

FRAMEWORK FOR HOUSING IN CAMBRIDGE, MASSACHUSETTS:  
AN EXPLORATION OF FLEXIBILITY AND GROWTH OVER TIME

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B.S.A.D. Massachusetts Institute of Technology, 1976

Submitted in Partial Fulfillment of the Requirements for the Degree of  
Master of Architecture  
at the MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
September 1979

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Signature of the Author \_\_\_\_\_

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ABSTRACT

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William C. Spears

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This thesis investigates the formal aspects of a framework designed for a twenty-two unit development on a one-acre lot at the corner of Broadway and Ellery Street in Cambridge. The framework represents a primary level of decision making which depends on and informs subsequent completion. It is both the unifying element for the site organization, and provides for flexibility and change over time. A hierarchy of fixed and variable building elements is established, after which three different housing types are explored as to their ability to accept user participation in the design process. Drawings illustrate options from which the architect and resident can choose. A detailed presentation of site considerations (parking, public/private space, building elements) is included, as well as a study of unit variability. In addition, the range of roles which the architect/developer/resident play in this inhabitation process is considered.

Thesis Supervisor \_\_\_\_\_

Jan Wampler, Associate Professor of Architecture



## ACKNOWLEDGEMENTS

I would like to thank

Jan Wampler  
for his insights and for bearing with me

Nina  
for keeping me together

Mike  
for keeping things loose

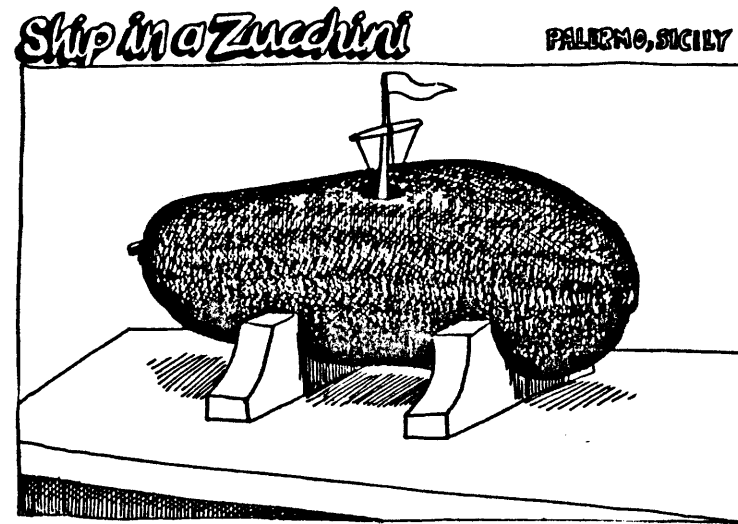
Captain Ozone and the Ozone Patrol  
for being around

Bob P. just for the hell of it





FOREWORD

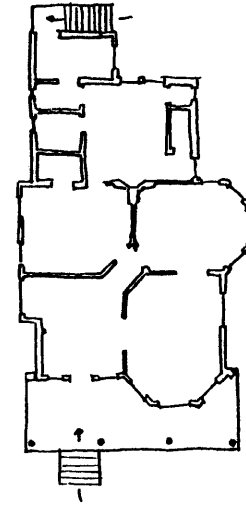




## INTRODUCTION

Due to the rising cost of land and construction materials, it is becoming less and less feasible for a middle class family to buy a home. This is especially true in Cambridge where land is at a premium and rents exorbitant. This situation encourages developers to buy plots of land, which used to be adequate for one single family house, and build multi-unit, high density housing. If these are expensive they are called "condominiums;" if they are for lower income groups, then they are "housing projects." In either case, the development usually lacks individuality, and is standardized in order to lower building costs for the developer, but offers little flexibility for the resident/owner. This is in sharp contrast to older, single family houses in Cambridge which have been both added to, and subdivided over the years. It follows that if the home is responsive to the owner's changing needs, the inhabitant will not have to move elsewhere when he/she has "out-grown" the house, thereby guaranteeing a certain stability to the household and to the neighborhood.

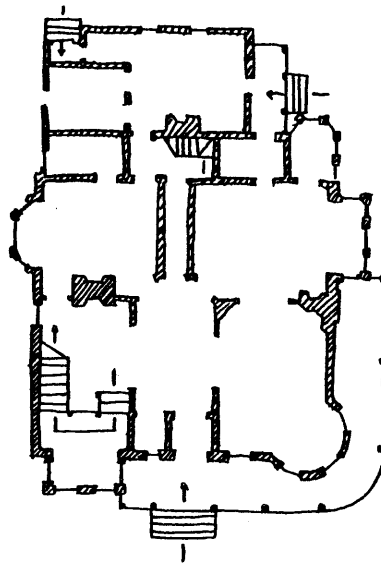
The problem of standardization did not arise until now, because the older houses were designed and built independently of each other, yet they all followed a certain traditional style. These buildings are similar as to



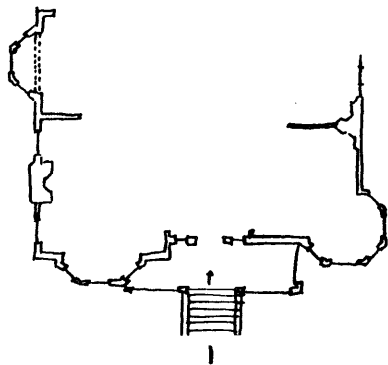
326 HARVARD ST., 1899, PLAN



55 GARFIELD ST., 1889, PLAN



280 HARVARD ST., PLAN



298 HARVARD ST., 1888. PLAN

height limitations, general arrangement of the house, construction materials and formal vocabulary. The resident could take pride in owning his home. It was different from those adjacent to it, yet still in harmony with the rest of the neighborhood.

Modern dwelling design, on the other hand, is based on the belief in a "universal standard" of construction. For this reason, it has long been disinterested in and subsequently unable to reintroduce individuality as part of dwelling design. Although attempts are now made to emulate the complexity exhibited by the formal vernacular of traditional housing in this country and abroad, they merely represent pale imitations of an architecture that has evolved through the collective efforts of its inhabitants. It is not often feasible to translate this process into current housing construction, because it must occur over a much shorter time period, and traditional values no longer represent an organizing force.

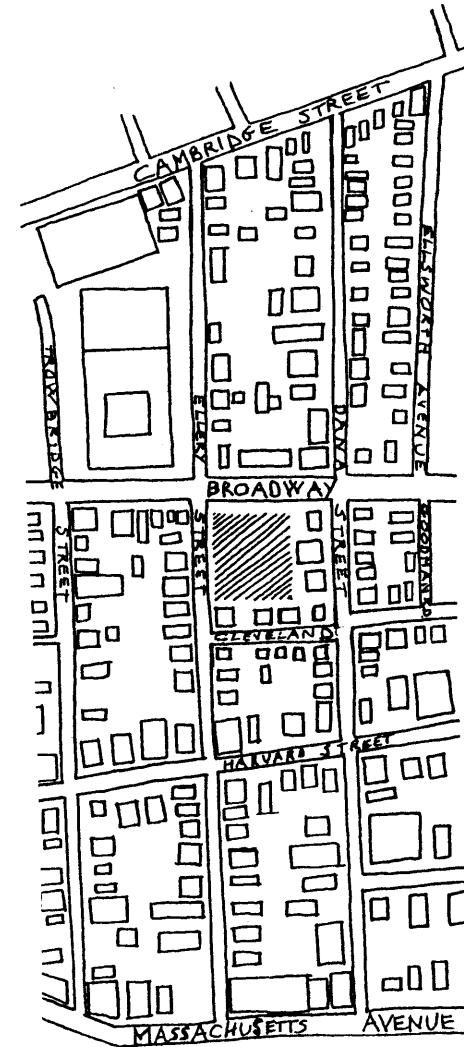
The architect, who sees standardization encroaching on his role as designer, could become the one responsible for bringing coherence to the overall design of a project, while leaving room for individual input by the resident. This new role is multi-faceted: as mediator between developer and resident, as coordinator and designer.

This thesis examines how the process of inhabitation might occur, and how the architect might step out of his/

her typical role. The investigation is developed from a designer's point of view. To this end, I have chosen a one-acre site at the corner of Ellery Street and Broadway, in Cambridge, which was recently acquired by an architect/contractor/developer team and have re-defined the priorities which ought to be involved in the design of the proposed twenty-two housing units on that site. Making the problem site-specific allows me to draw from the formal vocabulary of Cambridge. Specific design parameters are also established, with respect to the location in its larger, urban context.

I plan to explore the notion of "user participation" in the design process, ensuring that the units respond to the resident's needs. Similarly, the site as a whole should reinforce and be integrated with the quality of the public street network. After resolving the larger organizational issues, I design mainly single-family houses, keeping open possibilities for change and growth over time. The idea of flexibility was expanded, during the course of the work, to include resident input in the initial development stage.

Examples of resident participation in modern housing design are scarce. The so-called "self-help" architecture assumes that people will actually do the work themselves. The term usually applies to low income developments where the burden of construction is shifted onto the residents.



There is little direction and it is not clear whether these people actually have the time (after a hard day's work) or the skills to build their own dwelling. Their time may, in fact, be better spent in other endeavors.

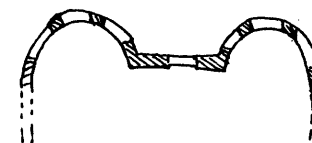
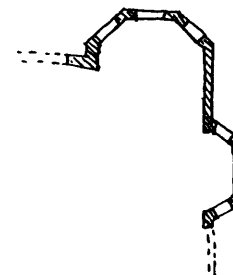
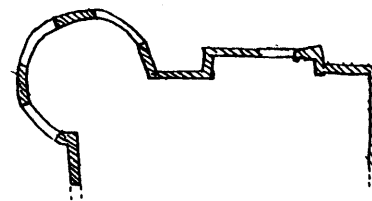
Le Corbusier's housing at Pessac is an unusual, yet significant case where residents have responded to a standardized house by making modifications on their own initiative. It is an example of what was expected to be a finished building, however certain features, such as an accessible flat roof and porches have inadvertently made subsequent changes easier. The austerity of the original design was undoubtedly an important factor prompting the alterations. The end product, richer than in its original state, suggests a solution to the problem of anonymity in large scale projects. One could imagine a similar form of dweller participation in the Cambridge condominium. The variety of forms found in the surrounding houses might be reintroduced if a positive relationship between home and inhabitant on the one hand, and inhabitant and developer/architect on the other, were encouraged.

Another example is the current trend towards renovating old barns as dwellings or transforming old factories and lofts into apartments in New York City. In each case, the span of the structural system allows partition walls to be situated freely. Residents are thus able to plan their own apartments within a given shell. This form of infill has

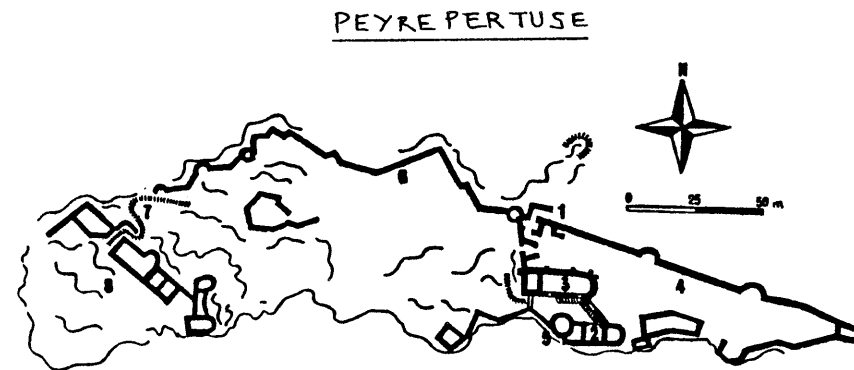
been tried in new apartment houses in Holland, where architects assist future tenants in planning their own apartments. The old barn or factory has all the more appeal as a possible housing infrastructure, since each is an intimate part of a larger physical historic context. The formal qualities of these structures encourage future alterations, yet they are neither neutral, like a bare concrete frame, nor as overwhelming as the completed housing project.

These examples actually represent built frameworks which were changed over time. The notion of framework was the conceptual basis of this thesis. It was to be the unifying element of the design by generating a physical organization for the site in a way that was responsive to its environment. The fact that this framework was in some sense incomplete, played an equally essential role in fostering user participation in the design process.

The question one then faces is not only what, but how much to design. My original intention, derived from the housing at Pessac, was to design a unit that was in some sense complete, i.e., that could be lived in. The decision to build subsequently is then an optional one—change over time would be primarily by addition of useable space. This concept required the design of a core house which could be altered by conventional methods used in Cambridge, such as building flat roofs, inhabiting attics and basements, en-



closing porches and subdividing the house. During the course of my work, a more process-oriented approach, based on participation by the prospective resident evolved. At what stage is the "house" handed over to the buyer? I do not propose to resolve this logistic question in definitive way, since many alternatives exist. I will first investigate the question as a design problem, and then discuss a range of possible strategies.



Massive walls provide protection against attack for this 12<sup>th</sup> century castle in the south of France. Under, siege, wood structures several stories tall are built within the walls to shelter the inhabitants of the surrounding villages. This network of walls is an example of a framework which supports change over time.

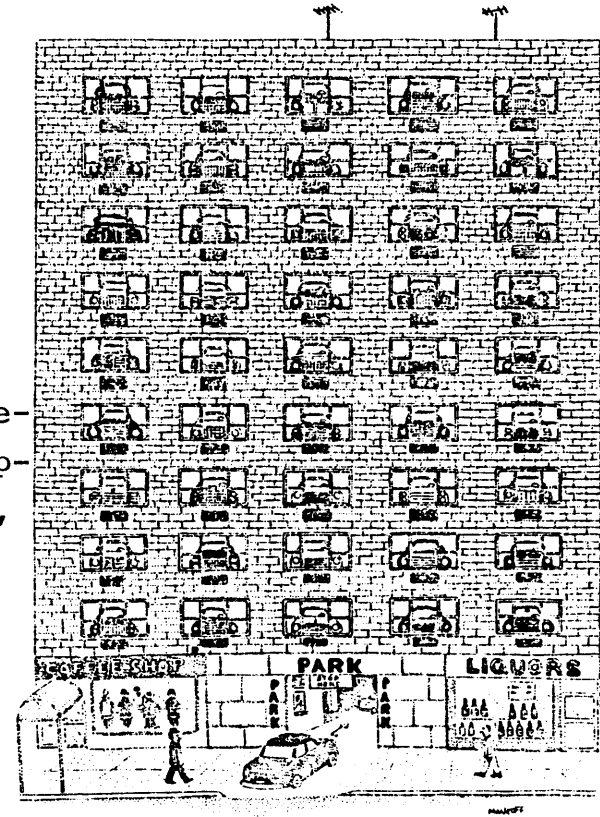


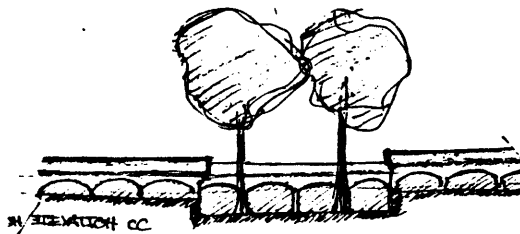
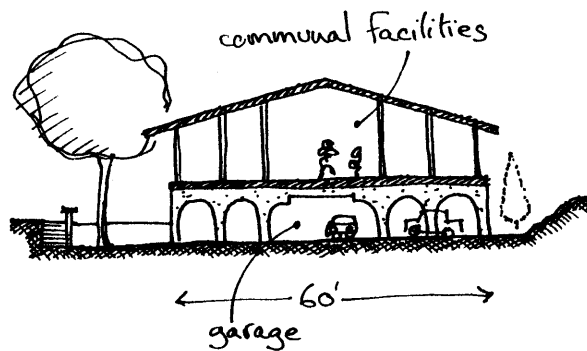
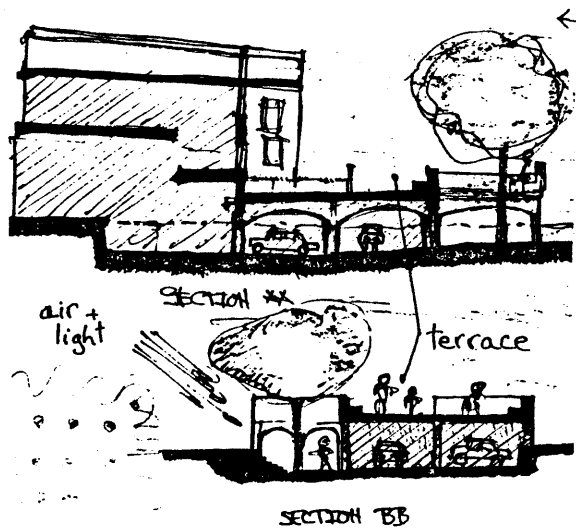
## SITE ORGANIZATION

### PARKING

The Cambridge Zoning Ordinance calls for one on-site parking space per dwelling unit. In response to this requirement, recently built condominiums have been organized as a string of row house units along a communal driveway, perpendicularly to the existing street. These developments clearly disregard the continuity of the street front, possibly because of the inherent difficulty in making this housing type turn the corner. Conventional row houses avoid this problem by fronting on major streets while presenting an end condition to streets of secondary importance.

The site could, for example, accommodate a row of units facing Broadway and two rows of units facing an access street off of Ellery. This scheme, however, reduced the public space to a long driveway that has none of the more pleasant physical attributes of an urban street such as front yards, stoops, trees, front porches, etc. Secondly, such a configuration covers the site with a uniform density of buildings which is inappropriate in the context of this neighborhood. In general, attempts to provide individual parking spaces as a part of each unit inevitably generated simplistic site plans while creating public spaces of dubious merit. In





order to free precious ground area, I decided to centralize the parking. It is advantageous to put it one-half level below ground and to reclaim the space above, either as buildable territory, as a plaza or green space. The level change could be designed to allow air and light to circulate freely through the garage.

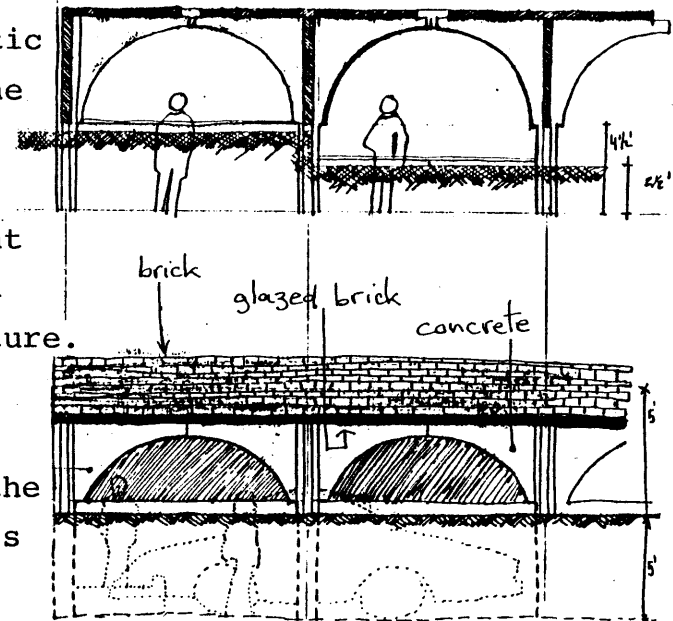
In one of my early organizational diagrams, the parking structure was part of a communal building. Such functions as laundry and day care could then be housed in a low building over the garage, leaving the rest of the roof accessible as a playground or public area. This arrangement is similar to Gaudi's Parque Güell, where many heavy columns support a new raised ground. The garage would be a pleasant place where residents wash and repair their cars. It is also an important first stage in arriving at one's home. Each unit could rent some space in this building to be used as storage or as a workshop. Alternatively, cooperative workshops could find room there. This approach was abandoned because a structure of such size and geometry could not be properly integrated into a site-responsive scheme.

In a second approach to the parking issue, the garage became a relatively extensive underground world (still one-half level below grade) of heavy concrete columns or arches. This design would be more like a Roman aqueduct running throughout the site. It is a heavy, ground related place, yet full of air and light which could support light wood frame housing.

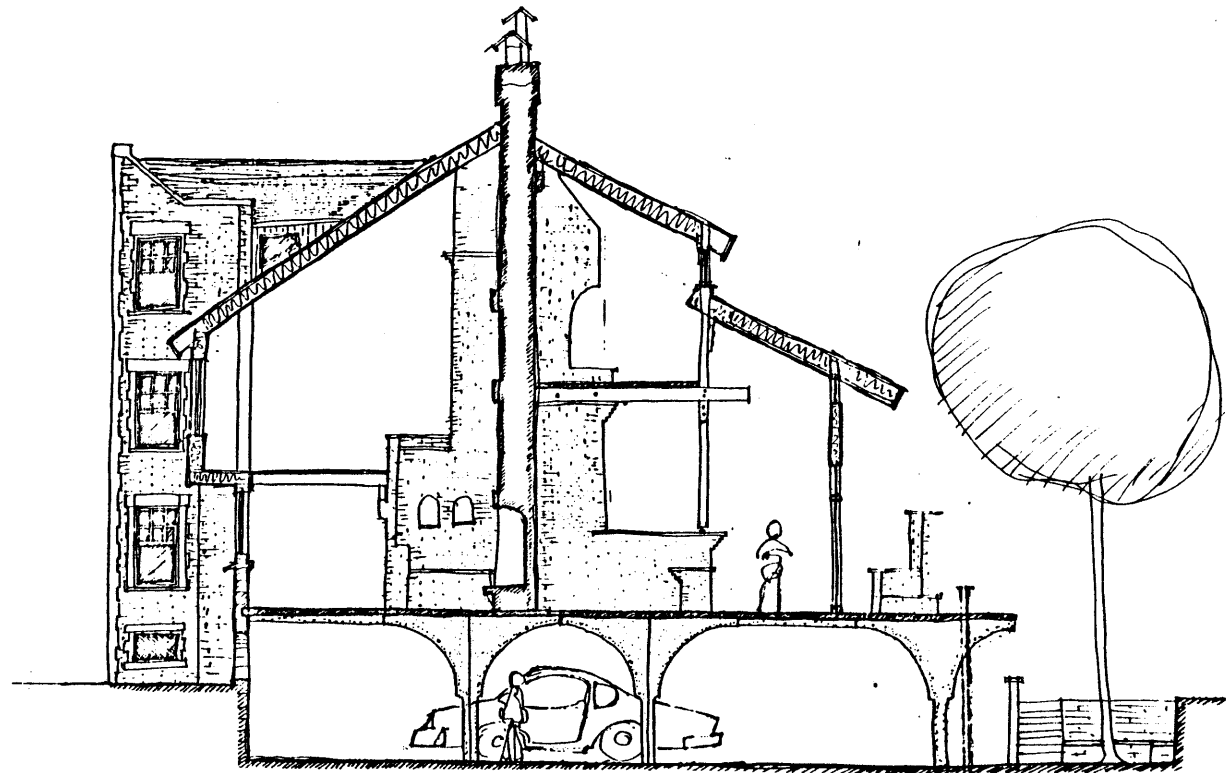
The edge of the garage must be strongly articulated to reinforce the connection to the public world. This approach was also dropped: it, too, generated simplistic site plans and interfered with a careful handling of the public/private edge.

