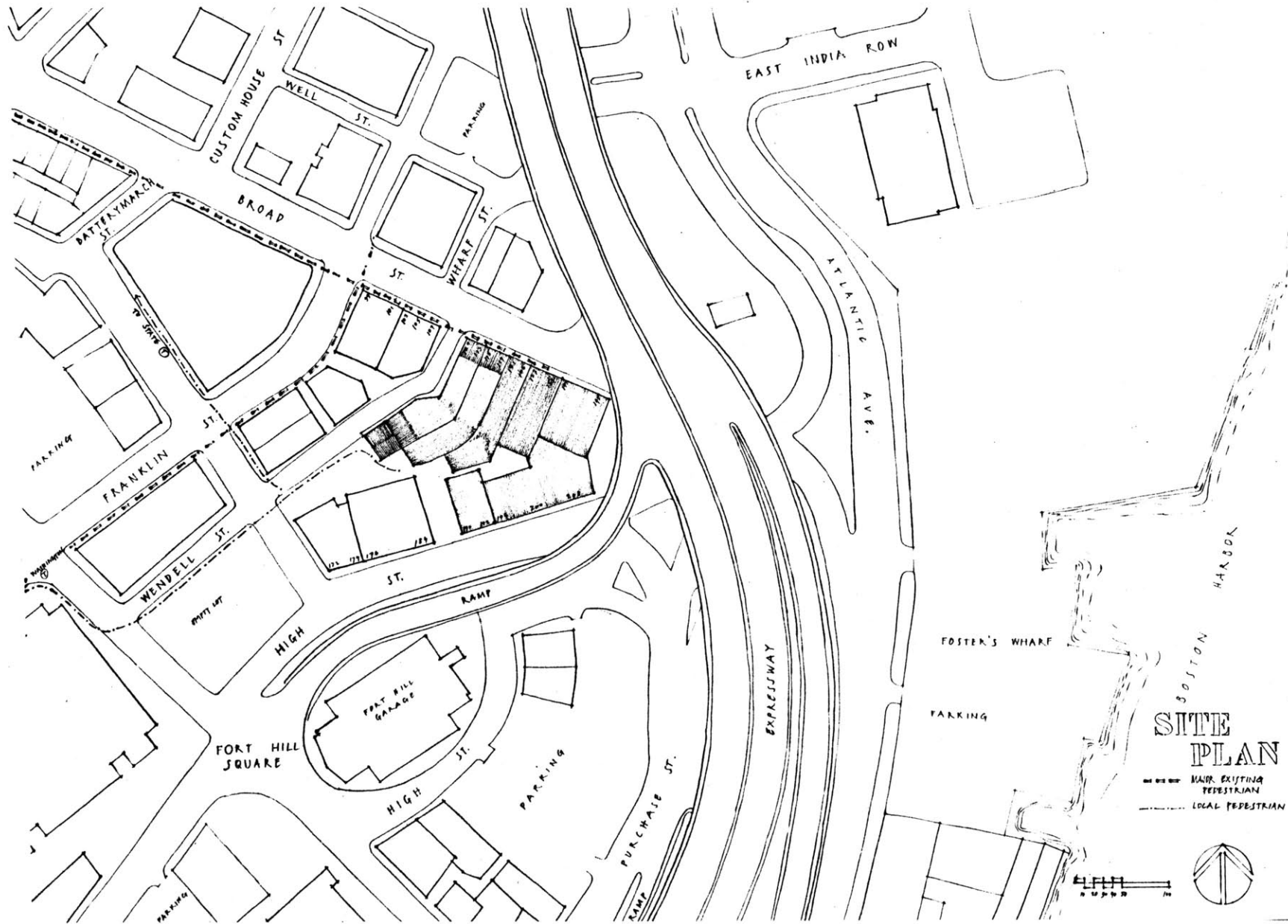
I focused on the form implications of these existing buildings, on the questions basic to so many of the older under-utilized buildings in Boston — whether an 'out-dated' form can retain its meaning in the face of radical social and physical changes in the structure of the city, and on how it can be changed to accommodate the new needs of the city while maintaining a continuity with the positive elements of its past. The form of these mercantile buildings, large undifferentiated interior spaces admitting little light,

modestly ornamented exteriors strongly defining the public street edge, were fitting for their original uses. The commercial interaction occurred near the street edge where there was some natural light and ease of access. Freight elevators and staircases too were located at the perimeter. The rest of each building was used for storage of merchandise. They are large loft spaces, with no defined horizontal distribution.

The formal elements which still make sense are the relationships of the building to the street and to each other, as buildings which are part of a greater fabric, and not isolated objects in the landscape. And so instead of trying to preserve a special architecturally significant building, I concerned myself with a coherent set of structures, respecting their differences, but interpreting them as elements of a continuous field. My approach was analogous to working with a ruin: inheriting a structural framework (walls, floors, posts), some circulation elements (elevators, stairs), adding to it, removing parts of it to arrive at a form more fitting with the new needs, a form which admits natural light and ventilation, and provides for safe egress.

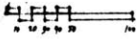
My primary concern was to develop a distribution network, to design the collective spaces, the interface between the shared and private worlds. To test the framework I made several unit plans; however I wish to stress that my concern was to develop not so much specific units as an overall organization and public framework, one which came to terms with the severe constraints inherent in an

already existing set of buildings, seen as a dense urban landscape. These constraints included tight dimensions, little light and ventilation, inadequate fire egress, limited and repetitive vertical circulation, and virtually no internal horizontal distribution. My concern too was to try to understand how a twentieth century vocabulary can comfortably live within a primarily nineteenth century world.



SITE PLAN

- MAJOR EXISTING PEDESTRIAN
- LOCAL PEDESTRIAN

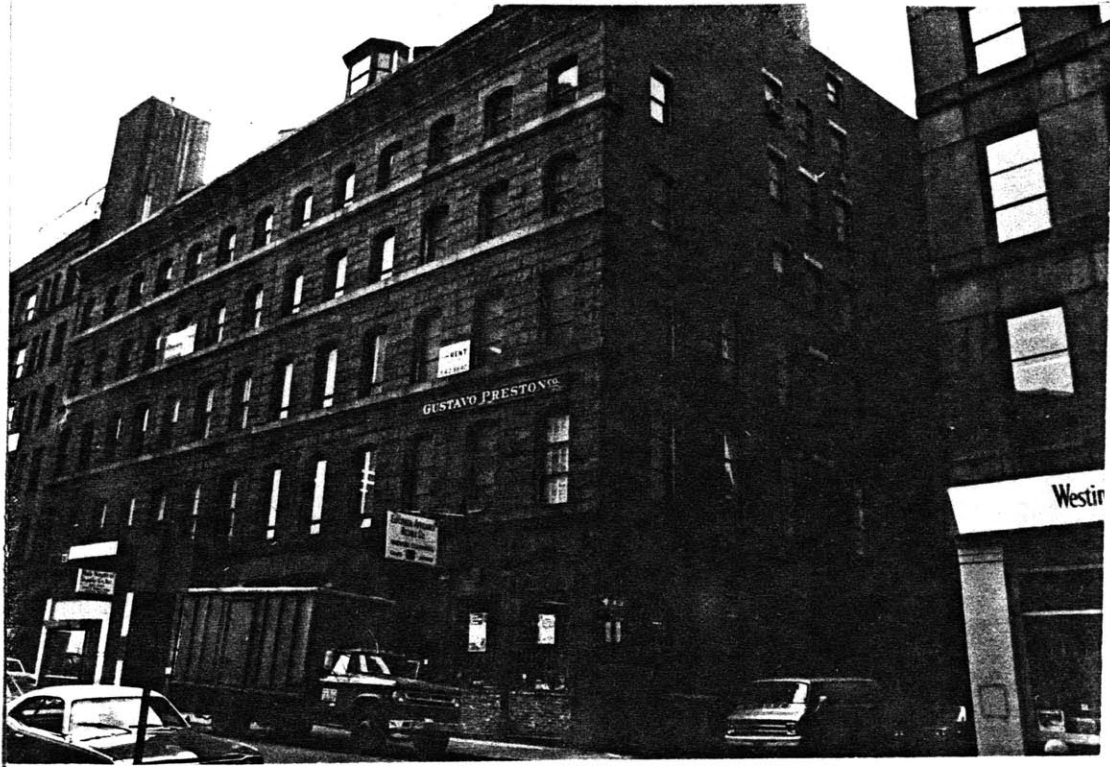


THE EXISTING BUILDINGS

Since there were no available plans or sections of the existing buildings, I had planned to do some measured drawings. However I was not able to enter the buildings to survey them, and so the plans, sections with which I worked are crude approximations, extrapolated from outside observations, occasional interior glimpses, and enlargements of the B.R.A.'s site maps.

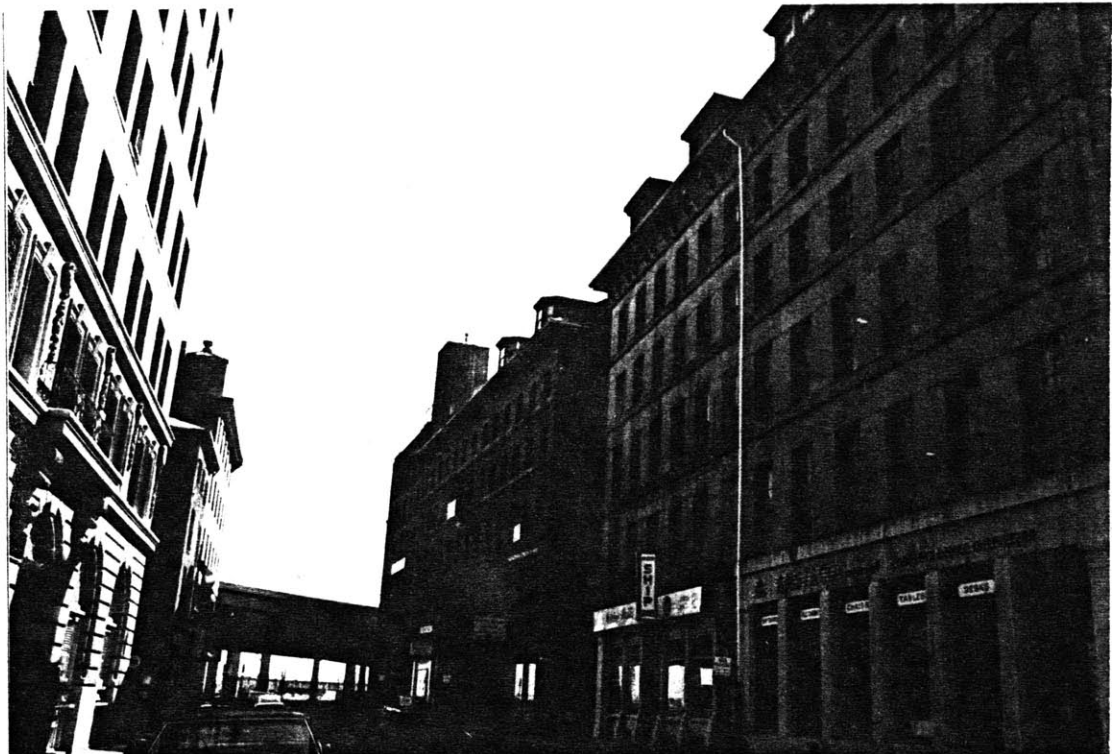
The Structure of the specific buildings with which I worked:

- 109 - 127 Broad St. — Brick bearing walls, wood floor construction (joists 12" deep, 3" wide, 12" o.c.)
- 141 - 149 Broad St. -- Post and beam construction with concrete & encased steel posts and beams, wood floor construction (joists 12" deep, 3" wide, 12" o.c.)
- 194 - 208 High St. floor construction (joists 12" deep, 3" wide, 12" o.c.)



BROAD ST.

WENDELL ST



VIEW DOWN BROAD ST. TOWARD EXPRESSWAY/HARBOR



BROAD ST. EDGE

WENDELL ST.

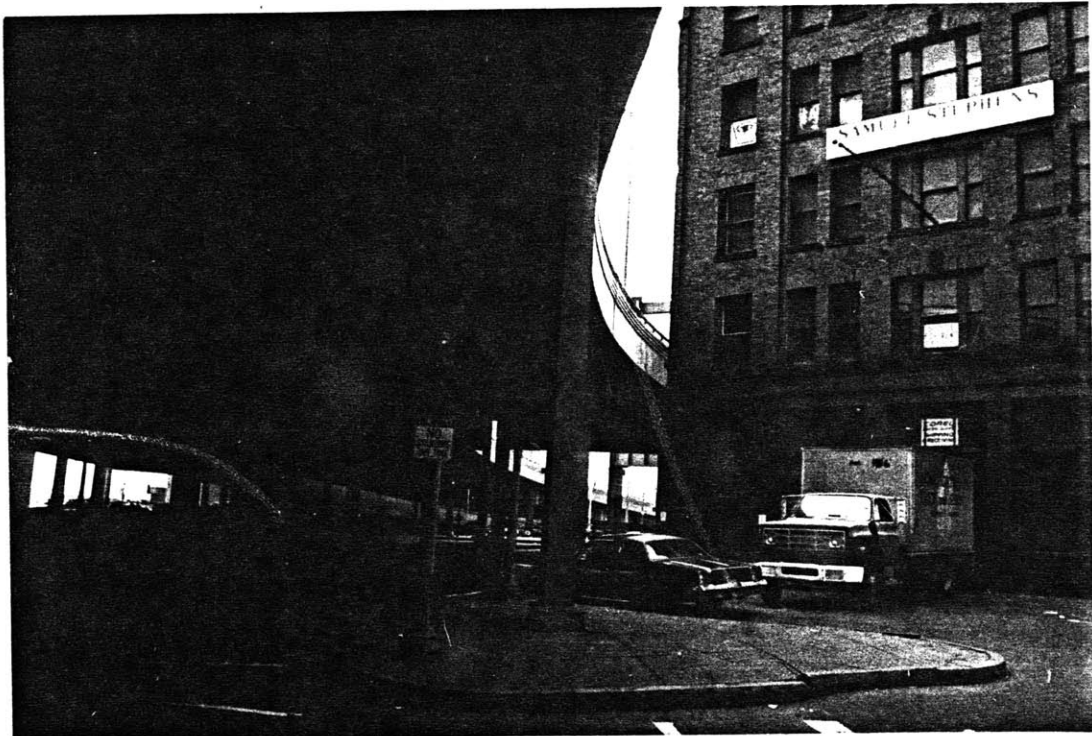


WENDELL ST.



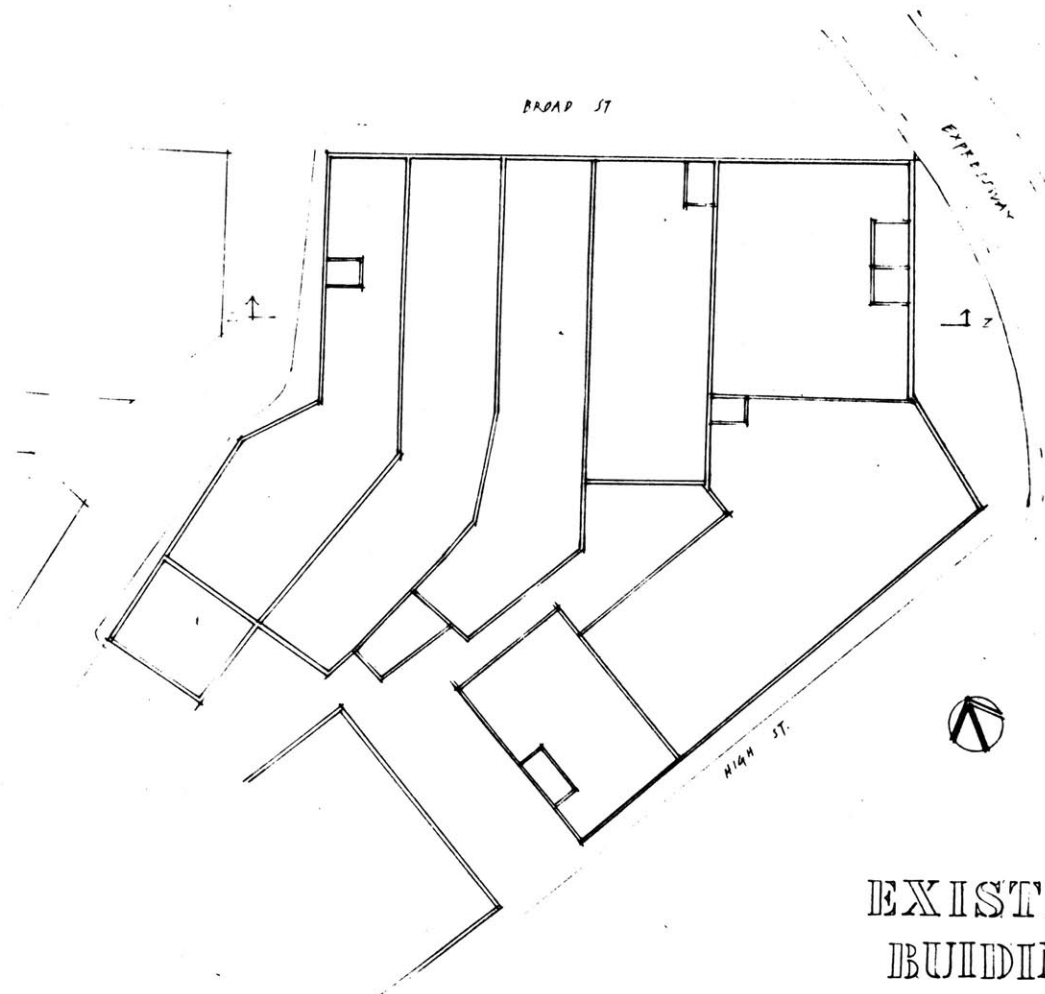
BATTERY MARCH ST.

HIGH ST.

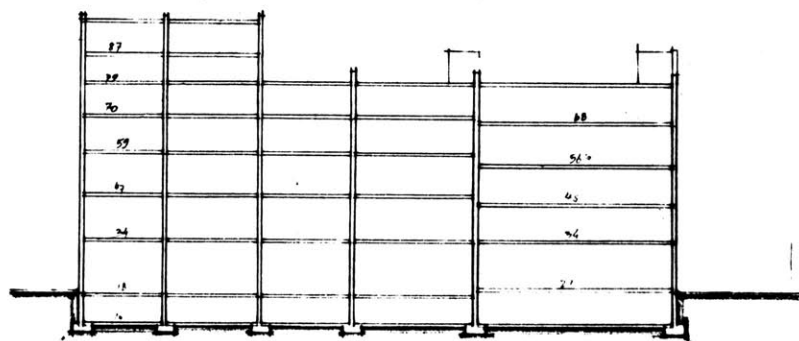


THE EXPRESSWAY

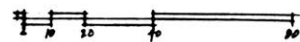
BROAD ST.

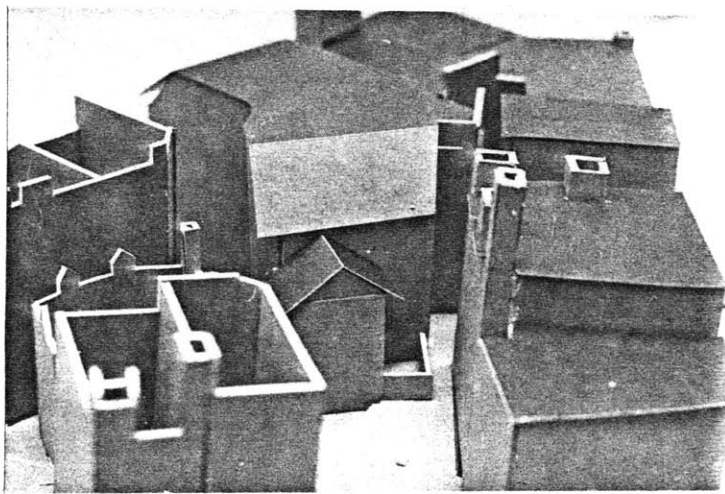


EXISTING
BUILDINGS



SECTION Z.



