

DESIGN FROM THE OUTSIDE-IN

A housing strategy using street facades
in Row-House dwelling types as a catalyst
for neighborhood development.

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Bach. of Architecture
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Submitted to the Department of Architecture of the
Massachusetts Institute of Technology in partial
fulfillment of the requirements for the degree of
Master of Architecture in Advanced Studies.

June 1978

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Submitted to the department on June 1, 1978, in partial fulfillment of the requirements for the degree of Master of Architecture in Advanced Studies.

THESIS ABSTRACT

The subject matter of this thesis is two-fold; the study of street facades in Row-House dwellings as catalysts for neighborhood development; the use of the Dutch S.A.R. Methodology of supports and detachables as a tool for developing a housing strategy behind the facades. The basic premise as defined by the S.A.R. Methodology is that the neighborhood facades are elements of the support, part of the community, based on clues taken from the existing dwelling types of a particular neighborhood.

As a role model the South End section of Boston was chosen because the bow-front Row-Houses indicative of the area are excellent examples of the interaction of Facades and Space, and also provide an approach to a higher density of living with individual participation of the user.

Thesis Supervisor: _____

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Title: Head of Department of Architecture

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DESIGN From The OUTSIDE-IN

INTRODUCTION

To clarify the title of this thesis and outline the approach taken in the study, it is necessary to discuss a particular point-counterpoint architects have had to deal with throughout history: the role of a building's facade within a given context. At what point does a facade become less of an enclosure for interior space and become more of an element of exterior space? It is not a question that has a definitive answer, but it does suggest an interpretation of the relationship between the Outside/Inside of architectural expression.

Throughout history various periods have stressed the importance of one over the other as form giver. But recently, during the last century, we have experienced a preference of most architects to design from the "Inside Out," that is, "Form follows Function." This thesis is not an attempt to disprove this approach, but to show

that in a particular circumstance, that of Row-Houses in the South End of Boston, the opposite is preferred: "Designing From the Outside In."

This process will be tested through the development of a housing strategy that reinstates the involvement and initiative of the user. In conjunction with this premise and the use of building facades as a catalyst for neighborhood development, the Dutch S.A.R. Methodology was applied. In essence the method deals with the separation of the decision making processes into two spheres: that of the community, and that of the individual, with both contributing to complete the act of housing as a process. As a tool, the S.A.R. approach provides the means to establish the strategy behind the facade as well as the rules for placement within the community. The distinction that S.A.R. makes between community-controlled elements--supports--and the user-controlled elements--detachables--coincides with the viewpoint of the facade as a catalyst for the community and the interaction

the user provides at the level of the dwelling.

To understand the importance facades have in creating an ambience of a particular part of our environment, it is necessary to discuss them as the interface between the space defined on one side and the building mass on the other.

The FACADE As Interface

MASS AND SPACE: HISTORICAL ORIENTATION

Throughout history one of the prime purposes of architecture has been to heighten the drama of living. The cities we live in are built up over time and constitute a collection of many cultures within space. Architects have struggled to achieve this drama through the manipulation of architecture's two basic elements: Mass and Space.

The interface between the two has been a paramount pre-occupation with designers and builders in their attempts at creating a livable environment. The surface articulation of building masses serves not only to define the building as object, but also creates the ambience of the adjacent spaces within which it is placed.

Historians have been able to mark the passing of time, through the changes expressed within this interface and

have pinpointed with great accuracy the shift from one period or style to another. This effort has provided us with an historical frame of reference to evaluate present conditions and speculate on the future.

To plan we must know what has gone on in the past and feel what is coming in the future.

-Siegfried Giedion
Space, Time and Architecture

It is generally accepted that each building placed in our environment takes into account its setting, those adjacent elements which have preceded it. They may be other buildings or may be open space such as a city square, park, or garden. And of course, thought must be given to the probability of its endurance and change. The interpretation of this placement has varied from architect to architect--one may choose to ignore the surrounding context while another may decide to blend in his creation invisibly.

During ancient times when "existing contexts" were relatively nonexistent, buildings were treated as objects in space with refined orders and proper orientation. Their position on the plateau, within the forum or square, was paramount to the actual function these structures were enclosing. It was the presentation to the cityscape or countryside to which the designers and builders gave top priority. These have been fundamental concerns to architects through each period of history up to the present and will probably continue long into the future. What has changed from generation to generation is the interpretation.

OUTSIDE/INSIDE

Within the past century of architectural history, the work of Frank Lloyd Wright, le Corbusier, and others has had significant effect on subsequent generations with regard to the interface between building mass and space. New interpretations of the process of designing from the inside out and the relationships of placement of new

works began to emerge. It was from this period that the phrase, "Form follows function," was coined, which gave us specific direction: inside-out. Wright professed an intense concern for the interplay of interior/exterior spaces--defined in some way by an "organic" architecture that established a proper confrontation with ground and sky, mass and space. Corbu recognized the importance of this interface between Outside/Inside relationships by developing a modular coordination of the elements of a facade that linked the two spheres. Each in his own way created new points of view from which to interpret the relationship of Inside/Outside in architectural terms and the placement of these interpretations within a context.



It is this idea of separating the "Outside" of a building as a function of its effect on the immediate environment, from the "inside" and the human activity that is housed, that this thesis addresses.

The source for viewing buildings in such a dissecting fashion originated from my studies of the Dutch S.A.R. methodology, which also separates the process of building into two spheres: those elements controlled by the community, and those elements controlled by the individual who lives or works within the building. This coincides with the approach of separating the facade from the building mass, both ideologically and technically: ideologically because S.A.R. views the building as two

separate spheres, that of supports and detachables, and technically because the method has established rules of coordination to organize the process of placement.

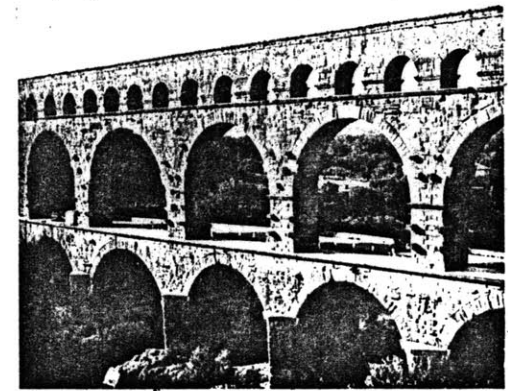
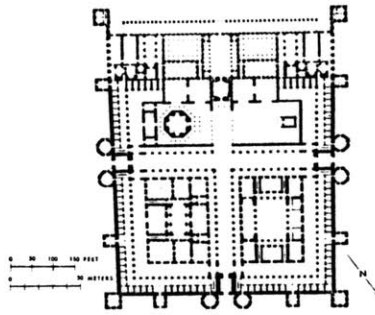
Before presenting the details of the housing strategy developed in this study, it would further clarify my interpretation of "Facade" as an element of space by presenting precedents. To do this, I have chosen several historical examples that have dealt with this preference of environmental placement, or, as I have termed it, "design from the outside-in."

The FACADE: Historical Precedents

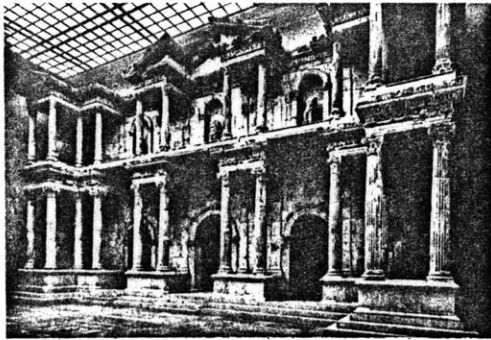
The ideal of creating a facade of a building as an element of space rather than mass is not new. In fact, examples can be found in every period of architectural history, whether they were conscious attempts or not. Today we see the results in ancient ruins whose only structural endurance has been expressed in the free-standing wall or columned arcade.

THE MARKET GATE OF MILETUS
100 A.D.

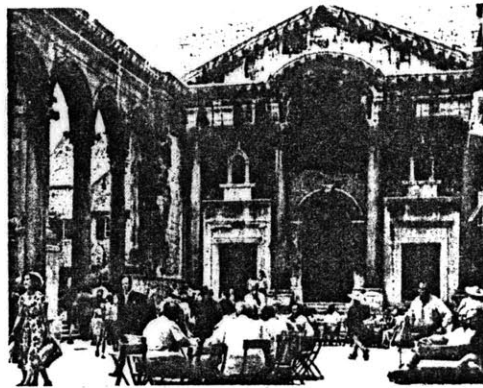
The entry to the Market area of Miletus, now Palatia, Turkey, is an example of a facade changing context. The entire Gate of this finely articulated portal was dismantled, transported, and reconstructed in the State Museum of Berlin (Fig. 1). Here it stands as a pure expression of "Facade" as an art object. But because the arched portals are the passageways of one museum chamber to another, it functions as something more than an object to ^{be} viewed in space. One can say that the



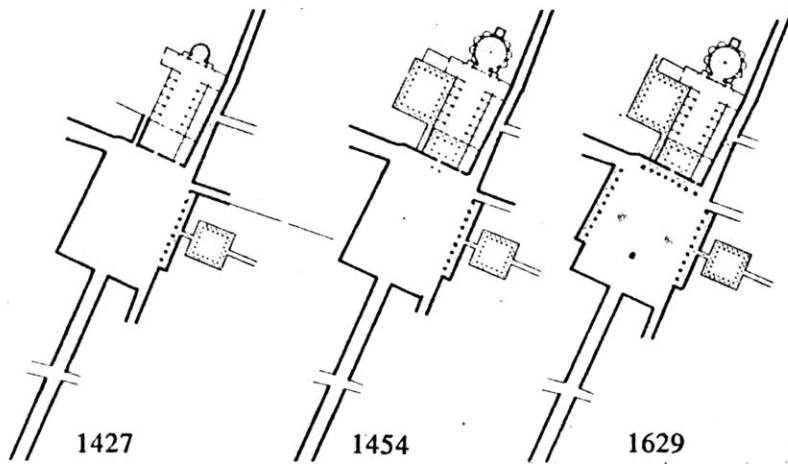
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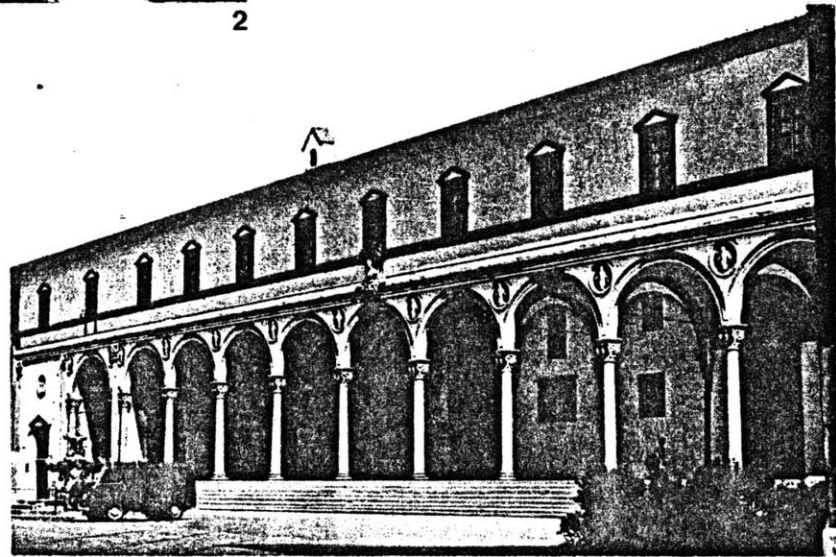


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1454

1629

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Miletus Gate is not only an example of Greek architectural artifacts, but also a fine articulation for the wall of the space in the Museum.

THE PALACE OF DIOCLETIAN
300 A.D.

The Roman ruins of the Palace of Diocletian in Split, Yugoslavia, show the complexities that can arise through the reuse of antiquities (Fig. 2). The ceremonial court of the "country house" built around 300 A.D., once roofed over, now stands as an outside court. The walls of the "room" are now the facades of the "square." The interface of space and mass has been given new meaning by reversing the roles of the original enclosure.

ROMAN AQUEDUCT

Although not an example of a building's facade, the ancient aqueduct provides us with an interesting variation on the Mass/Space interface. The Pont du Gard near Nimes, France (Fig. 3), is not only an aqueduct, but a road and bridge as well. Besides providing the necessary functions of transporting water and people, it stands

as a good example of Space/Space interface. We can see similarities in the effect of these arched stone wall ruins and the columned expressways that dissect our cities and countrysides today.

PIAZZA DELLA SANTISSIMA

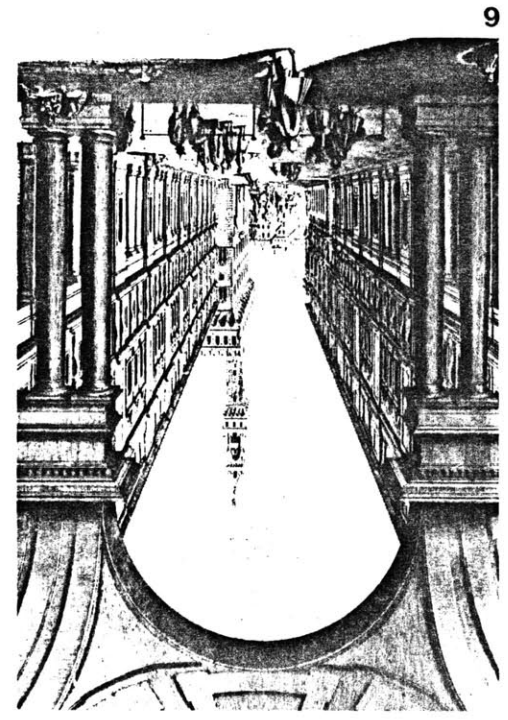
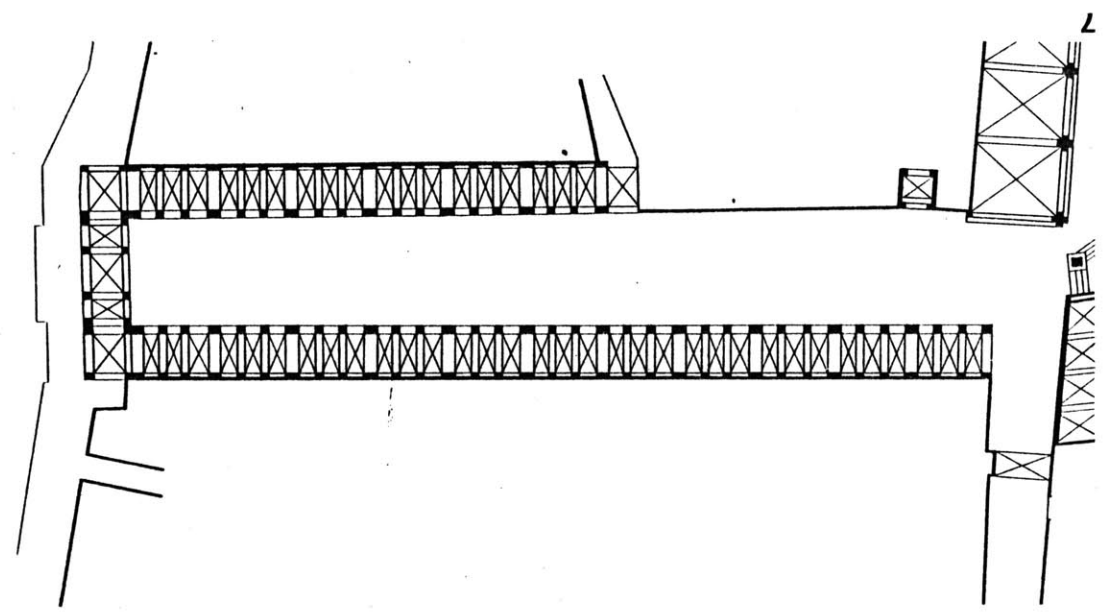
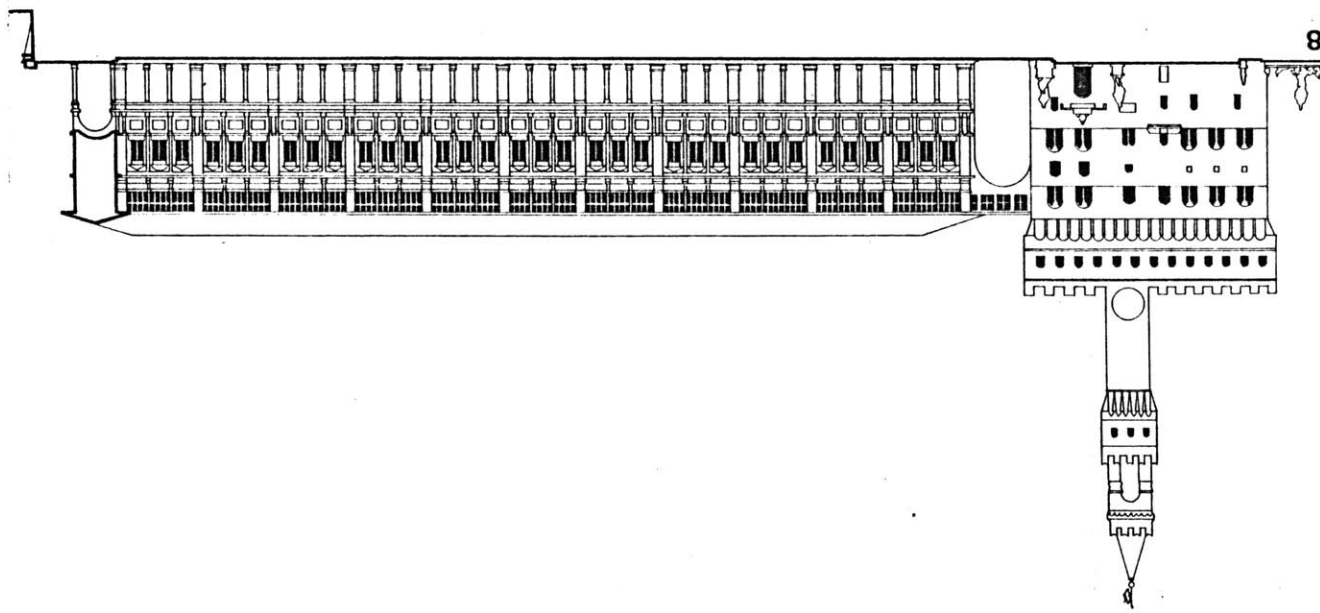
In fifteenth-century Florence, the concepts of space created by several buildings designed in relation to one another was expressed in the development of the Piazza della Santissima Annunziata (Fig. 4). The beauty and elegance of Brunelleschi's arcade of the Foundling Hospital on the right (Fig. 5) was the stimulus for the completion of the square ninety years later. The design and construction of the central bay of the Santissima Annunziata Church by Michelozzo in 1454 was the second stage in the Piazza's development, using many of the details of the hospital's facade to its left. In 1516, the architects, Antonio da Sangallo the Elder and Baccio d'Agnolo, were commissioned to design the building opposite to Brunelleschi's arcade. The decision of Sangallo

to follow verbatim the design of the then near century-old facade of the Brunelleschi design overcame any need for self-expression.¹ It was the importance of the space over the mass that Sangallo was responding to, and it is to him that we owe the present conditions of the Piazza.

UFFIZI PALACE

Another Renaissance example of a facade addressing a space is that of the Uffizi Palace (Figs. 6,7,8). Designed by Giorgio Vasari in 1560, the project was unique in that it dealt with two building masses facing each other across a linear passage. Vasari was commissioned to renovate and add to the already existing building stock and provide a proper promenade connecting the river Arno and the Palazzo Vecchio.² To do this he used a one bay deep colonnade covered by two floors of gal-leried spaces running parallel to the street on which it faced. The facade in this case takes on a more three-dimensional character accentuated by the depth of

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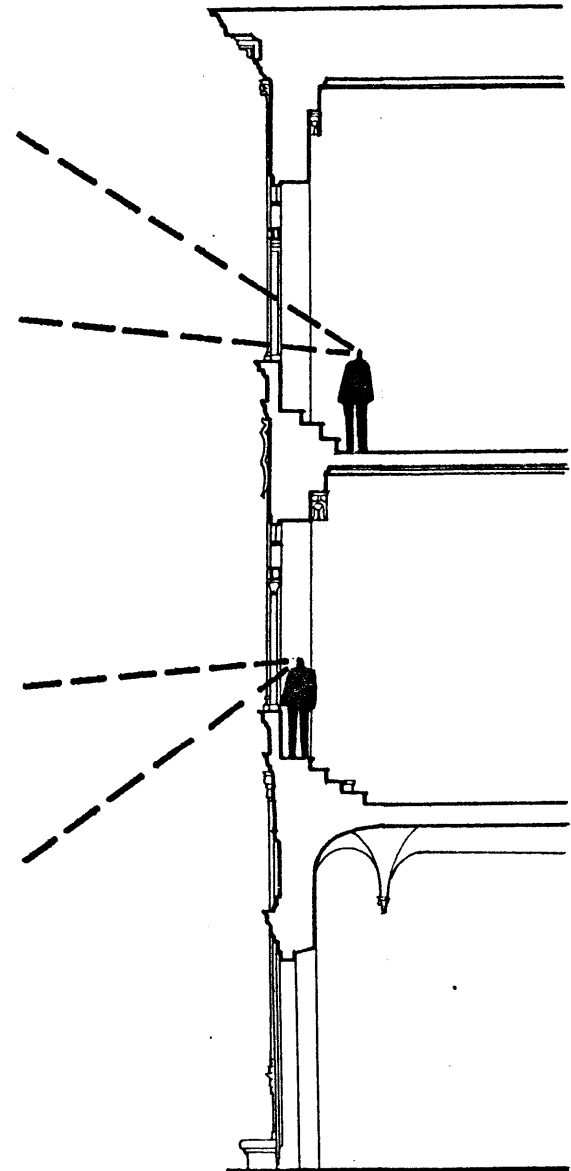
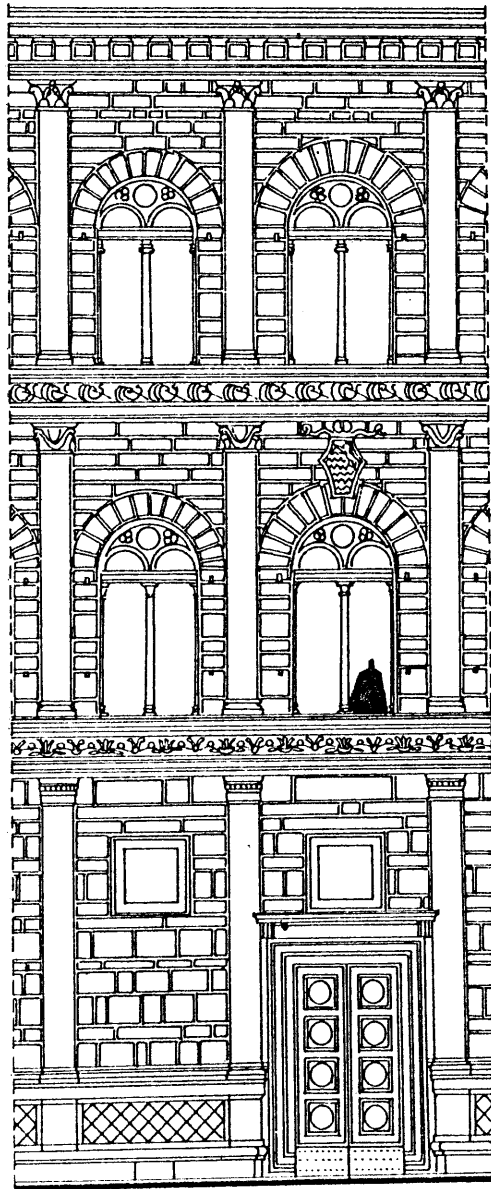


the colonnade and strong overhang of the roof eave.