I finally settled upon locating the garage along Broadway which allowed for a space-efficient arrangement of the parking. Being a "hard" urban edge, this street can accommodate the rigid geometry of the parking structure. Row houses can then be built above where the garage is reduced to a forty-foot, single loaded condition. The standard sixty-foot dimension is then used to support the corner apartments and a public plaza. Pedestrian access to the garage is along one side of the plaza, where the garage borders a public green space. Uses adjacent to the plaza also face onto Ellery Street and Broadway. Small retail shops might open here (if a zoning variance is obtained) or else day care, laundry and other communal facilities.

This scheme is quite different from the suburban model where every house has its own garage. In an urban setting like mid-Cambridge, compromises must be made in favor of providing more common ground, and drawing people away from the inward suburban lifestyle. A driveway is no substitute for an enjoyable public green space or plaza. Putting the cars underneath frees the ground for people to stroll and

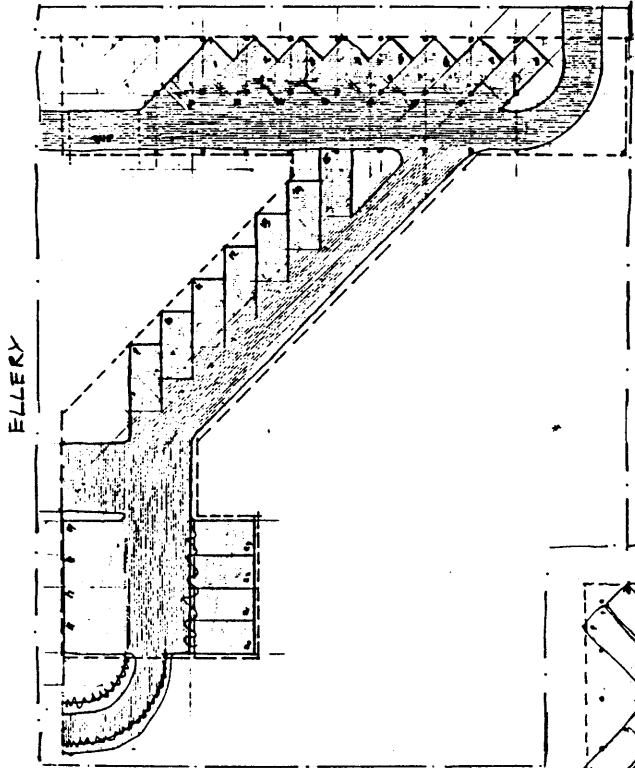


and children to play. In the next section, I will describe how the public and private areas intermesh.

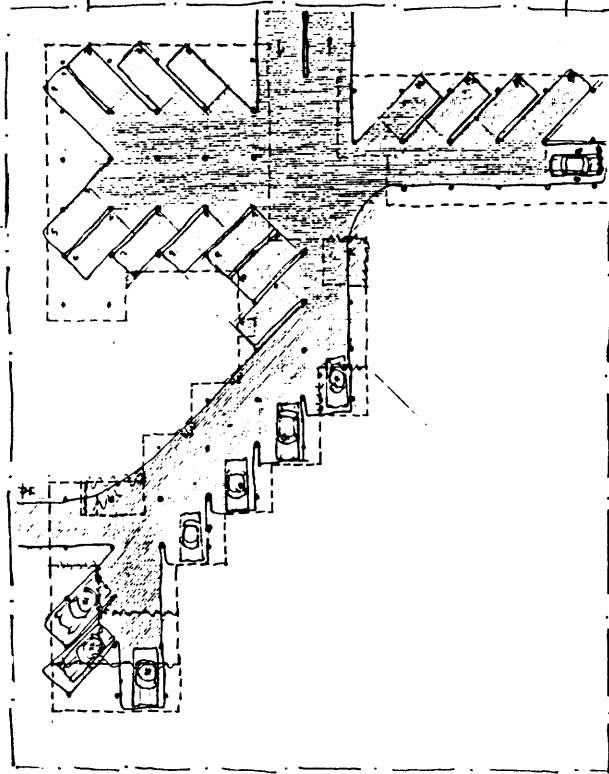
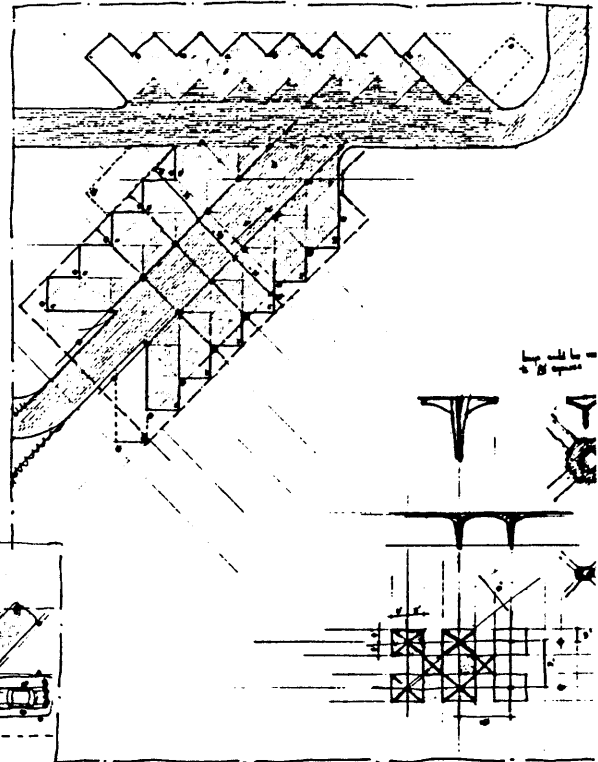


Early sketch of the units along Broadway, exploring the relationship between the parking structure and the masonry cores

BROADWAY



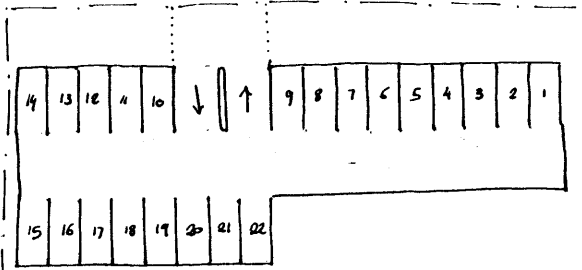
Explosion of various parking schemes as a potential framework, or pedestal for housing





PARKING SCHEMES

BROADWAY

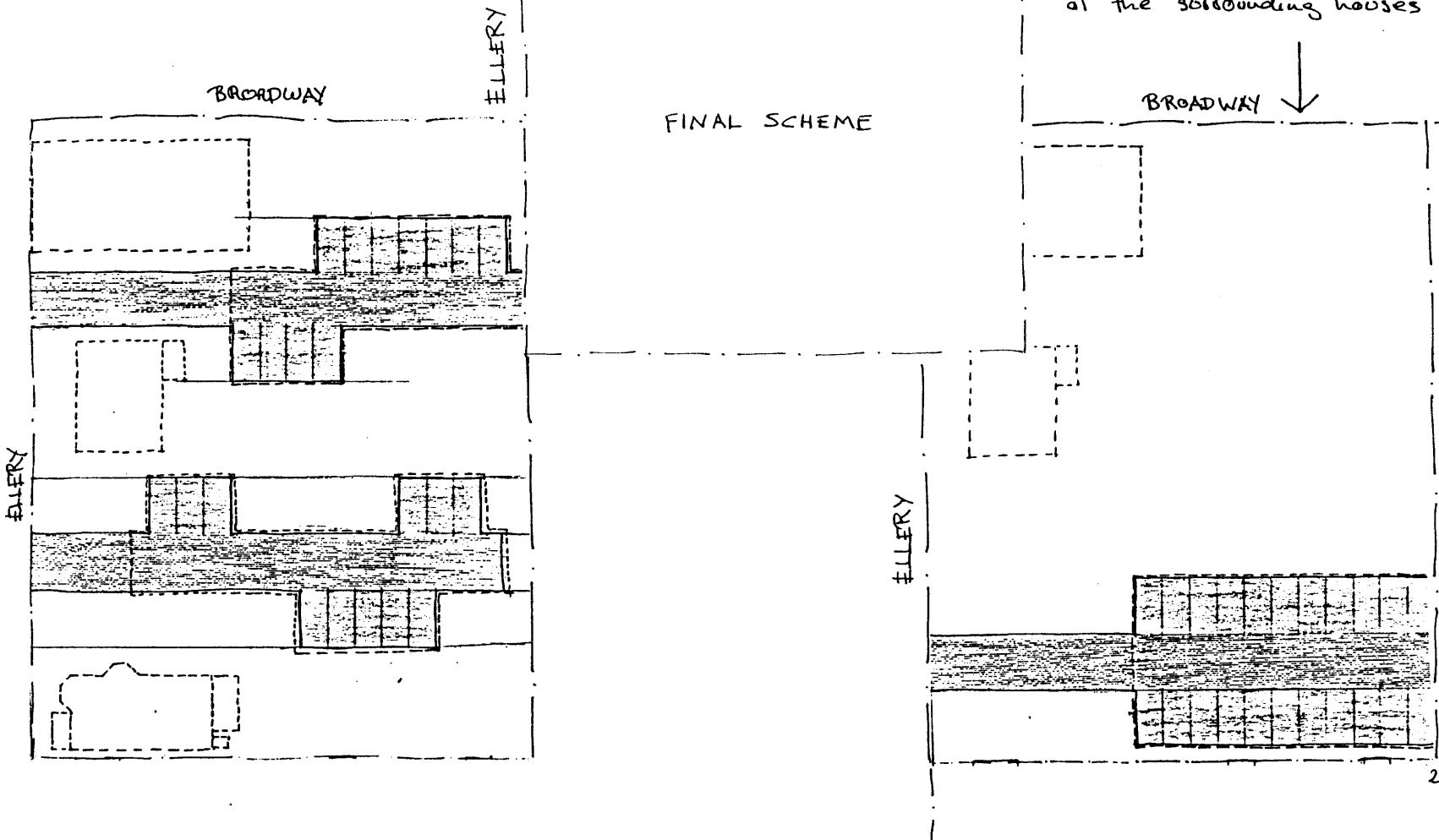


Concentrating the parking towards the interior of the block was inappropriate with respect to the back yards of the surrounding houses

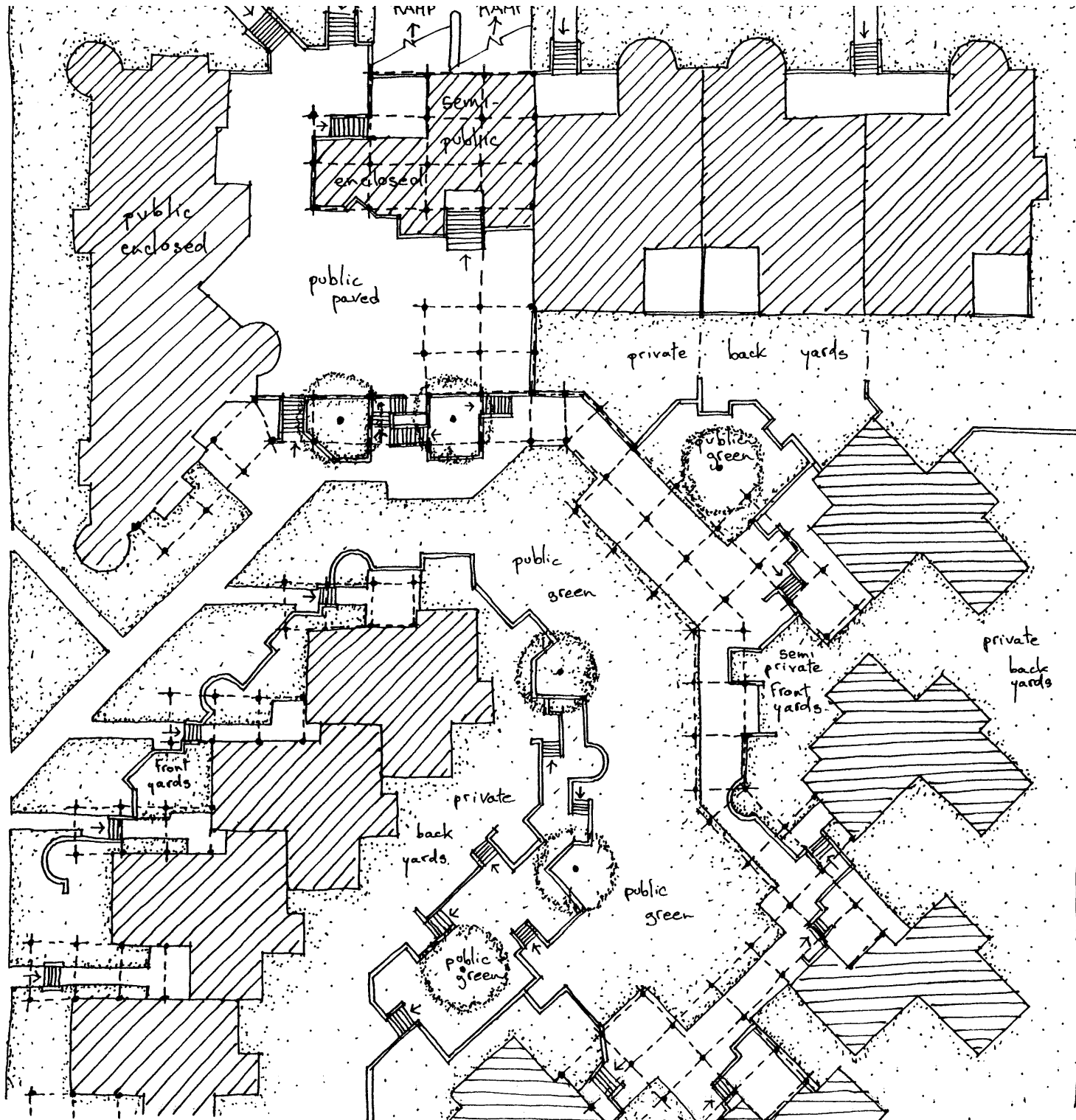


BROADWAY

FINAL SCHEME



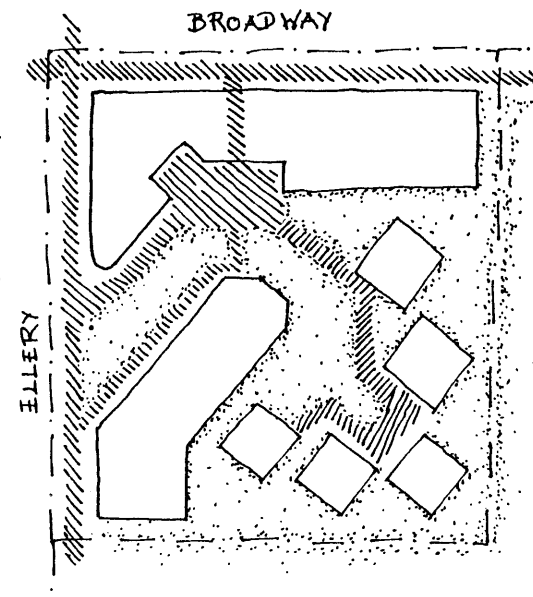
GROUND LEVEL  
ARTICULATION OF THE  
PUBLIC / PRIVATE EDGE





## PUBLIC/PRIVATE INTERFACE

It was necessary to determine how to access the interior of this square, corner site. A diagonal orientation to the overall organization, and a public plaza near the corner leading to the back portion of the site allow both the Broadway and Ellery edges to be built up. Orienting the courtyard on Ellery street at an angle lessens the discontinuity along that edge and opens the site up to the neighborhood. There are other advantages to this plan. Entering the inner-most portion of the site from the corner strengthens the pedestrian link to the garage, relates those units to the rest of the site via the plaza, and guarantees a dead end condition. Some passers-by should find it convenient to cut through the site across the corner. This flow will give the development an integrated place in the neighborhood. It will not be an infiltrator. From Broadway, one moves up one-half level and under a piece of the building into the plaza. This deemphasis of the connection to Broadway discourages access to people unfamiliar with the neighborhood, reading it as access to private property. The rest of the outdoor public space consists of a green strip, a continuum of the courtyard on Ellery, around to the back of the site. The strip doubles as a fire lane, which means that it must be at least sixteen feet wide, and clear of trees. If an analogy is made to a dried river flowing from



the back of the site gently around and out to Ellery Street, the detached units in the back then appear as islands, while the Ellery Street houses, on higher ground, stand more like a mountain ridge.

The back part of the site is organized around the collective front yard. Private front yards are defined by a rise in ground level. Due to the juxtaposition of the rear yards of the Ellery Street Townhouses and the "collective front yard" of the detached units, the former are raised six or seven feet in insure everyone's privacy. At that interface, intermediate public terraces provide a transitional level while creating a situation more akin to a a natural landscape.

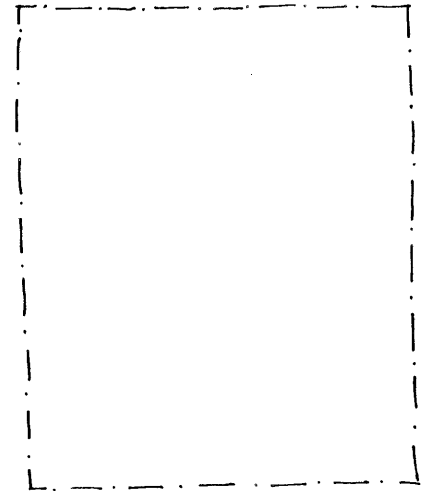
The walkway that leads to the back of the site is reinforced by a trellis. It runs along the public edge of the front yards which are raised three feet to provide a little more privacy, which sould encourage their use. The walkway leads from these detached units to the edge of the plaza where one finds the parking entrance. The level change along the pathway is articulated, so as to provide seating and create places to sit or play, and to help make the trellis more like a communal front porch. It essentially provides territory which can be claimed in some temporal way. The tree-like trellis provides shelter overhead and will substitute for actual trees until their canopies have had time to mature. The trellis could also be subject to alterations

such as painting, growing vines, being enlarged, partially enclosed, etc. It might encourage group initiative and represent a growth process that is symbolic of the collective presence.

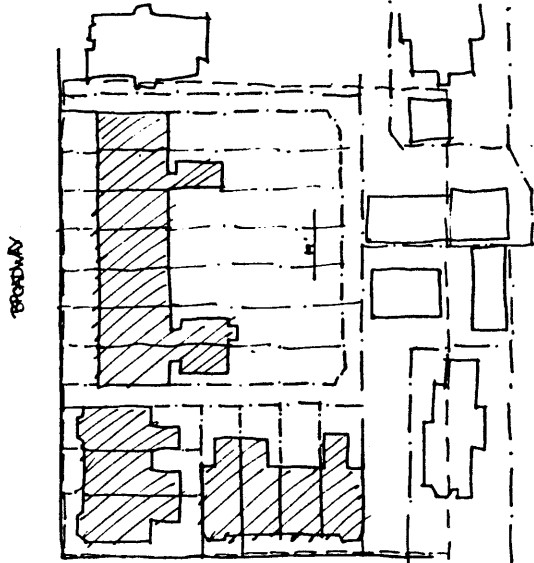
## LOCAL REFERENCES

These are examples of how interior portions of a city bloc have been filled in around Cambridge

boundaries of the site  
overlayed onto the  
references on the  
following page



ROW HOUSE

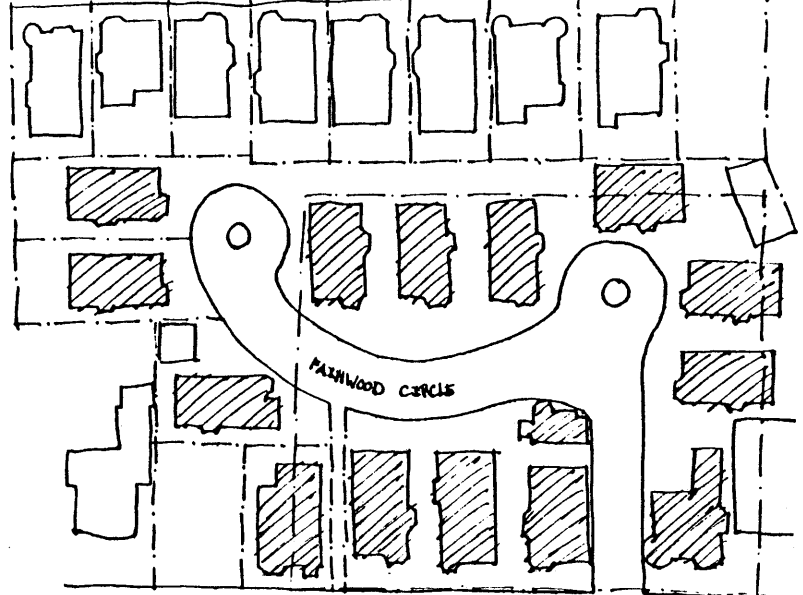


DANA ST

FAINWOOD CIRCLE

FASHWOOD CIRCLE

MARLE AVE

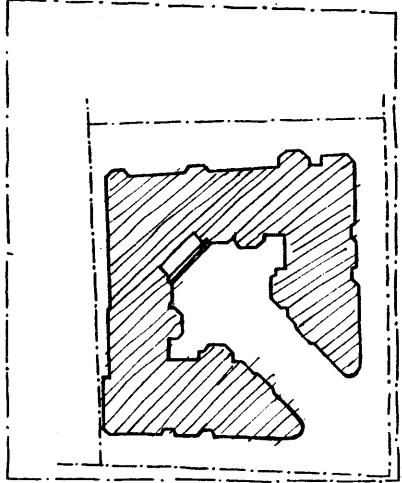


FASHWOOD CIRCLE

FAYETTE STREET

FAYETTE PARK

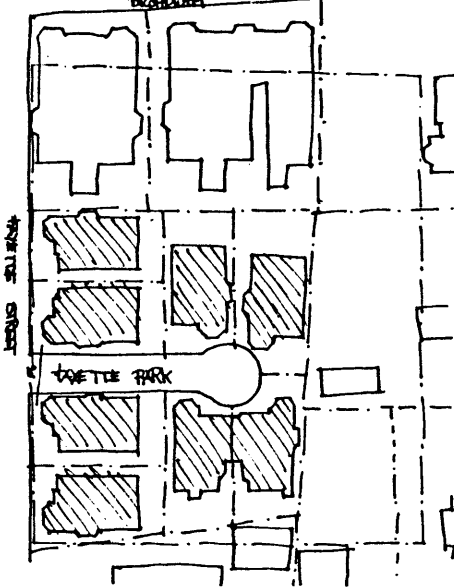
DANA COURT



DANA STREET

CENTER STREET

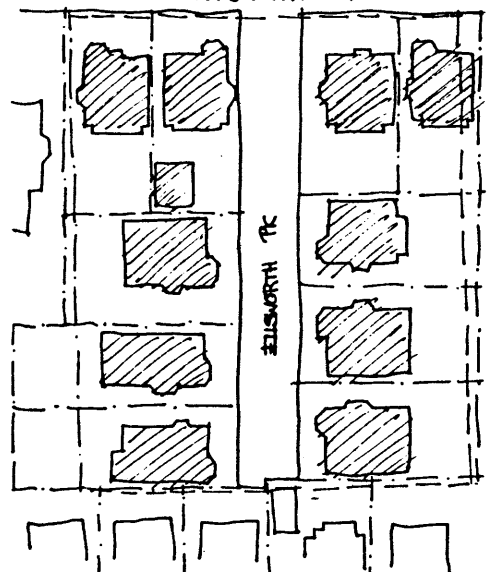
PROPLAN



HOUSE SELLING

FAYETTE PARK

ELLSWORTH PARK



ELLSWORTH AVE

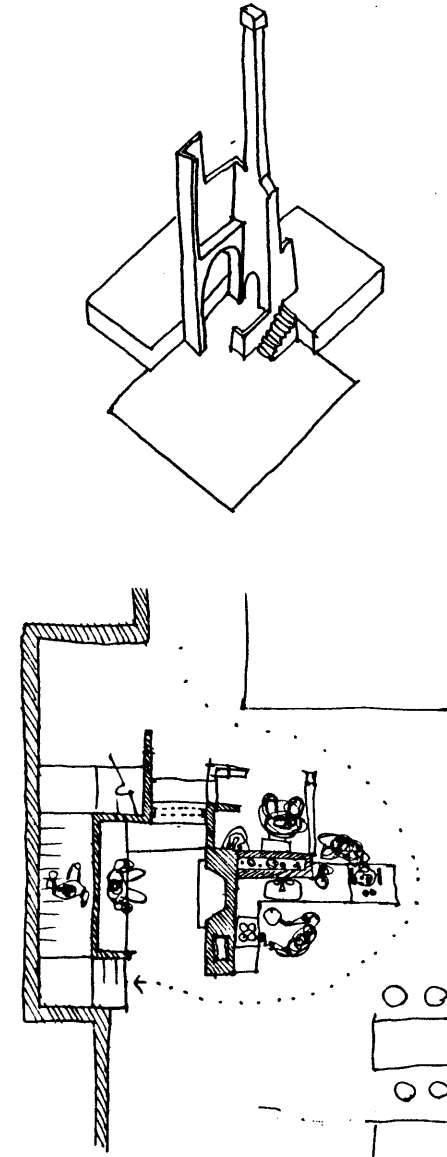
ELLSWORTH PL



## BUILDING ELEMENTS

One of the goals of this project was to design a continuous physical framework to unify the various housing types. In order to achieve this, it was necessary to define a hierarchy of building materials. Poured or precast concrete is the most ground-related, and its use as foundations and retaining walls as well as in the parking structure provides continuum. These walls become more pronounced where they surface as a base for the masonry cores. The concrete system also incorporates the archpiece from the parking structure. The cores are considered vertical extensions of the ground and are the main organizing elements of the units. They are made of masonry so as to be distinct from the horizontal concrete infrastructure which spreads over the site. Changes in ground level are used in conjunction with the cores to define the public/private edge. Heavy timber is used to create a covered passageway which then becomes "public property." Finally, conventional wood frame construction is used to complete the units.