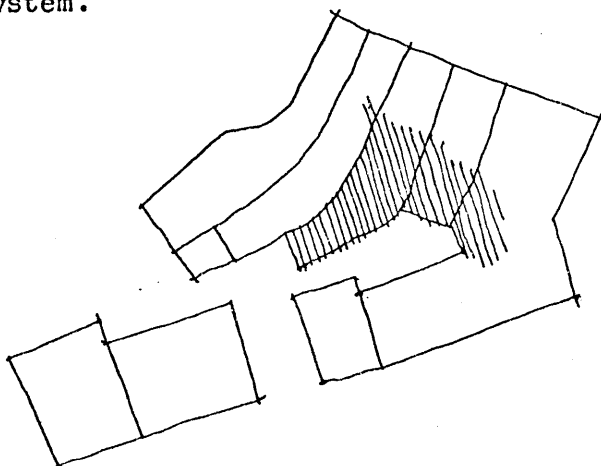


MODEL

EXISTING BUILDINGS

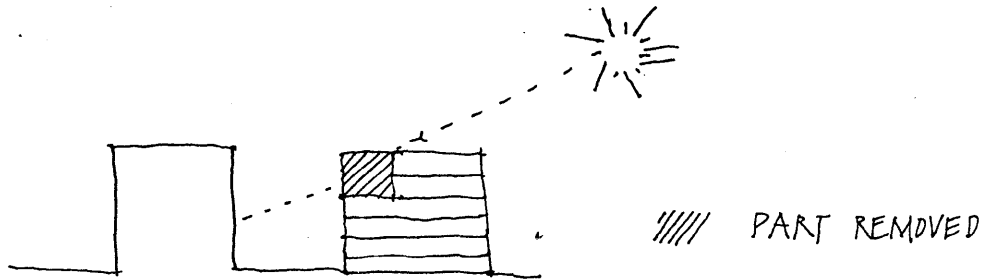
THE NEW AND THE OLD

An important early issue was what to keep, what to remove, what to add. Instead of nibbling away at the building, I decided to remove a large swath in the middle down to the basement and build back new ground and new building where needed. Such large strokes seemed justified for several reasons. First, they were appropriate in making large collective areas, to which intermediate zones would relate, where two zones might interlock, and where some of the large central area of the outside courtyard could get into the building. Second the partial removal of the existing heavy wood joist system allowed the construction of a really three-dimensional new ground, which provided direct entries from an outside distribution path on the second, third, and fourth levels. Third, the resulting depths of the existing buildings were immediately reduced to reasonable light admitting dimensions. A fourth possible advantage, an early attempt to provide some parking below the building, proved inefficient and impractical. The two elevator zones at the corners of the large swath were also radically altered to allow the generation of a clearly legible vertical distribution system.



||||| PART REMOVED

In addition, to permit more light to enter the courtyard and the south elevation of the buildings on the north side of the courtyard, I removed one row of bays on the fifth and sixth floors of the north face of the building on the south side (194 - 200 High St.).

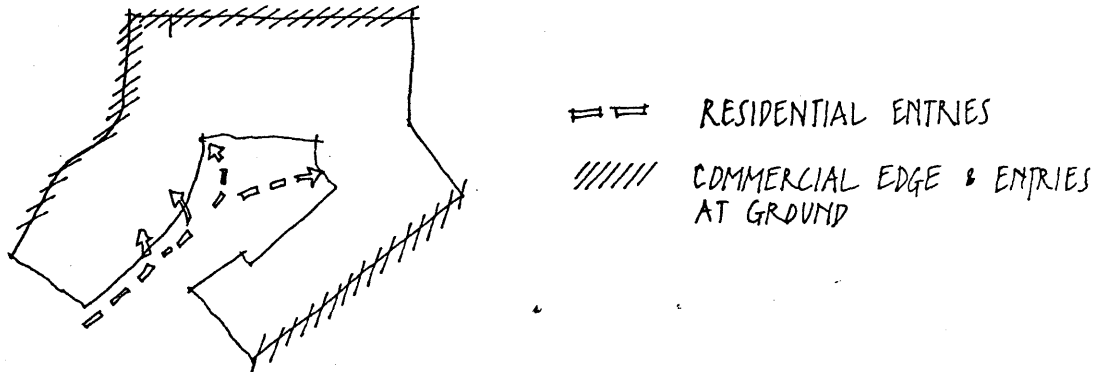


PHYSICAL GENERATORS

1. A major constraint influencing the design process was a decision not to alter the facades along Broad St. and High St., in accordance with the wishes of the B.R.A.
2. Another constraint I chose to impose was that each unit have two-sided exposure, providing natural light and ventilation, and obviating the need for heavy-duty artificial systems. This required reducing the depth of the buildings to a reasonable dimension (40 - 60' deep rather than the existing depths of up to 150').

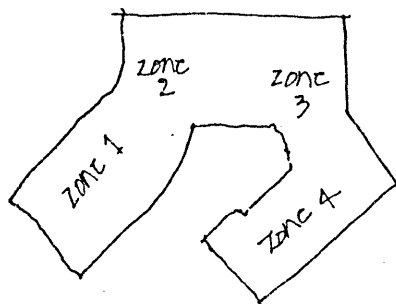
ORGANIZATIONAL GENERATORS

1. Separation of the commercial entrance(s) from that of housing, and giving the street frontage along Broad St., High St., and possibly Wendell St. to commercial uses.

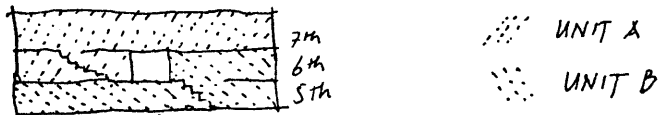


In section, the first floor would be commercial stores; the second floor would be primarily commercial (warehousing, office space) with some residential. The third to sixth floors would have conventional and artists' housing with semi-public areas off the distribution. Above the seventh floor, the use is residential with only minimal semi-private distribution.

In organizing the non-commercial parts of the building, four zones were established. The zones are not extruded in section and they often overlap, with shared collective space, or their individual collective space adding up to a larger collective territory. The entries to the housing zones would be from the internal courtyard. The path begins outside the building, climbs up as the building steps back. One may enter zones 1 and 2 from the internal courtyard at the second level, the rest at the third or fourth level.



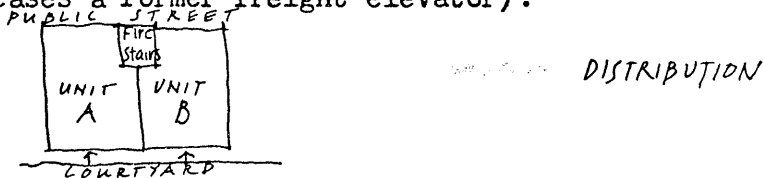
Housing zone 1 is organized as walkup units, for the second, third, and fourth floors. At the sixth floor a central corridor connects the units with the elevator within zone 2, and a skip-stop organization with duplex units is planned for the fifth through seventh floors.



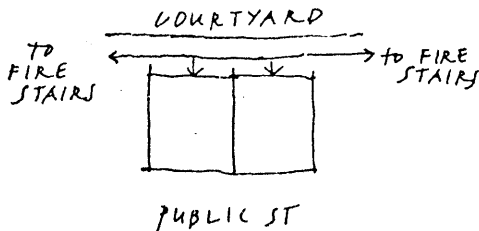
The units in zone 2 are organized nodally around the elevator core. The units in both zones 3 and 4 are linked by an inside/outside distribution path, which sometimes collapses to a node. In general the distribution is internal to each zone. However at the third and sixth levels there is continuous distribution among the four zones.

There are two basic diagrams governing private entries and fire exits for the housing units:

- A. The entries are off the central courtyard or a zone connected to the courtyard, and have a fire exit on the street side (in many cases a former freight elevator).

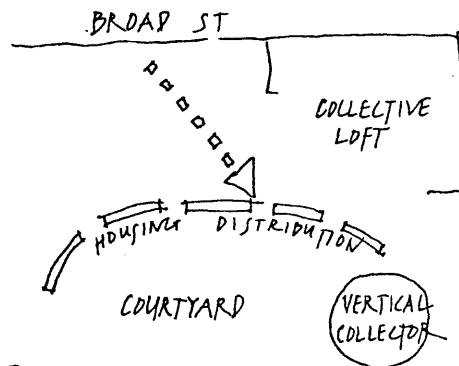
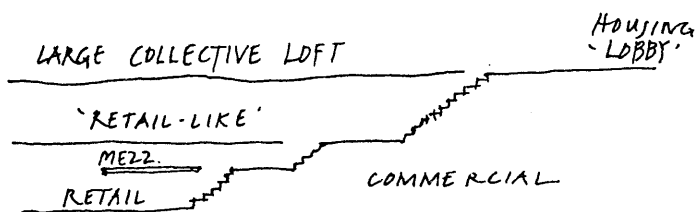


- B. The entries are off a courtyard or a public territory connected to the courtyard and have access to fire stairs in the opposite direction. In this case both the entries and fire stairs are associated with the interior courtyard.



In addition to the primary move to separate the residential from the commercial, I wished to provide some secondary but forceful penetration from Broad St. to the housing, to provide some potential overlap between the housing and the retail (a multi-level exhibition space perhaps). Thus the framework includes a directional distribution path from the Broad St. entry, up to a mezzanine level, then up to the second floor, where there may be more retail-like space, and up to the third where there is a large collective loft area and the collective entry to the housing. The movement of this public 'retail spine' crosses that of the housing distribution; it is at this overlap that a large public zone occurs.

see
Section 2-2
p. 43



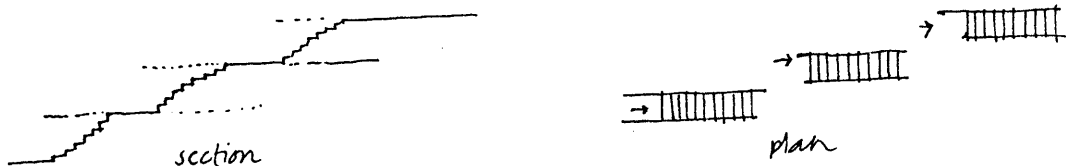
2. Pedestrian Distribution to the Roof.

The Southeast Expressway currently separates the block from the water's edge, the Boston Harbor. By establishing a public walkway to some collective space on the roof, some space with a view to the water, I hoped to restore the now lost association with the sea. This collective, semi-public, indoor-outdoor access to the roof doubles as a fire egress. To load the story it is also conceived as an artists' gallery, a linear exhibition area, sometimes bypassing artists' studios, always in close proximity to them, with some larger 'joints' where collective activity may occur (outdoor terraces,

lounges, etc.). Inherent in the distribution diagram is an intent to accommodate a scenario of visitors taking an elevator up to the roofscape, milling around on top, perhaps at a small indoor/outdoor coffee shop which may be set up on the roof (& 90 level) and walking down to see the exhibits, being able to purchase crafts, artwork in the retail shop(s) below.

3. Directional Stairs.

The walkway to the roof can be entered from the interior courtyard, or from the Broad St. public 'retail spine' or from within the building. It is part of a pattern of 'soft'¹ directional stairs which organize the public movement through the building. The stairs provide the residents and visitors with a strong sectional continuity, with the opportunity to move up, maintaining direct association with the major direction of the building, being informed of where one has been, and where one is going.



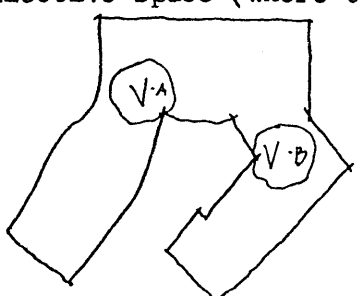
The directional stairs are associated with the courtyard; they move within it, or parallel to its edge. They and the horizontal distribution, are part of a changeable edge, an indoor/outdoor margin, an assemblage of screens (vertical partitions and 'greenhouse-like' roofs) that can respond to changes in season: in the winter it

¹ Bruce Barker in his thesis, An Exploration of Associative/Alternative Physical ..., used 'soft stairs' to describe the vertical distribution where the residents could move from level to level without the strong discontinuity of having to use the elevator or fire stairs.

is enclosed, although unheated; in moderate seasons it is open. Collective spaces such as outside terraces, laundries, etc. relate to the stairs. A larger outside/inside territory occurs where the stairs change direction.

4. Vertical Zones as Organizing Elements

Because of the form of the building, and the use of the courtyard for access, two separate elevator/vertical zones were established, at the inside of the 'L's. These zones include an elevator, enclosed fire stairs, mechanical stacks, 'soft' directional stairs, collective areas, and entries into the units. A view to the courtyard -- the largest collective space -- gives association with an outdoor collective space (where the directional stairs reverse direction).



These vertical zones are not identical. The one near Wendell St. is simply servicing the residents. The one near the Expressway services the residents, the artists, and the visitors. Because it would have access to an existing freight elevator at a loading dock, the artists' housing was located at the east (Expressway) end of the site. To clearly identify the collective path, to distinguish it from the private, strictly residential ones, a new heavy structural peice was introduced. A large vertical extruded element, one

SCC p 33

SCC pp. 34-37

25.

resembling a mushroom whose stem has been displaced¹, provides a continuous landmark, identifying the collective distribution as one moves up and down through the building. Formally it is a faceted circle of 32' diameter: the framework is always there, but the circular floors, walls, appear, disappear. The curved walls aid movement around the outside, and contain collective activity within (see axonometric, pp. 34-37). The element is reduced to a simple framework above the seventh floor where the collective activity terminates in the roofscape overlooking the water, and several floors of 'private world' are added above.

Since many thousand square feet of space were removed to make the internal courtyard, additional levels were added in an effort to maintain the total square footage. These levels accommodate a private, non-collective world where unlike the floors below, there is no shared distribution network. In adding new structure on top of the old roof, I tried to not just have it sit on top of the old, but to have it generated from the old or added structure. The framework of the 'mushroom' extends above the roofscape. It is used as structure for the private world of housing, disassociated with the collective territory below. The circular ground form does not extend beyond the original roofscape, as it is identified with the collective uses of the building.

¹Originally the image was of a giant mushroom, an extension of the large mushroom columns proposed for the basement garage; the centered stem was inhabited by fire stairs.

MATERIALS

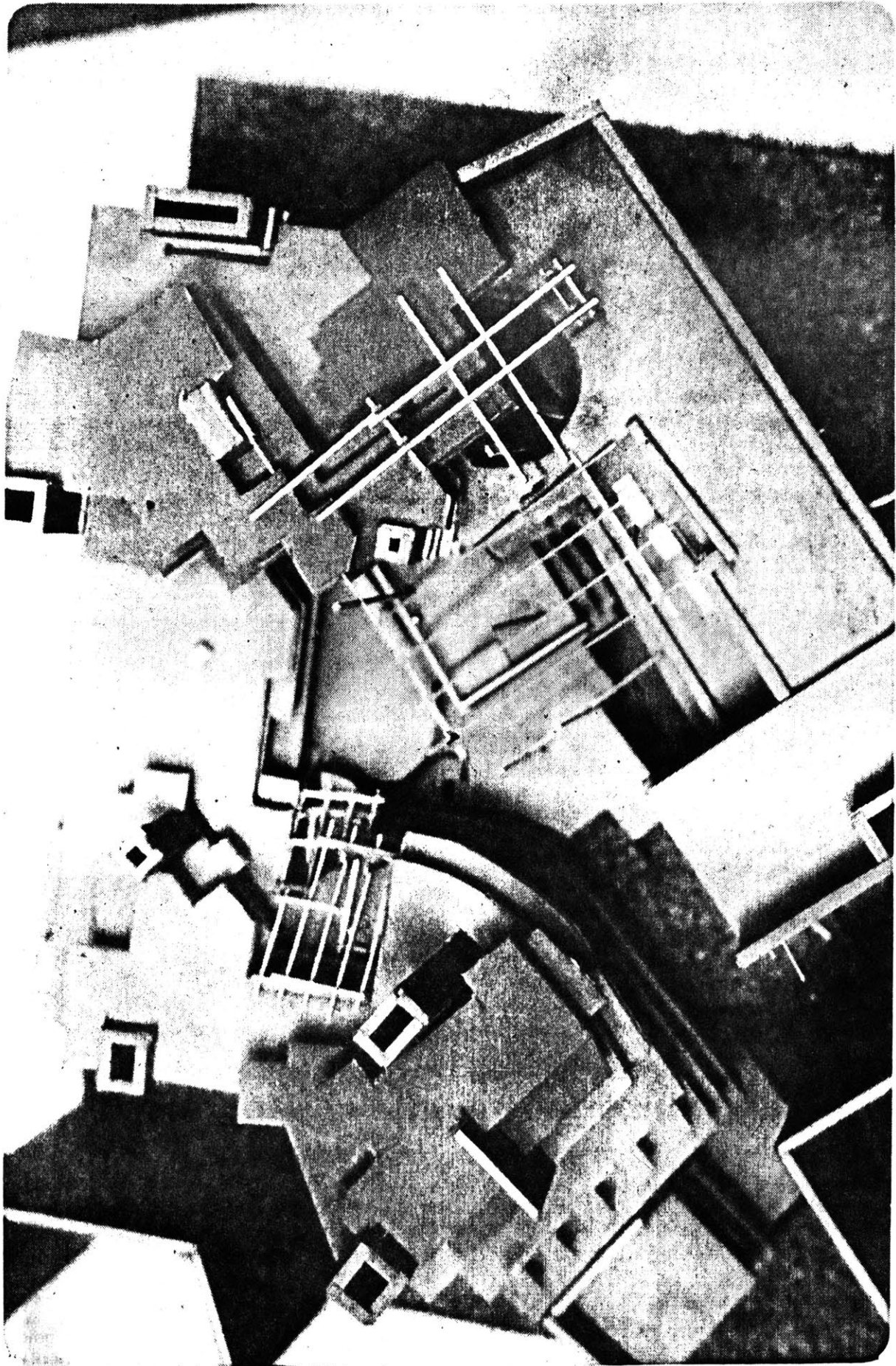
For ground and warehousing, mushroom columns were introduced. The grid is at 45° to the direction of Broad St. in an effort to relate the geometry of Broad St. with that of the rest of the site. The bay is 20' x 20'.