This example seems to provide literal similarities to the conditions of nineteenth-century Row-Houses of the South End that will be discussed later. Both deal with the creation of an architectural space by providing facade articulation, one opposite the other.

PALAZZO RUCELLAI
1446

The "townhouses" of the Renaissance, many commissioned by the great families of Florence, dealt with the problems of context and programmatic requirements. The stratification of levels in these palazzi were evidence of internal family structures. The architectural details and fenestrations of the facade which faced the street were a response to the orders of the time and rules of proportion. In the example of the Palazzo Rucellai (Fig. 9), by Alberti, it is evident that the location of window openings in relation to floor elevation was the result of facade design requirements. The window sills from the inside are above eye level requiring a series of steps



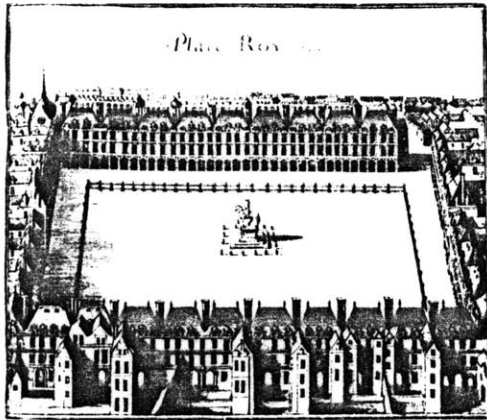
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to allow viewing out. On this point, one can say that the design process was from the Outside-In.

PLACE ROYALE
1605-1612
PLACE VENDOME
1698-

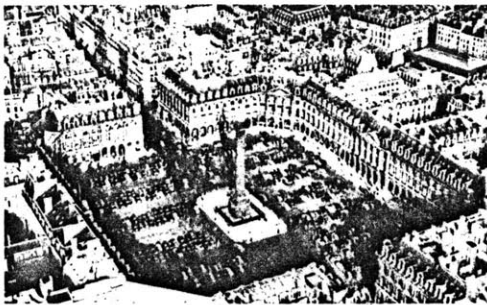
The city of Paris has an abundance of squares defined by buildings' facades. Their development spans several centuries, incorporating a variety of architectural styles. Both the Place Royale (Fig. 10) and the Place Vendome (Fig. 11,12) illustrate the concern of the designer for defining the space which enfronts the facades of the dwellings.³ Through early engravings (Fig. 13) we can see that the facades of the buildings were erected prior to the floor levels and subsequent dwelling units that eventually filled out the mass of the building behind the walls.

Today very few changes have occurred to these facades facing their respective plazas. But when one considers the modifications that normally accompany change of occupancy, in some cases from residential use to office use, we can imagine a wide range of variations that have

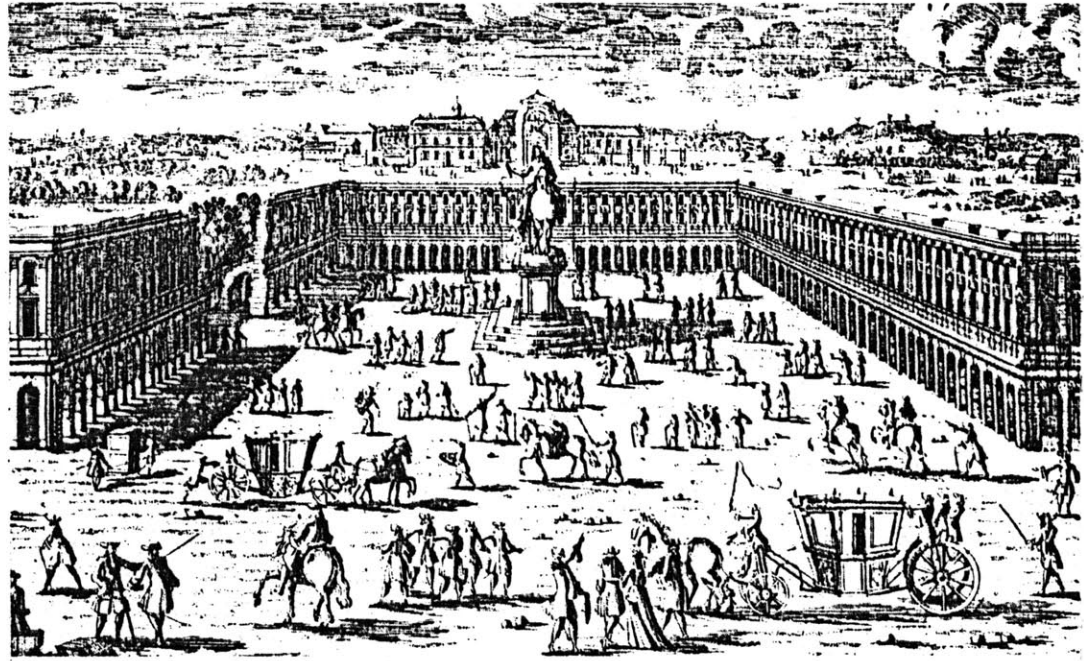


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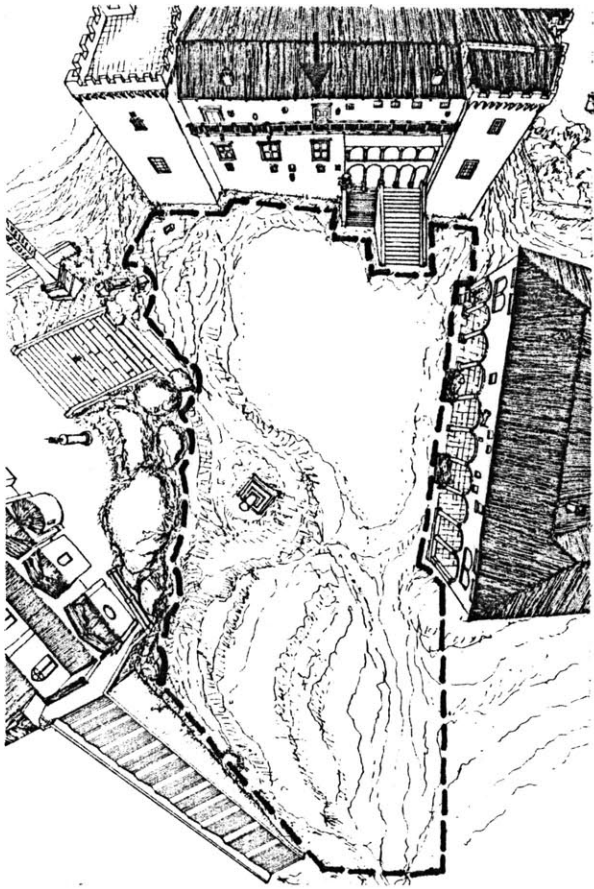
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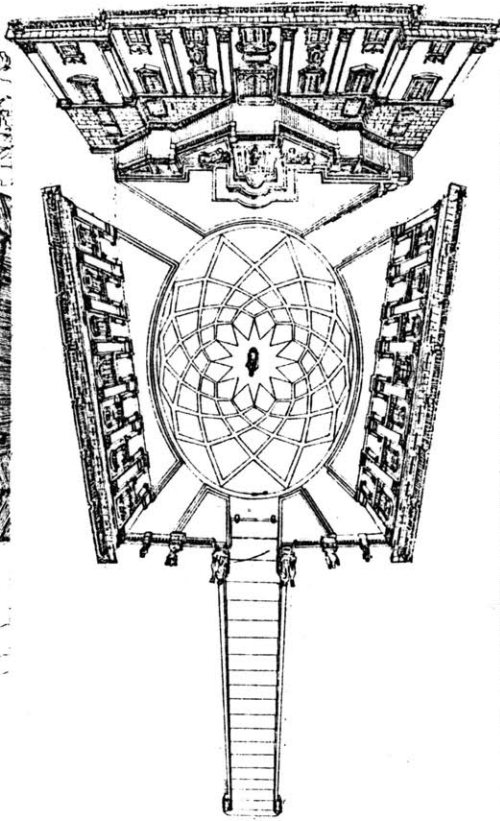
taken place behind the facades. One place it is evident, without inspecting updated floor plans, is at the rear of the structures. Here an infinite variety of additions and expansions spanning the life of the building show how preceding generations of users have adapted their spaces to suit their particular needs of the time, without touching the plaza facade.

THE CAMPIDOGLIO
1546

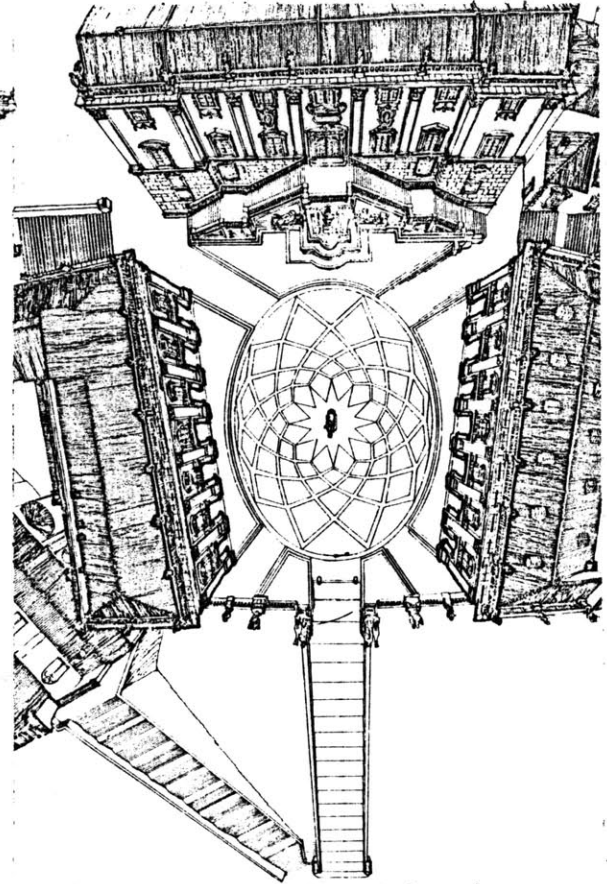
The strongest example of a designer taking space as a subject for design has been attributed to Michelangelo and his design of the buildings forming the Campidoglio (the capitol) in Rome (Figs. 14-18). Actually the project began as a face-lift for the existing administration buildings. Although completed after his death, it was Michelangelo's decision to retain the basic structure of the two old palaces already on the site, and to confine his efforts to the building of new facades. As the project developed a third building was added following Michelangelo's facade design.⁴ This approach is similar to the priorities of urban planning expressed in the



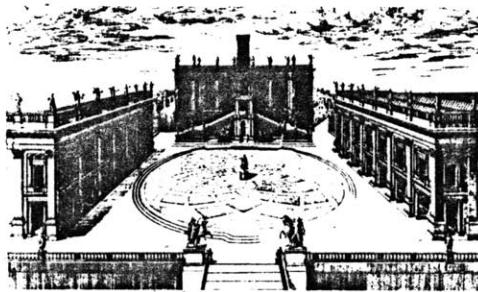
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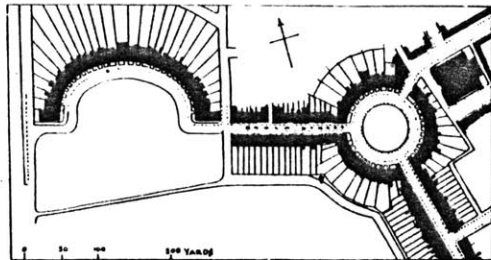
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staging of the Pizza della Santissima by Brunelleschi and Sangallo. Both show the preference of the orders of the Space over the individual building Mass.

THE CIRCUS
AND ROYAL CRESCENT
AT BATH



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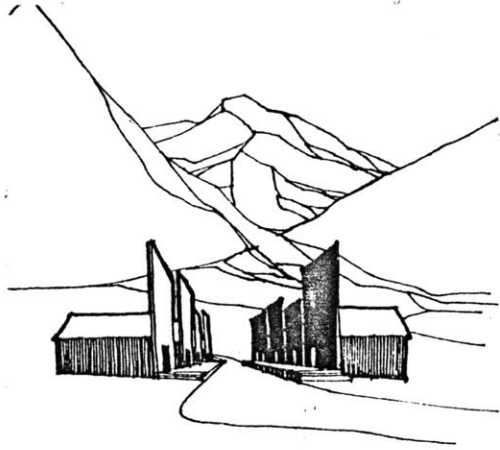
The Circus and the Royal Crescent in Bath (Figs. 19,20) were two projects of row houses built in the eighteenth century "for the entertainment of an anonymous and mixed society." The town was considered a form of resort where one came to "take the waters." ⁵

Built by John Wood the Younger, both the Circus and the Crescent in one respect resemble the squares of Paris already mentioned: from the pedestrian level they all are perceived as facades defining space. The facades are the container and form-giver to their respect space. As such, the orders to which these surfaces were originally governed have met with little change through the years. The only variations one encounters are the finishes of the entry doors themselves, and an occasional ivy-covered ground floor, neatly clipped at party-wall

center lines. Much more freedom for change has occurred at the rear of the units, where a variety of additions and extensions have resulted. This suggests the separation between individual freedom of expression and community consciousness which occurs behind the plane of the street facade.

THE WESTERN FRONT

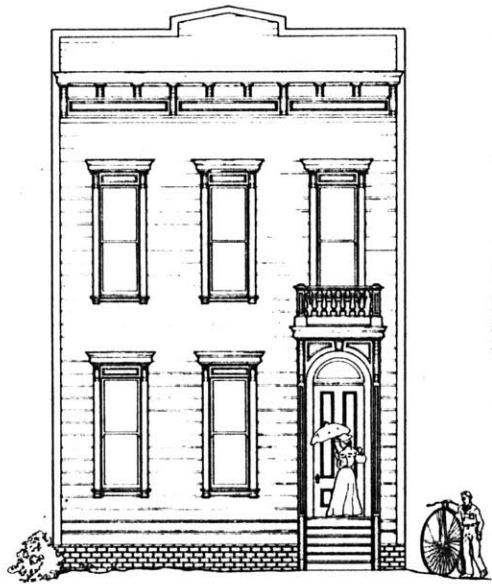
With the rapid growth of this country and the natural mover west in the 1800's came the development of "Main Street." From the Dakotas to the Panhandle of Texas, the crossing of two roads was usually sufficient stimulus to create a small community. The central and western states presented new problems to the early anonymous builder: that of vast open space. Along the central street, the false fronts covered the gabled ends of the structure behind them to create a larger urban scale, and to attempt to give shape and definition to the "street"⁶(Figs. 21,22). This type of building quickly became synonymous with the development of the West and was duly named the "Western Front." Moving further west



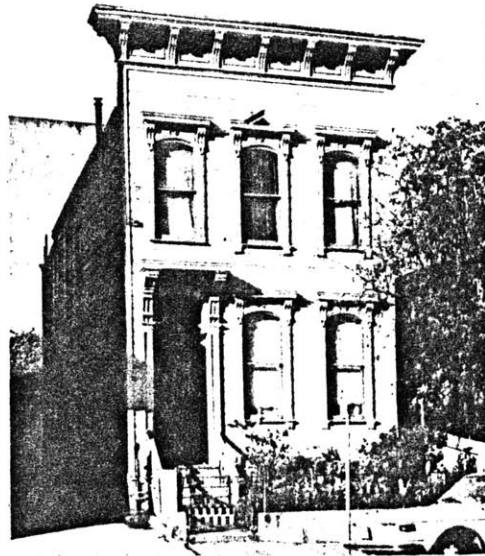
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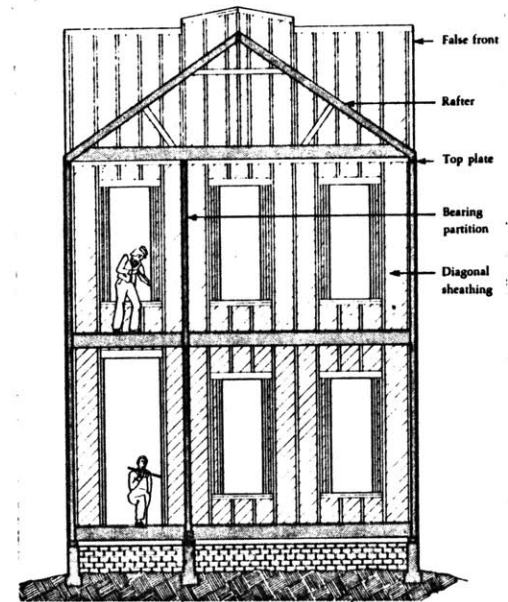
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to San Francisco, we find Victorian versions of the false front in single-family dwellings (Figs. 23,24,25).

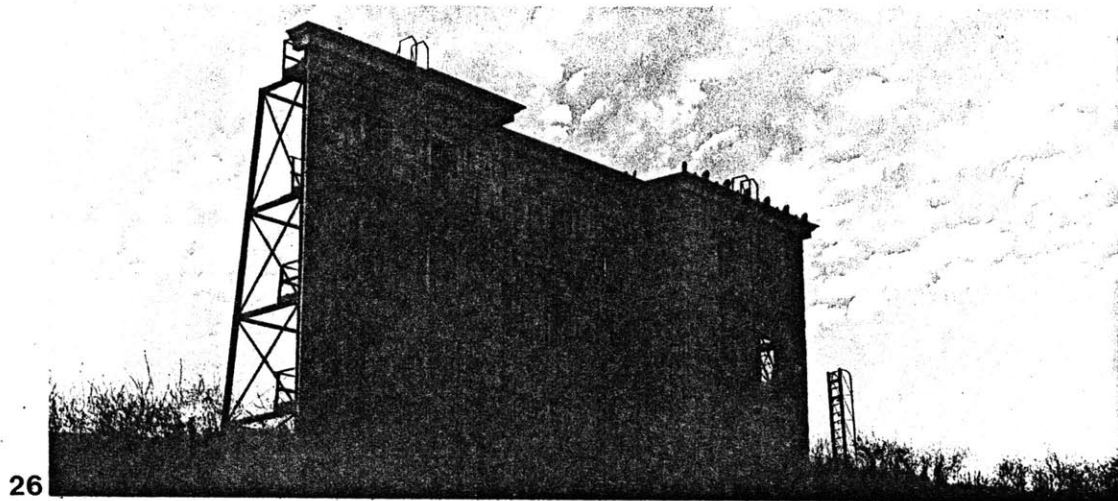
In The Place of Houses, Moore, Allen and Lyndon refer to this building effect as "enfronting":

Enfronting the site requires one face of a house to be made special in order to address a certain feature of the site. It is distinct from the way the rooms inside are assembled, since they can be put together to enfront one thing while the building enfronts something else in a different direction.⁷

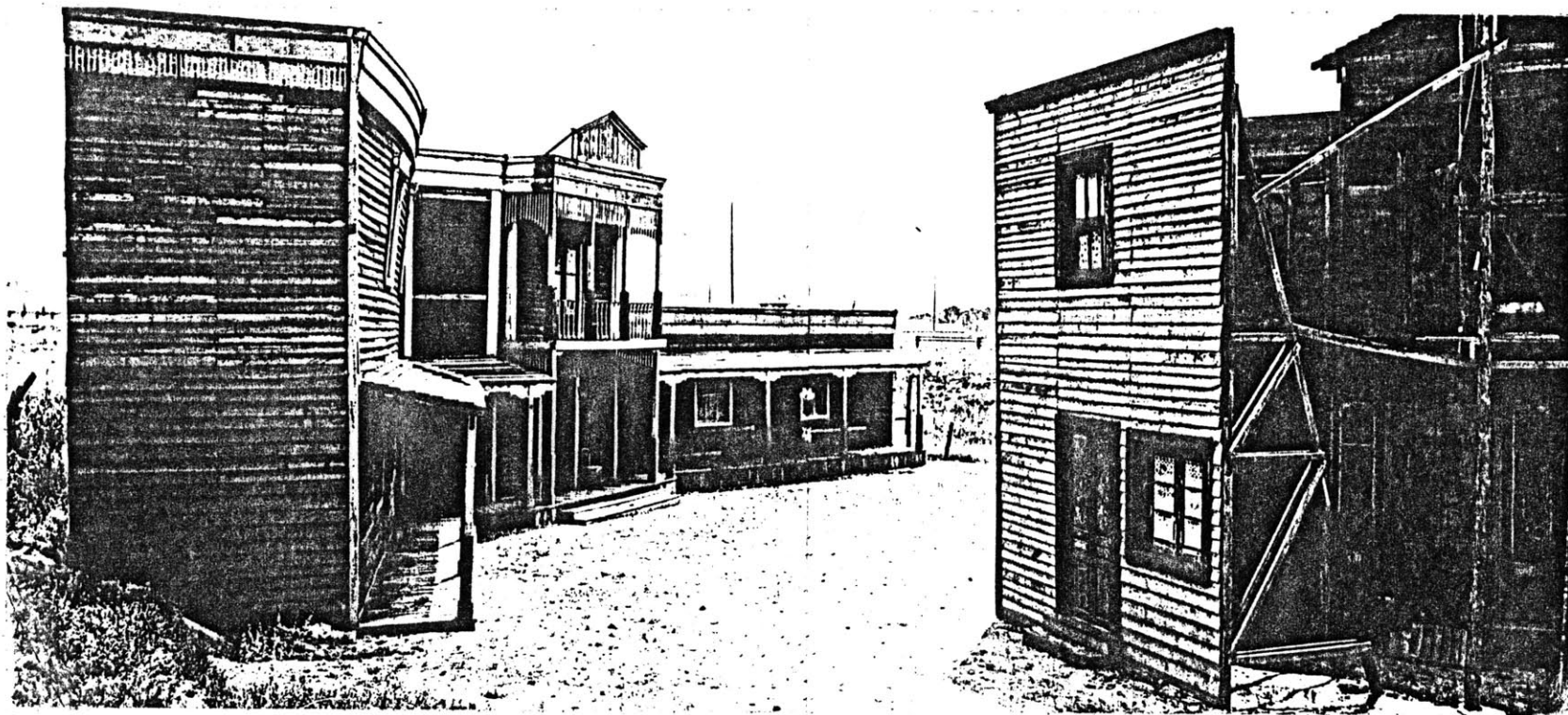
This is a clear distinction between the use of a facade as a definition for the space it faces, and the interior rooms it encloses.