The core is articulated in such a way that it provides opportunities for use. Although the dimension of the masonry unit is six or eight inches, returns in the wall create a virtual width of about two to three feet. This treatment provides places for seats, shelves, counters or closets. The core works in conjunction with the foundation walls to



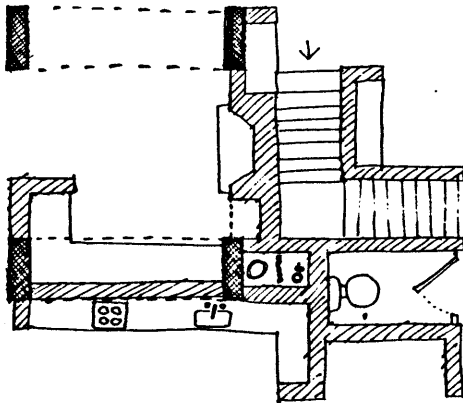
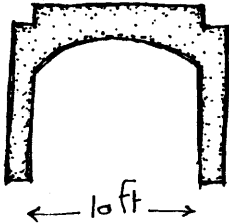
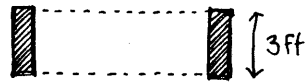
define different spacial relationships, depending on their placement with respect to each other. The user then decides what space and what use relationships he/she would like.

The archpiece from the parking structure has strong formal qualities which could be used elsewhere on the site. It is either precast or poured concrete and becomes associated with the notion of ground and ultimately incorporated into the core element. This piece also extends up through the parking structure to define "hearth-like" places within the units.

The arch used above stands as a transition between two rooms, to be completely or partially filled in. Two such pieces together define a bay, creating a vault-like space. Used in conjunction with the fire place, they provide a hearth.

The archpiece is flexible in that it can be used many ways. It is part of the primary decision making, and cannot be altered once in place.

The wood elements, however, are easily modified if a change is desired. The most versatile of these elements is the porch. It is a standard piece of local architecture which builds up the public/private edge. It is often screened in, closed in or used to enlarge rooms. These changes create different degrees of openness to the outdoors, generating a range of thermal conditions from which to choose. From the outside, these changes could express variety between units.





The trellis is an extension of the private porch into the public domain. It is made of heavy timber and is thus more massive than a porch, to reflect the fact that it is a communal structure.

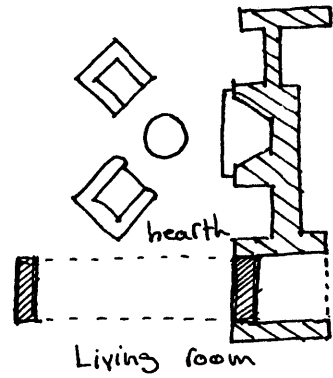
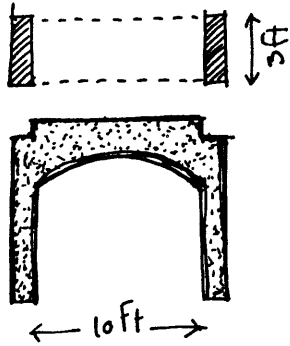
The building elements having been described, they must now be put together to provide options for the prospective buyers. In the next section I shall use a "mix and match" approach to the three different housing types.



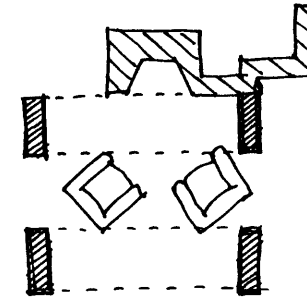
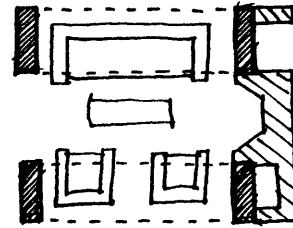
49 GARFIELD ST. 1888  
ARCHITECT EUGENE CLARK

THE ARCHPIECE

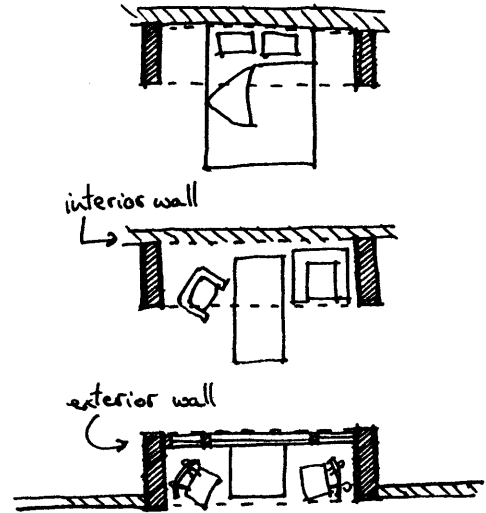
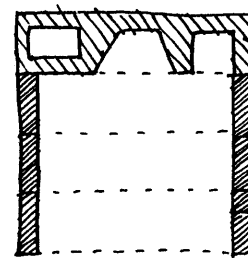
use variations



Living room  
Arch as transition element

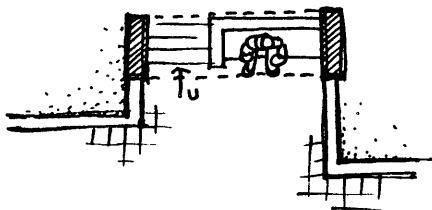
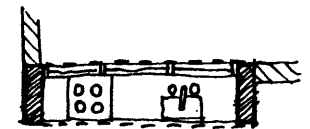
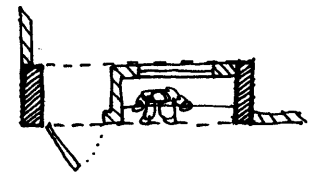
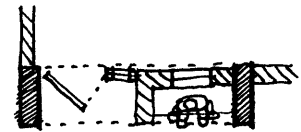


Arch pair defines vault-like space

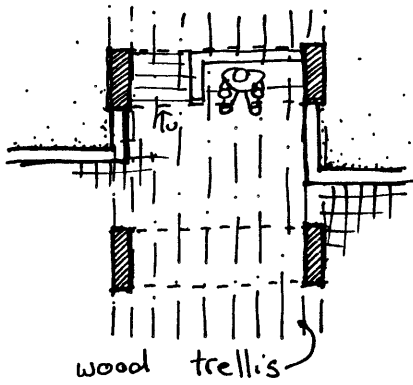


interior wall

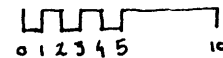
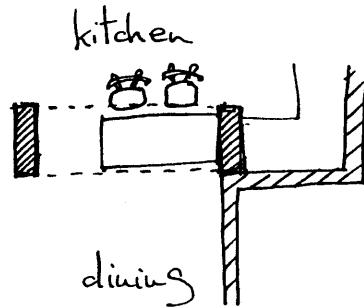
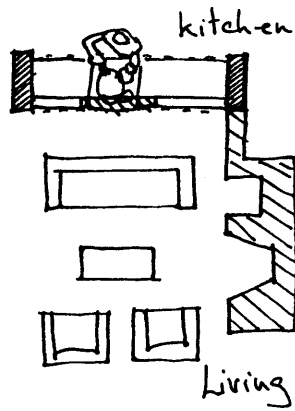
exterior wall



Arch as gateway to private yards

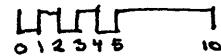
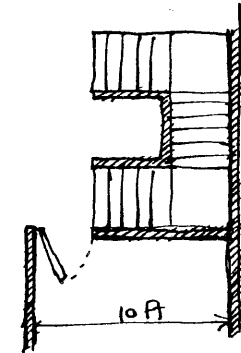
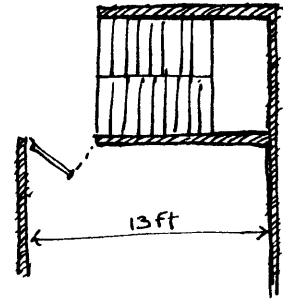
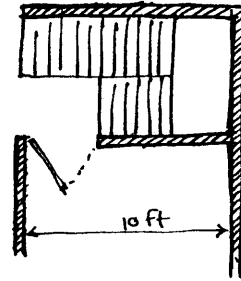
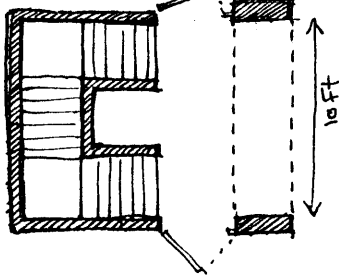
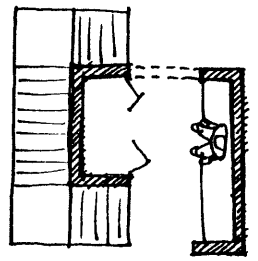
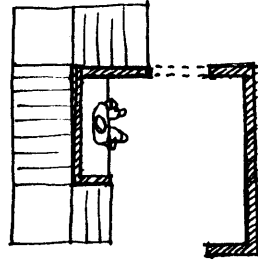
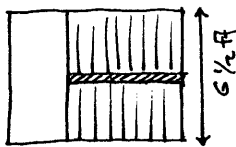
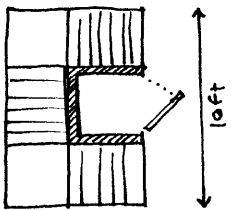
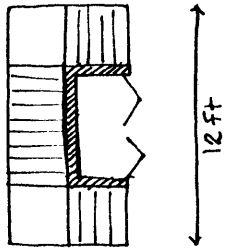
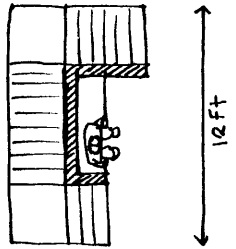
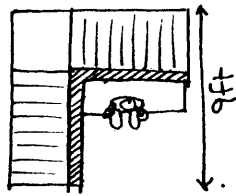
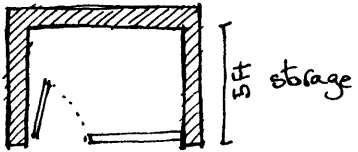
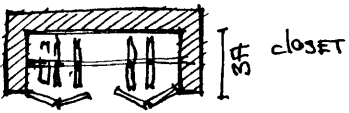
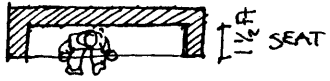


wood trellis



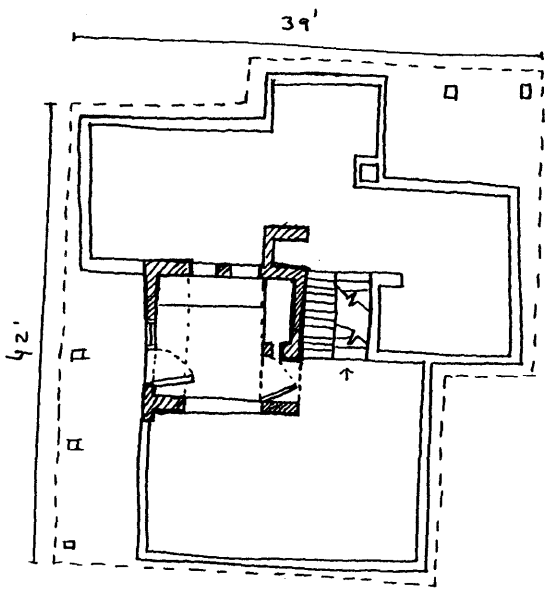
## MASONRY CORES

Identifying useable elements

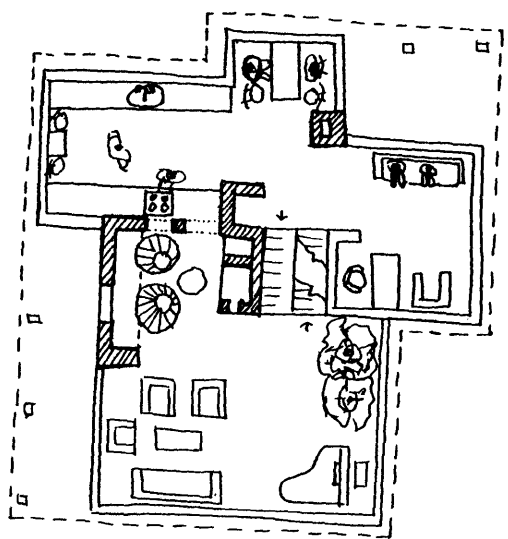


## MASONRY CORE

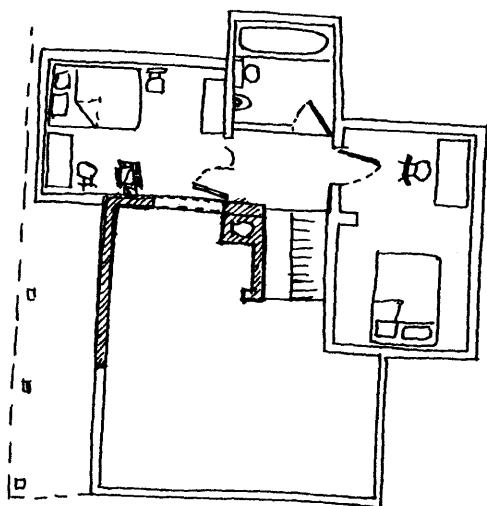
A comparison  
of a  
split level unit  
and a  
solid core unit



GROUND FLOOR

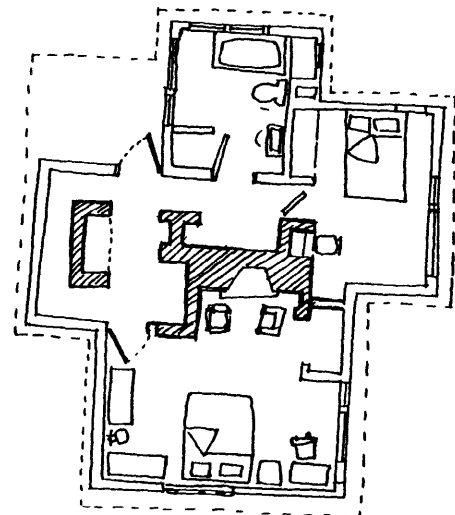
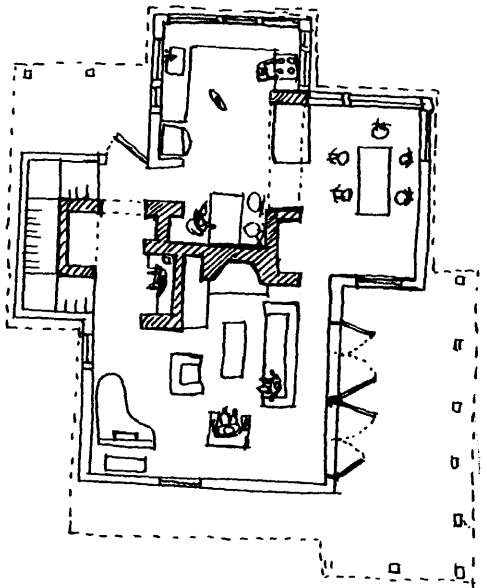
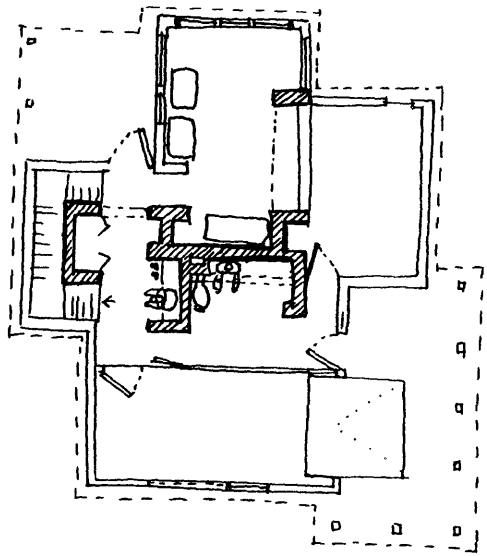


SECOND FLOOR

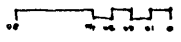
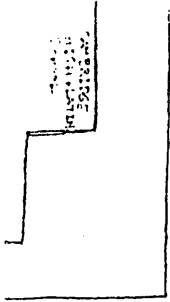


THIRD FLOOR

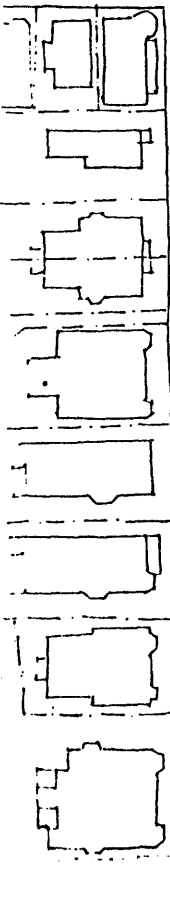
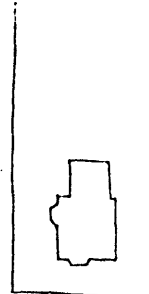
SPLIT LEVEL



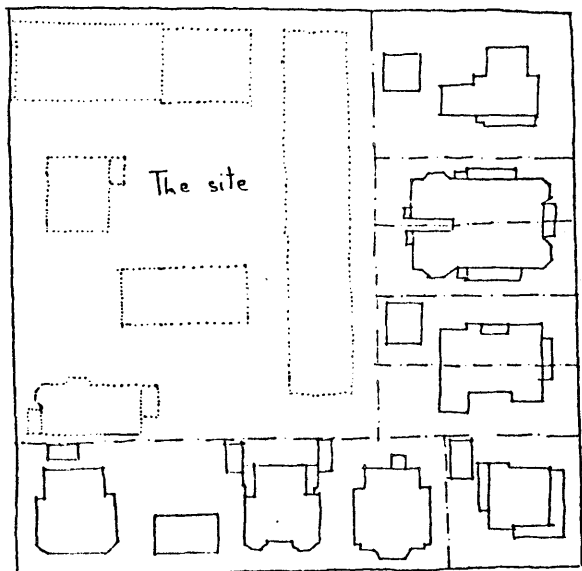
SOLID CORE



BROADWAY

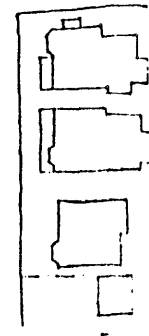
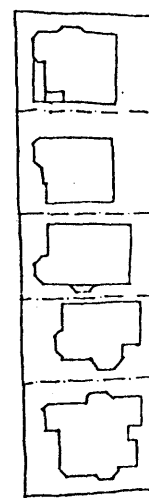


ELLERY ST.