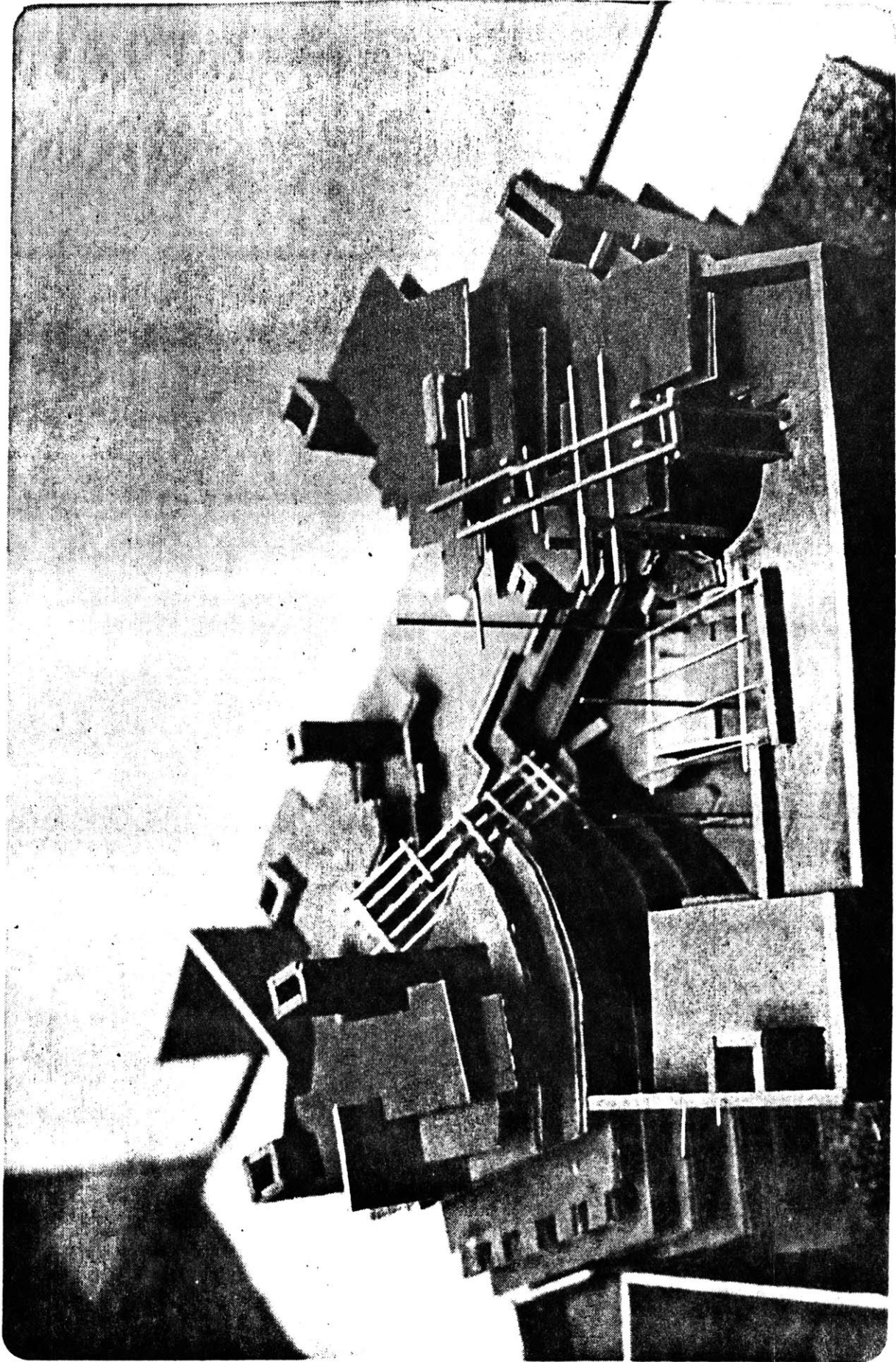
When the new structure accomodates housing and gets high, a poured-in-place concrete post and beam system is used on a 20' x 10' bay replacing the non-directional mushroom columns.

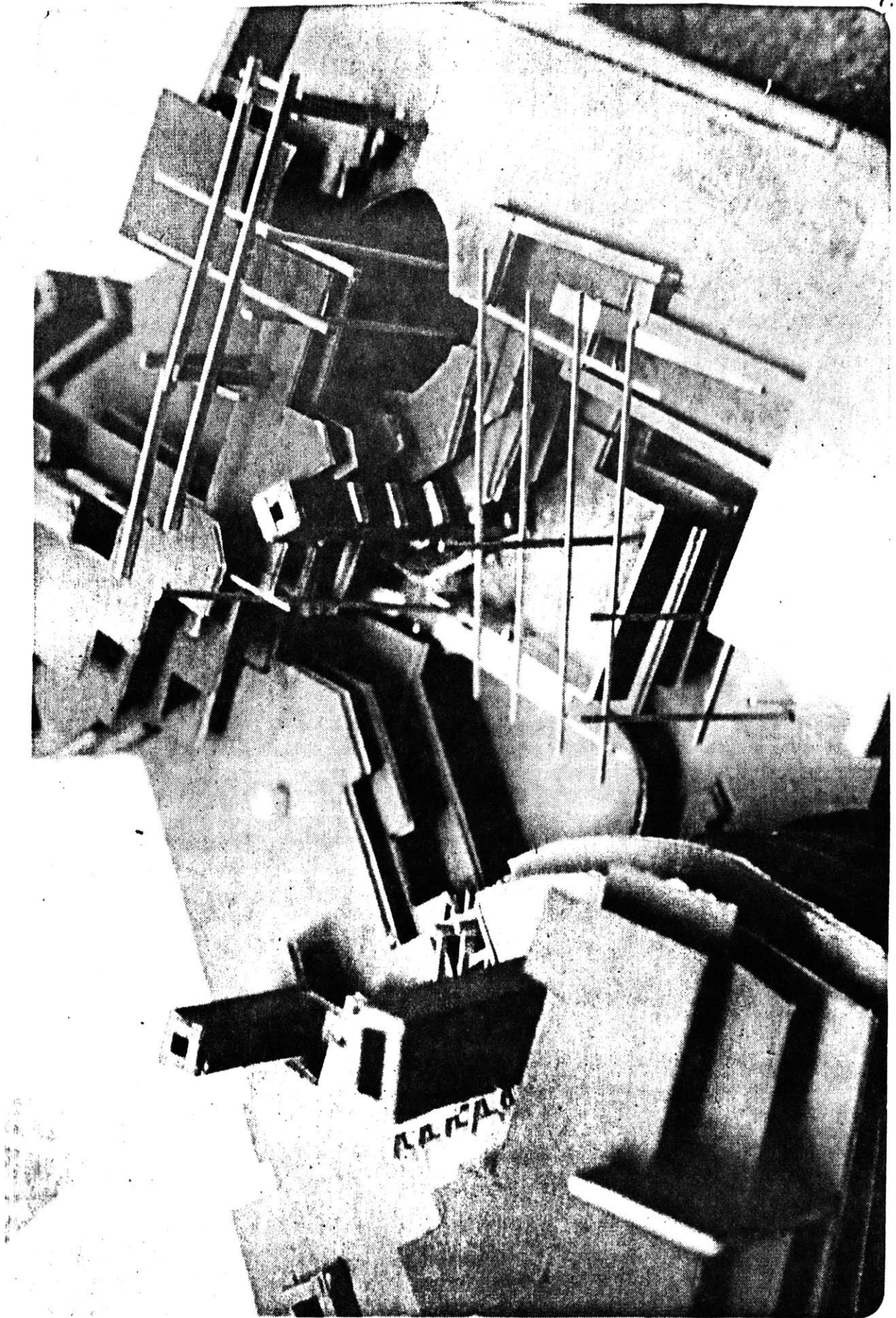
Frequently some indoor/outdoor collective spaces are partially covered by glass roofing. For this purpose steel framework is used: open web steel joists, steel I-beams and channels.

Brick and poured-in-place concrete were used for heavy continuous surface elements.

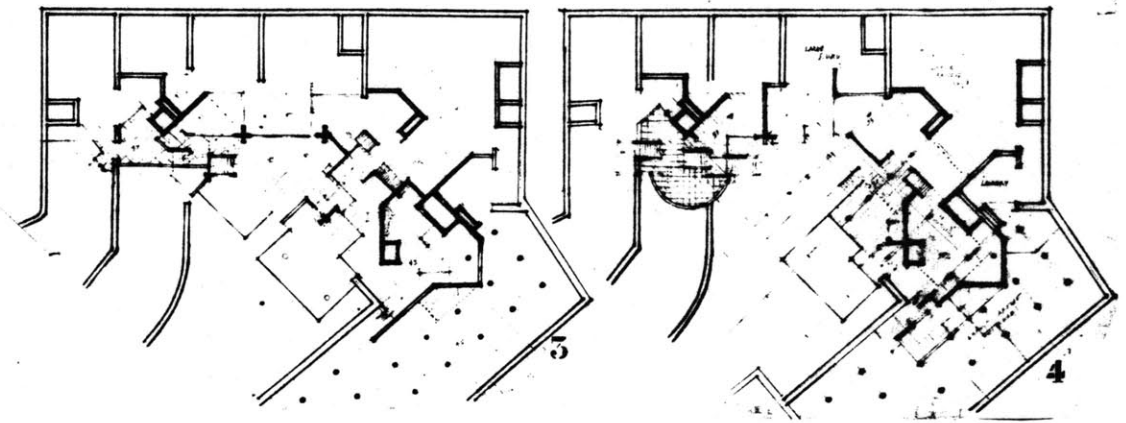
To reflect the light falling on the south elevation back into the couryard glass block was used on a steel frame. Glass block was used on parts of other elevations where both privacy and natural light were desireable.



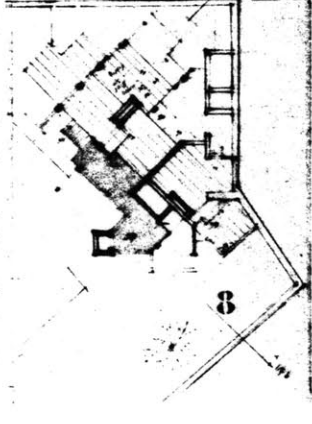
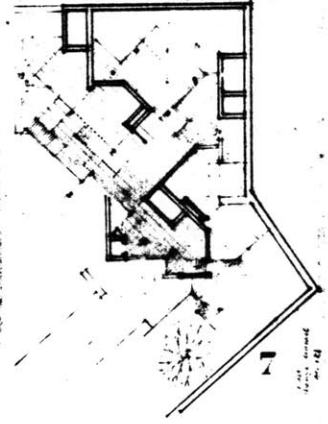
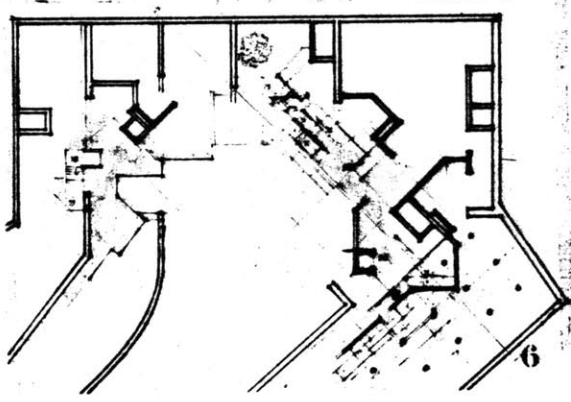
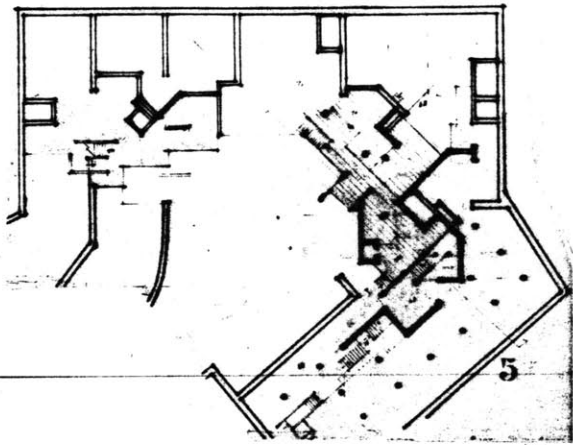
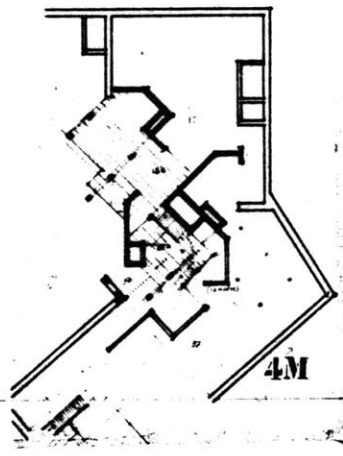




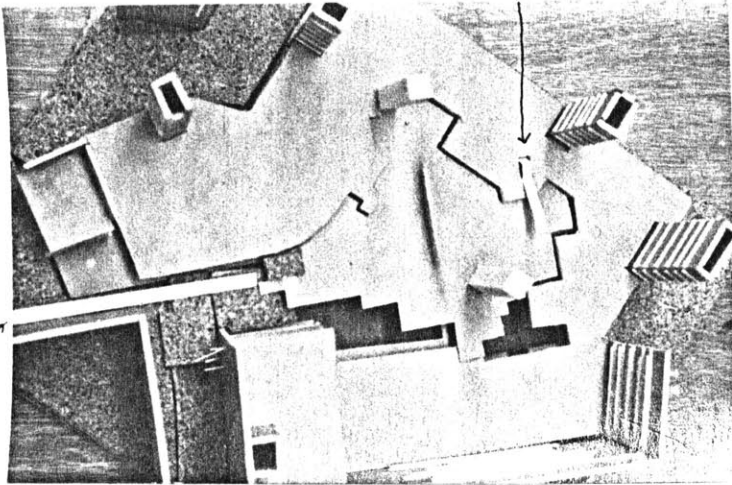
30.



PROCESS:
AN EARLY
DIAGRAM



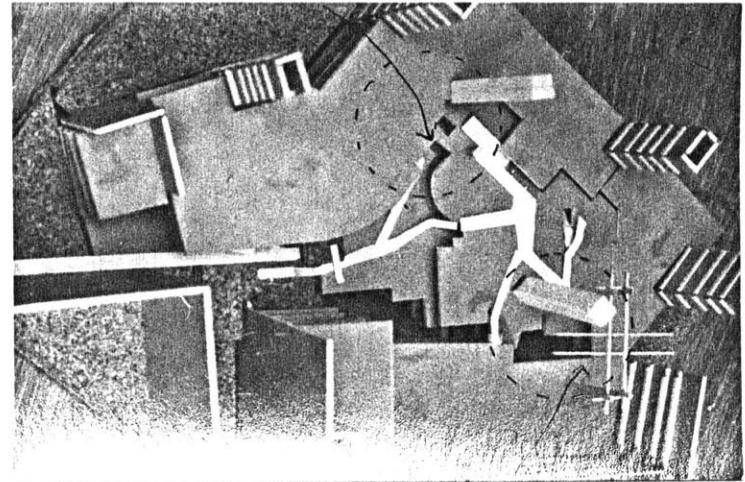
PATH FROM BROAD ST.



PATH FROM COURTYARD

§ 2

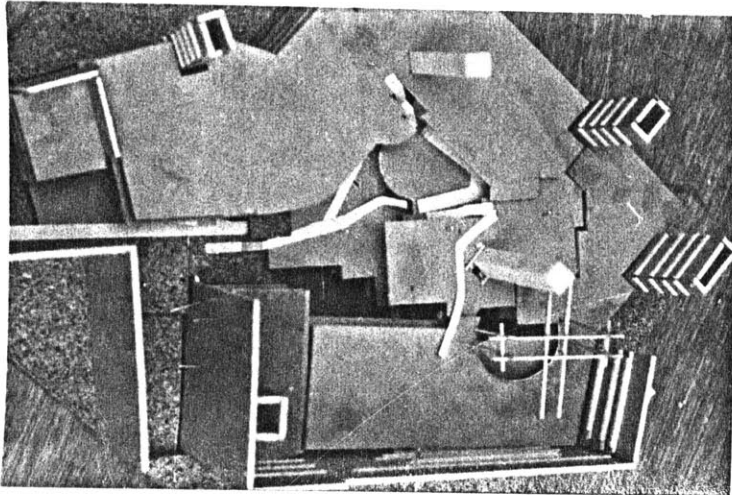
COLLECTIVE ZONE A



'VERTICAL COLLECTOR'
'COLLECTIVE ZONE B'