THE HOLLYWOOD VERSION

With the invention of movies came an unexpected interpretation of the importance of facades in an environmental setting. The large movie companies of Hollywood--Warner Brothers, Twentieth Century Fox, Paramount, and others--created large back lots where set designers were set free to build past, present, and future environments. For



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example, for the filming of "Hello Dolly," Twentieth Century Fox recreated in great detail several streetscapes of a New York City neighborhood. These were two dimensional facades whose trompe-l'oeil effects were often painted on. And, of course, all of the studios produced their share of Western movies. So popular were these cowboy epics that the Western Town set facades were mounted on mobile platforms to be moved around at will to create the desired effect (Figs. 26, 27). Today, movie production is moving away from elaborate set designs as it is less expensive to transport an entire company many hundreds of miles to shoot on location than it is to create the same effect on the back lot.

Although architecture is concerned with many more variables than the false front of a movie set, this example provides us with an abstract view of the role of facades. They are without context, totally illusionary, and with only a single point of reference, that of the camera's eye.

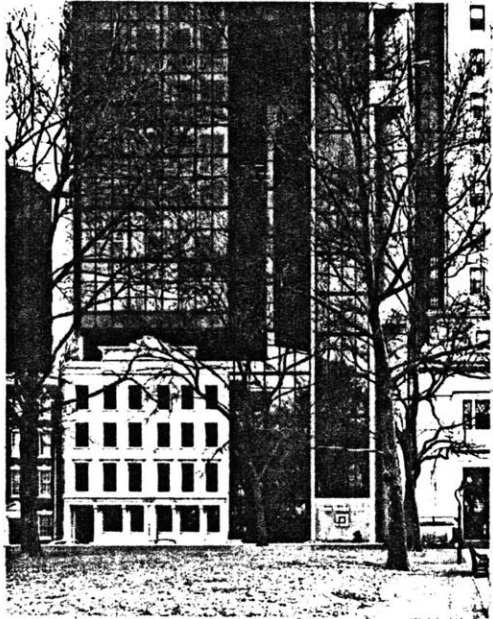
MODERN COUNTERPOINT

The point of these examples of Facades as interface between Mass and Space can be brought up to the present. There are several architects who, within the past ten years, have used Facades in variations of this theme.

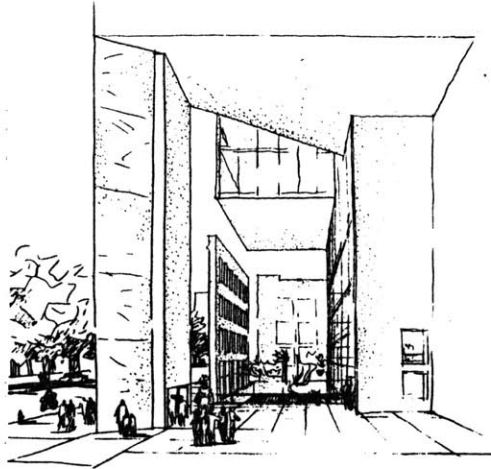
ROMALDO GIURGOLA

The Philadelphia architect, Romaldo Giurgola, was commissioned by the Penn Mutual Insurance Co. to design their new office building. This meant the demolition of the existing offices which were housed in a four story building with an Egyptian Revival facade that faced a city park. It was decided by the architect that this facade be retained and incorporated into the design of the new high-rise to preserve historical continuity (Figs. 28, 29). The facade, detached from the demolished office building, was raised to the level of "sculpture" or "monument" to create a source of "memory" for the line of the street.

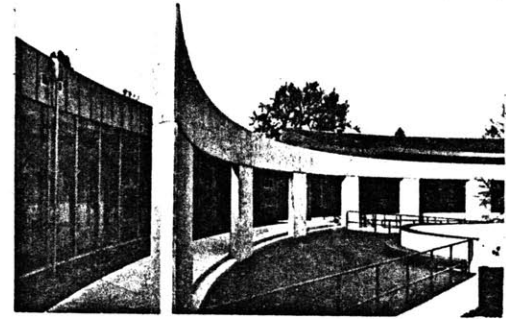
A second project by Giurgola that provides us with another use of a facade as interface is the Tredyffrin Public Library in Pennsylvania (Fig. 30). Opposite the



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all glass wall that opens into reading spaces was constructed a free-standing concrete wall. This provided a backdrop for terrace activities as well as year-round solar control for these south and west facing spaces. Here the "wall" could be better described as a "fence," or a "screen," but its use provides close similarities to all of the previous examples.

MELVIN CHARNEY

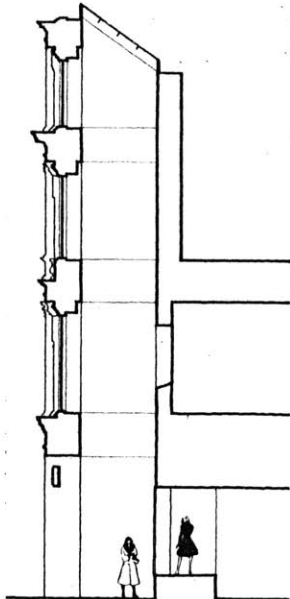
An approach similar to that used by Giurgola in the Penn Mutual Building was taken by the Canadian architect Melvin Charney in Montreal. In a district of the city where renewal efforts were underway, he detached and restored one of the row-house facades to establish a point of focus⁸(Fig. 31).

ROBERT VENTURI

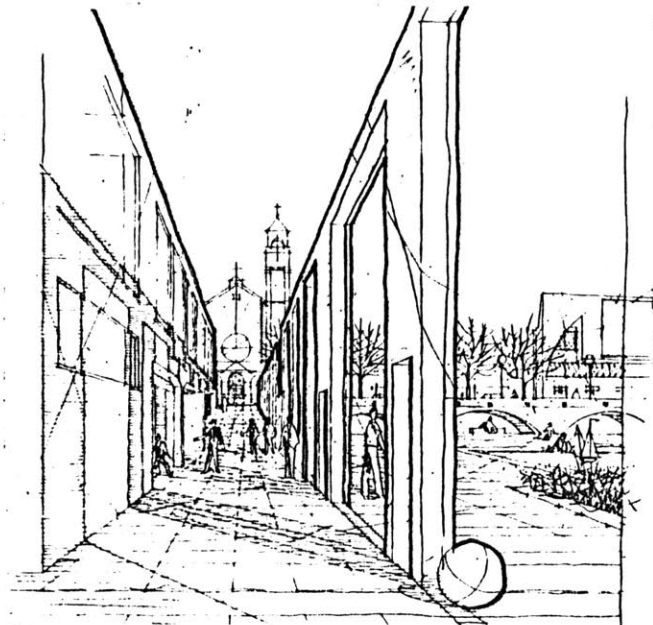
In the project for a new Y.M.C.A. in North Canton, Pennsylvania (Fig. 34, 35), Robert Venturi employed the use of Facade layering to solve the problem of interfacing the building with a space. Here, a screen wall



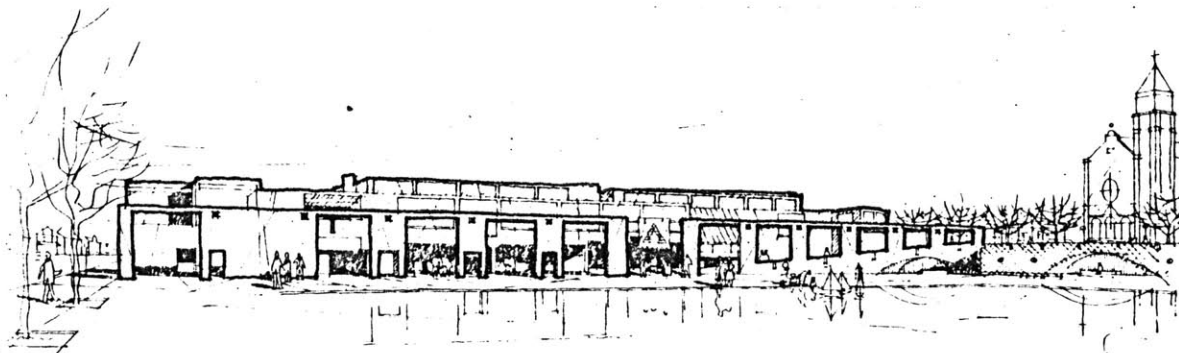
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was provided along the plaza front to simplify the openings and make them bigger. As Venturi describes, this is intended to help relate the "Y" to the much bigger factory building across the square.⁹ Along the back of this wall, the true facade of the building reflects the complexities of the program requirements within. It was the importance of the plaza and the relation of the new building to the existing elements of context that Venturi recognized. The problem of Building Program and Plaza Facade were handled separately and eventually integrated.

HOLT ASSOCIATES

In Boston's downtown shopping district, architects, urbanists, and preservationists banded together on behalf of the nineteenth-century facade of Jordan Marsh Co., one of New England's largest department stores. The old building was scheduled for demolition to make way for new facilities (Figs. 32, 33).

Architects Stephen Holt and Richard Bosch of Holt Associates proposed an alternate scheme to tearing down the old to make way for the new. Their proposal shows new retail space inside the existing facade. Except for lateral bracing, new construction and facade restoration could proceed independently.¹⁰ This is a very literal example of a facade relating to a space, rather than as the enclosure for a building's mass. The two functions require two completely different solutions.

CONCLUSIONS

The objective of presenting these examples is to explain a point of view of Facades and the role they play as elements of space as well as of buildings. It is a reversal of "Form follows Function" in certain circumstances. The dilemma arises when an architect is confronted with strict program requirements on one hand, and a very specific physical context on the other.

What this suggests is the separation of the one larger

problem into two distinct categories: solutions for interior program requirements; and building facade as articulation for the street or park on which it faces.

It was this approach that was taken in my study of a new housing proposal for the South End of Boston.

The ROW-HOUSE



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In America, most metropolitan areas of the Northeast utilized the row-house building type during one point or another in their histories. Although borrowed from earlier European developments, these "townhouses" served the purposes of the early American city dweller.

By the middle of the nineteenth century, this building type covered many square miles of Boston, New York, Philadelphia, Washington, and Baltimore¹¹ (Fig. 36).

Vincent Scully, in his book American Architecture and Urbanism, described the effect of these structures:

. . . the buildings are high enough to give the street a shape, the doors and windows showing the scale of human use, the red brick of the defining walls varying in tone and therefore seeming to flow in and out down the street, the window cornices marking a beat, syncopating the rhythm, the major cornices giving the whole street-shape a volumetric definition. They were the strongest definers of domestic streets ever produced in America.¹²

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Because of the craftsmanship of the time and the use of durable materials such as brick and stone, nineteenth-century row-houses have withstood the onslaught of time. They also constitute an important part of the building stock in many of our city centers. Today these areas are being assigned historic monument status, with attempts at preservation and restoration.

THE BOSTON VARIATION



In Boston such communities as the Back Bay (Fig. 37), Beacon Hill and the South End are all examples of the row-house development. With variations in style, each of these neighborhoods have produced their own unique character. The use of entry stoops, bay windows, roof shapes, ornamentation, and the changes made by tenants, both good and bad, are the elements that have created the differences from street to street. The one common denominator that they all share is the singular presentation of a two-dimensional plane, the Facade, to the space of a street.

The South End bow-front was chosen as a test case for this study for several reasons:

- 1) the area has an abundance of row-house examples, all of which address themselves to the relationship of facades and spaces;
- 2) it provides the desired context for a new housing proposal based on the existing building prototype, i.e., four- to six-story walk-up row-house dwelling units;
- 3) the row-house format lends itself to the utilization of the concept of supports and detachables as defined by the S.A.R. Methodology.

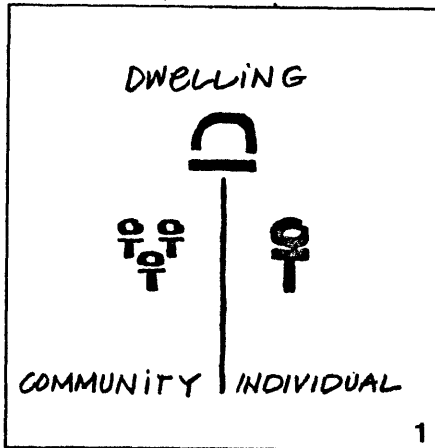
In addition, my personal experience of having lived and worked in the South End provides me with first-hand exposure to the intricacies of the neighborhood.

The SAR Method

The second part of this thesis deals with the use of the Dutch S.A.R. (Stichting Architecten Research) Methodology as a tool for developing a housing strategy behind the Facades of the South End row houses. To understand this approach to housing, it is necessary to outline the basic philosophy of the method.

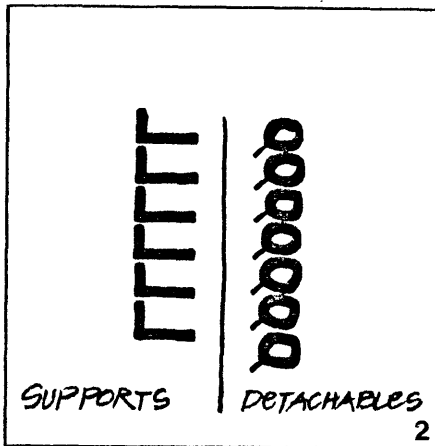
As an alternative to mass housing of the post-war period, a group of Dutch architects formed the S.A.R. Institute and put forth the concept of support structures and detachable units. After ten years of research and implementation, pilot projects have been built in several countries in Europe. These projects have subsequently been absorbed by the housing market with great success. The common denominator to which their success has been attributed is the guaranteed adaptability of the dwelling to the user's needs, now and in the future.

The Basic Principles of the SAR Methodology are:



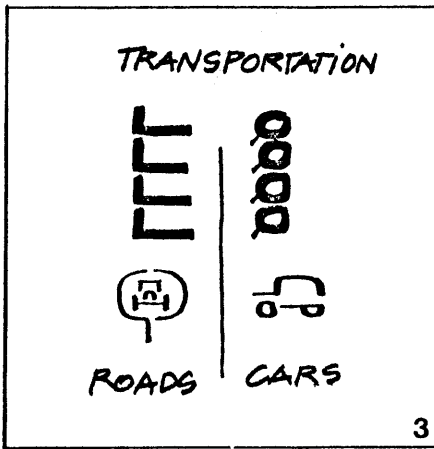
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1. A dwelling is the responsibility of two parties: the user (right) and the larger community (left); the dwelling exists partly in the private sphere and partly in the public sphere.¹³



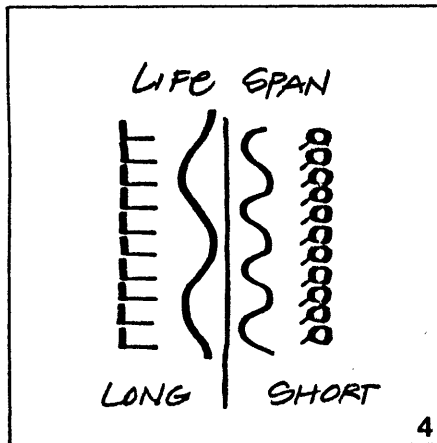
39

2. These two spheres should be reflected in production. The Support is the product of the public sphere. The Detachable units are products of the private sphere. The Support is a building, a piece of real estate. The Detachable unit is a piece of durable consumer goods.¹⁴



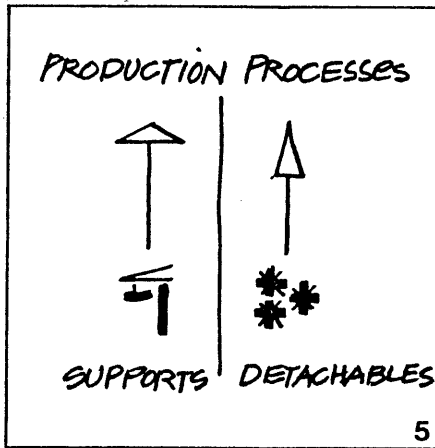
40

3. An analogy with transportation can be made. Transportation needs roads in the public sphere and cars in the private sphere. It is not possible to produce transportation, but roads and cars can be produced separately. It is equally impossible to produce a dwelling, but supports and detachable units can be produced.¹⁵



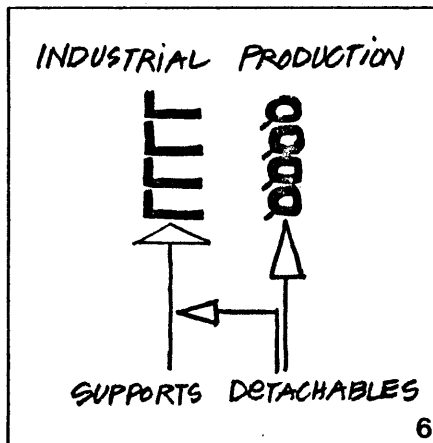
41

4. Supports and detachable units have different life spans. The support can be used for several generations. The detachable units are less than one generation.¹⁶



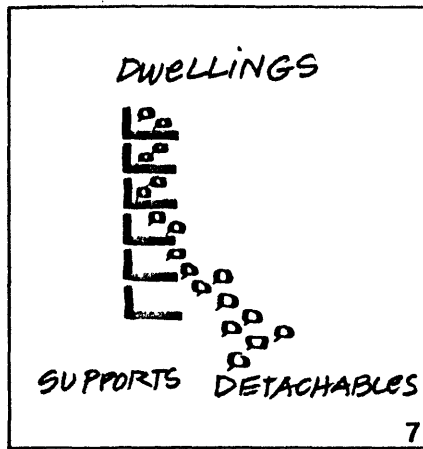
42

5. Supports and detachable units need different production processes. The support is the product of building. The detachable unit is an industrial product like any other durable consumer goods.¹⁷



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6. Industrial production therefore has a dual role. It produces directly the detachable units for the user. It produces also elements out of which support structures can be built.¹⁸



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7. Support and detachable units are brought together by the user; the result is the dwelling.¹⁹

THE SAR ALTERNATIVE

There are several points one must consider to understand the need for the S.A.R. approach to Mass Housing. Present day "solutions" have become part of the problem. Uniformity and monotony are no longer considered acceptable. The public outcry against the rigid mass housing projects of the post-war period has reached the marketplace and has seriously affected the salability of public housing. The nonadaptable buildings of traditional mass housing cannot meet future needs. What we build today will be used beyond the year 2000, and it is inconceivable

that people then will accept the lifestyles and standards on which these buildings are based today. The user wants emancipation--he wants the power to decide about his own dwelling.²⁰

This approach to mass housing has yet to be tested in this country, and in only a few isolated cases has it been tested in Europe. But the success of the European experiments suggests that the idea of Supports and Detachables may be an inevitable conclusion worldwide.

SAR: Levels of Organization

The basis for the S.A.R. method is divided into four levels of organization: 1) the Urban structure; 2) the Urban tissue; 3) Supports; 4) Detachable Units. Each level deals with both physical and theoretical elements of the urban environment. To simplify the scope of this study, however, I will briefly outline each level, dealing with the physical elements and the position that the South End Case Study has at each level.

? URBAN STRUCTURES

As the term implies, urban structures are those broad elements of our cities that give each its particular character. These include major circulation arteries, freeways, turnpikes, railroad lines, rivers, as well as geographical particulars, that may be integrated with a city's matrix. In Boston, one can point to the Boston Bay, the Charles River, the Massachusetts Turnpike, Route 128, the Southeast Expressway, and others.

These are the major elements of the Boston Urban Structure. As we move closer in scale and focus on specific areas of the metropolitan area, other elements become evident. Within the city of Boston, there are separate areas, such as the Downtown, Back Bay, Beacon Hill, and the South End that share interlocking elements.

In the case of the South End, parts of the urban structure not only link it to its adjacent areas, but also define its borders. These are: the New York, New Haven, and Hartford railroad lines to the Northwest; the Southeast Expressway to the Northeast and Southeast; and a series of streets bordering the Dorchester community to the Southwest. The major arteries that traverse the South End and link it to its neighbors are: Columbus Avenue, Tremont Street, Washington Street, Albany Street, and Massachusetts Avenue. This can be considered the urban structure of the South End. The block areas within these elements can be defined by the concept of "tissues."

TISSUES

The second level of the S.A.R. Organization Method is Urban Tissues. These are general agreements on certain rules which determine the disposition of elements in space on the community level. The combination of accepted rule systems and spatial characteristics of an urban area are manifested by both positional and dimensional elements, as well as behavioral elements. These include density, building types, pedestrian and automobile patterns, private and public spaces.