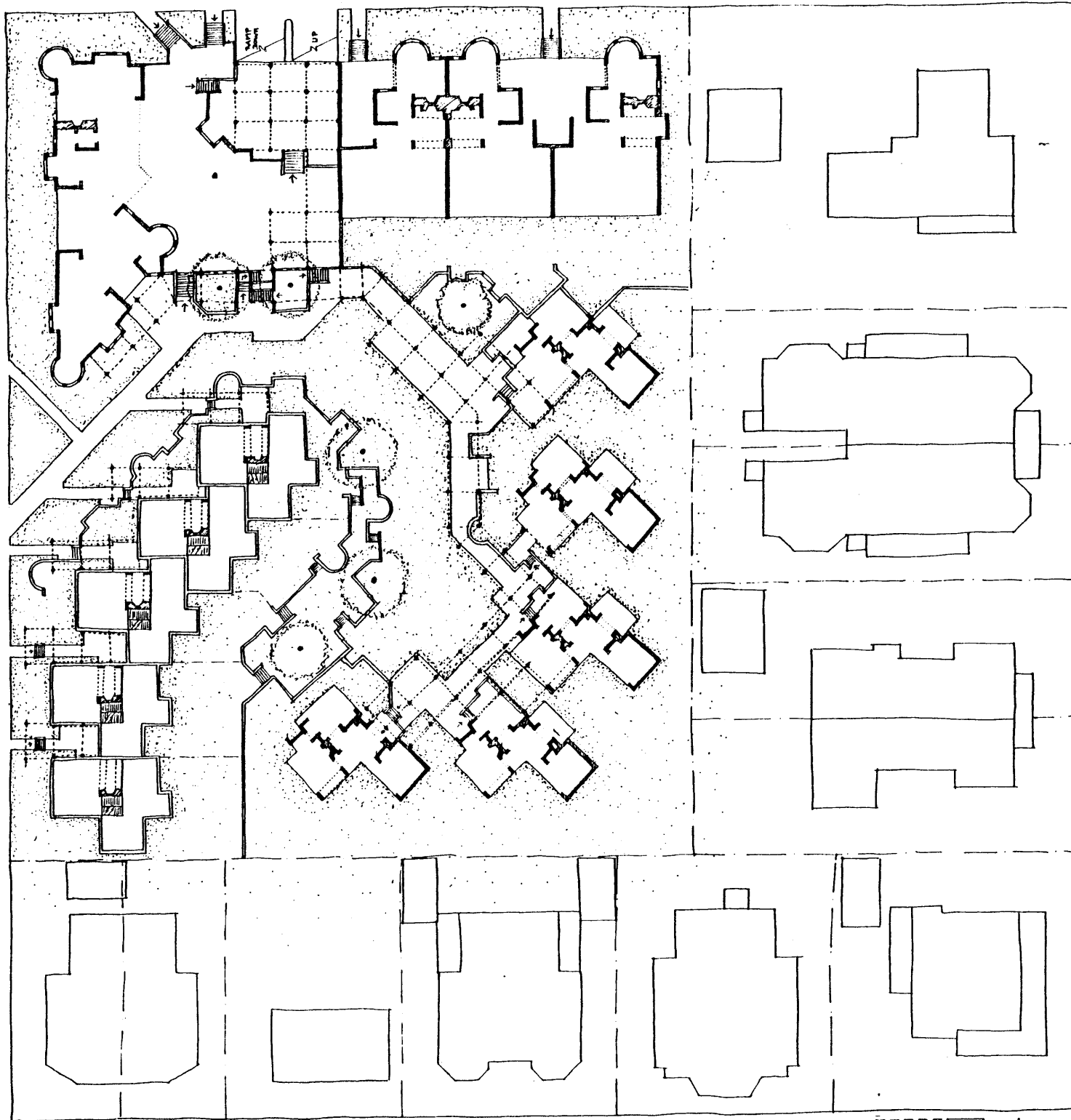


CLEVELAND

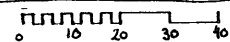
DANA







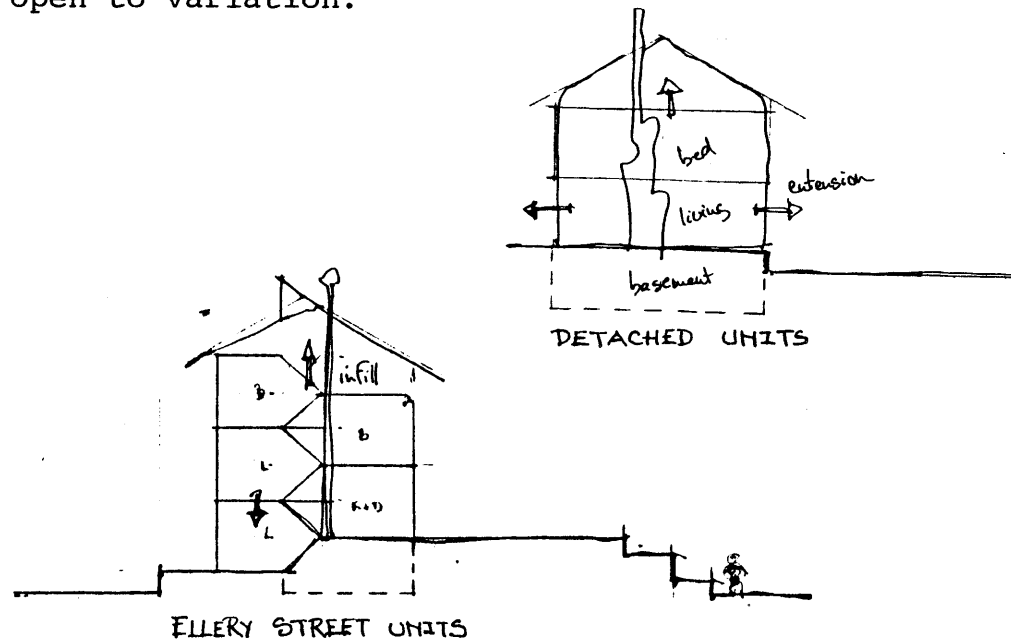
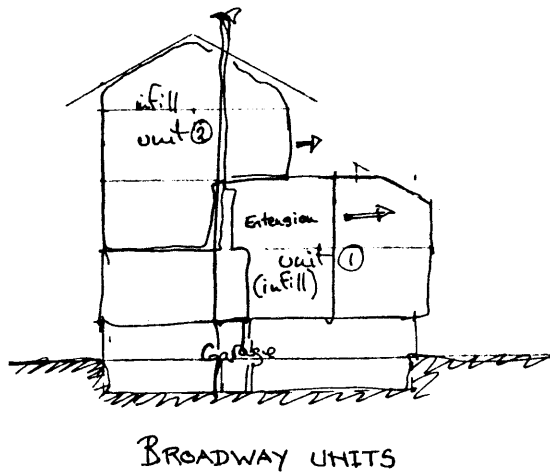
1/16" = 1 Ft

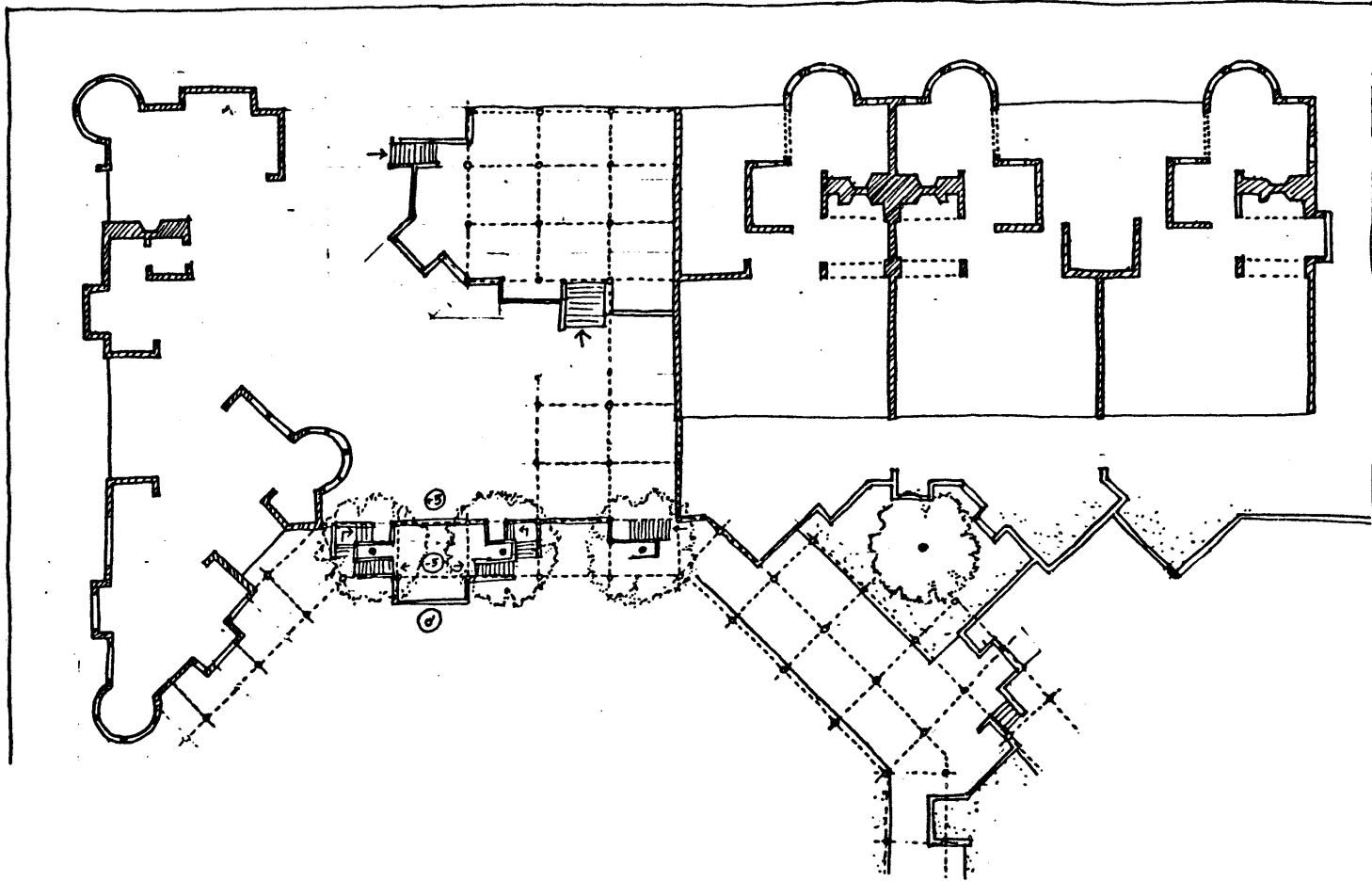




## UNIT ORGANIZATION

In order to fit twenty-two units on this site, and still allow them to be responsive to their locations, I have designed three basic housing types. They all have a certain characteristic flexibility in addition to elements that are fixed. The nature of this flexibility and the organizing features of the unit are different for each housing type. I will analyze the implications of each of these separately in the following three sections. The concepts will be presented by a combination of written description, illustrations and drawings, starting with the row house which is the least flexible and ending with the detached units, which are most open to variation.

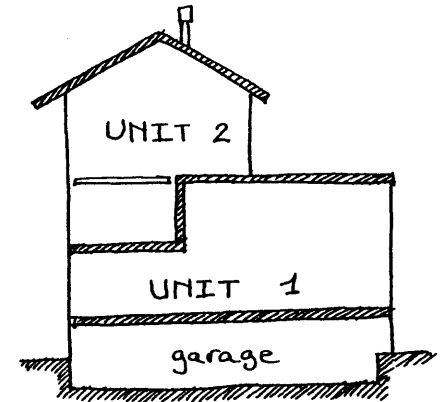




BROADWAY UNITS

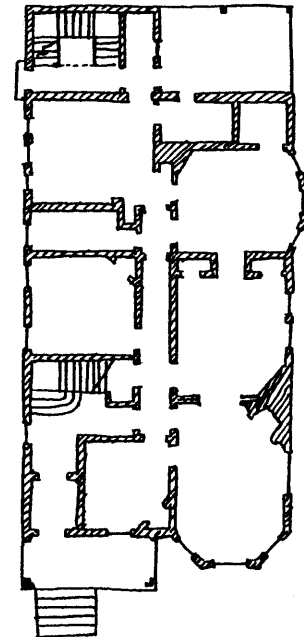
## BROADWAY TOWNHOUSE

The row house units along Broadway follow a duplex arrangement that interlocks in section, both apartments sharing the second floor. The building reaches the height limit set by the Cambridge zoning ordinance of four stories, with an eave line at thirty-five feet. The decision to build a "hard" edge along Broadway is in response to its fronting on a major public artery, and provides continuity with the row houses and apartment buildings along the street. In addition, this edge corresponds to the north side of the site, which encouraged building as densely as possible for reasons of solar orientation. The thirty-foot width of the units derived from the parking structure, is more similar to that of a standard "triple decker" than to a row house. This dimension allows for a good deal of flexibility since it can accommodate two generous rooms, or a room and some outdoor space. The advantage over a conventional twenty-foot width is that the enclosure can step back to let air and light penetrate into the unit. It is possible for every room, including kitchen and bathrooms, to have a window. Porches are used on the front facade as a means of introducing public/private transitional areas along a busy street. They occur between masonry bays which are extensions of the core to the exterior skin. The semicircular form draws from the turret-like bay windows found on turn-of-the-century apart-

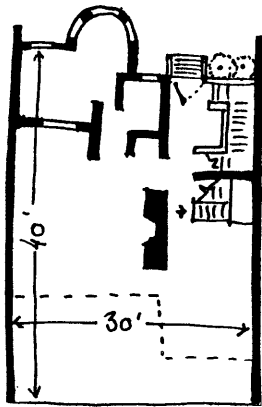


FROM: SURVEY OF ARCHITECTURAL  
HISTORY IN CAMBRIDGE (3)  
CAMBRIDGEPORT (P. 43)  
CAMBRIDGE HISTORICAL COMMISSION

THREE-DECKER PLAN  
(1667 CAMBRIDGE ST., 1896;  
GEORGE FOGERTY, ARCHITECT)



ment buildings throughout Cambridge. The facade, therefore, consists of a vertical pattern of alternating wood and masonry pieces.

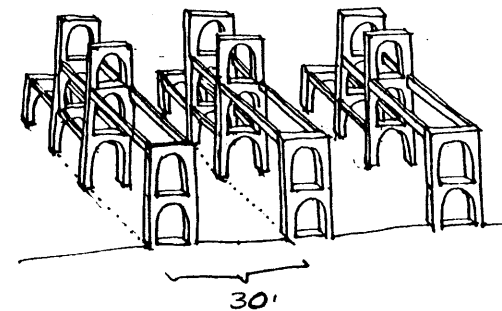
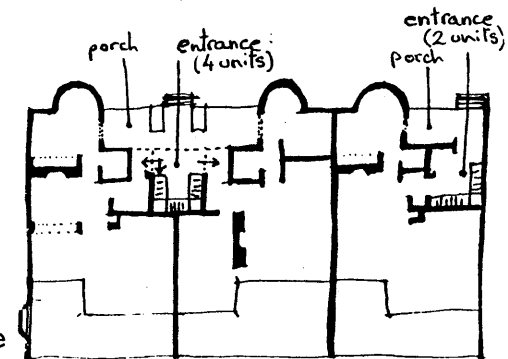


The customary differentiation between the formal front, and informal back of the row house type is carried further here in terms of flexibility. Space in the front part of the unit is rigidly defined by the masonry walls. It is adaptable only in that it can accommodate various uses. The design of these masonry elements by the architect maintains coherence along the facade, presenting a clear image to the street. The back portion of these units, on the other hand, consists of a two-story shell which is filled in according to personal preference. The parking structure is used here as a means of creating a two-story space: spanning the thirty-foot width between masonry bearing walls with prestressed hollow core slabs. Above this space is a large terrace for the upper unit, so that one need not worry about supporting load bearing elements in mid-span. It should be noted that concrete plank is used because it is found in the parking structure, otherwise steel or wood truss could span the distance equally well. Alternatively, the long span could be avoided altogether by using a post and beam system assuming that one does not mind the disruption in the potential flexibility of the space. Since it faces onto the site, the way the enclosure is handled need not conform to any outside standard. It does, instead, use

elements which respond to the other houses on the site, in a way that encourages an informal atmosphere and individual expression. The upper unit is similar, except that the flexible zone consists of one full floor and another level possible, within the volume defined by roof.

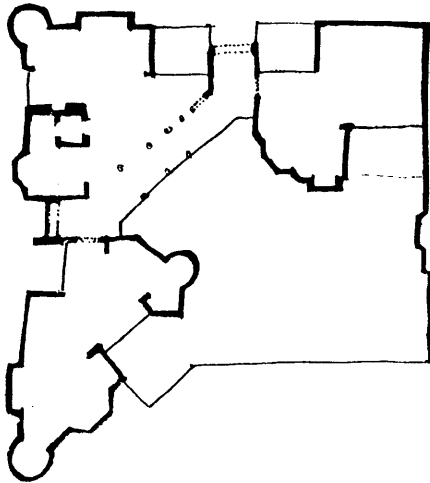
Working with these parameters I designed several units in an attempt to generalize certain variations. In each case, I tried to group entrances together to make front porch space available for the ground floor unit. This resulted in one entrance for two pairs of units, and another for the end pair. The main stair-well is generous in size, because it doubles as a collective entrance, with enough room for putting packages, waiting, and picking up mail. The downstairs unit is entered at the masonry part of the house where the kitchen and dining are likely to be located. The rest of the unit consists of the two story volume, which basically accommodates the living area below and bedrooms above and gives onto a back yard. One enters the upstairs unit on the second floor, and moves past a large room up to the main living floor. As mentioned previously, space can be claimed under the roof for additional rooms or lofts.

The unit design is in part determined by the parking garage, above which the apartments are situated. Or rather, it is a symbiotic relationship where the archpiece is carried through to the apartments to define the hearth, and where the garage is perceived as an assemblage of familiar and domesti-

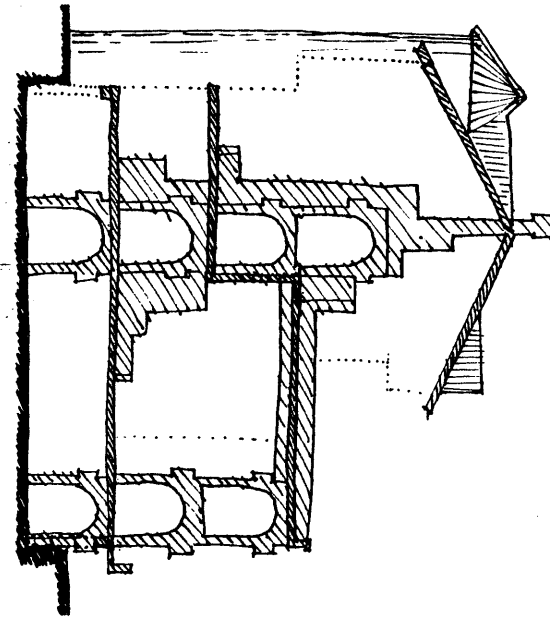
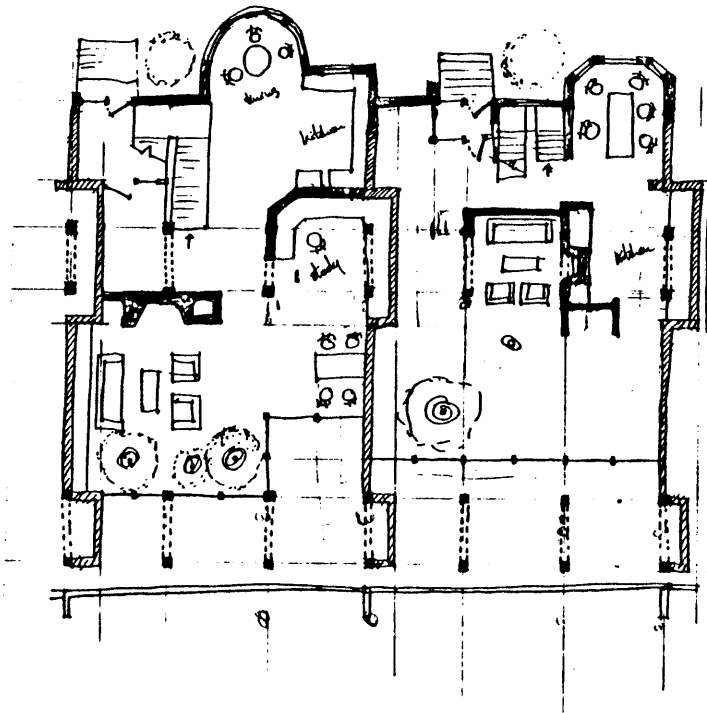


cated archpieces. This same relationship exists for the other units on the site as well. The parking structure was also helpful in lifting the housing one-half level off the ground, assuring privacy for the lower units.

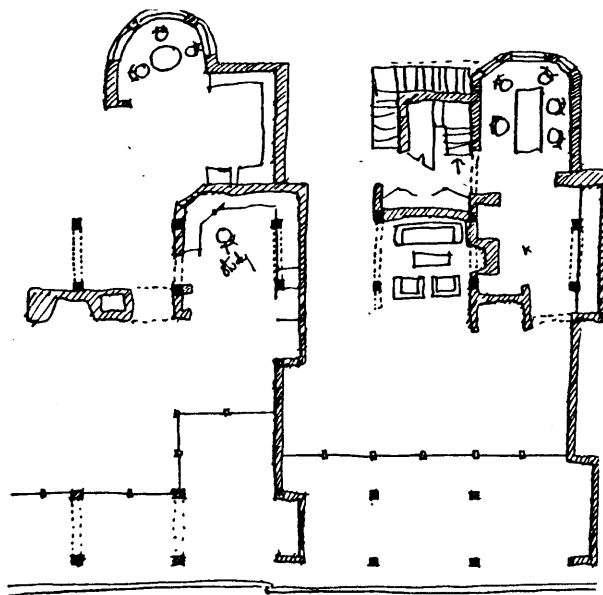
The units at the corner of the site have not been designed in detail in this work. They are like conventional apartments, spreading over one floor only, and the least flexible units on the site. Variations can occur, however, by allowing residents to decide on the placement of partition walls. The exterior walls are of masonry construction, and therefore not open to modification, reflecting a concern to maintain a coherent facade in view of the fact that the apartments are surrounded on all sides by public space. These masonry walls are also similar in form and material to the perimeter walls of the local apartment buildings. Again, porches occur between wall pieces, although here, they are less prominent than in the row houses. The six apartments are accessed from the interior plaza, leaving the ground floor along the two streets available for commercial use. Although these units cover only one floor, one can also imagine them extending partially or completely onto a second floor. One would then have a volume rather than a plan to fill in. Windows punched in the masonry facade would be key elements in the placement of rooms.