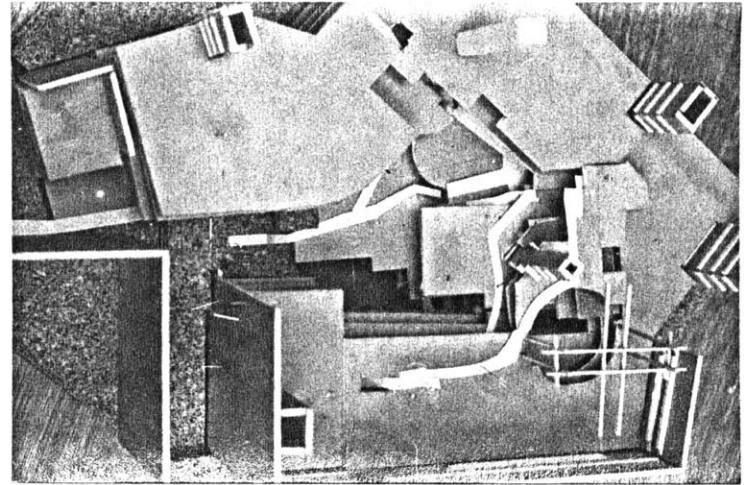
§ 2 D

DISTRIBUTION

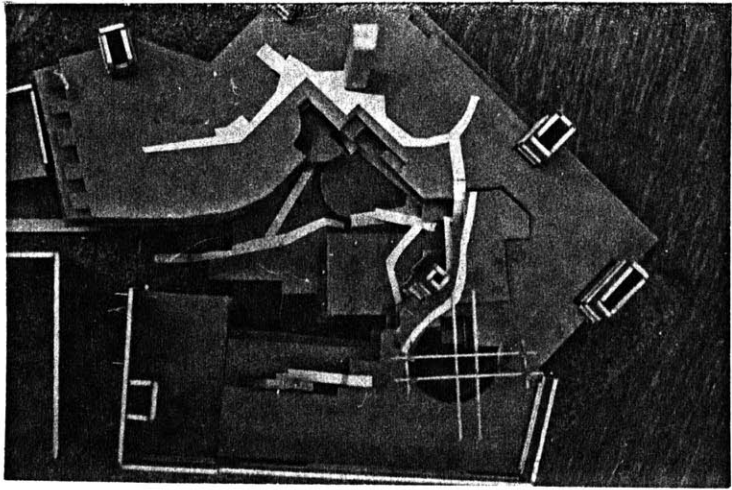


§ 4

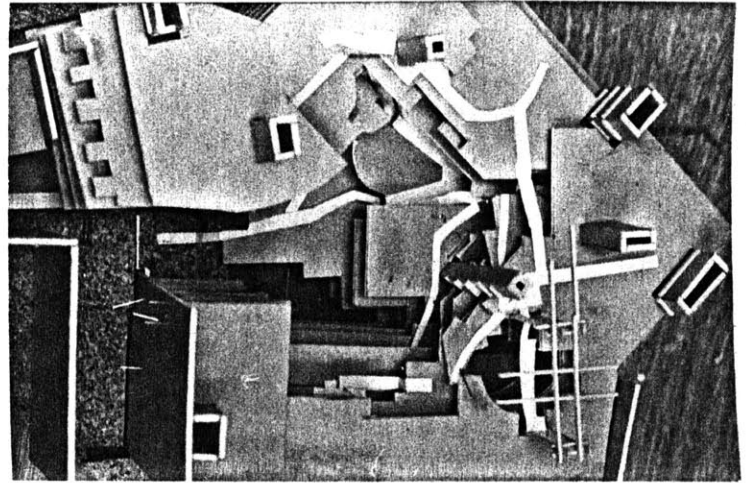
DIAGRAMS



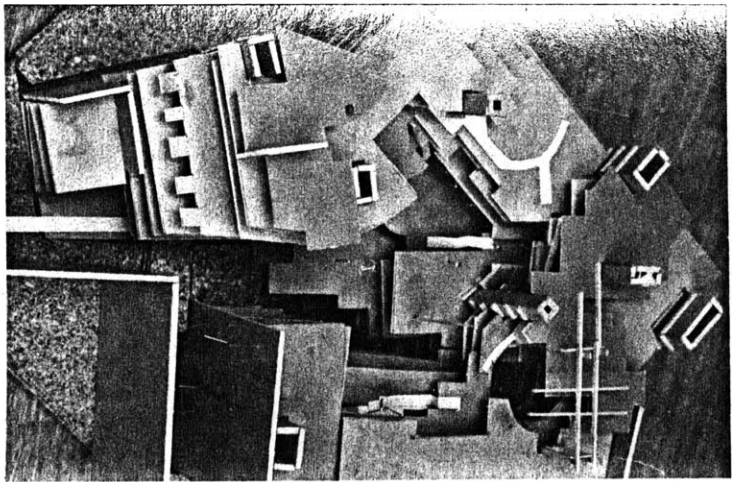
§ 2 D



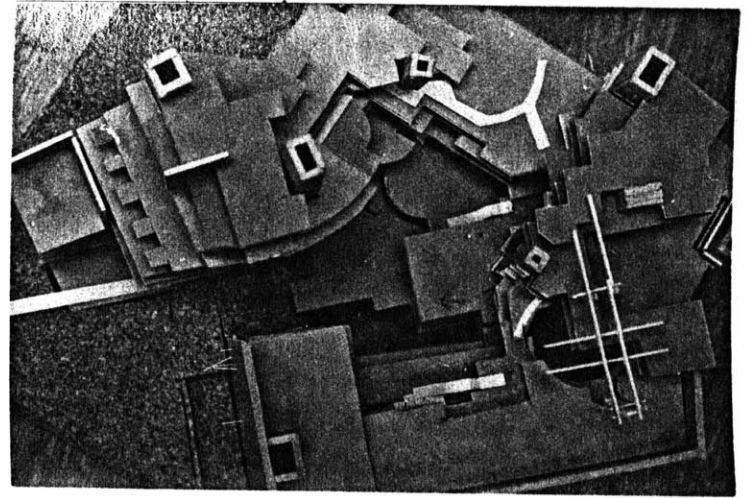
6



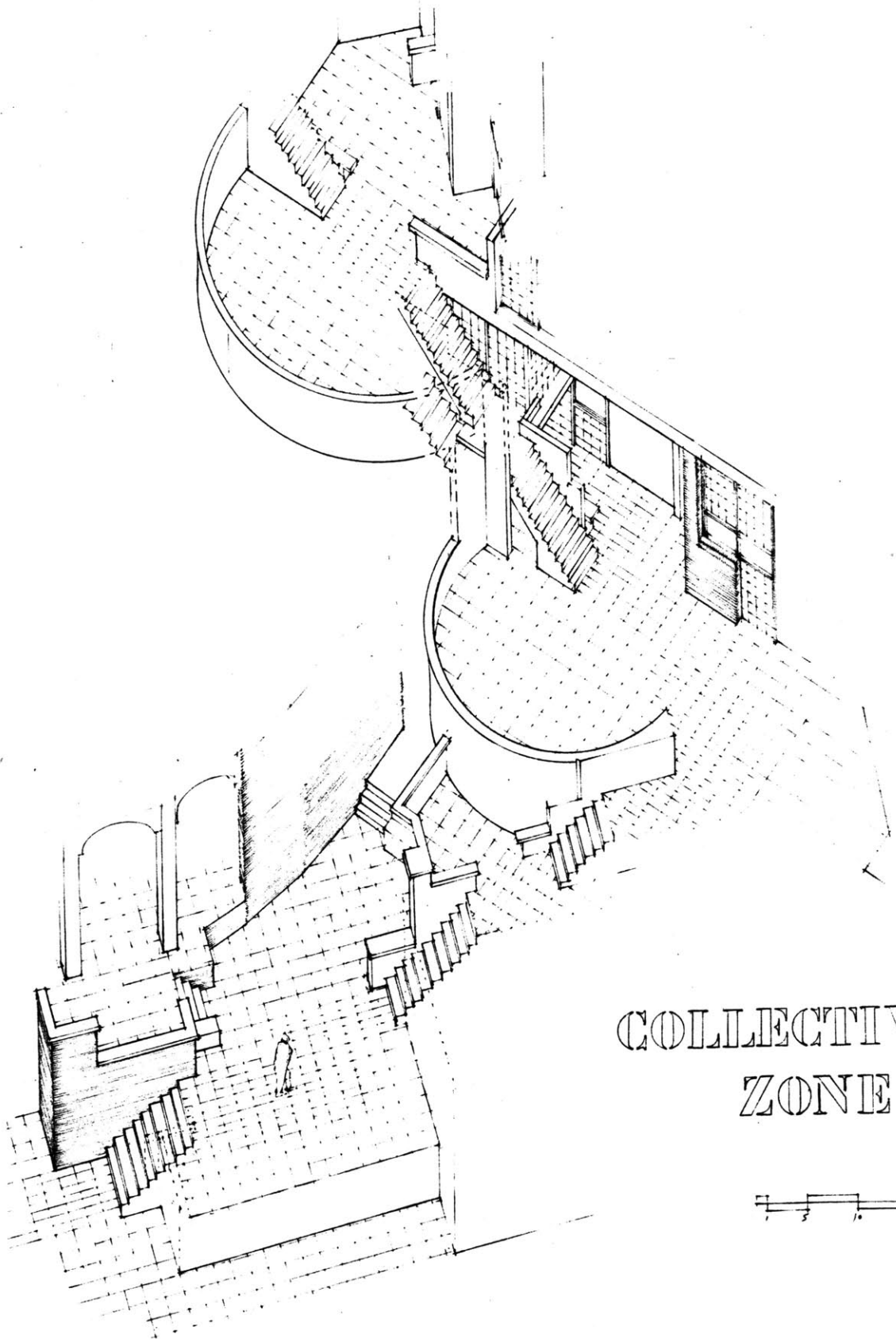
7



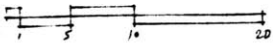
8

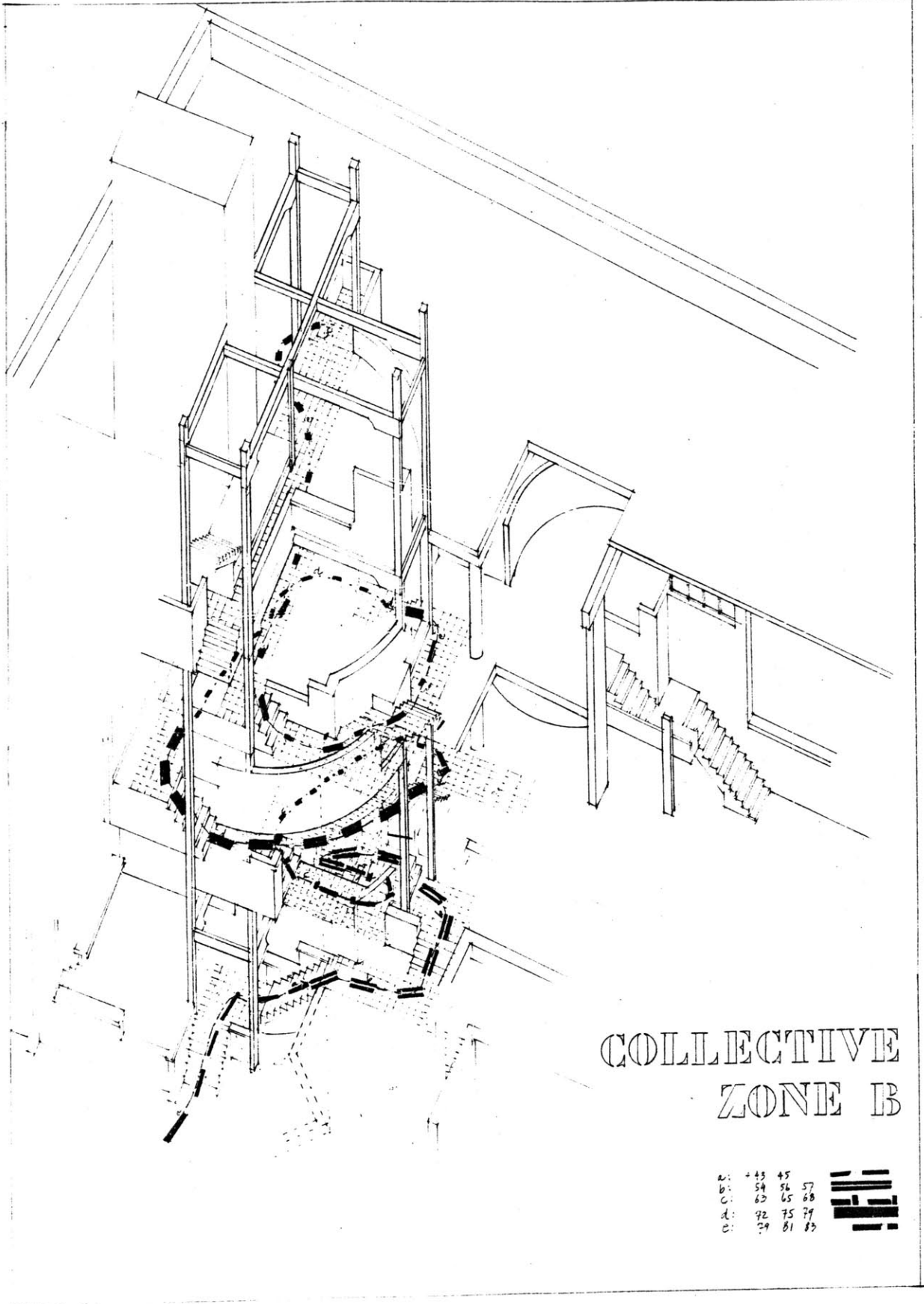


32.




COLLECTIVE
ZONE A



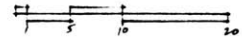


COLLECTIVE
ZONE B

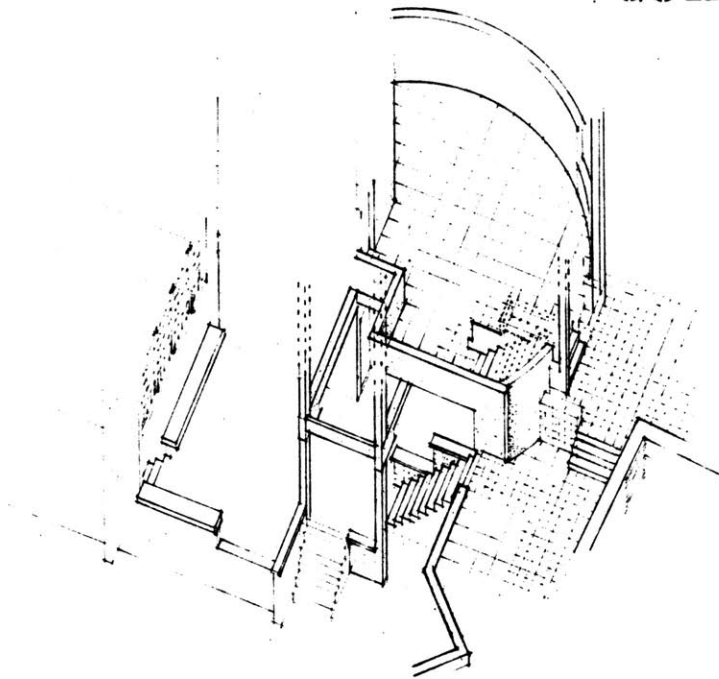
a:	43	45	
b:	54	56	57
c:	62	65	68
d:	72	75	79
e:	79	81	83