SUPPORTS

The support concept is one in which the dwelling is the product of two spheres of responsibility and decision-making. It is the result of a process in which the user can make decisions within a larger framework of communal services and infrastructure. In any community where large numbers of people have to share a limited amount of space, it is no longer possible to think in terms of separate lots and individual houses. Therefore, when the philosophy is applied to mass housing in a dense environment, it is concerned with larger structures,

either low-rise or high-rise, that contain a number of dwellings.

A Support is any building intended to contain a number of dwelling units, which can individually be adapted to the ever changing needs and desires of the users over the course of time.²¹

DETACHABLES

The major difference between support and detachable is one of control and decision-making. The detachable unit is that area over which the individual decides. It includes all the elements of the dwelling that the user can manipulate without affecting the infrastructure in which he lives. The detachable is independent of the support structure and is normally non-load-bearing. If the resident wishes to change these elements, he may do so without concern for collapse of the structure in which it is placed.

In this thesis I have focused on the level of Supports and the integration of the Street Facade as an element

of the Support. The issues of Urban Tissues and Detachable Units are only briefly discussed in this thesis as a frame of reference for the Support within the collective S.A.R. methodology.

The SOUTH END Boston

HISTORY

In the seventeenth and eighteenth century, before anyone began tinkering with the outline of the Shawmut peninsula, filled land, or built bridges, Boston was connected to Roxbury by a very narrow neck of land, along which ran Washington Avenue. This was widened during the early nineteenth century by the filling in of the Back Bay. The creation of all this new land in the direction of Roxbury led to some ambiguity in geographical terms. Due to its proximity to the center of the city, there was a tendency to think of this as an extension of the downtown area to the south and to apply the term "South End"--hence, the name.²²

During the first half of the nineteenth century, the area, although laid out into streets, developed slowly. Beginning with the 1850's, it rapidly grew into a region of high shouldered blocks, with red brick or brownstone

houses with bow-fronts, high stoops, and Mansard roofs. The avenues and cross streets having been developed, the building blocks were rapidly filled in with due regard to the architectural unity of the block.²³

The South edge of the land fill along the shore was intended for industrial development, which in the short period of only thirty years, caused a change of occupancy. The single-family dwellings were converted into apartments and rooming houses for low-income people and remained in this condition until the late 1960's.

With the election of Mayor John F. Collins and the appointment of Edward J. Logue as Development Administrator in 1960, Boston began an urban redevelopment program that was unparalleled in its history. The South End received its share of assistance, both for public services and new projects which attempted to provide solutions to the housing shortages in the area.²⁴

Typical of the times, a variety of housing types were built, mostly low-rise housing blocks positioned with monotonous repetition. Many of these public projects have become unkempt slums that are dangerous and unhealthy.

HOUSING ATTEMPTS

One objection to the housing projects started during this boom period is that none of them made any attempt to respond to the character of the existing neighborhood in which they were placed. In addition, as in most public housing projects, the user was systematically excluded from the decision-making processes. The result was the creation of a damaging social stigma, that of living in a "Project" (Fig. 45). Even though the services in these new structures were often better than the century-old brownstones, they were nevertheless looked down upon by those still living in the older structures. The reasons for this are embedded in the need for self-expression and individuality. The dweller of one of the nineteenth-century brownstones can identify his home by



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describing the variation in his entry door, the type of stoop, or variations in the window treatment. The "Project" tenant is forced to resort to a building block number and apartment number.

This failure of public housing is not unique to the South End, nor is it as serious a problem compared to other parts of the Boston Metropolis, or other cities. A typical example of a more deplorable situation is the "war zone" of the Bedford Stuyvesant, an area in New York, where housing blocks have been burned by tenants in protest of the inhuman conditions of public projects. Nor has Boston seen conditions such as those which brought about the demolition of the ill-fated Pruitt Igoe housing project in St. Louis, Missouri.

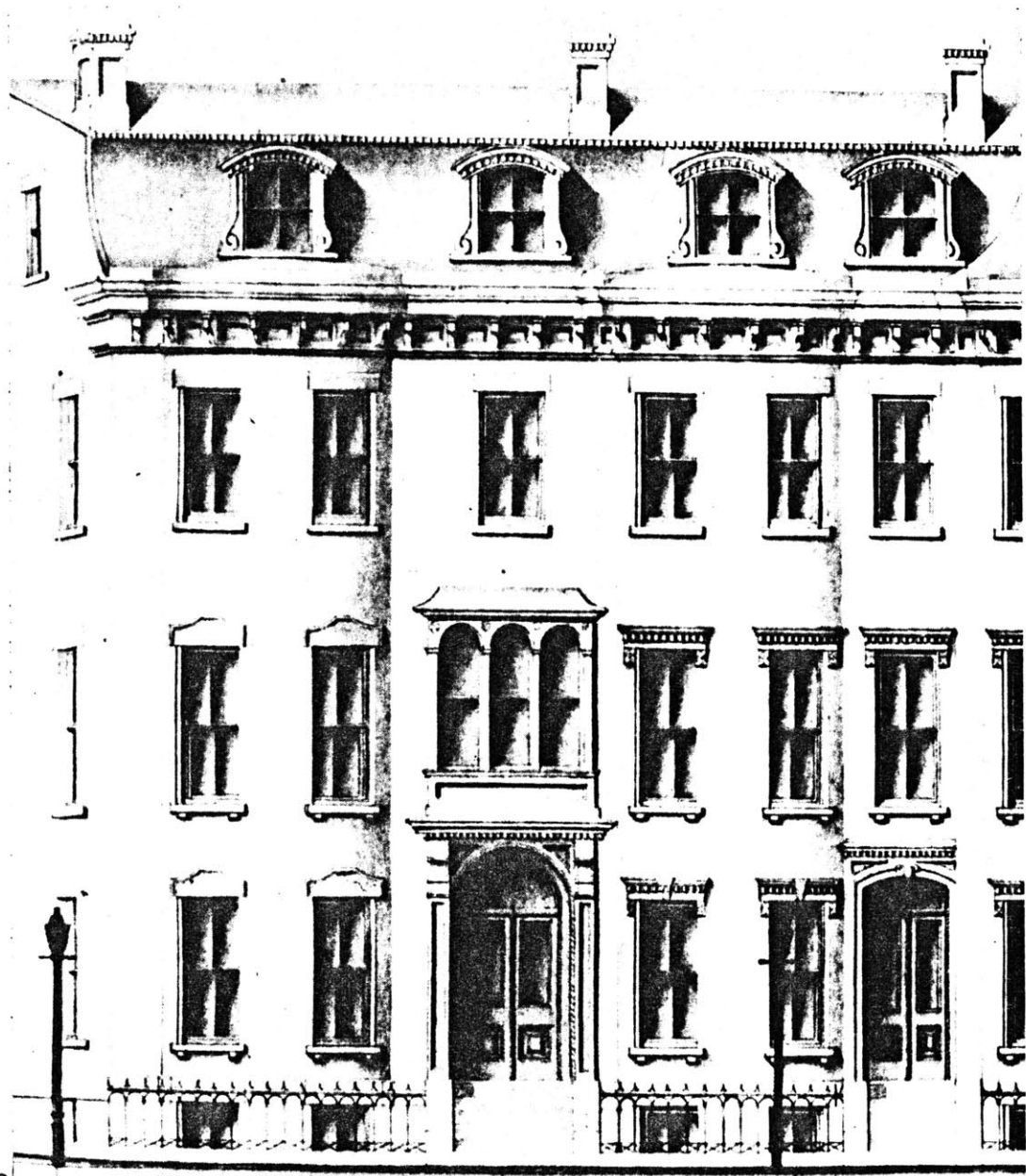
It is the general consensus that the South End is on an upswing in its development. Due to the shortages of available housing and the proximity to the downtown area, the South End has attracted middle- and upper-income

families and developers who have converted the existing building stock into high-rent dwellings. As a result, large investments in renovations and restorations have proven to be an obvious plus for the area. However, this new input has had adverse effects on the market for South End row-houses. Prices have sky-rocketed to the point that only these middle- and upper-income families can afford them.

Both city and federal programs have tried to make housing available to lower-income groups by developing new projects as well as subsidized financing, but this has proven ineffectual. The cost of materials and labor have risen disproportionately to the help these programs provide. The various ethnic groups that have been well entrenched for generations are finding it impossible to meet minimum finance requirements to upgrade their existing conditions or compete with tax and rent increases that have resulted from "market improvements."

The South End Boston

CASE STUDY



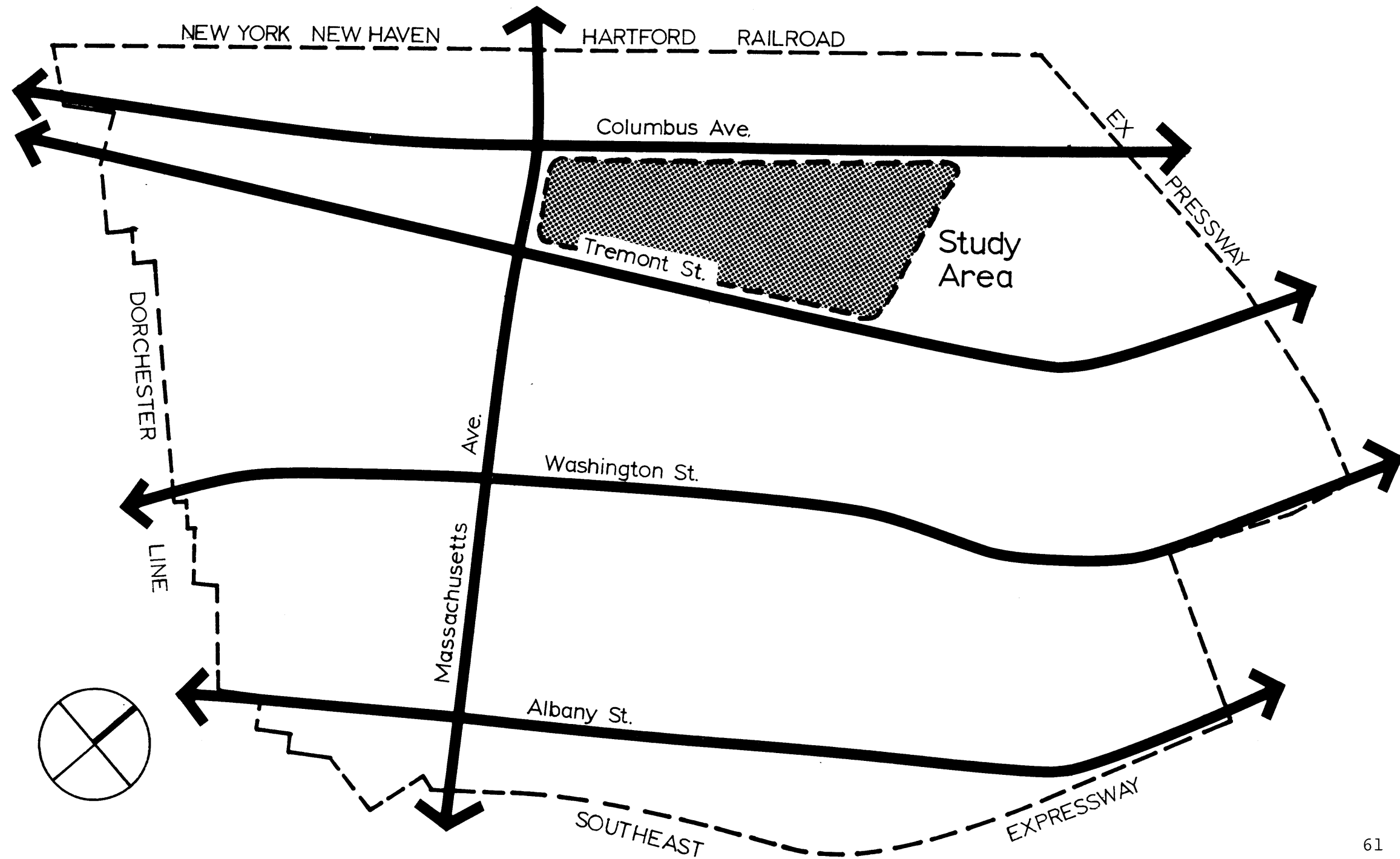
The SOUTH END Neighborhood

As illustrated by the map prepared by the Boston Redevelopment Authority in 1965, the South End is well defined by physical lines of demarcation on three sides, and a politically designated line on the fourth side (p. 60). The elements of the Urban Structure are clearly marked (p. 61), and the neighborhoods defined between the major arteries are communities with varying and distinct characteristics. The row houses in these neighborhoods show the great possibilities for variation within a single building type. Having been built at different stages in the development of the South End and by different builders, these structures range from two to six stories, with each builder or architect giving his own interpretation to the street Facades.

For this study, a specific area of the South End was investigated for selection of a role model neighborhood.

SOUTH END
Area Map

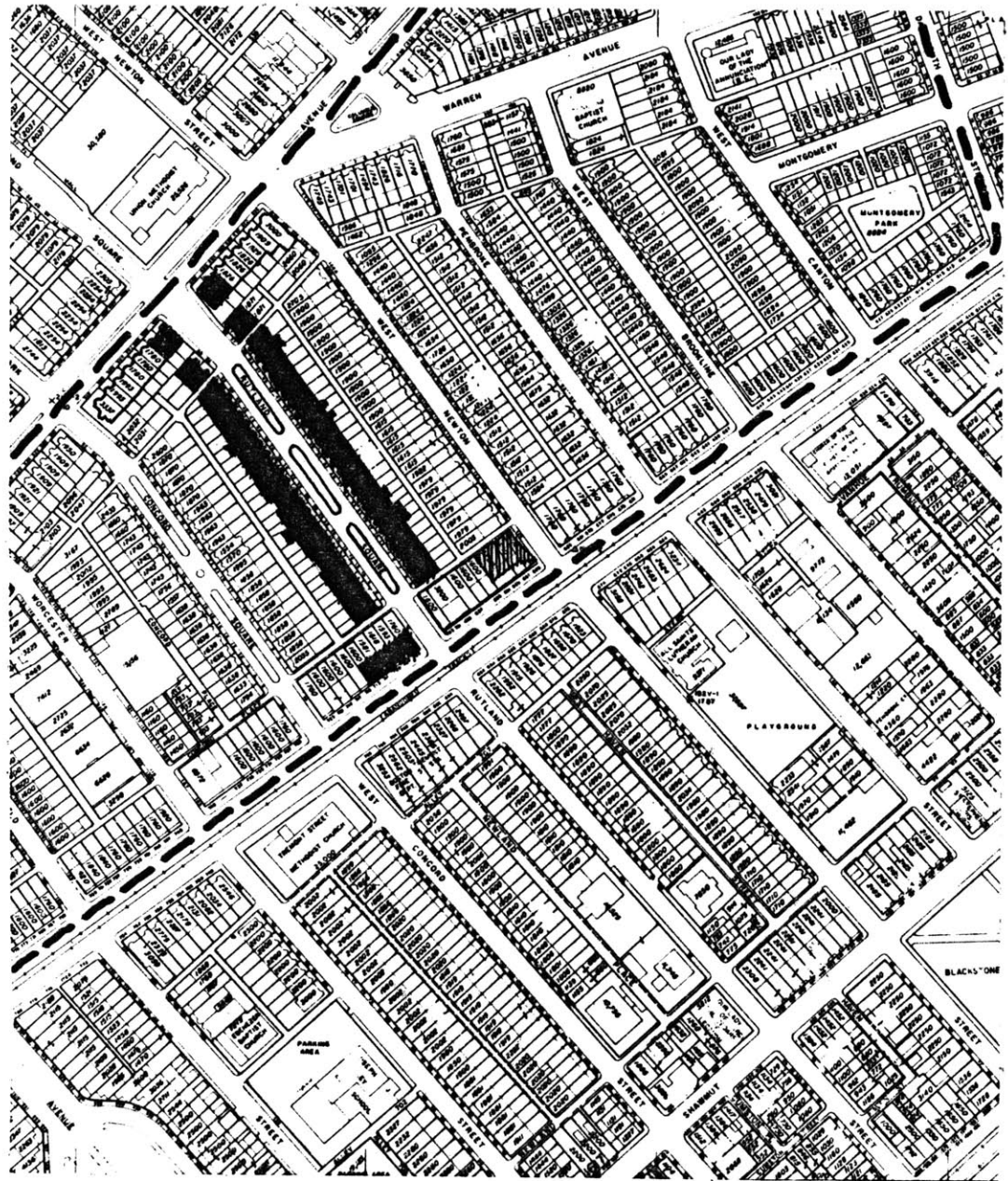
MAJOR ARTERIES
Urban Structure



SOUTH END
Area Map Detail

Neighborhood
Study Area

RUTLAND SQUARE



B.R.A.

1965



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This area is bordered by Columbus Avenue to the Northwest, Dartmouth Street to the Northeast, Tremont Street to the Southeast, and Massachusetts Avenue to the Southwest. Within this area are several tree-lined streets which have been given the term "squares." These are not as the term implies, but vary from the typical street by the fact that the two opposite lanes of traffic are divided by a green strip. This central piece of greenery was originally intended as a private garden area for the exclusive use of the homeowners whose houses bordered the street.

As a case study, Rutland Square, between Columbus Avenue and Tremont Street, was chosen (p.). This strip of housing has many of the elements that typify South End living. There are two basic reasons why this "square" was chosen over other streets: it provides the contextual conditions for studying the Facade as an element of Space and Building Mass; and as a "square" it provides an additional amenity of a median green strip to enhance

the space between the block Facades--an amenity which is often lacking in public housing.

The following are photographs of the existing Facades on Rutland Square (p. 65). It can be seen that within the context of the row-house, bowfront configuration, a great deal of variation occurs. Because of the variety that exists, I selected one particular type to illustrate the specific elements that make up the predominant character of the "square." This was a six-level, curved bowfront unit with raised stoop with Mansard roof with dormers (p. 65).

The lot dimensions for this type vary slightly, but the average lot ranges from 20'-0" to 22'-0" wide and 85'-0" to 90'-0" long. The lot lines border the public sidewalk on the street side and the service alley at the rear. The building itself is set back from the property line to accommodate the stoop which provides access to the second level entry. The depth of the structure is