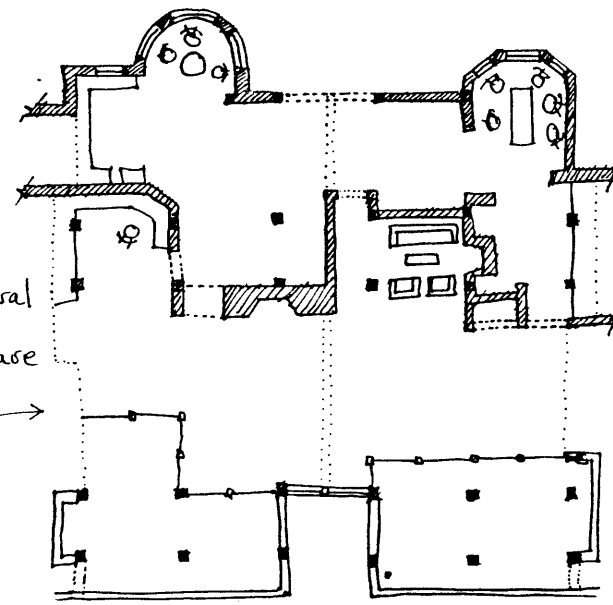


Exploration  
of how  
arch piece  
could be  
incorporated  
into the  
apartments

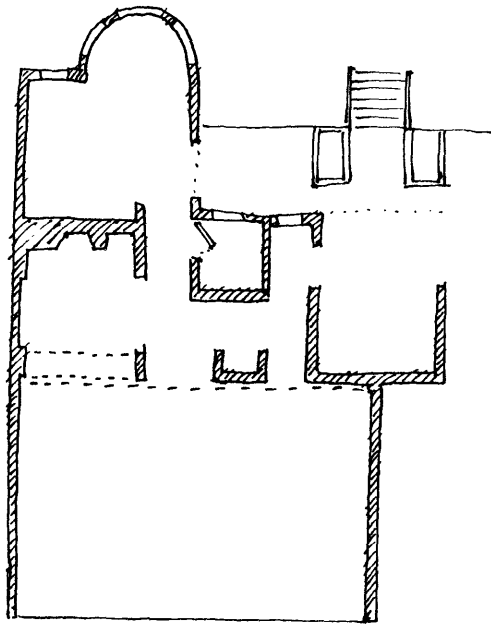


masonry  
party walls

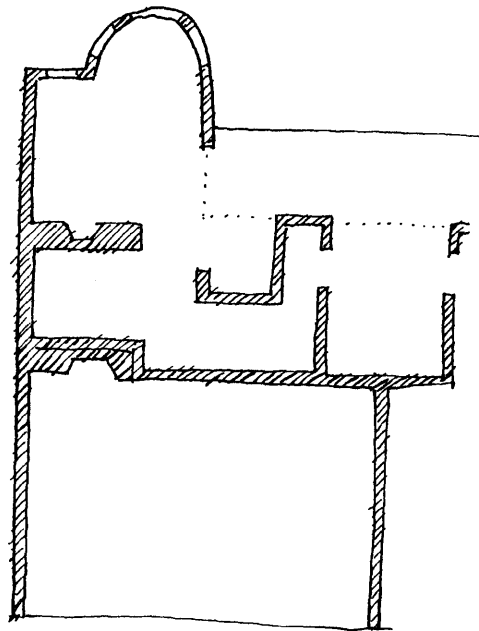
masonry lateral  
walls  
party walls are  
wood frame



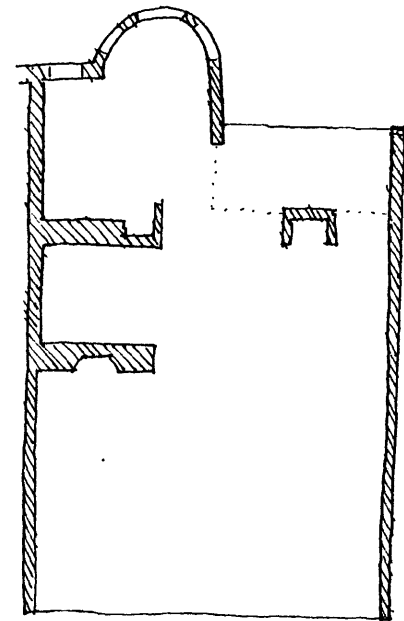




first floor

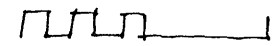


second floor



third floor

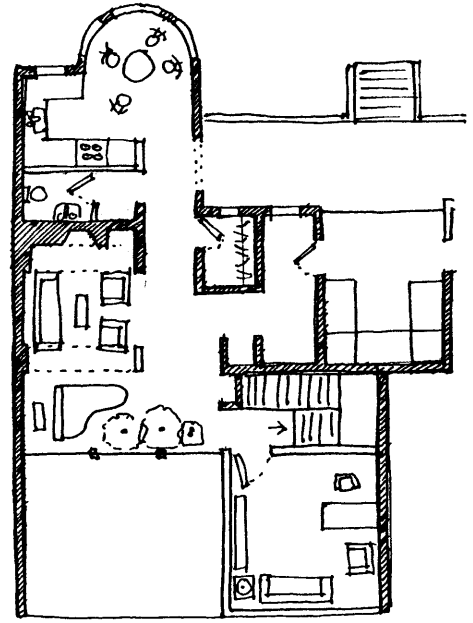
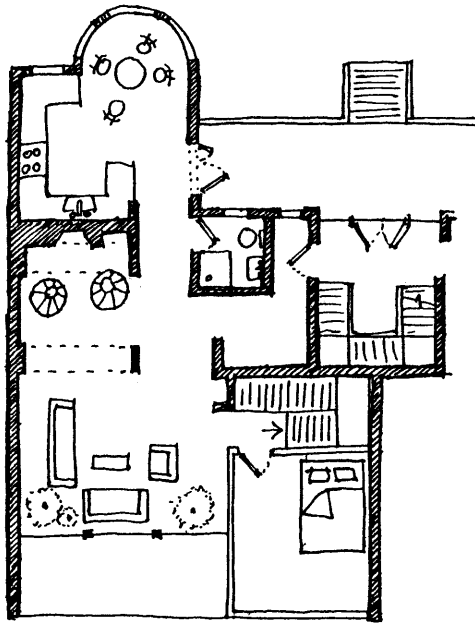
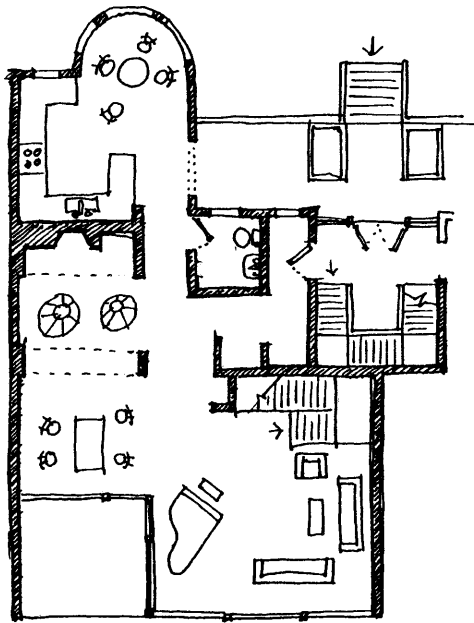
THE SHELL



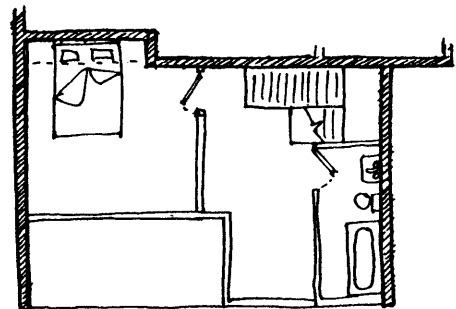
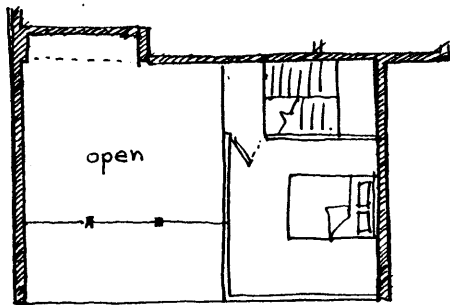
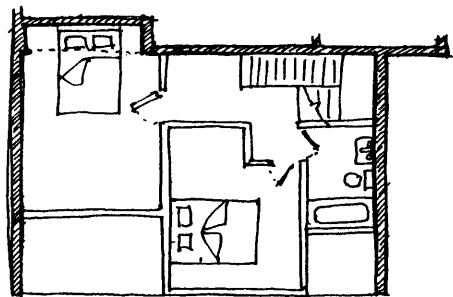
0 2 4 6 8 10

20 51





FIRST FLOOR



SECOND FLOOR

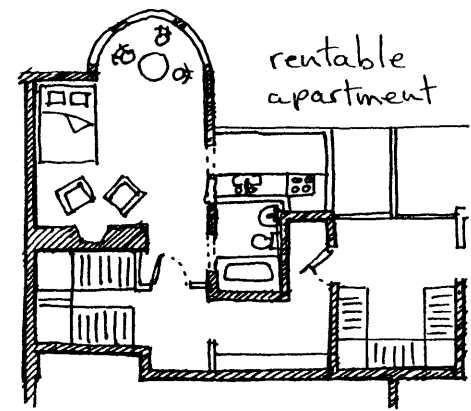
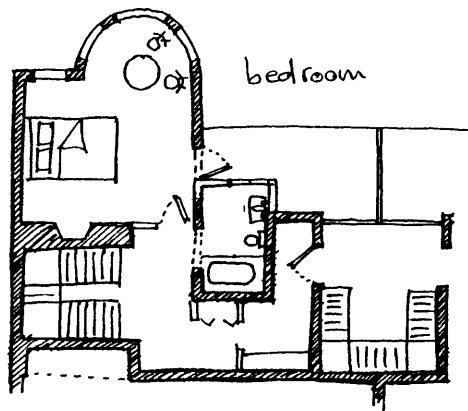
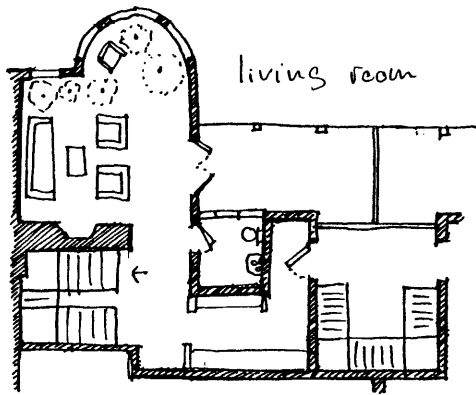
OPTIONS  
UNIT 1



0 2 4 6 8 10

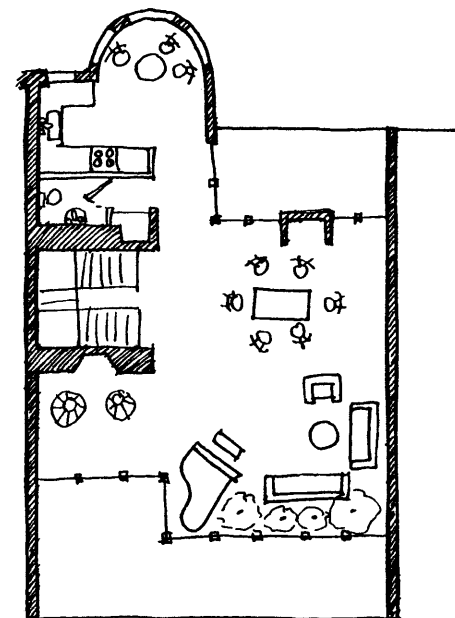
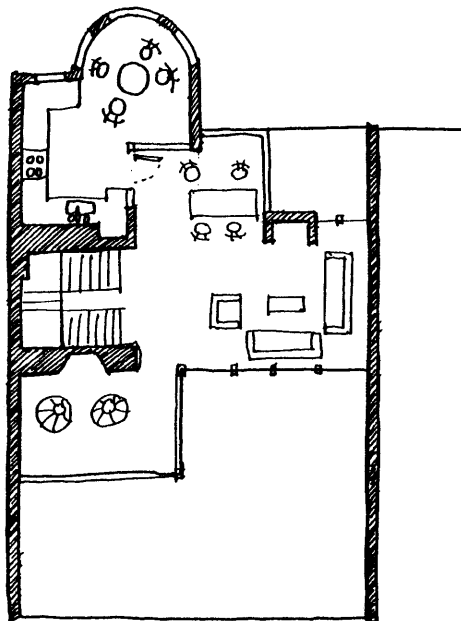
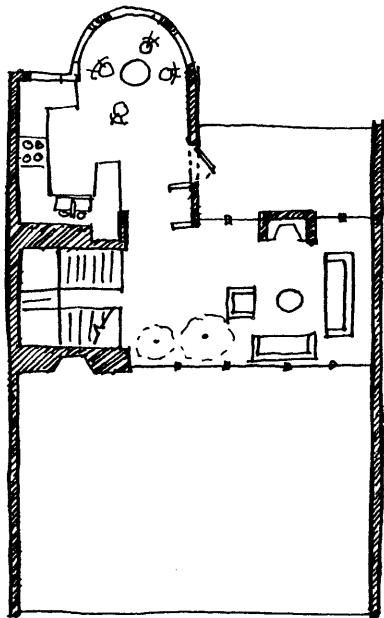
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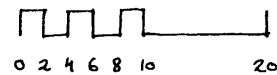


SECOND FLOOR

THIRD FLOOR

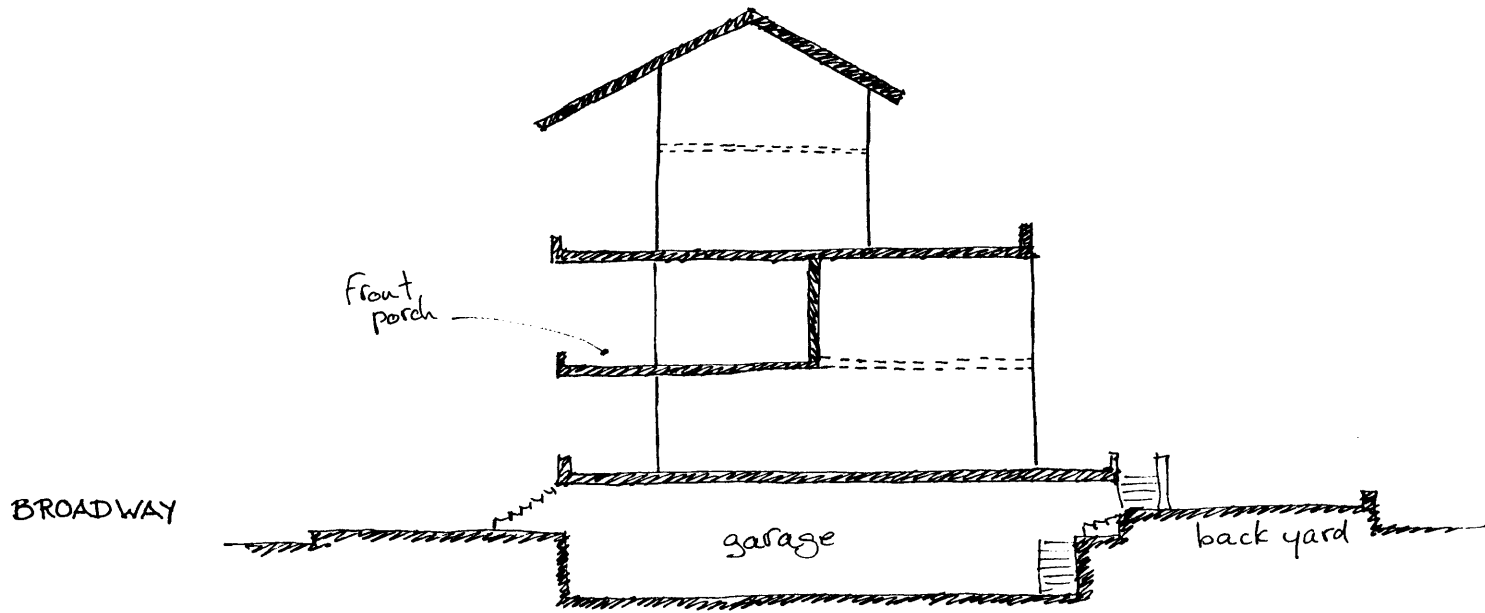


OPTIONS  
UNIT 2

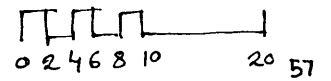


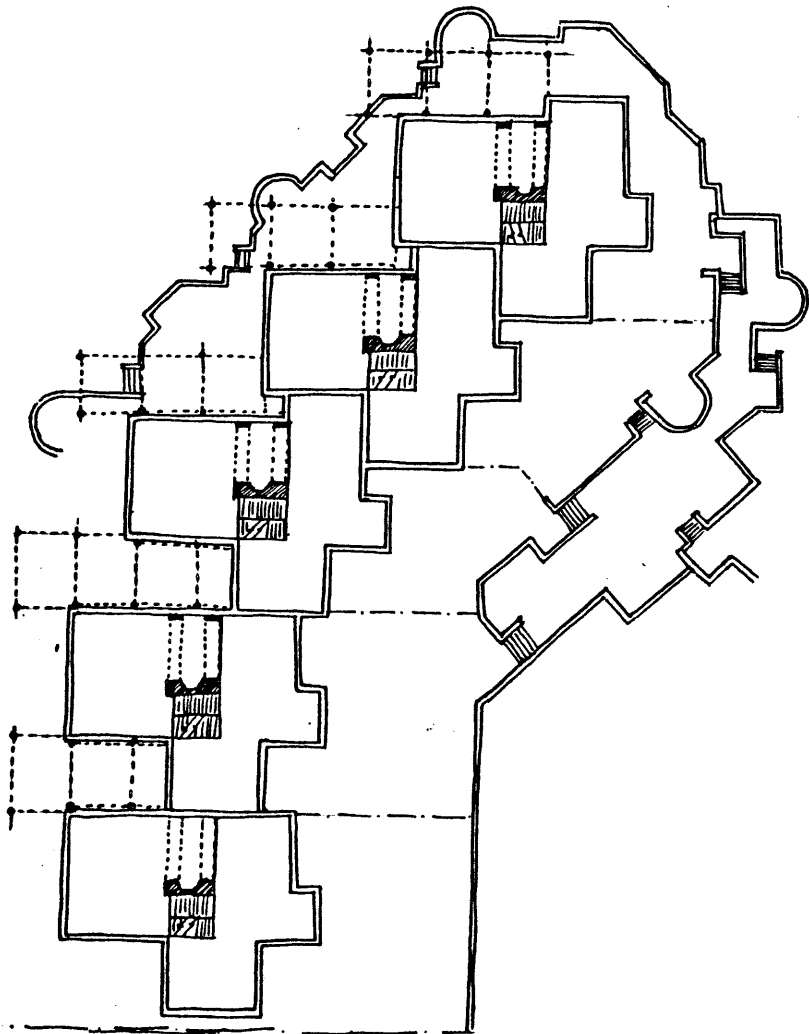






SECTION  
BROADWAY UNIT



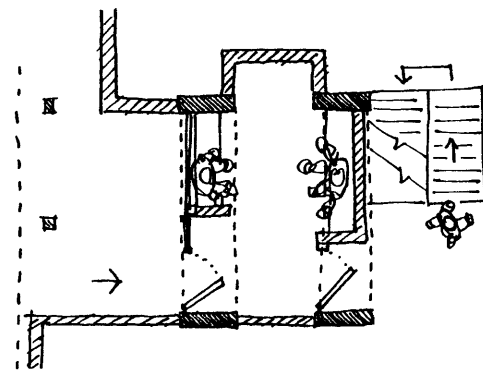
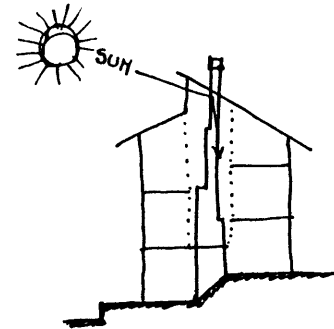


ELLERY STREET UNITS

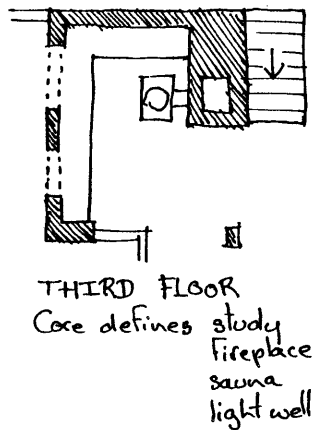
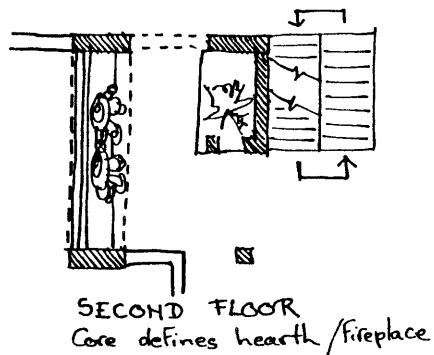
## ELLERY STREET UNITS

The units along Ellery are semidetached single family houses. The main organizing concept is the use of a split level floor arrangement on either side of a central light atrium. The unit can then be built over a smaller ground area and still maintain a variety of spatial interrelationships. Establishing a visual connection from one level onto two others creates both horizontal and vertical continuity between floors, heightening one's sense of spaciousness. The house is perceived as a volume rather than a series of distinct, unrelated floors. Light travels down from a skylight overhead along the masonry chimney to the fireplace area on the main living level.

Flexibility results primarily from situating living functions on different levels, thereby changing their relationship to the house and to each other. Between the ground and the roof, spaces are defined by different physical attributes. The ground floor is a more cave-like area, open to the outside rather than towards the rest of the unit. As one enters from Ellery Street, one moves past the masonry core to the stair. Because the core is "U" shaped it provides a cozy place to sit and leave shoes and coats. Since the core is provided with a flue for wood stoves, it is conceivable to close off this space as a sauna. The rest of this level is considered to be workshop area, and/or



GROUND FLOOR  
Core defines entrance/mudroom

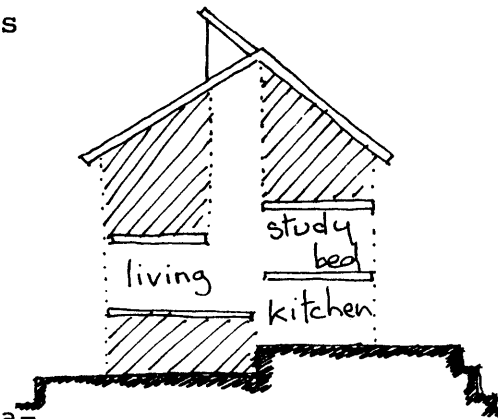
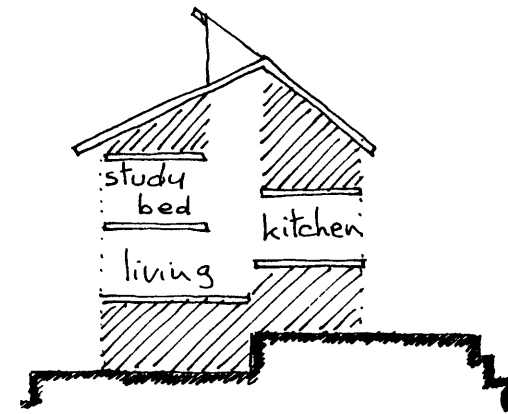


storage for bicycles, etc., and/or a large mudroom. The potential exists for making this space into a bedroom. However, if it were to be transformed into a rental studio apartment, the rest of the house would have to be entered through the backyard. The next level up has a southern orientation and gives onto the backyard. This space can be used basically as a kitchen/dining room, or bedroom/bathroom, or laundryroom/greenhouse. One half level up, again, is the main living area and fireplace. The light atrium originates on this level, making the upper part of the house much more open, at the same time the core becomes much smaller, being ultimately reduced to just the chimney. Kitchen, dining, study and bedrooms then find their place between the living level and the roof.