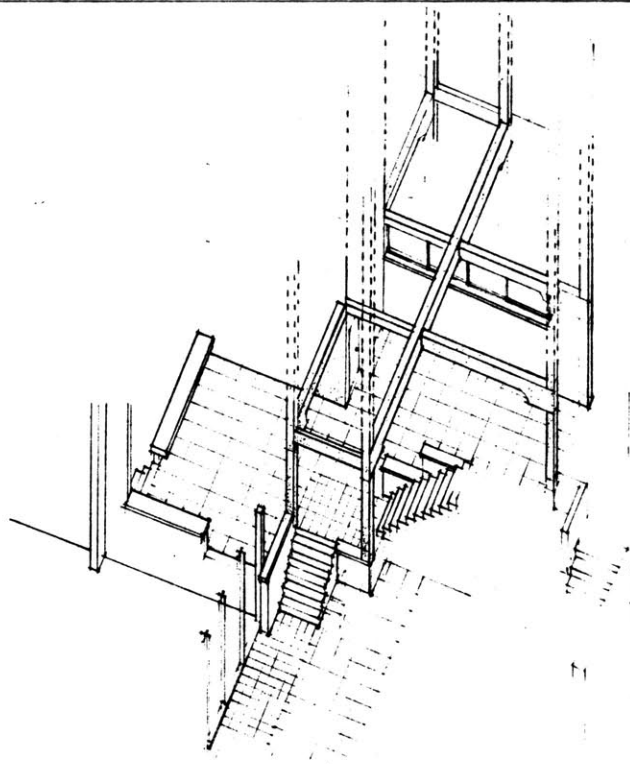
COLLECTIVE ZONE B



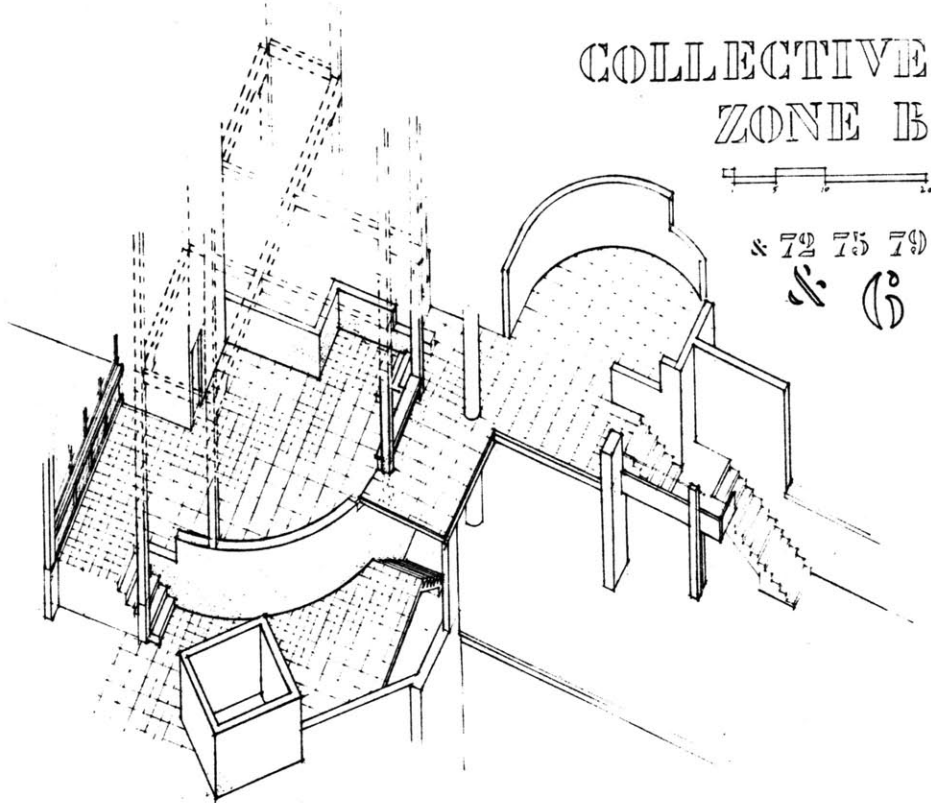
& 54 56 57



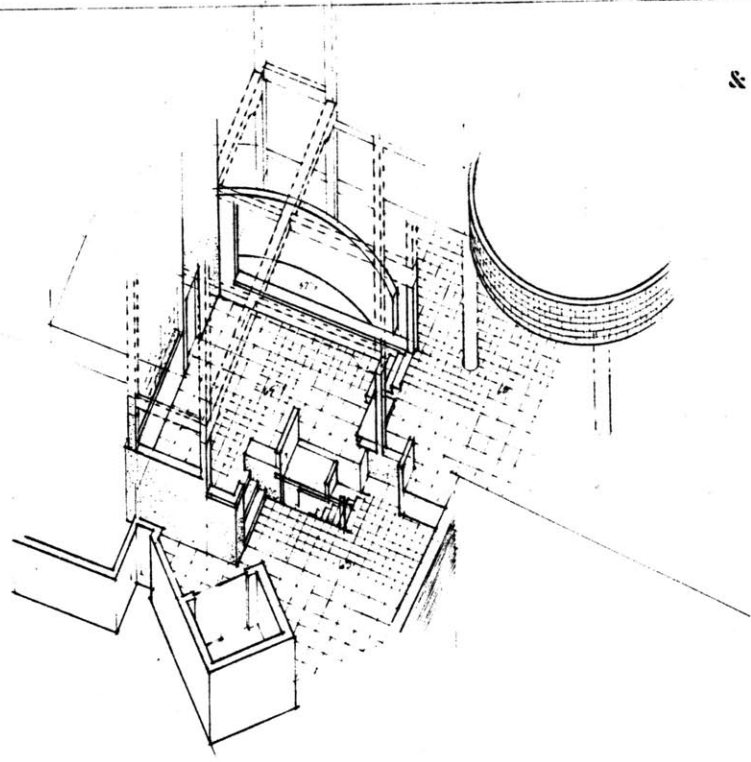
& 43 45



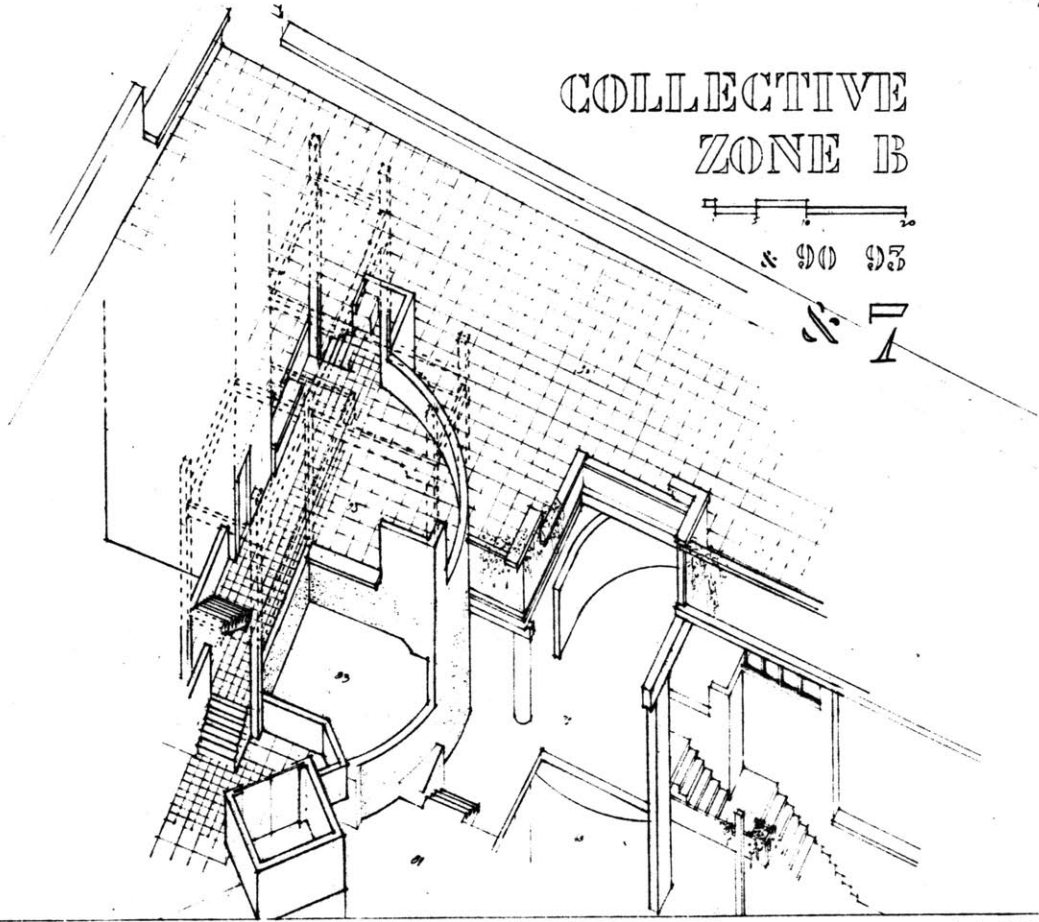
COLLECTIVE ZONE B



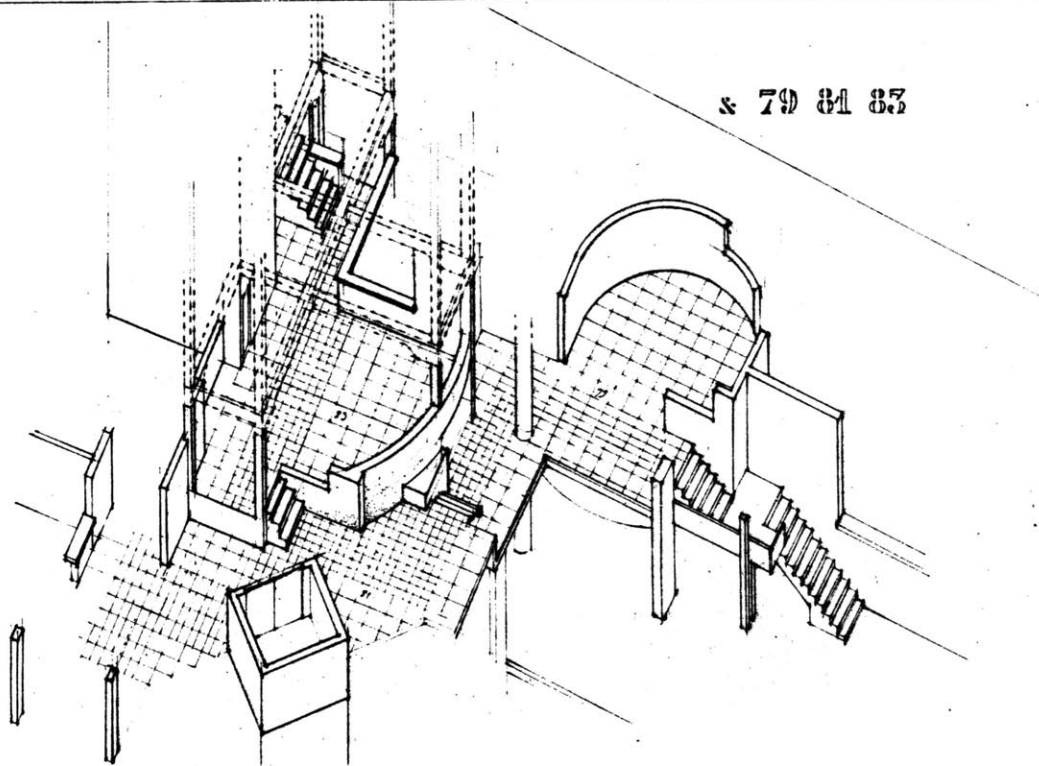
& 67 65 68
& 75

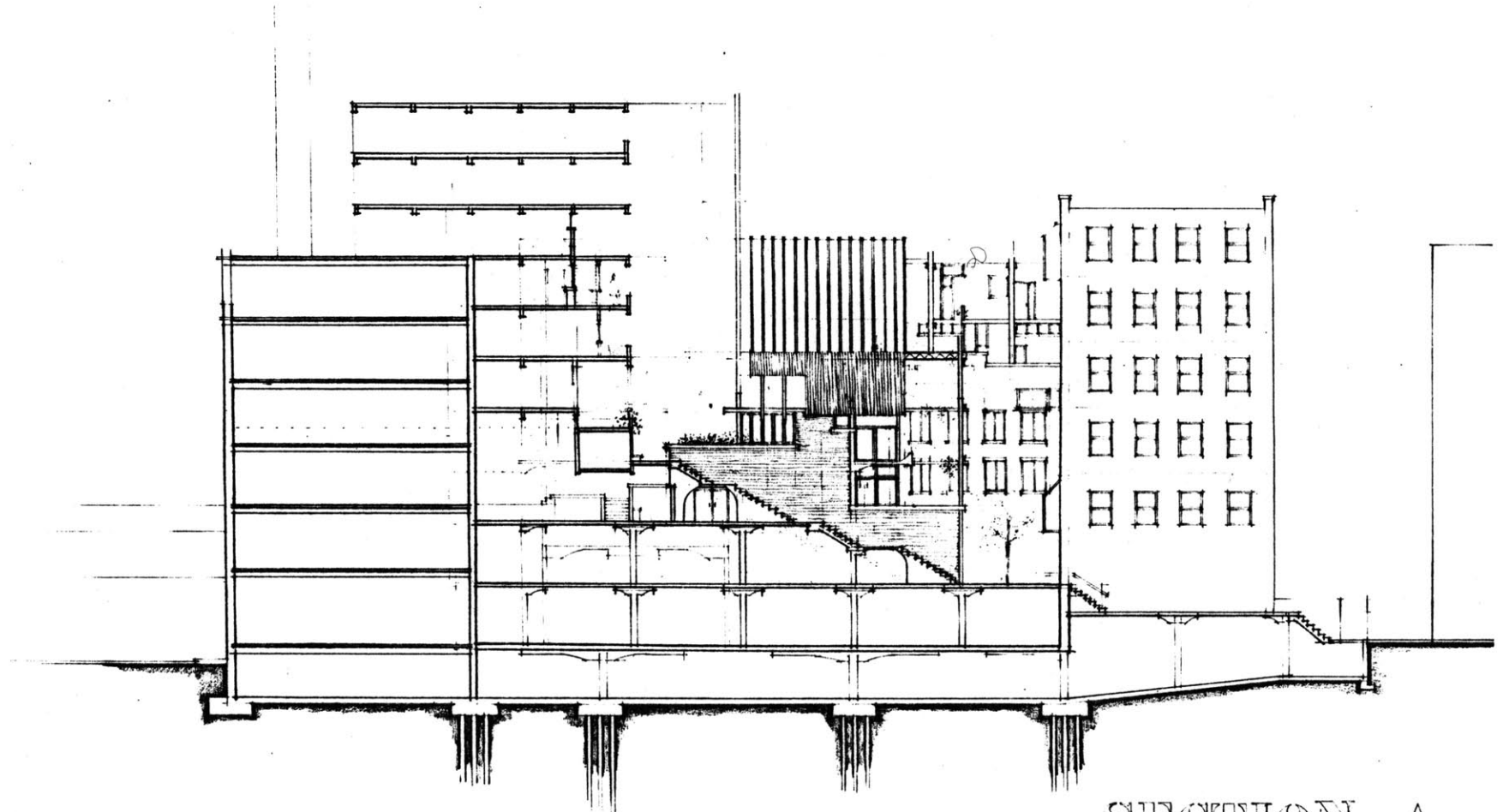


COLLECTIVE
ZONE B

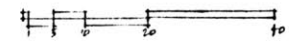


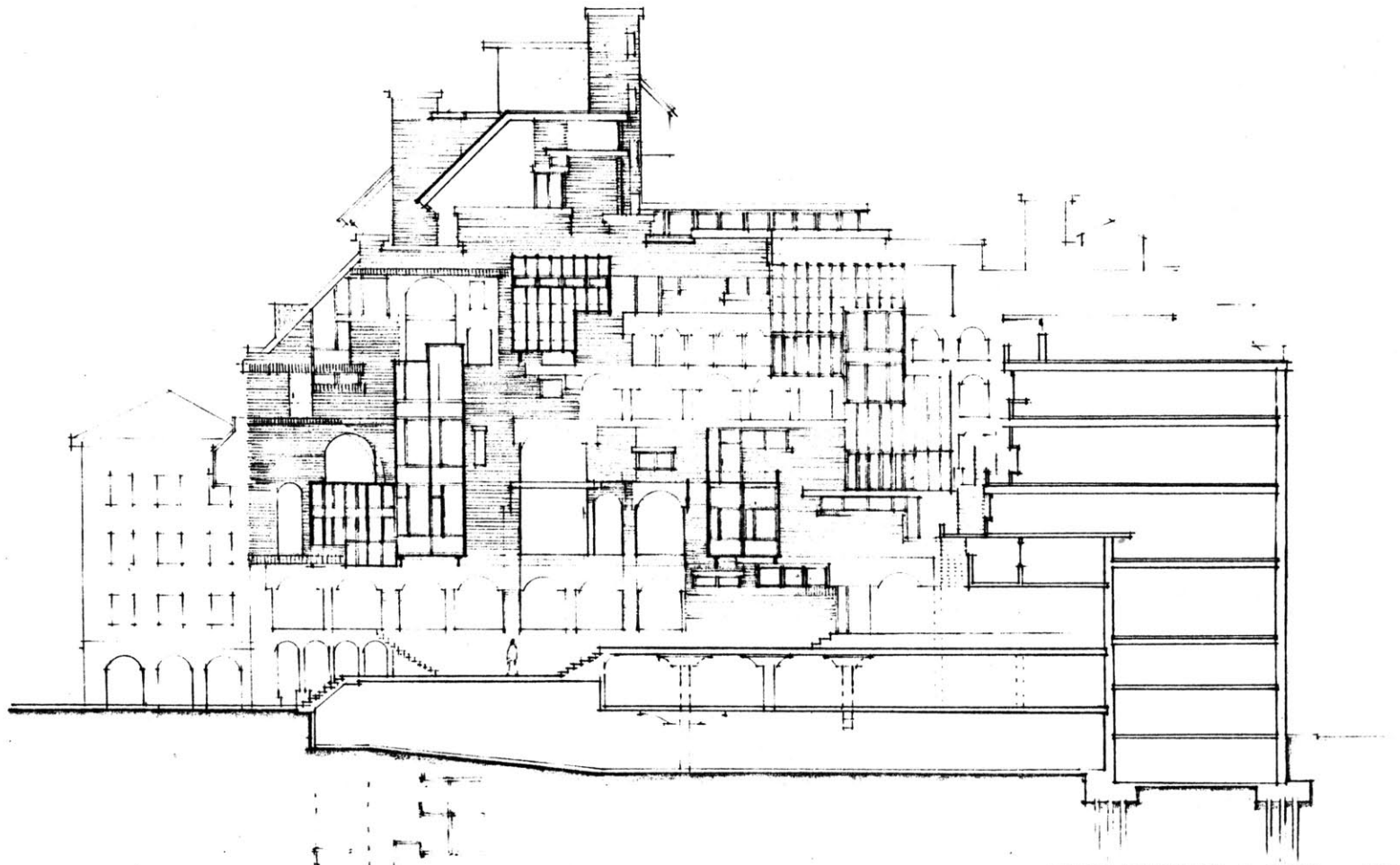
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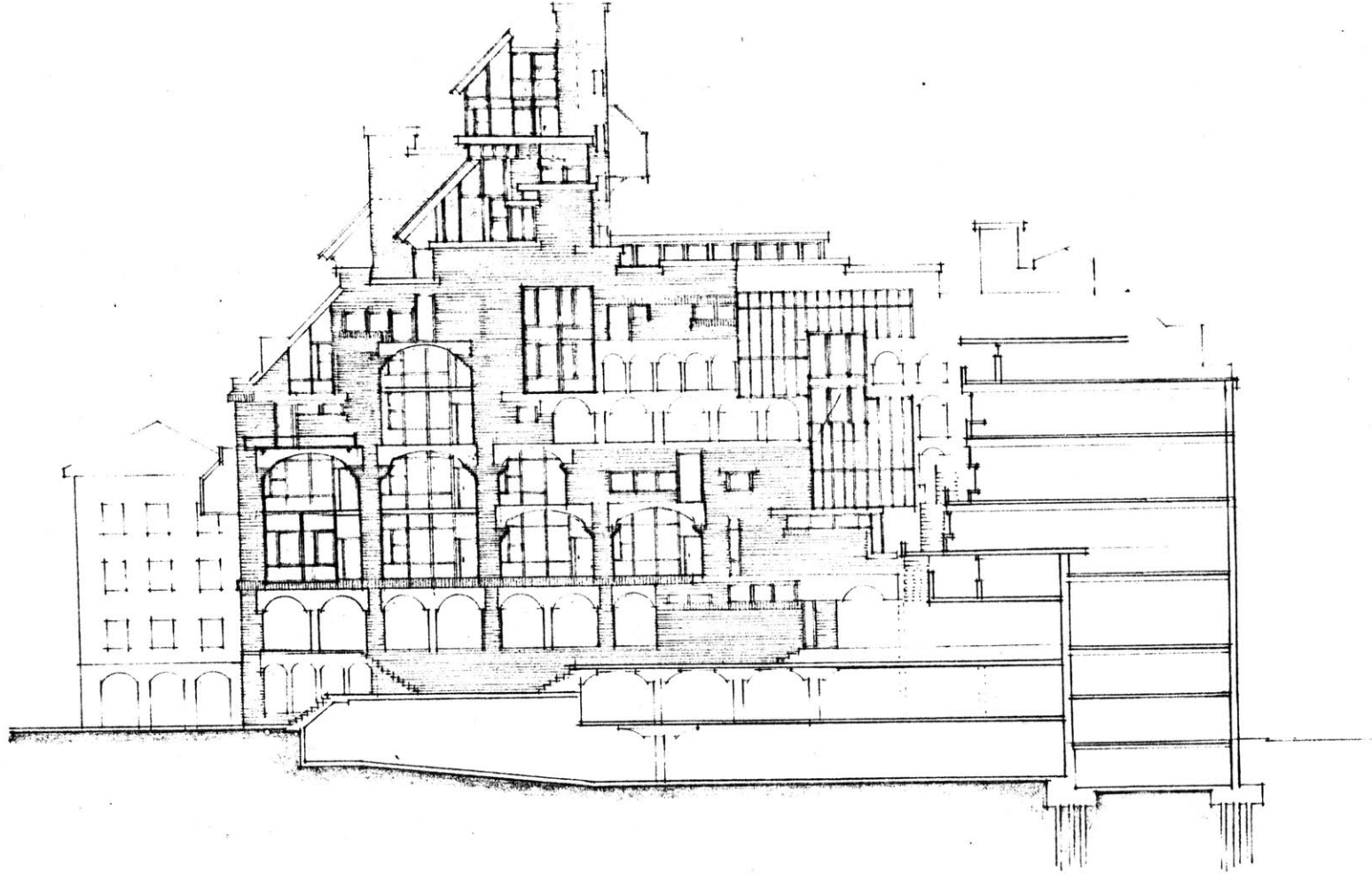
SECTION A