Case Study
FACADE

RUTLAND SQUARE



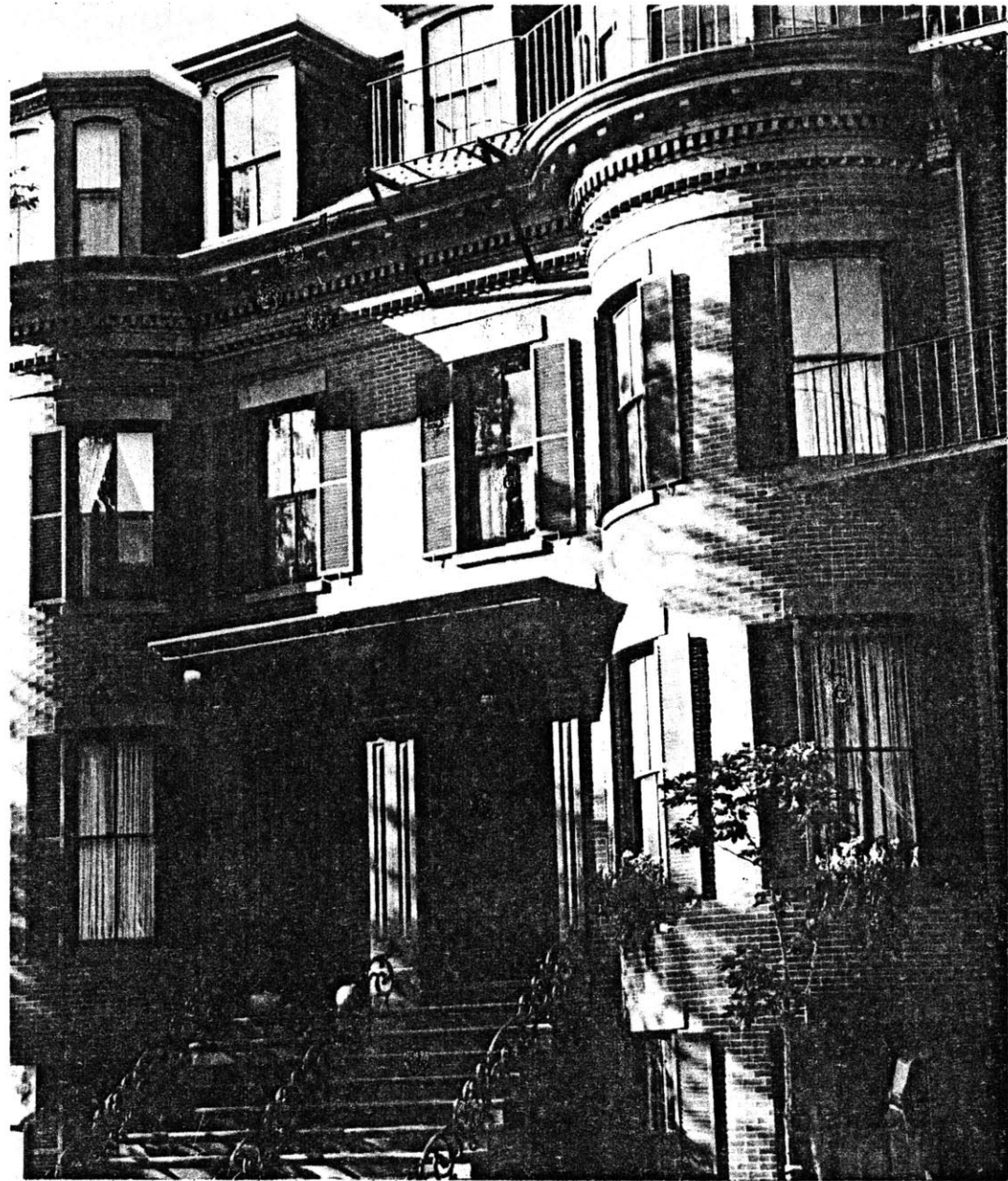
Case Study
FACADE

RUTLAND SQUARE



Case Study
FACADE

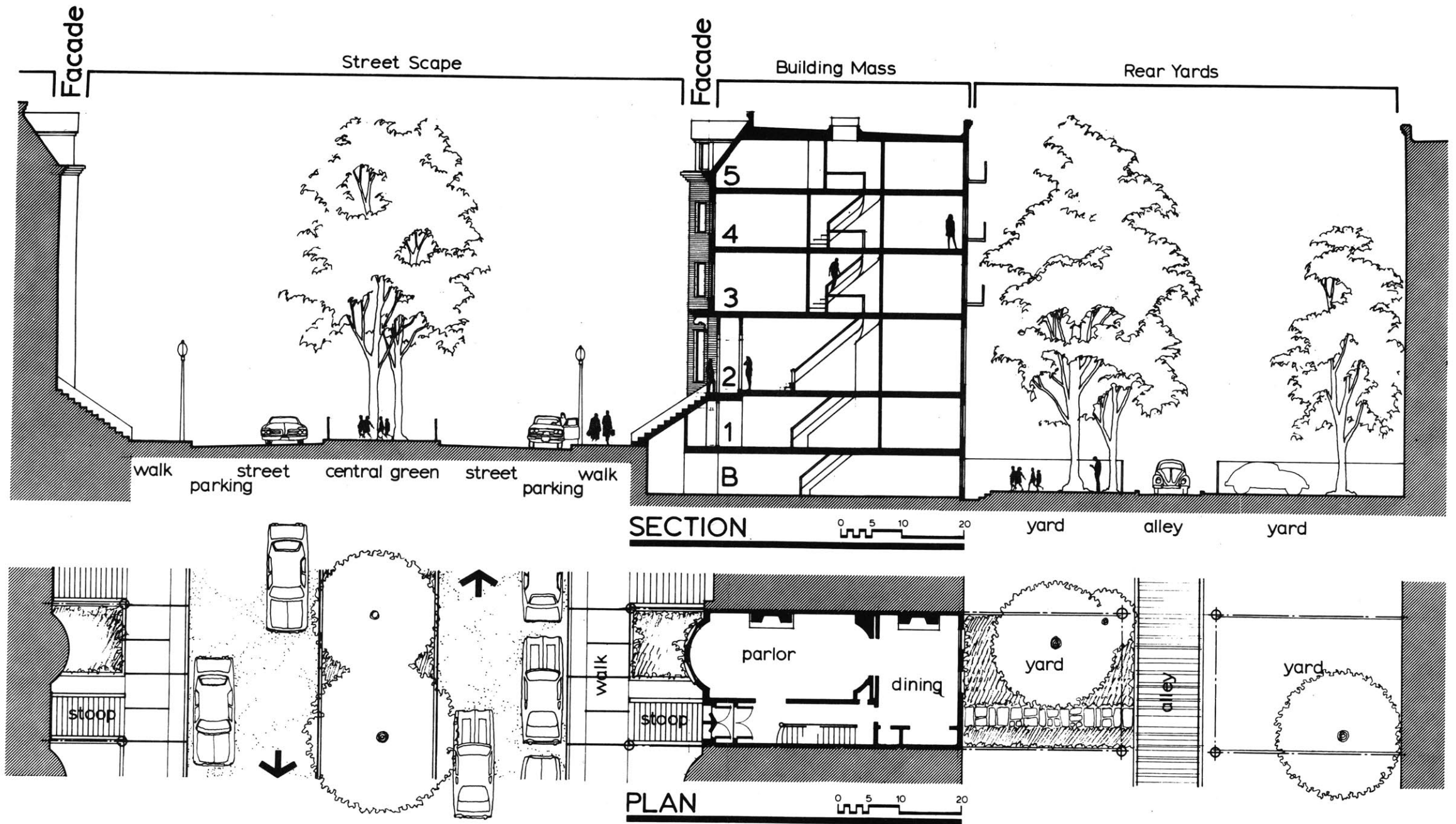
RUTLAND SQUARE



approximately twice its width, 40'-0". This leaves the remainder of the lot for rear yard space. Vertical circulation is totally internal, with fire exits to narrow metal balconies connecting adjacent units on the rear wall (p. 69).

Existing Dwelling Type

RUTLAND SQUARE



South End CLUES.

Since this study is intended to be a strategy proposal rather than a building proposal, no specific site was chosen. The object, then, is to show the process of analyzing an existing set of circumstances and to adapt the positive and constructive elements of those circumstances into a contemporary version.

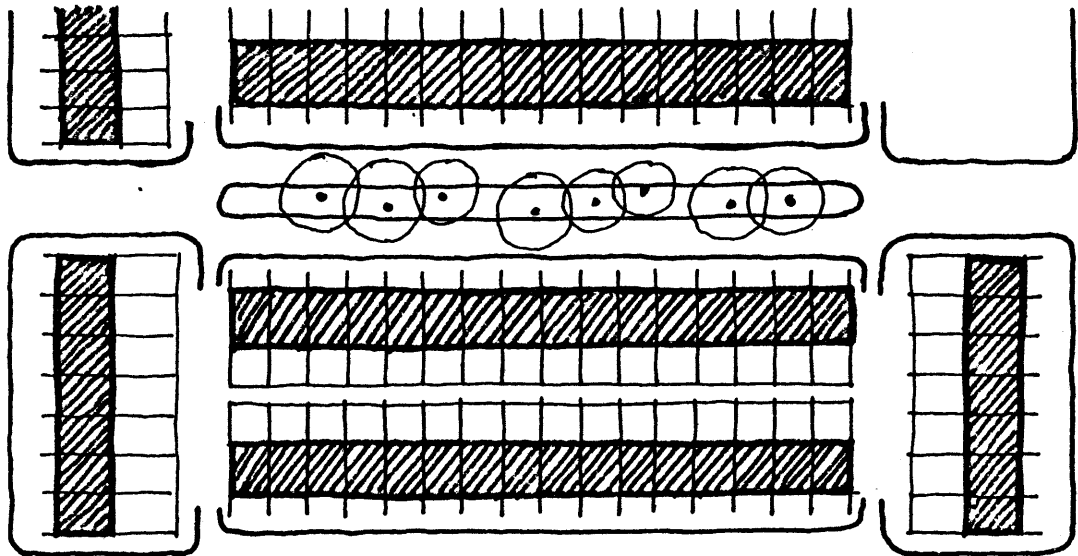
As a starting point, certain clues were defined as desirable elements to be used in the design of new housing for the South End. These are:

- the neighborhood tissue--central green strip dividing the street; access to center block alley; street connections to major arteries (p. 72).
- generic lot and building coverage--general size and location of building on the lot (p. 73).

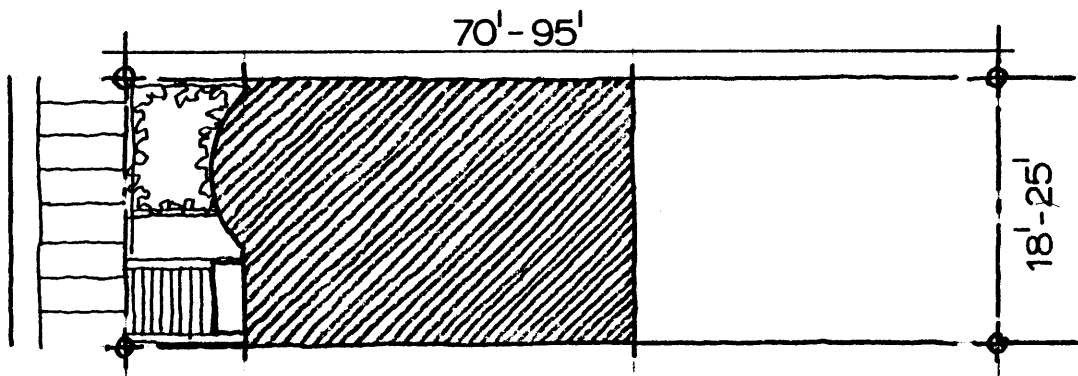
- maximum building height of six levels, with the main entry at one story above street level, and a secondary entry at street level below the stoop (p. 73).
- the facade should have a bow front bay and a flat front bay; a prominent cornice line above the fourth floor; sloped roof with dormers; and a higher floor to ceiling height at the main entry level for accent (p.74).

These elements form the basis for design parameters to begin schematic design. They give a general description of the generic building type upon which the remaining analysis will depend.

South End CLUES

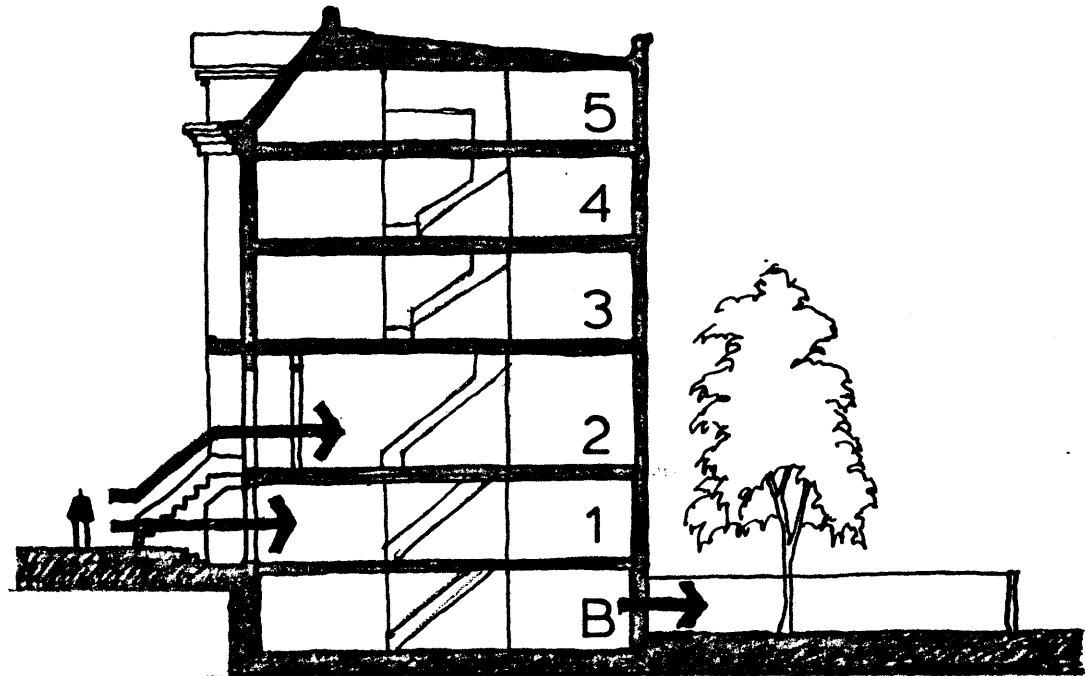


Neighborhood Tissue

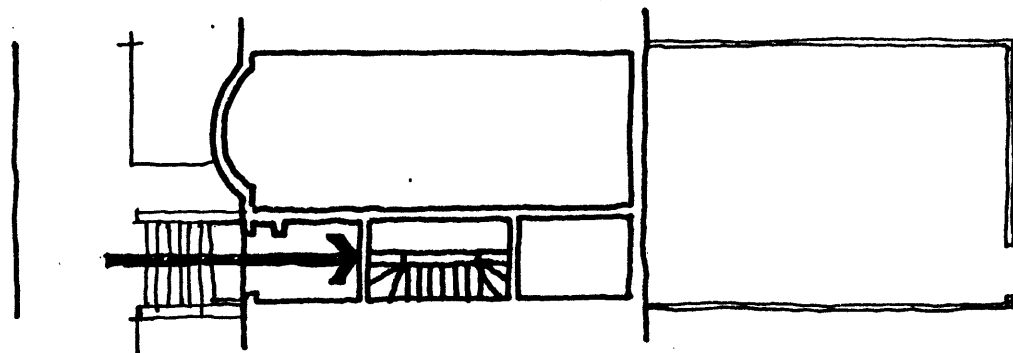


Generic Lot and Building Coverage

South End CLUES

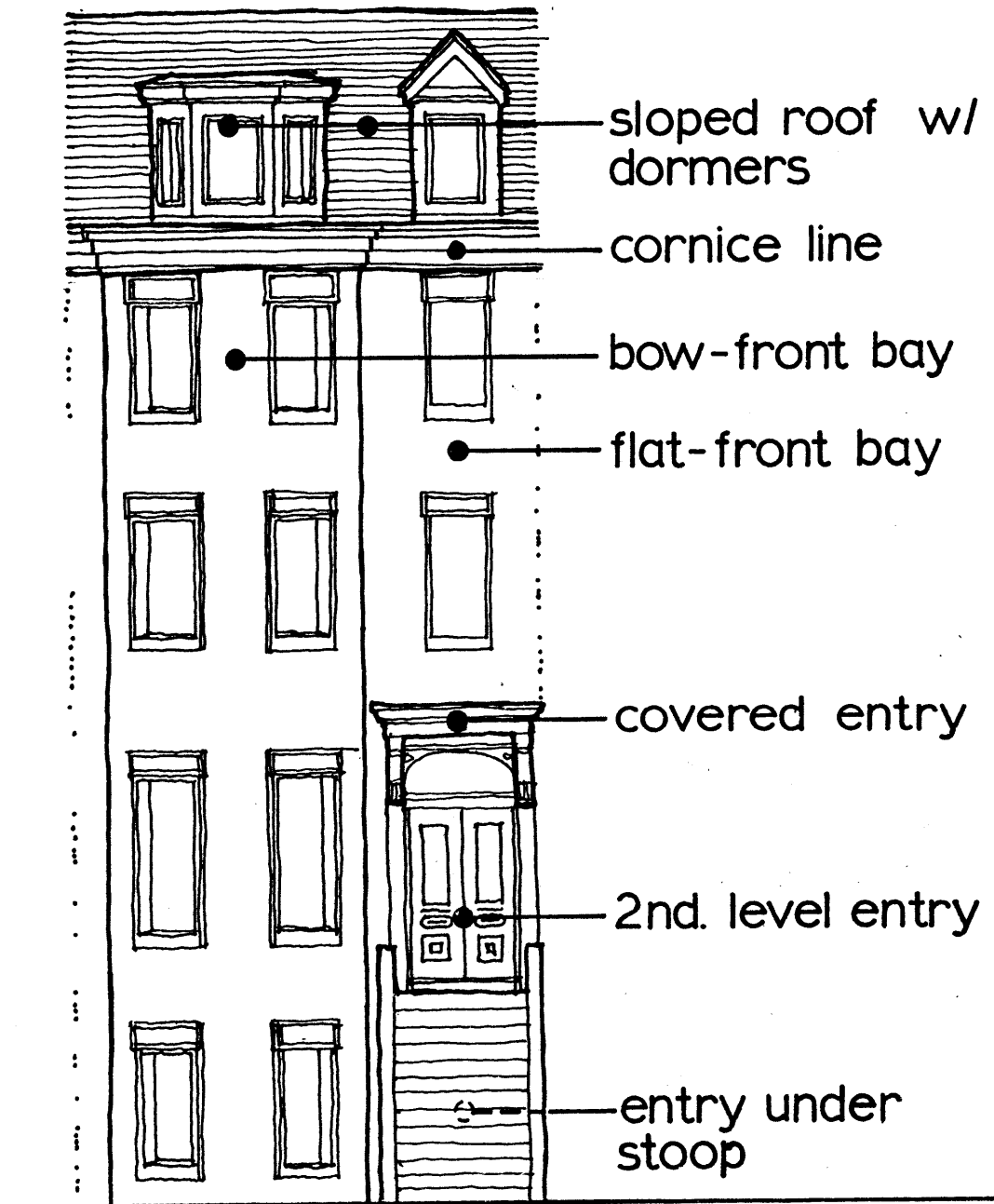


Double Level Entry



Internal Vertical Circulation

South End CLUES



FACADE As Support

In the situation of row-house dwellings, the effect of the collective row is greater than the individual unit. It is the sum of the parts that gives life and character to the neighborhood spaces which it defines. The facades of the South End bowfront dwellings are the starting point for the proposal outlined in this thesis. The correlation between the importance of row-house facades and the concept of supports can be defined by the various levels of the decision-making processes. Since the nature of the street depends so heavily on the facades that border it, a support in this context must make a greater commitment to these facades.

To do this one must understand all the elements that contribute to the vitality of a neighborhood facade. These can be reduced to two basis categories: Physical architectural components; and the decorative manipulation

by the user that gives individual expression to each dwelling. It is the latter of the two that is crucial and most often missing in public housing projects. Both of these elements combined are needed. A balance between the two must be provided within the facade; sufficient architectural structure and detailing to reinforce the design of the street; and potential for user participation in deciding on the nature of the individual dwelling expressed in the facade.

These factors are the philosophical basis for viewing the Facade as an element of the Support.

Design Of A Support

A support is that part of a habitable structure over which the resident has no individual control.²⁵

In the conventional method of producing housing, the major effort has centered around the unit floor plan. Once the basic unit is designed, it is repeated to create a larger complex. In a situation in which cost must be minimized and adherence to government standards and codes must be followed, while complex space and utility requirements must be accommodated in a restricted area, the basis floor plan is always a compromise.²⁶

In the design of a support, the floor plan of the dwelling unit is not the end product. It is the result of the user's input within the framework of a support structure. The unit plan cannot be the sole criteria for evaluation of the design of a support. It must be judged on its potential for accommodating a variety of dwelling unit

plans that satisfy individual requirements of different users throughout its lifespan. The methods developed by architects of S.A.R. provide the tools to cope with the problem of evaluation and design of Supports and Detachables.

The procedures for developing the design of Support are outlined in Variations; The Systematic Design of Supports, by Habraken, Boekholt, Dinjens, and Thijssen. Since it is the intent of this thesis to use the S.A.R. method as a tool, the procedures shall be briefly outlined to explain the accompanying drawings.

To begin, a generic dwelling type must be defined. This is the result of outlining specific clues taken from the existing South End dwelling type, and used as design criteria (p.). From these, general schematic design features were established:

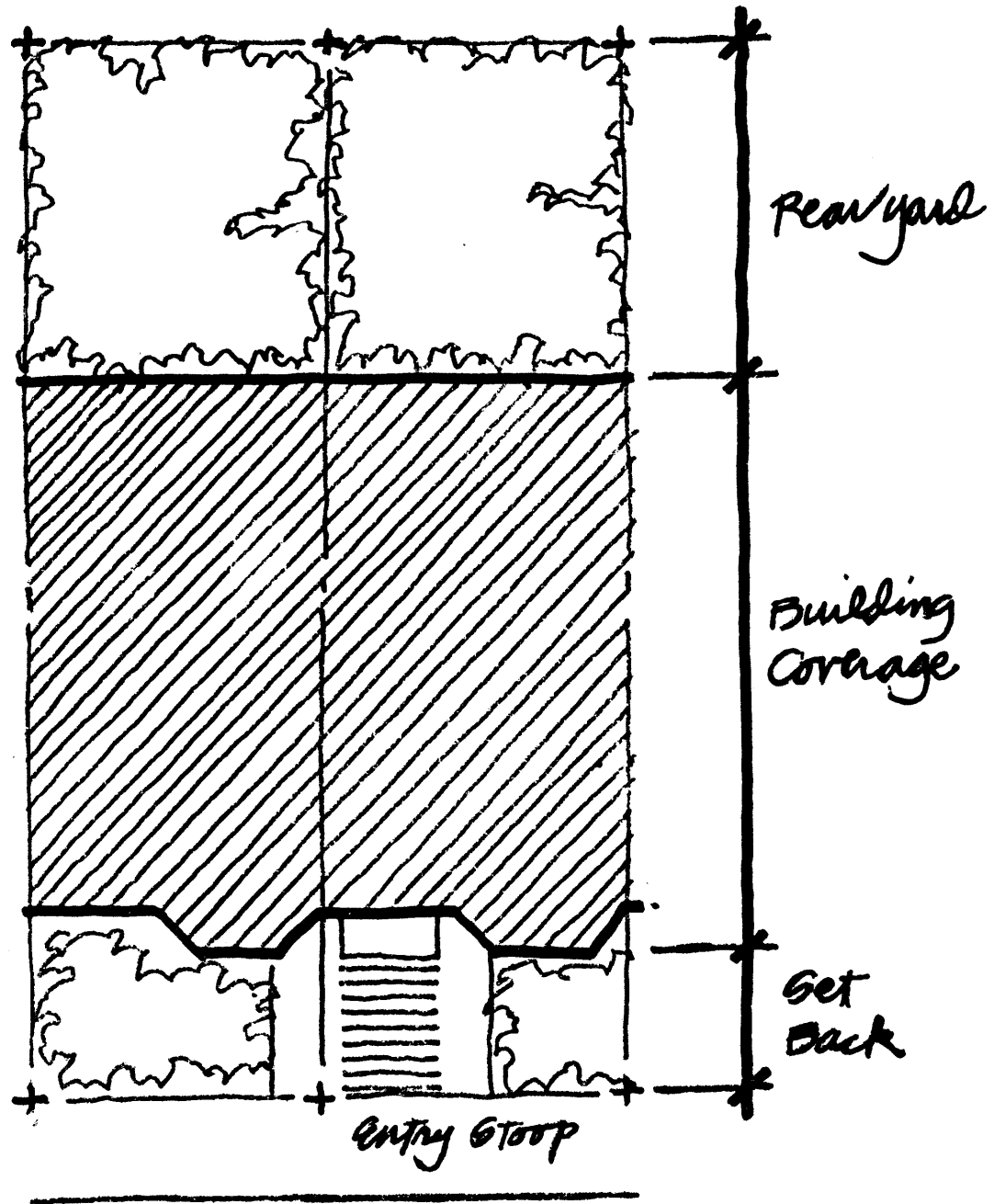
- relative size of lot, front setback

and stoop location, and relative percentage of building coverage (p.80).

- internal vertical circulation, with double loaded access to dwelling units (p. 81).
- function distribution of sleeping areas to the rear, living areas to the front, or street, side, and service spaces between the two (p. 82).