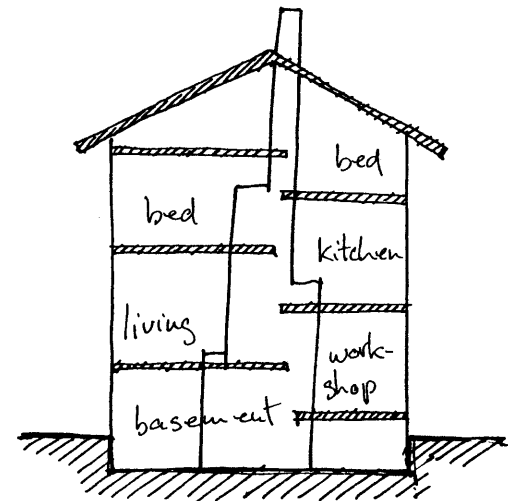
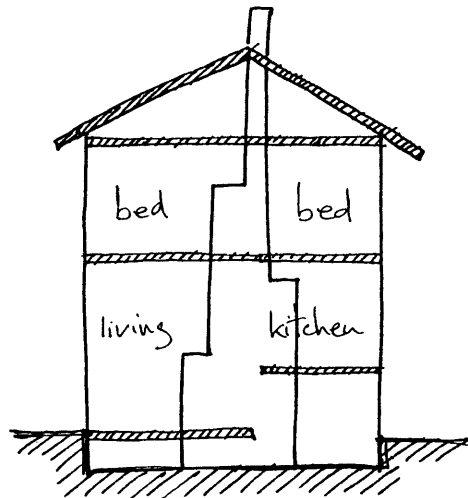
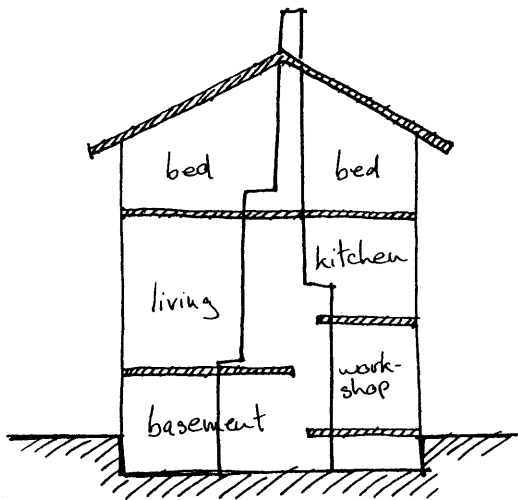
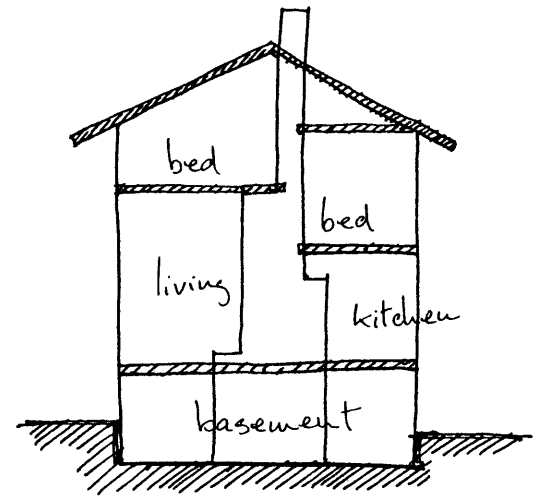
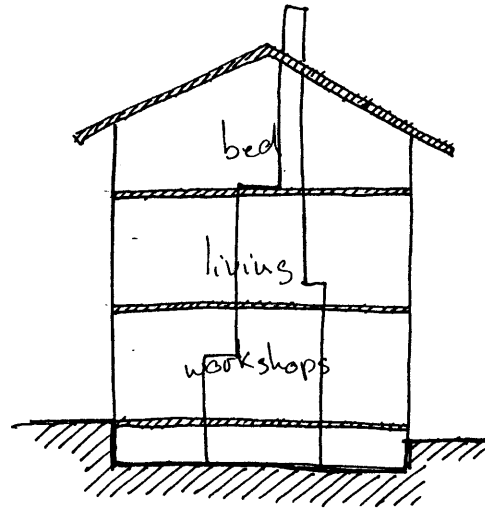
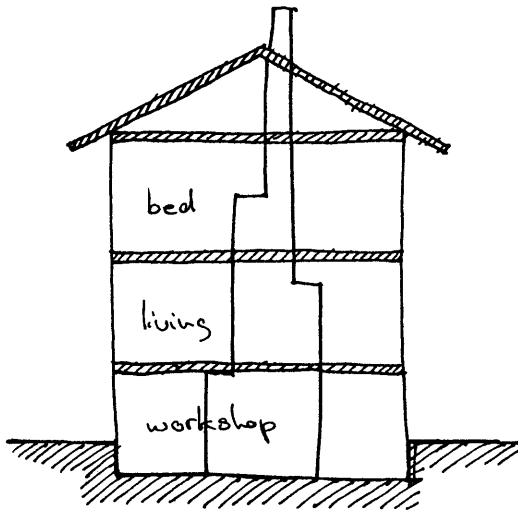
Different use scenarios can then be worked out by simply assigning functions to different levels. For example, the kitchen can be either on the backyard level or on the floor directly above. In the first case, it is separated from the living areas, but open to the garden. In the second case, the kitchen overlooks the living area and is in fact part of the same space. Connection to the rear yard can then be made by adding a deck and staircase. By raising the kitchen off the ground one creates an opportunity to introduce another use, such as a nursery, greenhouse, workshop, or bedroom which will open onto the backyard. Similarly, in each case the relationship of the

study/bedroom area to the other living functions changes. In the first it overlooks the living room, while in the second it overlooks the kitchen. Finally, the bedrooms make use of the space left under the roof. Where a full-height room is not possible, one can use dormers to make the roof habitable.

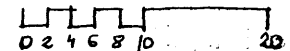
Flexibility of the system is enhanced by the fact that major organizational differences can be made through relatively minor changes in design. The skin of the unit does not vary in plan, only in terms of the elevation. After the floor levels are established, significant changes can still be made by partitioning off the rooms. These decisions need not be made at the outset, but can take place over time. One can also envisage introducing one-and-a-half and two story spaces. As soon as these options become possible, many other use scenarios can be developed. Alternatively, a two story space can simply be provided over the living room which could, eventually, either be subdivided into two full height rooms or into a story-and-a-half space with a bedroom squeezing in under the roof.





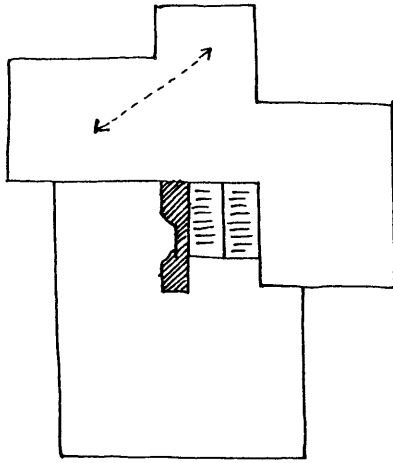


OPTIONS  
SHIFTING FLOOR LEVELS

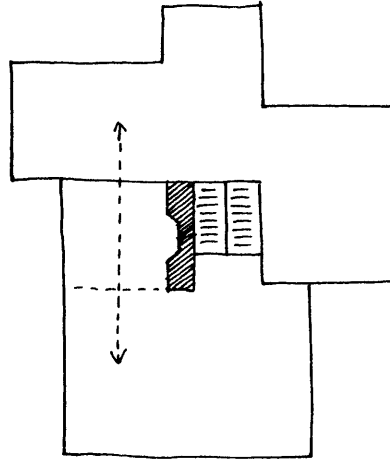




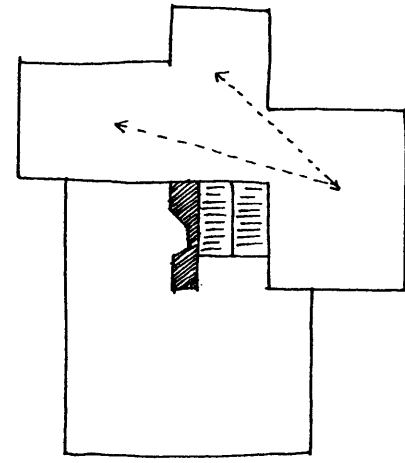




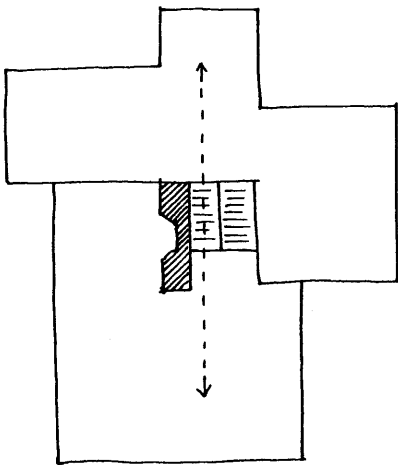
two parts of one larger space  
or could be partitioned into  
two small rooms



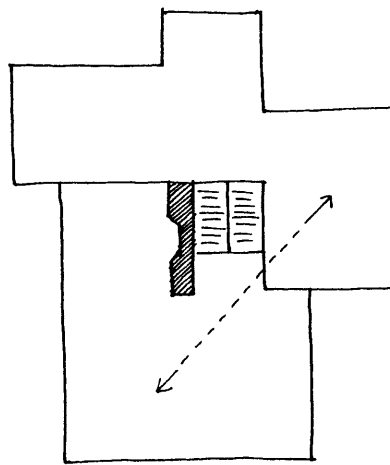
strong visual connection across  
open space to level below  
and above



lesser connection with other  
spaces, can be partitioned  
off as a separate room

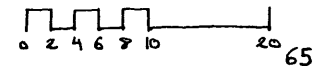


minor connection through  
staircase to level below  
and above

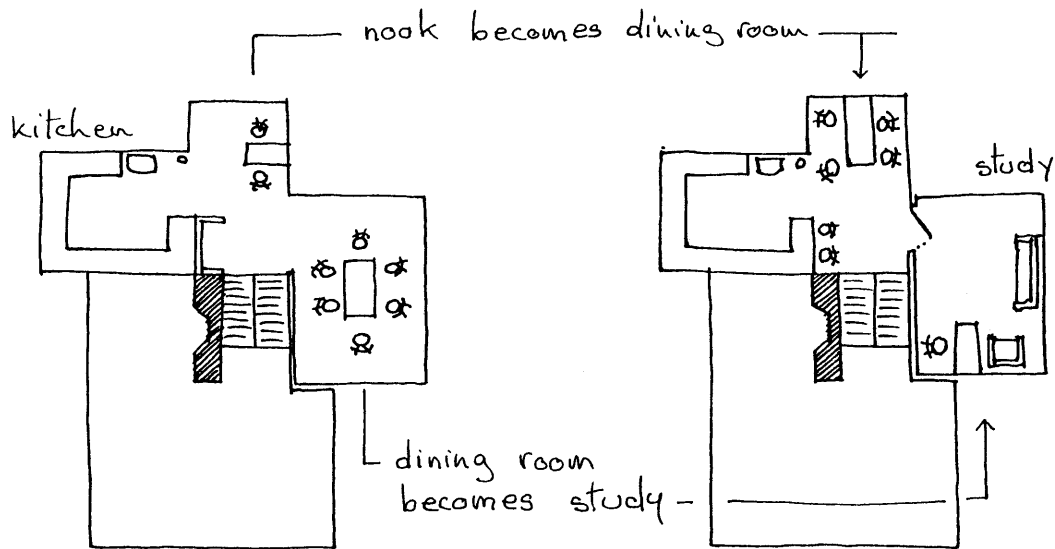


visual connection only  
possible if living area  
is more than one story  
in height

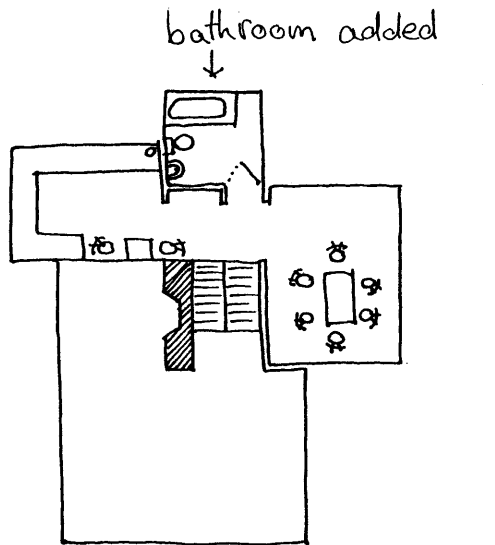
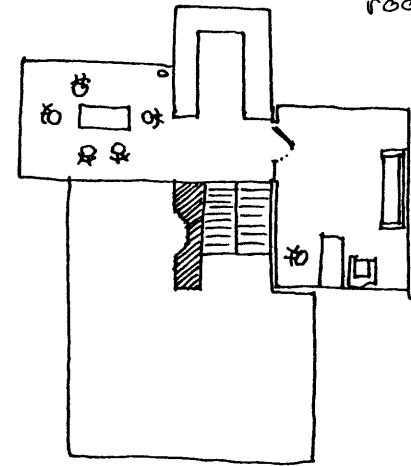
## STUDY OF SPACIAL INTERRELATIONSHIPS



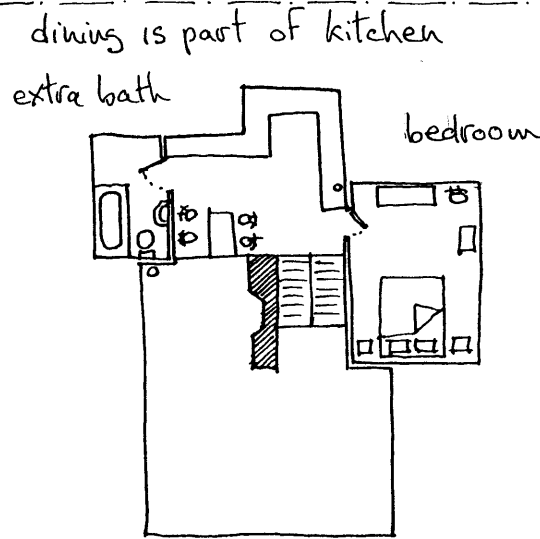




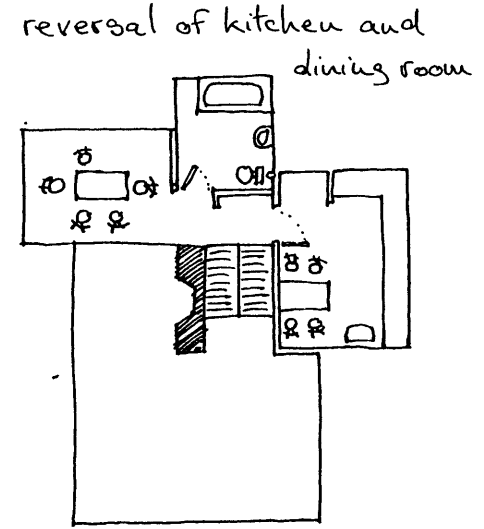
kitchen is smaller  
dining overlooks living  
room



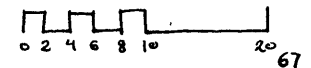
STUDY OF  
KITCHEN-DINING LEVEL



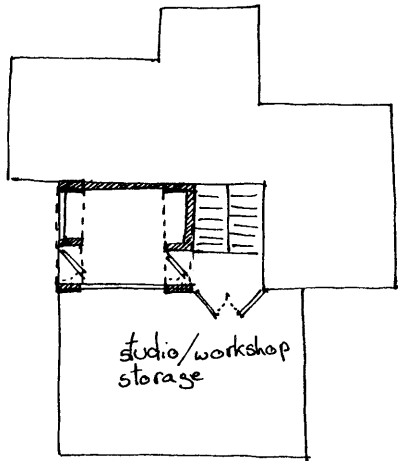
relocation of one plumbing chase  
and addition of another



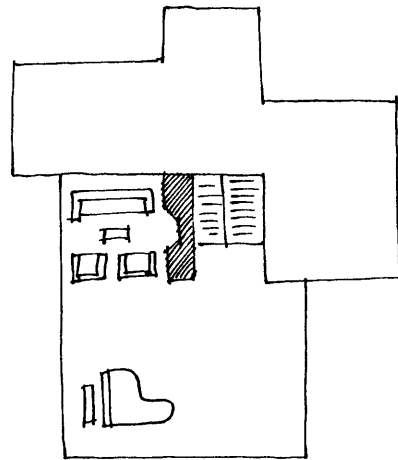
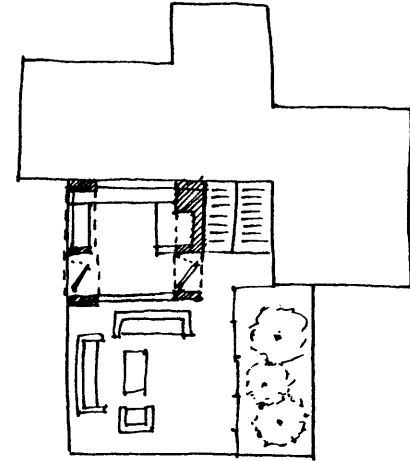
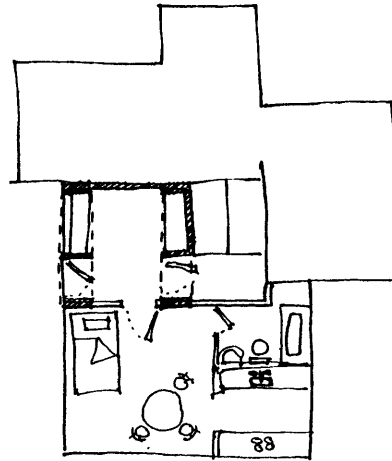
relocation of plumbing  
chase



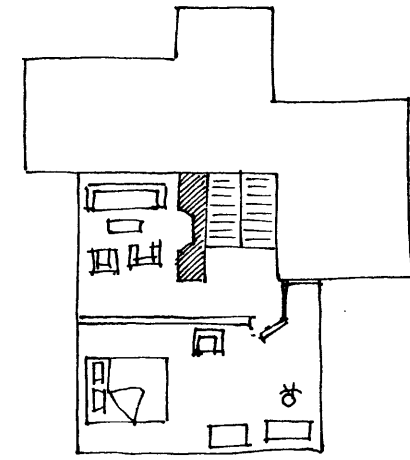
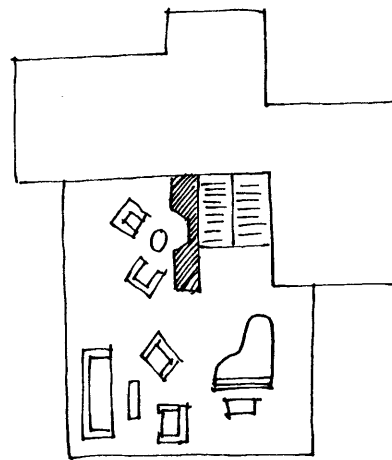




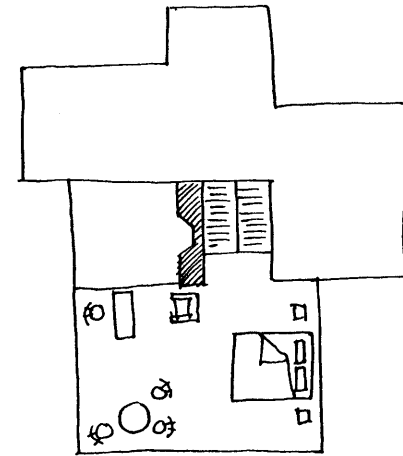
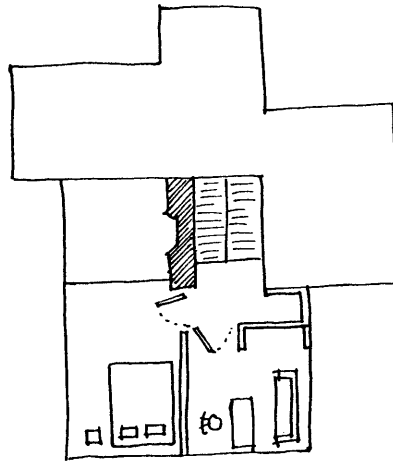
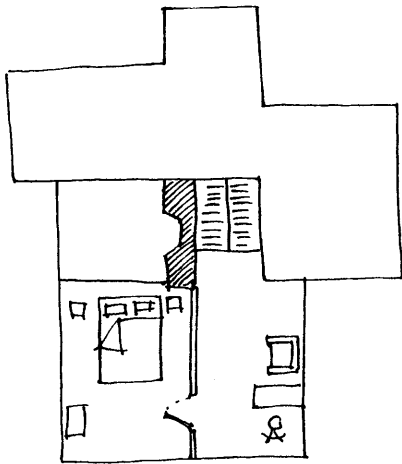
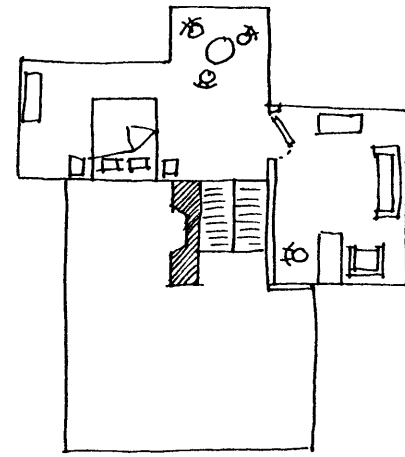
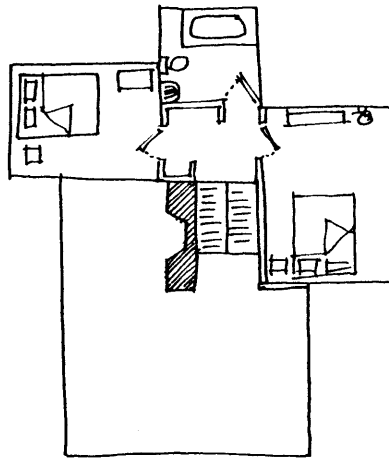
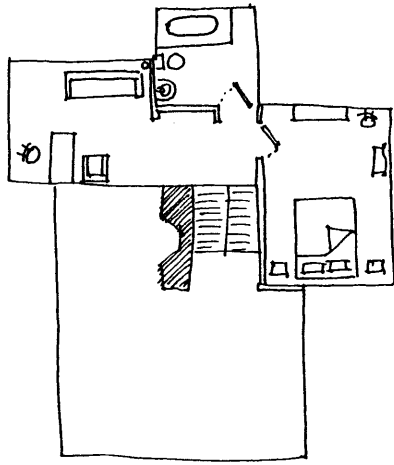
ENTRANCE LEVEL