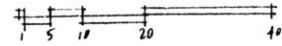


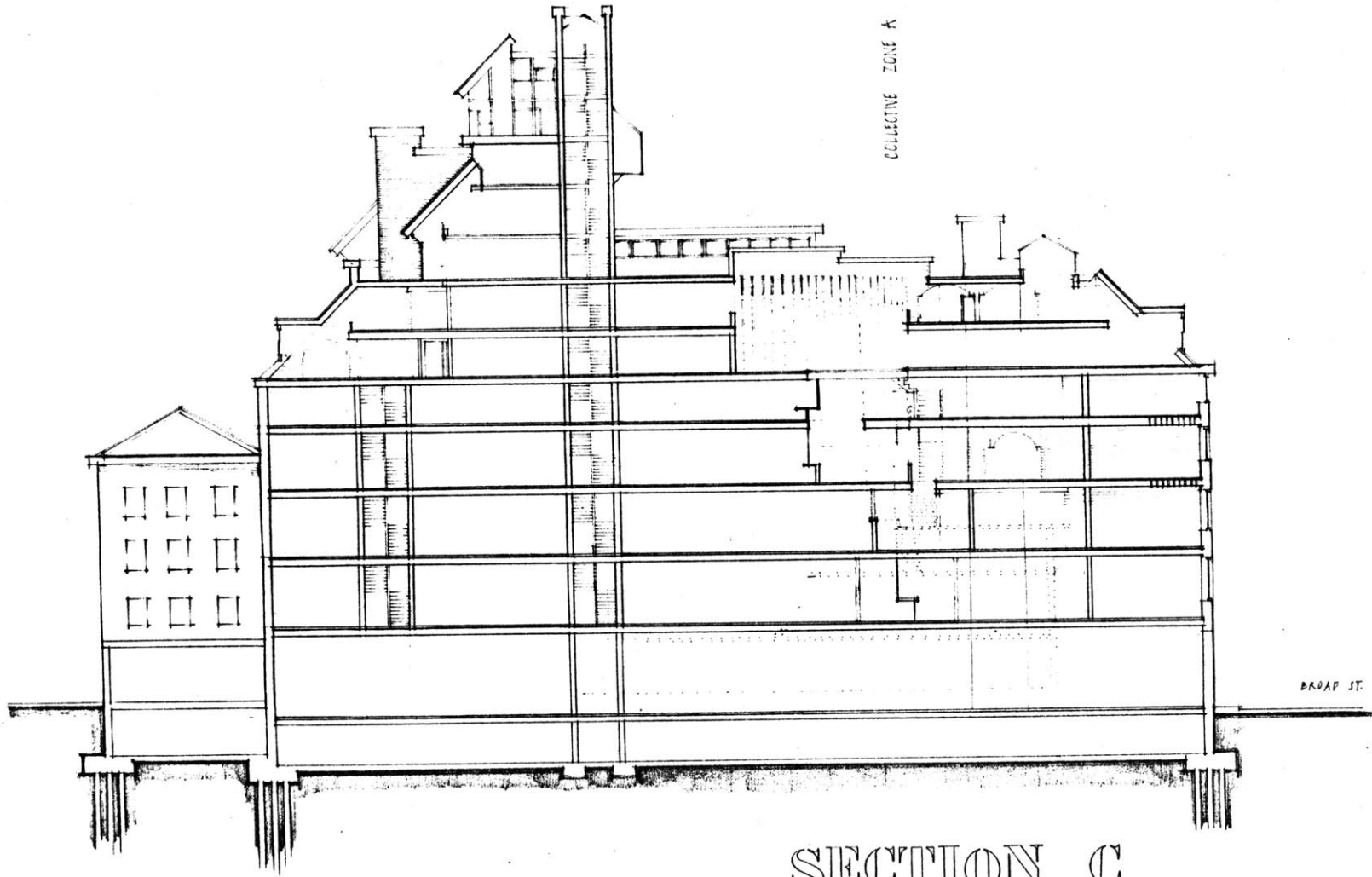
SECTION B



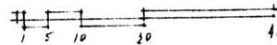


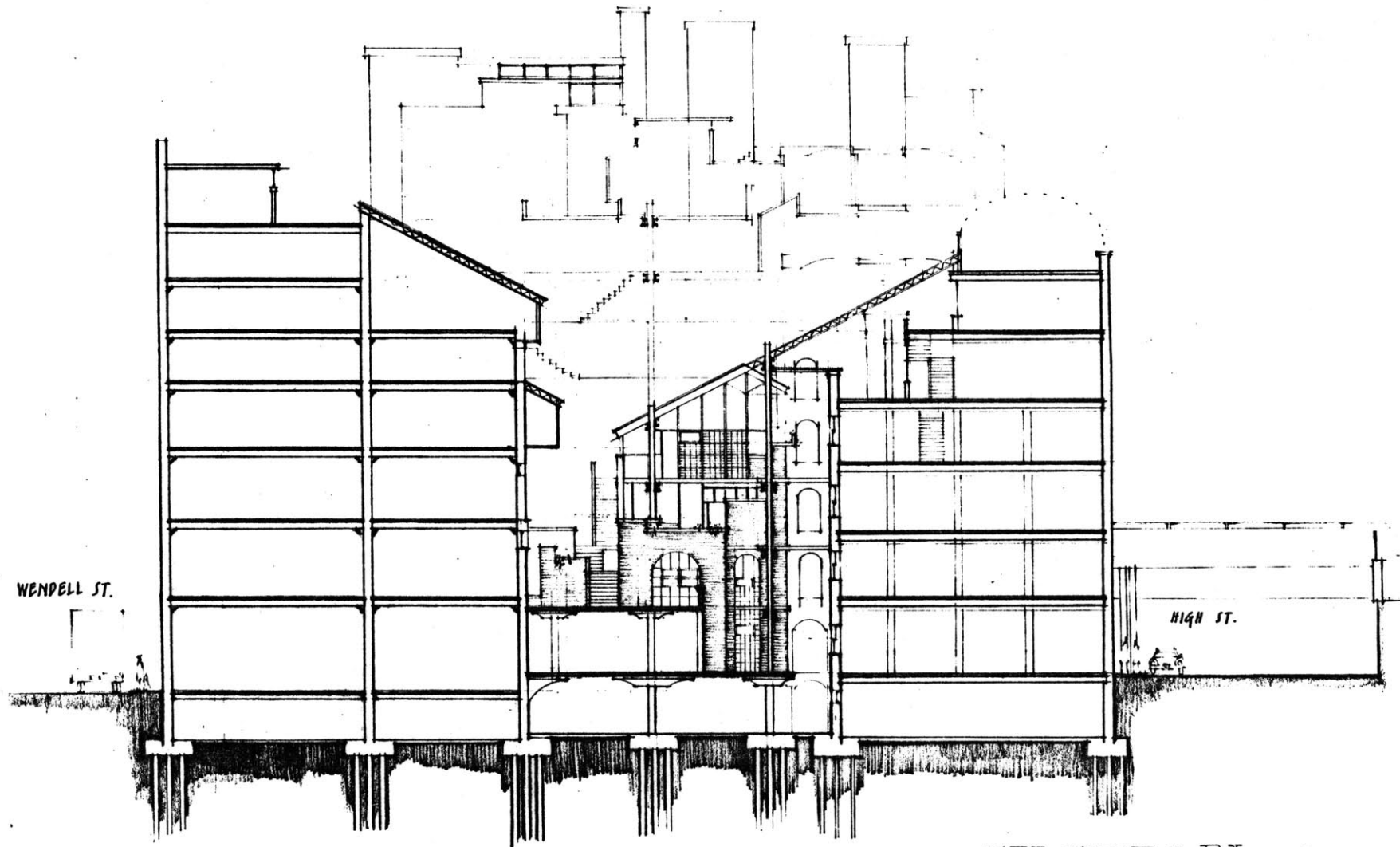
SECTION B



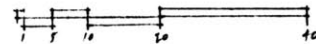


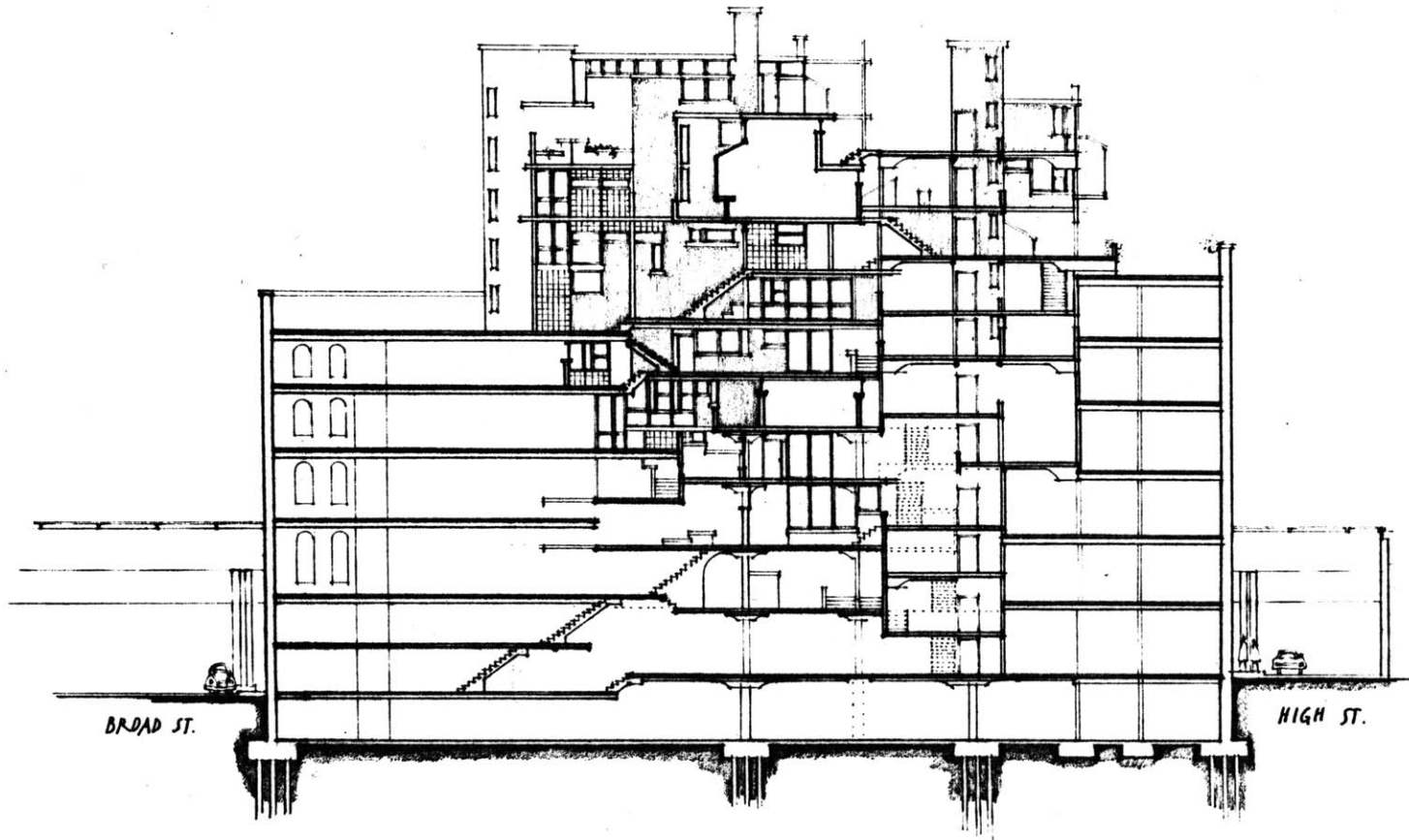
SECTION C



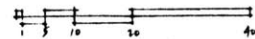


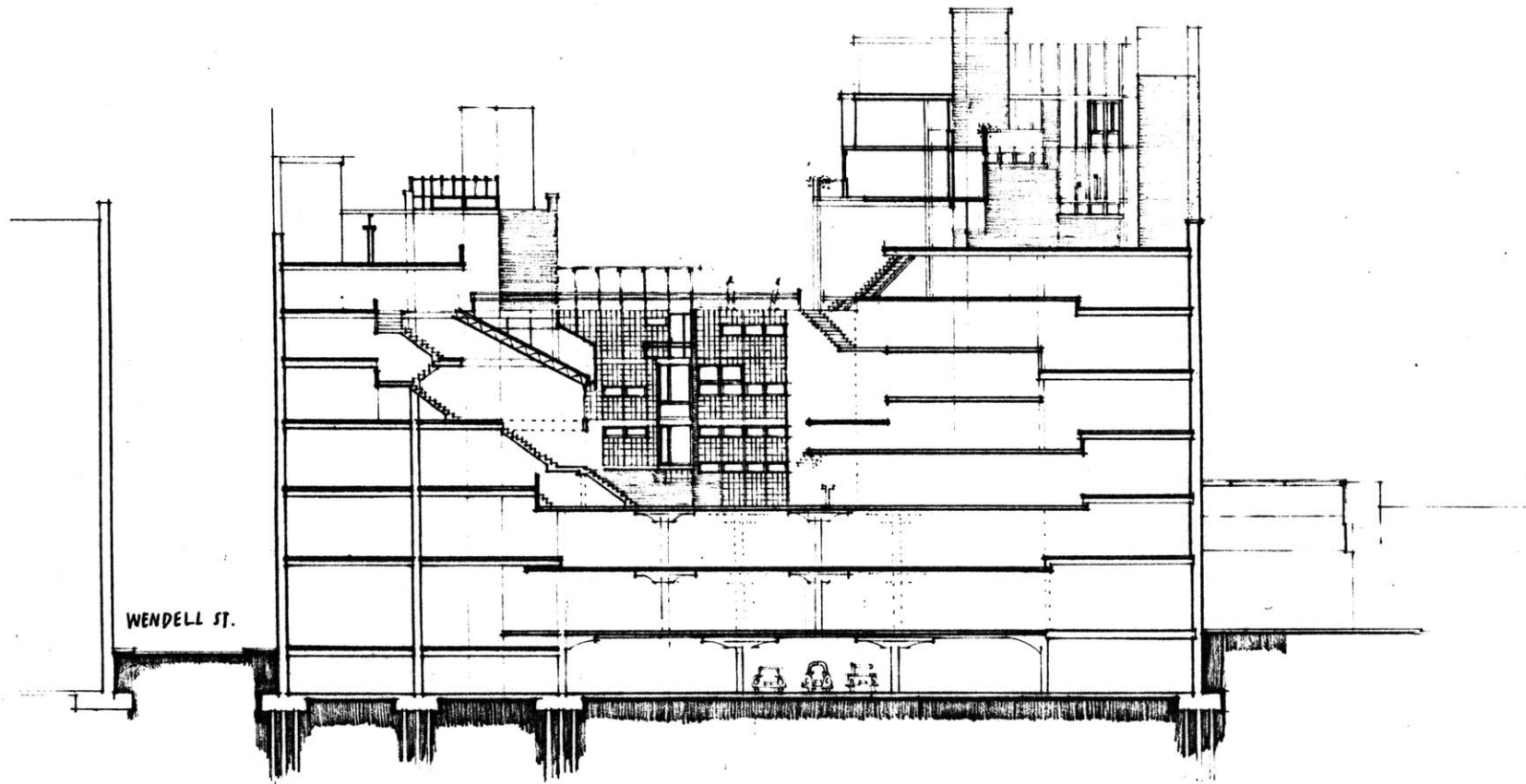
SECTION 1





SECTION 2

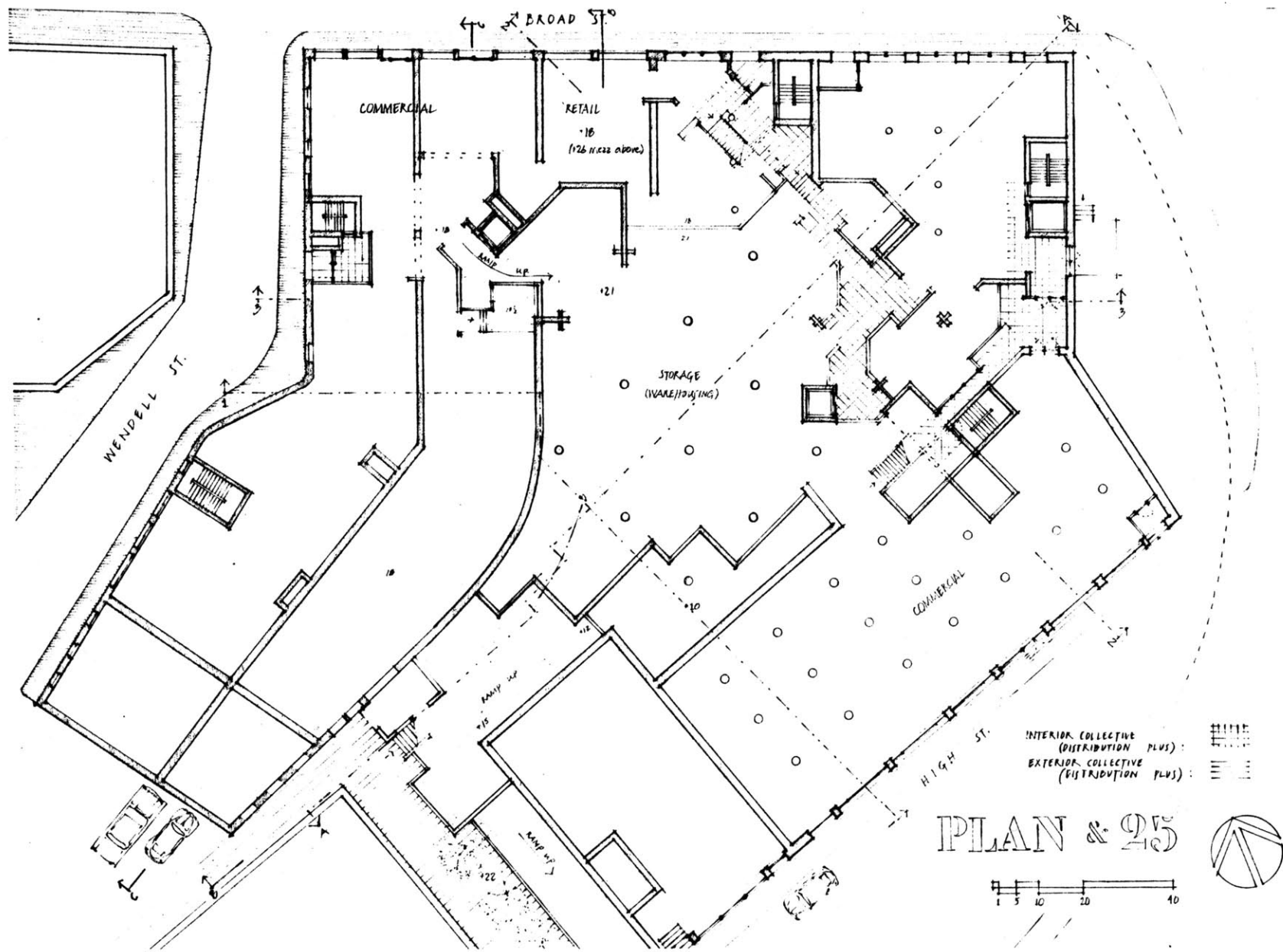




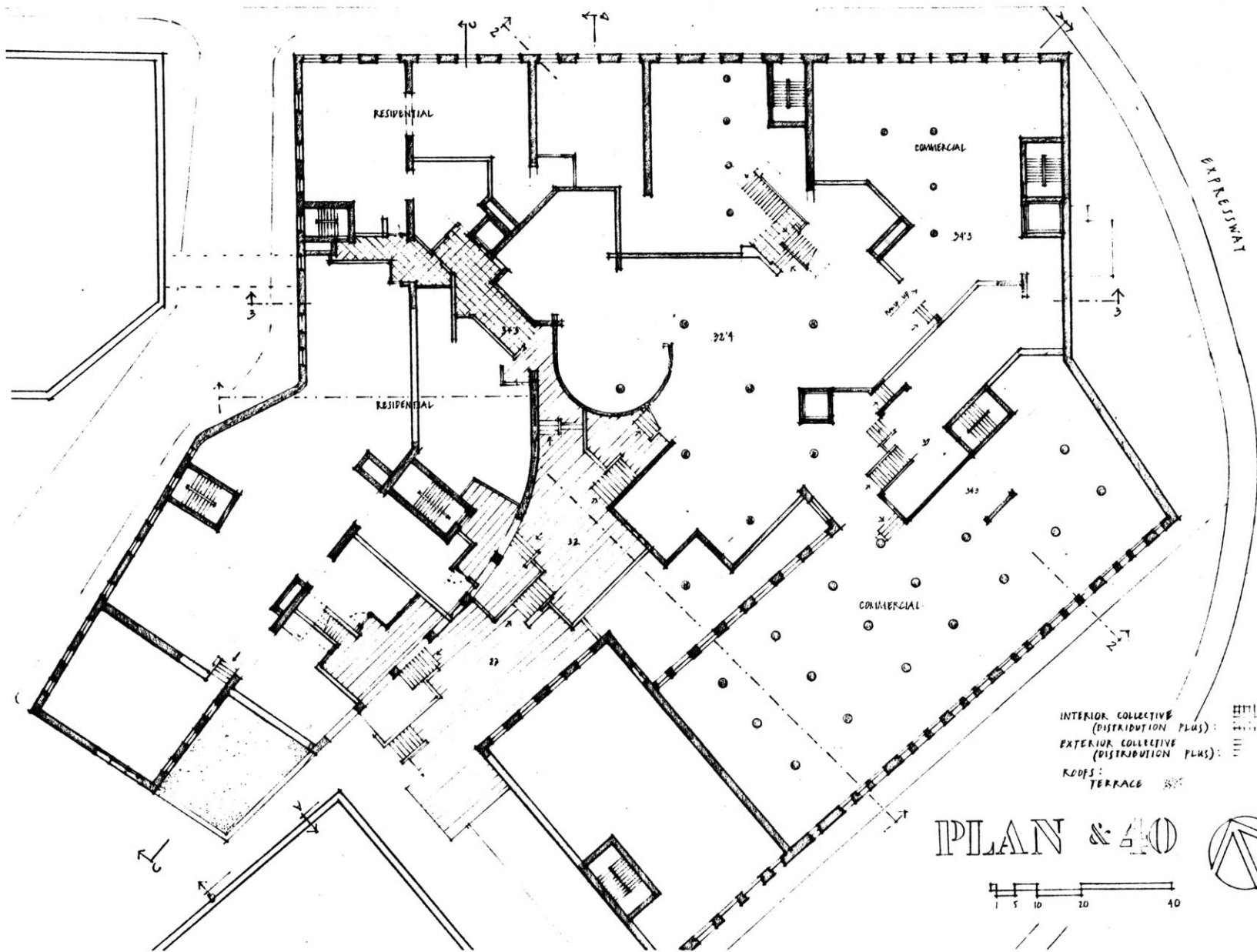
WENDELL ST.