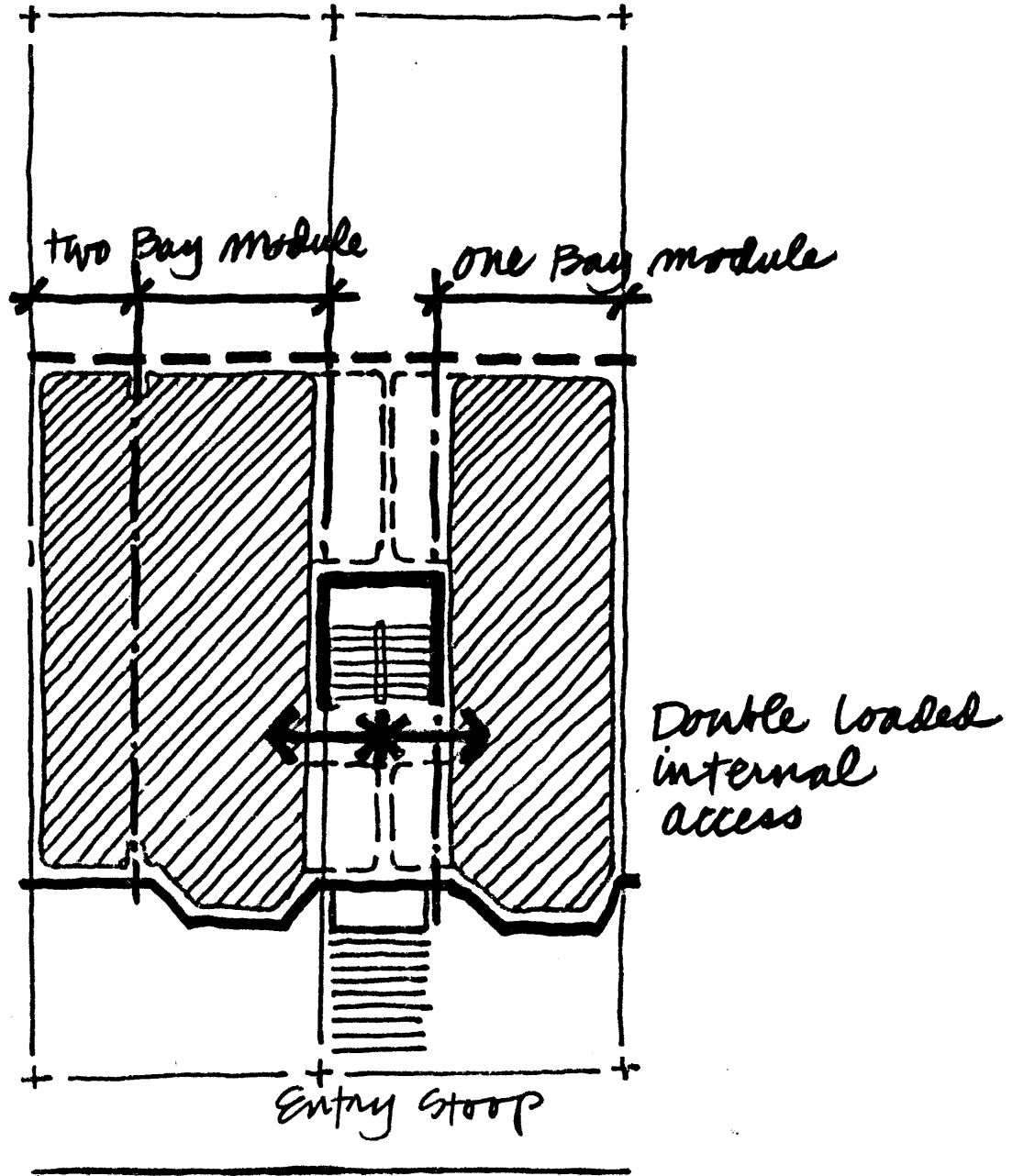
Schematic Design

STRUCTURE
DISPLACEMENT



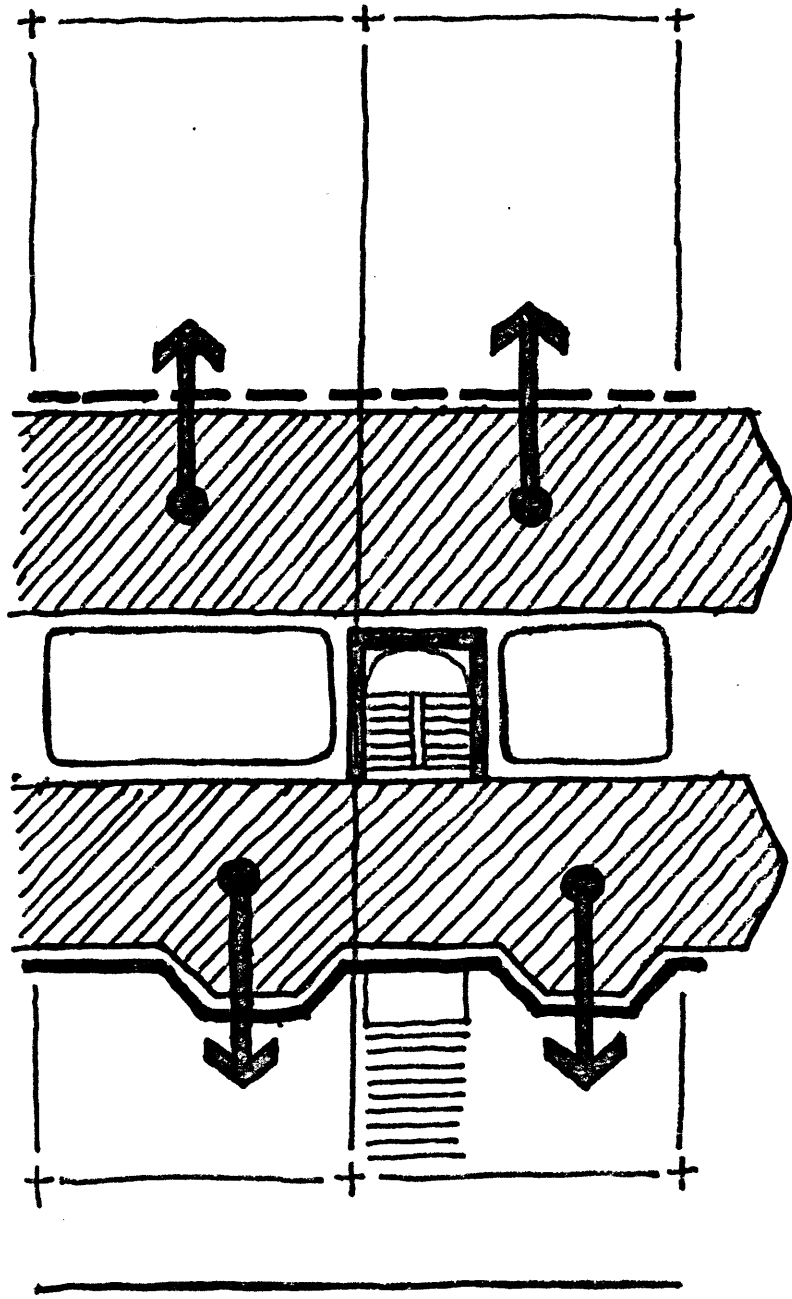
Schematic Design

CIRCULATION,
BAY ASSIGNMENT



Schematic Design

FUNCTION
DISTRIBUTION



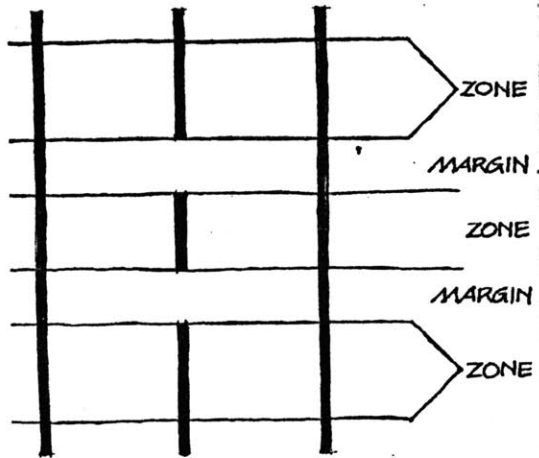
QUIET

*Sleeping
Spaces*

*Service
Spaces*

*Living
Spaces*

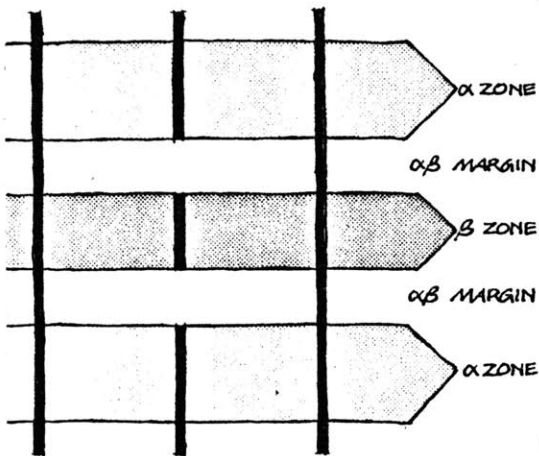
NOISE



48

The Zone distribution system outlined by S.A.R. follows certain conventions. The limits of the support are divided into a series of zones and margins which are fixed bands within which spaces can be placed according to certain conventions.

The zone adjacent to the faces (front and rear) is called the alpha zone. This is an internal area intended for private use.²⁷



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The central zone is called the beta zone. This is an internal zone, intended for private use and is not adjacent to an external wall.²⁸

The area between two zones is called a margin and has the characteristics of the adjacent zones.²⁹

Spaces with determinate functions can be analyzed with a range of positions within the system of zones and margins. The zones and margins at this point would be

dimensionless. The exact dimensions are related to the sizes of the spaces which are to be accommodated.

S.A.R. makes the distinction between three basic kinds of spaces: special purpose spaces, general purpose spaces, and service spaces.

A special purpose space is a space intended for occupancy over a certain length of time, such as a bedroom.³⁰

A general purpose space is one that allows for a combination of specific activities that cannot always be determined in advance. It is a space intended to be used by the whole family, such as a living room or den.³¹

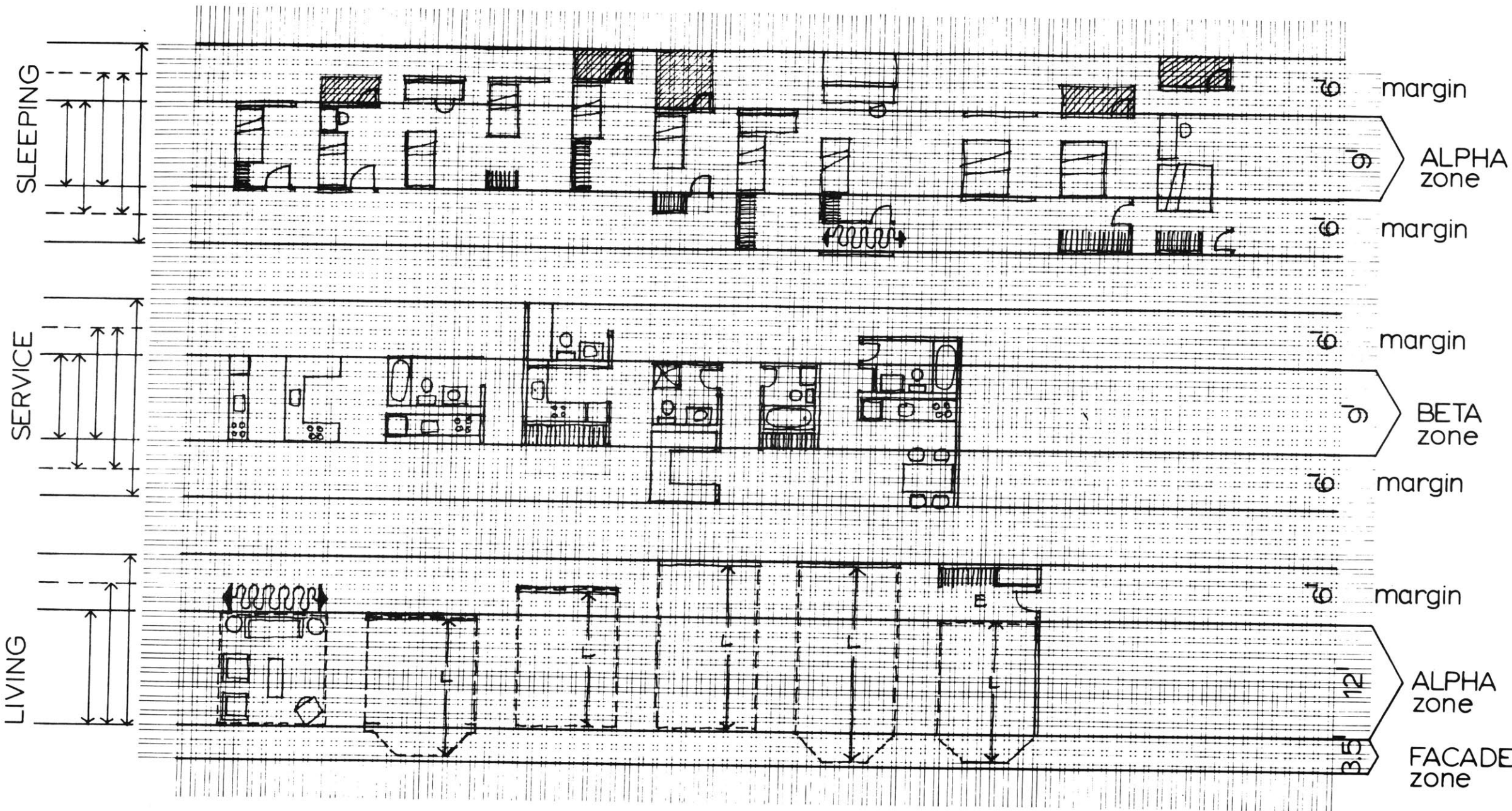
A service space is a space meant for short term occupancy and is utilitarian in character, such as a bathroom or kitchen.³²

With these space distinctions and the zone/margin distribution, a space analysis was made in each of the alpha and beta zones (p.86). From this analysis, dimensions were given to each of the zones and margins (p.87).

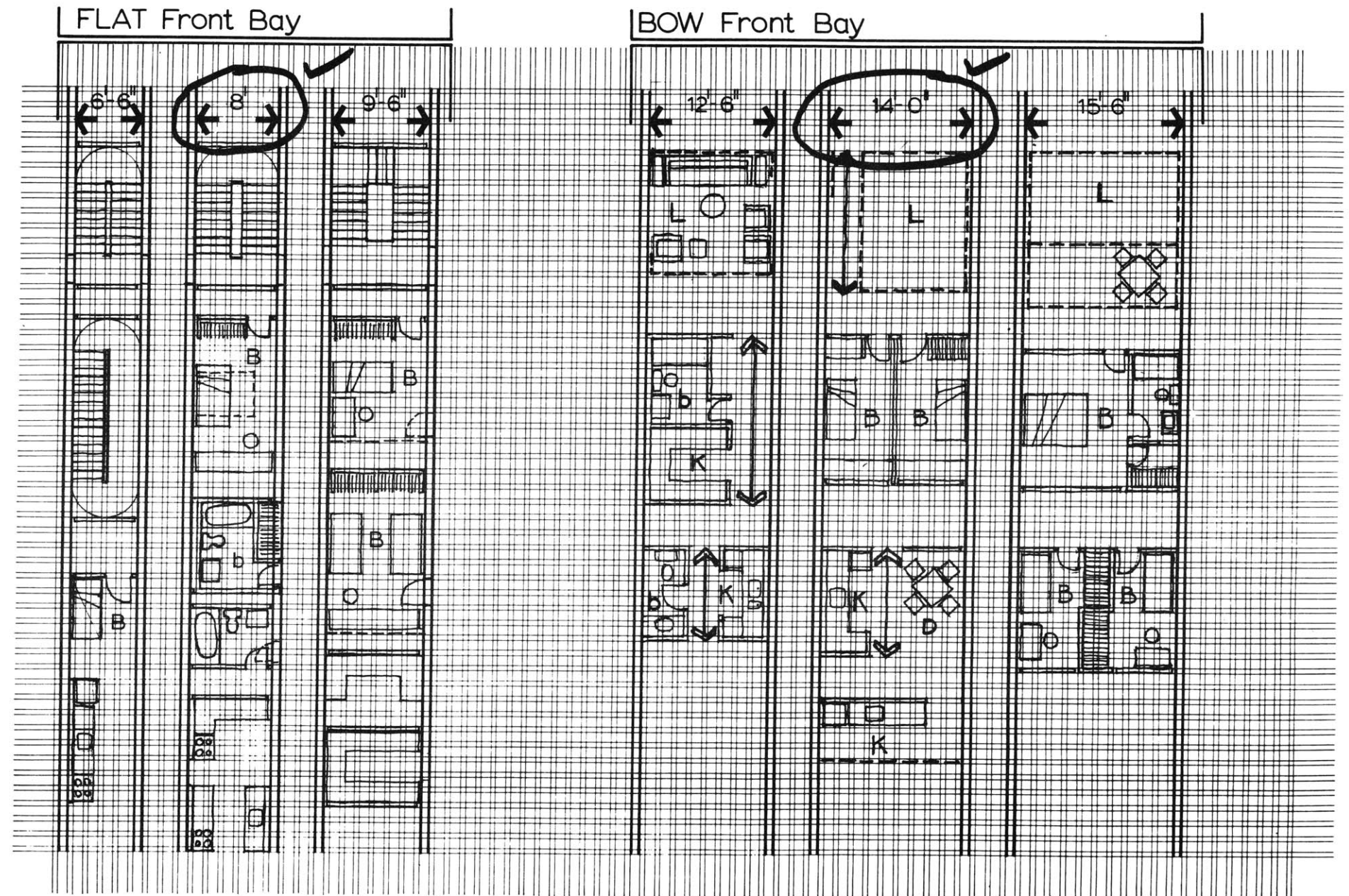
SECTOR ANALYSIS

As described by the schematic design criteria, each modular unit of the street facade consists of a flat front bay sector and a bow front bay sector. These sectors are reflected in the plan with respect to the location of the structural elements of the Support. To arrive at fixed dimensions for these bays, a sector analysis was studied (p.88). By definition, a sector is an area within the support which is part of a zone and its adjoining margins that is completely open and can be planned freely. This process is similar to the zone analysis in that spaces or combination of spaces of different widths can be examined.

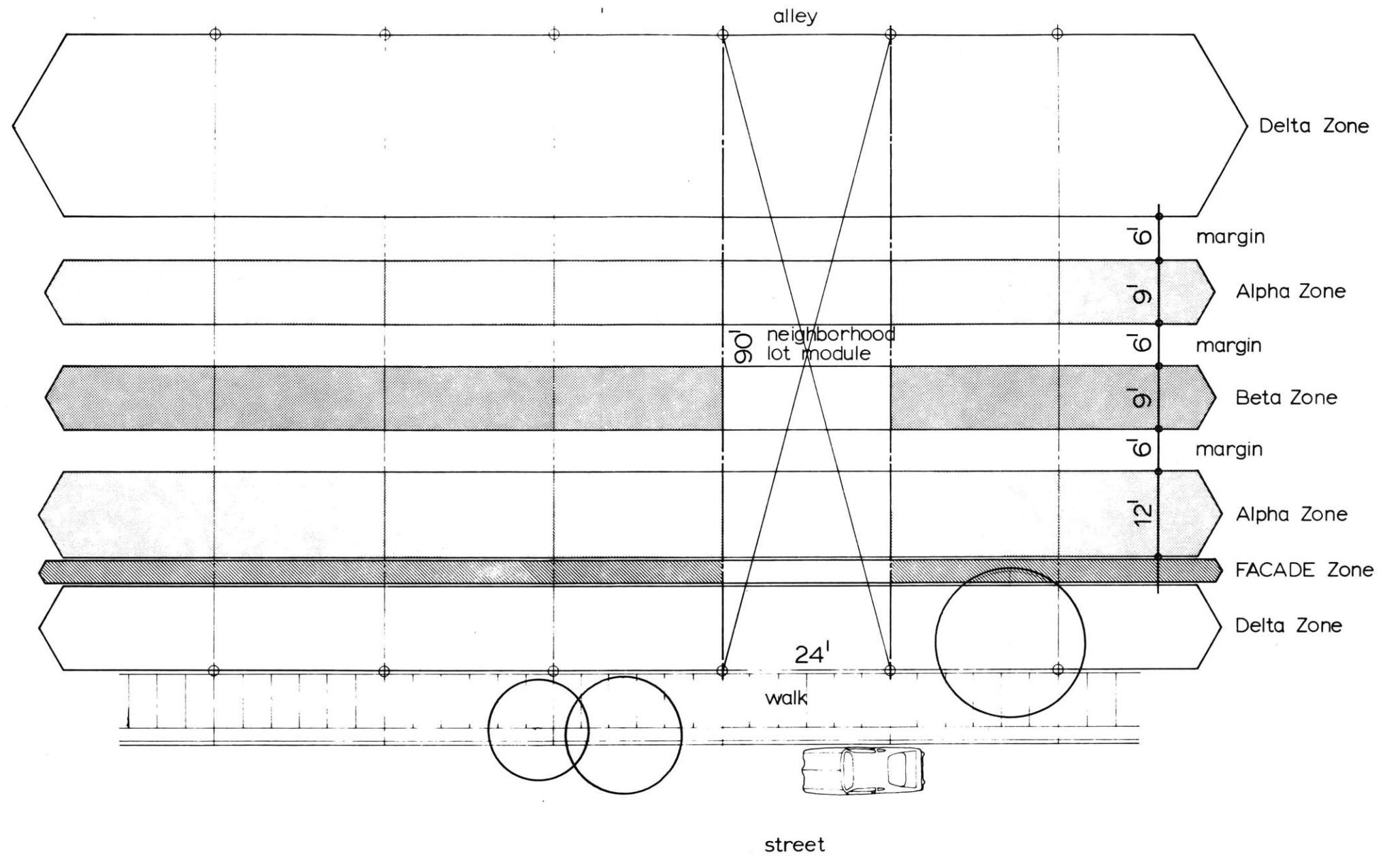
ZONE Analysis



Sector Analysis

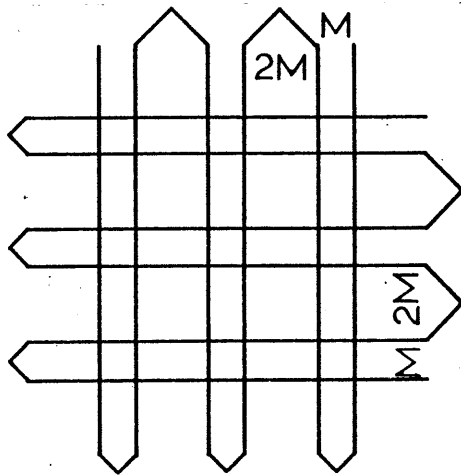


ZONE Distribution

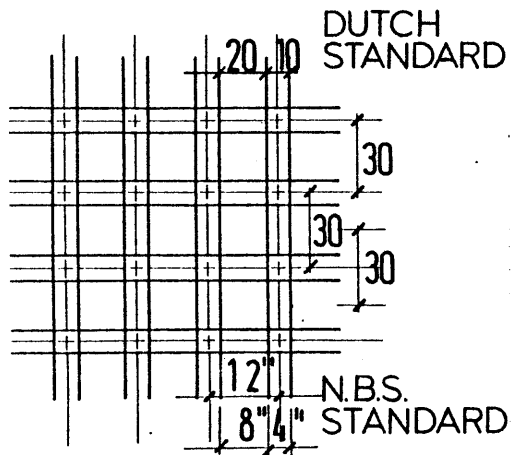


From this analysis, dimensions were chosen based on the optimum space utilization (p. 88). These are: Flat Front Bay interior = 8'-0"; and Bow Front Bay interior = 14'-0". Assuming a dimension of twelve feet for structural thickness of the support elements, the combination of the two bays would yield a center line lot dimension of 24'-0".