OPTIONS  
LIVING ROOM LEVEL



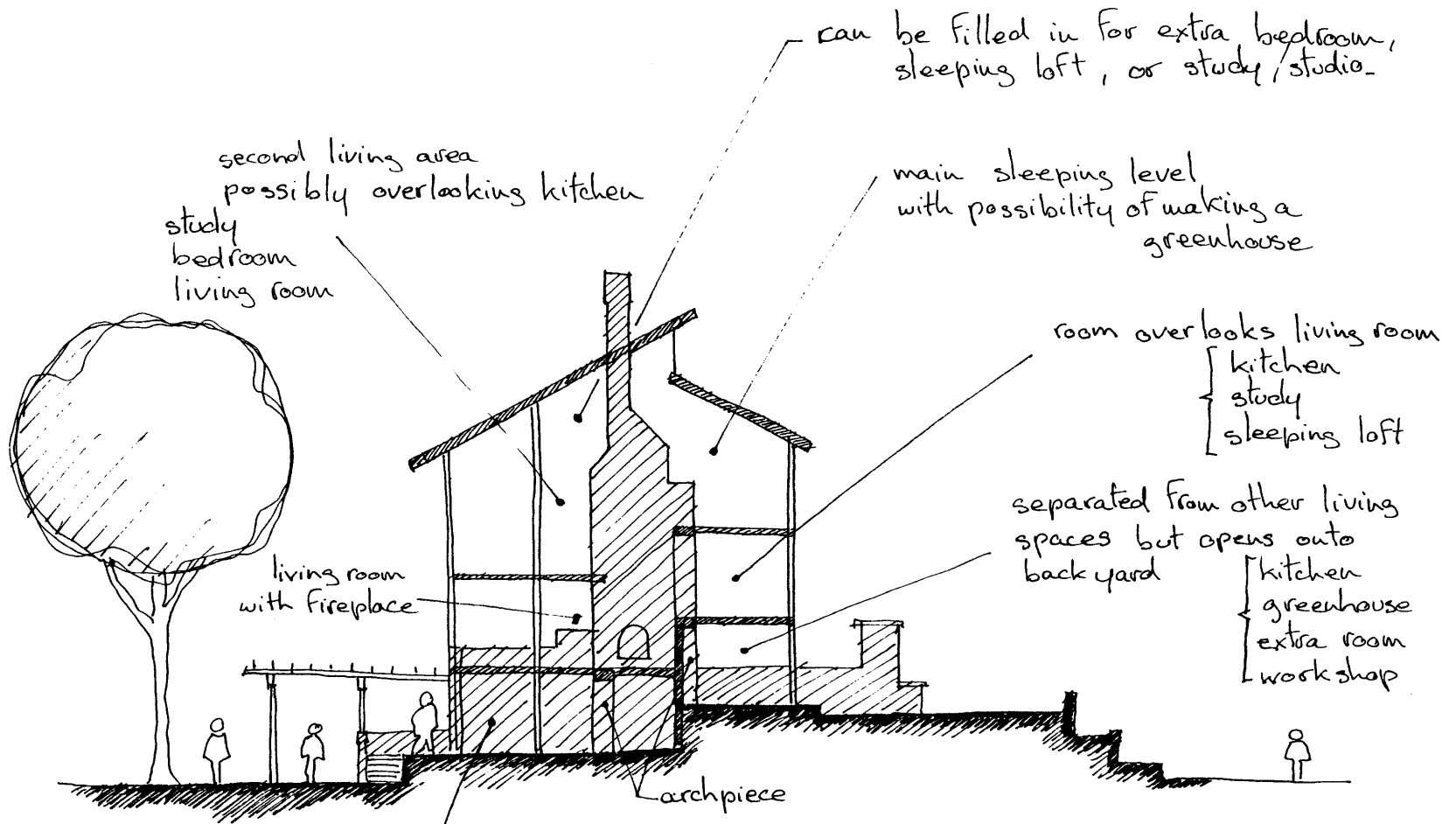




OPTIONS  
BEDROOM LEVELS





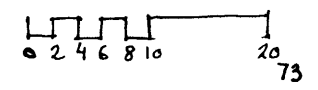


cave-like space

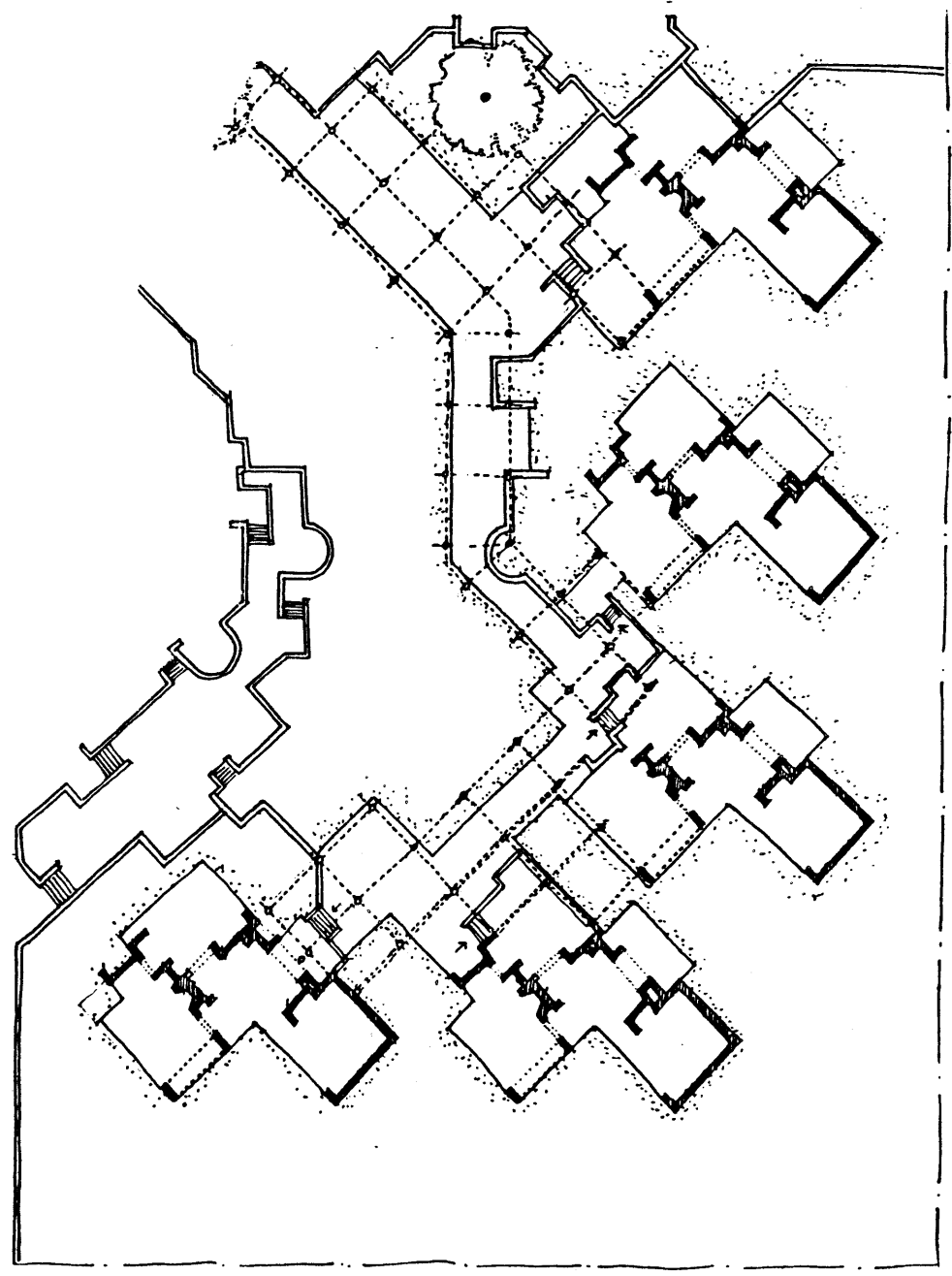
opens to outside and becomes part of street life

- { workshop
- { bicycle storage
- { mudroom
- { extra bedroom

SECTION  
ELLERY STREET UNIT



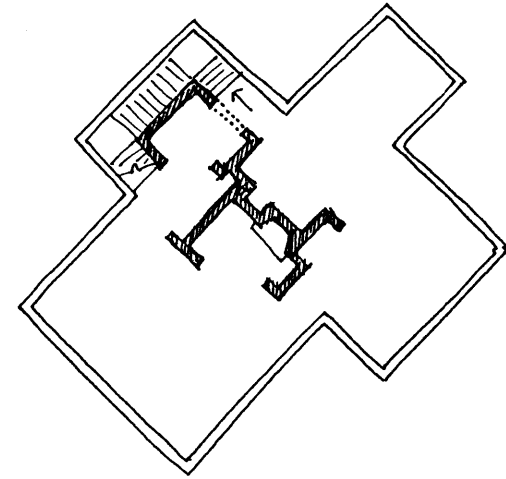
DETACHED UNITS



## DETACHED UNITS

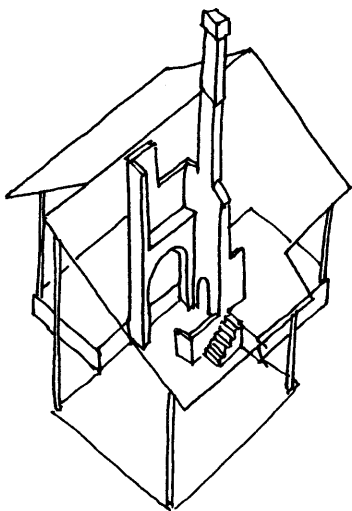
The detached units in the interior of the site emulate the form of the neighboring houses. The eave at the top of the second story makes these units considerably lower than either the units along Ellery or Broadway. The greater portion of green space reflects the boundary conditions where the site adjoins the surrounding backyards. The houses are turned at forty-five degrees to accommodate the corner unit more easily. This configuration also helps to improve views, while emphasizing the fact that they are detached as opposed to the other units on the site. It was important to maintain a link between the front and back yards, as distinct from a row house situation, because the yards become more similar and therefore an extension of the public green space.

The general organization of the units puts the main living functions on the second floor. The ground floor is considered as a very public part of the house which can be opened to the outside with large garage-type doors. Here one would find various workshops, a summer kitchen, a laundry room or an extra guest room. Bedrooms could be oriented towards the rear yard, avoiding the privacy issue. The living room, kitchen and dining room are on the floor above. Since it is these areas that are most likely to be changed, the unit will balloon out on the second floor, creating useable

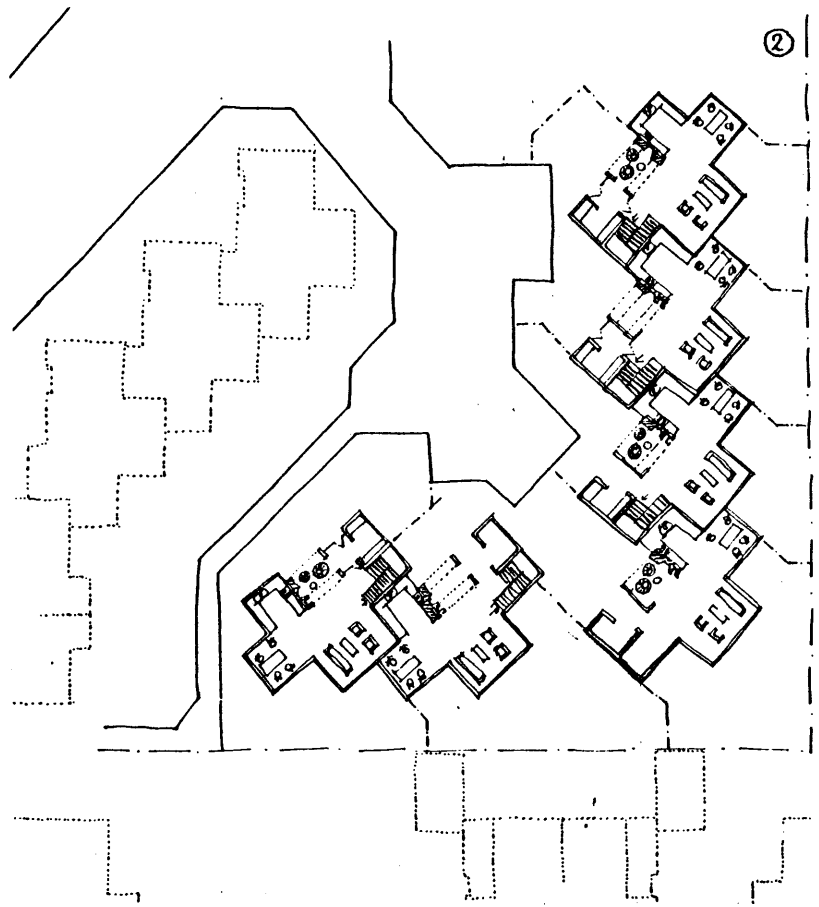
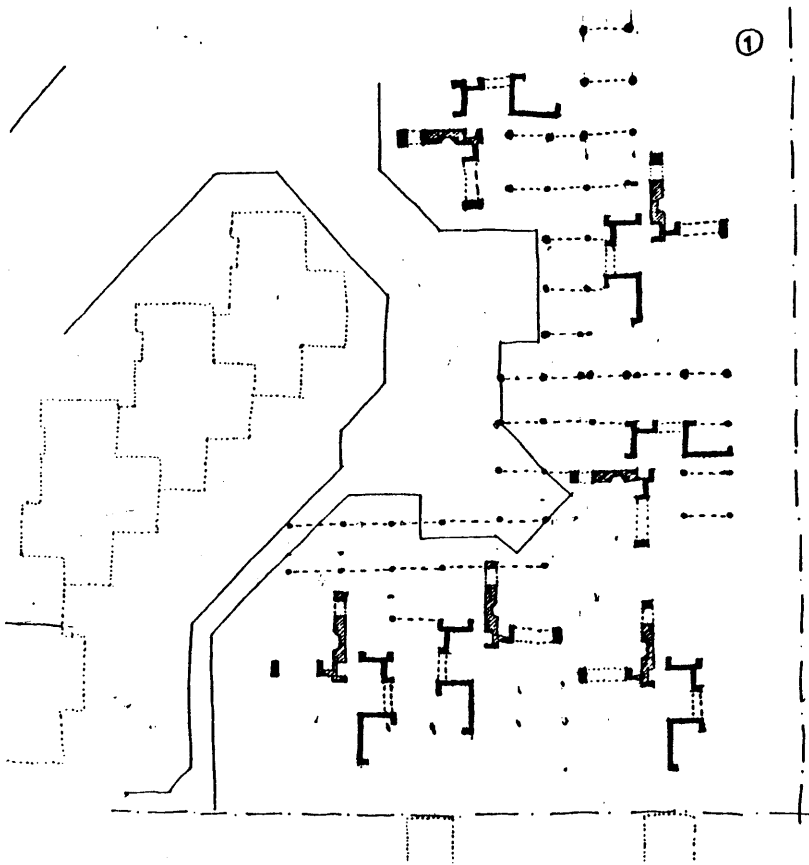


space below. The bedrooms fill in the space under the roof.

In this case the unit can be considered as essentially a volume defined by a roof, masonry, and foundation plan. The skin is not a rigid constraint. Everything within this volume, then, is variable. It is, however, easier to fix the fireplace at some height on the core. Assuming that it is a fixed element, it would be situated on the second floor. This guarantees at least one room at ground level. This space would then be used as the entrance, storage, and mud-room. The rest of the unit could be either in a split level relationship to this piece, or could be simply continuous floors. One can also imagine the possibility of supporting the roof independently of the enclosing walls by post and beam system. The masonry core and certain exterior masonry walls could then be used to provide lateral restraint. The actual closing in of the building occurs in a subsequent design stage. Perhaps, if many of these units were built, the standardization of the roof structure would offset the cost incurred by the ultimate redundancy of the roof support.

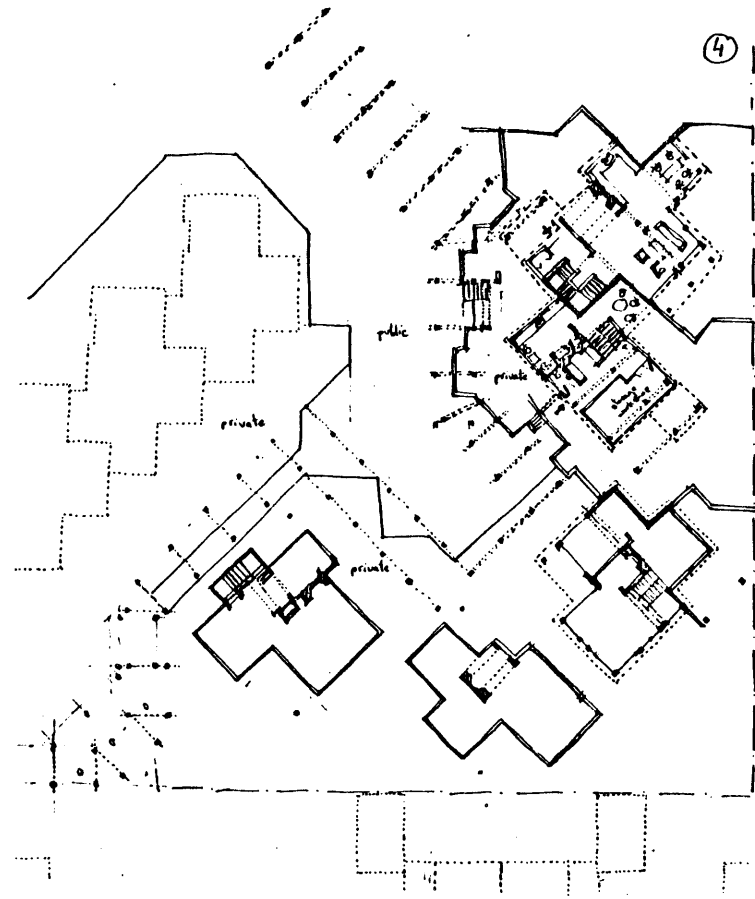
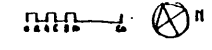
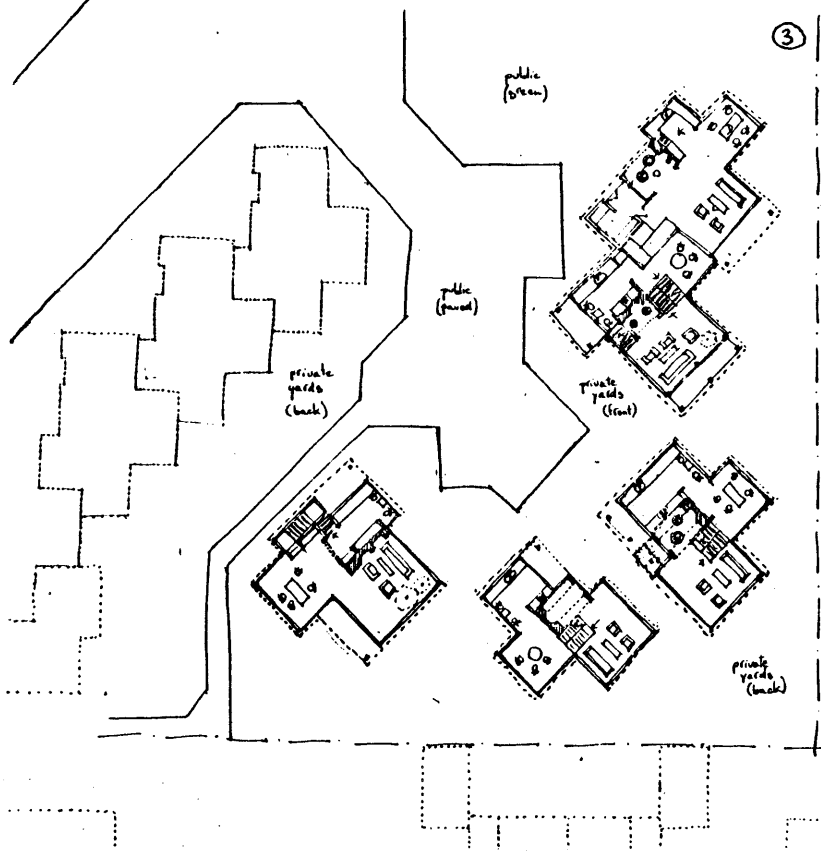


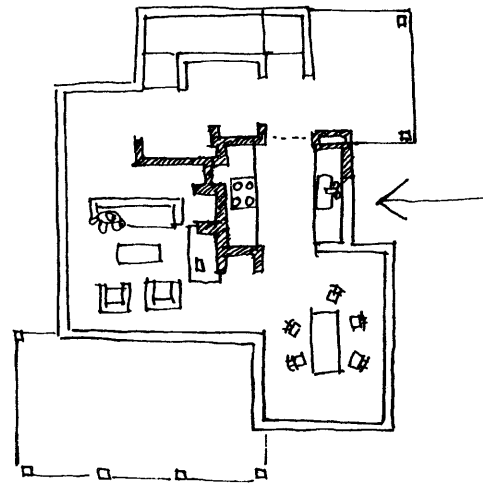
PROCESS DRAWINGS



Development of the detached units

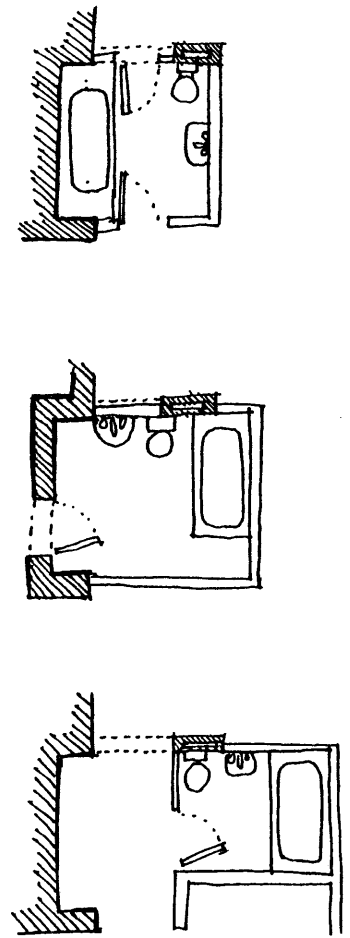
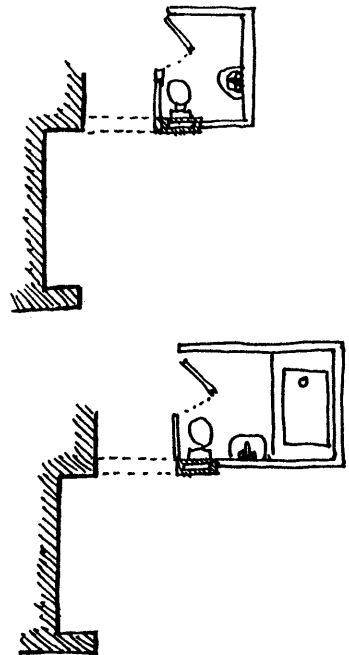
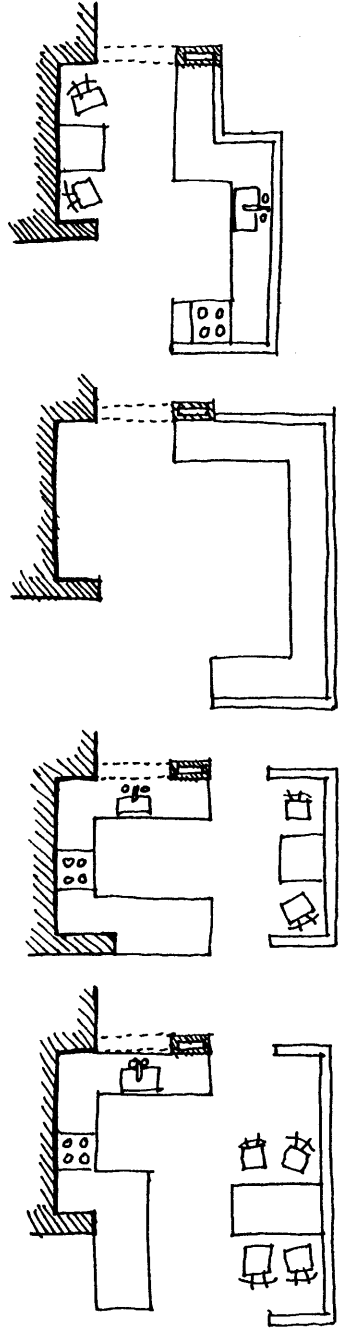
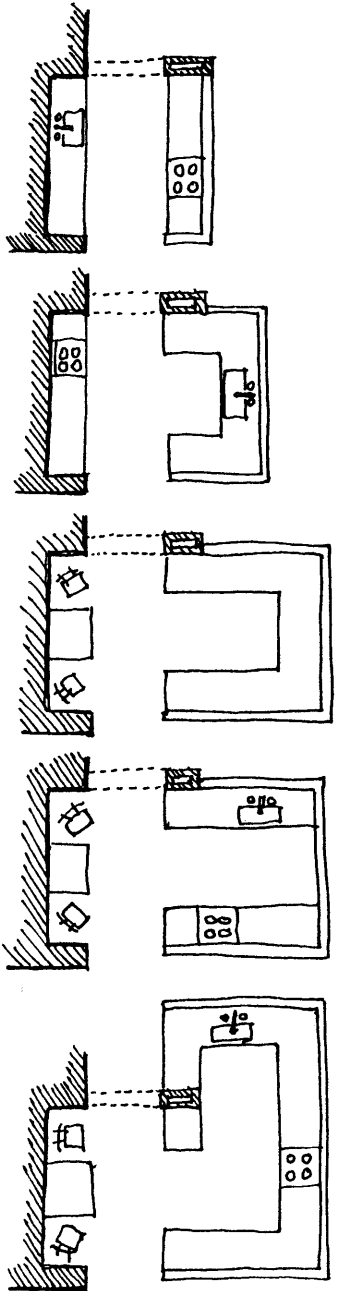