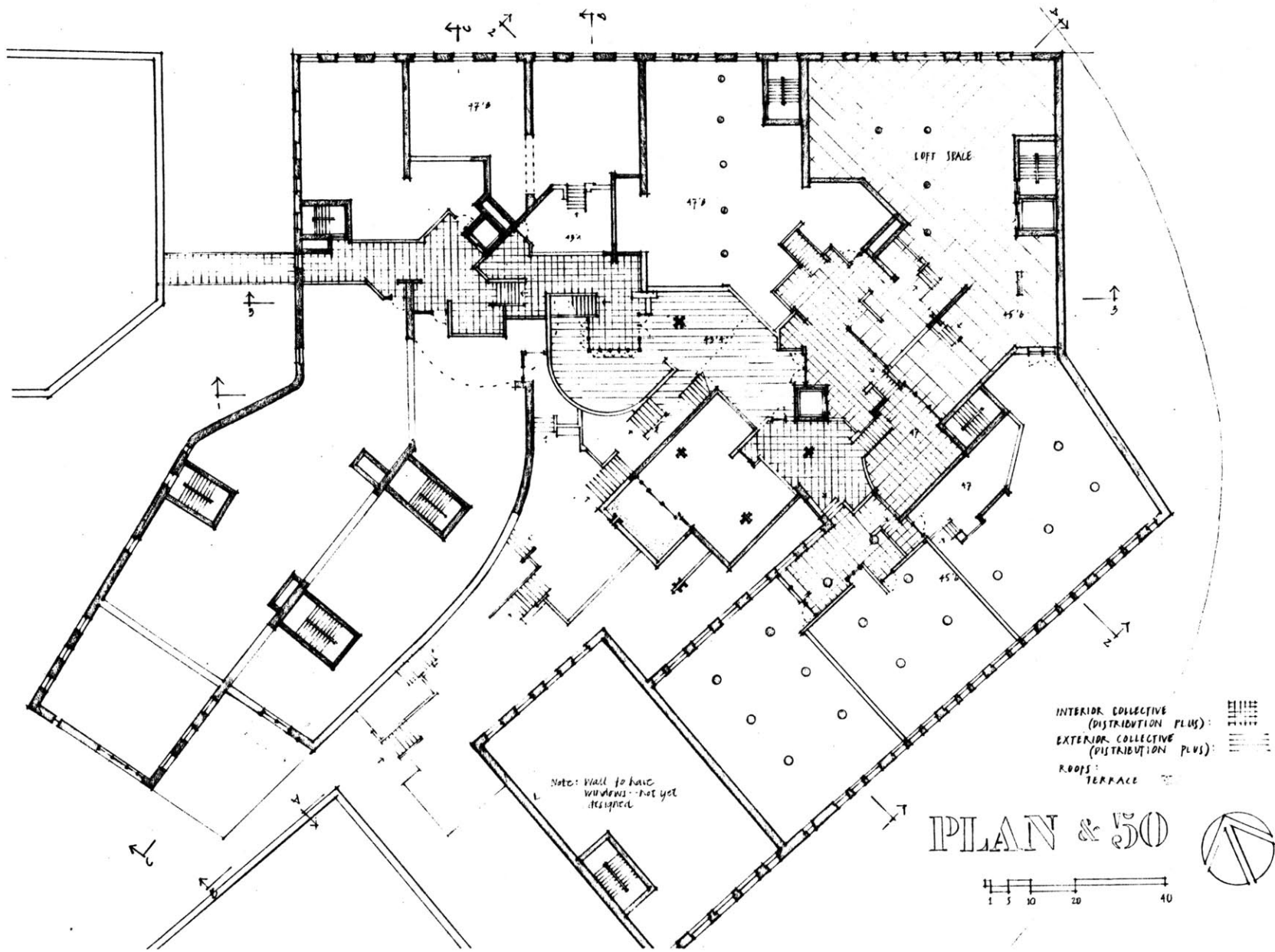
SECTION 3





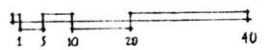
PLAN & 25

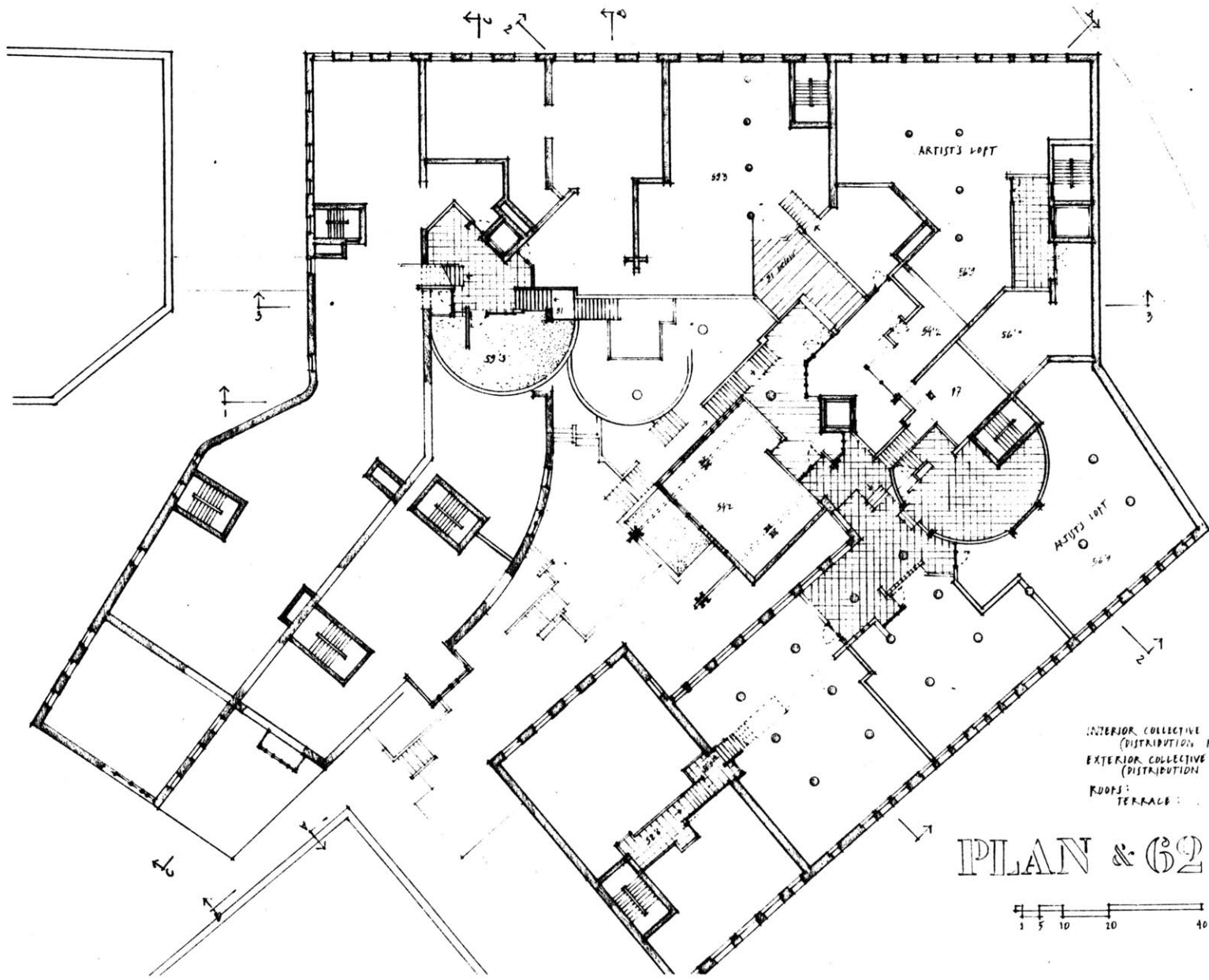




INTERIOR COLLECTIVE
 (DISTRIBUTION PLUS): [grid pattern]
 EXTERIOR COLLECTIVE
 (DISTRIBUTION PLUS): [hatched pattern]
 ROOFS:
 TERRACE: [diagonal lines]

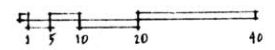
PLAN & 50

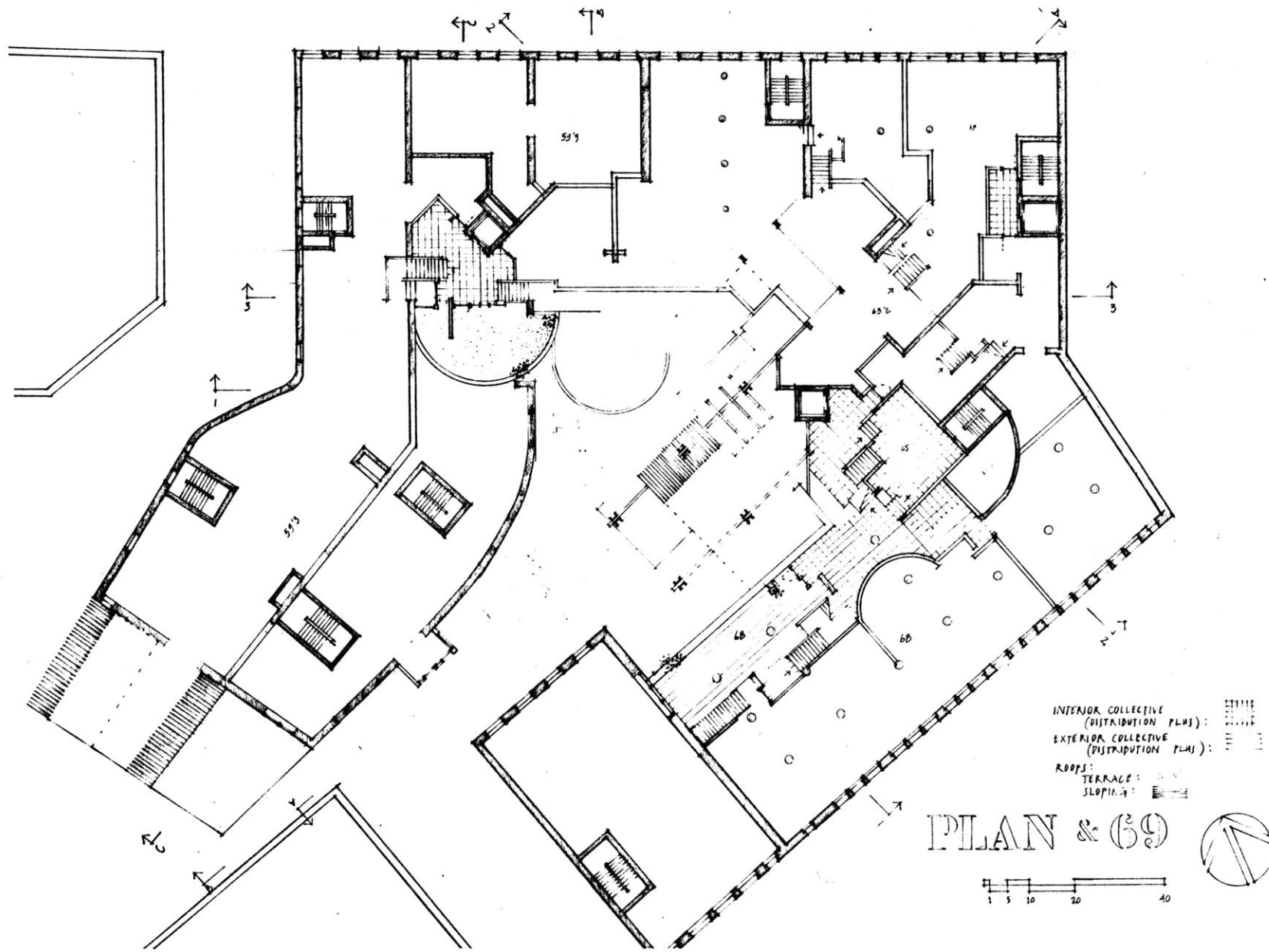


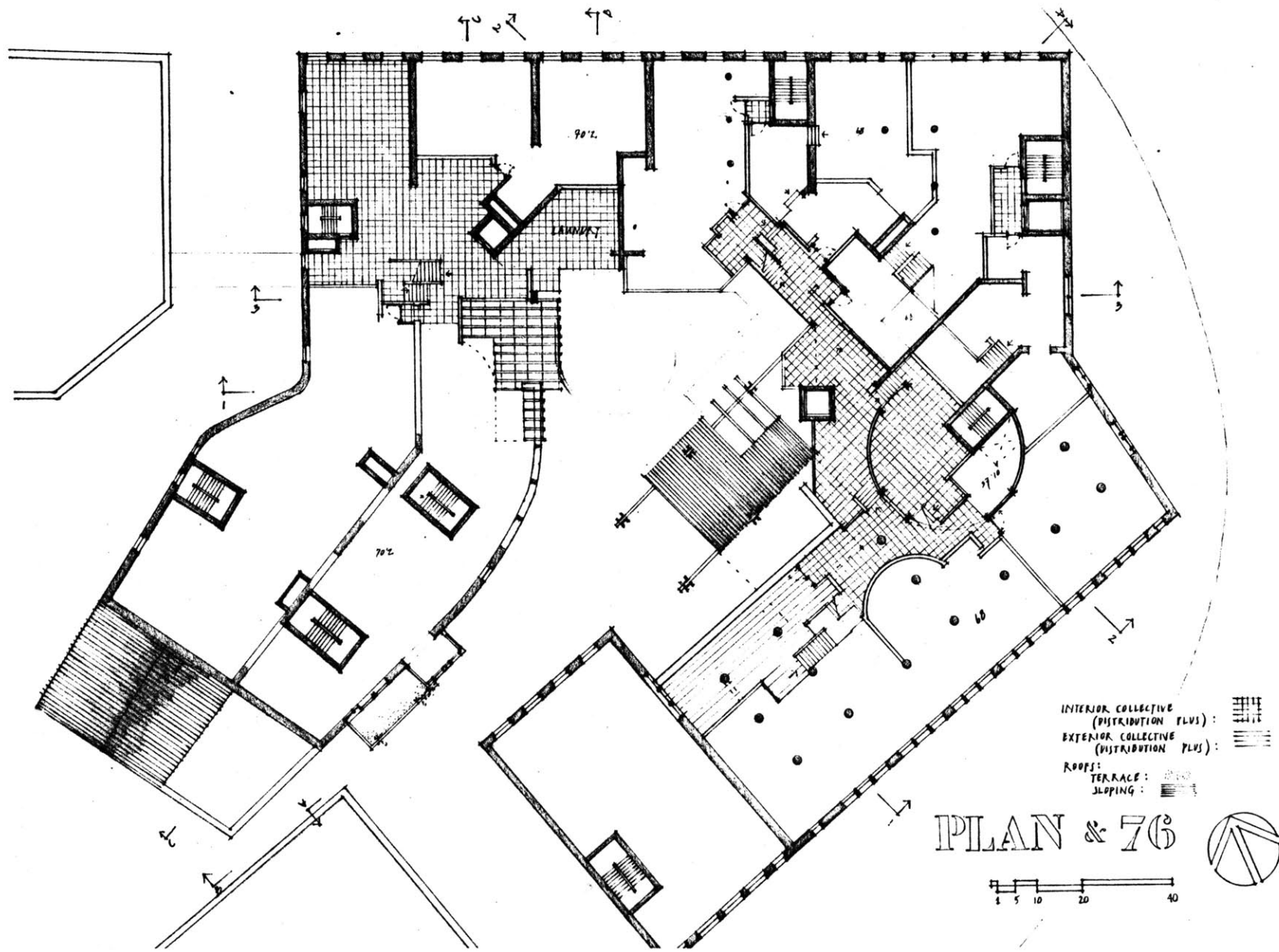


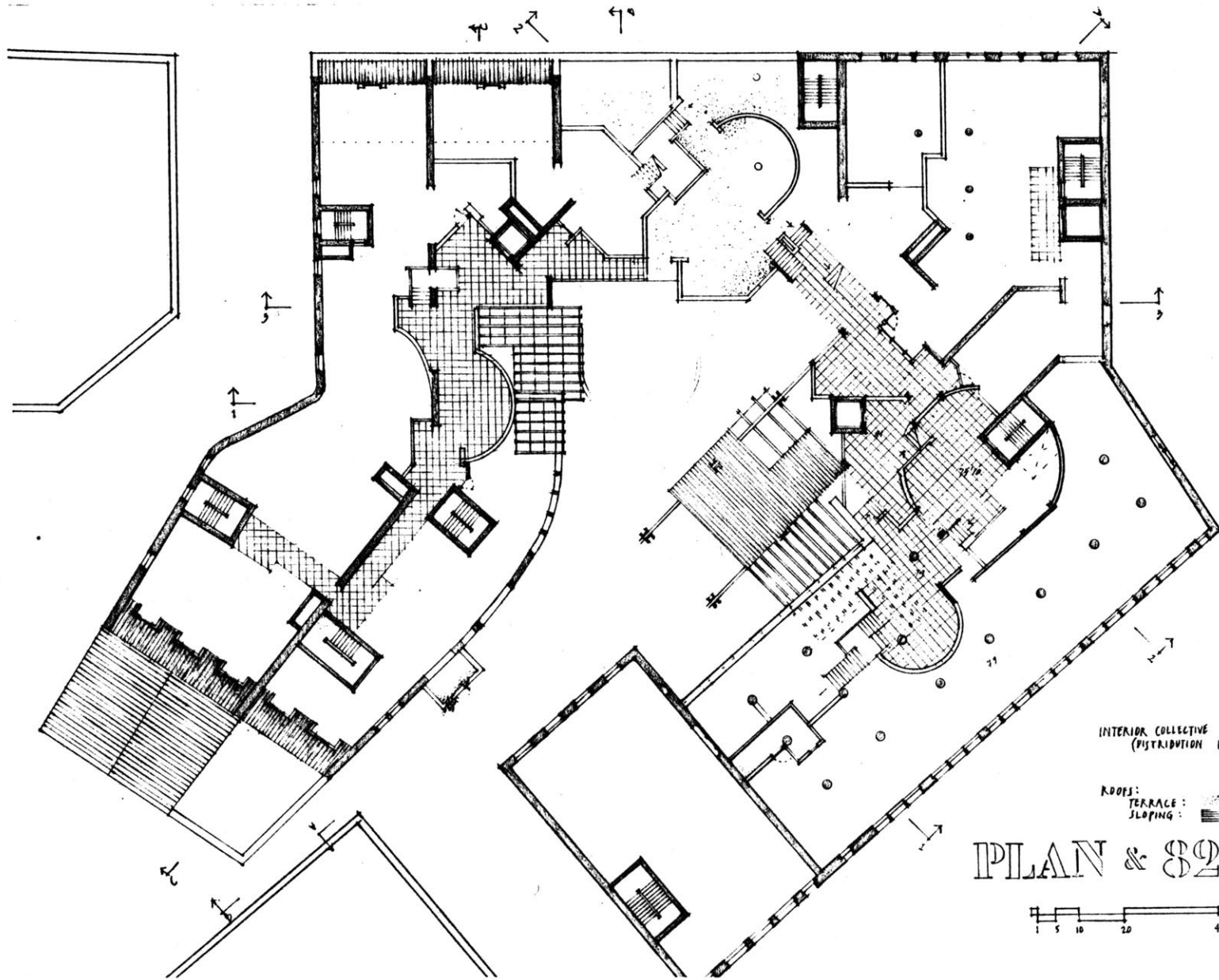
INTERIOR COLLECTIVE
 (DISTRIBUTION PLUS): [hatched pattern]
 EXTERIOR COLLECTIVE
 (DISTRIBUTION PLUS): [cross-hatched pattern]
 ROOFS:
 TERRACE: [dotted pattern]