TARTAN GRID



In order to coordinate the elements of the Support and the Detachables, the S.A.R. method provides a system for location of size and position of these elements. This is done with the use of a tartan grid, which is a two-way grid consisting of an alternating narrow band and wide band, the wide band being twice the dimension of the narrow band. In a tartan grid all dimensions can be stated in terms of the basic module, "M", which is equal to the narrow band. The distance between the center lines of the narrow bands will be $3M$, as will the distance between the center lines of the wide bands.



When dealing with the installation of detachables in a support, it is essential to know the exact location and size of elements so that space standards can be established. The choice of the dimension of the basic module "M" on which the tartan grid is based must be carefully evaluated.

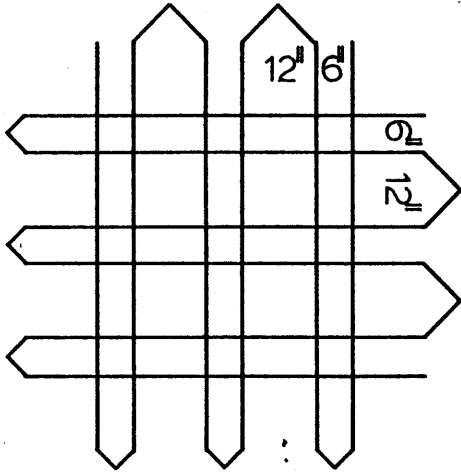
In Holland and most of Europe, which uses the metric system, a tartan grid of 10cm/20cm has been widely accepted. The grid represents a main module of 30 cm, which is a dimensional standard in Europe.³³

N.B.S. REPORT

In 1976 a report to the National Bureau of Standards by the Housing and Related Methods Graduate Program at M.I.T. was made to assess the new Dutch Standards, N.E.N. 2880, with the intent of establishing standards for the United States. In that report a 4 inch/8 inch tartan grid was proposed. This is the closest round number conversion from the Dutch grid of 10cm/20cm (Fig.). It also provides a logical module of twelve inches for already

existing building standards in this country.

In the N.B.S. report, certain problems became evident with respect to standard wall construction thicknesses and the compatibility of the 4 inch/8 inch tartan grid. For this reason a larger basic module was chosen for the study of this thesis, to accommodate a greater range of standard wall construction.



Two basic element groups were decided upon to establish the grid for this study.

Element "A" = 12 inch reinforced concrete support wall

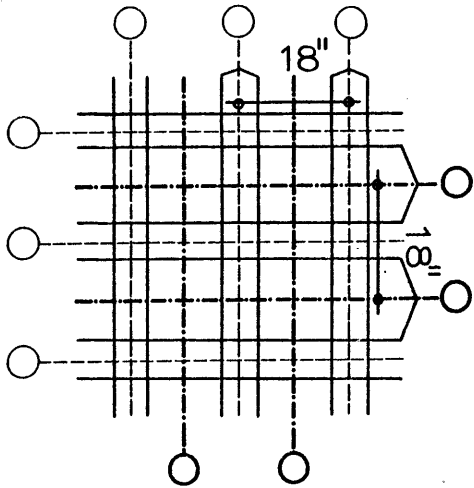
Element "B" = 4½ inch wood stud partition as a standard detachable unit.

From these, the smallest banding that would accommodate the two element groups was chosen (Fig. 52):

12 inch band for element group "A" (wide band)

6 inch band for element group "B" (narrow band).

This results in a main module of 18 inches (Fig. 53).



Although this module and tartan grid does accommodate some standard building components, there are others that do not fit so conveniently. The conclusion can be drawn that for an efficient system of standards and modular coordination, a collaboration must be established between those who decide upon a system and those who produce standard building materials and components.

It should be explained for the sake of sequencing, the decisions regarding the 6/12 tartan grid were made in an early stage of the process. The reason for this was to provide a measuring grid for sketching and analysis. Both the zone analysis and the sector analysis were done superimposed on the tartan grid, free-hand sketch fashion. It provided an immediate visualization of element dimensions as well as space dimensions.

THE SUPPORT FINALIZED

The final disposition of the fixed elements of supports were made after many hypothetical dwelling plans were

tested. These were formulated with the information acquired from the zone analysis, sector analysis and applied to the tartan grid for coordination. Besides space standards, one of the key factors that established the exact location of the support structural elements was circulation. After a period of trial and error, it became evident that circulation within the unit as well as the entries to the unit occurred predominantly in the margins between the alpha and beta zones. A secondary line of circulation would develop from alpha zone to alpha zone as a result of the final floor plan decided on by the user. But the cross circulation suggested the location for openings for passage through the structural elements. After a series of workable dwelling unit plans at various sizes were made, the final position of the support elements was established (p. 96).

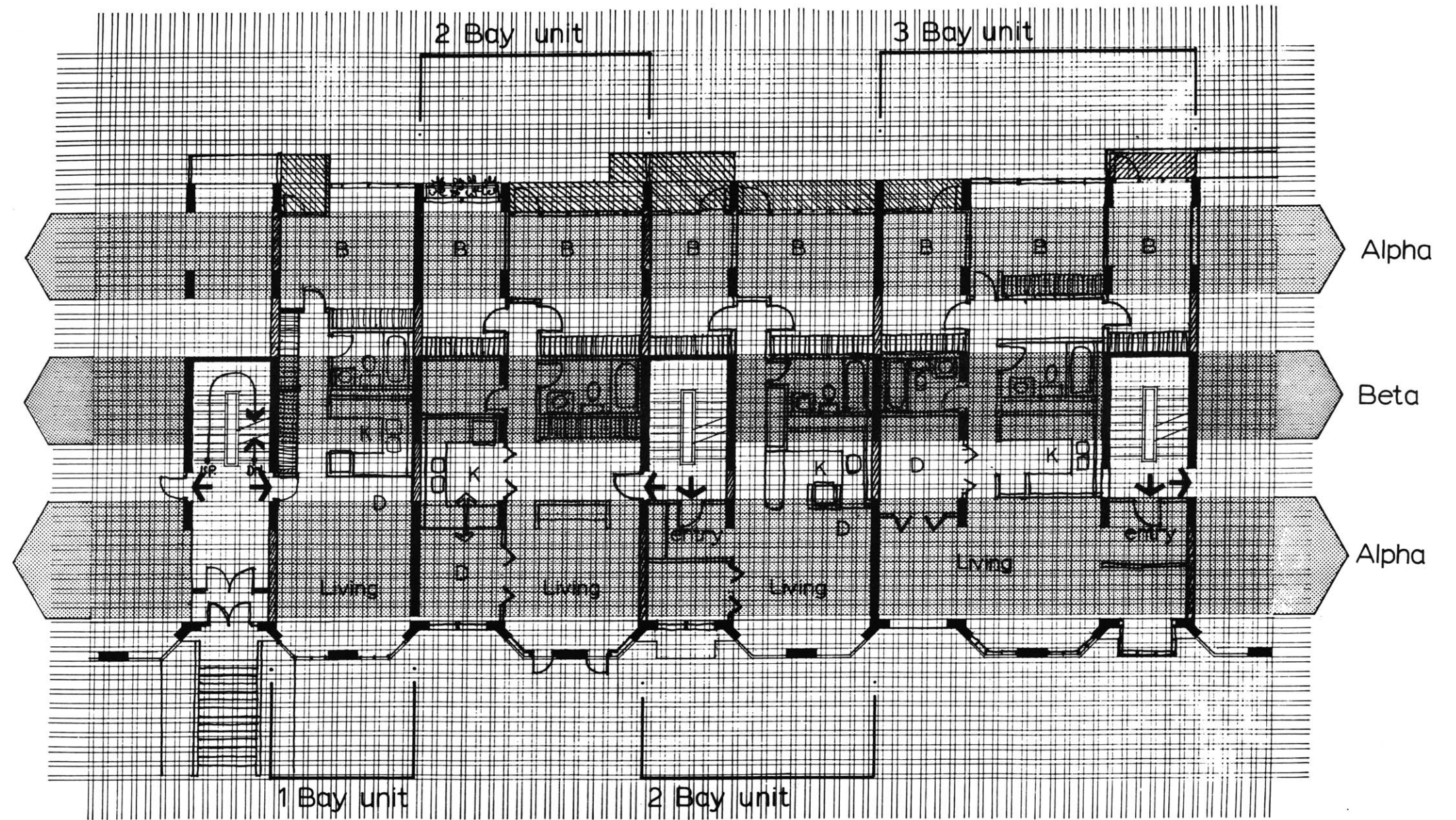
Variations on the dwelling area can be easily visualized and decided upon by the user. Since the square foot area is a financial consideration in either rent or mortgage,

the user can set the limits of his dwelling with a variety of possibilities prior to finalizing the floor plan (p. 97).

In consideration of time priorities, I have limited the analysis and design of the support to the accommodation of single level dwellings. But by viewing the plan of the support, bare of any infill detachables, it became evident that a greater range of unit layouts was possible by allowing double level dwellings. This would be accomplished by removing strategic areas of the floor slab, as indicated on page 96, thus allowing vertical circulation to occur within the dwelling unit. In addition, the cost of construction would be greatly reduced and would offset the cost of covering the openings with a less expensive method of construction when the opening was not desired.

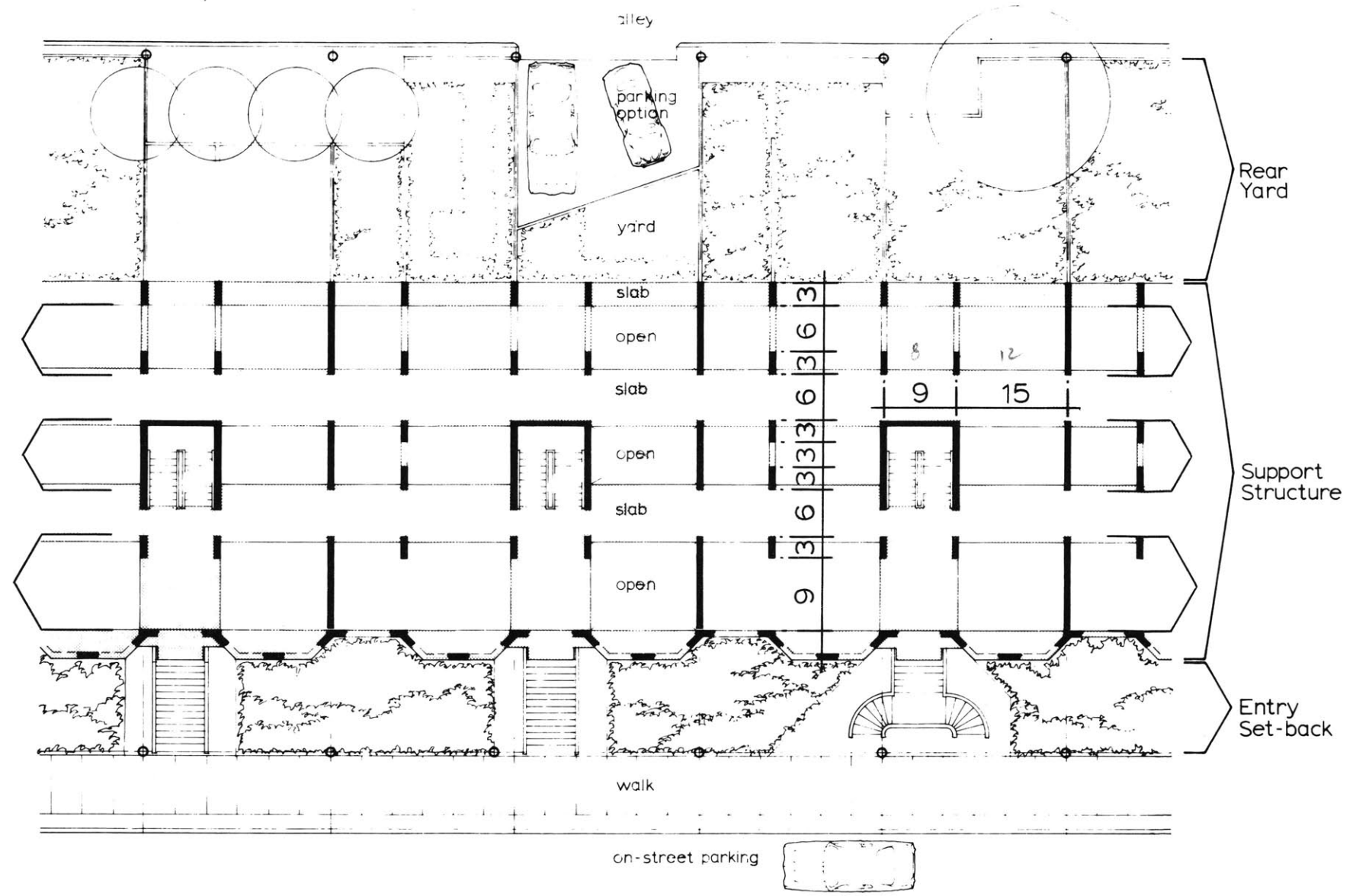
With the design of the support finalized, it was necessary to turn to the problem of the design of the street facade as an element of support for the street.

Dwelling Variation



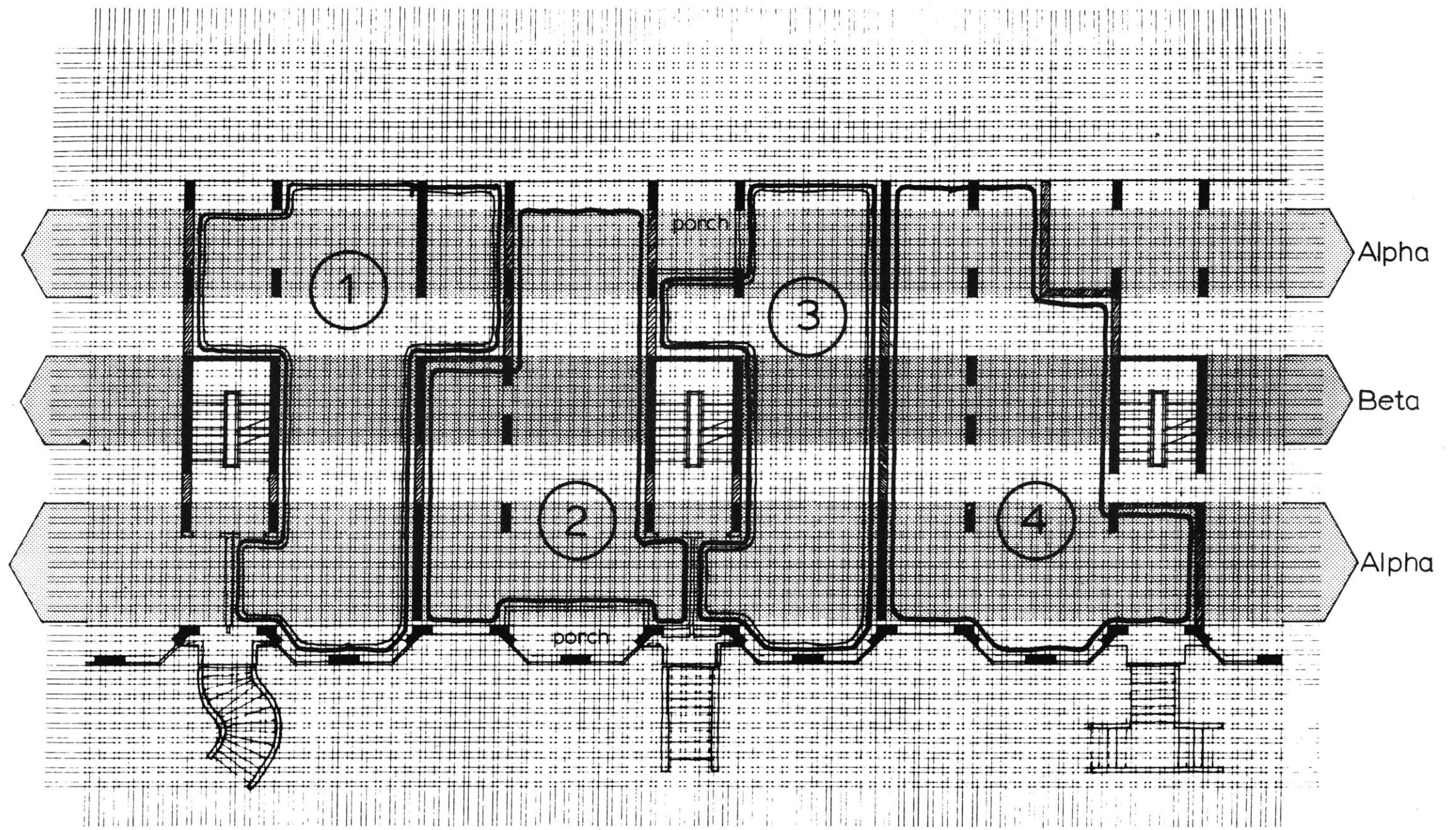
Support Structure

PLAN



Dwelling Area

VARIATIONS



FACADE Proposal

FACADE AS TISSUE ELEMENT

Although a detailed tissue study was not included in this thesis for the sake of other priorities, a few points should be made in reference to the facade and its place in the tissue (p.101).

For the purpose of establishing a frame of reference, the existing tissue conditions of street elements, lot size, building placement, rear yards, and center block alleys were adopted as design parameters for the new proposed project. The intent was to use those elements of the South End that have proven successful as neighborhood environments, and to improve on those that were not.

As an alternative to public projects of the past, the bowfront brownstones are a housing type that has been converted into higher density living without dehumanizing results. The facades are the first place where this

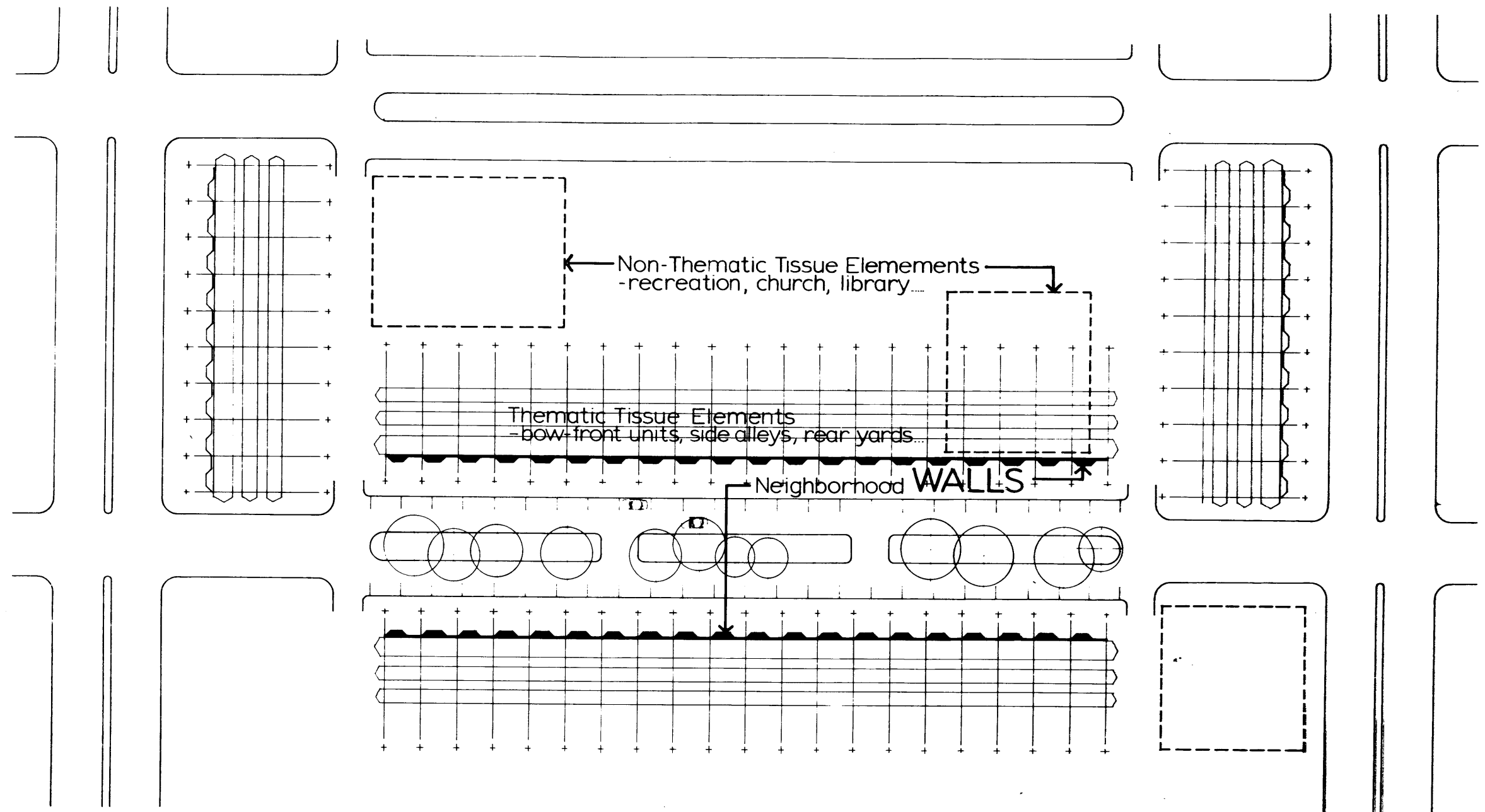
becomes evident through the "improvements" made by the users. One of the objectives for a new proposal was to design a facade that created the ambiance that already exists in the given context, and accommodated the interaction of the dweller whose home it will enclose.