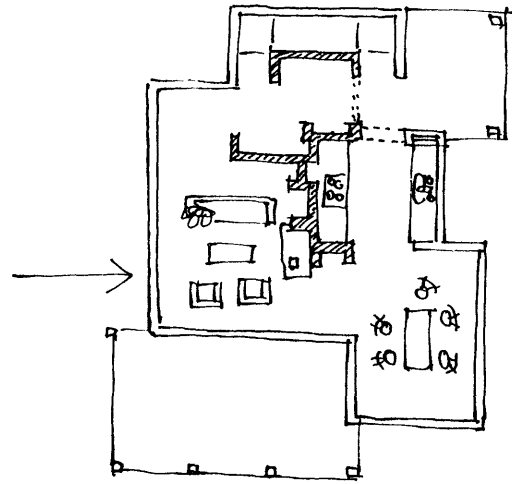




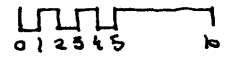
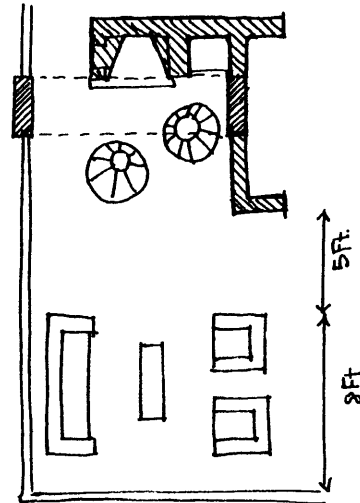
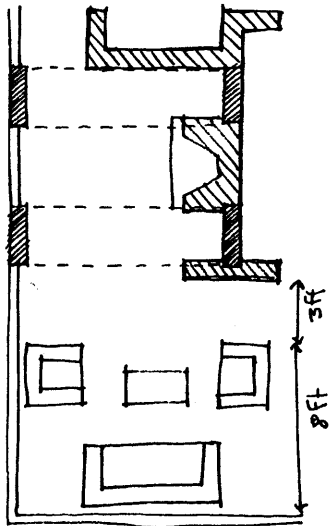
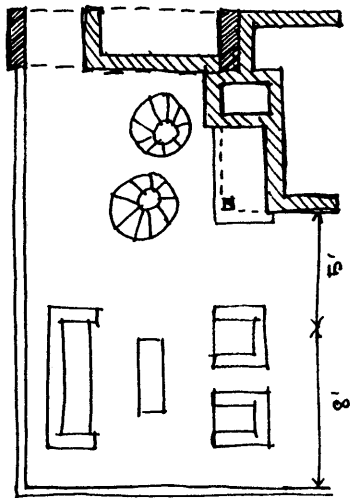
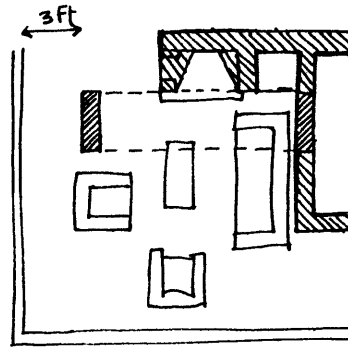
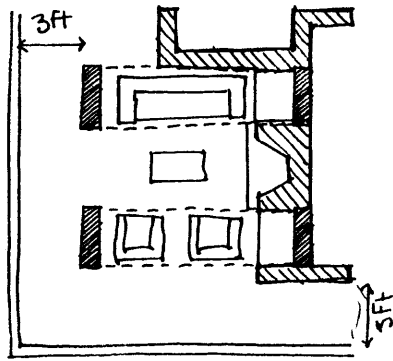
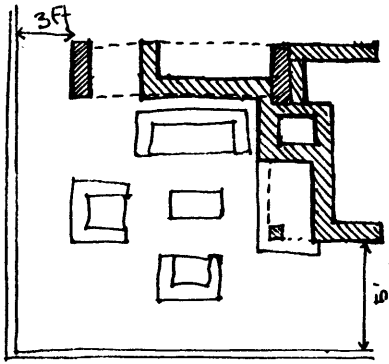
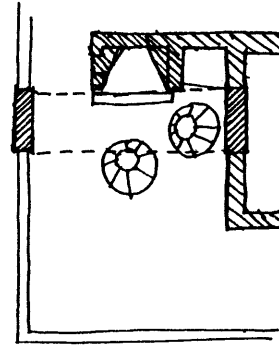
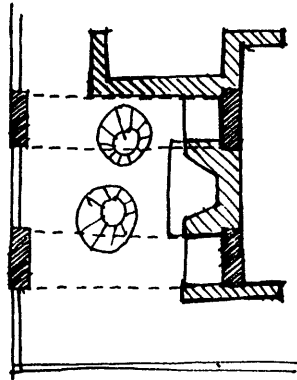
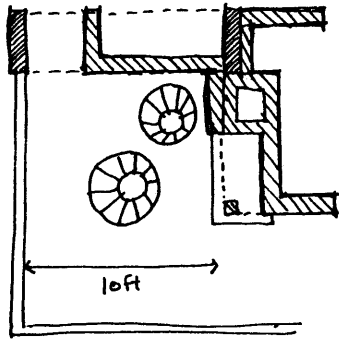
EXPLORATION OF  
KITCHEN VARIABILITY  
by using a  
3 Foot cantilever  
and a  
point Footing 7 Feet out

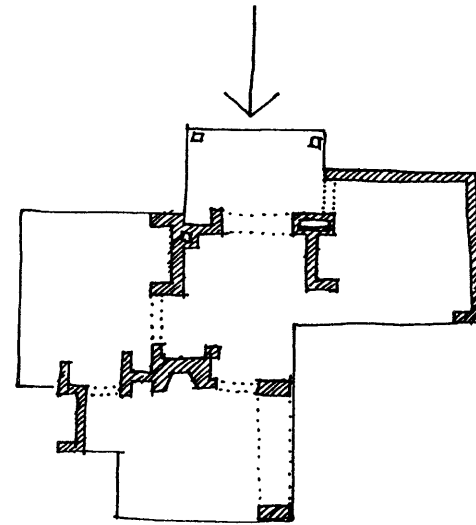




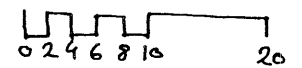


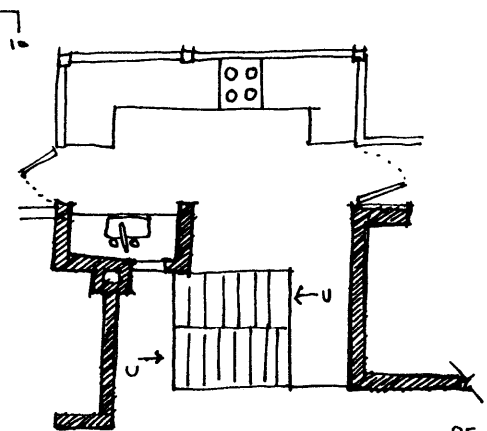
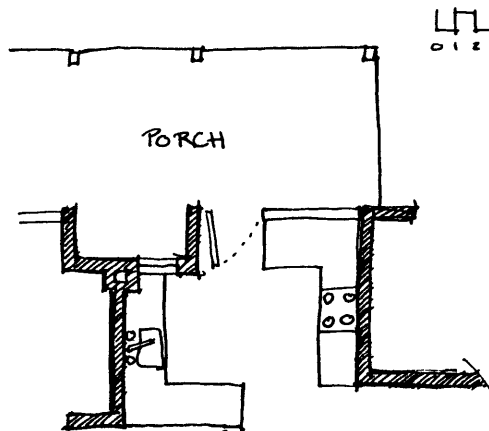
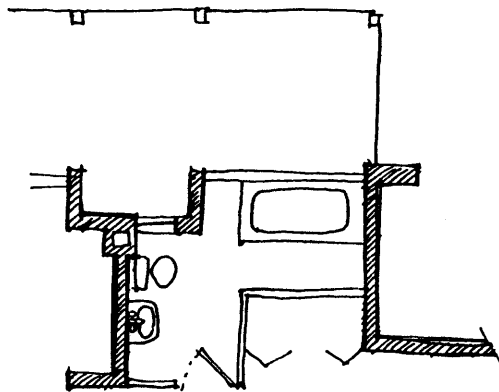
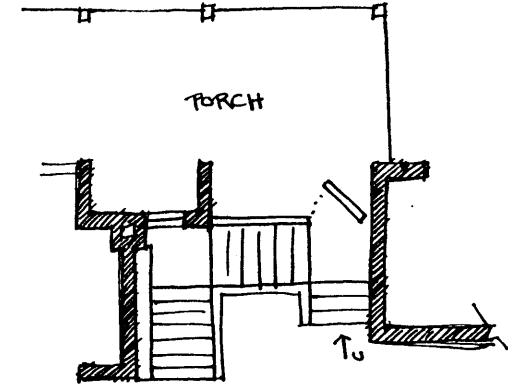
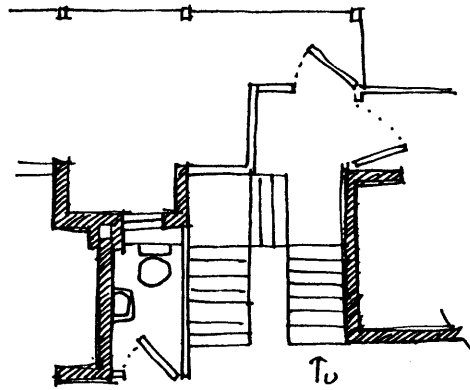
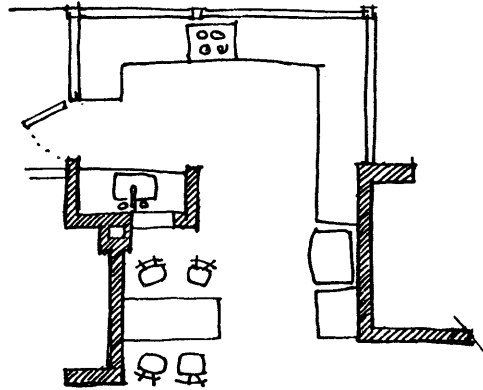
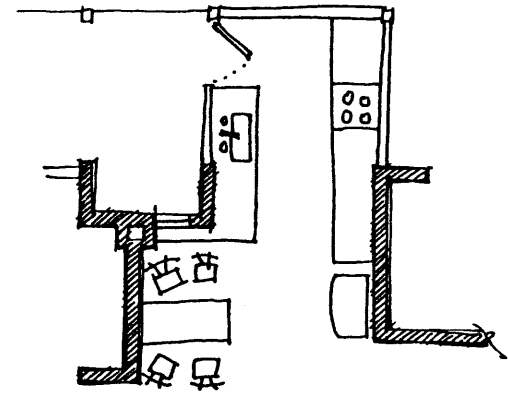
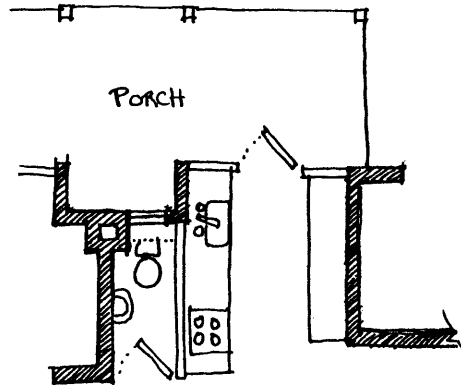
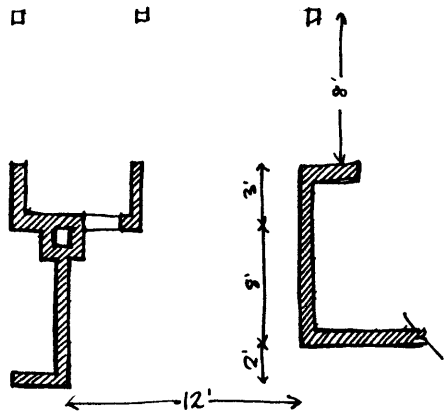
EXPLORATION OF  
LIVING ROOM VARIABILITY  
by using a  
3 foot cantilever  
and  
building out on to a  
porch



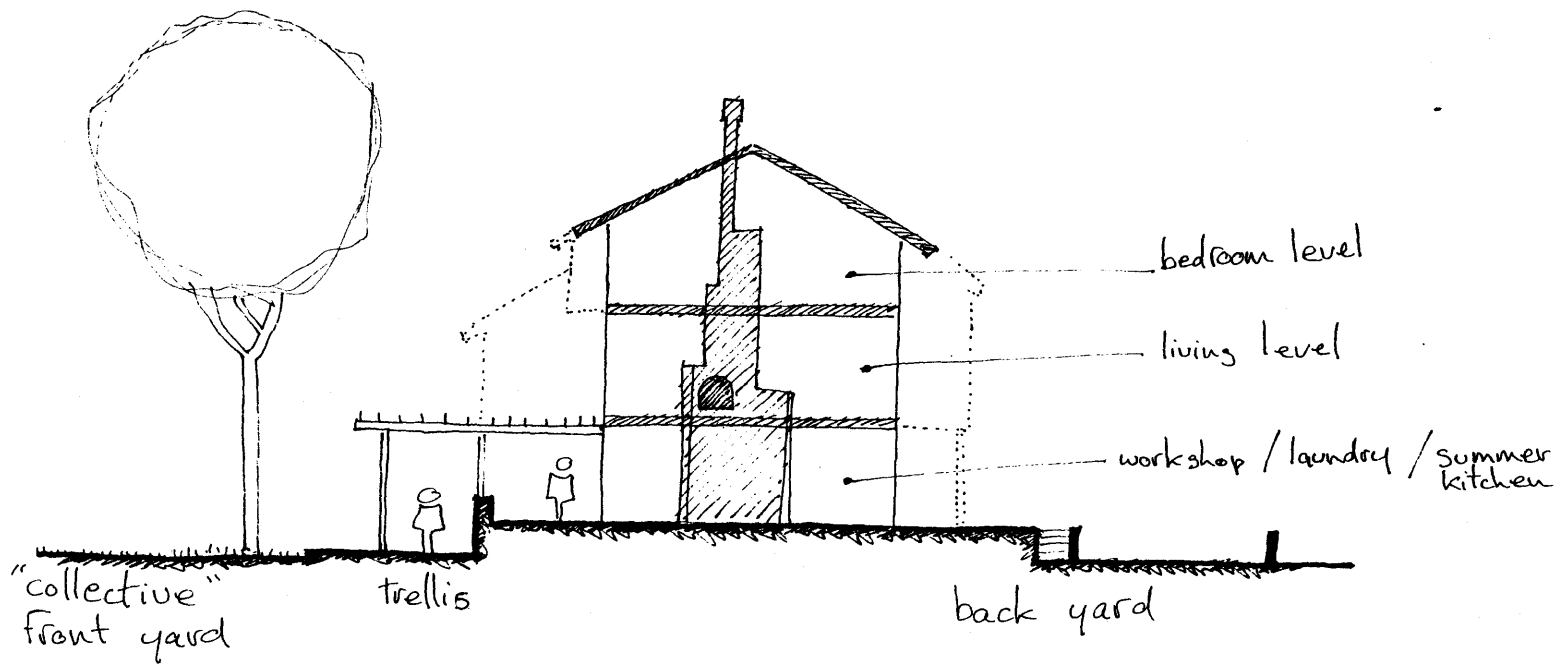


EXPLORATION OF  
CORE VARIABILITY

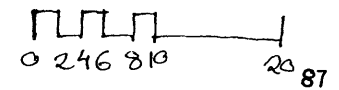








SECTION







## DISCUSSION

The role of the designer is unusual in this case, since it involves interrupting the design process at some point and presenting options towards eventual completion. The elaboration of such options could inform the prospective resident or subsequent architect of the essential objectives, while leaving the final design open to individual interpretation. The designer thus avoids the awkward situation of having to make assumptions about every aspect of the lifestyle of a "typical" resident. The role of the developer is also different from any standard one seen in this country.

The preceding description was devised solely from a design point of view. It is an exercise in flexibility for everyone concerned: architect, developer, residents, builders, but the actual logistics and feasibility were given little consideration. For the sake of discussion, it is worthwhile to put the approach in perspective, within the range of viable alternatives. At one extreme, one can imagine a complete break in responsibility midway through the construction process. It is in the developer's best interest to supply a finished product, preferably one that is standardized to avoid unpleasant surprises. He/she could build all the plumbing infrastructure and do the concrete and masonry work. Lots would be purchased by individuals who then build on this framework "landscape." The

developer, in this way, can dissociate early on from the work.

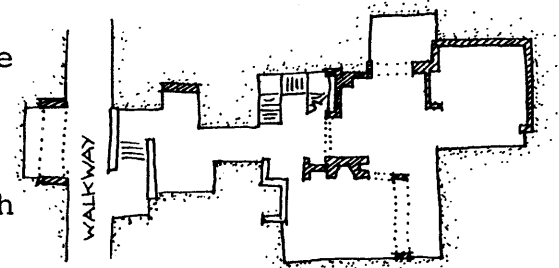
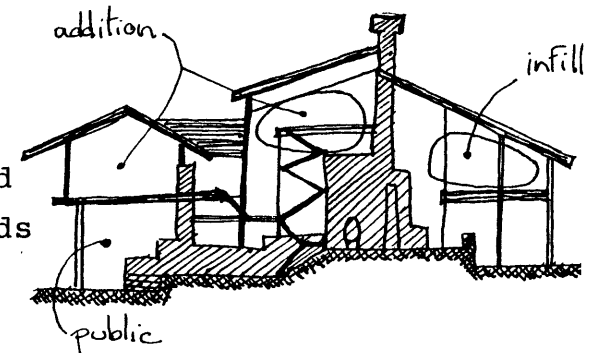
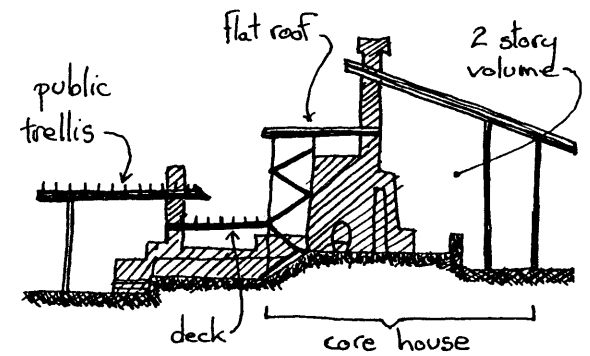
The person who has bought land there is provided with a core, foundation walls and a set of guidelines as a basis from which to build his/her home. One must assume, for the sake of coherence throughout the site and project, that the buyer is bound by contract with respect to the guidelines. They determine, for example, roof height, slope and direction, and perhaps a limit as to how far out from the given foundations he/she can build. Given these constraints, the owner can either build the house him/herself, or hire a local builder. Alternatively, the buyers can cooperate and help each other build their houses, sharing tools and some costs. This type of arrangement is seen in rural villages in Africa or Latin America, where the inhabitants all get together to build houses for each other using local materials.

This solution could take advantage of the cost savings of certain standardized parts and the use of large scale development for the heavy and expensive work which requires highly skilled laborers. The flexible wood frame construction could be left in the hands of many different people. The problem with this approach is that it is a radical departure from the status quo, and it is not likely that the public or the banking institutions would have a strong motivation to get involved in such a project. The need for individual expression in housing will surely arise as large scale planning

plays an increasing role in dwelling design. If a process, such as the one explored in this thesis, could also incur cost savings to the buyer and developer, it would be all the more attractive and banks could be encouraged to finance such "process-developments."

At the other end of the process/product spectrum, the developer would supply a substantially completed house and then relinquish control to the buyer. All of the elements such as roofing, outer wall, etc., would be constructed, guaranteeing the unity of the whole site. The buildings are truly "core houses" which are habitable yet unfinished inside. Some flooring and interior partitions could be left out. Alternatively, one part of the house might be inhabited and the rest left as a volume to be dealt with later, as needs and funds arise. The two-story livingroom, attic space and flat portions of the roofs can all be developed into habitable space, at any time. This approach has a large advantage over the previous one, since it is less radical, more feasible and requires much less dialogue between developer, architect, and owner. Potential buyers might be more open to purchasing such a core house than a substantially unfinished product with "vast possibilities."

The scenario which I have envisaged lies somewhere between the two extremes. The approach is not exactly "self help," because the people are not expected to take an active part in the construction but in the design of their homes.



The resident makes some basic decisions at the outset, in conjunction with the architect, to design a core house, but this is still an incomplete product. The idea is that whatever portion of the house is to be lived in should need no further modification. For example, the size and location of the kitchen would be decided at the initial stage, since it involves basic decisions such as the placement of the plumbing chase. Any major subsequent changes would be highly disruptive to everyday life. Parts of the house left unfinished could be everything excluding the communal spaces. The sleeping areas could be left open until one decides how much privacy is desired. The ground floor is left open since living functions are in most cases on the second floor. Space under the roof is either left open or closed off as an attic, until it is needed for other functions.

I see the design and development of the units broken down into basically three phases. In a primary development stage, the architect makes decisions concerning the concrete and masonry construction. This network clearly defines the overall organization of the site and the size and types of the units. A second stage invites buyers to choose between basic variations in layout, which correspond to the wood system. The third stage is essentially the filling-in of the core house. These as decision are made over time, and could be built by the resident, or contracted out to a local carpenter.

The key to this scheme is that it is based on a systematized rather than a standardized approach. The task of the developer is simplified by repeating the same foundation and roof plans for each unit-type. For the architect, systematization represents designing standard elements which can be combined to create different cores. He/she must define possible variations and establish a price list for each basic change. The person who intends to buy a house or apartment is presented with a "core" and can have certain specified changes made at extra cost. Alternatively, he/she can buy the core house and have his/her own changes made later, according to agreed-upon constraints. These after-the-fact modifications are likely to be minor, with respect to the original house. Such activity corresponds to the third in-fill stage, which is protracted over time.

The point of this intricate process is to provide a better quality building which is incomplete, rather than a rigid, mediocre one which risks becoming run down as the novelty wears off, as is often the case with modern construction. If the unit is adaptable and responsive to the people's invested time, energy and money, it is more likely that they will stay there for a substantial period. This attitude generates two alternatives (which are not necessarily mutually exclusive): to lower the initial cost of the dwelling by allowing for subsequent completion as needs arise, or to create a better unit which is smaller at the outset, but can

be expanded over time. Both processes imply a long-term commitment.

The major problem is a strategic one: how much disruption can this community tolerate? This consideration, along with the need for every unit to be subsequently completed, makes the necessity for centralized development more clear. The incompletions, however, give the residents the opportunity to try out an open plan arrangement, and to partition off the space later. It also gives them time to become acquainted with their surroundings, and to decide where various uses should be. The openness of the site organization and the fact that everyone is involved in the same type of growth process within their home, should foster a community spirit and an air of mutual understanding and cooperation between residents.







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