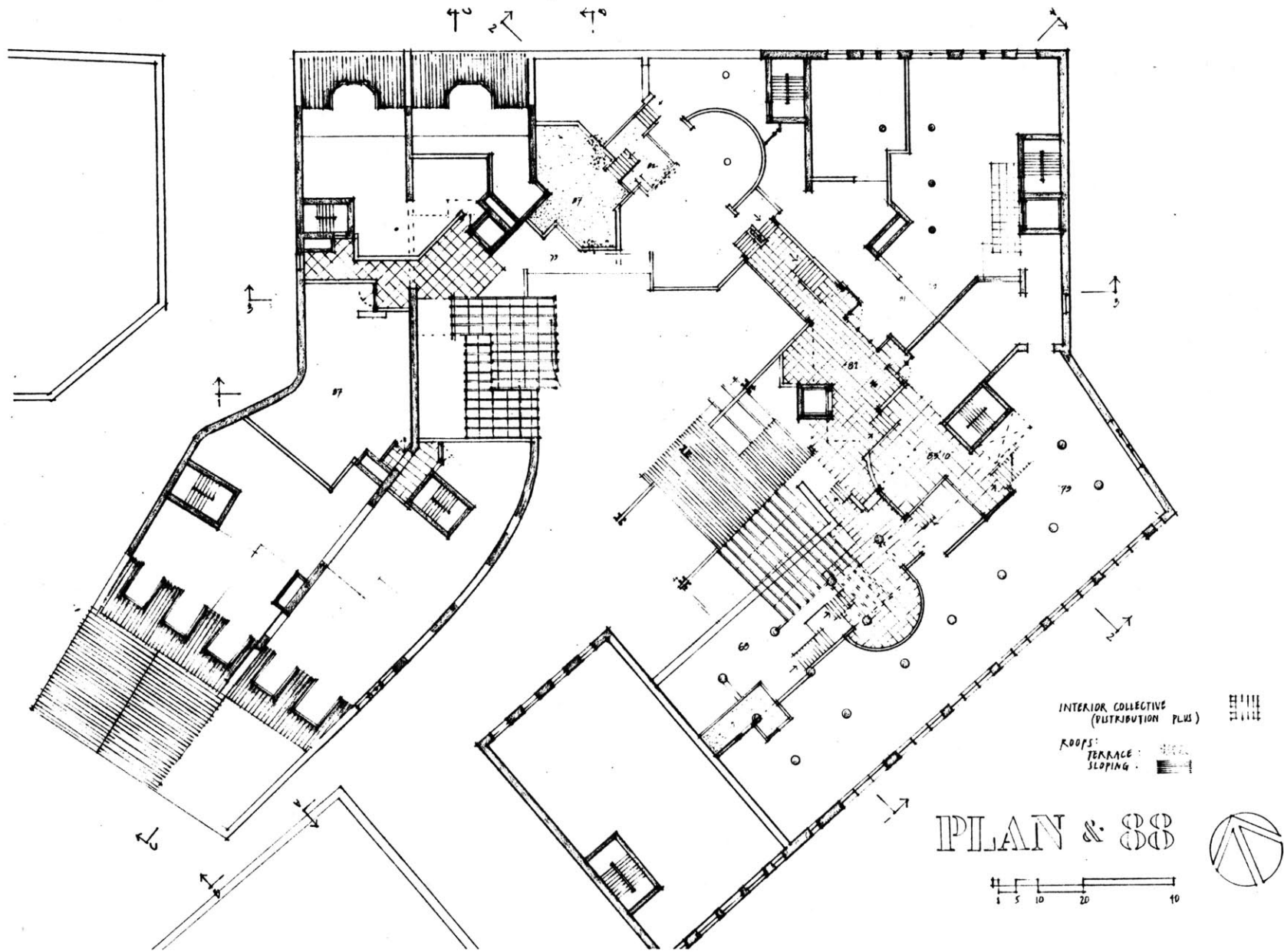
PLAN & 62

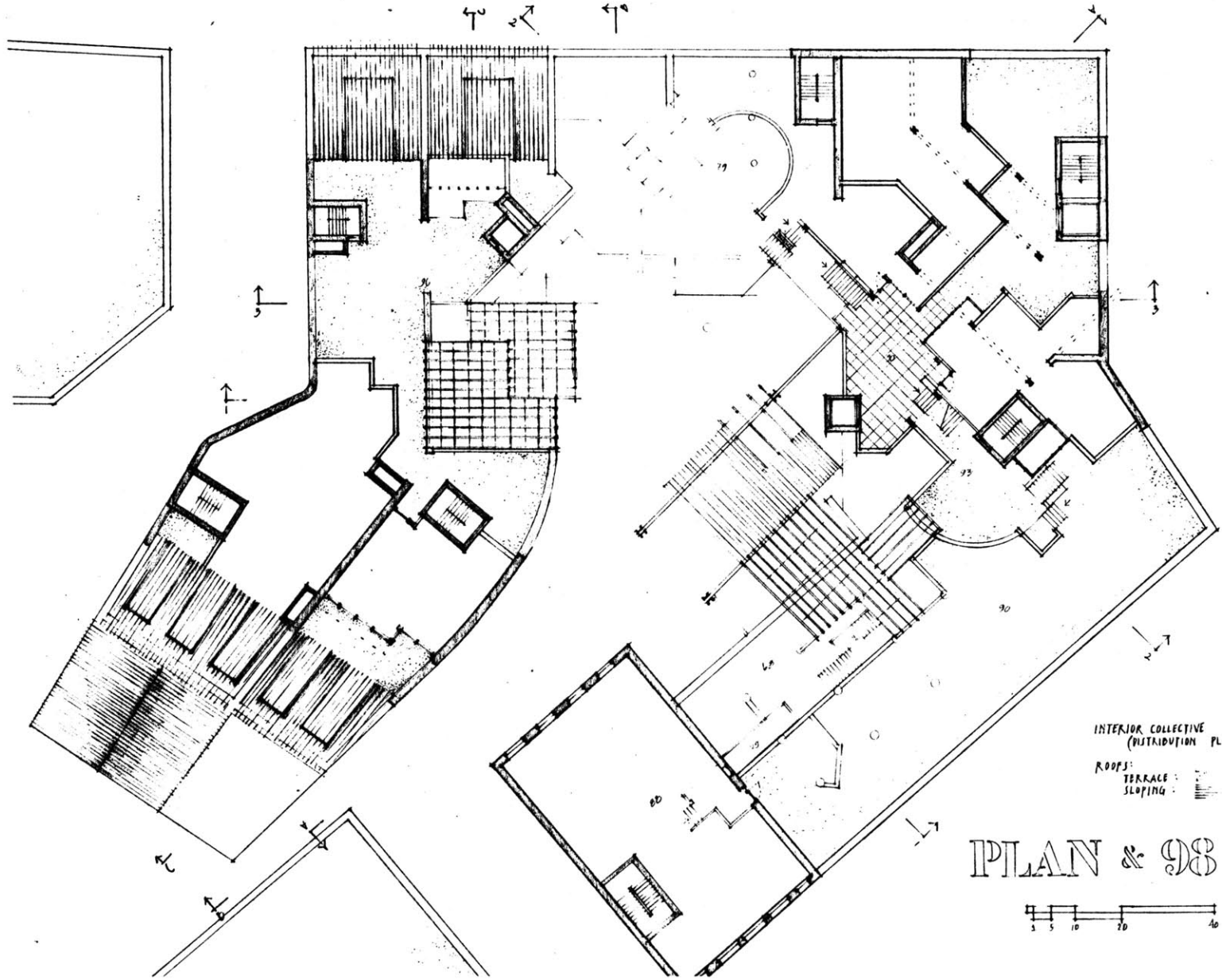


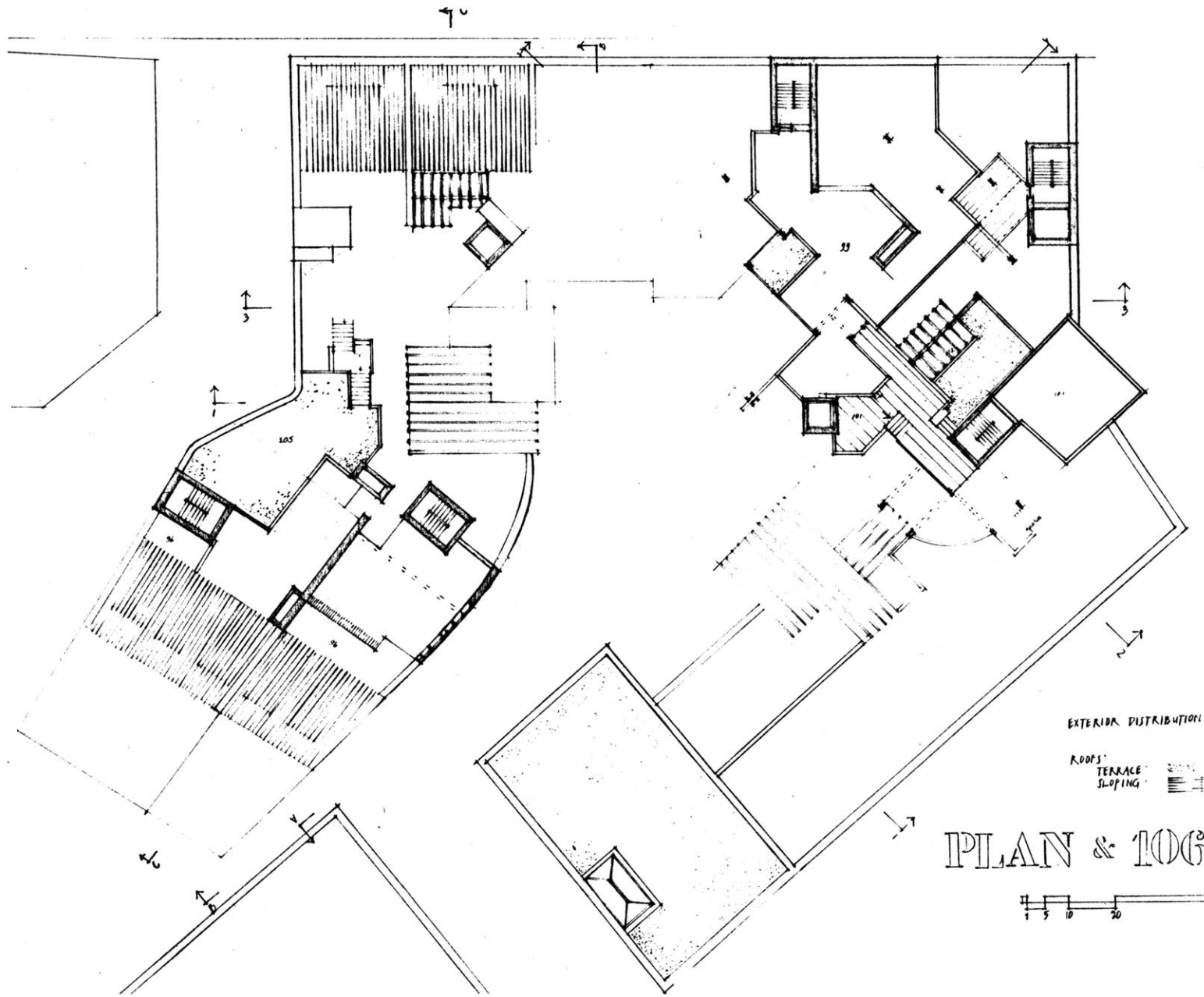












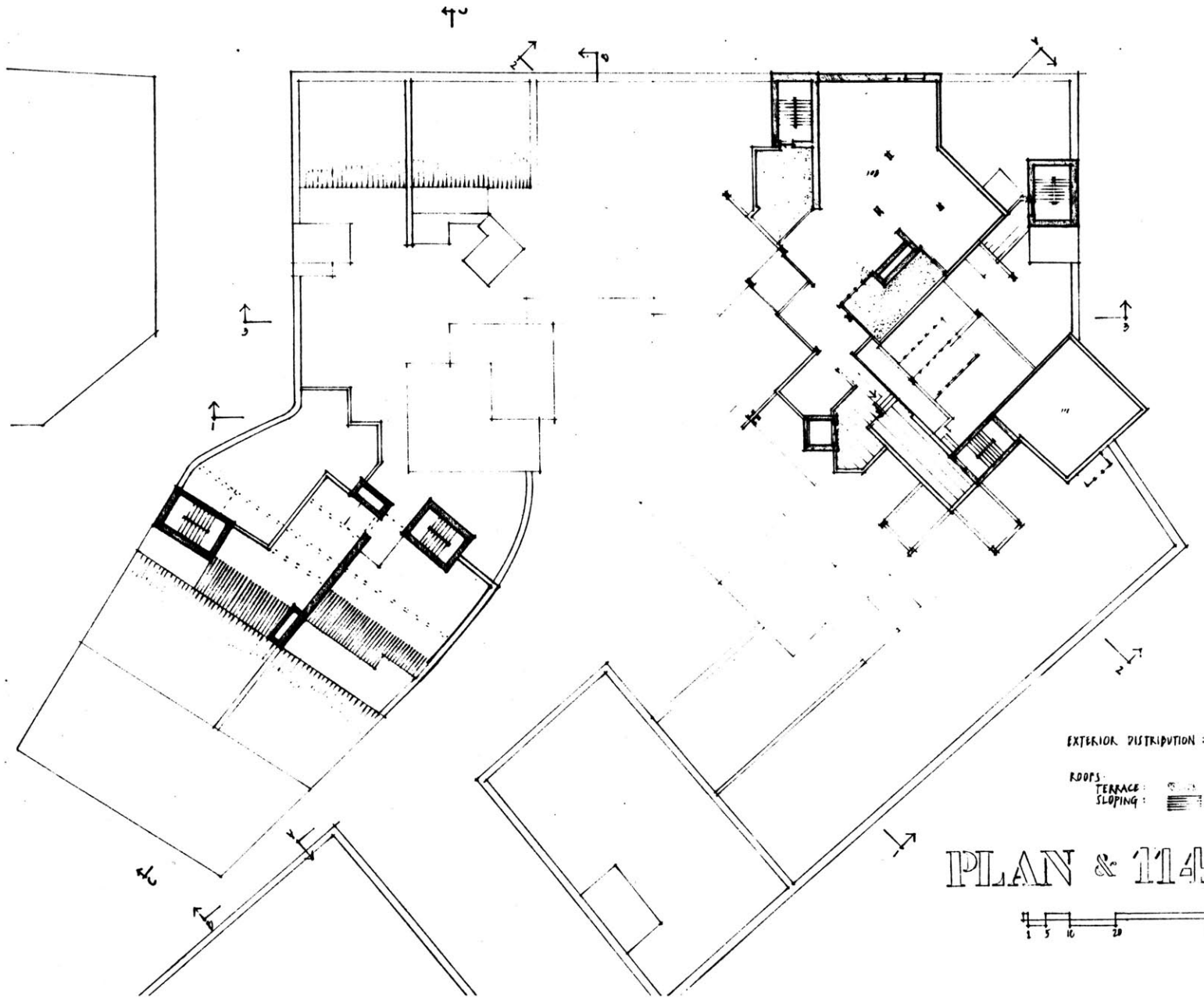
PLAN & 106



EXTERIOR DISTRIBUTION

ROOFS
TERRACE
SLOPING



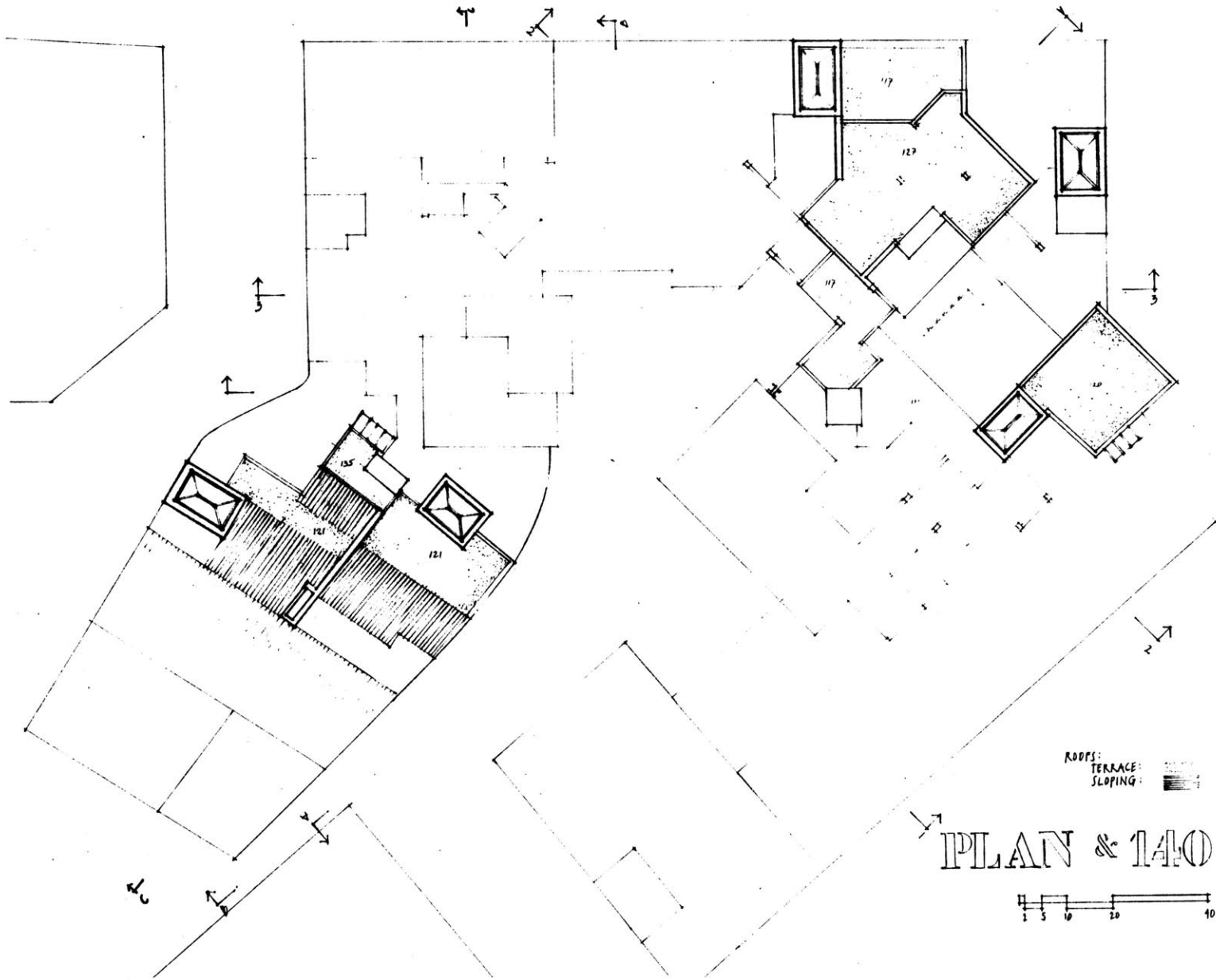


EXTERIOR DISTRIBUTION :

ROOFS
TERRACE
SLOPING :

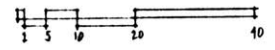
PLAN & 114

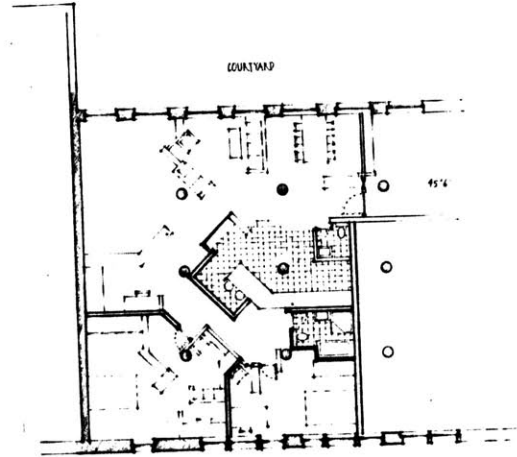
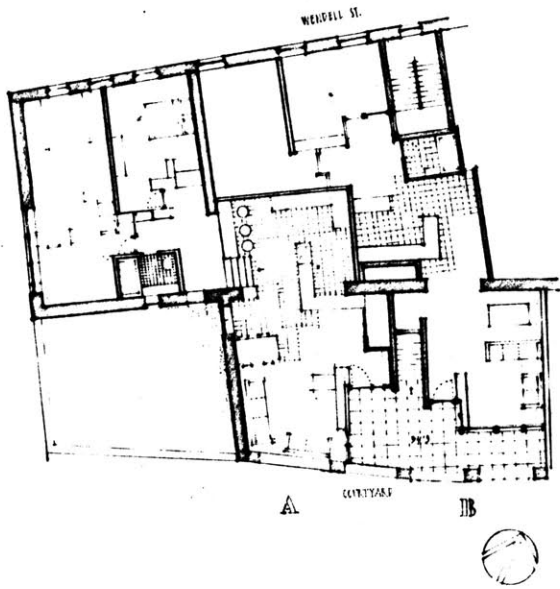




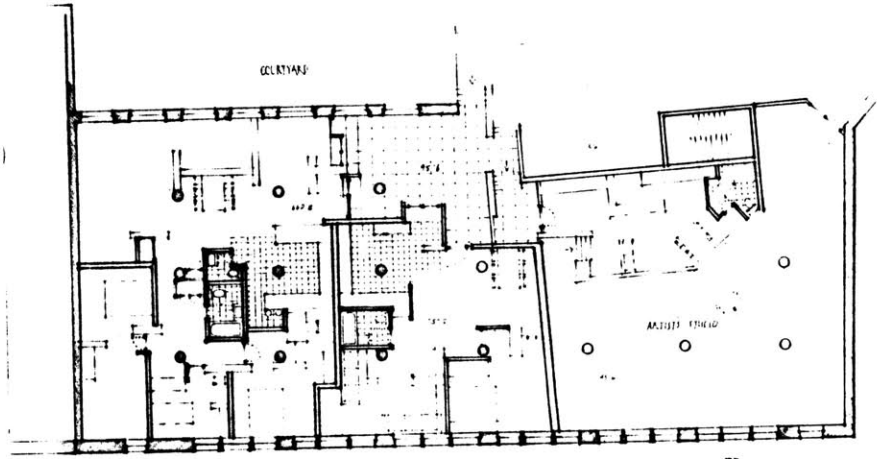
ROOFS:
 TERRACE:
 SLOPING:

PLAN & 140





SAMPLE UNITS



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