As described in the S.A.R. levels of organization, a tissue is composed of two basic elements: thematic = in this case, the bowfront houses; and nonthematic = those elements that momentarily break the pattern of the row houses, such as a school, a church, or a small park.³⁴ Since these interruptions exist in most tissue patterns are usually desired features in a community, any new planning projects should include provisions for these elements.

In this study, the idea was taken a step further by incorporating the use of the street facades as a feature of both thematic and nonthematic elements. The problem was to design a facade that could not only be perceived

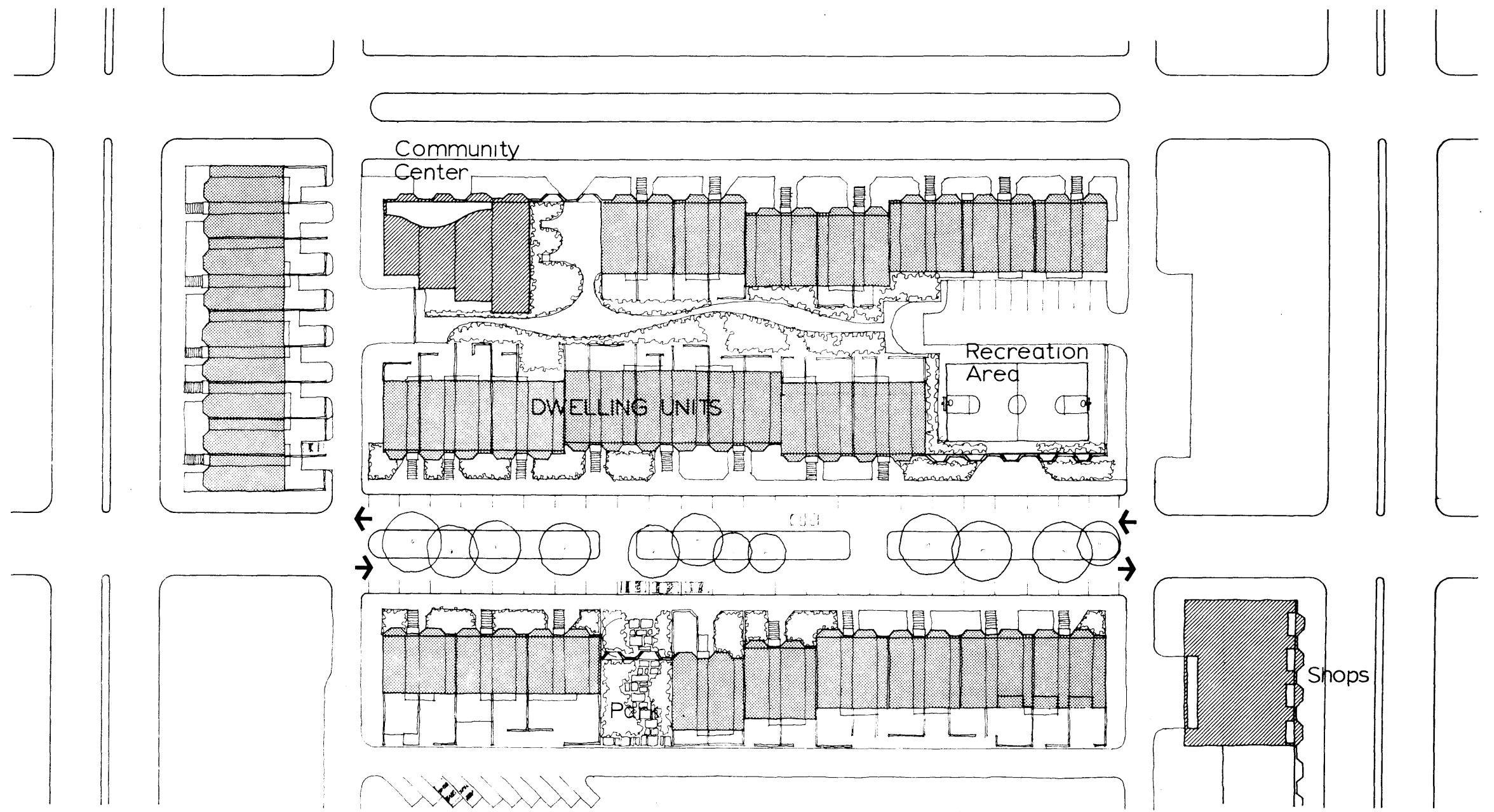
as a face for dwellings, but could also be read as a face for nondwelling functions, such as a community center, a church, a playground, or a parking lot. The complexities of attempting to define a common denominator of such counterposing elements is obvious. In dealing with thematic elements which are known, (i.e., the row house dwellings) and nonthematic functions which are not known, the facade must be capable of various levels of abstract interpretation. If the facade designed for row house dwellings is used to enclose a gymnasium or community center with considerations for their respective program requirements, it would be perceived as a truly "false" front resembling the Hollywood stage set. If this same facade were used, with all its finished details, to enclose a nonthematic open space as a park or playground, it would be viewed as unfinished construction void of human interaction similar to the "ruins" discussed earlier in this thesis.

Schematic Tissue Plan



SITE PLAN

Possible Usage



The approach to the design of the facade was to include in the requirements already established by the housing program the possibility of abstracting the support elements of the facade to a nondescript architectural character. By altering the nature of infill fenestrations, entry treatment, and roof shape, the facade could be used as the "front" for a nonresidential-nonthematic function.

FACADE DESIGN

The design process for the facade began with a review of the existing nineteenth-century bowfronts along the case study street. Certain features were chosen to be used as design elements:

- the rhythm of alternating flat bay and bowfront bay;
- the raised stoop with covered second level entry;

- protruding cornice line;
- mansard roof with dormers;
- higher floor to floor height at second level from the street.

The greatest degree of individual decoration by the owners occurred with the stoop, entry door, and canopy.

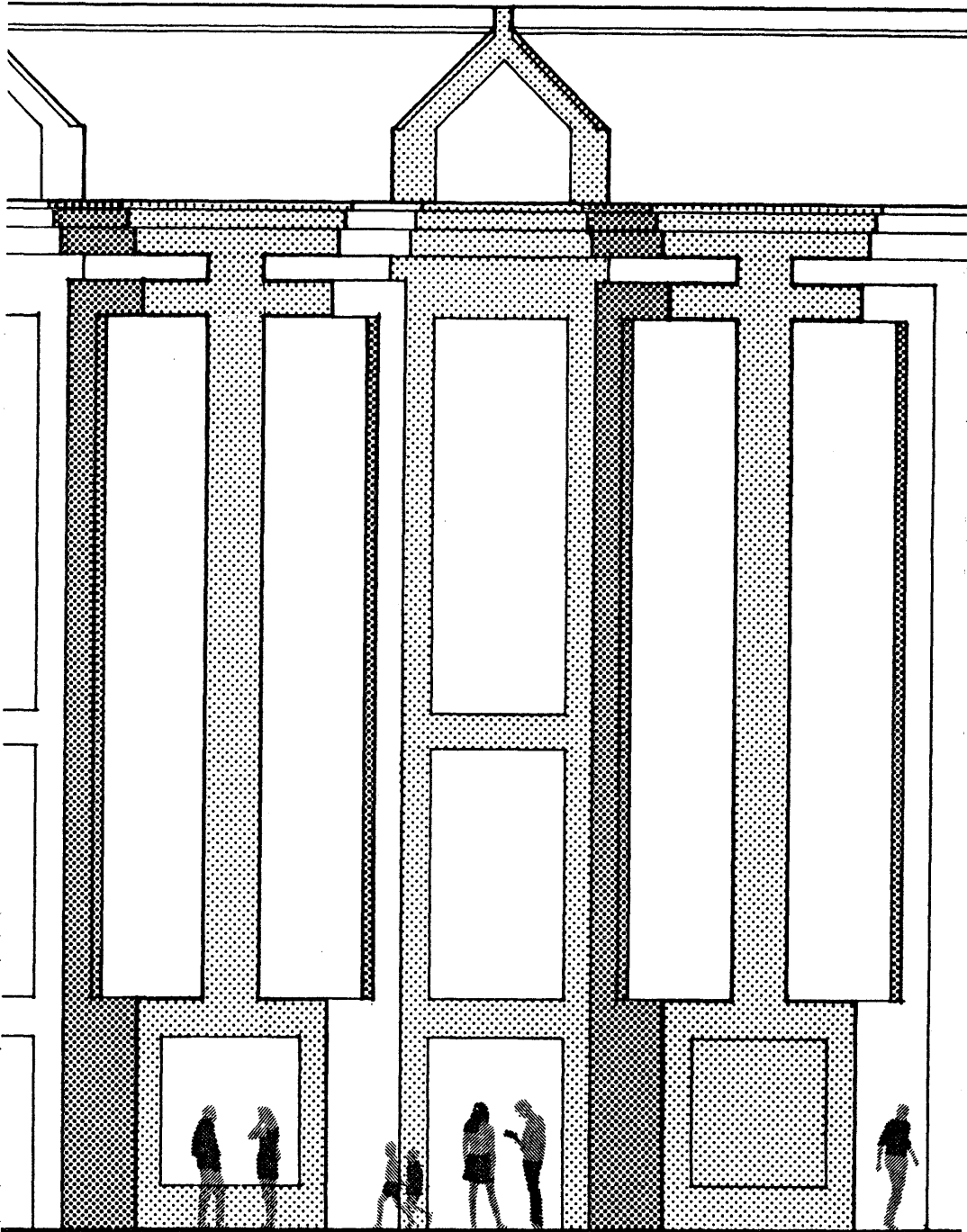
Just as in the process of designing the support to receive detachable units to make a dwelling, the same approach was applied to the new facade. The distinction was made between those elements the user will have control over, and those he will not. The elements of user control are:

- enclosing window wall in facade at the level of the dwelling;
- entry stoop and front door.

Reversing the process by subtracting the user-controlled elements and incorporating the design elements previously listed, a facade design was made (p.).

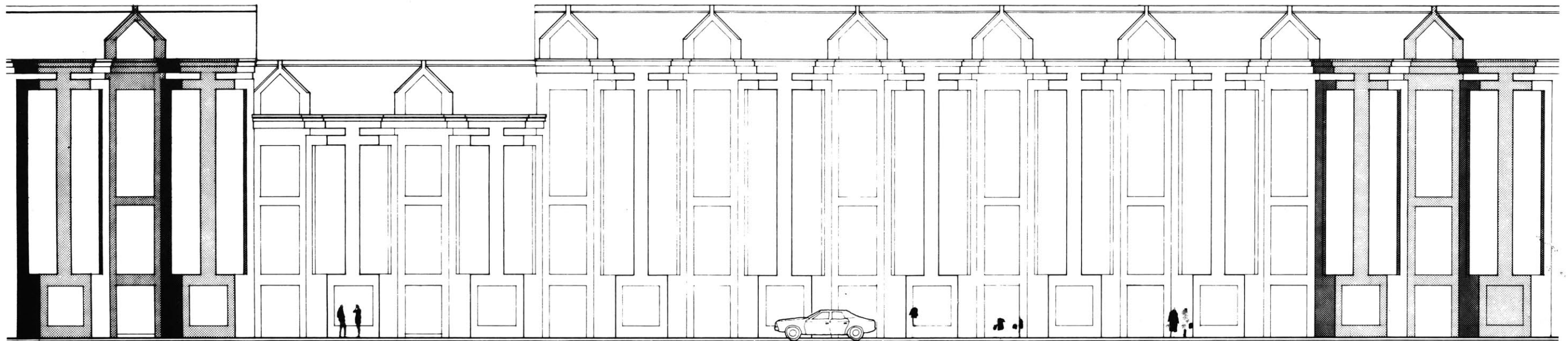
DACADE SUPPORT

Unit Detail



FACADE SUPPORT

Street Elevation



FACADE SUPPORT
with DETACHABLES

Street Elevation



The skeletal framework of the facade could be accomplished in either poured-in-place concrete, or precast elements. This presents an immediate problem of conflicting technologies with respect to the concrete frame and the user's infill components. To facilitate the connecting process, a second support element is proposed. This is a support "fitting gasket," which would be a metal or wood channel attached to the perimeter of the openings in the support and spandrel panels at the floor slabs. This would reduce the area to be enclosed to a more suitable workable scale, and provide a more pliable material to attach infill components.

This idea is similar to the technique used by many nineteenth- and early twentieth-century architects. Many of the buildings by Louis Sullivan used metal framed windows and spandrel panels, beautifully ornamented and "fitted" between brick and stone piers. A local example of this can be seen in the facade of a four-story office building in Central Square, Cambridge, built in 1910 (Fig. 50).

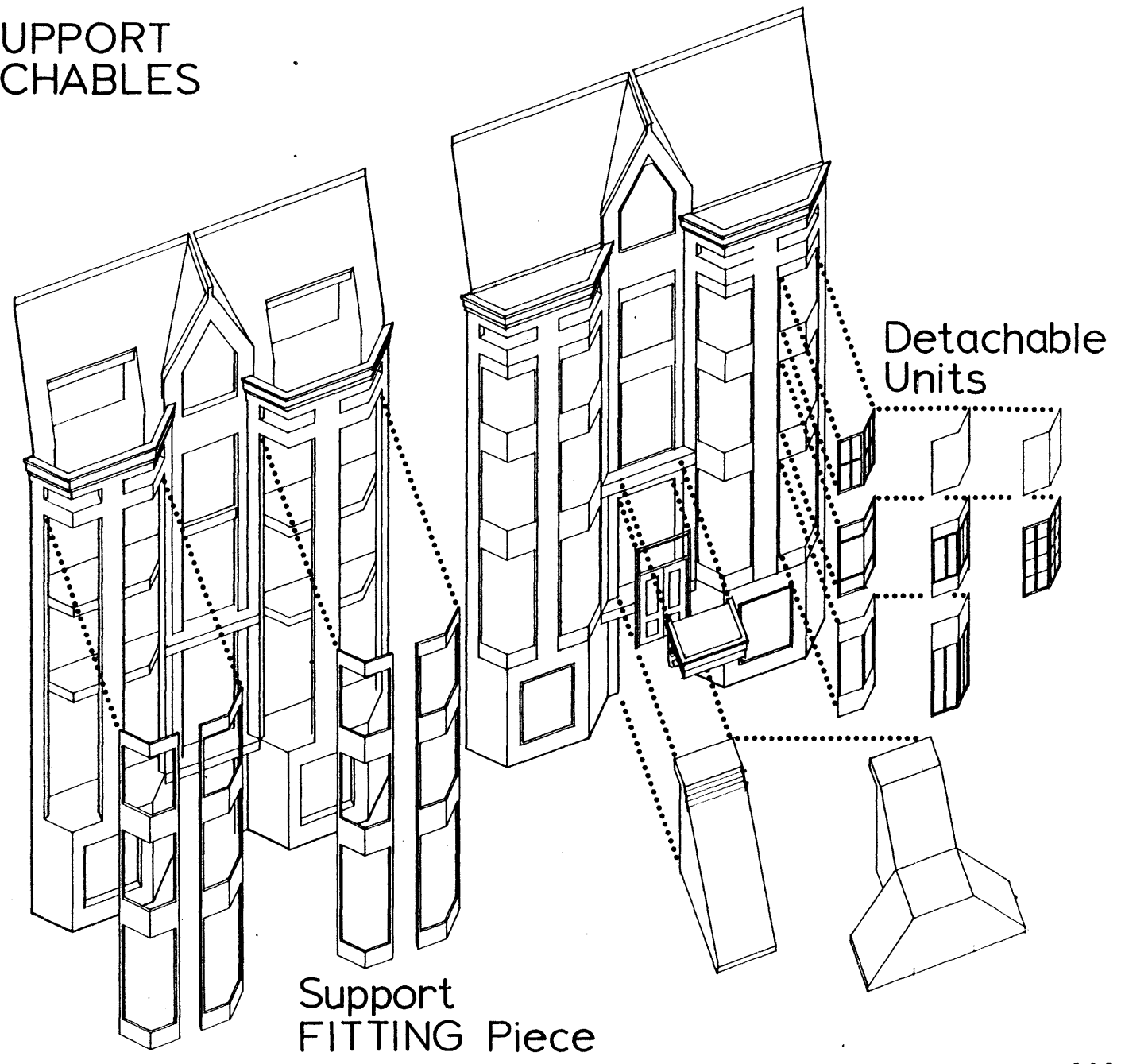


50

The metal window frames and spandrel panels fill the bays between the stone piers.

All of the elements of the new facade are illustrated in the isometric drawing on page 109.

FACADE SUPPORT And DETACHABLES



CONCLUSIONS

In the process of setting priorities for this thesis, it was necessary to establish a line of thought with specific objectives. As with most research, tangential topics reveal themselves that must be put aside for another time, in consideration for a planned timetable. In conclusion, it would further clarify the position taken in this thesis by mentioning several ideas that grew out of the process but were not elaborated on here.

The interest in facades as isolated elements of architecture is held by many architects, teachers, and students. Recently projects dealing with the concept of layering, where multiple facade planes create a desired effect, have shown this interest ^san aesthetic concern. As time passes, our environment is becoming more dense. As a result, architects are being confronted by architectural placement that deals more with two dimensional presentations

than with three dimensional. I am referring to those buildings in an existing context, usually bracketed by older structures which prevent them from being perceived as three dimensional objects, that appear as a two dimensional presentation of the Facade Plane.

It is obvious that the complexity of the subject of facades as a study in itself is open to wide interpretation. Whether studied in relation to an existing context or independently as an element of a design process, the architectural facade provides substantial possibilities for further research.

In response to interest in urban facades, another area of research lies in the conditions of the spaces between the facades that form the streetscapes. With the problems of pedestrian and automobile conflicts as well as the need for space amenities, this topic could provide ample subject matter for detailed study. Although city planners, urban designers, and landscape architects have dealt with

these concerns as a matter of course in their professions, many architects tend to ignore the problems of placement or are ignorant of the possibilities for improving the spaces between buildings in our environment. I feel that architects bring a different perspective to urban design, as they tend to be "object design" oriented, if only for providing a counterposing view from those who are solely concerned with space. Architects should be familiar with the process of "designing from the outside-in."

With regard to the topic of housing, the S.A.R. methodology presents a totally new approach to the problem. It is the general consensus that housing is a problem--there is not enough, it is too expensive, and it is invariably of poor quality. For many years, and most intensely in the period from the Second World War to the present, the solution was thought to be in industrialized systems. It has been a gallant effort to satisfy the need for quantity with some positive effects on costs,

but it resulted in the abandonment of quality. The S.A.R. method proposes a more equitable distribution of power and control in solving the problems of quantity, quality, and costs, by including the user in the effort. It means a degree of reallocation of the responsibilities of planners, architects, industrial designers, and government officials in deciding what constitutes the end product in housing. The professionals would provide the means for housing through the design of supports--and the user would complete the process by deciding upon the final disposition of the elements of detachables for his particular dwelling.

To fully comprehend the logic in the various levels of the S.A.R. method--tissues, supports, and detachables--one must study each level in detail. This is necessary to establish the relationships of the different levels to each other. In this study, concentration was made on the level of the supports. There is substantial subject matter on the level of tissues and detachables to develop

a thesis topic around each. Taking into account the support design in this thesis, another study could be made on the design of the detachable units that would fit this support, based on available standard building components. On the level of tissues, further study could be made again using this support and variations on placement in the South End neighborhoods. Once an overview is achieved, the S.A.R. method allows for isolated research within the system.

The S.A.R. methodology is the work of many Dutch architects over a period of ten years of development and experimentation. Hopefully we will not have to wait ten years to test this alternative to mass housing in the United States.

ILLUSTRATIONS

1. The Market Gate of Miletus (Key Monuments of the History of Architecture, Henry Millon, ed.)
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FOOTNOTES

¹Edmund N. Bacon, Design of Cities (New York: Viking Press, 1967), pp. 94-95.

²Ibid., pp. 97-98.

³Banister Fletcher, A History of Architecture on the Comparative Method (New York: Charles Scribners Sons, 1963).

⁴Bacon, pp. 101-04.

⁵S. Giedion, Space, Time and Architecture (Cambridge: Harvard University Press, 1974), pp. 147-49.

⁶Vincent Scully, American Architecture and Urbanism (New York: Frederick A. Praeger Pub., 1969), pp. 80-85.

⁷Charles Moore, The Place of Houses (New York: Holt, Rinehart and Winston), p. 188.

⁸Calendar of Events, 1977 (New Haven: Yale University, School of Art and Architecture).

⁹Robert Stern, New Directions in American Architecture (New York: George Braziller, 1977), p. 59.

¹⁰Progressive Architecture, 10/75, p. 44.

¹¹Scully, pp. 83-85.

¹²Ibid., p. 85.

¹³N.J. Habraken, "Three R's for Housing," Lotus #9 (Milan, Italy: Alfieri Edizioni d'Arte), pp. 172-93.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ N.J. Habraken, Experiences on Practical Application of S.A.R. Method in Design and Production in Housing, a report, February 1975.

²¹ N.J. Habraken, Variations: The Systematic Design of Supports (Cambridge: M.I.T. Press, 1976), p. 11.

²² Walter Muir Whitehill, Boston: A Topographical History (Cambridge: Harvard University Press, 1959), pp. 119-140.

²³ Ibid.

²⁴ Architectural Forum, vol. 120, no. 6, June 1964, p. 81.

²⁵ Habraken, Supports: An Alternative to Mass Housing, p. 21.

²⁶ Ibid., p. 39.

²⁷ Ibid., p. 53.

²⁸ Ibid., p. 53.

²⁹ Ibid., p. 53.

³⁰Ibid., p. 57.

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